ADDENDUM TO DC2678

OPERATING INSTRUCTIONS FOR HIGH LIFT FLANGE PLUGS USED AS WELD ISOLATION PLUGS WITHOUT FLANGE

WARNING!

- ***PRESSURE TESTING IS INHERENTLY DANGEROUS. STRICT ADHERENCE TO THESE OPERATING INSTRUCTIONS AND INDUSTRY SAFETY PRACTICES COULD PREVENT INJURY TO PERSONNEL.***
- ***ALL PERSONNEL MUST BE CLEAR OF TEST PLUG WHEN PRESSURE TESTING. FOR SAFETY, AN INCOMPRESSIBLE LIQUID SUCH AS WATER SHOULD BE USED AS THE TEST MEDIUM. RESIDUAL AIR OR GAS IS TO BE EVACUATED FROM THE PIPE PRIOR TO TESTING.***

CAUTION:

THE SEAL ASSEMBLY, WHEN NOT ATTACHED TO A PROPERLY INSTALLED FLANGE, WILL NOT SEAL THE TEST PRESSURES PER ANSI B16.5. TO AVOID EXPULSION OF THE SHAFT AND SEAL ASSEMBLY FROM THE PIPE, DO NOT ALLOW UPSTREAM PRESSURE TO EXCEED THE VALUES SHOWN IN TABLE (2) AND INSTALL SAFETY GAG (SEE FIGURE 2).

PRIOR TO INSTALLATION

1. To insure that all installation torque is transmitted to the seal, liberally spread antiseize over both sides of the hardened washer and onto the threads of the shaft. Use caution when applying the lubricant and handling the test plug after lubrication. The lubricant must not come in contact with the rubber seal or tube ID.

   WARNING! FAILURE TO USE ANTISEIZE MAY CAUSE AN INCOMPLETE TORQUE TRANSMITTAL WHICH WILL RESULT IN A DECREASE IN THE PRESSURE RATING.

2. Verify stamping on washer is equivalent to the pipe size being tested. The washer should be stamped with the flange size and pipe schedule. Example: The stamp “1P80” should be interpreted as 1” Sch 80 pipe sizes. The seal OD should be the same as the washer OD.

3. Complete Site safety standard checklist.

   NOTE: If the size of the seal/washer set is different than the pipe to be tested, contact Expansion Seal for the correctly sized set.

4. Prior to installing the flange welding/hydrostatic test plug, clean all debris from the pipe ID.

For ¾” – 1” Plug Sizes

5. Disassemble plug by removing jam nuts from end of plug. Remove all parts except hex nut and hardened washer. Install safety gag link, long tube and remaining parts as shown in Figure 2. Insert the plug into the pipe. Attach pipe restraint and tighten bolts on clamp to avoid slippage. Proceed with either step 8 9, or 10 below depending on plug size.

For 1-1/2” – 8” Plug Sizes

6. Remove hex nut and hardened washer, compression tubes & flange. Install long tube and safety gag link as shown in Figure 2. Insert the plug into the pipe. Attach pipe restraint and tighten bolts on clamp to avoid slippage. Proceed with either step 8, 9 or 10 below depending on plug size.

For 10” – 24” Plug Sizes

7. Locate the flange on the pipe using an alignment tool *(The Flange Test & Welding Plug is not designed to support or position flange to be welded).* Apply gasket to mating flange face and insert the Flange plug into the flange and pipe with the inert gas purge ports oriented at the top and bottom of the flange. Tighten bolts in a cross-like pattern to properly seal the flange gasket. See figure 4. Proceed with either step 8, 9 or 10 below depending on plug size.

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TIGHTENING AND EXPANSION OF SEAL ELEMENT

For 3/4" to 2-1/2" Plug Sizes

8. Tighten hex nut to normal installation torque listed in Table 1 using a calibrated torque wrench. If shaft spins while hex nut is being tightened, a crowsfoot and a pipe wrench/opened end wrench must be used. *(See Table 1 for crowsfoot sizes.)*

For 3" - 8" Plug Sizes

9. Tighten the hex nut by hand to remove any slack from the parts. Then use a ¾" drive or larger impact wrench capable of producing the torque values listed in Table 1. A deep impact socket is required *(See Table 1 for impact socket sizes.)*. The use of an impact wrench will prevent the shaft from spinning and enable the counting of turns listed in Table 1 to reach the required torque.

For 10" - 24" Plug Sizes

10. Correct Tightness of hex nut is critical to the operation of the Flange Test & Welding Plug, a leak of the seal is usually an indication the hex nuts were not adequately tightened. The normal torque listed in Table 1 should be adequate for most installations, however due to variations within pipe ID finishes the torque may need to be increased up to the maximum torque value listed in Table 1. A deep impact socket is required *(See Table 1 for impact socket sizes.)* If at the maximum torque the plug still leaks, verify the correct seal and washers are being used. Verify that the seal O-ring is seated correctly in the groove on seal and that the O-ring is not damaged, (10" and 12" plugs only).

    Tighten hex nuts in a cross-like pattern in approx. 100 ft/lbs increments using an impact wrench until torque specified in Table 1 has been reached. Verify this torque with a calibrated torque wrench. Remove the purge plug closest to highest point. Connect hydropump to fill port on Flange. Slowly begin to fill the plug until water flows from the vent. Discontinue water input and install plug leak tight.

11. After isolation application is complete, insure all back pressure is released for pipe.

12. Relax the Seal by loosening the Compression Nut(s). Remove safety gag. Un-bolt the flange. (10" and larger)

13. Withdraw the plug from the tube end.

14. Inspect the plug for wear and replace any worn components. Re-lubricate the shaft threads and between the hexnut and mating surface as previously described. Any component, which is worn or damaged, must be replaced before attempting any further testing. Contact the factory for additional information on the replacement of worn or damaged parts.

    WARNING! FAILURE TO REPLACE WORN OR DAMAGED COMPONENTS MAY AFFECT THE ABILITY OF THE PLUG TO HOLD PRESSURE AND MAY CAUSE INJURY OR DAMAGE TO PERSONS OR PROPERTY IN THE TEST AREA.

15. Continue steps 8 through 14 for the number of pipes being tested.

QUESTIONS? Contact EST Group Customer Service at any of the following locations with questions.
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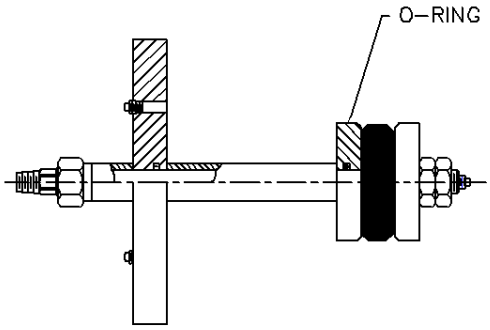

Figure 1. Flange Test Plug With Flange Installed.
Note: Above Figures are representative of ¾" to 8" sizes.

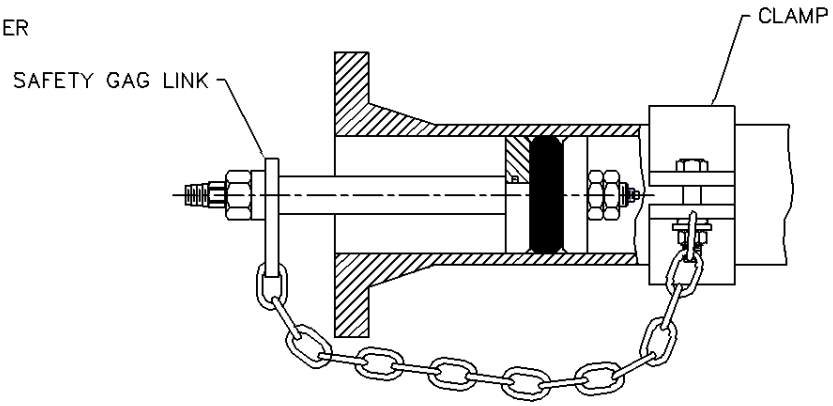

Figure 2. Flange Test Plugs Installed as Isolation Plug, After Flange Has Been Removed.
Note: Above Figures are representative of ¾" to 8" sizes.

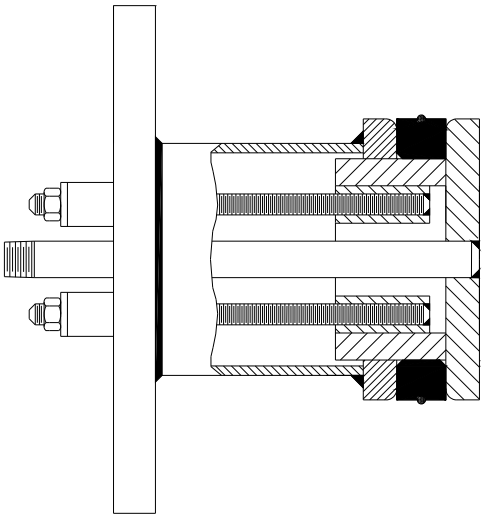

Figure 3. Flange Test Plug With Flange Installed.
Note: Above Figures are representative of 10" to 24" sizes.

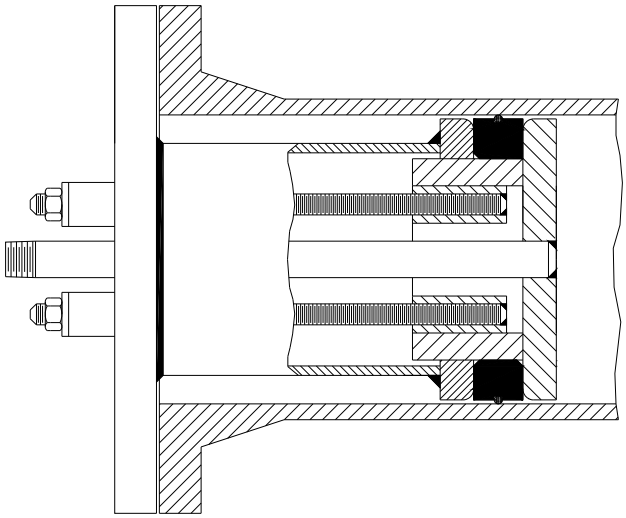

Figure 4. Flange Test Plugs Installed as Isolation Plug.
Note: Above Figures are representative of 10" to 24" sizes.

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TABLE 1A. ¾" to 2-1/2" Plug Sizes High Lift Flange Weld Test Plug Clearance and Suggested Installation Torque Values

Nom. Plug Size	Clearance Between Plug & Pipe (in)	Normal Installation Torque (*)	Maximum Installation Torque (*)	Wrench Size to Hold Shaft (in)	Crowsfoot Size (in)	Maximum Ambient Back Pressure of Shaft & Seal w/o Flange installed
¾"	0.07	50 in-lbs.	Do Not Exceed Normal Torque	9/16	9/16	10 psi (0.7Bar)
1"	0.11	100 in-lbs	200 in-lbs	9/16	9/16	10 psi (0.7Bar)
1-1/4"	0.13	25 ft-lbs	40 ft-lbs	1/2	15/16	10 psi (0.7Bar)
1-1/2"	0.17	25 ft-lbs	40 ft-lbs	1/2	15/16	10 psi (0.7Bar)
2"	0.26	35 ft-lbs	50 ft-lbs	1/2	15/16	10 psi (0.7Bar)
2-1/2"	0.25	100 ft-lbs	200 ft-lbs	7/8	2	10 psi (0.7Bar)

TABLE 1B. 3" to 8" Plug Sizes High Lift Flange Weld Test Plug Clearance and Suggested Installation Torque Values

Nom. Plug Size	Clearance Between Plug & Pipe (in)	Normal Installation Torque (*)	Maximum Installation Torque (*)	Estimated Number of Turns of Hex Nut	Wrench Size to Hold Shaft (in)	Deep Impact Socket Size (in)	Maximum Ambient Back Pressure of Shaft & Seal w/o Flange installed
3"	0.38	200 ft-lbs	400 ft-lbs	5	7/8	2	10 psi (0.7Bar)
4"	0.44	200 ft-lbs	400 ft-lbs	5	7/8	2	5 psi (0.4Bar)
6"	0.50	400 ft-lbs	900 ft-lbs	6	1-5/8	3-1/8	5 psi (0.4Bar)
8"	0.50	400 ft-lbs	900 ft-lbs	6	1-5/8	3-1/8	5 psi (0.4Bar)

- Under normal conditions a 200lb. Man would require at least a 1ft. lever to achieve 200ft-lbs. The same man would require at least a 2ft. lever to achieve 400ft-lbs.

TABLE 1C. 10" to 24" Plug Sizes High Lift Flange Weld Test Plug Clearance and Suggested Installation Torque Values

Nom Plug Size	Clearance Between Plug & Pipe (in)	Normal Installation Torque	Maximum Installation Torque	Deep Impact Socket Size (in)	Maximum Ambient Back Pressure of Shaft & Seal w/o Flange welded
10" 150lb	½	150	600	1-5/8	5 psi (0.4Bar)
10" 300lb	½	200	600	1-5/8	5 psi (0.4Bar)
10" 600lb	½	300	600	1-5/8	5 psi (0.4Bar)
12" 150lb	½	200	600	1-5/8	5 psi (0.4Bar)
12" 300lb	½	250	600	1-5/8	5 psi (0.4Bar)
12" 600lb	½	300	600	1-5/8	5 psi (0.4Bar)
14" 150lb	½	200	600	1-5/8	5 psi (0.4Bar)
14" 300lb	½	300	600	1-5/8	5 psi (0.4Bar)
16" 150lb	½	200	600	1-5/8	5 psi (0.4Bar)
16" 300lb	½	300	600	1-5/8	5 psi (0.4Bar)
18" 150lb	½	250	600	1-5/8	5 psi (0.4Bar)
18" 300lb	½	350	600	1-5/8	5 psi (0.4Bar)
20" 150lb	½	250	600	1-5/8	3 psi (0.2 Bar)
20" 300lb	½	350	600	1-5/8	3 psi (0.2 Bar)
24" 150lb	½	300	600	1-5/8	3 psi (0.2 Bar)
24" 300lb	½	400	600	1-5/8	3 psi (0.2 Bar)

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