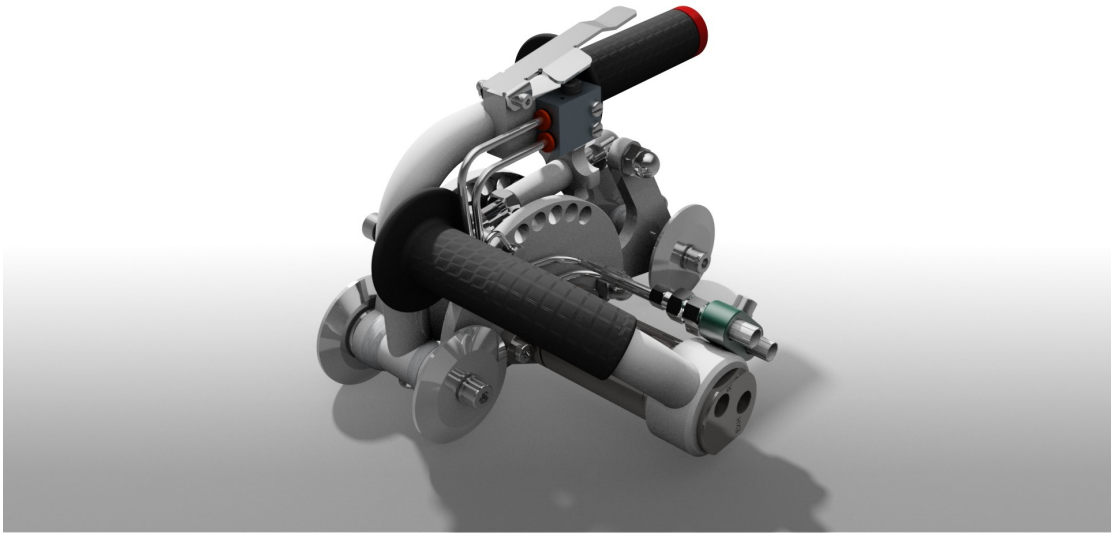
SOLUTIONS FOR THE REPAIR RENOVATION AND DECOMMISSIONING OF PIPELINES



Rapid Window Cutter

Operating Instructions

Steve Vick International Ltd

Treenwood Industrial Estate, Bradford on Avon, Wiltshire, BA15 2AU, UK

CE

CONTENTS

1. INTRODUCTION

Since its foundation in 1981, Steve Vick International has been at the leading edge of trenchless techniques for the repair and renovation of underground **gas** distribution pipes.

In the UK, we are a major supplier to the gas distribution networks and many of our techniques have become accepted practice in the industry. We constantly seek to provide our customers with renewal methods which will minimise their costs and maximise their production.

The company has been supplying pipe handler equipment to the **water** utilities and their contractors for over 20 years. More recently we have entered the market with pipe cutting equipment and our sealant technology has been successfully adapted for use in the waste water sector.

In 2014 the company relocated and can be found at:

Steve Vick International Ltd
Treenwood Industrial Estate
Bradford on Avon
Wiltshire
BA15 2AU

Phone: +44 (0)1225 864 864
Email: info@stevevick.com
Website: stevevick.com
Social Media: #stevevick

2. PRODUCT DESCRIPTION

The Rapid Window Cutter is designed to cut out windows on ductile iron mains to allow the installation of a service top tee where the host main is already inserted with PE pipe. Common diameters often associated with ductile iron 4” (100mm), 6” (150mm), and 8” (200mm) would require two longitudinal cuts approximately 8” (200mm) long at approximately the 2 and 10 o’clock position. The window is completed with two circumferential cuts at either end of the longitudinal cuts. The Rapid Window Cutter is adjusted to allow longitudinal and the semi circumferential cuts requiring no other cutting gear.

The Rapid Window Cutter comprises an aluminium chassis with four alignment wheels. Housed between this is an air driven motor and a specialist cutting disc. The Rapid Window Cutter is supplied with depth control discs which allow it to cut inserted mains safely. The motor and cutting disc assembly has a feed screw depth control which also helps to ensure the right depth of cut is achieved.

The motor is air driven and is powered from a typical compressor. The unit comes with a short pneumatic hose and airline lubrication unit which is connected to the hose on the compressor. The lubrication unit maintains the operation of the motor preventing it from freezing, seizing up and prolonging the life of the unit.

The air exhaust hose prevents dust and debris from being blown around the trench and into the face of the operative.

The motor and cutting disc assembly includes a water feed hose that can be connected to a water bowser however the motor is designed to prevent sparking when cutting ductile iron although if sparking is encountered due to the condition of the surface of the main, the water feed can be used.

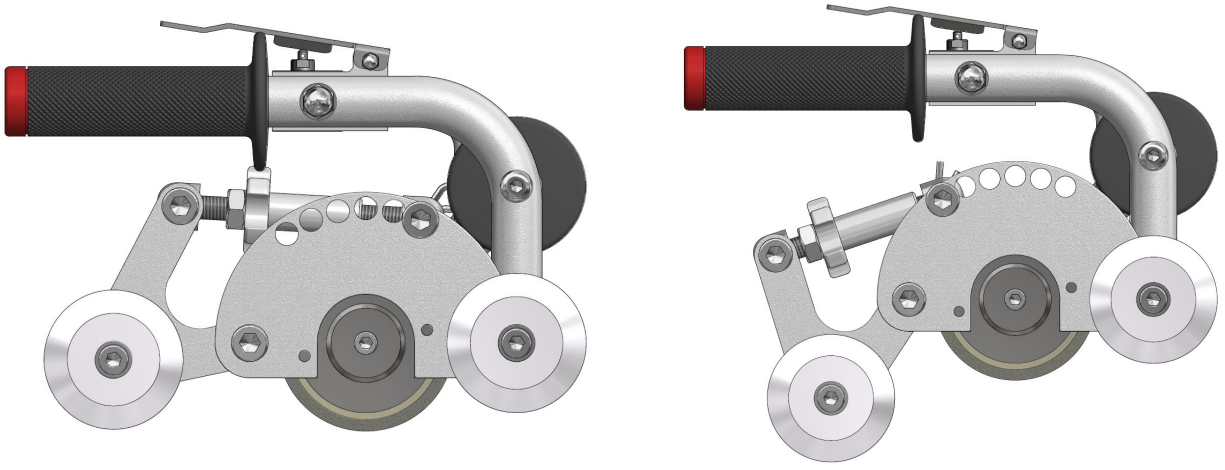


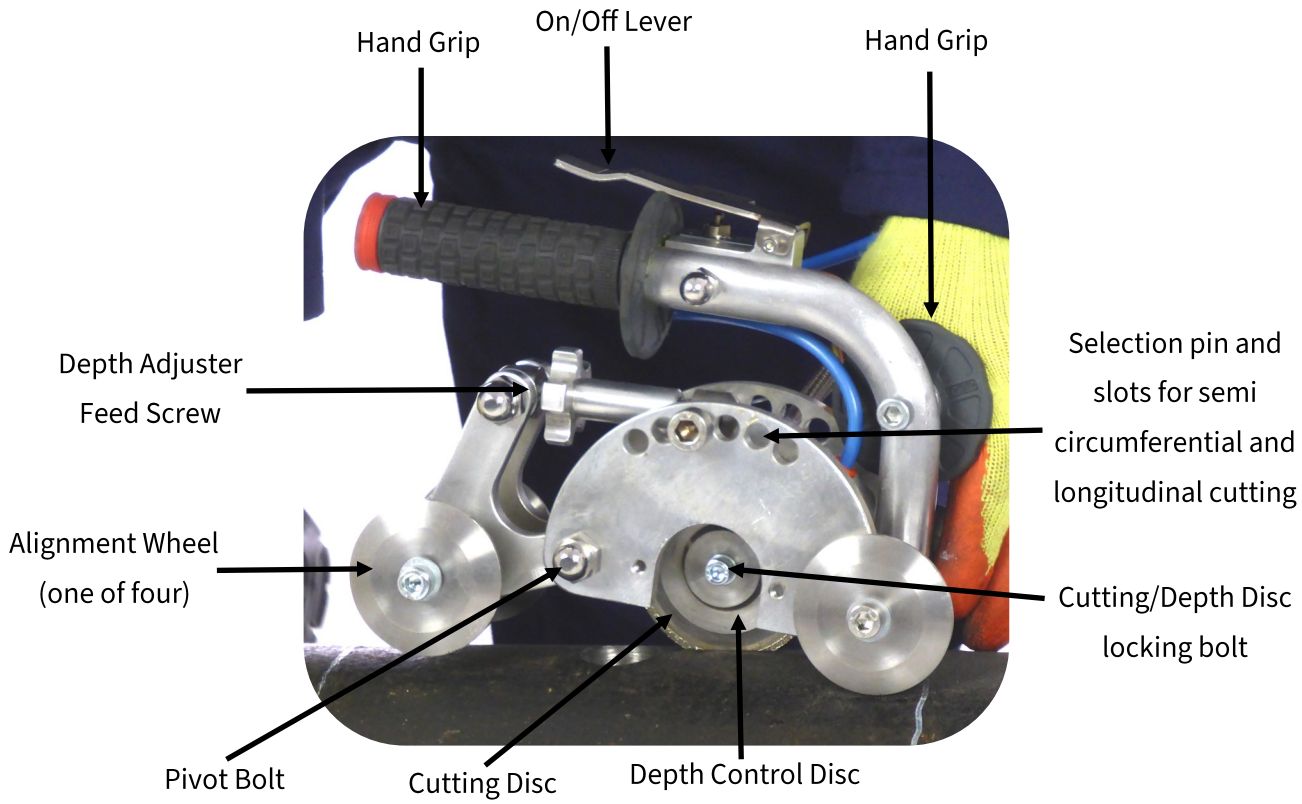
Figure 1 The Rapid Window Cutter uses a cutting disc to make longitudinal cuts on ductile iron mains and Figure 2 shows the Rapid Window Cutter pivoted to make the semi circumferential cuts which complete the window.

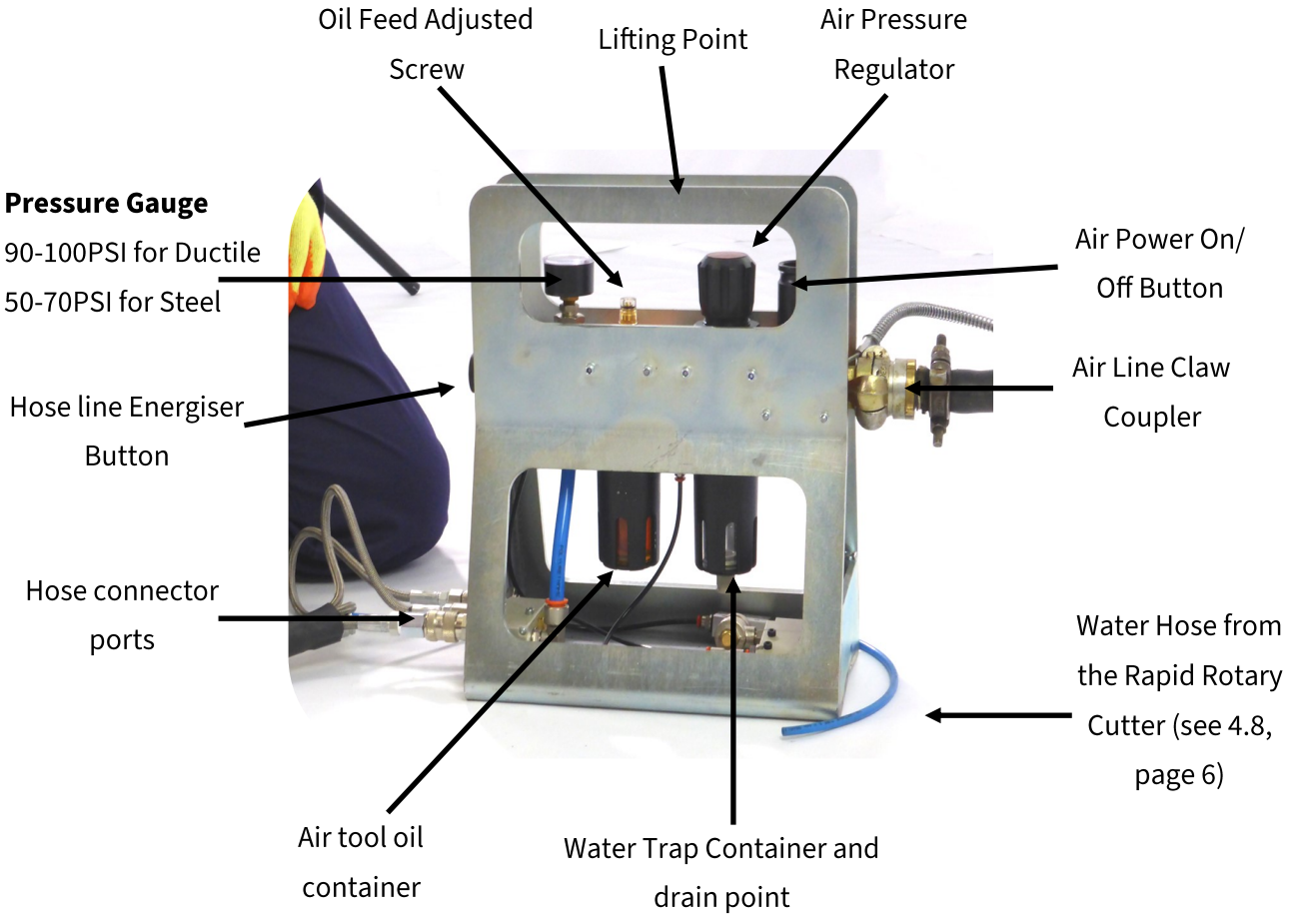
2.1 ROTARY WINDOW CUTTER HIGHLIGHTS

Key Features:

For semi circumferential cuts and longitudinal cuts on ductile mains including live and dead inserted mains	No need to increase the size of the trench
The Rapid Window Cutter can be used on all sizes of Ductile Iron	Safe – cutting blade is mounted safely away from the operator's hand
Extremely quick cutting time	Depth control discs prevent damage to inserted PE
Quick assembly time – install the correct depth disc and it's ready	Incorporates a water feed line to prevent sparking—if required
Single man operation	Uses standard compressor typically found on site – no extra power source needed
Lightweight	Simple to use

2.2 RAPID WINDOW CUTTER OVERVIEW





Figures 3 (top) and 4 above show the key parts of the Cutting Unit (top) and the Lubricator Unit.

3. SPECIFICATION

UNIT	WEIGHT
Rapid Window Cutter without hoses	7kg
Rapid Window Cutter with hoses	9kg
Lubricator Unit	8kg
Complete Kit housed in the storage tin	36kg

Table 1—Showing key weights

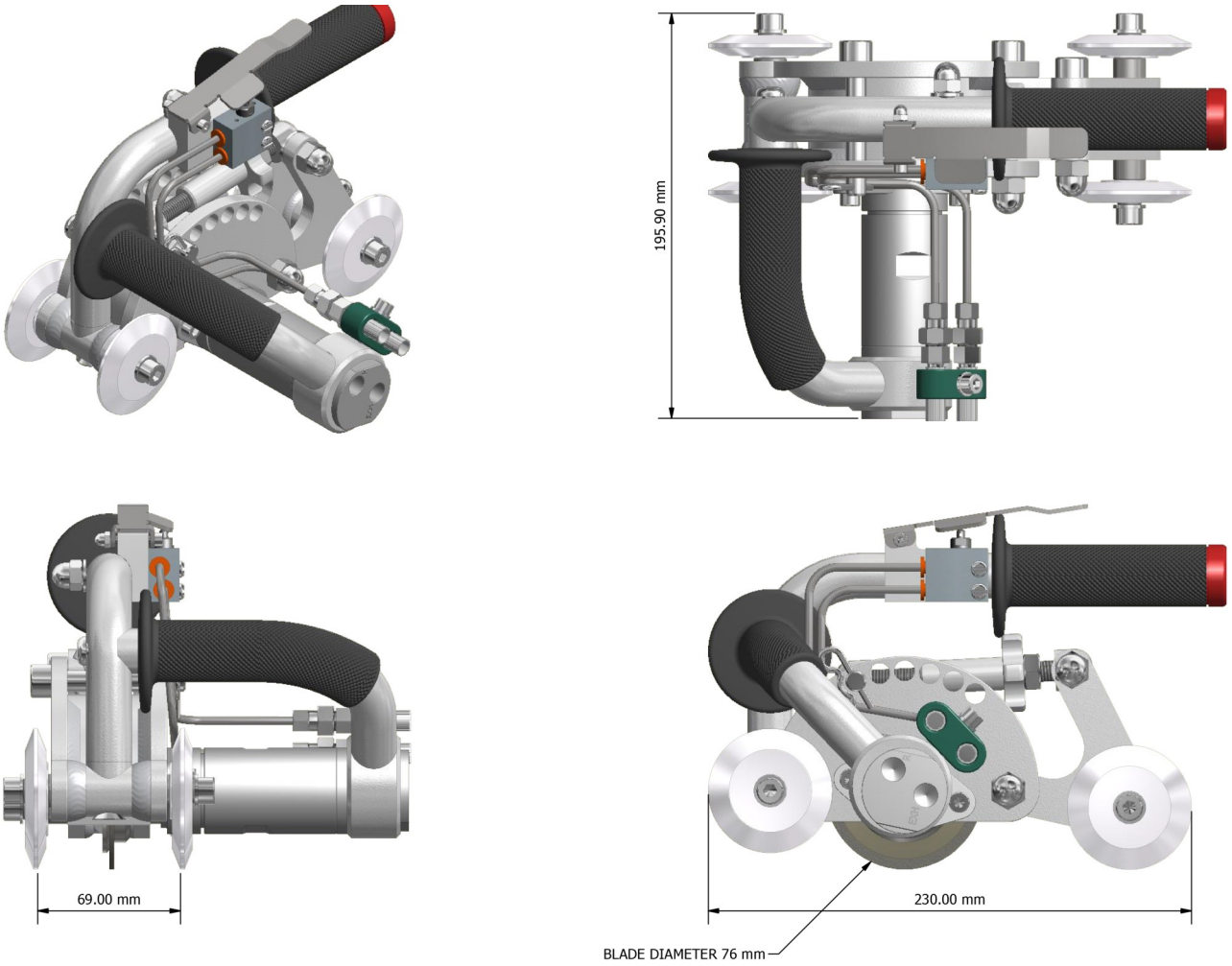


Figure 5 The basic dimensions of the Rapid Window Cutter

4. SAFETY AND PRECAUTIONS - RAPID WINDOW CUTTER

4.1 The following PPE must be worn at all times:

A. Safety goggles
B. Approved Dust Mask
C. The Rapid Window Cutter runs at 85-90db—check local policy if ear defenders are mandatory
D. Hard hat—if applicable
E. High visibility jacket
F. Cut resistant Gloves
G. Steel toe cap footwear

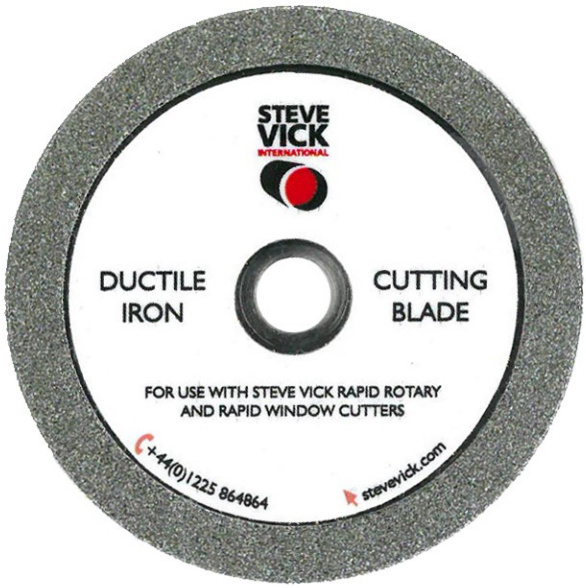
4.2 Operatives MUST BE TRAINED IN THE CORRECT USE OF THE CUTTER TO A SATISFACTORY LEVEL highlighting that limbs must not be placed underneath the unit at any time and always use the hand grips.

4.3 Ensure all operations and equipment, including the compressor and hoses, are situated within an area contained by a barrier.

4.4 Ensure the correct blade is in good condition and can be compared to Figure 6 (below). Any obvious signs of wear or if the diamond coating is missing then the disc must not be used. A disc in unsatisfactory condition will perform badly and create sparks.

4.5 IN ALL CIRCUMSTANCES THE ANNULUS MUST BE CONFIRMED DEAD BEFORE ANY CUTTING OPERATIONS ARE CARRIED OUT. REFER TO STANDARD PROCEDURES.

Figure 6—Cutting blade in good condition scale 1:1



4.6 Ensure that the correct depth control disc is used, i.e. corresponding to the pipe wall thickness; as a guide use a coupon drilled from the main.—See 5.2 onwards

4.7 The section of the ductile main being cut should be cleaned of any rust that may inhibit the movement of the Rapid Window Cutter and if possible move 3rd party plant out of the way (dead PE service tails).

4.8 Under no circumstances should the 'dead mains' handle be overridden.

4. SAFETY AND PRECAUTIONS (CONTINUED)

4.9 USE OF WATER: It is mandatory to use water when cutting, this is essential in suppressing dust produced by the cutting operation. Ensure the bowser is full of clean water and constantly pressurised.

4.10 Ensure the lubricator unit is connected to the hose arrangement and correctly filled with anti-freeze air tool lubricator oil. It is unlikely that the setting on the assembly will need to be adjusted.—See 5.5 to 5.8.

4.11 Ensure enough clearance to the sides of the main. This can be checked by having a dummy run of the cutting movement using the cutter prior to connecting it to the airline. For best practice keep the handle of the cutter to the side of the operative. This allows the cutter to be positioned further around the sides and edges of the main.

4.12 Although the Rapid Window Cutter has been designed primarily for service windows, it can be used for cutting out longer sections to accommodate a connection for example. However it is recommended to cut in the 12 o'clock position over the entire length but to rest the motor and blade for a few minutes every 12"/300mm.

5. SAFETY AND PRECAUTIONS - WATER BOWSER DUST SUPPORT SYSTEM

Steve Vick International supply a standard 5 litre water bowser to compliment the range of rapid pipe cutters. It is essential to use the bowser for both ductile and steel sets of cutters to act as a dust suppressant and prolong blade life. The entire range of rapid pipe cutters have an incorporated water line. A separate bowser is required to connect onto.

Figure 7

5.1 Identify the water line on the type of rapid pipe cutter being used. This is a blue nylon tube terminating near the cutting disc and running back from the main body of the cutter through the hose line sheath. It will either connect above or to the side of the cutting disc and spray a jet of water onto the cutting disc.

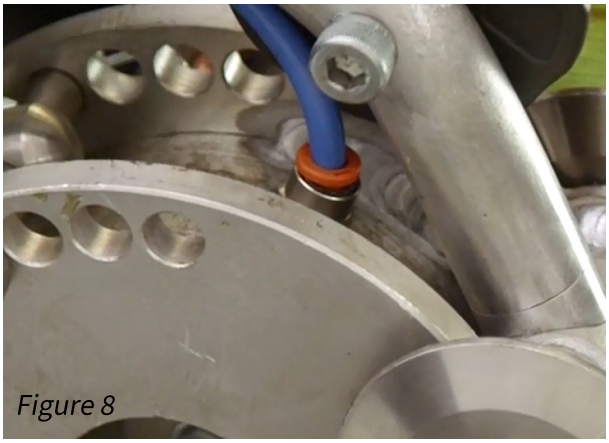


Figure 8

5. SAFETY AND PRECAUTIONS - WATER BOWSER DUST SUPPORT SYSTEM (CONTINUED)

5.2 The water hose will travel back through the hose sleeve and become visible at the other end. This end needs to be connected to the solid nozzle of the water bowser which has a quick fitting type connector. Insert the blue nylon hose into the quick fitting and gently pull back to confirm it is correctly locked in.

Figure 9

5.3 Fill the water bowser and fully retighten the pump assembly. Pressurise the bowser by pumping the handle in and out several times. If needed there is a pressure release valve to the side of the pump.

Figure 10

Prepare the rapid pipe cutter for use as per the operators manual. Note, wear all PPE including the appropriate dust mask. Do not carry out any cuts until water is allowed to flow from the bowser and confirmed at the cutting disc.

Prior to starting the cutting operation open the valve on the bowser water nozzle—image right the valve is closed.

To open the valve push down and slide away from the bowser to lock in place.

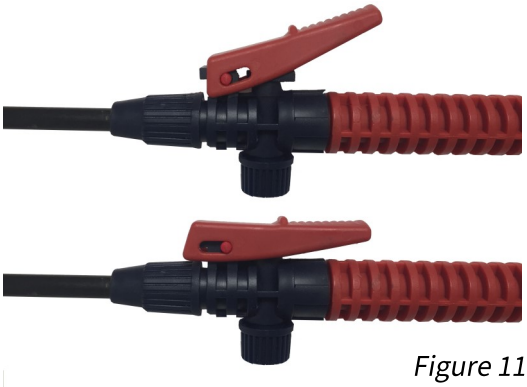


Figure 11

Visually confirm water is flowing onto the cutting disc. If not do not proceed until reason has been identified. The water line may be blocked.

Ensure the water flows throughout the cutting operation and maintain pressure in the bowser by regularly operating the pump. When the bowser becomes empty stop the operation and refill the bowser before proceeding.

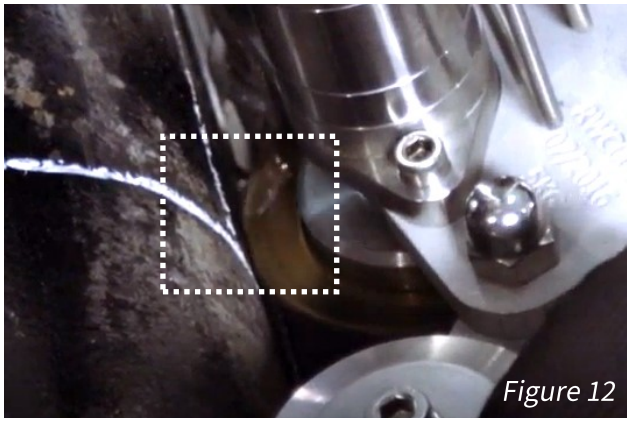


Figure 12

6. OPERATING INSTRUCTIONS

6.1 Mark the outline of the intended window on top of the main using a suitable scribe (e.g. chalk). The size of window will be dependant on size of inserted main, size of top tee required, but should be the right size to allow a safe and correct fitting of the tee.


Figure 13

6.2 Select depth control disc using coupon as a guide or a measurement taken from a nearby service hole.


Figure 14

6.3 Choose the depth control disc that allows the same measurement of travel to the edge of the cutting disc and install. This should be printed on the wheel.

If in any doubt use depth control blade that offers the least travel.

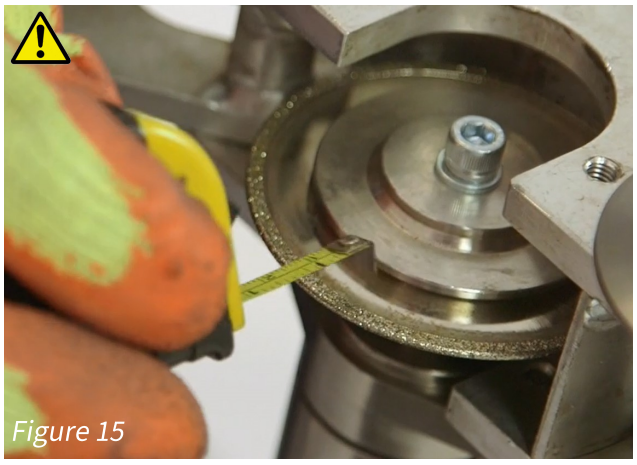


Figure 15

6.4 Fitting the blade and depth disc

Once the correct depth disc is selected the cutting blade is installed at the same time. Verify visually that the blade is fit for purpose and has not worn down.

Slide both discs onto the central spindle, fit and tighten the central locking bolt with an Allen key and a 19mm spanner.

Removal of the cutting blade and depth discs must only be undertaken with the cutter disconnected from the oiler unit

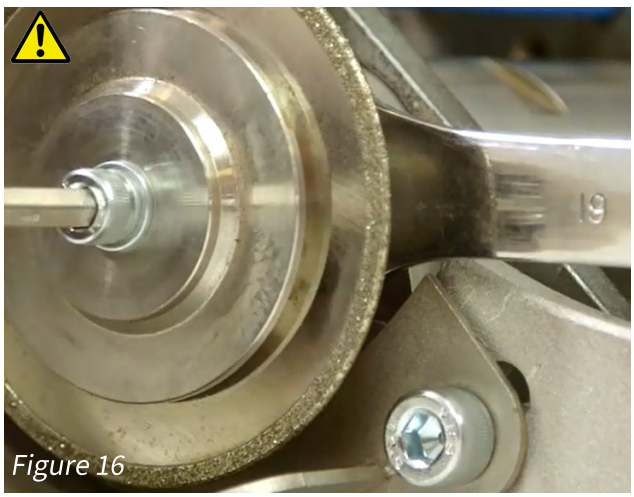


Figure 16

6. OPERATING INSTRUCTIONS (CONTINUED)

6.5 Connect the air line hose from the compressor to the claw coupler fitting on the lubricator unit. Make safe by fitting the whip chain.

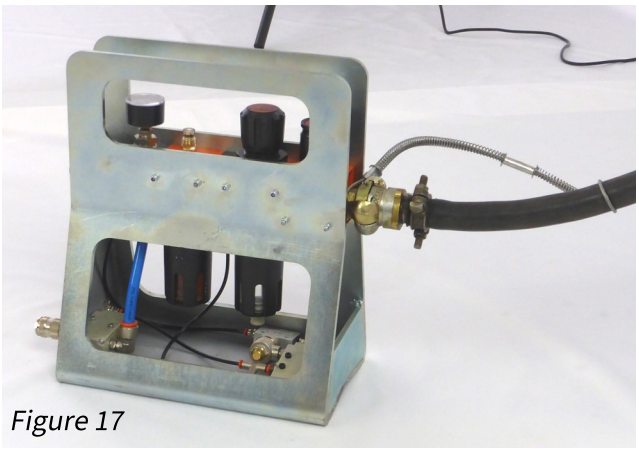


Figure 17

6.6 The group of hoses from the Rapid Window Cutter need to be connected into the other side of the lubricator unit. Each hose has specific opposite connector ports on the lubricator unit so that they cannot be connected up incorrectly. The three hoses are:

A. The air inlet
B. The air exhaust
C. The lubricator line

The blue water hose will need to be connected to a water bowser if required.

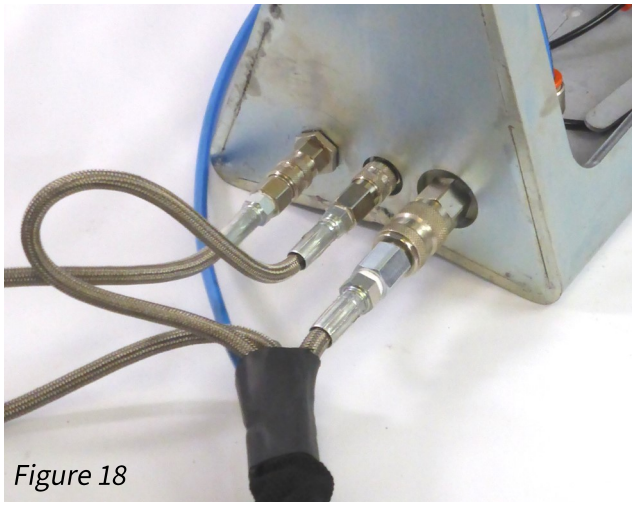


Figure 18

6.7 Check all the functions on the Lubricator Unit as outlined on Page 5 Figure 4:

A. The oil reservoir is filled with standard air tool oil and should be about half full.
B. Whilst operating the Rapid Window Cutter ensure there is a sufficient drip rate going to the motor from the oil reservoir. Adjust if necessary.
C. Confirm the water trap container is empty if not there is a drain point underneath the container.

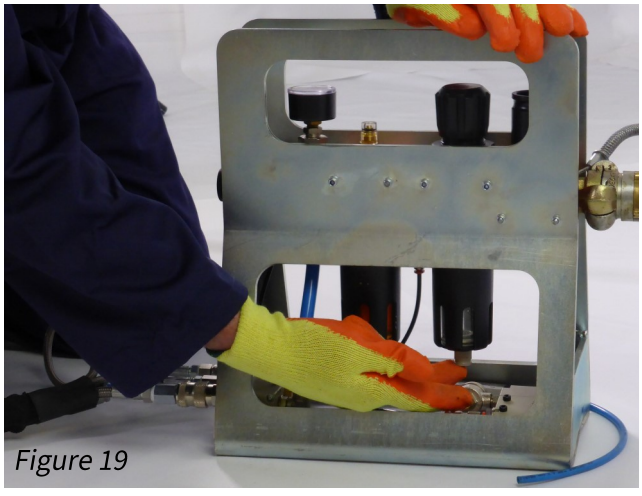


Figure 19

6. OPERATING INSTRUCTIONS (CONTINUED)

6.8 Switch on the air at the compressor. Switch on the air at the Lubricator Unit using the Air Power On/Off button. The orange centre button turns the air on and the black outer rim button switches the air off. Figure 14 shows the Air Power button in the ON position.
If necessary increase pressure by pulling the regulator upwards and turn clockwise. Refer to page 5 for correct pressure gauge reading—lift up regulator and adjust.

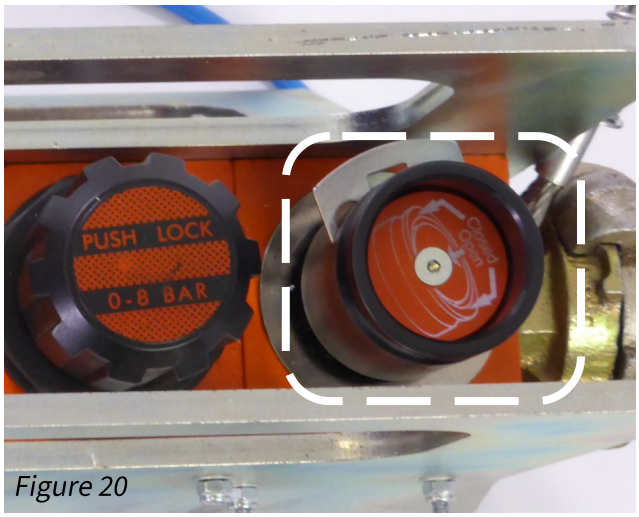


Figure 20

Depress the orange hose line energiser button above the connector ports to allow pressurised air to the motor. *(The hose line energiser button ensures the Rapid Window Cutter cannot accidently start when the compressor is started and the on/off button is on).*

6.9 With the Rapid Window Cutter in the flat position the longitudinal cuts are carried out. The Pivot bolt should be one of the two central selection holes. First of all carry out a dummy cut in the 12 o'clock position by contacting the front alignment wheels onto the pipe as shown in Figure 20. The dummy cuts allow the Rapid Window Cutter to be configured for the longitudinal cuts and to check the desired depth of cut is achieved. *See 4.9 page 8 if sparking is experienced at any point of the operation.*


Figure 21

6.10 Press the on/off lever to turn on the motor.

Lower the rear wheels onto the pipe allowing the cutting disc to cut into the pipe wall. Press down until the depth control disc prevents any more travel.

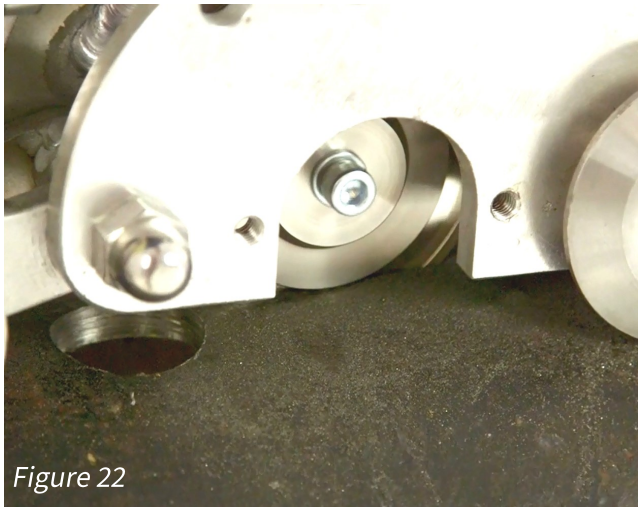


Figure 22

6. OPERATING INSTRUCTIONS (CONTINUED)

6.11 Ensure all four wheels are on the pipe squarely which can be achieved by switching off the power and turning the depth control feed screw. With all four wheels in contact with the pipe the cutting disc should be raised slightly so that the depth disc is just short of the pipe wall. This will prevent the depth disc from rubbing against the pipe wall.

Figure 23

6.12 With the Rapid Window Cutter set the full longitudinal cuts can be carried out. Locate the cutting disc onto the line mark using the front two alignment wheels. Press the on/off lever and lower the disc into the pipe wall and confirm all four wheels are in contact with the pipe. Gently drive the Rapid Window Cutter along the pipe until the full length of cut is achieved. If too much pressure is applied the motor will stall, pull the Rapid Window Cut back slightly to restart.

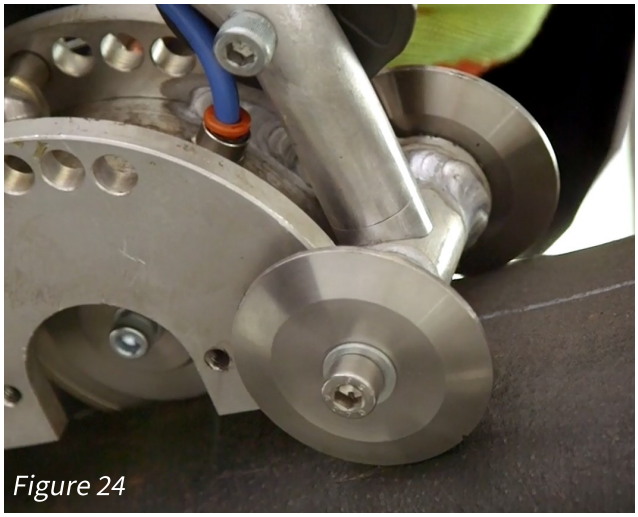


Figure 24

It is good practice to have the motor side of the Rapid Window Cutter facing you as this allows the flat face to be up close to the trench wall. It is also a safer way of holding the Rapid Window Cutter.

6.13 With both longitudinal cuts complete the Rapid Window Cutter must now be configured for the semi circumferential cuts. To do this pull out the R-Pin holding in the Selector Pin and remove from the slot.

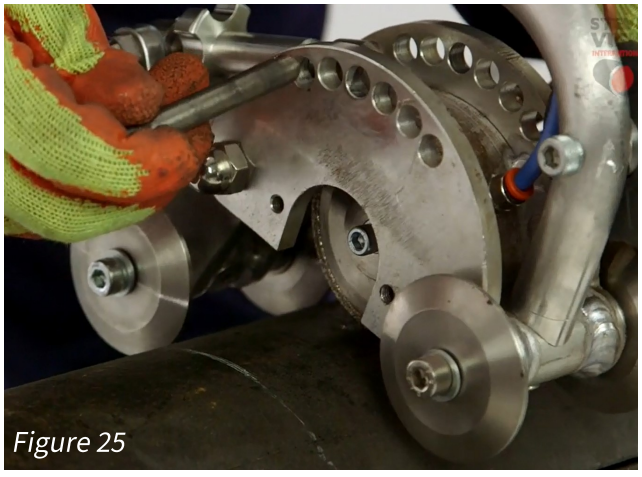


Figure 25

6. OPERATING INSTRUCTIONS (CONTINUED)

6.14 Typically the slot closest to the rear alignment wheels will be used for the smallest size of Ductile Iron pipe which is 100mm/4”. The next slot back towards the centre is for 150mm/6” and the next one for 200mm/8”. Secure with the R-Pin.

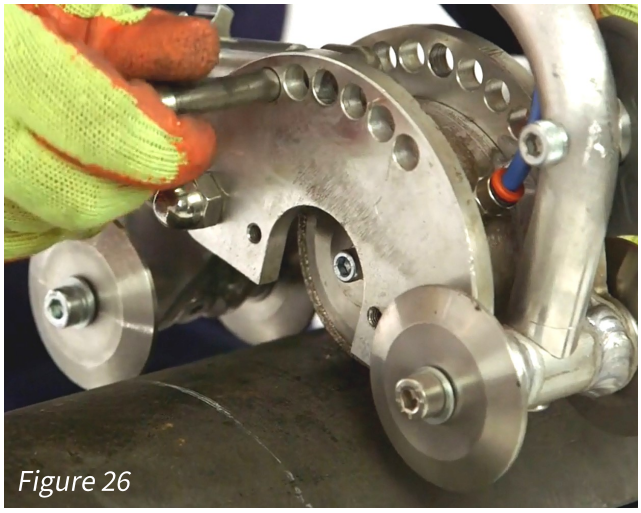


Figure 26

6.15 Repeat steps **6.9 to 6.12** for the two semi-circumferential cuts. The side of the Rapid Window Cutter without the hose lines should be facing the trench wall, this makes the most of the trench space and is the safest way to hold the Rapid Window Cutter.

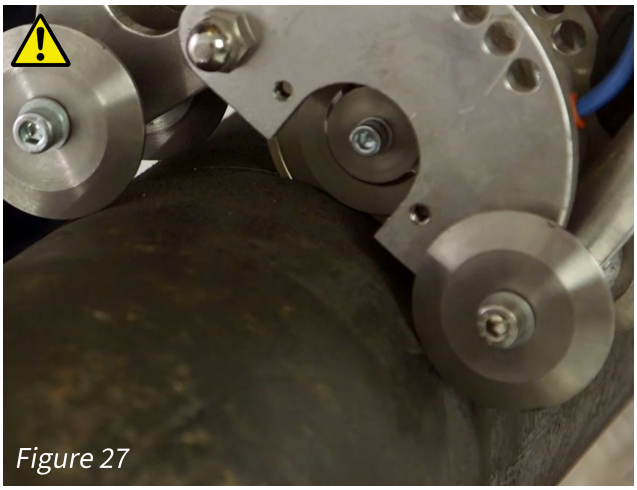


Figure 27

6.16 Ensure the semi-circumferential cuts fully pass the initial longitudinal cuts. This will ensure the window can be removed with minimal effort.

Figure 28

6.17 All four cuts should overlap each other fully. Visually inspect the cuts are to the desired depth before attempting to remove the window.

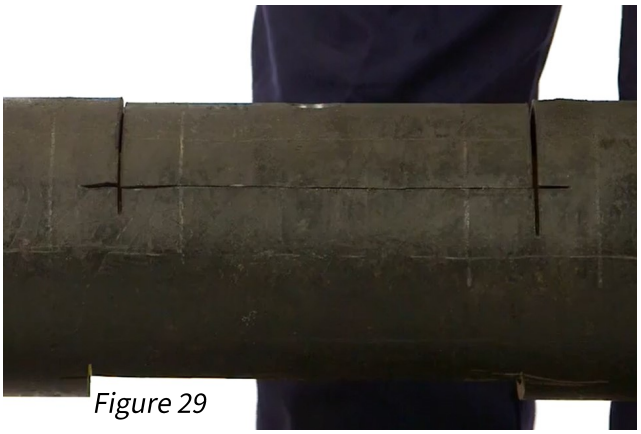


Figure 29

6. OPERATING INSTRUCTIONS (CONTINUED)

6.18 With gloves still on remove the window by pulling up from the original service hole. If the cutting depth was set to leave a slither of wall material it will be necessary to tap the top of the window with a hammer. Minimal force should be required, however if the window will not move then the Rapid Window Cutter will be needed to remove the excess wall material.

Figure 30

6.19 The inserted PE will be exposed by removing the window. Visually check for any damage to the PE pipe and clean and scrape the area in readiness for the electro-fusion of the new service tee.

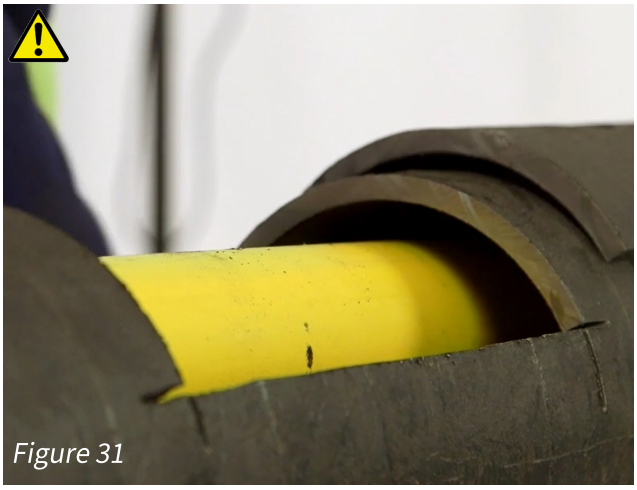


Figure 31

6.20 Check the service tee will fit safely and securely onto the PE pipe before final installation.

Carry out standard procedures for the relay or transfer of the service.

At all times wear gloves and remove any dangerous burrs on the edges of the cut out section.

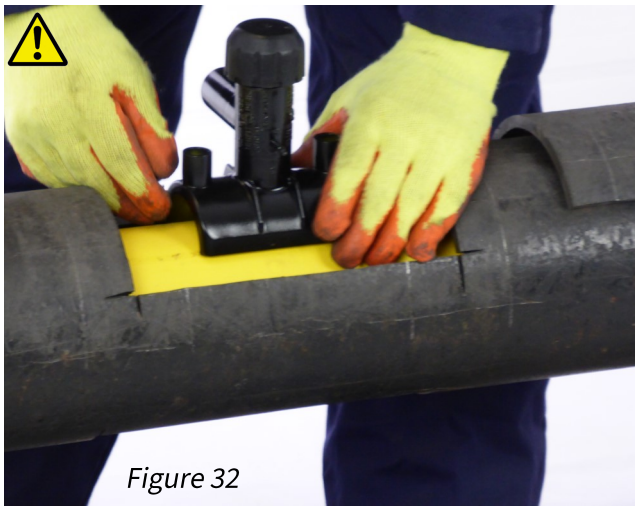


Figure 32

7. SERVICE GUIDE

It is recommended that the Rapid Window Cutter is serviced every 12 months by Steve Vick International. Please contact us for details.

8. ROUTINE MAINTENANCE

The Rapid Window Cutter has been designed to be relatively free of maintenance. Simple checks on the tightness of bolts and clips, any hydraulic leaks and general wear on parts being all that is required in normal day to day operation.

8.1 The assembly unit is designed so that the filter pot precedes the lubricator pot when attached to the airline hose. If in doubt refer to the direction arrow found on assembly which indicates the flow.

8.2 Oil feed rate is pre-set and should last a typical days cutting. On cold days it may be necessary to increase the oil feed rate by inserting a flat head screw driver into the top of the oil pot and twisting a half a turn clockwise.

ROUTINE MAINTENANCE
Clean down the machine and check all moving parts for wear and tear.
Thoroughly check the cutting blade and replace when worn.
Check all hoses remain in good condition.
Ensure the airline lubricator is operational.
Retighten all nuts and bolts.
Ensure all wheels are present and can rotate.
Ensure all depth control discs are present.
When mounting the cutting blade and depth control disc, ensure they can attach to the motor assembly securely and are not loose.
If the motor fails to operate it is recommended that it is taken to a specialist to investigate the problem.