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WIRE ROPE GRIPPER WGO190

PRODUCT CODE No. 980460

**INSTRUCTIONS FOR INSTALLATION,
OPERATION & MAINTENANCE**

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DESCRIPTION

The WGO190 is a gripping tool intended for use with wire ropes, flexible risers and umbilicals up to 190mm in diameter. It is designed for use in a sub-sea environment and operates hydraulically, with hydraulic motor driven clamp screws for back up where required. The maximum gripping force is 20 tonnes and the tool is designed to sustain a maximum lifting load of 20 tonnes.

1 SAFETY

Before operation, read and understand this operations manual.

Ensure that the tool and all its associated equipment, including shackles, lifting lines and hoses are in good condition.

Before operating the tool hydraulically, ensure that a return hydraulic line is fitted as well as the pressure line. This is to prevent fluid locks and the possibility of generating very high pressures within the system.

Ensure that suitable pressure regulation equipment is used and that the unit is not subjected to pressures higher than those stated in section 2.

If an operator is adjacent to the tool during trials or other tests, ensure that moving parts are shielded to prevent entrapment. Appropriate personal safety equipment should be worn (e.g. Safety glasses, Helmet & Gloves as a minimum)

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

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2 INSTALLATION

The gripper is supplied with internal piping, with a manifold block for customer connection. All manifold block ports are ¼" BSPP. There are 4 ports for end user connection, these being:

Name	Max Input Pressure	Flow Rate
Jaw Close	172.5 bar	
Jaw Open	210 bar	
Motor Up	125 bar	Approx 1 ltr/min
Motor Down	125 bar	Approx 1 ltr/min

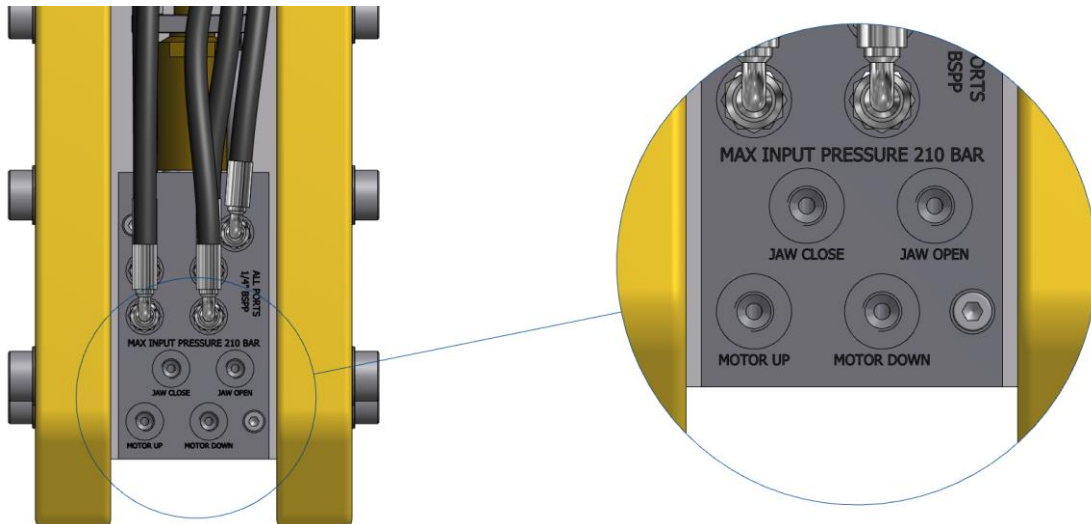


Fig 1 – Hydraulic connection points.

Gripper Jaw Cylinder

The main gripper jaw cylinder is controlled by the ports marked “Jaw Close” and “Jaw Open”. The “Jaw Close” port is directly coupled to an integrated hydraulic intensifier which increases the pressure by a ratio of 4:1. That is, for every 1 bar input, the cylinder is pressurised to 4 bar.

At an input pressure of 172.5 bar (690 bar internal pressure) the gripper jaw will exert a force of approximately 20 tonnes.

The piston of the gripper is fitted with an internal pressure relief valve on the “Jaw Close” side of the circuit. If the “Jaw Close” port is pressurised to above 187.5 bar (750 bar internal pressure) the relief valve will open, venting the pressure out through the “Jaw Open” port.

The “Jaw Open” port used to retract the jaws is designed for a maximum input pressure of 210 bar.

Locking Screws

The locking screws are operated by two hydraulic motors, which are controlled by the “Motor Up” and “Motor Down” ports of the manifold.

Both the “Motor Up” and “Motor Down” ports are designed to be operated at a maximum pressure of 125 bar. The flow should be set to approximately 1 ltr/min to give an output speed of 50 rpm. The pressure should be regulated such that the torque output is enough to overcome frictional forces.

IMPORTANT - Ensure that the correct pressures as stated above are used for each piece of equipment. Do not mix up these connections/pressures.

The lifting capacity of this tool is 20 tonnes. DO NOT try and lift higher loads than this as this will lead to tool damage and invalidate the warranty of the tool.

4 off M10 Tapped holes are provided in the body for buoyancy attachment along with additional M12 tapped holes to enable the fitting of rope guide plates if required. See fig 2 below.

Technical drawing of the WGC130 gripper assembly, showing front and side views with dimensions and a detail of the lifting pin.

Front View Dimensions:

- Overall Height: 690
- Overall Width: 465
- Top Section Height: 590
- Section A-A Height: 420
- Section A-A Width: 280
- Section A-A Depth: 60
- Section A-A Width (Inner): 50
- Section A-A Width (Outer): 150
- Section A-A Width (Total): 440
- Section A-A Width (Total): 465
- Section A-A Width (Total): 430
- Section A-A Width (Total): 465
- Section A-A Width (Total): 415
- Section A-A Width (Total): 450
- Section A-A Width (Total): 150
- Section A-A Width (Total): 185

Side View Dimensions:

- Overall Height: 690
- Overall Width: 465
- Top Section Height: 590
- Section A-A Height: 420
- Section A-A Width: 280
- Section A-A Depth: 60
- Section A-A Width (Inner): 50
- Section A-A Width (Outer): 150
- Section A-A Width (Total): 440
- Section A-A Width (Total): 465
- Section A-A Width (Total): 430
- Section A-A Width (Total): 465
- Section A-A Width (Total): 415
- Section A-A Width (Total): 450
- Section A-A Width (Total): 150
- Section A-A Width (Total): 185

Section A-A LIFTING PIN:

- Width: 110
- Height: 110
- Radius: R60
- Pin Diameter: Ø50

Labels and Text:

- WARNING: This device is not to be used for lifting or moving loads. It is designed for use as a lifting device only. Refer to the operating manual for more information. www.silipnehl.co.uk
- SAFE WORKING LOAD 20 TONNES
- WGC130 GRIPPER
- PART NO. 950460
- SILOPA, INC.
- REFER TO OPERATING MANUAL BEFORE USE
- www.silipnehl.co.uk
- M12x1.75 X 25 DEEP 4 PLACES
- M10x1.5 X 20 DEEP 4 PLACES
- SECTION A-A LIFTING PIN

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3 SEQUENCE OF OPERATION



IMPORTANT – 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 times during subsea operation.

This tool is supplied with two different spikes, which can be changed to suit the material being lifted. Where possible, perform a test grip on a sample of the riser or wire to be lifted to check that the spike will puncture the armour/wire.

If during testing it is found that neither of the spikes will puncture the armour of the item to be lifted then it can be removed completely.

The spike is held in place by a single 12mm bolt which can be removed with a 19mm socket.

Please note that it is advised that the spike is used where possible, particularly when lifting towards the cut end of a wire rope or riser/umbilical.

DEPLOYMENT

1. Ensure that the cylinder and motor screws are retracted before deployment
2. Deploy the tool and position so that the cable or wire rope is located in the mouth of the gripper, touching the back of the throat, as shown in fig 3 below.

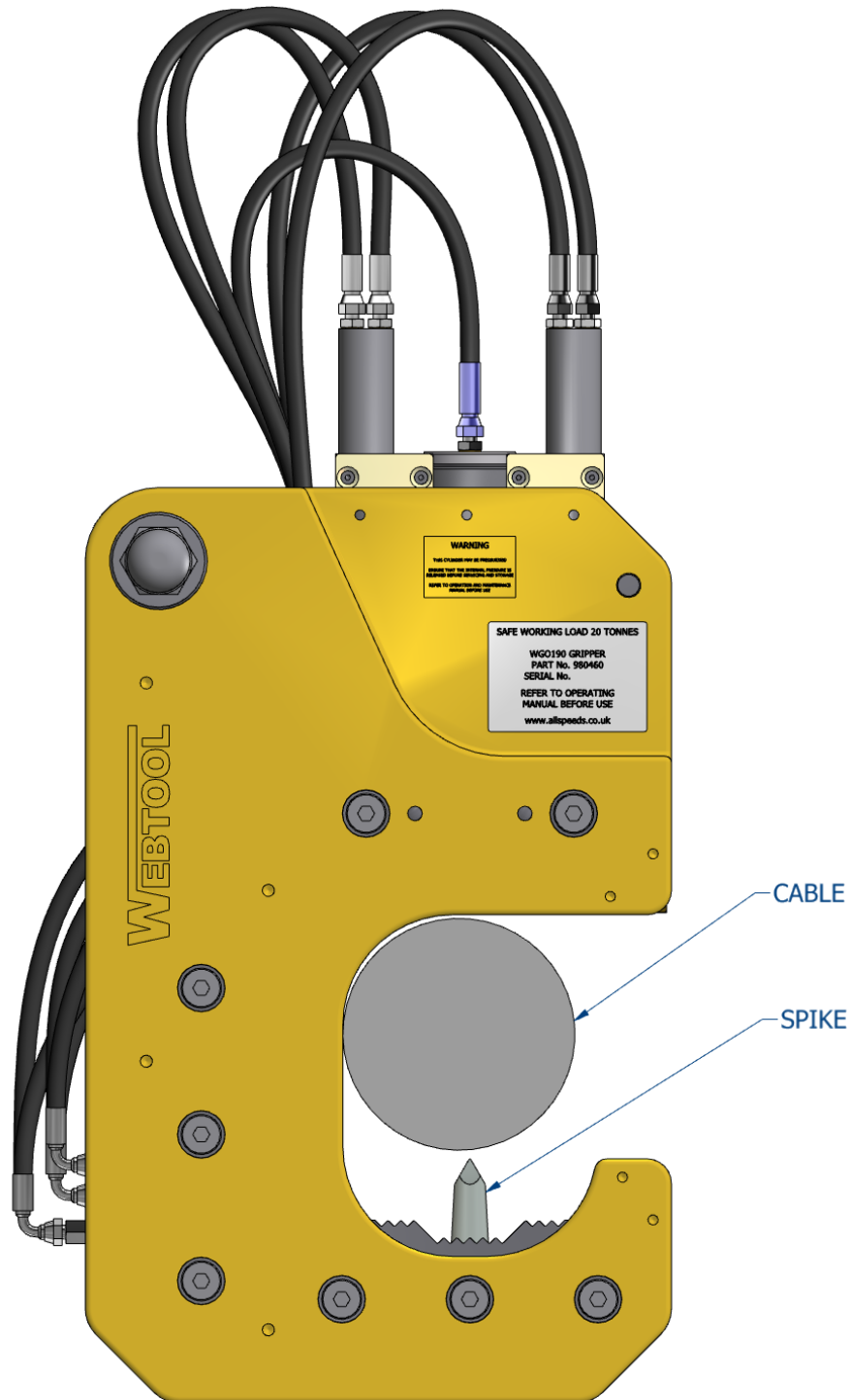


Figure 3 – Cable correctly positioned inside mouth of tool

3. Pressurise the “Jaw Closed” port. This will cause the moving jaw to move downwards. The cable or wire rope will be pushed onto the optional spike (if fitted) which helps to anchor it.

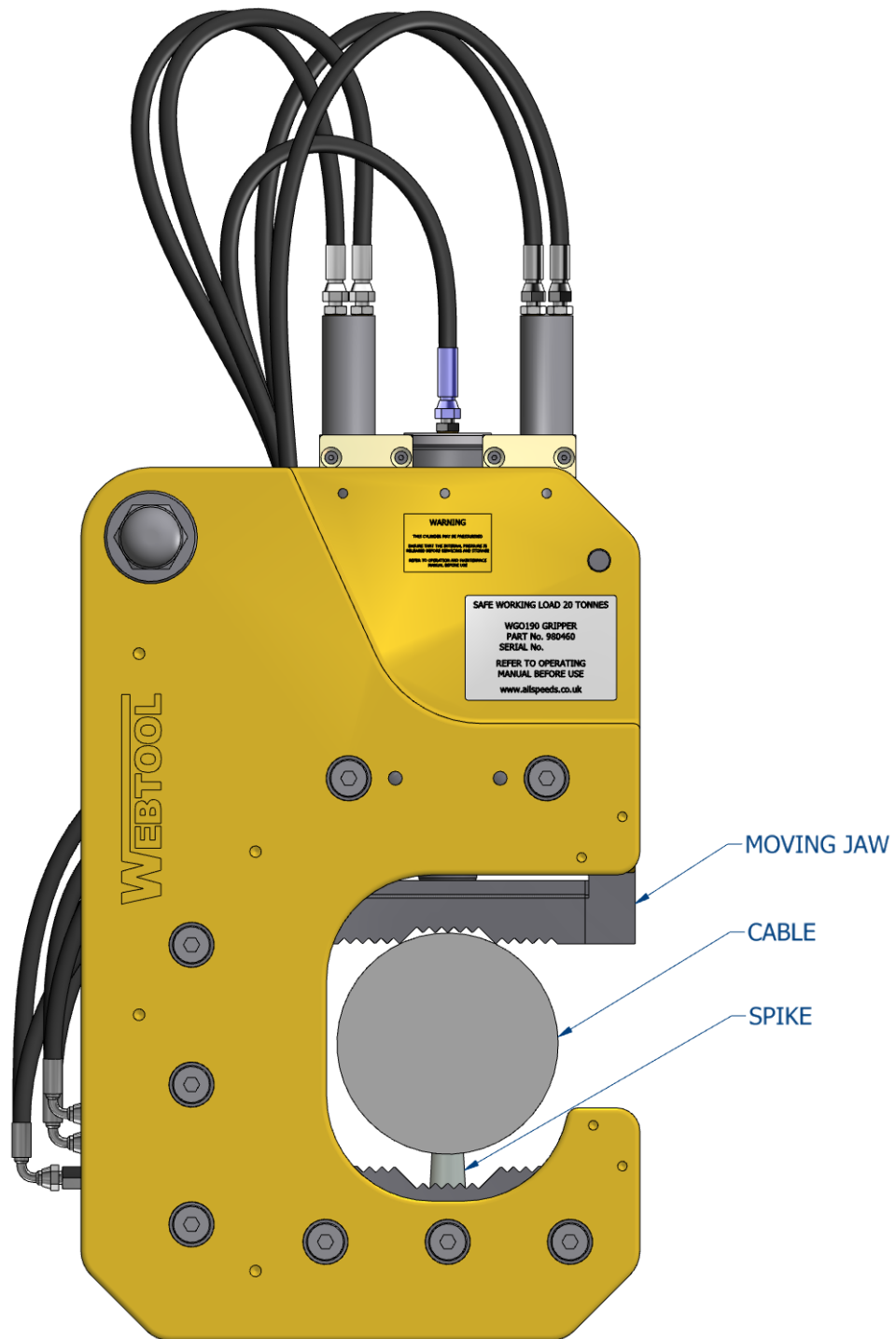


Figure 4 – Cylinder partially extended. Cable is pushed onto spike

4. Keep the “Jaw Closed” port pressurised until the moving jaw has fully gripped the wire and will go no further as shown in figure 5. Please note that the gap shown will differ due to the dimensions and flexibility of the cable or rope being gripped.

DO NOT release the pressure on the main cylinder at this time.

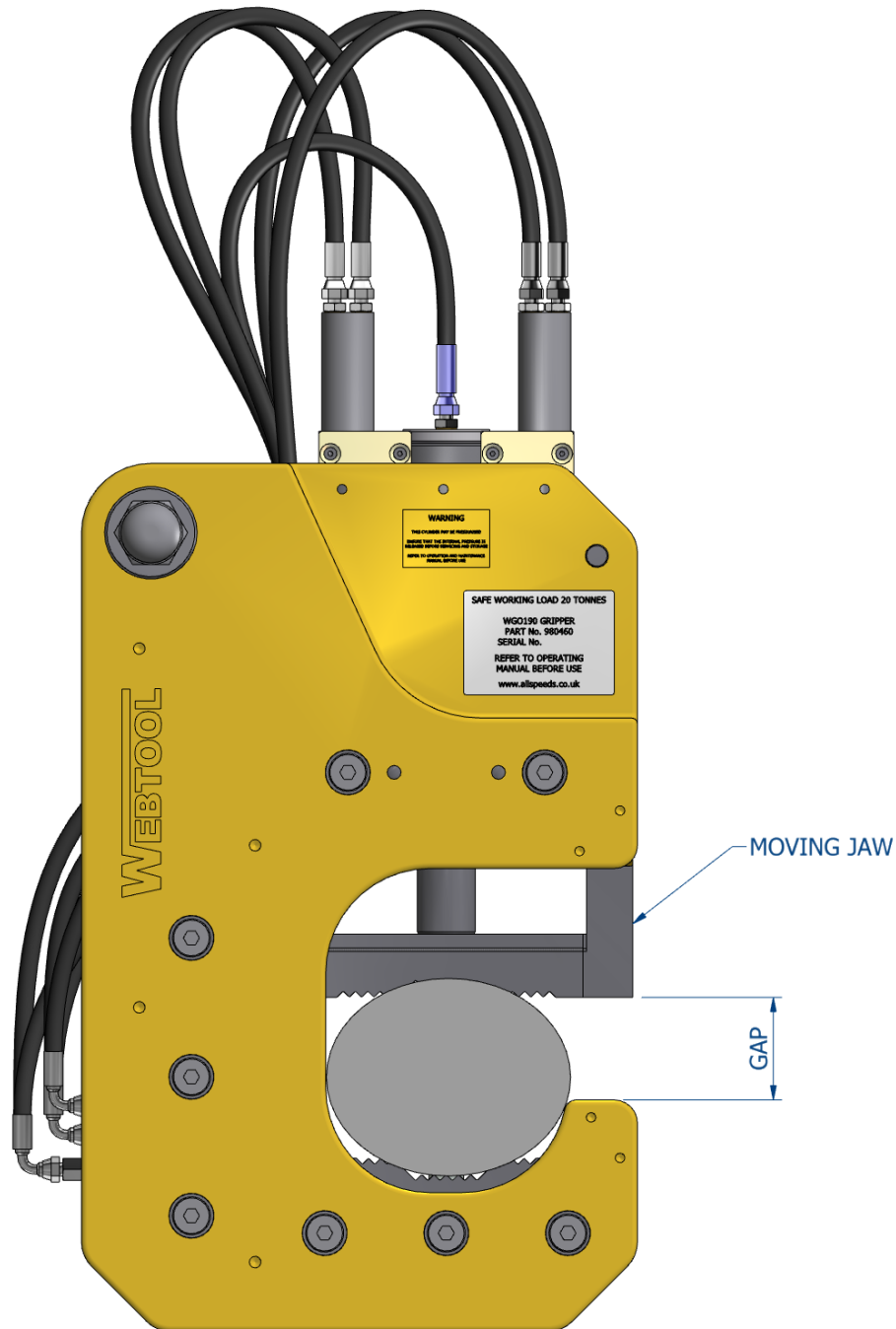


Figure 5 – Wire fully gripped –Moving jaw is no longer moving

5. Whilst maintaining the pressure on the “Jaw Closed” port, pressurise the “Motor Down” port. This will cause the locking screws to slowly screw downwards towards the moving jaw.
6. Check that the locking screws have bottomed out onto the moving jaw as shown below in figure

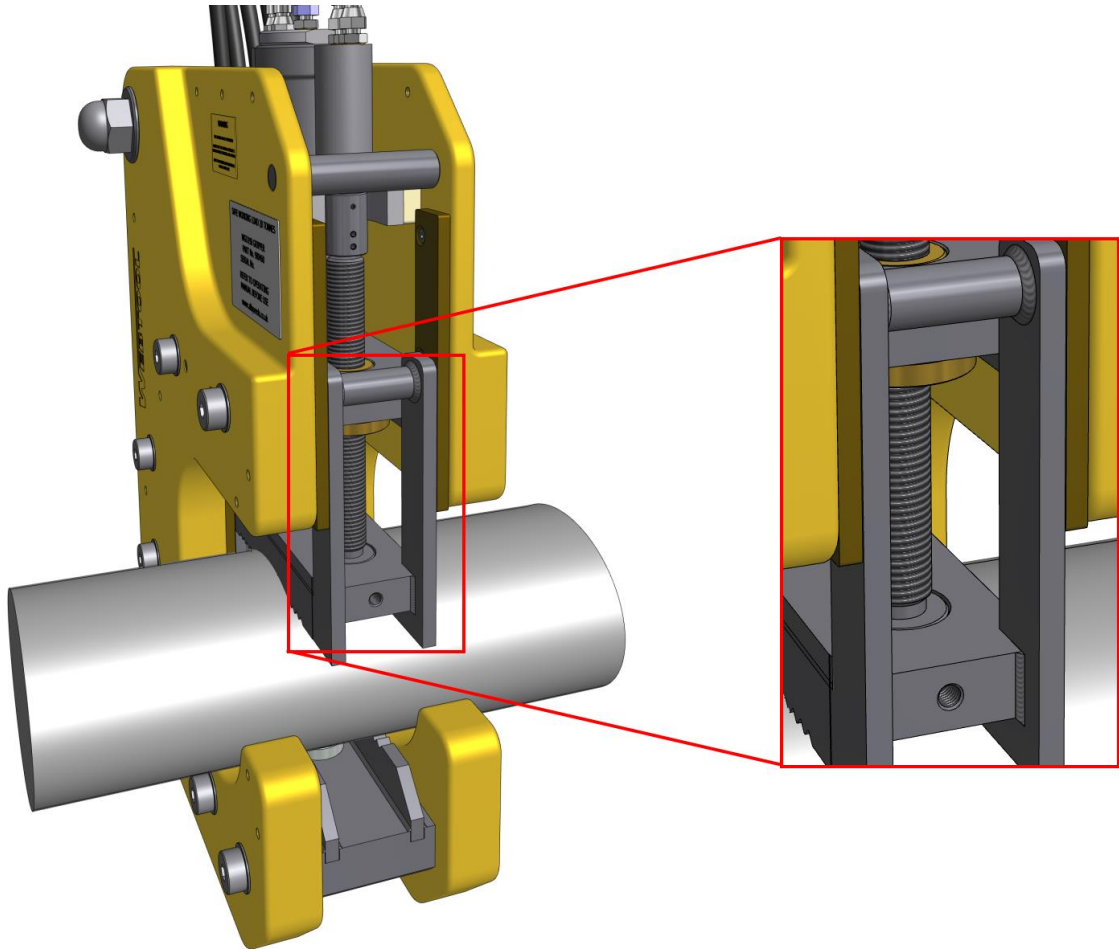


Figure 6 – Locking screws bottomed out onto moving jaw

7. **IMPORTANT - Release all hydraulic pressure to the tool.**

DO NOT ATTEMPT TO LIFT WIRE/CABLE WHILST THE CYLINDER FEED LINE IS STILL PRESSURISED. DOING SO MAY CAUSE FAILURE OF THE TOOL.



IMPORTANT – This procedure MUST be followed before lifting or tool retrieval

The hydraulic intensifier in this tool contains a check valve that holds pressure in the main cylinder, even when the input pressure to the “Jaw Open” port is removed.

This pressure must be relieved before the tool is used for lifting, or before the tool is brought back to surface. If the pressure is not relieved there may be a build up of excessive pressure in the main cylinder.

To perform this procedure:

Ensure that the screws are fully tightened as described previously. This will ensure that the jaws do not move and maintain their grip.

Ensure that the “Jaw Close” port is open to tank and **momentarily** pressurise the “Jaw Open” port. This will open the check valve on the intensifier which will allow the pressure in the main cylinder to be relieved.

Please note that a brief pulse is all that is required (<1s), do NOT hold the pressure on this port as it will cause the jaw to try to open.

LIFTING

8. Using the shackle or sling connected to the main lifting point, slowly lift the tool (and attached cable or rope) vertically
9. The tool may rotate during lifting due to the centre of gravity of the gripper and cable/rope
10. Monitor the lift using the ROV camera
11. Retrieve the tool and wire to deck

RELEASING THE CABLE/WIRE

Ensure that the tool is held in position safely by suitable lifting equipment during this procedure as it may move during wire removal.

12. Pressurise the “Jaw Closed” port. This will apply gripping force to the wire, and release the tension in the locking screws
13. Pressurise the “Motor Up” port so that the locking screws disengage and release pressure once they are fully retracted
14. Retract the gripper by pressurising the “Jaw Open” port. Keep this line pressurised until the jaw is fully retracted
15. Ensure that ALL hydraulic pressure to the system is removed
16. If the optional spike has been fitted, the cable/wire may still be captive in the mouth of the tool as it has been impaled during the gripping procedure
17. If required, lever the cable/wire from the spike to release it. Take care not to damage the gripper mouth area during this operation
18. Check for any damage and ensure that the motors and moving jaw are fully retracted before redeploying the gripper.

4 AFTER USE

If the tool has been used in a marine environment it should be hosed down with clean water, allowed to drain and sprayed externally with a de-watering fluid. Before storage inspect the general condition of the tool and make good any damage.

5 SERVICE

It is unlikely that service should be required on the hydraulic components of the tool under normal circumstances; however spare seal kits are available if required. Replacement spikes are available as a spares item. Please quote the tool serial number whenever ordering new parts.

Please note: The hydraulic motors are not user-serviceable.

6 CYLINDER PROOF TESTING

If at any time it is necessary to carry out proof tests on the tool, e.g. after service on the hydraulic cylinder, the following procedure should be applied.

Ensure that moving parts are shielded to prevent entrapment. Appropriate personal safety equipment should be worn (e.g. Safety glasses, Helmet & Gloves as a minimum)

- 6.1 A return line ("Jaw Open" port) as well as a pressure line ("Jaw Closed" port) must be connected at all times, and the tool must be guarded during the test operation.
- 6.2 The proof test pressure should not exceed 125% of the working pressure:
 - $210 \times 1.25 = 262.5$ bar for the cylinder feed line ("Jaw Closed" port)
This pressure will be increase by a factor of four by the integrated intensifier unit.
 - $210 \times 1.25 = 262.5$ bar for the cylinder return line ("Jaw Open" port)

Note – It is normal for the cylinder feed line ("Jaw Closed" port) to exhaust to the return line ("Jaw Open" port) as the maximum setting for the internal pressure relief valve (approx. 750 bar) is reached.

- 6.3 The proof test pressure should be applied gradually by means of a handpump, until the maximum test pressure is reached.

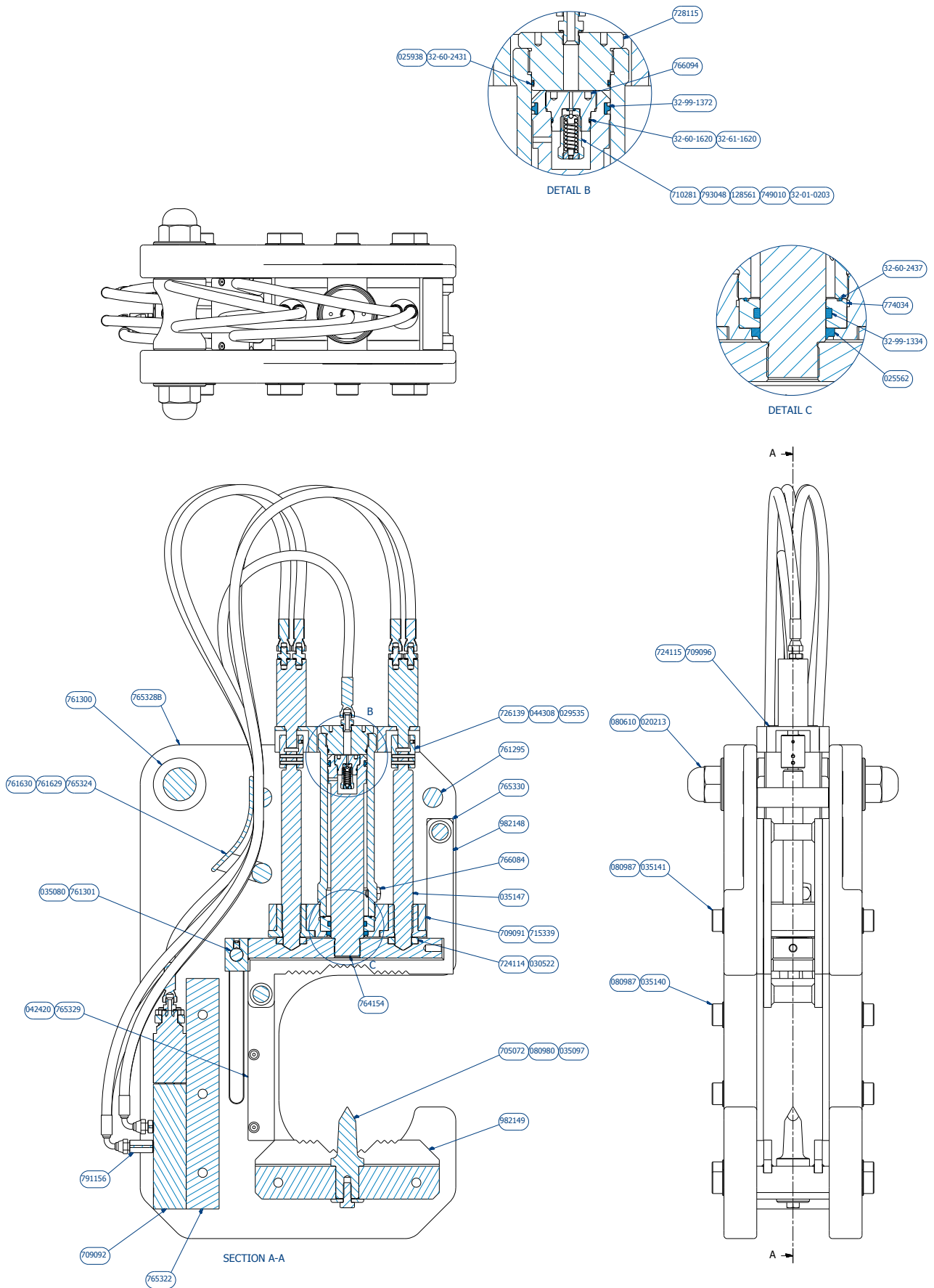


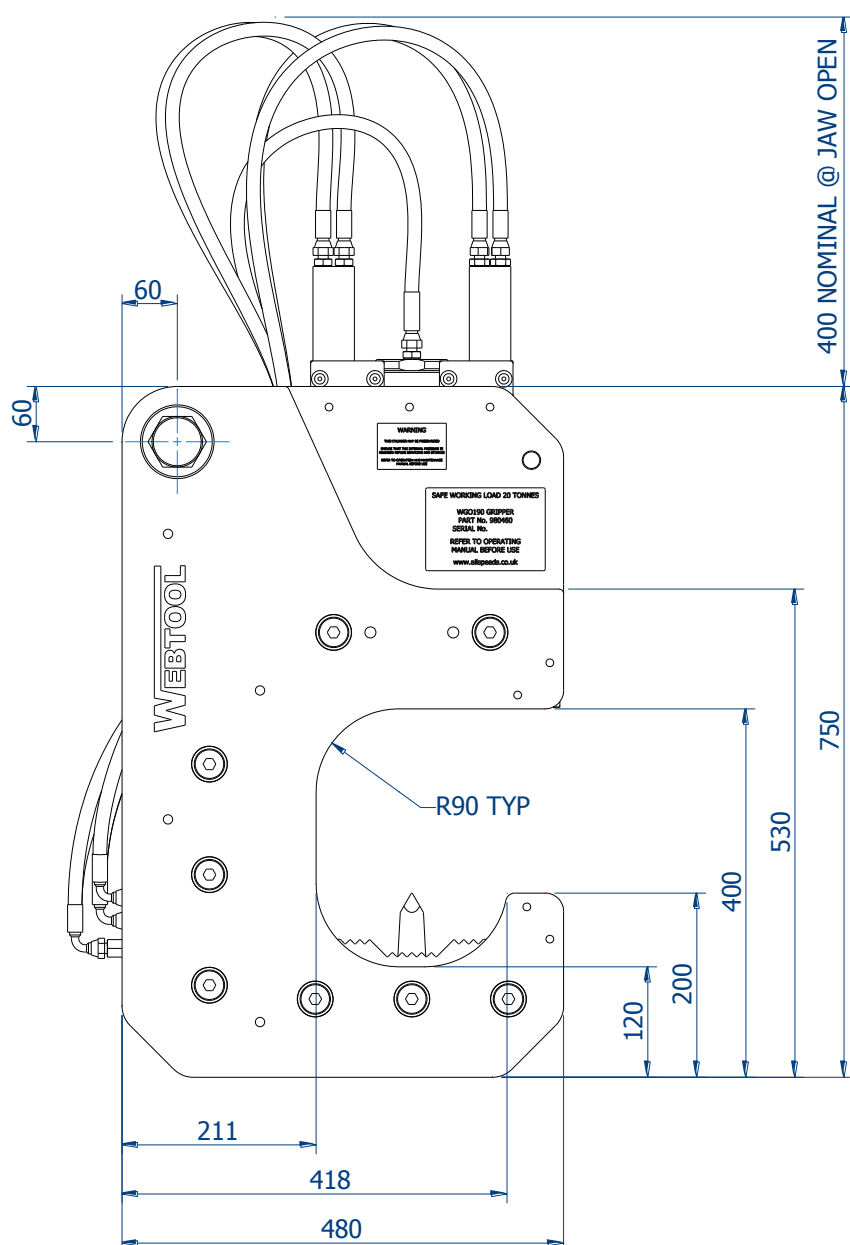
Figure 7 – Parts List Identifier

Parts List

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	020213	SHACKLE PIN NUT
2	4	020994	M10 NUT
3	1	025562	WIPER SEAL
4	2	025674	O RING
5	2	025932	A/E RING FOR 025674
6	1	025938	BACKUP RING - 56 X 60
7	4	027780	DOWEL
8	4	029535	SPIROL PIN - Ø5 X 35 LONG
9	2	030522	SPRING PIN - 3/16" X 1-3/8"
10	1	035080	M10 X 12 SET SCREW - CUP POINT
11	2	035086	SKT HD CAP SCREW - M8 X 50
12	1	035097	M12 X 40 HEX HEAD SCREW
13	16	035099	M5 X 20 CSK HEAD SCREW
14	4	035134	INTENSIFIER CLAMPING SCREW
15	10	035140	SHOULDER SCREW
16	6	035141	SHOULDER SCREW
17	4	035142	M10 x 10 SKT SET SCREW - CUP POINT
18	2	035147	HYDRAULIC MOTOR SCREW
19	4	042312	M5 x 12 HEX SKT CSK SCREW
20	20	042420	M6 X 25 CSK HEAD SCREW
21	2	044308	M5 X 8 CONE POINT SET SCREW
22	2	080610	SHACKLE PIN WASHER
23	1	080980	CHISEL CLAMPING WASHER
24	16	080987	M22 PLAIN WASHER
25	1	1241055	HYDRAULIC HOSE - LP
26	4	1241056	HYDRAULIC HOSE - LP
27	1	1241057	HYDRAULIC HOSE - HP
28	1	128561	SPRING
29	4	31-47-0310	5/16" BALL
30	1	32-01-0203	O RING
31	1	32-60-1620	O-RING
32	1	32-60-2431	O RING - BS4518-0546-24
33	1	32-60-2437	O RING
34	1	32-61-1620	BACKUP RING
35	15	32-67-1201	DOWTY WASHER
36	1	32-99-1334	ROD SEAL
37	1	32-99-1372	PISTON SEAL
38	2	420039	HYDRAULIC MOTOR OML8
39	1	705072	SPIKE/CHISEL

Parts List (Continued)

PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
40	1	705073	SPIKE/CHISEL
41	1	709091	CYLINDER BLOCK
42	1	709092	MANIFOLD BLOCK
43	2	709096	MOTOR MOUNT BLOCK
44	1	710281	RELIEF VALVE BODY
45	2	715339	SCREWED BUSH
46	2	724114	SCREW RETAINING COLLAR
47	4	724115	MOTOR MOUNT BLOCK PAD
48	1	725005	INTENSIFIER
49	2	726139	MOTOR/SCREW COUPLING
50	1	728114	CYLINDER
51	1	728115	TOP CAP
52	1	749010	RELIEF VALVE SOCKET
53	2	752569	PRESSURE WARNING LABEL
54	2	752570	NAME PLATE
55	1	761295	MOTOR PROTECTION PIN
56	1	761300	SHACKLE PIN
57	1	761301	JAW GUIDE PIN
58	1	761629	HOSE RETAINING PIN
59	1	761630	LOWER HOSE PROTECTION PIN
60	1	764154	PISTON
61	1	765322	SUPPORT PLATE
62	1	765324	HOSE PROTECTION PLATE
63	1	765328A	RIGHT HAND SIDE PLATE
64	1	765328B	LEFT HAND SIDE PLATE
65	2	765329	WEAR PLATE
66	2	765330	FRONT WEAR PLATE
67	1	765333	INTENSIFIER RETAINING PLATE
68	1	766084	1/4" BSPP BLANKING PLUG
69	2	766086	MICRO FILTER
70	1	766094	RELIEF VALVE PLUG
71	2	769012	INTENSIFIER CONNECTOR
72	1	774034	BEARING RING
73	10	791154	1/4" BSPP MALE ADAPTOR
74	2	791156	EXTENDED STRAIGHT ADAPTOR
75	1	793048	VALVE ADJUSTER
76	1	982148	MOVING JAW
77	1	982149	FIXED JAW



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 - 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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