



Wireteknik Swagers
Manual
model A350

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1. Manufacturer's EU declaration of conformity and address

Wireteknik AB, P.O Box 4053, SE-102 61 Stockholm, Sweden, phone +46 8 643 67 33, hereby declares at its own risk that the machines for swaging A100, A200, A270, A350, A400, A400rs and A500 with serial numbers from 2020 onwards (the year followed by the serial number is clearly stated on the type

plate) correspond to the regulations in the council directive of 17 May 2006 concerning machinery 2006/42/EC.

Standards applied are SS-EN ISO 12100:2010 and SIS-ISO/TR14121-2:2112.

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Jesper Ott
CEO and responsible for technical documentation

Wireteknik AB
P.O Box 4053
SE-102 61 Stockholm
Sweden

2. About the manual



It is of **utmost importance** that the safety and operating instructions are read and understood by all users before installing and operating the machine.

3. Tools for the A350 model

Roller dies



Required equipment, sold separately.
One pair of roller dies for each wire size.

Pulling tools supplied as standard equipment



Straight and bended links
Art. No: CHL-6 / CHL-10



Fork Puller Small
Art. No: PP6.2



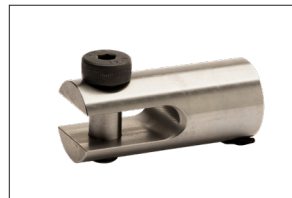
Fork Puller Medium
Art. No: PP10



Fork Puller Large
Art. No: PP20



Fork Small, pin Ø 6 mm
Art. No: F2



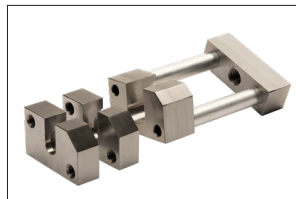
Fork Medium, pin Ø 10 mm
Art. No: F3



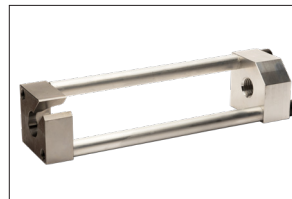
Fork Medium, pin Ø 12 mm
Art. No: F35



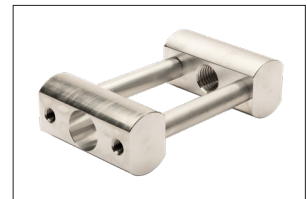
Fork Large, pin Ø 16 mm
Art. No: F4



Ball Puller 4–8 mm Stem
Balls. Art. No: BP4-8



Ball Puller 10–12 mm Stem
Balls. Art. No: BP10-12



Multipurpose Pulling Tool
Art. No: MP-1



Adapter
Art. No: M12/M20



UNF Nuts, right hand
thread.
Art. No: 3/4" / 7/8" / 1"



Nuts "Olives". Metric and UNF, right hand thread.
Left hand thread optional.
Art. No: Olives, M10-M5 / M12-M6 / M14-M8 / M16 /
1/4"-7/16" / 3/8"-9/16" / 1/2"-5/16" / 5/8"

4. Safety instructions

Special safety measures are required when operating the machine as there is a risk of crushing and cutting injuries and leakage.

Read and understand all the operating instructions before using the machine for the first time and keep the manual safe for future reference.

4.1 General things to observe

Follow current safety regulations from the Work Environment authorities in your country.

Minors are not allowed to operate the machine – excepting those who are 16 years of age and over and have been trained under supervision.

Keep children, animals and onlookers away.

The machine is intended for use in a specified work area by a person with knowledge and experience of using this type of machine in accordance with the

operating instructions. The person operating the machine must have full ability in arms and hands and satisfactory vision. The person must also be rested, healthy and in good shape.

Never operate the machine after the intake of alcohol, drugs or medications that impair the ability to react.

The machine may only be handed over or lent to people who know it and how to use it. Always include the manual.

4.2 Intended use and function

The machine is intended for swaging terminals (e.g eye-terminals, forks, threaded studs) onto full-steel wire. This is done by pressing (cold forming) the metallic terminal around the wire.

There are a number of different dimensions of wires and terminals to choose from. Choosing the appropriate machine model is based on these dimensions.

The machine **must not** be used for other purposes than those intended as it can be a risk of accident.

Changes or modifications to the machine are **not** allowed.

Wiretechnik AB is not responsible for the injury of persons or damage of equipment that occurs with incorrect use or lack of protective equipment.

4.3 Clothing and protective equipment



Wear appropriate, tight-fitting clothing that won't obstruct the work or get caught in the moving parts of the machine. Remove all scarves, ties and jewellery. Put long

hair up and tuck it away safely with a hat, cap etc.



Use tight-fitting protective glasses to minimize the risk of eye injuries. Make sure the glasses fit properly.



Use appropriate shoes med slip-free soles and steel caps. This is especially important when installing and moving the machine and when changing roller dies.



Use sturdy work gloves made of a durable material (e.g. leather) when handling wire and terminals.

5. General description of the machine

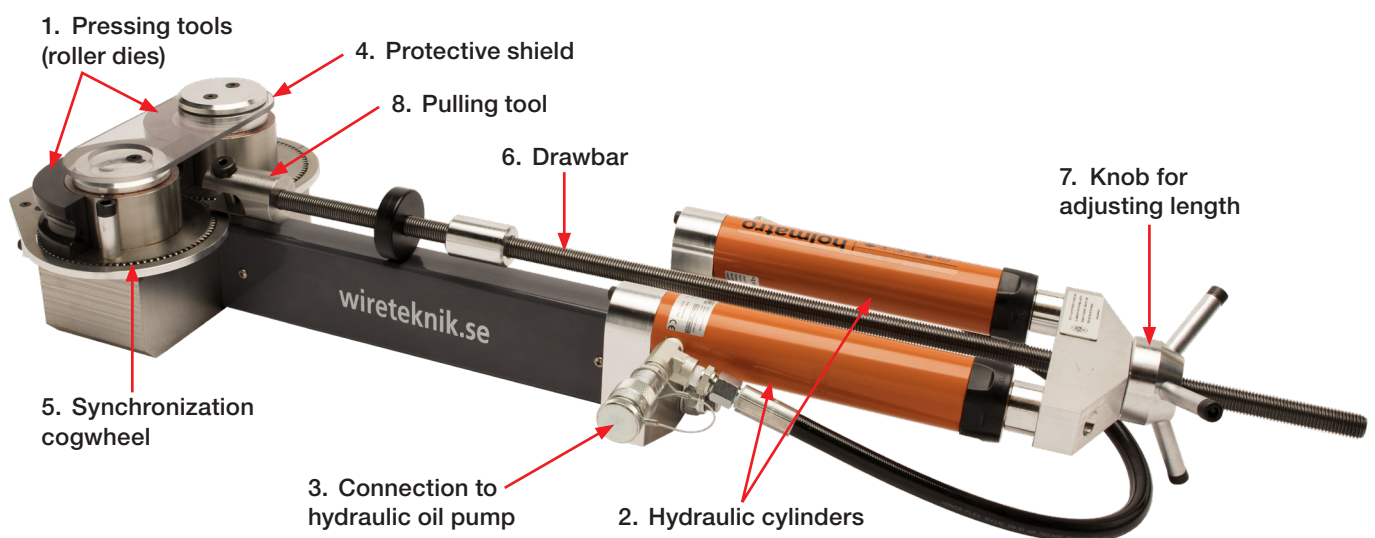
The machine is intended for swaging terminals (e.g eye-terminals, forks, threaded studs) onto the end of a wire by the use of hydraulics. The material to be worked with (wire and terminal) is placed manually in the machine. The terminal that encloses the wire is pulled through pressing tools (roller dies) under pressure which presses the terminal onto the wire (cold formed). The roller dies [1] in the machine are specially designed for this type of machine.

The machine comes with different sized roller dies to fit several different dimensions of wires and terminals. Installing and adjusting the roller dies is done manually.

A hydraulic pump and hydraulic cylinders [2] are used to achieve the mechanical power needed to perform the swaging. The hydraulic pump is connected to the machine [3] to obtain hydraulic pressure (up to 700 bar) in the cylinder. The hydraulic pump can be a hand pump, an electric pump, a pump powered by an electric screwdriver or a pump powered by fossil fuel.

For how to use different types of hydraulic pumps please refer to the manual of your selected pump.

The machine is intended to be used by a trained operator only.



NB! The machine is transported with the hydraulic cylinders mounted according to figure 1 in section 9.

Before using the machine, the hydraulic cylinders must be disassembled and reassembled according to figure 2 in section 9.

Hydraulic pumps suitable for model A350 and available from Wiretechnik AB



Hand pump



Electric pump (single-phase)



Electric pump (three-phase)



Existing hydraulic oil systems can also be used with the machine. **It is very important that the pressure does**

not exceed 700 bar. The flow of hydraulic oil affects the speed of swaging and should conform to the specifications in the table below (section 5.1).

5.1 Technical data

Diameter of wire to be worked	Ø 2.5–16 mm (3/32"–5/8")
Length of the machine	1117 mm (44")
Width of the machine	370 mm (14 3/4")
Height of the machine	210 mm (8 1/4")
Weight of the machine	66 kg (146 lbs)
Dimensions of hydraulic hoses and connections	1/4", 3/8" and 1/2"
Hydraulic oil pressure	≤700 bar
Hydraulic oil flow	0.8–2.5 litres/minute
Operating temperature	0–30°C

5.2 Installing the machine in the work area

Remove the machine from the packaging and place it where it will be operated. For ergonomic and safety reasons the machine should be placed on a sturdy bench or table at a comfortable height. It is important to have a stable surface and ample free space (over 2 metres) around the machine.



Remember to wear appropriate shoes with anti-slip soles and steel caps when lifting the machine.

5.3 Connecting a hydraulic pump

Connect the hydraulic pump to the coupling on the machine and place the pump where it is not in the way of the work or risk falling over in the case of electric and motor driven pumps. Use the foot pedal to start and stop the pump.

If a hand pump is used, it is important that it is placed on a stable surface at a suitable height.



Check the hydraulic system to make sure that they are intact and undamaged and that there is no leakage around the connectors. **If there is a damage or leakage, the hydraulic hoses, connections, cylinders must be replaced before use.** Pressure in the hydraulic pump unit, hoses and cylinders can be up to 700 bar.

Check that external hydraulic units or other pressurized hydraulic systems are connected correctly. **If that is not the case, they must be adjusted or replaced before use.**

5.4 Connecting electric power

If using an electric hydraulic pump, make sure that it is connected to the same voltage as stated on the pump (one-phase or three-phase).



Position the power cord in such a way as to avoid the risk of tripping over it.

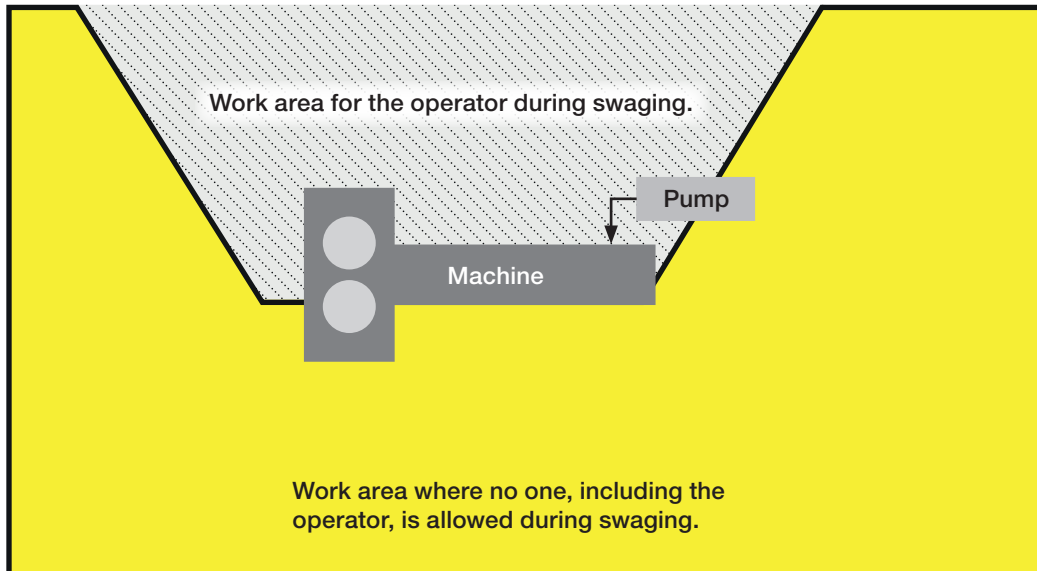
5.5 Work area for the operator when swaging



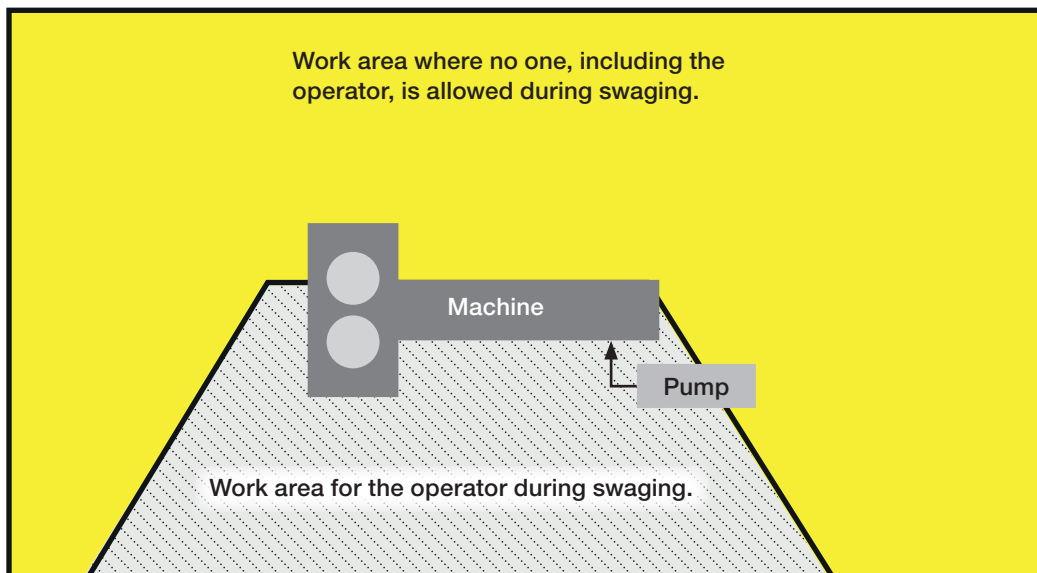
The operator must be within the work area along the side of the machine to avoid potential splintering from a faulty

or incorrectly chosen terminal. Work areas are shown in the figure below.

RISK AREAS – alternative 1



RISK AREAS – alternative 2



6. Operating instructions

6.1 Step 1 – Choosing and mounting roller dies



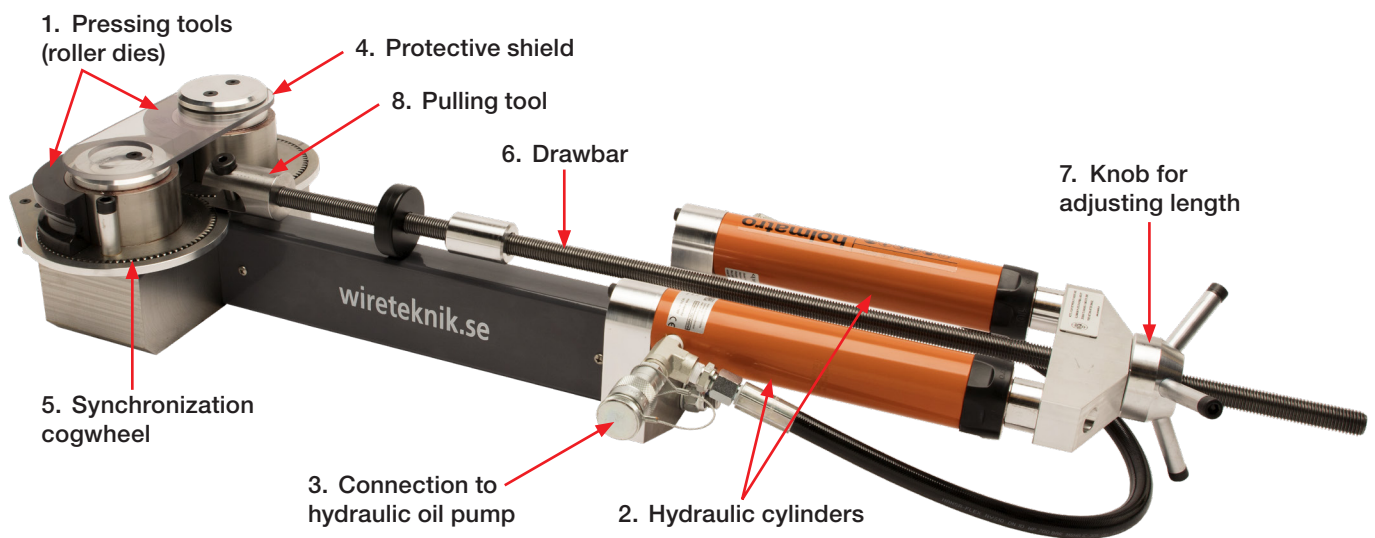
NB! It is important to choose the roller dies corresponding to the dimensions of the wire and terminal. The roller dies are marked with the wire dimensions they are to be used for.



Use protective gloves to avoid cutting and crushing injuries.



It is of utmost importance that terminals are not made of other materials than intended. Otherwise they may crack and/or not comply with the standard, and will not have sufficient performance.













1. Choose the roller dies [1] that correspond to the diameter of your wire.
2. Move the protective shield [4] aside.
3. If roller dies that do not correspond to the diameter of your wire are already mounted on the machine, remove them.
4. Place the chosen roller dies onto the cogwheel synchronizing pins [5].
5. The arrows on the roller dies should always point in the swaging direction.

6.2 Step 2 – Choosing and mounting pulling tools

1. Use the guide below to choose a pulling tool to mount on the drawbar [6].
2. Choose the corresponding pulling tool to be attached to the terminal.

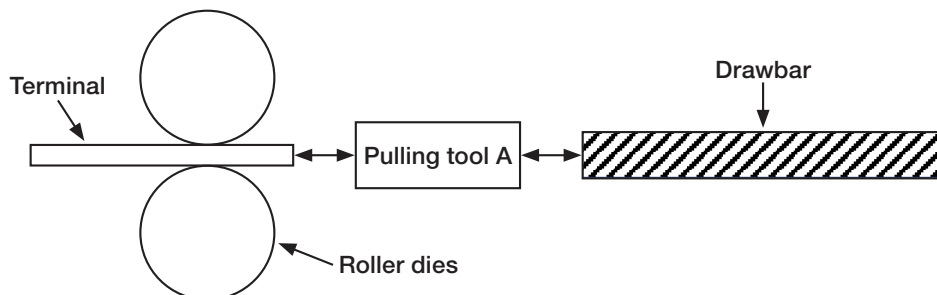
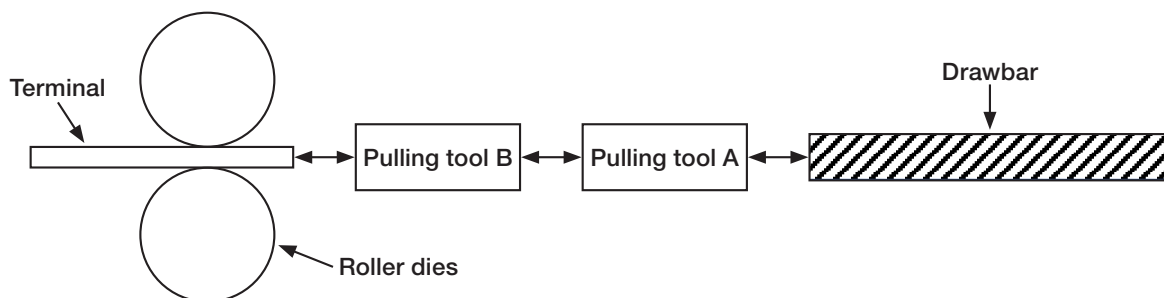
NB! In some cases the terminal is attached directly to the pulling tool mounted on the drawbar. [6]

Guide to choosing pulling tools

Terminal	Pulling tool to be mounted on the drawbar [6]*	Pulling tool to be mounted on the terminal*
T-terminal	 <p>Art. No: F2, F3 or F35</p>	 <p>Art. No: CHL-6 or CHL-10</p>
Fork	 <p>Art. No: F3 or F4</p>	 <p>Art. No: PP6.2 or PP10 or PP20</p>
Eye-terminal	 <p>Art. No: F2 or F3 or F4</p>	<p>Mount the terminal directly on Art. No. F2 or F3 or F4</p>
Ball	 <p>Art. No: BP4-8 or BP10-12</p>	<p>Mount the terminal directly on Art. No: BP4-8 or BP10-12</p>
Threaded studs	 <p>Art. No: BP4-8 or BP10-12</p>	 <p>Art. No: Olives, M10-M5 / M12-M6 / M14-M8 / M16 / 1/4"-7/16" / 3/8"-9/16" / 1/2"-5/16" / 5/8" Right hand thread. Left hand thread optional</p>
Threaded studs	 <p>Art. No: MP-1</p>	 <p>Art. No: 3/4" / 7/8" / 1". Right hand thread.</p>

* Choose tool depending on dimension of terminal

How to mount pulling tools, depending on the terminal



6.3 Step 3 – Preparing wire and terminal



NB! It is of utmost importance that the terminal is made of the right kind of material.

1. Choose a terminal and attach it to the pulling tool on the drawbar [6].
2. Adjust the length so that the roller dies meet the terminal shank at desired position.
3. Apply just enough hydraulic pressure (from the pump) to make the roller dies hold the terminal firmly in place. **NB!** Watch your fingers. Risk of crushing injuries.
4. Insert the wire to the bottom of the terminal throat and put a mark on the wire at the opening of the terminal. After swaging the mark will tell if the wire is still inserted to the bottom of the shank.

6.4 Step 4 – Swaging



It is important to use safety glasses as splintering may occur if the terminal is faulty or made of the wrong material.



It is important to make sure that there is no leakage around the connections in the hydraulic oil system (hoses, connectors etc).



When swaging the operator must stand in the work area shown in section 5.5.



NB! If there is a power cut an electric hydraulic pump will stop and so will the roller dies. Remove your foot from the foot pedal or manually turn off the switch to stop the machine from starting up automatically when power is restored. When power is restored, start the machine in the usual, controlled way.

1. Move the protective shield [4] to safety position.

NB! Remove fingers from the roller dies [1].

2. Close the hydraulic valve in the hydraulic oil system.
3. Apply hydraulic pressure (from the pump) until the whole terminal has been pulled through the roller dies [1]. When the roller dies rotate the terminal shank is pressed onto the wire.
4. Move the protective shield [4] to the side.
5. Lift out the wire with the swaged terminal.
6. Check that the wire is inserted to the bottom of the terminal by looking at the mark made on the wire before swaging. It should still be at the opening of the terminal or partly/totally covered by the terminal elongation.
7. Measure the diameter of the terminal and compare it to the dimensions listed in the table of swage dimensions (section 6.5). If the correct dimension has not been obtained see further below.
8. Repeat Step 3 (1–4) and Step 4 (3–7) until all terminals of the same type and dimension have been swaged.

NB! The machine is designed to reduce the terminal shank to the required diameter in one step (one passage through the machine). However, dimensional variations in terminals and wires or material hardness might make it necessary to pass the terminal through twice in the same tracks. If this too fails to reach the correct dimension, discard the swaged material.

If the marking is not at the opening of the terminal or partly/totally covered by the terminal elongation, discard the swaged terminal.

When swaging solid rods a special swaging component must be used. After swaging, wipe off the roller dies and the machine and apply a corrosion preventative.

NB! The machine is designed to swage complete wire ropes and solid rods. For swaging solid rods, silicon carbide grit size 80-120 must be used.

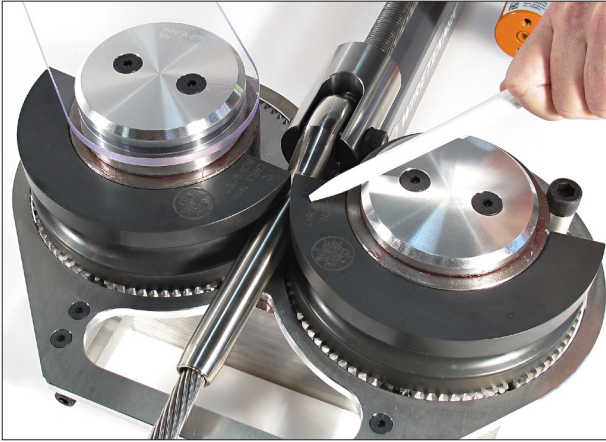
6.5 Swage dimensions

Diameter of wire (mm)	Diameter of terminal before swaging (mm)	Diameter of terminal after swaging (mm)	Diameter of wire (inch)	Diameter of terminal before swaging (inch)	Diameter of terminal after swaging (inch)
1.6	4.06/3.94	3.50/3.40	1/16	.160/.155	.138/.133
2.5	5.53/5.41	4.82/4.70	3/32	.218/.213	.190/.185
3	6.35/6.22	5.56/5.44	1/8	.250/.245	.219/.214
4	7.54/7.42	6.35/6.23	5/32	.297/.292	.250/.245
5	9.12/9.00	7.95/7.83	3/16	.359/.354	.313/.308
5.5	10.84/10.72	9.50/9.35	7/32	.427/.422	.375/.368
6	12.54/12.42	11.12/10.95	1/4	.494/.489	.438/.431
7	14.30/14.18	12.70/12.50	9/32	.563/.558	.500/.492
8	16.13/16.01	14.30/14.07	5/16	.635/.630	.563/.554
9–10	17.85/17.73	15.90/15.70	3/8	.703/.698	.625/.618
11	19.83/19.63	17.47/17.27	7/16	.781/.773	.688/.680
12	21.44/21.32	19.05/18.82	1/2	.844/.839	.750/.741
12E	20.08/20.00	17.80/17.60	9/16	.984/.979	.875/.866
14	25.00/24.88	22.23/22.00	5/8	1.109/1.104	1.000/.990
16	28.17/28.05	25.40/25.15	3/4	1.359/1.354	1.250/1.238
19	34.52/34.40	31.75/31.44	7/8	1.593/1.583	1.437/1.425
22	40.46/40.21	36.50/36.20	1	1.812/1.802	1.625/1.613
25	46.02/45.77	41.28/40.97	1 1/8	1.968	1.732/1.751
28	50.0	44/44.5	1 1/4	2.284	2.007/2.028
32	58	51.0/51.5	1 3/8	2.559	2.244/2.275
36	65.0	57.0/57.8	1 1/2	2.835	2.488/2.519
38 ~ 40	72	63.2/64.0	1 3/4	2.952	2.598/2.640

7. General description of swaging

The basic principles of swaging a terminal on a wire.

NB! Follow the detailed instructions in section 6.



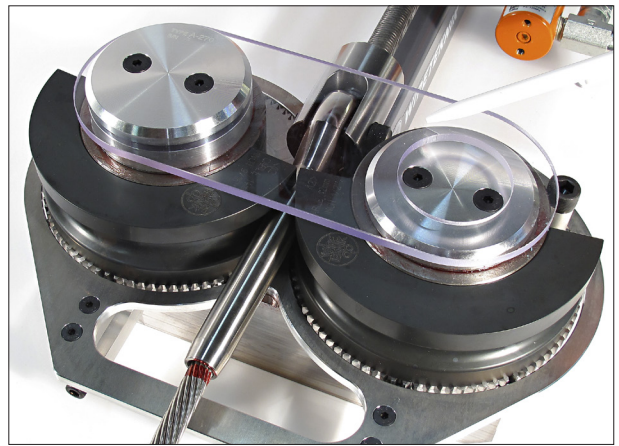
1. Choose the roller dies that correspond to the wire diameter, and slip them onto the cogwheel synchronizing pins.



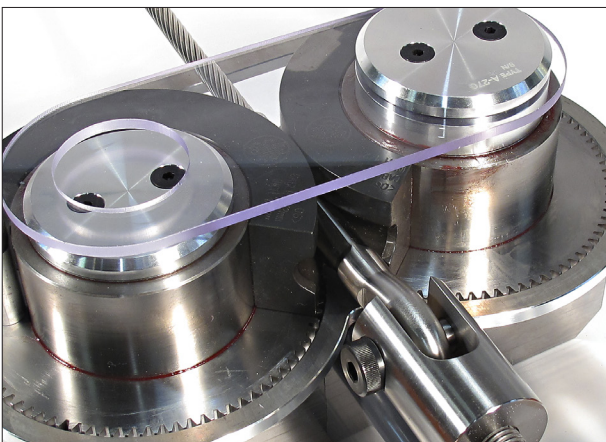
2. Mount the pulling tool on the drawbar and attach the terminal to it. Adjust the length so the roller dies meet the terminal shank at desired position.



3. Apply hydraulic power to fasten the terminal between the roller dies. Insert the wire to the bottom of the terminal throat and mark the wire.



4. Move the transparent protective shield into position. Apply hydraulic pressure to pull the terminal through the roller dies.



5. When the roller dies rotate, they will press the terminal shank onto the wire.



6. Measure the diameter of the terminal after swaging and compare it to the swage dimensions table (section 6.5).

8. Service and maintenance

Changes or modifications to the machine are **not** allowed.

Use only original replacement parts from the manufacturer.

8.1 Planned service intervals

Work cycles	Service
<2 000 cycles/year	Machine service interval 5 years
2 000–35 000 cycles/year	Machine service interval 1 year

The hydraulic hoses must be replaced every five years or less depending on local regulations.

9. Storing the machine

Store the machine in a cool, dry space without direct sunlight.

When the machine is not in use remove the roller dies and pulling tools and apply a suitable light

corrosion preventative oil to both machine and tools. When transporting the machine place it securely to prevent it from receiving knocks and blows. Remove the roller dies and pulling tools from the machine and place them next to it.

9.1 How to mount the hydraulic cylinders before use

The hydraulic cylinders are delivered assembled according to figure 1 below. Before using the machine, the cylinders must be mounted according to figure 2.

of the cylinders and remount the HEX screws from the other direction.

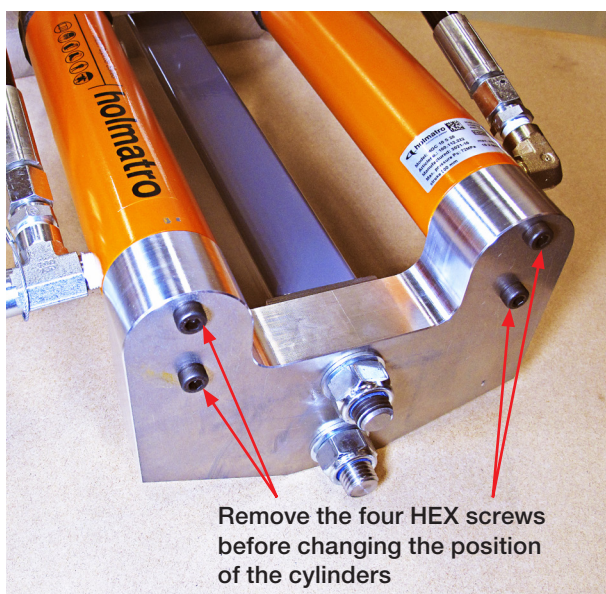


Figure 1.

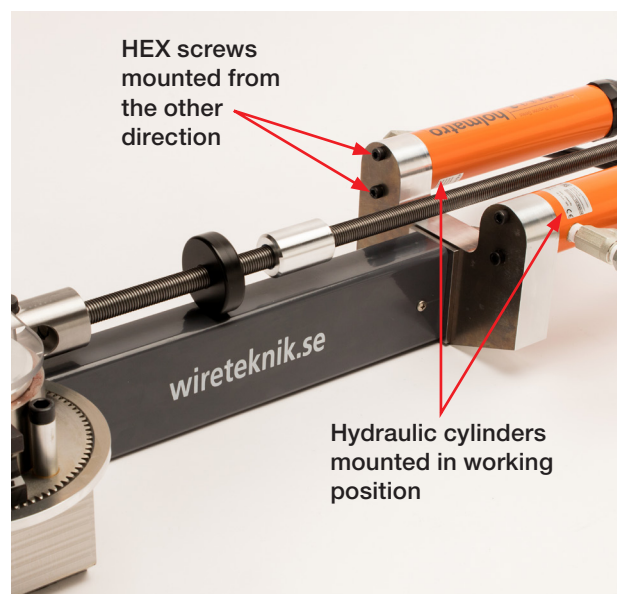


Figure 2.

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