



T.D. Williamson, Inc.

Instructions for the Preparation and Use of TDW 4- through 56-inch Inflatable UNISPHERE™ Pigs

1.0 Introduction

The purpose of this publication is to provide instructions for the preparation, handling and use of TDW inflatable UNISPHERE™ Pigs.

2.0 Description

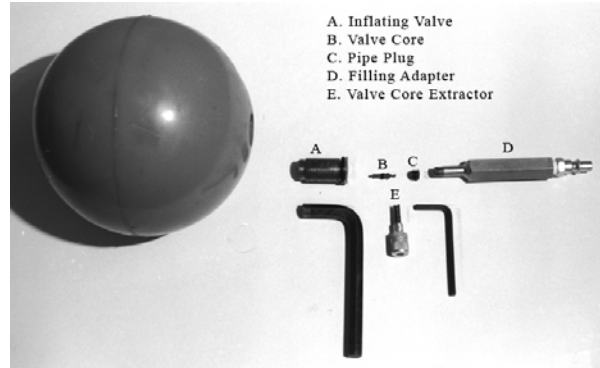
TDW UNISPHERE Pigs are seamless, liquid cast polyurethane balls. They are designed for service in the removal of liquid hydrocarbons and water from pipelines and piping systems, and batch separation for pipelines handling different liquids. Inflatable UNISPHERE Pigs range in size from 4- through 56-inch. They are hollow, are filled with liquid and can be inflated with pressure to match pipeline inside diameter.

TDW spheres can be used in natural gas, crude oil and refined hydrocarbon products. The factory should be consulted before spheres are used in special chemicals. Table 1 (page 4) shows the specifications for various sized spheres.

3.0 Preparations for Use

3.1 General Information

- A. 4-inch and larger Inflatable UNISPHERE Pigs must be filled with liquid before placing into service. A water, water/glycol, or light lube oil solutions recommended. Avoid using pure glycol as a filing solution.
- B. 4- through 8-inch .spheres have one filling valve. Larger spheres have two filling valves on opposite sides, and either valve can be used to fill and inflate the spheres.
- C. The components which make up an inflatable sphere and the tools required are shown in figure 1.



**Figure 1. Inflatable UNISPHERE™
Pig Components and Tools**

3.2 Filling Procedures

- A. Remove the inflating valve using a 3/8-inch Allen wrench as shown in Figure 2.

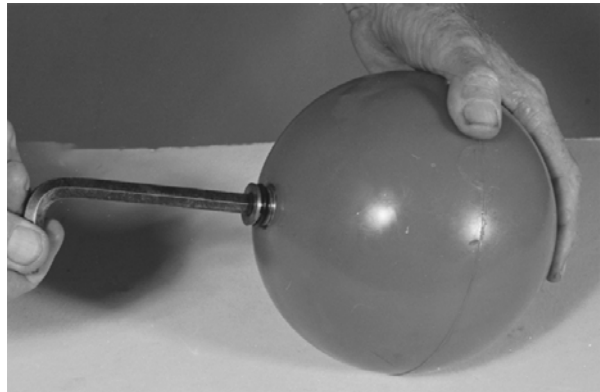


Figure 2. Remove Inflating Valve

- B. Fill the sphere with liquid, using a funnel or hose, as shown in Figure 3. The opening must at the top and the sphere completely filled. All air must be displaced with liquid.



Figure 3. Fill With Liquid

- C. Inspect O-Ring on inflating valve for nicks and cuts, and replace if necessary. Apply lubricant to O-Ring and threads. See Figure 4.



Figure 4. Inflating Valve

- D. Remove pipe plug and check tightness of valve as shown in Figure 5. A valve core extractor (part number 00-1833-0002) is available.
- E. Install inflating valve and tighten securely.



Figure 5. Check Tightness of Valve Core

3.3 Inflating Procedures

If spheres are to be inflated, a filling adapter, part number 00-1831-0003 is required. See Figure 6. A hydraulic pump is also available under part number 01-0506-0000, and is shown in Figure 7.



Figure 6. Filling Adapter



Figure 7. Hydraulic Pump

Spheres should not be inflated beyond pipe ID. Over inflation will cause excessive and uneven wear. A small cross section of the pipe can be placed over the sphere as a gauge in determining the desired OD. Check Table 1 for inflation limitations.

- A. Remove 1/16-inch pipe plug from inflating valve using a 5/32 Allen wrench. See Figure 8.

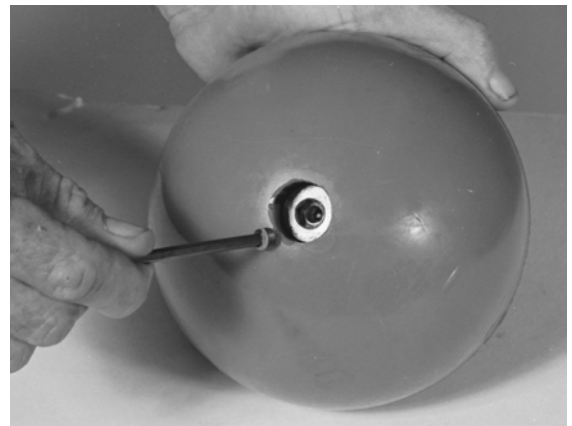


Figure 8. Remove Pipe Plug

- B. Thread filling adapter into inflating valve.
- C. Remove cap from top of pump. See Figure 7. Fill with same liquid used in sphere.
- D. Purge air from hose by pumping the pump.
- E. Connect the pump to filling adapter when air is purged. See Figure 9.



Figure 9. Connect Pump

- F. Inflate sphere to desired OD.

- G. Detach hydraulic pump from filling adapter.
- H. Remove filling adapter, making sure that inflating valve does not back out.
- I. Apply Teflon tape to 1/16-inch pipe plug and reinstall. Tighten to prevent pipeline pressure from going into sphere.

4.0 Handling

The larger the sphere, the more difficult it is to handle. When filled with liquid, the larger sphere is heavy and awkward to lift. For example, a 16-inch sphere filled with liquid weighs about 70 lbs, and a 30-inch, 500 lbs. Handling equipment with sharp edges or points should not be used, as it will cut and gouge the urethane, reducing its effectiveness.

Sphere handling tongs are available from TDW in different sizes. An example is shown in Figure 10. Used with a hoist, loading and unloading spheres is made easier.



Figure 10 Sphere Handling Tongs

5.0 Cleaning

Spheres should be cleaned as soon as possible after removal from the pipeline, especially when used in line containing large amounts of hydrogen sulfide (H₂S).

5.1 Removing Liquid, Powder or Mud

Clean with high pressure water jet.

5.2 Cleaning With Solvents

Diesel fuel or kerosene is acceptable cleaning solvents. The sphere can be immersed in, or wiped clean with either one.

6.0 Storage

6.1 New Spheres

New spheres should be left in shipping carton until ready for use.

6.2 Storage After Use

On return to storage after use, liquid can be left in the sphere. However, if the sphere has been inflated, the pressure should be relieved. If filled with water only, it should be stored where it will not freeze.

6.3 Storage Conditions

Extremes of temperature and humidity will hasten deterioration of urethane.

- A. Shelf life will be maximized when the temperature is maintained below 80° F with relative humidity less than 60 percent.
- B. Spheres should not be stored where they are subjected to direct sunlight.
- C. Urethane becomes very brittle when stored in extreme cold temperatures. If this type of storage has been necessary, spheres should be warmed before use.

TABLE 1

SPHERE SPECIFICATIONS

Size in Inches	Part Number	Approx. Wt. in Lbs. (Empty)	Approx. Wt. in Lbs. (Full of Water)	Min. Pipe ID in Inches	Max. Pipe ID in Inches*
4	01-1324-0000	.86	1.4	3.89	4.13
6	01-1325-0000	2.9	4.6	5.88	6.24
8	01-1326-0000	6.7	10.5	7.71	8.18
10	01-1327-0000	12.1	21	9.76	10.36
12	01-1328-0000	19.7	36	11.70	12.41
14	01-1329-0000	24.5	46	12.74	13.52
16	01-0941-0000	32.1	70	14.78	15.60
18	01-0942-0000	47.6	102	16.75	17.68
20	01-0943-0000	65.1	142	18.72	19.76
24	01-0924-0000	112	251	22.66	23.92
26	01-0945-0000	142.1	323	24.63	26.00
28	01-0946-0000	177	406	26.60	28.08
30	01-0947-0000	217.4	502	28.57	30.16
32	01-0948-0000	263.5	613	30.54	32.24
34	01-0949-0000	315.5	739	32.51	34.32
36	01-0950-0000	374	882	34.48	36.40
38	01-0951-0000	439.4	1041	36.45	38.48
40	01-0930-0000	502	1217	38.42	40.56
42	01-0952-0000	570	1411	40.39	42.64
48	01-0955-0000	807.3	2115	46.30	48.88
56	01-0965-0000	1168	3279	53.68	56.68

Consult the factory for sizes not shown and for minimum pipe ID smaller than listed in above chart.

Do not inflate beyond pipe ID; over inflation results in excessive wear.

*Maximum inflation diameter.

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