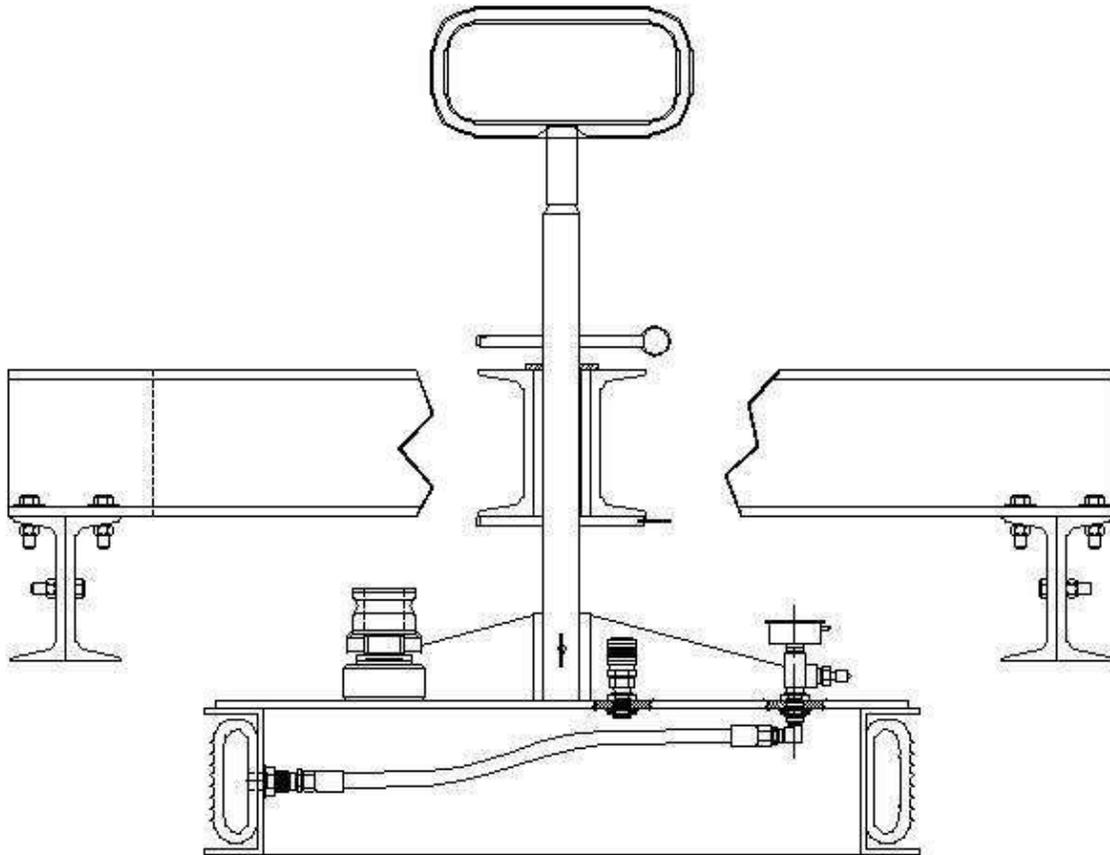


INSTRUCTIONS

AIR-LOC® Vacuum Manhole Tester

24", 26", 30", 32" & 36" Sizes



Approved by Tom Beckey

Date 9/20/2004

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UNPACKING

Inspect the product as soon as it is received. If you find damage, notify the delivering carrier immediately to begin the claims process. Carriers have the right to refuse claims for damage if it's not promptly identified.

LIMITED WARRANTY

Manufacturer warrants all products manufactured by it will be free from defects in material and workmanship for one (1) year following the date of manufacture. If any of the goods are found to be defective, such goods will, at manufacturer's option be replaced or repaired at manufacturer's cost. The parties hereto expressly agree that buyer's sole and exclusive remedy against the manufacturer shall be for repair or replacement of defective goods as provided herein. (The sole purpose of the stipulated exclusive remedy shall be to provide the buyer with free repair and replacement of defective goods in the manner provided herein. The exclusive remedy shall not be deemed to have failed of its essential purpose so long as the manufacturer is willing and able to repair or replace defective goods in the prescribed manner.) Goods which may be sold by manufacturer but are not manufactured by it are not warranted by manufacturer, but are sold only with the warranties, if any, of the original manufacturers thereof. (This warranty does not cover labor or other costs or expenses to remove or install any defective, repaired or replaced goods.) Manufacturer's warranty does not apply to any goods which have been subjected to misuse, mishandling, misapplication, neglect (including but not limited to use of unauthorized parts or attachments), or adjustment or repair performed by anyone other than manufacturer or one of manufacturer's authorized agents.

Any claim by buyer with reference to the goods sold hereunder shall be deemed waived by the buyer unless submitted in writing to manufacturer within the earlier of (1) thirty days (30) days following the date buyer discovered or by reasonable inspection should have discovered, any claimed breach of the foregoing warranty, or (2) thirteen (13) months following the date of manufacture. Any cause of action for breach of the foregoing warranty shall be brought within one year from the date the alleged breach was discovered or should have been discovered, whichever comes first.

LIMITATION OF LIABILITY. Manufacturer's liability (whether under the theories of breach of contract or warranty, negligence, or strict liability) for its goods shall be limited to repairing or replacing parts found by the manufacturer to be defective, or at manufacturer's option, to refunding the purchase price of such goods or parts thereof.

DISCLAIMER OF CONSEQUENTIAL DAMAGES. In no event shall manufacturer be liable for consequential damages arising out of or in connection with this agreement, including without limitation breach of any obligation imposed on manufacturer hereunder or in connection herewith. Consequential damages for purposes hereof shall include, without limitation (including death) to any person, or loss of or damage to property (including without limitation property handled or processed by the use of goods). Buyer shall indemnify manufacturer against all liability, cost or expense which may be sustained by manufacturer on account of any such loss, damage or injury.

DEFECTIVE PRODUCTS POLICY. To obtain performance under this warranty, any product suspected of having a manufacturing defect in materials or workmanship at manufacturers request must be returned to CHERNE INDUSTRIES INCORPORATED, freight prepaid, for inspection. A returned goods authorization must be obtained before shipping any product back to CHERNE. Call 1-800-843-7584 and ask for customer service.

CUSTOMER TRANSPORTATION REIMBURSEMENT. Whenever CHERNE repairs or replaces a product at CHERNE'S expense CHERNE will reimburse the distributor by credit memo, the surface freight amount it cost CHERNE to return the warranty items.

The foregoing warranty is in lieu of all other warranties express or implied, including those of merchantability or fitness for any purpose not expressly set forth herein. No affirmation of manufacturer, by words or action, other than as set forth in this language shall constitute a warranty.



WARNING Test all manholes for gases before using the Manhole Tester. Ventilate the manhole if toxic or flammable gases are present. **Gases can cause injury, asphyxiation and death!** If the sewer system has hazardous gases from sewage or solvents, the Manhole Tester may draw them into the manhole during the vacuum operation. Test again for gases after the vacuum operation if you need to enter the manhole.

INTRODUCTION

The Cherne Manhole Tester is used for testing the integrity of manholes and their resistance to water infiltration/exfiltration using a vacuum as a test medium. The manhole's integrity is checked by measuring the vacuum loss over a specified time. If too much vacuum is lost, the manhole is defective and must be repaired.

This manual will help you install and operate the Manhole Tester. Parts lists of the test heads and vacuum pumps are included if it becomes necessary to order replacement parts.

PRODUCTS COVERED IN THIS MANUAL

PRODUCT #	DESCRIPTION
210-248	24" Manhole Tester
210-268	26" Manhole Tester
210-308	30" Manhole Tester
210-328	32" Manhole Tester
210-368	36" Manhole Tester

200-458	Air powered vacuum generator
200-908	Air powered vacuum generator (Hi-Flow)
055-348	20' Vacuum hose with vacuum gauge

DESCRIPTION

Refer to FIGURE 1

THE MANHOLE SUPPORT BRACE provides an easy way of controlling the depth of the Manhole Tester when it is positioned in the manhole chimney. It has a depth range of 0-24 inches (or 0-610 mm).

THE SEALING ELEMENT is a circular-shaped, multi-ribbed inflatable sealing ring that is situated within the Manhole Tester's inverted C-channel. When inflated, the element creates an air-tight seal between the Manhole Tester and the interior surface of the manhole.

THE TWO-INCH (50MM) AIR PRESSURE GAUGE monitors air pressure contained within the Manhole Tester sealing element. The range of the gauge is 0-60 psig (or 0-4.1 Bar).

Refer to FIGURE 2

THE ROTARY VANE VACUUM PUMP

Is used for drawing air out of the manhole. The pump is a rotary vane vacuum type which has a minimum pump rating of 20 cubic feet per minute (CFM) air flow when operating at 10 inches Hg. of vacuum.

The pump is powered by either a 5.5 horsepower gasoline Briggs engine or Honda engine (both tuned for use with unleaded regular gasoline).

!!CAUTION!!

ENGINE IS SHIPPED WITHOUT OIL

FILL ENGINE WITH OIL BY REMOVING OIL FILLER PLUG AND FILL UNTIL OVERFLOWING BEFORE ATTEMPTING TO START ENGINE

FAILURE TO FILL ENGINE WITH OIL BEFORE STARTING ENGINE WILL RESULT IN ENGINE FAILURE AND VOID THE WARRANTY.

VACUUM GENERATORS**Cherne Air-Loc® vacuum generator. (#200-458).**

The air operated vacuum generator has a minimum rating of 15 cubic feet per minute (CFM) air flow when operating at 10 inches Hg of vacuum. When supplied with at least 10 cubic feet per minute (CFM) at 100psi.

Cherne Hi-Flow Vacuum Generator. (#200-908).

The air operated vacuum generator has a minimum rating of 40 cubic feet per minute (CFM) airflow when operating at 10 inches Hg of vacuum. When supplied with at least 80 cubic feet per minute (CFM) compressor at minimum of 125psi.

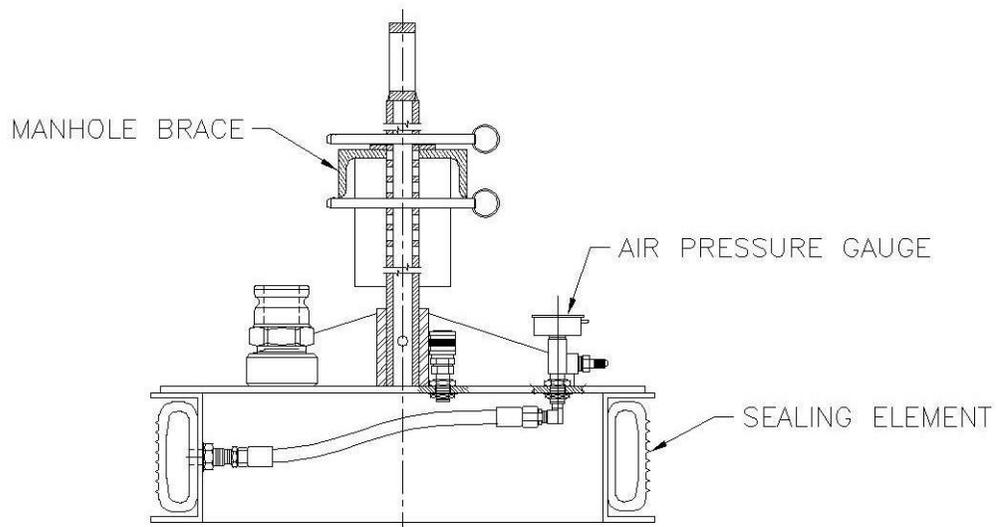


Fig 1.

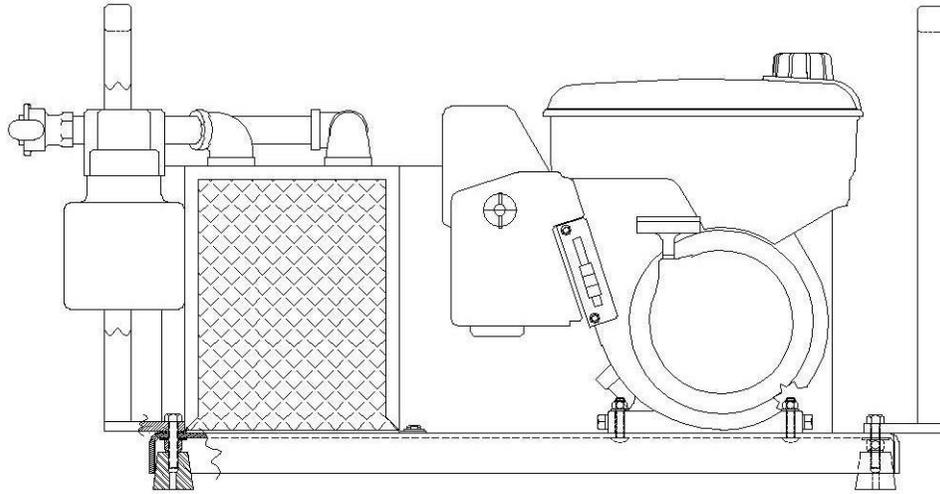


Fig. 2

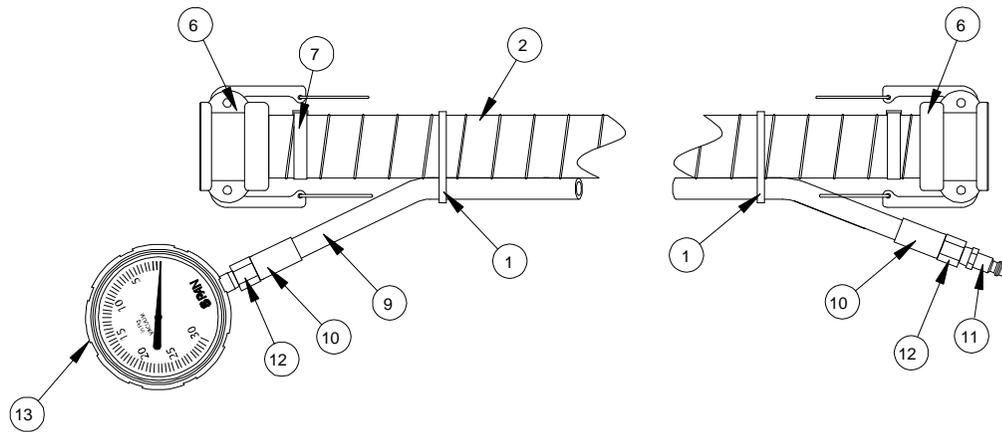


Fig. 3

SAFETY

1. Observe all state and federal regulations when entering manholes. Also follow Cherne's Manhole Safety Procedure on page 16 of this manual.

- 2.



DANGER!

**Never operate the manhole tester while a person is inside the manhole.
This may result in death or serious bodily injury!**

3. Never inflate the sealing element outside of a manhole – or inside a manhole chimney larger than the sealing element's specified size range.
4. Inflate the sealing element 55PSIG (3.8 Bar). DO NOT OVER-INFLATE.
5. Brace the pipeline inverts if the lines entering the manhole have not been back-filled. This will prevent the pipe from dislodging and being pulled into the manhole.
6. Do not pressurize any manhole with the Manhole Tester – the unit could dislodge and injure the operator.
7. Make sure the cross brace is properly positioned on the manhole ring prior to testing. NEVER REMOVE THE CROSS BRACE BEFORE OR DURING THE MANHOLE TEST – THIS COULD INJURE THE OPERATOR AND SEVERLY DAMAGE THE MANHOLE TESTER.
8. Make sure the inlet/outlet ball valve is closed before starting the vacuum generator or vacuum pump engine.
9. Always disconnect the air source or spark plug wire before servicing.
10. Wear a safety hat, safety glasses, and ear protection during operation.

PREPARING THE MANHOLE

1. Plug the manhole inverts and exits (other than the manhole top access) using proper sized pneumatic or mechanical plugs.

CAUTION!

FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS AND WARNINGS REGARDING SAFE AND PROPER INSTALLATION OF SUCH PLUGS. MAKE SURE THE PLUGS ARE PROPERLY RATED FOR THE PRESSURES REQUIRED IN THE TEST. THE STANDARD TEST OF 10" MERCURY IS EQUIVALENT TO ABOUT 5 PSIG (0.3 BAR) BACKPRESSURE. CHERNE INDUSTRIES INCORPORATED RECOMMENDS THAT THE PLUGS USED HAVE A BACK PRESSURE RATING OF AT LEAST 10 PSIG/0.7 BAR AND BE BLOCKED.

2. Brace the pipeline inverts if the lines entering the manhole have not been back-filled. This will prevent the pipe from dislodging and being pulled into the manhole.

INSTALLATION AND OPERATION

Refer to the parts list and drawings on pages 13-18.



DANGER!

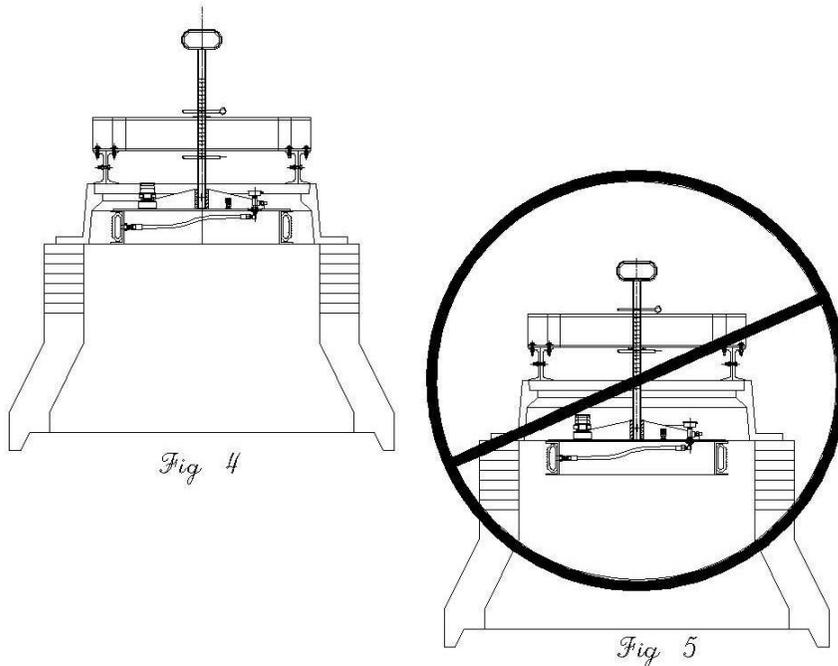
**Never operate the manhole tester while a person is inside the manhole.
This may result in death or serious bodily injury!**

1. Remove the manhole cover and place the Manhole Tester in the manhole chimney.
2. Adjust the cross brace (item 19) so the sealing element will seal against the manhole ring as shown in Fig 3.
3. This adjustment is done by moving the pin (item 17) and flat washer (item 18) on the support rod (item 16). The Manhole Tester must be in this position to create a proper seal.

NOTE: For best results, pre-test the manhole before back-filling.

NOTE: You may set the Manhole Tester in the straight" neck area of the manhole if there's at least 3" of contact area. Placing the Manhole Tester in this area will allow effective testing. However, this method does not ensure the ring assembly is properly secured to the rest of the manhole.

4. Inflate the Manhole Tester sealing element to 55 PSIG (3.8 bar) by way of the 5' extension hose. DO NOT OVER-INFLATE!
5. Attach the suction hose to the coupling on the Manhole Tester.



WARNING!

Manhole tester can suddenly shoot upwards. This can happen if the plugs suddenly dislodge for any reason. As the plugs move they can pressurize the manhole causing the tester to shoot upwards suddenly. This may cause death, severe injury and/or property damage.

Testing with gas engine powered vacuum pumps.

6. Prime and start the engine according to the manufacturer's instructions.
7. Honda engine models: The engine throttle is pre-set to achieve maximum RPM.
8. Briggs engine models: Place the throttle in the "fast" position to achieve maximum RPM.
9. Open the ball valve to pull a vacuum in the manhole. The normal test is 10" Hg.
10. Close the ball valve and monitor the vacuum for the specified test period.
11. If the vacuum drops less than one inch of mercury within the test time, the manhole is considered acceptable and passes the test. If the manhole fails and leaks, make the needed repairs and test again until satisfactory results are obtained.

12. To disconnect from vacuum pump, shut engine off, turn 3-way valve to vent the hose releasing the vacuum, disconnect hose when vacuum gauge reads zero.

13. Repeat this manhole test after back filling.

Testing with vacuum generator #200-908, #200-458 and #200-308.

1. Connect “vacuum” port on generator #200-308 or #200-458 to adapter #055-398 to allow use of the 1-1/2” vacuum hose assy. #055-348. If using vacuum generator #200-908, connect directly to hose assy. Connect vacuum hose and read-back hose w/gauge to manhole tester plate. Make sure the vacuum ball valve is in the closed position.

2. Connect “air supply” port on generator to output hose from compressor.
CAUTION: Make sure the compressor output hose has zero gauge pressure when connecting /disconnecting from the vacuum generator.

3. Pressurize the output hose from the compressor.
CAUTION: Wear hearing & eye protection, keep face away from exit port of vacuum generator.

4. Open the ball valve and evacuate manhole to 10” Hg. (0.3) bar.

5. Close vacuum inlet ball valve and monitor vacuum for the specified time period. If the vacuum does not drop in excess of 1” Hg. over the specified time period, the manhole is considered acceptable and passes the test.

6. To disconnect vacuum generator from manhole tester: Depressurize the compressor output hose, open ball valve, then disconnect the vacuum generator when the vacuum gauge reads zero.

7. Repeat this manhole test after back filling.

DEPTH (FEET) MANHOLE LENGTH	48 INCH	60 INCH	72 INCH
8	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	65
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97
26	64	85	105
28	69	91	113
30	74	98	121

Maintenance

1. Don't let the Manhole Tester sit in direct sunlight for long periods of time – the sun's ultra-violet rays will cause the rubber bladder to deteriorate.

Replacing the sealing bladder

Removing the damaged bladder

1. Remove the manhole tester from the manhole and disconnect the inflation hose (item 23) from the bladder.
2. Using the proper wrench, remove the hex nut from the bladder inflation fitting.
3. Remove the damaged bladder from the weld assembly with pry bars and dispose of it properly (return it to Cherne if it is covered under warranty).

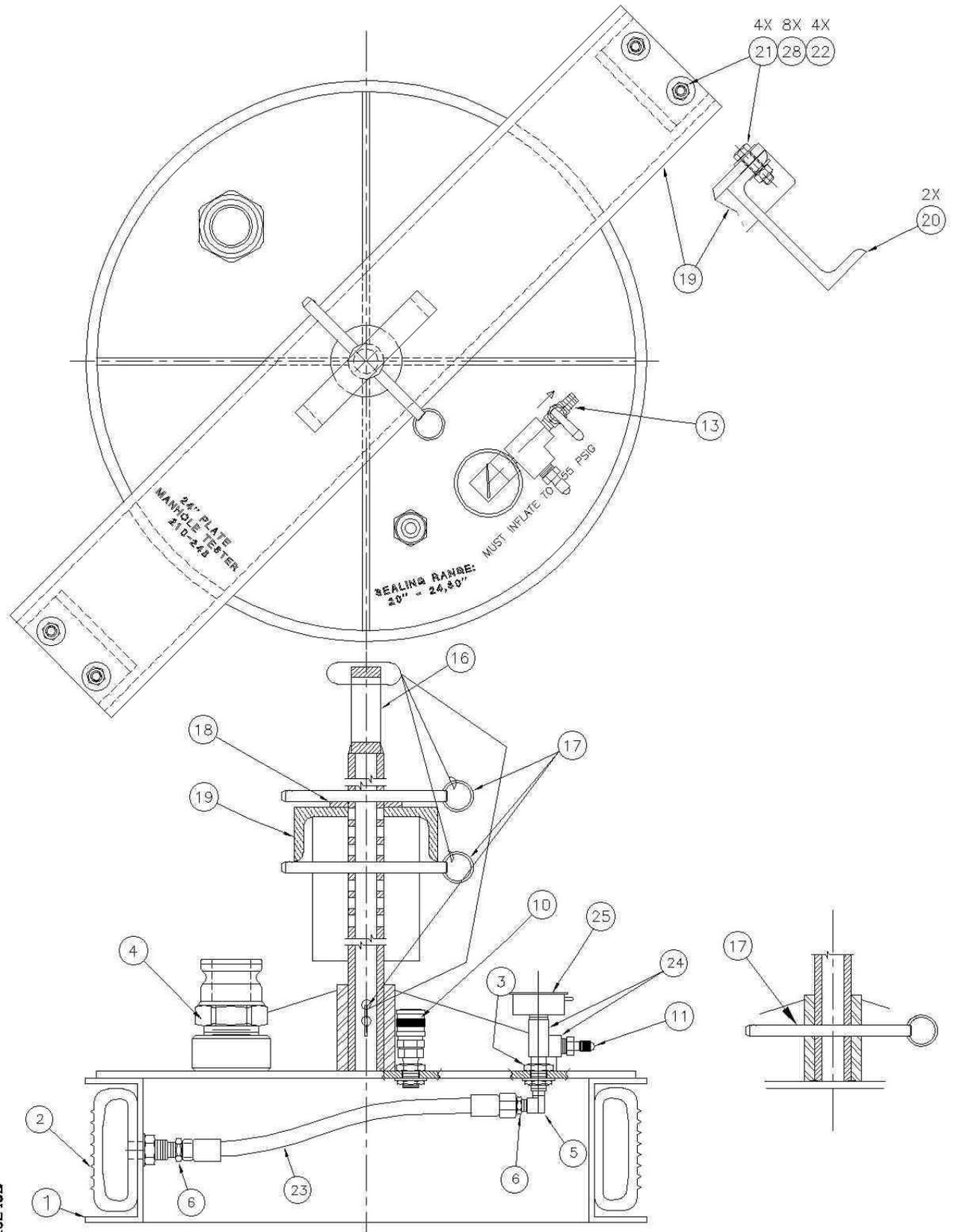
Installing the new bladder

4. Insert the bladder inflation fitting through the weld assembly's $\frac{3}{4}$ inch inflation hole. Secure the fitting on the inside of the weld assembly using the hex nut supplied with the new bladder.
5. Apply a light coat of liquid silicone to the inside of the bladder and to the edges of the weld assembly. Corn starch or soapy water may be used if desired.
6. Stretch the bladder over the weld assembly (using pry bars) and into the weld assembly channel.
7. Reconnect the inflation hose to the bladder inflation fitting.

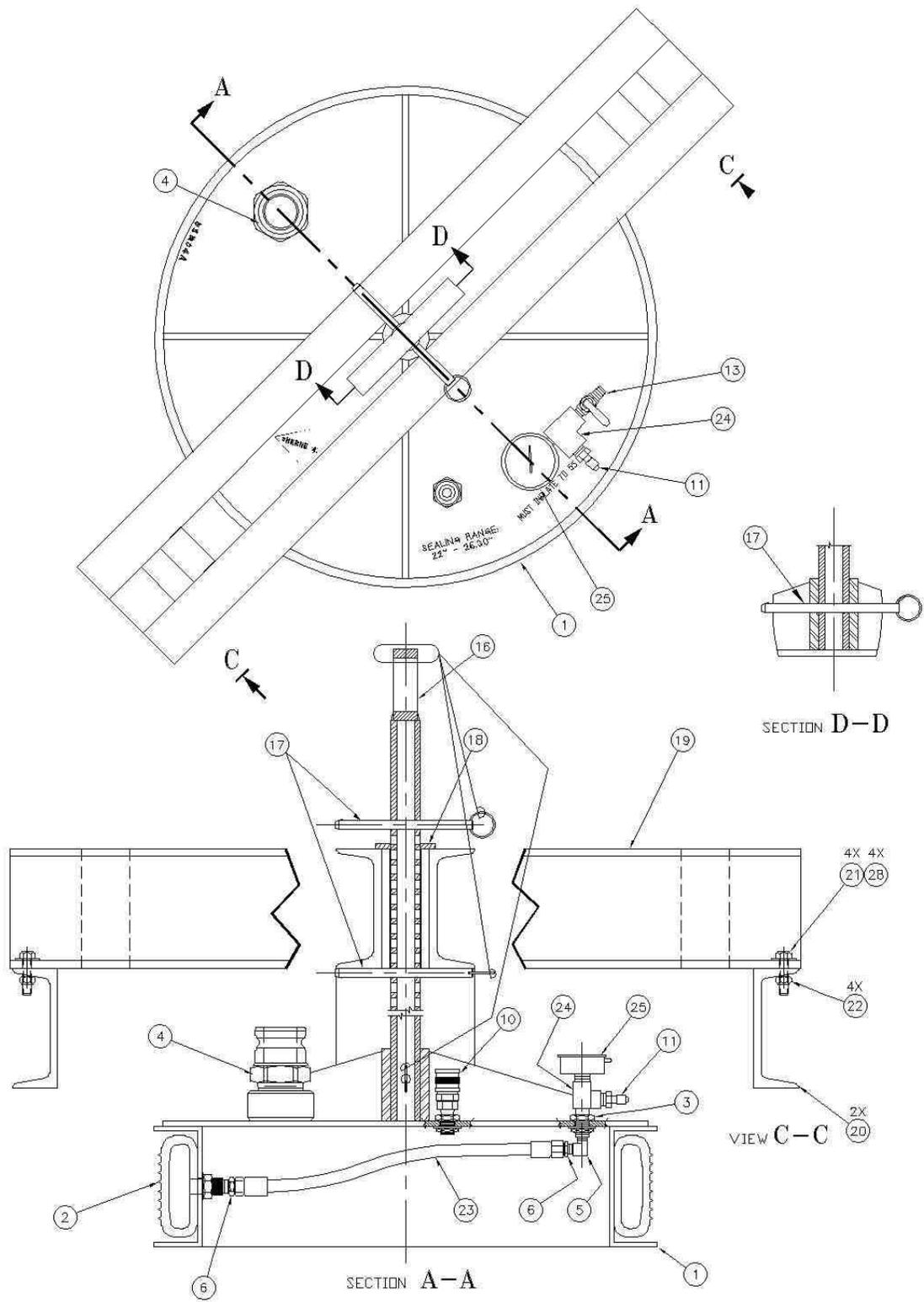
MANHOLE TESTER (HEAD ASSEMBLY) PARTS LIST

Refer to drawings on following pages

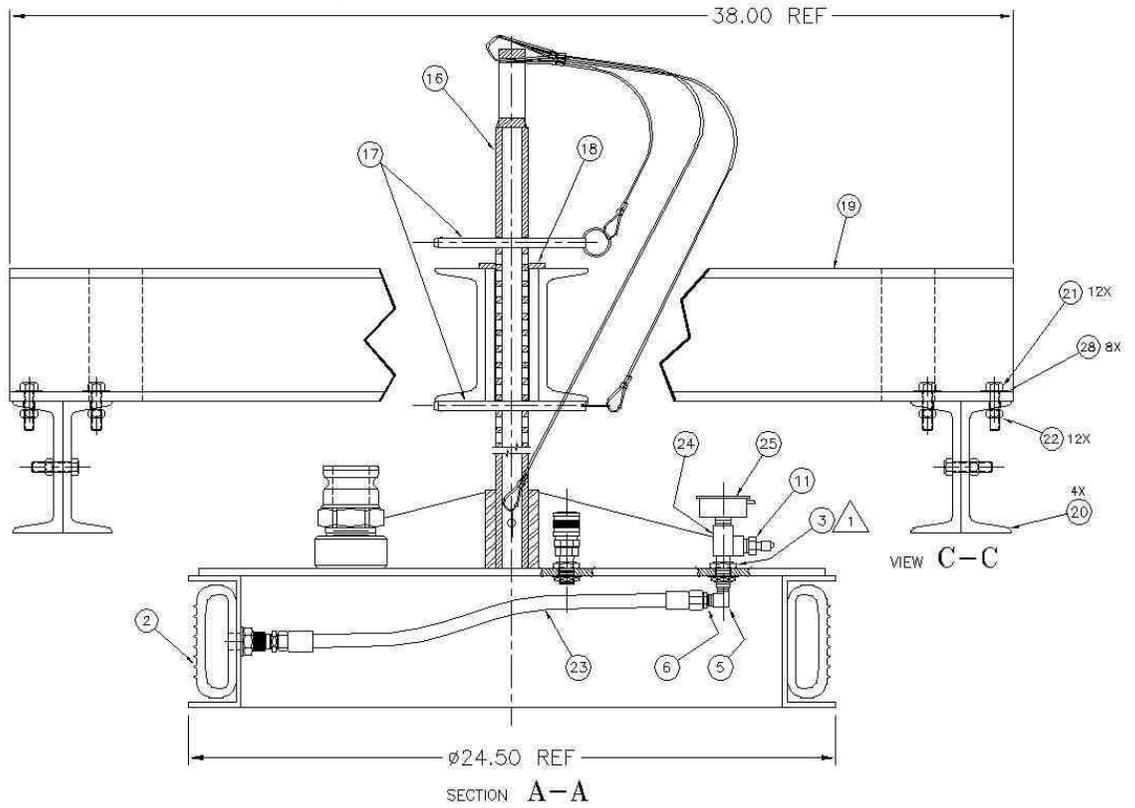
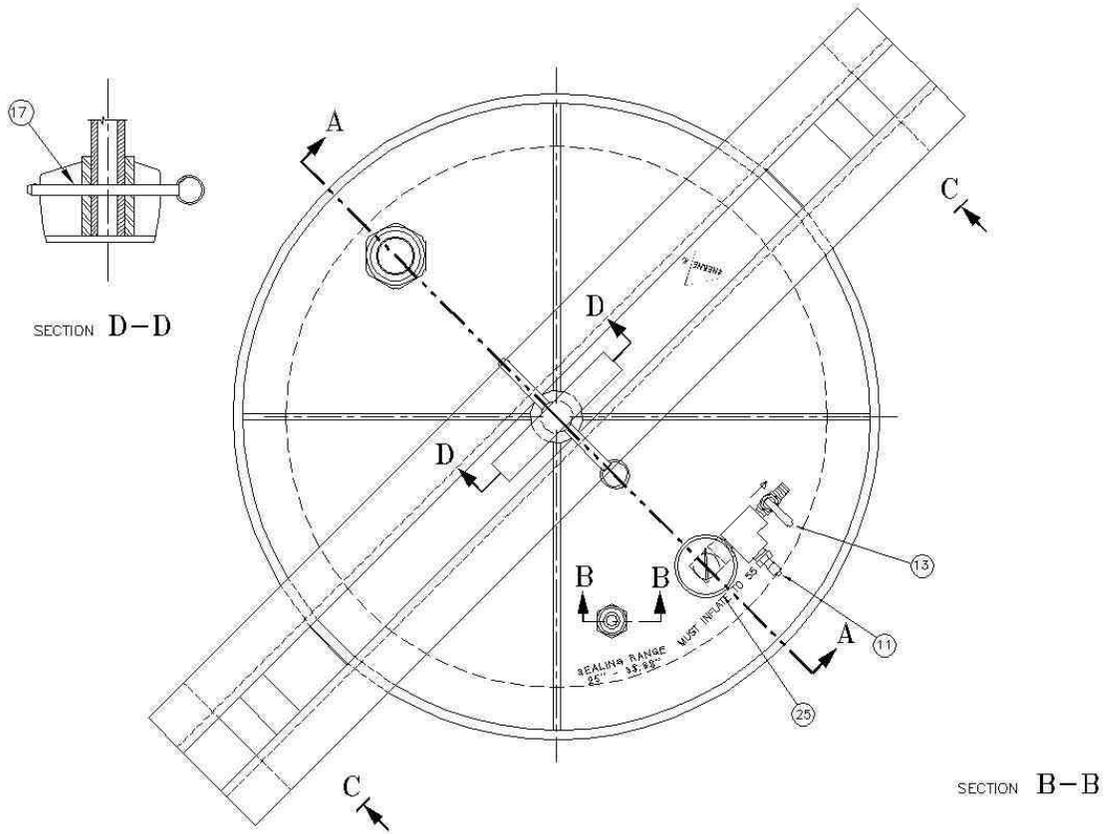
<u>ITEM</u>	<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	028-128	24" Weld Assembly
		028-138	26" Weld Assembly
		028-158	30" Weld Assembly
		028-168	36" Weld Assembly
2	1	098-485	24" Sealing Element
		008-404	26" Sealing Element
		099-406	30" Sealing Element
		063-541	36" Sealing Element
3	2	002-518	1/4" Bulkhead
4	1	054-308	1-1/2" Coupler, Cam and Groove
6	1	251-615	Swivel Ball adapter
10	1	054-978	1/4" Quick-Coupler
11	1	277-037	Snifter valve
13	1	031-138	1/4" Ball valve
16	1	025-248	Rod support
17	3	025-298	Pin, quick release
18	1	025-288	Flat washer, 2.5" O.D.
19	1	028-098	Brace, 24" Assy.
		028-108	Brace, 26" Assy.
		028-508	Brace, 30" Assy.
		025-268	Brace, 36" Assy.
20	2	025-258	Leg Brace, 24" Assy.
	2	025-278	Leg Brace, 26" Assy.
	4	" "	Leg Brace, 30" and 36" Assys.
21	4	000-396	Bolt, 1/4-20 x 1" (24" Assy)
	4	000-515	Bolt, 3/8-16 x 1.5" (26" Assy)
	12	" "	" " (30" and 36" Assys)
22	5	037-338	Nut, 1/4-20 (24" Assy)
	5	000-892	Nut, self-locking, 3/8-16 S.S. (26" Assy)
	12	" "	" " " (30" and 36" Assys)
23	1	068-195	Inflation hose, 14" (24", 26", 32" and 36" Assy)
23	1	035-498	Inflation hose, 18" (30" Assy)
24	2	003-492	1/4" Tee
25	1	251-372	Gauge (0-60 PSIG)
27	1	009-318	5' Extension hose
28	8	000-027	Washer, 1/4 flat (24" Assy)
	4	000-051	Washer, 3/8 flat (26" Assy)
	8	" "	" " (30" and 36" Assys)
	1	055-348	1-1/2" Vacuum hose w/vacuum gauge.



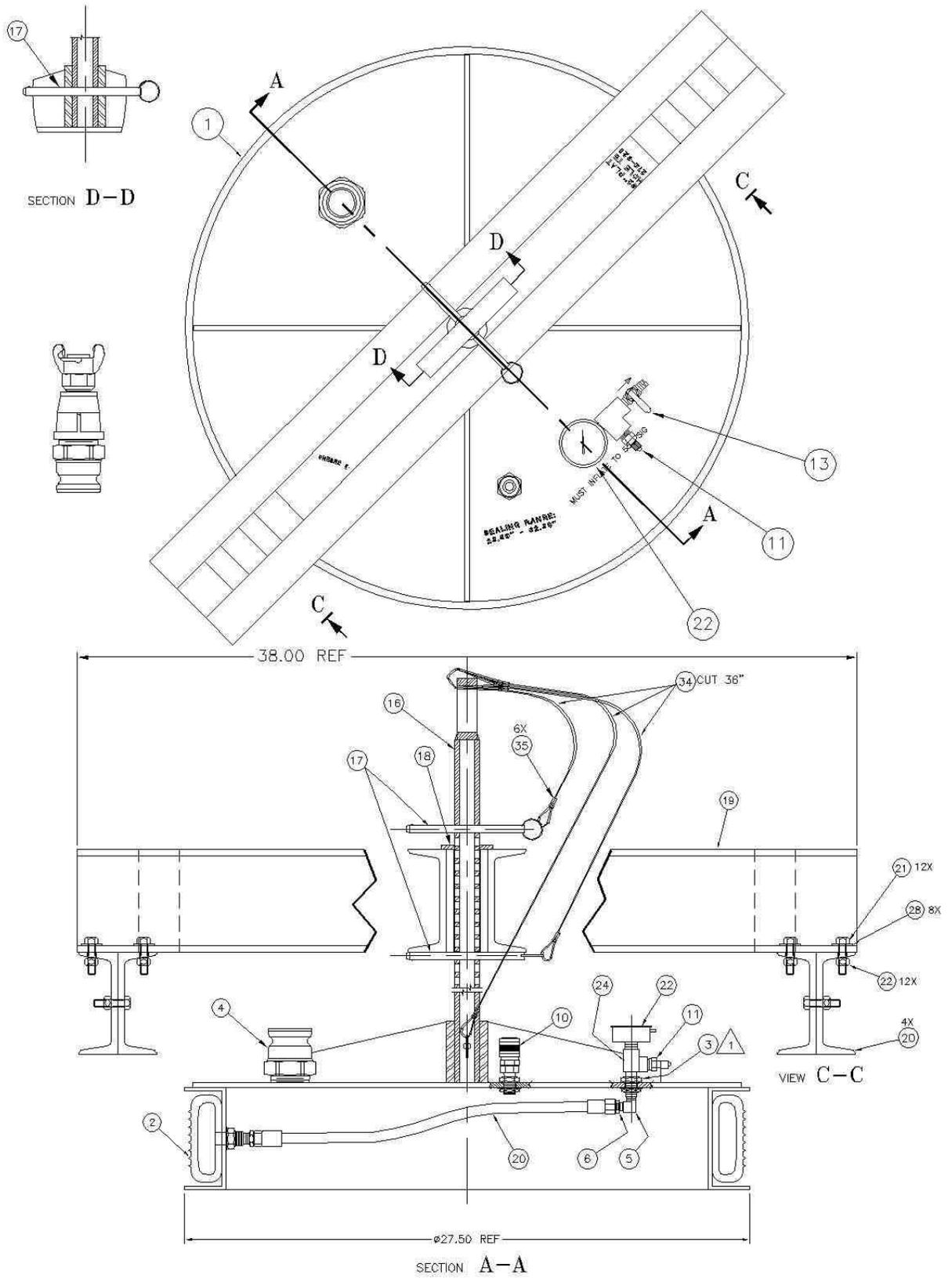
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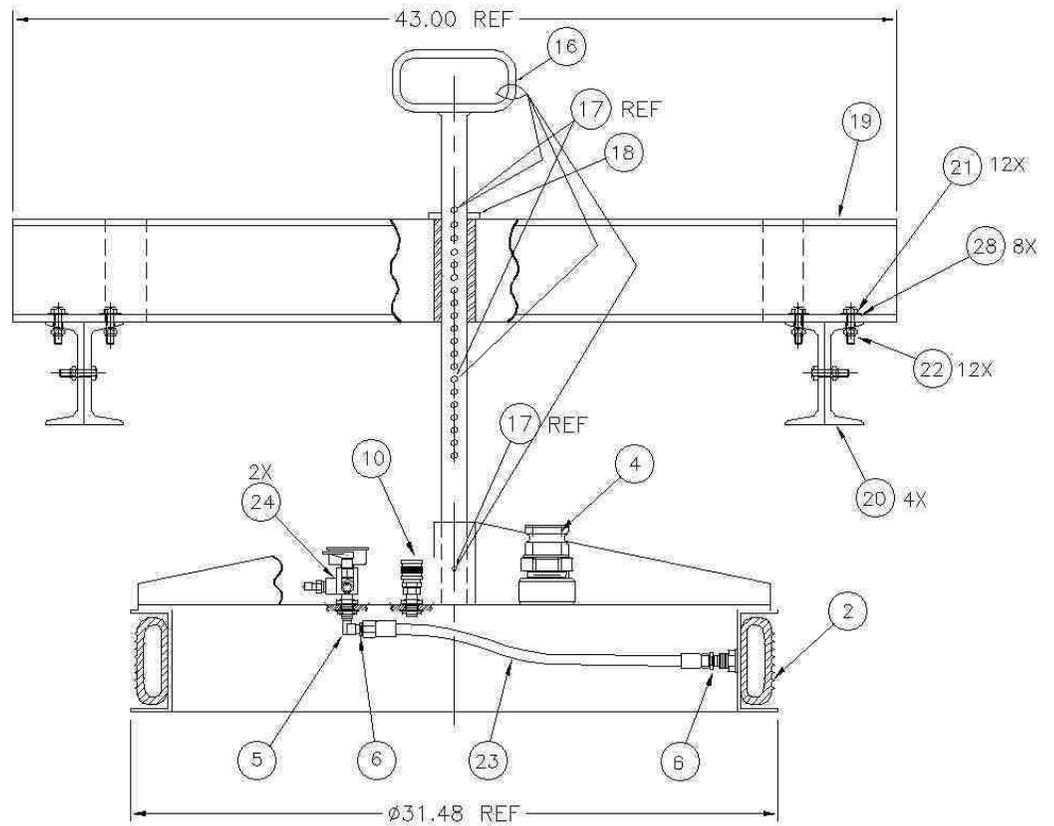
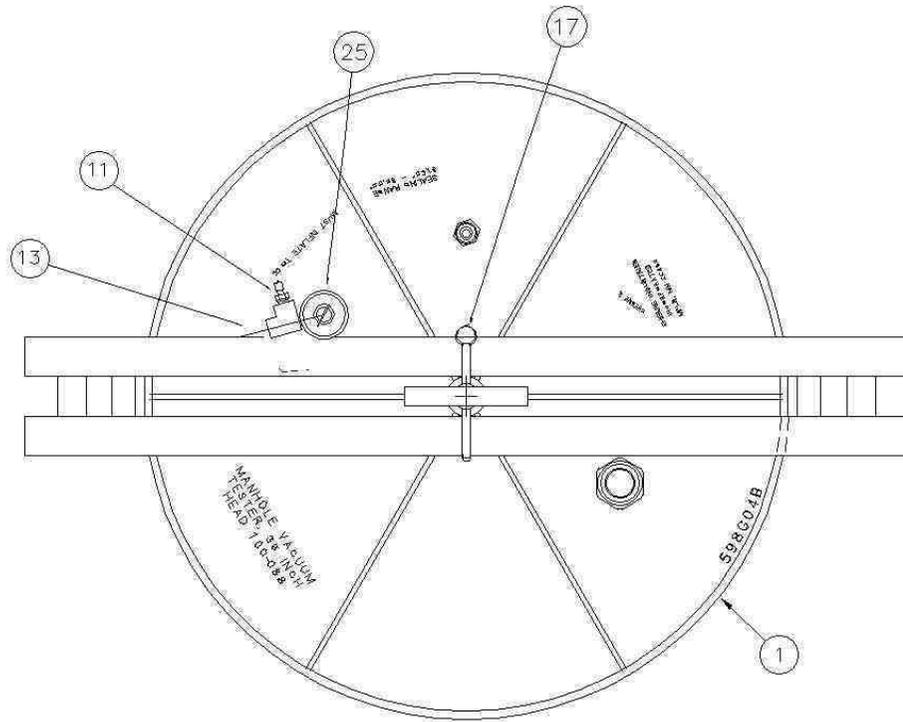


210268B



210308B





210368C1

MANHOLE SAFETY PROCEDURE

RECOMMENDED SAFETY PROCEDURE FOR ENTRANCE INTO MANHOLES OR CONFINED SPACES

WARNING: THESE RECOMMENDATIONS ARE TO BE USED AS A GENERAL GUIDELINE ONLY. ALTHOUGH CHERNE RECOMMENDS THESE FOLLOWING GUIDELINES, IT DOES NOT WARRANT, REPRESENT, OR ASSUME ANY RESPONSIBILITY THAT THESE RECOMMENDATIONS WILL FULFILL ALL APPLICABLE FEDERAL, STATE, OR LOCAL REQUIREMENTS. CHERNE ASSUMES NO LIABILITY FOR EITHER PERSONAL INJURY OR CONSEQUENTIAL DAMAGES THAT RESULT FROM THE RELIANCE ON THESE RECOMMENDATIONS.

WARNING: IT IS THE PRODUCT USER'S RESPONSIBILITY TO READ AND COMPLY WITH ALL APPLICABLE REGULATIONS. REFER TO THE CODE OF FEDERAL REGULATIONS, "'CFR" PART 1926 AND ALL OTHER PERTINENT FEDERAL, STATE, AND LOCAL REGULATIONS.

ALWAYS OUTFIT YOURSELF WITH THE NECESSARY SAFETY EQUIPMENT FOR ENTRANCE INTO A MANHOLE OR CONFINED SPACE. THIS MAY INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING ITEMS (REFER TO WARNING STATED IMMEDIATELY ABOVE):

Recommended equipment is as follows:

- | | |
|---|--|
| A. Safety Hat | G. Ear Protection |
| B. Safety Glasses | H. Hazardous Gas Detector and Oxygen Monitor |
| C. Respirator or Self-Contained Air Source | I. Manhole or Confined Space Ventilation |
| D. Safety Harness, Ropes, and Winching System | J. Protective Clothing |
| E. Safety Shoes or Boots | K. Safety Ladders |
| F. Protective Gloves | L. Any Other Recommended or Required |
- Equipment

ALWAYS ENSURE THAT ALL EQUIPMENT MEETS OR EXCEEDS THE MINIMUM REQUIREMENTS OF ALL APPLICABLE REGULATORY GUIDELINES. ALL EQUIPMENT SHOULD BE PROPERLY MAINTAINED, STORED, CALIBRATED IF NECESSARY, AND INSPECTED PRIOR TO EACH USE, IN COMPLIANCE WITH APPLICABLE REGULATIONS AND EQUIPMENT MANUFACTURER RECOMMENDATIONS.

ALWAYS PROPERLY VENTILATE MANHOLE OR CONFINED SPACE BEFORE ENTERING AND MAINTAIN VENTILATION WHILE IN MANHOLE OR CONFINED SPACE.

ALWAYS THOROUGHLY CHECK AT ALL LEVELS FOR HAZARDOUS GASES AND PROPER OXYGEN LEVELS (20% MINIMUM). CONTINUOUSLY MONITOR THESE LEVELS WHEN WORKERS ARE IN THE MANHOLE.

NEVER ENTER A MANHOLE OR CONFINED SPACE WITHOUT CO-WORKER ASSISTANCE. CO-WORKERS MUST BE PROPERLY TRAINED IN SAFETY REQUIREMENTS FOR ACCESS TO MANHOLES OR CONFINED SPACES.

IF YOU ENCOUNTER OR OBSERVE ANY CONDITIONS THAT ARE NOT EXPLAINED HERE OR NOT FULLY UNDERSTOOD BY YOU, NOTIFY YOUR SUPERVISOR OR SAFETY DIRECTOR BEFORE PROCEEDING.

ALWAYS CONSULT WITH PROPER STATE, LOCAL, AND FEDERAL AGENCIES TO INSURE THAT ALL REQUIRED REGULATIONS ARE BEING FULFILLED.

FAILURE TO COMPLY WITH PROPER SAFETY REGULATIONS MAY RESULT IN DEATH, SERIOUS BODILY INJURY AND/OR PROPERTY DAMAGE.