

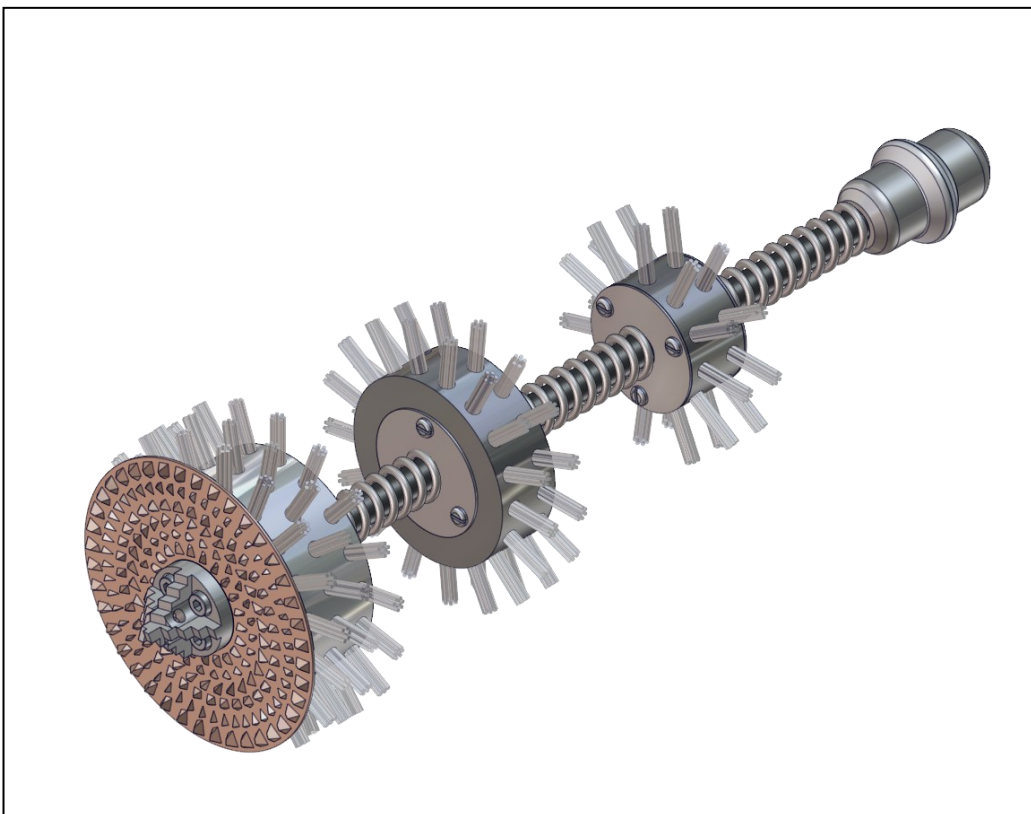


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Operating & Safety Manual

Twister DN50, DN70, DN100, DN150 & DN200 / 2", 3", 4", 6" & 8" for
8mm/1/3" and 12mm/1/2" Shaft



WARNING

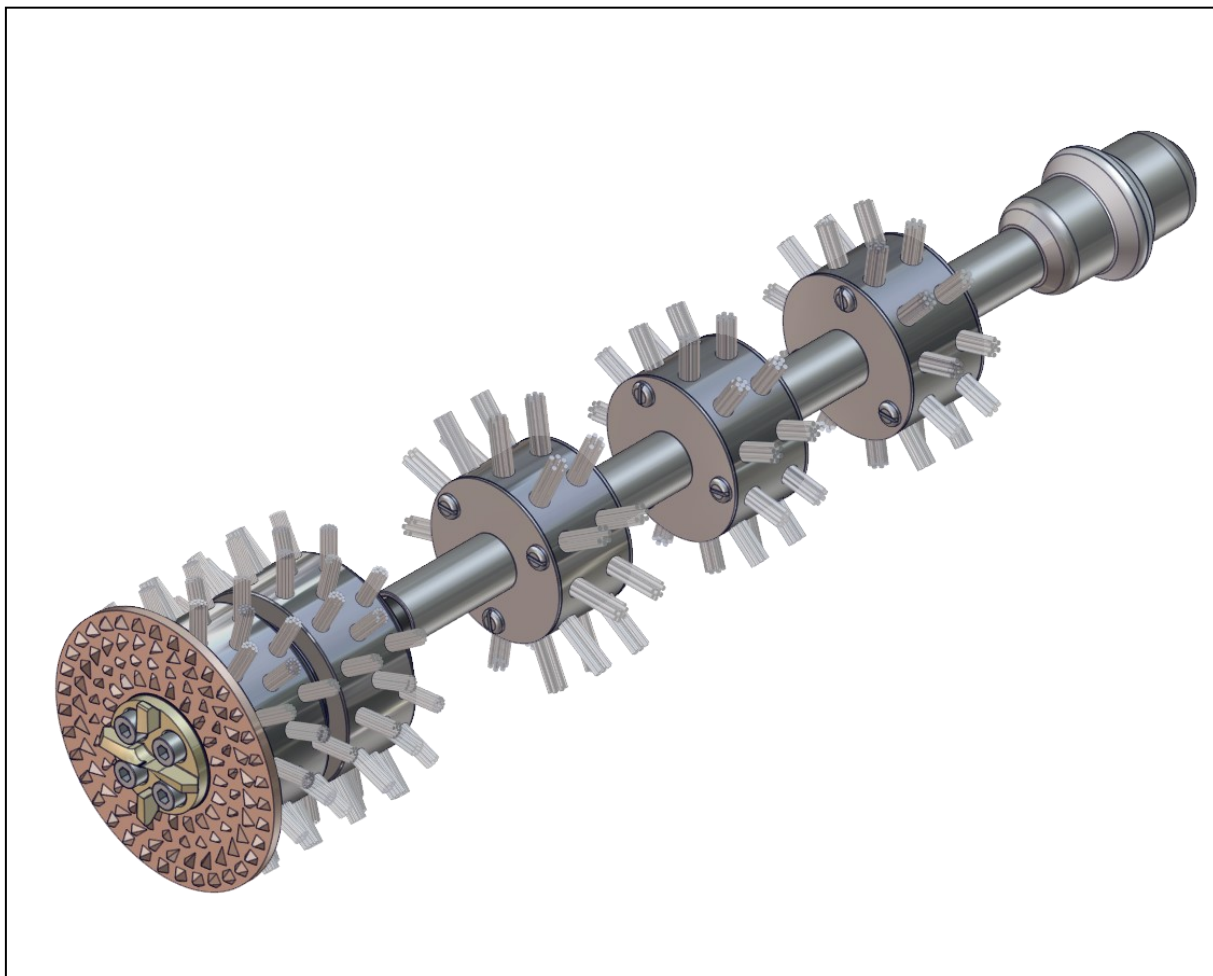
These instructions are for your personal safety. Always ensure that you have read and understood these instructions before using any tools of the Twister range. Please also read and understand the corresponding Miller manual before using the Twister tool.



We now have resellers in the U.S., Europe & Australasia.
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To watch practical demonstration videos, or to download an electronic copy of these Instructions, please visit www.picotesolutions.com. Please note that videos are not intended as a replacement or alternative to this operating and safety manual, but only as an additional learning tool.

SAFETY INFORMATION

WARNING

This section contains important safety information. Failure to comply could result in serious injury or death.

Safety Symbols

Safety symbols are used throughout this manual to draw attention to potential hazards.



Danger risk of serious injury, follow instructions



Danger risk of serious injury from rotating parts

Personal Protective Equipment (PPE)

Always use Personal Protective Equipment when using the Twister and Miller systems, including suitable overalls / protective clothing & footwear and the following:



Always wear suitable eye protection when using the Twister to prevent dust from irritating your eyes.



Always wear suitable ear protection when using the Twister to prevent any hearing loss.



Always wear suitable cut-resistant gloves when using the Twister to prevent any hand injuries. Any open injuries or skin irritations should be covered at all times to avoid contact with sewage, chemicals or dust.



Always wear a suitable respirator when using the Twister to prevent any resin dust or fumes from pipes being inhaled or consumed, which can cause occupational asthma or dermatitis as well as eye irritation.

Always remember



Dust produced can be dangerous to your health, inflammable or explosive.

Make sure the pipe has been **opened** and **ventilated** to stop any gases forming in the lateral pipe where the work takes place.

Before assembly, use, replacement of parts or maintenance, unplug the Pi-cote milling machine or your hand drill from its power socket. **Failure to comply may lead to serious injury including electric shock or injury from rotating parts!**

AVAILABLE SIZES & POWER SOURCES

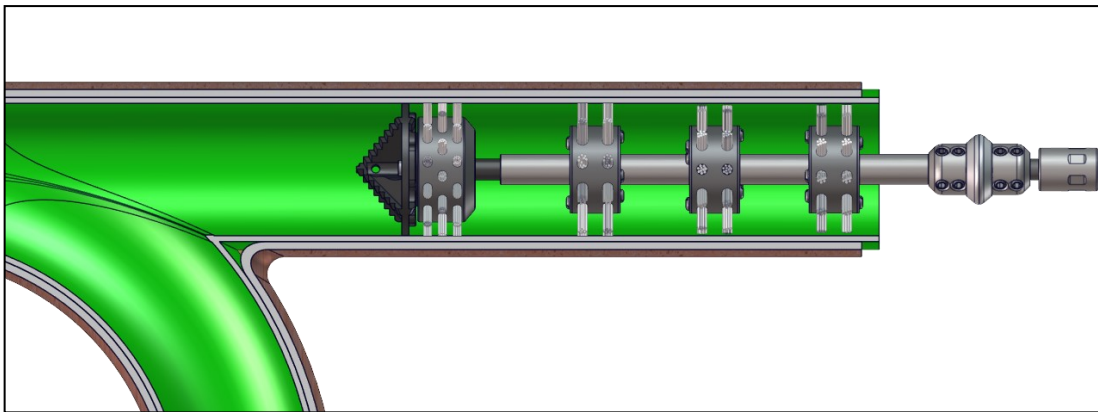
The Twister products have a variety of different application purposes. The main purpose of the Twister is to be used for reinstatements. The Twister with 12mm (1/2") shaft can also be used to remove collapsed linings, concrete, lime scale or nails & other metal inserts.

Choosing the correct Twister for the job

Select the correct Twister according to the size of the original host pipe, taking into account whether or not the tool shall be used in a lined or unlined pipe.

Place the tool completely inside the pipe before powering up the tool.

It is possible to use a Twister designed for lined pipe inside an unlined pipe, but the opening will be smaller and will require significantly more grinding afterwards with the Smart Cutter™. Do not use a Twister designed for a unlined pipe in a lined pipe.



! WARNING



TWISTER	Shaft size mm/inches	BEND 90°	BEND 45°
Twister Mini DN50 (2")	8 (1/3")	YES	YES
Twister Mini DN70 (2 3/4")	8 (1/3") & 12 (1/2")	YES	YES
Twister DN100 (4"), DN150 (6") & DN200 (8")	12 (1/2")	YES	YES
Twister Express DN100 (4")	12 (1/2")	YES	YES
Twister Concrete Remover DN100 (4") & DN150 (6")	12 (1/2")	YES	YES
Twister Liner Remover DN100 (4") & DN150 (6")	12 (1/2")	YES	YES
Twister Metal Grinder DN100 (4")	12 (1/2")	YES	YES
Twister Cleaner DN100 (4")	12 (1/2")	YES	YES

CHOOSING YOUR POWER SOURCE

The Twister products with the 8mm ($\frac{1}{3}$ ") diameter shaft can be operated with the **Picote Micro & Mini Miller** machines. The Twister products with the 12mm ($\frac{1}{2}$ ") diameter shaft, have been designed for and can be operated with the **Picote Midi & Maxi Miller** machines.

AVAILABLE MODEL TYPES

Mini Twister

The Mini Twister is a lateral cutter for plastic pipes, although it can also be used in cast iron and clay pipes. The Mini Twister is only used for making the initial cut.

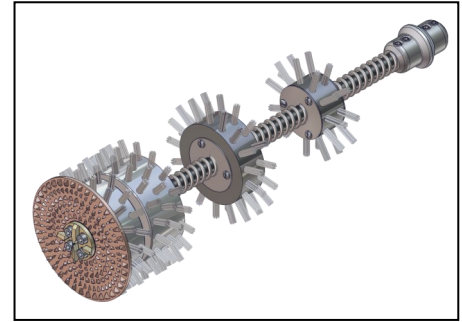


Benefits: The Twister is fitted with special stabilisers and a spring that make it very flexible and easy to work within small diameter pipes DN50 (2") and DN70 (3").

Name	Shaft size mm/inches	Product Number
Twister Mini DN50 (2")	8 ($\frac{1}{3}$ ")	1230000050
Twister Mini DN70 (2 $\frac{3}{4}$ ")	8 ($\frac{1}{3}$ ")	1230000070
Twister Mini DN70 (2 $\frac{3}{4}$ ") unlined pipe	12 ($\frac{1}{2}$ ")	1230000370
Twister Mini DN70 (2 $\frac{3}{4}$ ") lined pipe	12 ($\frac{1}{2}$ ")	1230000470

Twister

The Twister is a lateral cutter for plastic pipes, although it can also be used in cast iron and clay pipes. The Twister is only used for making the initial cut.

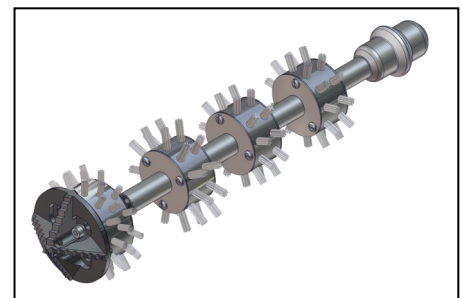


Choose your Twister according to pipe size and if the pipe is lined or unlined. Twisters DN100 & DN150 / 4" & 6" are delivered with 1mm and 3mm grinding plates which can be changed according to the job.

Name	Shaft size mm/inches	Product Number
Twister DN100 (4") lined pipe	12 (½")	1230075100Y
Twister DN100 (4") unlined pipe	12 (½")	1230085100Y
Twister DN150 (6") lined pipe	12 (½")	1230115150Y
Twister DN150 (6") unlined pipe	12 (½")	1230115150Y
Twister DN200 (8")	12 (½")	1230175200Y

Twister Express

The Twister Express make the working faster and safer, minimizing the risk of damage to the original pipe. The Twister Express is used for making the initial cut and for light liner removal.



Choose your Twister according to pipe size and if the pipe is lined or unlined.

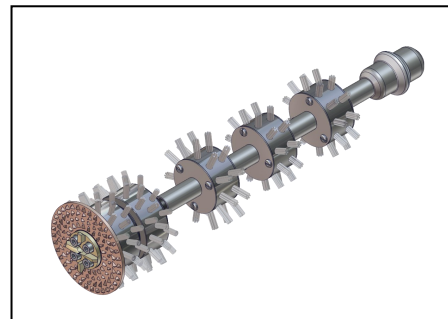
Name	Shaft size mm/inches	Product Number
Twister Express DN100 (4") lined pipe	12 (½")	1233075101
Twister Express DN100 (4") unlined pipe	12 (½")	1233085101

Twister Liner Remover

The Twister Liner Remover is a special tool designed to remove collapsed or failed linings. It has two front brushes for stabilising the cutter centrally. It also features a custom built flat drill head.

The 3mm front metal panel features large carbides, enabling it to remove collapsed or failed linings in DN100 (4") and DN150 (6") cast iron or concrete pipes efficiently.

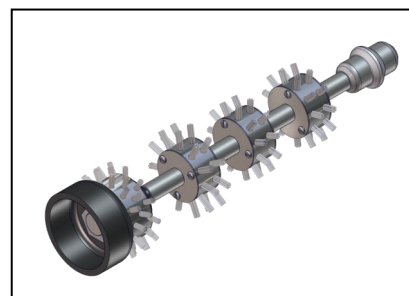
Liner removal is hard work for the Miller machine. Where long distances are needed to be removed it is recommended to use Maxi Miller or preferably Maxi Miller Power+.



Name	Shaft size mm/inches	Product Number
Twister Liner Remover DN100 (4") lined pipe	12 (1/2")	1233075100
Twister Liner Remover DN100 (4") unlined pipe	12 (1/2")	1233085100
Twister Liner Remover DN150 (6") lined pipe	12 (1/2")	1231115150Y
Twister Liner Remover DN150 (6") unlined pipe	12 (1/2")	1230125150Y

Twister Metal Grinder

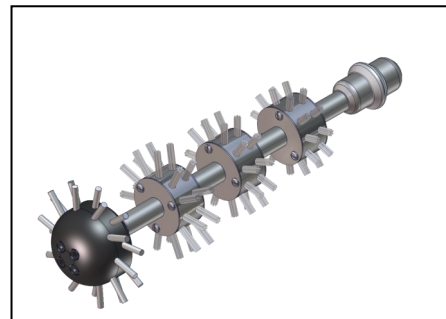
The Twister Metal Grinder is a special tool designed for removing metal inserts like steel reinforcement bars from the pipe. Carborundum Stone head cuts any metal inserts efficiently. Gives outstanding finish when followed with Smart Cutter to grind away sharp edges left behind.



Name	Shaft size mm/inches	Product Number
Twister Metal Grinder DN100 (4")	12 (1/2")	1233075101N

Twister Cleaner

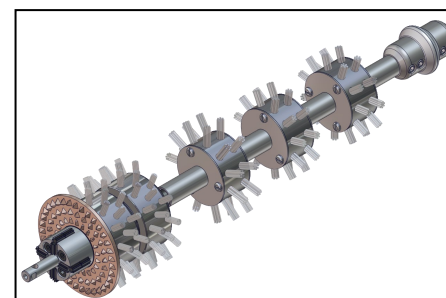
The Twister Cleaner is a gentle option for PVC pipes. Suitable for cleaning DN100 (4") this useful tool is also effective at removing small inconsistencies inside pitch fibre pipes. Use with the Midi Miller or Maxi Miller for outstanding results.



Name	Shaft size mm/inches	Product Number
Twister Cleaner DN100 (4")	12 (1/2")	1230085100CL

Twister Concrete Remover

Twister Concrete Remover is a special tool with two front bushes, a heavy duty 3mm front metal panel with large carbides and a specialised front drill head with star carbides used for efficient concrete removal. Removes concrete, grout, slurry



and large rocks. May be used to grind offsets in clay and concrete pipe to provide a superior finish after lining. Dual brushes provide added stability. Heavy duty front panel with larger carbides brings added power to the process. Available with and without steering axle.

Concrete removal is hard work for the Miller machine. Where long distances are needed to be removed it is recommended to use Maxi Miller or preferably Maxi Miller Power+.

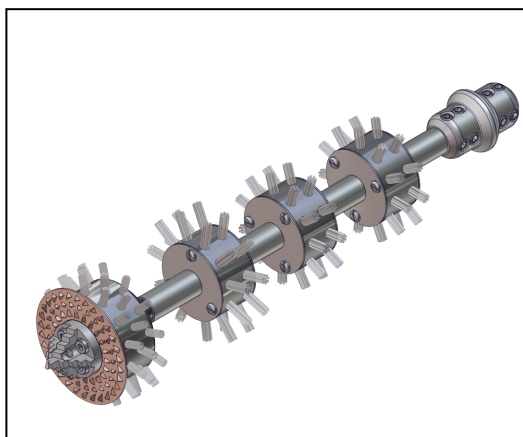
Name	Shaft size mm/inches	Product Number
Twister Concrete Remover DN100 (4")	12 (1/2")	1234085100
Twister Concrete Remover DN150 (6")	12 (1/2")	1234125150
Twister Concrete Remover DN100 (4") Steering Axle	12 (1/2")	1234085100SA
Twister Concrete Remover DN150 (6") Steering Axle	12 (1/2")	1234125150SA

TWISTER RANGE, ASSEMBLY & USE

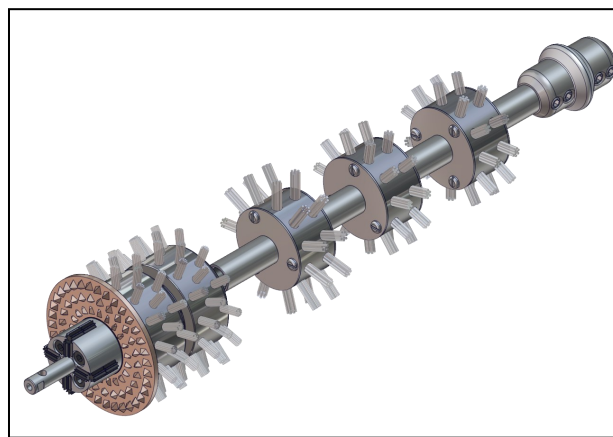


Please read safety information on page 3 before assembly and use.

Twisters for Branch Opening



Twisters for Special Purposes



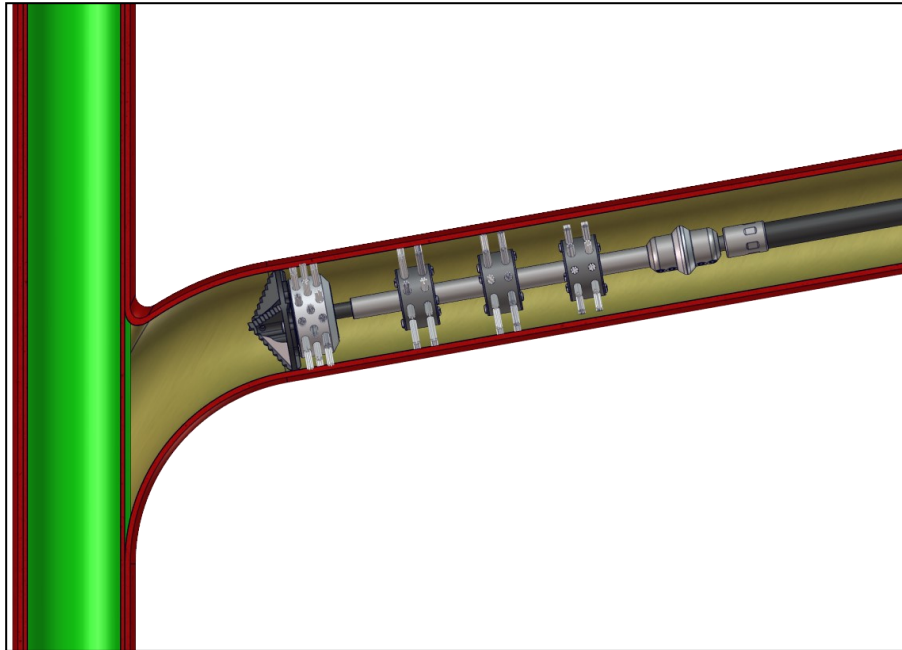
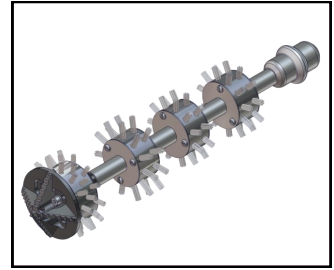
1230000052	Twister Mini DN50 (2") for 8mm shaft
1230000072	Twister Mini DN70 (3") for 8mm shaft
1230000371	Twister Mini DN70 (3") for 12mm (1/2") shaft/ unlined pipe
1230000471	Twister Mini DN70 (3") for 12mm (1/2") shaft/ lined pipe
1230075100Y	Twister DN100 (4") FP 75mm (3") for lined pipe
1230085100Y	Twister DN100 (4") FP 85mm (3.3") for unlined pipe
1230115150Y	Twister DN150 (6") FP 115mm (4.5") for lined pipe
1231125150Y	Twister DN150 (6") FP 125mm (5") for unlined pipe
1230175200Y	Twister DN200 (8") FP 175mm (7")
1233085101	Twister Express DN100 (4") FDH 85mm (3.3")
1233075101	Twister Express DN100 (4") FDH 75mm (3") for lined pipe

1234085100	Twister Concrete Remover DN100 (4") FP 85 (3.3")
1234125150	Twister Concrete Remover DN150 (6") FP125 (5")
1234085100SA	Twister Concrete Remover DN100 (4") FP85 (3.3") Steering Axle
1234125150SA	Twister Concrete Remover DN150 (6") FP125 (5") Steering Axle
1233075101N	Twister Metal Grinder DN100 (4")
1233075100	Twister DN100 (4") FP75 (3") Liner Remover for lined pipe
1233085100	Twister DN100 (4") FP85 (3.3") Liner Remover for unlined pipe
1231115150Y	Twister DN150 (6") FP 115mm (4.5") Liner Remover
1230125150Y	Twister DN150 (6") FP 125mm (5") Liner Remover
1230085100CL	Twister Cleaner DN100 (4")

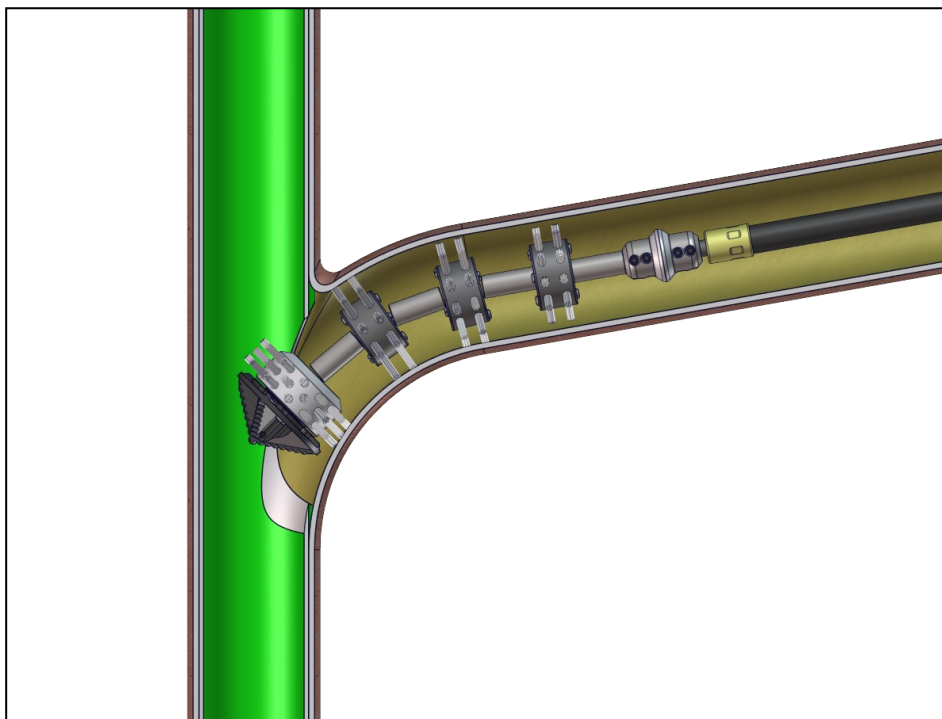
User Guide—Opening Connections

Step 1. Select the unlined Twister version, according to the size of host pipe, for the job. Place a CCTV camera into lined pipe so that you will see how the work is progressing.

Never work blind!

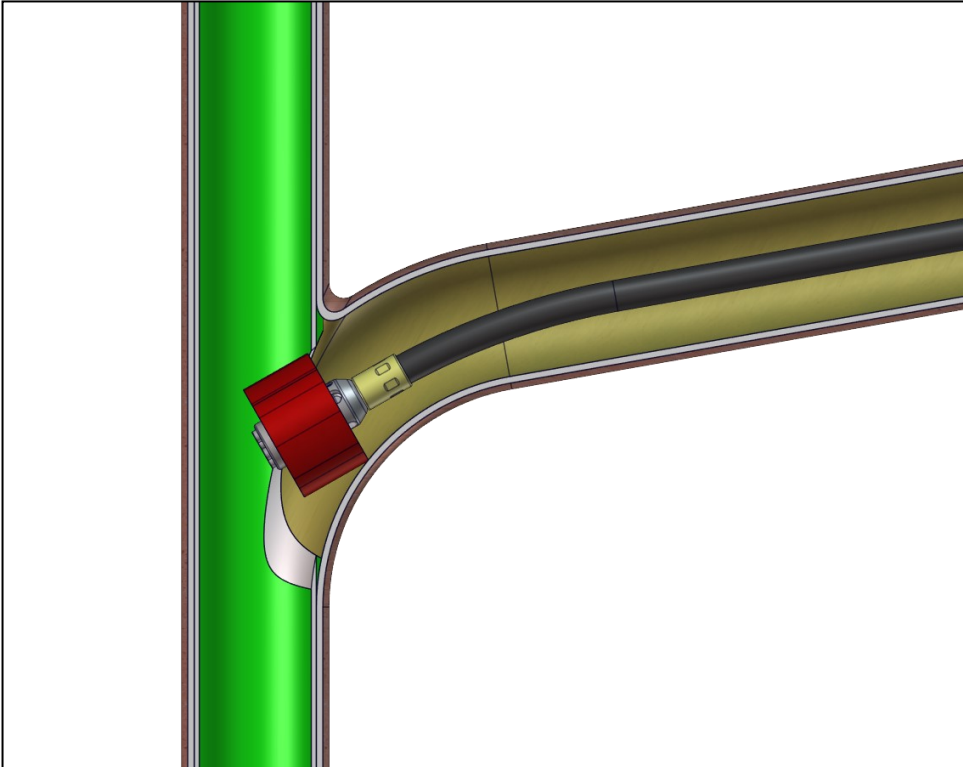
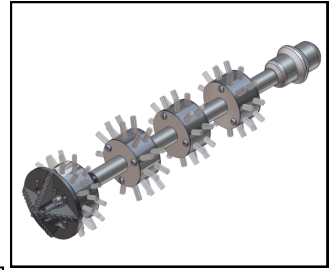


Step 2. Carefully drill the hole. Continue to push through so that you remove as much the liner away from the connection as possible. **Beware that you do not damage the already lined pipe during the process.** When you are satisfied with the opening, use Smart Cutter to grind the edges in the end.

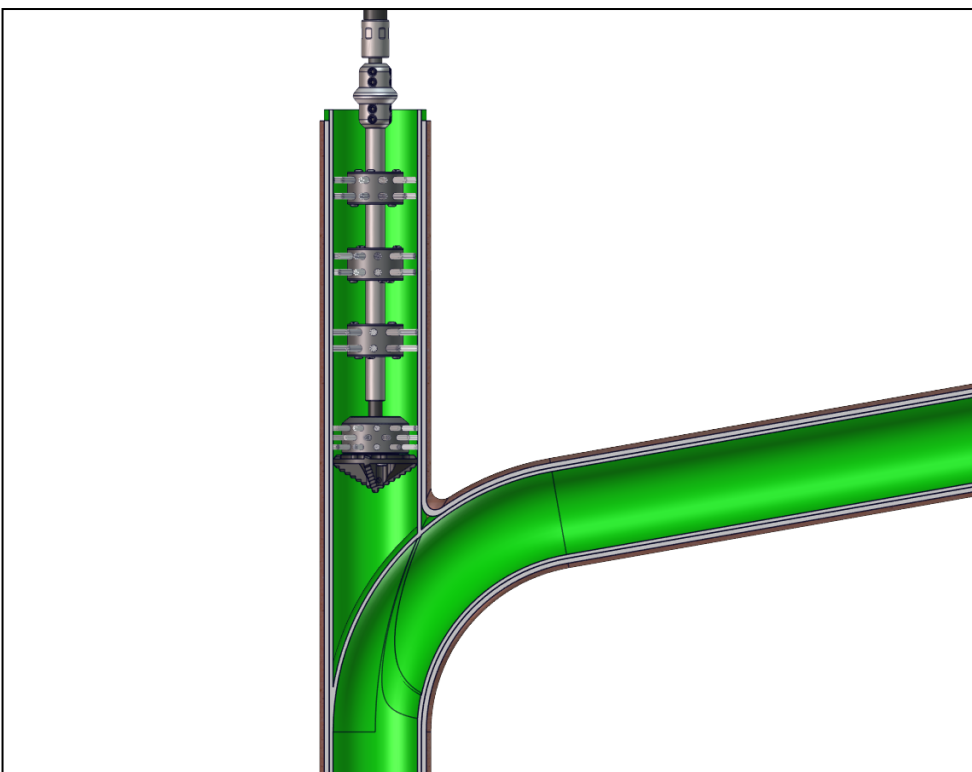


User Guide—Opening Connections

Step 3. Use Smart Cutter™ to finalize the connection.
Shoot a liner into lateral branch.

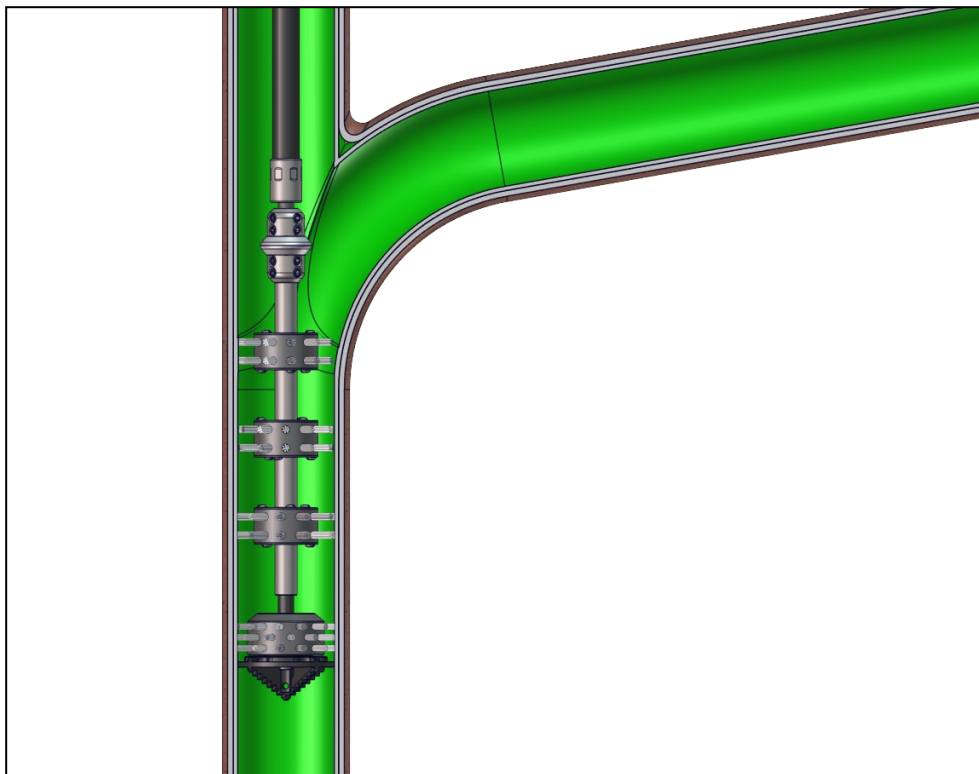
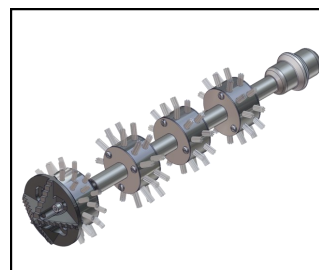


Step 4. Select the lined Twister version, according to the size of host pipe, for the job. Drill the connection open carefully. Push the Twister through the opening to remove all the remaining liner.



User Guide—Opening Connections

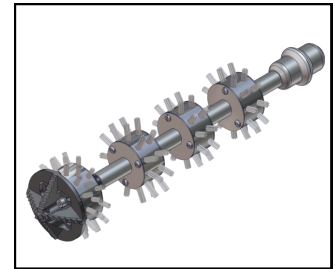
Step 5. Push the Twister through the opening to remove all the remaining liner. If required finish off with Smart Cutter™.



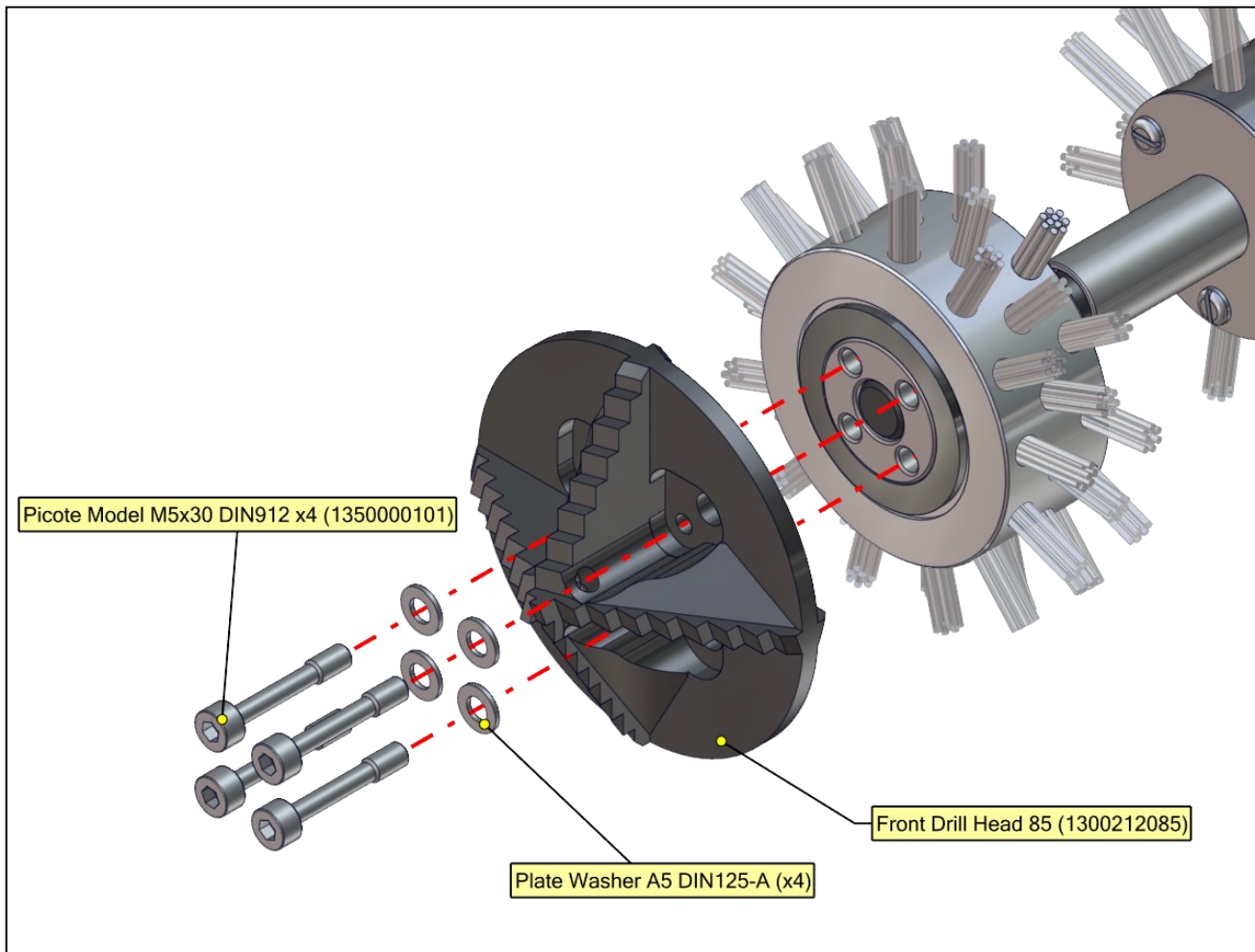
Tool Change—Twister Express



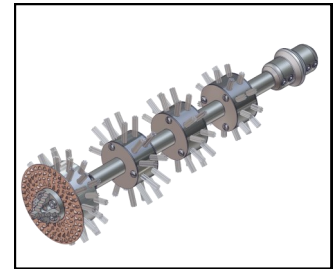
Remove Allen Bolts and change the worn out Front Drill Head.
Repeat in opposite order to mount the new Drill Head.



Recommended to use Loctite 542.



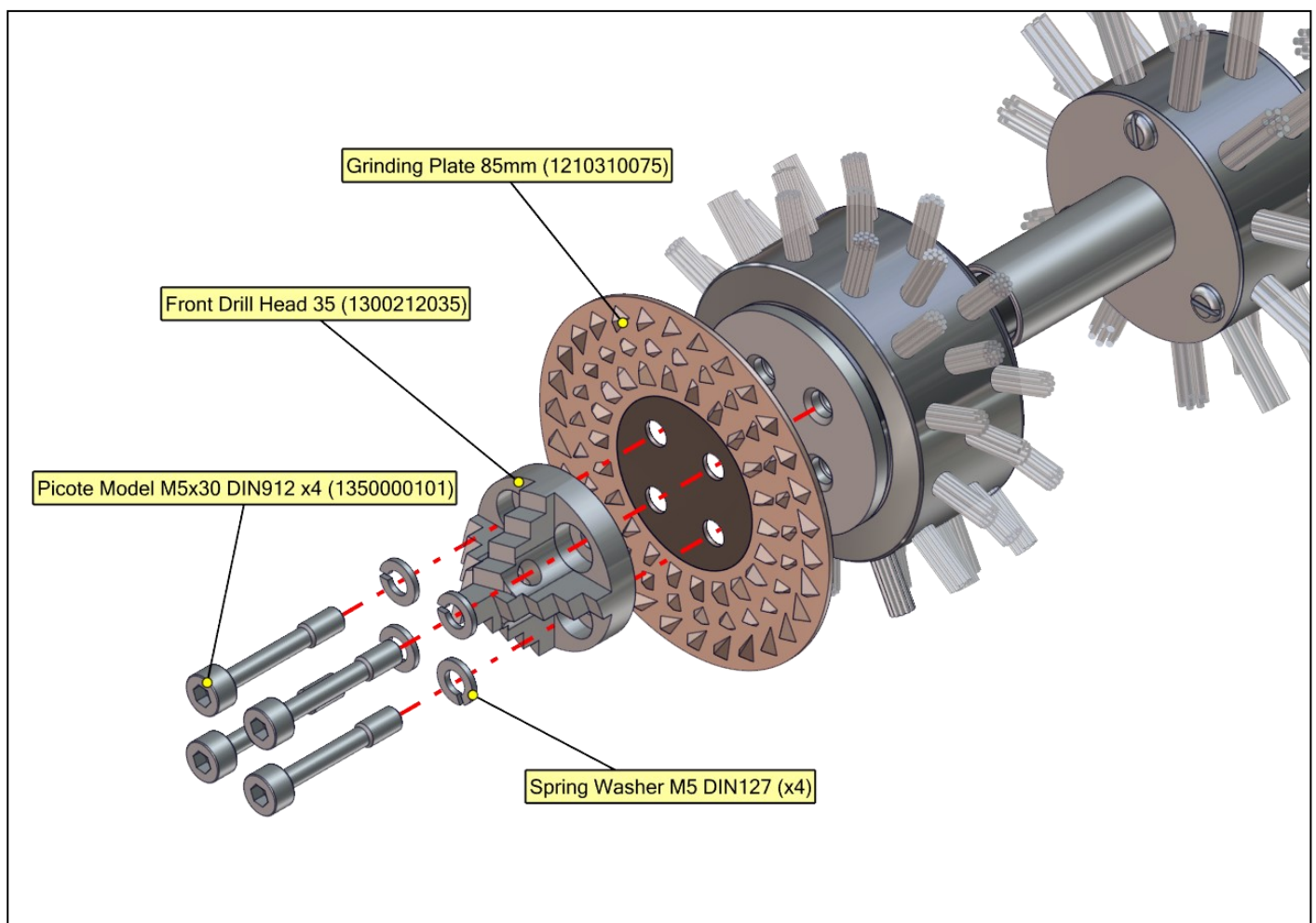
Tool Change—Twister



Remove Allen Bolts and change the worn out Front Drill Head and Grinding Plate. Repeat in opposite order to mount the new front pieces.

If needed, Twisters can be also equipped with 3mm grinding plates when performing tougher jobs. The grinding plate can be simply changed the same way than worn out 1mm thick plate.

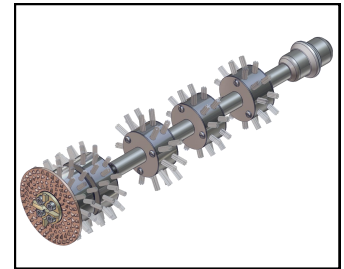
Recommended to use Loctite 542.



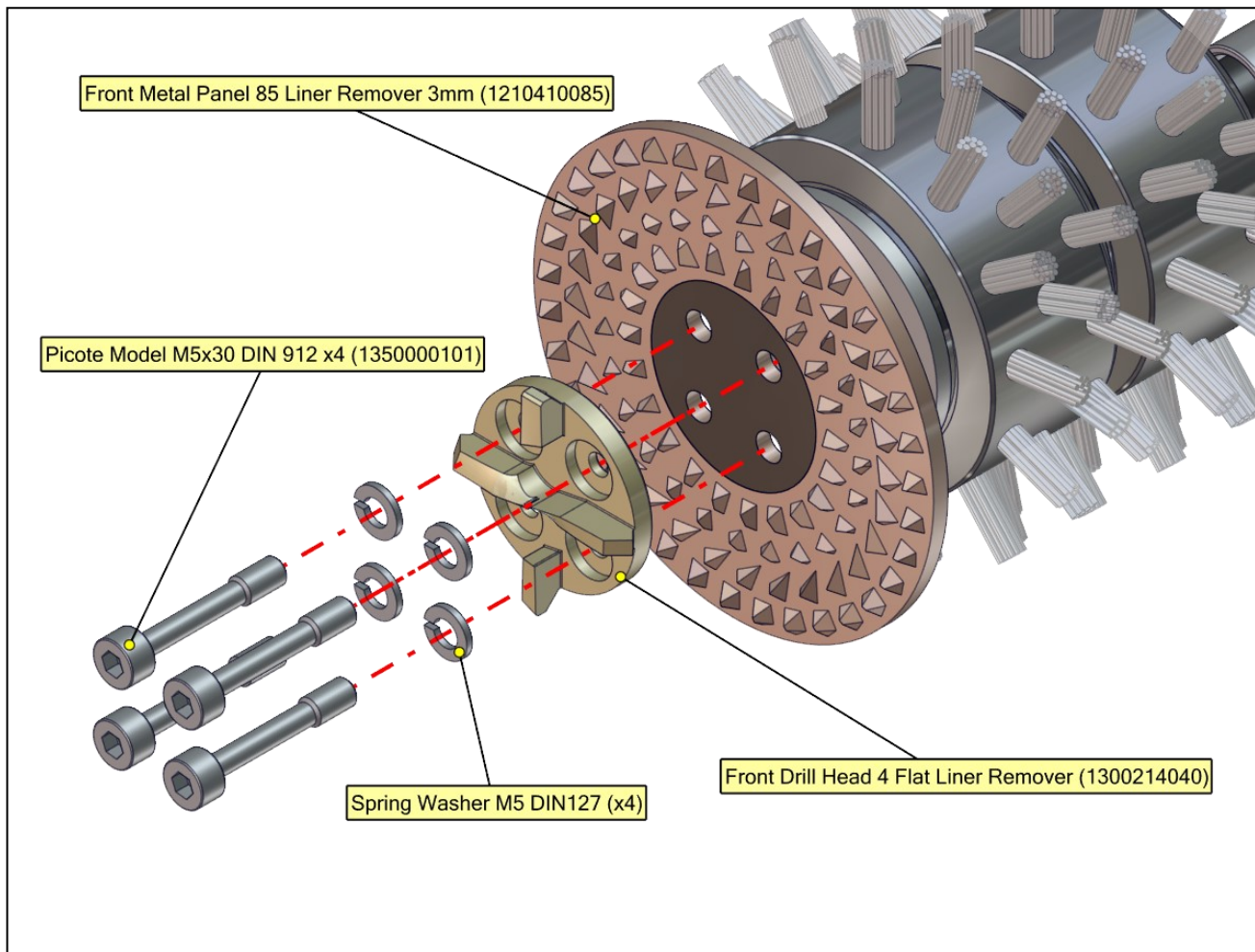
Tool Change—Twister Liner Remover



Remove Allen Bolts and change the worn out Front Drill Head and Front Metal Panel. Repeat in opposite order to mount the new front pieces.



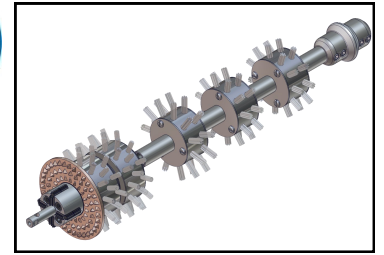
Recommended to use Loctite 542.



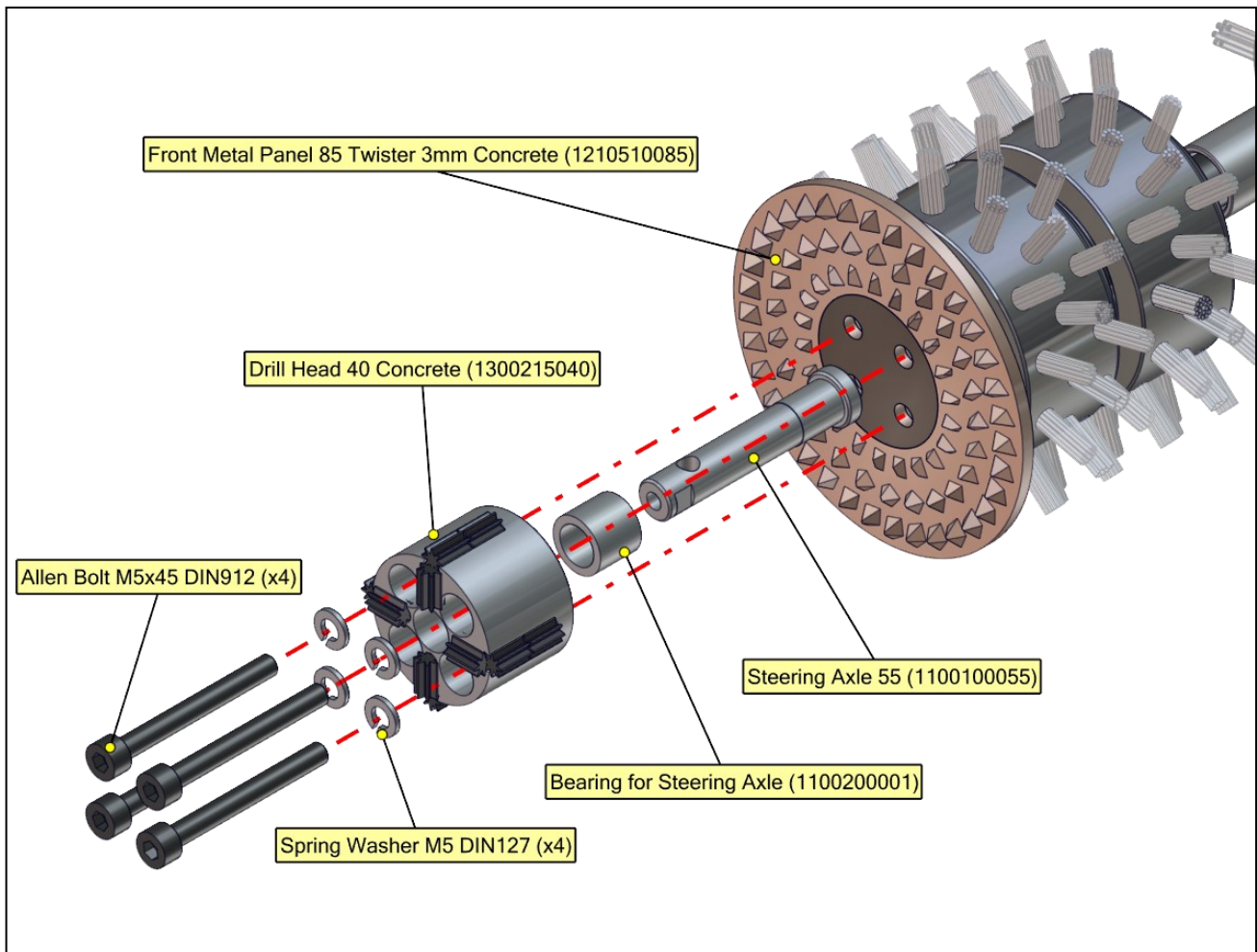
Tool Change—Twister Concrete Remover



Remove Allen Bolts and change the worn out Drill Head and Front Metal Panel. Repeat in opposite order to mount the new front pieces.



Recommended to use Loctite 542.

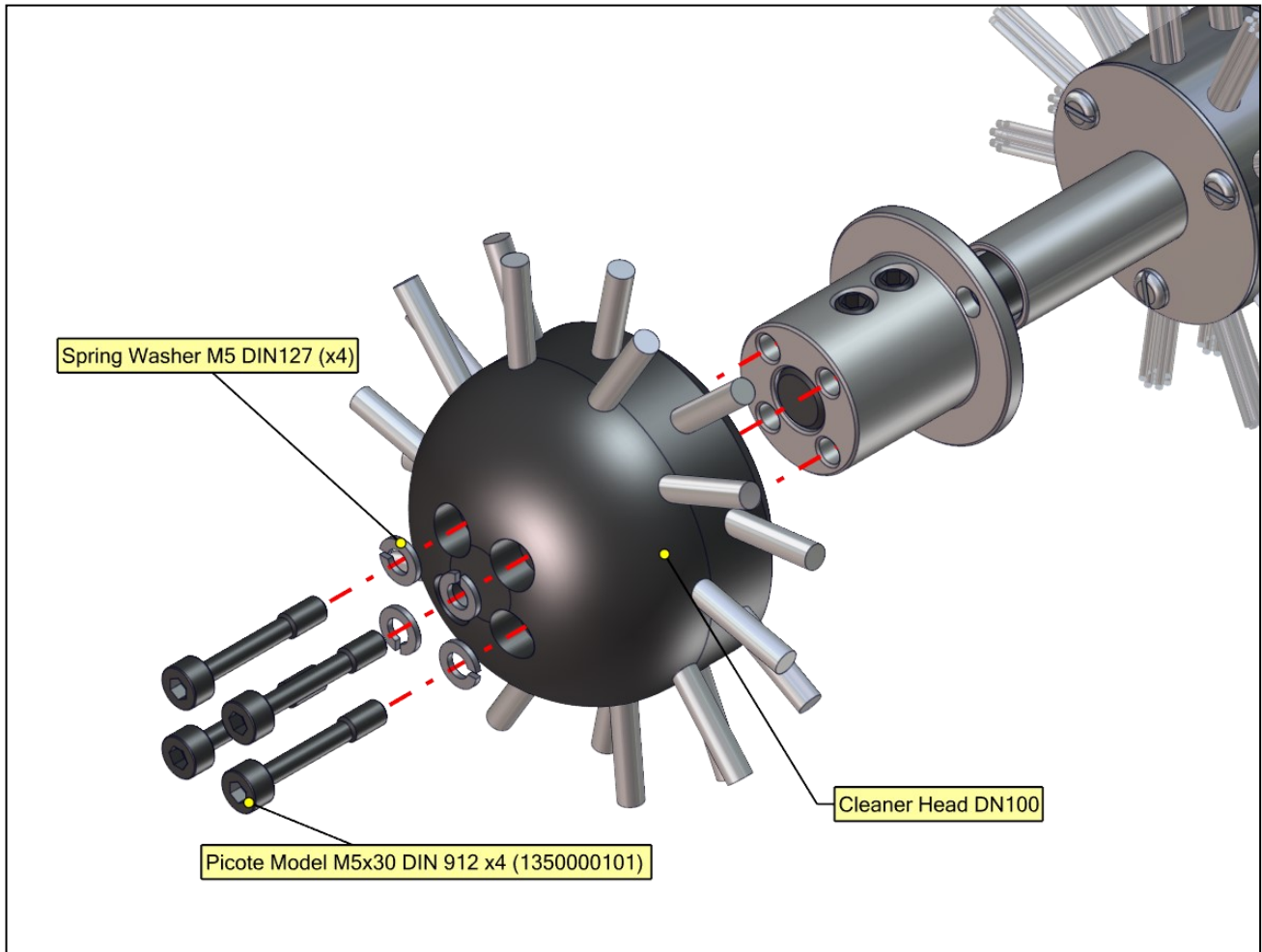
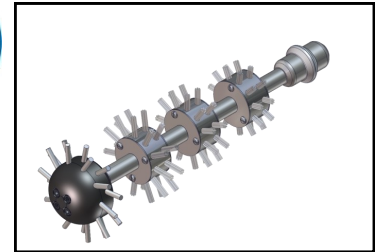


Tool Change—Twister Cleaner



Remove Allen Bolts and change the worn out Cleaner Head.
Repeat in opposite order to mount the new front piece.

Recommended to use Loctite 542.

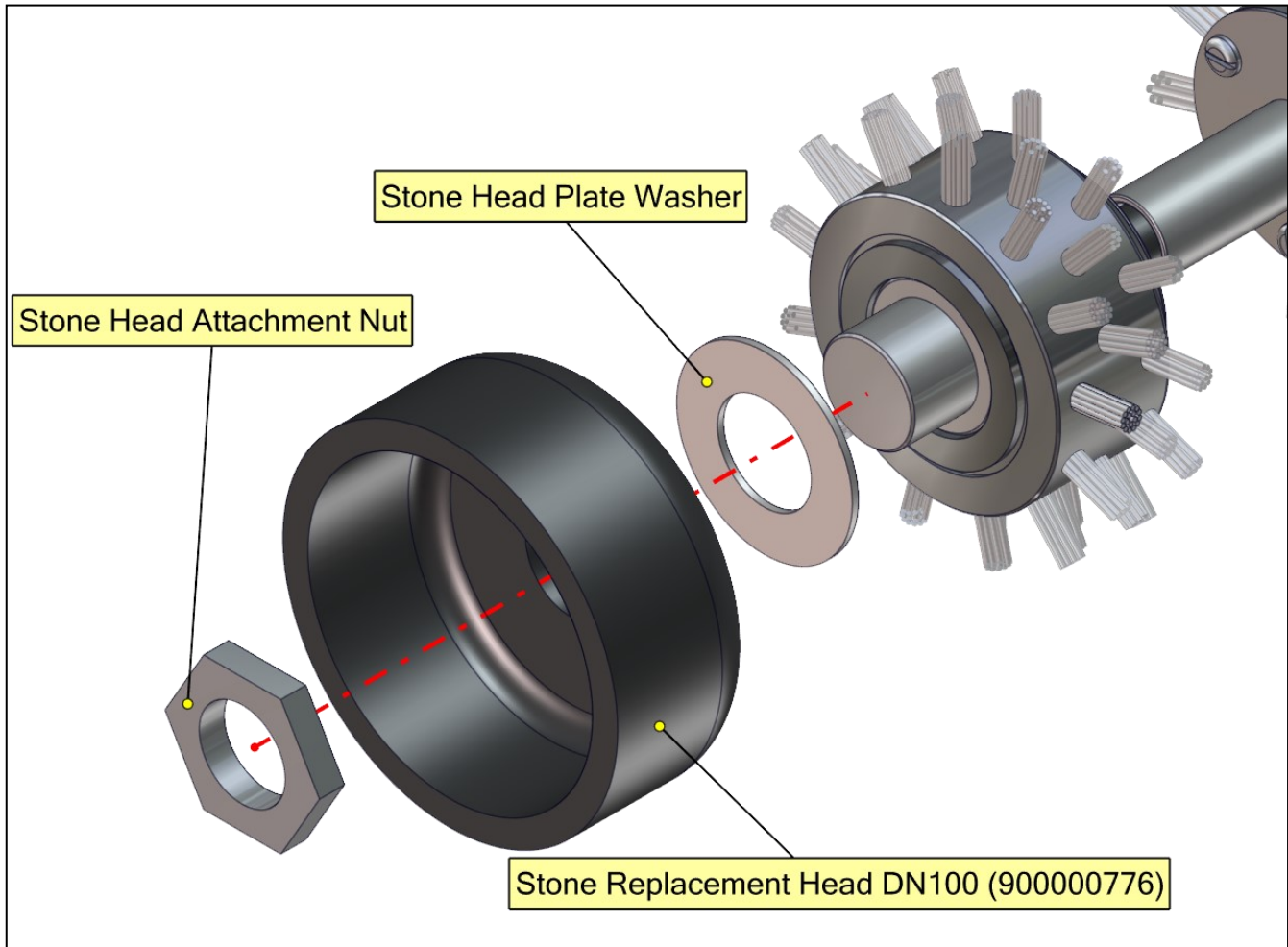
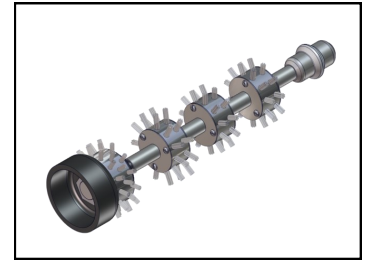


Tool Change—Twister Metal Grinder



Remove Attachment Nut and change the worn out Stone Head. Repeat in opposite order to mount the new front piece.

Recommended to use Loctite 542.

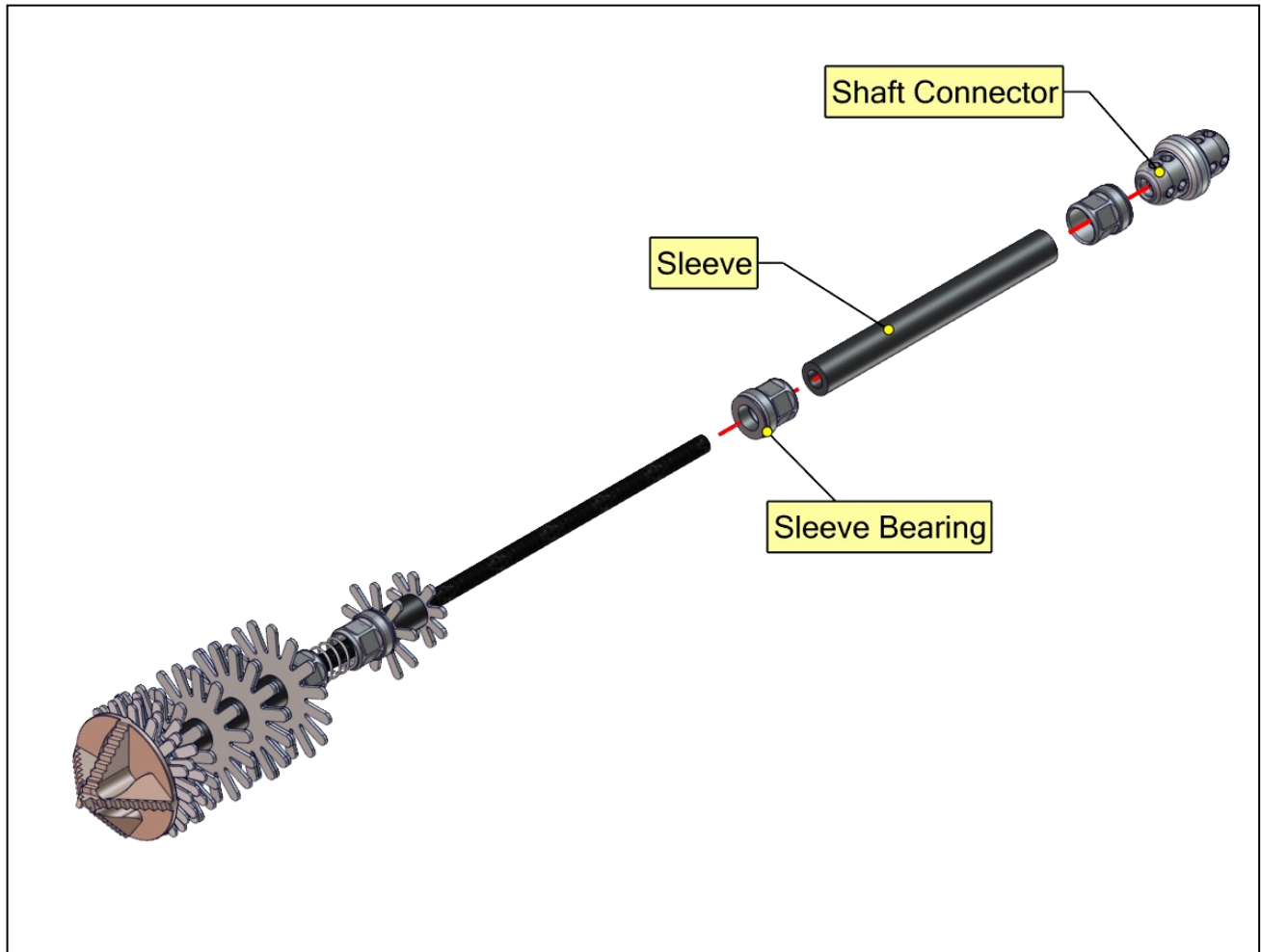


Tool Change—Mini Twister



Step 1. All of the components need to be removed to change the drill head. Keep track of the components so that you can easily assemble the tool after you have changed the drill head.

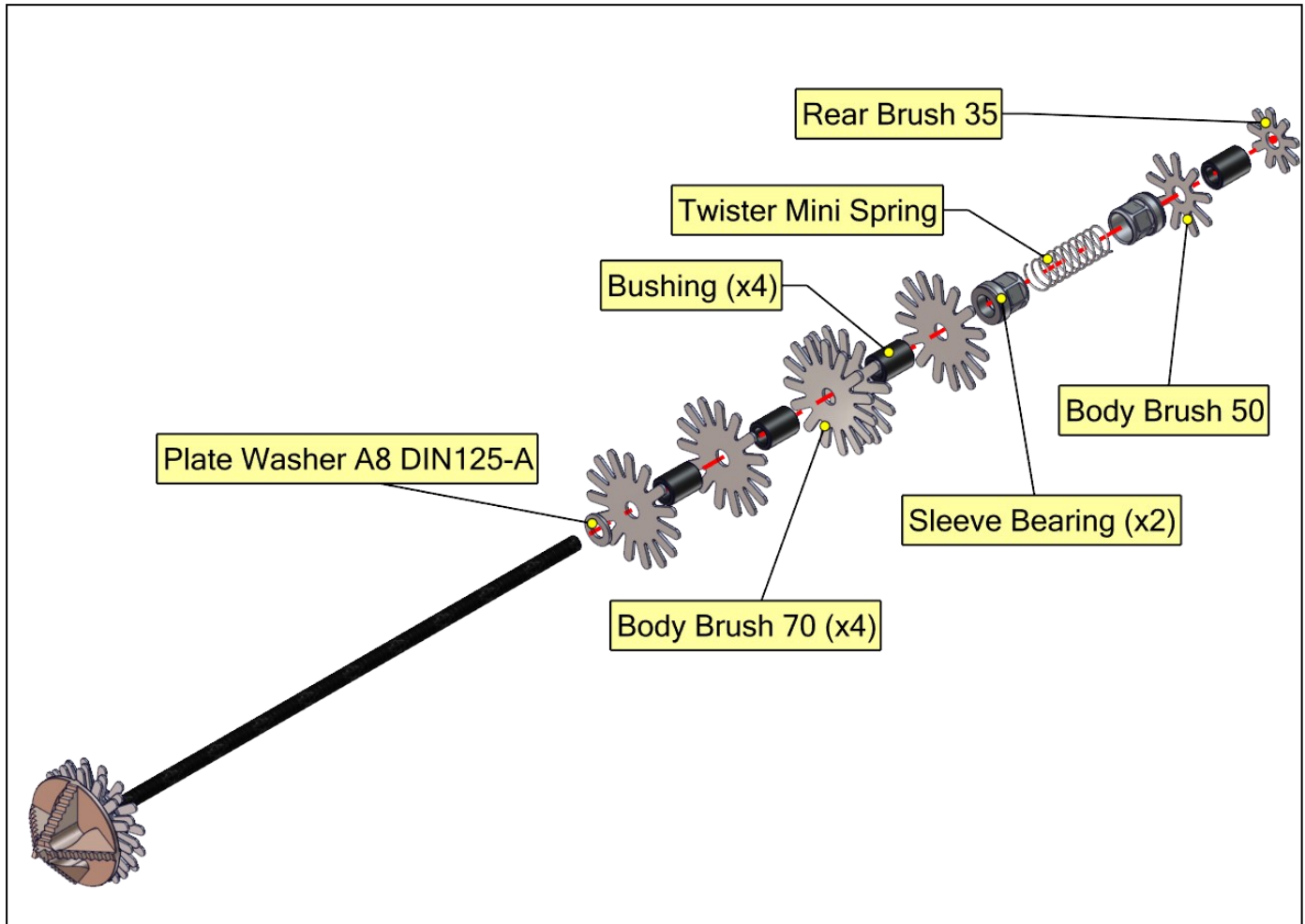
Begin the process by removing the components shown below.



Tool Change—Mini Twister



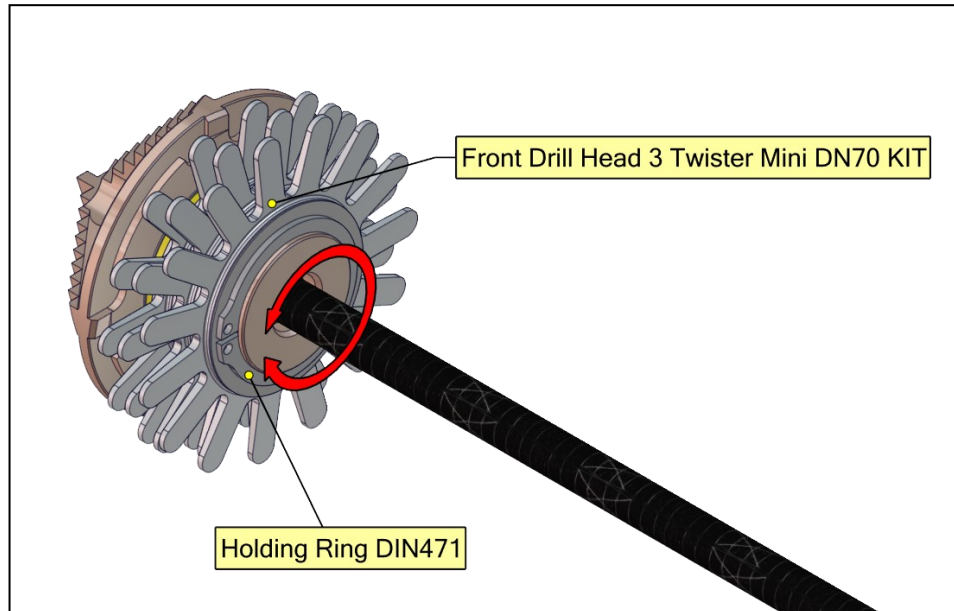
Step 2. Continue removing the components.



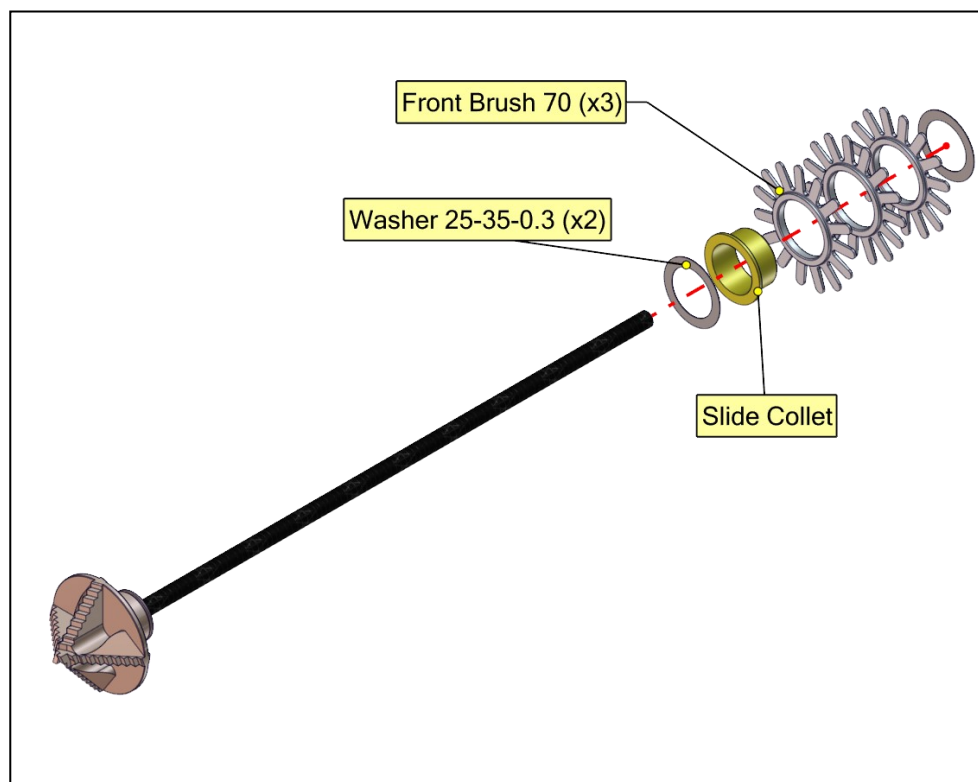
Tool Change—Mini Twister



Step 3. Take out the Holding Ring with circlip pliers.



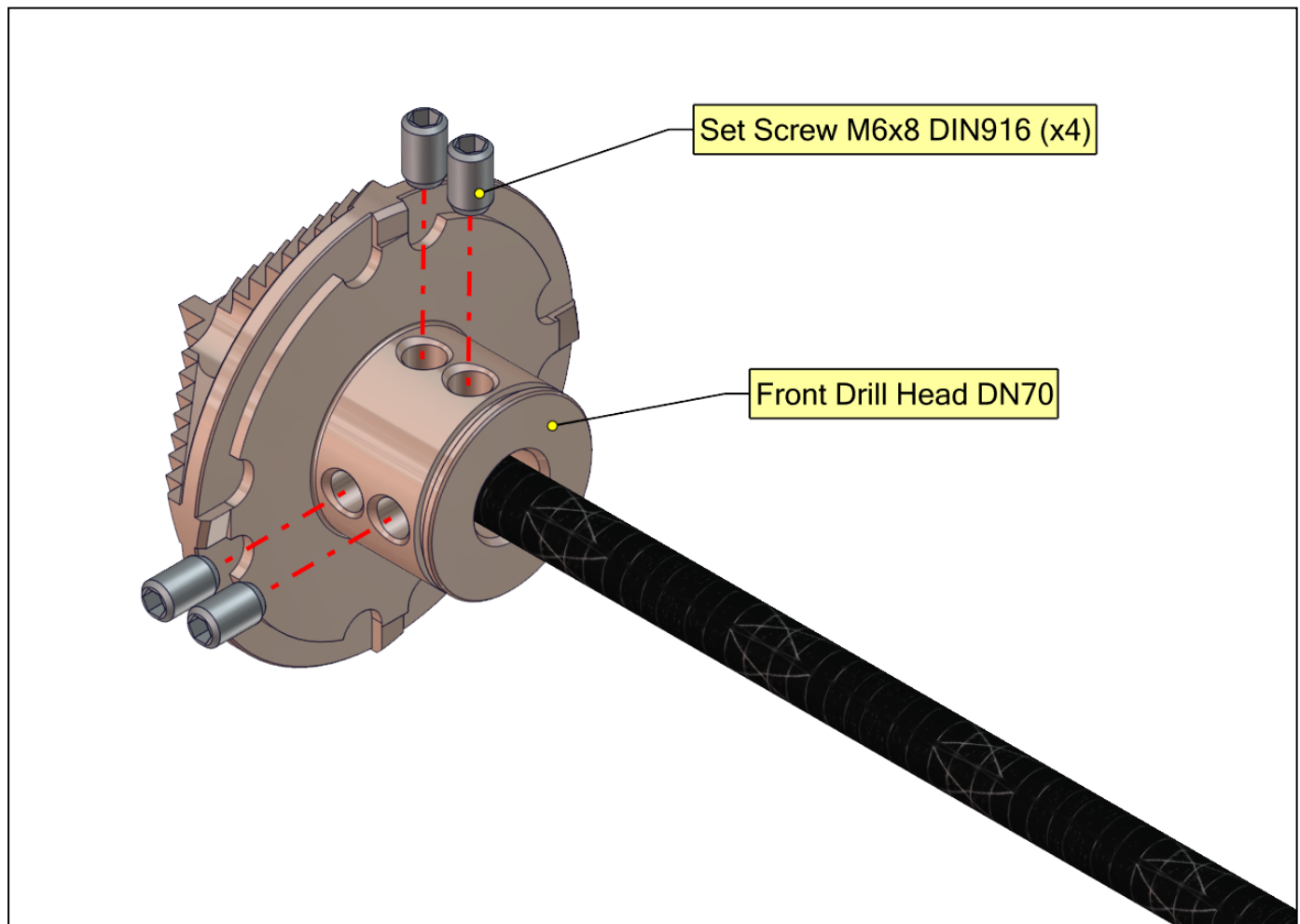
Step 4. Continue to remove components.



Tool Change—Mini Twister



Step 5. Remove Set Screws to remove the worn out Front Drill Head. Repeat all the steps in opposite order to assemble the Mini Twister again. **Recommended to use Thread Sealant Loctite 542.**



Using the Twister products



Before starting work

Select the correct size Twister for your job. Ensure water is flowing in the pipe or the vacuum extraction is ready (dry cleaning). Ventilate the working area properly. Ensure that pipes are grounded / earthed. The Twister products causes high friction and there is risk of electric shocks. Use a CCTV camera to locate the Twister in the right spot. Place the Twister inside the pipe so that it fits completely inside the pipe before turning the power on.

During use

Turn the power on. Start the Twister at a lower speed. Adjust the speed while working. Tightly hold the shaft. Move the tool in a back and forth movement within the pipe. Make sure that you have your CCTV camera inside the lined pipe while opening connections.

Do not force the tool through the pipe—let the tool do the work. If too much force or excessive high speed is used the tool might get stuck resulting in damaging or breaking the tool, shaft or the pipe. Use either water or vacuum to remove the debris. Use a lower speed when working in fragile or damaged sections of the pipe.



Please note! When using special purposes Twisters such as Liner or Concrete Removal Twisters or Twister Metal Grinder, **the tool head gets very hot during use.** Where water cooling is not being used, you need to take breaks, especially if working inside the plastic pipes, to **cool down the tool head after 10-15 min.** Always wear heat resistant gloves after the machine has been switched off and the power supply isolated. The tools can then be cooled down using water or left to cool in the open air. Always observe the temperature of the outer casing and let the **Miller cool down after every 30 min** periods of constant work.

Please read safety information on page 3 before assembly and use.

Using Twister products



After use

WARNING: Turn the power off and isolate the supply before you remove the tool from the pipe. There is a risk of serious injury or death! The tool can be very hot. Carefully take the tool out from the pipe.

Check out the condition of the tooling and shaft. Replace worn-out parts. If shaft looks damaged, remove decrepit part with an angle grinder and shorten outer casing accordingly.

Where required the Twister drill head can be sharpened with a grinder. Do not remove more material than you must because the outer hard layer is only 2-3 mm thick.

RECOMMENDATIONS

Do not power up the Twister products outside of the pipe! The tooling needs to fit completely inside the pipe before use.

Always use CCTV camera while working.

Adjust the rotation speed while working.

Use water cooling when possible.

Do not use excess amount of force to push the tooling. Let the tool do the work.

Use lined version of Twister inside lined pipes and unlined version in unlined pipes to ensure the best results.

Use Smart Cutter™ to ensure perfect end result.

Please read safety information on
page 3 before assembly and use.

MAINTENANCE

CARING FOR THE FLEXIBLE SHAFT

Prior to shipping the flexible shaft is pre-treated with **Picote Flexible Shaft Lubricant (1350000020)** and the outer casing replaced. Always inspect the condition and when required apply lubricant between the flexible shaft and its outer casing. If necessary remove the shaft from its casing to treat. When the casing has been re-placed, manually rotate the shaft for even coverage.



TWISTER FRONT HEADS

Always replace the Drill Head/Grinding Plate/Stone Head if they are worn or cracked.

FASTENER SCREWS

Replace the fastener screws immediately if you are unable to fully tighten them due to worn out hex socket heads. Otherwise, a panel could detach from the hub during the cutting operation and fall into the pipe.



DRILL HEAD BOLTS

Use Thread Sealant (Loctite 542 or similar) when tightening bolts which secure Front Metal Panel/Drill Head to the Hub. Otherwise, the front parts can fall into the pipe while working.

SPARE PARTS

Twister Express

1300212085	Front drill head 3 85 (3.3") with plastic guards (spare part)
1300212075	Front drill head 3 75 (3") with plastic guards (spare part)

Mini Twister

1230000053	Front Drill Head 3 Twister Mini DN50 (2") KIT (spare package)
1230000073	Front Drill Head 3 Twister Mini DN70 (3") KIT (spare package)
900000987	Twister Mini DN70 (3") unlined pipe FDH kit
900000988	Twister Mini DN70 (3") lined pipe FDH kit

Mini Metal Grinder

900000776	Stone Replacement Head DN100 (4")
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Twister

1210310175	Front Metal Panel 175 (7") 1mm g10
1210310125	Front Metal Panel 125 (5") 1mm g10
1210410125	Front Metal Panel 125 (5") Liner Remover 3mm (spare part)
1210310115	Front Metal Panel 115 (4.5") 1mm g10
1210410115	Front Metal Panel 115 (4.5") Liner Remover 3mm (spare part)
1210310085	Front Metal Panel 85 (3.3") 1mm g10
1210410085	Front Metal Panel 85 (3.3") Liner Remover 3mm(spare part)
1210310075	Front Metal Panel 75 (3") 1mm g10
1210410075	Front Metal Panel 75 (3") Liner Remover 3mm (spare part)
1210310055	Front Metal Panel 55 (2.2") 1mm g10
1300212035	Front Drill Head 3 Ridged Hardened 35mm (1.4")

Twister Concrete Remover

1210510125	Front Metal Panel 125 (5") Twister g6 3mm concrete
1210510115	Front Metal Panel 115 (4.5") Twister g6 3mm concrete
1210510095	Front Metal Panel 95 (3.7") Twister g6 3mm concrete
1210510085	Front Metal Panel 85 (3.3") Twister g6 3mm concrete
1210510075	Front Metal Panel 75 (3") Twister g6 3mm concrete
1100100055	Steering Axle 55 (2.2")
1100200001	Bearing for Steering Axle
1300215040	Drill Head 40 (1.6") concrete

Twister Liner Remover

1210410075	Front Metal Panel 75 (3") Liner Remover 3mm (spare part)
1210410085	Front Metal Panel 85 (3.3") Liner Remover 3mm(spare part)
1210410115	Front Metal Panel 115 (4.5") Liner Remover 3mm (spare part)
1210410125	Front Metal Panel 125 (5") Liner Remover 3mm (spare part)
1300214040	Front Drill Head 4 Flat Liner Remover (spare part)

Please contact your reseller for more information.

PRACTICAL TIPS & SAFETY ADVICE

Here are some useful tips on how to get the most out of your Picote system. Always use the recommended tools for maintenance to avoid personal injury.



SHAFT ROUNDER



The shaft rounder smooths the end of the flexible shaft, preventing the user from being cut by the otherwise sharp metal edge.



ATTACHING A SHAFT SOCKET



Feed the shaft through the socket to the end and **securely fasten**. To protect the shaft the outer casing should reach all the way to the base of the shaft socket.

CUTTING THE FLEXIBLE SHAFT



Before use always inspect the flexible shaft. If there are potential weak points or the shaft is damaged, cut off the damaged length using an angle-grinder. This should be done outside, in a clear area, as the process will generate sparks.



ADDING A VISUAL MARKER FOR SAFETY



For your safety attach a visual marker (tape) to the outer casing of the flexible shaft. Place it around half a meter from the end point of the shaft. The marker will indicate the tool's location and prevent possible injuries, from the rotating parts, when the tool is removed from the pipe.



WARRANTY POLICY AND PROCEDURE

Limited Warranty:

Picote warrants to the original End User that the Product purchased by such End User will operate in accordance with and substantially conform to their published specifications when shipped or otherwise delivered to the End User and for a period of one (1) year, except electric motors for which the warranty period shall be six (6) months, provided, however, that Picote does not warrant any claim or damage under this

Warranty if such claim or damage results from:

1. Consumable parts included the Products (such as brushes) or normal wear and tear resulting from use of the Products,
2. Product overload or overheated motor,
3. Regular periodic maintenance of Products,
4. Misuse, neglect, or improper installation or maintenance of the Products, or use of Products not for their intended purpose,
5. Products that have been altered, modified, repaired, opened or tampered with by anyone other than Picote or an authorized Picote Service Centre, or unsuitable or unauthorized spare parts, accessories or third party products when using the Products or;
6. the use of the Products not in compliance with their respective Documentation, user manuals, safety and maintenance instructions, and any usage restrictions contained therein, or
7. accident, fire, power failure, power surge, or other hazard.

Otherwise, the Products are sold AS IS. End User is responsible for using the Products within their specifications and instructions as contained in the Documentation.

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