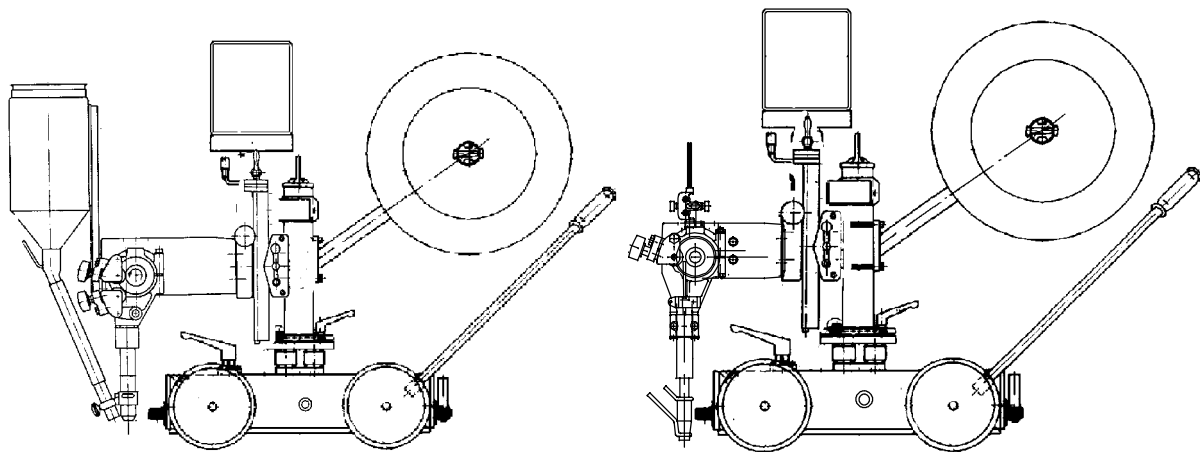


A6 Mastertrac

A6 TFE1/A6 TFE2/A6 TGE1



**Bruksanvisning
Brugsanvisning
Bruksanvisning
Käyttöohjeet
Instruction manual
Betriebsanweisung**

**Manuel d'instructions
Gebruiksaanwijzing
Instrucciones de uso
Istruzioni per l'uso
Manual de instruções
Οδηγίες χρήσεως**

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Rätt till ändring av specifikationer utan avisering förbehålles.
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1 DIRECTIVE

DECLARATION OF CONFORMITY

Esab Welding Equipment AB, 695 81 Laxå, Sweden, gives its unreserved guarantee that automatic welding machine A6 TFE1/TFE2/TGE1 from serial number 725 complies with standard EN 60292, in accordance with the requirements of directive 89/392/EEA and addendum.

Laxå 97-04-15



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2 SAFETY

Users of ESAB automatic welding machines have ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions.

The following recommendations should be observed in addition to the standard regulations that apply to the work place.

All work must be carried out according to the specified instructions by personnel who are thoroughly familiar with the operation of the welding machine.

Incorrect or unintentional operation of the equipment may lead to a hazardous situation which can result in injury to the operator and damage to the equipment.

1. Anyone who uses the automatic welding machine must be familiar with:
 - its operation
 - the location of emergency stops
 - its function
 - relevant safety precautions
2. The operator must ensure that:
 - no unauthorized person is stationed within the working area of the machine when it is started up.
 - that no-one is in a hazardous position when the carriage or slide mechanisms are operated.
3. The work place must:
 - be clear of mechanical components, tools, or other obstructions that could prevent the operator from moving freely within the working area.
 - be organized so that there is free access to the emergency stop.
4. Personal safety equipment
 - Always wear recommended personal safety equipment, such as safety glasses, flame-proof clothing, safety gloves.
 - Do not wear loose-fitting items, such as scarves, bracelets, etc., which could become trapped.
5. General precautions

Live electrical components are normally shielded from accidental contact.

 - Make sure the return cable is connected securely.
 - Work on high voltage components may **only be carried out by a qualified electrician.**
 - Appropriate fire extinguishing equipment must be clearly marked and close at hand.
 - Lubrication and maintenance must not be carried out on the equipment during its operation.



WARNING



ARC WELDING AND CUTTING CAN BE INJURIOUS TO YOURSELF AND OTHERS. TAKE PRECAUTIONS WHEN WELDING. ASK FOR YOUR EMPLOYER'S SAFETY PRACTICES WHICH SHOULD BE BASED ON MANUFACTURERS' HAZARD DATA.

ELECTRIC SHOCK - Can kill

- Install and earth the welding unit in accordance with applicable standards.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from earth and the workpiece.
- Ensure your working stance is safe.

FUMES AND GASES - Can be dangerous to health

- Keep your head out of the fumes.
- Use ventilation, extraction at the arc, or both, to keep fumes and gases from your breathing zone and the general area.

ARC RAYS - Can injure eyes and burn skin.

- Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

FIRE HAZARD

- Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.

NOISE - Excessive noise can damage hearing

- Protect your ears. Use ear defenders or other hearing protection.
- Warn bystanders of the risk.

MALFUNCTION - Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

3 INTRODUCTION

3.1 General

The A6 TFE1 automatic welding machine is mounted on a self-propelled trolley and is designed for submerged-arc welding of butt and fillet welds.

The A6 TFE2 automatic welding machine, with two welding heads, is mounted on a self-propelled trolley and is designed for submerged-arc welding of butt welds.

The A6 TGE1 automatic welding machine is mounted on a self-propelled trolley and is designed for MIG/MAG welding of butt and fillet welds.

All other uses are prohibited.

The automatic welding machines are used in conjunction with ESAB's control box A2-A6 Process Controller (PEH).

The supply voltage to the control box and to the welding machine motors is provided by ESAB's welding power sources LAF and TAF.

The position of welding head can be set horizontally and vertically with the linear slides. Angular movement is adjusted with the angular slide.

3.2 Technical data

A6 Mastertrac	A6 TFE1	A6 TFE2	A6 TGE1
	Submerged-arc		MIG/MAG
Supply voltage	42 V AC	42 V AC	42 V AC
Rated load 100 %	1500 A DC/AC	1500 A DC/AC	600 A DC
Electrode dimensions:			
solid single wire	3.0-6.0 mm	3.0-6.0 mm	1.0-2.4 mm
flux-cored wire	3.0-4.0 mm	3.0-4.0 mm	1.6-3.2 mm
twin wire	2 x 2.0-3.0	2 x 2.0-3.0 mm	--
Electrode feed rate, max.	4 m/min	4 m/min	16 m/min
Brake drum braking torque	1.5 Nm	1.5 Nm	1.5 Nm
Speed of travel	0.1-2.0 m/min	0.1-2.0 m/min	0.1-2.0 m/min
Electrode weight, max.	30 kg	2 x 15 kg	30 kg
Flux hopper capacity (Must not be filled with preheated flux)	10 l	10 l	--
Weight (excluding electrode and flux)	110 kg	158 kg	100 kg
Sideways tilt, max.	25°	25°	25°
Continuous A weighted sound pressure	68 dB	68 dB	83 dB

3.3 Welding method

Submerged-arc welding

For submerged-arc welding, an A6 Mastertrac of type A6 TF is used, which is available in several different versions:

- **Submerged-arc Light duty**

Submerged-arc light duty, with a \varnothing 20 mm connector, which permits a load of up to 800 A (100%) or 1000 A (60%).

- **Submerged-arc Heavy duty**

Submerged-arc heavy duty, with a \varnothing 35 mm connector, which permits a load of up to 1500 A.

Both versions can be equipped with feed rollers for single or twin wire welding (twin-arc). A special knurled feed roller is available for flux-cored wire, which guarantees even wire feed without the risk of deformation due to high feed pressure.

For work in confined spaces, (smaller than 50 cm), a special welding head of type **A6 SFE1C** is available, which can be installed on the Mastertrac as required.

Tandem welding (submerged-arc)

For tandem welding, a welding head of type **A6 TFE2** is always used, which must be connected to 2 welding power sources and 2 control boxes of type A2-A6 Process Controller.

The tandem welding head includes 2 single welding heads (A6 SF), each with its own contact tip. Each contact tip has a maximum rated load of 1500 A.

MIG/MAG welding

For MIG/MAG welding, an A6 Mastertrac A6 TE1 is used, which has a maximum rated load of 600 A. The welding head is water cooled, with the cooling water supplied by hoses from connections intended for the purpose.

3.4 Equipment

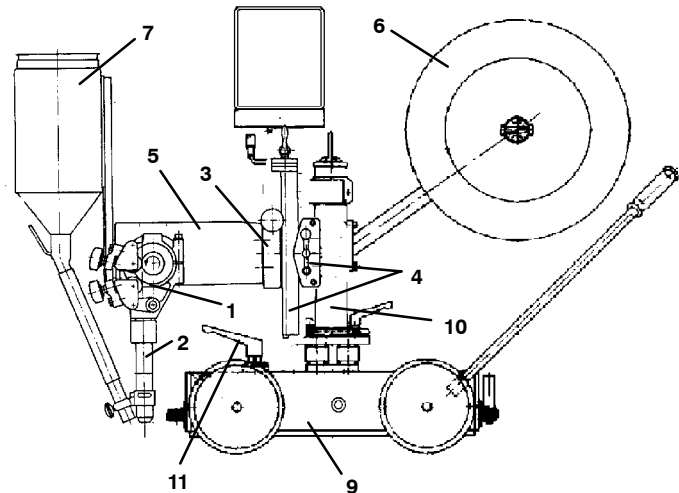
Included in a complete welding head are a feed motor (A6 VEC) to feed in the wire and contact equipment which supplies current to the wire and provides a good contact.

Contact equipment is available in several different versions.

- A6 TF is used for submerged-arc welding.
- A6 TG is used for MIG/MAG welding.

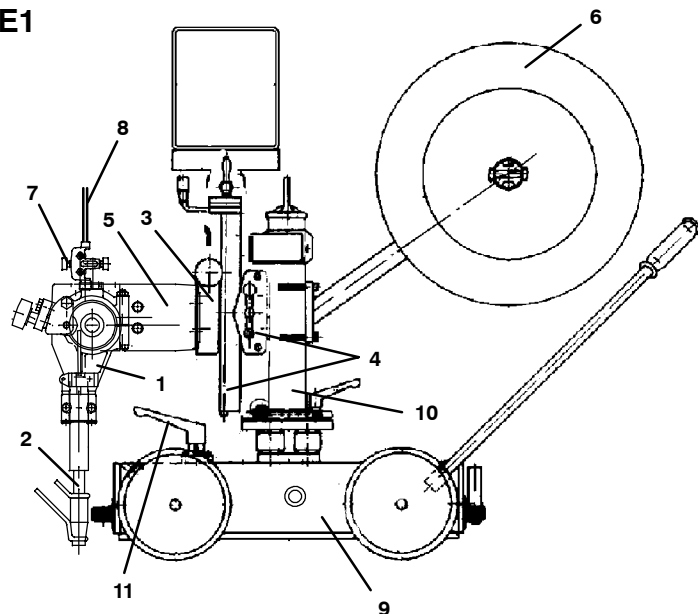
Main components of the A6 TFE1 and A6 TFE2

- 1 Straightener.
- 2 Contact equipment which consists of a contact tip, connector and flux tube.
- 3 Angular slide
- 4 Slide (motor or handdriven)
- 5 Motor and gearbox (A6 VEC)
- 6 Wire drum
- 7 Flux hopper (may be fitted with a cyclone)
- 8 -
- 9 Trolley
- 10 Column
- 11 Disengagement lever



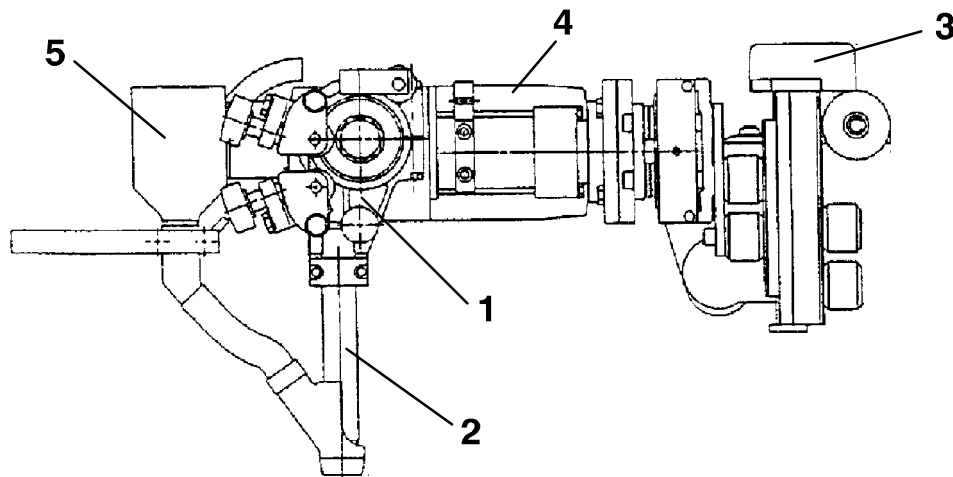
Main components of the A6 TGE1

- 1 Straightener.
- 2 Contact equipment which consists of a connector, gas nozzle and water hoses.
- 3 Angular slide.
- 4 Slide (motor or hand driven).
- 5 Motor and gearbox (A6 VEC).
- 6 Wire drum.
- 7 Fine wire straightener.
- 8 Wire guide.
- 9 Trolley.
- 10 Column.
- 11 Disengagement lever.



Example of the A6 SFE1C, which can be mounted on an A6 Mastertrac

- 1 Straightener.
- 2 Contact equipment, which consists of a contact tip, connector and flux tube.
- 3 Slide (motor driven).
- 4 Motor and gearbox (A6 VEC).
- 5 Flux hopper (1 l).


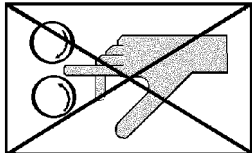


For connection instructions for submerged-arc and MIG/MAG welding, see page 69.

4 INSTALLATION

4.1 General

Installation may only be performed by qualified personnel.

	WARNING! Rotating parts can cause injury, take great care.	
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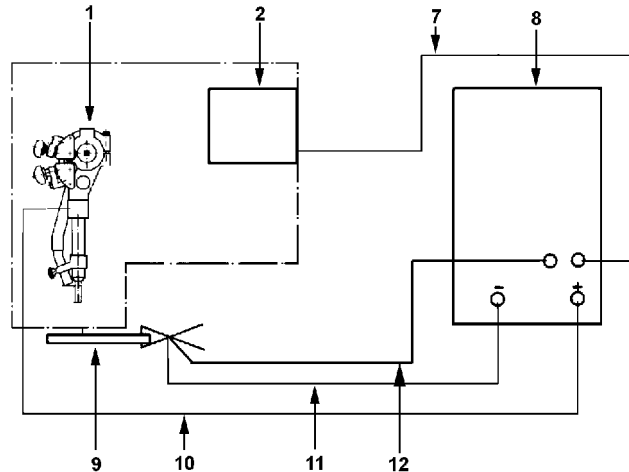
4.2 Connections

1. Connection of the control box A2-A6 Process Controller (PEH) to the automatic welding machine is carried out prior to delivery.
For further information, see instruction manual for the A2-A6 Process Controller (PEH).

2. Connect the A6 Mastertrac in accordance with the following diagrams.

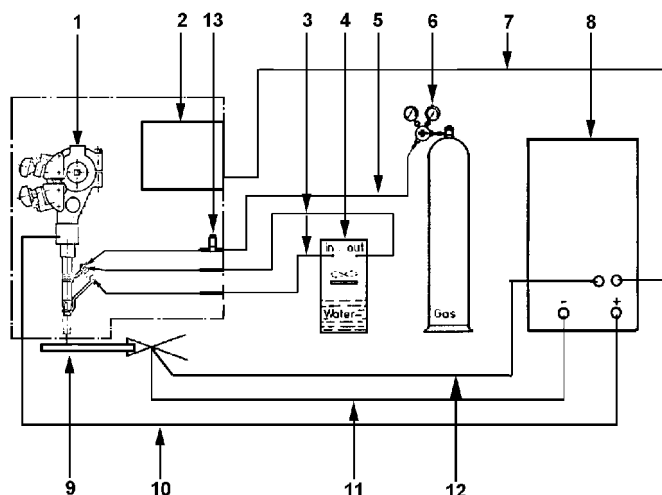
SUBMERGED-ARC WELDING

- Connect the control cable (7) between the welding power source (8) and the control box A2-A6 Process Controller (PEH) (2).
- Connect the return cable (11) between the welding power source (8) and the work piece (9).
- Connect the welding cable (10) between the welding power source (8) and the automatic welding machine (1).
- Connect the measuring cable (12) between the welding power source (8) and the work piece (9).



GAS METAL ARC WELDING MIG/MAG

- Connect the control cable (7) between the welding power source (8) and the control box A2-A6 Process Controller (PEH) (2).
- Connect the return cable (11) between the welding power source (8) and the work piece (9).
- Connect the welding cable (10) between the welding power source (8) and the automatic welding machine (1).
- Connect the gas pipe (5) between the reduction valve (6) and the gas valve on the automatic welding machine (13).
- Connect the hoses for cooling water (3) between the cooling unit (4) and the automatic welding machine (1).
- Connect the measuring cable (12) between the welding power source (8) and the work piece (9).



5 OPERATION

5.1 General

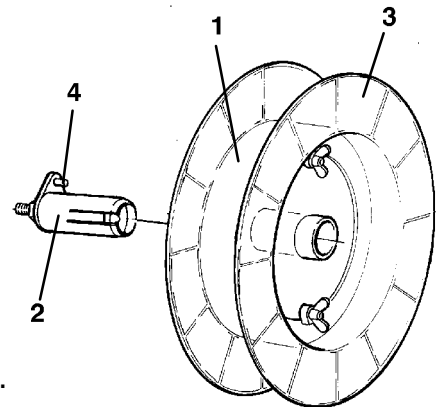
General safety regulations for the handling of the equipment appear from page 64. Read through before you start using the equipment!

- Select wire type and flux powder or shielding gas so that the weld material is as close as possible to the analysis of the base metal. Select wire size and welding data in accordance with the values recommended by the welding materials supplier.
- Thorough preparation of the weld surfaces is necessary to achieve a good weld. **NOTE!** The width of the weld joint gap must be uniform.
- To minimise the risk of heat crack formation, the width of the weld must be greater than the penetration depth.
- Always carry out a test weld with the same joint type and sheet thickness as the production work piece.
- For control and adjustment of the automatic welding machine and welding power supply, see the instruction manual for the A2-A6 Process Controller (PEH).
- The trolley can be moved manually after disengaging the disengagement lever, see the diagram on page 67.
- When changing consumables, see table on page 185.

5.2 Starting work

Loading the welding wire

- Remove the wire drum (1) from the brake hub (2) and take off the side plate (3).
- Locate the wire reel on the wire drum (1).
- Cut off the binding wires from around the wire reel.
- Replace the side plate (3).
- Replace the wire drum (1) on the brake hub (2). Check that the carrier (4) is in the correct position.

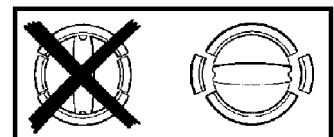


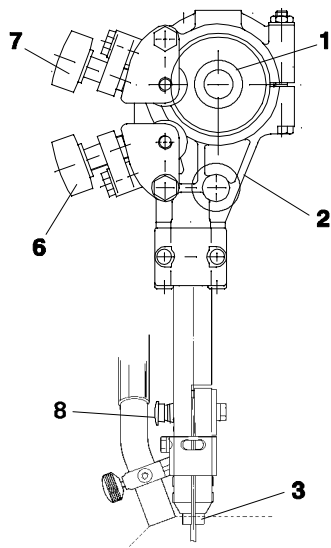
NOTE! The maximum angle for the wire bobbin is 25°. At extreme angles, wear will occur on the brake hub locking mechanism and the wire bobbin will slide off the brake hub.



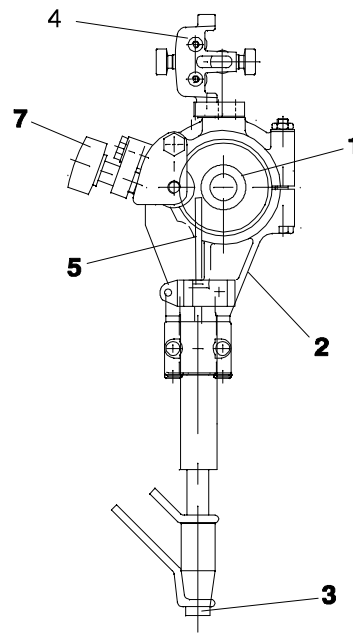
IMPORTANT!

To prevent the reel sliding off the hub: Lock the reel in place by turning the red knob as shown on the warning label attached next to the hub.






SAW



MIG/MAG

- Check that the feed roller (1) and contact jaw or contact tip (3) are of the correct dimension for the selected wire size.
- Pull the end of the wire through the straightener (2). For a wire diameter greater than 2 mm; straighten out 0.5 m of wire and feed it by hand down through the straightener.
- Locate the end of the wire in the feed roller (1) groove.
- Set the wire tension on the feed roller with the knob (7). **Note!** Do not tension more than is required to achieve an even feed.
- The pressure screw (8) must not be dismantled. (Applies to Submerged-arc Heavy duty).
- Feed the wire forward 30 mm by pressing  on the control box A2-A6 Process Controller.
- Direct the wire by adjusting the knob (6).

For fine wire, the special fine wire straightener (4) is used for both single and twin wire.

Ensure that the straightener is correctly adjusted so that the wire emerges straight out through the contact jaws or contact tip.

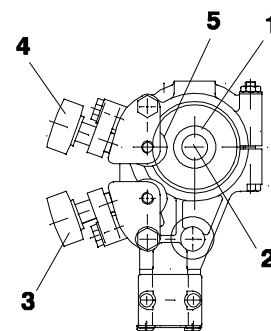
Always use a guide tube (5) to ensure even feeding of fine wire (1.6 – 2.5 mm).

For MIG/MAG welding with wire sizes < 1.6 mm, use a guide spiral, which is inserted in the guide tube (5).

Changing the feed roller

- **Single wire**

- Release the knobs (3) and (4).
- Release the hand wheel (2).
- Change the feed roller (1). They are marked with their respective wire sizes.



- **Twin wire (Twin-arc)**

- Change the feed roller (1) with twin grooves in the same way as for single wire.
- **NOTE!** The pressure roller (5) must also be changed. A special curved pressure roller for twin wire replaces the standard pressure roller for single wire.
- Assemble the pressure roller with special stub shaft (order no. 146 253-001).

- **Flux-cored wire (for knurled rollers)**

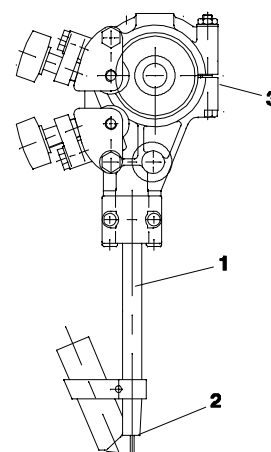
- Change the feed roller (1) and pressure roller (5) as a pair for the wire size to be used.
- **NOTE!** A special stub shaft is required for the pressure roller (order no. 2129 011-01).
- Tighten the pressure screw (4) with moderate pressure to ensure that the flux-cored wire does not deform.

Contact equipment for submerged-arc welding

- **For single wire 3.0 - 4.0 mm. Light duty (D20)**

Use the straightener (3), connector (1) D20 with contact tip (2) (M12 thread).

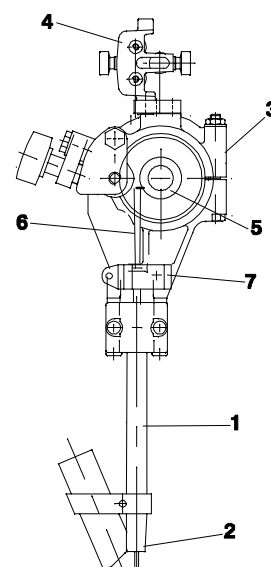
- Tighten the contact tip (2) with a key in order to ensure that a good contact is achieved.



- **For single wire 1.6 - 2.5 mm Submerged-arc. Light duty (D20)**

Use the straightener (3), connector (1) D20 with contact tip (2) (M12 thread) and separate fine wire straightener (4) with guide tube (6).

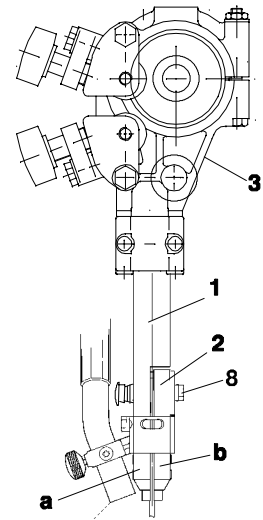
- Assemble the clamp (7) with guide tube (6) in the M12 hole on the straightener (3). The guide tube (6) should bottom on the contact tip (2).
- If necessary, cut the guide tube (6) to length so that the feed roller (5) runs freely.
- Assemble the fine wire straightener (4) on the upper side of the clamp for the straightener (3).



- **For single wire 3.0 - 6.0 mm. Heavy duty (D35)**

Use the straightener (3), connector (1) D35 with contact jaws (2).

- Assemble one contact jaw with the M5 bolts provided, in the fixed contact tip (a).
- Assemble the other contact jaw in the free half of the two-piece connector (b) under the bolt (8) and tighten down hard to ensure that a good contact is achieved between the contact jaws and the wire.



- **For flux-cored wire 1.6 mm - 4.0 mm (D20 and D35) (Accessories)**

If contact jaws (D35) are used, the contact jaws must not be tightened down too hard in order to ensure that the flux-cored wire is not distorted. Ensure that good contact is achieved with the wire.

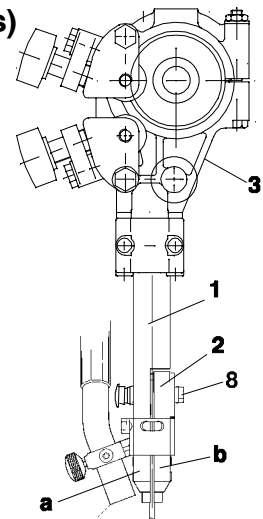
- **Adjustment of the wire for tandem welding**

- The distance between the first and second wires must not be so great that the slag has time to solidify between the wires.
- Ensure that good flux coverage is achieved between the first and second wires.

- **For twin wires 2 x 2.0 - 3.0 Heavy Twin (D35) (Accessories)**

Use the straightener (3), connector (1) D35 with contact jaws (2).

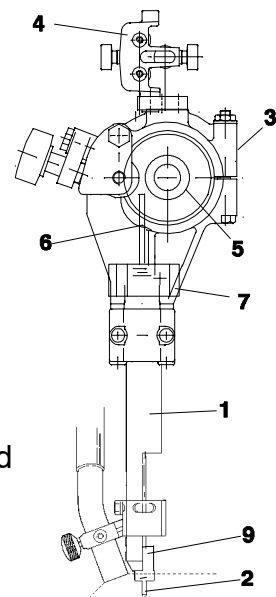
- Assemble the first contact jaw with the M5 bolts supplied, in the fixed connector (a).
- Assemble the other contact jaw in the free half of the two-piece connector (b) under the bolt (8) and tighten down hard to ensure that a good contact is achieved between the contact jaws and the wire.



• **For twin wires 2 x 1.2 - 2.0 mm, Light Twin (D35) (Accessories)**

Use the straightener (3), connector (1) D35 with twin adapter (9) and 2 contact tips (2) (M6 threads) and separate fine wire straightener (4) with two guide tubes (6). For twin wires < 1.6 mm, a guide spiral, inserted into each guide tube, is used.

- Assemble the twin adapter (9) for M6 contact tips (2) with the M5 bolts in the fixed half of the two-piece connector (1).
- Assemble the clamp (7) with guide tube (6) in the M12 hole on the standard straightener (3). The guide tube should bottom on the twin adapter (9) for the contact tip (2).
- Tighten the contact tip (2) with a key to ensure that a good contact is achieved.
- If necessary, cut the guide tube (6) to length so that the feed roller (5) runs freely.



• **Adjustment of the wires for Twin-arc welding:**

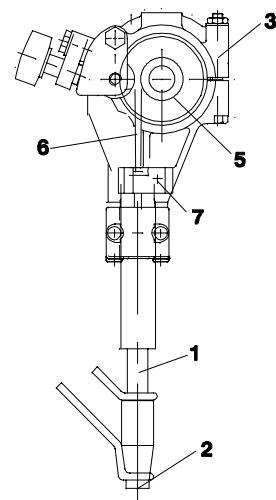
- Position the wires in the joint so as to achieve optimal weld quality by rotating the connector. The two wires can be rotated so that they are positioned one after the other along the line of the joint, or in any position up to 90° across the joint, i.e. one wire on each side of the joint.

Contact equipment for MIG/MAG welding.

• **For single wire 1.6 - 2.5 mm (D35)**

Use the straightener (3), connector (1) D35 with contact tip (2) (M10 thread).

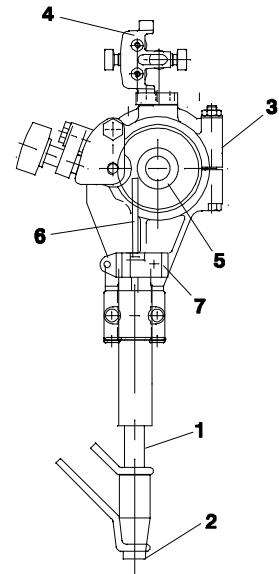
- Tighten the contact tip (2) with a key to ensure that a good contact is achieved.
- Assemble the clamp (7) with guide tube (6) in the M12 hole on the standard straightener (3). The guide tube (6) should bottom on the contact tip (2).
- If necessary, cut the guide tube (6) to length so that the feed roller (5) runs freely.



- **For single wire < 1.6 mm (D35)**

Use the straightener (3), connector (1) D35 with contact tip (2) (M12 thread), fine wire straightener (4) with guide tube (6) and guide spiral, which is inserted in the guide tube (6).

- Assemble the clamp (7) with guide tube (6) in the M12 hole on the standard straightener (3). The guide tube (6) should bottom on the contact tip (2).
- If necessary, cut the guide tube (6) to length so that the feed roller (5) runs freely.
- Assemble the fine wire straightener (4) on the upper side of the clamp for the straightener (3).
- Connect the cooling water and gas (MIG/MAG welding).



5.3 Refilling with flux powder (submerged-arc welding)

- Close the flux valve on the flux hopper.
- Remove the cyclone on the flux recovery unit, if fitted.
- Fill with flux powder. **NOTE!** The flux powder must be dry. Where possible avoid using agglomerating flux powder outdoors and in damp environments.
- Position the flux tube so that it does not become kinked.
- Adjust the height of the flux nozzle above the weld so that the correct amount of flux is delivered.
Flux coverage should be sufficient so that penetration of the arc does not occur.

5.4 Conversion of A6 TFE1 (Submerged-arc welding) to MIG/MAG welding

- Assemble in accordance with the instructions accompanying the conversion kit.

5.5 Conversion of A6 TFE1 / A6 SFE2 (Submerged-arc welding) to Twin-arc

- Assemble in accordance with the instructions accompanying the conversion kit.

6 MAINTENANCE

6.1 General

NB! Before doing any kind of maintenance work, make sure the mains is disconnected.

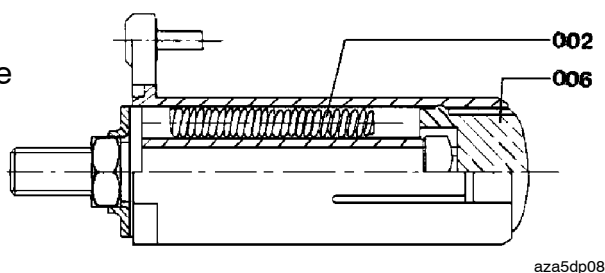
For the maintenance of the A2-A6 Process Controller (PEH), see the instruction manual.

6.2 Daily

- Clean flux and dirt off moving parts of the welding machine.
- Check that the contact tip and all electrical cables are connected.
- Check that all bolted joints are tight and that guides and drive rollers are not worn or damaged.
- Check the brake hub braking torque. It should not be so low, that the wire reel continues to rotate when wire feed is stopped and it should not be so great that the feed rollers slip. As a guide, the braking torque for a 30 kg wire reel should be 1,5 Nm.

Adjusting the braking torque:

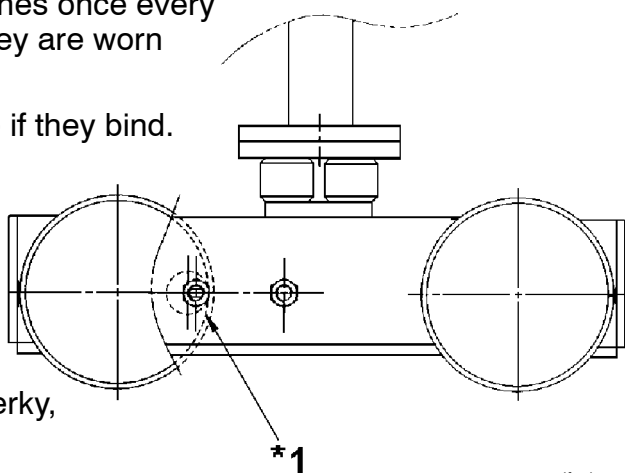
- Set the locking button (006) to the locked position.
 - Insert a screwdriver into the hub springs.
 - Turning the springs (002) clockwise reduces the braking torque.
 - Turning the springs anticlockwise increases the torque.
- NOTE!** Turn the springs by the same amount.



aza5dp08

6.3 Regularly

- Check the wire feed motor brushes once every three months. Replace when they are worn down to 6 mm.
- Examine the slides and lubricate if they bind.
- Inspect the wire guides, drive rollers and contact tip on the wire feed unit. Replace any worn or damaged components, (see spare parts list on page 185).
- If the carriage travel becomes jerky, check that the chain is correctly tensioned. Tension the chain if necessary.
- To tension the chain undo the nut (*1) and turn the cam, then tighten the nut.



dfa4b001

7 TROUBLESHOOTING

- Equipment**
- Instruction manual for control box A2-A6 Process Controller.
 - Operating manual for motor with gear A6 VEC, best nr 443 393.
- Check**
- that the power supply is connected for the correct mains supply
 - that all three phases are supplying the correct voltage (phase sequence is not important)
 - that welding cables and connections are not damaged
 - that the controls are correctly set
 - that the mains supply is disconnected before starting repairs

POSSIBLE FAULTS

1. Symptom **Current and voltage readings show large fluctuations.**

Cause 1.1 Contact jaws or nozzle are worn or wrong size.

Action Replace contact jaws or nozzle.

Cause 1.2 Feed roller pressure is inadequate.

Action Increase pressure on feed rollers.

2. Symptom **Wire feed is irregular.**

Cause 2.1 Pressure on feed rollers incorrectly set.

Action Pressure on feed rollers incorrectly set.

Cause 2.2 Feed rollers wrong size.

Action Replace feed rollers.

Cause 2.3 Grooves in feed rollers are worn.

Action Replace feed rollers.

3. Symptom **Welding cables overheating.**

Cause 3.1 Poor electrical connection.

Action Clean and tighten all electrical connections.

Cause 3.2 Cross-sectional area of welding cables too small.

Action Use cables with a larger cross-section or use parallel cables.

8 ORDERING OF SPARE PARTS

Spare parts are ordered through your nearest ESAB representative, see back cover. When ordering spare parts, please state machine type and number as well as designation and spare part number as shown in the spare parts list on page 189. This will simplify dispatch and ensure you get the right part.

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