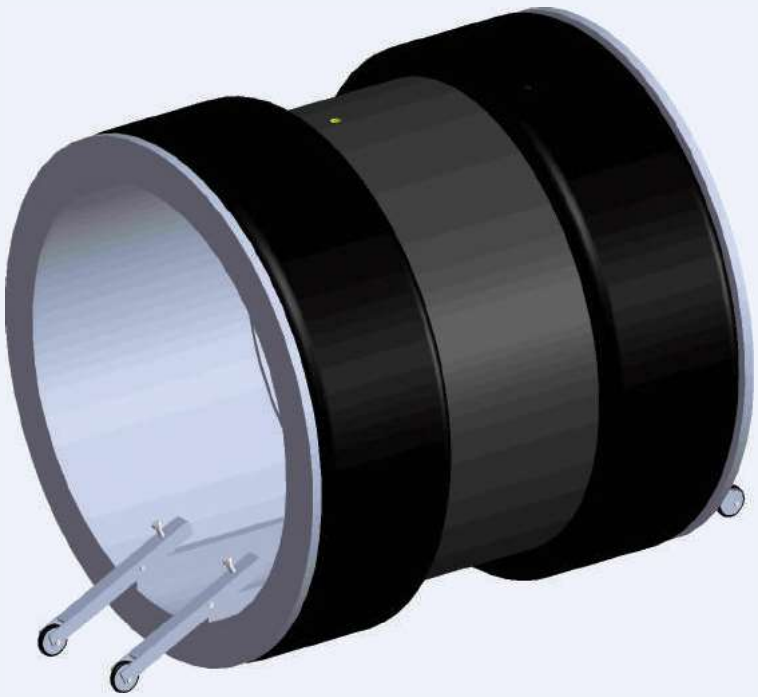
# B - USER MANUAL OF JOINT TESTER (JT)

Please Read And Understand This Manual
Before Using PlugCo Joint Tester!

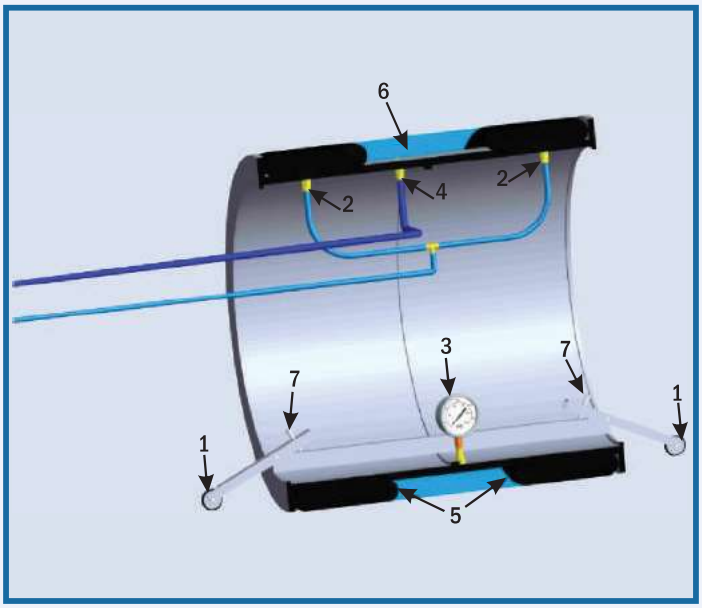


## Joint Tester User Manual

This manual explains how the Joint Tester is used. It also includes important safety rules which must be followed during use of the JT plug. The end user should also read and understand all applicable saftey rules of international and local authorities and follow the PlugCO Joint Tester User Manual, as well.

## What is the Joint Tester?

The PlugCo Joint Tester is used for testing the connections between sections of piping. Regular pipe test plugs can be used in joint testing, but in that case the consumption of water is significantly more than when a JT plug is used. Thus, the JT plug provides reduced water use, shorter test times and lower environmental impact when compared to regular pipe test plugs.




**1- Wheels** (Allow moving the JT in the pipe)

**2- Air Filling Point** (For inflating the JT)

**3- Pressure Gauge** (Shows the test pressure inside the test area)

**4- Air/Water Filling Point** (Supplies air or water to the joint under test. After filling, the test pressure can be observed outside the pipe on a connected pressure gauge)

**5- Inflatable Parts** (Seal the joint under test)

**6- Test Area** (Equals the joint length)

**7- Adjustment Bolts** (To center the joint tester at joint)

## How to Choose the Correct Joint Tester?

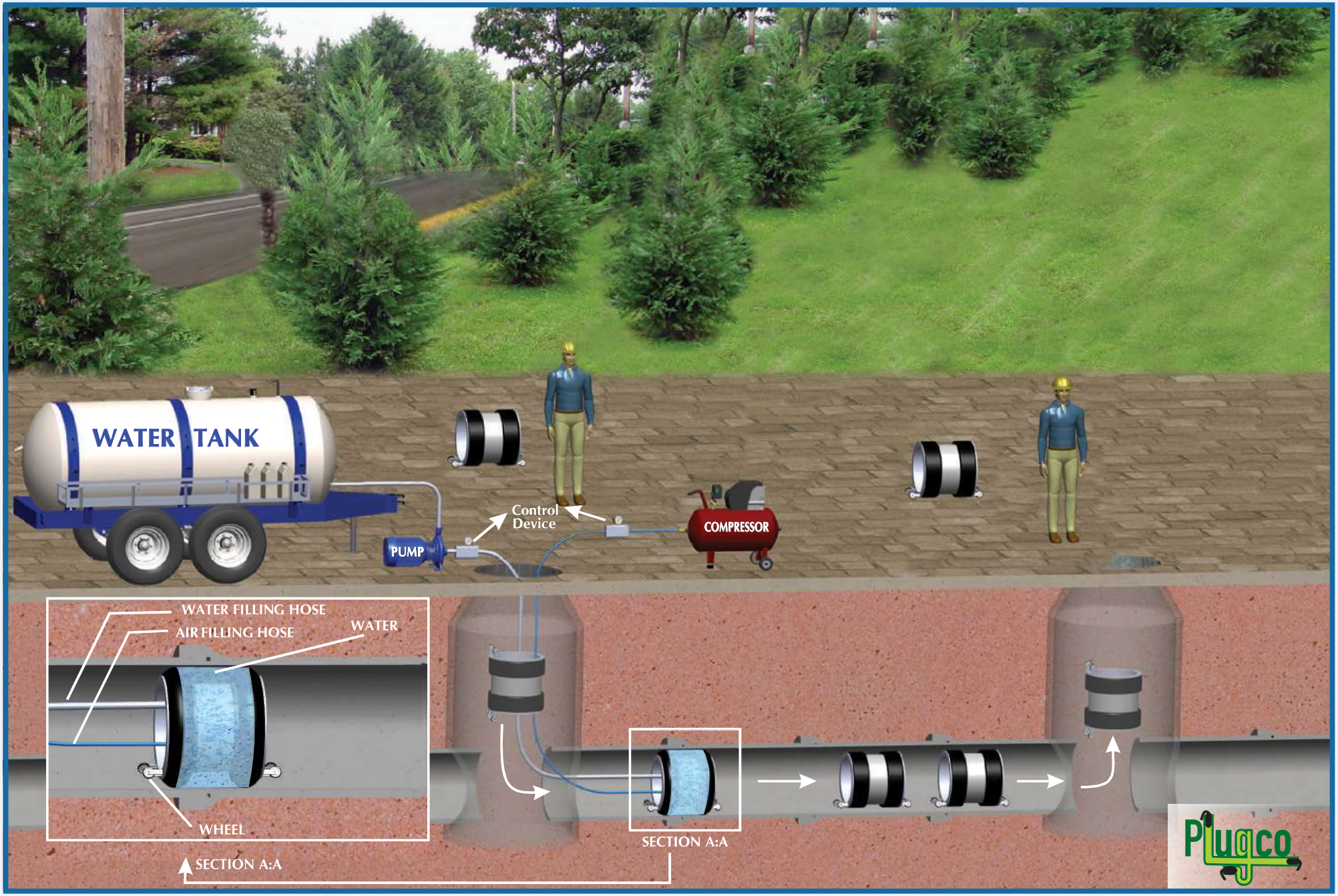
1- Measure the internal diameter of the pipe and select a matching size and model of the JT.

2- Measure the joint length and select the corresponding JT length.

JT Length (L) = Joint Length (l) + 300 mm

3- Determine the test method. Is it an air leak test or a water leak test?

4- Check the required test pressure as per the test specifications and select suitable inflation and test pressures from the PlugCo Catalog.


WATER TANK
PUMP
Control Device
COMPRESSOR
WATER FILLING HOSE
AIR FILLING HOSE
WATER
WHEEL
SECTION A:A
SECTION A:A
Plugco

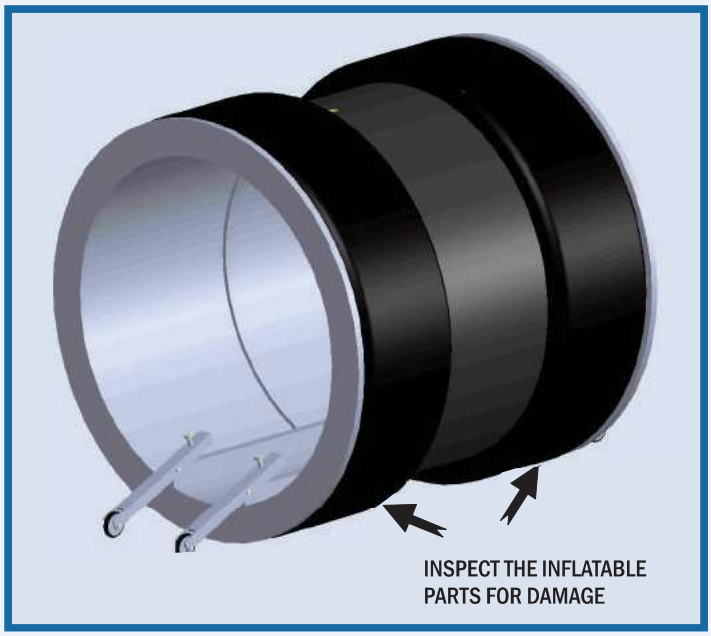
# APPLICATION OF JOINT TESTER

## Step_1 Before Using the JT


**1.1** Read and understand the safety instructions in the safety rules of international and PlugCo Joint Tester user Manual before using this equipment.

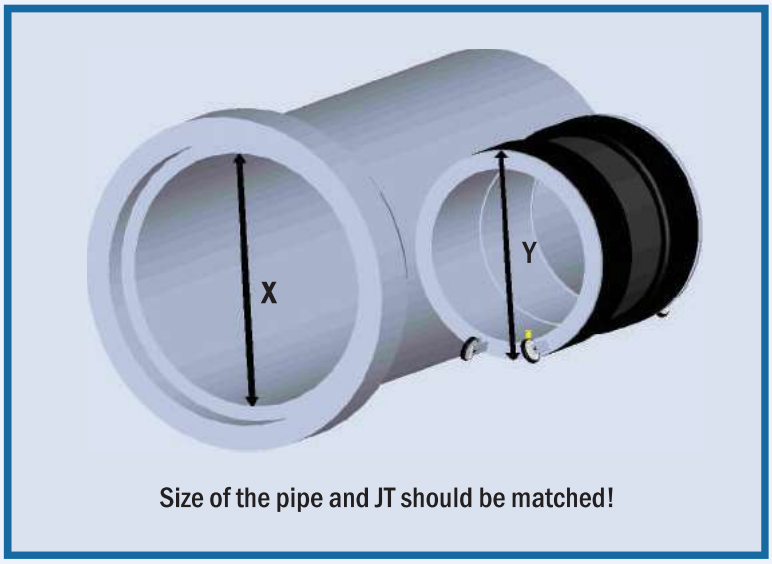

**1.2** Wear all required personal protective equipment such as protective footwear, safety glasses, and gloves.

Follow safety rules of international and local authorities!!!!

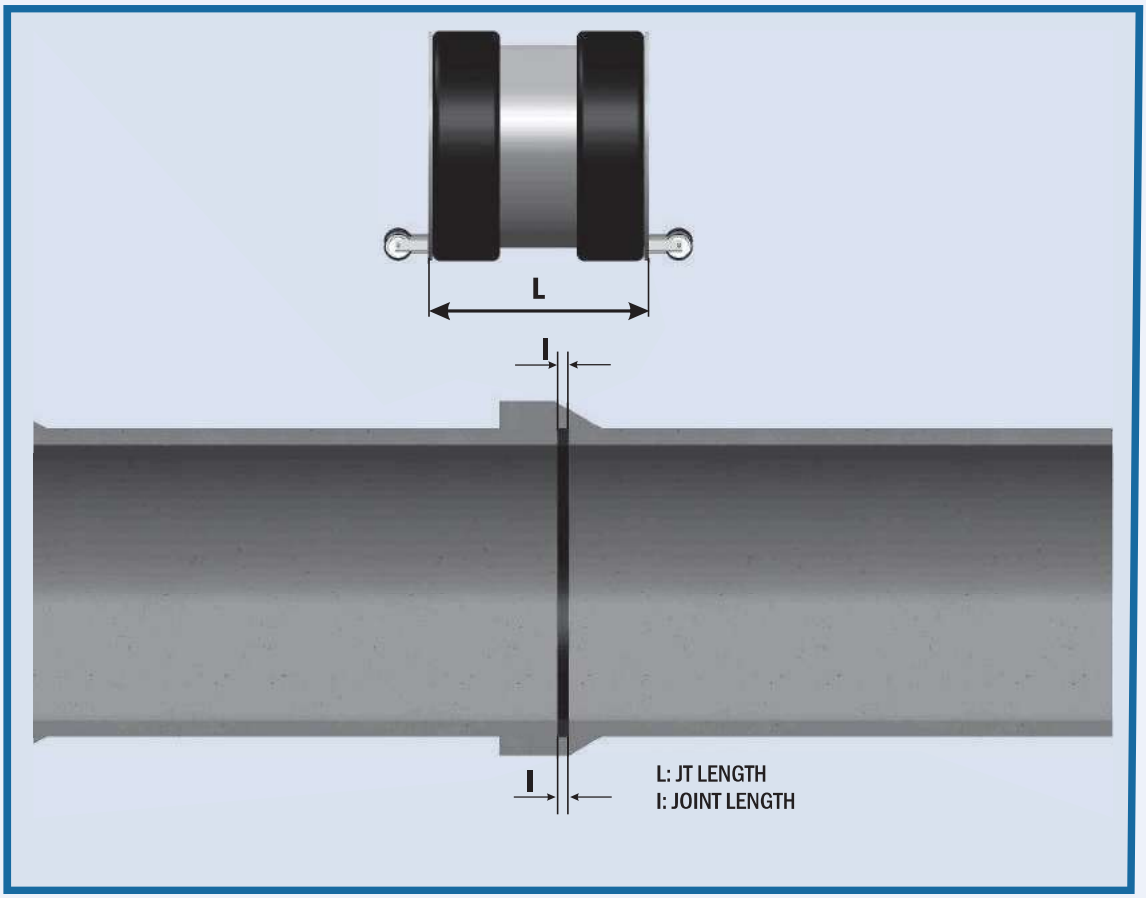



**1.3** Inspect the JT and all accessories for surface tears, cuts or any other damage. Inspection can be facilitated by using a soapy water solution that will show bubbles at any points of leakage.

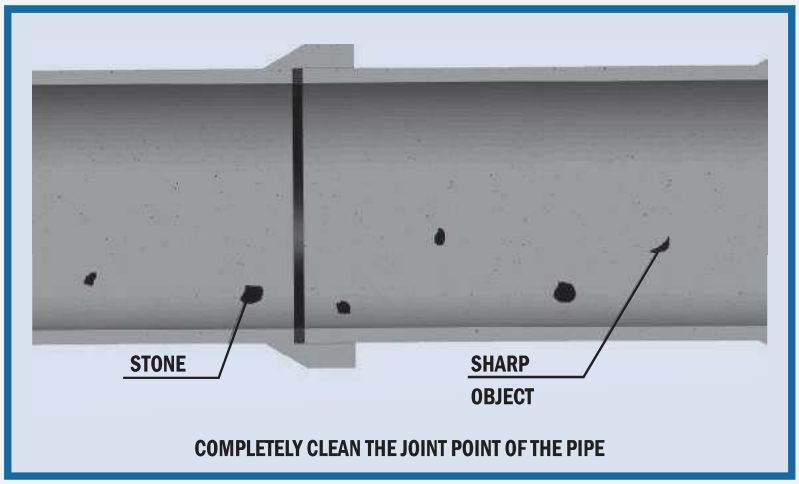
**WARNING!** Never clean the JT plug with solvents, hydrocarbons or other aggressive agents that may damage or destroy the plug.




Size of the pipe and JT should be matched!

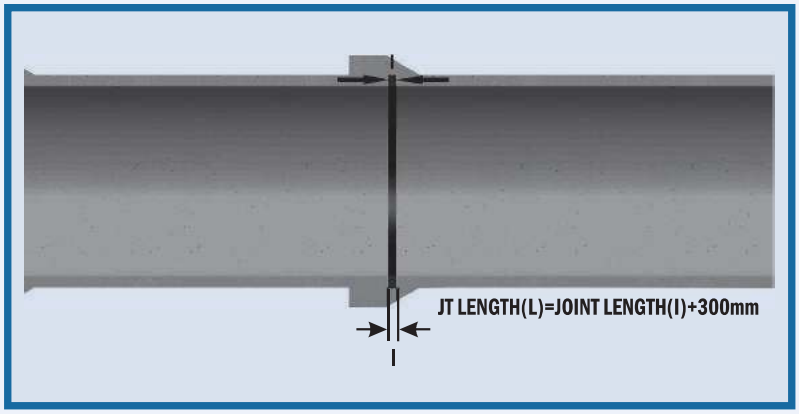



**1.4** Choose the proper size of plug. Be sure that the diameter of plug matches the pipe diameter. Select a JT that is manufactured for the pressure, temperature, and chemical requirements of the test conditions.

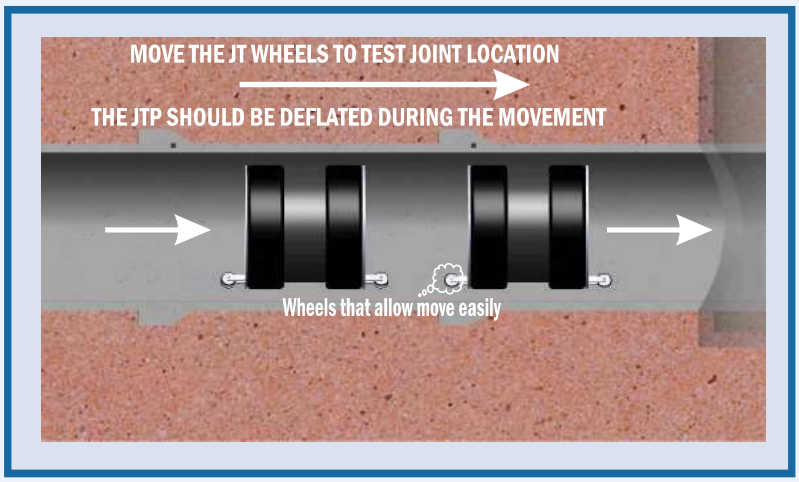



**1.5** Thoroughly clean the pipeline, particularly at the connection points between pipe sections. Ensure all foreign material and sharp objects are removed from the pipeline.

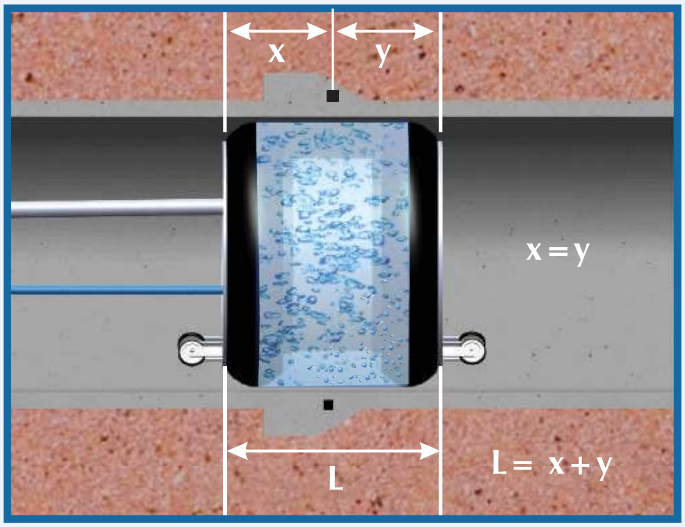
**1.6** Check the length of air and water hoses. Make sure they are long enough to reach the test location. Ensure the length of the JT is sufficient to perform the leak test.

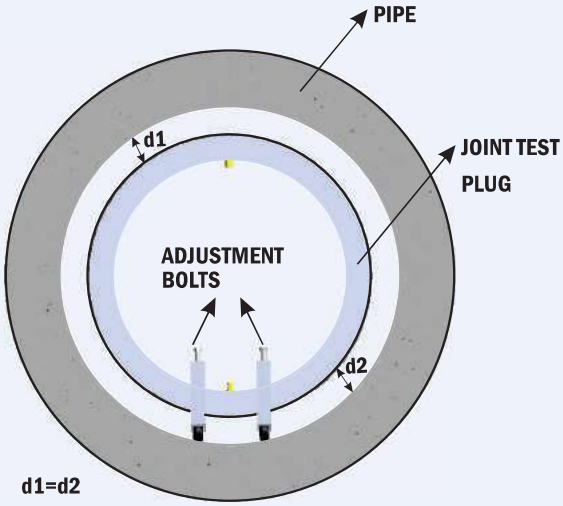



**1.7** Be sure that length of JT is sufficient to perform the test. Joint lengths are variable as per joint length.




**1.8** Place the JT into the pipeline and move it to the test location. The JT should be deflated during movement and positioning.

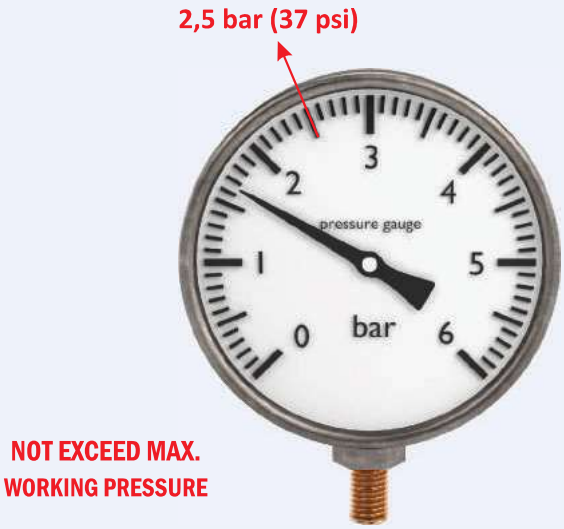



**1. 9** Center the JT at the joint using the adjustment bolts until the centerline of the JT is aligned with the centerline of the pipe sections.

**1.10** Connect the air hose to the air compressor.

## Step_2 Operation of JT



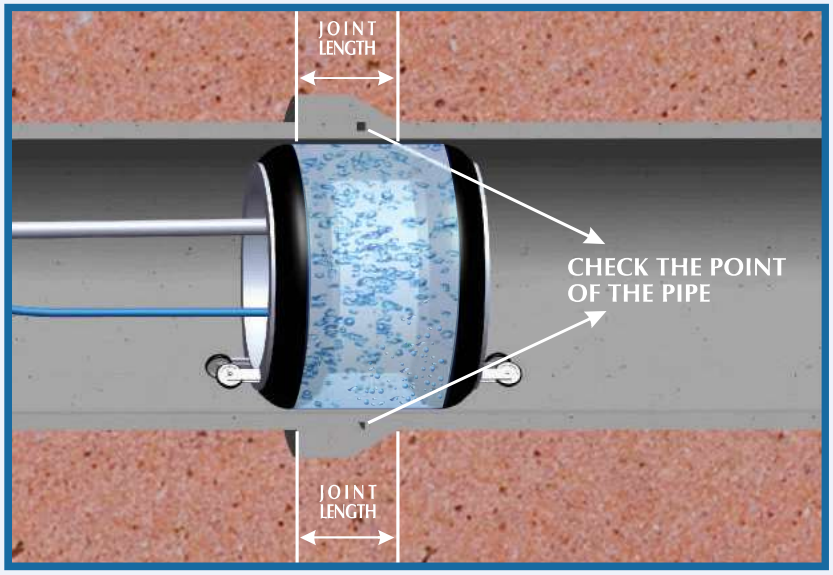

Use calibrated pressure gauge

**2.1** Inflate the JT to 1,0 bar (14,5 psi) and shut off the air supply to the JT plug. Monitor the test pressure gauge for signs of leakage, i.e., a drop in the pressure in the test apparatus. If there is no leakage, increase up to maximum inflation pressure, 2,5 bar (37 psi). During inflation, monitor the pressure gauge to ensure that the maximum allowed inflation pressure is not exceeded.

**2.2** Connect the test pressure control set to the hose connected to the JT and open the valve. The air or water will fill the test area.

**2.3** Observe the rise of pressure from the manometer. When the correct pressure is reached, 0,2 bar (3 psi) for air or 0,5 bar (7,5 psi) for water, close the filling valve as per EN 1610.

**2.4** Remove the pressure control set and connect a pressure gauge to monitor the pressure during the test period.




### 2.5 Air test duration;

At the end of the minimum test period shown in EN 1610, Table 3, check the joint under test for leakage. For example, the minimum test period is 5 minutes for DN800 and 7minutes for DN1000 Wet Concrete Pipe.Concrete Pipe.

### 2.6 Water test duration;

The test duration is 30 minutes for all pipe sizes as per EN1610.

**EN 1610:1997 - (Construct and Testing of Drains and Sewers Lines)**
**TABLE# 3 - AIR TEST TABLE: Test Pressure, Acceptable Pressure Drop Value, Test Duration**

| Pipe Material | Test Type | Po mbar (kPa) | ΔP | Minimum Test Period | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DN 100 | DN 200 | DN 300 | DN 400 | DN 600 | DN 800 | DN 1000 |
| Dry Concrete Pipe | LA | 10 (1) | 2,5 (0,25) | 5 | 5 | 5 | 7 | 11 | 14 | 18 |
| | LB | 50 (5) | 10 (1) | 4 | 4 | 4 | 6 | 8 | 11 | 14 |
| | LC | 100 (10) | 15 (1,5) | 3 | 3 | 3 | 4 | 6 | 8 | 10 |
| | LD | 200 (20) | 15 (1,5) | 1,5 | 1,5 | 1,5 | 2 | 3 | 4 | 5,5 |
| Kp - Value | | | | 0,058 | 0,058 | 0,053 | 0,040 | 0,0267 | 0,020 | 0,016 |
| Wet Concrete Pipes and All other Pipes | LA | 10 (1) | 2,5 (0,25) | 5 | 5 | 7 | 10 | 14 | 19 | 24 |
| | LB | 50 (5) | 10 (1) | 4 | 4 | 6 | 7 | 11 | 15 | 19 |
| | LC | 100 (10) | 15 (1,5) | 3 | 3 | 4 | 5 | 8 | 11 | 14 |
| | LD | 200 (20) | 15 (1,5) | 1,5 | 1,5 | 2 | 2,5 | 4 | 5 | 7 |
| Kp - Value ¨) | | | | 0,058 | 0,058 | 0,040 | 0,030 | 0,058 | 0,015 | 0,012 |

Po = Test Pressure
ΔP = Allowed Pressure Drop

$$t = \frac{1}{K_P} \times \ln\left(\frac{Po}{Po-\Delta P}\right)$$

For Dry Concrete Pipe $K_p = \frac{16}{DN}$, maximum 0.058

For Wet Concrete Pipe and all other pipes $K_p = \frac{12}{DN}$, maximum 0.058

-When it is t≤5, t is rounded to the nearest 0.5 minutes.
-When it is t≥5, t is rounded to the nearest minutes.

**2.6** If there is no leakage from the joint under test and the pressure drop is acceptable, the JT can be deflated and moved to the next joint to be tested.

## Step_3 Storage of JT

**3.1** After testing all piping joints, deflate and remove the JT from the pipeline.

**3.2** Thoroughly clean the inflatable parts of JT with water or detergent and wait until dry.

**3.3** Store the JT at room temperature away from direct sunlight

Example of calculation of minimum test period test by air;

To be tested WET pipe diameter **DN1200.**

**Pipe :Wet**

$$t = \frac{1}{K_P} x \ \ln\left(\frac{P_0}{P_0 - \Delta P}\right)$$

For Wet Concrete Pipe $K_P = \frac{12}{DN} = \frac{12}{1200} = 0{,}01$

Test pressure, Po=0.2 Bar

ΔP=Allowed pressure drop=0.015 **(specified at Table-3)**

$$t = \frac{1}{0.01} x \ \ln\left(\frac{0.2}{0.2 - 0.015}\right) = 7.7 \text{ Minutes}$$

**t= 8 minutes**

***Please Consult to PlugCo for questions.***