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Total Underground Solutions Since 1982

Pilot Tube Guided Auger Boring

800-836-5011
WWW.ICONTUNNELSYSTEMS.COM
By using the pilot tube trenchless method of installing underground utilities, waterlines and sanitary sewers you can reduce costs by 50% when compared to conventional micro tunneling.

WHAT IS PILOT TUBE GUIDED AUGER BORING?

Pilot tube guided auger boring was developed in Germany by Dr. Peter Uffman of Bohrtec for the installation of trenchless house connection sewer pipes. The technology was later developed further to install mainline sanitary sewer pipes on line and grade over 300’ from manhole to manhole as an alternative to expensive tunnel boring machines. ICON Tunnel Systems is the exclusive distributor for Bohrtec pilot tube guided auger boring equipment in the United States and Canada.

HOW DOES IT WORK?

Pilot tube guided auger boring or pilot tube micro tunneling or guided auger boring equipment is used to install pipe that has an outside diameter from 4” to 55”. Pilot tube guided auger boring is a trenchless method of installation for small diameter pipes with a grade and alignment accuracy that the gravity sewer and water industry demands. The pipe is installed in three ways – either a three-step installation, two-step installation, or a one-step installation starting with a launch and reception pit at either end of the proposed drive length.

When faced with a gravity sewer project that requires a precision installation with line and grade accuracy of 1” or better, the pilot tube guided auger boring system will provide the consistent accuracy required.

The Bohrtec pilot tube guided auger boring machines are available from ICON Tunnel Systems in three different styles and models: The first are our Small Compact units that can install up to 40” O.D. pipe in as little as a 6.5’ round or square shaft. The second are our Long Frame units that can install up to 55” O.D. pipe in as little as an 8’ x 13’ rectangular shaft (Expansion legs can be purchased for this unit to install up to 50’ long pipes if needed). The third are our Long Compact unit that can install up to 48” O.D. pipe in as little as a 12’ round shaft or square shaft (Expansion legs can be purchased for this unit to install up to 50’ long pipes if needed). Each meticulously designed model by Bohrtec is capable of providing at least 100 tons of jacking force and 50 tons of pullback with 8,850 foot lbs of rotational torque through the gear box and up to 36,878 foot lbs with the largest model.
WHERE DOES IT GET ITS POWER?
Bohrtec-designed hydraulic power packs provide constant power for the auger boring machine. These power packs provide a minimum of 67 horsepower or 50 kilowatts with a diesel engine and variable speed with a silencer built in. Each system will provide hydraulic flow of 0 to 34.8 gpm and up to 5,000 psi working pressure.

The above picture shows a BM400LS machine in one of ICON’s slide rail jacking pits in the process of installing 365LF of double wall pilot tubes on 1” line and grade for a new 8” gravity sewer under a 4 lane highway.

what makes our pilot operation better than our competition?
The pilot tube operation itself is what makes the accuracy of the pilot tube guided auger boring system possible. Bohrtec’s pilot tube rod construction is like no other in the world; they have perfected this design over the last two decades. Bohrtec is the only company operating in the United States that uses independent inside and outside pilot tube rods in their double wall pilot tube design. This means the inside rod turns and rotates the head only, not unlike a directional drill design. The outside pilot tube rod is essentially a steel jacking pipe with male and female threaded ends. It jacks in place, never turning during the steering operation of the pilot tubes.

By not having to rotate the inside and outside pilot rods simultaneously through the ground allows the pilot tube machine to use less torque during operation. As a result we do not have to introduce messy lubricants, gels or bentonite to reduce friction. This also reduces additional heat caused by rotating the outer skin, which can slow the operation and decrease production.

The above picture shows a BM400LS in an 18’ round concrete shaft in the process of installing a “Dead End Bore” for the installation of multiple steel drainage lines.
**THREE DIFFERENT APPLICATIONS WITH ONE SYSTEM**

**Pilot Tube: Application 1 (New Installation of Jacking Pipes for Gravity Sewers)**

The first application is the trenchless installation of jacking pipes for gravity sewer projects. Owners, Engineers and Construction Managers demand these sewers be installed within extremely tight tolerances, leaving little room for error. With the pilot tube guided auger boring systems from ICON Tunnel Systems you can now meet these demands and install jacking pipes within a 1” line and grade for gravity sewer projects. Three-step installation required.

**Pilot Tube: Application 2 (Exact 1” Line and Grade with simple adaption to Auger Boring Machines)**

The second application is for the trenchless installation of steel casing pipes for the auger boring industry. Thousands of contractors own diesel auger boring machines that run on steel tracks but lack the superior line and grade guidance of the pilot tube systems. ICON Tunnel Systems can easily adapt the BM400LS pilot tube machine to all boring machine models for establishing a 1” line and grade up to 500’ in length depending on your soil conditions. Two-step installation required.

**Pilot Tube: Application 3 (Establishing 1” Line and Grade with the PT Pullback Expander for large diameter plastic or ductile iron pipes)**

The third application is for the trenchless installation of plastic or ductile iron pipes for gravity sewer projects. The PT (Pilot Tube) Pullback Expander effectively provides a 100% field proven alternative to Horizontal Directional Drilling that contractors can use to install these types of pipes for gravity sewers that will meet the required 1” line and grade that the water and sewer industry demands. The PT (Pilot Tube) Pullback Expander is an accessory item for our pilot tube systems. Three-step installation required. *Picture not shown, please visit www.icontunnelsystems.com for more information.*

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**THREE-STEP INSTALLATION DIAGRAM**

**Step one:** Install hollow pilot rods establishing 1” line and grade.

**Step two:** Install casings and augers behind the hollow pilot rods. Remove the pilot rods as they are pushed out in the end pit or reception area.

**Step three:** Install the desired jacking pipes behind the casings and augers as seen in Step 2. Remove the casings and augers as they are pushed out in the end pit or reception area.

**Step four:** If the desired jacking pipe is larger than the casings and augers used in Step 2, then an increase kit with hydraulic reamer can be installed to handle the larger jacking pipe.
**Digital Theodolite Camera**

This device is the center of the Bohrtec pilot tube system and enables the machines to steer through the ground while constantly maintaining line and grade precision. The plumb bobs shown above act as control axis points, which are dropped down from a string line overhead. This allows for the proper setup of both digital theodolite camera and the pilot tube machine to the exact line and grade for the job before the start of the proposed drive.

**MORE POWER. MORE TORQUE.**

Selecting the right model and machine can be challenging at times. ICON can guide you through this process with the knowledge and experience you are looking for.

**BM150D**
- Jacking Force: 56,202.24 lbf
- Torque: 2,950.24 lbf
- Pullback: 33,721.34 lbf
- Hydraulic Stroke: 11.81"
- Weight of Unit: 1,433 lbs
- Minimum Pit Size: 5’ x 4’
- Maximum Pipe O.D. 12”

**BM150DT**
- Jacking Force: 35,070.2 lbf
- Torque: 2,950.24 lbf
- Pullback: 20,907.23 lbf
- Hydraulic Stroke: 2” x 16.93”
- Weight of Unit: 1,322.7 lbs
- Minimum Pit Size: 3.93’
- Maximum Pipe O.D. 12” Round.
- Can be used inside a 48” pipe to drill out.

**BM400**
- Jacking Force: 224,808.9 lbf
- Torque: 8,850.73 lbf
- Pullback: 112,404.5 lbf
- Hydraulic Stroke: 2” x 23.62”
- Weight of Unit: 4,409.24 lbs
- Minimum Pit Size: 7” dia.
- Maximum Pipe O.D. 24”

**BM400LS**
- Jacking Force: 300,000 lbf
- Torque: 14,751.22 lbf
- Pullback: 150,000 lbf
- Hydraulic Stroke: 23.62”
- Weight of Unit: 5,952.47 lbs
- Frame Size: 7.38’ L x 5’ W
- Maximum Pipe O.D. 36”

The image to the left shows a BM500 machine in a 10.5’ round jacking pit installing an increaser with hydraulic engine for large diameter jacking pipe.
PILOT TUBE GUIDED AUGER BORING

BM500
Jacking Force: 359,694.3 lbf
Torque: 17,701.46 lbf
Pullback: 179,847.2 lbf
Hydraulic Stroke: 3” x 29.52”
Weight of Unit: 12,125.41 lbs
Minimum Pit Size: 10.5” dia.
Maximum Pipe O.D. 42”

BM600LS
Jacking Force: 539,541.5 lbf
Torque: 22,186.83 lbf
Pullback: 247,289.8 lbf
Hydraulic Stroke: 15.35”
Weight of Unit: 10,141.25 lbs
Frame Size: 11.48’ L x 6.03’ W
Maximum Pipe O.D. 48”

BM600LSC
Jacking Force: 562,022.4 lbf
Torque: 36,878 lbf
Pullback: 247,289.8 lbf
Hydraulic Stroke: 23.62”
Weight of Unit: 12,345.87 lbs
Frame Size: 8’ L x 6’ W
Maximum Pipe O.D. 48”

BM800LS
Jacking Force: 708,148.20 lbf
Torque: 50,000.00 lbf
Pullback: 393,415.7 lbf
Hydraulic Stroke: 47.2”
Weight of Unit: 17,636 lbs
Frame Size: 12.63’ L x 7.05’ W
Maximum Pipe O.D. 55”

INCREASE YOUR VALUE
BM400LS, BM400LSC (not shown), BM600LS, BM600LSC and BM800LS can be used as a guided machine with pilot rods or as an unguided machine without pilot rods. The increased torque allows the contractor to use larger augers to install larger steel casings in various soils without steering, much like conventional auger boring machines. The dual functionality of these machines brings more value to the table.
Rognes Corporation - Ankeny, IA
In Carroll Iowa, Rognes Corporation installed over 3,200 LF of 20” diameter vitrified clay jacking pipe supplied by Mission Clay Products with the help of ICON’s BM400LS (150 ton jacking force) pilot tube machine. ICON used the “patented water auger adaptor” to close the face of the tunnel & control the 12’ to 14’ of water table conditions on site.

DiFazio Industries - Staten Island, NY
DiFazio Industries installed over 330 LF of 18” VRCP supplied by Mission Clay Products with the help of ICON’s BM400LS (150 ton jacking force) pilot tube machine. Open cut was determined “not an option” and the method was changed to pilot tube guided auger boring.

Austin & Bednash Construction, Inc. - New Castle, DE.
In Middletown, Delaware, Austin & Bednash Construction, Inc. installed over 600 LF of 12” diameter VRCP supplied by Mission Clay Products with the help of ICON’s BM400LS (150 ton jacking force) pilot tube machine. This project was originally designed as an open cut excavation with an 8” PVC pipe to be installed. Open cut was determined “not an option” and the method was changed to pilot tube guided auger boring.

Trenchless Construction Services L.L.C. - Arlington, WA
In Sedro Woolley, WA, Trenchless Construction installed over 3,400 LF of 15” and 24” diameter VRCP for the installation of gravity sewers on a 16% grade. This project was the first pilot tube project of its kind in the State of Washington.