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RISER/FLOWLINE/HOSE/UMBILICAL CUTTER HCV270

PRODUCT CODE No. 980216

INSTRUCTIONS FOR INSTALLATION, OPERATION & MAINTENANCE

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Description

The cutter is intended for use on Coflexip type riser and will cut hose up to 270mm diameter. It may be used on alternative materials, such as electrical power or communication cables, up to a maximum of 200mm diameter. 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.

IMPORTANT
If it is required to extend the recommended use of the cutter, for instance to cut solid steel bar or wire rope, please refer to the manufacturer with full details of material size and tensile strength. Cutting unsuitable materials could result in damage to the tool.

1. 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.

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.

No attempt should be made to cut any material that is under tension.

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

When cutting near the very end of hose 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 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.

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.

CAUTION – 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.

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.
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 7

CAUTION – USE OF BLADES AND PARTS NOT APPROVED BY WEBTOOL MAY RESULT IN TOOL FAILURE AND CONSEQUENTIAL DAMAGE

2. CUTTING CAPACITY

The cutter is intended for use on Coflexip type riser and will cut hose up to 270mm diameter. It may be used on alternative materials, such as electrical power or communication cables, up to a maximum of 200mm diameter. 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.

3. INSTALLATION

Tapped Holes, ⅝” UNC, are provided in the tool body (see sketch) 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, any warranty could be invalidated by such actions.

Two hydraulic supplies are required, ported as shown below. The maximum working pressures are shown in the table below and pressure limiting valves must be fitted into the supply to limit the pressures to these levels.

The weight of the tool is 352kg.

TABLE 1.

Function	Max. Working Pressure		Swept Volume		Port Tapping
	psi	bar	ml.	U.S. Gallon	
Main Ram Working Stroke	10,000	690	5300	(1.40)	⅜" NPT
Main Ram Return Stroke	10,000*	690*	1910	(0.51)	⅜" NPT
Auxiliary Cylinders Out Stroke (to retract anvil)	2,750	190	132	(0.035)	¼" NPT
Auxiliary Cylinders Instroke (to reset anvil)	2,750	190	81	(0.021)	¼" NPT

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

4. <u>OPERATION</u>

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 fully retracted.
DEPLOYMENT -

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 hose.
Place the cutter over the hose. Ensure that the hose is as far into the cutter as possible so that the anvil does not foul as it is reset.
Place the cutter over the hose. Ensure that the wire rope is as far into the cutter as possible.

Operate the auxiliary cylinder instroke to position the anvil fully home under the hose, the main ram should not be activated until the auxiliary cylinders are operated to the full extent of their stroke.

Operate the main ram down-stroke to sever the hose. Once the hose is severed, pressurize the main ram retract port to withdraw the cutting blade. Then, and only then, retract the anvil. It is important not to operate the anvil cylinder 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 since this would damage the anvil.
Please note that this tool has a relief valve fitted which will blow off at approx. 750 bar, DO NOT leave the pressure on so that the relief valve is continually blowing off.

TROUBLESHOOTING

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

If the hose 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 700 bar (10,000psi).

If the rope to be cut is still not severed after multiple cycles and at a pressure of 700 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.

IMPORTANT NOTE – ENSURE THAT THE BLADE IS FULLY RETRACTED AND THAT ALL PRESSURE TO THE CUTTER IS RELIEVED AS IT IS RAISED TO THE SURFACE. FAILURE TO DO THIS CAN LEAD TO A DANGEROUS BUILD UP OF PRESSURE IN THE CYLINDER.

5. AFTER USE

When the tool is retrieved, it should be hosed off with clean water, allowed to drain and sprayed externally with a de-watering fluid. Before storage, inspect the general condition of the tool. Particular attention should be paid to the anvil and blade. The anvil should be clean and free from any damage or bruising on the outside diameter that would prevent it from retracting properly. The blade edge should be smooth and free from any serrations. Note that a slight ripple to the blade edge is acceptable and will not cause problems. Any minor damage can be smoothed off with an oil stone if necessary.

IMPORTANT: Please note this tool is designed for intermittent subsea use. Please refer to the manufacturer should you wish to use this tool subsea for any period over 14 days.

6. 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 up on the following spares reference numbers, but in addition please quote the tool serial number.

Seal Kit	Part Number	995 288
Anvil	Part Number	SSC 6488
Blade	Part Number	705 050C

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 (Chapter 1), 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 ie. 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 not recommended as damage will occur.

7. 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.

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. 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.
The three pins are ¼" (6.35mm) diameter and they should be knocked out enough to release the blade.

9. 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.
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 a piece of flat bar, typically 30x10mm section and 900mm long 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.

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 careful 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.

When re assembling the relief valve plug with the ram, first fill the ram with oil to the bottom of the counterbore, 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.

HCV 270 – 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, ⅜ NPTF	1
030636	Pin, blade retaining	3
752342	Nameplate	1
752571	Cutting stroke label	1
752573	Pressure warning label	1
766047	Plug, blanking, ¼” BSP, red polythene	4
766061	Plug, blanking, ⅜” 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

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

Auxiliary Cylinder, Sub-Assembly – Part List		982 131
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, 90º, ¼ NPT male / ¼ NPT female	1

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

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

<u>Cylinder Assembly Tool</u> - SK4377A

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

<u>Webtool Hydraulic Intensifier</u> – HP690A *(available in a range on intensification ratios)*

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

<u>Optional Completion kit 999018 Fitted to HCV270 including Manifold, Intensifier and Hoses</u>

This cutter is also available fitted with a completion kit, which includes manifold block, intensifier and hoses, the part number for this tool is 999018

The manifold block is secured in position using the two socket cap screws on the anvil lever side of the cutter

The manifold block is fitted with intensifier and hoses, if the intensifier is removed it is important that it is replaced in exactly the same position. The hose connected to the 'BLADE DOWN' port must be connected to the Intensifier port marked 'IN' and the hose connected to the 'BLADE UP' to the Intensifier 'R' port.

Below is shown the cutter with a side plate removed to show the hose arrangement

The two hoses connected to the far ports on the underside of the auxiliary cylinders, are both connected to the underside of the 'ANVIL OPEN' port, the two other hoses connected to the front of the auxiliary cylinders connect to the underside of the 'ANVIL CLOSED' port.

Below is shown the schematic drawing of the hydraulic system for the HCV270

HCV270 Completion Kit – Part List		999 018
SK4372	Manifold block	1
725005	Intensifier	1
1242046	Adaptor ¼” BSP male both ends, straight	10
1242005	Adaptor ¼” BSP to ¼” NPT male both ends, straight	4
791123	Quick connector male end	4
726356	Male ¼” BSP connector for 791123	4
32-07-0035	Bonded seal ¼” BSP	15
1242061	Adaptor ¼” BSP to 3/8” NPT male both ends, straight	1
1242059	Hydraulic fitting 90º	1
1242060	Connector, high pressure	1
1242007	Hydraulic hose 700 bar	1
1241046	Hydraulic hose 225 bar	1
1241047	Hydraulic hose 225 bar	2
1241048	Hydraulic hose 225 bar	1
1241049	Hydraulic hose 225 bar	2
1241030	Hydraulic hose 225 bar	1
33-99-1160	Pressure plug	3

CUTTING EDGE TECHNOLOGY

Webtool specialises in engineering powerful hydraulic tools for cutting and gripping rope, cable and umbilicals.
Models designed for use in subsea environments by ROV's, and surface applications in hostile environments.

- Wire rope cutters (WCS and WCOS) – capable of cutting steel wire rope up to 75mm diameter
- Wire Rope Cutters (RCV) – capable of cutting steel wire rope up to 190mm diameter
- Cable Cutters (HCV) – capable of cutting cable, umbilical and armoured flexible pipe lines up to 330mm diameter
- Softline Cutters (SL) – capable of cutting fibre ropes in various sizes
- 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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