

# About Us

Trenchless Supplies' head office is based at Fernleigh House, Trowbridge, Wiltshire, United Kingdom.

Using engineering experience gained over many years, we design and distribute a range of products for the Horizontal Directional Drilling, No-Dig and Trenchless Technology sectors of the construction industry.

To ensure that our products meet the highest of standards and are as functional and appropriate to their applications as possible, we always value feedback received from our end users. We feel that this business ethos is a primary mechanism in enabling us to provide an outstanding service and superior product range.



# Quality Assurance

Our commitment to continuous improvement extends to every area of the business. We enhance the quality of our products by embracing and incorporating international quality standards. Whenever possible, all manufacturing works are undertaken in accordance with ISO9001:2000 Series Quality Management System.

## **Breakthrough Management System (BMS)**

At Trenchless Supplies every employee is encouraged to find improvements through imagination and change. This ensures that all design and production processes are examined in relation to Quality, Cost, Delivery, Improvements, Safety, Morale and the Environment, encouraging commitment towards continuous improvement from every employee.



# Standard Towing Heads

The Standard Towing Head is the most efficient way to allow the safe towing of polymer pipes into position. Also known as a "duct puller" or "pipe puller" this tool is now part of pipe manufacturers' recommended practice.

The Towing Head operates in a very similar way to an expanding bolt for anchoring into masonry. Each Towing Head has a series of four grippers connected to the eyebolt via a tail cone. As the eyebolt is tightened the tail is pulled toward the nose and the grippers expand.

The key components of a Trenchless Supplies Towing Head are all manufactured under ISO 9001:2000 Quality Assurance Management Standard.

## Key Features

- ◆ Single piece high tensile steel forged eyebolt
- ◆ Zinc coated components
- ◆ Bullet/taper profiled nose
- ◆ Researched gripper design
- ◆ Rear locking nut/eyebolt
- ◆ Compatible with both SDR 11 to 17



All these features culminate in making certain that Trenchless Supplies can provide a Standard Towing Head that meets the demands of today's modern contracting environment.



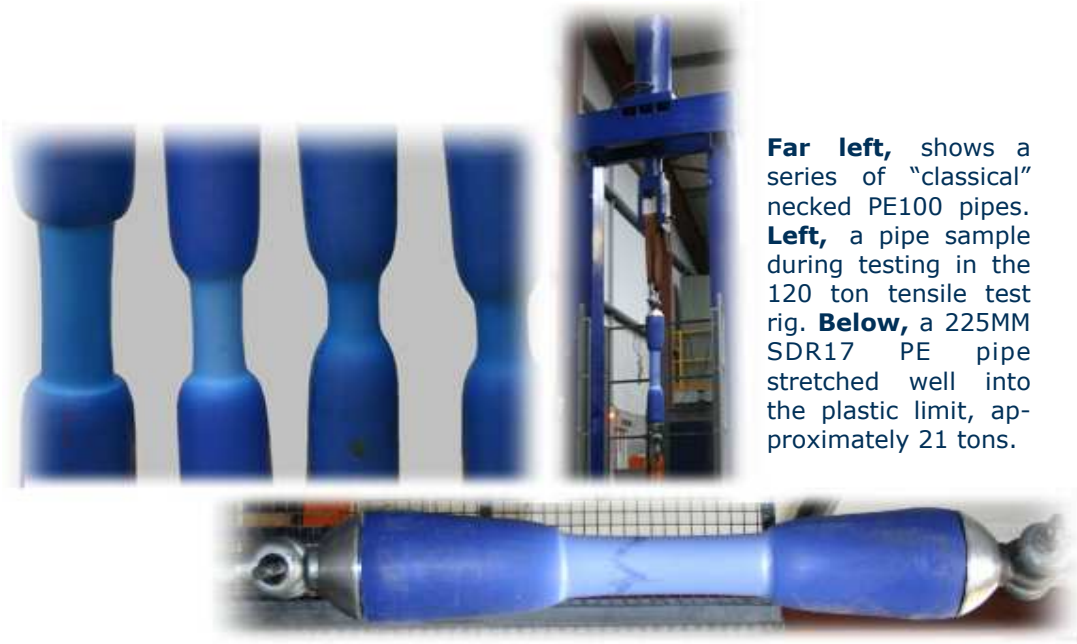
# Product Testing

## Towing Head Testing

The testing schedule for the range of Trenchless Supplies Towing Heads was carried out using the facilities and guidance of local universities, together with the large capacity tensile testing machines of industry accredited test houses.

A comprehensive test programme was devised to ensure that a wide range of diameters as well as different wall thicknesses (SDR) and polymer density (PE80 and PE100) were tested.

Numerous tests were performed to prove the principle of the design. Repeatable results were gained of the classical "necking" as secondary bonding forces were overwhelmed and the polymer began to elongate. This together with the tensile test machine read out was proof of the Towing Head's success.



**Far left,** shows a series of "classical" necked PE100 pipes. **Left,** a pipe sample during testing in the 120 ton tensile test rig. **Below,** a 225MM SDR17 PE pipe stretched well into the plastic limit, approximately 21 tons.



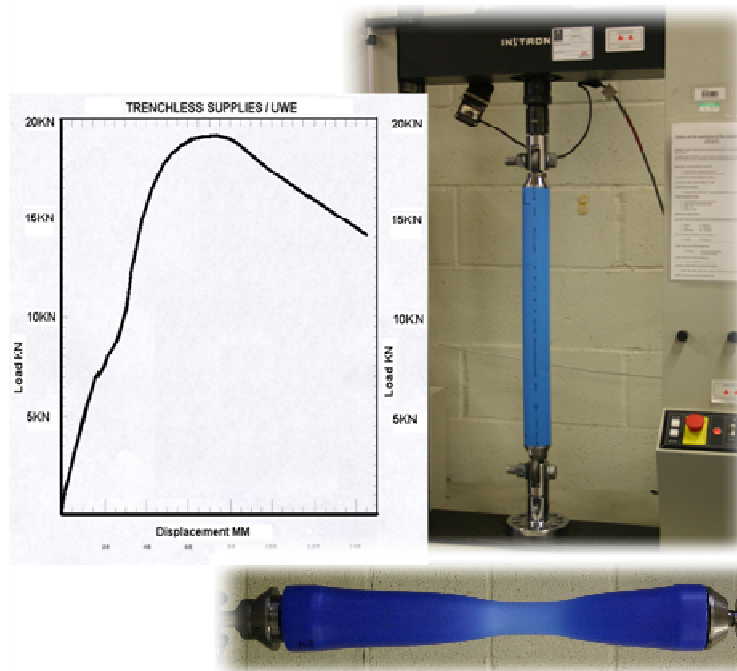
# Product Testing

An important aspect of the testing was to ensure that the profile of the grippers was not too aggressive. In the industry it has been known for some time that incorrect geometry of the grip profile can lead to premature failure through excessive shear stress.

The Trenchless Supplies Towing Head grip profile was comprehensively tested using a series of calculated and theorised profile changes. This resulted in the ultimate grip profile being achieved. It is this profile that has been incorporated into the range of Trenchless Supplies Towing Heads.

The conclusion of the comprehensive test programme is that the range of Trenchless Supplies Towing Heads can tow P.E. pipe well in excess of the recommended towing load advised by polyethylene pipe manufacturers.

The achievements and knowledge gained during the test programme, together with the analytical design process, have culminated in the production of an exceptional Standard Towing Head.



**Far left,** a graphical representation of the tensile test curve for the 63mm Towing Head. This graph demonstrates the increasing load on the 63mm sample to 19 kN (1.9 tonnes). Once the maximum strength of the material is reached the pipe begins to yield and "necking" begins. The load decreases gradually, which can be seen in the right hand slope of the line as the pipe deformation continues. **Left,** the 63mm test sample in situ. **Below,** the 63mm sample during the intermediate stages of plastic deformation/"necking."



# Guidelines For Use

Trenchless Supplies Towing Heads are specifically designed to remain with the product pipe even under excessive loads. With this in mind, we ask you to adhere to the recommended towing instructions from the pipe manufacturer.

The maximum recommended towing load for polyethylene pipe is 50% of the ultimate tensile strength of the pipe. The ultimate tensile strength can be defined as the load necessary to yield the polyethylene material.

The pipe manufacturers' recommendation assumes that the tensile loads are applied for less than one hour. In these situations it is recommended that a period of at least one hour should pass after full insertion is complete. This then allows for the viscoelastic recovery of the material.

During techniques such as horizontal directional drilling, loads are applied for substantially longer than an hour, often exceeding 24 hours. It is recommended that for these longer installations maximum towing load should be rated to 40% of the ultimate tensile strength. The rest time to allow for the viscoelastic recovery should be at least equal to the time under load, ideally five times the period under load.

Please refer to the relevant pipe manufacturer's website for specific loads.



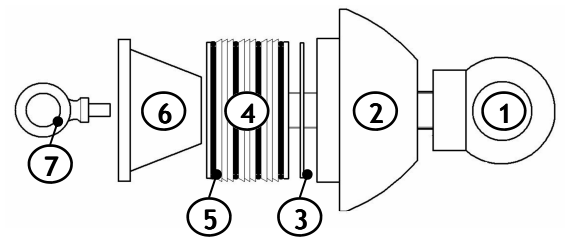
# Standard Towing Head

## Installation and Maintenance Instructions

### Please ensure before installing your Towing Head that the:-

- size of the Towing Head is correct for the pipe, both outside diameter and SDR.
- eyebolt tightens fully (**see fig. 2**) and turns freely. The grippers should expand until they make contact with the rear flange of the Tail.
- o-rings are in good condition. Replace if necessary.
- end of the pipe has been properly cut. It must be 90 degrees to the length of the pipe so that the nose fits tightly to the end of the pipe.

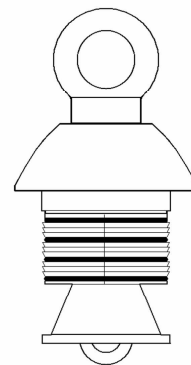
- |    |              |    |                            |
|----|--------------|----|----------------------------|
| 1) | Eyebolt      | 5) | O-rings                    |
| 2) | Nose         | 6) | Tail                       |
| 3) | Thrust plate | 7) | Rear eyebolt/<br>Nyloc nut |
| 4) | Gripper Set  |    |                            |



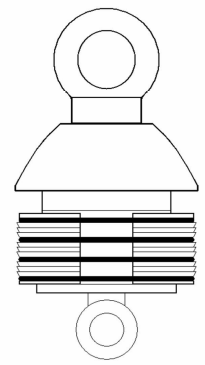
**Fig. A**

### Installation :-

- 1) Collapse the grippers, this is done by turning the eyebolt anti-clockwise whilst stopping the tail from rotating. When complete the Towing Head resembles **fig 1**.
- 2) Insert Towing Head into pipe.
- 3) Ensure the Towing Head is pushed tightly against into the pipe so there is little or no gap between the pipe face and the Nose of the Towing Head, see **fig 3**.
- 4) Turn the eyebolt clockwise until the grippers engage then use a Tommy Bar to tighten.



**Fig. 1**



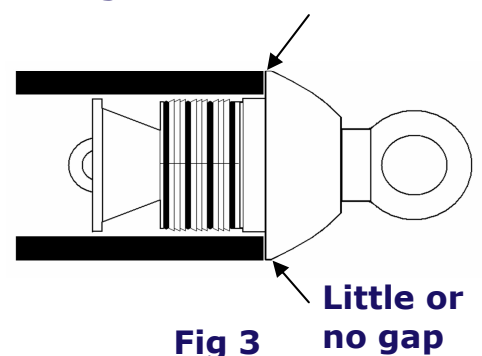
**Fig. 2**

### To Remove

Rotate the eyebolt anti clock-wise until the grippers release. Re move puller from the pipe. If the grippers fail to release, tap the top of the eyebolt lightly with a mallet to make certain the tail has been released from the grippers. Then tap the side of the pipe until the grippers disengaged.

### Maintenance

To ensure the best performance, Towing Heads should be disassembled, cleaned and re-greased before and after every use. A small amount of grease should be applied to the outside cone of the tail and the eyebolts threads.



**Fig 3**

**Little or no gap**

