

Operation Manual
KOBUS 400 Series Pipe Puller



THE PROOF IS
IN THE PULLING

Table of Contents

1	Introduction	4
2	EC declaration of conformity	5
3	Product identification	7
4	Component identification	8
4.1	Main components	8
4.2	Winch section component identification	8
5	Safety	9
5.1	General safety instructions	9
5.2	Manual handling	10
5.3	Risk assessment	10
6	Brief description	11
7	Excavator specifications	12
8	Attachment to excavator	12
8.1	Mounting on excavator	12
8.2	Hydraulic pipe connection	13
9	Transportation & positioning	13
9.1	Transportation on ground whilst attached to excavator	13
9.2	Transportation on trailer	14
9.3	Positioning	14
10	Preparation of excavations	14
10.1	Where to pull from	15
10.2	Size of excavations	15
10.2.1	Pulling pit	15
10.2.2	Pipe feeder pit	15
11	Inserting the pulling cable	16
11.1	Cutting existing pipe	16
11.2	Selection of pulling cable size	16
11.2.1	Pulling cable breaking load	16
11.2.2	Length of pulling cable	17
11.3	Inserting pulling cable	17
11.3.1	Test insertion with leader cable	17
11.3.2	Insert pulling cable by hand	18
11.3.3	K-line drawstring	18
12	Locating the expander & pulling ferrule	20
13	Positioning the puller	20
14	Fixing pulling cable to spool	21
15	Connecting a new service pipe	22
15.1	Connecting polyethylene pipe (pe)	22
15.2	Connecting copper pipe	22
15.2.1	Method 1	22
15.2.2	Method 2- towing sock (Chinese fingers)	23
15.3	Tighten the pulling cable	23
15.4	Pull 31	23
15.5	Completion of pull	23
15.6	Removal of spool with extracted pipe	24

15.8	Removal of old pipe from spool	25
16	Parts and maintenance	26
17	Support	26
17.1	Training	26
17.2	On-site support	26
17.3	Telephone support	26
18	Contact details	26
19	Troubleshooting	27
20	Go – no go guide to pipe pulling 40	29
21	Technical specifications	30

1 Introduction

This manual details the relevant set up, use and maintenance for the **KOBUS 400 Series Pipe Puller (KPP400)**. The safety information included is directly relevant to operation and maintenance of the Pipe Puller.

This **INSTALLATION, OPERATION AND MAINTENANCE MANUAL** describes the proper use of the Kobus 400 Series Pipe Puller, and is to accompany the machine.

PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATION OF THE PIPE PULLER

The KOBUS 400 Series Pipe Puller is designed to extract small diameter underground service pipe from the ground and to replace it with a new service pipe in a single operation. To do this, requires a torque generated by the hydraulic system of the excavator on which the Puller is mounted, to be applied to the spool at the top of the machine. It is therefore imperative that all operators are trained and fully aware of the hazards that can potentially arise if the operating procedures are not correctly implemented. The principle of operation uses a specially designed steel pulling cable with an integral pulling ferrule. This pulling cable is fed through the pipe to be removed, and the pulling ferrule 'pulls' the old pipe out with the hydraulic winch apparatus. The new pipe is connected to the pulling ferrule via a towing head and clevis/shackle, and as the original pipe is extracted, the new pipe follows the same bore path created by the extracted pipe.

Further help and advice can be obtained from Kobus personnel. Contact details are provided at the end of this manual.

All information in this document is based on the latest product information available at the time of printing. Kobus reserves the right to make changes to the product and the accompanying documentation without prior notice of such a change and without undertaking any obligation or liability.



WARNING: If incorrectly used, this product can cause severe injury. Those who use and maintain this product must be trained in its proper use, warned of its dangers, and should read the entire manual before attempting to set up, operate, adjust or service the product.



2 EC Declaration of Conformity

We KOBUS Inc
Of 2911 Pasadena Blvd, B200, Pasadena, 77503 TX, USA

In accordance with the following EU Directives:

- 2006/42/EC EC Machinery Directive
- 96/58/EC Personal Protective Equipment Directive
- 97/23/EC Pressure Equipment Directive

Hereby declare that:

Equipment: Underground pipe extraction and replacement machine
Model Name: KOBUS 400 Series Pipe Puller
Serial Numbers:

Has been designed and manufactured to the following Harmonized Standard:

BS EN 14492-1:2006 Cranes – Power driven winches and hoists – Part 1: Power driven winches

And that the equipment named above has been tested and found to comply with the relevant sections of the above reference’s specifications. The equipment complies with the essential requirements of the Directives.

A signed Certificate of Conformance is issued with each Kobus Pipe Puller machine



Manufacturer Warranty

This product's warranty, provided by our company, covers a period of 1 year from the date of purchase. All faulty parts and/or functions, resulting despite user's normal use, will be repaired and/or replaced at no charge during the warranty period. However, if any of the malfunctions are caused by user carelessness, inadequate maintenance, or natural disaster, we will provide repair and/or replacement services for a fee regardless of warranty period.

When in need of warranty services, the purchaser may visit our headquarter or one of our sales offices with the product or send the product with a detailed description of services required via postal/shipping service to any of our sales offices (the purchaser will be responsible for packaging, postage, and any postal insurance). Once repair services are completed, the supplier will return the product to the purchaser (return postage will be paid by the supplier). However, if we determined required services to be outside the boundaries of the warranty coverage, we will first contact the purchaser and provide an estimate of repair costs and obtain authorization to conduct services before any work is done. In such a case, return postage along with the repair costs will be billed to the purchaser when the repaired product is returned.

It is the user's responsibility to ensure that the product is suitable for the user's application. We will not be held legally for any malfunction resulting from user carelessness, abnormal use, and/or natural disaster. Even if we are in receipt of prior notification of such dangers, we will not be held legally liable. Product Warranty Guide Please read through the "Operation Manual" and "RAMS" carefully to obtain a long and safe use of this product. This product has been processed through careful quality control and testing procedures. Any malfunctions occurring during normal use are covered under the guidelines of the "Troubleshooting" which is included on this Manual. If you experience product malfunction, please contact our headquarters or any of our sales offices.

3 Product Identification

The KOBUS 400 Series Pipe Puller can be identified by the part number and serial number, which can be found on the data plate. The serial number and year of manufacture must be provided during any requests for servicing and repair.

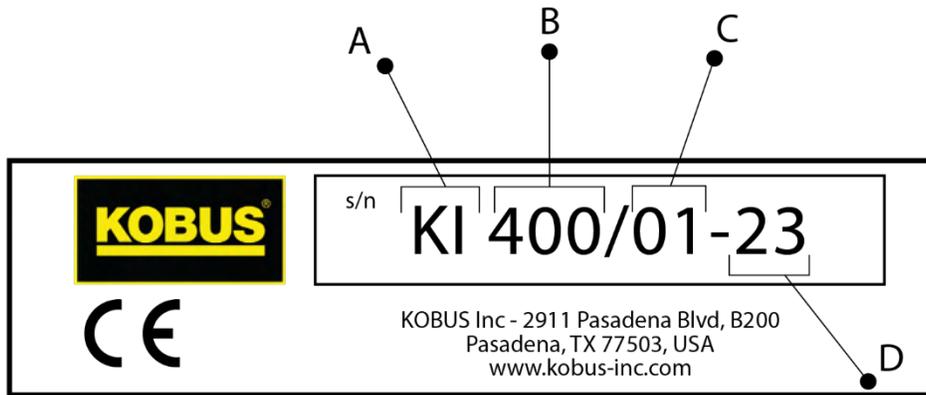


Fig 1: Data Plate

A	Company Abbreviation - Kobus Inc
B	Model Number
C	Serial Number
D	Year of Manufacture

4 Component Identification

4.1 Main Components

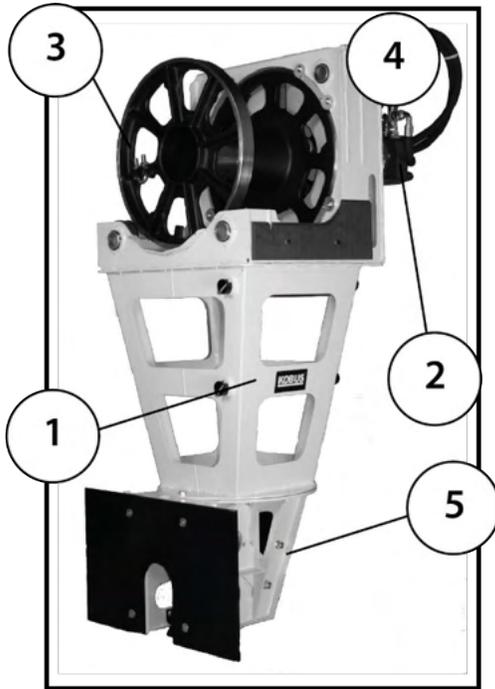


Fig 2: Component Identification

Item No.	Description	Quantity
1	Main Frame Assembly	1
2	Hydraulic Motor Assembly	1
3	Spool	1
4	Winch Section Assembly Bottom	1

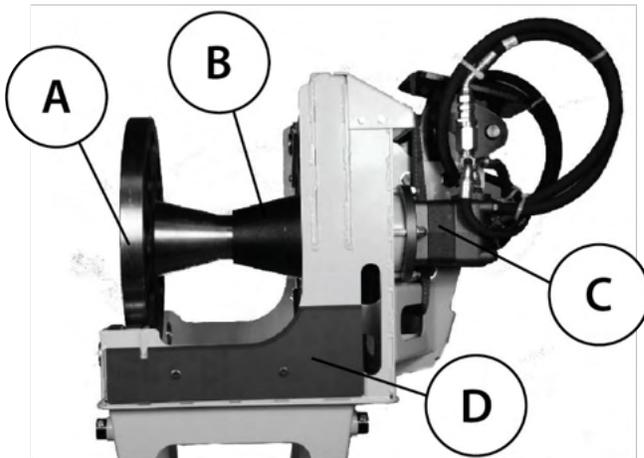


Fig 3: Winch Section Components

Item No.	Description	Quantity
A	Male Spool	1
B	Female Spool	1
	Hydraulic Motor	2
D	Nylon Wear Strip	1

5 Safety

This manual contains instructions for safe work. Important safety messages in this manual are marked in text by the following symbol:



WARNING: We warn you against danger of severe injury or life threat if appropriate instructions are not followed.

Other symbols used in this manual are as follows:



INFORMATION: Provides useful information



CAUTION: HEAVY ITEM
REQUIRES 2 MAN LIFTING



Gloves



Safety Glasses



Hard Hat



Ear Protection



Safety Boots

PPE: Advice on relevant PPE to wear

5.1 General Safety Instructions

- The KOBUS Pipe Puller may only be used and operated by fully trained personnel
- The operator(s) must receive a practical training in the Pipe Puller operation
- The operator of the required excavator must be trained and qualified to operate the excavator. This is the responsibility of the Customer
- Relevant Personal Protective Equipment must be worn as instructed by this manual or by any specific or general requirements of the site environment where the machine is operated
- When operating the Pipe Puller, the operator must respect and follow the Set Up, Operation and Maintenance Manual
- The user's manual must be stored at a place permanently accessible to the operator and must be available to him/her at any time.
- Do not allow unauthorized or untrained persons to use the product
- The operator of the equipment is responsible for any damage caused to third parties or property by operating the machine.

- Do not remove any of the safety labels.
- Do not remove any covers or safety elements unless required to do so as instructed in this manual.
- Do not use the machine if any of the protecting devices or covers are damaged or missing
- Do not use the machine as a ladder or means to gain any height or entry into excavations
- Do not use the machine as a lifting tool
- Keep the machine and its accessories clean and in a good technical condition at all times
- It is strictly prohibited to make changes or modifications to the machine that were not previously approved by the manufacturer. Any modification to the machine may lead to a hazardous situation or injury. If these instructions are not followed, the manufacturer does not bear any liability for the machine.
- Do not lead or anchor the cable across roads, pavements and other areas where other people may be present without proper use of safety zoning.
- The operator/user is responsible for the safety of persons that enter the working area of the machine. Immediately interrupt work and stop the machine if third persons enter the working area or approach the Pipe Puller.
- Do not place any objects or tools on or within the product.
- Do not use pulling cable supplied from any source other than that approved by the manufacturer
- Do not connect cable lengths together to make a longer pulling cable. Source and use the correct length of pulling cable.
- Repairs and Maintenance should only be performed by authorized personnel who have been properly trained.
- Do not operate the Pipe Puller after drinking alcohol or using drugs or medications that may impair your normal performance.
- Do not reach with your hand into the spool area during operation
- Do not allow any persons to be in the same excavation as the Pipe Puller while operating.

5.2 Manual Handling

The machine has been designed to reduce the need for manual lifting, although removal of the male part of the spool is handled manually and the weight of this element is approximately 50lbs. additionally, the removed pipe, once wound around the spool is a concentrated load, the weight of which depends on pipe diameter, material and length. It is possible that the weight of the male spool plus removed pipe (with the pulling cable inside) could be in excess of 200lbs, and this should therefore not be removed manually from the machine. The mode of operation outlined in this document specifically addresses this point and demonstrates how manual lifting is avoided.

5.3 Risk Assessment

Before carrying out any work using the KOBUS Pipe Puller, a full Risk Assessment and Method Statement must be completed. Individual site conditions will need to be assessed for each scope of work.



6 Brief Description

The KOBUS 400 Series Pipe Puller (KPP400) is a discrete item of plant equipment weighing approximately 650lbs when no extracted pipe is present. The machine is designed for use without the need for manual lifting, although adequate space for laying down of the removed pipe and the removable part of the spool will be necessary. This will necessitate providing sufficient space as a safety zone around the machine with physical demarcation using portable barriers or similar measures. The safety measures already employed in the industry, such as physical barriers to segregate pedestrians and traffic from the work area are deemed sufficient in use of the KOBUS Pipe Puller.

Most of the components on the machine are steel, either fabricated or cast, and have been designed with site conditions in mind. Maintenance is kept to a minimum.

The machine is mounted on the dipper arm of a compact excavator and positioned in an excavation at one end of a disconnected service pipe. A wire rope (pulling cable) is passed through the existing service pipe and a steel component (fixed to the wire rope) is located against the far end of the pipe. The component is also attached to a new service pipe to be inserted into the void left by the existing pipe as it is extracted. The wire rope is passed up through the tower section of the machine and attached to the spool at the head (top) of the machine. Once this is done, the machine operator in the excavator activates the hydraulic system of the excavator. This action turns the spool, withdrawing the existing pipe and winding the old pipe around the spool. As the existing pipe is extracted from the ground, the new pipe is drawn into the bore left behind.

Once the old pipe is wound around the spool and the new pipe is visible at the base of the machine, the new pipe is cut or disconnected from the pulling cable at the machine's base and the machine removed from the excavation. The new pipe is then reconnected to the main supply and to the customer's property in the approved manner as used elsewhere in any replacement program.

On withdrawal from the excavation, the Puller is positioned horizontally to the side of the excavation and approximately 4-6" above the ground surface. The motors on the machine are run in reverse by the operator in the excavator cab, and the detachable part of the spool unscrews automatically and is deposited on the ground whilst containing the withdrawn pipe as a coil. The spool element on the ground is turned over manually allowing removal of the old pipe as a coil. This can then be recycled.

7 Excavator Specifications

The Puller has a dead weight of approximately 320kilos/650lbs and has been designed to be attached to standard compact excavators typically found on civil construction sites, and generally referred to as being 35/45 series machines. The lifting capacity, both in transit whilst the Puller is attached to the excavator, and during the pulling operation, has therefore been considered and both the excavator and the Puller use will be satisfactory, provided normal operating procedures are followed. The extracted service pipe must be removed from the spool prior to tracking the excavator.

It is the responsibility of the User to ensure the lifting capacity and hydraulic capacity of the chosen excavator is capable of handling the potential loads involved in operation of the Kobus Pipe Puller. Consideration to total weight of the unit plus pulling cable and extracted pipe at full extension of the dipper arm from depth of excavation needs to be taken into account. Check load capacity specification of excavator being used in excavator manufacturer’s manual.

If in doubt, contact Kobus for assistance.

8 Attachment to Excavator

8.1 Mounting on Excavator

The Pipe Puller must only be lifted using the Pipe Puller mounting bracket and adaptor plate.

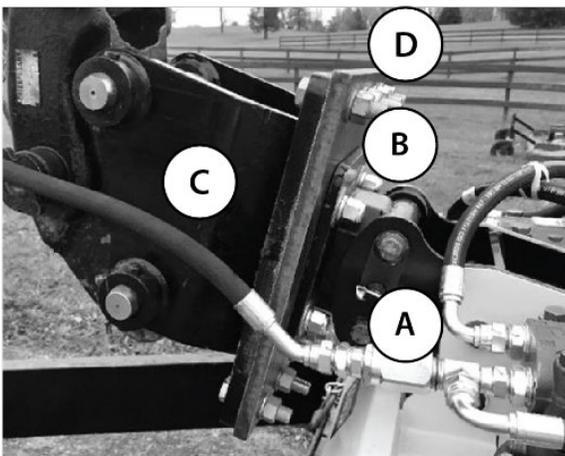


Fig 4: Machine Mounting Plates

A	Mounting Bracket
B	Adaptor Plate
C	Quick Hitch Bracket
D	Intermediate Adaptor Plate

The mounting bracket 'A' is permanently fixed to the machine frame. The mounting bracket has two 30mm steel pins with locking tabs. Attach the adaptor plate 'B' to the mounting bracket using the two steel pins and lock the pins in position with the locking tabs.

The mounting bracket is then attached to the quick hitch assembly bracket 'C' for the model of excavator being used.

Note: an intermediate adaptor plate may be required for some models of excavator/quick hitch adaptor.
Note: please refer to Kobus Services personnel for guidance on correct mounting of the adaptor plate to the quick hitch bracket in the first instance.

8.2 Hydraulic Pipe Connection

Connect the two hydraulic hoses on the Pipe Puller to the auxiliary hydraulics of the excavator using the 3/4" quick release flat face hydraulic connectors. Clean all flat faces of the connectors with a clean rag before connecting.

9 Transportation & Positioning

9.1 Transportation on ground whilst attached to excavator

When transporting the KPP400 Pipe Puller on the excavator, always carry the Puller drawn back in the horizontal position, and support the base plate of the Puller on the dozer blade of the excavator centered as shown in Fig 5 below. Do not carry the Puller with the dipper arm fully extended to avoid tipping/overturning hazard.



Fig 5: Correct position for transportation of KPP400 Pipe Puller on excavator

9.2 Transportation on trailer

- Unattached from excavator: ensure foot assembly is flat on trailer, there is a 4x4 block centered and supporting the spool and strap the Pipe Puller down using a 2" though the Quick Hitch wing plate
- Attached to excavator: ensure foot assembly is flat on trailer, there is a 4x4 block centered and supporting the spool and strap the Pipe Puller down using a 2" though the Quick Hitch wing plates

9.3 Positioning

The Excavator should be positioned close to side of the excavation during the pulling operation to minimize the reach of the dipper arm required and also to give the operator optimum visibility of the Puller in operation. As with normal practice, the excavator should be positioned on level and stable ground for Pipe Pulling. The lower foot section of the Puller can be rotated through 3600 to allow the best positioning of the excavator for access.

In operation of the Puller, lower the dozer blade of the excavator to the ground for maximum stability.

10 Preparation of Excavations



PPE: Wear safety boots, gloves, glasses & helmet

Note: Ensure correct PPE is worn when excavating pits on site and during operation of the Pipe Puller.

The Pipe Puller is designed to minimize the extent of any open trench excavation work. Two pits are required at each end of the pipe to be extracted (Fig 6)

Usually, this would be one pit at the point where the service pipe is connected to the mains pipe; the other excavation is close to the service pipe entry to the property. If the service pipe is being extracted from a basement then the process may only require a single excavation.

Where required by the depth of service pipe, adequate shoring of the excavation walls may be required in accordance with good practice.

In the event that the overall length of service pipe to be replaced is greater than about 80 feet, then intermediate excavation(s) should be considered and the pipe replacement done in more than one pull.



10.1 Where to pull from

The 'pulling pit' is the pit where the Pipe Puller machine will be located and will pull from. It is generally preferable to locate the Pipe Puller at the end with greatest depth of hole. However, ground conditions or accessibility may dictate that the Pipe Puller has to be located in the shallower hole. Decide from which end the pipe is to be pulled, and choose a hole that is the most accessible for the Pipe Puller. Whichever end is selected to locate the Pipe Puller, the minimum depth of excavation at the selected 'pulling pit' should be 3 feet to avoid damage to the ground surface (Fig 7)

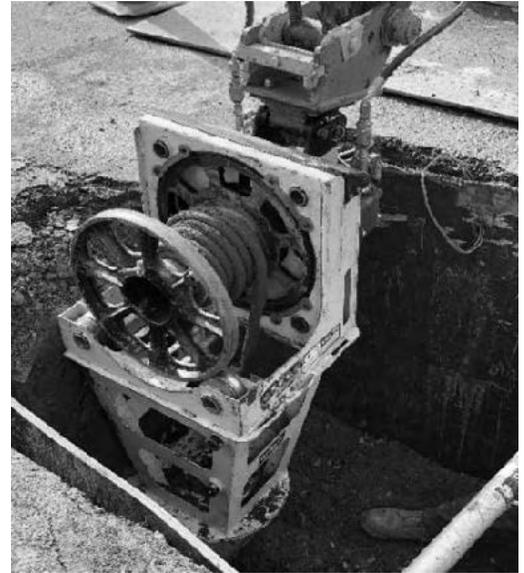


Fig 7: Minimum depth of excavation 3 feet

10.2 Size of excavations

10.2.1 Pulling Pit

The size of excavation (A and B) is dictated by the depth of service to enable access to the service pipe, and to provide adequate shoring of the excavation walls. The wall of the excavation where the service pipe is exposed needs to be flat and vertical to provide a secure face for the Puller to pull against. Excavate at least 4" below the old exposed pipe (Fig 8)

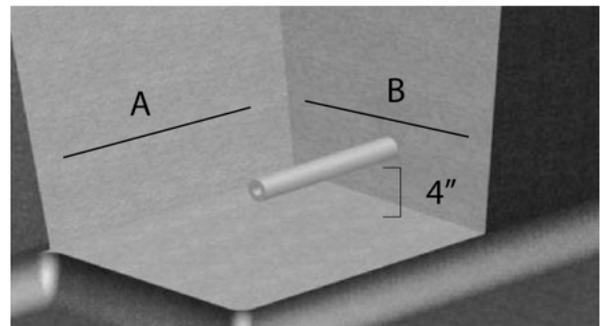


Fig 8 Pulling pit excavations

10.2.2 Pipe Feeder Pit

The pipe feeder pit excavation only needs to be large enough to be able to disconnect the old pipe and to feed in the new pipe. The depth and size of excavation needs to be sufficient to expose and cut the old pipe.

When extracting service pipe from within the basement of a property, ensure that the surrounding brickwork/foundation around the pipe is removed to ensure that the pipe is free to move when pulled.

11 Inserting the Pulling Cable

11.1 Cutting existing pipe

Follow normal work procedures to disconnect existing live service pipe supply. Using an appropriate tool (hacksaw/pipe cutters) cut the existing pipe at both ends. Cut pipe cleanly and square.

At the pulling pit end, cut the old pipe so that at least 4-6" is exposed from the vertical face of the excavation pit.

At the pipe feeder pit, cut the old pipe, leaving enough pipe to allow pulling ferrule to engage onto end of pipe. Allow sufficient pipe to feed the pulling cable into the existing service pipe and towing the new pipe into the ground.

11.2 Selection of Pulling Cable Size

11.2.1 Pulling Cable Breaking Load

There are two sizes of pulling cable available in 10mm (3/8" approx.) and 14mm (9/16" approx.) diameters. Selection of cable depends on length of pipe replacement, internal bore of existing pipe, pipe and ground conditions.

The 10mm (3/8") pulling cable is designed for internal diameters of 3/4" and above. The breaking load of 10mm (3/8") cable is approx. 23,000 lbs. The 10mm pulling cable is the standard size cable for the majority of 3/4" to 1 1/4" pipe replacements.

The 14mm (9/16") pulling cable is recommended for galvanized steel service pipes between 3/4" to 1 1/4" internal diameters. Breaking load of 14mm (9/16") cable is 46,200 lbs. Selection of pulling cable will vary from site-to-site.

The pulling cable is supplied with a standard expander. The expander can be replaced with different sized expanders depending on the size of new pipe being towed in.

Pulling Cable Diameter	Pipe Sizes ID	MBL - Maximum Breaking Load (lbs)	Pipe Materials (suggested)
10mm-0.2+0.4 (approx. 3/8")	1/2" to 1 1/4"(*)	23,000lbs	Lead, Copper, Poly, Galvanized Steel
14mm-0.2+0.4 (approx. 9/16")	3/4" to 1 1/4"(*)	46,200lbs	Galvanized Steel, others

Note: pull length will be dependent on ground conditions.

(*) of thin wall not exceeding 2mm (0.08")

11.2.2 Length of Pulling Cable

Measure the length of pipe being replaced from one end to the other. Select Pulling Cable length to suit length of pipe being replaced. The Pulling Cable length is defined by the length of pipe to be replaced; additional cable length (approx. 9-10ft) is supplied to allow threading through the Pipe Puller and onto the spool. Example:

Length of pipe to be replaced (ft.)	Specified Pulling Cable Length (ft.)	Actual Length of Pulling Cable (ft.) *
20	20	29 on 10mm cable
30	30	37 on 14mm cable

Pulling cable can be supplied in 10 feet length increments starting at 30ft to 100ft on 10mm and 80 on 14mm.

***Note: The extra length of cable is provided ONLY for the purpose of threading through the Pipe Puller and onto the spool and creating the safety loops**

11.3 Inserting Pulling Cable



WARNING: Take care when cutting cable ties on the Pulling Cable and uncoiling the cable. The pulling cable is under tension and may spring out from the coil causing injury.

11.3.1 Test insertion with leader cable

It is recommended to first feed the low friction leader cable into the pipe to determine if there are any restrictions in the pipe which may prevent the pulling cable from feeding through the pipe. Connect the spring loaded head 10mm (approx. 3/8") or 14mm (approx. 9/16") to the low friction leader cable. The low friction leader cable should be washed with chlorinated water prior to insertion into the pipe to minimize the risk of contaminating the pipe should the existing service need to be reconnected.

In the event that the leader cable will not feed all the way through the pipe, hold (or tape) the leader cable at the point of entry into the pipe when it has been inserted as far as it will go. Pull the leader cable back out of the pipe (still holding the same point), and lay the extracted leader cable across the ground to identify where the restriction is located.

A decision can then be made whether it is feasible and/or economic to remove the restriction by making a further small excavation, or to abort the pull (and reconnect the existing service if necessary).

If the leader cable feeds through the pipe successfully, it indicates that the pulling cable is more likely to pass through the pipe. Remove the leader cable from the pipe and begin inserting the pulling cable. Uncoil the pulling cable before attempting to insert into the pipe.

11.3.2 Insert Pulling Cable by Hand



Fig 9: Inserting pulling cable into pipe

Insert the pulling cable into the existing pipe manually from the pipe feeder pit (Fig 9).

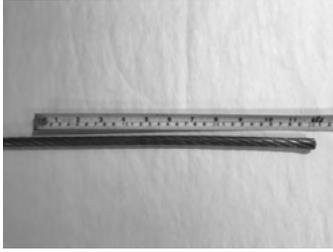
The cable is fed through the pipe until it appears from the pipe at the pulling pit. Continue to push (and pull) the cable through the pipe until there is no slack at the feeder pit end.

11.3.3 K-Line Drawstring

If the pulling cable will not easily push completely through the pipe by hand, use K-Line Drawstring. Refer to table below for recommended drawstring to use depending on pulling cable size:

Item	Color	Description	Application
KS.03015.1536.12	Red	K-Line 1.5mm (MBL 360kgs)	Recommended for 10mm (3/8") pulling cable

- i. Insert the low friction leader cable through the pipe from the pipe feeder pit with the spring loaded head attached.
- ii. Once through the pipe, detach the spring loaded head, and attach a threaded eyelet connector to the leader cable
- iii. Tie the K-Line drawstring to the threaded eyelet connector
- iv. Pull the leader cable, with the K-Line attached, back through the pipe until the K-Line appears. Disconnect the K-Line from the leader cable.
- v. Before attaching the K-Line to the pulling cable, thoroughly clean and dry the first 3 feet of the pulling cable.
- vi. Attach the K-Line to the pulling cable as per the following method:



1. Start about 1ft from end of pulling cable



2. Secure K-Line tightly to Pulling Cable with electrical tape



3. Create a loop in the K-Line as shown



4. Feed loop over Pulling Cable



5. Carefully move loop to taped end of K-Line



6. Secure loop tightly to Pulling Cable with tape



7. Create 2 further loops & equally space on pulling cable as shown



8. Secure last loop tightly to Pulling Cable & continue tape onto free K-Line as shown

- vii. Pull the K-Line from the pulling pit, and as the pulling cable enters the pipe from the pipe feeder end, carefully pull and push at the same time. Steadily pull the K-Line to pull the pulling cable through the pipe, and push the pulling cable gently from the other end to assist the K-Line pull.
- viii. Once the pulling cable is fully through the pipe, disconnect the K-Line



IMPORTANT: When using the K-Line, do not 'push' the pulling cable too hard from the other end as this will tend to loosen the knots attaching the K-Line to the pulling cable. Push as pulling tension is felt.

12 Locating the Expander & Pulling Ferrule



Fig 10: Expander over old pipe with pulling cable inserted

Once the pulling cable is fully inserted through the old pipe, locate the expander onto the old service pipe making sure that the expander head is seated fully over the pipe. (Fig 10)

Ensure that the cone on the pulling ferrule mates with the expander as the pulling cable is pulled under tension to connect with the expander.

13 Positioning the Puller

Once the pulling cable is inserted fully through the underground pipe, position the excavator in the optimum place for access and visibility. Ensure that the excavator is positioned close to the excavation pit, i.e. the dipper arm is not excessively extended, but not too close as to cause potential collapse of the edge of the excavation. Lower the dozer blade to the ground for stability. Ensure there is a clear zoned area around the excavation to be able to lay the Puller horizontally at the end of the pull to remove the extracted pipe from the spool. (See Section 15.6). The Pipe Puller is positioned vertically and close enough to the old pipe such that there is sufficient pulling cable to thread through the Puller tower section. This may be on the edge of the excavation or, if the excavation is deep, the Puller may need to be lowered into the excavation pit.

Thread the pulling cable through the 'mouse hole' in the front plate, and around the bottom roller. Pass the cable up through the Puller towards the spool.

The Pipe Puller is then moved into position so that the mouse hole in the front plate is positioned centrally over the protruding section of old pipe to be extracted. A second operator should assist by signaling to the excavator operator to get the positioning correct. The second operator should hold the loose end of the pulling cable as the Puller is moved in to position, and pulls the cable through the Puller to no loose cable becomes snagged or trapped.

Check the position of the old pipe/pulling cable to ensure that it is free to enter into the Puller through the mouse hole. Reposition as necessary.

14 Fixing Pulling Cable to Spool



Fig 11: Pulling Cable sits in central groove of roller

Feed the end of the pulling cable around the bottom roller, ensuring the cable sits in the central groove of the roller (fig 11). Feed the pulling cable up through the main frame of the Puller to the spool.

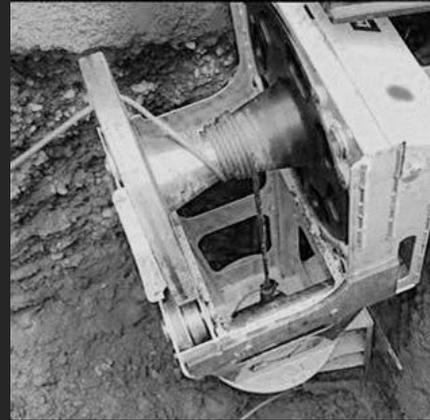


Fig 12: Wind pulling cable around spool up to 2 loops +

Wind at up to 2 revolutions of the pulling cable onto the spool (Fig 12). More loops will not affect the pulling if performed.

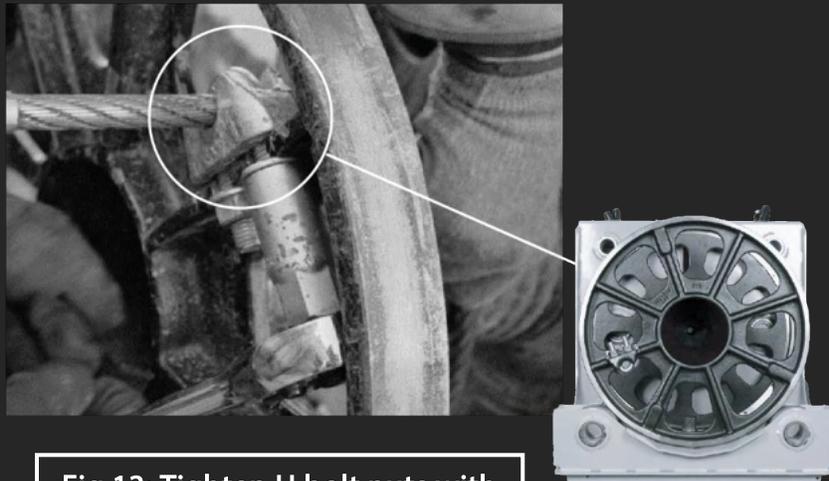


Fig 13: Tighten U bolt nuts with spanner or socket

Attach the pulling cable end to the U Bolt on the outside of the male (outer) spool. Tighten the two U-bolt nuts using an appropriate spanner or socket to secure the pulling cable to the spool (Fig 13).

15 Connecting a new service pipe

15.1 Connecting Polyethylene Pipe (PE)



Fig 14: Towing head with loop shackle

Select a towing head of suitable size for the internal diameter of new PE pipe. Towing heads are available in 20mm (3/4"), 25mm (1") and 32mm (1 1/4") diameters.

Push the towing head into the end of the new pipe and turn the exposed loop on the towing head until the towing head starts to grab onto the inner wall of the new pipe.

Continue to turn the loop on the towing head until the new pipe starts to deform where the towing head pushes against the wall of the pipe.

Connect the loop on the towing head to the pulling ferrule using a loop shackle or loop shackle/clevis. Fully tighten shackle/clevis to secure shackle in place.

15.2 Connecting Copper Pipe

To connect a new copper service pipe, there are two available methods.

15.2.1 Method 1



Fig 15: Copper pipe flattened at one end

Before connecting the copper pipe, close the open end of the copper pipe using a hammer to create a flat closed end. In the flattened section, drill a hole through the copper using an appropriate drill (Fig 15). Hole size needs to be at least 3/8" diameter.

Connect the loop shackle/clevis through the hole created in the copper flat end. Connect the loop shackle/clevis to the pulling ferrule loop.

15.2.2 Method 2 – Towing Sock (Chinese Fingers)

Fit a towing sock (“Chinese Fingers”) over the copper pipe. Connect the towing sock to loop shackle/clevis and then connect the loop shackle/clevis to the pulling ferrule loop.



Fig 16: Typical towing sock

15.3 Tighten the Pulling Cable

Before putting tension on the pulling cable:

- Check that the pulling cable is secure on the spool, and is threaded around the central groove in the bottom roller of the Pipe Puller.
- Check that the new service pipe is securely connected to the pulling ferrule using the most appropriate method described above.
- Check the old pipe is centrally located within the mouse hole in the front guide plate of the Pipe Puller.
- Check the dozer blade of the excavator is down to stabilize the excavator.
- All personnel must evacuate the excavation

Slowly, put tension on the pulling cable by starting the excavator auxiliary hydraulics. Check direction of winding of the pulling cable around the spool. Continue to increase tension until the expander and pulling ferrule are fully engaged in the feeder pit.

15.4 Pull

Slowly continue to apply tension to the pulling cable by driving the excavator auxiliary hydraulics. The underground pipe will start to move into the ground at the feeder pit end and the pipe will appear around the roller of the Puller.

Continue to apply STEADY pressure onto the pull so the pulling cable and old pipe start winding around the spool. Once a few revolutions of old pipe are wound onto the spool, the speed can be steadily increased.

Feed the new pipe as it is towed into the ground by the pulling cable.

15.5 Completion of Pull

When towing in copper pipe, STOP the Puller when the pulling ferrule is visible at the base of the Puller. Do NOT wind new copper pipe around the bottom roller. Move the bottom section of the Puller away from the pit wall which will draw the copper pipe through the ground.

When towing in Polyethylene (PE) pipe, slow the Puller down when the pulling ferrule and new service pipe start to appear at the base of the Puller. Continue to pull until the pulling ferrule is about to be wound onto the spool. Stop the pull at this point.

Carefully move the Puller away from the wall of the excavation, angling the bottom section away first. This will pull more new service pipe through the ground.

Reverse the direction of the hydraulic drive for about 3 seconds (two spool rotations) to release tension in the system.

Cut the new service pipe to disconnect it from the Puller, and then lift the Puller with the extracted pipe on the spool out of, and clear of, the excavation. Remove the loop shackle/clevis from the pulling ferrule and retain for next pulls. Remove the towing head/towing sock from the new pipe and retain for future use.

15.6 Removal of Spool with extracted pipe

Maneuver the Puller into a horizontal position (Fig 17) at the side of the excavation (in the clear zoned area as mentioned in Section 13 – Positioning the Puller), with the front guide plate resting on the ground and the spool about 4-6" above the ground.

All personnel must be clear of the area.

Reverse the hydraulic drive to the Puller to start to slowly unwind the extracted pipe. Continue to unwind until the male half of the spool starts to unwind itself from the female half of the spool. Allow the male spool to drop to the ground with the extracted pipe, and then lift the Puller clear of the male spool.



Fig 17: Puller in horizontal position ready to unwind male spool

15.6 Removal of Spool with extracted pipe



CAUTION: HEAVY ITEM REQUIRES 2 MAN LIFTING

Cover the male spool thread with cloth or similar, and tape to prevent the threads getting covered in dirt and grit when removing the old pipe (Fig 18). Turn the spool over so the male thread is facing downwards and resting on the ground.

Undo the U Bolt nuts connecting the pulling cable to the spool, and disconnect the pulling cable



Fig 18: Cover male spool thread with cloth and tape to protect from dirt and grit

Lift the male spool clear of the extracted pipe (Fig 19), remove the cloth and tape, and rewind onto the female spool ready for the next pull.

Remove the extracted pipe from the area for recycling/recovery or safe disposal.



Fig 19: Disconnect pulling cable from spool and lift male spool clear of extracted pipe coil

16 Parts and Maintenance

The Kobus Pipe Puller KPP400 is designed for minimal maintenance.

- All the bearings are sealed for life.
- Regularly check the hydraulic system for leaks particularly around connectors.
- Regularly check condition of hydraulic hoses
- Regularly rotate foot section
- Keep male/female spool threads clean. Wipe with a cloth after use to clean threads.
- Use anti-seize lubricant grease on the male/female threads to prevent sticking
- Keep machine clean after use by brushing off loose dirt and debris, or use a pressure washer

It is required to have the machine fully inspected and serviced by trained Kobus Engineers after 2 years from date shown on the "Declaration of Conformity"

Do not replace any parts except with instruction from Kobus personnel. If in doubt, contact Kobus Inc for advice.

17 Support

17.1 Training

- All operators using the Kobus Pipe Puller have to be fully trained by Kobus authorized trainers.
- Training is provided on site.
- Qualified operator training certificates can be issued, on request, following successful training

17.1 Training

- Kobus can provide chargeable support for problematic situations.

17.1 Training

- Telephone Support is available.

18 Contact Details

KOBUS Pipe Puller

2911 Pasadena Blvd, B200

Pasadena, Texas 77503

Tel: +1-269-216-3916

Email: kobus@dresserutility.com

Website: www.dresserutility.com

19 Troubleshooting

This section provides information of some common issues that you may come across when using the Kobus Pipe Puller and provides all the troubleshooting steps you can take to assist you with resolving the problem.

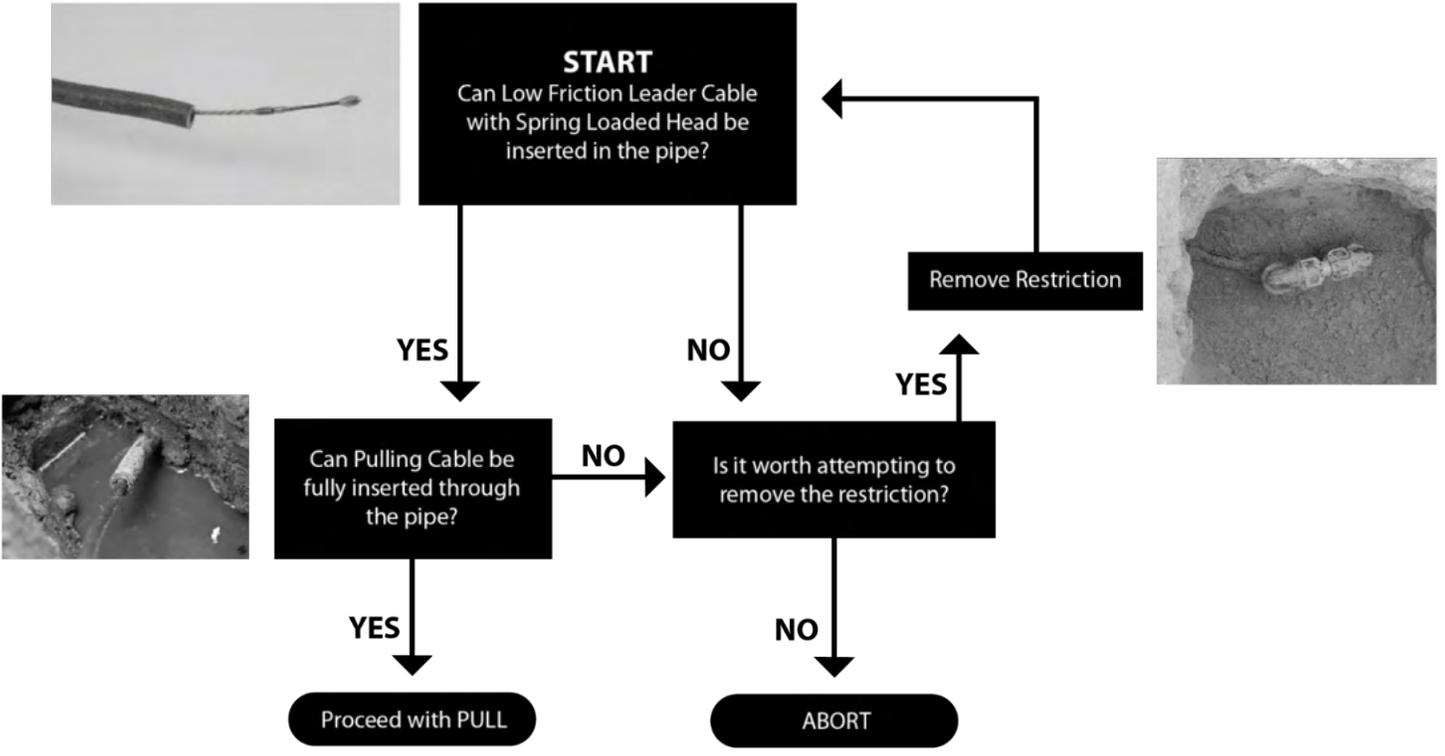
Observation	Reason	Solution
Pulling Cable doesn't feed through pipe	Sharp bend, elbow or tee connection in pipe prevents feeding of pulling cable	The pulling cable and low friction leader cable can maneuver around bends with a radius of approximately 150mm or greater. Where there are sharper bends, do a spot excavation at the restriction, and straighten or remove it. When doing a spot dig, use the low friction leader cable to show accurately how far the bend is from the end of the pipe.
	Internal bore of pipe is damaged or restricted preventing feeding of pulling cable	Locate the damaged section of pipe and dig a small excavation to expose the damaged section. Cut out the damaged section (removing the pulling cable first), and then feed the pulling cable through the pipe and across the gap created by the removed section of damaged pipe. The Pipe Puller will then pull both existing sections of pipe in a single pull.
Pipe will not move when pulled	Pipe may be embedded in concrete or similar material	<p>Progress pull very slowly with steady and consistent speed applied. Do not stop and start the pull, as this may cause the cable to break. If the pipe still does not move, the most likely cause of the problem is concrete around the pipe.</p> <ol style="list-style-type: none"> i. When the pipe is shallow and crosses a road, the concrete of the curb stone may encompass the pipe. With shallow pipes, always excavate next to the curb stone to ensure that the pipe is free. ii. Look out for manholes or other features that lie in the vicinity of the pipe. Should the pull not be successful, this is a likely problem area and a spot excavation will be required. iii. When pulling a pipe from inside a building, ensure the pipe is correctly installed in a duct, where it enters the foundation wall
	Length of existing pipe being removed is too long	<ul style="list-style-type: none"> • Ideally long length of pipe should be pulled in 80 feet sections. • Additional intermediate excavation pits will be required for multiple section pulls.

Observation	Reason	Solution
Ground is being pushed upwards	Pipe is too shallow in the ground. When the pipe is less than 3 feet deep, the ground may not provide enough resistance to the foot of the pipe puller allowing it to pull the pipe out. As the front guide plate of the bottom section pushes against the ground it may push the ground upwards. This results in a bulge forming above ground while the foot is ploughing through the ground.	This can easily be avoided by using suitable support boards inserted in front of the guide plate of the bottom section at a depth of more than 3 feet. Sheeting to increase surface contact area is also possible.
Other services in proximity	The Pipe Puller is designed to fit in tight holes with other services in the vicinity. However, care has to be taken not to damage these services when pulling a pipe. Care is taken by correctly inserting the bottom section.	<ul style="list-style-type: none"> i. Ensure that the bottom of the bottom section and the kick plate sit securely against the soil and not against other services. ii. Allow enough space behind the bottom section to accommodate movement without damaging other services. iii. If the above are not possible, it is possible to pull against or on top of other services by first reinforcing with appropriate braces, such as sections of railway sleeper and/or scaffold board, which must be firmly in place and well compacted into the ground. Bear in mind that the forces exerted on this bracing will be the same as the maximum pull force when pulling the pipe. The bracing and the services must be able to withstand these forces, so this must be checked before the pull. <p>If this is not possible then the pull should be carried out from the other end of the pipe, or carry out a spot excavation between the holes and perform two pull operations.</p>

Pullers stops before completing pull	If the Pipe Puller suddenly stops when in the middle of a pull, the most likely scenario is there is a restriction stopping the pipe e.g a fitting on the pipe may get snagged around an obstacle	<p>Continue very slowly; if it does not release itself, follow the steps below:</p> <ul style="list-style-type: none"> i. Use a volt stick as in the risk assessment to determine that the Pipe Puller is safe to touch. ii. Release the tension on the cable. iii. Switch off the machine iv. Push the low friction leader cable into the new pipe to measure accurately the position where the expander head got stuck. v. Make a spot excavation at that point to remove the cause of the problem. vi. Re-start the machine and carry on with the pull.
--------------------------------------	---	--



20 Go – No Go Guide to Pipe Pulling



21 Technical Specifications

Item	Specification
Overall dimensions (Assembled)	H66" x W24" x L36" (approx.)
Weight	320 kgs (approx.) – 700lb
Spool Capacity	80 feet of 1¼" pipe*
Pipe diameters (ID)	½ " to 1¼ "
Pipe Lengths	Up to 80 feet; dependent on pipe and ground conditions
Pipe Materials	Steel, Lead, Copper, black poly, PE
Pulling Cable 10mm (3/8")	10mm (3/8") tapered and welded one end.
Pulling Cable 10mm (3/8") Maximum Breaking Load	MBL 23,000lbs
Pulling Cable 14mm (9/16")	14m (9/16") tapered and welded one end
Pulling Cable 14mm Maximum Breaking Load	MBL 46,200lbs
Excavator Type Check with Kobus personnel for max pressure rating and max flowrates allowed	Compact Excavators 35/45 Series

NOTE *: useable on 1 ¼" ID pipes as long as it fits into expander fully. This may apply to newer steel pipes with wall thickness of 2mm (0.08") Max OD is 1.4"

Kobus Pipe Puller

2911 Pasadena Blvd, Suite B200,
Pasadena, Texas 77503
+1 (269) 216-3916

Dresser Coupling & Repair

41 Fisher Avenue
Bradford, PA 16701
(800) 521-1114

© 2025 Natural Gas Solutions North America, LLC – All rights reserved. Dresser Utility Solutions reserves the right to make changes in specifications and features shown herein, or discontinue the product described at any time without notice or obligation. Contact your Dresser Utility Solutions representative for the most current information. The Dresser Logo and all Trademarks containing the term “Dresser” are the property of Dresser, LLC, a subsidiary of Baker Hughes.



dresserutility.com

DUS.KPP.003a

9.25