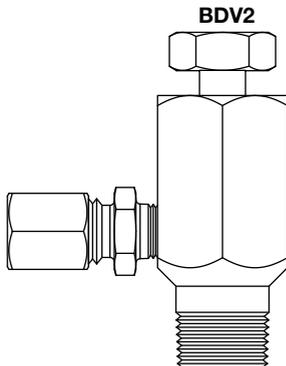
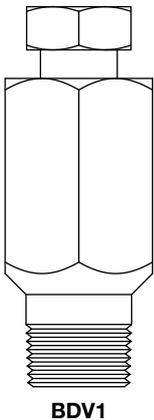


BDV1 and BDV2
Blowdown / Depressurisation Valves
Installation and Maintenance Instructions



- 1. Safety information*
- 2. General product information*
- 3. Installation*
- 4. Commissioning*
- 5. Operation*
- 6. Maintenance*
- 7. Spare parts*

1. Safety information

Safe operation of the unit can only be guaranteed if it is properly installed, commissioned and maintained by a qualified person (see Section 1.11) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

1.1 Intended use

Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended use / application. The products listed comply with the requirements of the European Pressure Equipment Directive 97 / 23 / EC, carry the CE mark when so required.

The product(s) falls within the following Pressure Equipment Directive categories:

Product	Group 2 Gases	Group 2 Liquids
BDV1 and BDV2	SEP	SEP

- i) The product has been specifically designed for use on steam, air or water / condensate which are in Group 2 of the above mentioned Pressure Equipment Directive.

The product's use on other fluids may be possible but, if this is contemplated, Spirax Sarco should be contacted to confirm the suitability of the product for the application being considered.

- ii) Check material suitability, pressure and temperature and their maximum and minimum values. If the maximum operating limits of the product are lower than those of the system in which it is being fitted, or if malfunction of the product could result in a dangerous overpressure or overtemperature occurrence, ensure a safety device is included in the system to prevent such over-limit situations.
- iii) Determine the correct installation situation and direction of fluid flow.
- iv) Spirax Sarco products are not intended to withstand external stresses that may be induced by any system to which they are fitted. It is the responsibility of the installer to consider these stresses and take adequate precautions to minimise them.
- v) Remove protection covers from all connections and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.

1.2 Access

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.

1.3 Lighting

Ensure adequate lighting, particularly where detailed or intricate work is required.

1.4 Hazardous liquids or gases in the pipeline

Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider: flammable materials, substances hazardous to health, extremes of temperature.

1.5 Hazardous environment around the product

Consider: explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.

1.6 The system

Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk?

Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.

1.7 Pressure systems

Ensure that any pressure is isolated and safely vented to atmospheric pressure. Consider double isolation (double block and bleed) and the locking or labelling of closed valves. Do not assume that the system has depressurised even when the pressure gauge indicates zero.

1.8 Temperature

Allow time for temperature to normalise after isolation to avoid the danger of burns and consider whether protective clothing (including safety glasses) is required.

1.9 Tools and consumables

Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco replacement parts.

1.10 Protective clothing

Consider whether you and/or others in the vicinity require any protective clothing to protect against the hazards of, for example, chemicals, high /low temperature, radiation, noise, falling objects, and dangers to eyes and face.

1.11 Permits to work

All work must be carried out or be supervised by a suitably competent person. Installation and operating personnel should be trained in the correct use of the product according to the Installation and Maintenance Instructions.

Where a formal 'permit to work' system is in force it must be complied with. Where there is no such system, it is recommended that a responsible person should know what work is going on and, where necessary, arrange to have an assistant whose primary responsibility is safety.

Post 'warning notices' if necessary.

1.12 Handling

Manual handling of large and /or heavy products may present a risk of injury. Lifting, pushing, pulling, carrying or supporting a load by bodily force can cause injury particularly to the back. You are advised to assess the risks taking into account the task, the individual, the load and the working environment and use the appropriate handling method depending on the circumstances of the work being done.

1.13 Residual hazards

In normal use the external surface of the product may be very hot. If used at the maximum permitted operating conditions the surface temperature of some products may reach temperatures of 250°C (482°F).

Many products are not self-draining. Take due care when dismantling or removing the product from an installation (refer to 'Maintenance instructions').

1.14 Freezing

Provision must be made to protect products which are not self-draining against frost damage in environments where they may be exposed to temperatures below freezing point.

1.15 Disposal

Unless otherwise stated in the Installation and Maintenance Instructions, this product is recyclable and no ecological hazard is anticipated with its disposal providing due care is taken. However, if the valve is fitted with a Viton or PTFE seat, special care must be taken to avoid potential health hazards associated with decomposition/burning of these seats.

1.16 Returning products

Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.

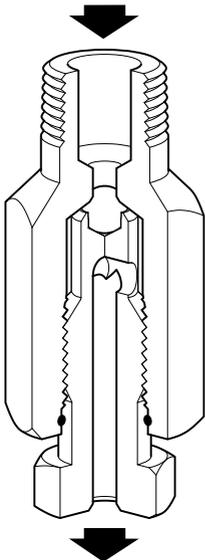


Fig. 1 BDV1

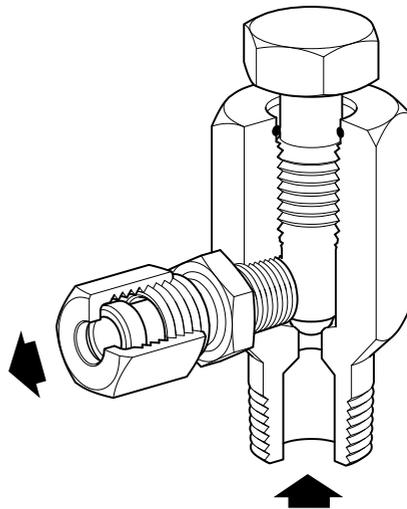


Fig. 2 BDV2

— 2. General product information —

2.1 General description

The BDV depressurisation valves are designed to be fitted into 3/8", 1/2" and DN15 connections for drain/blowdown/purge and vent/depressurisation of pipework or products.

The **BDV1** provides discharge straight through the valve, generally to be used as a drain, or for line depressurisation where discharge is directed to grade/atmosphere.

The **BDV2** provides side connection discharge, generally to be used as a vent for top pipe mounting or for line depressurisation, to ensure discharge is piped to grade/atmosphere.

BDV1/BDV2 fitted to pipeline connectors PC3_ / PC4_ :

When a depressurisation valve type BDV1/BDV2 is fitted to a pipeline connector type PC3_ / PC4_ designed for use with swivel connector steam traps, the valve can be used for drain/vent/depressurisation of pipework and upstream/downstream trap testing. An internal drilling is provided in certain connector bodies specifically for trap testing.

Where it is acceptable to discharge to atmosphere a BDV1 may be used for line drain and trap test service. Where it is not acceptable to discharge to atmosphere the BDV2 should be used and the piped discharge taken to a suitable point.

For upstream trap vent applications always use a BDV2.

Spirax Sarco recommendations

Applications	Installation / purpose	Recommended installation	
		Bottom	Top
Depressurisation or purge and vent	Fitted to the pipe or product to depressurise the pipeline upstream or downstream of the product.	BDV1 or BDV2	BDV2
Drain	Fitted to the bottom of the pipe or product for draining.	BDV1 or BDV2	
Vent	Fitted to the top of the pipe or product for venting.		BDV2
Blowdown	Fitted to the strainer cap or bottom of the dirt pocket for the removal of dirt.	BDV1 or BDV2	
Trap test	Fitted to a PC3_ / PC4_ with cross-drilling to test the inlet and / or outlet of the steam trap to ensure correct operation.	BDV1 or BDV2	

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 97/23/EC.

Certification

This product is available with certification to EN 10204 3.1. **Note:** All certification/inspection requirements must be stated at the time of order placement.

Note:

For further product data see the following Technical Information sheet: TI-P600-01.

2.2 Sizes and pipe connections

Screwed $\frac{3}{8}$ " NPT and BSP (to fit DTP strainer cap) for straight through discharge.

BDV1 Screwed $\frac{1}{2}$ " NPT and BSP for straight through discharge.

Socket weld DN15 pipe end schedule 80 to suit ANSI B 16.11 Class 3000 for straight through discharge.

Screwed $\frac{3}{8}$ " and $\frac{1}{2}$ " BSP fitted with $\frac{1}{8}$ " BSP compression fitting for side discharge with 6 mm O/D tube.

BDV2 Screwed $\frac{3}{8}$ " and $\frac{1}{2}$ " NPT fitted with $\frac{1}{8}$ " NPT compression fitting for side discharge with $\frac{1}{4}$ " O/D tube

Socket weld DN15 with $\frac{1}{8}$ " NPT compression fitting for side discharge with $\frac{1}{4}$ " O/D tube.

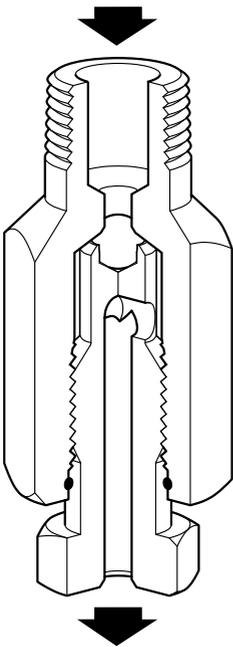


Fig. 3 BDV1

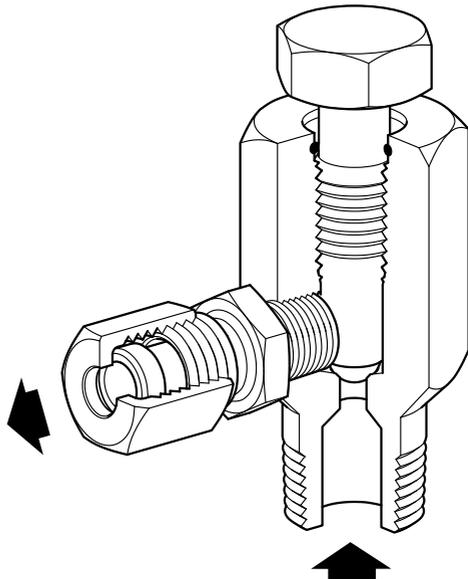
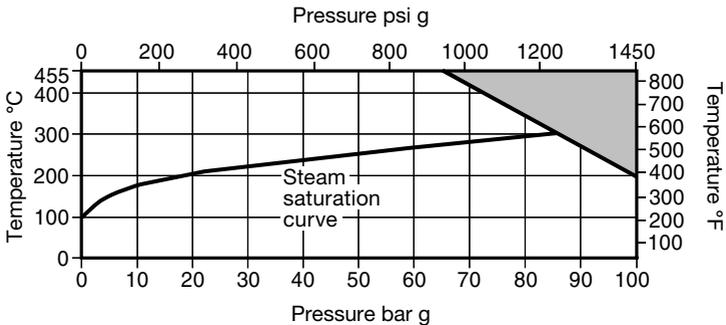


Fig. 4 BDV2

2.3 Pressure / temperature limits

Note: When the BDV1 and BDV2 are fitted for use as blowdown valves on other products, the limiting conditions are that of the lowest rated part. See the appropriate TI as listed in the table below for technical data:

BPC32Y		TI-P005-01
BPS32Y		TI-P005-03
FTC80	ASTM body	TI-P179-02
	EN body	TI-P179-03
PC20		TI-P128-15
SMC32Y		TI-P076-10
TD3-3		TI-P068-04
TD42		TI-P068-22
TD42L, TD42LA, TD42H and TD42HA		TI-S01-03
TD42S2		TI-P068-07
TD42S3		TI-P068-23
TD62		TI-P068-08
UTD30L, UTD30LA, UTD30H and UTD30HA		TI-P154-01



 The product **must not** be used in this region.

Body design conditions		PN100	
PMA	Maximum allowable pressure	100 bar g @ 200°C	(1 450 psi g @ 392°F)
TMA	Maximum allowable temperature	455°C @ 66 bar g	(851°F @ 957 psi g)
Minimum allowable temperature		-10°C	(14°F)
PMO	Maximum operating pressure for saturated steam service	85 bar g	(1 232 psi g)
TMO	Maximum operating temperature	455°C @ 66 bar g	(851°F @ 957 psi g)
Minimum operating temperature		0°C	(32°F)
Δ PMX	Maximum differential pressure	80 bar g	(1 160 psi g)
Designed for a maximum cold hydraulic test pressure		150 bar g	(2 175 psi g)

3. Installation

Note: Before actioning any installation, observe the 'Safety Information' in Section 1.

- 3.1** Check materials, pressure and temperature and their maximum values. If the maximum operating limit of the product is lower than that of the system in which it is being fitted, ensure that a safety device is included in the system to prevent overpressurisation.
- 3.2** Determine the correct installation situation and direction of fluid flow.
- 3.3** Remove protective covers from all connections and protective film from all name-plates, where appropriate, before installing on steam or other high temperature applications.
Note: The BDV2 compression fitting nipple (item 5, Figure 8 on page 12) is loosely assembled for transportation and requires to be tightened to a torque of 8 - 10 N m (6 - 7 lbf ft) when installing the unit in its final location.

3.4 How to install the BDV1 and BDV2

When fitting the depressurisation valve for drain/blowdown/purge and vent/depressurisation of pipework, consideration must be given to the position of discharge. The discharge must be directed or piped to a safe place where it will not injure personnel nor damage plant. For screwed connections, the application of PTFE tape or (Loctite) thread locking compound is recommended before tightening to pipe fittings standards. The BDV2 is supplied with compression fitting pre-installed on screwed variants. For male pipe end connection, weld to ANSI B 16.11 Class 3000 – refer to Sections 3.5 and 3.6.

3.5 Welding a BDV1 or BDV2 into socket of pipe end variants (refer to Section 3.7)

A universal weld procedure covering the requirements of different National and International Standards and practices is difficult to provide - specifically regarding the welding procedure, welding conditions (run number, consumable size, current, voltage, polarity), storage of consumables and make/type of consumables due to the abundance of appropriate consumable suppliers. Therefore, this is only advice based on British Standards to be used for guidance on the essential requirements of welding pipe fittings and socket weld pipeline connectors to the depressurisation valve.

3.6 Welding a BDV1 or BDV2 into PC3_/PC4_ pipeline connectors (refer to Section 3.8)

General guidelines still apply regarding safe discharge and screwing or socket welding into pipeline connectors. It is recommended to fit a BDV1 for drain or trap testing, where discharge can be directed to grade and a BDV2 for venting or to ensure discharge is piped to grade. Care should be taken regarding orientation of the valve (particularly if fitted above the pipeline connector), to ensure discharge tubing does not obstruct installation of the trap to the swivel connector face or the operation of the handwheel. There is the option of having the BDV pre-installed into the pipeline connector body.

3.7 Welding of pipe fittings

The welding of pipe fittings DN15 socket weld to depressurisation valve DN15

PARENT MATERIAL(S)

Description

Austenitic stainless steel with minimum tensile strength up to and including 480 N/mm²

Specification(s)

BS 970 304S11 (DV)
ASTM A105N (Coupling)

Material group(s)

R and A1

PARENT MATERIAL(S) DIMENSIONS

	DN15	
	Coupling	BDV
Thickness	8.85 mm	3.73 mm
O/D	39.00 mm	21.30 mm

JOINT TYPE

Socket joint to BS 3799 Class 3000 lb

WELDING PROCESS

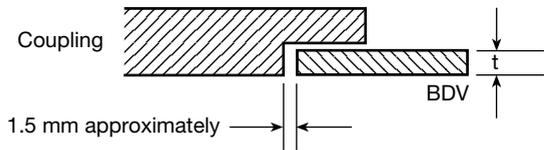
Manual Metal Arc (MMA)

WELDING POSITION(S)

All: Site welded

WELD PREPARATION

Dimensioned sketch



Diametrical clearance 1.0 mm maximum

Reference - BS 2633: 1987: Section 3.

WELDING CONSUMABLES

Filler material:

Composition - Low C : 23% Cr: 12% Ni
Specification - BS 2926 : 1984 : 23-12 L BR

Shielding gas / flux:

Not applicable.

METHOD OF PREPARATION AND CLEANING

Coupling: As supplied and wire brushed.

DV: As supplied and wire brushed.

ADDITIONAL INFORMATION

1. It is not necessary to disassemble prior to welding, but BDV should be open.
2. Fit-up using tack welds.

PARENT MATERIAL TEMPERATURE

Preheat temperature

Only required when ambient is below 5°C (9°F) then 'warm to touch'

Interpass temperature

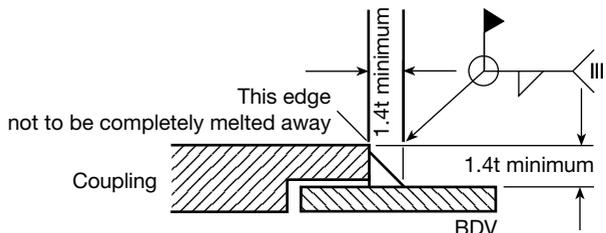
Not applicable

POST-WELD HEAT TREATMENT

None required

RUN SEQUENCE AND COMPLETED WELD

Dimensions sketch



Reference.- BS 806: 1990: Section 4: Clause 4.7.3

3.8 Welding of pipeline connector

The welding of pipeline connector DN15 socket weld to depressurisation valve DN15

PARENT MATERIAL(S)

Description

Austenitic stainless steel with minimum tensile strength up to and including 485 N/mm²

Specification(s)

ASTM A182 F304L (PC)
BS 970 304S11 (DV)

Material group(s)

R

PARENT MATERIAL(S) DIMENSIONS

	DN15	
	Coupling	BDV
Thickness	8.85 mm	3.73 mm
O/D	39.00 mm	21.30 mm

JOINT TYPE

Socket joint to BS 3799 Class 3000 lb

WELDING PROCESS

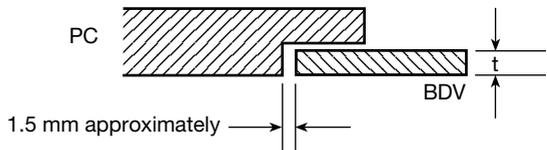
Manual Metal Arc (MMA)

WELDING POSITION(S)

All: Site welded

WELD PREPARATION

Dimensioned sketch



Diametrical clearance 1.0 mm maximum

Reference - BS 2633: 1987: Section 3.

WELDING CONSUMABLES

Filler material:

Composition - Low C: 20% Cr: 10% Ni:
0.8% Si: 1% Mn

Specification - BS 2926: 1984: E19 9 LR

Shielding gas/flux:

Not applicable

METHOD OF PREPARATION AND CLEANING

PC: As supplied and wire brushed.

DV: As supplied and wire brushed.

ADDITIONAL INFORMATION

1. It is not necessary to disassemble PC/BDV prior to welding, but both to be open during welding.
2. Fit-up using tack welds.

PARENT MATERIAL TEMPERATURE

Preheat temperature

Only required when ambient is below 5°C (9°F) then 'warm to touch'

Interpass temperature

Not applicable

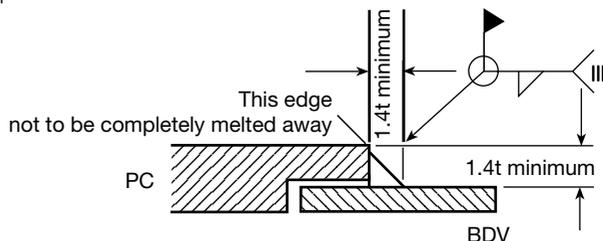
POST-WELD

HEAT TREATMENT

None required

RUN SEQUENCE AND COMPLETED WELD

Dimensions sketch



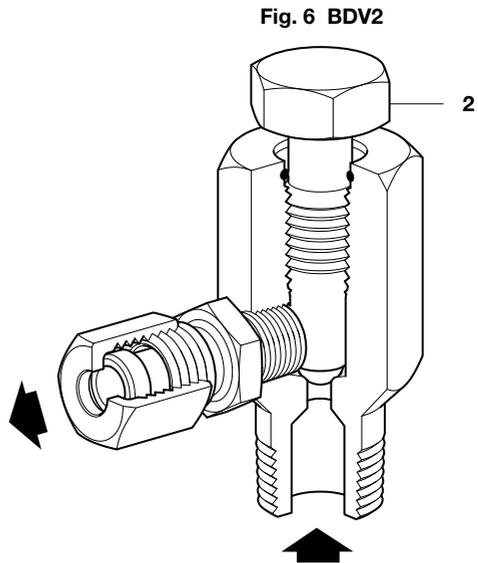
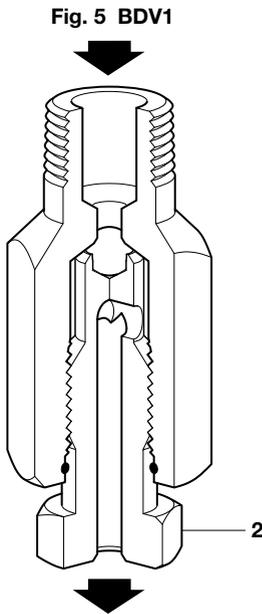
Reference.- BS 806: 1990: Section 4: Clause 4.7.3

4. Commissioning

After installation or maintenance ensure that the system is fully functioning. Carry out tests on any alarms or protective devices.

5. Operation

The BDV1 and BDV2 blowdown / depressurisation valves have a valve screw (2), which can be unscrewed with a 17 mm A/F spanner to drain / depressurise / vent the connecting pipework. A locked set screw will prevent the valve screw from disengaging from the valve body. Recommended tightening torque 22 - 25 N m (16 - 17 lbf ft) for resealing the valve screw. Ensure adequate safety precautions are taken when opening the valve to atmosphere – hand and eye protection is recommended when opening the BDV1. Periodical operation will ensure the correct working of the valve.



6. Maintenance

Note: Before actioning any maintenance programme observe the 'Safety information' in Section 1.

Warning

The strainer and cap gasket on the TD62 contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.

The BDV1, BDV2 depressurisation valves are maintenance free products, with long life expectancy.

7. Available spares

There are no spare parts available for these products.

How to order a new product

Example: 1 off Spirax Sarco DN15 BDV1 depressurisation valve having austenitic stainless steel body with male pipe end schedule 80 connections to ANSI B 16.11 Class 3000.

Fig. 7 BDV1

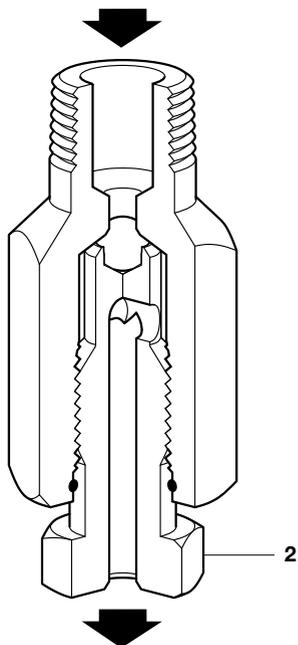


Fig. 8 BDV2

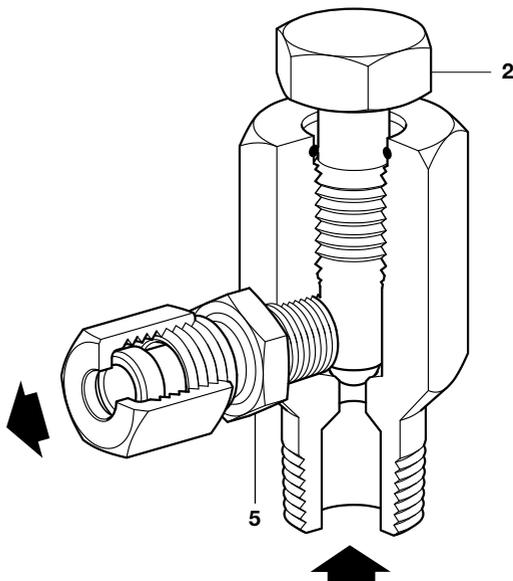


Table 1 Recommended tightening torques

No.	Part	Thread	N m	(lbf ft)
2	Valve screw	17 mm A/F	22 - 25	(16 - 17)
5	Compression fitting nipple	14 mm A/F	8 - 10	(6 - 7)