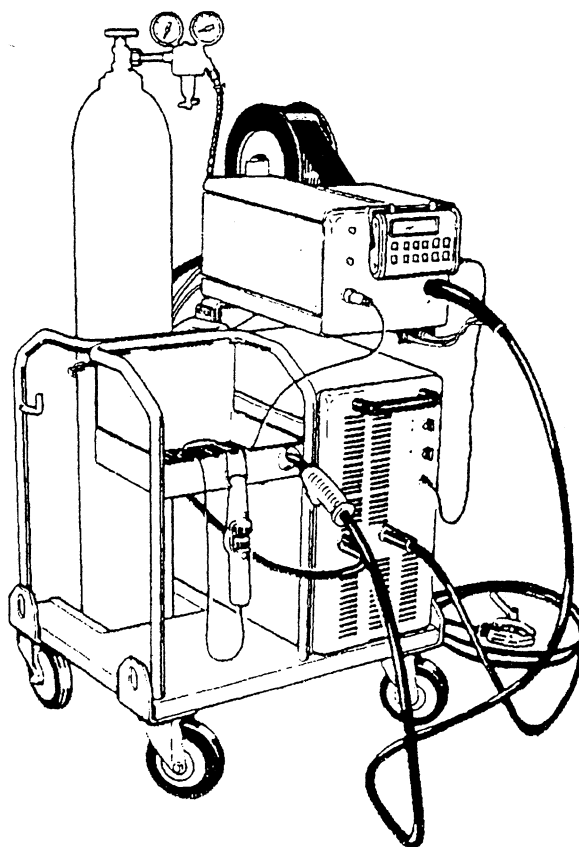


MED 44 Aristo

Wire feed unit



Service manual

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Note that the page numbering in the instructions and in this service manual are not the same, and that a number of pages in the instructions are omitted as this service manual contains only the English text.

CONTENTS, INSTRUCTIONS MED 44 Aristo

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INTRODUCTION

This service manual is intended for use by technicians with electrical training, for assistance when fault-tracing and repairing the equipment.

A copy of the User Instructions is included at the end of the manual for help in understanding operation of the wire feed unit.

This manual contains details of all design changes up to and including August 1993.

The manual is structured so that faults in the wire feed unit can be found quickly and easily.

Use the schematic and wiring diagrams in the manual when fault-tracing. The components shown in the connection diagram are identified in a list on pages 6 and 7.

Rights reserved to alter specifications without notice



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 MANUFACTURER'S 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 flammable materials nearby.

MALFUNCTION

- Call for expert assistance in the event of malfunction.

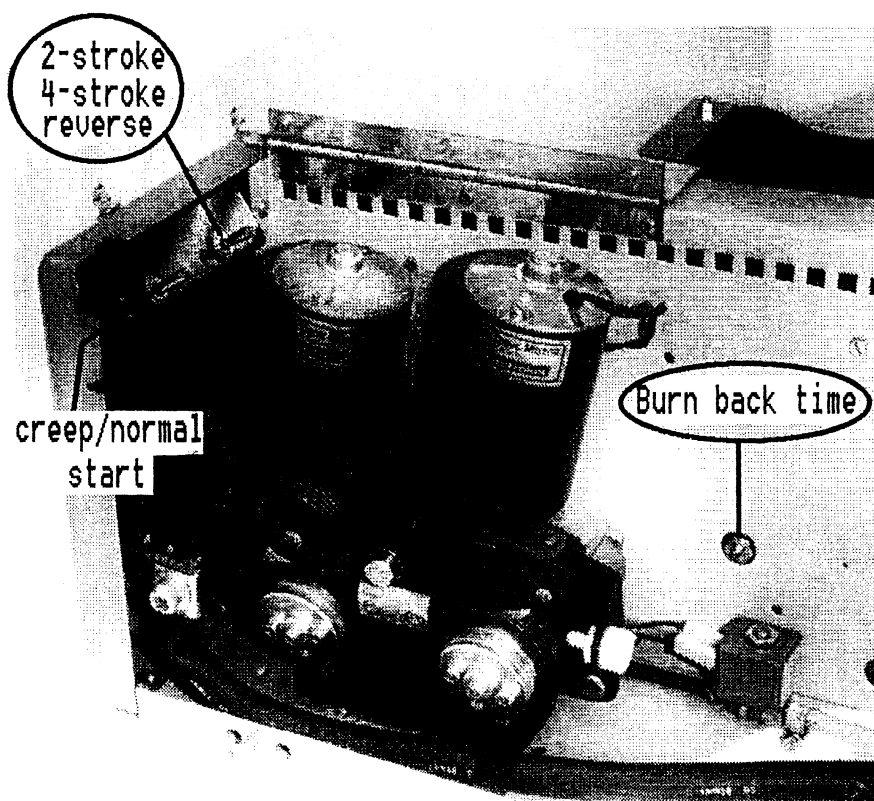
**READ AND UNDERSTAND THE INSTRUCTION MANUAL
BEFORE INSTALLING OR OPERATING THE EQUIPMENT**

PROTECT YOURSELF AND OTHERS!

SETTINGS AND ADJUSTMENTS

- 2-stroke: The arc strikes when the torch trigger switch is pressed, and is extinguished when the trigger switch is released.
- 4-stroke: The trigger switch does not have to be held depressed to keep the arc alight. A first press and release of the switch strikes the arc, and a second press and release extinguishes it.
- Creep start: The wire is fed forward at 45% of the set speed until the arc strikes, after which the speed increases to the set speed.
- Normal start: The wire is fed forward at normal speed from the start.
- The back-burn time is adjustable between 20 and 500 ms. As delivered, the back-burn time is set at 100 ms.
- The potentiometers for gas pre-flow and post-flow are mounted on the rear plate. The times can be adjusted between zero and five seconds.
- Pushbuttons for manual gas pre-flow and wire feed are fitted on the front plate.

The back-burn time can be adjusted by means of the potentiometer beneath the cover of the unit, as shown in the picture below.



Switches for 2/4-stroke operation and Creep/Normal start, together with the back-burn time adjustment potentiometer.

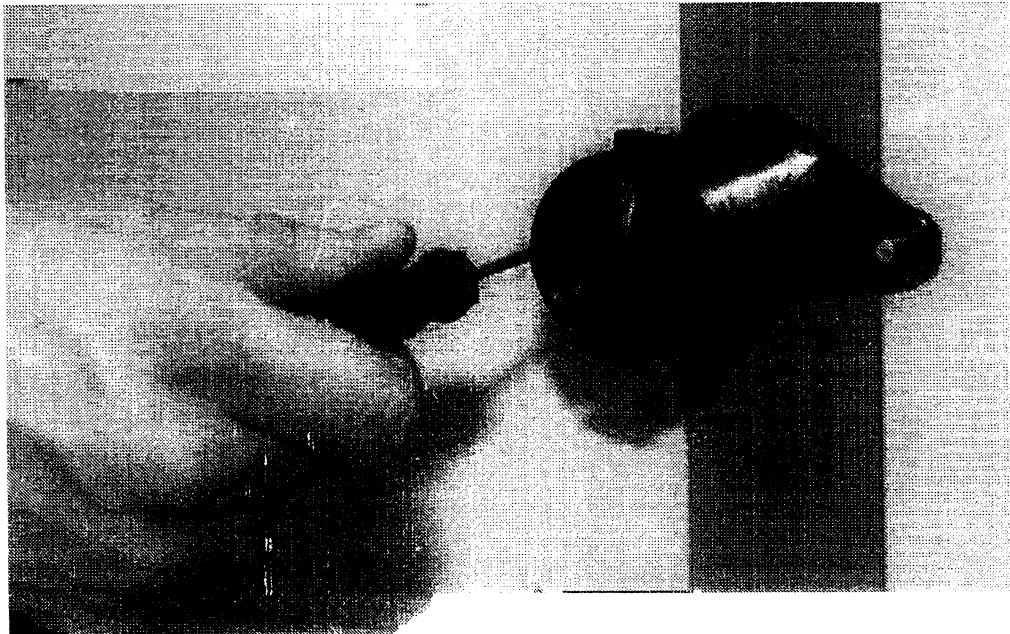
cny0ap05

ADJUSTING THE BRAKE HUB

- Adjust the pressure rollers so that the wire is fed forward smoothly without slipping.
- Adjust the brake hub so that the wire is slightly slack when wire feed stops.

Adjust the braking power by means of the two screws (springs) inside the hub on each side of the mechanism securing the wire bobbin.

Turn the adjustment screws clockwise to reduce the braking power.



cny0ap12

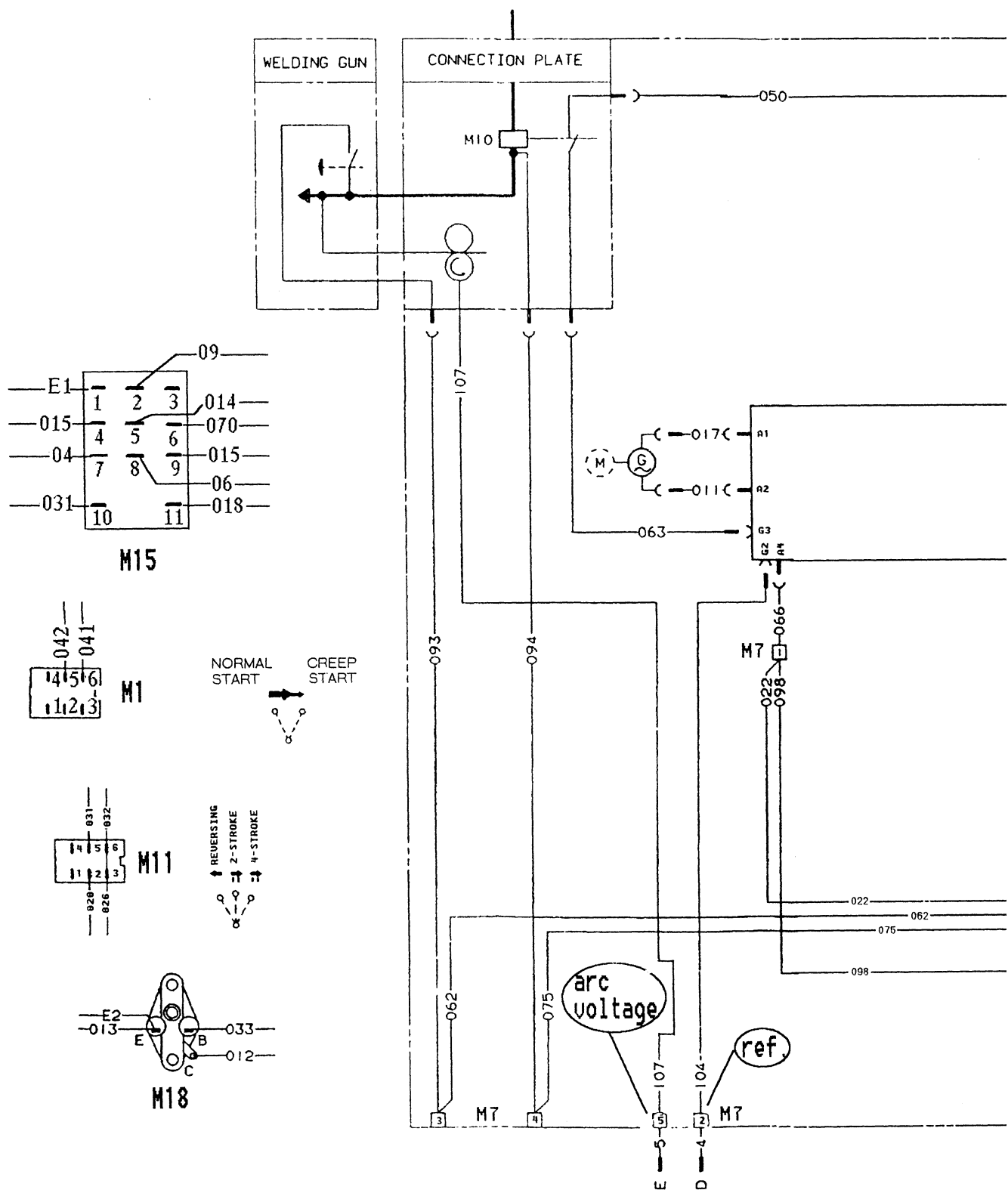
Adjusting the brake hub.

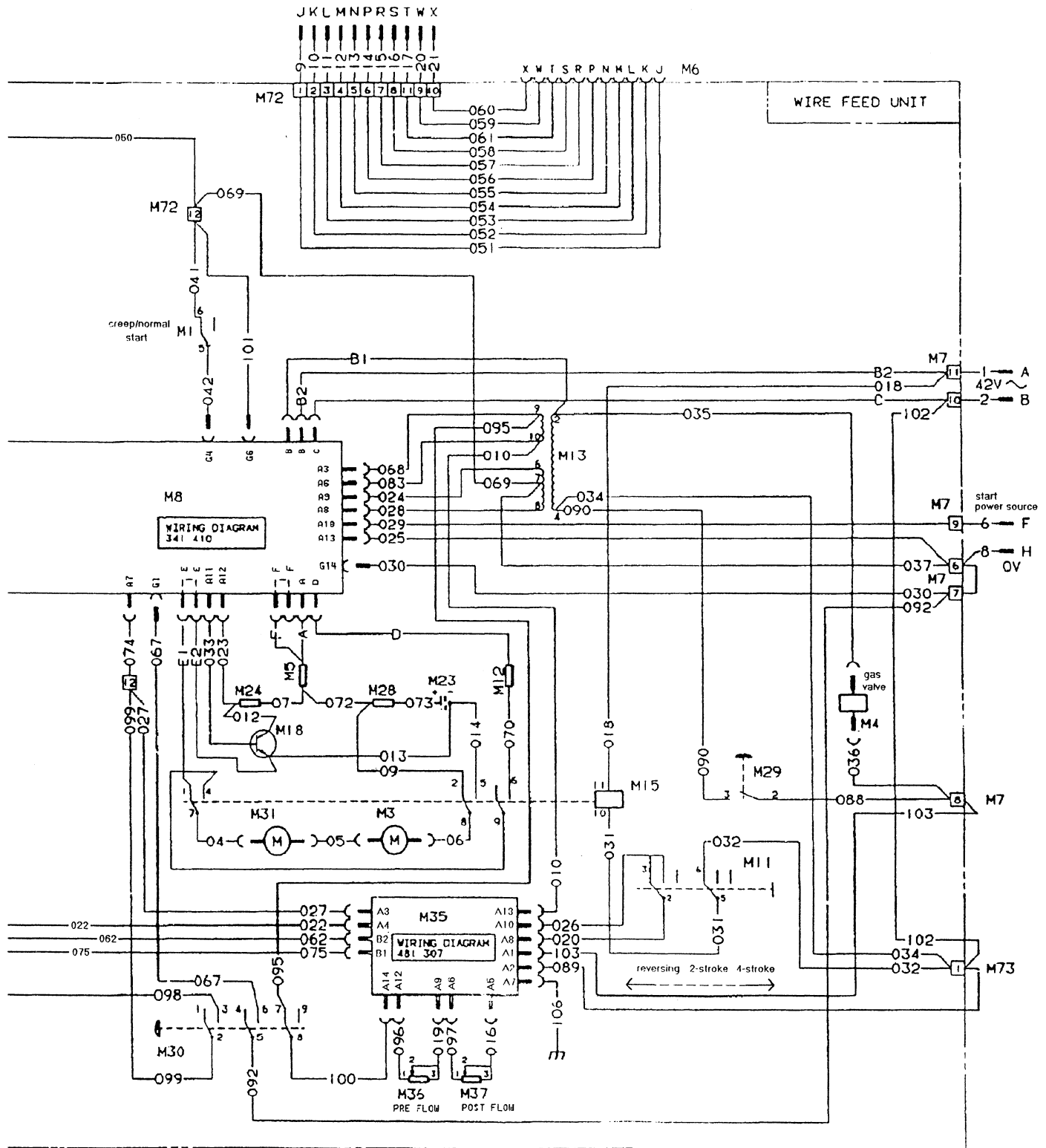
COMPONENT DESCRIPTION, MED 44A

- G** Tachometer, mounted on motor M31. see description on page 15 item 3.
- M1** Selector switch, Creep/Normal start.
- M3** Motor, 12 V.
- M4** Solenoid valve, 42 V AC, for welding gas.
- M5** Resistor (for limiting starting and braking current), 0.3 Ω 50 W.
- M6** 23-pole connector for remote control unit.
- M7** 12-pole terminal block. External connections to the block are as follows:
- 2** Wire speed reference signal from the power unit.
 - 3, 4** Remote start for wire feed unit.
 - 5** Actual value signal of arc voltage, to power unit.
 - 6, 7** Electronic neutral, connected to welding circuit negative at the power unit.
 - 9** Start power unit.
 - 10,11** 42 V AC power supply from the power unit.
- M8** Circuit board for electronic control of the motor and of the back-burn time. See description on page 14 .
- M10** Current relay: operates when welding currents exceeds 20 A.
- M11** Selector switch. 2-stroke/4-stroke control mode and reversing.
- M12** Resistor, 0.75 Ω 50 W, to limit starting current when reversing the wire feed motor.
- M13** Transformer. Primary voltage 42 V, secondary 19-0-19 V and 19 V.
- M15** Relay, for Normal/Reversing changeover.
- M18** Braking transistor. Not fitted to machines with serial numbers 147 and above. See also item 9 on page 18 .
- M23** Smoothing capacitor, 2200 μ F 100 V.
- M24** Current limiting resistor for transistor M18, 0.75 Ω 50 W. Not fitted to machines with serial numbers 147 See also item 9 on page 18 .
- M28** Current limiting resistor for smoothing capacitor M23, 0.5 Ω 50 W.
- M29** Control switch, gas purge (manual).
- M30** Control switch, wire inching.
- M31** Motor 12 V, with tachogenerator (G).
- M35** Circuit board with gas pre-flow and post-flow control circuitry and 2-stroke and 4-stroke control mode circuitry. See description on page 21 .
- M36** Potentiometer, 500 k Ω 2 W, for adjustment of gas pre-flow time over range 0-5 seconds.

- M37** Potentiometer, 500 k Ω 2 W, for adjustment of gas post-flow time over range 0-5 seconds.
- M72** 12-pole terminal block, for connection of remote control unit to power unit.
- M73** 2-pole terminal block.

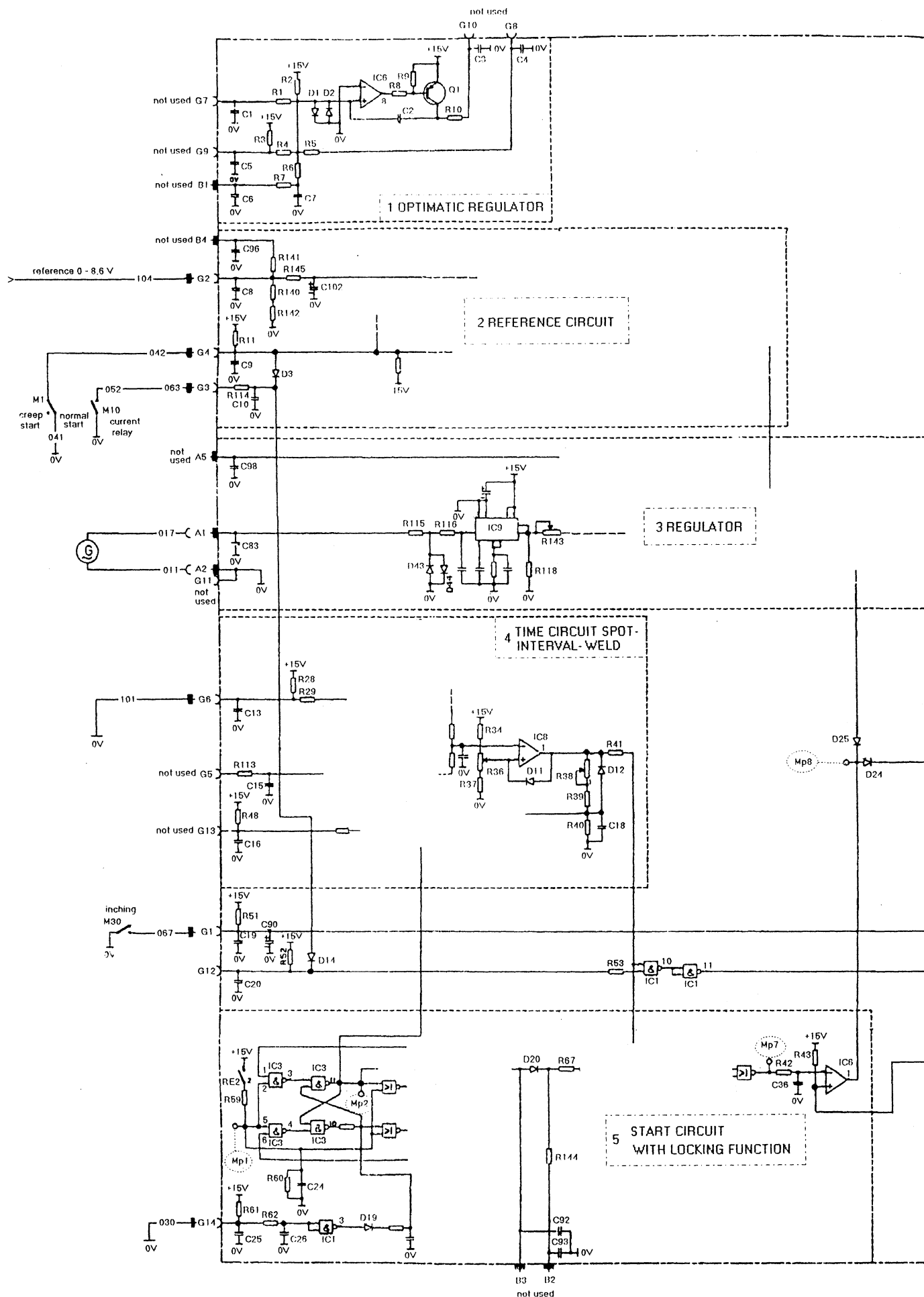
CONNECTION DIAGRAM, MED 44A

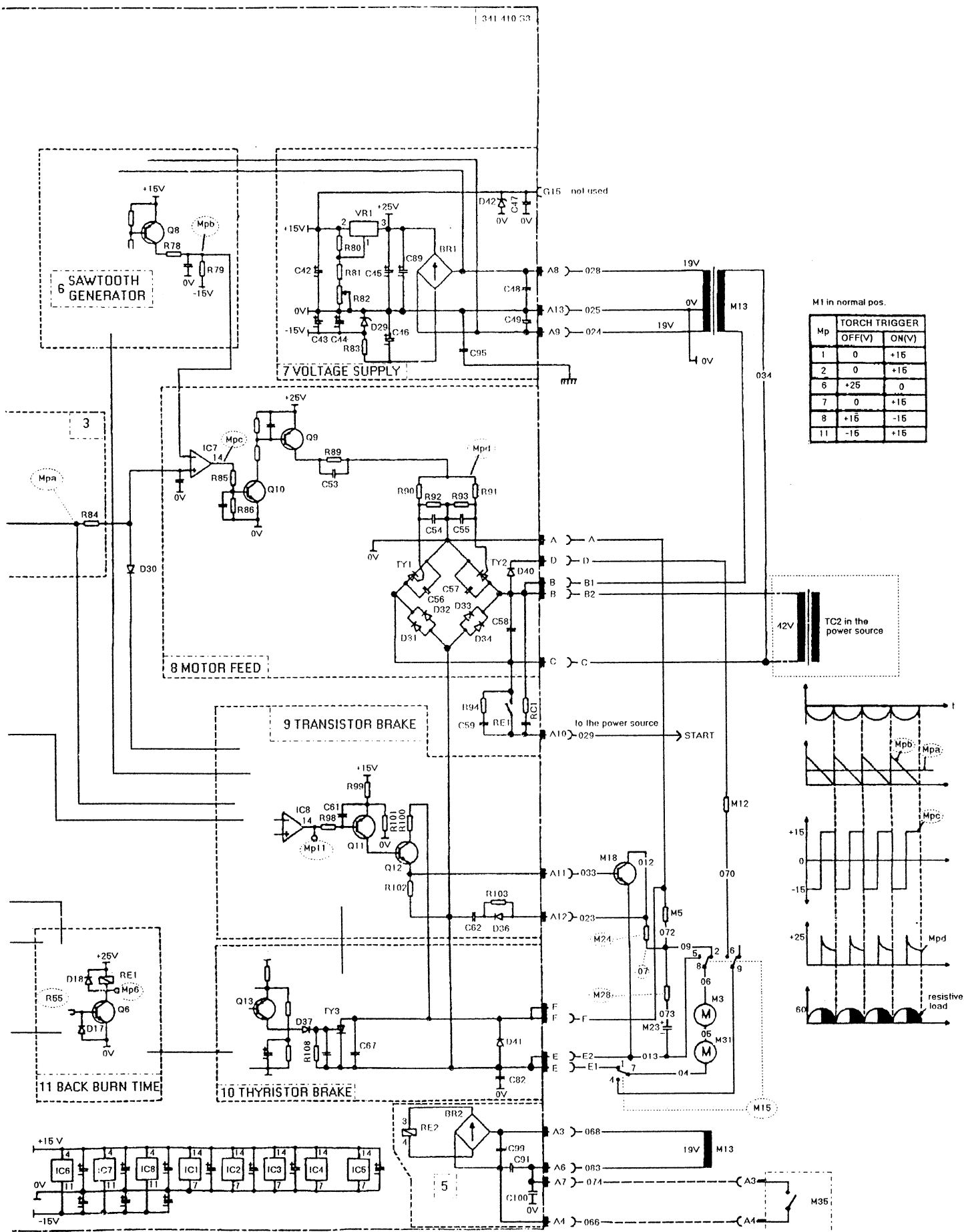




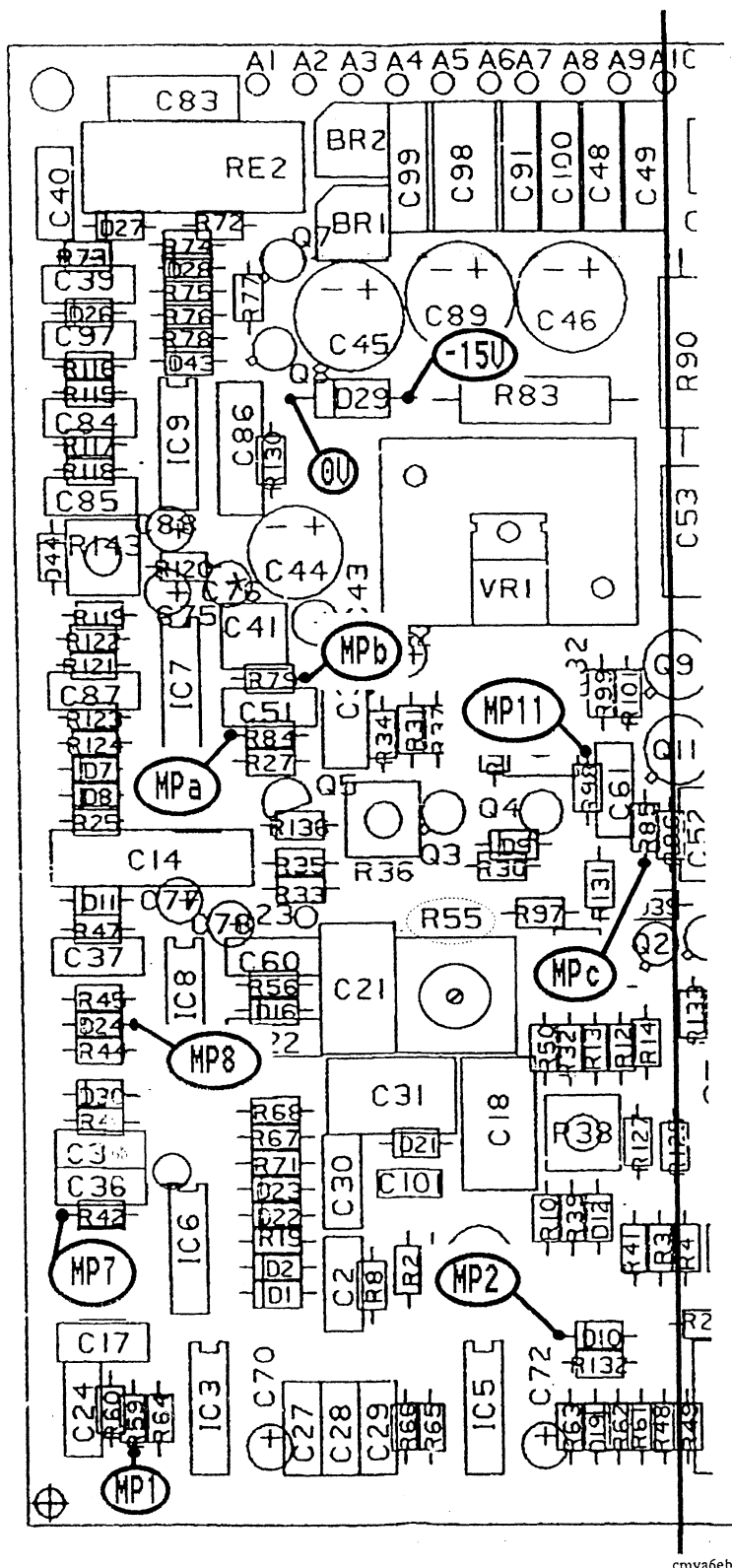
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CIRCUIT DIAGRAM, CIRCUIT BOARD M8

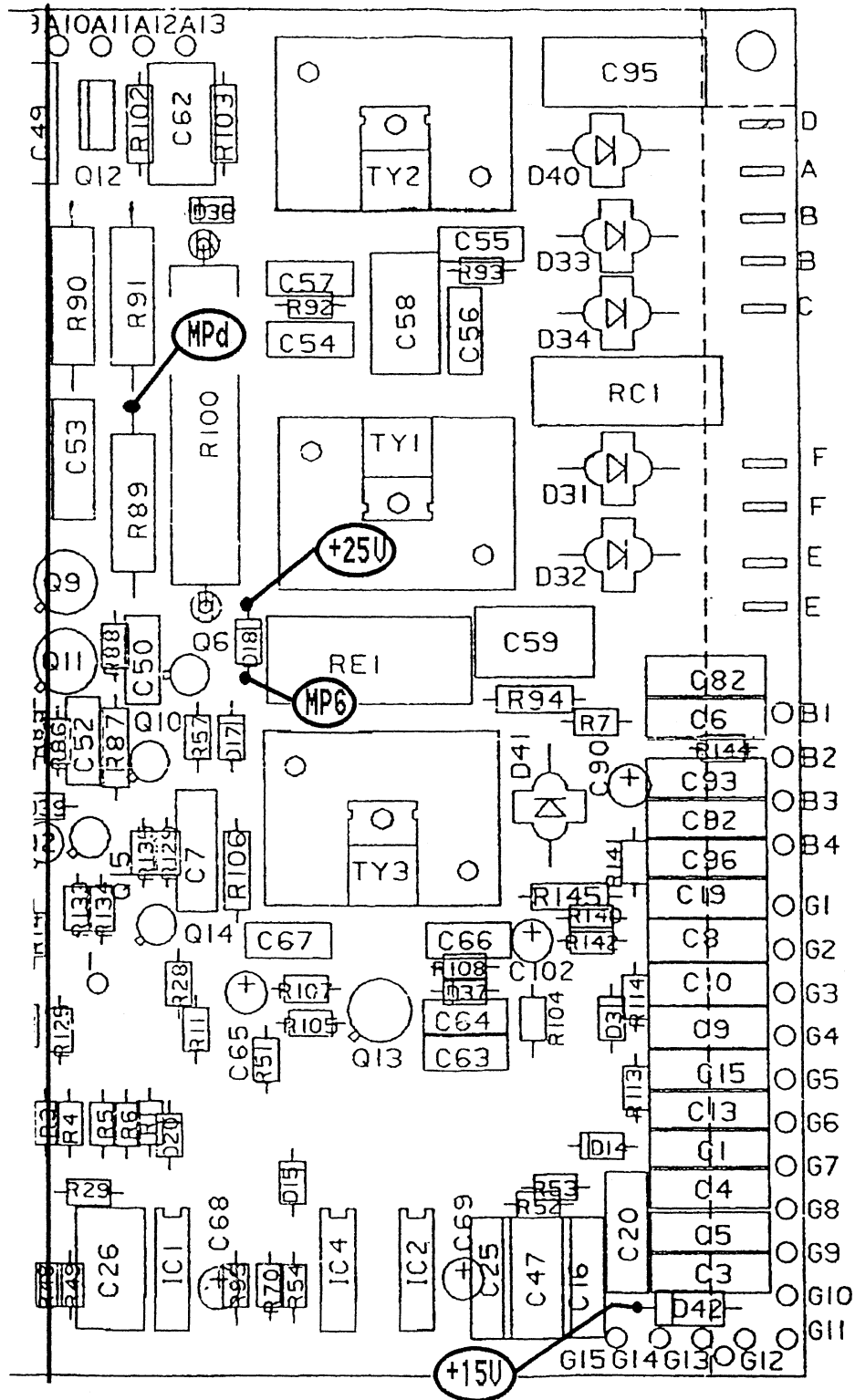




COMPONENT POSITIONS, CIRCUIT BOARD M8



cmva6eba



cmva6ebb

METHOD OF OPERATION, CIRCUIT BOARD M8

Circuit board M8 carries the control electronics for the wire feed unit. The circuit diagram is shown on page 10 , and the component position diagram is shown on page 12 .

The following description, and the circuit diagram, relate only to the components connected to the board's inputs and outputs and to the relevant test points.

The component names used in this description refer to the circuit board and to the connection diagram on page 8 .

The circuit board's inputs and outputs are connected to the following connectors:

A1-A15 Connection points on the circuit board in the 15-pole male plug-and-socket connector.

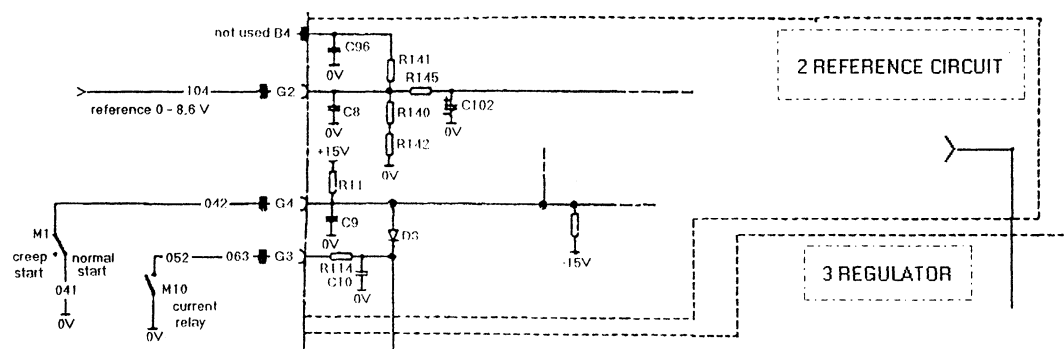
G1-G15 Connection points on the circuit board in the 15-pole female plug-and-socket connector.

B1-B4 Connection points on the circuit board connected to the 9-pole male plug-and-socket connector.

A-F Blade connectors on the circuit board.

1 OPTIMATIC REGULATOR
This function is not used in the MED 44 Aristo.

2 REFERENCE CIRCUIT



cmed0e03

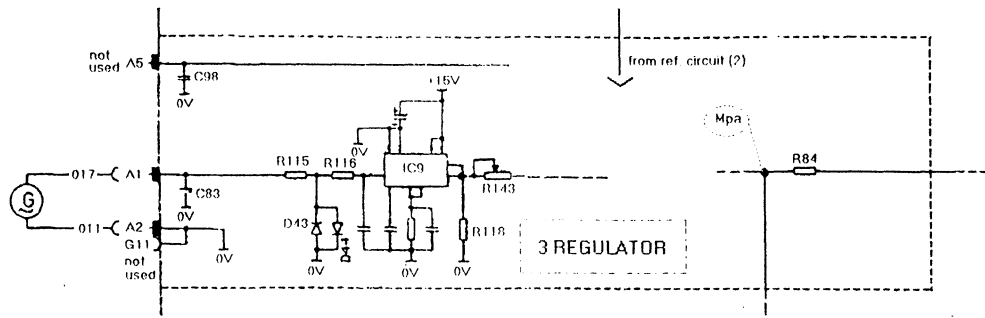
The reference voltage from the power unit is connected to the board via input G2. The voltage can vary between 0 and +8.6 V, with 8.6 V being equivalent to a wire feed speed of 22 m/min.

When selector switch M1, which is connected to G4, is in the Normal Start position, the voltage at G4 is 0 V.

When the switch is in the Creep Start position, the reference voltage to the regulator (3) is reduced to about 45% of the set value. When the arc strikes, current relay M10 closes, pulling the voltage at G3 down to 0 V and allowing the reference voltage signal to return to its normal value.

3

REGULATOR



cmed0e04

An AC tachogenerator is connected to drive motor M31. Output frequency is 588 Hz at a wire feed speed of 18 m/min.

The signal from the tachogenerator is connected to A1 and A2. Frequency is converted to voltage and adjusted by resistor R143. Signal value at 588 Hz is -1.8 V. This voltage can be measured at terminal A5.

The regulator compares the actual value signal with the set value signal, producing an output signal between -15 V and +15 V depending on the magnitude and direction of the error between the actual value signal and the set value signal.

The speed reference signal can be measured at test point Mpa.

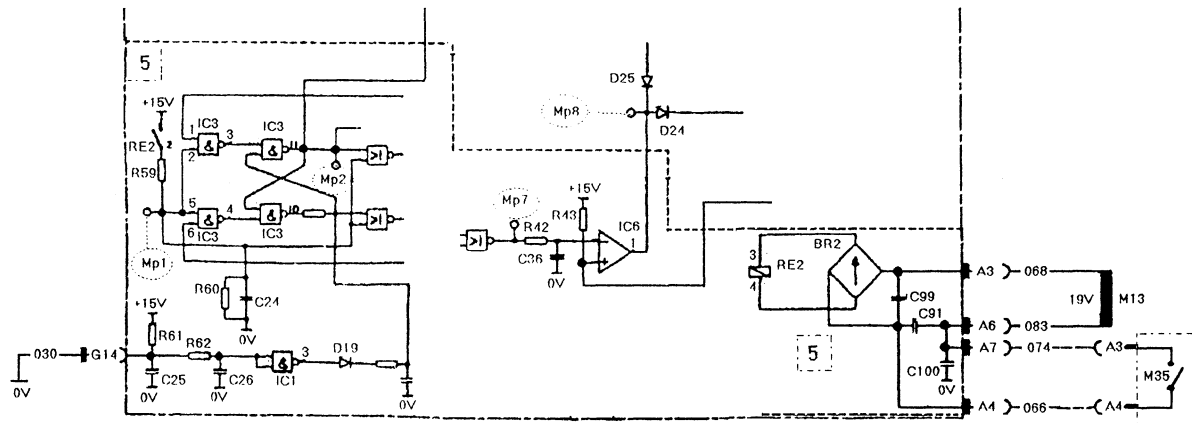
4

TIMER CIRCUIT FOR SPOT AND INTERVAL WELDING

This function is not used in the MED 44 Aristo.

5

STARTING CIRCUIT WITH LOCKOUT FUNCTION



cmed0e05

Rectifier BR2 is supplied at 19 V from control power transformer M13.

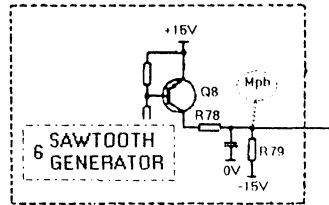
When the relay contact on circuit board M35 closes, RE2 operates, producing a voltage of +15 V at test points Mp1 and Mp2.

The starting circuit also incorporates a lockout function that blocks firing pulses to the main thyristors before the braking thyristor has turned off after a restart.

The lockout function is released when the voltage at test point Mp7 is +15 V and that at test point Mp8 changes from +15 V to -15 V.

6

SAWTOOTH GENERATOR

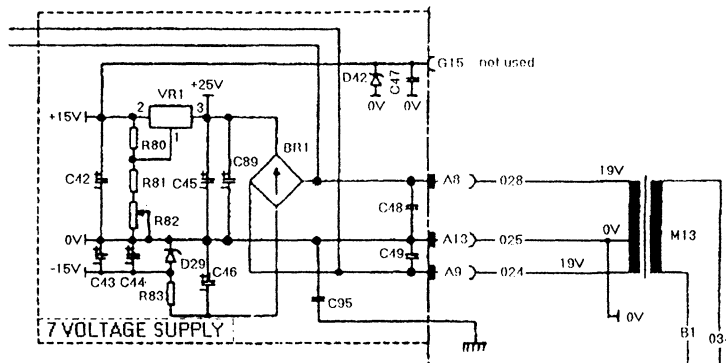


cmed0e06

The sawtooth generator produces a sawtooth waveform in synchronism with the mains frequency. It can be measured at test point Mpb.

7

POWER SUPPLY

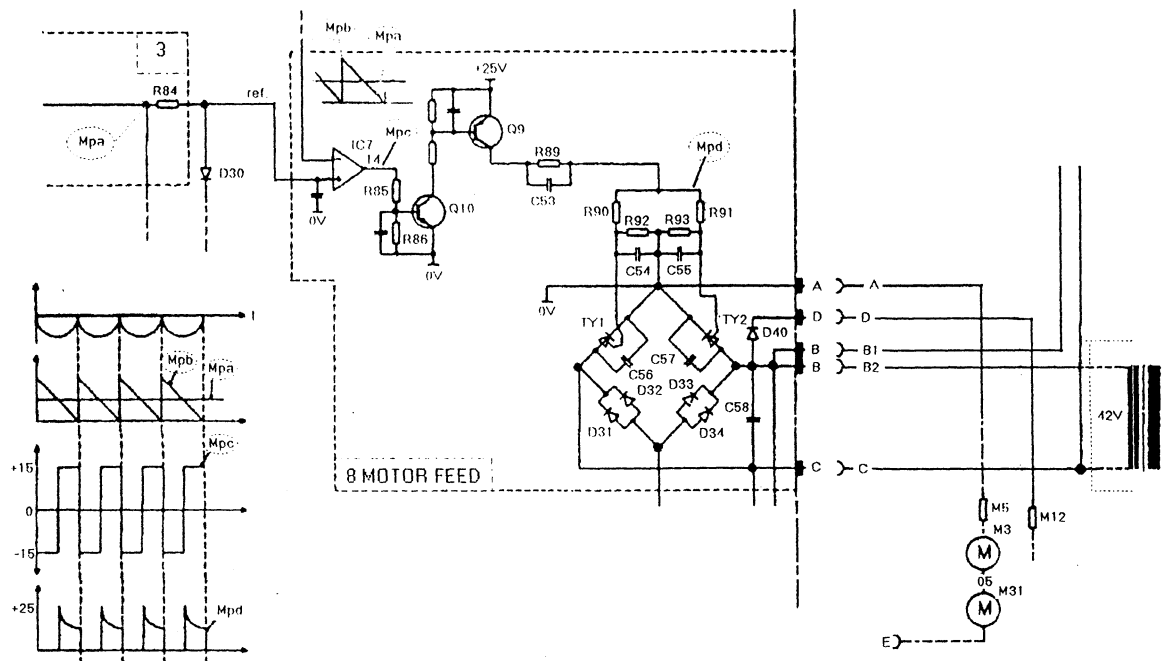


cmed0e07

The power supply unit supplies the circuit board with +25 V and 15-0-15 V. Rectifier BR1 is supplied at 19-0-19 V from control power supply transformer M13. Voltage regulator VR1 produces a +15 V supply, adjustable by means of potentiometer R82.

Resistor R83 and zener diode D29 supply the circuit board at -15 V.

The electronic neutral is connected to the negative side of the welding circuit at the power unit via connection A13.



cmed0e08

Thyristors TY1 and TY2 and diodes D31 - D34 form a phase-controlled rectifier bridge for speed control of the wire feed motors. The bridge receives a 42 V supply via connections B and C. The motors are connected to A via current-limiting resistor M5 and to connector E.

The thyristors' firing angle is controlled by comparing the reference signal from the speed regulator with the sawtooth waveform voltage in comparator IC7. When the reference signal voltage exceeds the sawtooth waveform voltage, the voltage at test point Mpc switches from -15 V to +15 V. Firing pulses are supplied to the thyristors via transistors Q8 and Q10, and can be measured at test point MPd, at the common point of resistors R90 and R91.

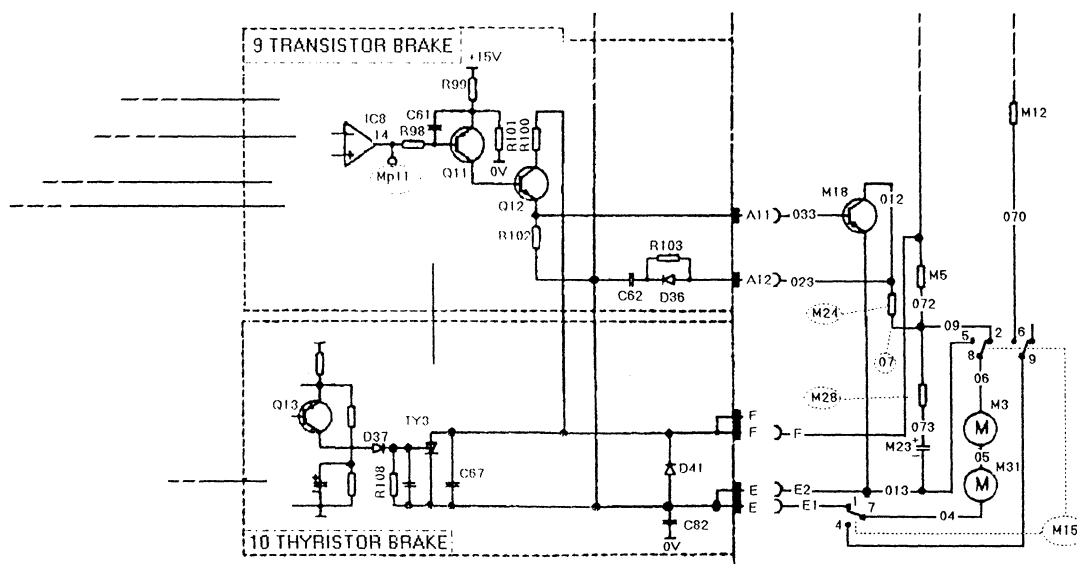
At a wire feed speed of 10 m/minute, the sum of the armature voltage of the motors is $20.5 \text{ V} \pm 2 \text{ V}$, and the drive roller speed is $66 \pm 5 \text{ r/min}$. At the maximum wire feed speed of 22 m/minute, the sum of the armature voltages is $42.5 \pm 2 \text{ V}$ and the drive roller speed is $145 \pm 5 \text{ r/min}$. Measure the voltages between conductor E1 and conductor 072, see the diagram on page 18.

TRANSISTOR BRAKE

The dynamic braking circuit operates if relay RE2 in the starting circuit (5) drops off or if the speed signal reference is altered rapidly.

When dynamic braking is activated, the voltage at test point Mp11 is -15 V. Brake transistor M18 conducts, connecting current-limiting resistor M24 across the motor. At the same time, the speed control regulator is also locked out, so that the thyristors do not receive any firing pulses.

Transistor M18 and braking resistor M24 have not been fitted in units with serial numbers of 147 and above. This is because the transistor brake is only used when the interval welding function is activated. As this function is not used in the MED 44 Aristo, there is no use for transistor M18.

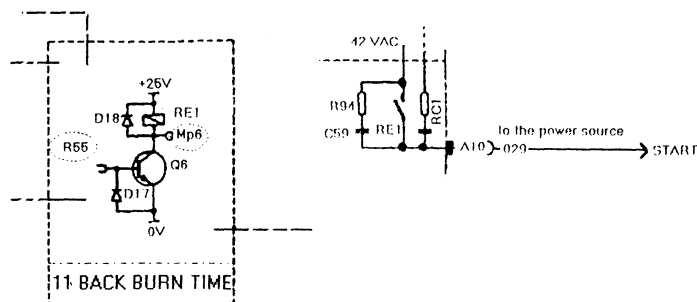


cmed0e09

THYRISTOR BRAKE

The thyristor brake operates if relay RE2 in the starting circuit (5) drops off

When thyristor TY3 fires, it short-circuits the wire feed motors via current limiting resistor M5. At the same time, the speed control regulator is also locked out, so that thyristors TY1 and TY2 do not receive any firing pulses.



cmcd0e10

The voltage at test point Mp6 is pulled down to 0 V when the wire feed unit is activated. This allows relay RE1 to operate, closing the welding current contactor in the power unit.

When wire feed stops, potentiometer R55 controls the discharge of a timer circuit, connected to the base of transistor Q6, which provides a seal-in circuit for relay RE1. When the voltage has fallen to the cut-off voltage, transistor Q6 turns off and relay RE1 opens.

Potentiometer R55 controls the back-burn time between 20 and 500 ms. This time is set to 100 ms when the unit is delivered from the factory. The potentiometer is accessible through a hole in the barrier plate in front of the wire bobbin: see the picture on page 4 .

KRET SKORT 481306-880



METHOD OF OPERATION, CIRCUIT BOARD M35

This circuit board complements circuit board M8, and contains the following functions:

Start/stop, two-stroke/four-stroke, gas pre-flow and gas post-flow.

The test points referred to below are marked in the diagram by 'Mp', and can be found in the circuit diagram and component position diagrams. Component positions are shown on page 23 .

1 POWER SUPPLY

Rectifier BR1 is supplied at 19 V from transformer M13 via connections A13 and A14. Capacitor C13 provides a smoothed but unregulated voltage of +25 V, which is used for power supply to relays RE1 and RE2. Zener diode D1 and resistor R1 provide a diode-regulated voltage of +15 V.

2 START/STOP

The welding gun trigger switch is connected to inputs B1 and B2. It makes (ON) or breaks (OFF) a 19 V AC supply to rectifier bridge BR2. The output voltage from BR2 supplies the LED in optocoupler IC1. Operating the trigger switch pulls down the voltage at Mp1 from +15 V to 0 V, while the voltage at test points Mp2 and Mp3 changes from 0 V to +15 V.

With the 2-stroke/4-stroke selector switch in the 4-stroke position, the voltage at test point Mp3 remains at +15 V when the trigger switch is released. Pressing the trigger switch a second time switches Mp3 from +15 V to 0 V.

3 2-STROKE / 4-STROKE

Switch M11, connected to inputs A8 and A10, selects 2-stroke or 4-stroke control mode. When the switch is in the 2-stroke position, the voltage at test point Mp4 is +15 V, while it is 0 V when the switch is in the 4-stroke position.

4 GAS PRE-FLOW

When the welding gun trigger switch is operated, the voltage at test point Mp3 switches to +15 V. Capacitor C17, connected to the non-inverting input of comparator IC4, charges up via R14 and D7. When IC4 switches, the voltage at test point Mp6 switches to +15 V, turning on transistor Q3 and operating relay RE2, which opens the gas valve. At the same time, the 15 V at test point Mp3 charges capacitor C12 via potentiometer M36. This potentiometer is connected to inputs A12 and A9. When the voltage at pin 9 of comparator IC4 has risen to +7.5 V, the output switches from 0V to +15 V (test point Mp5). Relay RE1 is energised via transistor Q2, resulting in a starting signal to circuit board M8 via connections A3 and A4.

The gas pre-flow time is adjustable between 0 and 5 seconds.

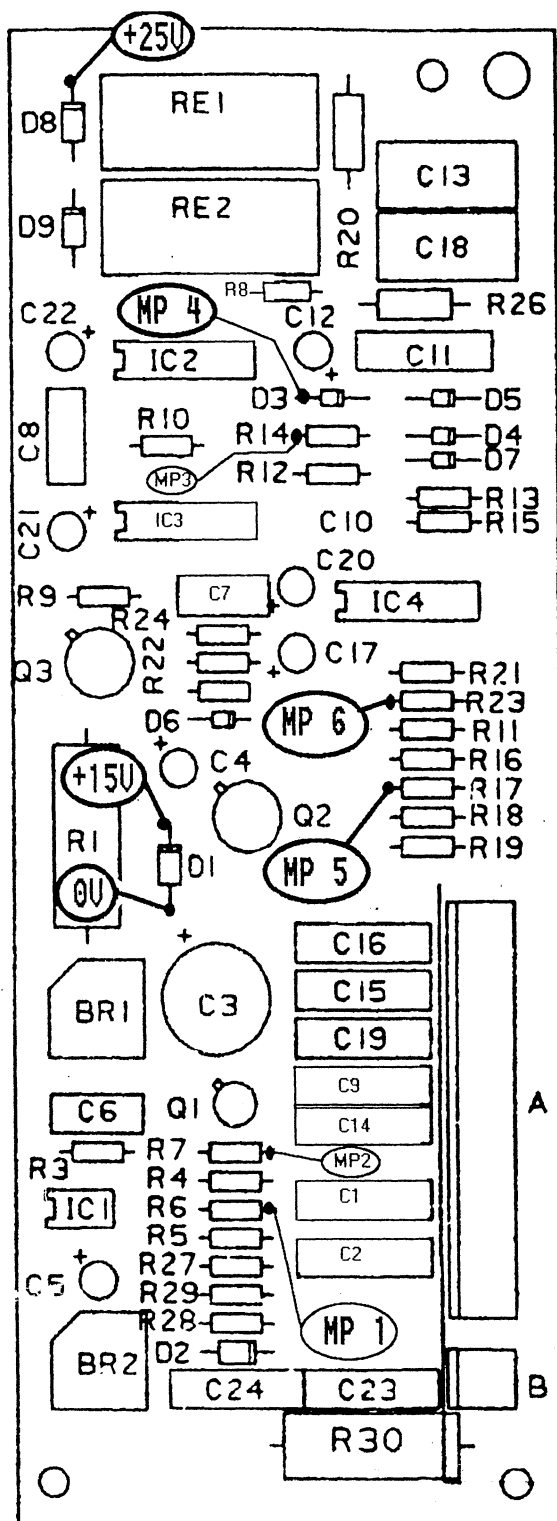
GAS POST-FLOW

When the trigger switch contact closes, the voltage at test point Mp3 changes to +15 V. Capacitor C17 charges up through diode D7 and resistor R14. Comparator IC4 switches, producing an output voltage of +15 V (Mp6), allowing transistor Q3 to conduct and operating relay RE2, which opens the gas valve.

Releasing the trigger switch changes the voltage at Mp3 to 0 V. Capacitor C17 discharges through potentiometer M37. When the voltage at pin 7 of IC4 has fallen to 7.5 V, the comparator switches, producing an output voltage of 0 V (Mp6). Relay RE2 drops off and the gas valve closes.

The gas post-flow time is adjustable between 0 and 5 seconds.

COMPONENT POSITIONS, CIRCUIT BOARD M35



cny0aem5

MED 44

Aristo

Wire feed unit

**Instruction manual and
parts list**

CONTENTS	Page
Technical description	4
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Instructions

General

The Med 44 Aristo is a wire feed unit for MIG/MAG welding included as a component of the Aristo system. Wire feed is achieved with two electronically controlled electric motors which push the wire through the wire guide to the gun—the electric push method.

The wire feed unit can be used with both positive and negative electrode polarity.

The pistol switch can be locked electronically (double action).

Changing heavy wire is made easier as the motors can be reversed allowing the wire to be fed back out of the welding hose.

The wire feed unit has a creep start for soft starts when welding with heavy gauge wires and when welding aluminium.

The following remote control devices can be connected:

ARISTO CONTROL 5 RANGE

For switching between 5 pre-programmed parameter settings, with the capacity for adjusting one parameter (voltage).

ARISTO SYNERGIC CONTROL

With stepless control of the wire feed speed and voltage when using MIG/MAG welding current for MMA and TIG welding.

The wire feed unit is divided into two sections. The first contains the electrical equipment and is covered with a screwed down plate. The second contains the feed unit, shielding gas valve and the connection block for the welding hose. Above the connection block is the electronic locking switch, creep start switch and reversing switch. This section is protected by a lockable cover. The electrode wire is protected from dust and unforeseen damage by a polyester strip.

Technical Description

The wire feed unit is driven by an electric motor with a four roller drive. The drive arrangement consists of two seriesconnected motors each driving a feed roller and a pressure roller. The driving force is evenly shared between the two pairs of rollers. Any slipping due to differences in the diameters of the rollers is evened out by the motors. The pressure rollers are housed in a bogie which is mounted on a shaft. The shaft is placed so that the pressure on each pair of feed rollers is the same. The bogie can easily be removed once the leaf spring is moved aside. There is an intermediate nozzle between the roller pairs which provides additional support for the electrode. The wire feed unit is insulated from the casing.

Control Equipment

The electronic components are mounted on two circuit boards. The boards are retained in place by

clamps and screws. The wiring is connected using spade connectors and multi-pin sockets.

Mounting Alternatives

The Med 44 Aristo can be installed in four different ways: on a swingarm, on a counterbalanced arm, on a trolley or on a suspension unit.

Turning piece

The turning piece is fitted to the rear of the feed unit casing. The wire feed unit is then mounted on the support bracket supplied. This then allows the feed unit to be swung around.

The hub for the wire reel is screwed into holes at the top of the turning piece. There is provision for both 30 and 44 cm reels.

Counterbalanced Arm

The counterbalanced arm keeps the welding hose off the floor and makes the welding gun and hose as near to weightless as possible. The hose is also protected from damage which can easily occur if it lies on the workshop floor. The hose runs in an arm which can be pulled down to a horizontal position or be lifted up next to vertical.

Trolley

The wire feed unit can be equipped with a back plate incorporating an axle with a rubber wheel at each end. This attachment serves as a carriage for the wire feed unit which can then be set up independently of the power source. The trolley is also fitted with two castor wheels under the front plate of the wire feed unit.

Suspension unit

The wire feed unit can be fitted with a suspension unit which allows it to be hung over the workplace. The suspension unit is fitted to the swingarm or to the trolley next to the wire reel hub.

Reel Protection Cap

In order to protect the wire reel a plastic reel guard is available as an optional extra for both 30 and 40 cm reels (see the spare parts list).

Drive Unit

Two permanent magnet DC motors with an integrated worm drives.

Reel Hub

Hub bore	51.5 mm
Hub length	100 mm

Feed Speed

0–22 m/min, infinitely variable

Burn-back Time

When the welding process is interrupted the solenoid valve M4 and the main power source relay remain energised until the feed motor armatures come to rest. This prevents the electrode from sticking to the workpiece.

Adjustable between 20–500 ms. (Set at 100 ms on delivery)

Gas Pre/Post Purge

Gas pre/ post purge can be adjusted between 0–5 seconds. The potentiometers are placed on the rear plate.

Front Panel

On the front panel are buttons for manual gas pre-purge and cold wire feed.

There is also a socket to allow fitting of the adaptor set for the A9E gun.

Dimensions and Weight

Length 456 mm
Width 323 mm
Height 254 mm
Weight 20 kg

Installation

Connection

Voltage: 42 V, 50–60 Hz

Welding current: The welding cable connector is attached to the connection block with an M10 bolt.

Control connections: The cable is 23 core with a 23 pin connector which is connected to the welding rectifier.

Remote control: On the front of the wire feed unit is a 23 pin socket for remote control to which the remote control devices are connected.

Gas connections: Hose nipple 6 mm.

Welding gun: Common connection at the connection block for welding current, control current, shielding gas and wire feed.

Welding wires	Ø mm
Steel	0.8–2.4
Aluminium, type 18 13 or harder	1.0–2.4
Stainless	0.8–1.6
Cored electrode	0.9–3.2

Feed rollers

The rollers are tooothed for four wheel drive.

There are four types of feed roller

Feed roller no. 1

for solid wire

Feed roller no. 2

for solid wire

Feed roller no.3

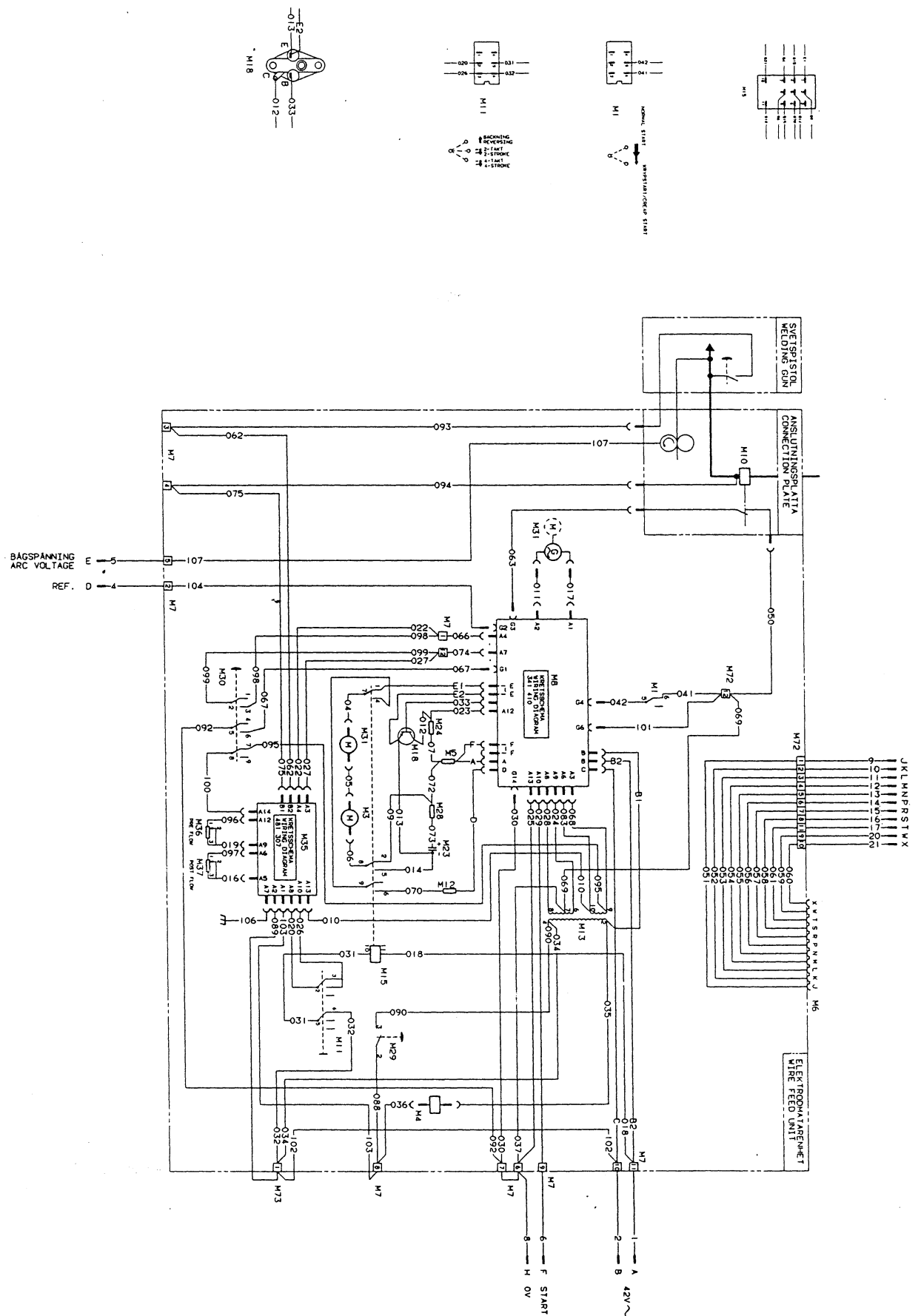
for cored electrode

Feed roller no. 4

for cored electrode

Nozzles (see page 21)

Kretsschema
Circuit diagram
Schaltplan
Schéma électrique



Reservdelsförteckning
Spare parts list
Ersatzteilverzeichnis
Liste de pièces détachées

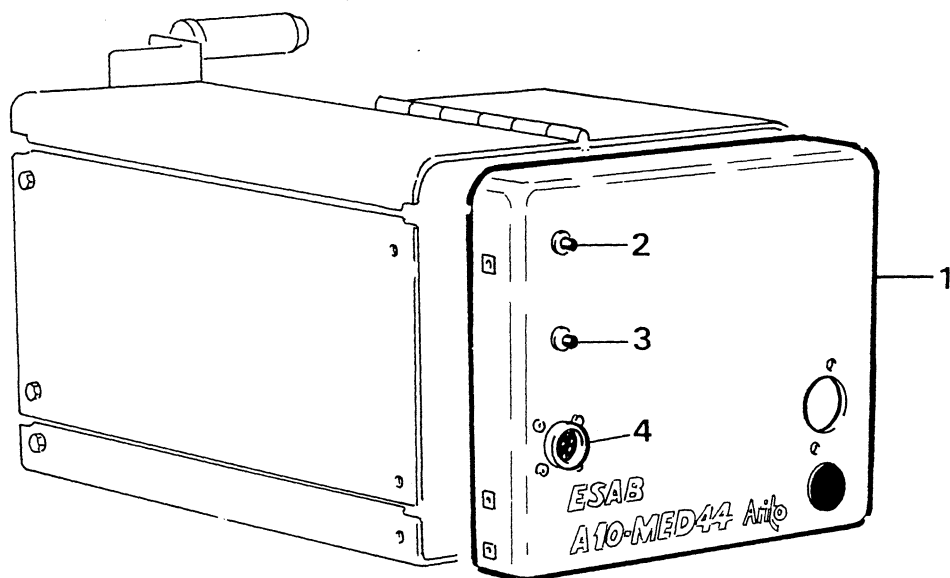
Reservdelar beställas genom närmaste ESAB-representant, se sista sidan. Vid beställning v.v. uppgi typ och tillverkningsnummer samt benämningar och beställningsnummer enl. reservdelsförteckningen.

Spare parts are to be ordered through the nearest ESAB agency as per the list on the back of the cover. Kindly indicate type of unit, serial number, denominations, and ordering numbers acc. to the spare parts list.

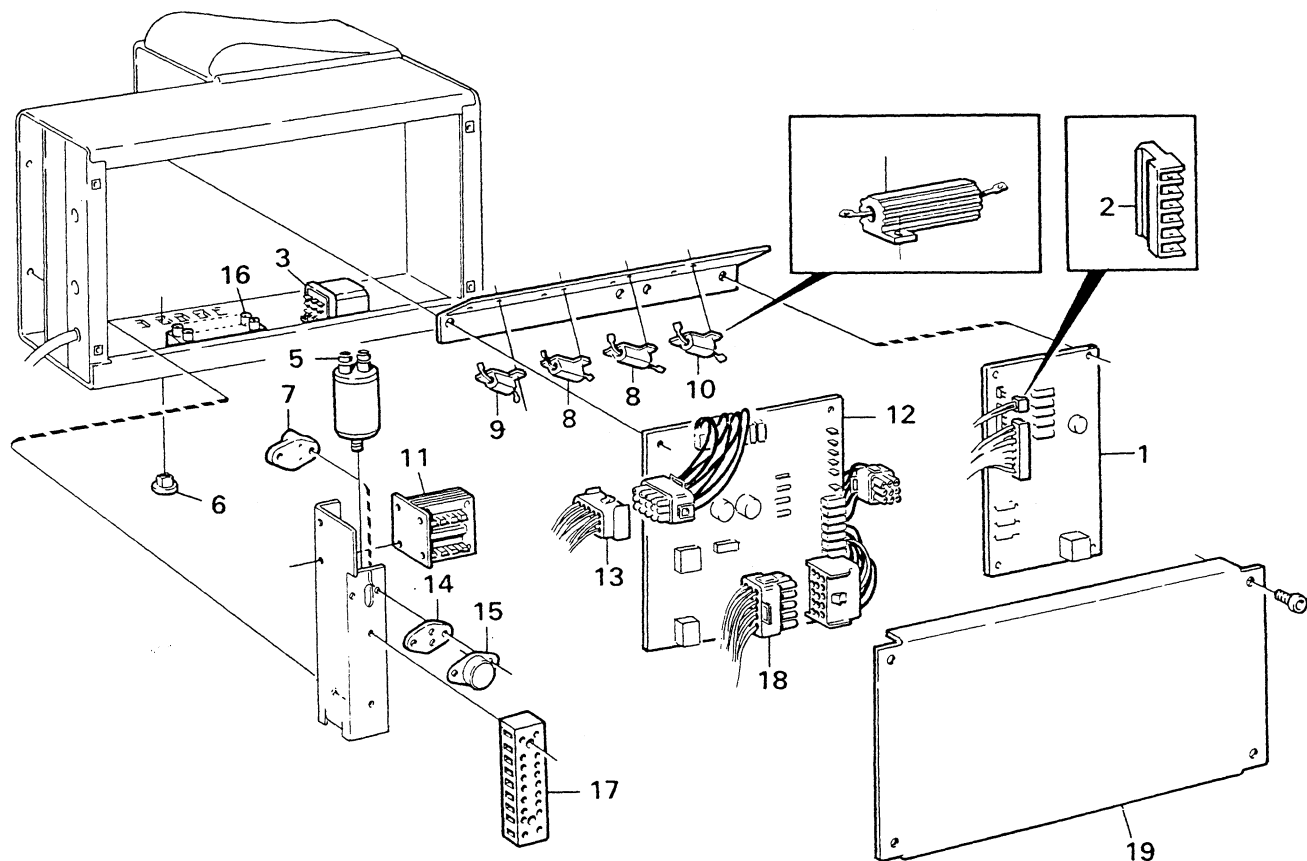
Die Ersatzteile können bei der nächsten ESAB-Vertretung bestellt werden, siehe letzte Seite. Bitte geben Sie Typenbezeichnung und Herstellnummer sowie Bezeichnungen und Bestellnummern lt. Ersatzteilverzeichnis an.

Au dos de la brochure, vous trouverez l'adresse du représentant ESAB le plus proche. Prière de lui adresser votre commande, après avoir pris le soin de mentionner le type et le numéro de série de l'unité ainsi que le numéro de commande et la désignation conformément à la liste de pièces détachées.

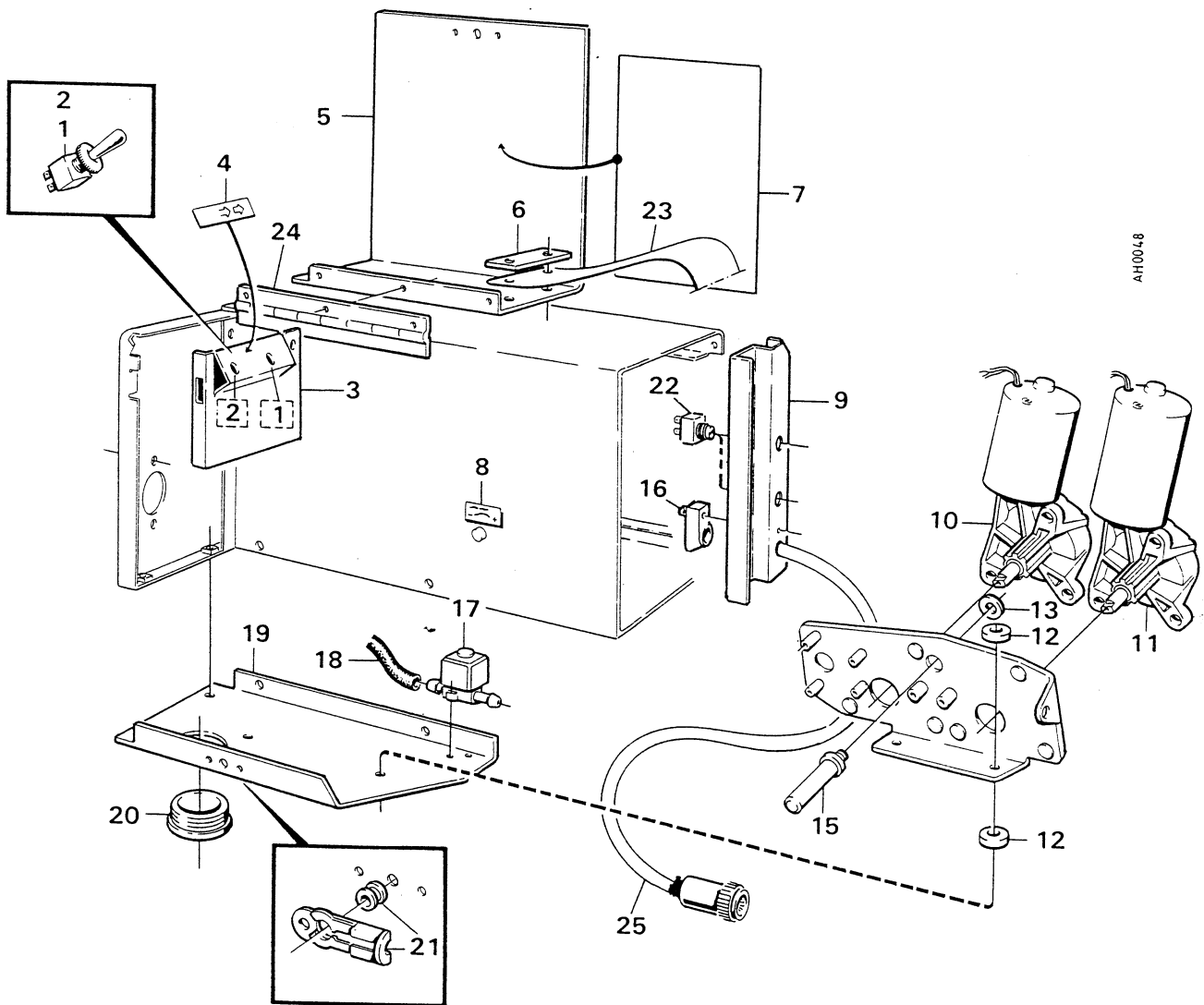
Pos nr Item no. Pos Nr. No. de ref.	Ant Qty Anz Qte	Best nr Ordering no. Bestellnr. No. de commande	Benämning	Denomination	Bezeichnung	Désignation	Anm Remarks Anm. Remarques
M1	1	147 866-001	Strömställare	Switch	Schalter	Interrupteur	MTG 205 N
M3	1	156 728-008	Elektrodm. motor	Elektr. feed mot.	Elektr.- Vorschubmotor	Moteur d'alimentation	12 V
M4	1	193 054-002	Magnetventil	Solenoid valve	Magnetventil	Electrovanne	
M5	1	192 579-239	Motstånd	Resistor	Widerstand	Résistance	0,3 ohm 50 W
M6	1	368 544-005	Hylsuttag	Sleeve socketock	Buchsensteckdose	Prise femelle	23-pol
M7	1	5231 041-05	Apparatplint	Connection block	Klemmleiste	Bloc de connexion	12-pol
M8	1	341 409-884	Kretskort	PC-board	Platine (Leiterplatte)	Circuit imprimé	
M9	1	192 784-016	Hylspropp	Sleeve plug	Buchsenstecker	Fiche femell	15-pol
M10	1	341 035-880	Kretskort	Printed circuit	Platine (Leiterplatte)	Circuit imprimé	
M11	1	147 866-002	Strömställare	Switch	Schalter	Interrupteur	MTG 206-PA
M12	1	192 579-205	Motstånd	Resistor	Widerstand	Résistance	0,75 ohm 50 W
M13	1	319 828-003	Transformator	Transformer	Trafo	Transformateur	
M15	1	192 854-001	Relä	Relay	Relais	Relai	CTA
M18	1	146 166-005	Transistor	Transistor	Transistor	Transistor	2N5886
M23	1	192 903-033	Kondensator	Capacitor	Kondensator	Condensateur	2200 UF 100 V
M24	1	192 579-205	Motstånd	Resistor	Widerstand	Résistance	0,75 ohm 50 W
M25	1	192 784-015	Stiftpropp	Pin plug	Stiftstecker	Fiche mâle	15-pol
M28	1	192 579-204	Motstånd	Resistor	Widerstand	Résistance	0,5 ohm 50 W
M29	1	193 483-002	Strömställare	Switch	Schalter	Interrupteur	2-pol
M30	1	193 483-001	Strömställare	Switch	Schalter	Interrupteur	3-pol
M31	1	156 728-006	Elektrodm. motor	Elektr. feed mot.	Elektr. Vorschubmotor	Moteur d'alimentation	12 V
M35	1	481 306-880	Kretskort	PC-board	Platine (Leiterplatte)	Circuit imprimé	
M36	1	191 870-228	Vridmotstånd	Rheostat	Drehwiderstand	Rhéostat	500 K 2 W
M37	1	191 870-228	Vridmotstånd	Rheostat	Drehwiderstand	Rhéostat	500 K 2 W
M72	1	193 045-011	Plint	Connection block	Klemmleiste	Bloc de connexion	12-pol
M73	1	193 045-001	Plint	Connection block	Klemmleiste	Bloc de connexion	2-pol



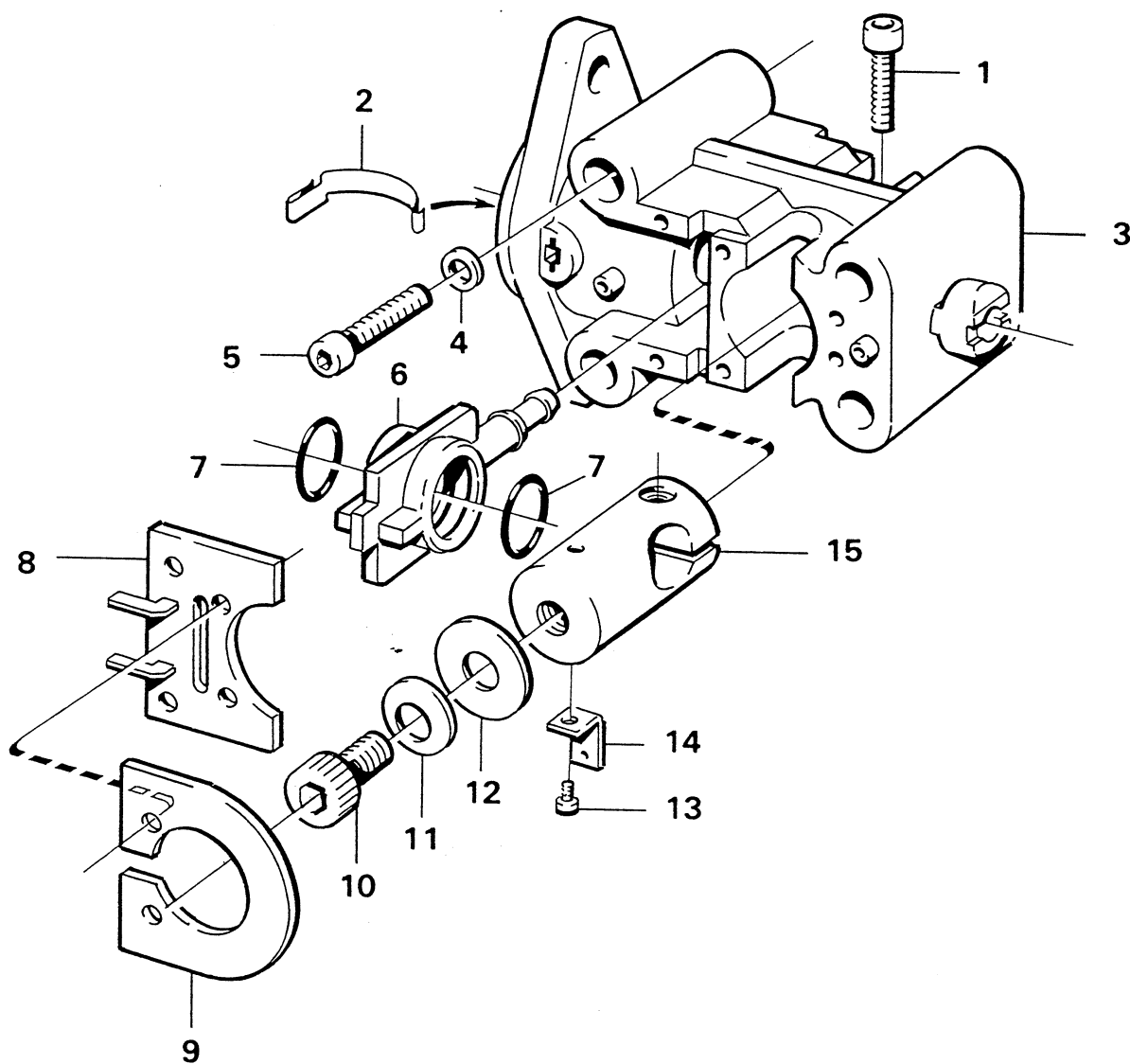
Pos nr Item no. Pos Nr. No. de ref.	Ant Qty Anz Qte	Best nr Ordering no. Bestellnr. No. de commande	Benämning	Denomination	Bezeichnung	Désignation	Anm Remarks Anm. Remarques
1	1	466 529-001	Frontplåt	Front plate	Frontblech	Plaque frontale	
2	1	193 483-001	Strömställare	Switch	Stromschalter	Interrupteur	M30
3	1	193 483-002	Strömställare	Switch	Stromschalter	Interrupteur	M29
4	1	368 544-005	Hylsuttag	Sleeve socket	Hülsenanschluß	Prise femelle	
	10	367 972-005	Hylsa	Sleeve	Hülse	Douille	
5	1	365 942-880	Adaptersats A9E	Adaptor set A9E	Adaptersatz A9E	Adapteur A9E	Tillbehör Accessories Zubehör Option
	1	157 482-880	Bobinskydd	Reel guard	Spulenschutz	Protection de bobine	Tillbehör Accessories Zubehör Option



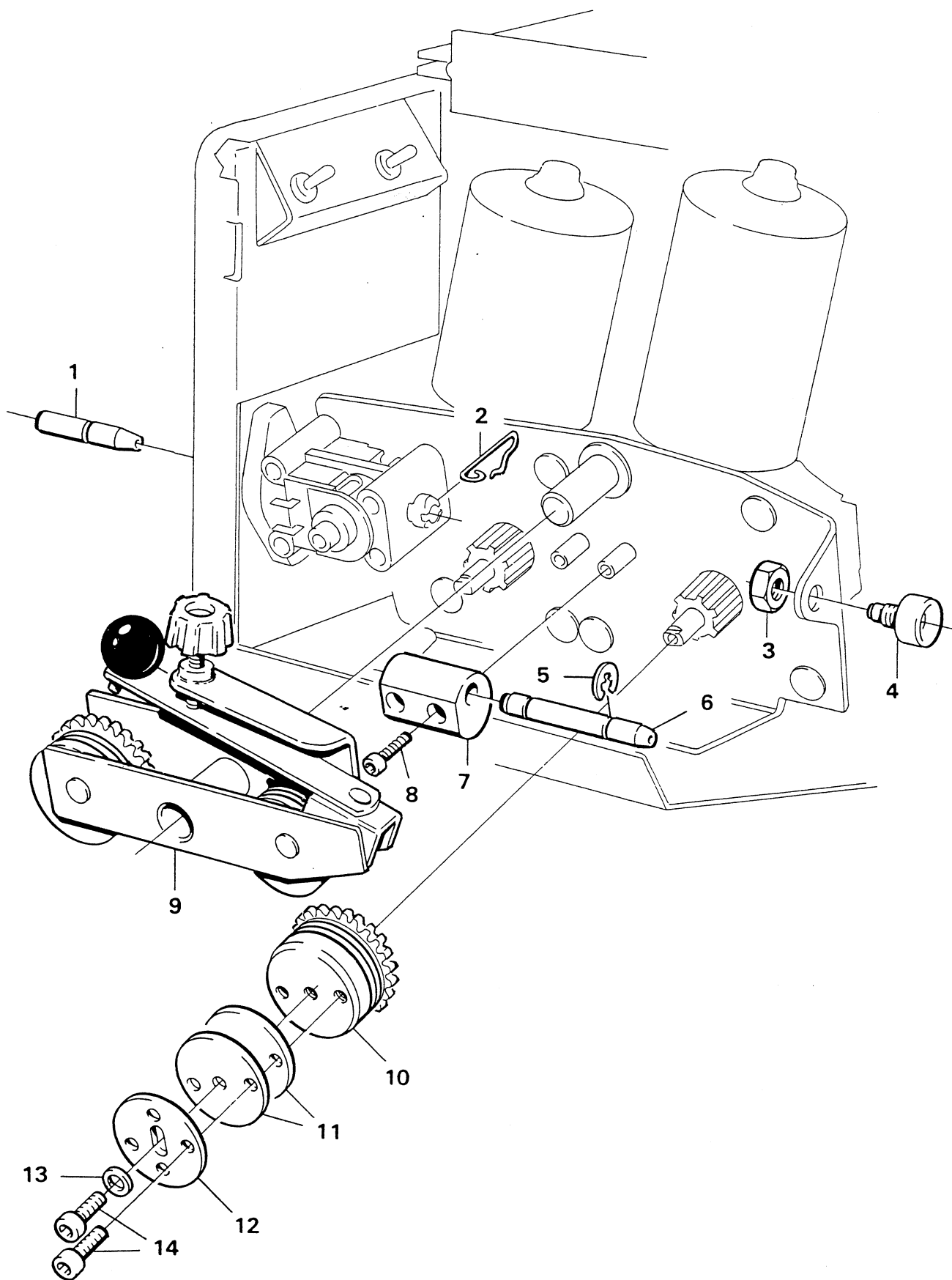
Pos nr Item no. Pos Nr. No. de ref.	Ant Qty Anz Qte	Best nr Ordering no. Bestellnr. No. de commande	Benämning	Denomination	Bezeichnung	Désignation	Anm Remarks Anm. Remarques
1	1	481 306-880	Kretskort Postflow	Circuit board Postflow	Platine (Leiterplatte)	Circuit imprimé	M35
2	1	193 260-132	Kontakt don	Connector	Stecker	Contacteur	14 pol
	1	193 260-120	Kontakt don	Connector	Stecker	Contacteur	2 pol
3	1	192 854-001	Relä	Relay	Realis	Relai	M15
5	1	192 903-033	Elektrolyt kondensator	Electrolytic capacitor	Elektrolyt-kondensator	Condensateur	M23
6	4	156 631-001	Hållare	Reservoir	Halterung	Support	
7	1	192 578-001	Sockel	Base	Sockel	Douille	
8	2	192 579-205	Motstånd 0,75 Ω 50 W	Resistor	Widerstand	Résistance	M24, M12
9	1	192 579-204	Motstånd 0,5 Ω 50 W	Resistor	Widerstand	Résistance	M28
10	1	192 579-239	Motstånd 0,3 Ω 50 W	Resistor	Widerstand	Résistance	M5
11	1	319 828-003	Transformator	Transformer	Trafo	Transformateur	M13
12	1	341 409-884	Kretskort	Circuit board	Platine (Leiterplatte)	Circuit imprimé	M8
13	1	192 784-016	Hylspropp	Connect socket 12 pin	Buchsenstecker 15-polig	Fiche femelle	
	15	192 784-102	Hylsa 15 pol	Sleeve	Buchse	Douille	
14	1	146 166-003	Isolerbricka	Insulating washer	Isolierscheibe	Plaque isolante	
15	1	146 166-005	Transistor	Transistor	Transistor	Transistor	M18
16	1	193 367-112	Koppl. plint 12 pol	Connection terminal 12 pin	Klemmleiste 12-polig	Bloc de connexion 12 pôles	M72
	1	193 367-102	Koppl. plint 2 pol	Connection terminal 12 pin	Klemmleiste 12-polig	Bloc de connexion 12 pôles	M73
17	1	5231 041-05	Apparatplint	Equipment terminal	Klemmbrett	Bloc de connexion	M7
18	1	192 784-015	Stiftpropp 15 pol	Connector plug 15 pin	Stiftstecker 15-polig	Connector plug 15 pin	
	15	192 784-101	Stift	Plug	Stift	Fiche	
19	1	156 640-001	Lucka	Cover	Deckel	Couvercle	



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1	1	147 866-002	Strömställare	Toggle switch	Schalter	Interrupteur	M11
2	1	147 866-001	Strömställare	Toggle switch	Schalter	Interrupteur	M1
3	1	156 643-001	Skyddsplåt	Protective cover	Schutzblech	Plaque protectrice	
4	1	156 754-001	Skylt	Sign	Schild	Plaque indicatrice	
5	1	466 526-001	Lucka	Cover	Deckel	Couvercle	
6	1	156 630-001	Klämstycke	Clamping plate	Klemmstück	Bride de serrage	
7	1	367 002-001	Skylt	Sign	Schild	Plaque d'indicatrice	
8	1	366 988-001	Skylt	Sign	Schild	Plaque d'indicatrice	
9	1	466 528-001	Distansplåt	Spacer plate	Zwischenblech	Entretoise	
10	1	156 728-008	Drivenhet	Drive unit	Antriebseinheit	Unité motrice	M3
10, 11	1	332 351-009	Ankare	Armature	Anker	Induit	
10, 11	1,2	332 351-001	Kolborste	Carbon brush	Kohlenbürste	Balai de charbon	
10, 11	2	332 351-002	Kolborste	Carbon brush	Kohlenbürste	Balai de charbon	
10, 11	2	332 351-003	Drivaxel	Drive shaft	Antriebsachse	Axe moteur	
10, 11	1	332 351-010	Ankare med tacho	Armature with tachometer	Anker mit Tachometer	Induit avec tacho Unité motrice	
11	1	156 728-006	Drivenhet med tacho	Drive unit with tacho	Antriebseinheit mit Tachometer	avec tacho	M31
12	4	153 043-002	Isolerbricka	Insulating washer	Isolierscheibe	Plaque isolante	
13	1	2151 002-02	Bricka	Washer	Scheibe	Rondelle	
15	1	366 962-001	Pivåtapp	Pivot stud	Pivotzapfen	Pied pivot	
16	1	321 220-002	Dragavlastning	Cable retainer	Zugentlastung	Equilibreur	
17	1	193 054-002	Magnetventil	Solenoid valve	Magnetventil	Electrovanne	M4
18	1	191 954-101	Gummislang	Rubber hose	Gummischlauch	Tube caoutchouc	L=350 mm
19	1	466 629-001	Bottenplåt	Base plate	Deckblech, unten	Plaque de fond	
20	1	190 753-107	Bussning	Bush	Hülse, Buchse	Palier	
21	1	193 302-001	Slidlås	Sliding lock	Schlittensicherung	Verrou latéral	
22	2	191 870-528	Vridmotstånd	Potentiometer	Drehwiderstand	Rhéostat	
23	1	156 633-001	Skydd	Protective strip	Schutz	Protection	M36, M37
24	1	156 636-002	Gångjärn	Hinge	Scharnier	Ferrure	
25	1	466 535-880	Manöverkabel	Control cable	Steuerkabel	Câble de commande	
	1	368 541-005	Stiftpropp	Connector plug	Stiftstecker	Fiche mâle	
	23	367 972-004	Stift 23-pol	Plug 23 pin	Stift 23-polig	Fiche 23 pôles	



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1	1	192 238-331	Skruv	Screw	Schraube	Vis	M5×20
2	1	156 701-001	Flatstift	Plug	Flachstecker	Contact	
3	1	156 596-001	Anslutningsplatta	Conn.block	Anschlußplatte	Bloc d'accouplement	
4	4	2195 043-02	Tallriksfjäder	Washer	Tellerfeder	Ressort Belleville	D10/5,2×0,5
5	4	192 238-333	Skruv	Screw	Schraube	Vis	M5×25
6	1	156 597-001	Kopplingsstycke	Connecting piece	Anschlußstück	Connecteur de gaz	
7	2	2152 012-12	O-ring	O-ring	O-Dichtungsring	Joint torique	
8	1	341 035-880	Kretskort	Printed circuit	Steckplatte	Circuit imprimé	M10
9	1	156 688-001	Magnetbleck	Magnetic plate	Magnetblech	Plaque magnétique	
10	1	192 238-491	Skruv	Screw	Schraube	Vis	M10×20
11	1	2195 043-07	Tallriksfjäder	Cup spring	Tellerfeder	Ressort Belleville	
12	1	2151 000-23	Bricka	Washer	Scheibe	Rondelle	D22/10,5×2
13	1	192 238-291	Skruv	Screw	Schraube	Vis	M4×12
14	1	191 548-005	Flatstiftanslutning	Plug connection	Flachstecker- anschluß	Contact mâle	
15	1	156 706-001	Kabelfäste	Cable fixture	Kabelfestigung	Connecteur de courant	



Pos nr Item no. Pos Nr. No. de ref.	Ant Qty Anz Qte	Best nr Ordering no. Bestellnr. No. de commande	Benämning	Denomination	Bezeichnung	Désignation	Anm. Remarks Bemerkungen Remarques					
							Storlek Size Größe Alésage	Tråd ø Wire ø Draht ø Fil	Tråd typ Wire type Draht Fil			
									A	B	C	D
1	1	156 705-006*	Utloppsmunst.	Outlet nozzle	Auslaufdüse	Guide de sortie	ø 1,6 Cu	0,8–1,2	×	×		
	1	365 696-001	Utloppsmunst.	Outlet nozzle	Auslaufdüse	Guide de sortie	ø 1,5 PI	1,0–1,2			×	
	1	156 705-001	Utloppsmunst.	Outlet nozzle	Auslaufdüse	Guide de sortie	ø 4,0 Cu	1,6–2,4	×	×		
	1	332 742-001	Utloppsmunst.	Outlet nozzle	Auslaufdüse	Guide de sortie	ø 2,0 PI	1,6			×	
	1	156 705-007	Utloppsmunst.	Outlet nozzle	Auslaufdüse	Guide de sortie	ø 2,4 Cu	1,2–2,0				×
	1	156 705-001	Utloppsmunst.	Outlet nozzle	Auslaufdüse	Guide de sortie	ø 4,0 Cu	2,4–3,2				×
2	1	156 703-001	Låstråd	Locking wire	Sicherungs- draht	Verrou guide de sortie						
3	1	2126 020-10	Mutter	Nut	Mutter	Ecrou	M10					
4	1	156 602-001*	Inloppsmunst.	Inlet nozzle	Einlaufdüse	Guide d'entrée	ø 2,0 PI	0,8–1,6	×	×	×	
	1	156 602-002	Inloppsmunst.	Inlet nozzle	Einlaufdüse	Guide d'entrée	ø 4,0 PI	1,6–2,4	×	×	×	
	1	332 318-001	Inloppsmunst.	Inlet nozzle	Einlaufdüse	Guide d'entrée	ø 2,4 Fe	1,2–2,0				×
	1	332 318-002	Inloppsmunst.	Inlet nozzle	Einlaufdüse	Guide d'entrée	ø 4,0 Fe	2,4–3,2				×
5	2	2157 027-08	Spår ryttare	Locking washer	Sicherungs- scheibe	Circlips						
6	1	156 603-001*	Mellanmunst.	Intermediate	Zwischendüse	Guide intermédiaire	ø 2,0 PI	0,8–1,2	×	×	×	
	1	156 603-002	Mellanmunst.	Nozzle	Zwischendüse	Guide intermédiaire	ø 4,0 PI	1,6–2,4	×	×	×	
	1	332 322-001	Mellanmunst.	Nozzle	Zwischendüse	Guide intermédiaire	ø 2,4 Cu	1,2–2,0				×
7	1	332 322-002	Mellanmunst.	Nozzle	Zwischendüse	Guide intermédiaire	ø 4,0 Cu	2,4–3,2				×
	1	366 961-001	Mellanmunst.- hållare	Intermediate nozzle	Zwischendüse- halter	Support de guide intermédiaire						
9	1	366 941-880*	Boggie	Bogie	Doppelachse	Boggie	No. 1	0,8–1,6	×	×	×	
	1	366 941-881	Boggie	Bogie	Doppelachse	Boggie	No. 2	1,4–2,4	×	×	×	
	1	366 941-882	Boggie	Bogie	Doppelachse	Boggie	No. 3	1,2–2,0				×
	1	366 902-883	Boggie	Bogie	Doppelachse	Boggie	No. 4	2,4–3,2				×
	1	366 902-880	Boggie med kullager	Bogie with ball bearing	Doppelachse mit Kugellager	Boggie avec roulement						
	1	366 902-881	Boggie med kullager	Bogie with ball bearing	Doppelachse mit Kugellager	Boggie avec roulement						
	1	366 902-882	Boggie med kullager	Bogie with ball bearing	Doppelachse mit Kugellager	Boggie avec roulement						
10	2	366 966-880*	Matarrulle	Feed roller	Vorschubrolle	Galet moteur	No. 1	0,8–1,6	×	×	×	
	2	366 966-881	Matarrulle	Feed roller	Vorschubrolle	Galet moteur	No. 2	1,4–2,4	×	×	×	
	2	366 966-882	Matarrulle	Feed roller	Vorschubrolle	Galet moteur	No. 3	1,2–2,0				
	2	366 966-883	Matarrulle	Feed roller	Vorschubrolle	Galet moteur	No. 4	2,4–3,2				
11	4	156 707-001	Distansbricka	Spacer	Distanzscheibe	Entretoise						
12	2	156 707-002	Medbringare	Carrier	Mitbringer	Rondelle porte-gallet						
13	2	366 944-001	Bricka	Washer	Scheibe	Rondelle						
14	6	192 238-331	Skruv	Screw	Schraube	Vis	M5×20					

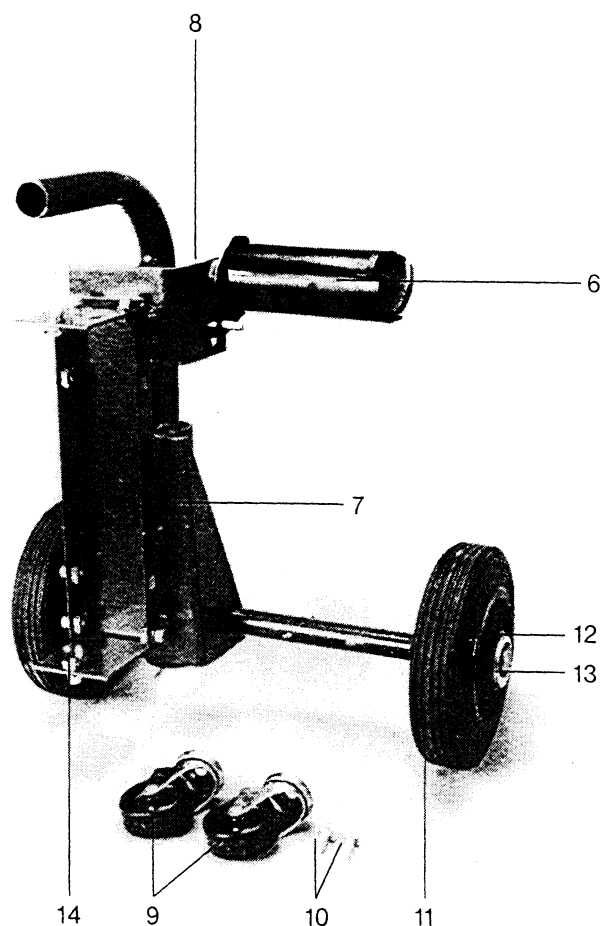
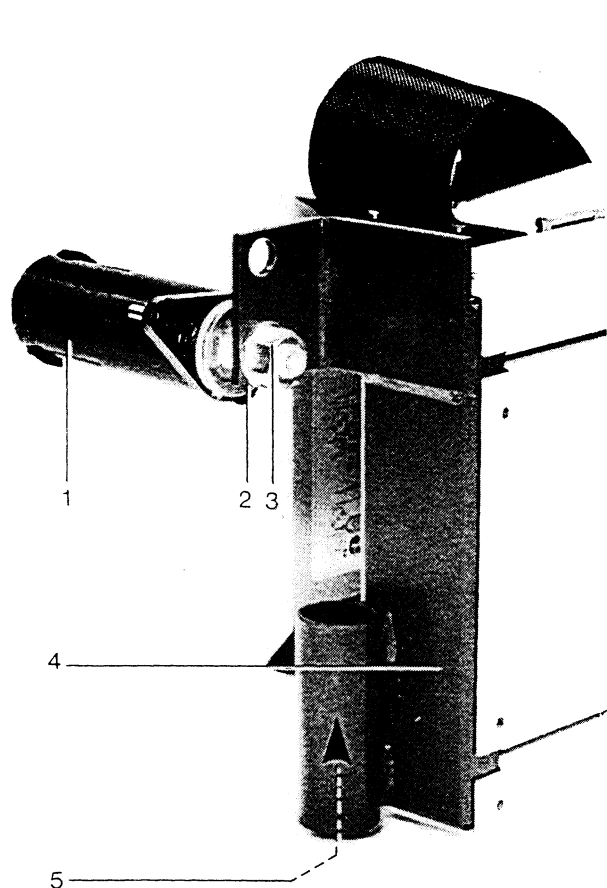
A Fe

B Ss

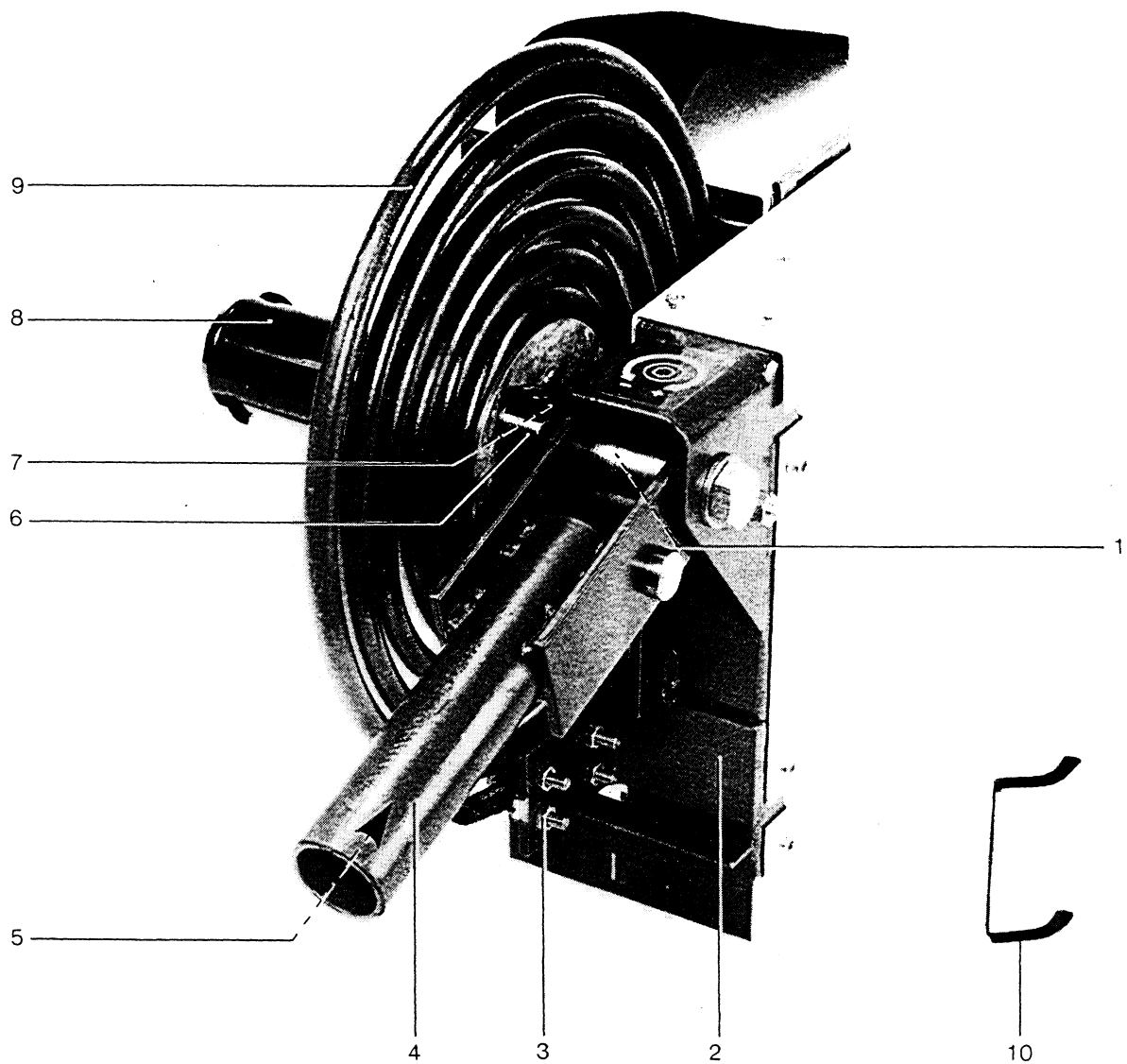
C Al

D Rörtråd/Cored wire/Fülldraht/Fil fourré

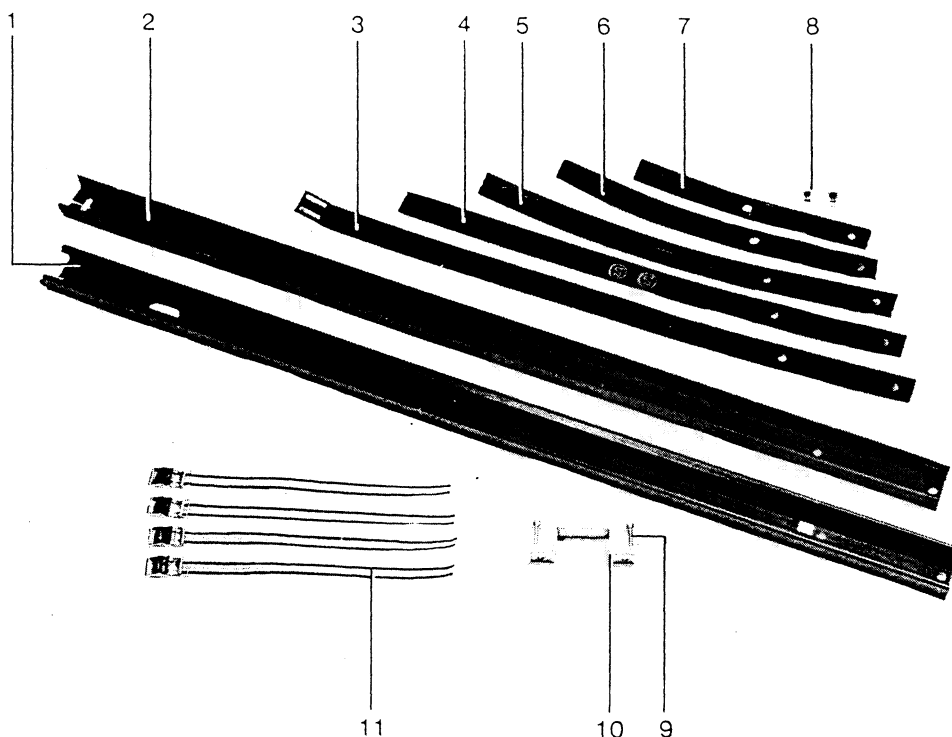
* Standard/monté à la livraison



Pos nr Item no. Pos Nr. No. de ref.	Ant Qty Anz Qte	Best nr Ordering no. Bestellnr. No. de commande	Benämning	Denomination	Bezeichnung	Désignation	Anm Remarks Anm. Remarques
	1	156 681-880	Vridstycke, kompl.	Turning piece compl.	Drehstück, kpl.	Composant montage sur redresseur, compl.	
1	1	146 967-881	Bromsnav	Brake hub	Bremsnabe	Moyeu-frein	
2	1	2151 000-31	Bricka	Washer	Scheibe	Rondelle	D30/17×3
3	1	2126 011-13	Mutter	Nut	Mutter	Ecrou	M16
4	1	156 657-880	Bakstycke	Back	Rückstück	Panneau arrière	
5	1	466 530-880	Upphängning kpl.	Support complete	Aufhängung kpl.	Suspension compl.	
		332 650-880	Vagn kompl.	Carriage compl.	Wagen, kpl.	Chariot, compl.	
6	1	146 967-881	Bromsnav	Brake hub	Bremsnabe	Moyeu-frein	
7	1	332 646-880	Bakstycke, vagn	Rear panel carriage	Rückteil, Wagen	Panneau arrière, charoit	
8	1	2126 011-13	Mutter	Nut	Mutter	Ecrou	M16
9	2	321 203-001	Länkhjul	Castor wheel	Lenkrollen	Galet pivotant	
10	2	2121 015-31	Skruv	Screw	Schraube	Vis	M6×16
11	2	157 325-001	Gummi hjul	Rubber wheel	Gummirollen	Galet en caoutchouc	
12	4	2151 000-37	Bricka	Washer	Scheibe	Rondelle	
13	4	2157 010-16	Spärring	Retaining ring	Nutring	Circlips	
14	8	192 562-106	Mutter, korg	Nut	Mutter	Ecrou	M6



Pos nr Item no. Pos Nr. No. de ref.	Ant Qty Anz Qte	Best nr Ordering no. Bestellnr. No. de commande	Benämning	Denomination	Bezeichnung	Désignation	Anm Remarks Anm. Remarques
	1	156 682-880	Avlastningsdon, kompl.	Counterbalanc- ing unit, compl.	Entlastungsvor- richtung, kpl.	Equilibreur compl.	
1	1	156 678-001	Axel	Shaft	Achse	Axe	
2	1	156 674-880	Bakstycke	Back	Rückstück	Panneau arrière	
2	-	156 673-880	Bakstycke	Back	Rückstück	Panneau arrière	
3	2	156 676-001	Fästbygel	U-bolt	Befestigungs- bügel	Etrier fileté	
	4	2126 011-07	Mutter	Nut	Mutter	Ecrou	
4	1	156 664-880	Arm	Arm	Arm	Tube de fixation	
5	1	466 530-880	Upphängning kpl.	Support complete	Aufhängung kpl.	Suspension compl.	
6	1	156 680-001	Medbringare	Carrier	Mitbringer	Support	
	1	192 857-507	Skruv	Screw	Schraube	Vis	M10×80
7	1	192 866-002	Lager	Bearing	Lager	Piton	
8	1	146 967-881	Bromsnav	Brake hub	Bremsnabe	Moyeu-frein	
9	1	156 668-880	Fjäder	Spring	Feder	Ressort	
10	1	156 721-001	Krok för svetspistol	Hook for welding gun	Haken für Schweißpistole	Support de torche	



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1	1	156 746-880	Mast. kompl.	Mast, compl.	Mast, kpl.	Mât, compl.	
2	1	156 661-001	Undre mast	Mast, lower	Unterer Mast	Mât, inférieur	
3	1	156 660-001	Övre mast	Mast, upper	Oberer Mast	Mât, supérieur	
4	1	156 686-001	Fjäder	Spring leaf	Feder	Ressort	l = 700 mm
5	1	156 686-002	Fjäder	Spring leaf	Feder	Ressort	l = 570 mm
6	1	156 686-003	Fjäder	Spring leaf	Feder	Ressort	l = 470 mm
7	1	156 686-004	Fjäder	Spring leaf	Feder	Ressort	l = 370 mm
8	1	156 686-005	Fjäder	Spring leaf	Feder	Ressort	l = 270 mm
8	2	2121 086-41	Skruv	Screw	Schraube	Vis	
9	2	192 847-003	Svetsmutter	Welding nut	Schweißmutter	Ecrou soudé	
10	2	192 238-370	Skruv	Screw	Schraube	Vis	M6×20
11	1	156 658-001	Klammer	Clamp	Klammer	Clamme	
11	4	192 855-001	Spännrem	Tightening strap	Spannriemen	Sangle	

Verktgssats Tool kit Werkzeugsatz Boite en outils	Art.nr. Ordering no. Bestellnr. Référence	Beskrivning	Description	Bezeichnung	Désignation	Anm Remarks Bemerk. Remarques
1	6880 003-02	Nyckel	Wrench	Schlüssel	Clé	N4
1	6880 003-03	Nyckel	Wrench	Schlüssel	Clé	N5
1	6880 003-05	Nyckel	Wrench	Schlüssel	Clé	N8
2	2529 004-02	Slangklämma	Hose Clip	Schlauchklemme	Collier de serrage	
×	190 315-102	Gasslang	Gas hose	Gasschlauch	Tuyau à gaz	Metervara Piece goods Meterware Vendu par mètre

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