

# 37° Flared SAE - J514

## Tube Fittings with O-Ring for Fractional and Metric

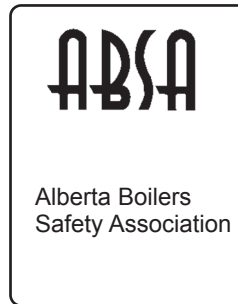
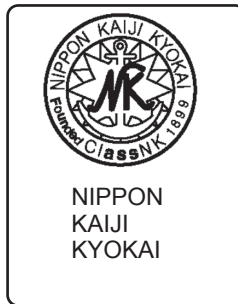
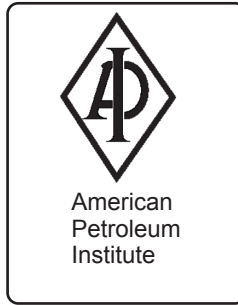


Catalog No. H - 240FF  
Mar. 2002

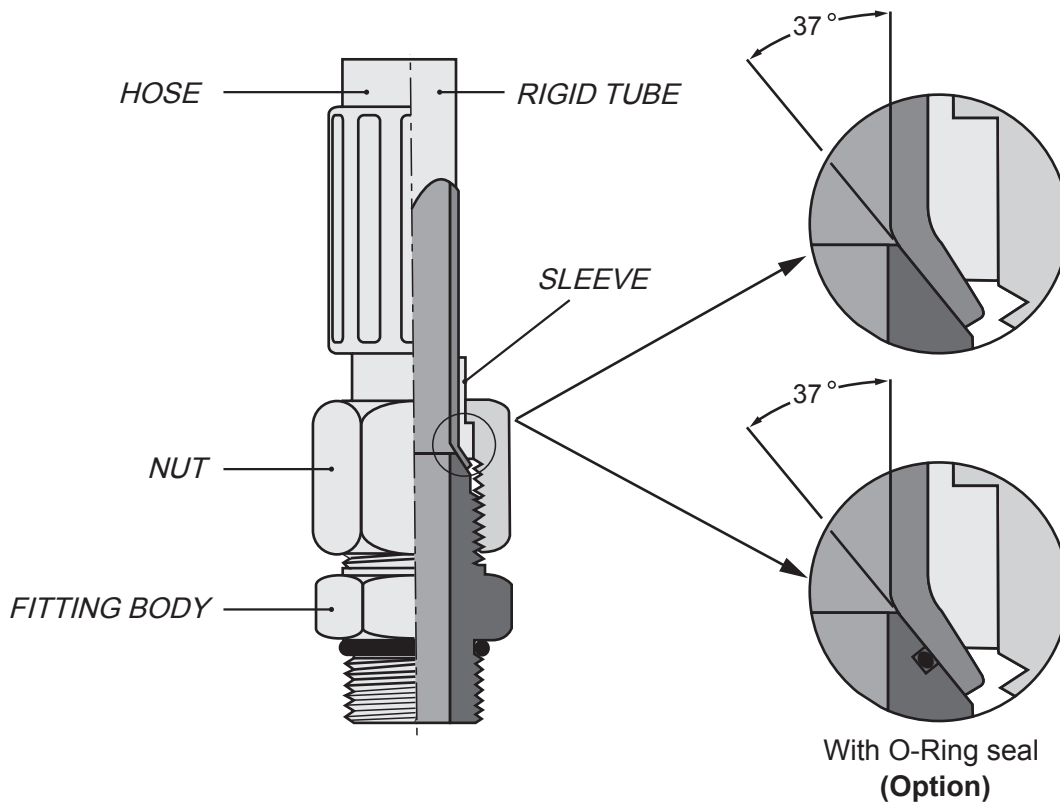


하이록코리아주식회사  
HY-LOK CORPORATION









*This type of assembly ensures very high dependability.*

*The assembly is achieved by connecting the two parts together by means of a nut and a sleeve.*

## MAIN CHARACTERISTICS

- The assembly performs extremely well even under severe vibrations, pressure bursts, and thermal shocks.
- On tightening, the sleeve ensures tube alignment with fitting axis, reduces mechanical strain on tube and decreases vibrations.
- Fitting can be equally coupled to metric or inch-tubes.
- The tube doesn't undergo distortion, remains constant and fluid pressure losses are negligible.
- The system efficiency remains equally guaranteed after several disassemblies and assembly operations and individual replacement of any component.

## MATERIAL AND SURFACE PROTECTION

Fittings are normally made of steel and obtained from controlled bar-stock machining (straight fittings, nuts) or by hot or cold forming (shaped fittings, sleeves). Alternative materials such as brass, aluminium, stainless steel available upon request. All carbon steel fittings but those to be brazed or welded-on tubes, are yellow zinc plated to a Min. thickness of 0.008 mm to comply with ASTM-B-117, UNI 5687 hot salt spray test method. All threads are shock protected with plastic caps or plugs.

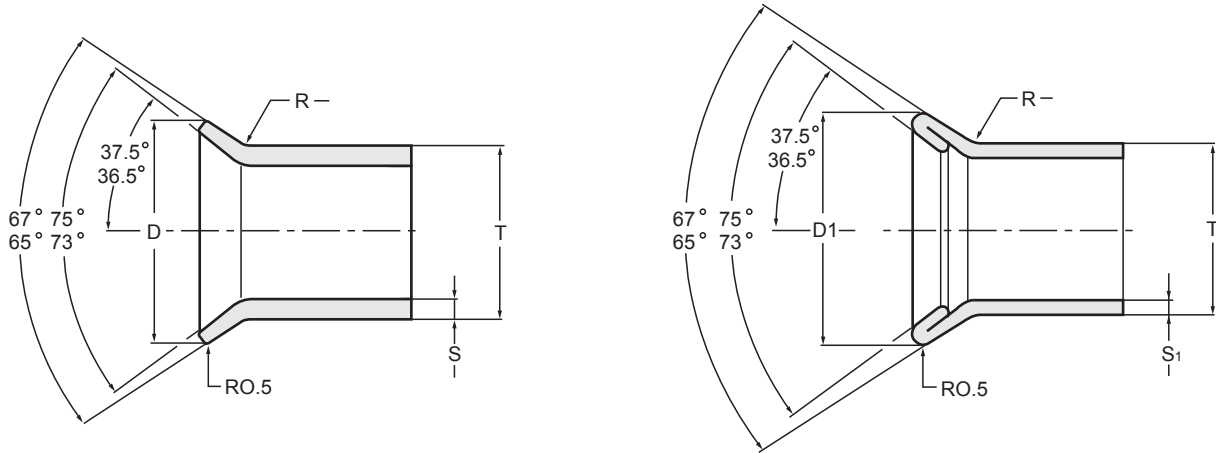
## SEALS

All fittings requiring seals are supplied with O-Ring seals and washers.



## FLARING OPERATION

Tube flaring is carried out in two different ways ; single wall flare on thick wall tubes and double wall flare on thin wall tubes to reinforce same. Refer to table I and II for recommended values.



**TABLE I - Metric tubes.**

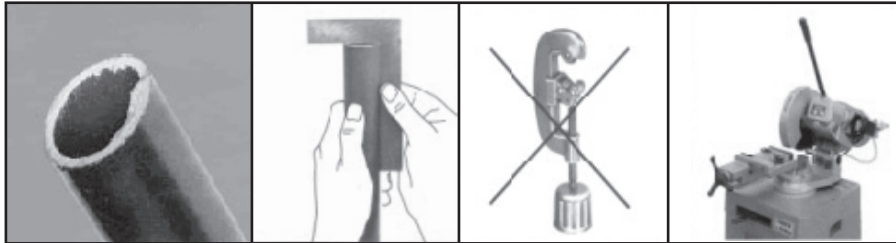
| T<br>Tube<br>O.D | D    |      | S   | D1   |      | S1   | R   |
|------------------|------|------|-----|------|------|------|-----|
|                  | Max. | Min. |     | Max. | Min. |      |     |
| 6                | 9.2  | 8.4  | 1.5 | 9.2  | 8.4  | 0.88 | 0.8 |
| 8                | 10.8 | 10.1 | 1.5 | 10.8 | 10.1 | 0.88 | 0.8 |
| 10               | 12.5 | 12   | 1.5 | 12.5 | 12.0 | 1.2  | 1.0 |
| 12               | 16.7 | 16   | 2.0 | 16.7 | 16.0 | 1.2  | 1.5 |
| 14               | 19.5 | 18.8 | 2.0 | 19.5 | 18.8 | 1.2  | 1.5 |
| 15               | 20.0 | 19.4 | 2.0 | 20.0 | 19.4 | 1.2  | 1.5 |
| 16               | 20.0 | 19.4 | 2.5 | 20.0 | 19.4 | 1.2  | 1.5 |
| 18               | 24.0 | 23.5 | 2.5 | 24.0 | 23.5 | 1.2  | 2.0 |
| 20               | 24.5 | 24.0 | 2.5 | 24.5 | 24.0 | 1.5  | 2.0 |
| 22               | 27.2 | 26.2 | 3.0 | 27.2 | 26.2 | 1.5  | 2.0 |
| 25               | 30.2 | 29.5 | 3.0 | 30.2 | 29.5 | 1.5  | 2.3 |
| 30               | 38.0 | 37.4 | 3.0 | 38.0 | 37.4 | 1.5  | 2.3 |
| 32               | 38.3 | 37.6 | 3.0 | 38.3 | 37.6 | 1.5  | 2.3 |
| 38               | 44.5 | 43.5 | 4.0 | 44.5 | 43.5 | 1.5  | 2.8 |

**TABLE II - Inch tubes**

| T<br>Tube<br>O.D | D    |      | S   | D1   |      | S1  | R   |
|------------------|------|------|-----|------|------|-----|-----|
|                  | Max. | Min. |     | Max. | Min. |     |     |
| 1/4              | 9.1  | 8.6  | 1.6 | 9.1  | 8.6  | 0.8 | 0.8 |
| 5/16             | 10.9 | 10.2 | 1.6 | 10.9 | 10.2 | 0.8 | 0.8 |
| 3/8              | 12.4 | 11.6 | 1.6 | 12.4 | 11.6 | 1.2 | 1.0 |
| 1/2              | 16.7 | 16.0 | 2.1 | 16.7 | 16.0 | 1.2 | 1.5 |
|                  |      |      |     |      |      |     |     |
|                  |      |      |     |      |      |     |     |
| 5/8              | 20.0 | 19.3 | 2.4 | 20.0 | 19.3 | 1.2 | 1.5 |
| 3/4              | 24.1 | 23.3 | 2.7 | 24.1 | 23.3 | 1.2 | 2.0 |
|                  |      |      |     |      |      |     |     |
| 7/8              | 27.1 | 26.4 | 2.7 | 27.1 | 26.4 | 1.6 | 2.0 |
| 1"               | 30.4 | 29.7 | 3.0 | 30.4 | 29.7 | 1.6 | 2.2 |
|                  |      |      |     |      |      |     |     |
| 1"1/4            | 38.3 | 37.5 | 3.0 | 38.3 | 37.5 | 1.6 | 2.2 |
| 1"1/2            | 44.4 | 43.1 | 3.0 | 44.4 | 43.1 | 1.6 | 2.7 |

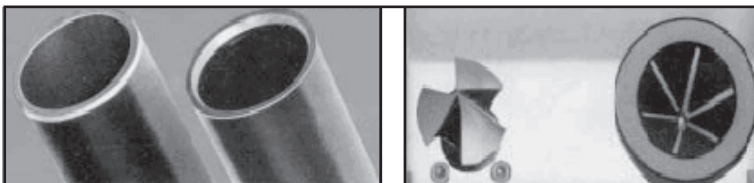


## CONDITION FOR A CORRECT FLARING



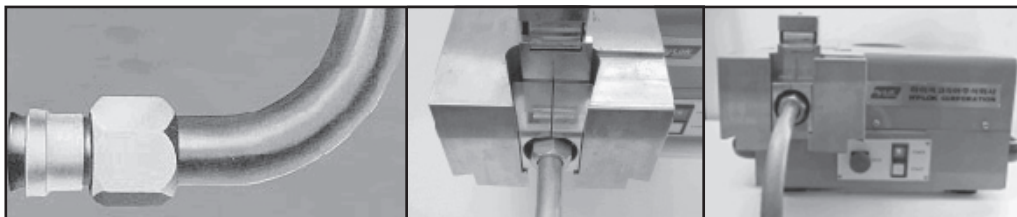
### 1.0 Swaging process

- 1.1 Saw the tube at light angle. An angular offset of  $0.5^\circ$  in relation to the tube axis is permissible.
- 1.2 Do not use a tube cutter because this would cause formation of considerable burrs and an angular cut. Use sawing machine or device instead.



### 2.0 Deburring process

- 2.1 After clean the tube, lightly deburr tube ends at the inside and outside edge.



### 3.0 Flaring process

- 3.1 Set the pressure in accordance with table.
- 3.2 Oil the flaring cone.
- 3.3 Insert the clamping grips corresponding to each outside diameter of the tube to the flaring device.
- 3.4 Slide the nut and sleeve onto the tube.
- 3.5 Insert the tube through the clamping grips up to the stopper and press against it.
- 3.6 Start with the flaring process.
- 3.7 Remove the flared tube including the clamping grips from the flaring device.

## ATTENTION

The flare collar has to be square and concentric to the tube as well as to the flared body of  $37^\circ$  □

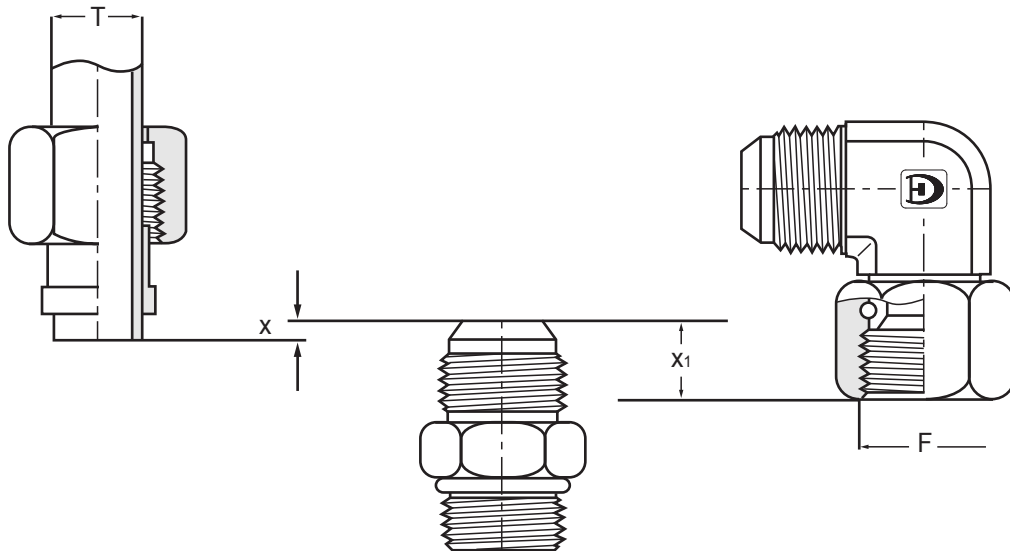
Unequal flarings point to either defect tools or to manual operating mistakes.

The inside cone of the tube has to be clean, in case the surface is faulty, it has to be polished with a polishing mandrel.



## ASSEMBLY INSTRUCTIONS.

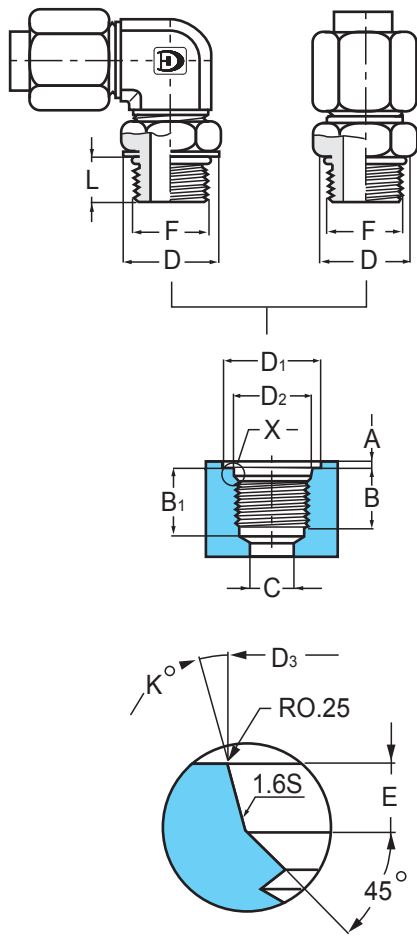
On the table below are shown the basic dimensions to calculate the overall length of tube assemblies, the actual dimension of fittings when assembled, the recommended assembly torques and working pressures.



**Table of Dimensions**

| T<br>Tube<br>O.D |       | F<br>Thread | X   | X1   | Assembly torque | Working Pressures |     |
|------------------|-------|-------------|-----|------|-----------------|-------------------|-----|
| mm               | in    |             |     |      |                 | MPa               | bar |
| 6□               | 1/4□  | 7/16-20     | 2   | 10   | 13 - 15□        | 31.5              | 315 |
| 8□               | 5/16□ | 1/2-20      | 2   | 11   | 18 - 25□        | 31.5              | 315 |
| 10□              | 3/8□  | 9/16-18     | 2   | 11.5 | 24 - 31□        | 25.0              | 250 |
| 12□              | 1/2   | 3/4-16□     | 3   | 13   | 45 - 52□        | 25.0              | 250 |
| 14□              | -□    | 7/8-14      | 3.5 | 15.5 | 65 - 72□        | 20.0              | 200 |
| 15□              | -□    |             |     |      |                 |                   |     |
| 16□              | 5/8□  | 1"1/16-12□  | 3.5 | 17.5 | 92 - 100□       | 20.0              | 200 |
| 18□              | 3/4□  |             |     |      |                 |                   |     |
| 20□              | -□    |             |     |      |                 |                   |     |
| 22□              | 7/8   | 1"3/16-12□  | 3.5 | 18   | 118 - 130□      | 18.0              | 180 |
| 25□              | 1"    | 1"5/16-12   | 3.5 | 18.5 | 127 - 145□      | 16.0              | 160 |
| 30□              | -     | 1"5/8-12    | 5   | 20.5 | 175 - 190□      | 12.5              | 125 |
| 32□              | 1"1/4 |             |     |      |                 |                   |     |
| 38               | 1"1/2 | 1"7/8-12    | 5   | 23   | 215 - 240       | 10.0              | 100 |





## SAE J475 STRAIGHT THREAD PORTS

O-Ring sealing.

D<sub>3</sub> diameter must be concentric to thread.  
Max. allowed error 0.13 mm.

Spot-faced surface must be square to thread in port.

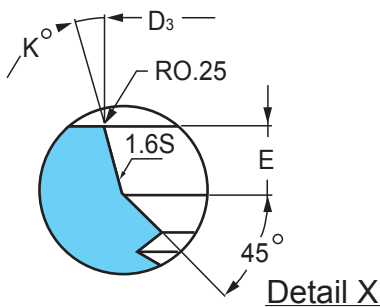
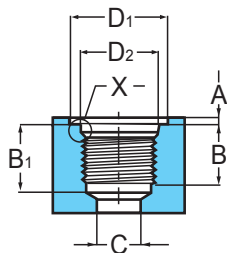
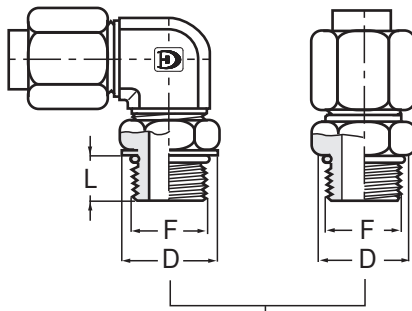
Machining operations such as A and D<sub>1</sub> not required  
when port surface complies with requirements.

Detail X

### Table of Dimensions

| F (Thread)   | 7/16-20 | 1/2-20  | 9/16-18 | 3/4-16   | 7/8-14  | 1"1/16-20 | 1"3/16-12 | 1"5/16-12 | 1"5/8-12 | 1"7/8-12 |
|--|---------|---------|---------|----------|---------|-----------|-----------|-----------|----------|----------|
| <b>Division</b>                                    |         |         |         |          |         |           |           |           |          |          |
| <b>OD Nom.</b>                                     | 11.11□  | 12.70□  | 14.29□  | 19.05□   | 22.23□  | 26.99□    | 30.16□    | 33.34□    | 41.27□   | 47.62□   |
| <b>ID Min.</b>                                     | 9.85    | 11.50   | 12.95   | 17.50    | 20.45   | 24.85     | 27.90     | 31.30     | 39.10    | 45.50    |
| <b>A Max.</b>                                      | 1.50    | 1.50□   | 1.50□   | 2.50□    | 25.00   | 2.50      | 2.50□     | 3.00□     | 3.00□    | 3.00     |
| <b>B Min.</b>                                      | 12.00   | 12.00□  | 13.00□  | 15.00□   | 17.00□  | 20.00□    | 20.00     | 20.00□    | 20.00□   | 20.00    |
| <b>B<sub>1</sub> Min.</b>                          | 14.00   | 14.00□  | 16.00□  | 18.00□   | 20.00□  | 24.00□    | 24.00□    | 24.00□    | 24.00□   | 24.00□   |
| <b>C Min.</b>                                      | 4.40    | 6.00□   | 8.00□   | 10.00□   | 13.00□  | 16.00□    | 19.00□    | 22.00□    | 28.00□   | 34.00    |
| <b>D</b>   | 16.50   | 18.50□  | 20.50□  | 26.00□   | 29.50□  | 36.50□    | 40.50□    | 44.50□    | 55.00□   | 62.00    |
| <b>D<sub>1</sub> Min.</b>                          | 21.00   | 23.00□  | 25.00□  | 30.00□   | 34.00□  | 41.00□    | 45.00□    | 49.00□    | 58.00□   | 65.00    |
| <b>D<sub>2</sub> Min.</b>                          | 15.00   | 16.00□  | 18.00□  | 22.00□   | 26.00□  | 32.00□    | 35.00□    | 38.00□    | 48.00□   | 54.00    |
| <b>D<sub>3</sub></b> <sup>+0.1□</sup> <sub>0</sub> | 12.40   | 14.00□  | 15.60□  | 20.60□   | 23.90□  | 29.20□    | 32.30□    | 35.50□    | 43.50□   | 49.80□   |
| <b>E</b> <sup>+0.4□</sup> <sub>0</sub>             | 2.40    | 2.40□   | 2.50□   | 2.50□    | 2.50□   | 3.30□     | 3.30□     | 3.30□     | 3.30□    | 3.30□    |
| <b>K ± 1°</b>                                      | 12°     | 12°     | 12° □   | 15° □    | 15° □   | 15° □     | 15° □     | 15° □     | 15° □    | 15° □    |
| <b>L</b>   | 9.50    | 9.50    | 10.50   | 12.00    | 13.50   | 15.50     | 15.50     | 15.50     | 15.50    | 15.50    |
| <b>*O.Ring</b>                                     | OR3-904 | OR3-905 | OR3-906 | OR3-908□ | OR3-910 | OR3-912□  | OR3-914   | OR3-916□  | OR3-920  | OR3-924□ |
| <b>Assembly torque (Nm)</b>                        | 21      | 27      | 40      | 78       | 110     | 180       | 230       | 285       | 320      | 400      |

Standard O-Rings : NBR SHORE-A 85 <sup>+5</sup><sub>-0</sub> (Max. temp. rang. -30 °C +120 °C). Additional compounds available on request.  
For special applications, please contact our technical department.



## METRIC PARALLEL THREAD PORTS (ISO 6149)

O-Ring sealing.

D<sub>3</sub> diameter must be concentric to thread.  
Max. allowed error 0.13 mm.

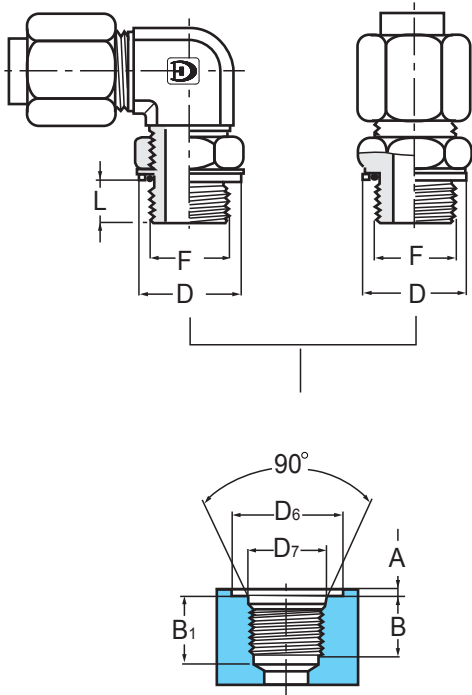
Spot-faced surface must be square to thread in port.

Machining operations such as A and D<sub>1</sub> not required  
when port surface complies with requirements.

**Table of Dimensions**

| Division                                      | F (Thread) |           |           |           |           |           |           |           |           |           |           |
|---|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|   | M10 × 1.5  | M12 × 1.5 | M14 × 1.5 | M16 × 1.5 | M18 × 1.5 | M20 × 1.5 | M22 × 1.5 | M27 × 2.0 | M33 × 2.0 | M42 × 2.0 | M48 × 2.0 |
| OD Nom.                                       | 10.00      | 12.00□    | 14.00     | 16.00□    | 18.00□    | 20.00□    | 22.00□    | 27.00     | 33.00□    | 42.00□    | 48.00     |
| ID Min.                                       | 8.90       | 10.30     | 12.30     | 14.30     | 16.30     | 18.30     | 20.30     | 24.80     | 30.80     | 39.80     | 45.80     |
| A Max.  | 1.00       | 1.50□     | 1.50□     | 1.50      | 2.00□     | 2.00□     | 2.00□     | 2.00□     | 12.50□    | 2.50□     | 2.50□     |
| B Min.  | 10.00□     | 11.50□    | 11.50□    | 13.00□    | 14.50□    | 14.50□    | 15.50□    | 19.00□    | 19.00□    | 19.50□    | 22.00     |
| B <sub>1</sub> Min.                           | 11.50□     | 14.00□    | 14.00□    | 15.50□    | 16.50□    | 16.50□    | 18.00□    | 22.00□    | 22.00□    | 22.50□    | 25.00□    |
| C Min.  | 4.00□      | 6.00□     | 7.00□     | 9.00      | 11.00□    | 12.00□    | 14.00□    | 16.00□    | 22.00□    | 30.00□    | 36.00□    |
| D   | 14.50□     | 17.50□    | 19.50□    | 22.50□    | 24.50□    | 27.50□    | 27.50□    | 32.50□    | 41.50□    | 50.50□    | 55.50□    |
| D <sub>1</sub> Min.                           | 20.00□     | 22.00□    | 25.00□    | 28.00□    | 29.00□    | 32.00□    | 34.00□    | 40.00□    | 49.00□    | 60.00□    | 66.00□    |
| D <sub>2</sub> Min.                           | 14.50□     | 17.50□    | 19.50□    | 22.50□    | 24.50□    | 25.50□    | 27.50□    | 32.50□    | 41.50□    | 50.50□    | 55.50□    |
| D <sub>3</sub> <sup>+0.1□</sup> <sub>0□</sub> | 11.10□     | 13.80□    | 15.80□    | 17.80□    | 19.80□    | 21.80□    | 23.80□    | 29.40□    | 35.40□    | 44.40□    | 50.40□    |
| E <sup>+0.4□</sup> <sub>0</sub>               | 1.60□      | 2.40□     | 2.40□     | 2.40□     | 2.40□     | 2.40□     | 2.40□     | 3.10□     | 3.10□     | 3.10□     | 3.10□     |
| K ± 1°  | 12°□       | 15°□      | 15°□      | 15°       | 15°□      | 15°□      | 15°□      | 15°□      | 15°□      | 15°□      | 15°□      |
| L   | 9.00       | 9.00      | 10.50     | 12.00     | 13.50     | 13.50     | 14.00     | 17.00     | 17.00     | 17.50     | 20.00     |
| O-Ring  | KP-B-P9    | KP-B-P10  | KP-B-P12  | KP-B-P14  | KP-B-P16  | KP-B-P18  | KP-B-P20  | KP-B-P24  | KP-B-P30  | KP-B-P39  | KP-B-P45  |
| Assembly torque (Nm)                          | 20         | 35        | 45        | 55        | 68        | 80        | 98        | 180       | 310       | 330       | 400       |

Standard O-Rings : NBR SHORE-A 85 <sup>+5</sup>/<sub>0</sub> (Max. temp. rang. -30 °C +120 °C). Additional compounds available on request.  
For special applications, please contact our technical department.



## BSPF THREAD PORTS

O-Ring and retainer ring sealing.

Spot-faced surface must be square to thread in port.

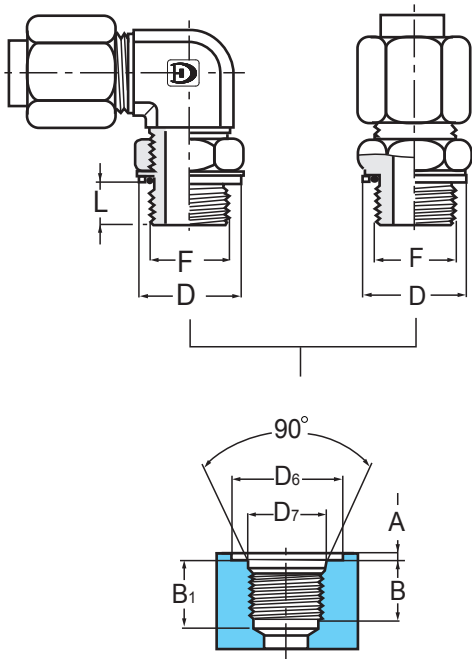
Machining operations such as A and D<sub>6</sub> not required when port surface complies with requirements.

## Table of Dimensions

| Division             | F (Thread) |           |           |           |           |          |             |             |
|----------------------|------------|-----------|-----------|-----------|-----------|----------|-------------|-------------|
|                      | 1/8" - 28  | 1/4" - 19 | 3/8" - 19 | 1/2" - 14 | 3/4" - 14 | 1" - 11  | 1 1/4" - 11 | 1 1/2" - 11 |
| OD Nom.              | 9.73       | 13.16□    | 16.66□    | 20.96□    | 26.44□    | 33.25□   | 41.91□      | 47.80□      |
| ID Min.              | 8.60       | 11.45□    | 14.95□    | 18.65□    | 24.12□    | 30.30    | 38.95□      | 44.85□      |
| A Max.               | 1.00□      | 1.50□     | 2.00□     | 2.50□     | 2.50□     | 2.50□    | 2.50□       | 2.50□       |
| B Min.               | 8.00       | 12.00□    | 12.00□    | 14.00□    | 16.00□    | 18.00□   | 20.00□      | 22.00□      |
| B <sub>1</sub> Min.  | 13.00□     | 18.50□    | 18.50□    | 22.00□    | 24.00□    | 27.00□   | 29.00□      | 31.00□      |
| D                    | 15.50□     | 19.50□    | 24.00□    | 28.50□    | 35.00     | 43.00□   | 52.50□      | 58.50□      |
| D <sub>6</sub> Min.  | 16.50□     | 21.50□    | 25.50□    | 30.00□    | 36.50□    | 45.00□   | 55.00□      | 61.00□      |
| D <sub>7</sub>       | 9.70□      | 13.20□    | 16.80□    | 21.00□    | 26.40□    | 33.30□   | 41.90□      | 47.80□      |
| L                    | 6.50       | 9.00      | 9.50      | 11.50     | 13.50     | 15.00    | 16.00       | 16.00       |
| O-Ring               | KP-B-P8    | KP-B-P11  | KP-B-P14  | KP-B-P18  | KP-B-P24  | KP-B-P29 | KP-B-P38    | KP-B-P44    |
| Assembly torque (Nm) | 20         | 35        | 70        | 100       | 190       | 300      | 330         | 400         |

Standard O-Rings : NBR SHORE-A 85<sup>+5</sup> (Max. temp. rang. -30 °C +120 °C). Additional compounds available on request.  
For special applications, please contact our technical department.





## METRIC PARALLEL THREAD SEAL PORTS

O-Ring and retainer ring sealing.

Spot-faced surface must be square to thread in port.

Machining operations such as A and D<sub>6</sub> not required when port surface complies with requirements.

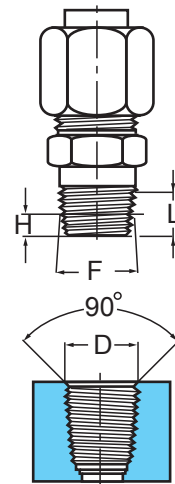
**Table of Dimensions**

| F (Thread)                  | M10 × 1.0 | M12 × 1.5 | M14 × 1.5 | M16 × 1.5 | M18 × 1.5 | M20 × 1.5 | M22 × 1.5 | M26 × 1.5 | M27 × 2.0 | M33 × 2.0 | M42 × 2.0 | M48 × 2.0 |
|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Division</b>             |           |           |           |           |           |           |           |           |           |           |           |           |
| <b>OD Nom.</b>              | 10.00□    | 12.00□    | 14.00□    | 16.00□    | 18.00□    | 20.00□    | 22.00□    | 26.00□    | 27.00□    | 33.00□    | 42.00□    | 48.00□    |
| <b>ID Min.</b>              | 8.90□     | 10.30□    | 12.30□    | 14.30□    | 16.30□    | 18.30□    | 20.30□    | 24.30□    | 24.80     | 30.80□    | 39.80□    | 45.80     |
| <b>A Max.</b>               | 1.00      | 1.50□     | 1.50□     | 1.50□     | 2.00□     | 2.00□     | 2.50□     | 2.50□     | 2.50      | 2.50□     | 2.50□     | 2.50□     |
| <b>B Min.</b>               | 8.00□     | 12.00□    | 12.00□    | 12.00□    | 14.00□    | 14.00□    | 14.00□    | 16.00□    | 16.00□    | 18.00□    | 20.00□    | 22.00□    |
| <b>B<sub>1</sub> Min.</b>   | 13.50□    | 18.50□    | 18.50□    | 18.50□    | 20.50□    | 20.50     | 20.50□    | 22.50□    | 22.50□    | 26.00□    | 28.00□    | 30.00□    |
| <b>D</b>                    | 15.50□    | 18.50□    | 19.50□    | 23.00□    | 28.00□    | 28.00□    | 29.00□    | 35.00□    | 35.00□    | 43.00□    | 53.00□    | 59.00□    |
| <b>D<sub>6</sub> Min.</b>   | 16.50□    | 20.00□    | 21.50□    | 24.50□    | 30.00□    | 30.00□    | 31.50□    | 36.50□    | 36.50□    | 45.00□    | 55.00□    | 62.50□    |
| <b>D<sub>7</sub></b>        | 10.00□    | 12.00□    | 14.00□    | 16.00□    | 20.00□    | 20.00□    | 22.00□    | 26.00□    | 26.00□    | 33.00□    | 42.00□    | 48.00□    |
| <b>L</b>                    | 8.00      | 9.00      | 9.00      | 10.50     | 12.00□    | 12.00     | 12.50     | 13.50     | 14.50     | 14.50     | 15.00□    | 17.50     |
| <b>O-Ring</b>               | KP-B-P9   | KP-B-P10  | KP-B-P12  | KP-B-P14  | KP-B-P16  | KP-B-P18  | KP-B-P20  | KP-B-P24  | KP-B-P24  | KP-B-P30  | KP-B-P39  | KP-B-P45  |
| <b>Assembly torque (Nm)</b> | 20        | 20        | 20        | 20        | 20        | 20        | 20        | 20        | 20        | 20        | 20        | 20        |

Standard O-Rings : NBR SHORE-A 85<sup>+5</sup> (Max. temp. rang. -30 °C +120 °C). Additional compounds available on request.  
For special applications, please contact our technical department.

## NPTF THREAD SEAL

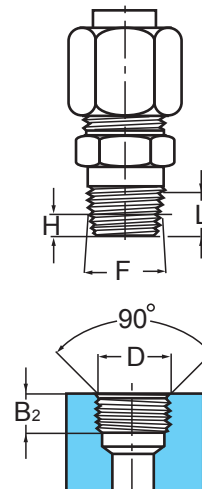
The sealing action being achieved by the male and female tapered threads is therefore suitable to withstand high pressures. If required, the sealing action can be enhanced with auxiliary compounds or tapes.



| F (Thread)       | 1/8"-27 | 1/4"-18 | 3/8"-18 | 1/2"-14 | 3/4"-14 | 1"11 1/2 | 1"1/4-11 1/2 | 1"1/2-11 1/2 |
|------------------|---------|---------|---------|---------|---------|----------|--------------|--------------|
| Division         |         |         |         |         |         |          |              |              |
| D                | 10.24□  | 13.61□  | 17.05□  | 21.22□  | 26.56□  | 33.22□   | 41.98□       | 48.05□       |
| H                | 4.10    | 5.80    | 6.10    | 8.10    | 8.60    | 10.20    | 10.70        | 10.70        |
| L working thread | 6.70    | 10.00   | 10.50   | 13.50   | 14.00   | 17.00    | 18.00        | 18.50        |

## BSPT THREAD SEALS

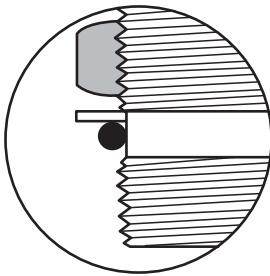
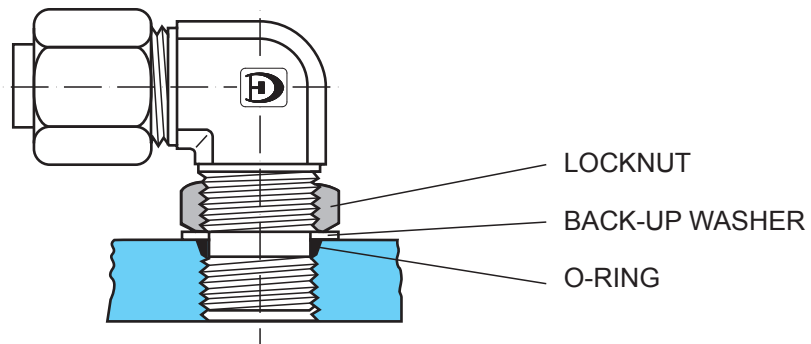
The sealing is achieved by matching a male tapered and female parallel threads. This type of seal is not recommended under high pressures.



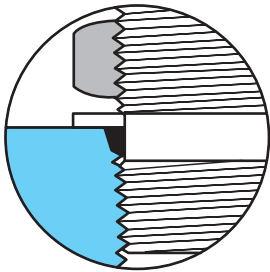
| F (Thread)          | 1/8"-28 | 1/4"-19 | 3/8"-19 | 1/2"-14 | 3/4"-14 | 1"-14  | 1"1/4-11 | 1"1/2-11 |
|---------------------|---------|---------|---------|---------|---------|--------|----------|----------|
| Division            |         |         |         |         |         |        |          |          |
| B <sub>2</sub> Min. | 5.50□   | 8.50□   | 8.50□   | 10.50   | 13.00   | 14.50  | 17.00□   | 17.00□   |
| D                   | 9.72□   | 13.15□  | 16.66   | 20.95□  | 26.44□  | 33.24□ | 41.91□   | 47.80□   |
| H                   | 4.00    | 6.00    | 6.40    | 8.20    | 9.50    | 10.40  | 12.70    | 12.70    |
| L working thread    | 6.50    | 9.70    | 10.10   | 13.20   | 14.50   | 14.50  | 19.10    | 19.10    |

## ASSEMBLY PROCEDURE FOR RADIALY ADJUSTABLE FITTINGS.

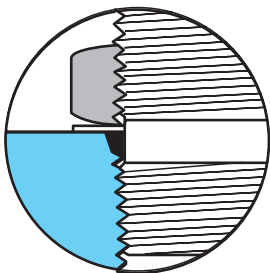
ON SAE, METRIC ISO 6149



For adjustable positioning, O-Ring and back-up washer should be in proper position on non-threaded section nearest to locknut. Lubrication of O-Ring is recommended.



Screw fitting by hand into straight thread port until back-up washer contacts face of port.

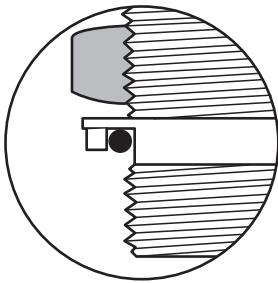
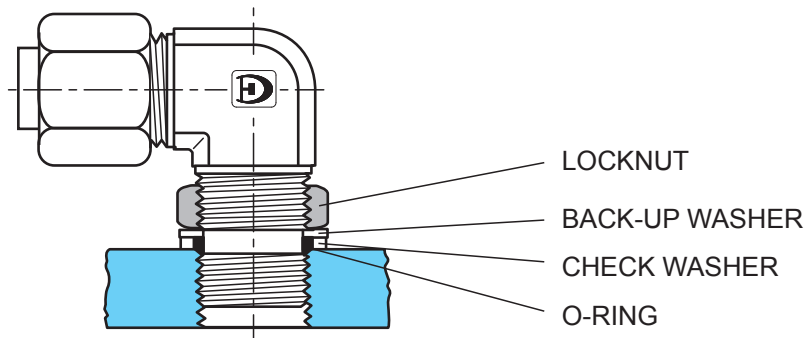


To position fitting, unscrew up to one full turn then hold fitting in desired position and tighten locknut until back-up washer contacts face of port and force O-Ring within port cavity.

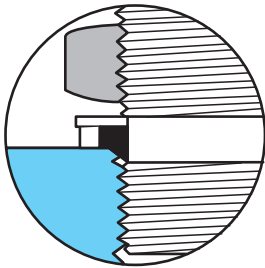


## ASSEMBLY PROCEDURE FOR RADIALY ADJUSTABLE FITTINGS.

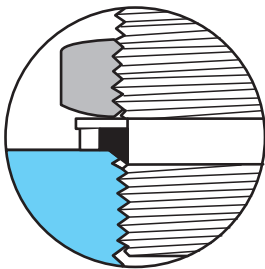
ON SAE, METRIC ISO 6149



For adjustable positioning, O-Ring and back-up washer should be in proper position on non-threaded section nearest to locknut. Lubrication of O-Ring is recommended.



Screw fitting by hand into straight thread port until check washer contacts face of port.



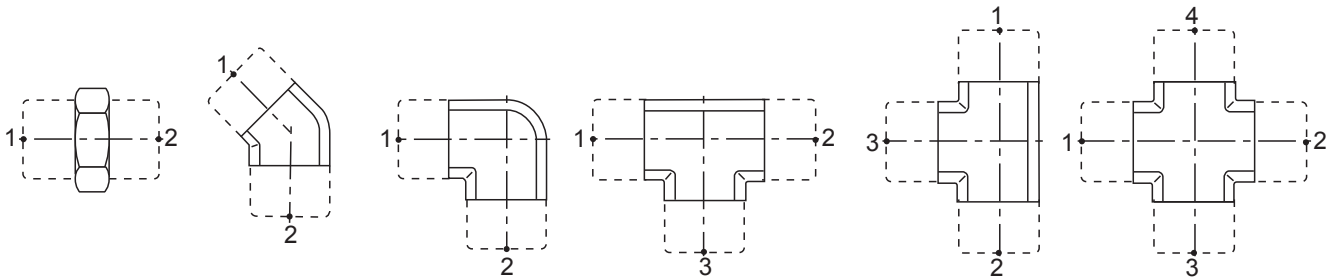
To position fitting, unscrew up to one full turn then hold fitting in desired position and tighten locknut until check washer is in contact with face of port.

## SPECIAL FITTINGS.

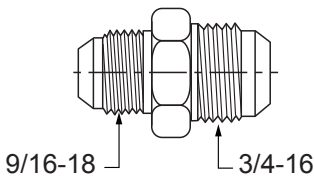
### CODING PROCEDURE

Fittings having thread combinations other than those listed in our catalogue can be ordered provided the following conditions are met :

- The geometric shape of any new fitting meets with those in the table below.
- The nominal dimension of the new fitting's ends are shown in our catalogue.
- The new fitting envelope dimensions will be those originated by the biggest thread.

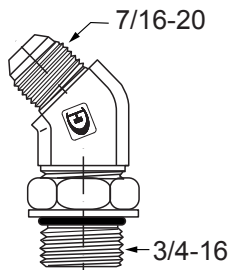


### EXAMPLES :



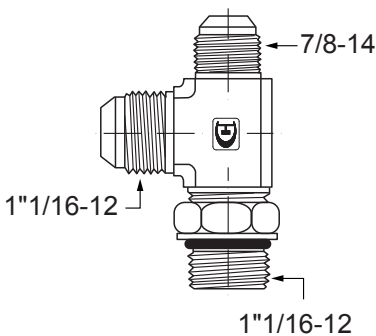
Should you wish a fitting in page 16 with following threads:  
 FUR (9/16-18) (3/4-16) this will be by for encoded as : FUR 6T - 8T.

|                                    |                            |
|------------------------------------|----------------------------|
| Example 1. Tube to Tube Connection | Option (O-Ring Seal)       |
| <u>FUR 6T - 8T - S316</u>          | <u>FOUR 6T - 8T - S316</u> |
| 1      2      5                    | 1      2      5            |



From page 37 you may order :  
 FOLMB (7/16-20) (3/4-16) by for encoded as FOLMB 4T - 08U.

|                                    |                               |
|------------------------------------|-------------------------------|
| Example 2. Tube to Tube Connection | Option (O-Ring Seal)          |
| <u>FOLMB 4T - 08U - S316</u>       | <u>FOOLMB 4T - 08U - S316</u> |
| 1      2      3      5             | 1      2      3      5        |



From page 39 you may order :  
 FORTM - (7/8-14) (1 1/16-12) (1 1/16-12) by for encoded as FORTM 10T 12T - 12U.

|                                    |                                   |
|------------------------------------|-----------------------------------|
| Example 3. Tube to Tube Connection | Option (O-Ring Seal)              |
| <u>FORTM 10T12T - 12U - S316</u>   | <u>FOORTM 10T12T - 12U - S316</u> |
| 1      2      3      5             | 1      2      3      5            |

- |                      |     |                                       |
|----------------------|-----|---------------------------------------|
| 1. Name of Fittings  | □   | : "Refer to index" (Complete fitting) |
| 2. Tube O.D          | □ □ | : See Tubing Designator               |
| 3. Thread Connection | □   | : See Thread Designator               |
| 4. Elastomer Seal    | □   | : O-Ring                              |
| 5. Material          | □ □ | : See Material Designator             |

## Tube Designator

Inch Tube

|            |      |      |      |       |        |     |
|------------|------|------|------|-------|--------|-----|
| Tube O.D   | 1/8" | 3/8" | 1/2" | ..... | 1-1/2" | 2"  |
| Identifier | 4T   | 6T   | 8T   | ..... | 24T    | 32T |

Metric Tube

|            |     |     |     |       |      |      |
|------------|-----|-----|-----|-------|------|------|
| Tube O.D   | 4mm | 6mm | 8mm | ..... | 38mm | 42mm |
| Identifier | 4M  | 6M  | 8M  | ..... | 38M  | 42M  |

## Thread Designator

Pipe Thread

|             |      |      |      |      |      |    |        |        |
|-------------|------|------|------|------|------|----|--------|--------|
| Nomial Size | 1/8" | 1/4" | 3/8" | 1/2" | 3/4" | 1" | 1-1/4" | 1-1/2" |
| Identifier  | 01   | 02   | 03   | 04   | 06   | 08 | 10     | 12     |

Unified Thred

|            |      |      |     |     |        |        |       |
|------------|------|------|-----|-----|--------|--------|-------|
| Size       | 7/16 | 9/16 | 3/4 | 7/8 | 1-5/16 | 1-5/16 | 1-5/8 |
| Identifier | 04   | 06   | 08  | 10  | 12     | 16     | 20    |

Thread Symbol

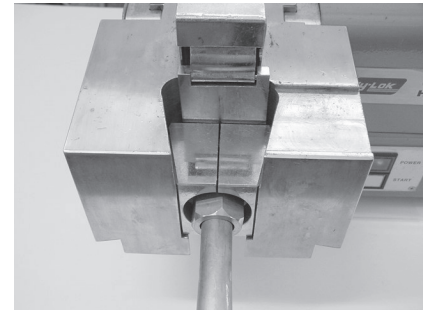
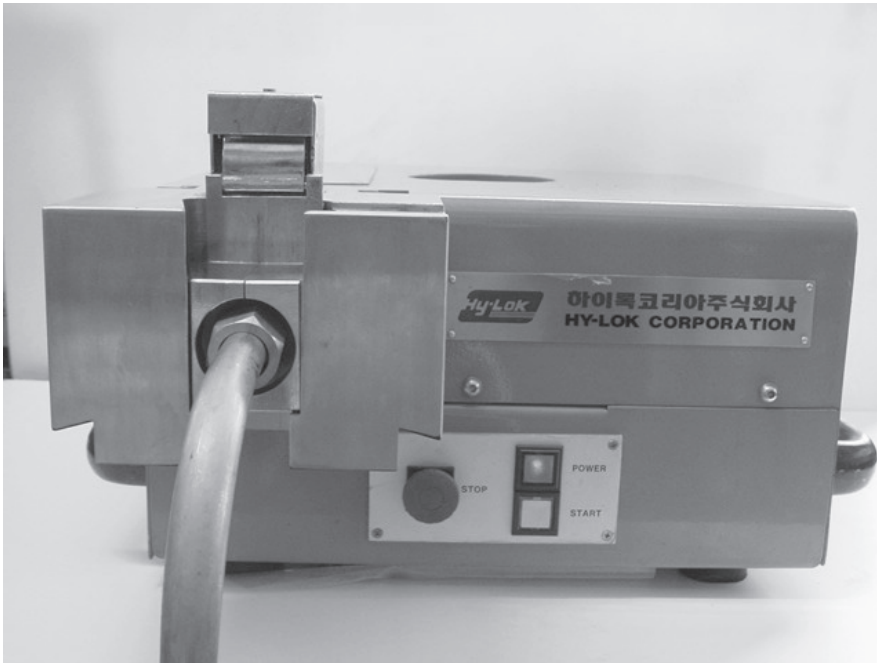
| Size            | Symbol | Specification               |
|-----------------|--------|-----------------------------|
| Taper Thread    | R      | BS 21 (BSPT), ISO 7/1       |
|                 | N      | ASME / ANSI B1. 20. 1 (NPT) |
| Parallel Thread | G      | BS 2779 (BSPP), ISO 228/1   |
|                 | U      | ASME B1.1 (Unified)         |

## Material designator

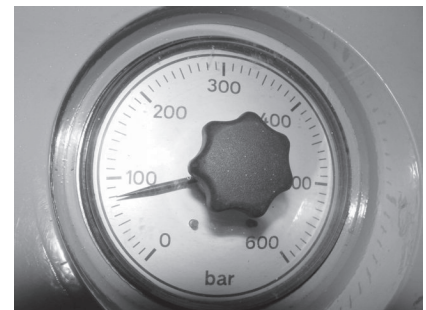
|            |                 |              |       |
|------------|-----------------|--------------|-------|
| Material   | Stainless Steel | Carbon Steel | Brass |
| Identifier | S316 / S316L    | Stel         | Bras  |



## EZY MAT - II Portable flaring machine



Flaring device



Pressure switch

Overall dimensions : 400 x 400 x 230. Weight : 50 Kg.



Clamping grip

Benefit :

- Very easy operating.
- Ensure Constant quality.
- Quick flaring time.

Caution!

Do not actuate the flaring cone without first inserting the tube.

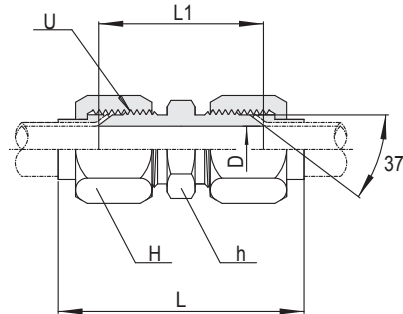
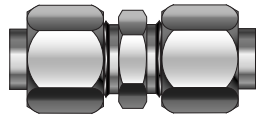
## Clamping grips for EZY MAT - II

| Tube O.D (mm.) | Part No. | Tube O.D (in.) | Part No. |
|----------------|----------|----------------|----------|
| 6              | M-FG06   | 1/4            | M-FG04T  |
| 8              | M-FG08   | 5/16           | M-FG05T  |
| 10             | M-FG10   | 3/8            | M-FG06T  |
| 12             | M-FG12   | 1/2            | M-FG08T  |
| 14             | M-FG14□  |                |          |
| 15             | M-FG15   |                |          |
| 16             | M-FG16   | 5/8            | M-FG10T  |
| 18             | M-FG18   |                |          |
| 20             | M-FG20   | 3/4            | M-FG12T  |
| 22             | M-FG22   | 7/8            | M-FG14T  |
| 25             | M-FG25   | 1              | M-FG16T  |
| 28             | M-FG28□  |                |          |
| 30             | M-FG30   |                |          |
| 32             | M-FG32   | 1-1/4          | M-FG20T  |
| 35             | M-FG35   |                |          |
| 38             | M-FG38   | 1-1/2          | M-FG24T  |
| 42             | M-FG42   |                |          |

## Union

### FU

SAE J514(070101)



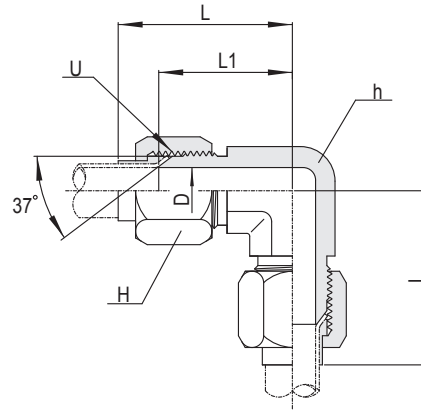
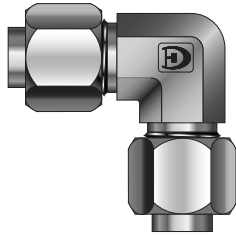
| Part No. | Tube O.D. |        | U (UNF)    | h (HEX) | H (HEX) | D    | L     | L1   |
|----------|-----------|--------|------------|---------|---------|------|-------|------|
|          | Inch      | Metric |            |         |         |      |       |      |
| FU-2T    | 1/8"      | 3      | 5/16"-24   | 11.0    | 9.5     | 1.6  | 45.3  | 29.7 |
| FU-3T    | 3/16"     | 4      | 3/8"-24    | 11.0    | 11.0    | 3.2  | 50.0  | 31.2 |
| FU-4T    | 1/4"      | 6      | 7/16"-20   | 12.0    | 14.2    | 4.4  | 53.0  | 34.8 |
| FU-5T    | 5/16"     | 8      | 1/2"-20    | 14.2    | 15.8    | 6.0  | 55.6  | 34.8 |
| FU-6T    | 3/8"      | 10     | 9/16"-18   | 16.0    | 17.4    | 7.5  | 59.6  | 35.8 |
| FU-8T    | 1/2"      | 12     | 3/4"-16    | 21.0    | 22.2    | 9.9  | 66.5  | 41.1 |
| FU-10T   | 5/8"      | 16     | 7/8"-14    | 23.8    | 25.4    | 12.3 | 81.0  | 47.8 |
| FU-12T   | 3/4"      | 18,20  | 1 1/16"-12 | 29.0    | 31.7    | 15.5 | 85.9  | 54.9 |
| FU-14T   | 7/8"      | 22     | 1 3/16"-12 | 32.0    | 34.9    | 18.0 | 91.3  | 56.1 |
| FU-16T   | 1"        | 25     | 1 5/16"-12 | 36.0    | 38.1    | 21.5 | 95.2  | 57.2 |
| FU-20T   | 1-1/4"    | 32     | 1 5/8"-12  | 46.0    | 50.8    | 27.5 | 98.7  | 61.7 |
| FU-24T   | 1-1/2"    | 38     | 1 7/8"-12  | 50.0    | 57.1    | 33.0 | 123.2 | 69.8 |
| FU-32T   | 2"        | 50     | 2 1/2"-12  | 66.7    | 73.0    | 45.0 | 141.4 | 86.4 |

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Union Elbow

### FL

SAE J514(070201)



| Part No. | Tube O.D. |        | U (UNF)    | D    | h<br>(HEX) | H<br>(HEX) | L     | L1   |
|----------|-----------|--------|------------|------|------------|------------|-------|------|
|          | Inch      | Metric |            |      |            |            |       |      |
| FL-2T    | 1/8"      | 3      | 5/16"-24   | 1.6  | 11.1       | 9.5        | 27.4  | 19.6 |
| FL-3T    | 3/16"     | 4      | 3/8"-24    | 3.2  | 11.1       | 11.0       | 30.5  | 21.1 |
| FL-4T    | 1/4"      | 6      | 7/16"-20   | 4.4  | 11.1       | 14.2       | 31.7  | 22.6 |
| FL-5T    | 5/16"     | 8      | 1/2"-20    | 6.0  | 14.2       | 15.8       | 34.5  | 24.1 |
| FL-6T    | 3/8"      | 10     | 9/16"-18   | 7.5  | 14.2       | 17.4       | 38.8  | 26.9 |
| FL-8T    | 1/2"      | 12     | 3/4"-16    | 9.9  | 19.0       | 22.2       | 44.5  | 31.8 |
| FL-10T   | 5/8"      | 16     | 7/8"-14    | 12.3 | 22.2       | 25.4       | 53.4  | 36.8 |
| FL-12T   | 3/4"      | 18,20  | 1 1/16"-12 | 15.5 | 27.0       | 31.7       | 57.7  | 42.2 |
| FL-14T   | 7/8"      | 22     | 1 3/16"-12 | 18.0 | 33.3       | 34.9       | 63.3  | 45.7 |
| FL-16T   | 1"        | 25     | 1 5/16"-12 | 21.5 | 33.3       | 38.1       | 65.0  | 46.0 |
| FL-20T   | 1-1/4"    | 32     | 1 5/8"-12  | 37.5 | 41.3       | 50.8       | 70.8  | 52.3 |
| FL-24T   | 1-1/2"    | 38     | 1 7/8"-12  | 33.0 | 47.6       | 57.1       | 85.9  | 59.2 |
| FL-32T   | 2"        | 50     | 2 1/2"-12  | 45.0 | 63.5       | 73.0       | 105.2 | 77.7 |

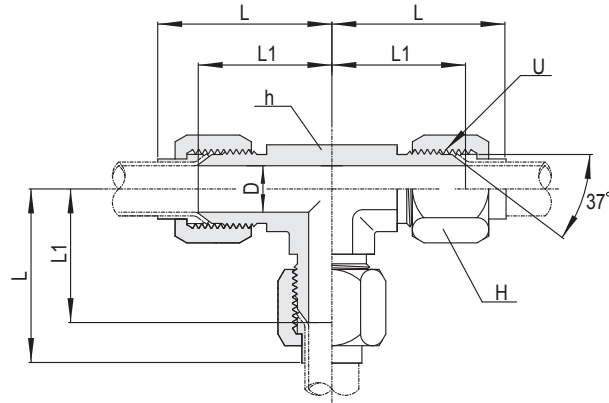
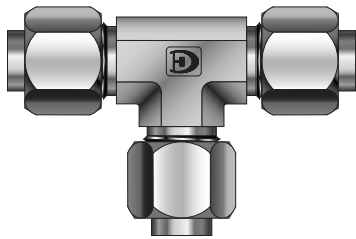
All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.



## Union Tee

### FT

SAE J514(070401)



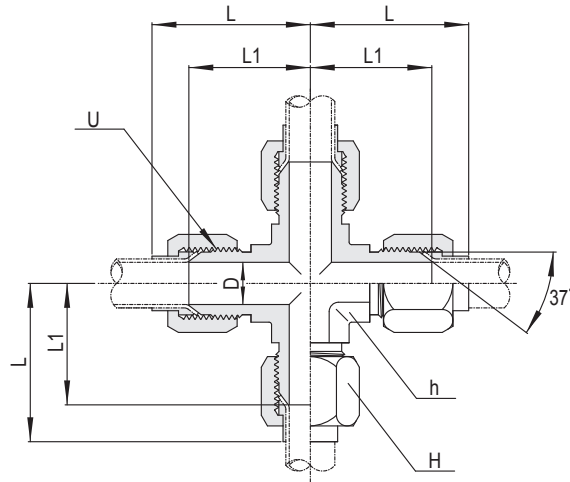
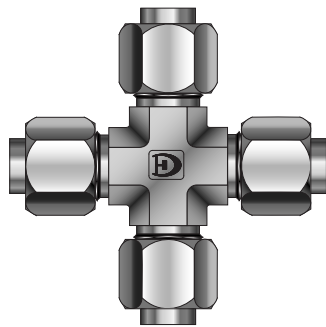
| Part No. | Tube O.D. |        | U (UNF)    | D    | h<br>(HEX) | H<br>(HEX) | L     | L1   |
|----------|-----------|--------|------------|------|------------|------------|-------|------|
|          | Inch      | Metric |            |      |            |            |       |      |
| FT-2T    | 1/8"      | 3      | 5/16"-24   | 1.6  | 11.1       | 9.5        | 27.4  | 19.6 |
| FT-3T    | 3/16"     | 4      | 3/8"-24    | 3.2  | 11.1       | 11.0       | 30.5  | 21.1 |
| FT-4T    | 1/4"      | 6      | 7/16"-20   | 4.4  | 11.1       | 14.2       | 31.7  | 22.6 |
| FT-5T    | 5/16"     | 8      | 1/2"-20    | 6.0  | 14.2       | 15.8       | 34.5  | 24.1 |
| FT-6T    | 3/8"      | 10     | 9/16"-18   | 7.5  | 14.2       | 17.4       | 38.8  | 26.9 |
| FT-8T    | 1/2"      | 12     | 3/4"-16    | 9.9  | 19.0       | 22.2       | 44.5  | 31.8 |
| FT-10T   | 5/8"      | 16     | 7/8"-14    | 12.3 | 22.2       | 25.4       | 53.4  | 36.8 |
| FT-12T   | 3/4"      | 18,20  | 1 1/16"-12 | 15.5 | 27.0       | 31.7       | 57.7  | 42.2 |
| FT-14T   | 7/8"      | 22     | 1 3/16"-12 | 18.0 | 33.3       | 34.9       | 63.3  | 45.7 |
| FT-16T   | 1"        | 25     | 1 5/16"-12 | 21.5 | 34.9       | 38.1       | 65.0  | 46.0 |
| FT-20T   | 1-1/4"    | 32     | 1 5/8"-12  | 37.5 | 41.3       | 50.8       | 70.8  | 52.3 |
| FT-24T   | 1-1/2"    | 38     | 1 7/8"-12  | 33.0 | 47.6       | 57.1       | 85.9  | 59.2 |
| FT-32T   | 2"        | 50     | 2 1/2"-12  | 45.0 | 63.5       | 73.0       | 105.2 | 77.7 |

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Union Cross

### FC

SAE J514(070501)



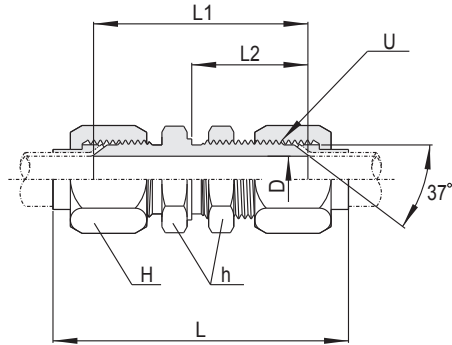
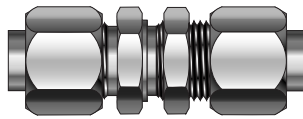
| Part No. | Tube O.D. |        | U (UNF)    | D    | h<br>(HEX) | H<br>(HEX) | L     | L1   |
|----------|-----------|--------|------------|------|------------|------------|-------|------|
|          | Inch      | Metric |            |      |            |            |       |      |
| FC-2T    | 1/8"      | 3      | 5/16"-24   | 1.6  | 11.1       | 9.5        | 27.4  | 19.6 |
| FC-3T    | 3/16"     | 4      | 3/8"-24    | 3.2  | 11.1       | 11.0       | 30.5  | 21.1 |
| FC-4T    | 1/4"      | 6      | 7/16"-20   | 4.4  | 11.1       | 14.2       | 31.7  | 22.6 |
| FC-5T    | 5/16"     | 8      | 1/2"-20    | 6.0  | 14.2       | 15.8       | 34.5  | 24.1 |
| FC-6T    | 3/8"      | 10     | 9/16"-18   | 7.5  | 14.2       | 17.4       | 38.8  | 26.9 |
| FC-8T    | 1/2"      | 12     | 3/4"-16    | 9.9  | 19.0       | 22.2       | 44.5  | 31.8 |
| FC-10T   | 5/8"      | 16     | 7/8"-14    | 12.3 | 22.2       | 25.4       | 53.4  | 36.8 |
| FC-12T   | 3/4"      | 18,20  | 1 1/16"-12 | 15.5 | 27.0       | 31.7       | 57.7  | 42.2 |
| FC-14T   | 7/8"      | 22     | 1 3/16"-12 | 18.0 | 33.3       | 34.9       | 63.3  | 45.7 |
| FC-16T   | 1"        | 25     | 1 5/16"-12 | 21.5 | 34.9       | 38.1       | 65.0  | 46.0 |
| FC-20T   | 1-1/4"    | 32     | 1 5/8"-12  | 37.5 | 41.3       | 50.8       | 70.8  | 52.3 |
| FC-24T   | 1-1/2"    | 38     | 1 7/8"-12  | 33.0 | 47.6       | 57.1       | 85.9  | 59.2 |
| FC-32T   | 2"        | 50     | 2 1/2"-12  | 45.0 | 63.5       | 73.0       | 105.2 | 77.7 |

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## Bulkhead Union

### FBU

SAE J514(070601)

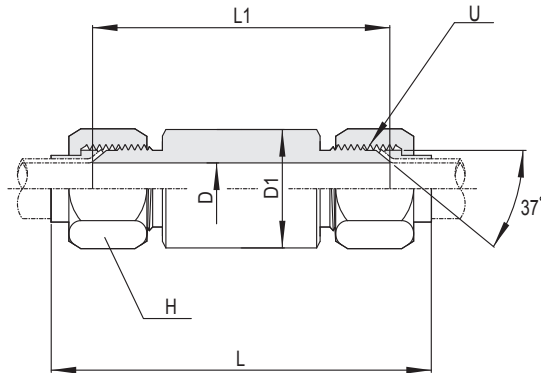


| Part No. | Tube O.D. |        | U (UNF)    | D    | h<br>(HEX) | H<br>(HEX) | L     | L1    | L2   |
|----------|-----------|--------|------------|------|------------|------------|-------|-------|------|
|          | Inch      | Metric |            |      |            |            |       |       |      |
| FBU-2T   | 1/8"      | 3      | 5/16"-24   | 1.6  | 14.2       | 9.5        | 63.1  | 47.5  | 28.2 |
| FBU-3T   | 3/16"     | 4      | 3/8"-24    | 3.2  | 15.8       | 11.0       | 67.1  | 48.3  | 28.2 |
| FBU-4T   | 1/4"      | 6      | 7/16"-20   | 4.4  | 17.4       | 14.2       | 70.8  | 52.6  | 30.5 |
| FBU-5T   | 5/16"     | 8      | 1/2"-20    | 6.0  | 19.0       | 15.8       | 73.4  | 52.6  | 30.5 |
| FBU-6T   | 3/8"      | 10     | 9/16"-18   | 7.5  | 20.6       | 17.4       | 79.2  | 55.4  | 32.5 |
| FBU-8T   | 1/2"      | 12     | 3/4"-16    | 9.9  | 25.4       | 22.2       | 87.4  | 62.0  | 36.6 |
| FBU-10T  | 5/8"      | 16     | 7/8"-14    | 12.3 | 28.5       | 25.4       | 102.8 | 69.6  | 40.1 |
| FBU-12T  | 3/4"      | 18,20  | 1 1/16"-12 | 15.5 | 34.9       | 31.7       | 109.5 | 78.5  | 44.4 |
| FBU-14T  | 7/8"      | 22     | 1 3/16"-12 | 18.0 | 38.1       | 34.9       | 114.4 | 79.2  | 44.4 |
| FBU-16T  | 1"        | 25     | 1 5/16"-12 | 21.5 | 41.2       | 38.1       | 117.8 | 79.8  | 44.4 |
| FBU-20T  | 1-1/4"    | 32     | 1 5/8"-12  | 37.5 | 47.6       | 50.8       | 121.1 | 84.1  | 45.7 |
| FBU-24T  | 1-1/2"    | 38     | 1 7/8"-12  | 33.0 | 53.9       | 57.1       | 142.8 | 89.4  | 46.0 |
| FBU-32T  | 2"        | 50     | 2 1/2"-12  | 45.0 | 69.8       | 73.0       | 161.7 | 106.7 | 53.1 |

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## Weld Bulkhead Union

## FBUW

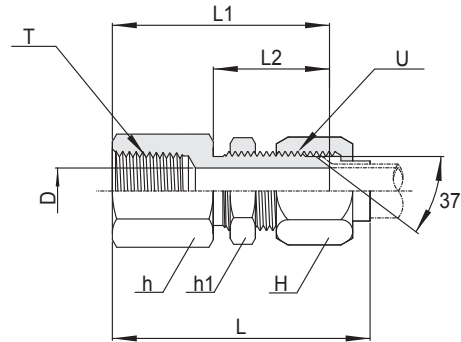
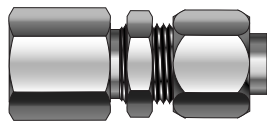


| Part No. | Tube O.D. |        | U (UNF)    | D    | D1   | H<br>(HEX) | L     | L1    |
|----------|-----------|--------|------------|------|------|------------|-------|-------|
|          | Inch      | Metric |            |      |      |            |       |       |
| FBUW-2T  | 1/8"      | 3      | 5/16"-24   | 1.6  | 11.0 | 9.5        | 85.6  | 70.0  |
| FBUW-3T  | 3/16"     | 4      | 3/8"-24    | 3.2  | 11.0 | 11.0       | 88.8  | 70.0  |
| FBUW-4T  | 1/4"      | 6      | 7/16"-20   | 4.4  | 14.0 | 14.2       | 98.2  | 80.0  |
| FBUW-5T  | 5/16"     | 8      | 1/2"-20    | 6.0  | 16.0 | 15.8       | 120.8 | 100.0 |
| FBUW-6T  | 3/8"      | 10     | 9/16"-18   | 7.5  | 17.0 | 17.4       | 123.8 | 100.0 |
| FBUW-8T  | 1/2"      | 12     | 3/4"-16    | 9.9  | 22.0 | 22.2       | 125.4 | 100.0 |
| FBUW-10T | 5/8"      | 16     | 7/8"-14    | 12.3 | 25.0 | 25.4       | 143.2 | 110.0 |
| FBUW-12T | 3/4"      | 18,20  | 1 1/16"-12 | 15.5 | 30.0 | 31.7       | 151.0 | 120.0 |
| FBUW-14T | 7/8"      | 22     | 1 3/16"-12 | 18.0 | 32.0 | 34.9       | 165.2 | 130.0 |
| FBUW-16T | 1"        | 25     | 1 5/16"-12 | 21.5 | 40.0 | 38.1       | 168.0 | 130.0 |
| FBUW-20T | 1-1/4"    | 32     | 1 5/8"-12  | 27.5 | 46.0 | 50.8       | 177.0 | 140.0 |
| FBUW-24T | 1-1/2"    | 38     | 1 7/8"-12  | 33.0 | 50.0 | 57.1       | 193.4 | 140.0 |
| FBUW-32T | 2"        | 50     | 2 1/2"-12  | 45.0 | 70.0 | 73.0       | 205.0 | 150.0 |

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Female Bulkhead Union

## FBFC



| Part No.    | Tube O.D. |        | U (UNF)    | T (NPT) | D    | h<br>(HEX) | h1<br>(HEX) | H<br>(HEX) | L     | L1   | L2   |
|-------------|-----------|--------|------------|---------|------|------------|-------------|------------|-------|------|------|
|             | Inch      | Metric |            |         |      |            |             |            |       |      |      |
| FBFC2T-01N  | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 14.2       | 14.2        | 9.5        | 49.0  | 41.2 | 28.2 |
| FBFC3T-01N  | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 14.2       | 15.8        | 11.0       | 50.6  | 41.2 | 28.2 |
| FBFC4T-01N  | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 14.2       | 17.4        | 14.2       | 52.6  | 43.5 | 30.5 |
| FBFC5T-01N  | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 14.2       | 19.0        | 15.8       | 53.9  | 43.5 | 30.5 |
| FBFC6T-02N  | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 19.0       | 20.6        | 17.4       | 62.5  | 50.5 | 32.5 |
| FBFC8T-03N  | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 22.2       | 25.4        | 22.2       | 69.3  | 56.6 | 36.6 |
| FBFC10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 29.0       | 28.5        | 25.4       | 82.7  | 66.1 | 40.1 |
| FBFC12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 34.9       | 34.9        | 31.7       | 86.0  | 71.4 | 44.4 |
| FBFC14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 34.9       | 38.1        | 34.9       | 89.0  | 71.4 | 44.4 |
| FBFC16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 41.2       | 41.2        | 38.1       | 94.4  | 75.4 | 44.4 |
| FBFC20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 27.5 | 50.8       | 47.6        | 50.8       | 99.2  | 80.7 | 45.7 |
| FBFC24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 60.0       | 53.9        | 57.1       | 107.7 | 81.0 | 46.0 |
| FBFC32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 73.0       | 69.8        | 73.0       | 120.6 | 93.1 | 53.1 |

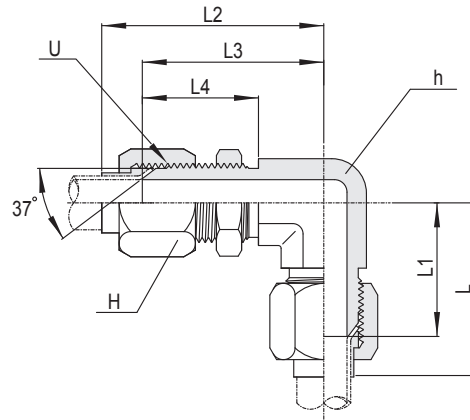
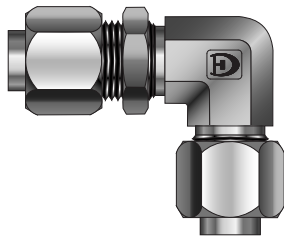
\* Pipe Thread NPT(N) or PT(R).

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## Bulkhead Union Elbow

### FBL

SAE J514(070701)



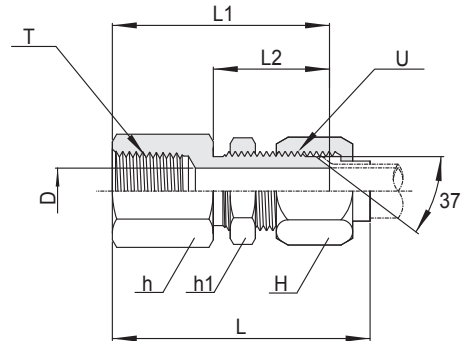
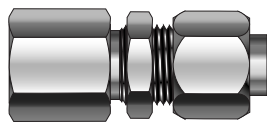
| Part No. | Tube O.D. |        | U (UNF)    | h (HEX) | H (HEX) | L     | L1   | L2    | L3    | L4   |
|----------|-----------|--------|------------|---------|---------|-------|------|-------|-------|------|
|          | Inch      | Metric |            |         |         |       |      |       |       |      |
| FBL-2T   | 1/8"      | 3      | 5/16"-24   | 11.1    | 9.5     | 30.2  | 22.4 | 45.9  | 38.1  | 23.4 |
| FBL-3T   | 3/16"     | 4      | 3/8"-24    | 11.1    | 11.0    | 33.3  | 23.9 | 47.5  | 38.1  | 23.4 |
| FBL-4T   | 1/4"      | 6      | 7/16"-20   | 11.1    | 14.2    | 33.7  | 24.6 | 49.5  | 40.4  | 25.9 |
| FBL-5T   | 5/16"     | 8      | 1/2"-20    | 14.3    | 15.8    | 37.3  | 26.9 | 54.1  | 43.7  | 25.9 |
| FBL-6T   | 3/8"      | 10     | 9/16"-18   | 14.3    | 17.4    | 39.6  | 27.7 | 57.9  | 46.0  | 27.7 |
| FBL-8T   | 1/2"      | 12     | 3/4"-16    | 19.0    | 22.2    | 47.2  | 34.5 | 66.3  | 53.6  | 31.8 |
| FBL-10T  | 5/8"      | 16     | 7/8"-14    | 22.2    | 25.4    | 56.2  | 39.6 | 77.3  | 60.7  | 35.8 |
| FBL-12T  | 3/4"      | 18,20  | 1 1/16"-12 | 27.0    | 31.7    | 60.7  | 45.2 | 83.1  | 67.6  | 39.6 |
| FBL-14T  | 7/8"      | 22     | 1 3/16"-12 | 33.3    | 34.9    | 66.4  | 48.8 | 88.7  | 71.1  | 39.6 |
| FBL-16T  | 1"        | 25     | 1 5/16"-12 | 33.3    | 38.1    | 68.3  | 49.3 | 90.1  | 71.1  | 39.6 |
| FBL-20T  | 1-1/4"    | 32     | 1 5/8"-12  | 41.3    | 50.8    | 73.6  | 55.1 | 97.7  | 79.2  | 40.9 |
| FBL-24T  | 1-1/2"    | 38     | 1 7/8"-12  | 47.6    | 57.1    | 86.1  | 59.4 | 113.6 | 86.9  | 41.1 |
| FBL-32T  | 2"        | 50     | 2 1/2"-12  | 63.5    | 73.0    | 100.9 | 73.4 | 131.9 | 104.4 | 48.5 |

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## Female Bulkhead Union

## FBFC



| Part No.    | Tube O.D. |        | U (UNF)    | T (NPT) | D    | h<br>(HEX) | h1<br>(HEX) | H<br>(HEX) | L     | L1   | L2   |
|-------------|-----------|--------|------------|---------|------|------------|-------------|------------|-------|------|------|
|             | Inch      | Metric |            |         |      |            |             |            |       |      |      |
| FBFC2T-01N  | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 14.2       | 14.2        | 9.5        | 49.0  | 41.2 | 28.2 |
| FBFC3T-01N  | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 14.2       | 15.8        | 11.0       | 50.6  | 41.2 | 28.2 |
| FBFC4T-01N  | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 14.2       | 17.4        | 14.2       | 52.6  | 43.5 | 30.5 |
| FBFC5T-01N  | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 14.2       | 19.0        | 15.8       | 53.9  | 43.5 | 30.5 |
| FBFC6T-02N  | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 19.0       | 20.6        | 17.4       | 62.5  | 50.5 | 32.5 |
| FBFC8T-03N  | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 22.2       | 25.4        | 22.2       | 69.3  | 56.6 | 36.6 |
| FBFC10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 29.0       | 28.5        | 25.4       | 82.7  | 66.1 | 40.1 |
| FBFC12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 34.9       | 34.9        | 31.7       | 86.0  | 71.4 | 44.4 |
| FBFC14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 34.9       | 38.1        | 34.9       | 89.0  | 71.4 | 44.4 |
| FBFC16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 41.2       | 41.2        | 38.1       | 94.4  | 75.4 | 44.4 |
| FBFC20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 27.5 | 50.8       | 47.6        | 50.8       | 99.2  | 80.7 | 45.7 |
| FBFC24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 60.0       | 53.9        | 57.1       | 107.7 | 81.0 | 46.0 |
| FBFC32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 73.0       | 69.8        | 73.0       | 120.6 | 93.1 | 53.1 |

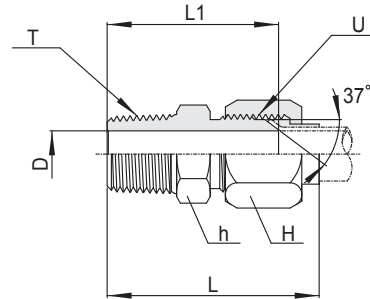
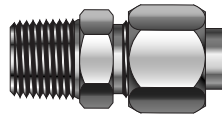
\* Pipe Thread NPT(N) or PT(R).

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## Male Connector

### FMC

SAE J514(070102)



| Part No.   | Tube O.D. |        | U (UNF)    | T (NPT) | D    | h<br>(HEX) | H<br>(HEX) | L     | L1   |
|------------|-----------|--------|------------|---------|------|------------|------------|-------|------|
|            | Inch      | Metric |            |         |      |            |            |       |      |
| FMC2T-01N  | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 11.1       | 9.5        | 36.0  | 28.2 |
| FMC3T-01N  | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 11.1       | 11.0       | 38.4  | 29.0 |
| FMC4T-01N  | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 12.7       | 14.2       | 40.1  | 31.0 |
| FMC5T-01N  | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 14.2       | 15.8       | 41.4  | 31.0 |
| FMC6T-02N  | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 15.8       | 17.4       | 48.2  | 36.3 |
| FMC8T-03N  | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 20.6       | 22.2       | 51.6  | 38.9 |
| FMC10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 20.6       | 25.4       | 64.6  | 48.0 |
| FMC12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 28.5       | 31.7       | 67.8  | 52.3 |
| FMC14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 31.7       | 34.9       | 70.7  | 53.1 |
| FMC16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 34.9       | 38.1       | 77.4  | 58.4 |
| FMC20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 27.5 | 42.8       | 50.8       | 80.7  | 62.2 |
| FMC24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 50.8       | 57.1       | 94.8  | 68.1 |
| FMC32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 66.6       | 73.0       | 106.5 | 79.0 |

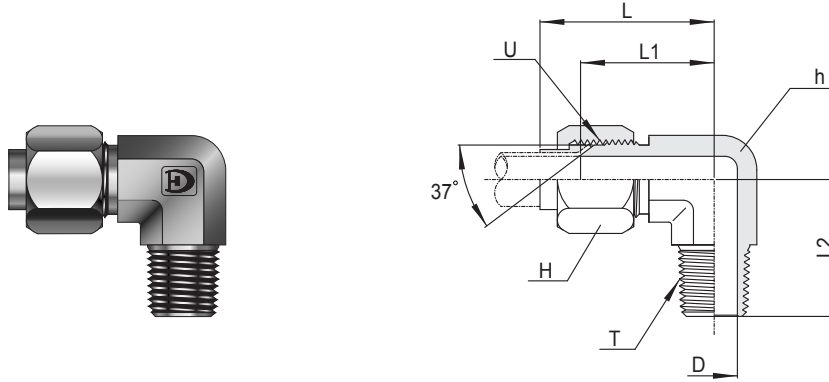
\* Pipe Thread NPT(N) or PT(R).

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Male Elbow

### FLM

SAE J514(070202)



| Part No.   | Tube O.D. |        | U (UNF)    | T (NPT) | D    | h<br>(HEX) | H<br>(HEX) | L     | L1   | L2   |
|------------|-----------|--------|------------|---------|------|------------|------------|-------|------|------|
|            | Inch      | Metric |            |         |      |            |            |       |      |      |
| FLM2T-01N  | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 11.1       | 9.5        | 27.4  | 19.6 | 18.3 |
| FLM3T-01N  | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 11.1       | 11.0       | 30.5  | 21.1 | 18.3 |
| FLM4T-01N  | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 11.1       | 14.2       | 31.7  | 22.6 | 19.8 |
| FLM5T-01N  | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 14.3       | 15.8       | 34.5  | 24.1 | 19.8 |
| FLM6T-02N  | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 14.3       | 17.4       | 38.8  | 26.9 | 27.7 |
| FLM8T-03N  | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 19.0       | 22.2       | 44.5  | 31.8 | 31.0 |
| FLM10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 22.2       | 25.4       | 53.4  | 36.8 | 37.3 |
| FLM12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 27.0       | 31.7       | 57.7  | 42.2 | 40.4 |
| FLM14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 33.3       | 34.9       | 63.3  | 45.7 | 42.9 |
| FLM16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 33.3       | 38.1       | 65.0  | 46.0 | 50.0 |
| FLM20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 27.5 | 41.3       | 50.8       | 70.8  | 52.3 | 60.5 |
| FLM24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 47.6       | 57.1       | 85.9  | 59.2 | 67.1 |
| FLM32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 63.5       | 73.0       | 105.2 | 77.7 | 76.2 |

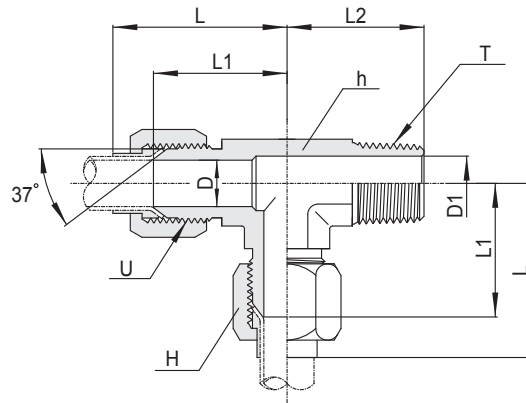
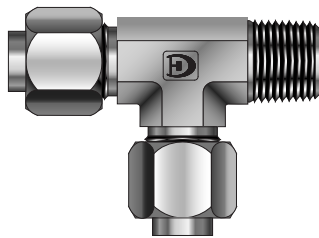
\* Pipe Thread NPT(N) or PT(R).

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Male Run Tee

### FRTM

SAE J514(070424)



| Part No.    | Tube O.D. |        | U (UNF)    | N (NPT) | D    | D1   | h<br>(HEX) | H<br>(HEX) | L     | L1   | L2   |
|-------------|-----------|--------|------------|---------|------|------|------------|------------|-------|------|------|
|             | Inch      | Metric |            |         |      |      |            |            |       |      |      |
| FRTM2T-01N  | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 4.8  | 11.1       | 9.5        | 27.4  | 19.6 | 18.3 |
| FRTM3T-01N  | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 4.8  | 11.1       | 11.0       | 30.5  | 21.1 | 18.3 |
| FRTM4T-01N  | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 4.8  | 11.1       | 14.2       | 31.7  | 22.6 | 19.8 |
| FRTM5T-01N  | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 4.8  | 14.3       | 15.8       | 34.5  | 24.1 | 19.8 |
| FRTM6T-02N  | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 7.0  | 14.3       | 17.4       | 38.8  | 26.9 | 27.7 |
| FRTM8T-03N  | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 10.3 | 19.0       | 22.2       | 44.5  | 31.8 | 31.0 |
| FRTM10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 13.5 | 22.2       | 25.4       | 53.4  | 36.8 | 37.3 |
| FRTM12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 18.0 | 27.0       | 31.7       | 57.7  | 42.2 | 40.4 |
| FRTM14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 18.0 | 33.3       | 34.9       | 63.3  | 45.7 | 42.9 |
| FRTM16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 23.8 | 33.3       | 38.1       | 65.0  | 46.0 | 50.0 |
| FRTM20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 27.5 | 31.7 | 41.3       | 50.8       | 70.8  | 52.3 | 60.5 |
| FRTM24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 38.0 | 47.6       | 57.1       | 85.9  | 59.2 | 67.1 |
| FRTM32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 49.0 | 63.5       | 73.0       | 105.2 | 77.7 | 76.2 |

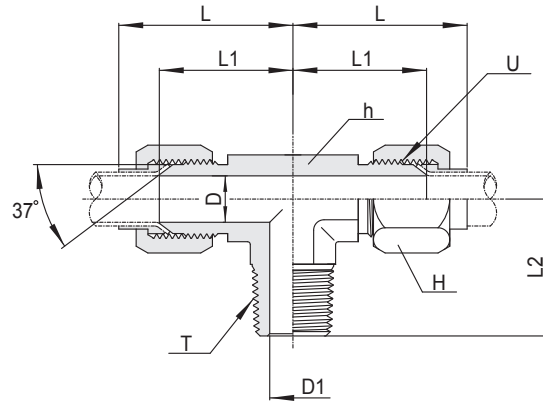
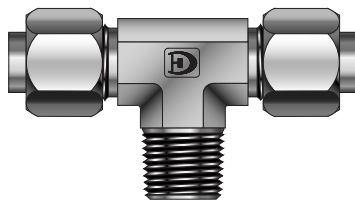
\* Pipe Thread NPT(N) or PT(R).

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Branch Tee

### FBTM

SAE J514(070425)



| Part No.    | Tube O.D. |        | U (UNF)    | T (NPT) | D    | D1   | h (HEX) | H (HEX) | L     | L1   | L2   |
|-------------|-----------|--------|------------|---------|------|------|---------|---------|-------|------|------|
|             | Inch      | Metric |            |         |      |      |         |         |       |      |      |
| FBTM2T-01N  | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 4.8  | 11.1    | 9.5     | 27.4  | 19.6 | 18.3 |
| FBTM3T-01N  | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 4.8  | 11.1    | 11.0    | 30.5  | 21.1 | 18.3 |
| FBTM4T-01N  | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 4.8  | 11.1    | 14.2    | 31.7  | 22.6 | 19.8 |
| FBTM5T-01N  | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 4.8  | 14.3    | 15.8    | 34.5  | 24.1 | 19.8 |
| FBTM6T-02N  | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 7.0  | 14.3    | 17.4    | 38.8  | 26.9 | 27.7 |
| FBTM8T-03N  | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 10.3 | 19.0    | 22.2    | 44.5  | 31.8 | 31.0 |
| FBTM10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 13.5 | 22.2    | 25.4    | 53.4  | 36.8 | 37.3 |
| FBTM12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 18.0 | 27.0    | 31.7    | 57.7  | 42.2 | 40.4 |
| FBTM14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 18.0 | 33.3    | 34.9    | 63.3  | 45.7 | 42.9 |
| FBTM16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 23.8 | 35.0    | 38.1    | 65.0  | 46.0 | 50.0 |
| FBTM20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 37.5 | 31.7 | 41.3    | 50.8    | 70.8  | 52.3 | 60.5 |
| FBTM24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 38.0 | 47.6    | 57.1    | 85.9  | 59.2 | 67.1 |
| FBTM32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 49.0 | 63.5    | 73.0    | 105.2 | 77.7 | 76.2 |

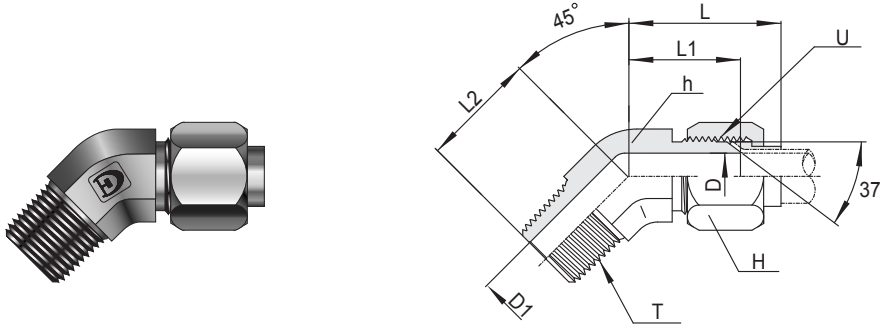
\* Pipe Thread NPT(N) or PT(R).

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## 45° Male Elbow

### FLMB

SAE J514(070302)



| Part No.    | Tube O.D. |        | U (UNF)    | T (NPT) | D    | D1   | h (HEX) | H (HEX) | L    | L1   | L2   |
|-------------|-----------|--------|------------|---------|------|------|---------|---------|------|------|------|
|             | Inch      | Metric |            |         |      |      |         |         |      |      |      |
| FLMB2T-01N  | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 1.6  | 11.1    | 9.5     | 25.3 | 17.5 | 13.2 |
| FLMB3T-01N  | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 3.2  | 11.1    | 11.0    | 26.9 | 17.5 | 13.2 |
| FLMB4T-01N  | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 4.4  | 11.1    | 14.2    | 27.4 | 18.3 | 16.3 |
| FLMB5T-01N  | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 6.0  | 14.3    | 15.8    | 30.0 | 19.6 | 16.3 |
| FLMB6T-02N  | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 7.5  | 14.3    | 17.4    | 33.0 | 21.1 | 21.8 |
| FLMB8T-03N  | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 9.9  | 19.0    | 22.2    | 37.6 | 24.9 | 24.1 |
| FLMB10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 12.3 | 22.2    | 25.4    | 44.8 | 28.2 | 29.7 |
| FLMB12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 15.5 | 27.0    | 31.7    | 48.0 | 32.5 | 30.5 |
| FLMB14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 18.0 | 33.3    | 34.9    | 54.4 | 36.8 | 33.0 |
| FLMB16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 21.5 | 35.0    | 38.1    | 56.3 | 37.3 | 37.6 |
| FLMB20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 37.5 | 37.5 | 41.3    | 50.8    | 58.9 | 40.4 | 42.4 |
| FLMB24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 33.0 | 47.6    | 57.1    | 71.9 | 45.2 | 45.0 |
| FLMB32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 45.0 | 63.5    | 73.0    | 83.9 | 56.4 | 53.6 |

\* Pipe Thread NPT(N) or PT(R).

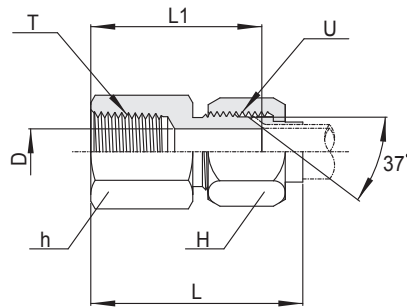
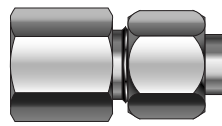
All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.



## Female Connector

### FFC

SAE J514(070103)



| Part No.   | Tube O.D. |        | U (UNF)    | N (NPT) | D    | h (HEX) | H (HEX) | L     | L1   |
|------------|-----------|--------|------------|---------|------|---------|---------|-------|------|
|            | Inch      | Metric |            |         |      |         |         |       |      |
| FFC2T-01N  | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 14.2    | 9.5     | 36.2  | 28.4 |
| FFC3T-01N  | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 14.2    | 11.0    | 38.1  | 28.7 |
| FFC4T-01N  | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 14.2    | 14.2    | 39.3  | 30.2 |
| FFC5T-01N  | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 14.2    | 15.8    | 40.1  | 29.7 |
| FFC6T-02N  | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 19.0    | 17.4    | 47.5  | 35.6 |
| FFC8T-03N  | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 22.2    | 22.2    | 52.3  | 39.6 |
| FFC10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 28.5    | 25.4    | 64.6  | 48.0 |
| FFC12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 34.9    | 31.7    | 67.8  | 52.3 |
| FFC14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 34.9    | 34.9    | 69.9  | 52.3 |
| FFC16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 41.2    | 38.1    | 78.7  | 59.7 |
| FFC20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 37.5 | 50.8    | 50.8    | 81.7  | 63.2 |
| FFC24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 60.3    | 57.1    | 93.2  | 66.5 |
| FFC32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 73.0    | 73.0    | 102.9 | 75.4 |

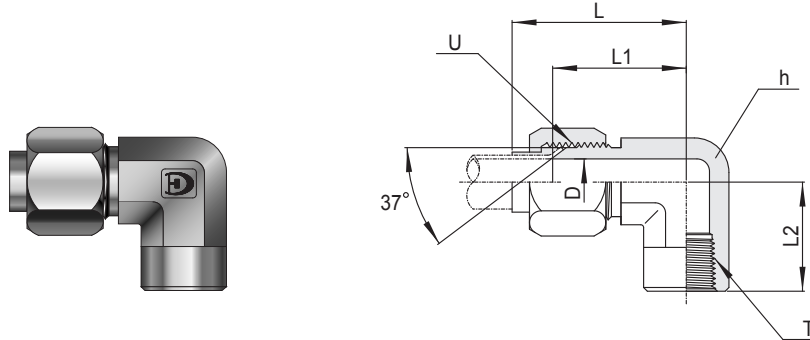
\* Pipe Thread NPT(N) or PT(R).

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Female Elbow

### FLF

SAE J514(070203)



| Part No.   | Tube O.D. |        | U (UNF)    | N (NPT) | D    | h<br>(HEX) | H<br>(HEX) | L     | L1   | L2   |
|------------|-----------|--------|------------|---------|------|------------|------------|-------|------|------|
|            | Inch      | Metric |            |         |      |            |            |       |      |      |
| FLF2T-01N  | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 14.3       | 9.5        | 33.2  | 25.4 | 16.8 |
| FLF3T-01N  | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 14.3       | 11.0       | 35.6  | 26.2 | 16.8 |
| FLF4T-01N  | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 14.3       | 14.2       | 36.5  | 27.4 | 16.8 |
| FLF5T-01N  | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 14.3       | 16.0       | 37.8  | 27.4 | 16.8 |
| FLF6T-02N  | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 19.0       | 17.4       | 43.1  | 31.2 | 22.4 |
| FLF8T-03N  | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 22.2       | 22.2       | 48.8  | 36.1 | 25.9 |
| FLF10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 27.0       | 25.4       | 58.3  | 41.7 | 31.2 |
| FLF12T-06N | 3/4"      | 18.20  | 1 1/16"-12 | 3/4"    | 15.5 | 33.3       | 32.0       | 63.5  | 48.0 | 34.5 |
| FLF14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 33.3       | 35.0       | 64.8  | 47.2 | 36.1 |
| FLF16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 41.3       | 38.0       | 74.1  | 55.1 | 41.1 |
| FLF20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 37.5 | 47.6       | 50.8       | 77.7  | 59.2 | 43.2 |
| FLF24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 65.1       | 57.0       | 100.1 | 73.4 | 52.8 |
| FLF32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 71.4       | 73.0       | 111.3 | 83.8 | 60.7 |

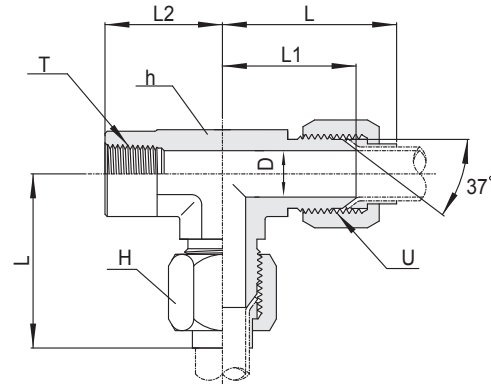
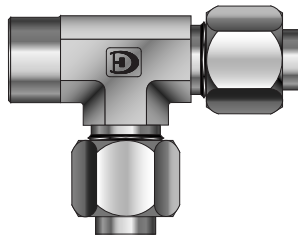
\* Pipe Thread NPT(N) or PT(R).

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Female Run Tee

### FRTF

SAE J514(070426)



| Part No.    | Tube O.D. |        | U (UNF)    | T (NPT) | D    | h<br>(HEX) | H<br>(HEX) | L     | L1   | L2   |
|-------------|-----------|--------|------------|---------|------|------------|------------|-------|------|------|
|             | Inch      | Metric |            |         |      |            |            |       |      |      |
| FRTF2T-01N  | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 14.3       | 9.5        | 33.2  | 25.4 | 16.8 |
| FRTF3T-01N  | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 14.3       | 11.0       | 35.6  | 26.2 | 16.8 |
| FRTF4T-01N  | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 14.3       | 14.2       | 36.5  | 27.4 | 16.8 |
| FRTF5T-01N  | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 14.3       | 16.0       | 37.8  | 27.4 | 16.8 |
| FRTF6T-02N  | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 19.0       | 17.4       | 43.1  | 31.2 | 22.4 |
| FRTF8T-03N  | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 22.2       | 22.2       | 48.8  | 36.1 | 25.9 |
| FRTF10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 27.0       | 25.4       | 58.3  | 41.7 | 31.2 |
| FRTF12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 33.3       | 32.0       | 63.5  | 48.0 | 34.5 |
| FRTF14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 33.3       | 35.0       | 64.8  | 47.2 | 36.1 |
| FRTF16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 41.3       | 38.0       | 74.1  | 55.1 | 41.1 |
| FRTF20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 37.5 | 47.6       | 50.8       | 77.7  | 59.2 | 43.2 |
| FRTF24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 65.1       | 57.0       | 100.1 | 73.4 | 52.8 |
| FRTF32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 71.4       | 73.0       | 111.3 | 83.8 | 60.7 |

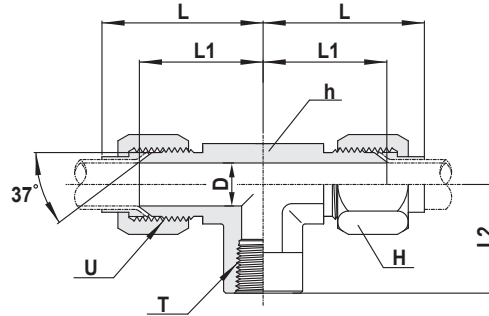
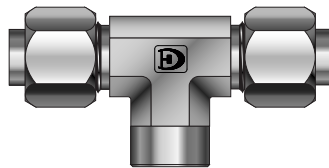
\* Pipe Thread NPT(N) or PT(R).

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Female Branch Tee

### FBTF

SAE J514(070427)



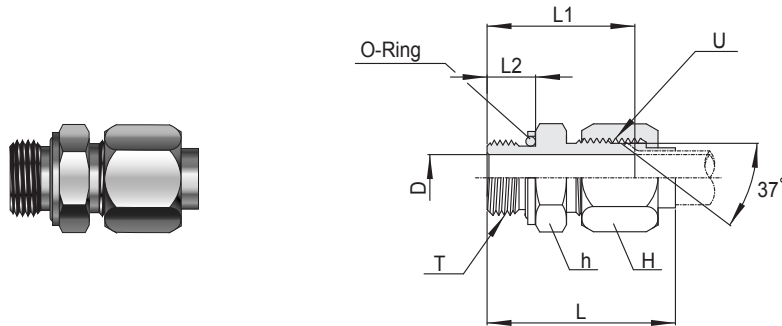
| Part No.    | Tube O.D. |        | U (UNF)    | N (NPT) | D    | h (HEX) | H (HEX) | L     | L1   | L2   |
|-------------|-----------|--------|------------|---------|------|---------|---------|-------|------|------|
|             | Inch      | Metric |            |         |      |         |         |       |      |      |
| FBTF2T-01N  | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 14.3    | 9.5     | 33.2  | 25.4 | 16.8 |
| FBTF3T-01N  | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 14.3    | 11.0    | 35.6  | 26.2 | 16.8 |
| FBTF4T-01N  | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 14.3    | 14.2    | 36.5  | 27.4 | 16.8 |
| FBTF5T-01N  | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 14.3    | 16.0    | 37.8  | 27.4 | 16.8 |
| FBTF6T-02N  | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 19.0    | 17.4    | 43.1  | 31.2 | 22.4 |
| FBTF8T-03N  | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 22.2    | 22.2    | 48.8  | 36.1 | 25.9 |
| FBTF10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 27.0    | 25.4    | 58.3  | 41.7 | 31.2 |
| FBTF12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 33.3    | 32.0    | 63.5  | 48.0 | 34.5 |
| FBTF14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 33.3    | 35.0    | 64.8  | 47.2 | 36.1 |
| FBTF16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 41.3    | 38.0    | 74.1  | 55.1 | 41.1 |
| FBTF20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 37.5 | 47.6    | 50.8    | 77.7  | 59.2 | 43.2 |
| FBTF24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 65.1    | 57.0    | 100.1 | 73.4 | 52.8 |
| FBTF32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 71.4    | 73.0    | 111.3 | 83.8 | 60.7 |

\* Pipe Thread NPT(N) or PT(R).

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## O-Ring Seal Male Connector.(PF)

### FOMR



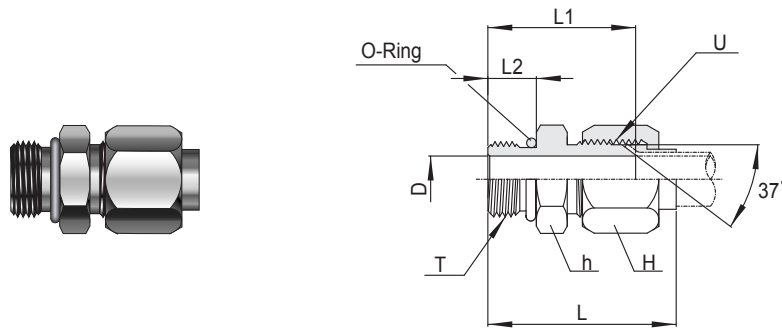
| Part No.    | Tube O.D. |        | U (UNF)    | T (PF) | D    | h (HEX) | H (HEX) | L     | L1   | L2   |
|-------------|-----------|--------|------------|--------|------|---------|---------|-------|------|------|
|             | Inch      | Metric |            |        |      |         |         |       |      |      |
| FOMR2T-01G  | 1/8"      | 3      | 5/16"-24   | 1/8"   | 1.6  | 11.1    | 9.5     | 35.3  | 27.5 | 8.0  |
| FOMR3T-01G  | 3/16"     | 4      | 3/8"-24    | 1/8"   | 3.2  | 12.7    | 11.0    | 37.9  | 28.5 | 8.0  |
| FOMR4T-01G  | 1/4"      | 6      | 7/16"-20   | 1/8"   | 4.4  | 14.2    | 14.2    | 39.3  | 30.2 | 8.0  |
| FOMR5T-01G  | 5/16"     | 8      | 1/2"-20    | 1/8"   | 6.0  | 15.8    | 16.0    | 40.6  | 30.2 | 8.0  |
| FOMR6T-02G  | 3/8"      | 10     | 9/16"-18   | 1/4"   | 7.5  | 17.4    | 17.4    | 46.9  | 35.0 | 12.0 |
| FOMR8T-03G  | 1/2"      | 12     | 3/4"-16    | 3/8"   | 9.9  | 22.2    | 22.2    | 51.4  | 38.7 | 12.0 |
| FOMR10T-04G | 5/8"      | 16     | 7/8"-14    | 1/2"   | 12.3 | 25.4    | 25.4    | 61.1  | 44.5 | 14.0 |
| FOMR12T-06G | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"   | 15.5 | 31.7    | 32.0    | 66.4  | 50.9 | 16.0 |
| FOMR14T-06G | 7/8"      | 22     | 1 3/16"-12 | 3/4"   | 18.0 | 34.9    | 35.0    | 69.0  | 51.4 | 16.0 |
| FOMR16T-08G | 1"        | 25     | 1 5/16"-12 | 1"     | 21.5 | 38.0    | 38.0    | 71.7  | 52.7 | 18.0 |
| FOMR20T-10G | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4" | 37.5 | 42.8    | 50.8    | 78.5  | 60.0 | 20.0 |
| FOMR24T-12G | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2" | 33.0 | 55.0    | 57.0    | 92.8  | 66.1 | 21.0 |
| FOMR32T-16G | 2"        | 50     | 2 1/2"-12  | 2"     | 45.0 | 70.0    | 73.0    | 108.0 | 80.5 | 25.0 |

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## O-Ring Seal Male Connector.(UNF)

### FOM

SAE J514(070120)



| Part No.   | Tube O.D. |        | U (UNF)    | T (UNF)    | D    | h<br>(HEX) | H<br>(HEX) | L    | L1   | L2   |
|------------|-----------|--------|------------|------------|------|------------|------------|------|------|------|
|            | Inch      | Metric |            |            |      |            |            |      |      |      |
| FOM2T-02U  | 1/8"      | 3      | 5/16"-24   | 5/16"-24   | 1.6  | 11.1       | 9.5        | 34.7 | 26.9 | 7.5  |
| FOM3T-03U  | 3/16"     | 4      | 3/8"-24    | 3/8"-24    | 3.2  | 12.7       | 11.0       | 37.3 | 27.9 | 7.5  |
| FOM4T-04U  | 1/4"      | 6      | 7/16"-20   | 7/16"-20   | 4.4  | 14.2       | 14.2       | 40.3 | 31.2 | 9.1  |
| FOM5T-05U  | 5/16"     | 8      | 1/2"-20    | 1/2"-20    | 6.0  | 15.8       | 16.0       | 41.6 | 31.2 | 9.1  |
| FOM6T-06U  | 3/8"      | 10     | 9/16"-18   | 9/16"-18   | 7.5  | 17.4       | 17.4       | 44.9 | 33.0 | 9.9  |
| FOM8T-08U  | 1/2"      | 12     | 3/4"-16    | 3/4"-16    | 9.9  | 22.2       | 22.2       | 50.3 | 37.6 | 11.1 |
| FOM10T-10U | 5/8"      | 16     | 7/8"-14    | 7/8"-14    | 12.3 | 25.4       | 25.4       | 59.8 | 43.2 | 12.7 |
| FOM12T-12U | 3/4"      | 18,20  | 1 1/16"-12 | 1 1/16"-12 | 15.5 | 31.7       | 32.0       | 65.5 | 50.0 | 15.1 |
| FOM14T-14U | 7/8"      | 22     | 1 3/16"-12 | 1 3/16"-12 | 18.0 | 34.9       | 35.0       | 68.1 | 50.5 | 15.1 |
| FOM16T-16U | 1"        | 25     | 1 5/16"-12 | 1 5/16"-12 | 21.5 | 38.1       | 38.0       | 70.8 | 51.8 | 15.1 |
| FOM20T-20U | 1-1/4"    | 32     | 1 5/8"-12  | 1 5/8"-12  | 37.5 | 47.6       | 50.8       | 73.6 | 55.1 | 15.1 |
| FOM24T-24U | 1-1/2"    | 38     | 1 7/8"-12  | 1 7/8"-12  | 33.0 | 53.9       | 57.0       | 86.9 | 60.2 | 15.1 |
| FOM32T-32U | 2"        | 50     | 2 1/2"-12  | 2 1/2"-12  | 45.0 | 69.8       | 73.0       | 98.1 | 70.6 | 15.1 |

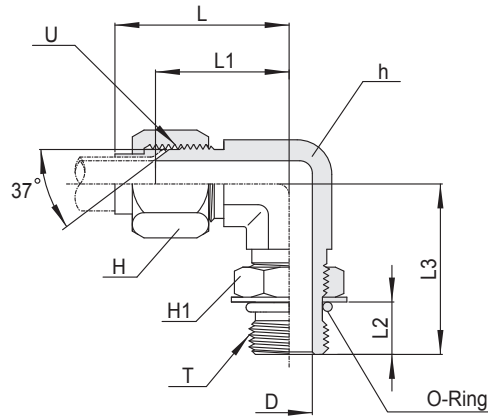
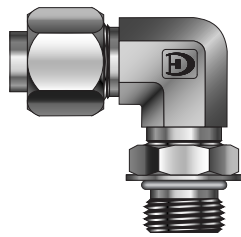
All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.



## O-Ring Seal Male Elbow.(UNF)

### FOLM

SAE J514(070220)



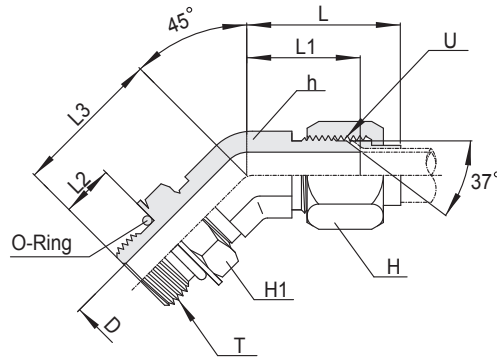
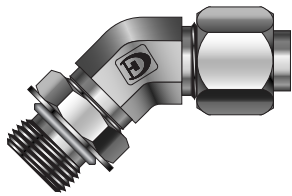
| Part No.    | Tube O.D. |        | U (UNF)    | T (UNF)    | D    | h (HEX) | H (HEX) | H1 (HEX) | L     | L1   | L2   | L3   |
|-------------|-----------|--------|------------|------------|------|---------|---------|----------|-------|------|------|------|
|             | Inch      | Metric |            |            |      |         |         |          |       |      |      |      |
| FOLM2T-02U  | 1/8"      | 3      | 5/16"-24   | 5/16"-24   | 1.6  | 11.1    | 9.5     | 14.2     | 27.4  | 19.6 | 8.4  | 23.9 |
| FOLM3T-03U  | 3/16"     | 4      | 3/8"-24    | 3/8"-24    | 3.2  | 11.1    | 11.0    | 15.8     | 30.5  | 21.1 | 8.4  | 23.9 |
| FOLM4T-04U  | 1/4"      | 6      | 7/16"-20   | 7/16"-20   | 4.4  | 11.1    | 14.2    | 17.4     | 31.7  | 22.6 | 9.8  | 26.2 |
| FOLM5T-05U  | 5/16"     | 8      | 1/2"-20    | 1/2"-20    | 6.0  | 14.3    | 16.0    | 19.0     | 34.5  | 24.1 | 9.8  | 28.7 |
| FOLM6T-06U  | 3/8"      | 10     | 9/16"-18   | 9/16"-18   | 7.5  | 14.3    | 17.4    | 20.6     | 38.8  | 26.9 | 9.9  | 31.8 |
| FOLM8T-08U  | 1/2"      | 12     | 3/4"-16    | 3/4"-16    | 9.9  | 19.0    | 22.2    | 25.4     | 44.5  | 31.8 | 11.0 | 36.8 |
| FOLM10T-10U | 5/8"      | 16     | 7/8"-14    | 7/8"-14    | 12.3 | 22.2    | 25.4    | 28.5     | 53.4  | 36.8 | 12.5 | 43.2 |
| FOLM12T-12U | 3/4"      | 18,20  | 1 1/16"-12 | 1 1/16"-12 | 15.5 | 27.0    | 32.0    | 34.9     | 57.7  | 42.2 | 16.5 | 49.3 |
| FOLM14T-14U | 7/8"      | 22     | 1 3/16"-12 | 1 3/16"-12 | 18.0 | 33.3    | 35.0    | 38.1     | 63.3  | 45.7 | 16.5 | 50.8 |
| FOLM16T-16U | 1"        | 25     | 1 5/16"-12 | 1 5/16"-12 | 21.5 | 33.3    | 38.0    | 41.2     | 65.0  | 46.0 | 16.5 | 52.1 |
| FOLM20T-20U | 1-1/4"    | 32     | 1 5/8"-12  | 1 5/8"-12  | 37.5 | 41.3    | 50.8    | 47.6     | 70.8  | 52.3 | 16.5 | 57.2 |
| FOLM24T-24U | 1-1/2"    | 38     | 1 7/8"-12  | 1 7/8"-12  | 33.0 | 47.6    | 57.0    | 53.9     | 85.9  | 59.2 | 16.5 | 60.7 |
| FOLM32T-32U | 2"        | 50     | 2 1/2"-12  | 2 1/2"-12  | 45.0 | 63.5    | 73.0    | 69.8     | 105.2 | 77.7 | 16.5 | 73.4 |

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## O-Ring Seal 45° Male Elbow.(UNF)

### FOLMB

SAE J514(070320)



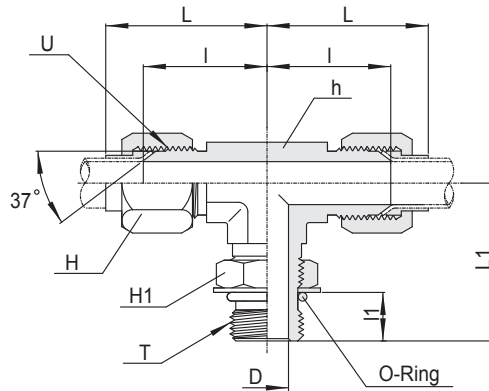
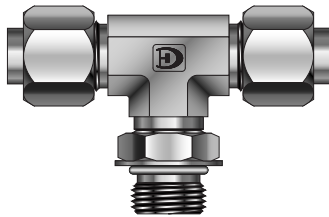
| Part No.     | Tube O.D. |        | U (UNF)    | T (UNF)    | D    | h<br>(HEX) | H<br>(HEX) | H1<br>(HEX) | L    | L1   | L2   | L3   |
|--------------|-----------|--------|------------|------------|------|------------|------------|-------------|------|------|------|------|
|              | Inch      | Metric |            |            |      |            |            |             |      |      |      |      |
| FOLMB2T-02U  | 1/8"      | 3      | 5/16"-24   | 5/16"-24   | 1.6  | 11.1       | 9.5        | 14.2        | 25.3 | 17.5 | 8.4  | 23.9 |
| FOLMB3T-03U  | 3/16"     | 4      | 3/8"-24    | 3/8"-24    | 3.2  | 11.1       | 11.0       | 15.8        | 26.9 | 17.5 | 8.4  | 23.9 |
| FOLMB4T-04U  | 1/4"      | 6      | 7/16"-20   | 7/16"-20   | 4.4  | 11.1       | 14.2       | 17.4        | 27.4 | 18.3 | 9.8  | 23.9 |
| FOLMB5T-05U  | 5/16"     | 8      | 1/2"-20    | 1/2"-20    | 6.0  | 14.3       | 16.0       | 19.0        | 30.0 | 19.6 | 9.8  | 25.4 |
| FOLMB6T-06U  | 3/8"      | 10     | 9/16"-18   | 9/16"-18   | 7.5  | 14.3       | 17.4       | 20.6        | 33.0 | 21.1 | 9.9  | 28.4 |
| FOLMB8T-08U  | 1/2"      | 12     | 3/4"-16    | 3/4"-16    | 9.9  | 19.0       | 22.2       | 25.4        | 37.6 | 24.9 | 11.0 | 32.5 |
| FOLMB10T-10U | 5/8"      | 16     | 7/8"-14    | 7/8"-14    | 12.3 | 22.2       | 25.4       | 28.5        | 44.8 | 28.2 | 12.5 | 36.6 |
| FOLMB12T-12U | 3/4"      | 18,20  | 1 1/16"-12 | 1 1/16"-12 | 15.5 | 27.0       | 32.0       | 34.9        | 48.0 | 32.5 | 16.5 | 43.9 |
| FOLMB14T-14U | 7/8"      | 22     | 1 3/16"-12 | 1 3/16"-12 | 18.0 | 33.3       | 35.0       | 38.1        | 54.4 | 36.8 | 16.5 | 45.7 |
| FOLMB16T-16U | 1"        | 25     | 1 5/16"-12 | 1 5/16"-12 | 21.5 | 33.3       | 38.0       | 41.2        | 56.3 | 37.3 | 16.5 | 47.2 |
| FOLMB20T-20U | 1-1/4"    | 32     | 1 5/8"-12  | 1 5/8"-12  | 37.5 | 41.3       | 50.8       | 47.6        | 58.9 | 40.4 | 16.5 | 48.5 |
| FOLMB24T-24U | 1-1/2"    | 38     | 1 7/8"-12  | 1 7/8"-12  | 33.0 | 47.6       | 57.0       | 53.9        | 71.9 | 45.2 | 16.5 | 48.5 |
| FOLMB32T-32U | 2"        | 50     | 2 1/2"-12  | 2 1/2"-12  | 45.0 | 63.5       | 73.0       | 69.8        | 83.9 | 56.4 | 16.5 | 47.2 |

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## O-Ring Seal Branch Tee.(UNF)

### FOBTM

SAE J514(070429)



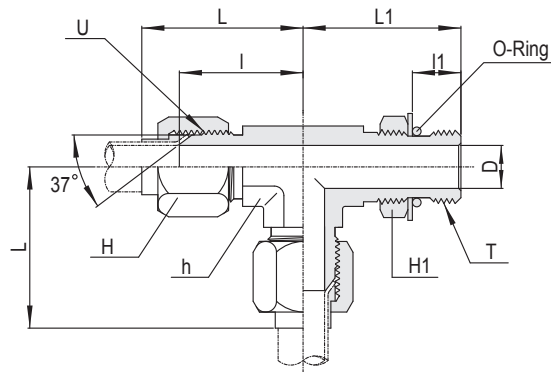
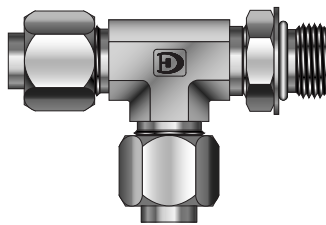
| Part No.     | Tube O.D. |        | U (UNF)    | T (UNF)    | D    | h<br>(HEX) | H<br>(HEX) | H1<br>(HEX) | L     | L1   | I    | I1   |
|--------------|-----------|--------|------------|------------|------|------------|------------|-------------|-------|------|------|------|
|              | Inch      | Metric |            |            |      |            |            |             |       |      |      |      |
| FOBTM2T-02U  | 1/8"      | 3      | 5/16"-24   | 5/16"-24   | 1.6  | 11.1       | 9.5        | 14.2        | 27.4  | 23.9 | 19.6 | 8.4  |
| FOBTM3T-03U  | 3/16"     | 4      | 3/8"-24    | 3/8"-24    | 3.2  | 11.1       | 11.0       | 15.8        | 30.5  | 23.9 | 21.1 | 8.4  |
| FOBTM4T-04U  | 1/4"      | 6      | 7/16"-20   | 7/16"-20   | 4.4  | 11.1       | 14.2       | 17.4        | 31.7  | 26.2 | 22.6 | 9.8  |
| FOBTM5T-05U  | 5/16"     | 8      | 1/2"-20    | 1/2"-20    | 6.0  | 14.3       | 16.0       | 19.0        | 34.5  | 28.7 | 24.1 | 9.8  |
| FOBTM6T-06U  | 3/8"      | 10     | 9/16"-18   | 9/16"-18   | 7.5  | 14.3       | 17.4       | 20.6        | 38.8  | 31.8 | 26.9 | 9.9  |
| FOBTM8T-08U  | 1/2"      | 12     | 3/4"-16    | 3/4"-16    | 9.9  | 19.0       | 22.2       | 25.4        | 44.5  | 36.8 | 31.8 | 11.0 |
| FOBTM10T-10U | 5/8"      | 16     | 7/8"-14    | 7/8"-14    | 12.3 | 22.2       | 25.4       | 28.5        | 53.4  | 43.2 | 36.8 | 12.5 |
| FOBTM12T-12U | 3/4"      | 18,20  | 1 1/16"-12 | 1 1/16"-12 | 15.5 | 27.0       | 32.0       | 34.9        | 57.7  | 49.3 | 42.2 | 16.5 |
| FOBTM14T-14U | 7/8"      | 22     | 1 3/16"-12 | 1 3/16"-12 | 18.0 | 33.3       | 35.0       | 38.1        | 63.3  | 50.8 | 45.7 | 16.5 |
| FOBTM16T-16U | 1"        | 25     | 1 5/16"-12 | 1 5/16"-12 | 21.5 | 33.3       | 38.0       | 41.2        | 65.0  | 52.1 | 46.0 | 16.5 |
| FOBTM20T-20U | 1-1/4"    | 32     | 1 5/8"-12  | 1 5/8"-12  | 37.5 | 41.3       | 50.8       | 47.6        | 70.8  | 57.2 | 52.3 | 16.5 |
| FOBTM24T-24U | 1-1/2"    | 38     | 1 7/8"-12  | 1 7/8"-12  | 33.0 | 47.6       | 57.0       | 53.9        | 85.9  | 60.7 | 59.2 | 16.5 |
| FOBTM32T-32U | 2"        | 50     | 2 1/2"-12  | 2 1/2"-12  | 45.0 | 63.5       | 73.0       | 69.8        | 105.2 | 73.4 | 77.7 | 16.5 |

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## O-Ring Seal Run Tee.(UNF)

### FORTM

SAE J514(070428)

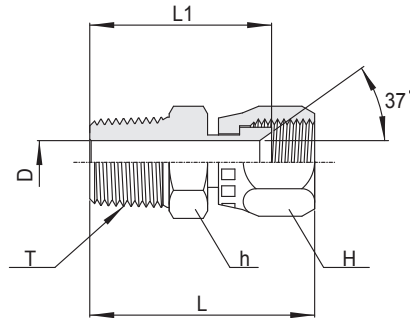
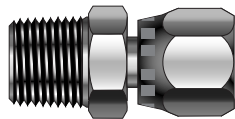


| Part No.     | Tube O.D. |        | U (UNF)    | T (UNF)    | D    | h<br>(HEX) | H<br>(HEX) | H1<br>(HEX) | L     | L1   | I    | I1   |
|--------------|-----------|--------|------------|------------|------|------------|------------|-------------|-------|------|------|------|
|              | Inch      | Metric |            |            |      |            |            |             |       |      |      |      |
| FORTM2T-02U  | 1/8"      | 3      | 5/16"-24   | 5/16"-24   | 1.6  | 11.1       | 9.5        | 14.2        | 27.4  | 23.9 | 19.6 | 8.4  |
| FORTM3T-03U  | 3/16"     | 4      | 3/8"-24    | 3/8"-24    | 3.2  | 11.1       | 11.0       | 15.8        | 30.5  | 23.9 | 21.1 | 8.4  |
| FORTM4T-04U  | 1/4"      | 6      | 7/16"-20   | 7/16"-20   | 4.4  | 11.1       | 14.2       | 17.4        | 31.7  | 26.2 | 22.6 | 9.8  |
| FORTM5T-05U  | 5/16"     | 8      | 1/2"-20    | 1/2"-20    | 6.0  | 14.3       | 16.0       | 19.0        | 34.5  | 28.7 | 24.1 | 9.8  |
| FORTM6T-06U  | 3/8"      | 10     | 9/16"-18   | 9/16"-18   | 7.5  | 14.3       | 17.4       | 20.6        | 38.8  | 31.8 | 26.9 | 9.9  |
| FORTM8T-08U  | 1/2"      | 12     | 3/4"-16    | 3/4"-16    | 9.9  | 19.0       | 22.2       | 25.4        | 44.5  | 36.8 | 31.8 | 11.0 |
| FORTM10T-10U | 5/8"      | 16     | 7/8"-14    | 7/8"-14    | 12.3 | 22.2       | 25.4       | 28.5        | 53.4  | 43.2 | 36.8 | 12.5 |
| FORTM12T-12U | 3/4"      | 18,20  | 1 1/16"-12 | 1 1/16"-12 | 15.5 | 27.0       | 32.0       | 34.9        | 57.7  | 49.3 | 42.2 | 16.5 |
| FORTM14T-14U | 7/8"      | 22     | 1 3/16"-12 | 1 3/16"-12 | 18.0 | 33.3       | 35.0       | 38.1        | 63.3  | 50.8 | 45.7 | 16.5 |
| FORTM16T-16U | 1"        | 25     | 1 5/16"-12 | 1 5/16"-12 | 21.5 | 33.3       | 38.0       | 41.2        | 65.0  | 52.1 | 46.0 | 16.5 |
| FORTM20T-20U | 1-1/4"    | 32     | 1 5/8"-12  | 1 5/8"-12  | 37.5 | 41.3       | 50.8       | 47.6        | 70.8  | 57.2 | 52.3 | 16.5 |
| FORTM24T-24U | 1-1/2"    | 38     | 1 7/8"-12  | 1 7/8"-12  | 33.0 | 47.6       | 57.0       | 53.9        | 85.9  | 60.7 | 59.2 | 16.5 |
| FORTM32T-32U | 2"        | 50     | 2 1/2"-12  | 2 1/2"-12  | 45.0 | 63.5       | 73.0       | 69.8        | 105.2 | 73.4 | 77.7 | 16.5 |

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Swivel Connector.

## FSFMC



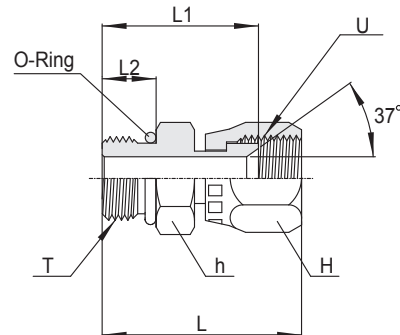
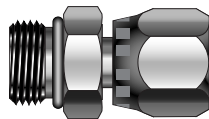
| Part No.     | Tube O.D. |        | U (UNF)    | T (NPT) | D    | h<br>(HEX) | H<br>(HEX) | L    | L1   |
|--------------|-----------|--------|------------|---------|------|------------|------------|------|------|
|              | Inch      | Metric |            |         |      |            |            |      |      |
| FSFMC 2T-01N | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 11.1       | 11.1       | 30.0 | 22.0 |
| FSFMC 3T-01N | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 11.1       | 12.7       | 32.0 | 23.5 |
| FSFMC 4T-01N | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 12.7       | 14.2       | 34.2 | 25.5 |
| FSFMC 5T-01N | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 14.2       | 16.0       | 35.0 | 25.5 |
| FSFMC 6T-02N | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 16.0       | 17.4       | 40.2 | 30.7 |
| FSFMC 8T-03N | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 21.0       | 22.2       | 42.7 | 32.0 |
| FSFMC10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 23.8       | 25.4       | 51.3 | 38.6 |
| FSFMC12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 29.0       | 32.0       | 54.5 | 40.2 |
| FSFMC14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 32.0       | 35.0       | 56.0 | 41.2 |
| FSFMC16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 36.0       | 38.0       | 63.7 | 48.6 |
| FSFMC20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 37.5 | 46.0       | 50.8       | 68.9 | 53.0 |
| FSFMC24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 50.0       | 57.0       | 77.6 | 59.0 |
| FSFMC32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 66.7       | 73.0       | 92.9 | 69.1 |

\* Pipe Thread NPT(N) or PT(R).

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## O-Ring Seal Swivel Connector (UNF)

### FSFOM

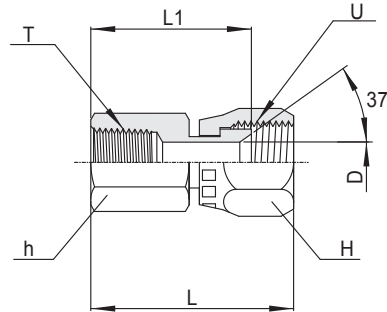
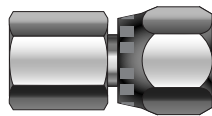


| Part No.     | Tube O.D. |        | U (UNF)    | T (UNF)    | h (HEX) | H (HEX) | L     | L1    | L1    |
|--------------|-----------|--------|------------|------------|---------|---------|-------|-------|-------|
|              | Inch      | Metric |            |            |         |         |       |       |       |
| FSFOM 2T-02U | 1/8"      | 3      | 5/16"-24   | 5/16"-24   | 11.1□   | 11.1□   | 30.4□ | 22.5□ | 7.5□  |
| FSFOM 3T-02U | 3/16"     | 4      | 3/8"-24    | 3/8"-24    | 12.7□   | 12.7□   | 31.0□ | 22.7□ | 7.5□  |
| FSFOM 4T-04U | 1/4"      | 6      | 7/16"-20   | 7/16"-20   | 14.2□   | 14.2□   | 33.9□ | 25.2□ | 9.1□  |
| FSFOM 5T-05U | 5/16"     | 8      | 1/2"-20    | 1/2"-20    | 15.8□   | 15.8□   | 35.7□ | 26.2□ | 9.1□  |
| FSFOM 6T-06U | 3/8"      | 10     | 9/16"-18   | 9/16"-18   | 17.4□   | 19.0□   | 37.4□ | 27.9□ | 9.9□  |
| FSFOM 8T-08U | 1/2"      | 12     | 3/4"-16    | 3/4"-16    | 22.2□   | 22.2□   | 41.6□ | 30.9□ | 11.1□ |
| FSFOM10T-10U | 5/8"      | 16     | 7/8"-14    | 7/8"-14    | 25.4□   | 27.0□   | 47.6□ | 34.9□ | 12.7□ |
| FSFOM12T-12U | 3/4"      | 18,20  | 1 1/16"-12 | 1 1/16"-12 | 31.8□   | 32.0□   | 54.4□ | 40.1□ | 15.1□ |
| FSFOM14T-14U | 7/8"      | 22     | 1 3/16"-12 | 1 3/16"-12 | 34.9□   | 34.9□   | 55.6□ | 40.9□ | 15.1□ |
| FSFOM16T-16U | 1"        | 25     | 1 5/16"-12 | 1 5/16"-12 | 38.1□   | 38.1□   | 56.8□ | 41.7□ | 15.1□ |
| FSFOM20T-20U | 1-1/4"    | 32     | 1 5/8"-12  | 1 5/8"-12  | 47.6□   | 50.8□   | 63.2□ | 47.3□ | 15.1□ |
| FSFOM24T-24U | 1-1/2"    | 38     | 1 7/8"-12  | 1 7/8"-12  | 54.0□   | 60.0□   | 71.3□ | 52.7□ | 15.1□ |
| FSFOM32T-32U | 2"        | 50     | 2 1/2"-12  | 2 1/2"-12  | 70.0    | 73.0    | 72.5  | 58.7  | 15.1  |

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Swivel Female Connector.

## FSFFC



| Part No.     | Tube O.D. |        | U (UNF)    | T (NPT) | D    | h (HEX) | H (HEX) | L    | L1   |
|--------------|-----------|--------|------------|---------|------|---------|---------|------|------|
|              | Inch      | Metric |            |         |      |         |         |      |      |
| FSFFC 2T-01N | 1/8"      | 3      | 5/16"-24   | 1/8"    | 1.6  | 14.2    | 11.1    | 36.1 | 28.2 |
| FSFFC 3T-01N | 3/16"     | 4      | 3/8"-24    | 1/8"    | 3.2  | 14.2    | 12.7    | 37.3 | 29.0 |
| FSFFC 4T-01N | 1/4"      | 6      | 7/16"-20   | 1/8"    | 4.4  | 14.2    | 14.2    | 39.7 | 31.0 |
| FSFFC 5T-01N | 5/16"     | 8      | 1/2"-20    | 1/8"    | 6.0  | 14.2    | 16.0    | 40.5 | 31.0 |
| FSFFC 6T-02N | 3/8"      | 10     | 9/16"-18   | 1/4"    | 7.5  | 19.0    | 17.4    | 45.8 | 36.3 |
| FSFFC 8T-03N | 1/2"      | 12     | 3/4"-16    | 3/8"    | 9.9  | 22.2    | 22.2    | 47.0 | 38.9 |
| FSFFC10T-04N | 5/8"      | 16     | 7/8"-14    | 1/2"    | 12.3 | 29.0    | 25.4    | 51.6 | 48.0 |
| FSFFC12T-06N | 3/4"      | 18,20  | 1 1/16"-12 | 3/4"    | 15.5 | 35.0    | 32.0    | 66.6 | 52.3 |
| FSFFC14T-06N | 7/8"      | 22     | 1 3/16"-12 | 3/4"    | 18.0 | 35.0    | 35.0    | 67.8 | 53.1 |
| FSFFC16T-08N | 1"        | 25     | 1 5/16"-12 | 1"      | 21.5 | 41.0    | 38.0    | 73.5 | 58.4 |
| FSFFC20T-10N | 1-1/4"    | 32     | 1 5/8"-12  | 1-1/4"  | 37.5 | 50.8    | 50.8    | 78.1 | 62.2 |
| FSFFC24T-12N | 1-1/2"    | 38     | 1 7/8"-12  | 1-1/2"  | 33.0 | 60.0    | 57.0    | 86.7 | 68.1 |
| FSFFC32T-16N | 2"        | 50     | 2 1/2"-12  | 2"      | 45.0 | 73.0    | 73.0    | 89.3 | 65.5 |

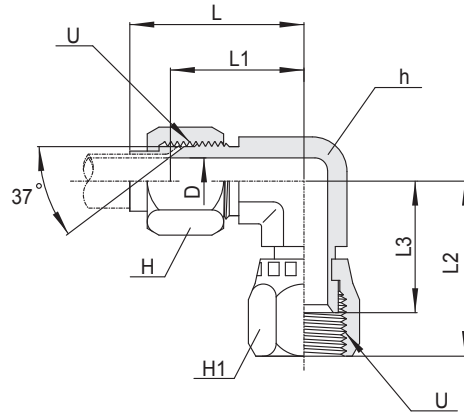
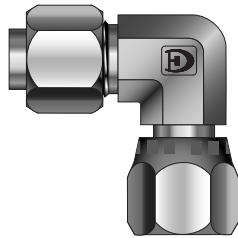
All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.



## Swivel Elbow.

### FSL

SAE J514(070221)



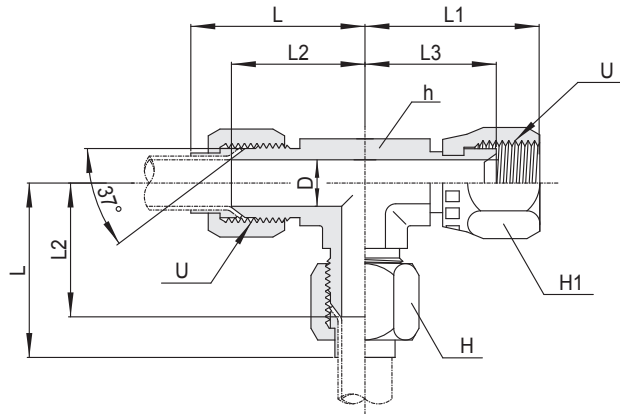
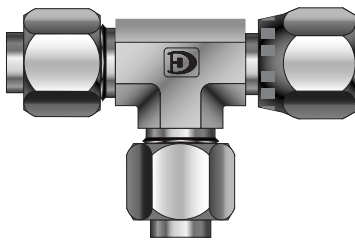
| Part No. | Tube O.D. |        | U (UNF)    | D    | h<br>(HEX) | H<br>(HEX) | H1<br>(HEX) | L     | L1   | L2   | L3    |
|----------|-----------|--------|------------|------|------------|------------|-------------|-------|------|------|-------|
|          | Inch      | Metric |            |      |            |            |             |       |      |      |       |
| FSL-2T   | 1/8"      | 3      | 5/16"-24   | 1.6  | 11.1       | 9.5        | 11.1        | 27.4  | 19.6 | 24.6 | 16.7□ |
| FSL-3T   | 3/16"     | 4      | 3/8"-24    | 3.2  | 11.1       | 11.0       | 12.7        | 30.5  | 21.1 | 25.4 | 17.1□ |
| FSL-4T   | 1/4"      | 6      | 7/16"-20   | 4.4  | 11.1       | 14.2       | 14.2        | 31.7  | 22.6 | 25.4 | 16.7□ |
| FSL-5T   | 5/16"     | 8      | 1/2"-20    | 6.0  | 14.3       | 16.0       | 15.8        | 34.5  | 24.1 | 26.9 | 17.4□ |
| FSL-6T   | 3/8"      | 10     | 9/16"-18   | 7.5  | 14.3       | 17.4       | 17.4        | 38.8  | 26.9 | 31.8 | 22.3□ |
| FSL-8T   | 1/2"      | 12     | 3/4"-16    | 9.9  | 19.0       | 22.2       | 22.2        | 44.5  | 31.8 | 35.1 | 24.4□ |
| FSL-10T  | 5/8"      | 16     | 7/8"-14    | 12.3 | 22.2       | 25.4       | 25.4        | 53.4  | 36.8 | 41.1 | 28.4□ |
| FSL-12T  | 3/4"      | 18,20  | 1 1/16"-12 | 15.5 | 27.0       | 32.0       | 31.7        | 57.7  | 42.2 | 44.4 | 30.1□ |
| FSL-14T  | 7/8"      | 22     | 1 3/16"-12 | 18.0 | 33.3       | 35.0       | 34.9        | 63.3  | 45.7 | 45.2 | 30.5□ |
| FSL-16T  | 1"        | 25     | 1 5/16"-12 | 21.5 | 33.3       | 38.0       | 38.1        | 65.0  | 46.0 | 50.8 | 35.7□ |
| FSL-20T  | 1-1/4"    | 32     | 1 5/8"-12  | 37.5 | 41.3       | 50.8       | 50.8        | 70.8  | 52.3 | 58.7 | 42.8□ |
| FSL-24T  | 1-1/2"    | 38     | 1 7/8"-12  | 33.0 | 47.6       | 57.1       | 57.1        | 85.9  | 59.2 | 65.8 | 47.2□ |
| FSL-32T  | 2"        | 50     | 2 1/2"-12  | 45.0 | 63.5       | 73.0       | 69.8        | 105.2 | 77.7 | 85.9 | 62.1  |

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## Swivel Run Tee.

### FSRT

SAE J514(070432)



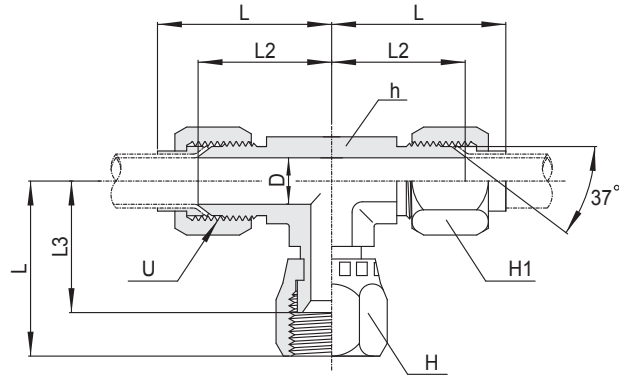
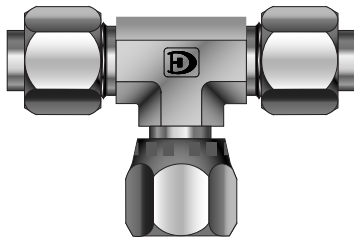
| Part No. | Tube O.D. |        | U (UNF)    | D    | h (HEX) | H (HEX) | H1 (HEX) | L     | L1   | L2   | L3   |
|----------|-----------|--------|------------|------|---------|---------|----------|-------|------|------|------|
|          | Inch      | Metric |            |      |         |         |          |       |      |      |      |
| FSRT-2T  | 1/8"      | 3      | 5/16"-24   | 1.6  | 11.1    | 9.5     | 11.1     | 27.4  | 24.6 | 19.6 | 16.7 |
| FSRT-3T  | 3/16"     | 4      | 3/8"-24    | 3.2  | 11.1    | 11.0    | 12.7     | 30.5  | 25.4 | 21.1 | 17.1 |
| FSRT-4T  | 1/4"      | 6      | 7/16"-20   | 4.4  | 11.1    | 14.2    | 14.2     | 31.7  | 25.4 | 22.6 | 16.7 |
| FSRT-5T  | 5/16"     | 8      | 1/2"-20    | 6.0  | 14.3    | 16.0    | 15.8     | 34.5  | 26.9 | 24.1 | 17.4 |
| FSRT-6T  | 3/8"      | 10     | 9/16"-18   | 7.5  | 14.3    | 17.4    | 17.4     | 38.8  | 31.8 | 26.9 | 22.3 |
| FSRT-8T  | 1/2"      | 12     | 3/4"-16    | 9.9  | 19.0    | 22.2    | 22.2     | 44.5  | 35.1 | 31.8 | 24.4 |
| FSRT-10T | 5/8"      | 16     | 7/8"-14    | 12.3 | 22.2    | 25.4    | 25.4     | 53.4  | 41.1 | 36.8 | 28.4 |
| FSRT-12T | 3/4"      | 18,20  | 1 1/16"-12 | 15.5 | 27.0    | 32.0    | 31.7     | 57.7  | 44.4 | 42.2 | 30.1 |
| FSRT-14T | 7/8"      | 22     | 1 3/16"-12 | 18.0 | 33.3    | 35.0    | 34.9     | 63.3  | 45.2 | 45.7 | 30.5 |
| FSRT-16T | 1"        | 25     | 1 5/16"-12 | 21.5 | 33.3    | 38.0    | 38.1     | 65.0  | 50.8 | 46.0 | 35.7 |
| FSRT-20T | 1-1/4"    | 32     | 1 5/8"-12  | 37.5 | 41.3    | 50.8    | 50.8     | 70.8  | 58.7 | 52.3 | 42.8 |
| FSRT-24T | 1-1/2"    | 38     | 1 7/8"-12  | 33.0 | 47.6    | 57.1    | 57.0     | 85.9  | 65.8 | 59.2 | 47.2 |
| FSRT-32T | 2"        | 50     | 2 1/2"-12  | 45.0 | 63.5    | 73.0    | 69.8     | 105.2 | 85.9 | 77.7 | 62.1 |

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## Swivel Branch Tee.

### FSBT

SAE J514(070433)



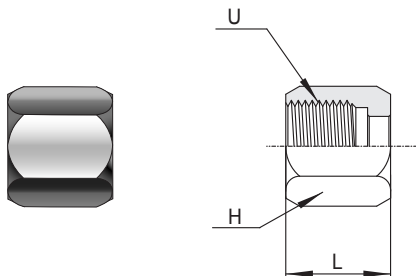
| Part No. | Tube O.D. |        | U (UNF)    | D    | h (HEX) | H (HEX) | H1 (HEX) | L     | L1   | L2   | L3   |
|----------|-----------|--------|------------|------|---------|---------|----------|-------|------|------|------|
|          | Inch      | Metric |            |      |         |         |          |       |      |      |      |
| FSBT-2T  | 1/8"      | 3      | 5/16"-24   | 1.6  | 11.1    | 9.5     | 11.1     | 27.4  | 24.6 | 19.6 | 16.7 |
| FSBT-3T  | 3/16"     | 4      | 3/8"-24    | 3.2  | 11.1    | 11.0    | 12.7     | 30.5  | 25.4 | 21.1 | 17.1 |
| FSBT-4T  | 1/4"      | 6      | 7/16"-20   | 4.4  | 11.1    | 14.2    | 14.2     | 31.7  | 25.4 | 22.6 | 16.7 |
| FSBT-5T  | 5/16"     | 8      | 1/2"-20    | 6.0  | 14.3    | 16.0    | 15.8     | 34.5  | 26.9 | 24.1 | 17.4 |
| FSBT-6T  | 3/8"      | 10     | 9/16"-18   | 7.5  | 14.3    | 17.4    | 17.4     | 38.8  | 31.8 | 26.9 | 22.3 |
| FSBT-8T  | 1/2"      | 12     | 3/4"-16    | 9.9  | 19.0    | 22.2    | 22.2     | 44.5  | 35.1 | 31.8 | 24.4 |
| FSBT-10T | 5/8"      | 16     | 7/8"-14    | 12.3 | 22.2    | 25.4    | 25.4     | 53.4  | 41.1 | 36.8 | 28.4 |
| FSBT-12T | 3/4"      | 18,20  | 1 1/16"-12 | 15.5 | 27.0    | 32.0    | 31.7     | 57.7  | 44.4 | 42.2 | 30.1 |
| FSBT-14T | 7/8"      | 22     | 1 3/16"-12 | 18.0 | 33.3    | 35.0    | 34.9     | 63.3  | 45.2 | 45.7 | 30.5 |
| FSBT-16T | 1"        | 25     | 1 5/16"-12 | 21.5 | 33.3    | 38.0    | 38.1     | 65.0  | 50.8 | 46.0 | 35.7 |
| FSBT-20T | 1-1/4"    | 32     | 1 5/8"-12  | 37.5 | 41.3    | 50.8    | 50.8     | 70.8  | 58.7 | 52.3 | 42.8 |
| FSBT-24T | 1-1/2"    | 38     | 1 7/8"-12  | 33.0 | 47.6    | 57.1    | 57.0     | 85.9  | 65.8 | 59.2 | 47.2 |
| FSBT-32T | 2"        | 50     | 2 1/2"-12  | 45.0 | 63.5    | 73.0    | 69.8     | 105.2 | 85.9 | 77.7 | 62.1 |

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## Nut

### FN

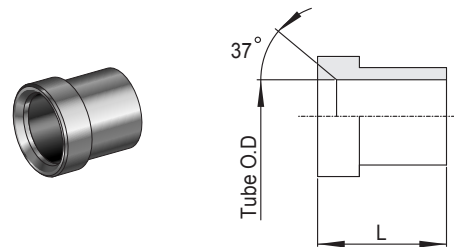
SAE J514(070110)



## Sleeve

### FS

SAE J514(070115)



| Part No. | Tube O.D. |        | U (UNF)    | H (HEX) | L    |
|----------|-----------|--------|------------|---------|------|
|          | Inch      | Metric |            |         |      |
| FN-2T    | 1/8"      | 3      | 5/16"-24   | 9.5     | 14.0 |
| FN-3T    | 3/16"     | 4      | 3/8"-24    | 11.1    | 15.5 |
| FN-4T    | 1/4"      | 6      | 7/16"-20   | 14.2    | 15.8 |
| FN-5T    | 5/16"     | 8      | 1/2"-20    | 15.8    | 17.3 |
| FN-6T    | 3/8"      | 10     | 9/16"-18   | 17.4    | 18.5 |
| FN-8T    | 1/2"      | 12     | 3/4"-16    | 22.2    | 21.6 |
| FN-10T   | 5/8"      | 16     | 7/8"-14    | 25.4    | 24.9 |
| FN-12T   | 3/4"      | 18,20  | 1 1/16"-12 | 31.7    | 26.2 |
| FN-14T   | 7/8"      | 22     | 1 3/16"-12 | 34.9    | 27.7 |
| FN-16T   | 1"        | 25     | 1 5/16"-12 | 38.1    | 28.7 |
| FN-20T   | 1-1/4"    | 32     | 1 5/8"-12  | 50.8    | 31.2 |
| FN-24T   | 1-1/2"    | 38     | 1 7/8"-12  | 57.1    | 36.1 |
| FN-32T   | 2"        | 50     | 2 1/2"-12  | 73.0    | 44.5 |

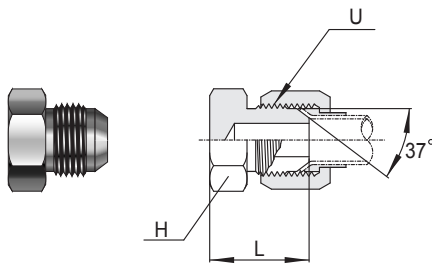
| Part No. | Tube O.D. |        | L    |
|----------|-----------|--------|------|
|          | Inch      | Metric |      |
| FS-2T    | 1/8"      | 3      | 8.6  |
| FS-3T    | 3/16"     | 4      | 8.6  |
| FS-4T    | 1/4"      | 6      | 10.4 |
| FS-5T    | 5/16"     | 8      | 11.2 |
| FS-6T    | 3/8"      | 10     | 12.7 |
| FS-8T    | 1/2"      | 12     | 14.2 |
| FS-10T   | 5/8"      | 16     | 16.8 |
| FS-12T   | 3/4"      | 18,20  | 17.3 |
| FS-14T   | 7/8"      | 22     | 19.3 |
| FS-16T   | 1"        | 25     | 19.8 |
| FS-20T   | 1-1/4"    | 32     | 23.1 |
| FS-24T   | 1-1/2"    | 38     | 28.4 |
| FS-32T   | 2"        | 50     | 30.2 |

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## Plug

### FP

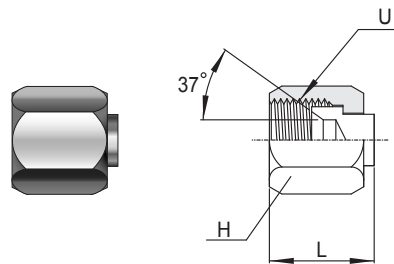
SAE J514(070109)



## Plug Cap

### FPC

SAE J514(070112)



| Part No. | Tube O.D. |        | U (UNF)    | H (HEX) | L    |
|----------|-----------|--------|------------|---------|------|
|          | Inch      | Metric |            |         |      |
| FP-2T    | 1/8"      | 3      | 5/16"-24   | 11.1    | 17.8 |
| FP-3T    | 3/16"     | 4      | 3/8"-24    | 11.1    | 18.5 |
| FP-4T    | 1/4"      | 6      | 7/16"-20   | 12.7    | 20.3 |
| FP-5T    | 5/16"     | 8      | 1/2"-20    | 14.2    | 20.3 |
| FP-6T    | 3/8"      | 10     | 9/16"-18   | 15.8    | 21.3 |
| FP-8T    | 1/2"      | 12     | 3/4"-16    | 20.6    | 23.9 |
| FP-10T   | 5/8"      | 16     | 7/8"-14    | 20.6    | 27.9 |
| FP-12T   | 3/4"      | 18,20  | 1 1/16"-12 | 28.5    | 32.5 |
| FP-14T   | 7/8"      | 22     | 1 3/16"-12 | 31.7    | 33.3 |
| FP-16T   | 1"        | 25     | 1 5/16"-12 | 34.9    | 33.8 |
| FP-20T   | 1-1/4"    | 32     | 1 5/8"-12  | 42.8    | 36.8 |
| FP-24T   | 1-1/2"    | 38     | 1 7/8"-12  | 50.8    | 41.9 |
| FP-32T   | 2"        | 50     | 2 1/2"-12  | 66.6    | 52.1 |

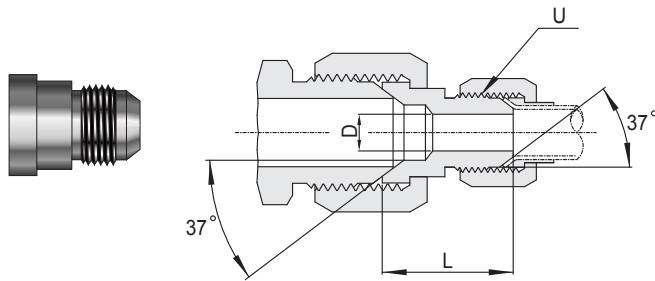
| Part No. | Tube O.D. |        | U (UNF)    | H (HEX) | L    |
|----------|-----------|--------|------------|---------|------|
|          | Inch      | Metric |            |         |      |
| FPC-2T   | 1/8"      | 3      | 5/16"-24   | 9.5     | 13.7 |
| FPC-3T   | 3/16"     | 4      | 3/8"-24    | 11.1    | 15.2 |
| FPC-4T   | 1/4"      | 6      | 7/16"-20   | 14.2    | 15.5 |
| FPC-5T   | 5/16"     | 8      | 1/2"-20    | 15.8    | 17.0 |
| FPC-6T   | 3/8"      | 10     | 9/16"-18   | 17.4    | 18.3 |
| FPC-8T   | 1/2"      | 12     | 3/4"-16    | 22.2    | 21.3 |
| FPC-10T  | 5/8"      | 16     | 7/8"-14    | 25.4    | 24.6 |
| FPC-12T  | 3/4"      | 18,20  | 1 1/16"-12 | 31.7    | 25.9 |
| FPC-14T  | 7/8"      | 22     | 1 3/16"-12 | 34.9    | 27.4 |
| FPC-16T  | 1"        | 25     | 1 5/16"-12 | 38.1    | 28.4 |
| FPC-20T  | 1-1/4"    | 32     | 1 5/8"-12  | 50.8    | 31.0 |
| FPC-24T  | 1-1/2"    | 38     | 1 7/8"-12  | 57.1    | 35.8 |
| FPC-32T  | 2"        | 50     | 2 1/2"-12  | 73.0    | 44.2 |

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.

## Tube End Reducer

### FTER

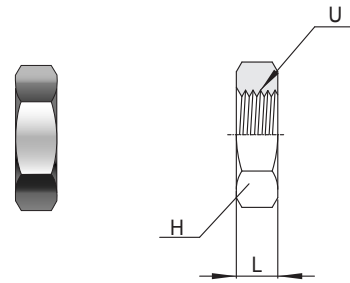
SAE J514(070123)



## Bulkhead Lock Nut

### FLN

SAE J514(070118)



| Part No.    | Reducing Tube O.D. | U (UNF)    | D    | L    |
|-------------|--------------------|------------|------|------|
| FTER6T-4T   | 3/8" x 1/4"        | 7/16"-20   | 4.4  | 24.6 |
| FTER8T-4T   | 1/2" x 1/4"        | 7/16"-20   | 4.4  | 25.4 |
| FTER8T-6T   | 1/2" x 3/8"        | 9/16"-18   | 7.5  | 25.4 |
| FTER10T-4T  | 5/8" x 1/4"        | 7/16"-20   | 4.4  | 26.2 |
| FTER10T-6T  | 5/8" x 3/8"        | 9/16"-18   | 7.5  | 26.2 |
| FTER12T-4T  | 3/4" x 1/4"        | 7/16"-20   | 4.4  | 27.7 |
| FTER12T-6T  | 3/4" x 3/8"        | 9/16"-18   | 7.5  | 27.7 |
| FTER12T-8T  | 3/4" x 1/2"        | 3/4"-16    | 10.0 | 30.2 |
| FTER16T-12T | 1" x 3/4"          | 1-1/16"-12 | 15.5 | 37.3 |
| FTER20T-12T | 1-1/4" x 3/4"      | 1-1/16"-12 | 15.5 | 38.3 |
| FTER20T-16T | 1-1/4" x 1"        | 1-5/16"-12 | 21.5 | 40.3 |
| FTER24T-20T | 1-1/2" x 1-1/4"    | 1-5/8"-12  | 27.5 | 42.9 |

| Part No. | Tube O.D. |        | U (UNF)    | H (HEX) | L    |
|----------|-----------|--------|------------|---------|------|
|          | Inch      | Metric |            |         |      |
| FLN-2T   | 1/8"      | 3      | 5/16"-24   | 14.2    | 5.6  |
| FLN-3T   | 3/16"     | 4      | 3/8"-24    | 15.8    | 5.6  |
| FLN-4T   | 1/4"      | 6      | 7/16"-20   | 17.4    | 6.4  |
| FLN-5T   | 5/16"     | 8      | 1/2"-20    | 19.0    | 6.4  |
| FLN-6T   | 3/8"      | 10     | 9/16"-18   | 20.6    | 6.9  |
| FLN-8T   | 1/2"      | 12     | 3/4"-16    | 25.4    | 7.9  |
| FLN-10T  | 5/8"      | 16     | 7/8"-14    | 28.5    | 9.1  |
| FLN-12T  | 3/4"      | 18,20  | 1-1/16"-12 | 34.9    | 10.4 |
| FLN-14T  | 7/8"      | 22     | 1-3/16"-12 | 38.1    | 10.4 |
| FLN-16T  | 1"        | 25     | 1-5/16"-12 | 41.2    | 10.4 |
| FLN-20T  | 1-1/4"    | 32     | 1-5/8"-12  | 47.6    | 10.4 |
| FLN-24T  | 1-1/2"    | 38     | 1-7/8"-12  | 53.9    | 10.4 |
| FLN-32T  | 2"        | 50     | 2-1/2"-12  | 69.8    | 10.4 |

All dimensions are in millimeters unless otherwise specified. Dimensions are for reference only, subject to change.