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**RISER/FLOWLINE/HOSE/UMBILICAL CUTTER HCV270**

**TOOL PRODUCT CODE No. 980216**

**INSTRUCTIONS FOR INSTALLATION,  
OPERATION & MAINTENANCE**

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## 1. Introduction

The cutter will cut hose up to 270mm diameter. It may be used on alternative materials, such as electrical power or communication cables. Where small diameters are to be cut, effort should be made to place the material centrally along the anvil to minimise any offset loading. The cutter is not designed to cut large diameter wire rope or solid steel sections.

**Important:** If it is required to extend the recommended use of the cutter, please refer to the manufacturer with full details of material size and tensile strength. Cutting unsuitable materials could result in damage to the tool.

**WARNING!** – Any modification made to this tool will invalidate the warranty and may lead to equipment failure or personal injury. If in doubt please contact the manufacturer (Allspeeds Ltd) or an authorised distributor for assistance.

**Important:** Please note this tool is designed for intermittent subsea use. Please refer to the manufacturer (Allspeeds Ltd) or an authorized distributor should you wish to use this tool subsea for any period over 14 days.

This machine is not intended for use in an explosive environment.

CAUTION – USE OF PARTS NOT SUPPLIED OR APPROVED BY ALLSPEEDS LTD MAY RESULT IN TOOL FAILURE AND CONSEQUENTIAL DAMAGE

## 2. Safety

Before operation, read and understand this operations manual.

Whilst the tool is intended for remote or local operation sub-sea, there is no reason why it should not be used above surface as long as suitable safety precautions and guarding are employed.

Ensure that the tool, hoses and pump are in good condition and properly connected.

Ensure that suitable pressure regulation equipment is used and that the unit is not subjected to pressures higher than those stated in section 3

In all cases, where an operator is present, the safety aspects must be reviewed before the cutting operation is commenced.

Cutting a work piece under tension will likely cause the item to recoil after cutting. Ensure adequate safety precautions are taken.

Ensure that the operator is shielded from the cutting blade during the cutting operation.

When cutting near the very end of the work piece fragments can be expelled from the tool, please ensure that the operator is shielded from these.

If in doubt please contact the manufacturer (Allspeeds Ltd) or an authorized distributor for assistance.

If at any time it is necessary to carry out proof tests on the tool, e.g. after service on the hydraulic cylinders, it must be returned to the supplier for testing where the following procedures apply.

The maximum proof test pressure should not exceed 125% of the maximum working pressure and this should only be done by Allspeeds Ltd using our specially adapted test rig.

The tool should be guarded during the proof test operation, and be carried out in a safe working environment.

The proof pressure should be applied gradually, until the maximum pressure is reached.

### 3. Technical data

#### 3.1. Hydraulic Data

Hydraulic supply used with this unit **MUST** fall within the below limits.

Function	Max. Working Pressure		Swept Volume		Port Tapping
	psi	bar	ml.	U.S. Gallon	
Main Ram Working Stroke	10,000	690	5300	(1.40)	3/8" NPT
Main Ram Return Stroke	10,000*	690*	1910	(0.51)	3/8" NPT
Auxiliary Cylinders Out Stroke (to retract anvil)	2,750	190	132	(0.035)	1/4" NPT
Auxiliary Cylinders Instroke (to reset anvil)	2,750	190	81	(0.021)	1/4" NPT

\***N.B.** Actual pressure required to return Ram < 200 psi (14 bar)

### 4. Hydraulic Requirements

#### 4.1. Fluid Type

The tool is compatible with the following hydraulic fluids:

ISO 32 mineral hydraulic oil (e.g. Shell Tellus 32)

ISO 46 Water Glycol hydraulic fluid (e.g. Millmax FRG 46)

Please note that whilst compatible, the use of water glycol fluids may reduce system life.

Where possible it is recommended that the chosen fluid is ISO 32 hydraulic oil.

**IMPORTANT** - Please contact Allspeeds Ltd before using this product with any other hydraulic fluid to check compatibility.

#### 4.2. Fluid Cleanliness

**IMPORTANT** - It is critical that the correct grade and cleanliness of fluid is used with this system as contaminated fluid may lead to system failure.

The tool does NOT contain screens. Precautions need to be put in place to stop large particles from accidentally entering the critical components. System damage can be caused by the use of contaminated fluid.

It is critical that filters are fitted to the input stage to provide additional protection.

The minimum recommended fluid cleanliness levels are as follows:

Fluid Type	ISO 4406:1999 Target Level	Filtration Rating (µm)
ISO 32 Hydraulic Oil	17/15/12	3
ISO 46 Water Glycol	16/14/11	3

## **5. General safety rules**

### **5.1. Warnings!**

These warnings are provided to improve safety and should be carefully read before installing, using or maintaining the machine.

### **5.2. Important Information**

It is vital that these instructions are available to machine users. It is also important to retain with the machine if the machine is sold or transferred to another user.

### **5.3. Safety for operation**

The tool should only be used by fully trained operators experience to prevent the risk of injury to themselves or other personnel.

Before operation there are several safety elements that have to be taken into account:

- Ensure sure that suitable PPE including safety glasses is worn when operating, adjusting or making connections to this equipment.
- Make sure that the equipment is isolated from the hydraulic supply before any hydraulic connection is made or altered.
- Make sure that all hydraulic connections are rated to the correct working pressure (see hydraulic data for reference section 3.1)
- Make sure that all hydraulic connections are tightened correctly.
- When operating the tool ensure that the maximum input pressure is not exceeded, as described in section 3.1.

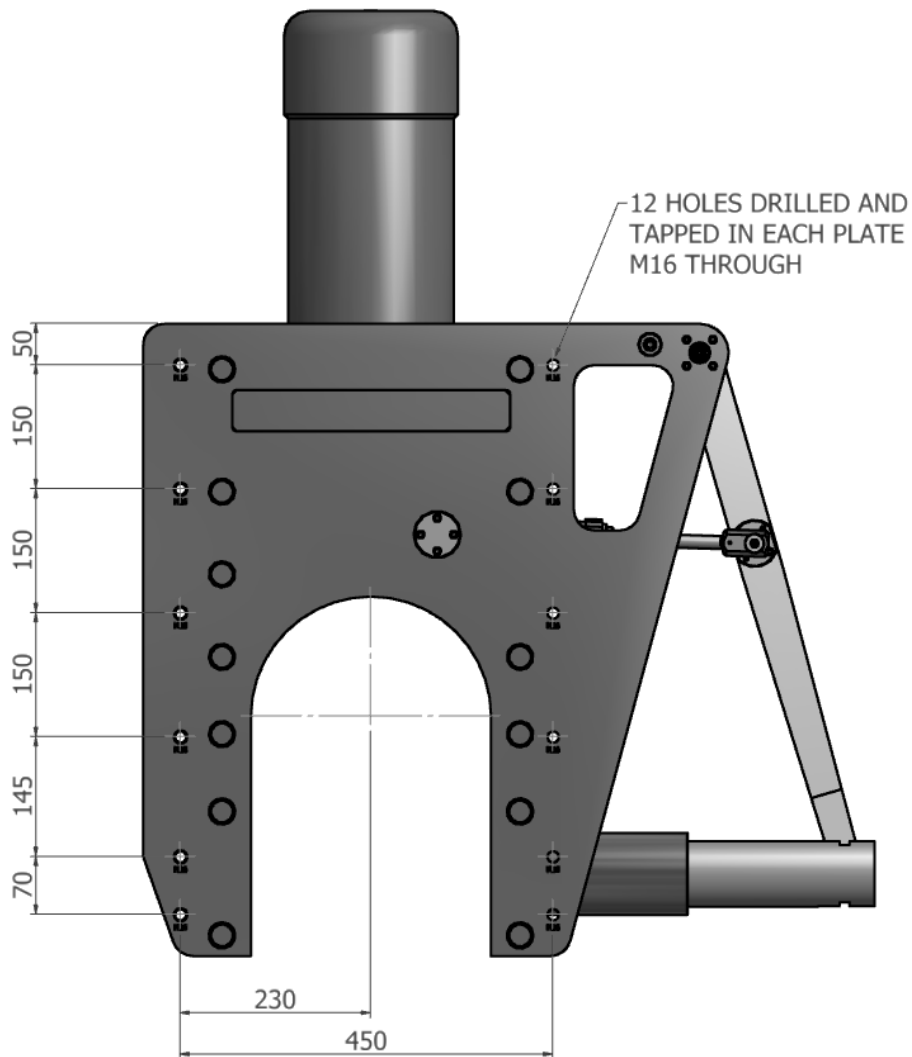
Recommended PPE is safety shoes, safety glasses and gloves.

### **5.4. Safety for maintenance**

Repairs carried out by untrained or unauthorised personnel may result in personal injury or serious malfunction of the equipment. If in doubt, return the unit to Allspeeds Ltd for servicing or maintenance.

## 6. Installation

Tapped Holes, M16, are provided in the tool body (see image below) which can be used for any attachment necessary to mount the cutter. The cylinder is a pressure vessel and is not recommended as a mounting point, the cylinder should not be drilled, machined, mutilated or damaged in any way, and any warranty could be invalidated by such actions.



**Figure 1 – Tool Mounting Holes**

Two hydraulic supplies are required, ported as shown below. The maximum working pressures are shown in section 3.1 and it is recommended that pressure limiting valves are fitted into the supply to limit the pressures to these levels.

The weight of the tool is 375kg.

## 7. Operating instructions

### 7.1. Inspect the tool before use

With the cutter isolated from the hydraulic supply, check the condition of the blade edge. If the blade is damaged or blunt replace with a fresh blade before cutting. This procedure is as described in section 8.3. Ensure that care is taken when checking the blade as the edge may be sharp.

Check the condition of the anvil. It is normal that the anvil will show an indent where the blade has pressed down into it and can withstand multiple cuts, but any excessively damaged anvil should be replaced. This procedure is as described in section 8.2.

### 7.2. Cutting capacity

The cutter is intended for work pieces up to 270mm diameter. It may be used on alternative materials, such as electrical power or communication cables. Where small diameters are to be cut, effort should be made to place the material centrally along the anvil to minimise any offset loading. The cutter is not designed to cut large diameter wire rope.

### 7.3. Hydraulic supply

The tool requires two hydraulic supplies. Ports come with 7/16" JIC 4 male connectors for use when connecting to your hydraulic supply. Ports into tool are NPT as can be seen below.

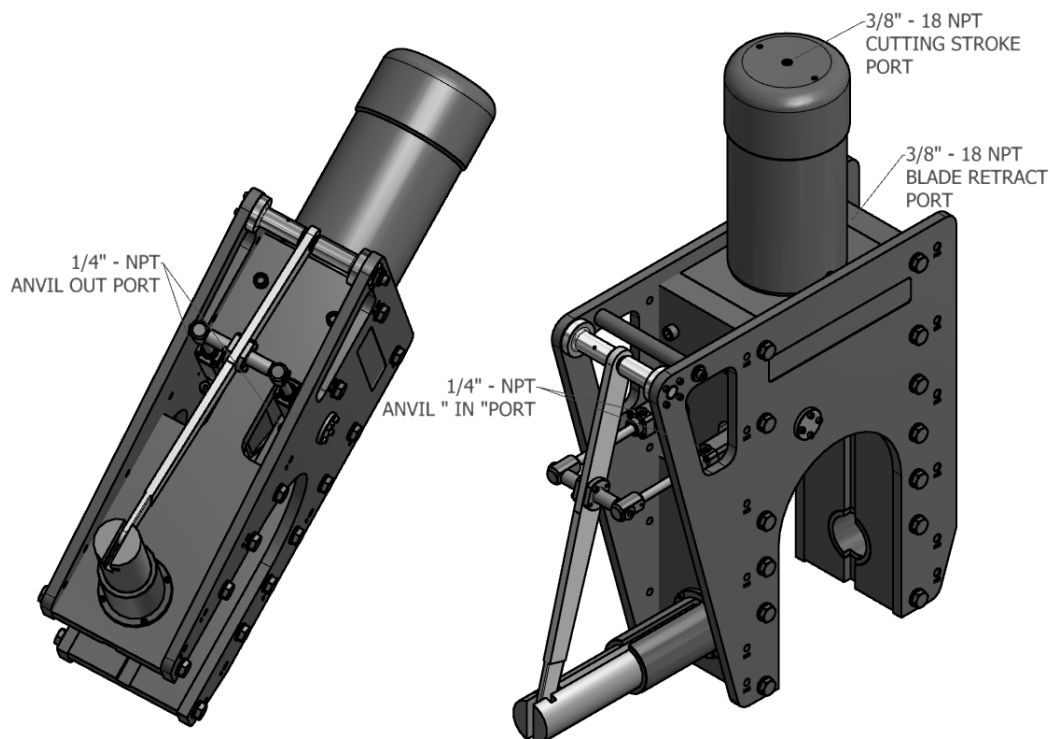


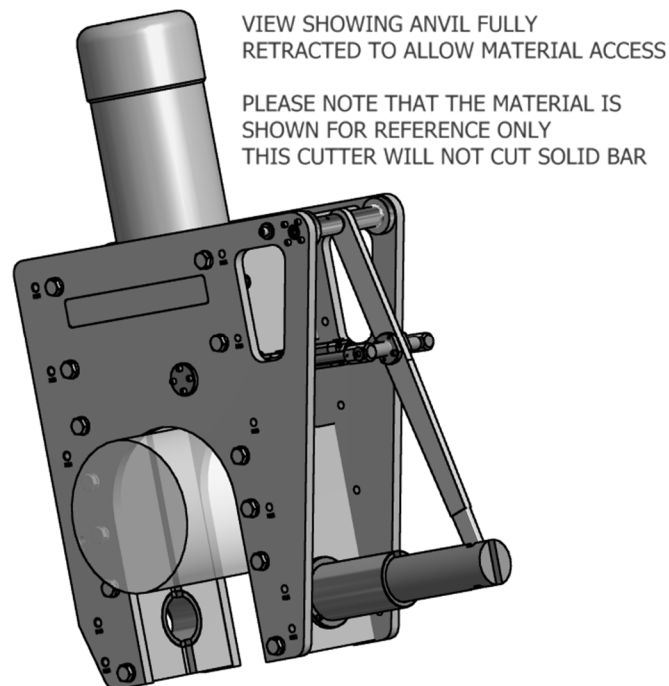
Figure 2 – Connection Ports



## 7.4. Deployment

Before deployment, function test the tool and ensure that all operators are familiar with this procedure. ROV observation of the tool should be maintained at all time during operation. Prior to use, ensure no damage has occurred to the blade or anvil. Ensure the anvil is not obstructed and can move freely between open and closed positions.

Prior to use, the auxiliary cylinder outstroke should be operated to withdraw the anvil. This clears access for the cutter to be placed over the work piece. Place the cutter over the work piece. Ensure that the work piece is as far into the cutter as possible so that the anvil does not foul as it is closed.



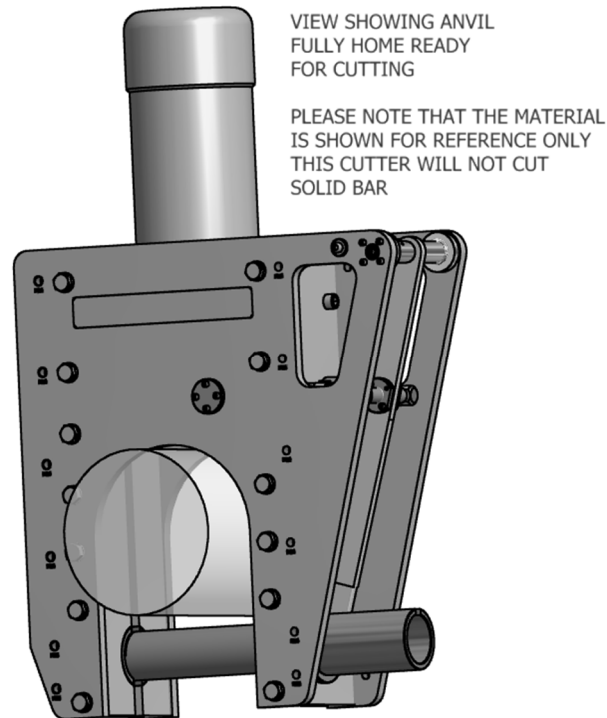
**Figure 3 – Tool Deployment 1**

Operate the auxiliary cylinder instroke to fully close the anvil under the work piece; the main ram should not be activated until the auxiliary cylinders are operated to the full extent of their stroke.

**IMPORTANT** - Ensure that the anvil is fully closed before pressurising the main ram.

**IMPORTANT** - Maintain pressure on the auxiliary anvil instroke to keep the anvil closed throughout the cut cycle.

**DO NOT OPERATE THE MAIN RAM IF THE ANVIL IS NOT FULLY CLOSED AND PRESSURISED**



**Figure 4 – Tool Deployment 2**

Operate the main ram down-stroke to sever the work piece. Once the work piece is severed, pressurize the main ram retract port to withdraw the cutting blade. Then, and only then, retract the anvil.

**IMPORTANT** – Do not attempt to open the anvil whilst the main ram and blade are in the fully extended position.

If a further cut is required, the above procedure should be repeated.

**N.B.** Do not operate the auxiliary cylinders when the main ram is fully extended as this will damage the anvil.

Please note that this tool has a relief valve fitted to the blade down port which will operate at approx. 750 bar, **DO NOT** continue to apply pressure if the relief valve is operating.

**IMPORTANT** - Always fully retract the blade before resurfacing. Failure to do so can lead to a dangerously high pressure build up inside the tool resulting in tool failure.

## 8. Maintenance

### 8.1. Service

It is unlikely that service would be required on the hydraulic components of the tool under normal circumstances, but a seal spares kit is available if required. The only parts that would need intermittent replacement would be the anvil and blade depending on the frequency of use and materials being cut. These parts can be ordered using the following spare parts numbers, but in addition please quote the tool serial number.

Seal Kit	Part Number	995288
Anvil	Part Number	SSC6488
Blade	Part Number	705050C
Blade pin (3 off required)	Part Number	030636

We advise that any servicing should be carried out by an authorised distributor only. If required, the tool can be returned to the manufacturer for servicing and testing.

If servicing is to be undertaken by the user, please see note on proof testing under SAFETY section 2 and the following:-

All servicing operations should be carried out in a clean environment to prevent contamination of the oil and mating components.

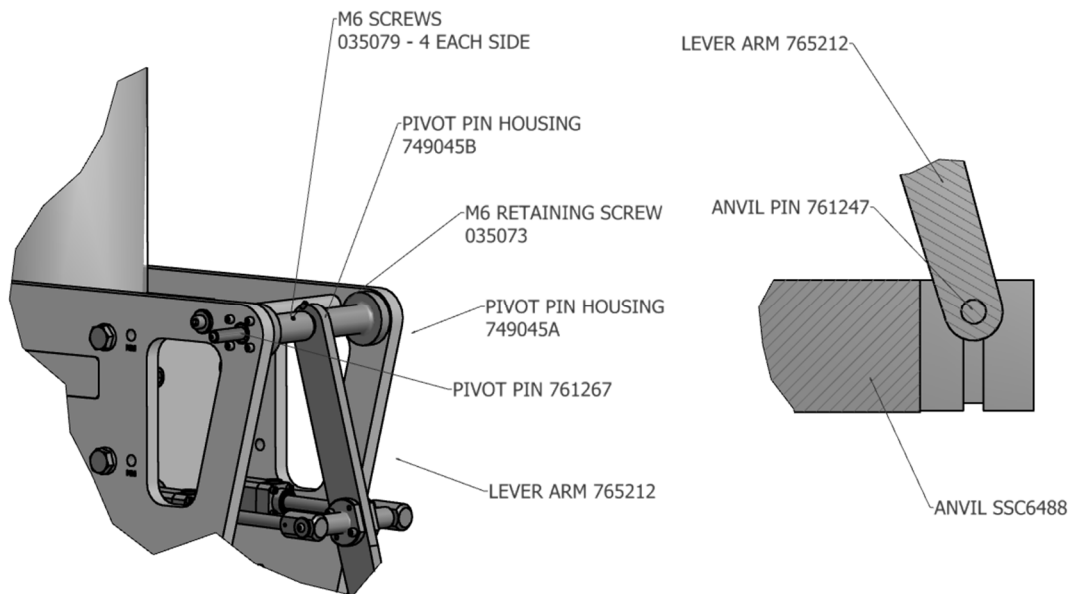
Care should be taken with all mating areas i.e. threads and sealing faces, as any damage or abrasive contamination could cause galling or seizing on re-assembly.

The cylinder is a pressure vessel and should not be drilled, machined, mutilated or damaged in any way for mounting purposes or to assist in its removal for servicing, any warranty could be invalidated by such actions.

The use of stilsons to remove the cylinder is forbidden as damage will occur; see section 9.4 for information on cylinder removal.

## 8.2. Replacement of the anvil

Extend the auxiliary cylinders so that the lever arm 765212 exits the guide bush 715348.  
Loosen the 8 off M6 screws 035079 holding pivot pin housings 749045A & B.  
Loosen the M6 retaining screw 035073.



**Figure 5 – Anvil Replacement**

Withdraw the pivot pin 761267 far enough to release the lever arm. (There is an M6 tapped hole in the end of the pivot pin to assist in withdrawing this)

The lever arm can be moved upwards to separate it, and the anvil pin 761247, from the anvil SSC6488. The anvil may now be slid out from the guide bush. Re-assembly is the reverse of the above process.

### 8.3. Replacement of the cutting blade

First withdraw the anvil as described above.

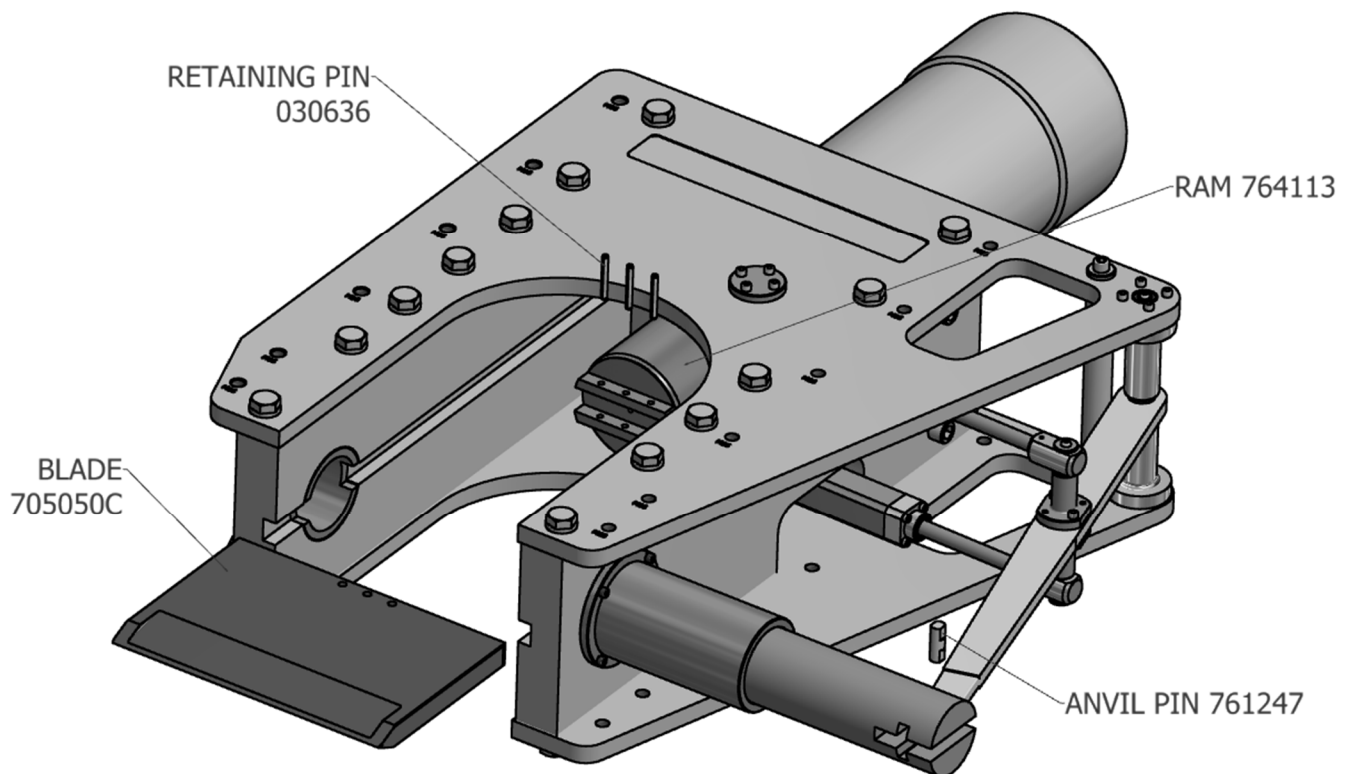
Pump out the main ram until the blade retaining pins 030636 can be seen in the opening of the cutter body.

Lay the tool on its side as shown below for easy and safe removal of blade.

The three pins are 1/4" (6.35mm) diameters, using a suitably sized drift remove all three and slide the blade out.

Protective gloves should be worn at all times as the blade may have sharp edges.

Re-assembly is the reverse of the above process.



**Figure 6 – Blade Replacement**

### 8.4. Removal of the main cylinder

If it is necessary to renew the hydraulic seals, the cylinder must be removed from the tool. As an aid to this, 2 off tapped holes are provided in the cylinder end face. These are M10 x12 deep on 130mm centres. Allspeeds Ltd do supply a tool for cylinder removal, see below.

#### Cylinder Assembly Tool - SK4377A

This tool can be used on RCV75, RCV75HD, RCV115, RCV135, RCV155, RCV190, HCV100, HCV120, HCV250 and HCV270 cutting tools

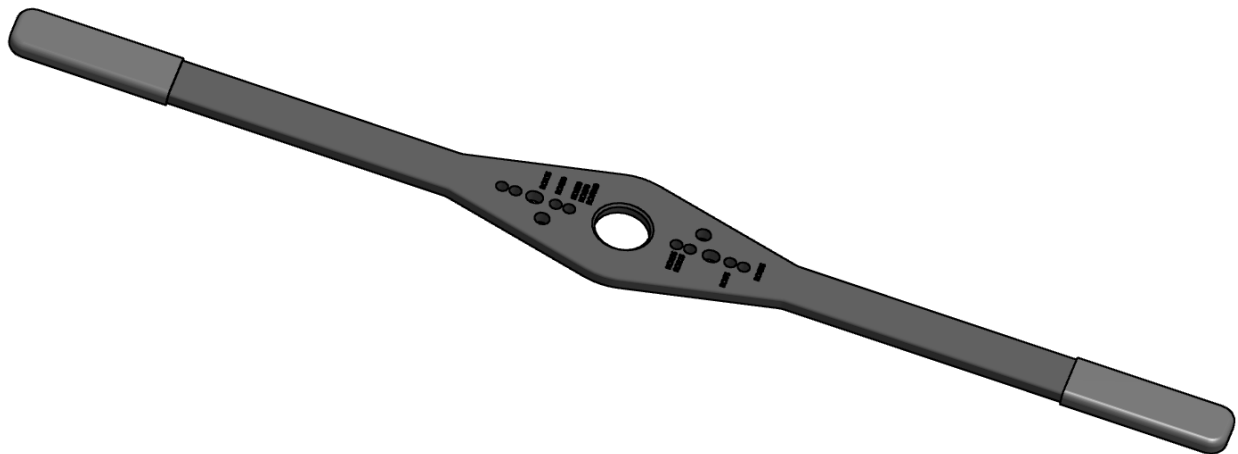


Figure 7 – SK4377A

First, remove the anvil as described above, pump out the ram and remove the blade. To use the holes in the top of the cylinder first remove the coupling, then the blanking screws 035050 and fasten the above tool centrally to the top of the cylinder. This can be used to loosen or re-tighten the cylinder. Do not use Stilsons to remove the cylinder as damage will occur. Unscrew the cylinder 728075 and remove from the assembly, it will come free but still attached will be the ram 764113 and bearing ring 774032.

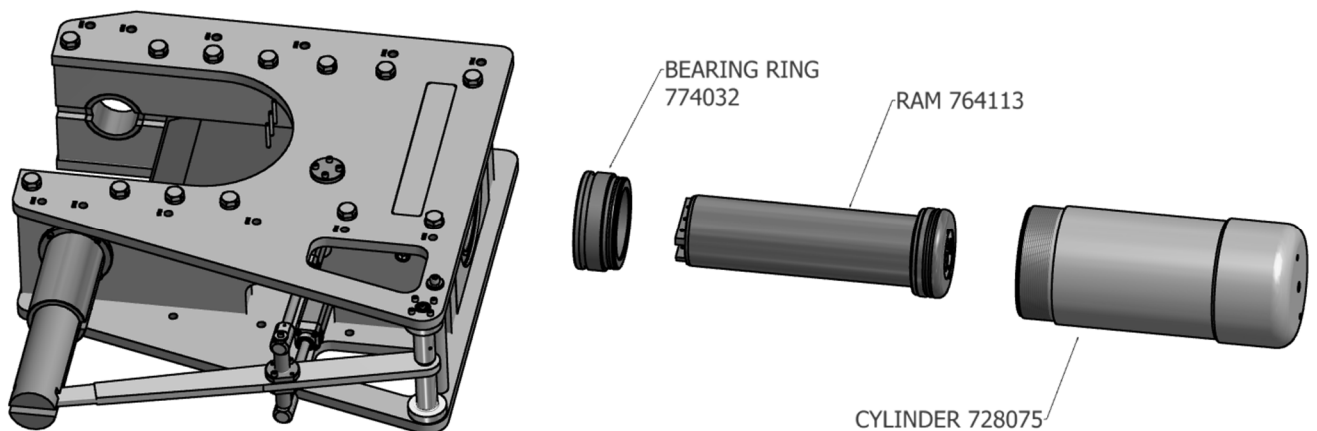
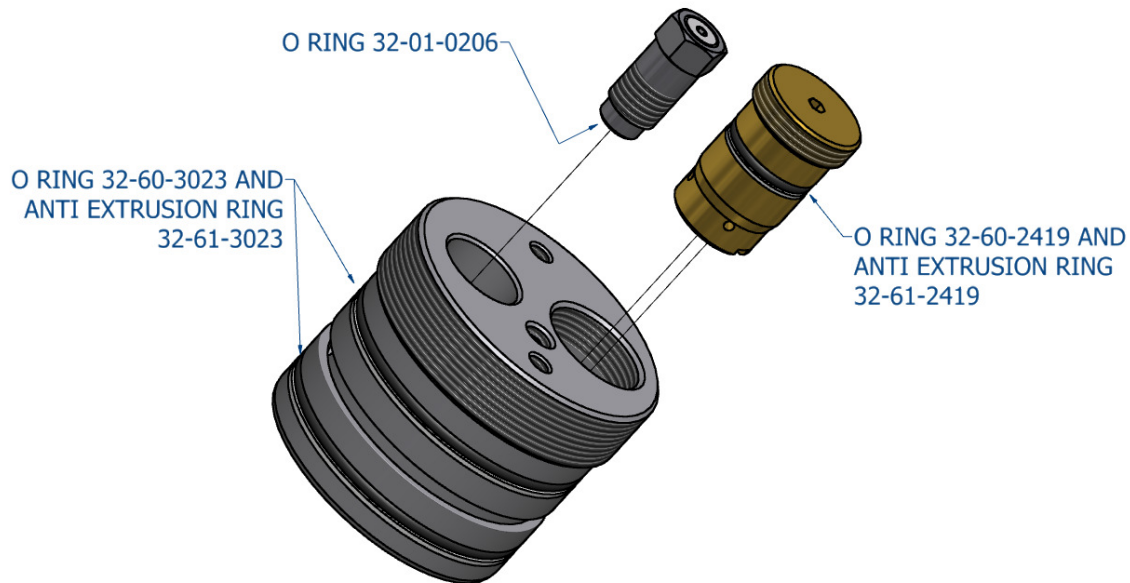


Figure 8 – Cylinder Removal

Put the assembled parts into a plastic dust bin or similar vessel, fit the coupling to the top of the cylinder, attach a hand pump to the coupling and pump out the ram, importantly, **by hand**. The ram can now be removed from the bearing ring and all seals will be accessible.

The ram has been fitted with a relief valve plug, this also contains seals, to remove the part, the two M8 tapped holes can be used to unscrew the plug. The two relief valves have been carefully set to blow off at a set pressure, these can be removed with a 17mm socket and 5mm allen key, care should be taken not to disturb the settings.



**Figure 9 – Seal Identifier**

When re-assembling the relief valve plug with the ram, first fill the ram with oil to the bottom of the counter bore. Smear silver goop on to the threads of the plug, screw in the plug, remove the set screw and ball in the top of the plug and top up the inside of the ram with oil until it fills the screw hole, fit the ball and screw and lock tight.

Check that the plug and the relief valves are tight and below the top face of the ram.

Fit the ram into the bearing ring, place the cylinder upside down under a press, position the ram on top of the cylinder and push home.

Position the assembly on top of the cutter, put grease on the threads and screw in the cylinder using the two tapped holes and the flat bar, remove the bar, replace the screws and fit the couplings.

### **8.5. IMPORTANT – Oil Cleanliness**

The most important maintenance task that should be carried out is to ensure that the hydraulic fluid supply is kept clean as described and conforms to the minimum cleanliness levels as described in section 4.

The use of contaminated fluid will reduce the life of this equipment or stop it from working altogether.

## 9. Parts list

### 9.1. HCV270 – Part List

HCV270 – Part List		980216
Part No.	Description	Qty.
728075	Cylinder	1
764113	Ram	1
774032	Bearing ring, main ram	1
SSC6488	Anvil	1
715348	Bush, anvil guide	1
715350	Bush, anvil	1
715345	Bush, lever, pivot pin	2
761247	Pin, sliding, anvil	1
749045A	Pivot pin housing, left hand	1
749045B	pivot pin housing, right hand	1
761267	Pin, pivot, lever	1
079043	Mounting stud, auxiliary cylinder	2
765212	Lever	1
761249	Cylinder rod pin, auxiliary cylinder	2
080971	Washer, special, M6	4
31-99-2834	Eye bolt, M16 thread	2
705050C	Blade	1
766093	Relief valve plug	1
035080	Socket set screw	1
31-47-0310	Ball for relief valve plug	1
32-99-1131*	Seal, piston head*	1
32-99-1333*	Seal, rod*	1
32-60-5725*	Seal, 'O' ring, cylinder/ram bearing, upper*	1
32-61-5725*	AE ring, cylinder/ram bearing, upper*	1
32-60-5727*	Seal 'O' ring, cylinder/ram bearing, lower*	1
32-61-5727*	AE ring, cylinder/ram bearing, lower*	1
025568*	Wiper, rod*	1
32-60-3023*	O ring	2
32-61-3023*	AE ring for 32-60-3023	2
32-60-2419*	O ring	1
32-61-2419*	AE ring for 32-60-2419	1
32-01-0206*	O ring	1
035111	Screw, sock cap. M6 x 35	4
035079	Screw, sock cap, M6 x 25	16
035066	Screw, sock cap, M6 x 20	8
035076	Screw, sock button head M6 x 16	5
035073	Screw, sock set, M6 x 10	1
035080	Screw, sock set, M10 x 12, cylinder blanking	2
33-99-1163	Screw, taper pressure plug, 3/8 NPTF	1
030636	Pin, blade retaining	3
752342	Nameplate	1
752571	Cutting stroke label	1
752573	Pressure warning label	1
766047	Plug, blanking, 1/4" BSP, red polythene	4



766061	Plug, blanking, 3/8" BSP, red polythene	2
982129	Body sub-assembly	1
982131	Auxiliary cylinder sub assembly (see separate parts list)	2
1155006	Relief valve 700 bar	1
1155007	Relief valve 250 bar	1
035119	Socket cap screw for customer mounting M16 x50 stainless steel	12

## 9.2. Auxiliary Cylinder, Sub-Assembly – Part List

Auxiliary Cylinder, Sub-Assembly – Part List		982131
Part No.	Description	Qty.
709062	Piston block	1
728077	Cylinder	1
SSC6476	End cap	1
764115	Piston	1
026701	Pellet, aluminium, 3Ø	1
025311**	Seal, 'O' ring, end cap**	1
025569**	Scraper, rod**	1
025801**	Seal, piston**	1
025802**	Seal, rod**	1
043206	Screw, socket set, M4 x 6, piston block	1
035067	Screw, sock cap, M5 x 30, end caps	4
701195	Adaptor, 90°, 1/4 NPT male / 1/4 NPT female	1

\* These parts are in the seal kit along with the auxiliary seals in seal kit 995288

\*\* These parts are in the auxiliary seal kit 995122 and also in full seal kit 995288

## 10. Troubleshooting

### 10.1. Cutting failure

If the work piece does not cut through completely on the first attempt, cycle the blade by retracting it slightly and then attempting the cut again.

If the work piece does not completely cut after multiple cycles of the blade, check the input pressure to the main input of the cylinder. This can be a maximum of 690bar (10,000psi).

If the work piece to be cut is still not severed after multiple cycles and at a pressure of 690 bar, retract the blade and then the anvil and return the tool to the surface for inspection of the blade and anvil, replace if necessary.

### 10.2. Unit is getting hot

Excessive operation of the input or output relief valves can cause the temperature of the oil to rise, leading to the tool feeling hot.

This can be caused by an input pressure that is too high, over the recommended 690 bar (10,000 psi).

To solve this problem, either reduce the input pressure to below 690 bar (10,000psi) at source to ensure that the relief valve is not operated or run the unit for short periods of time with sufficient time allowed for cooling.

## **11. Decommissioning**

This unit can be disassembled for disposal. The majority of the components in the unit can be recycled (e.g. stainless/mild steel and aluminium). Remaining components should be disposed of in accordance with local regulations.

Any oil that is drained from the system should be disposed of in accordance with local regulations.

## 12. Optional Extras

This HCV270 cutter is compatible with the following optional extras, not supplied as standard

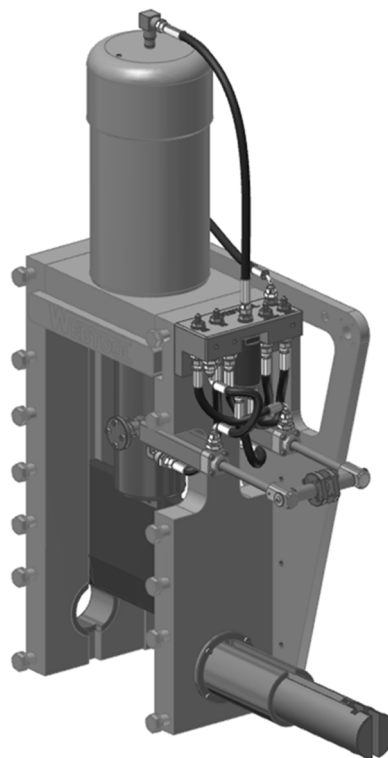
**Webtool Hydraulic Intensifier – HP690A** (available in a range on intensification ratios)



For further information contact the manufacturer (Allspeeds Ltd) or an authorised distributor.

**Optional Completion kit – 999018**

**Ordered Together – 980525**



For further information contact the manufacturer (Allspeeds Ltd) or an authorised distributor.

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- Cable Cutters (HCV) – capable of cutting cable, umbilical and armored flexible pipe lines up to 330mm diameter
- Softline Cutters (SL) – capable of cutting fibre ropes up to 135mm diameter
  - Wire Rope / Cable Grippers
    - Wire Rope Clamps
    - Automatic Shackles

### **Application specific solutions**

Our in house design and manufacturing capability means we can quickly and efficiently develop a solution to suit your particular application. Contact our engineering department to discuss how we can help.

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