



**SELBY ENGINEERING & LIFTING SAFETY LTD**



**SELS 12 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 SELS 12 ton hydraulic pulling machine is a robust and reliable hydraulically operated unit designed to be used for general pulling applications

The unit consists basically of two sections, the pulling unit top assembly and the swivel anchor post with directional control valve. The unit can be powered by an independent hydraulic supply and is suitable for use with 95/5 water soluble hydraulic oil fluid. Pressures and flow rates are confirmed in section 10, but for example a flow of 31.5 l/min at a pressure of 1600 lbs/sq in (108 bar) results in a pull of 12 tons, at 4.95 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 22mm diameter steel wire rope (any length to customer's requirements) passes through the centre of the unit/ram and is used in conjunction with the front and rear rope clamping jaws (ref 122 & 123) to transmit the haulage force.

The front jaw assembly (ref 122) is attached to one end of the ram body and the rear jaws (ref. 123) 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 121, 122, 123, 124 & 128) is located onto the swivel anchor post assembly (ref 125) by the crosshead journals which locate in slots in the base and are retained by two collars: Four 30mm diameter holes are drilled in the base flange for anchoring purposes.

An alternative method of anchorage is provided in the form of a double steel wire rope assembly. Each rope has an eye attachment at either end, one end being retained at the anchor post by means of D Shackles. An oval link captivates both eyes at the other end of each rope. The anchor ropes are positioned from the anchor post and under the sledge guide and anchored by means of a D 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 operating instructions.



## 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



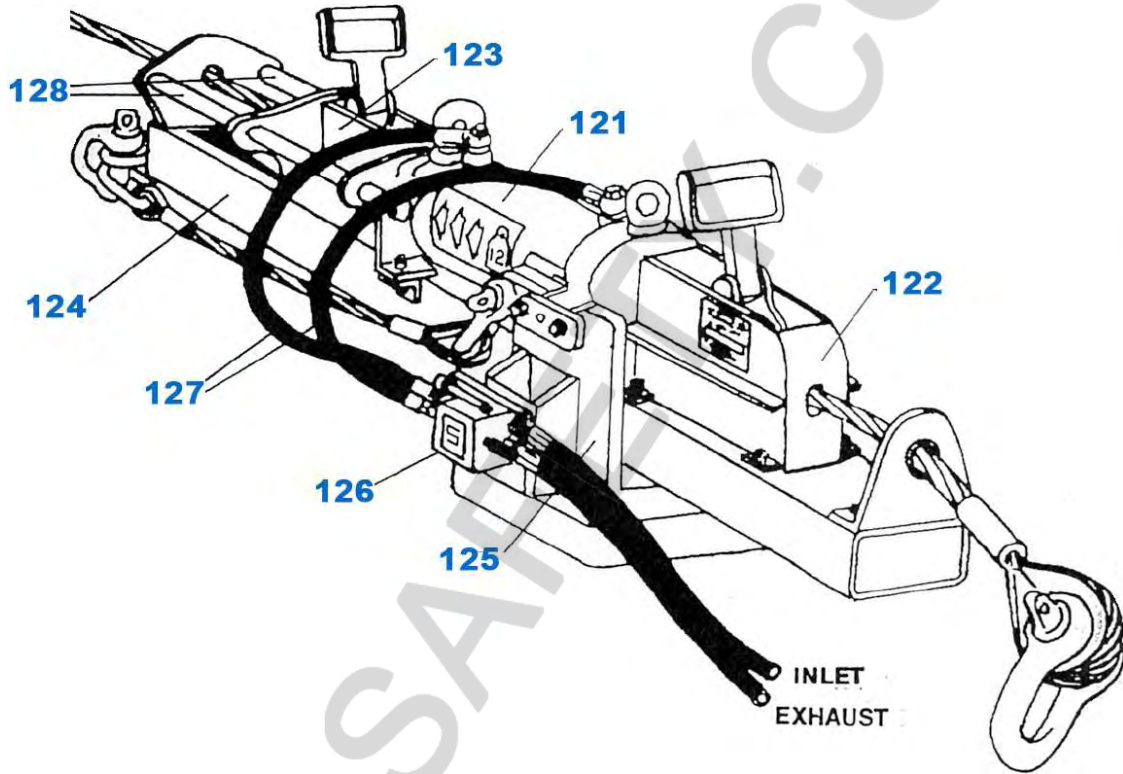


# SELBY ENGINEERING & LIFTING SAFETY LTD.

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
121	12ton Double Acting Ram 305mm (12") stroke
122	Front Jaw Assembly with Crosshead
123	Sliding Rear Jaw Assembly
124	Sledge Guide
125	Swivel Anchor Post Assembly c/w Anchor Ropes and D Shackle
126	Directional Control Valve
127	2 x 1 m lengths Hydraulic Hose c/w adaptors
128	Sliding Jaw Guide Rods and Centre Bracket Assembly

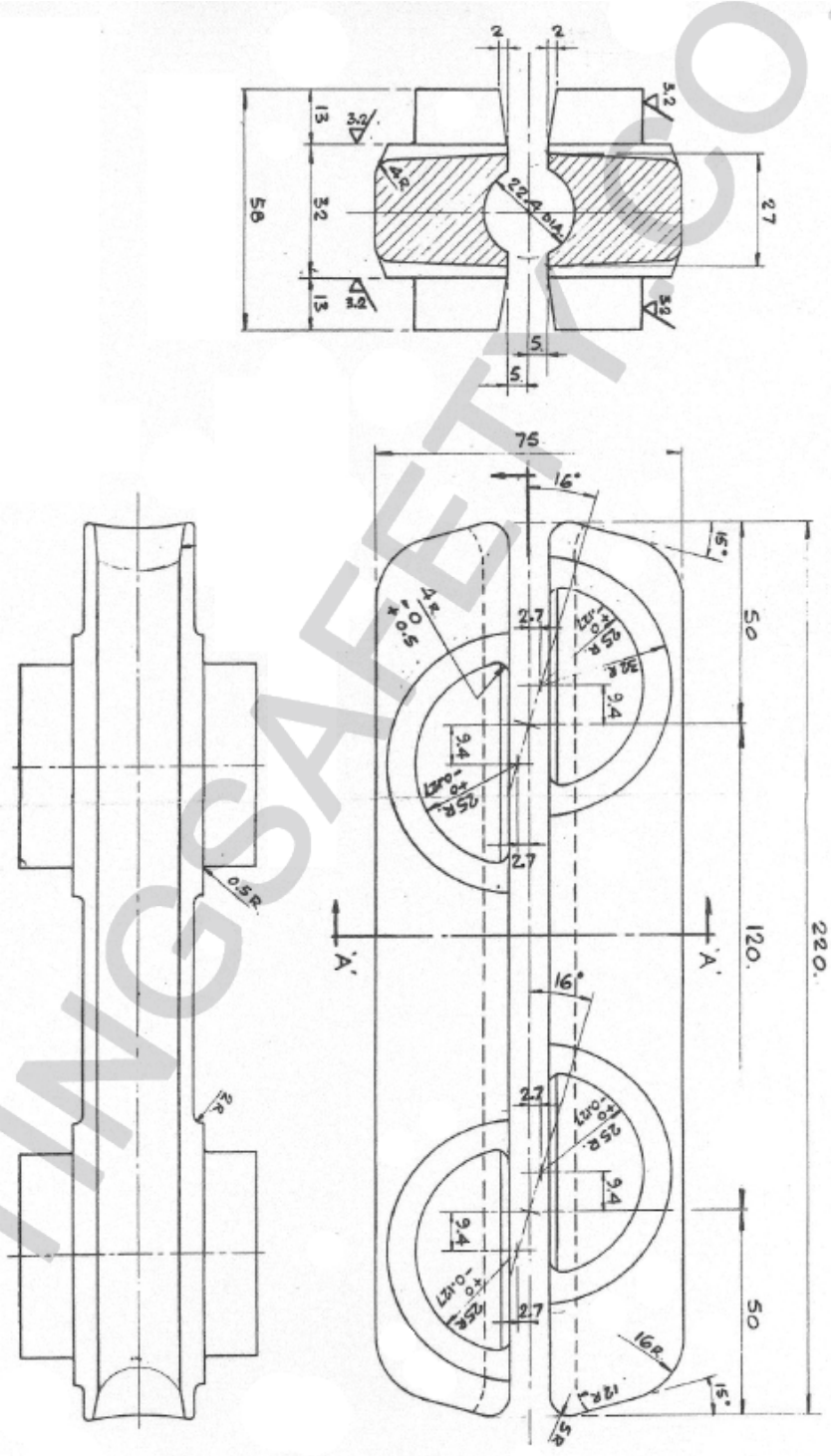




# SELBY ENGINEERING & LIFTING SAFETY LTD.

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

## Details of Jaw Set



-all measurements in mm-





## 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

### Line Pull vs. Hydraulic Pressure at Cylinder

PRESSURE LB/IN <sup>2</sup>	CYLINDER PULL	
	FORWARD	
	TONS	TONNES
100	.562	.571
200	1.330	1.351
300	2.042	2.075
400	2.775	2.820
500	3.480	3.536
600	4.248	4.316
700	4.984	5.064
800	5.722	5.814
900	6.461	6.565
1000	7.197	7.313
1100	7.933	8.061
1200	8.670	8.809
1300	9.407	9.558
1400	10.143	10.306
1500	10.883	11.058
1600	11.619	11.806
1700	12.392	12.591
1800	13.119	13.330
1900	13.900	14.123
2000	14.623	14.858





## 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

### Hydraulic Flow at Cylinder vs. Pulling Speed

INPUT FLOW LTRS/MIN	PULLING SPEED	
	METRES/MIN	FEET/MIN
0	0	0
1.5	.072	.236
3.0	.144	.471
4.5	.215	.707
6.0	.287	.942
7.5	.359	1.178
9.0	.431	1.414
10.5	.503	1.649
12.0	.575	1.885
13.5	.646	2.120
15.0	.718	2.356
16.5	.790	2.592
18.0	.862	2.827
19.5	.934	3.063
21.0	1.006	3.298
22.5	1.077	3.534
24.0	1.149	3.770
25.5	1.221	4.005
27.0	1.292	4.241
28.5	1.365	4.476
30.0	1.436	4.712
31.5	1.508	4.948
33.0	1.580	5.183





## 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 12 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 123) 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 122. 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 126). A pre-set relief valve, incorporated in the control valve block, ensures that the pressure in the cylinder does not exceed limits. 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 126 to the cylinder body.
5. Detach the unit from its anchor post (where fitted) and check whether the swivel anchor post 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 124 should be kept free from debris so as not to restrict the jaws ref 122 & 123 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. (operating instructions). If this procedure is not followed the life of both the rear sliding jaw ref. HU3 and the fixed jaw ref. 122 will become shortened.



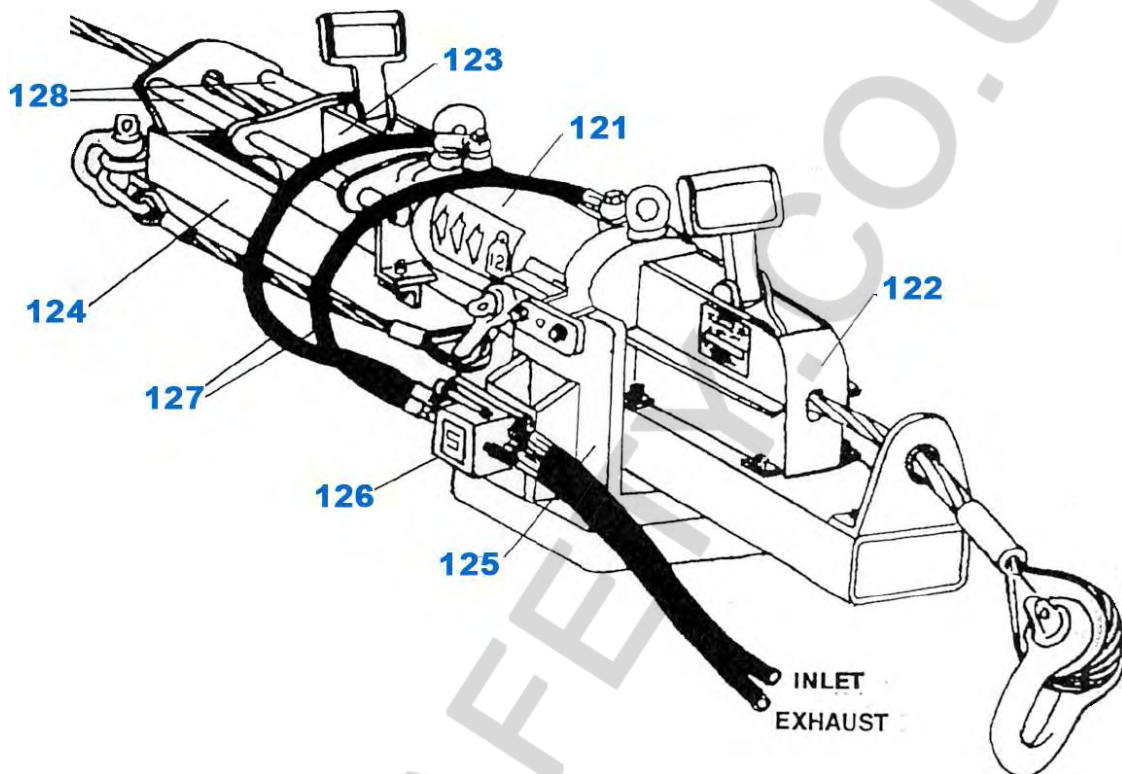




## SELBY ENGINEERING & LIFTING SAFETY LTD.

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 cap head screws and locating plates from both sides of swivel anchor post assembly
2. Lifting puller unit, enter into swivel anchor post by locating crosshead journals into anchor post recesses, and re-fit both locating plates, securing with head screws on both sides
3. Anchor post can be floor bolted, or alternative shackle anchorage can be achieved by means of anchor ropes shackled to anchor points on both sides of post, with 12t D shackle positioned to the rear of sledge guide
4. Connect ram hoses to rear side of control valve and connect face power supply hoses to other side of valve (marked inlet and exhaust)
5. Hold open the handles on 122 and 123 jaws and thread rope through rope guide (122), fixed jaw (121), hollow ram (123), sliding jaw and cut through rope guide.

#### OPERATION

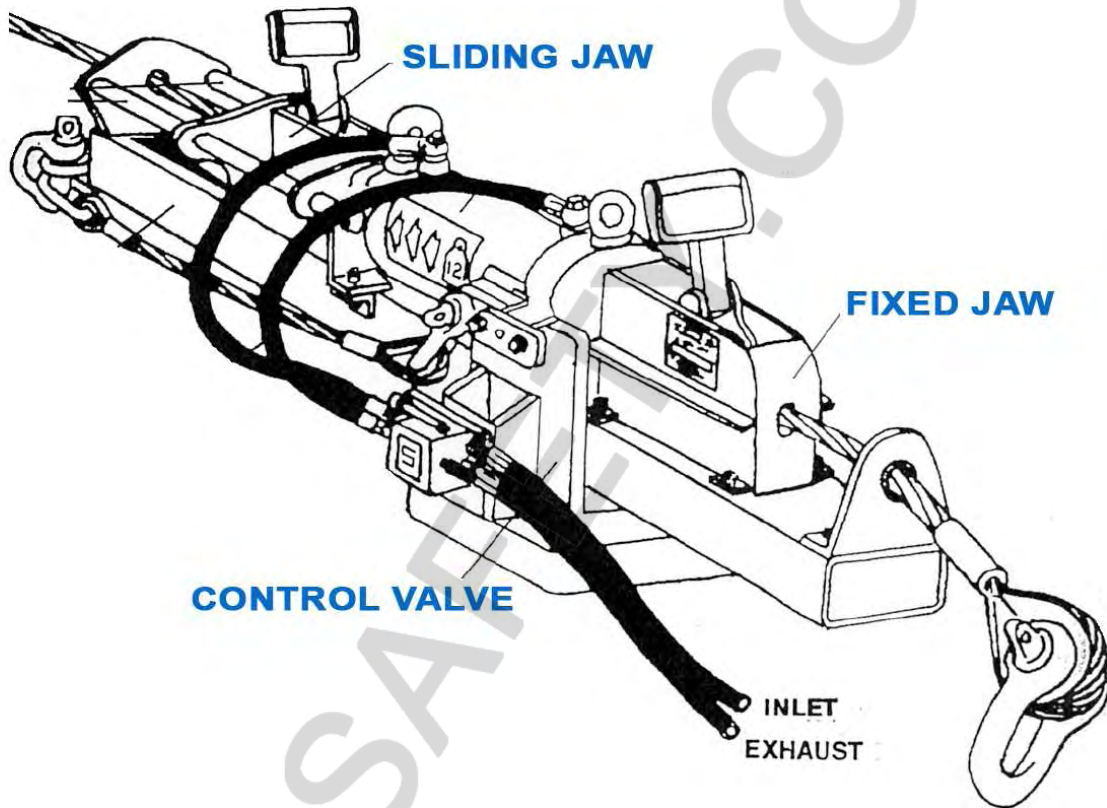
1. Ensure unit is assembled as above, and check hose and valve connections are tight
2. Operate HIJ6 control valve handle for ram movement, and automatically 123 jaw will grip the pulling rope for up to 12" of travel
3. Upon reversal of 126 control valve, 122 jaw will hold the tension applied whilst 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.



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

**NOTE:**

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

