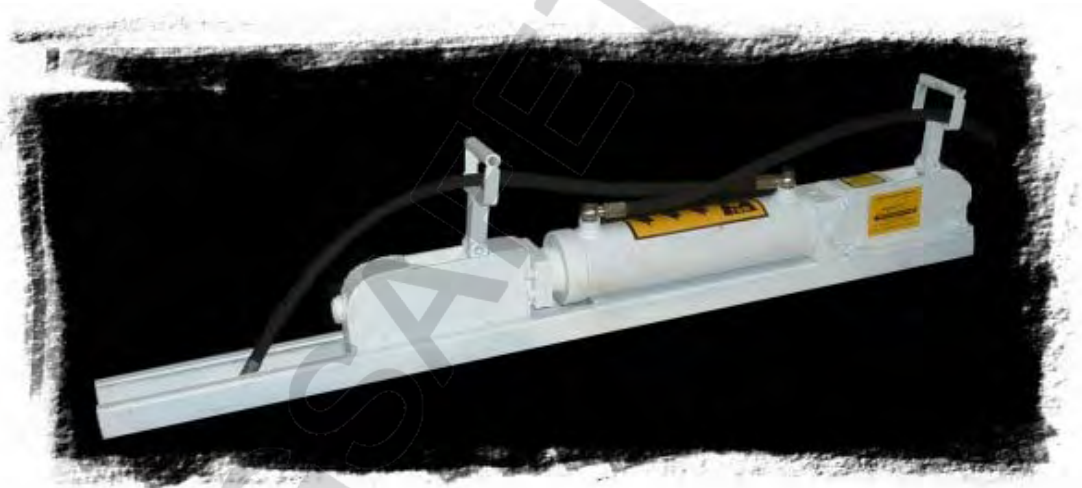




SELBY ENGINEERING & LIFTING SAFETY LTD



SELBS 6 TONNE HYDRAULIC CABLE PULLING MACHINE

USER MANUAL

LIFTING SAFETY CO. UK



SELBY ENGINEERING & LIFTING SAFETY LTD.

Lifting Equipment and Height Safety Specialists
www.liftingsafety.co.uk Email: sales@liftingsafety.co.uk
Tel: (01977) 684600 Fax: (01977) 685300

The 6 tonne hydraulic cable pulling machine is a transportable assembly weighing 103kg (227 lbs) consisting basically of two sections, the pulling unit top assembly and the swivel anchor post with directional control valve, and can be powered by any independent hydraulic supply. Pressures and flow rates are confirmed in section 10, but for example a flow of 31.5lt/min at a pressure of 1600 lbs/in² (108 bar) will result in a pull of approx. 6 tons at 10 ft/min.

The main component of the unit is a double acting hydraulic ram which is fitted with a hollow piston rod and mounted on a steel rectangular box section base. A 16mm (5/8") diameter steel wire rope (any length to customers requirements) passes through the centre of the unit/ram and is used in conjunction with the front and rear rope clamping jaws (ref HU2 & HU3) to transmit the haulage force.

The front jaw assembly (ref HU2) is attached to one end of the ram body and the rear jaws (ref. HU3) are fitted to the end of the piston rod. Both sets of jaws are spring loaded to give an initial grip on the pulling rope and are equipped with handles for manual operation to enable the rope to pass freely through the device.

The assembly (ref HU1, HU2, HU3, HU4) is located onto the swivel anchor post assembly (ref HU5) by the crosshead journals which locate in slots in the base and are retained by two collars: Four 20mm (25/32") diameter holes are drilled in the base flange for anchoring purposes.

An alternative method of anchorage is provided in the form of two 16mm (5/8") diameter steel wire rope assemblies 1430mm (4.69 ft) long. Each rope has an eye attachment at either end, one end being retained at the anchor post by means of two steel pins (ref HU8d). An oval link captivates both eyes at the other end of each rope. The anchor ropes (ref HU8b) are positioned from the anchor post and under the sledge guide (ref HU4) and anchored by means of a '0' shackle.

When the ram is extending, the rear jaw automatically grips the rope and pulls it through the assembly, the front jaw remaining ineffective during this operation.

When the ram is retracting the rear jaw is automatically released, the slight movement of the rope causing the front jaw to grip and maintain the tension in the rope. Rope tension is released in accordance with the procedure contained in section 11.



SELBY ENGINEERING & LIFTING SAFETY LTD.

Lifting Equipment and Height Safety Specialists
www.liftingsafety.co.uk Email: sales@liftingsafety.co.uk
Tel: (01977) 684600 Fax: (01977) 685300

APPLICATIONS

This versatile machine is suitable for a multitude of applications in many fields of industry where loads have to be moved or tension applied during erection, assembly or whilst carrying out other

Some proven applications are confirmed as follows:

MINING

- Tensioning of coal face conveyor chains
- Tensioning of belt conveyors
- Installation/ salvage of roof support systems
- Installation/ salvage of coal face conveyor sections
- Moving of underground equipment

GENERAL

- Pulling together of sub assembly structures for joining
- Pulling of pipes, ducts and jointing
- Tensioning of shuttering for construction work
- Moving of machinery
- Moving of steelwork/structures
- Heavy vehicle recovery
- Demolition work
- Tensioning/ pulling of cables
- Erection of structures
- Underground pipe replacement and bursting operations
- Moving of heavy/awkward loads where continued tension needs to be maintained for safety

Also used for any other manual Tirfor application where a greater pulling capacity is required



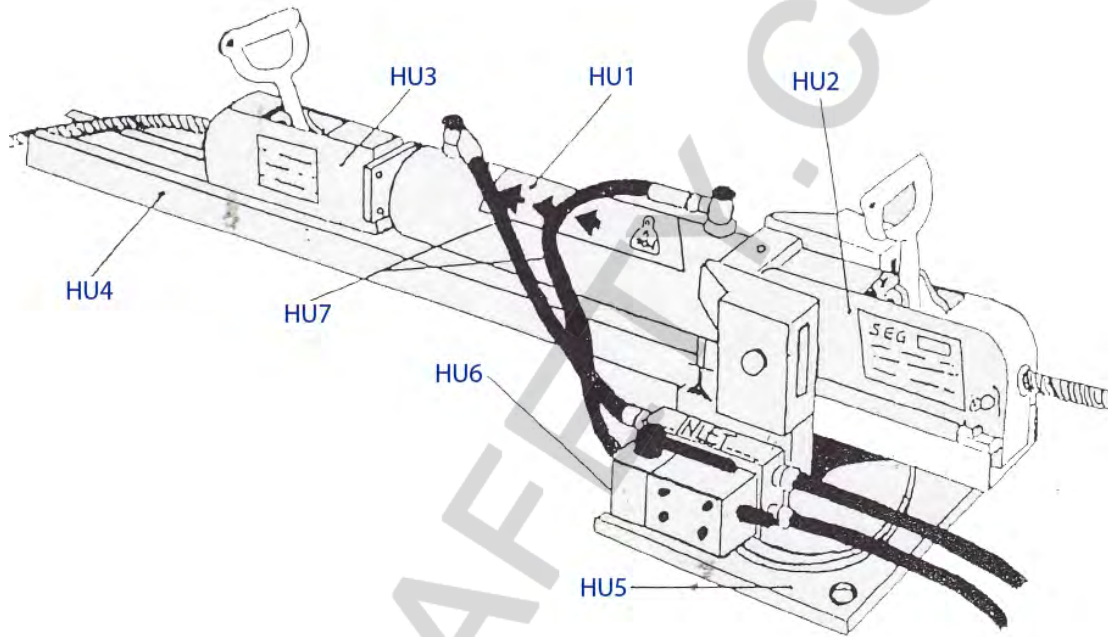


SELBY ENGINEERING & LIFTING SAFETY LTD.

Lifting Equipment and Height Safety Specialists
 www.liftingsafety.co.uk Email: sales@liftingsafety.co.uk
 Tel: (01977) 684600 Fax: (01977) 685300

6 TONNE HYDRAULIC CABLE PULLING MACHINE

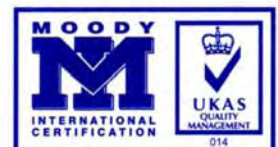
PARTS DIAGRAM



6 TONNE HYDRAULIC CABLE PULLING MACHINE

PARTS LIST

PART NO.	DESCRIPTION
HU1	6ton Double Acting Ram 305mm (12") stroke
HU2	Front Jaw Assembly with Crosshead
HU3	Sliding Rear Jaw Assembly
HU4	Sledge Guide
HU5	Swivel Anchor Post Assembly c/w Anchor Ropes and D Shackle
HU6	Directional Control Valve
HU7	2 x 1 m lengths Hydraulic Hose c/w adaptors

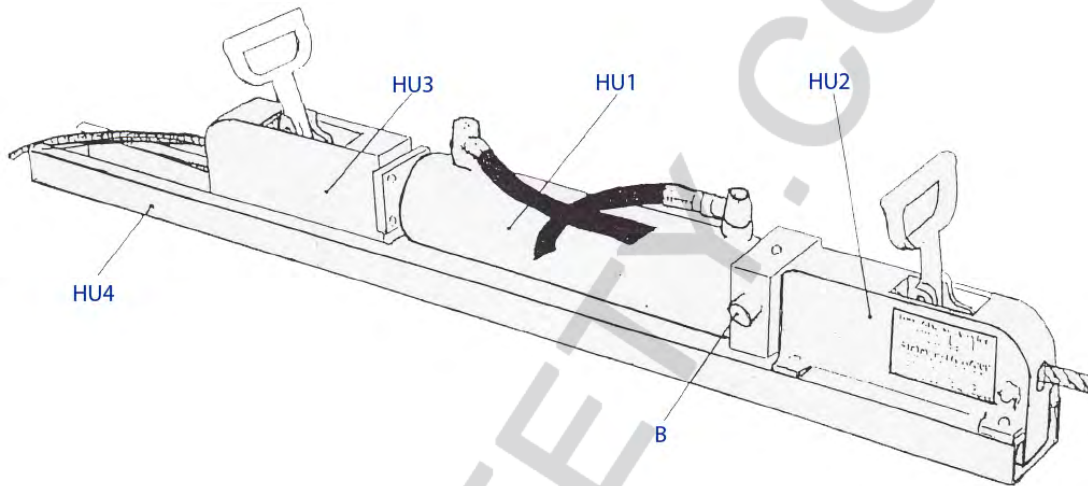




SELBY ENGINEERING & LIFTING SAFETY LTD.

Lifting Equipment and Height Safety Specialists
 www.liftingsafety.co.uk Email: sales@liftingsafety.co.uk
 Tel: (01977) 684600 Fax: (01977) 685300

DIMENSIONAL INFORMATION



HU4 SLEDGE GUIDE DIMENSIONS:

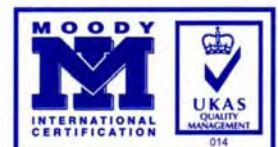
length:	147cm
Width:	10cm
height:	5cm
thickness:	5mm

JOURNALS (B):

diameter :	30mm
length across journals:	15cm
journal centre to sledge bottom	103mm

DISTANCE FROM HANDLE TOP TO SLEDGE BOTTOM: 33cm

COMPLETE WEIGHT OF ILLUSTRATED ASSEMBLY: HU1, 2, 3 & 4 = 55kg





SELBY ENGINEERING & LIFTING SAFETY LTD.

Lifting Equipment and Height Safety Specialists
 www.liftingsafety.co.uk Email: sales@liftingsafety.co.uk
 Tel: (01977) 684600 Fax: (01977) 685300

PISTON ANNULUS AREA = 8.395IN²

PRESSURE LB/IN ²	CYLINDER PULL	
	FORWARD	
	TONS	TONNES
100	.363	.369
200	.736	.748
300	1.107	1.125
400	1.479	1.503
500	1.850	1.880
600	2.223	2.258
700	2.595	2.637
800	2.967	3.015
900	3.339	3.393
1000	3.711	3.770
1100	4.083	4.148
1200	4.455	4.526
1300	4.827	4.905
1400	5.199	5.283
1500	5.571	5.660
1600	5.942	6.038
1700	6.316	6.418
1800	6.688	6.796
1900	7.063	7.176
2000	7.433	7.55

HYDRAULIC PRESSURE AT CYLINDER VS LINE PULL

TAKING SEAL FRICTION INTO CONSIDERATION





SELBY ENGINEERING & LIFTING SAFETY LTD.

Lifting Equipment and Height Safety Specialists
 www.liftingsafety.co.uk Email: sales@liftingsafety.co.uk
 Tel: (01977) 684600 Fax: (01977) 685300

SPECIFICATIONS USING 16MM DIAMETER WIRE ROPE

Cylinder Capacity for full stroke = 88.2in³ (1.449litres)

HYDRAULIC FLOW AT CYLINDER VS PULLING SPEED

(Neglecting seal friction)

INPUT FLOW LITRES/MIN	PULLING SPEED	
	METRES/MIN	FT/MIN
0	0	0
1.5	0.145	0.476
3.0	0.280	0.952
4.5	0.435	1.428
6.0	0.580	1.904
7.5	0.725	2.380
9.0	0.870	2.857
10.5	1.016	3.333
12.0	1.161	3.809
13.5	1.306	4.280
15.0	1.451	4.760
16.5	1.596	5.238
18.0	1.741	5.714
19.5	1.886	6.190
21.0	2.031	6.666
22.5	2.177	7.142
24.0	2.322	7.619
25.5	2.467	8.095
27.0	2.612	8.571
28.5	2.757	9.047
30.0	2.902	9.523
31.5	3.048	10.000
33.0	3.193	10.476





SELBY ENGINEERING & LIFTING SAFETY LTD.

Lifting Equipment and Height Safety Specialists
www.liftingsafety.co.uk Email: sales@liftingsafety.co.uk
Tel: (01977) 684600 Fax: (01977) 685300

SERVICE / MAINTENANCE INFORMATION

The SELS 6 tonne hydraulic cable pulling machine is a robust and reliable hydraulically operated unit designed to be used for general pulling applications. Unlimited trouble free pulling can be achieved providing regular inspections are carried out.

RECOMMENDED INSPECTIONS & MAINTENANCE

1. The rear sliding jaw assembly (ref HU3) should be inspected without the pulling rope being inserted in the machine. Does the jaw handle move freely and return closed after being released from its open position? This will test the condition of the spring mechanism within the jaw.
2. This should be repeated for the fixed jaw assembly, ref HU2. Slight oiling of both jaw assemblies to attain this is recommended but not a necessity.
3. The unit is operated by a four-way, closed centre, manual control valve (ref HU6). A pre-set relief valve, incorporated in the control valve block, ensures that the pressure in the cylinder does not exceed 10.34mn/m² (1,500lbin²). In extreme cases of use the valve may become hot and in such cases it is recommended to suspend the pulling application and allow the valve to cool. Internal seals may become damaged if this is not observed.
4. Check the condition of hoses and couplings from the directional control valve ref HU6 to the cylinder body.
5. Detach the unit from its anchor post (where fitted) and check whether the swivel anchorpost assembly is free from any obstruction and turns freely through 360°
6. It is recommended that the ram is retracted fully when the unit is not in use. This will avoid pitting or any external damage to the piston. General checks for leaks and the condition of the piston body should be made regularly.
7. The pulling rope should be removed from the unit when not in use. This will help to reduce spring damage/fatigue.
8. The sledge guide ref HU4 should be kept free from debris so as not to restrict the jaws ref HU2 & HU3 during operation. This is recommended to be done on a regular basis.

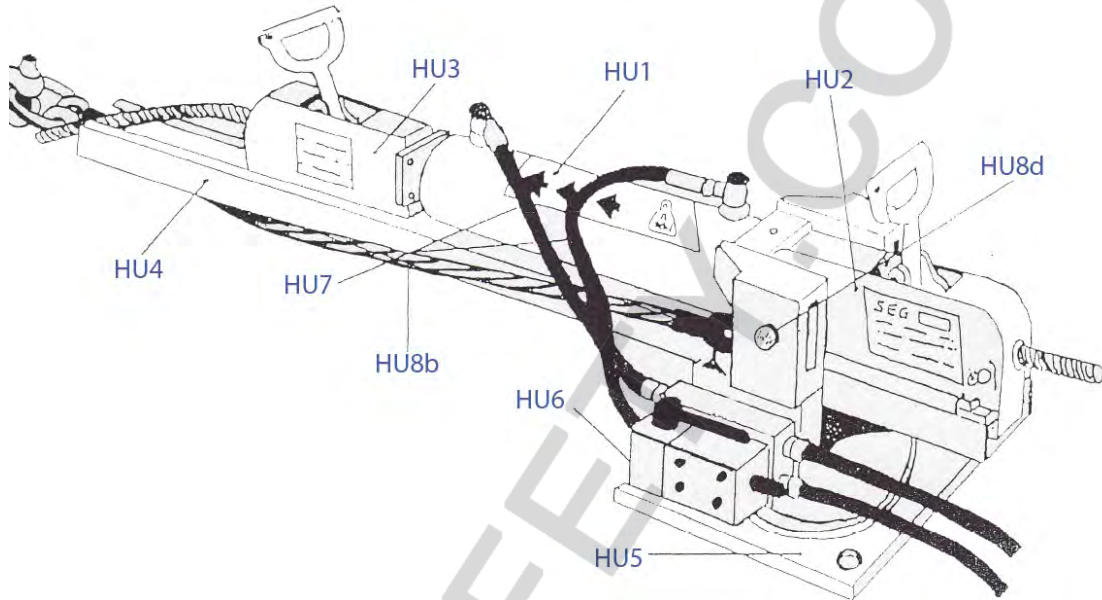
The above guidelines will aid to trouble free operations of the machine. Particular attention should be applied to slackening the wire rope tension on completion of pulling operations. (See section 11). If this procedure is not followed the life of both the rear sliding jaw ref. HU3 and the fixed jaw ref. HU2 will become shortened.



SELBY ENGINEERING & LIFTING SAFETY LTD.

Lifting Equipment and Height Safety Specialists
 www.liftingsafety.co.uk Email: sales@liftingsafety.co.uk
 Tel: (01977) 684600 Fax: (01977) 685300

ASSEMBLY AND OPERATING INSTRUCTIONS



ASSEMBLY

1. Remove collars from crosshead journals on HU2 jaw.
2. Insert pulling assembly HU1, 2, 3 & 4 into anchor post HU5, by means of entering journals into recesses, and then replace and screw collars for captivity.
3. HU5 anchor post can be floor bolted, or alternatively anchorage can be achieved by means of HU8b anchor ropes fitted to anchor pins (HU8d) in either side of HU5 and anchored back via the 6 ton D shackle.
4. Connect face power supply hoses to HU6 valve ports marked inlet and exhaust, and connect HU7 hoses to valve.
5. Hold open the handles on HU2 & HU3 jaws, then enter pulling rope through HU2 jaw, hollow ram and finally through HU3 jaw.

OPERATION

1. Ensure unit is assembled as above, and check hose and valve connections are tight
2. Operate HIJ6 control valve handle for ram movement, and automatically HU3 jaw will grip the pulling rope for up to 12" of travel
3. Upon reversal of HU.6 control valve, HU.2 jaw will hold the tension applied whilst the ram retracts.
4. Pulling operations can therefore be completed in increments of up to 12", but the control valve handle
5. Will return to neutral upon release, thereby giving infinite operator control.

NOTE: TO SLACKEN ROPE TENSION SEE PROCEDURE OVERLEAF

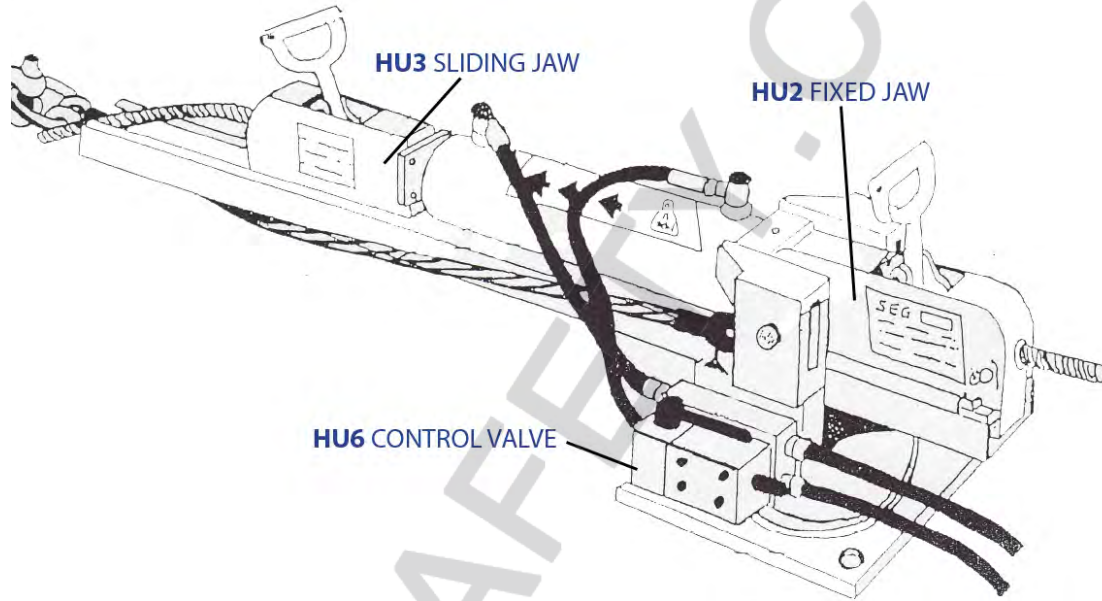




SELBY ENGINEERING & LIFTING SAFETY LTD.

Lifting Equipment and Height Safety Specialists
 www.liftingsafety.co.uk Email: sales@liftingsafety.co.uk
 Tel: (01977) 684600 Fax: (01977) 685300

**TO SLACKEN THE TENSION ON THE WIRE ROPE,
 THE FOLLOWING PROCEDURE MUST BE USED:**



1. When the desired pull has been achieved the HU6 control valve should be operated sufficiently to enable the HU3 sliding jaw to take all the tension of the rope.
2. The HU2 fixed jaw will now open freely and the handle should be moved to a full open position (towards the HU3 sliding jaw).
3. Retract the ram by operating the HU6 control valve in the opposite direction whilst holding open the HU2 fixed jaw handle.
4. Tension is now released from the wire rope.

NOTE:

If there is insufficient travel between the HU3 sliding jaw and the ram to release all the tension then hold open the HU3 sliding jaw handle and extend the ram 8". Now release the HUJ sliding jaw handle and follow the above procedure.

