Style 40VMP

Manhole Covers and Breather Vent

Installation and Maintenance Manual

(Technical Manual No SDM05)

INDEX

1.0 Important Notes

1.1 Regarding Manlids

NOTE 1: *Depending upon the regulations applying to a particular installation, these manhole cover may be suitable for use on tanks containing petroleum spirit and fuel oils.*

NOTE 2: *The VMP series of manhole covers do not meet the requirements of EN13317:2002 Manhole Cover Assembly – Tanks for the Transport of Dangerous Goods.*

NOTE 3: *Dependant upon the product carried there may be a residual pressure in the tank compartment. Before opening the manhole cover or carrying out any inspection or maintenance, ensure that this pressure has been safely relieved (see operator's maintenance procedure).*

1.1.1 The Style 40VMP manhole cover has been designed to perform a number of different functions. Some of these functions relate to the safety of the tank, not only during normal operating conditions, but also in the event of tank upset, fire engulfment, or overfilling. It is therefore important that the manhole cover is inspected and maintained on a regular basis, in order that it will carry out all these functions correctly when required to do so.

1.1.2 We have used our best endeavours to provide these guidelines for the inspection and replacement of the main operating parts. However, it is not possible to quantify exactly the condition of any component of the manhole cover, (in particular the condition of the spring, the fill cover seal or baseplate sealing face), that will guarantee a vapour and liquid tight seal, together with the correct operation of the 10" fill cover, which also acts as a pressure relief valve. If there is any doubt with regard to the condition of any component, in the interest of safety, we would recommend the replacement of that component. Similarly, if there is any doubt with regard to the vapour or liquid tightness of the manhole cover, we would recommend that it should be subjected to a pressure test.

1.1.3 Operators may like to use this manual as a basis for their own written scheme, but should note that it may need to be amended as appropriate to take account of each operator's individual operating conditions. In particular when drawing up a written scheme for inspection and maintenance, operators will need to determine if the same scheme should apply to both top and bottom loaded tankers.

NOTE 2: *This manual covers Style 40VMP manhole cover. The lists of spare parts are in appendix 1.*

Please do not hesitate to contact our Sales Department if you require further information or guidance.

1.1.4 The nominal pressure setting for these manhole covers is or 3.5 psi (24 kPa). This is a low pressure for the size of the aperture (10" diameter) and there will be variations in the opening pressure of each individual manhole cover. The variation proven by type testing is shown in the table below.

Table 1 - Pressure Settings

Nominal Opening Pressure	Minimum Opening Pressure	Maximum Opening Pressure
3.5 psi (24 kPa)	3.5 psi (24 kPa)	4.2 psi (29 kPa)

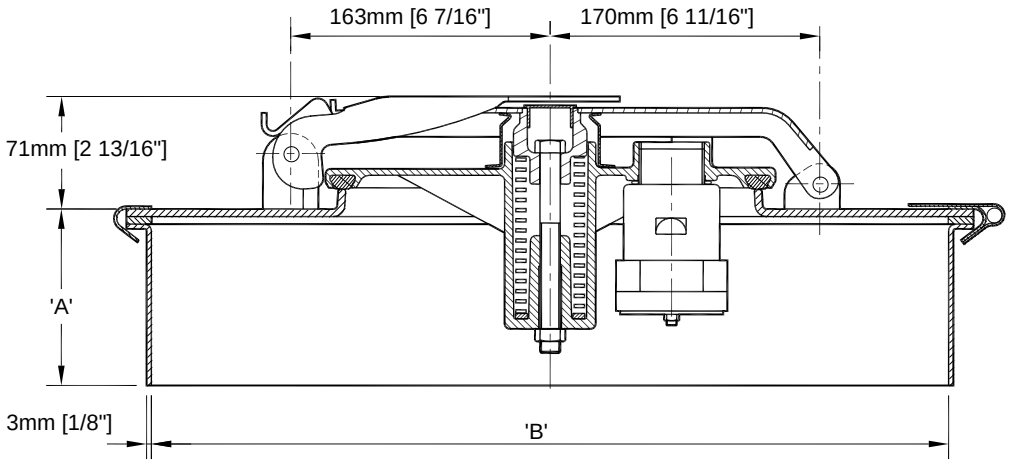
Note 3:: *1 kPa = 0.145 psi* *1 psi = 6.895 kPa*

2.0 Description

2.1 Style 40VMP Manhole Cover

Suitable for tanks and silos with a maximum working pressure of 0.35 bar (5 psi)

Figure 1 – Style 40VMP sketch showing dimensions



Dimensions	16"	20"	24"
'A'	86mm (3.4")	111mm (4.4")	163mm (6.4")
'B'	406mm (16")	508mm (20")	610mm (24")

2.1.1 The Style 40VMP manhole cover has a 255mm (10 inch) diameter opening with a hinged lid on a baseplate. The baseplate is secured to the neckring by the locking band and the compression of the gasket ensures an efficient seal. The neckring is designed for welding directly into the tank shell.

2.1.2 The 10 inch fill cover is spring loaded to act as a relief valve with a nominal opening pressure of 0.24 bar (3.5 psi). The opening pressure cannot be adjusted and this range of manhole covers is not tested after assembly. Manhole covers should be tested after installation as any distortion caused by welding the neckring to the tank may affect the sealing face and reduce the opening pressure.

2.1.3 The cam action of the lid clamp and hinge provides a positive closing and sealing arrangement.

2.1.4 Manufactured in mild steel (zinc electro-plated, except for the neckring). The standard fill cover gasket is nitrile and the standard neckring gasket is nitrile bonded cork.

WARNINGS

1 Before opening or removing any manhole cover or inspection hatch, ensure that all pressure in the tank has been relieved. This will eliminate the possibility of a potentially dangerous "kick-back" and the risk of injury.

2 Before ordering please ensure that the relief valve on this manhole cover is suitable for your application. If this valve is intended to protect against over pressurisation of a vessel or system, it is important that an assessment is made to ensure that the pressure setting and the flow capability of the valve will ensure protection against damage to the plant and/or personnel. Flow rates are detailed in table 1.

3.0 Installation of the Style 40VMP manhole cover

Suitable for tanks and silos with a maximum working pressure of 0.35 bar (5 psi)

Note 1: *Style 40VMP manhole covers are supplied assembled for final inspection and to facilitate easy packing and handling during despatch. The standard fill cover gasket is Buna-N, the standard neckring gasket is nitrile bonded cork and the PPV vent valve (if fitted) is supplied with Viton or Buna-N gaskets. Before installation, check that these materials are compatible with the products to be stored or carried in the tank.*

3.1 Before fitting the neckring to the tank the baseplate assembly should be removed from the neckring. Release the lid clamp (using a key if a lock is fitted). Remove the locking band bolt and lift off the locking band. Separate the neckring, gasket and baseplate assembly.

3.2 Insert the neckring into the tank aperture, adjust the height as required, and tack-weld into position.

3.3 Check that the top face of the neckring is flat, and that the shape is round, before welding.

3.4 After welding, re-assemble the manhole cover as follows.

3.5 Check that the neckring and baseplate faces are clean and free from damage. Release the lid clamp on the baseplate assembly and place the assembly on the neckring with the gasket between the baseplate and the neckring. Do not allow the gasket to fall into the tank.

3.6 Fit the locking band with the lugs in the most suitable position, usually in-line with the hinges. Fit the bolt and tighten up the locking band until it just starts to grip.

3.7 Open the lid and check that the neckring gasket is fitted correctly by feeling inside and pushing the gasket into position. Tighten the locking band and, at the same time, assist it to fit snugly by tapping gently with a soft mallet around the periphery. **DO NOT OVERTIGHTEN.**

NOTE 2: *These manhole covers are not tested before despatch. We therefore recommend that a pressure test should be carried out after installation, due to possible distortion caused by welding the neckring to the tank. This distortion will affect the seal face and reduce opening pressure.*

NOTE 3: *We are unable to advise on the appropriate procedure for this test, as these manhole covers are designed for use on a wide variety of tanks.*

4.1 Monthly Maintenance Schedule

4.1.2 Manhole cover baseplate - Style 40VMP
Check the manhole cover baseplate for obvious signs of damage. Check that the gasket between the baseplate and the neckring is in good condition. Inspect on and around the baseplate for any evidence of leakage of product.

4.1.2 Sealing face of 10" aperture - Style 40VMP
After relieving the pressure in the tank compartment, check the condition of the sealing face on the 10" aperture. A few scratches will not normally impair the sealing qualities of the manhole cover, but nicks and chips on the sealing face may cause leaks. A baseplate or neckring with a damaged sealing face must be replaced.

4.1.3 Fill cover assembly - Style 40VMP
After relieving the pressure in the tank compartment, check that the lock (if fitted) opens freely with the key. Open the manhole cover. Remove the key from the lock and close the manhole cover. Check that the locking mechanism prevents the manhole from being opened without the use of a key. Close and re-open the manhole cover several times to check the operation of the locking mechanism, lid hinge and lid clamp are operating correctly. Check the lock is held firmly in position by the four lock retaining rivets.

NOTE 3: The key must be removed from the lock before the manhole cover is closed.

4.1.4 Check the condition of the hinge pins and that the circlips and washers on each end of the hinge pins are in place and secure. See appendix 1 for details of parts.

4.1.5 Check that there is no wear in the hinge pin holes in the lid hinge, the lid clamp or the hinge lugs on the Style 40VMP baseplate.

4.1.6 Check that the lid hinge is straight and not damaged in any way. It should pass between the arms of the lid clamp without hitting the sides.

4.1.7 Inspect the fill cover gasket. The gasket should sit flush and tight in the groove, with the sealing face slightly convex. If the sealing face of the gasket has shrunk below the machined faces of the gasket groove it should be replaced. It should also be replaced if it is damaged or shows signs of hardening.

4.1.8 Finally, with the fill cover held firmly closed, check the adjustment of the fill cover as follows. Swing the lid clamp over the end of the lid hinge, see figure 3. It should just touch the tip of the safety catch as it hinges over. If it does, close the manhole cover. If it does not, the fill cover needs adjustment, see section 5.4.

4.2 Breather Vent

The Breather Vent should be checked as part of the monthly inspection schedule. Please refer to manual (reference SDM07) provided with the vent.

4.3 Other Maintenance

4.3.1 Initially, this should be carried out at intervals of not more than three months. After the first two inspections it may be advisable to decrease or increase the length of this period depending on the environment in which the manhole cover is installed, and also the product in the tank. We recommend that the fill cover assembly be dismantled and inspected to ensure correct operation at intervals of not more than six months.

4.3.2 To dismantle the fill cover, it is necessary to remove the plastic plug fitted to the adjusting bolt aperture in the top of the lid hinge and also the lock nut on the end of the centre bolt, see figure 3. The fill cover should be held in the OPEN position. It can then be safely dismantled by unscrewing the centre bolt with a socket spanner. Note: the compression of the spring is completely released before the centre bolt disengages from the thread in the fill cover, so the assembly can be dismantled without any danger from the spring.

4.3.3 The spring should be inspected and, if showing signs of significant corrosion, should be replaced. The spring well in the fill cover should be inspected and any deposits of road dirt etc should be removed.

4.3.4 To improve weather resistance a plastic plug and a rubber bellows are fitted to all Style 40VMP manhole cover, see appendix 1. However the bellows cannot completely prevent the ingress of water or cleaning chemicals, particularly when high pressure washing systems are used. Where ingress of water occurs, it may be necessary to increase the frequency of inspection.

4.3.5 We recommend that a new plug and bellows are fitted to all Style 40VM manhole cover on re-assembly if either of these items is damaged or missing.

4.3.6 The fill cover assembly must then be re-assembled, see section 5.4.2.

4.4 Adjustment of the fill cover assembly

4.4.1 With the fill cover held firmly closed, swing the lid clamp over the end of the lid hinge, see figure 3. It should just touch the tip of the secondary safety catch as it hinges over.

4.4.2 If the fill cover setting is not correct, then the fill cover assembly must be adjusted:-

4.4.3 Remove the lock nut on the centre bolt. The plastic plug which is in the centre of the lid hinge should then be removed to gain access to the end of the centre bolt. With the fill cover in the OPEN position, the centre bolt should be completely unscrewed from the fill cover. Before this occurs, the compression of the spring will be completely released, thus ensuring that the assembly can be dismantled without any danger from the spring.

4.4.4 Before re-assembling the fill cover assembly, several drops of Permabond A131 thread sealant must be applied to the thread of the centre bolt at a distance of 1¼" from the end of the thread nearest the head of the bolt. The fill cover assembly can then be re-assembled by screwing the centre bolt into the thread of the fill cover. Also check that the guide lugs on the top of the fill cover are at the end of the lid hinge nearest to the hinge pin, as shown in the photo at the top of this document.

4.4.5 With the fill cover held firmly closed, adjust the centre bolt until the lid clamp just touches the tip of the secondary latch on the end of the lid hinge as shown above.

4.4.6 Tighten the lock nut and check the adjustment again. If necessary, repeat the adjustment procedure and finally tighten the lock nut. Refit the plastic plug in the centre bolt aperture in the lid hinge.

4.4.7 Finally, we recommend that the tank compartment is pressurised to ensure that a leak-tight seal has been achieved. We are unable to advise on the appropriate procedure for this test as these manhole covers are designed for use on a wide variety of tanks.

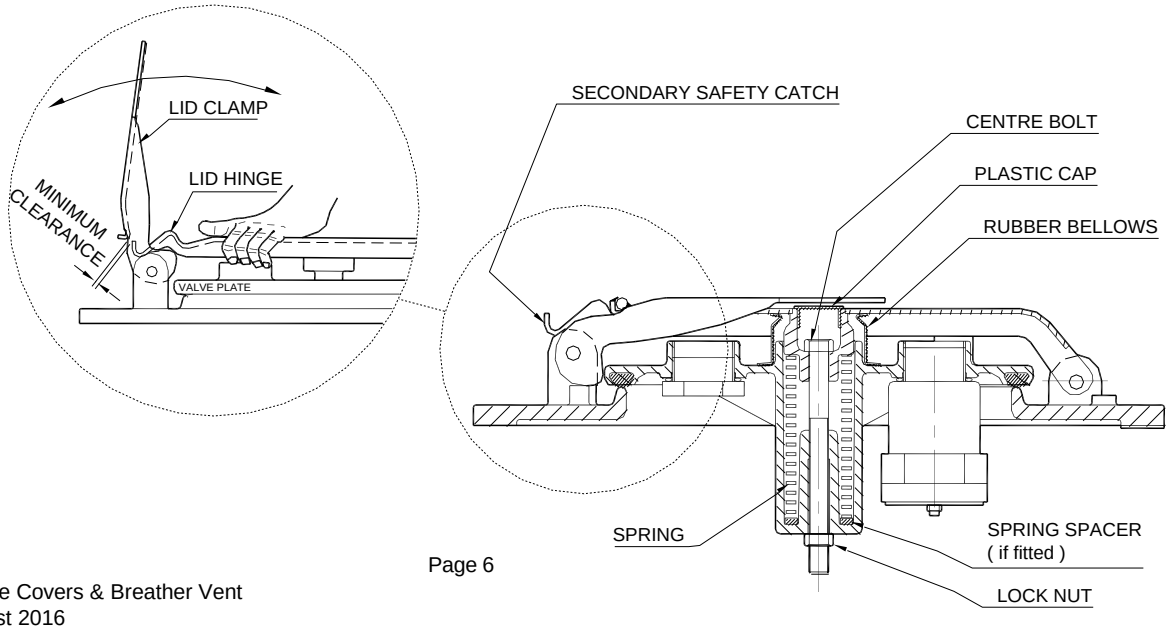


Figure 3 – fill cover adjustment

5.0 Fitting replacement parts

5.1 Removing the fill cover assembly and lid clamp

5.1.1 If the manhole cover is closed, relieve all tank pressure, then open the 10" fill cover.

5.1.2 Remove the circlip and washer from one end of the fill cover hinge pin, taking care that the circlip and washer do not fall into the tank compartment. Then, whilst holding the fill cover assembly in one hand, withdraw the hinge pin from the lugs in the baseplate, taking care that the circlip and washer on the other end of the hinge pin do not fall into the tank compartment.

5.1.3 Repeat the above process for the lid clamp, if this component is also being replaced.

5.2 Replacing the fill cover assembly and lid clamp

5.2.1 Before fitting the replacement fill cover assembly or lid clamp, we recommend that the manhole baseplate is inspected for signs of damage or wear, particularly on the sealing face of the 10" aperture.

5.2.2 Using the hinge pin previously removed from the manhole cover; fit the replacement fill cover assembly to the baseplate. Re-fit the washers and circlips to the hinge pin

5.2.3 Using the other hinge pin previously removed from the manhole cover, fit the replacement lid clamp. Re-fit the washers and circlips to the hinge pin.

5.2.4 Finally, the adjustment of the fill cover assembly must be checked. With the fill cover held firmly closed, swing the lid clamp over the end of the lid hinge, see figure 3. It should just touch the tip of the secondary safety catch as it hinges over. If the fill cover requires adjustment see section 4.4.2.

NOTE 1: All replacement fill covers are tested on a baseplate before despatch. We recommend that a pressure test should be carried out after installation of the replacement fill cover assembly to ensure that a vapour-tight seal has been achieved. The fill cover is designed to commence lifting at the pressures shown in table1 and the Breather vent (if fitted) at a nominal pressure setting of 87.5 mbar (1.25 psi). We are unable to advise on the appropriate procedure for this test as these manhole covers are designed for use on a wide variety of tanks.

5.3 Fitting or replacing the Breather Vent

Style 40VMP manhole covers are supplied with the Breather Vent (if fitted) located on the 10" fill cover under the hinge arm.

5.3.1 **To fit the valve the following parts are required,** Breather vent valve with O ring and a warning label. Also a small quantity of Permabond Pipe Sealant A131 - not supplied by Supply Plus Ltd.

5.3.2 Unscrew the existing vent

5.3.3 Wipe clean the threads on the new vent and the mating threads in the fill cover.

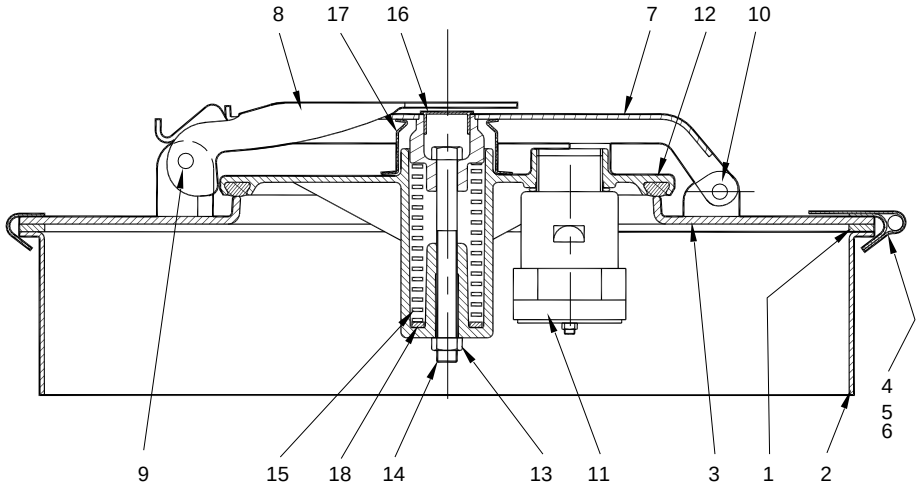
5.3.4 Apply 6 drops of Permabond A131 thread seal to the Breather Vent and screw it into place. Tighten hand-tight onto the O ring.

5.3.5 Check the condition of the 10" fill cover seal.

5.3.6 Where a diptube is fitted to the tank, check that the diptube cap is fitted with a vent valve. If not, fit a new cap.

Appendix 1

Style 40VMP Manhole Cover - Parts Breakdown



Item	Description	QTY	Part No
1	16" Neckring gasket	1	1064.00.N
	20" Neckring gasket	1	5038.01.N
	24" Neckring gasket	1	5039.02.N
2	16" Neckring	1	1062.00.M
	20" Neckring	1	5038.02.M
	24" Neckring	1	5039.01.M
3	16" Baseplate	1	1065.31.M
	20" Baseplate	1	5038.31.M
	24" Baseplate	1	5039.03.M
4	16" Locking band assembly	1	1073.00A.M
	20" Locking band assembly	1	5038.04.M
	24" Locking band assembly	1	5039.05.M
5	Locking Band Bolt	1	1074.01.M
6	Locking Band Nut	1	FPN.344
7	Lid Hinge (for manholes without lock)	1	9127.05.M
	Lid Hinge (for manholes fitted with lock)	1	9127.03.M
	Lock (if fitted)	1	9125.09.S
	Lock rivets (if lock fitted)	4	9125.15.Z
8	Lid Clamp (no lock lug)	1	9122.14.Z
	Lid Clamp (for manholes fitted with lock)	1	9128.03.M
9	Hinge pin & circlips (clamp)	1	9122.14. Z
10	Hinge pin & circlips (hinge)	1	9122.13.Z
11	PPV vent valve (if fitted)	1	9132.AT.A.04(or 20)
	or Aluminium plug (1635.00.A)		
12	Fill cover (including gasket)	1	9129.51.A
	(Fill cover nitrile gasket – 9129.02.T)		
13	½"UNC Staytite Nut	1	9131.02.Z
14	Centre Bolt	1	9131.55.01.Z
15	Spring	1	9131.55.03.M
16	Polythene Cap	1	PC.012
17	Rubber Bellows	1	9125.23.T
18	Aluminium Spacer (if fitted)	11	7607.55.A
	Key for lock (not shown)		9125.16.B