

LEAFIELD MARINE LIMITED
GENERAL USER MANUAL
FOR
GAS INFLATION SYSTEM, GIS4

M-07-UM-GIS4

Issue 2

**FOR INFORMATION ONLY –
WILL NOT BE KEPT UP TO DATE**



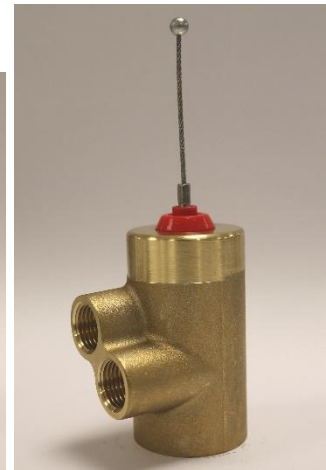
2308002L



2308002N



2308002LU



2308002NU



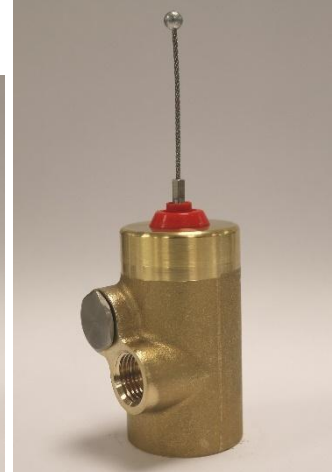
2402002TLU



2402002TNU



2402002SLU



2402002SNU



GIS425E300C



GIS425E300E

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CHANGE RECORD

Issue	NCR No.	Incorporated By	Date
1	FIRST ISSUE	S. HORN	26 th April 2024
2	15286	S. HORN	17 th November 2025

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Regulation 2019/1020 – for Surveillance Authorities use only.
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SECTION 1

INTRODUCTION

1. IMPORTANT INFORMATION

This user manual is provided by LEAFIELD MARINE LIMITED to ensure the safe handling, storage, installation and servicing of the LEAFIELD GAS INFLATION SYSTEM, GIS4 when used with CO₂/N₂, CO₂, N₂ or air.

For the GAS INFLATION SYSTEM, CUTTER TYPE use Manual LEL 20018.

For the GAS INFLATION SYSTEM WITH PRESSURE GAUGE, use Manual M-07-UM-GISPG.

For the GAS INFLATION SYSTEM, TORSIONAL, use Manual M-07-UM-GIST.

Use only cylinders approved for use up to the maximum working pressure of the Cylinder Valve. Care should be taken that the developed pressure at 65°C does not exceed that recommended for the burst disc (Diaphragm Assembly) in normal use.

210bar disc maximum pressure at 65°C = 200 bar ± 5%.

238bar disc maximum pressure at 65°C = 227 bar ± 5%.

250bar disc maximum pressure at 65°C = 238 bar ± 5%.

300bar disc maximum pressure at 65°C = 286 bar ± 5%.

The GIS4 system is designed to function in temperatures ranging from -30°C to +65°C and has a maximum working pressure of 300bar.

It is important that this manual is read and understood prior to any activity being undertaken.

2. NOTE

LEAFIELD MARINE LIMITED shall not be deemed by virtue of any of the instructions in this manual to have assumed any of the responsibilities of the Purchaser or his Service Agencies under the Health and Safety at Work Act nor any other Enactment.

The products detailed in this manual are covered by the European Pressure Equipment Directive 2014/68/EU.

3. WARNING AND CAUTION

The following text highlights **WARNING** and CAUTION. These are defined as follows:

A WARNING CALLS ATTENTION TO THE USE OF MATERIALS OR PROCEDURES WHICH MUST BE FOLLOWED PRECISELY TO AVOID INCIDENTS WHICH COULD RESULT IN INJURY, LOSS OF LIFE OR FAILURE TO INFLATE LIFERAFT.

A CAUTION CALLS ATTENTION TO PROCEDURES WHICH MUST BE FOLLOWED TO PREVENT POSSIBLE DAMAGE TO EQUIPMENT WHICH MAY RESULT IN A MALFUNCTION.

SECTION 2

STANDARD EQUIPMENT

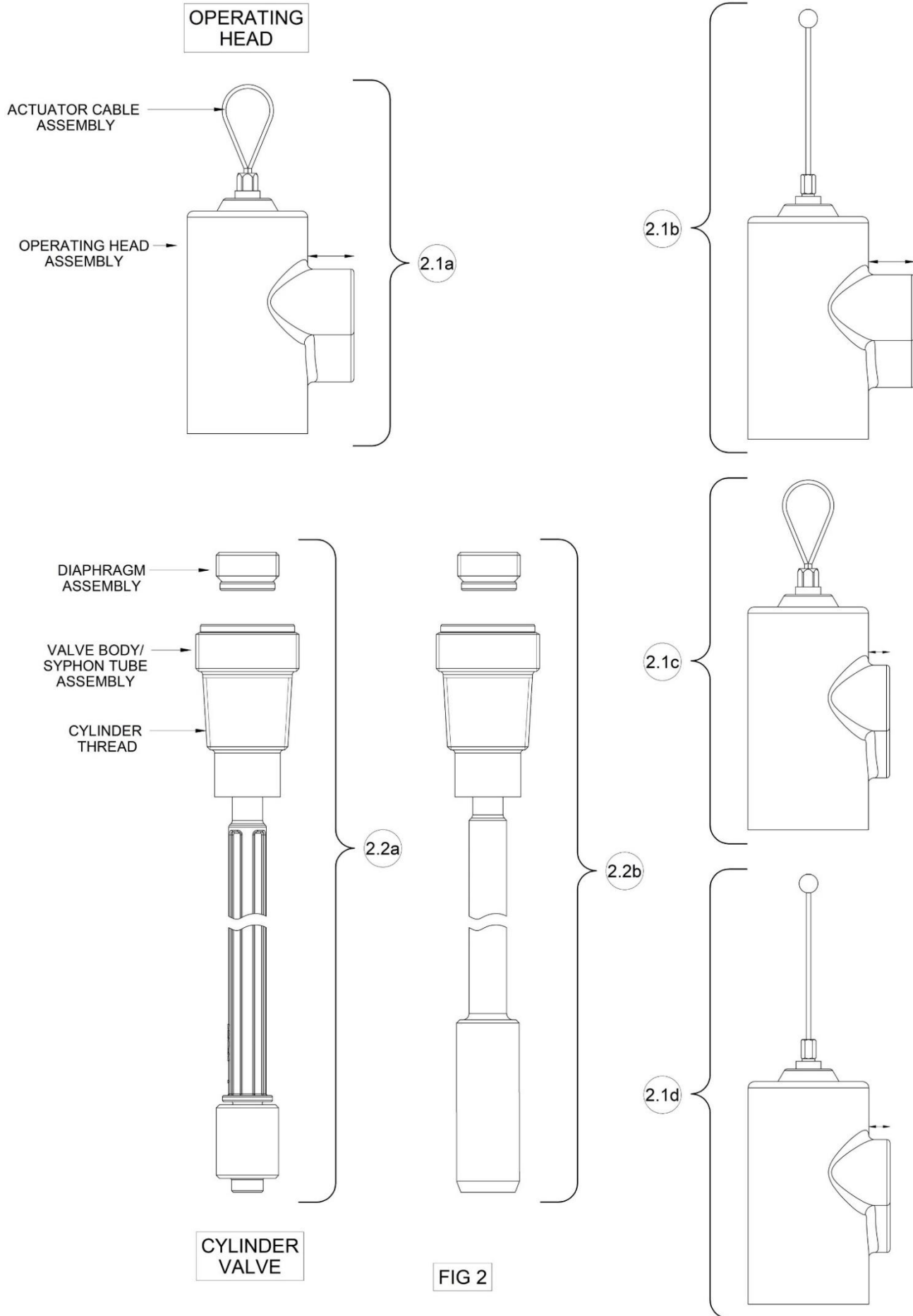


FIG 2

SECTION 2

STANDARD EQUIPMENT

Fig.2 refers.

ITEM	DESCRIPTION	NUMBER OF PORTS	PART NUMBER
2.1a	OPERATING HEAD - Plated	TWIN	2308002L
	OPERATING HEAD - Unplated	TWIN	2308002LU
2.1b	OPERATING HEAD – Plated	TWIN	2308002N
	OPERATING HEAD - Unplated	TWIN	2308002NU
2.1c	OPERATING HEAD – Plated	TWIN	2402002TLP
	OPERATING HEAD – Plated	SINGLE	2402002SLP
	OPERATING HEAD - Unplated	TWIN	2402002TLU
	OPERATING HEAD - Unplated	SINGLE	2402002SLU
2.1d	OPERATING HEAD – Plated	TWIN	2402002TNP
	OPERATING HEAD – Plated	SINGLE	2402002SNP
	OPERATING HEAD - Unplated	TWIN	2402002TNU
	OPERATING HEAD - Unplated	SINGLE	2402002SNU
<p>CAUTION: THE OPERATING HEAD IS SUPPLIED IN THE LOADED POSITION. CARE SHOULD BE TAKEN NOT TO PULL THE ACTUATOR CABLE OUT DURING HANDLING, TRANSIT OR STORAGE.</p>			

ITEM	DESCRIPTION	LEAFIELD PART NUMBER	CYLINDER THREAD	MAXIMUM WORKING PRESSURE
2.2a	CYLINDER VALVE with Clip Retained Weight	Plated GIS425E210C	25E	210 BAR
		Unplated GIS425EU210C		
		Plated GIS425E238C	25E	238 BAR
		Unplated GIS425EU238C		
		Plated GIS425E250C	25E	250 BAR
		Unplated GIS425EU250C		
		Plated GIS425E300C	25E	300 BAR
		Unplated GIS425EU300C		

ITEM	DESCRIPTION	LEAFIELD PART NUMBER	CYLINDER THREAD	MAXIMUM WORKING PRESSURE
2.2b	CYLINDER VALVE with Over Moulded Weight	Plated GIS425E210E	25E	210 BAR
		Unplated GIS425EU210E		
		Plated GIS425E238E	25E	238 BAR
		Unplated GIS425EU238E		
		Plated GIS425E250E	25E	250 BAR
		Unplated GIS425EU250E		
		Plated GIS425E300E	25E	300 BAR
		Unplated GIS425EU300E		

LUBRICATION: SILICONE GREASE TYPE MOLYKOTE 33 (DOW CORNING), LEAFIELD PART 50800120.

WARNING: USE ONLY MOLYKOTE 33 TO LUBRICATE THE LEAFIELD GAS INFLATION SYSTEM.

SECTION 3

SAFE HANDLING OF SYSTEM

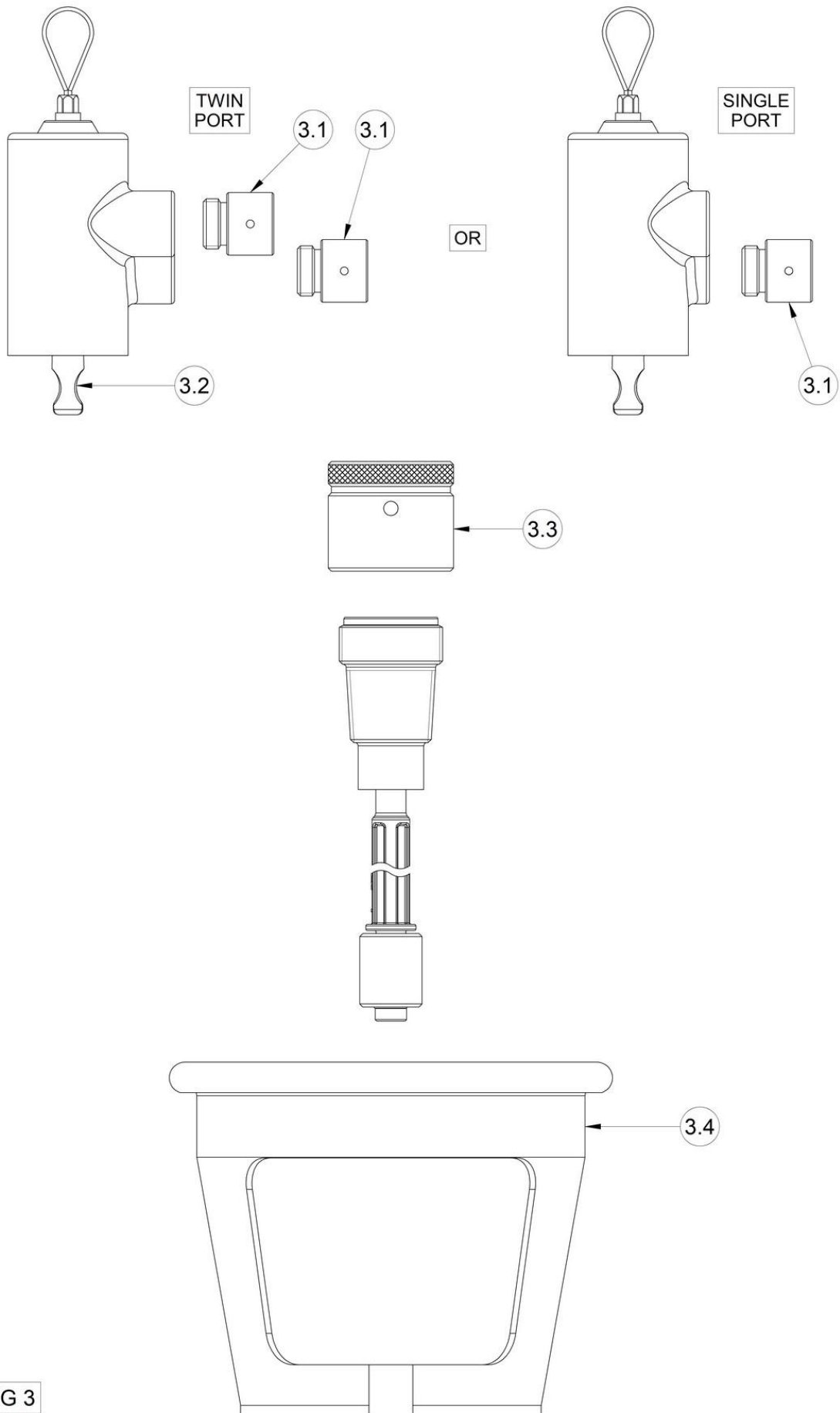


FIG 3

SECTION 3

SAFE HANDLING OF SYSTEM

Fig.3 refers.

ITEM	DESCRIPTION	PART NUMBER	FUNCTION
3.1	TRANSIT PLUG See Notes 1 & 2	19334	SAFETY DEVICE: Fitted to the Operating Head to balance and control the gas discharge if a charged cylinder is accidentally discharged prior to coupling to the Liferaft hose.
3.2	PROTECTIVE CAP	13000291	SAFETY DEVICE: Fitted to the Cutter to protect the cutting edge and prevent injury if the Operating Head is accidentally operated when not fitted to a Cylinder Valve.
3.3	TRANSIT CAP See Notes 1 & 3	19647	SAFETY DEVICE: Fitted to a Cylinder Valve to protect against damage and to balance and control the gas discharge if a charged cylinder is accidentally discharged.
3.4	GUARD RING See Notes 4 & 5	BB02	SAFETY DEVICE: Fitted to cylinders over 20 litres water capacity to protect the Cylinder Valve; except where the cylinders are transported and handled in cassettes.

1. **WARNING: USE ONLY LEAFIELD PRODUCED TRANSIT PLUGS AND TRANSIT CAP.**
2. **WARNING: TRANSIT PLUGS MUST ALWAYS BE FITTED TO THE OPERATING HEAD OUTLETS WHEN ASSEMBLED ON A CHARGED CYLINDER AND STORED UNCONNECTED TO A LIFERAFT.**
3. **WARNING: A TRANSIT CAP MUST ALWAYS BE FITTED TO THE CYLINDER VALVE WHEN A CHARGED CYLINDER IS TO BE HANDLED, TRANSPORTED OR STORED WITHOUT AN OPERATING HEAD & TRANSIT PLUGS FITTED.**
4. **WARNING: GUARD RING MUST BE FITTED TO CYLINDERS EXCEEDING 20 LITRES WATER CAPACITY TO PROTECT THE CYLINDER VALVE DURING TRANSIT AND HANDLING; UNLESS THE CYLINDERS ARE TRANSPORTED AND HANDLED IN CASSETTES.**
5. **CAUTION: IF A GUARD RING FITTED TO A CYLINDER BECOMES DAMAGED, THE CYLINDER VALVE SHOULD BE CLOSELY INSPECTED AND MUST BE REPLACED IF ANY DAMAGE OR DISTORTION IS FOUND.**

SECTION 4

SPECIAL TOOLS FOR ASSEMBLY, CHARGING AND SERVICING

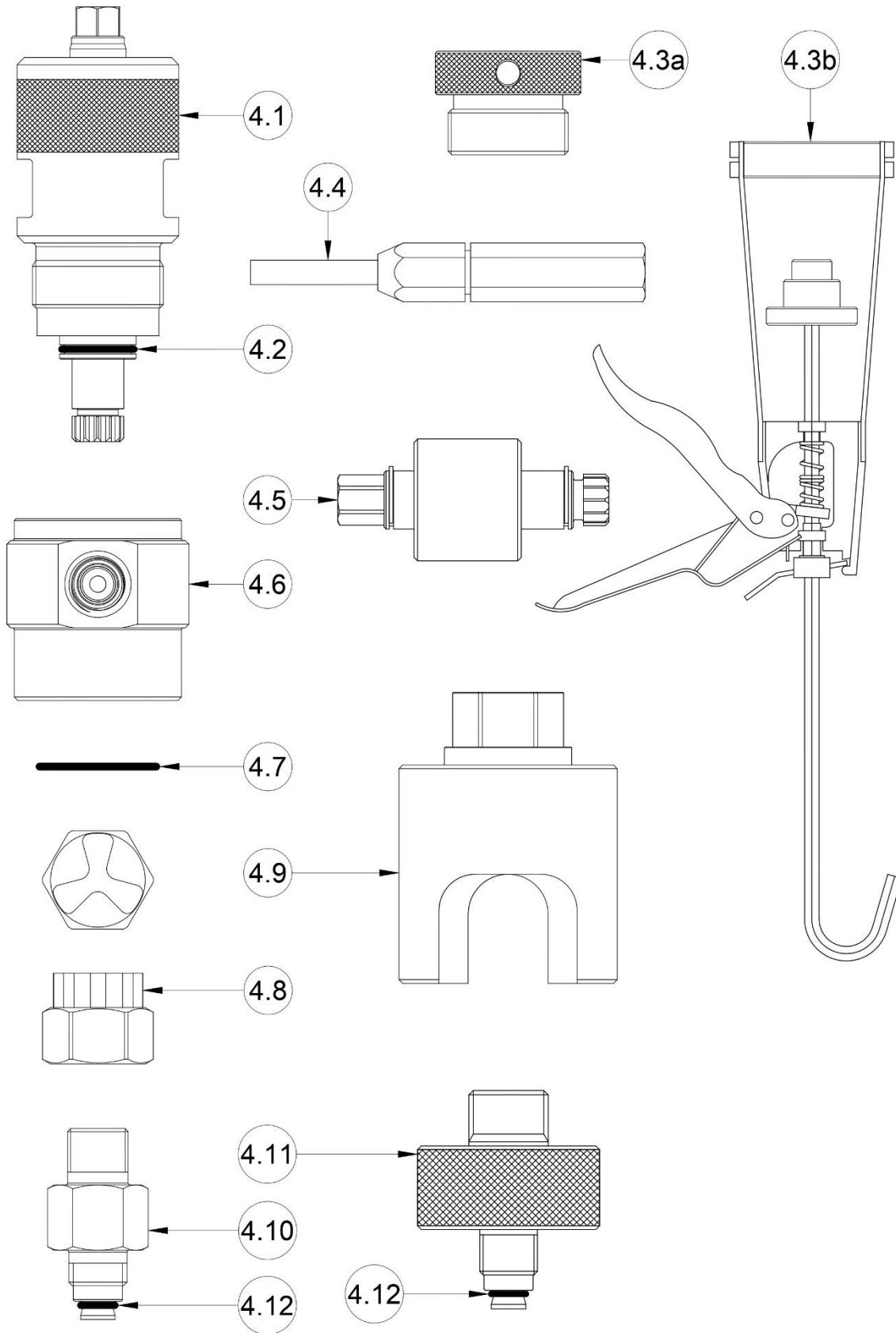


FIG 4

SECTION 4

SPECIAL TOOLS FOR ASSEMBLY, CHARGING AND SERVICING

Fig.4 refers.

ITEM	DESCRIPTION	PART NUMBER	FUNCTION
4.1	CYLINDER VALVE FILLING TOOL Complete with 'O' Ring Seal item 4.2 See Warnings 1 & 2 and Caution	C92100	To fit, lift and close the Diaphragm Assembly during cylinder filling.
4.2	'O' RING SEAL- Spares Item	66300760	---
4.3a	OPERATING HEAD LOADING TOOL See Warning 1	TM3376	Used to compress the Operating Head spring in the resetting operation.
4.3b		TM3525	
4.4	PLUG GAUGE See Warning 1	B15907	Used during a serviceability check of the Operating Head Cutter.
4.5	DIAPHRAGM EXTRACTOR TOOL See Warning 3	C99260	Used to remove the Diaphragm Assembly from an empty cylinder during cylinder servicing.
4.6	GIS4 FILLING TOOL ADAPTOR Complete with 'O' Ring Seal Item 4.7	TM3391	An adaptor between the Valve Body and Filling Tool C92100
4.7	'O' RING SEAL – Spares Item	66300756	---
4.8	GIS4 VALVE BODY INSERTION TOOL	TM3303	Tool to screw the Valve Body into the Cylinder.
4.9	GIS4 OPERATING HEAD TIGHTENING TOOL	TM3415	Tool to tighten the Operating Head onto the Valve Body.
4.10	PORT ADAPTOR 3/8" BSP	0617000	Adaptor to convert the outlet port from M16 x 1.5 to 3/8" bsp.
4.11	PORT ADAPTOR 0.860" WHITWORTH	0333000	Adaptor to convert the outlet port from M16 x 1.5 to 0.860" Whitworth.
4.12	'O' RING SEAL – Spares item	66300749	---

WARNING 1: USE ONLY THE ABOVE LISTED SPECIAL TOOLS WHEN SERVICING THE LEAFIELD GAS INFLATION SYSTEM. STANDARD TOOLS ARE ALSO CALLED FOR IN THE FOLLOWING TEXT

CAUTION: REGULARLY CHECK THE M36 THREAD OF THE FILLING TOOL FOR WEAR AND DAMAGE. THE OUTSIDE DIAMETER (OD) MUST BE AT LEAST 35mm FOR ALL BUT THE FIRST THREAD (THE FIRST THREAD MAY BE LESS THAN 35mm).

WARNING 2: DO NOT USE THE FILLING TOOL IF THE THREAD OUTSIDE DIAMETER MEASURES LESS THAN 35mm.

WARNING 3: THE DIAPHRAGM EXTRACTOR TOOL MUST NOT BE USED TO REMOVE THE DIAPHRAGM ASSEMBLY FROM A FILLED CYLINDER. VIOLENT GAS DISCHARGE WILL RESULT.

SECTION 5

CYLINDER VALVE INSTALLATION

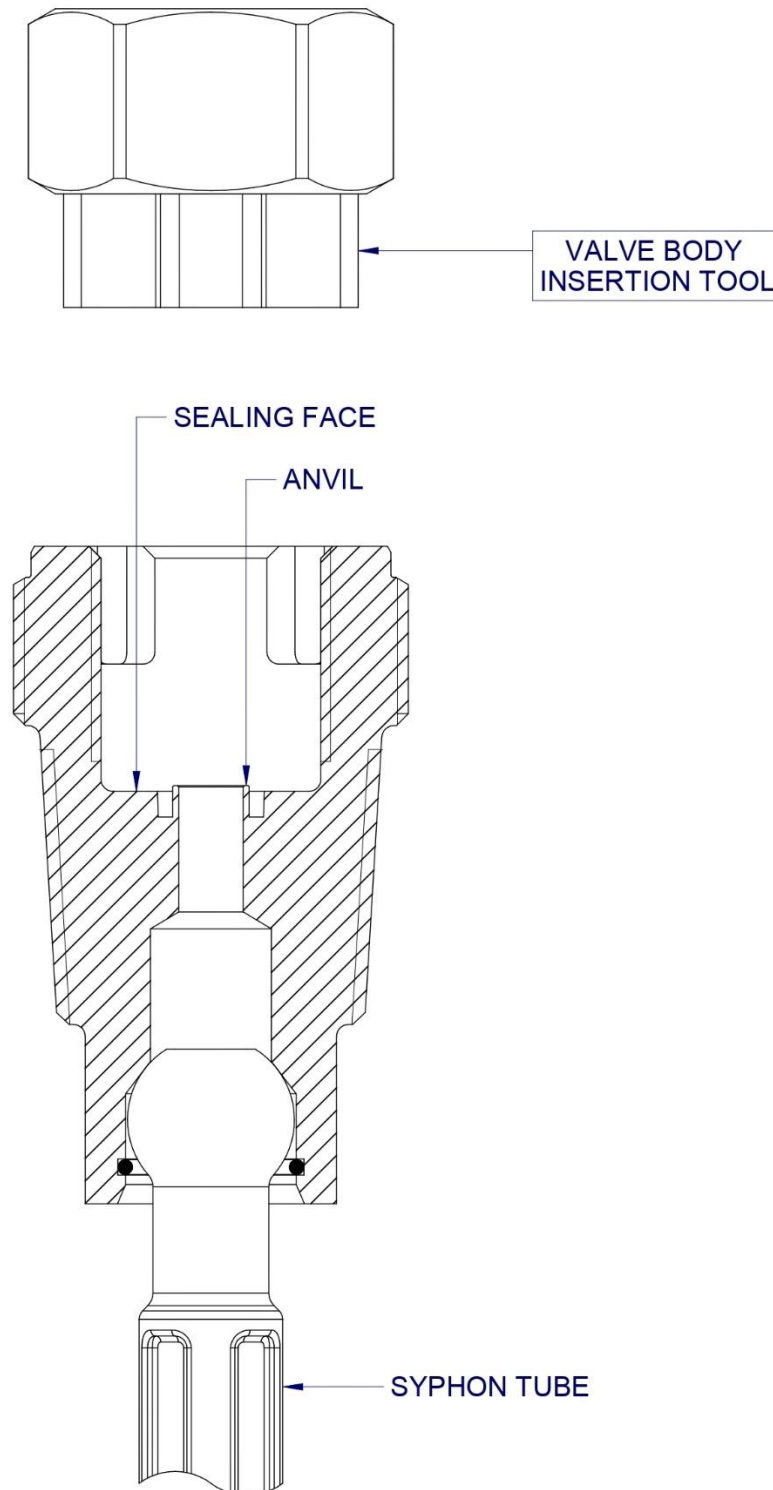


FIG 5.1

SECTION 5

CYLINDER VALVE INSTALLATION

Fig.5.1 refers.

WARNING: THE FOLLOWING CHECKS MUST BE CARRIED OUT PRIOR TO INSTALLATION OF A CYLINDER VALVE TO A CYLINDER.

1. Ensure that the Cylinder and Cylinder Valve threads are compatible and that the cylinder conforms to the standard specified for the working pressure of the Cylinder Valve.
2. Ensure that the Cylinder Valve threads show no visible signs of damage.
3. Ensure that the Syphon Tube (where fitted) is free to swivel and rotate.
4. Ensure that all Cylinder Valve bores and recesses are clean and free from particles.
5. Ensure that the Sealing Face and Anvil are free from damage and debris.

INSTALLATION

6. Sealing material should be applied to the threads as recommended by the Liferaft manufacturer or Leafield Marine Ltd.
No grease or oil should be used on the Cylinder Valve thread when fitting the Valve.
7. Using the GIS4 Valve Body Insertion Tool (Item 4.8, Section 4), and a 27mm AF socket, tighten the Cylinder Valve to a torque of **160-170Nm**.

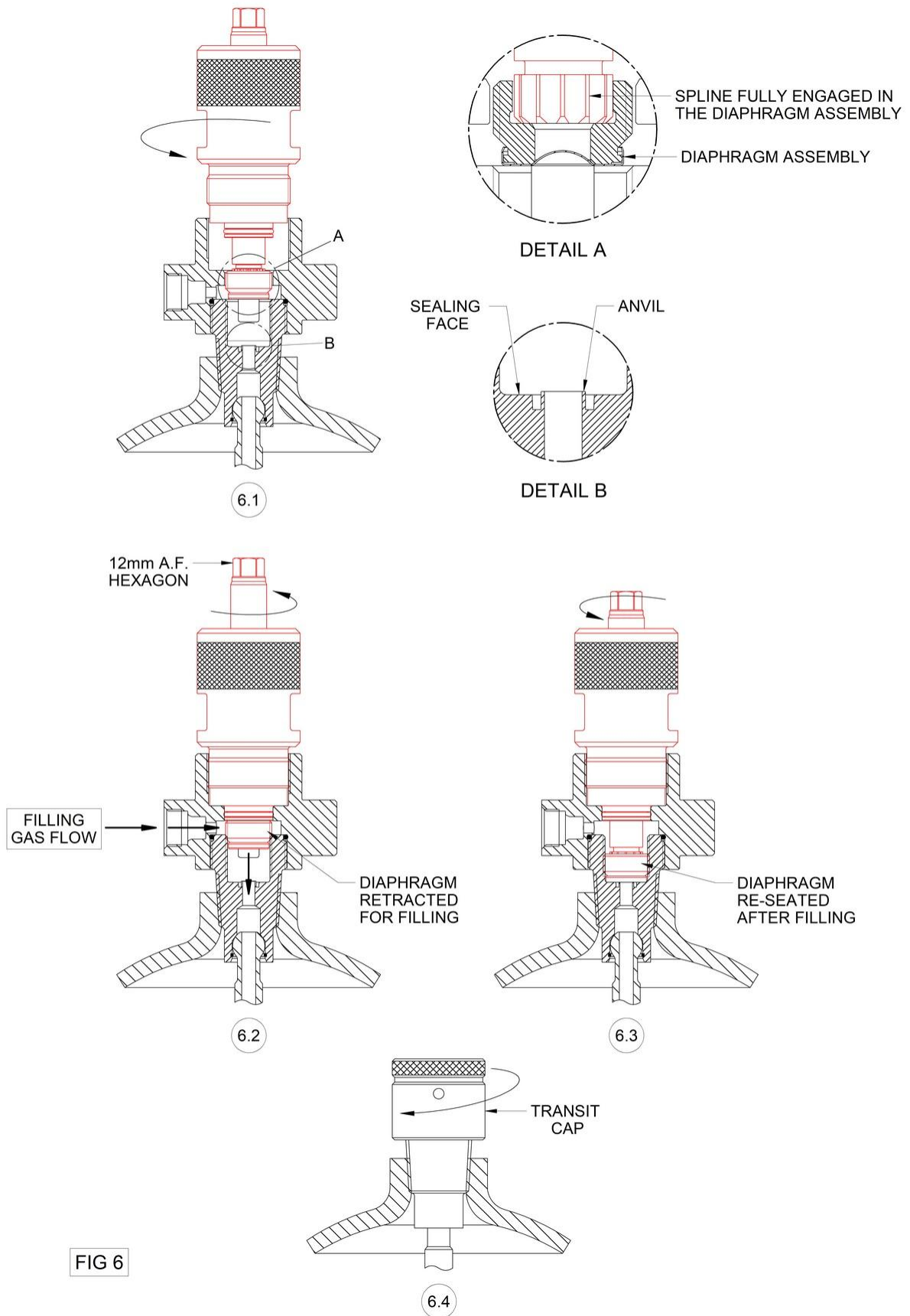
CAUTION: NEVER INSERT INTO THE CYLINDER VALVE BODY ANY IMPLEMENT WHICH COULD DAMAGE THE SEALING FACE OR ANVIL.

WARNING: DO NOT EXCEED THE RECOMMENDED TORQUE OR ATTEMPT TO FURTHER TIGHTEN THE CYLINDER VALVE ONCE THE GAS CYLINDER IS CHARGED AS THIS COULD CAUSE FAILURE OF THE VALVE.

CAUTION: DO NOT EXCEED THE SPECIFIED TORQUE AS THIS MAY DAMAGE THE INTERNAL THREADS.

SECTION 6

CYLINDER CHARGING PROCEDURE



SECTION 6

CYLINDER CHARGING PROCEDURE

Fig.6 refers.

WARNING: ONLY FILLING TOOL ITEM 4.1 (SEE PAGE 6) IS TO BE USED FOR MANIPULATING DIAPHRAGM ASSEMBLY DURING FILLING PROCEDURE.

1. Ensure that the Sealing Face and Anvil are clean and free from damage and debris.
2. Ensure the correct Diaphragm Assembly is to be fitted. (Items 14.10, Section 14)
3. Remove a pre-greased Diaphragm Assembly from its protective cap and immediately hand assemble into the Cylinder Valve Body, ensuring proper initial engagement of threads.

CAUTION: ALWAYS ENSURE THAT THE SURFACE OF THE DISC AND THREAD REMAIN GREASED AND FREE FROM LOOSE PARTICLES AS DEBRIS COULD CAUSE DAMAGE TO THE VALVE SEAT AND ADVERSELY AFFECT THE SEAL.

4. Engage a Diaphragm Extractor Tool (Item 4.5, Section 4), into the spline of the Diaphragm Assembly and proceed to screw down into the Valve Body.

CAUTION: DO NOT USE POWER TOOLS.

5. Screw the Filling Adaptor (Item 4.6, Section 4) onto the Valve Body.
6. Screw the Filling Tool (Item 4.1, Section 4) into the Filling Adaptor. Hand tight is sufficient. This will engage the splines of the Filling Tool and Diaphragm Assembly.

Fig.6.2 refers.

7. Using a 12mm A/F ring spanner retract the Diaphragm Assembly by turning the central shaft of the Filling Tool anticlockwise to its full limit (approximately 11 turns), taking care not to unscrew the Filling Tool from the Filling Tool Adaptor.
8. Ensure that the gas charging hose interface is compatible with the Filling Tool Adaptor port before making connection. Tighten as appropriate.

(Port Adaptors are available from Leafield Marine, items 4.10 and 4.11. See Figure 4, Section 4.)

CAUTION: CHARGING MUST ONLY BE INITIATED WHEN THE DIAPHRAGM ASSEMBLY IS FULLY RETRACTED.

9. Charge the cylinder with the required mass of CO₂/N₂, N₂ or air in accordance with the Liferaft manufacturer's filling procedures.

CAUTION: ENSURE THAT THE GAS CHARGE WILL NOT RESULT IN A DEVELOPED PRESSURE EXCEEDING THAT RECOMMENDED FOR THE BURST DISC FITTED (SEE SECTION 1, PARA. 1).

Fig.6.3 refers.

10. Tighten the Diaphragm Assembly by turning the 12mm A/F central shaft of the Filling Tool clockwise to its limit and torque to 35-40Nm. Shut off gas supplies.

CAUTION: ENSURE THAT A TORQUE WRENCH IS USED WHEN TIGHTENING

Fig.6.4 refers.

11. Remove the charging hose from the Filling Tool Adaptor.
12. Remove the Filling Tool by unscrewing the Filling Tool Body anticlockwise.

CAUTION: ON NO ACCOUNT SHOULD 12mm A/F SHAFT BE TURNED DURING FILLING TOOL REMOVAL AS THIS WILL UNSEAT DIAPHRAGM ASSEMBLY AND RESULT IN GAS LOSS.

13. Remove the Filling Tool Adaptor by unscrewing anticlockwise.

WARNING: NEVER INSERT ANY OBJECT INTO A CYLINDER VALVE BODY THAT COULD RESULT IN DAMAGE TO THE DIAPHRAGM ASSEMBLY AND SUBSEQUENT VIOLENT GAS DISCHARGE.

14. Inspect for leaks by applying ONLY METHYLATED SPIRITS or ALCOHOL sufficient to completely immerse the Diaphragm Assembly and observe for bubbles. If more than ONE bubble in 60 seconds is evident, the Filling Tool Adaptor and Filling Tool must be refitted (Ref. Para. 5, Section 6) and the torque checked to its maximum of 40Nm. If the leak persists, fit a Transit Plug (Item 3.1, Section 3) in the filling port of the Filling Adaptor, secure the cylinder and slightly retract the Diaphragm Assembly using the Filling Tool Adaptor & Filling Tool to vent the cylinder completely through the Transit Plug. The Diaphragm Assembly must then be removed, discarded and a new one fitted. Ensure that all sealing surfaces are clean and free from surface contamination and scratches. Recharge the cylinder as previously described. If the sealing problem persists, replace the Cylinder Valve.

WARNING: NEVER USE WATER OR WATER BASED LIQUIDS FOR LEAK TESTING.

15. On satisfactory completion of leak testing, pour off liquid and allow residue to evaporate.

WARNING: NEVER USE A CLOTH OR INSERT ANY IMPLEMENT INTO THE CYLINDER VALVE TO ASSIST WITH DRYING AS THIS COULD DAMAGE THE DISC OR JAM THE SYSTEM.

16. Fit a Transit Cap (Item 3.3, Section 3) and screw fully home. Hand tight is sufficient.

WARNING: A TRANSIT CAP MUST BE FITTED TO A CYLINDER VALVE WHEN A CHARGED CYLINDER IS TO BE HANDLED, TRANSPORTED OR STORED.

CAUTION: DO NOT STORE A CHARGED CYLINDER IN DIRECT SUNLIGHT OR WHERE THE TEMPERATURE CAN EXCEED 65°C.

WARNING: WHERE A CYLINDER CAPACITY EXCEEDS 20 LITRES WATER VOLUME, FIT A GUARD RING DURING TRANSIT AND HANDLING TO PROTECT THE VALVE FROM DAMAGE; UNLESS THE CYLINDER IS TRANSPORTED AND HANDLED IN A CASSETTE.

SECTION 7

ASSEMBLY OF OPERATING HEAD TO CYLINDER VALVE

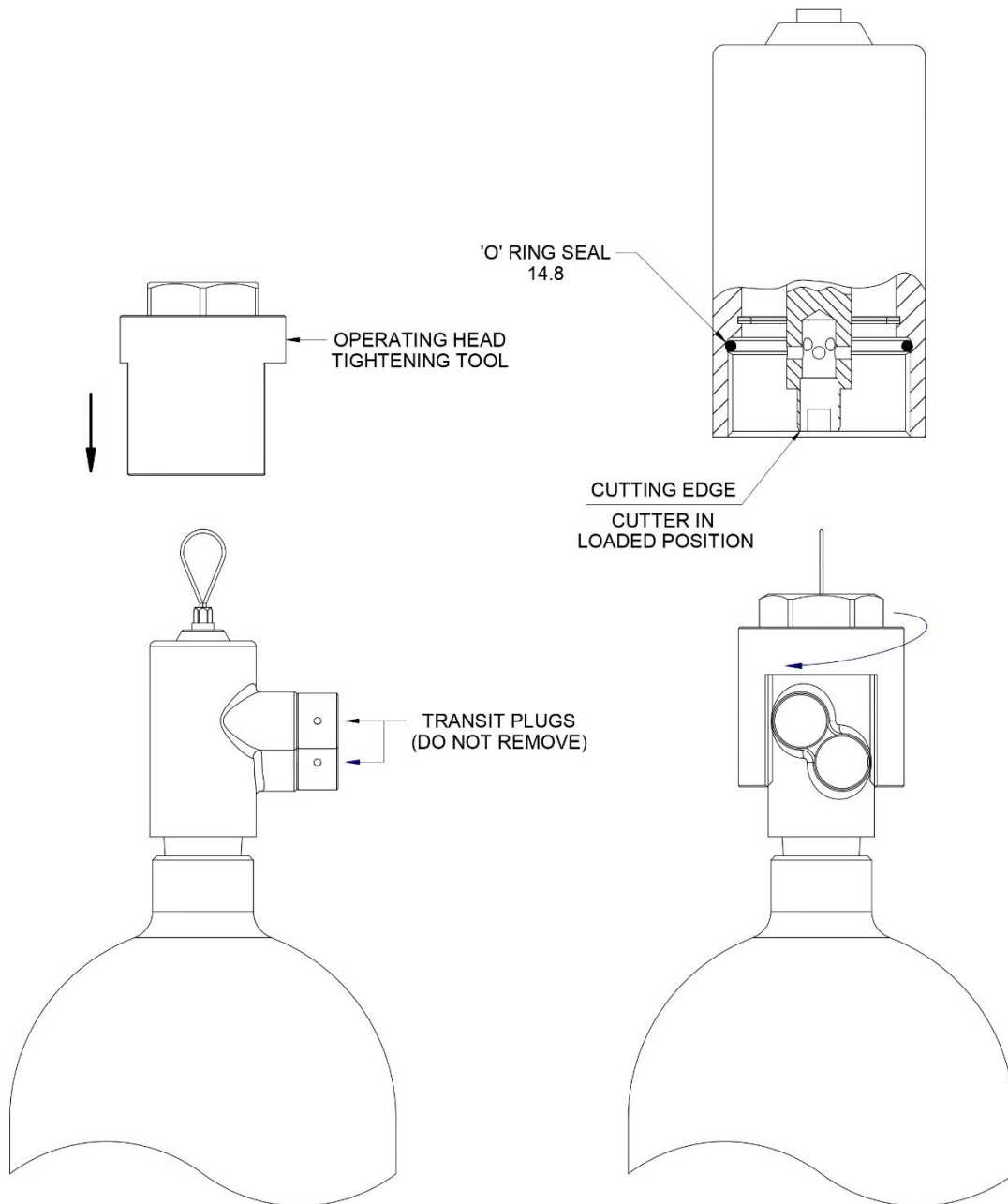


FIG 7

SECTION 7

ASSEMBLY OF OPERATING HEAD TO CYLINDER VALVE

Fig. 7 refers.

1. Check that the Operating Head is loaded. The tip of the Cutter should be sub-flush with the end of the Operating Head. If the Cutter projects from the end of the Operating Head, reload as described in Sections 11 & 12. (Figs. 7 and 12 refer).

WARNING: THE OPERATING HEAD MUST BE CORRECTLY LOADED OR THE SYSTEM WILL NOT FUNCTION.

2. Check that the 'O' Ring Seal is fitted in the Operating Head. (Item 14.8, Ref. Fig.7).
3. Ensure Transit Plugs are fitted to the Operating Head outlet ports (Item 3.1, Section 3).

WARNING: ENSURE THAT THE 'O' RING SEAL IS CORRECTLY FITTED IN THE OPERATING HEAD AS THIS IS CRITICAL TO PREVENT INGRESS OF WATER.

4. Visually inspect the Cutter to ensure there is no damage to the cutting edge. A Plug Gauge (Item 4.4, Section 4) must freely enter and move in the bore of the Cutter.

WARNING: IF THE PLUG GAUGE DOES NOT ENTER CUTTER OR IF THE CUTTER SHOWS SIGNS OF SIGNIFICANT DAMAGE, THE OPERATING HEAD MUST BE DISCARDED AND REPLACED.

CAUTION: WITH THE OPERATING HEAD IN THE LOADED POSITION CARE SHOULD BE TAKEN NOT TO PULL OUT THE ACTUATOR CABLE DURING HANDLING, TRANSIT OR STORAGE. ENSURE HANDS ARE KEPT CLEAR OF THE CUTTER.

5. If fitted, remove the Transit Cap (Item 3.3, Section 3) from the Cylinder Valve. The Transit Plugs should remain in place in the Operating Head ports.
6. Screw the Operating Head onto the Cylinder Valve by hand, then tighten to 20 ± 2 Nm using the Operating Head Tightening Tool (Item 4.9, Section 4).

WARNING: OPERATING HEADS FITTED WITH THE NO LOOP ACTUATOR CABLE SHOULD ONLY BE FITTED TO LIFERAFTS SEALED IN VACUUM BAGS.

WARNING: IF THE OPERATING HEAD IS FITTED WHEN IT IS NOT LOADED, THE CUTTER WILL BE IN THE FORWARD POSITION AND MAY PIERCE THE BURST DISC IN THE DIAPHRAGM ASSEMBLY, RESULTING IN VIOLENT GAS DISCHARGE.

IN THIS SITUATION, THE OPERATING HEAD WILL BE RETAINED ON THE VALVE BODY, AS THE CUTTER (IN THE FIRED POSITION) WILL ONLY CONTACT THE BURST DISC AFTER 6 TURNS OF THE OPERATING HEAD.

IF AN OPERATING HEAD WITH THE CUTTER IN THE FIRED POSITION IS LOADED ONTO A FILLED CYLINDER, THE CYLINDER SHOULD BE IMMEDIATELY VENTED (SECTION 6, PARA 14, OR SECTION 10), AND THE DIAPHRAGM ASSEMBLY REPLACED EVEN IF THE BURST DISC IS NOT CUT.

WARNING: TRANSIT PLUGS MUST ALWAYS BE FITTED TO THE OPERATING HEAD OUTLETS WHEN ASSEMBLED ON A CHARGED CYLINDER AND STORED UNCONNECTED TO A LIFERAFT.

CAUTION: DO NOT STORE A CHARGED CYLINDER IN DIRECT SUNLIGHT OR WHERE TEMPERATURE CAN EXCEED 65°C.

CAUTION: DO NOT USE POWER TOOLS WHEN FITTING THE OPERATING HEAD.

SECTION 8

INSTALLATION TO LIFERAFT

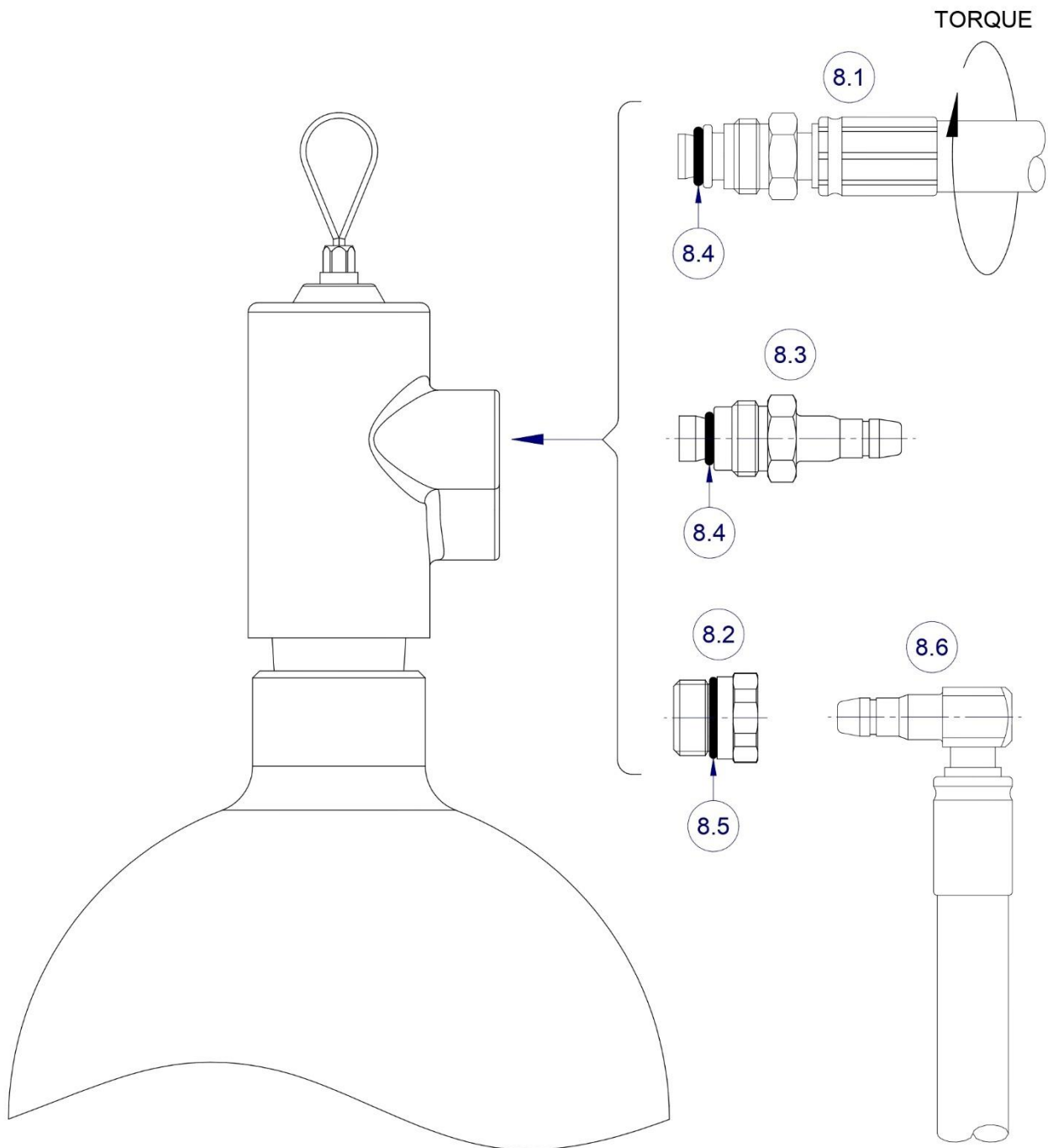


FIG 8

SECTION 8

INSTALLATION TO LIFE RAFT

Fig.8 refers.

1. Install a cylinder complete with Cylinder Valve and Operating Head to a Liferaft in accordance with the Liferaft manufacturer's instructions.
2. Rotate the cylinder to position the outlet ports as required.
3. Ensure that the thread of the port fitting, port thread and sealing surfaces are compatible and clean.
4. Remove one Transit Plug from the Operating Head outlet port and immediately proceed to the next step.
5. Fit the chosen port fitting option in accordance with the Liferaft manufacturer's procedures. Check and tighten as below: -
 - Hose (Item 8.1, Fig.8). Check the 'O' Ring Seal (Item 8.4, Fig.8) is installed on the hose and tighten to a torque of 12.2 Nm (9ftLb).
 - Quick Connect Coupling (Item 8.3, Fig.8). Check the 'O' Ring Seal (Item 8.4, Fig.8) is installed on the fitting and tighten to a torque of 12.2 Nm (9ftLb).
 - M16 Nut for push fit hose options (Item 8.2, Fig.8). Check the 'O' Ring Seal (Item 8.5, Fig.8) is installed and tighten to a torque of 20Nm (15ftLb).
6. Remove the remaining Transit Plug from the Operating Head outlet port and immediately fit and tighten the final port fitting as above.

Note: See Spares Parts List, Section 14 for items 8.1-8.6 in Fig.8.

CAUTION: WHEN REFITTING A PREVIOUSLY USED HOSE OR QUICK CONNECT COUPLING, A NEW 'O' RING SEAL MUST BE USED (Item 8.4, Fig.8 and Spare Parts List, Section 14).

CAUTION: WHEN REFITTING A PREVIOUSLY USED M16 NUT, A NEW 'O' RING SEAL MUST BE USED (Item 8.5, Fig.8 and Spare Parts List, Section 14).

CAUTION: DO NOT OVER-TORQUE THE COMPONENTS. THIS MAY DAMAGE THE ASSEMBLY AND CAUSE A LEAK.

WARNING: IF USING ONE OF THE PUSH-FIT HOSE OPTIONS (Item 8.6, Fig.8), PUSH FULLY INTO THE M16 NUT, (Item 8.2 Fig.8) THEN PULL AND TWIST TO ENSURE THAT THE FITTING IS CORRECTLY ENGAGED. FAILURE TO DO THIS COULD RESULT IN INFLATION FAILURE OR SEVERE PERSONAL INJURY.

SECTION 9

OPERATING PROCEDURE

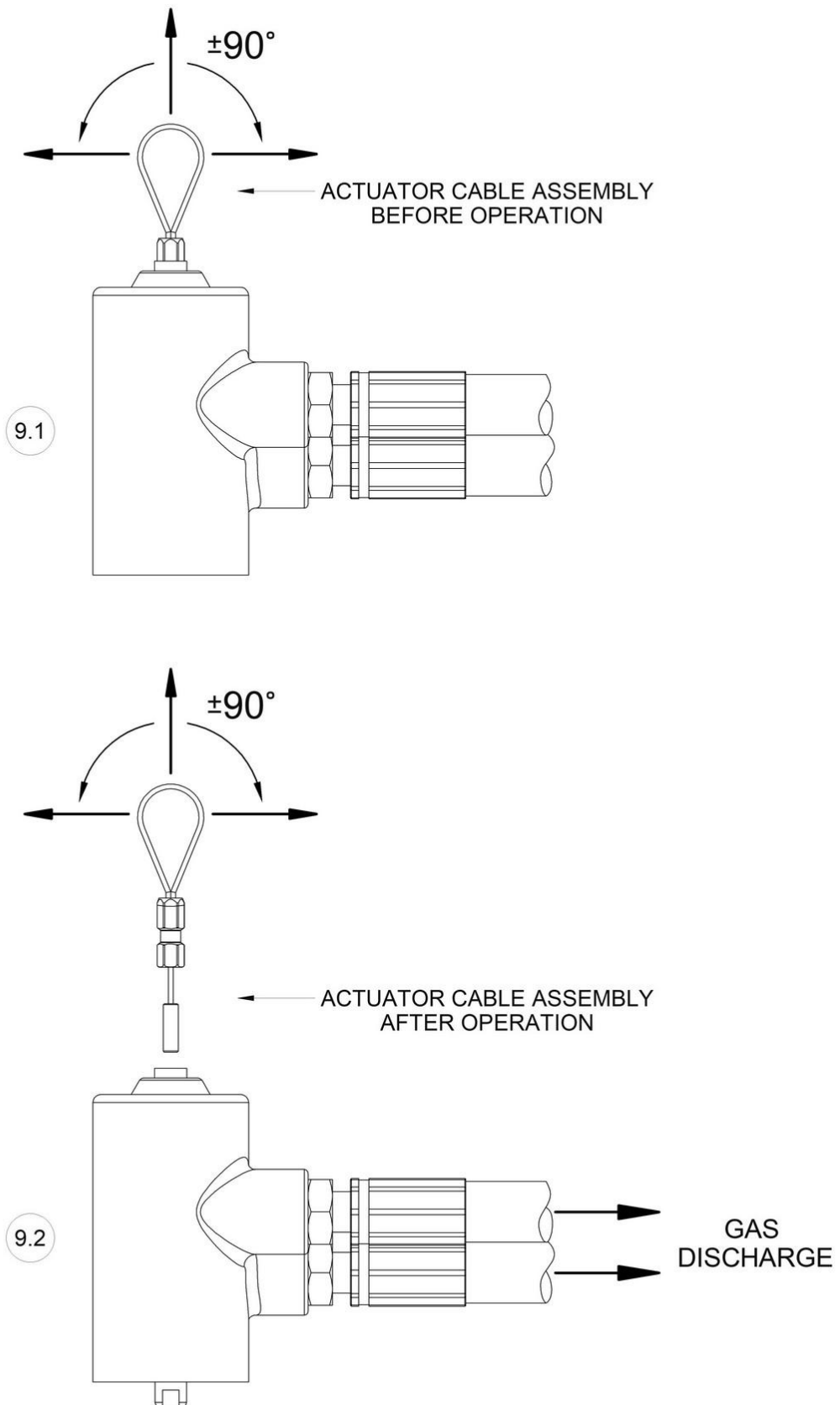


FIG 9

SECTION 9

OPERATING PROCEDURE

Fig.9 refers.

1. The Operating Head is activated by pulling the Actuator Cable.
2. Direction of pull can be up to 90° in any direction from axis of cable exit.
3. The Actuator Cable Assembly will pull free from the Operating Head.
4. Gas discharge will be through the Operating Head outlet ports to connected hoses.

WARNING: IF OPERATION IS CARRIED OUT WITH THE GAS INFLATION SYSTEM DETACHED FROM A LIFERAFT, THEN THE CYLINDER MUST BE ADEQUATELY SECURED AND TRANSIT PLUGS FITTED.

SECTION 10

DISCHARGE OF SYSTEM WHEN NOT FITTED TO LIFERAFT

WARNING: TO DISCHARGE A FULL CYLINDER WHICH IS NOT FITTED TO A LIFERAFT IT MUST BE FIRED AS A COMPLETE SYSTEM WITH TRANSIT PLUGS FITTED AND THE CYLINDER RESTRAINED.

SECTION 11

REFURBISHMENT OF OPERATING HEAD AFTER FIRING

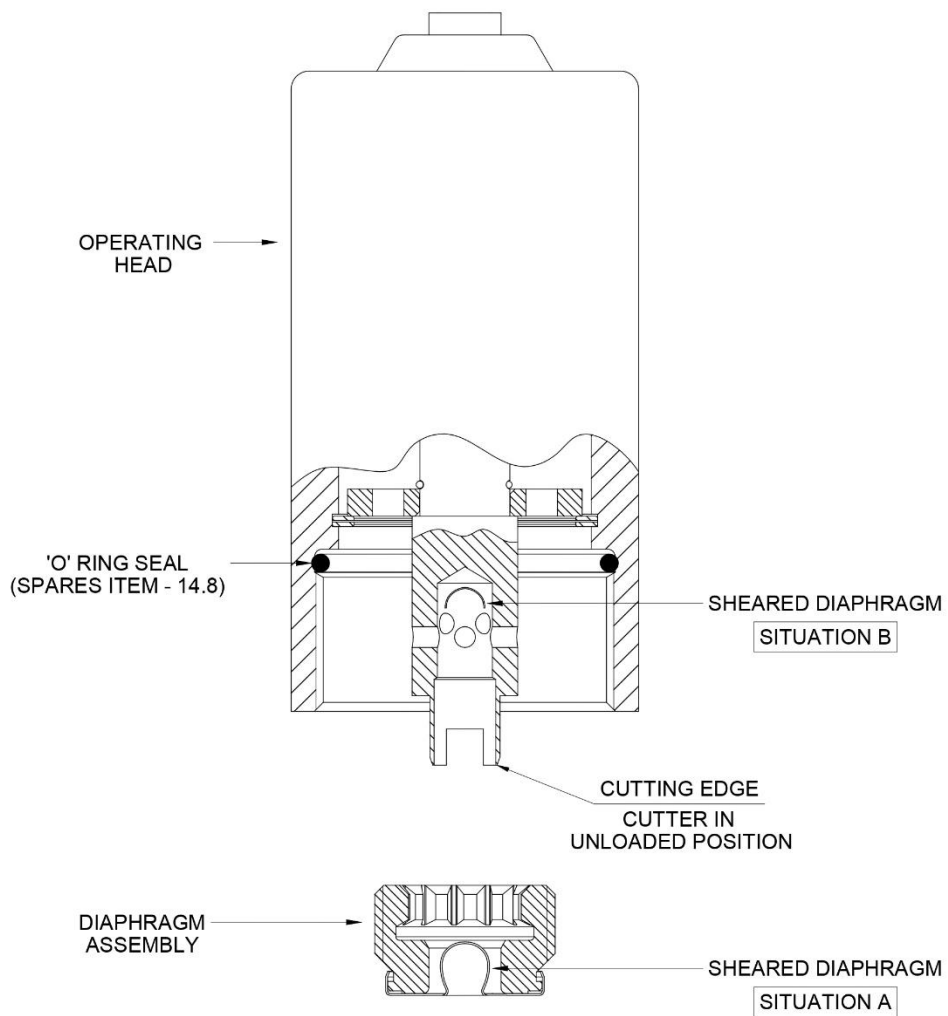


FIG 11

SECTION 11

REFUBISHMENT OF OPERATING HEAD AFTER FIRING

Fig.11 refers.

On removal from the Liferaft.

1. Unscrew the Operating Head from the Cylinder Valve.
2. Visually examine the Operating Head. Significant areas of exposed base metal (brass) or green corrosion are not acceptable. Discard if damaged or more than 15 years old.
3. An Operating Head previously used in a deployment on water **MUST** be flushed through with clean water and dried thoroughly in air.

WARNING: THE OPERATING HEAD MUST NOT BE REUSED IF THERE IS ANY SIGNIFICANT DISTORTION, CORROSION OR IMPACT DAMAGE OR IF THERE IS DAMAGE TO THREADS AND HOSE SEALING SURFACES.

WARNING: THE OPERATING HEAD MUST NOT BE CLEANED WITH SOLVENTS, SOAPS OR CHEMICAL CLEANING AGENTS. THESE MAY DEGRADE SYSTEM COMPONENTS AND CAUSE MALFUNCTION.

WARNING: DO NOT ATTEMPT TO DISMANTLE THE OPERATING HEAD - THIS ITEM IS NON-SERVICEABLE.

4. Inspect the Operating Head cutter and Diaphragm Assembly in the Valve Body to establish if the sheared diaphragm is in **Situation 'A'** or **Situation 'B'**. In either situation the Diaphragm Assembly **MUST** be discarded.
After a normal operation it is usual for the sheared diaphragm to be retained as shown in **Situation 'A'**. However, sometimes the cut element of the diaphragm may be lodged within the Cutter as shown in **Situation 'B'**.

CAUTION: THE OPERATING HEAD MAY BE ASSESSED AND REUSED IF IT HAS HAD NO MORE THAN 5 FIRINGS AND IS LESS THAN 15 YEARS OLD. OTHERWISE, IT MUST BE DISCARDED AND REPLACED WITH NEW.

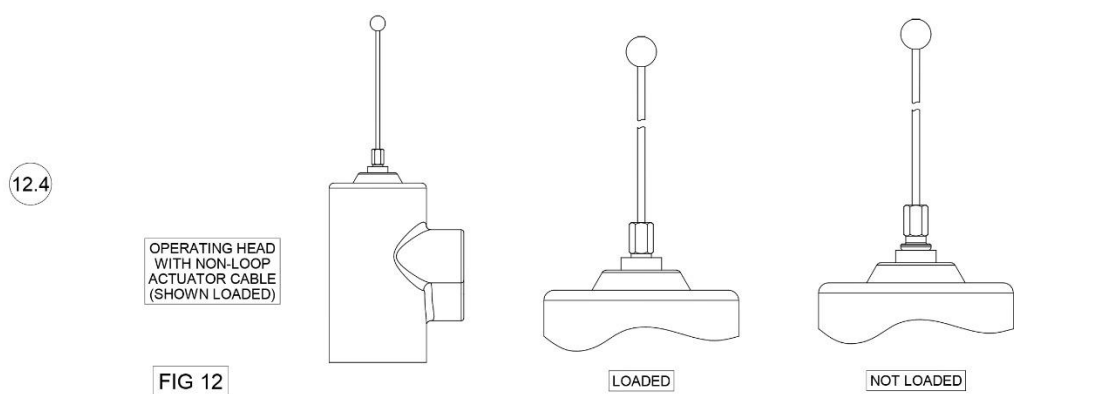
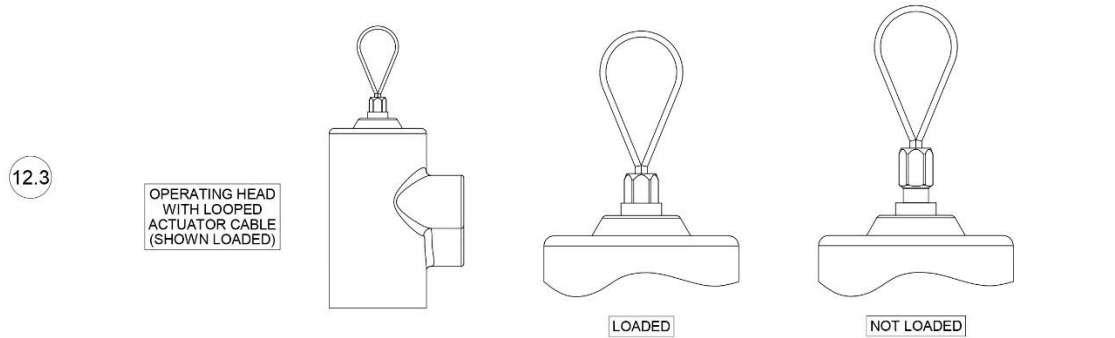
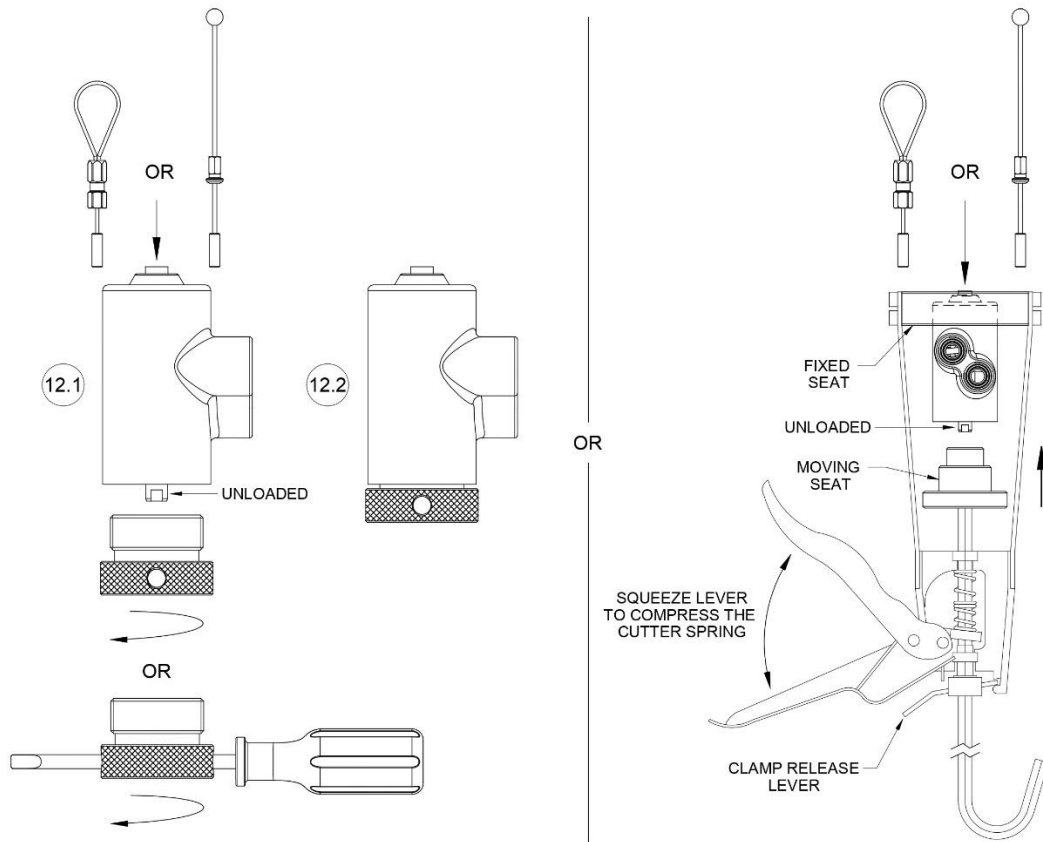
5. If the Operating Head is to be reused, then the following actions **MUST** be carried out:
 - 5.1 The sheared diaphragm, if in **Situation 'B'**, must be carefully removed using a pair of fine-nosed tweezers, so as not to damage the cutting edge of the Cutter.
 - 5.2 Visually inspect the Cutter to ensure there is no damage to the cutting edge. The Plug Gauge (item 4.4, see page 6) must freely enter and move in the bore of the Cutter.

WARNING: IF THE PLUG GAUGE DOES NOT ENTER THE CUTTER OR IF THE CUTTER SHOWS SIGNS OF SIGNIFICANT DAMAGE, THE OPERATING HEAD MUST BE DISCARDED AND REPLACED WITH NEW.

- 5.3 Fit a new 'O' Ring Seal (spares item 14.8, Section 14) to the Operating Head. See also Section 7 for the 'O' Ring Seal location.

SECTION 12

RESETTING OF OPERATING HEAD AFTER FIRING



SECTION 12

RESETTING OF OPERATING HEAD AFTER FIRING

Fig.12 refers.

1. Visually examine the Actuator Cable Assembly for condition of the crimp, cylinder end, loop or ball end. Discard if damaged. (Spares item 14.1 or 14.2, Section 14).
2. Visually examine the Actuator Cable Seal for signs of damage. Replace if damaged. (Spares item 14.3, Section 14),

WARNING: IF THE ACTUATOR CABLE SEAL SHOWS ANY SIGNS OF SURFACE DAMAGE IT MUST BE REPLACED, OR WATER MAY ENTER THE SYSTEM AND CAUSE A MALFUNCTION.

3. Reload the Operating Head using one of the following methods depending on the loading tool being used.

3.1 If using Loading Tool TM3376 (Item 4.3a, Section 4):

- Screw the Loading Tool (Item 4.3a, Section 4), onto the Operating Head by hand (Fig 12.1).
- Fully tighten the loading tool to reposition the Cutter ready for the Actuator Cable to be fitted, (Fig.12.2).
- Alternatively insert a suitable tool (e.g. Screwdriver), through the hole in the Loading Tool to ease this process, (Fig 12.1).
- Take care not to damage the tip of the Cutter when aligning the tool with the Operating Head.
- Insert the Actuator Cable into the Actuator Cable Seal of the Operating Head.
 - Loop Actuator Cable - Insert the cable until the neck of the ferrule engages in the Seal. (Fig.12.3)
 - No Loop Actuator Cable – Insert the cable until the shaped ferrule touches the top of the Actuator Cable Seal. (Fig.12.4).
- Unscrew the Loading Tool from the Operating Head while holding the Actuator Cable Assembly in position.
- The Operating Head is loaded when the Cutter is sub-flush with the front of the Operating Head. If the Cutter projects from the Operating Head, it is not loaded. (Fig.12 refers).
- If the Operating Head is not to be fitted directly onto a Cylinder Valve, then fit a protective Cap to the end of the Cutter. (Item 3.2, Section 3 or Item 14.9, Section 14).
- Store in a clean, dry place until required.

3.2 If using Loading Tool TM3525 (Item 4.3b, Section 4),

- Locate the Operating Head into the fixed seat of the Loading Tool (Item 4.3b, Section 4),
- Fully compress the Cutter spring by repeatedly squeezing the Loading Tool lever until it stops moving, ensuring that the moving seat engages on the Cutter and enters into the Operating Head.

- Insert the Actuator Cable into the Actuator Cable Seal of the Operating Head.
 - Loop Actuator Cable - Insert the cable until the neck of the ferrule engages in the Seal. (Fig.12.3)
 - No Loop Actuator Cable – Insert the cable until the shaped ferrule touches the top of the Actuator Cable Seal. (Fig.12.4)
- Press the release lever to unclamp the Loading Tool and remove the Operating Head.
- The Operating Head is loaded when the Cutter is sub-flush with the front of the Operating Head. If the Cutter projects from the Operating Head, it is not loaded. (Fig.12 refers).
- If the Operating Head is not to be fitted directly onto a Cylinder Valve, then fit a protective Cap to the end of the Cutter. (Item 3.2, Section 3 or Item 14.9, Section 14).
- Store in a clean, dry place until required.

WARNING: THE OPERATING HEAD MUST BE CORRECTLY LOADED OR THE SYSTEM WILL NOT FUNCTION.

CAUTION: WITH THE OPERATING HEAD IN THE LOADED POSITION CARE SHOULD BE TAKEN NOT TO PULL OUT THE ACTUATOR CABLE DURING HANDLING, TRANSIT OR STORAGE. ENSURE HANDS ARE KEPT CLEAR OF THE CUTTER.

SECTION 13

REFURBISHMENT OF CYLINDER VALVE AFTER FIRING

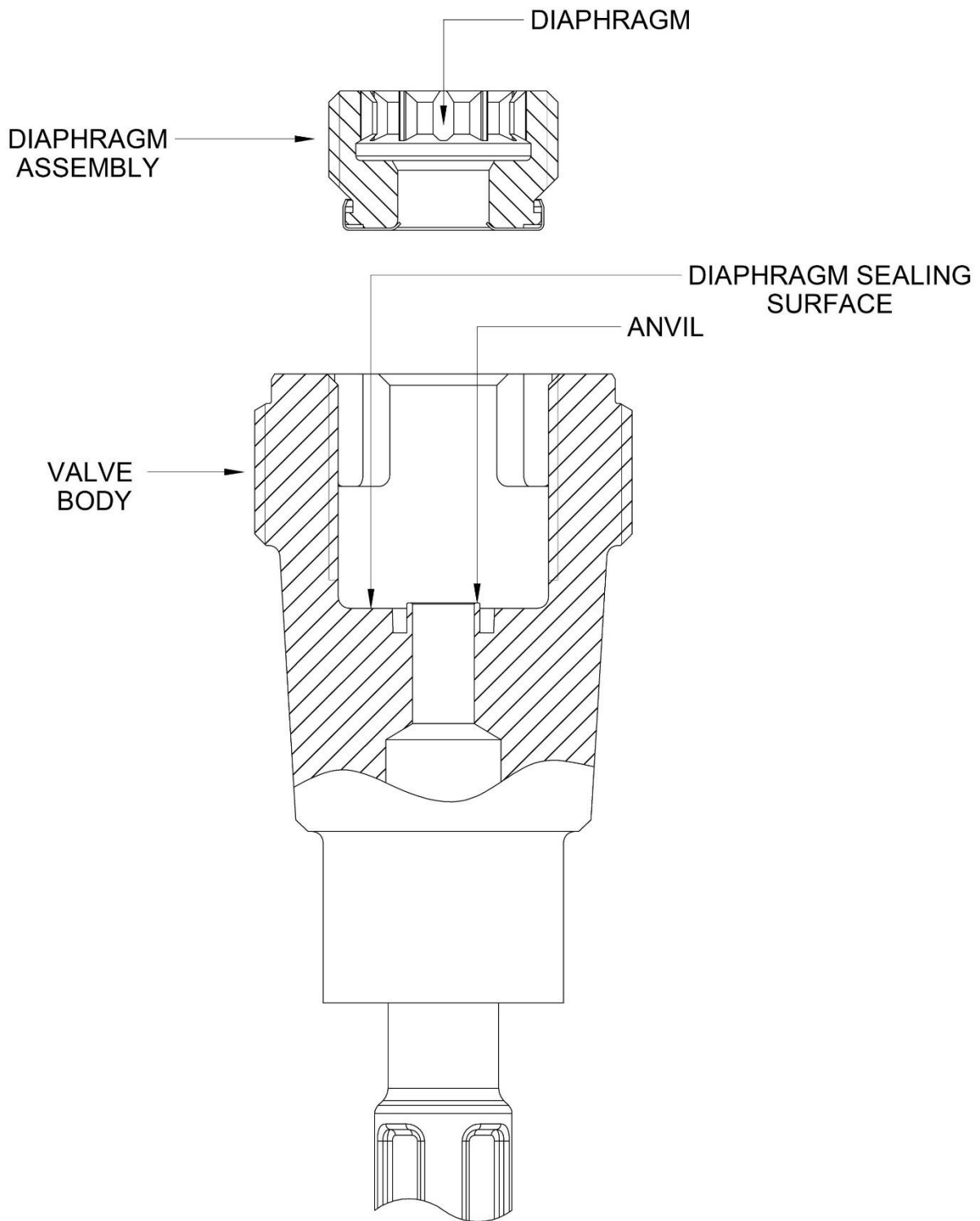


FIG 13

SECTION 13

REFURBISHMENT OF CYLINDER VALVE AFTER FIRING

Fig.13 refers.

1. Visually examine the exterior of the Cylinder Valve. Significant areas of exposed base metal (brass) or green corrosion are not acceptable.
2. Thoroughly clean and degrease the Cylinder Valve Body, ensuring no cleaning solution can enter the cylinder.

WARNING: THE CYLINDER VALVE MUST NOT BE REUSED IF THERE IS ANY SIGNIFICANT DISTORTION, CORROSION OR IMPACT DAMAGE OR IF THERE IS DAMAGE TO EXTERNAL THREADS, DIAPHRAGM SEATING SURFACE OR ANVIL.

3. Fit a NEW Diaphragm Assembly and charge the cylinder in accordance with Section 6 procedures.
4. Fit a Transit Cap (Item 3.3, Section 3) and screw fully home. Hand tight is sufficient.

WARNING: A TRANSIT CAP MUST ALWAYS BE FITTED TO THE VALVE BODY WHEN A CHARGED CYLINDER IS HANDLED TRANSPORTED OR STORED UNCONNECTED TO LIFERAFT.

CAUTION: DO NOT STORE A CHARGED CYLINDER IN DIRECT SUNLIGHT OR WHERE TEMPERATURE CAN EXCEED 65°C.

SECTION 14
SPARE PARTS LIST

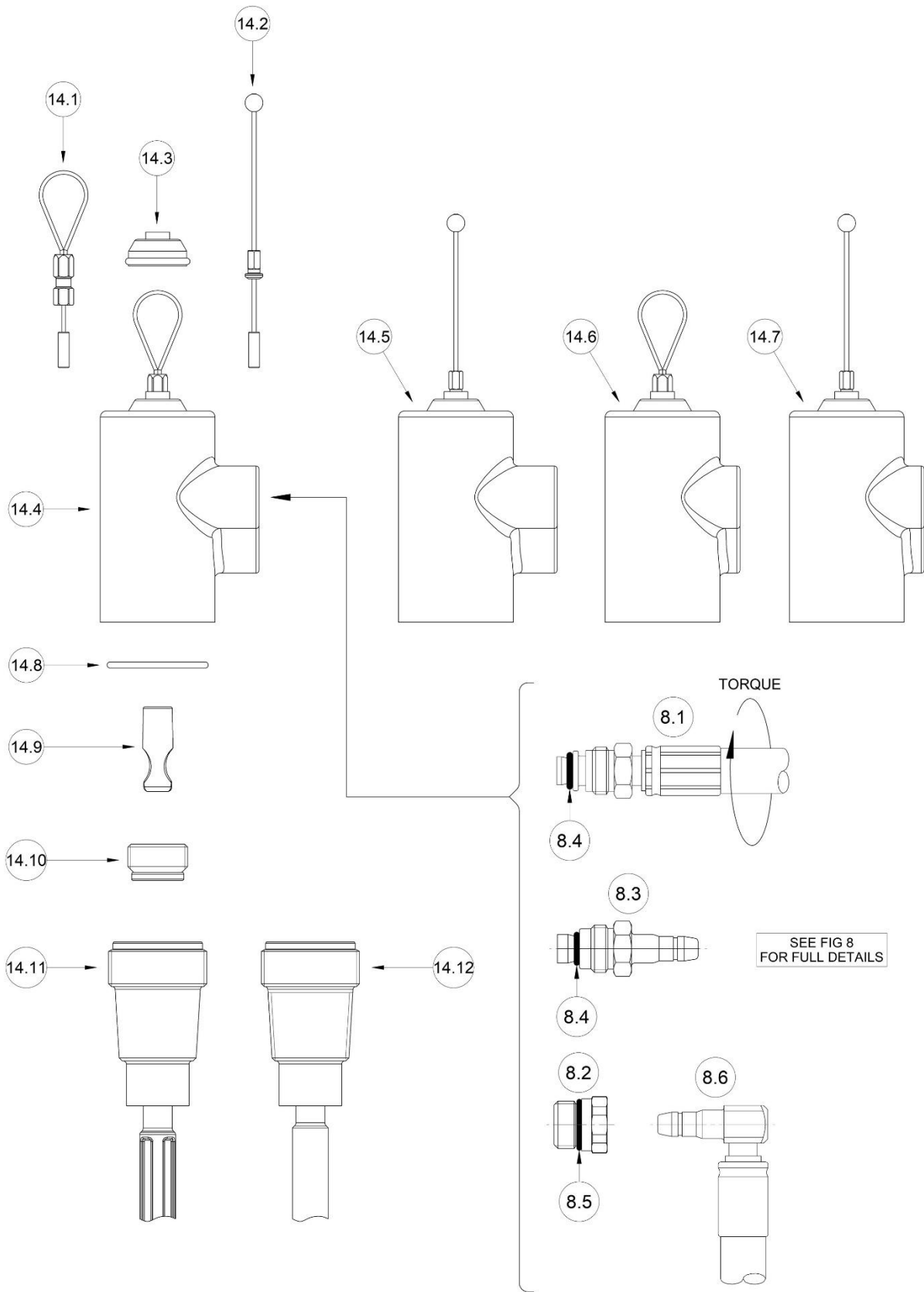


FIG 14

SECTION 14

SPARE PARTS LIST

Fig.14 refers.

ITEM	DESCRIPTION	PART NUMBER
14.1	LOOP ACTUATOR CABLE ASSEMBLY	19637
14.2	NO LOOP ACTUATOR CABLE ASSEMBLY	19638
3.2 & 14.3	ACTUATOR CABLE SEAL	19636
2.1a & 14.4	OPERATING HEAD ASSEMBLY - Complete with Actuator Cable Assembly, item 14.1, and 'O' Ring Seal, item 14.8	See Page 3, 2.1a
2.1b & 14.5	OPERATING HEAD ASSEMBLY - Complete with Actuator Cable Assembly, item 14.2, and 'O' Ring Seal, item 14.8	See Page 3, 2.1b
2.1c & 14.6	OPERATING HEAD ASSEMBLY - Complete with Actuator Cable Assembly, item 14.1, and 'O' Ring Seal, item 14.8	See Page 3, 2.1c
2.1d & 14.7	OPERATING HEAD ASSEMBLY - Complete with Actuator Cable Assembly, item 14.2, and 'O' Ring Seal, item 14.8	See Page 3, 2.1d
4.7 & 14.8	'O' RING	66300756
14.9	PROTECTION CAP	13000291
14.10	DIAPHRAGM ASSEMBLY 210 BAR (PURPLE COLOUR CODE)	2111006
	DIAPHRAGM ASSEMBLY 245 BAR (BROWN COLOUR CODE)	2111002
	DIAPHRAGM ASSEMBLY 250 BAR	B912221
	DIAPHRAGM ASSEMBLY 300 BAR (RED COLOUR CODE)	B912222
2.2a & 14.11	CYLINDER VALVE ASSEMBLY with clip retained weight syphon tube. Complete with diaphragm assembly.	See page 3, item 2.2a
2.2b & 14.12	CYLINDER VALVE ASSEMBLY with over moulded weight syphon tube. Complete with diaphragm assembly.	See page 3, item 2.2b
3.1 to 3.4	SAFE HANDLING EQUIPMENT	See pages 4 & 5
4.1 to 4.12	SPECIAL TOOLS FOR ASSEMBLY, CHARGING & SERVICING	See pages 6 & 7
8.1	HOSE ASSEMBLY	See Note 1 below
8.2	CONNECTOR M16 x 1.5 – 'O' RING SEAL VERSION	0907003
8.3	QUICK CONNECT COUPLING – Various lengths	18442 or 0910001
4.12 & 8.4	'O' RING SEAL	66300749
8.5	'O' RING SEAL FOR CONNECTOR M16 x 1.5	66300686
8.6	HOSE ASSEMBLY – PUSH FIT	See Note 1 below
-	SILICONE GREASE TYPE DOW CORNING MOLYKOTE 33	50800120

WARNING: USE ONLY SPARES MANUFACTURED BY LEAFIELD MARINE LIMITED WHEN SERVICING THE GAS INFLATION SYSTEM. OTHER ITEMS COULD FAIL AND CAUSE INJURY OR DEATH.