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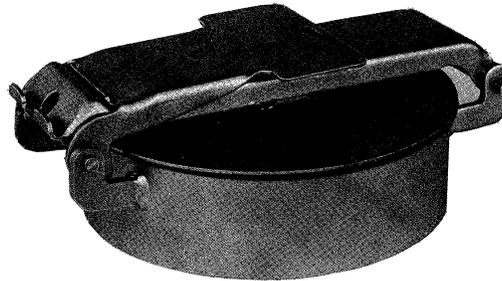
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TIONA[®]

10" FILL

- LIGHT WEIGHT
- SIMPLE CONSTRUCTION
- LESS MAINTENANCE
- LOW SILHOUETTE



Model 8010

Note: Not legal for DOT Specification Cargo Tanks.

The 10" fill is fabricated for lighter weight and greater strength. Heavy gauge collar is standard along with the secondary safety latch and a long lasting Bethane gasket.

Collar, Retainer Plate Shim Washer	Hinge Arm, Latch, Fill Cover	Hinge Pin, Washer, Cotter Pin	Vent	Weight	Assembly No.
Steel	Steel Zinc Pt.	Stainless 304	Aluminum	16.5 lb.	FVA8010BSM
Aluminum	Steel Zinc Pt.			12.0 lb.	FVA8010BAM
Stainless 304	Stainless 304			14.0 lb.	FVA8010CCM
Stainless 316	Stainless 304*			14.0 lb.	FVA8010DDM

*Fill Cover Material Stainless 316

Note: Fill assemblies, as listed above, have a 6238AL vent (prefix "FVA") and Bethane gasket (suffix "M"). For variation or additional vents see catalog Section 95 for proper prefix or assembly number. For variation in gasketing change last letter of suffix as follows.

Suffix "M" indicates Bethane gasket
Suffix "V" indicates Viton gasket
Suffix "W" indicates White Hypalon gasket
Suffix "A" indicates non-asbestos gasket
Suffix "T" indicates Teflon gasket w/ White Hypalon backer

When welding collars to tank, exercise care to insure collar remains flat and round.

Betts[™] INDUSTRIES, INC.
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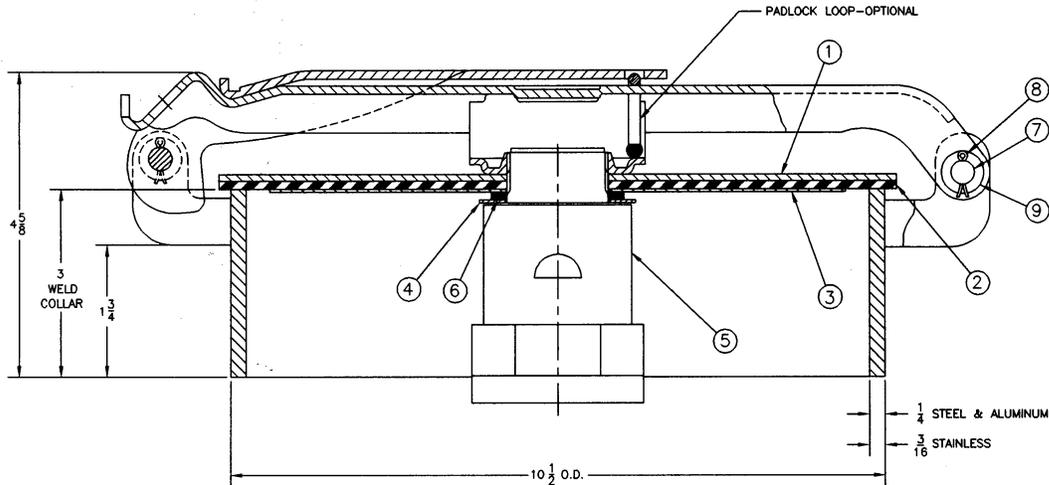
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PARTS LIST

10" FILL



No.	Description	Material	Part No.
1	Cover Plate	Steel	3021MS
		Steel Zinc Pt.	3021ZC
		Stnls 304	3021SL
		Stnls 316	3021SS
2	Fill Gasket	M Bethane	3024BU
		V Viton	3024VT
		W Wh. Hypalon	3024WH
		A Non-Asbestos	3024NA
		T Teflon	3024TF
3	Retainer-Fill Gasket	Steel	3213MS
		Aluminum	3213AL
		Stnls 304	3213SL
		Stnls 316	3213SS

No.	Description	Material	Part No.
4	Shim Washer	Steel	3023MS
		Aluminum	3023AL
		Stnls 316	3023SS
		Stnls 304	3023SL
5	Vent	Alum/Stnls	6238AL
6	Gasket	Buna-N	3716BN
7	Hinge Pin	Stnls 304	3953SL
8	Cotter Pin	Stnls 304	9Q5866
9	Washer	Stnls 304	3031SL

Gasket Maximum Temperature	
Bethane	250°F
Viton	400°F
White Hypalon	250°F
Non-Asbestos	350°F
Teflon	250°F

Adjustment due to gasket wear may be necessary to insure proper sealing on the 10" fill. A shim washer item No. 4 is provided for this purpose. To increase the sealing force of the 10" fill, remove shim from location shown above and reposition it above fill cover No. 1.

MAINTENANCE: Fill assemblies should be inspected with sufficient frequency and due regard to the products carried to insure a liquid tight closure. Any worn, damaged or missing parts must be replaced. Gaskets should be replaced if their effectiveness is impaired in any way. Replacement gaskets must be compatible with products carried.

WARNING Use only genuine BETTS INDUSTRIES INC. replacement parts. Use of substitute parts can impair the proper functioning of this product.

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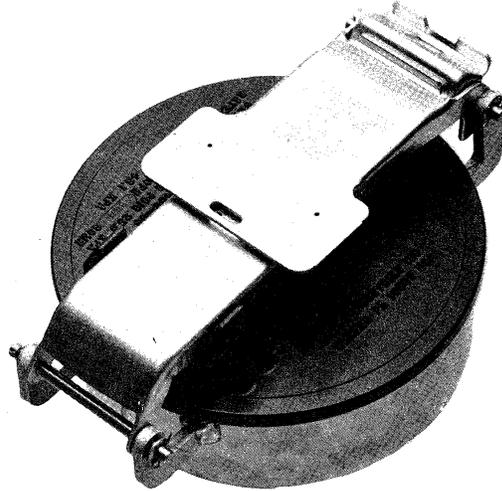
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10" PAF 406-98 PRESSURE RELIEF VALVE

- DOT 406 RELIEF VALVE/10" FILL
- LESS THAN 1 LITER LEAKAGE
- SET PRESSURE ADJUSTMENT
- SECONDARY SAFETY LATCH



Pressure Relief Valve setting 3.63 psig
Rated Pressure Actuated Emergency Venting: 494,084 cu. ft. free air per hour @ 6.25 psig
Rated Liquid Flow Capacity 1335 gpm @ 5.0 psig

The 10" relief valve provides emergency pressure relief and meets the 1 liter surge leakage limit imposed by DOT 406 Specifications in 49CFR178.345-10(b)(3)(ii). Also legal for replacement on MC306 specification cargo tanks. The relief valve also serves as a 10" latch style fill which can be easily opened to provide access for filling the tank or for inspection. Relief valves contain an adjustment feature to allow for fine-tuning of set pressure in the field. Other standard features include model 6496ALB pressure-vacuum vent mounted in the 10" relief valve cover.

Collar	Latch Hinge Arm	Cover	Hinge Pin Cotter Pin Washer	Spring	Normal Vent	Wt. (lb)	Assembly No.
Steel	Steel	Aluminum "E" Coated	Stnls 304	Van Steel "E" Coated	Aluminum	18.9	PPVL710BSB
Aluminum	Zinc Plt.					15.9	PPVL710BAB
Stnls 304	Stnls 304					18.9	PPVL710CCB
Stnls 316	Stnls 304					18.9	PPVL710DDB

NOTE: Relief Valve assemblies, as listed above, have Buna-N gaskets (suffix "B"). For variation in gasketing change last letter of assembly number as follows.

Suffix "V" indicates Viton gasket
 Suffix "W" indicates White Hypalon gasket
 Suffix "T" indicates Tef-Sil gasket

When welding collars to tank, care should be exercised to insure collar remains flat and round.

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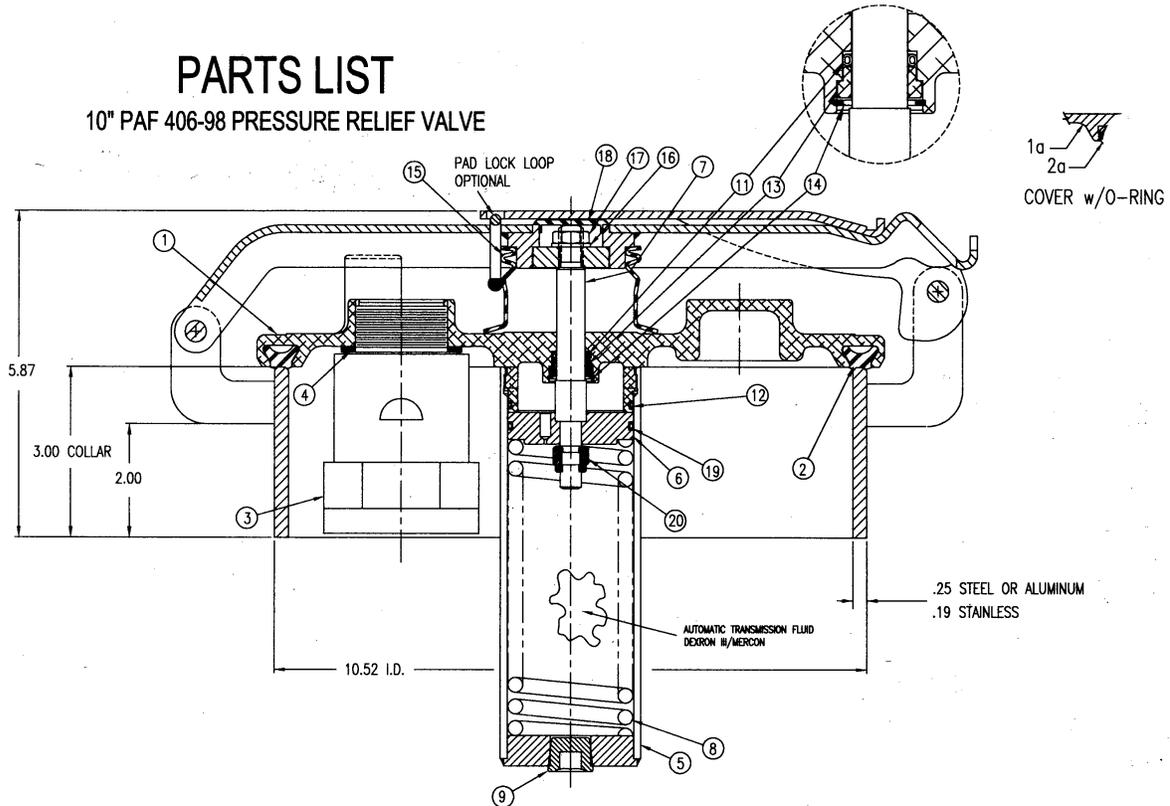
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PARTS LIST

10" PAF 406-98 PRESSURE RELIEF VALVE



No.	Description	Material	Part No.
1	Fill Cover	Alum/ E-Coated	8297ALEY
1a	Fill Cover (O-Ring Grvd.)	Alum/ E-Coated	8297ALEY389
2	Gasket - Integral Relief Valve	Buna-N	3119BN
		Viton	3119VT
		Wh. Hypalon	3119WH
2a	O-Ring	Tef-Sil	3902TS
3	Vent Assembly	Aluminum	6496ALB
4	Gasket	Buna-N	3716BN
5	Cylinder Assembly	Aluminum	6657AL
6	Piston	Aluminum	6654AL
7	Stem	Stnls 304	6688SL
8	Spring	Steel	4122MS

No.	Description	Material	Part No.
9	1/2" NPT Plug Zinc Plt.	Steel Zinc Plt.	9V4907
11	Stem O-Ring -112	Buna-N	4118BN
12	Cylinder O-Ring-137	Buna-N	4015BN
13	O-Ring Retainer	Alum/ E-Coated	4117ALEY
14	Retainer Ring	Stnls 304	9Q4961
15	Bellows	EPDM	4020EPDM
16	Lockwasher Ext. Tooth 7/16"	Stnls 304	9Q5961
17	Nut Hex 7/16-20UNF	Stnls 304	9Q5960
18	Plastic Plug	Polyethylene	9Z6163
19	Cylinder O-Ring-137	Tef-Sil	4015TS
20	3/8-16UNC Hex Nut W/ Insert	Steel Zinc Plt.	9Q5896

Gasket Maximum Temperature	
Buna N (Nitrile)	250°F
Viton	400°F
White Hypalon	250°F
Teflon-Silicone	400°F

Replace oil in cylinder using Automatic Transmission Fluid Dexron III/Mercon, SAE 5W-20 with viscosity of 177 SUS at 100°F and a pour point of no greater than -45°F.

MAINTENANCE: 10" relief valve assemblies should be inspected with sufficient frequency to insure relief valve functions properly. Any worn, damaged Or missing parts must be replaced. Gaskets should be replaced if their effectiveness to insure a liquid tight seal is impaired in any way. Replacement gaskets must be compatible with products carried.

WARNING Consult PAF406-98 maintenance manual prior to disassembly of this relief valve.
Use only genuine BETTS INDUSTRIES, INC. replacement parts. Use of substitute parts can impair the proper functioning of this product.

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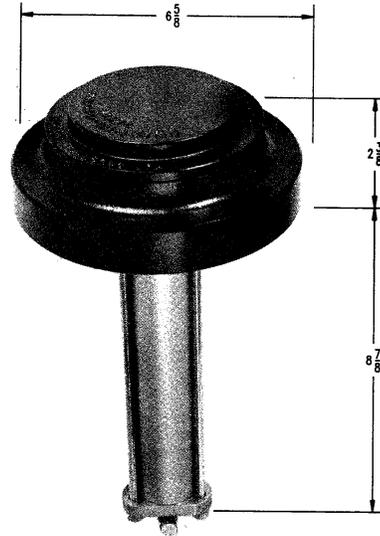
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4" Surge Suppression Pressure Relief Valve

- DUAL RATED MC306/DOT406
- NO LIQUID LOSS AT IMPACT
- ALUMINUM CONSTRUCTION



Pressure Relief Valve Setting 3.63 psig

Rated Pressure Actuated Emergency Venting:
 142,203 Cu. Ft. Free Air per Hour @ 5.0 psig
 181,828 Cu. Ft. Free Air per Hour @ 6.25 psig

Rated Liquid Flow Capacity 800 GPM @ 5.0 psig

Betts 4" Surge Suppression Pressure Relief Valves are designed to provide or augment the emergency venting capacity required for either MC306 or DOT406 specification cargo tanks. Because they release no liquid during the DOT specified pressure surge, the pressure relief valves exceed the requirements of 49 CFR 178.345-10(b)(3)(ii) which requires that pressure relief devices withstand a specified pressure surge with no more than one liter leakage.

Model 8292ALTS mounts in a special 20" offset PAF manhole and model 8290ALTS mounts on either Betts model 6516 weld pad or a standard TTMA 4" weld flange. Both models are constructed of aluminum, stainless steel, zinc plated steel and Tef-Sil seals.

O-Ring Holder & Mtg. Flange	Stem	Bolts	Description	Wt.	Assembly No.
Aluminum	Stainless	Steel Zinc Pt.	For Mounting on Manhole	5.25#	8292ALTS
			For Mounting on Flange		8290ALTS
Aluminum w/ Stainless			Mounting Pad	2.5#	6516AL
Stainless			Mounting Pad	7.5#	6516SS

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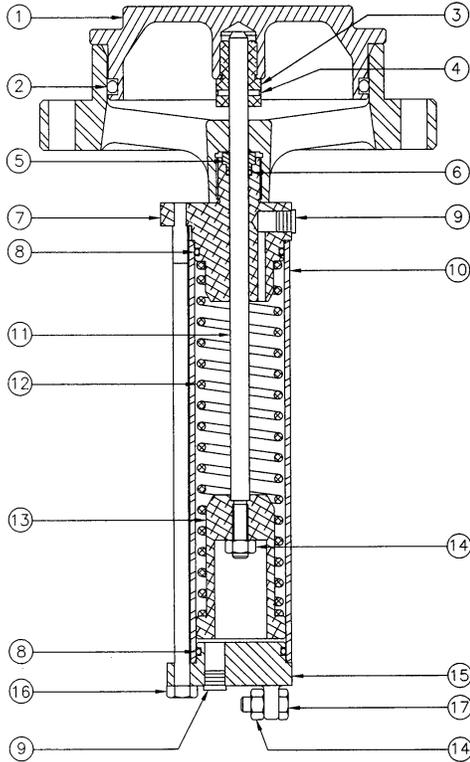
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PARTS LIST

4" Surge Suppression Pressure Relief Valve



No.	Description	Req.	Material	Part No.	
* 1	O-Ring Holder	1	Aluminum	6510ALEY	
2	O-Ring (Seat)	1	Tef/Sil	19028TS	
3	Stem Adapter	1	Aluminum	3985AL	
4	Spring Pin	1	Stainless	9Q4921	
5	O-Ring Retainer	1	Aluminum	3986ALEY	
6	O-Ring (Stem)	1	Tef/Sil	18591TS	
7	Top Cylinder Endplate	1	Aluminum	6512ALEY	
8	O-Ring (Endplate)	2	Tef/Sil	18592TS	
9	Pipe Plug	1/8 NPT	2	Steel	9V4915
10	Cylinder Tube	1	Aluminum	3989AL	
11	Stem	1	Stainless	3988SL	
12	Spring	1	Steel	4068MS	
13	Spring Holder (Piston)	1	Aluminum	3987AL	
14	Locknut	1/4 -28UNF	1	Steel	9Q5807
15	Bottom Cylinder Endplate	1	Aluminum	6513AL	
16	Cylinder Bolt	1/4 -28UNF x 8"	3	Steel	9Q5053
17	Bolt	1/4 -28UNF x 3/4"	1	Steel	9Q5823

* When ordering a replacement O-ring holder please add as a suffix to the 6510ALEY number, the model number of the unit on which the replacement O-ring holder is to be used.
EXAMPLE: 6510ALEY-8292

INSTALLATION

4" Surge Suppression Pressure Relief Valve may be installed on manhole covers or flanged outlets having a $4\frac{1}{4}$ " minimum I.D. and the 4" TTMA outlet flange drilling ($8-\frac{7}{16}$ " holes on $5\frac{1}{8}$ " B.C.). Adequate space should be provided to allow the O-ring holder to travel approx. $1\frac{1}{2}$ ". A static ground wire should be connected to the lug provided on the bottom of the cylinder.

NOTE: Do not attach air or hydraulic lines to the $\frac{1}{8}$ " NPT ports in the spring cylinders end plates. These ports are only intended for loading or draining the hydraulic oil contained in the spring cylinder.

MAINTENANCE

When bench testing valve, increase test pressure slowly in order to get an accurate reading of the set pressure. If pressure is applied too quickly, it will appear that the set pressure is too high. Note that valve cap must lift $\frac{1}{2}$ " before valve opens.

If it is necessary to replace the seat O-ring #2 first remove pipe plugs #9 and drain oil from the cylinder #10. Remove cylinder #10 by removing cylinder bolts #16. Compress spring to where O-ring holder #1 is free to be unscrewed from stem adapter #3. Replace O-ring #2 and reassemble.

Replace oil in cylinder using Kendall Hyken Glacial Blu Hydraulic Fluid, or if unavailable, a high quality SAE 5W-10W oil with viscosity of 90 SUS at 100°F and a pour point of no greater than -50°F. Set valve in an upright position and force oil into lower port until it starts to flow out the upper port. Reinstall pipe plugs.

WARNING Use only genuine BETTS INDUSTRIES INC. replacement parts. Use of substitute parts can impair the proper functioning of the Valve.

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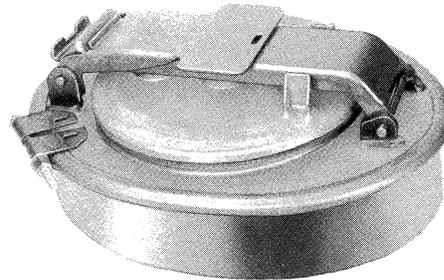
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12" X 16" ELLIPTICAL PAF 406-98 MANHOLE

WITH INTEGRAL RELIEF VALVE/10" FILL

- INTEGRAL RELIEF VALVE/10" FILL
- LESS THAN 1 LITER LEAKAGE
- SET PRESSURE ADJUSTMENT
- INCREASED FLOW RATE
- SECONDARY SAFETY LATCH



MODEL L712-STANDARD

Pressure Relief Valve setting 3.63 psig
 Rated Pressure Actuated Emergency Venting:
 494,084 cu. ft. free air per hour @ 6.25 psig
 Rated Liquid Flow Capacity 1335 gpm @ 5.0 psig

PAF manholes with integral latch style surge suppression relief valves are designed for use on DOT406 and replacement on MC306 specification cargo tanks. Elliptical manholes can only be used with compartments less than 400 gallons. Manholes are certified and marked in accordance with 49CFR178.345-5 with a test pressure of 36 psig. Manhole covers are 7 gage steel or stainless and are secured to the tank weld collar with a clamp ring and bolt which can be easily removed to provide access into the tank.

The integral 10" relief valve provides emergency pressure relief and meets the 1 liter surge leakage limit imposed by 49CFR178.345-10(b)(3)(ii). The relief valve also serves as a 10" latch style fill which can be easily opened to provide access for filling the tank or for inspection. Relief valves contain an adjustment feature to allow for fine-tuning of set pressure in the field. Other standard features include a heavy duty clamp ring, secondary safety latch and model 6496ALB pressure-vacuum vent mounted in the 10" relief valve cover.

Cover Plate	Relief Valve	Clamping Ring, Bolt, Washer, Stongback, & Latch	Clamping Ring Nut	Normal Vent	Wt. (lb)	Assembly No.
Steel Zinc Plt.	Alum.	Steel Zinc Plt.	Brass	Alum.	19.7	PPVL712BXB
Stnls 304	Alum.	Stnls 304	Stnls 304	Alum.	20.2	PPVL712CXB

NOTE: Manhole assemblies, as listed above, have Buna-N gaskets (suffix "B"). For variation in gasketing change last letter of assembly number as follows.

Suffix "V" indicates Viton collar gasket & Viton 10" fill gasket

Suffix "W" indicates White Hypalon collar gasket & White Hypalon 10" fill gasket

Suffix "T" indicates Teflon envelope collar gasket & Tef-Sil 10" fill o-ring

Manhole collars are available in aluminum, steel, and stainless steel. Please see parts page for correct numbers. When welding collars to tank, care should be exercised to insure collar remains flat and round.

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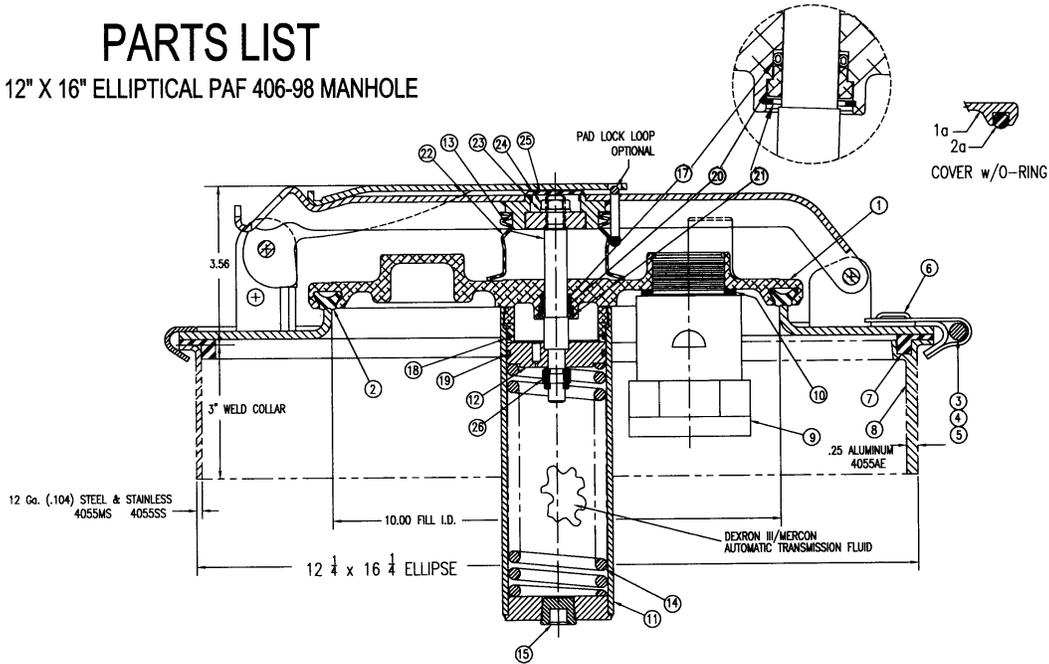
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PARTS LIST

12" X 16" ELLIPTICAL PAF 406-98 MANHOLE



No.	Description	Material	Part No.
1	Fill Cover	Alum/E-Coated	8297ALEY
1a	Fill Cover (O-Ring Grvd.)	Alum/E-Coated	8297ALEY389
2	Gasket – Integral Relief Valve	Buna-N	3119BN
		Viton	3119VT
		Wh. Hypalon	3119WH
2a	O-Ring	Tef-Sil	3902TS
3	Bolt-Clamp Ring	Steel Zinc Plt.	3029ZC
		Stnls 304	3029SL
4	Nut-Clamp Ring	Brass	3030BR
5	Washer-Clamp Ring	Stnls 304	9Q5809
		Steel Zinc Plt.	3031ZC
6	Clamping Ring	Stnls 304	3031SL
		Steel	3040MS
7	Manhole Gasket Channel type	Steel Zinc Plt.	3040ZC
		Stnls 304	3040SL
		Buna-N	3494BN
		Viton	3494VT
		Wh. Hypalon	3494WH
8	Manhole Collar Channel type	Teflon Env. w/Wh. Hypalon	3038TF
		Steel	4055MS
		Aluminum	4055AE
		Stnls 304	4055SL
		Stnls 316	4055SS

No.	Description	Material	Part No.
9	Vent Assembly	Aluminum	6496ALB
10	Gasket	Buna-N	3716BN
11	Cylinder Assembly	Aluminum	6657AL
12	Piston	Aluminum	6654AL
13	Stem	Stnls 304	6688SL
14	Spring	Steel	4122MS
15	1/2" NPT Plug Zinc Plt.	Steel Zinc Plt.	9V4907
17	Stem O-Ring -112	Buna-N	4118BN
18	Cylinder O-Ring-137	Buna-N	4015BN
19	Piston O-Ring-137	Tef-Sil	4015TS
20	O-Ring Retainer	Alum/E-Coated	4117ALEY
21	Retainer Ring	Stnls 304	9Q4961
22	Bellows	EPDM	4020EPDM
23	Lockwasher Ext. Tooth 7/16"	Stnls 304	9Q5961
24	Nut Hex 7/16x20	Stnls 304	9Q5960
25	Plastic Plug	Polyethylene	9Z6163
26	3/8-16 Hex Nut W/ Insert	Steel Zinc Plt.	9Q5896

Gasket Maximum Temperature
 Buna N (Nitrile) _____ 250°F
 Viton _____ 400°F
 White Hypalon _____ 250°F
 Teflon-Silicone _____ 400°F
 Teflon Envelope w/ White Hypalon Insert _____ 250°F

Replace oil in cylinder using Automatic Transmission Fluid Dexron III/Mercon, SAE 5W-20 with viscosity of 177 SUS at 100°F and a pour point of no greater than -45°F.

MAINTENANCE: Manhole assemblies should be inspected with sufficient frequency to insure 10" Integral Relief Valve functions properly. Any worn, damaged or missing parts must be replaced. Gaskets should be replaced if their effectiveness to insure a liquid tight seal is impaired in any way. Replacement gaskets must be compatible with products carried.

WARNING Consult PAF 406-98 maintenance manual prior to disassembly if this relief valve.
 Use only genuine BETTS INDUSTRIES, INC. replacement parts. Use of substitute parts can impair the proper functioning of this product.

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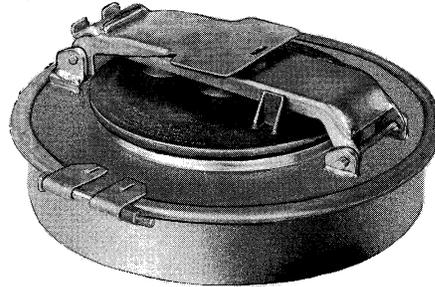
16" PAF450 MANHOLE

With Pressure Relief Valve

- NORMAL VENT
- WROUGHT STEEL COVER
- SECONDARY SAFETY LATCH
- HEAVY DUTY CLAMP RING

Not legal as replacement on
MC306 cargo tanks
after August 31, 1998

Pressure Relief Valve setting 3.0 psig.
Rated Pressure Actuated Emergency Venting:
375,000 cu. ft. free air per hour @ 5.0 psig.



Model 9716 – Standard
Model 9742 - Self-Latching

PAF Manholes with Model PAF450 10" Pressure Relief Valve are certified for use on MC306 cargo tanks. Manholes are certified and marked in accordance with 49CFR178.345-5 with a test pressure of 36 psig.

Per 49CFR180.405(h)(3), PAF450 assemblies may not be installed on MC306 cargo tanks on or before August 31, 1998. However, relief valves installed on MC306 cargo tanks on or before August 31, 1998, may be repaired if required. PAF450 relief valves may be installed in non-specification tanks or in tanks built in countries other than the United States where regulations permit.

Relief valve also serves as a 10" latch style fill which can be easily opened for filling the tank or for inspection. Standard features include heavy duty clamp ring, secondary safety latch and model 6238AL Normal Vent.

*No provision has been made for venting of product due to overfilling.

Manholes are also available with a self-latching feature which allows the Pressure Relief Valve cover to open only 91 degrees and drop closed and securely latch upon movement of the tank if the cover is inadvertently left open. For self-latching model substitute 9742 for 9716 in assembly number.

Cover Plate	PRV Cover	Clamping Ring, Bolt & Washer, Strongback, Latch	Clamping Ring Nut	Spring Bolt & Nut	Spring	Normal Vent	Wt. (lb.)	Assembly No.
Steel Zinc Pt.	Alum.	Steel Zinc Pt.	Brass	Stnls 304**	Van.	Alum.	22.1	FVA9716BXB
Stnls 304		Stnls 304	Stnls 304	Steel			22.6	FVA9716CXB
Stnls 316		Stnls 304	Stnls 304	Stnls 304			22.6	FVA9716DXB

**Nut Material – Steel Zinc Plated

Note: Manhole assemblies, as listed above, have a 6238AL vent (prefix "FVA") and Buna-N (suffix "B"). For variation or additional vents see catalog Section 95 for proper prefix or assembly number. For variation in gasketing change last letter of suffix as follows.

Suffix "V" indicates Viton gasket

Suffix "W" indicates White Hypalon gasket

Suffix "T" indicates Tef-Sil pressure relief valve gasket and Teflon Envelope w/ White Hypalon insert collar gasket

Manhole collars are available in aluminum, steel and stainless steel. Please see parts page for correct numbers. When welding collars to tank, exercise care to insure collar remains flat and round.

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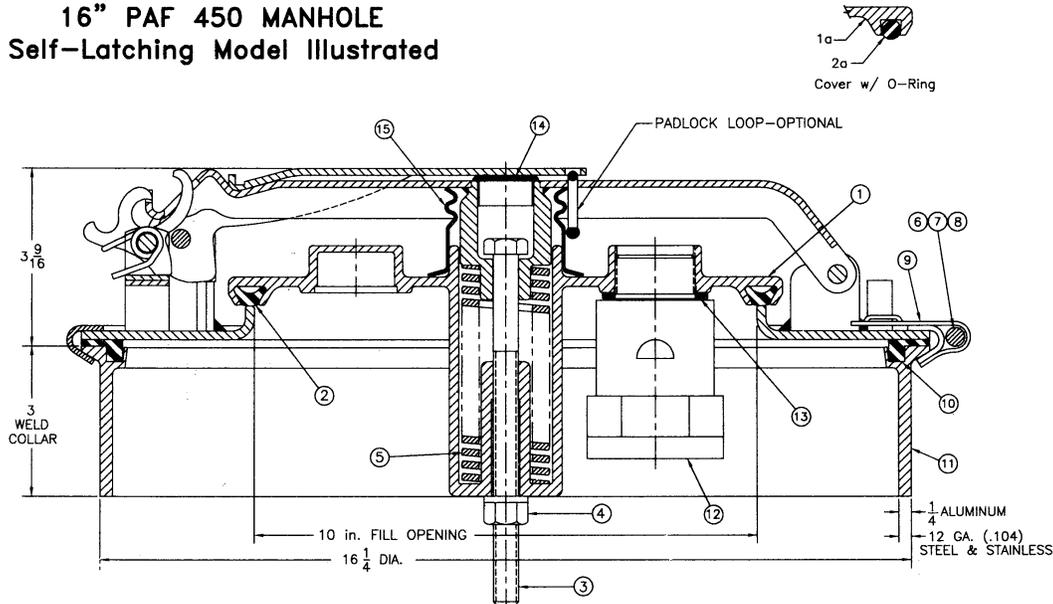
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PARTS LIST

16" PAF 450 MANHOLE

Self-Latching Model Illustrated



No.	Description	Material	Part No.
1	Cover-Relief Valve	Aluminum	8241AL
1a	Cover (O-Ring Grvd)	Aluminum	8246AL
2	Gasket-Relief Valve	Buna-N	3119BN
		Viton	3119VT
		Wh. Hypalon	3119WH
2a	O-Ring	Tef-Sil	3902TS
3	Bolt	Stnls 304	3876SL
4	Hex Nut $\frac{1}{2}$ -13 Thd	Steel Zinc Pt.	9Q5812
		Stnls 304	9Q5853
5	Spring	Van Steel	3859EY
6	Bolt-Clamp	Steel Zinc Pt.	3029ZC
		Stnls 304	3029SL
7	Nut-Clamp $\frac{3}{8}$ -16 Thd	Brass	3030BR
		Stnls 304	9Q5809
8	Washer-Clamp	Steel Zinc Pt.	3031ZC
		Stnls 304	3031SL
9	Clamping Ring	Steel	3028MS
		Steel Zinc Pt.	3028ZC
		Stnls 304	3028SL

No.	Description	Material	Part No.
10	Manhole Gasket Channel Type	B Buna-N	3559BN
		V Viton	3559VT
		W Wh. Hypalon	3559WH
		T Teflon Env. w/ Wh. Hypalon	3025TF
11	Manhole Collar Channel Type	Steel	3057MS
		Aluminum	3057AE
		Stnls 304	3057SL
		Stnls 316	3057SS
12	Vent Assembly	Alum / Stnls	6238AL
13	Gasket	Viton	3716VT
14	Plastic Cap	Polyethylene	9Z6150
15	Bellows	Buna-Urethane	4020BU

Gasket Maximum Temperature

Buna N (Nitrile)	250°F
Viton	400°F
White Hypalon	250°F
Teflon-Silicone	400°F
Teflon Envelope w/ White Hypalon Insert	250°F

MAINTENANCE: Manhole assemblies should be inspected with sufficient frequency and due regard to the products carried to insure a liquid tight closure. Any worn, damaged or missing parts must be replaced. Gaskets should be replaced if their effectiveness is impaired in any way. Replacement gaskets must be compatible with products carried.

WARNING Use only genuine BETTS INDUSTRIES INC. replacement parts. Use of substitute parts can impair the proper functioning of the Pressure Relief Valve and Manhole Assembly.

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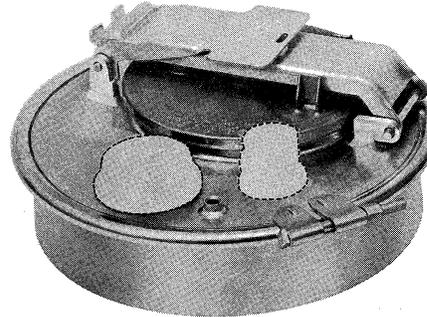


16" PAF450 MANHOLE

With Pressure Relief Valve

- NORMAL VENT
- WROUGHT STEEL COVER
- SECONDARY SAFETY LATCH
- HEAVY DUTY CLAMP RING

Not legal as replacement on
MC306 cargo tanks
after August 31, 1998



Model 9816 – Standard
Model 9842 – Self-Latching

Pressure Relief Valve setting 3.0 psig.
Rated Pressure Actuated Emergency Venting:
375,000 cu. ft. free air per hour @ 5.0 psig.

PAF Manholes with Model PAF450 10" Pressure Relief Valve are certified for use on MC306 cargo tanks. Manholes are certified and marked in accordance with 49CFR178.345-5 with a test pressure of 36 psig.

Per 49CFR180.405(h)(3), PAF450 assemblies may not be installed on MC306 cargo tanks after August 31, 1998. However, relief valves installed on MC306 cargo tanks on or before August 31, 1998, may be repaired if required. PAF450 relief valves may be installed in non-specification tanks or in tanks built in countries other than the United States where regulations permit.

Relief valve also serves as a 10" latch style fill which can be easily opened for filling the tank or for inspection. Standard features include heavy duty clamp ring, secondary safety latch and model 6238AL Normal Vent.

*No provision has been made for venting of product due to overfilling.

Manholes are also available with a self-latching feature which allows the Pressure Relief Valve cover to open only 91 degrees and drop closed and securely latch upon movement of the tank if the cover is inadvertently left open. For self-latching model substitute 9842 for 9816 in assembly number.

Note: 3-1/2" vent and Liquid Level Switch not included in assembly.

Cover Plate	PRV Cover	Clamping Ring, Bolt & Washer, Strongback, Latch	Clamping Ring Nut	Spring Bolt & Nut	Spring	Normal Vent	Wt. (lb.)	Assembly No.
Steel Zinc Pt.	Alum.	Steel Zinc Pt.	Brass	Stnls 304**	Van.	Alum.	22.1	FVA9816BXB
Stnls 304		Stnls 304	Stnls 304	Steel	22.6		FVA9816CXB	
Stnls 316		Stnls 304	Stnls 304	22.6	FVA9816DXB			

**Nut Material – Steel Zinc Plated

Note: Manhole assemblies, as listed above, have a 6238AL vent (prefix "FVA") and Buna-N (suffix "B"). For variation or additional vents see catalog Section 95 for proper prefix or assembly number. For variation in gasketing change last letter of suffix as follows.

Suffix "V" indicates Viton gasket

Suffix "W" indicates White Hypalon gasket

Suffix "T" indicates Tef-Sil pressure relief valve gasket and Teflon Envelope w/ White Hypalon insert collar gasket

Manhole collars are available in aluminum, steel and stainless steel. Please see parts page for correct numbers. When welding collars to tank, exercise care to insure collar remains flat and round.

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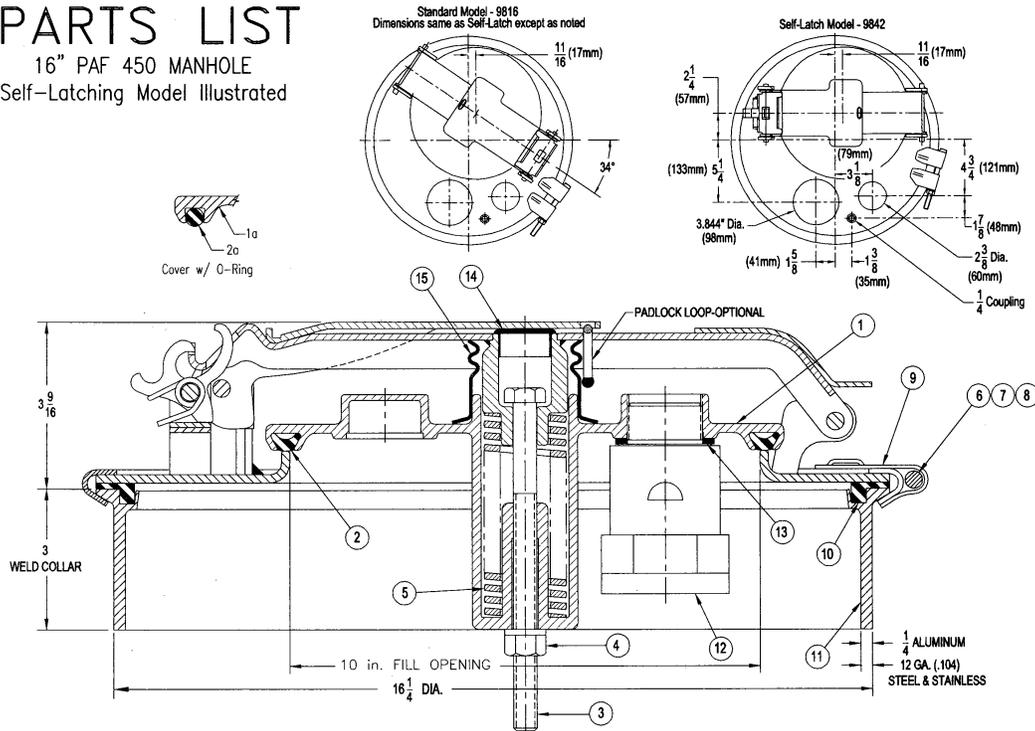
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16" PAF 450 MANHOLE
Self-Latching Model Illustrated



No.	Description	Material	Part No.
1	Cover-Relief Valve	Aluminum	8241AL
1a	Cover (O-Ring Grvd)	Aluminum	8246AL
2	Gasket-Relief Valve	Buna-N	3119BN
		Viton	3119VT
		Wh. Hypalon	3119WH
2a	O-Ring	Tef-Sil	3902TS
3	Bolt	Stnls 304	3876SL
4	Hex Nut 1/2-13 Thd	Steel Zinc Pt.	9Q5812
		Stnls 304	9Q5853
5	Spring	Van Steel	3859EY
6	Bolt-Clamp	Steel Zinc Pt.	3029ZC
		Stnls 304	3029SL
7	Nut-Clamp 3/8-16 Thd	Brass	3030BR
		Stnls 304	9Q5809
8	Washer-Clamp	Steel Zinc Pt.	3031ZC
		Stnls 304	3031SL
9	Clamping Ring	Steel	3028MS
		Steel Zinc Pt.	3028ZC
		Stnls 304	3028SL

No.	Description	Material	Part No.
10	Manhole Gasket Channel Type	B Buna-N	3559BN
		V Viton	3559VT
		W Wh. Hypalon	3559WH
		T Teflon Env. w/ Wh. Hypalon	3025TF
11	Manhole Collar Channel Type	Steel	3057MS
		Aluminum	3057AE
		Stnls 304	3057SL
		Stnls 316	3057SS
12	Vent Assembly	Alum / Stnls	6238AL
13	Gasket	Viton	3716VT
14	Plastic Cap	Polyethylene	9Z6150
15	Bellows	Buna-Urethane	4020BU

Gasket Maximum Temperature
 Buna N (Nitrile) _____ 250°F
 Viton _____ 400°F
 White Hypalon _____ 250°F
 Teflon-Silicone _____ 400°F
 Teflon Envelope w/ White Hypalon Insert _____ 250°F

MAINTENANCE: Manhole assemblies should be inspected with sufficient frequency and due regard to the products carried to insure a liquid tight closure. Any worn, damaged or missing parts must be replaced. Gaskets should be replaced if their effectiveness is impaired in any way. Replacement gaskets must be compatible with products carried.

WARNING Use only genuine BETTS INDUSTRIES INC. replacement parts. Use of substitute parts can impair the proper functioning of the Pressure Relief Valve and Manhole Assembly.

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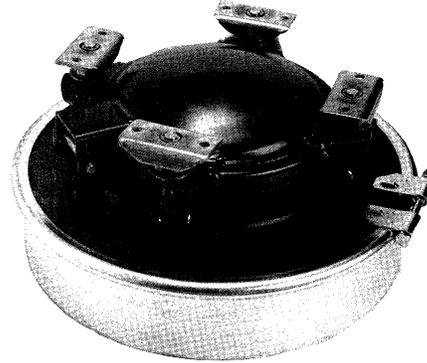
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TIONA[®]

16" HOT PRODUCT MANHOLE

With 10" Fill

- 25 PSIG YIELD PRESSURE
- MOUNT TO 16" PAF WELD COLLARS
- HEAVY DUTY CLAMP RING



Hot Product Manholes are designed for use on tanks hauling elevated temperature materials and are rated with a 25 PSIG yield pressure to meet the requirements of 49CFR 173.247(g)(2), which states:

"...Closures must be designed and constructed to withstand, without exceeding the yield strength of the packaging, twice the static loading produced by the lading in any packaging orientation and at all operating temperatures."

Hot Product Manholes are designed to retrofit existing PAF Manholes on elevated temperature tanks in order to bring them into compliance with the current closure requirements, as well as for new construction tanks.

The design features a 10" fill to provide tank access for filling or inspection and a heavy duty clamp ring which can be removed to provide access into the tank. Steel assemblies are black epoxy coated for corrosion resistance.

Cover & Fill Material	Clamping Ring	Clamping Bolt & Washer	Wt.	Assembly No.
Steel E-Coated	Steel Zinc Pt.	Steel Zinc Pt.	31.0 lb.	8274YXV
Stnls 304	Stnls 304	Stnls 304	31.0 lb.	8274CXV
Stnls 316	Stnls 304	Stnls 304	31.0 lb.	8274DXV

NOTE: Manhole assemblies, as listed above, have Viton gaskets (suffix "V"). For other gaskets available, see parts page for correct suffix.

During installation and welding the collars to the tank, care should be exercised to insure the collars remain flat and round in order to assure proper performance. If necessary, a welding fixture should be used to prevent distortion.

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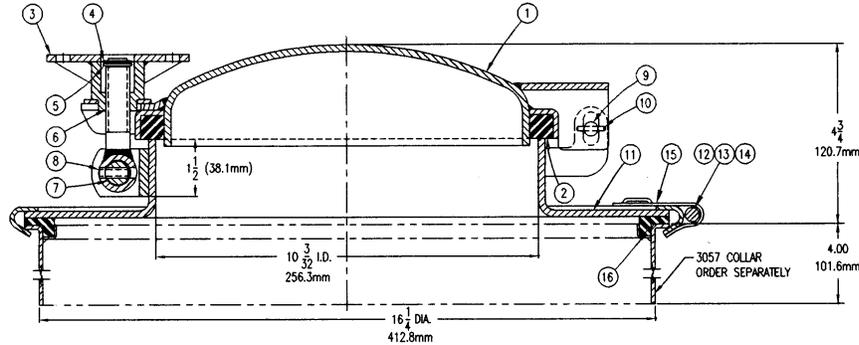
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PARTS LIST

16" HOT PRODUCTS MANHOLE



No.	Description	Material	Part No.
1	Cover	Steel	6554EY
		Stainless 304	6554SL
		Stainless 316L	6554LC
		Stainless 316	6554SS
2	Gasket *	B Buna-N	3567BN
		V Viton	3567VT
		W White Hypalon	3567WH
		E White Non-Asbestos with Teflon Suspensoid (Woven)	3567NT
3	Wing Nut	Stnls 304	3576SL
4	Snap Ring	Stnls 304	9Q4933
5	Snap Ring Washer	Stnls 304	3575SL
6	Swing Bolt	Stnls 304	3765SL
7	Swing Bolt Pin	Stnls 304	3086SL
8	Roll Pin-Swg Bolt	Stnls 304	9Q8593
9	Hinge Pin	Stnls 304	3618SL

No.	Description	Material	Part No.
10	Roll Pin-Hinge Pin	Stnls 304	9Q8601
11	Cover Assembly	Steel	6553EY
		Stnls 304	6553SL
12	Bolt-Clamp	Steel Zinc Pt.	3029ZC
		Stnls 304	3029SL
13	Washer-Clamp	Steel Zinc Pt.	3031ZC
		Stnls 304	3031SL
14	Nut-Clamp	Brass	3030BR
		Stnls 304	9Q5809
15	Clamping Ring	Steel	3028MS
		Steel Zinc Pt.	3028ZC
		Stnls 304	3028SL
16	Manhole Gasket Channel Type	B Buna N	3559BN
		V Viton	3559VT
		W White Hypalon	3559WH
		T Teflon Envelope w/ White Hypalon	3025TF

* Gasket Maximum Temperature

Buna N (Nitrile)	250° F
Viton	400° F
White Hypalon	250° F
Pure Teflon	500° F
White Non-Asbestos with Teflon Suspensoid	500° F

GASKETS:

Check the condition of all gaskets and replace if their effectiveness as a seal is impaired in any way. Replacement gaskets must be compatible with products carried.

WARNING Use only genuine BETTS INDUSTRIES INC. replacement parts. Use of substitute parts can impair the proper functioning of this product.

MAINTENANCE:

Manhole assembly should be inspected with sufficient frequency and with due regard to the products carried to insure a liquid tight closure. Any worn, damaged, or missing parts must be replaced.

WING NUTS AND SWING BOLTS:

All swing bolt and wing nut assemblies must be secured to the cover and tightened to insure the pressure and product retention performance of the manhole assembly.

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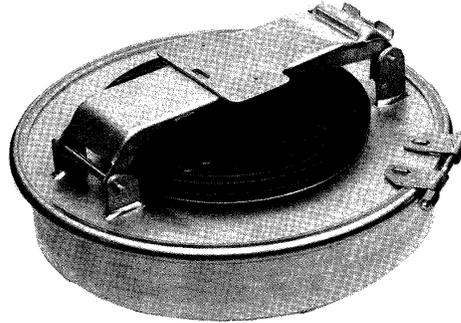
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16" PAF 406-98 MANHOLE

WITH INTEGRAL RELIEF VALVE/10" FILL

- INTEGRAL RELIEF VALVE/10" FILL
- LESS THAN 1 LITER LEAKAGE
- SET PRESSURE ADJUSTMENT
- INCREASED FLOW RATE
- SECONDARY SAFETY LATCH



MODEL L716-STANDARD
MODEL L742-SELF LATCHING

Pressure Relief Valve setting 3.63 psig
 Rated Pressure Actuated Emergency Venting:
 494,084 cu. ft. free air per hour @ 6.25 psig
 Rated Liquid Flow Capacity 1335 gpm @ 5.0 psig

PAF manholes with integral latch style surge suppression relief valves are designed for use on DOT406 and replacement on MC306 specification cargo tanks. Manholes are certified and marked in accordance with 49CFR178.345-5 with a test pressure of 36 psig. Manhole covers are 7 gage steel or stainless and are secured to the tank weld collar with a clamp ring and bolt which can be easily removed to provide access into the tank.

The integral 10" relief valve provides emergency pressure relief and meets the 1 liter surge leakage limit imposed by 49CFR178.345-10(b)(3)(ii). The relief valve also serves as a 10" latch style fill which can be easily opened to provide access for filling the tank or for inspection. Relief valves contain an adjustment feature to allow for fine-tuning of set pressure in the field. Other standard features include a heavy duty clamp ring, secondary safety latch and model 6496ALB pressure-vacuum vent mounted in the 10" relief valve cover.

Manholes are available with a self-latching feature that allows the 10" relief valve/fill cover to drop and securely latch upon movement of the tank if the cover is inadvertently left open. For self-latching model substitute L742 for L716 in assembly number.

Cover Plate	Relief Valve	Clamping Ring, Bolt, Washer, Strongback, & Latch	Clamping Ring Nut	Normal Vent	Wt. (lb)	Assembly No.
Steel Zinc Plt.	Alum.	Steel Zinc Plt.	Brass	Alum.	24.2	PPVL716BXB
Stnls 304	Alum.	Stnls 304	Stnls 304	Alum.	24.7	PPVL716CXB
Stnls 316	Alum.	Stnls 304	Stnls 304	Alum.	24.7	PPVL716DXB

NOTE: Manhole assemblies, as listed above, have Buna-N gaskets (suffix "B"). For variation in gasketing change last letter of assembly number as follows.

Suffix "V" indicates Viton collar gasket & Viton 10" fill gasket

Suffix "W" indicates White Hypalon collar gasket & White Hypalon 10" fill gasket

Suffix "T" indicates Teflon envelope collar gasket & Tef-Sil 10" fill o-ring

Manhole collars are available in aluminum, steel, and stainless steel. Please see parts page for correct numbers. When welding collars to tank, care should be exercised to insure collar remains flat and round.



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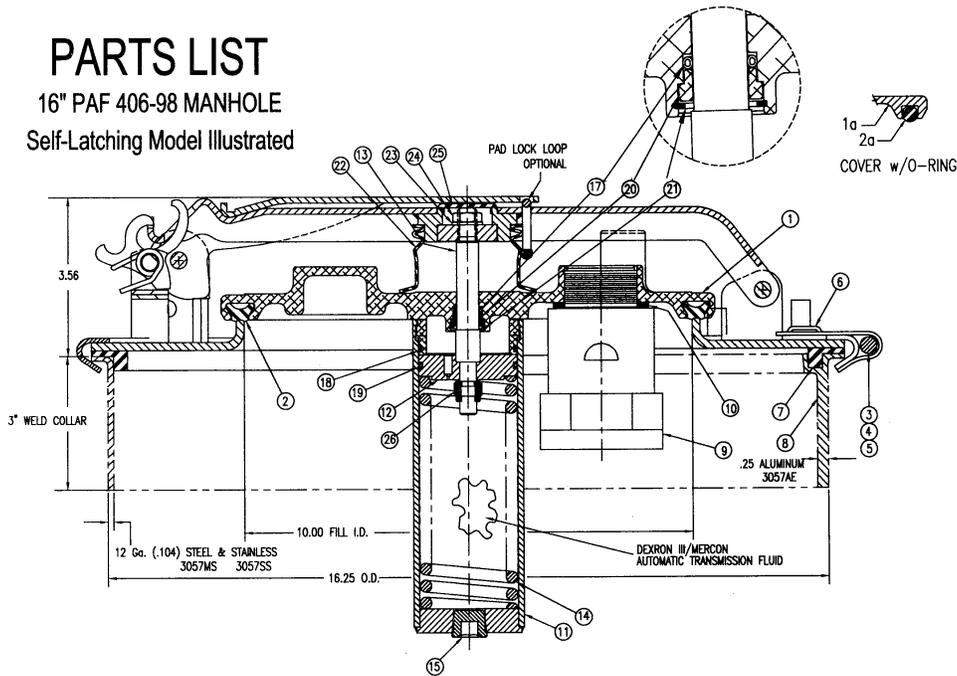
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PARTS LIST

16" PAF 406-98 MANHOLE
Self-Latching Model Illustrated



No.	Description	Material	Part No.	No.	Description	Material	Part No.
1	Fill Cover	Alum/E-Coated	8297ALEY	9	Vent Assembly	Aluminum	6496ALB
1a	Fill Cover (O-Ring Grvd.)	Alum/E-Coated	8297ALEY389	10	Gasket	Buna-N	3716BN
2	Gasket – Integral Relief Valve	Buna-N	3119BN	11	Cylinder Assembly	Aluminum	6657AL
		Viton	3119VT	12	Piston	Aluminum	6654AL
		Wh. Hypalon	3119WH	13	Stem	Stnls 304	6688SL
2a	O-Ring	Tef-Sil	3902TS	14	Spring	Steel	4122MS
3	Bolt-Clamp Ring	Steel Zinc Plt.	3029ZC	15	1/2" NPT Plug Zinc Plt.	Steel Zinc Plt.	9V4907
		Stnls 304	3029SL	17	Stem O-Ring -112	Buna-N	4118BN
4	Nut-Clamp Ring	Brass	3030BR	18	Cylinder O-Ring-137	Buna-N	4015BN
		Stnls 304	9Q5809	19	Piston O-Ring-137	Tef-Sil	4015TS
5	Washer-Clamp Ring	Steel Zinc Plt.	3031ZC	20	O-Ring Retainer	Alum/E-Coated	4117ALEY
		Stnls 304	3031SL	21	Retainer Ring	Stnls 304	9Q4961
6	Clamping Ring	Steel	3028MS	22	Bellows	EPDM	4020EPDM
		Steel Zinc Plt.	3028ZC	23	Lockwasher Ext. Tooth 7/16"	Stnls 304	9Q5961
		Stnls 304	3028SL	24	Nut Hex 7/16x20	Stnls 304	9Q5960
		Buna-N	3559BN	25	Plastic Plug	Polyethylene	9Z6163
7	Manhole Gasket Channel type	Viton	3559VT	26	3/8-16 Hex Nut W/ Insert	Steel Zinc Plt.	9Q5896
		Wh. Hypalon	3559WH				
		Teflon Env. w/Wh. Hypalon	3025TF				
		Steel	3057MS				
8	Manhole Collar Channel type	Aluminum	3057AE				
		Stnls 304	3057SL				
		Stnls 316	3057SS				

Gasket Maximum Temperature
 Buna N (Nitrile) _____ 250°F
 Viton _____ 400°F
 White Hypalon _____ 250°F
 Teflon-Silicone _____ 400°F
 Teflon Envelope w/ White Hypalon Insert _____ 250°F

Replace oil in cylinder using Automatic Transmission Fluid Dexron III/Mercon, SAE 5W-20 with viscosity of 177 SUS at 100°F and a pour point of no greater than -45°F.

MAINTENANCE: Manhole assemblies should be inspected with sufficient frequency to insure 10" Integral Relief Valve functions properly. Any worn, damaged or missing parts must be replaced. Gaskets should be replaced if their effectiveness to insure a liquid tight seal is impaired in any way. Replacement gaskets must be compatible with products carried.

WARNING Consult PAF406-98 maintenance manual prior to disassembly of this relief valve.
 Use only genuine BETTS INDUSTRIES, INC. replacement parts. Use of substitute parts can impair the proper functioning of this product.

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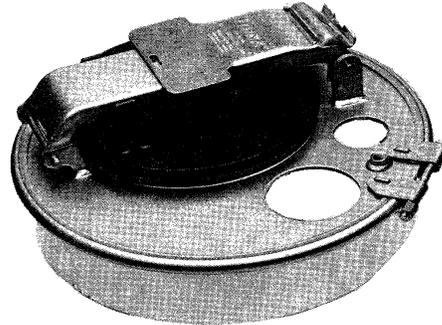
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16" PAF 406-98 OFFSET MANHOLE

WITH INTEGRAL RELIEF VALVE/10" FILL

- INTEGRAL RELIEF VALVE/10" FILL
- LESS THAN 1 LITER LEAKAGE
- SET PRESSURE ADJUSTMENT
- INCREASED FLOW RATE
- SECONDARY SAFETY LATCH



MODEL L816-STANDARD
MODEL L842-SELF LATCHING

Pressure Relief Valve setting 3.63 psig
 Rated Pressure Actuated Emergency Venting:
 494,084 cu. ft. free air per hour @ 6.25 psig
 Rated Liquid Flow Capacity 1335 gpm @ 5.0 psig

PAF manholes with integral latch style surge suppression relief valves are designed for use on DOT406 and replacement on MC306 specification cargo tanks. Manholes are certified and marked in accordance with 49CFR178.345-5 with a test pressure of 36 psig. Manhole covers are 7 gage steel or stainless and are secured to the tank weld collar with a clamp ring and bolt which can be easily removed to provide access into the tank.

The integral 10" relief valve provides emergency pressure relief and meets the 1 liter surge leakage limit imposed by 49CFR178.345-10(b)(3)(ii). The relief valve also serves as a 10" latch style fill which can be easily opened to provide access for filling the tank or for inspection. Relief valves contain an adjustment feature to allow for fine-tuning of set pressure in the field. Other standard features include a heavy duty clamp ring, secondary safety latch and model 6496ALB pressure-vacuum vent mounted in the 10" relief valve cover.

Manholes are available with a self-latching feature that allows the 10" relief valve/fill cover to drop and securely latch upon movement of the tank if the cover is inadvertently left open. For self-latching model substitute L842 for L816 in assembly number.

Note: 3-1/2" Vent and Liquid Level Switch not included in assembly.

Cover Plate	Relief Valve	Clamping Ring, Bolt, Washer, Strongback, and Latch	Clamping Ring Nut	Normal Vent	Wt. (lb)	Assembly No.
Steel Zinc Plt.	Alum.	Steel Zinc Plt.	Brass	Alum.	23.4	PPVL816BXB
Stnls 304	Alum.	Stnls 304	Stnls 304	Alum.	23.9	PPVL816CXB
Stnls 316	Alum.	Stnls 304	Stnls 304	Alum.	23.9	PPVL816DXB

NOTE: Manhole assemblies, as listed above, have Buna-N gaskets (suffix "B"). For variation in gasketing change last letter of assembly number as follows.

Suffix "V" indicates Viton collar gasket & Viton 10" fill gasket

Suffix "W" indicates White Hypalon collar gasket & White Hypalon 10" fill gasket

Suffix "T" indicates Teflon envelope collar gasket & Tef-Sil 10" fill o-ring

Manhole collars are available in aluminum, steel, and stainless steel. Please see parts page for correct numbers. When welding collars to tank, care should be exercised to insure collar remains flat and round.



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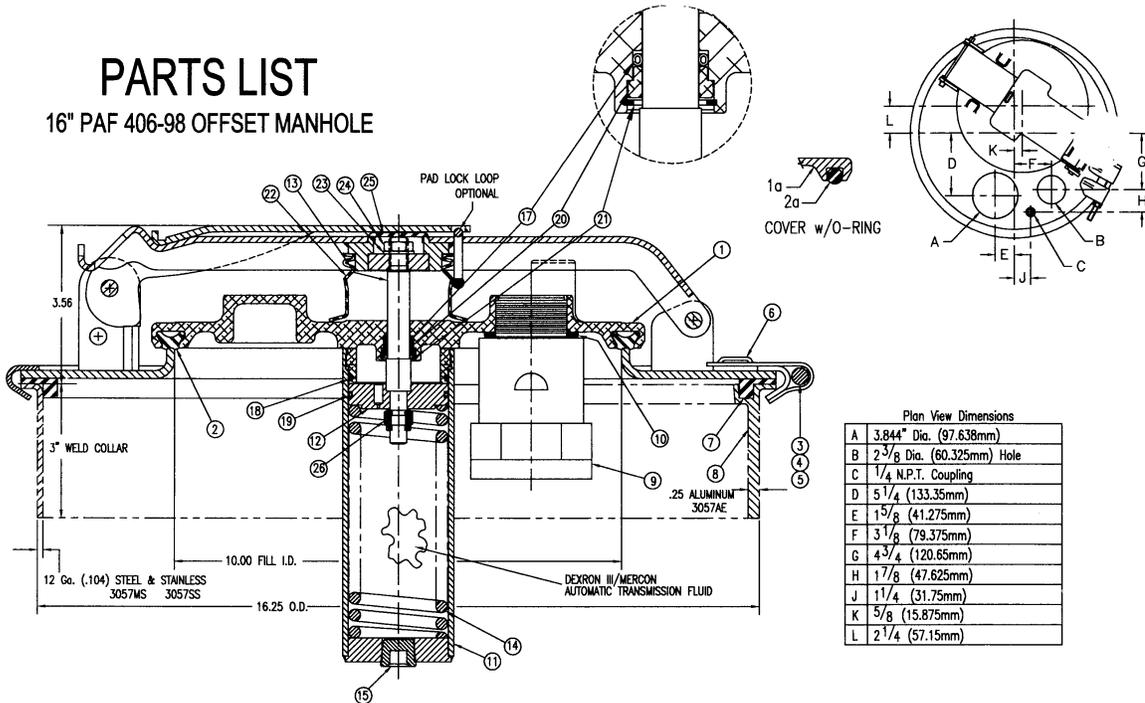
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PARTS LIST

16" PAF 406-98 OFFSET MANHOLE



Plan View Dimensions	
A	3.844" Dia. (97.638mm)
B	2 3/8 Dia. (60.325mm) Hole
C	1/4 N.P.T. Coupling
D	5 1/4 (133.35mm)
E	1 5/8 (41.275mm)
F	3 1/8 (79.375mm)
G	4 3/4 (120.65mm)
H	1 7/8 (47.625mm)
J	1 1/4 (31.75mm)
K	5/8 (15.875mm)
L	2 1/4 (57.15mm)

No.	Description	Material	Part No.
1	Fill Cover	Alum/E-Coated	8297ALEY
1a	Fill Cover (O-Ring Grvd.)	Alum/E-Coated	8297ALEY389
2	Gasket – Integral Relief Valve	Buna-N	3119BN
		Viton	3119VT
		Wh. Hypalon	3119WH
2a	O-Ring	Tef-Sil	3902TS
3	Bolt-Clamp Ring	Steel Zinc Plt.	3029ZC
		Stnls 304	3029SL
4	Nut-Clamp Ring	Brass	3030BR
		Stnls 304	9Q5809
5	Washer-Clamp Ring	Steel Zinc Plt.	3031ZC
		Stnls 304	3031SL
6	Clamping Ring	Steel	3028MS
		Steel Zinc Plt.	3028ZC
		Stnls 304	3028SL
7	Manhole Gasket Channel type	Buna-N	3559BN
		Viton	3559VT
		Wh. Hypalon	3559WH
		Teflon Env. w/Wh. Hypalon	3025TF
8	Manhole Collar Channel type	Steel	3057MS
		Aluminum	3057AE
		Stnls 304	3057SL
		Stnls 316	3057SS

No.	Description	Material	Part No.
9	Vent Assembly	Aluminum	6496ALB
10	Gasket	Buna-N	3716BN
11	Cylinder Assembly	Aluminum	6657AL
12	Piston	Aluminum	6654AL
13	Stem	Stnls 304	6688SL
14	Spring	Steel	4122MS
15	1/2" NPT Plug Zinc Plt.	Steel Zinc Plt.	9V4907
17	Stem O-Ring -112	Buna-N	4118BN
18	Cylinder O-Ring-137	Buna-N	4015BN
19	Piston O-Ring-137	Tef-Sil	4015TS
20	O-Ring Retainer	Alum/E-Coated	4117ALEY
21	Retainer Ring	Stnls 304	9Q4961
22	Bellows	EPDM	4020EPDM
23	Lockwasher Ext. Tooth 7/16"	Stnls 304	9Q5961
24	Nut Hex 7/16x20	Stnls 304	9Q5960
25	Plastic Plug	Polyethylene	9Z6163
26	3/8-16 Hex Nut W/ Insert	Steel Zinc Plt.	9Q5896

Gasket Maximum Temperature	
Buna N (Nitrile)	250°F
Viton	400°F
White Hypalon	250°F
Teflon-Silicone	400°F
Teflon Envelope w/ White Hypalon Insert	250°F

Replace oil in cylinder using Automatic Transmission Fluid Dexron III/Mercon, SAE 5W-20 with viscosity of 177 SUS at 100°F and a pour point of no greater than -45°F.

MAINTENANCE: Manhole assemblies should be inspected with sufficient frequency to insure 10" Integral Relief Valve functions properly. Any worn, damaged or missing parts must be replaced. Gaskets should be replaced if their effectiveness to insure a liquid tight seal is impaired in any way. Replacement gaskets must be compatible with products carried.

WARNING Consult PAF406-98 maintenance manual prior to disassembly of this relief valve.

Use only genuine BETTS INDUSTRIES, INC. replacement parts. Use of substitute parts can impair the proper functioning of this product.

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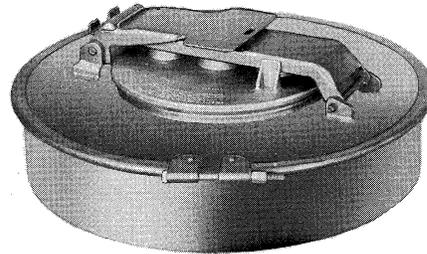
20" PAF450 MANHOLE

With Pressure Relief Valve

- NORMAL VENT
- WROUGHT STEEL COVER
- SECONDARY SAFETY LATCH
- HEAVY DUTY CLAMP RING

Not legal as replacement on
MC306 cargo tanks
after August 31, 1998

Pressure Relief Valve setting 3.0 psig.
Rated Pressure Actuated Emergency Venting:
375,000 cu. ft. free air per hour @ 5.0 psig.



Model 9720 – Standard
Model 9763 - Self-Latching

PAF Manholes with Model PAF450 10" Pressure Relief Valve are certified for use on MC306 cargo tanks. Manholes are certified and marked in accordance with 49CFR178.345-5 with a test pressure of 36 psig.

Per 49CFR180.405(h)(3), PAF450 assemblies may not be installed on MC306 cargo tanks after August 31, 1998. However, relief valves installed on MC306 cargo tanks on or before August 31, 1998, may be repaired if required. PAF450 relief valves may be installed in non-specification tanks or in tanks built in countries other than the United States where regulations permit.

Relief valve also serves as a 10" latch style fill which can be easily opened for filling the tank or for inspection. Standard features include heavy duty clamp ring, secondary safety latch and model 6238AL Normal Vent.

*No provision has been made for venting of product due to overfilling.

Manholes are also available with a self-latching feature which allows the Pressure Relief Valve cover to open only 91 degrees and drop closed and securely latch upon movement of the tank if the cover is inadvertently left open. For self-latching model substitute 9763 for 9720 in assembly number.

Cover Plate	PRV Cover	Clamping Ring, Bolt & Washer, Strongback, Latch	Clamping Ring Nut	Spring Bolt & Nut	Spring	Normal Vent	Wt. (lb.)	Assembly No.
Steel Zinc Pt.	Alum.	Steel Zinc Pt.	Brass	Stnls 304**	Van.	Alum.	29.2	FVA9720BXB
Stnls 304		Stnls 304	Stnls 304	Steel			29.7	FVA9720CXB
Stnls 316		Stnls 304	Stnls 304	Stnls 304			29.7	FVA9720DXB

**Nut Material – Steel Zinc Plated

Note: Manhole assemblies, as listed above, have a 6238AL vent (prefix "FVA") and Buna-N (suffix "B"). For variation or additional vents see catalog Section 95 for proper prefix or assembly number. For variation in gasketing change last letter of suffix as follows.

Suffix "V" indicates Viton gasket

Suffix "W" indicates White Hypalon gasket

Suffix "T" indicates Tef-Sil pressure relief valve gasket and Teflon Envelope w/ White Hypalon insert collar gasket

Manhole collars are available in aluminum, steel and stainless steel. Please see parts page for correct numbers. When welding collars to tank, exercise care to insure collar remains flat and round.

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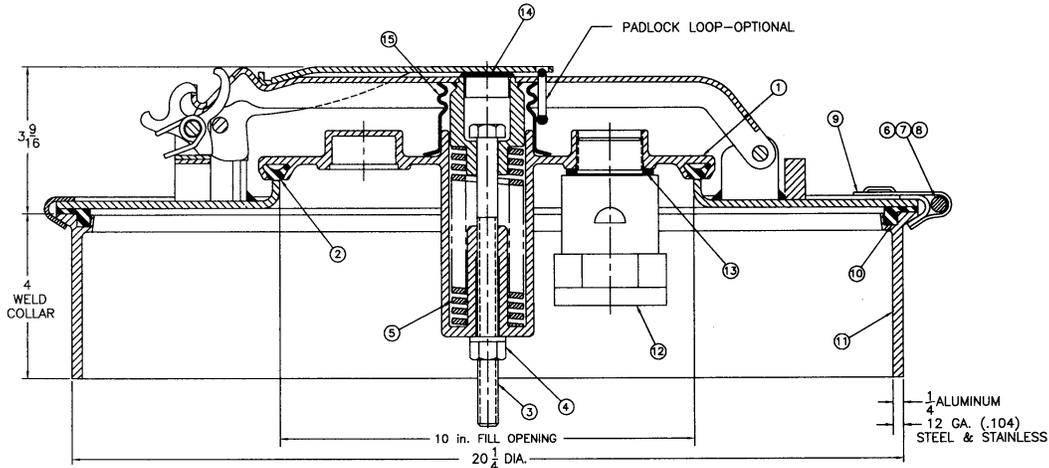
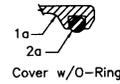
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PARTS LIST

20" PAF 450 MANHOLE

Self-Latching Model Illustrated



No.	Description	Material	Part No.
1	Cover-Relief Valve	Aluminum	8241AL
1a	Cover (O-Ring Grvd)	Aluminum	8246AL
2	Gasket-Relief Valve	Buna-N	3119BN
		Viton	3119VT
		Wh. Hypalon	3119WH
2a	O-Ring	Tef-Sil	3902TS
3	Bolt	Stnls 304	3876SL
4	Hex Nut 1/2 -13 Thd	Steel Zinc Pt.	9Q5812
		Stnls 304	9Q5853
5	Spring	Van Steel	3859EY
6	Bolt-Clamp	Steel Zinc Pt.	3029ZC
		Stnls 304	3029SL
7	Nut-Clamp 3/8 -16 Thd	Brass	3030BR
		Stnls 304	9Q5809
8	Washer-Clamp	Steel Zinc Pt.	3031ZC
		Stnls 304	3031SL
9	Clamping Ring	Steel	3036MS
		Steel Zinc Pt.	3036ZC
		Stnls 304	3036SL

No.	Description	Material	Part No.
10	Manhole Gasket Channel Type	B Buna-N	3560BN
		V Viton	3560VT
		W Wh. Hypalon	3560WH
		T Teflon Env. w/ Wh. Hypalon	3033TF
11	Manhole Collar Channel Type	Steel	3176MS
		Aluminum	3176AE
		Stnls 304	3176SL
		Stnls 316	3176SS
12	Vent Assembly	Alum / Stnls	6238AL
13	Gasket	Viton	3716VT
14	Plastic Cap	Polyethylene	926150
15	Bellows	Buna-Urethane	4020BU

Gasket Maximum Temperature

Buna N (Nitrile)	250°F
Viton	400°F
White Hypalon	250°F
Teflon-Silicone	400°F
Teflon Envelope w/ White Hypalon Insert	250°F

MAINTENANCE: Manhole assemblies should be inspected with sufficient frequency and due regard to the products carried to insure a liquid tight closure. Any worn, damaged or missing parts must be replaced. Gaskets should be replaced if their effectiveness is impaired in any way. Replacement gaskets must be compatible with products carried.

WARNING Use only genuine BETTS INDUSTRIES INC. replacement parts. Use of substitute parts can impair the proper functioning of the Pressure Relief Valve and Manhole Assembly.

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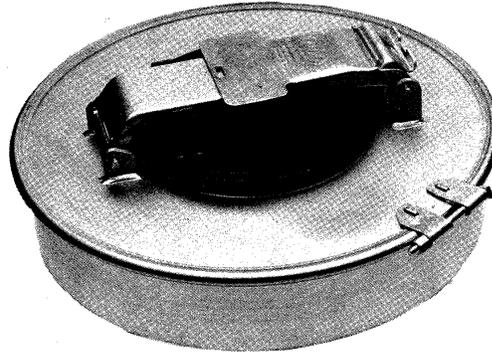
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20" PAF 406-98 MANHOLE

WITH INTEGRAL RELIEF VALVE/10" FILL

- INTEGRAL RELIEF VALVE/10" FILL
- LESS THAN 1 LITER LEAKAGE
- SET PRESSURE ADJUSTMENT
- INCREASED FLOW RATE
- SECONDARY SAFETY LATCH



MODEL L720-STANDARD
MODEL L763-SELF LATCHING

Pressure Relief Valve setting 3.63 psig
Rated Pressure Actuated Emergency Venting: 494,084 cu. ft. free air per hour @ 6.25 psig
Rated Liquid Flow Capacity 1335 gpm @ 5.0 psig

PAF manholes with integral latch style surge suppression relief valves are designed for use on DOT406 and replacement on MC306 specification cargo tanks. Manholes are certified and marked in accordance with 49CFR178.345-5 with a test pressure of 36 psig. Manhole covers are 7 gage steel or stainless and are secured to the tank weld collar with a clamp ring and bolt which can be easily removed to provide access into the tank.

The integral 10" relief valve provides emergency pressure relief and meets the 1 liter surge leakage limit imposed by 49CFR178.345-10(b)(3)(ii). The relief valve also serves as a 10" latch style fill which can be easily opened to provide access for filling the tank or for inspection. Relief valves contain an adjustment feature to allow for fine-tuning of set pressure in the field. Other standard features include a heavy duty clamp ring, secondary safety latch and model 6496ALB pressure-vacuum vent mounted in the 10" relief valve cover.

Manholes are available with a self-latching feature that allows the 10" relief valve/fill cover to drop and securely latch upon movement of the tank if the cover is inadvertently left open. For self-latching model substitute L720 for L763 in assembly number.

Cover Plate	Relief Valve	Clamping Ring, Bolt, Washer, Stongback, & Latch	Clamping Ring Nut	Normal Vent	Wt. (lb)	Assembly No.
Steel Zinc Plt.	Alum.	Steel Zinc Plt.	Brass	Alum.	30.5	PPVL720BXB
Stnls 304	Alum.	Stnls 304	Stnls 304	Alum.	31.0	PPVL720CXB
Stnls 316	Alum.	Stnls 304	Stnls 304	Alum.	31.0	PPVL720DXB

NOTE: Manhole assemblies, as listed above, have Buna-N gaskets (suffix "B"). For variation in gasketing change last letter of assembly number as follows.

Suffix "V" indicates Viton collar gasket & Viton 10" fill gasket

Suffix "W" indicates White Hypalon collar gasket & White Hypalon 10" fill gasket

Suffix "T" indicates Teflon envelope collar gasket & Tef-Sil 10" fill o-ring

Manhole collars are available in aluminum, steel, and stainless steel. Please see parts page for correct numbers. When welding collars to tank, care should be exercised to insure collar remains flat and round.



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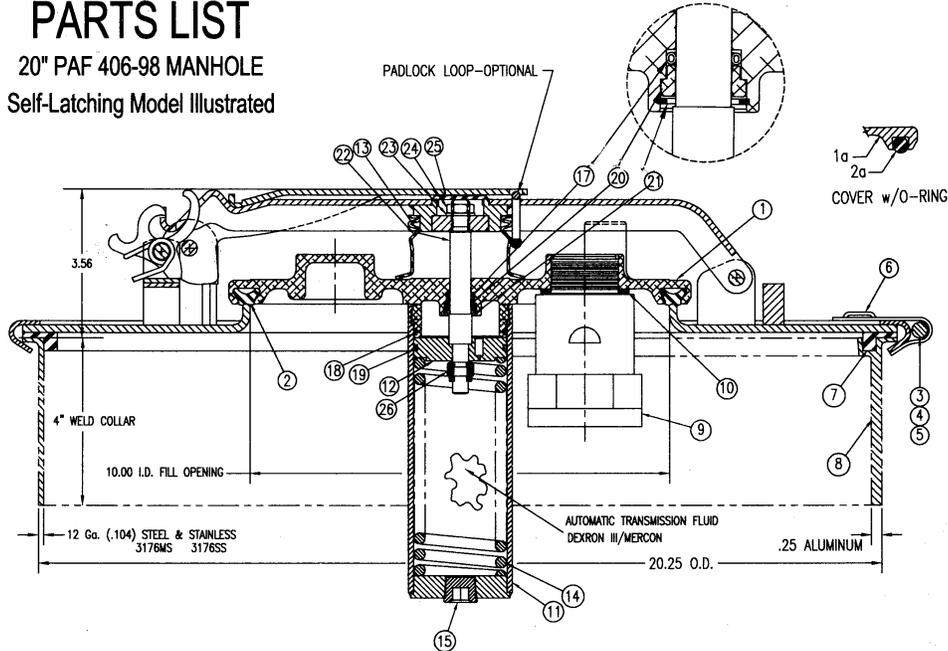
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PARTS LIST

20" PAF 406-98 MANHOLE
Self-Latching Model Illustrated



No.	Description	Material	Part No.	No.	Description	Material	Part No.
1	Fill Cover	Alum/E-Coated	8297ALEY	9	Vent Assembly	Aluminum	6496ALB
1a	Fill Cover (O-Ring Grvd.)	Alum/E-Coated	8297ALEY389	10	Gasket	Buna-N	3716BN
2	Gasket – Integral Relief Valve	Buna-N	3119BN	11	Cylinder Assembly	Aluminum	6657AL
		Viton	3119VT	12	Piston	Aluminum	6654AL
2a	O-Ring	Wh. Hypalon	3119WH	13	Stem	Stnls 304	6688SL
		Tef-Sil	3902TS	14	Spring	Steel	4122MS
3	Bolt-Clamp Ring	Steel Zinc Plt.	3029ZC	15	1/2" NPT Plug Zinc Plt.	Steel Zinc Plt.	9V4907
		Stnls 304	3029SL	17	Stem O-Ring -112	Buna-N	4118BN
4	Nut-Clamp Ring	Brass	3030BR	18	Cylinder O-Ring-137	Buna-N	4015BN
		Stnls 304	9Q5809	19	Piston O-Ring-137	Tef-Sil	4015TS
5	Washer-Clamp Ring	Steel Zinc Plt.	3031ZC	20	O-Ring Retainer	Alum/E-Coated	4117ALEY
		Stnls 304	3031SL	21	Retainer Ring	Stnls 304	9Q4961
6	Clamping Ring	Steel	3036MS	22	Bellows	EPDM	4020EPDM
		Steel Zinc Plt.	3036ZC	23	Lockwasher Ext. Tooth 7/16"	Stnls 304	9Q5961
		Stnls 304	3036SL	24	Nut Hex 7/16x20	Stnls 304	9Q5960
7	Manhole Gasket Channel type	Buna-N	3560BN	25	Plastic Plug	Polyethylene	9Z6163
		Viton	3560VT	26	3/8-16 Hex Nut W/ Insert	Steel Zinc Plt.	9Q5896
		Wh. Hypalon	3560WH				
		Teflon Env. w/Wh. Hypalon	3033TF				
8	Manhole Collar Channel type	Steel	3176MS				
		Aluminum	3176AE				
		Stnls 304	3176SL				
		Stnls 316	3176SS				

Gasket Maximum Temperature	
Buna N (Nitrile)	250°F
Viton	400°F
White Hypalon	250°F
Teflon-Silicone	400°F
Teflon Envelope w/ White Hypalon Insert	250°F

Replace oil in cylinder using Automatic Transmission Fluid Dexron III/Mercon, SAE 5W-20 with viscosity of 177 SUS at 100°F and a pour point of no greater than -45°F.

MAINTENANCE: Manhole assemblies should be inspected with sufficient frequency to insure 10" Integral Relief Valve functions properly. Any worn, damaged or missing parts must be replaced. Gaskets should be replaced if their effectiveness to insure a liquid tight seal is impaired in any way. Replacement gaskets must be compatible with products carried.

WARNING Consult PAF406-98 maintenance manual prior to disassembly of this relief valve.

Use only genuine BETTS INDUSTRIES, INC. replacement parts. Use of substitute parts can impair the proper functioning of this product.

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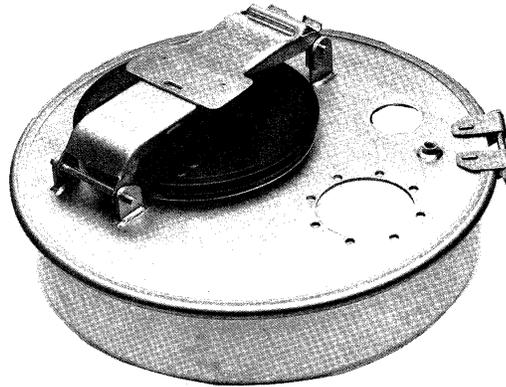
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20" PAF 406-98 OFFSET MANHOLE

WITH INTEGRAL RELIEF VALVE/10" FILL

- INTEGRAL RELIEF VALVE/10" FILL
- LESS THAN 1 LITER LEAKAGE
- SET PRESSURE ADJUSTMENT
- INCREASED FLOW RATE
- SECONDARY SAFETY LATCH



MODEL L820-STANDARD
MODEL L863-SELF LATCHING

Pressure Relief Valve setting 3.63 psig
 Rated Pressure Actuated Emergency Venting:
 494,084 cu. ft. free air per hour @ 6.25 psig
 Rated Liquid Flow Capacity 1335 gpm @ 5.0 psig

PAF manholes with integral latch style surge suppression relief valves are designed for use on DOT406 and replacement on MC306 specification cargo tanks. Manholes are certified and marked in accordance with 49CFR178.345-5 with a test pressure of 36 psig. Manhole covers are 7 gage steel or stainless and are secured to the tank weld collar with a clamp ring and bolt which can be easily removed to provide access into the tank.

The integral 10" relief valve provides emergency pressure relief and meets the 1 liter surge leakage limit imposed by 49CFR178.345-10(b)(3)(ii). The relief valve also serves as a 10" latch style fill which can be easily opened to provide access for filling the tank or for inspection. Relief valves contain an adjustment feature to allow for fine-tuning of set pressure in the field. Other standard features include a heavy duty clamp ring, secondary safety latch and model 6496ALB pressure-vacuum vent mounted in the 10" relief valve cover.

Manholes are available with a self-latching feature that allows the 10" relief valve/fill cover to drop and securely latch upon movement of the tank if the cover is inadvertently left open. For self-latching model substitute L863 for L820 in assembly number.

Note: 3-1/2" Vent and Liquid Level Switch not included in assembly.

Cover Plate	Relief Valve	Clamping Ring, Bolt, Washer, Stongback, & Latch	Clamping Ring Nut	Normal Vent	Wt. (lb)	Assembly No.
Steel Zinc Plt.	Alum.	Steel Zinc Plt.	Brass	Alum.	29.7	PPVL820BXB
Stnls 304	Alum.	Stnls 304	Stnls 304	Alum.	30.2	PPVL820CXB
Stnls 316	Alum.	Stnls 304	Stnls 304	Alum.	30.2	PPVL820DXB

NOTE: Manhole assemblies, as listed above, have Buna-N gaskets (suffix "B"). For variation in gasketing change last letter of assembly number as follows.

Suffix "V" indicates Viton collar gasket & Viton 10" fill gasket

Suffix "W" indicates White Hypalon collar gasket & White Hypalon 10" fill gasket

Suffix "T" indicates Teflon envelope collar gasket & Tef-Sil 10" fill o-ring

Manhole collars are available in aluminum, steel, and stainless steel. Please see parts page for correct numbers. When welding collars to tank, care should be exercised to insure collar remains flat and round.

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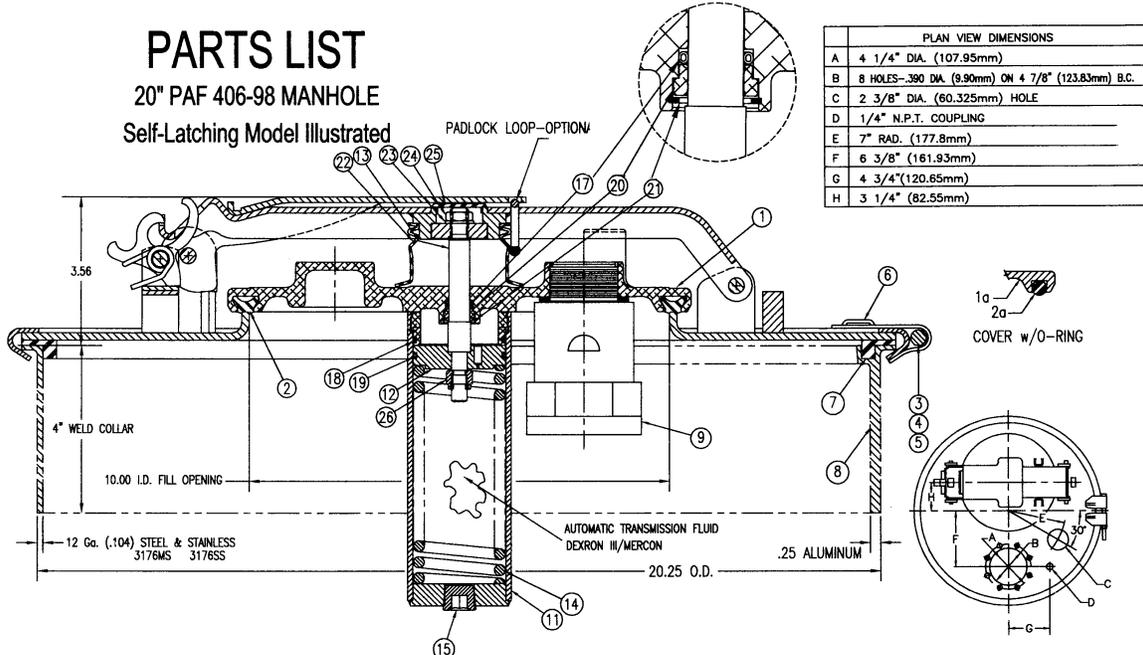
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PARTS LIST

20" PAF 406-98 MANHOLE

Self-Latching Model Illustrated



No.	Description	Material	Part No.
1	Fill Cover	Alum/E-Coated	8297ALEY
1a	Fill Cover (O-Ring Grvd.)	Alum/E-Coated	8297ALEY389
2	Gasket – Integral Relief Valve	Buna-N	3119BN
		Viton	3119VT
		Wh. Hypalon	3119WH
2a	O-Ring	Tef-Sil	3902TS
3	Bolt-Clamp Ring	Steel Zinc Pit.	3029ZC
		Stnls 304	3029SL
4	Nut-Clamp Ring	Brass	3030BR
		Stnls 304	9Q5809
5	Washer-Clamp Ring	Steel Zinc Pit.	3031ZC
		Stnls 304	3031SL
		Steel	3036MS
6	Clamping Ring	Steel Zinc Pit.	3036ZC
		Stnls 304	3036SL
		Buna-N	3560BN
		Viton	3560VT
7	Manhole Gasket Channel type	Wh. Hypalon	3560WH
		Teflon Env. w/Wh. Hypalon	3033TF
		Steel	3176MS
		Aluminum	3176AE
8	Manhole Collar Channel type	Stnls 304	3176SL
		Stnls 316	3176SS

No.	Description	Material	Part No.
9	Vent Assembly	Aluminum	6496ALB
10	Gasket	Buna-N	3716BN
11	Cylinder Assembly	Aluminum	6657AL
12	Piston	Aluminum	6654AL
13	Stem	Stnls 304	6688SL
14	Spring	Steel	4122MS
15	1/2" NPT Plug Zinc Pit.	Steel Zinc Pit.	9V4907
17	Stem O-Ring -112	Buna-N	4118BN
18	Cylinder O-Ring-137	Buna-N	4015BN
19	Piston O-Ring-137	Tef-Sil	4015TS
20	O-Ring Retainer	Alum/E-Coated	4117ALEY
21	Retainer Ring	Stnls 304	9Q4961
22	Bellows	EPDM	4020EPDM
23	Lockwasher Ext. Tooth 7/16"	Stnls 304	9Q5961
24	Nut Hex 7/16x20	Stnls 304	9Q5960
25	Plastic Plug	Polyethylene	9Z6163
26	3/8-16 Hex Nut W/ Insert	Steel Zinc Pit.	9Q5896

Gasket Maximum Temperature	
Buna N (Nitrile)	250°F
Viton	400°F
White Hypalon	250°F
Teflon-Silicone	400°F
Teflon Envelope w/ White Hypalon Insert	250°F

Replace oil in cylinder using Automatic Transmission Fluid Dexron III/Mercon, SAE 5W-20 with viscosity of 177 SUS at 100°F and a pour point of no greater than -45°F.

MAINTENANCE: Manhole assemblies should be inspected with sufficient frequency to insure 10" Integral Relief Valve functions properly. Any worn, damaged or missing parts must be replaced. Gaskets should be replaced if their effectiveness to insure a liquid tight seal is impaired in any way. Replacement gaskets must be compatible with products carried.

WARNING Consult PAF406-98 maintenance manual prior to disassembly of this relief valve.

Use only genuine BETTS INDUSTRIES, INC. replacement parts. Use of substitute parts can impair the proper functioning of this product.

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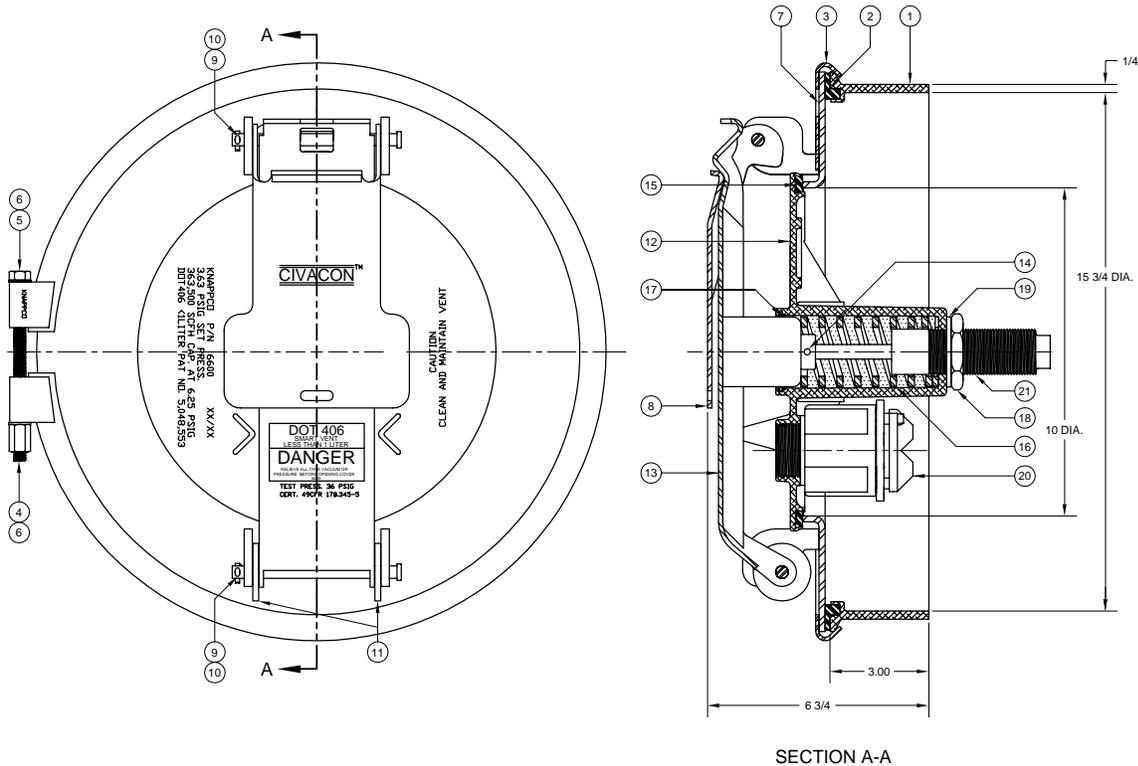
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Over 8,000 Part Numbers – Over 26,000 Square Feet of Warehouse – We Ship Worldwide

Rev. 0, January 2003

SST111100 16" MANHOLE ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	4754	WELD RING	1
2	4645	GASKET (BUNA, WELD RING) ²	1
3	3271	CLAMP RING	1
4	5009	NUT (HEX HEAD)	1
5	1110	SCREW (HEX HEAD)	1
6	1113	WASHER	2
7	6151	COVER WELDMENT	1
8	6121	LATCH	1
9	5951	CLEVIS PIN	2
10	1045	COTTER PIN	2
11	6025	WASHER	2

ITEM	PART NUMBER	DESCRIPTION	QTY.
12	6533	FILL COVER ¹	1
13	6535	STRONGBACK WELDMENT ¹	1
14	6534	DRIVE PIN ¹	1
15	6252	GASKET (BUNA, FILL COVER) ^{1,3}	1
16	5895	SPRING ¹	1
17	6532	LIP SEAL (POLY) ¹	1
18	6374	NUT (HEX JAM) ¹	1
19	6375	SEAL WASHER ¹	1
20	NV2001	VENT ASSEMBLY ¹	1
21	9241	MOTION CONTROL ¹	1

1 - Included in P/N 6600 - Fill Cover Assembly
 2 - Also available in Viton - P/N 4873, 3 - Also available in Viton - P/N 6263

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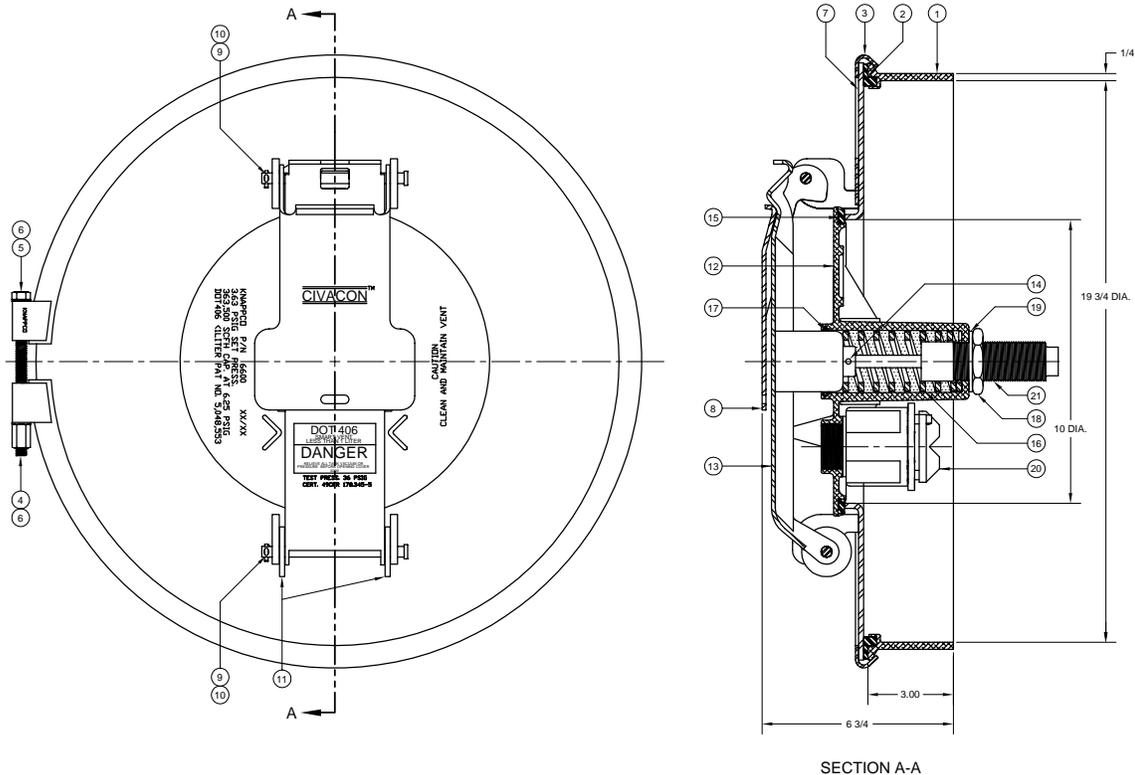
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Rev. 0, January 2003

SSU11100 20" MANHOLE ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	4755	WELD RING	1
2	4646	GASKET (BUNA, WELD RING) ²	1
3	3250	CLAMP RING	1
4	5009	NUT (HEX HEAD)	1
5	1110	SCREW (HEX HEAD)	1
6	1113	WASHER	2
7	6153	COVER WELDMENT	1
8	6121	LATCH	1
9	5951	CLEVIS PIN	2
10	1045	COTTER PIN	2
11	6025	WASHER	2

ITEM	PART NUMBER	DESCRIPTION	QTY.
12	6533	FILL COVER ¹	1
13	6535	STRONGBACK WELDMENT ¹	1
14	6534	DRIVE PIN ¹	1
15	6252	GASKET (BUNA, FILL COVER) ^{1,3}	1
16	5895	SPRING ¹	1
17	6532	LIP SEAL (POLY) ¹	1
18	6374	NUT (HEX JAM) ¹	1
19	6375	SEAL WASHER ¹	1
20	NV2001	VENT ASSEMBLY ¹	1
21	9241	MOTION CONTROL ¹	1

1 - Included in P/N 6600 - Fill Cover Assembly
 2 - Also available in Viton - P/N 4874, 3 - Also available in Viton - P/N 6263

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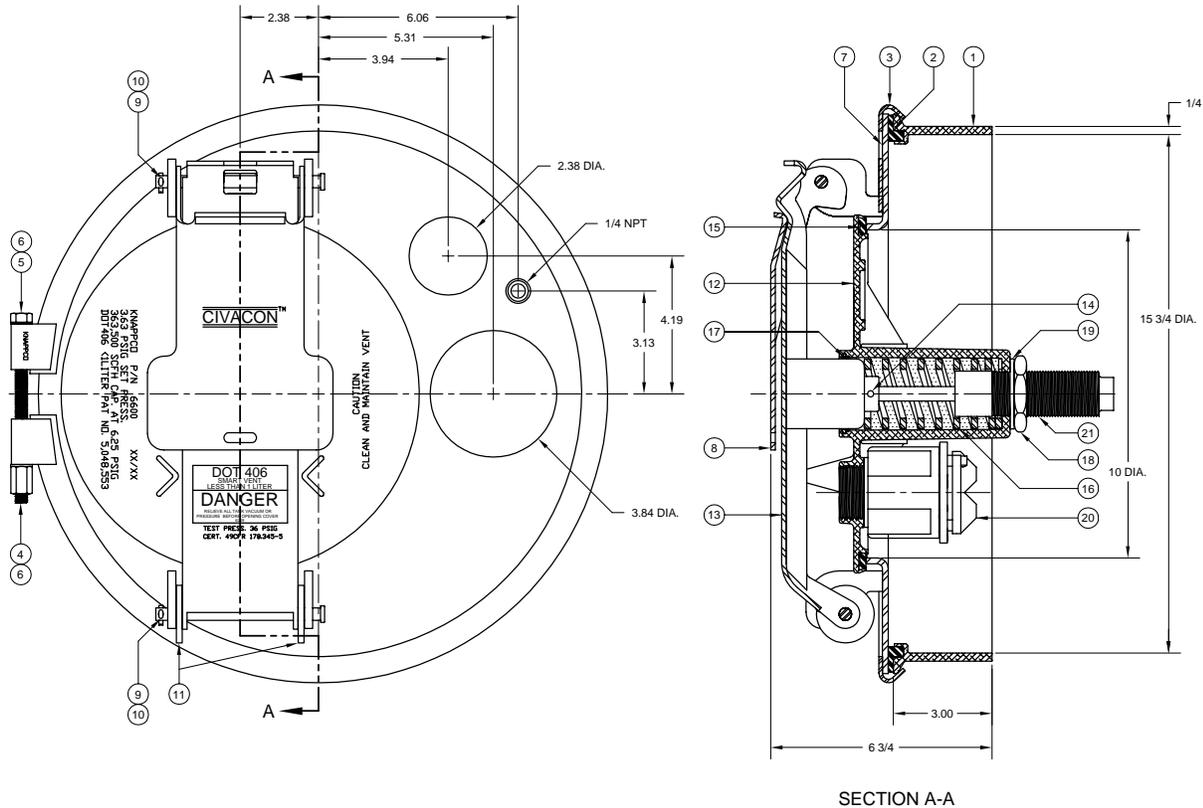
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Rev. 0, January 2003

SSV11110 16" MANHOLE ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	4754	WELD RING	1
2	4645	GASKET (BUNA, WELD RING) ²	1
3	3271	CLAMP RING	1
4	5009	NUT (HEX HEAD)	1
5	1110	SCREW (HEX HEAD)	1
6	1113	WASHER	2
7	6006	COVER WELDMENT	1
8	6121	LATCH	1
9	5951	CLEVIS PIN	2
10	1045	COTTER PIN	2
11	6025	WASHER	2

ITEM	PART NUMBER	DESCRIPTION	QTY.
12	6533	FILL COVER ¹	1
13	6535	STRONGBACK WELDMENT ¹	1
14	6534	DRIVE PIN ¹	1
15	6252	GASKET (BUNA, FILL COVER) ^{1,3}	1
16	5895	SPRING ¹	1
17	6532	LIP SEAL (POLY) ¹	1
18	6374	NUT (HEX JAM) ¹	1
19	6375	SEAL WASHER ¹	1
20	NV2001	VENT ASSEMBLY ¹	1
21	9241	MOTION CONTROL ¹	1

1 - Included in P/N 6600 - Fill Cover Assembly

2 - Also available in Viton - P/N 4873, 3 - Also available in Viton - P/N 6263

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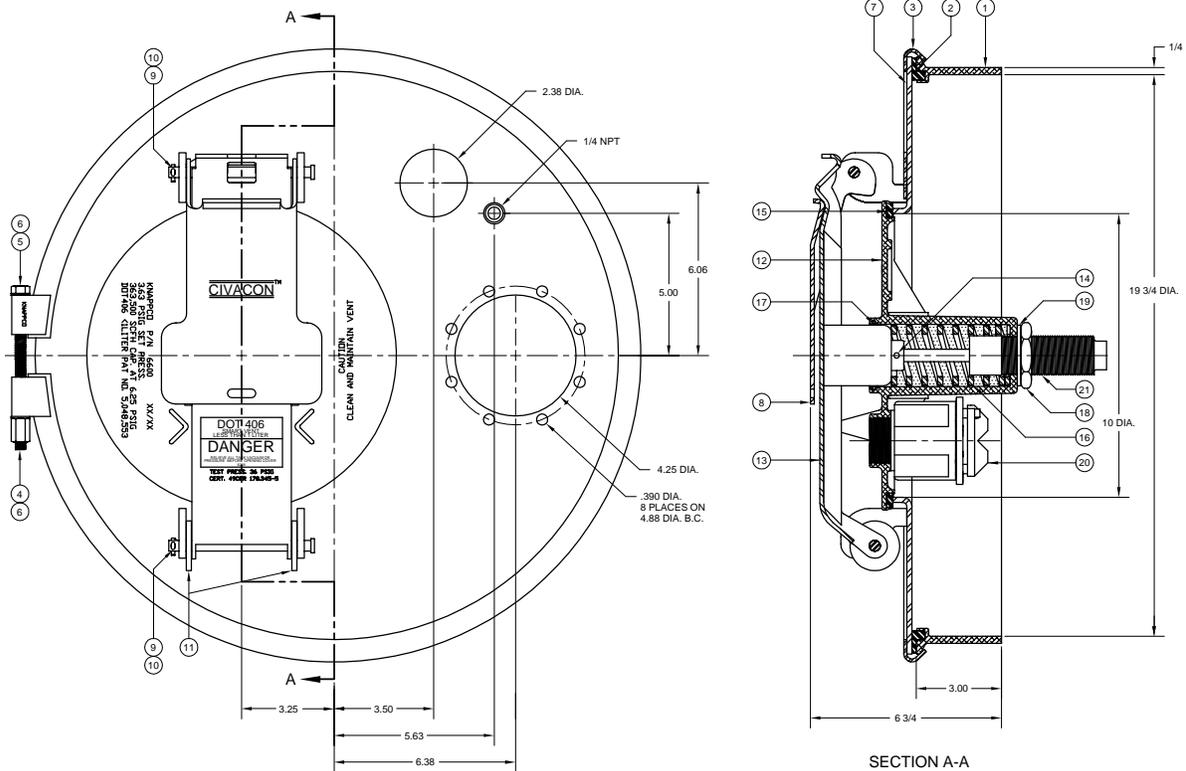
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Rev. 0, January 2003

SSW11120 20" MANHOLE ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	4755	WELD RING	1
2	4646	GASKET (BUNA, WELD RING) ²	1
3	3250	CLAMP RING	1
4	5009	NUT (HEX HEAD)	1
5	1110	SCREW (HEX HEAD)	1
6	1113	WASHER	2
7	6049	COVER WELDMENT	1
8	6121	LATCH	1
9	5951	CLEVIS PIN	2
10	1045	COTTER PIN	2
11	6025	WASHER	2

ITEM	PART NUMBER	DESCRIPTION	QTY.
12	6533	FILL COVER ¹	1
13	6535	STRONGBACK WELDMENT ¹	1
14	6534	DRIVE PIN ¹	1
15	6252	GASKET (BUNA, FILL COVER) ^{1,3}	1
16	5895	SPRING ¹	1
17	6532	LIP SEAL (POLY) ¹	1
18	6374	NUT (HEX JAM) ¹	1
19	6375	SEAL WASHER ¹	1
20	NV2001	VENT ASSEMBLY ¹	1
21	9241	MOTION CONTROL ¹	1

1 - Included in P/N 6600 - Fill Cover Assembly
 2 - Also available in Viton - P/N 4874, 3 - Also available in Viton - P/N 6263



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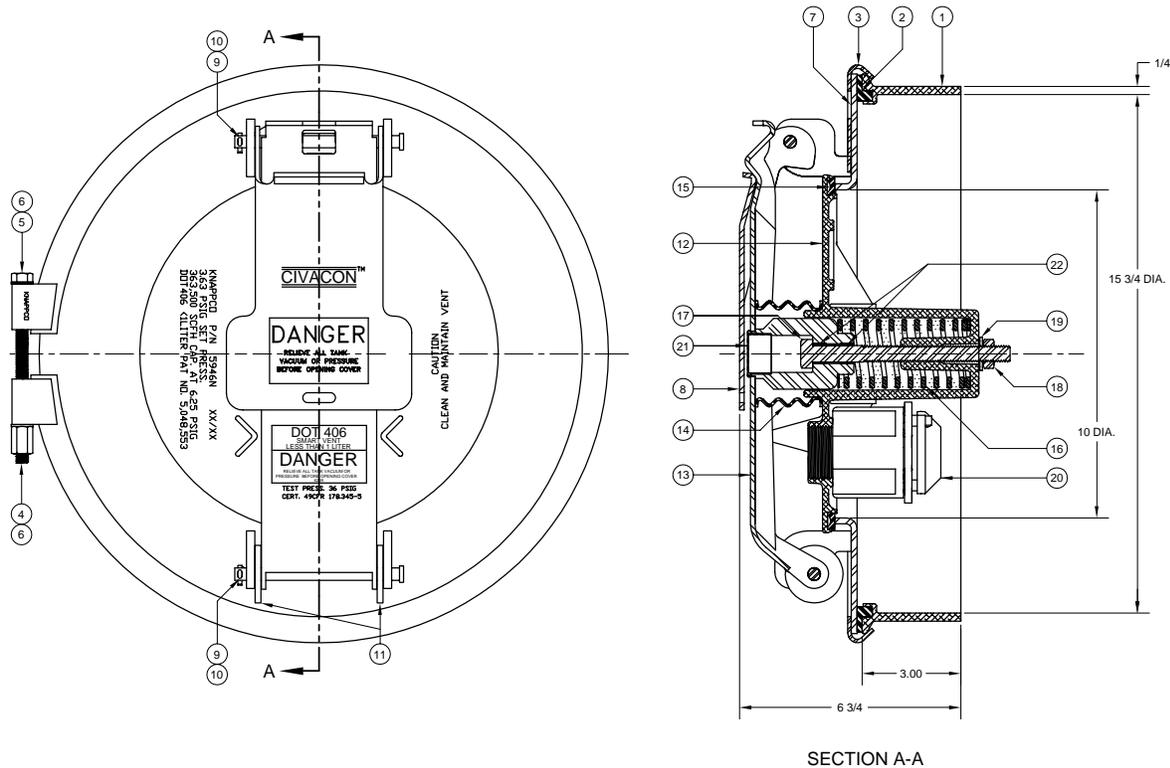
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Rev. 0, January 2003

ST111100 16" MANHOLE ASSEMBLY



SECTION A-A

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	4754	WELD RING	1
2	4645	GASKET (BUNA, WELD RING) ²	1
3	3271	CLAMP RING	1
4	5009	NUT (HEX HEAD)	1
5	1110	SCREW (HEX HEAD)	1
6	1113	WASHER	2
7	6151	COVER WELDMENT	1
8	6121	LATCH	1
9	5951	CLEVIS PIN	2
10	1045	COTTER PIN	2
11	6025	WASHER	2

ITEM	PART NUMBER	DESCRIPTION	QTY.
12	5870	FILL COVER ¹	1
13	5988	STRONGBACK WELDMENT ¹	1
14	5960	BOOT ¹	1
15	6252	GASKET (BUNA, FILL COVER) ^{1,3}	1
16	5895	SPRING ¹	1
17	5890	SCREW (HEX HEAD) ¹	1
18	5681	NUT (HEX SEAL) ¹	1
19	9874	SEAL WASHER ¹	1
20	NV2001	VENT ASSEMBLY ¹	1
21	5961	PLUG (PLASTIC) ¹	1
22	6755	BUSHING ¹	2

1 - Included in P/N 5946N - Fill Cover Assembly

2 - Also available in Viton - P/N 4873, 3 - Also available in Viton - P/N 6263

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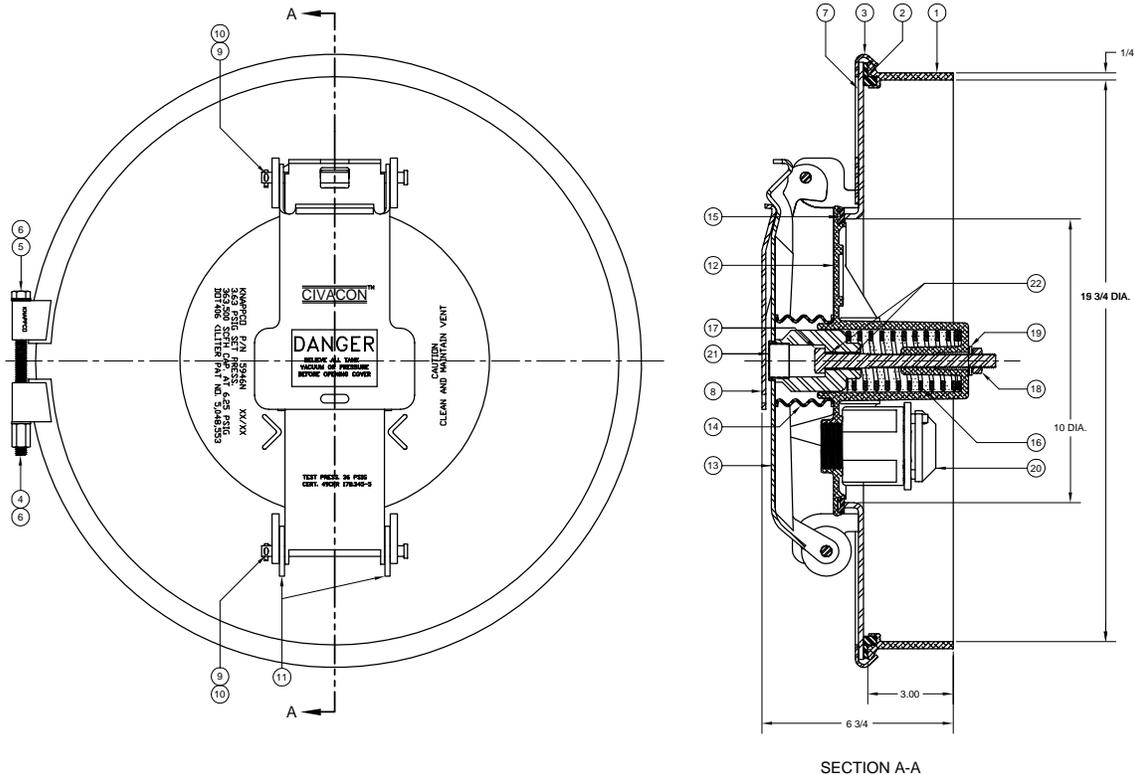
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SU111100 16" MANHOLE ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	4755	WELD RING	1
2	4646	GASKET (BUNA, WELD RING) ²	1
3	3250	CLAMP RING	1
4	5009	NUT (HEX HEAD)	1
5	1110	SCREW (HEX HEAD)	1
6	1113	WASHER	2
7	6153	COVER WELDMENT	1
8	6121	LATCH	1
9	5951	CLEVIS PIN	2
10	1045	COTTER PIN	2
11	6025	WASHER	2

ITEM	PART NUMBER	DESCRIPTION	QTY.
12	5870	FILL COVER ¹	1
13	5988	STRONGBACK WELDMENT ¹	1
14	5960	BOOT ¹	1
15	6252	GASKET (BUNA, FILL COVER) ^{1,3}	1
16	5895	SPRING ¹	1
17	5890	SCREW (HEX HEAD) ¹	1
18	5681	NUT (HEX SEAL) ¹	1
19	9874	SEAL WASHER ¹	1
20	NV2001	VENT ASSEMBLY ¹	1
21	5961	PLUG (PLASTIC) ¹	1
22	6755	BUSHING ¹	2

1 - Included in P/N 5946N - Fill Cover Assembly
 2 - Also available in Viton - P/N 4874, 3 - Also available in Viton - P/N 6263

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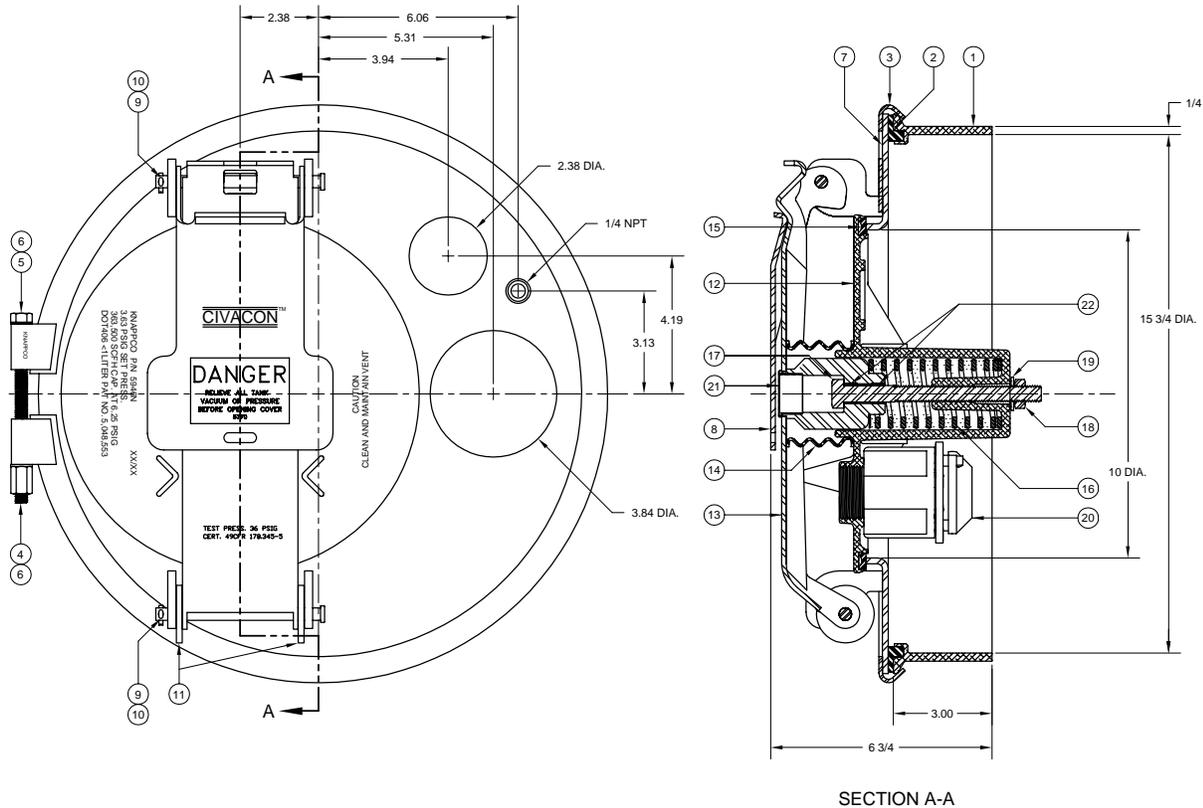
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Rev. 0, January 2003

SV111110 16" MANHOLE ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	4754	WELD RING	1
2	4645	GASKET (BUNA, WELD RING) ²	1
3	3271	CLAMP RING	1
4	5009	NUT (HEX HEAD)	1
5	1110	SCREW (HEX HEAD)	1
6	1113	WASHER	2
7	6006	COVER WELDMENT	1
8	6121	LATCH	1
9	5951	CLEVIS PIN	2
10	1045	COTTER PIN	2
11	6025	WASHER	2

ITEM	PART NUMBER	DESCRIPTION	QTY.
12	5870	FILL COVER ¹	1
13	5988	STRONGBACK WELDMENT ¹	1
14	5960	BOOT ¹	1
15	6252	GASKET (BUNA, FILL COVER) ^{1,3}	1
16	5895	SPRING ¹	1
17	5890	SCREW (HEX HEAD) ¹	1
18	5681	NUT (HEX SEAL) ¹	1
19	9874	SEAL WASHER ¹	1
20	NV2001	VENT ASSEMBLY ¹	1
21	5961	PLUG (PLASTIC) ¹	1
22	6755	BUSHING ¹	2

1 - Included in P/N 5946N - Fill Cover Assembly

2 - Also available in Viton - P/N 4873, 3 - Also available in Viton - P/N 6263

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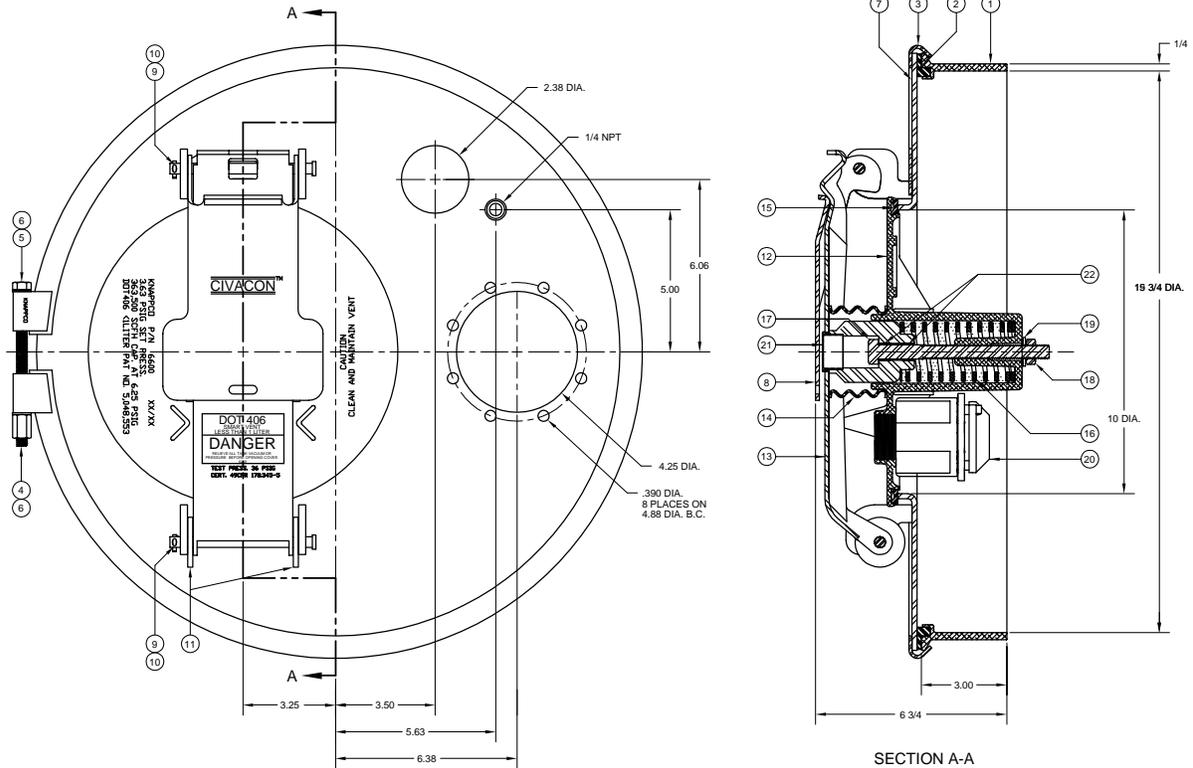
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SW111120 16" MANHOLE ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	4755	WELD RING	1
2	4646	GASKET (BUNA, WELD RING) ²	1
3	3250	CLAMP RING	1
4	5009	NUT (HEX HEAD)	1
5	1110	SCREW (HEX HEAD)	1
6	1113	WASHER	2
7	6049	COVER WELDMENT	1
8	6121	LATCH	1
9	5951	CLEVIS PIN	2
10	1045	COTTER PIN	2
11	6025	WASHER	2

ITEM	PART NUMBER	DESCRIPTION	QTY.
12	5870	FILL COVER ¹	1
13	5988	STRONGBACK WELDMENT ¹	1
14	5960	BOOT ¹	1
15	6252	GASKET (BUNA, FILL COVER) ^{1,3}	1
16	5895	SPRING ¹	1
17	5890	SCREW (HEX HEAD) ¹	1
18	5681	NUT (HEX SEAL) ¹	1
19	9874	SEAL WASHER ¹	1
20	NV2001	VENT ASSEMBLY ¹	1
21	5961	PLUG (PLASTIC) ¹	1
22	6755	BUSHING ¹	2

1 - Included in P/N 5946N - Fill Cover Assembly
 2 - Also available in Viton - P/N 4874, 3 - Also available in Viton - P/N 6263

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