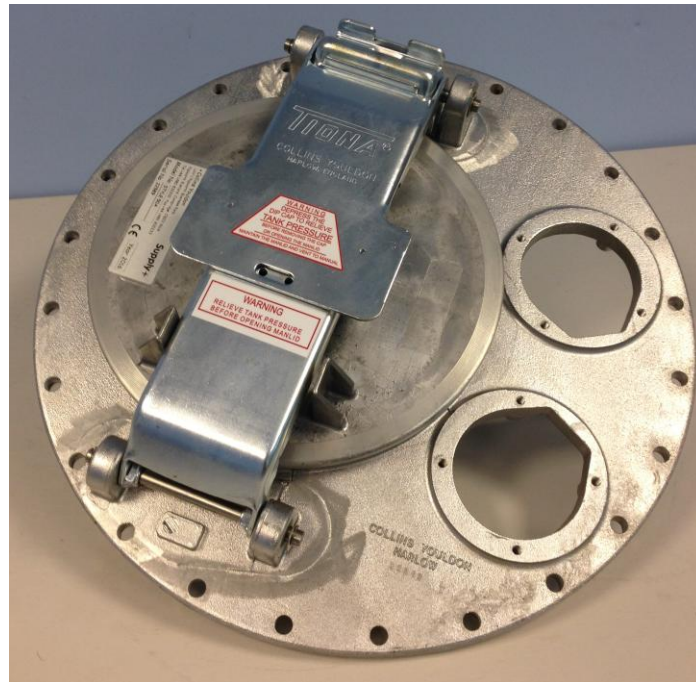




Style 50 Series Manhole Cover Installation and Maintenance Manual

(Technical Manual No SDM06)

Index

			Page
Section	1.0	Important Note	2
Section	2.0	Installation	3
Section	3.0	Inspection, Maintenance and Adjustment	4
	3.1	Monthly maintenance	4&5
	3.2	Bi-annual maintenance	6
	3.3	Adjustment of the fill cover assembly	7
Section	4.0	General notes	8
	4.1	Bottom loading	
	4.2	Electrical continuity	
Section	5.0	Fitting a replacement fill cover assembly	8
Section	6.0	Fitting a Style 50A fill cover kit	9
Tables			
	1	Fill cover flow rates Style 50A, Style 52A	2
	2	Fill cover flow rates Style 55 (16")	2
Appendices			
	1	Style 50A and 52A with dimensions and part numbers	10
	2	Style 50A and 52A parts list drawing	11
	3	Style 55 (16") parts list drawing	12
Figures			
	1	Adjustment of the fill cover assembly	7

1.0 Important Note

Note 1: This manual covers the Style 50, Style 50A, Style 52A and Style 55 (16") manhole cover. See appendices 1, 2 and 3 for spare parts lists and drawings.

Note 2: The Style 55 (16") manhole cover has been designed to meet the HSE requirement for a 1.2 metre drop test on an Australian test rig. The Style 50, 50A and 55 (16") manhole covers are very similar but the Style 55 (16") can be easily identified as the lock is mounted on top of the lid clamp. Care should be taken in the event of the replacement of any parts to ensure that the correct parts are fitted. Please do not hesitate to contact our sales department if you require clarification.

WARNING:

DEPENDING ON THE PRODUCT BEING CARRIED, THERE MAY BE A RESIDUAL PRESSURE IN THE TANK COMPARTMENT. BEFORE CARRYING OUT ANY INSPECTION OR MAINTENANCE, IT IS ESSENTIAL THAT THIS PRESSURE IS SAFELY RELIEVED.

Table 1 – Fill cover flow rates Style 50A and Style 52A

Emergency Relief Valve Setting	Not less than 21kPa
Air Flow at 34.5 kPa	6990 cubic metres/hour (m ³ /hour)
Liquid Flow at 34.5 kPa - tested with water at ambient temperature	approx 3600 litres/minute

Table 2 – Fill cover flow rates Style 55 (16") Manlid

Emergency Relief Valve Setting	Not less than 21 kPa
Air Flow at 34.5 kPa	approx 6990 cubic metres/hour (m ³ /hour)
Liquid Flow	Not known

The above flow rates have been taken from various tests conducted over a period. Actual flow rates may be influenced by many factors and therefore the figures shown should be used as a guide only.

Conversion Factors: 1 kPa = 0.01 bar = 0.1450 psi 1 psi = 6.9 kPa

- 1.1 The Style 50 series of manhole covers 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.
- 1.2 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 breather vent and the 10" fill cover, which also acts as the fire engulfment valve. Therefore 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.
- 1.3 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.

2.0 Installation

Note 1: The Style 50 manhole cover is supplied in a carton with this maintenance manual. The breather vent, which must be fitted to the manhole cover, is supplied separately with its own documentation. Please ensure that the breather vent is appropriate to your requirement, ie either top or bottom loading, and is fitted according to the instructions supplied with the vent.

Note 2: These manhole covers are suitable for tanks and silos with a maximum working pressure of 0.35bar (5 psi).

Note 3: The seals and gaskets fitted to the Style 50 series of manhole covers are of the following materials:

<i>Fill cover gasket:</i>	<i>Buna-N</i>
<i>Baseplate flange gasket :</i>	<i>Nebar</i>
<i>PPV p/v vent seals:</i>	<i>Viton or Buna-N</i>

Before installation, check that these materials are compatible with the products to be stored or carried in the tank.

- 2.1 A mounting face (either a neckring or a flange) should be provided on the tank top for the mounting of the manhole cover. It is essential that the top of the mounting face is flat and clean.
- 2.2 Place the flange gasket onto the mounting face. Place the manhole cover on top of the flange gasket, ensuring that the orientation of the baseplate is as required.
- 2.3 Twenty four bolts (3/8" or 10mm diameter); nuts and washers will be required to secure the manhole cover to the neckring (or flange). All the bolts and nuts should be lightly tightened, before being gradually tightened in turn. The bolts must not be over-tightened.
- 2.4 Finally, a pressure test may be required after installation to ensure that a vapour tight seal has been achieved between the manhole cover and the neckring. 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.

3.0 Inspection, Maintenance and Adjustment

WARNING:

EFFICIENT VAPOUR RECOVERY REQUIRES A RESIDUAL PRESSURE IN THE TANK COMPARTMENT. BEFORE CARRYING OUT ANY INSPECTION OR MAINTENANCE ON THE MANHOLE COVER, ENSURE THAT THIS PRESSURE HAS BEEN SAFELY RELIEVED (SEE OPERATOR'S MAINTENANCE PROCEDURE AND SECTION 5 OF THIS MANUAL).

CAUTION:

If at any time there are signs of physical damage, wear or signs of leakage of product through the manhole cover (or any other tank top fitting) these must be investigated and repaired.

3.1 Monthly Maintenance

3.1.1 Baseplate

- 3.1.1.1 Check the manhole cover baseplate for obvious signs of damage.
- 3.1.1.2 On the Style 50, 50A and 55 (16" diameter) manhole covers, check that the 24 nuts (or bolts) securing the baseplate to the tank flange are tight. On the Style 52A (oval) manhole cover relieve the tank pressure, open the manhole cover and check that the 6 eyebolts and hook clamps securing the manhole cover to the tank flange are tight.
- 3.1.1.3 Check that the gasket between the baseplate and the tank is in good condition.
- 3.1.1.4 Check that any equipment mounted on the baseplate is securely fastened and that all gaskets are in good condition.
- 3.1.1.5 Inspect on and around the baseplate for any evidence of leakage of product.
- 3.1.1.6 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 with a damaged sealing face must be replaced

3.1.2 Fill cover assembly

Note: The spring in the fill cover automatically gives the correct opening pressure for the fire engulfment valve. The opening pressure cannot be varied by adjustment. It is, however, important that the fill cover is adjusted so that the fire engulfment valve will function as designed and also so that the secondary latch operates correctly).

- 3.1.2.1 After relieving the pressure in the tank compartment, check that the lock 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 ensure that the locking mechanism is operating correctly. (N.B. The key must be removed from the lock before the manhole cover is closed). Check that the lock is held firmly in position by the four lock retaining rivets.
- 3.1.2.2 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 appendices for parts list drawings.
- 3.1.2.3 Check that there is no wear in the hinge pin holes in the lid hinge, the lid clamp or the hinge lugs on the baseplate. Worn parts must be replaced.
- 3.1.2.4 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.
- 3.1.2.5 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.
- 3.1.2.6 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 1. 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, then the fill cover needs adjustment, follow the instructions in section 3.3.

3.1.3 Breather Vent

The PPV pressure and vacuum breather vent valve should be checked as part of the monthly inspection schedule. Refer to the separate manual (Technical Manual SDM07) for recommended routine inspection.

3.2 Bi-annual Maintenance

3.2.1 In addition to the monthly maintenance schedule in section 3.1, it is recommended that the fill cover assembly should be periodically dismantled and inspected to ensure that it is operating correctly. This should be carried out at intervals of not more than two years.

3.2.2 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 1. 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.

3.2.3 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.

3.2.4 To improve weather resistance the plastic plug has been fitted to all Style 50 series of manhole covers manufactured after July 92. Additionally a rubber bellows has been fitted between the fill cover and the lid hinge from January 1993 onwards, see figure 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.

3.2.5 We recommend that a new plug and bellows are fitted to all Style 50 series of manhole covers on re-assembly if either of these items are damaged or missing. Section 3.3 gives instructions for this procedure.

3.2.6 With effect from November 2002 the spring, centrebolt and fill cover of the Style 50 manhole cover were discontinued. From that time production of the Style 50 ceased and a new manhole cover, utilising common parts from the Style 55 (16") manhole cover was offered. This is known as the Style 50A. All functionality remains the same. If operators need replacement springs or centrebolts for the old Style 50 manhole cover it will be necessary to purchase a Style 50A fill cover kit (9129.KIT) which will include replacement of the 10" fill cover. Any attempt to fit the new style spring to the old style fill cover could result in failure of the equipment and will invalidate warranties.

See section 6.0 for full information on upgrading with the 9129.KIT.

3.3 Adjustment of the fill cover assembly

- 3.3.1 With the fill cover assembly in the closed position, swing the lid clamp over the end of the lid hinge, see figure 1. It should just touch the tip of the secondary safety catch as it hinges over

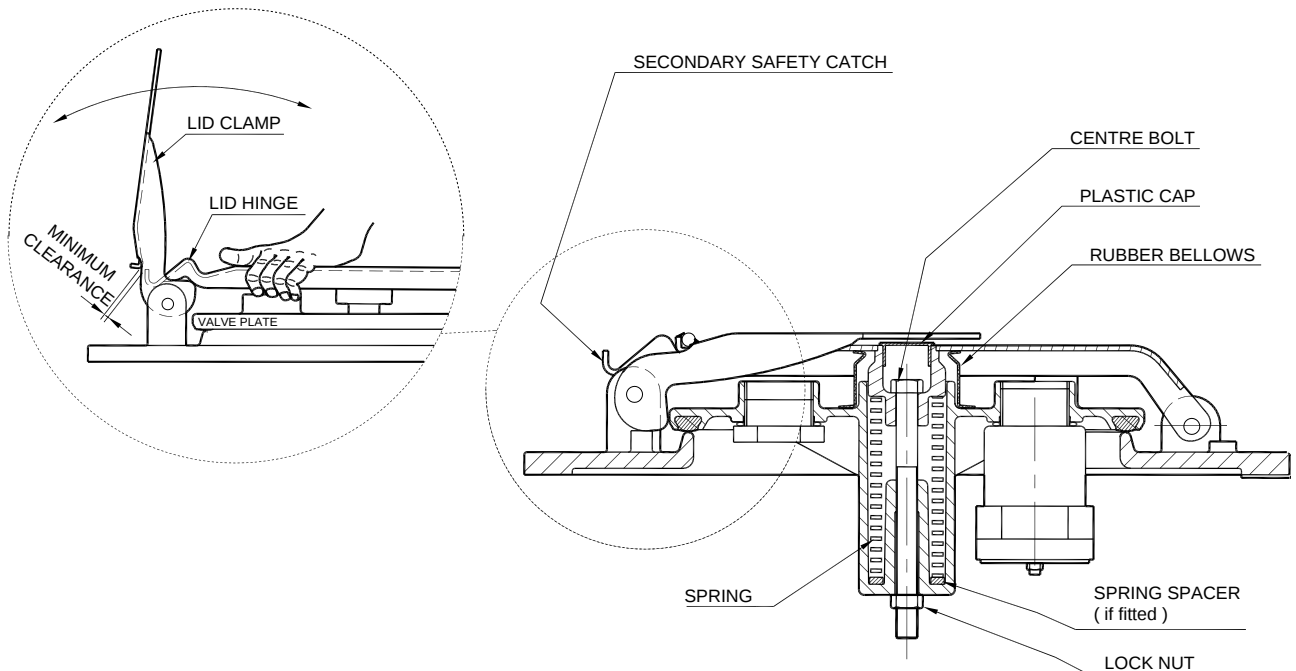


Figure 1 – Adjustment of the fill cover assembly

- 3.3.2 If the setting of the fill cover assembly is not correct, then it must be adjusted as follows:-
- 3.3.2.1 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.
- 3.3.2.2 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, after ensuring that the rubber bellows is in position. 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 above.
- 3.3.2.3 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.
- 3.3.2.4 Tighten the lock nut and check the adjustment again. If necessary, repeat the adjustment procedure and finally tighten the lock nut.
- 3.3.2.5 Refit the plastic plug in the centrebolt aperture in the lid hinge.
- 3.3.2.6 Finally, we recommend that each tank compartment is pressurised to ensure that a leak-tight seal has been achieved. The fill cover is designed to lift at approx 240 mbar (3.5 psi) and the breather vent (if fitted) at a nominal pressure setting of 87 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.

4.0 General Notes

4.1 Bottom loading

With bottom loading operations, the manhole cover may remain unopened between inspection intervals and consequently the sealing face of the 10" aperture on the manhole baseplate will generally be in good condition. Therefore it is essential that the manhole cover is checked regularly to ensure perfect operation, and to ensure that, in the event of fire engulfment, the fill cover will operate correctly. We would therefore recommend that the fill cover assembly is opened at least once each week and subjected to a general inspection.

4.2 Electrical continuity

In these notes we have not referred to an electrical continuity test. It is assumed this test will be carried out separately.

5.0 Fitting replacement parts

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 to lift at approximately 240 mbar (3.5 psi) and the breather vent (if fitted) at a nominal pressure setting of 87 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.

5.1 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.
- 5.1.4 The fill cover assembly should now be removed to a workshop or safe working environment before proceeding.

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 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 1. It should just touch the tip of the secondary safety catch as it hinges over. If the fill cover requires adjustment, see section 3.3.
- 5.2.5 Finally, a pressure test should be carried out, see section 3.3.2.6.

6.0 Fitting a Style 50A Fill Cover Kit

Note 1: Before proceeding, check that you have one new kit (9129.KIT) for each manhole cover to be worked on, together with a suitable thread sealant such as PermaBond A131. Each kit should contain a fill cover with gasket, spring, centrebolt, spring spacer, locknut, rubber bellows and polythene plug.

6.1 Removing the fill cover assembly

6.1.1 If the fill cover is closed, relieve all tank pressure, then open the lid clamp and the 10" fill cover. Using a suitable spanner on the flats of the breather vent (do not use a Stillson-type wrench) unscrew this valve from the fill cover and save it for re-use.

6.1.2 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.

The fill cover assembly should now be removed to a workshop or safe working environment before proceeding.

6.1.3 Remove the polythene plug from the centre of the hinge arm and use a suitable socket to hold the head of the centrebolt. Release and remove the locknut from the centrebolt using a ring spanner. Unscrew the centrebolt and remove it from the fill cover. The compression of the spring will be released before the bolt is removed, so no special restraining tools are required. The old fill cover, spring, spring spacer, centrebolt, locknut, rubber bellows and polythene plug **must not** be used for re-assembly, and should be set aside to avoid confusion with the new parts supplied in the kit ref 9129.KIT.

6.2 Before fitting the fill cover assembly, we recommend that the manhole baseplate is inspected for signs of damage or wear, particularly on the sealing face of the 10" aperture. Any necessary remedial action should be taken before proceeding.

6.3 Re-assembling and fitting the fill cover assembly

6.3.1 Using the new parts from the kit, insert the spring spacer, then the spring, into the springwell in the fill cover. Apply a few drops of thread sealant to the thread of the centrebolt at a distance of 32mm from the end of thread nearest the head of the bolt. Fit the rubber bellows to the top of the springwell with the largest flange against the fill cover, insert the bolt through the hole in the hinge arm and screw it into the thread in the springwell, ensuring that the two guide lugs on the top of the fill cover are at the end of the hinge arm nearest to the hinge pin.

6.3.2 Using the hinge pin previously removed from the manhole cover, fit the fill cover assembly to the baseplate. Re-fit the washers and circlips to the hinge pin. Clean the threads of the breather vent, and refit it to the fill cover as detailed in manual SDM07.

6.3.3 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 1. It should just touch the tip of the secondary safety catch as it hinges over. If the fill cover requires adjustment, see section 3.3.

6.3.4 When adjusted, fit the lock nut to the exposed thread of the centrebolt, and tighten it. Check the adjustment again, and finally tighten the lock nut on completion.

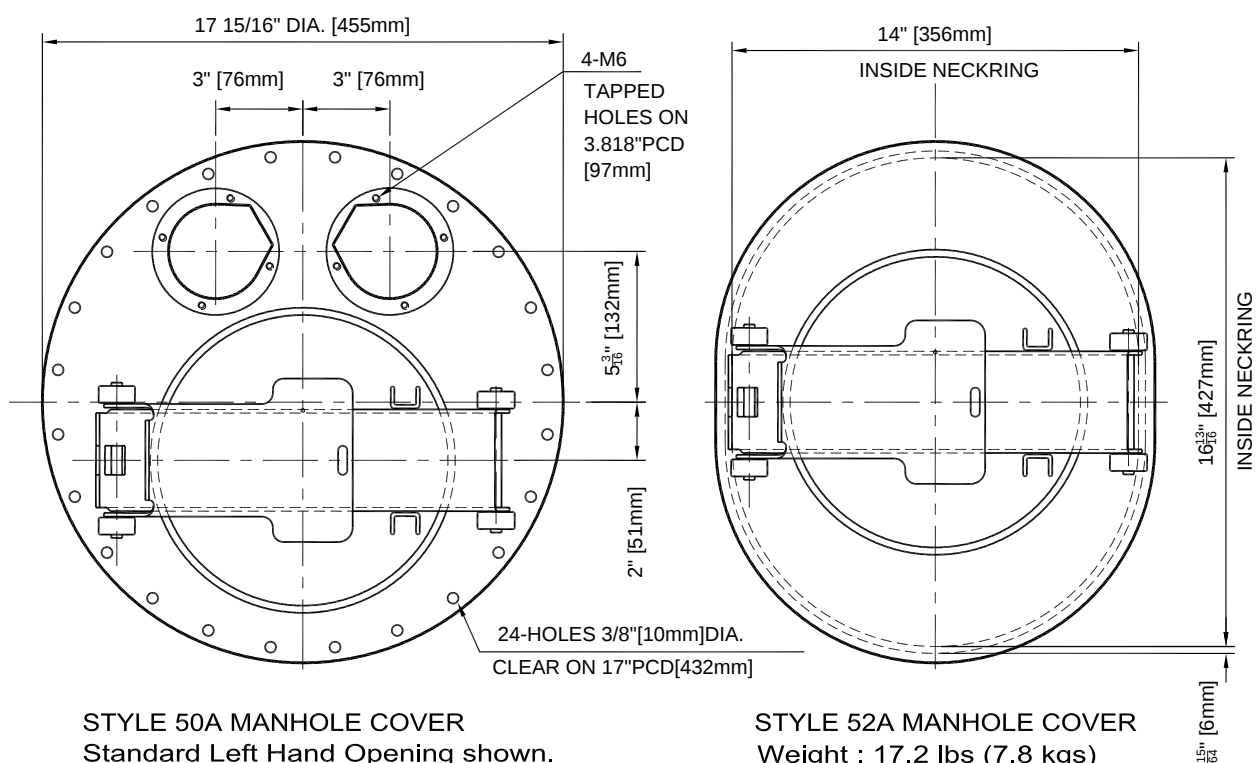
6.3.5 Fit the polythene plug to the centrebolt aperture in the hinge arm.

6.4 Check that the hinge and clamp arms close correctly, and that the lock works – as detailed in section 3.1.2.1.

6.5 Finally, a pressure test should be carried out, see section 3.3.2.6.

Appendix 1

Style 50A and Style 52A Drawings and Part Numbers



Style 50 series manhole covers are despatched with the breather vent (top or bottom loading as required) packed separately. Please order by part no:

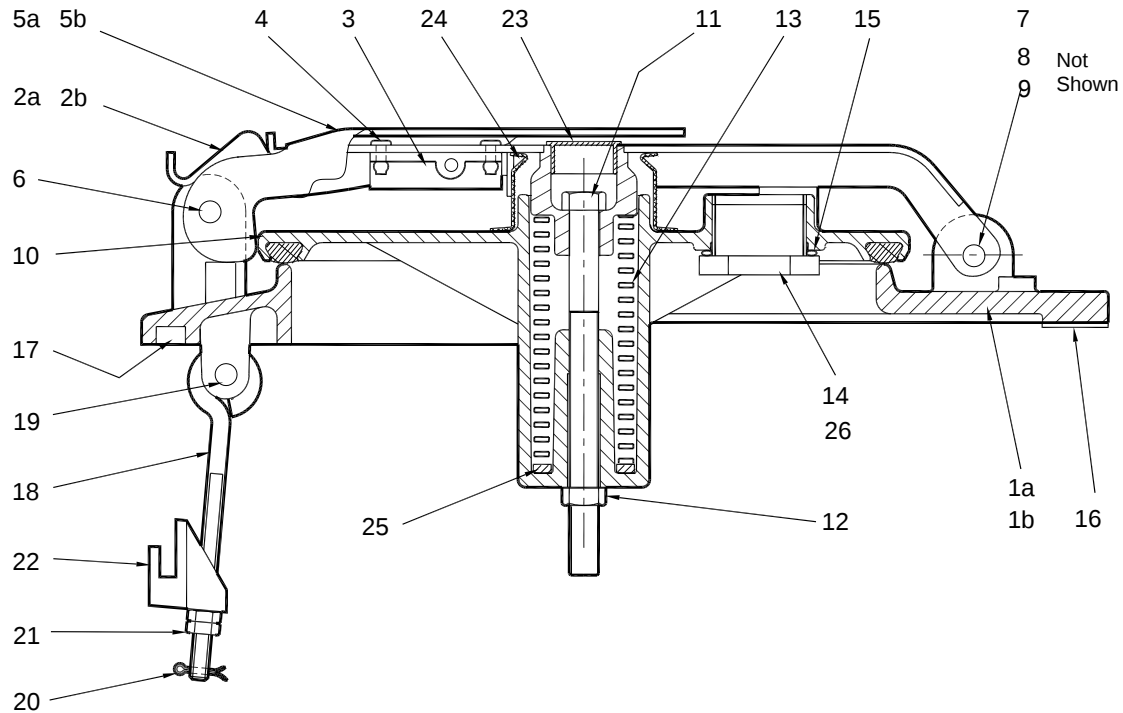
Part No	Description
9125A.05.A	Style 50A left hand with lock (mild steel arms)
9126A.05.A	Style 50A right hand with lock " "
9125A.05.Z	Style 50A left hand with lock (stainless steel arms)
9126A.05.Z	Style 50A right hand with lock " "

To order a style 50A manhole cover without a lock, the "05" is changed to "00" in all the above numbers.

9152A.01.A	Style 52A with lock (mild steel arms)
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Appendix 2

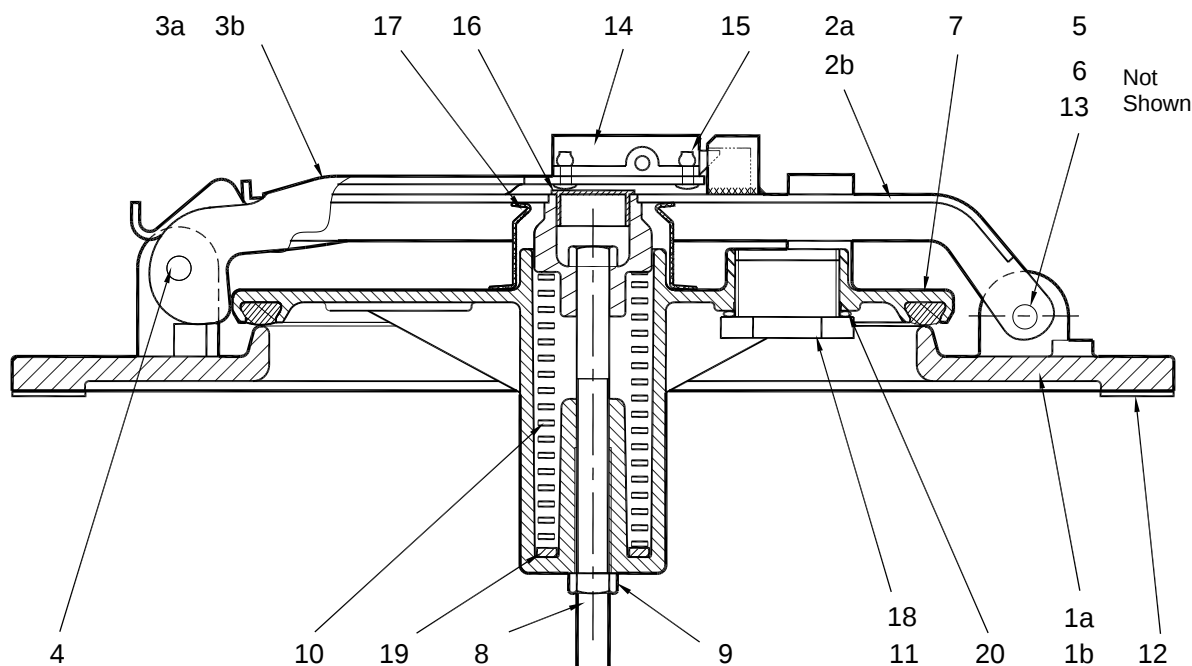
Style 50A and Style 52A Parts List Drawing



Item	Description	Qty	Style 52A	Style 50A
1a	Style 50A baseplate – lefthand	1	-	9130.01.A
1b	Style 50A baseplate – righthand	1	-	9130.02.A
1c	Style 52A baseplate	1	9153.00.A	--
2	Lid hinge – mild steel	1	9127.03.M	9127.03.M
	Lid hinge – stainless steel	1	9127.03.Z	9127.03.Z
3	Lock	1		9125.09.S
4	Lock rivet	4		9125.15.Z
5	Lid clamp – mild steel	1		9128.03.M
	Lid clamp – stainless steel	1		9128.03.Z
6	Hinge pin for lid clamp	1		9131.04.Z.K
7	Hinge pin for lid hinge	1		9131.05.Z.K
8	3/8" dia plain washer for above	4		FZW.340
9	3/8" plier type circlip for above	4		FSC.103
10	Fill cover and gasket	1		9129.51.A
11	Centre bolt	1		9131.55.01.Z
12	1/2" unc stayite nut	1		9131.02.Z
13	Style 55 (16")/50A spring	1		9131.55.03.M
14 *	Breather vent (specify 4 or 20 mbar) *	1	9132.AT.A.04 or 9132.AT.A.20	
15	O ring – included with item 14	1		0326.00.V
16	Style 50A flange gasket	1	--	1328.00.N
17	Style 52A baseplate gasket	1	1679.00.N	--
18	Style 52A eyebolt	6	1627.00.M	--
19	Style 52A clevis pin	6	7054.00.M	--
20	Style 52A split pin	12	FZP.006	--
21	Style 52A lock nut	12	FPN.244	--
22	Style 52A hook clamp	6	1628.00.A	--
23	Polythene plug	1		PC.012
24	Rubber bellows	1		9125.23.T
25	Spring spacer	1	7607.55.A	7607.55.A
26	Aluminium plug *	1		1636.12UN.A
*	The Breather vent is supplied separately to the manhole cover and must be fitted by the installer			

Appendix 3

Style 50 Parts List Drawing



Item	Description	Qty	Part Number
1a	Style 50A baseplate – left hand	1	9130.01.A
1b	Style 50A baseplate – right hand	1	9130.02.A
2a	Lid hinge – stainless steel	1	9127.55.Z
2b	Lid hinge – mild steel	1	9127.55.M
3a	Lid clamp – stainless steel	1	9128.55.Z
3b	Lid clamp – mild steel	1	9128.55.M
4	Hinge pin (clamp)	1	9131.04.Z.K
5	Hinge pin (hinge)	1	9131.05.Z.K
6	3/8" plain washer for above	4	FZW.340
13	3/8" external circlip for above	4	FSC.103
7	Fill cover and gasket	1	9125.51.A
8	Centre bolt	1	9131.55.01.Z
9	Staytite nut	1	9131.02.Z
10	Spring	1	9131.55.03.M
11	Breather vent (4mbar or 20mbar)#	1	9132.AT.A.04 or 9132.AT.A.20
12	Flange gasket	1	1328.00.N
14	Lock	1	9125.09.S
15	Lock rivet	4	9125.15.Z
16	Polythene plug	1	PC.012
17	Bellows	1	9125.23.T
18	Aluminium plug *	1	1636.12UN.A
19	Spring spacer	1	7607.55.A
20	O ring-included with item 11	1	0326.00.V

* Breather vent supplied separately to manhole cover to be fitted by installer aluminium plug not fitted after November 2002 due to product modification