

## 1. Introduction

The D7 Inflation/Deflation valve is manufactured from quality materials and has been engineered to ensure a long life in arduous marine environments.

## 2. Versions

Two versions of the valve core assembly are available:-

**Standard** - (identified by a grey spindle)

Operating pressure            7kPa to 103kPa (1 to 15psi)

**High Pressure** - (identified by a red spindle)

Operating pressure            69kPa to 172kPa (10 to 25psi)

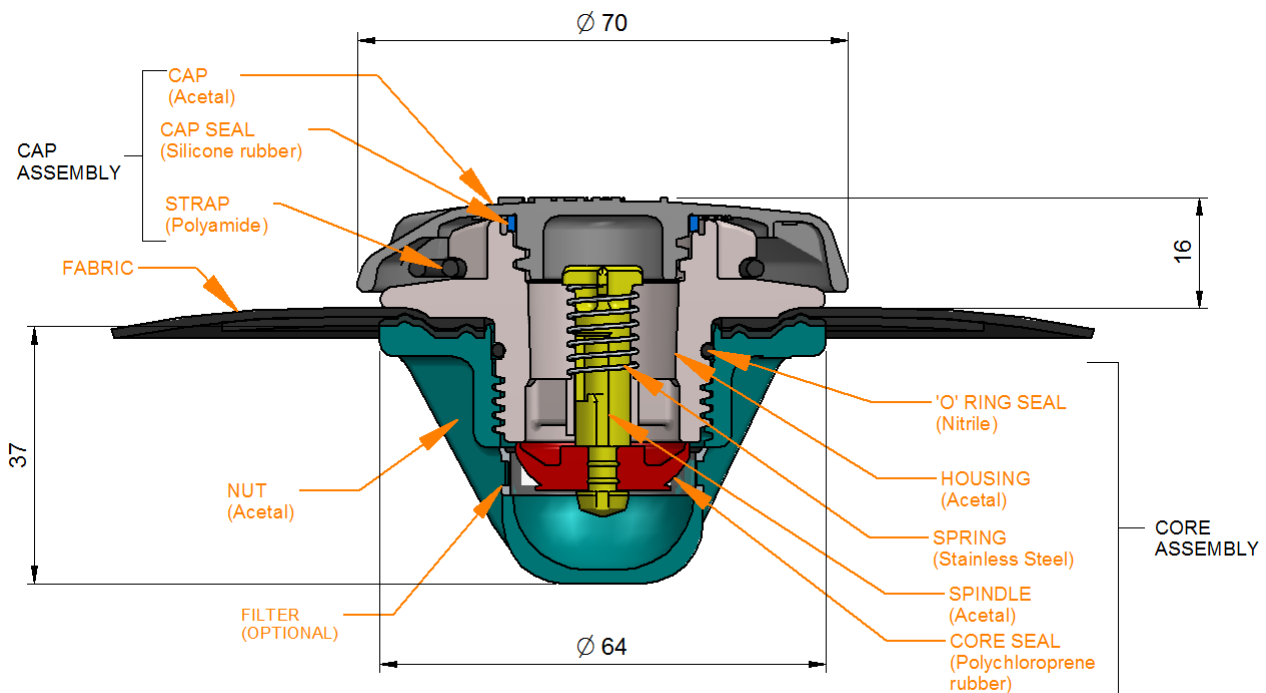
An optional filter may be fitted to prevent the ingress of fibres into the sealing face.

When using drop stitch fabrics, the optional filter should be used to prevent loose threads or fibres entering the valve seal.

## 3. Function

See figure 1 for the general arrangement of the valve.

- 3.1. The D7 valve is designed for the inflation and deflation of any flexible inflatable structure within the limits given by the clamping performance (See section 5).
- 3.2. To inflate the structure an adapter which fits tightly in the throat of the valve is required. Leaffield Marine supplies a range of such adapters.
- 3.3. With the spindle in its normal (i.e. raised) position the valve acts as a non-return valve which is opened by the inflation pressure. The low back pressure during inflation allows the use of manual (hand) pumps or electrical pumps/blowers).
- 3.4. To deflate, the spindle can be depressed and either held down to adjust the pressure or rotated clockwise to lock the valve in the "open" position if a full deflation is required.
- 3.5. Once inflation is complete the cap should be fitted, this acts as a secondary seal and will prevent the contamination of the valve core assembly and inadvertent release. It also provides a smooth snag free surface which reduces the possibility of damage to equipment or injury to personnel.
- 3.6. If it is intended to use a gas other than air, nitrogen (N<sub>2</sub>), carbon dioxide (CO<sub>2</sub>) or a mixture of these gases then Leaffield Marine must be consulted on its use.



**Figure 1 D7 Valve General Arrangement**

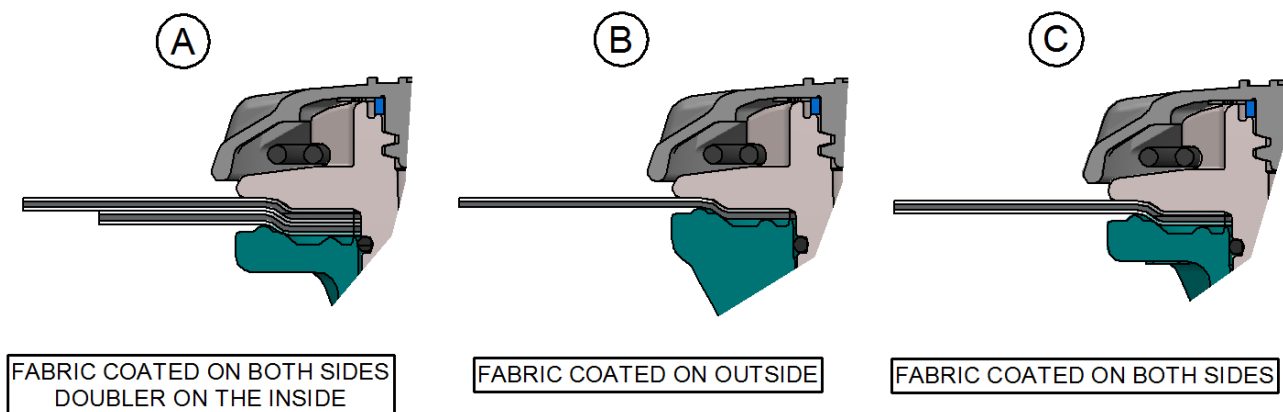
## 4. Factory Installation

- 4.1. The valve can be clamped to structures with a fabric thickness of 0.5 to 3.5mm.
- 4.2. The diameter of the fabric hole shall be 32.5/33.5mm.
- 4.3. A “Doubler” is generally recommended around the hole, ideally fitted to the inside to reduce stress in the area of the hole.
- 4.4. An O ring is fitted specifically for 2 applications: -
  1. Drop stitch fabric constructions, the O ring is fitted air leaking up the thread and into porous fabrics.
  2. Where a permeable reinforcing fabric is used over the airtight bladder. In these cases, the O ring must be used and ensure it remains in its groove.
- 4.5. If leakage occurs when the valve is installed see M-08-IS-0D7 Valve Service Advice for suggested solutions.
- 4.6. The valve must only be fitted using the special tools supplied by Leaffield Marine. These are Part No. C16603 for use on the outside of the structure on the housing and accepts a ½” square drive and Part No.B16604 which is the nest for holding the interior nut. The body of this tool is a 65mm A/F hexagon which can be held by any convenient method.
- 4.7. The recommended fitting torque is 27N.m (20lb.ft) for installations shown in Figure 2. For other arrangements Leaffield Marine must be consulted.

- 4.8. During assembly, the user must not expose the valve to any substance which will degrade it. The materials used in the construction of the valve are shown in Figure 1. Care should be taken to avoid contamination of the valve by adhesives or solvents during manufacture as this may degrade the valve performance.

**IMPORTANT**  
**DO NOT USE GREASES, SEALANTS OR ANY OTHER FORM OF LUBRICANT ON THE VALVE THREADS.**

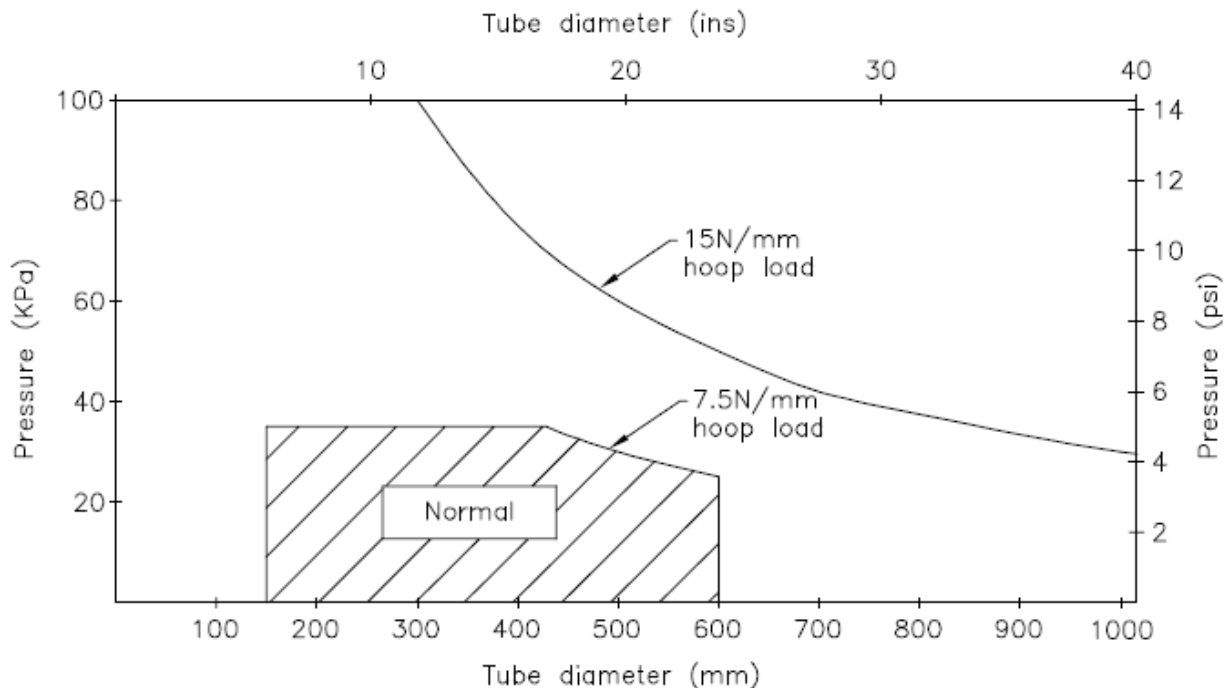
- 4.9. The valve should not be exposed to temperatures exceeding 100°C such as may be experienced by vulcanisation processes as this may degrade the valve performance. Normal operating temperature is + 60°C to -30°C.
- 4.10. Each valve shall be re-torqued to 27N.m (20ft.lb) after at least 24hrs have elapsed since the first tightening; this reduces the effect of creep in the clamped assembly during its service life. The second application of torque can be carried out with the structure inflated. With some combinations of fabric and doublers it may be possible to achieve satisfactory, long term clamping with just a single application of torque.



**Figure 2 Fabric Configurations**

## 5. Performance

- 5.1. The preferred installations are shown in Figure 2. When single sided coated fabric is used Leaffield Marine must be consulted for advice.
- 5.2. In normal use the valve clamping can withstand a typical fabric hoop load of 15N/mm (86 lbf/in). This is the proof load and the maximum working load must be set by applying a safety factor of at least 2, see Figure 3.
- 5.3. If the tube diameter is less than 150mm (6 inches) the assembly should be tested. If a valve is to be fitted where the hoop loads are greater than 7.5N/mm – please contact Leaffield Marine for advice.
- 5.4. Each non-return valve seal is tested for leakage; the maximum accepted leak rate is 1 litre of free air over a 24-hour period.
- 5.5. The cap seals against the housing and provides a secondary sealing method in case of damage and degradation affecting the non-return valve seal.
- 5.6. For applications using drop stitch flooring (e.g. stand up paddleboards) the maximum permitted pressure is 172kPa (25psi). For this type of application, the hard seal variant of the D7 valve must be used. In addition, the filter must be fitted to prevent the ingress of loose drop stitch fibres into the valves non-return seal which may cause the valve to leak.



**Figure 3 Hoop Loads**

## 6. Servicing

- 6.1. The valve needs minimum maintenance. It should be kept clean by using household detergents solution. Solvent cleaners should not be used.
- 6.2. For further information please refer to the service sheet – M-08-IS-0D7.

## 7. Storage

- 7.1. For long term storage the valve must be stored away from dirt and solvent contamination.
- 7.2. When stored in acceptable conditions the storage period prior to installation should not exceed 5 years.

## 8. Replaceable Items

Refer to Figure 1

Core Assembly  
Cap Assembly  
Cap Seal

Contact Details	
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