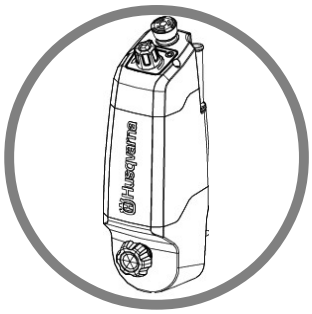
Husqvarna

GB

Workshop manual
AD10



HUSQVARNA CONSTRUCTION PRODUCTS

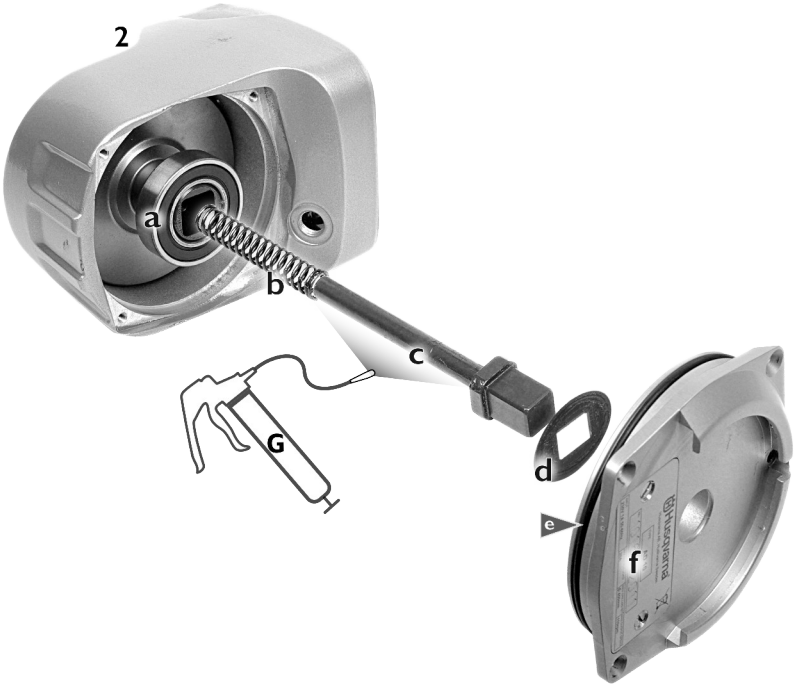
Technical data

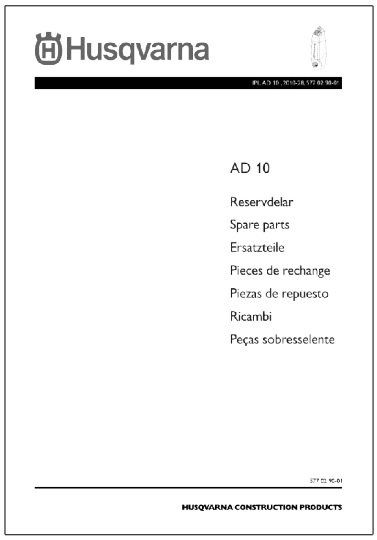
Feature	Data	
Model	**AD10**	
Motor power, W	80	
Weight, kg	3,7	
Max. drill diameter, mm	450	
Feed rate, m/min	3,2 (DS50-70) | 3,0 (DS450)	
Power supply	230 V, 50/60Hz	110 V, 50/60Hz
Current limit, A	0,6	1,25

HUSQVARNA
AD10

CONTENT

Dismantling in basic steps





Workshop manual

This manual includes most workshop procedures that can come into question on the AD 10. Some very simple and self-evident repairs have been omitted.

OUTLINE

Chapter 2 provides common service data and troubleshooting guidelines.

The chapters describe in a logical order the process of dismantling in order to perform various service tasks. Each chapter starts with references to previous chapter(s) and what should be dismantled as a preparation.

This means that as a mechanic, at least until you have learnt the basic composition of the machine, you need to start with some earlier chapters to allow for access to the service items concerned.

If not otherwise mentioned, any reassembling should be performed by reversing the process of dismantling. Occurring tools are described in the Tools chapter.

LAYOUT – PICTURES AND TEXT

The pictures are mostly enough to guide the mechanic through the various procedures. The text on the right hand column has further references and explanations for the repair work on the machine.

CONTENTS

The manual is divided into numbered chapters with chapter headings that are stated in bold at the top of each page.

The list of contents has chapter references as well as page references for relevant subtitles.

Spare parts

IPL DOCUMENT

This document comprises all spare parts for the automatic drill feeder AD10:

art. No: **577 02 90–01**

All components are illustrated in exploded views of the entire machine, where each component's position, spare part number and appearance can be easily identified.

Troubleshooting and suggested actions

1. Machine does not start (no led nor feeding function)

Action at customer	1. Connect unit to earthed outlet with residual-current device (RCD). 2. Check that emergency stop is out and try to start the machine by means of the On/Off button on the control panel. 3. If the problem persists; send machine to service workshop.

Action at service workshop

A	B	C	D	E
1. Remove cable from outlet. 2. Dismantle the control panel (chap. 6). 3. Check all cable connections • Replace any damaged cables or components. 4. Reassemble unit and re-check.	1. Connect potentiometer and a new membrane panel. • Check if unit is functional. 2. Optionally short-circuit position 1 and 3 on K6 (chap. 8, page 20–21). 3. Turn potentiometer to check if feeding commences. 4. Replace membrane panel if unit is functional.	1. Disassemble (chap. 6). 2. Detach inbound cable N (chap. 7, ill. 4). 3. Connect unit to earthed outlet with residual-current device (RCD). 4. Measure voltage with multimeter over cable N and pin f (chap. 6, ill. 8) • If voltage is zero: – check fuse (chap. 8, F1). 5. Reassemble and re-check.	1. Disconnect cables (chap. 7). 2. Connect unit to earthed outlet with residual-current device (RCD). 3. Measure voltage with multimeter over cables NS1 and N (chap. 8) • If voltage is zero: – replace emergency stop with cable (chap. 6). 4. Reassemble and re-check.	1. If there is voltage in the previous two steps: – replace circuit board (chap. 6–8)

2. Machine suddenly feeds at full speed (When reconnected, the diode is on but nothing happens as potentiometer is turned)

Action at customer	Send machine to service workshop.

Action at service workshop

A	B	C
1. Remove cable from outlet. 2. Dismantle the control panel (chap. 6). 3. Check all cable connections • Replace any damaged cables or components. 4. Reassemble unit and re-check.	1. Replace the potentiometer 2. Re-check.	Replace circuit board (chap. 6–8).

3. Machine starts flashing rapidly during upstart process

Action at customer	1. Disconnect from mains power and let machine rest approximately an hour. 2. Restart. ***Important:*** do not turn the potentiometer too rapidly during upstart. Wait approx. 5 sec. After the diode is on. This ensures machine can check currents at upstart. 3. If the problem persists; send machine to service workshop.

Action at service workshop

A	B
The motor temperature sensor may be faulty. 1. Remove cable from outlet. 2. Dismantle the control panel (chap. 6). 3. Check cable connections to temperature sensor • Replace any damaged cables or components. 4. Reassemble unit and re-check.	1. Remove cable to temperature sensor (chap. 8, K2) and measure over the leads. • The value should be approx. 11,8kΩ at 23°C (73°F). 2. If short-circuited (0 Ω), check sensor cable. 3. Replace the entire motor–pinion unit if the value is faulty.

Continue on next page...

Troubleshooting and suggested actions

4. Machine starts flashing rapidly after a short period of drilling (1—5min)

Action at customer	Check attachment to drill pillar: 1. Remove power cable and use the drill pillar crank lever – check for unusual resistance. 2. Drilling with smaller drill crowns may discharge the machine over-load function. • Turn the potentiometer to mid-position and press the membrane button until the diode emits a continuous light. 3. When discharged due to over-load, the machine automatically reduces the maximum level, 1A below set potential value. 4. Reset machine by removing the power cable from power mains for a few seconds. 5. If the problem persists; send machine to service workshop.

Action at service workshop

A	B	C	D
Check if the motor's cooling fan starts: 1. Turn the potentiometer slowly and listen carefully: • a low buzzing noise should start. 2. Visually check that the fan runs by detaching the control panel. 3. Replace a faulty fan (chap. 8).	1. Test feeding function by mounting it on a DS450 stand; 2. Attach a scale between feeder house and floor or directly on the pillar. • The machine should be capable to pull a minimum of 290kg. ***Important:*** increase the potentiometer carefully up to max. 20% of the available range.	If the machine is capable to pull less than 200 kg: 1. Listen for noise from the gearbox. • In case of noise, the gearbox should be dismantled it's parts thoroughly checked (chap. 5). 2. Replace any parts that appear worn or damaged.	In case of no noise or no apparent fault with the gearbox: • Replace the motor—pinion-unit (chap. 6—9).

5. Machine starts flashing rapidly after a longer period of drilling (5—60min)

Action at customer	Check attachment to drill pillar. 1. Remove AD 10 and use the crank lever of the drill pillar – check for heavy resistance. 2. Check if the drill crown is worn out, is uneven or if the segments are glazed. 3. The ambient temperature should be below 40°C (104°F) and the machine should not be used in direct sunlight. 4. If the problem persists; send machine to service workshop.
Action at service workshop	Same as above "4. Machine starts flashing rapidly after a short period of drilling (1—5min)"

6. Machine has a tendency to spin around its attachment while drilling

Action at customer	Check that the M4-screw is tightly secured in the gear house lid (chap. 5, page 11, ill. 2).

7. Drill machine connected to AD 10 does not start

Action at customer	1. Check that AD 10 diode emits a continuous light. 2. Check; that the PRCD of the drill motor is activated (press reset), check that the drill motor is switched on. 3. Connect drill motor directly to power outlet (not via the automatic drill feeder AD10). 4. If drill motor only works when connected directly to power outlet, send machine to service workshop.

Action at service workshop

A	B
1. Press control panel On/Off button; switch diode on and off. 2. Listen for a click noise from a relay inside the machine. • If no click noise, the emergency stop cable may be damaged. 3. Remove the control panel (chap. 6). 4. Remove cable from position K5 (chap. 8) 5. Check that this has contact when emergency stop is up and that the contact is cut off when emergency stop is down.	1. Disassemble (chap. 6). 2. Connect the control panel. 3. Connect unit to earthed outlet with residual-current device (RCD) and switch unit on. 4. Measure the voltage with multimeter over earth and position M (chap. 8). 5. If voltage is zero, the relay of the unit is damaged and the entire circuit board should be replaced. 6. If there is voltage, the Y-cable is faulty and should be replaced.

8. Y-cable is faulty

Action at customer	Send machine to service workshop.
Action at service workshop	Disassemble Y-cable and replace it (chap. 6—7).

Torque for occurring metric fasteners (Nm±5%)

Where otherwise not stated, all fasteners should be tightened with torque according to this table:

	Strength class 8.8 SS-EN 29898-1 metric coarse pitch threads					Strength class 10.9 SS-EN 29898-1 metric coarse pitch threads				
Screw head	**Hex**	**Hex FZB**		**Countersunk FZB**		**Hex**	**Hex FZB**		**Countersunk FZB**	
Type	Oiled	Dry	Oiled	Dry	Oiled	Oiled	Dry	Oiled	Dry	Oiled
M3	1,20	1,15	1,03	1,50	1,34	1,70	1,63	1,46	2,12	1,90
M4	2,9	2,8	2,5	3,6	3,2	4,0	3,8	3,4	5,0	4,5
M5	5,7	5,5	4,9	7,1	6,4	8,1	7,8	7,0	10,1	9,1
M6	9,8	9,4	8,4	12,2	11,0	14	13,4	12,0	17,5	15,7
M8	24	23	21	30	27	33	32	28	41	37
M10	47	45	40	59	53	65	62	56	81	73

General precautions

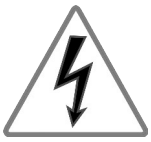
READ THE OPERATOR'S MANUAL

- Familiarize yourself with the machine. Read the operator's manual.
- The user's manual contains much information concerning basic service and maintenance, which is important in order to keep the machine safe and reliable.

WARNING

- This symbol indicates that hazardous safety risks to persons must be avoided.

- This symbol indicates when risk of machine damage should be avoided.



HIGH VOLTAGE

- Risk of electric shock. Service work on the machine should be performed with the power cable disconnected.
- Certain service actions that need connection to power mains, such as troubleshooting electric system should be performed by a qualified electrician.

PREVENT ELECTRICAL HAZARDS

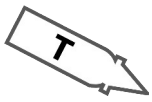
- Prevent the risk of the wrong cable being accidentally connected to power mains. A simple method is to wrap tape around the power cable contact pins.

Occurring symbols in the manual

Several graphical symbols are inserted in the manual's illustrations as simple means to better show details on actions to be taken, thus reducing the need to read through too much text.

Chemical substances

When performing service tasks involving the use of chemical substances (such as lubricants or retainer compounds), please refer to the instructions from the manufacturer.



THREAD-LOCK COMPOUND

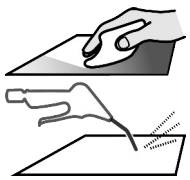
- Apply thread-lock compound of recommended quality
  See chapter 10 under “Recommended tools”

LUBRICATING GREASE

- Apply lubrication of recommended quality
  See chapter 10 under “Recommended tools”

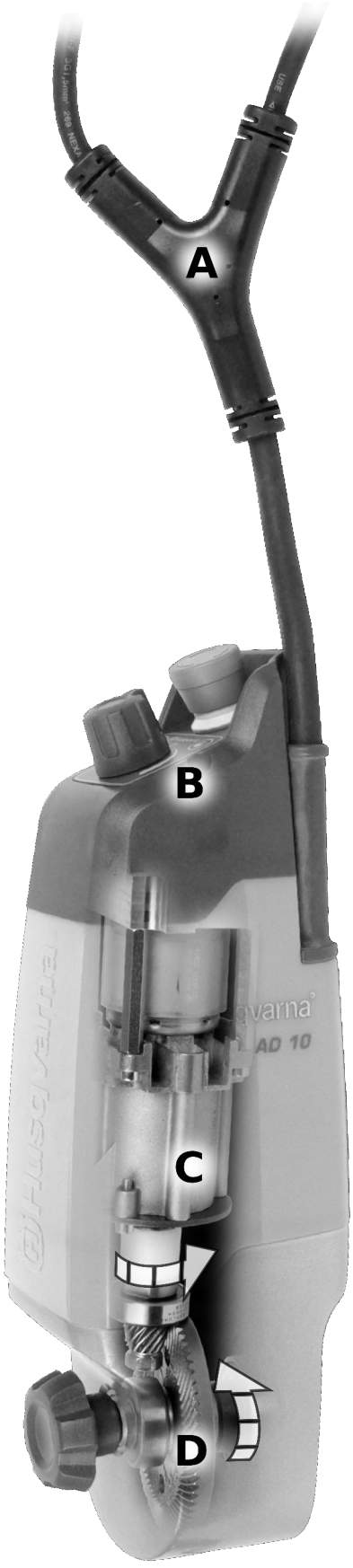
SCREWS OR FASTENERS (EXAMPLE)

- Quantity: 4
- Suitable tool: Allen wrench, size 2,5mm



KEEP MACHINE AND WORK AREA TIDY

- Prior to service; thoroughly clean areas concerned
- Remove dirty grease and lubricants
- Wipe clean with suitable solvent or cleaning agent and use compressed air to remove any dust or debris



Basic functional components

A) Power cable with Y-branch

- For power mains connection 230V/(110V) with Y-branch for control of connected drill unit

B) Control panel

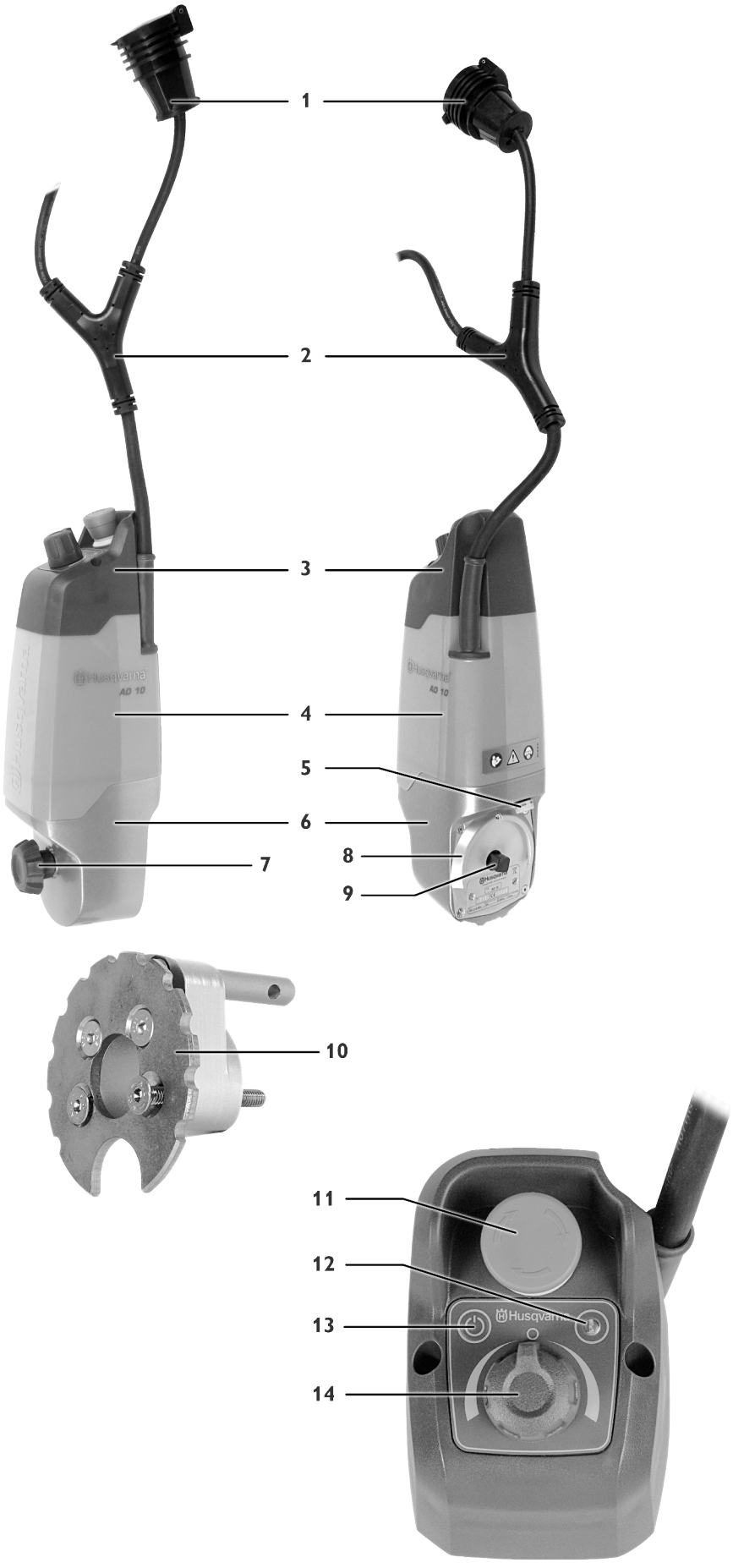
- Control buttons with LED indicator

C) Machine body

- Motor- & pinion unit with circuit board

D) Gear house

- The crown gear turns rotation 90° to drive coupling of feeding shaft



Components – overview

Machine overview

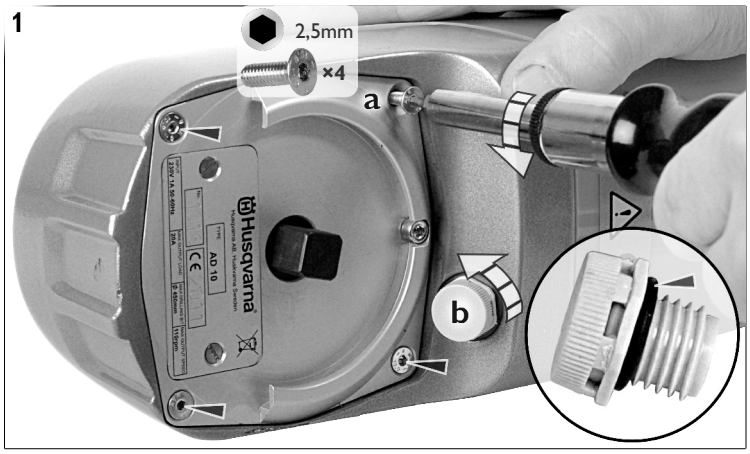
1. Power outlet 230V/110V), for drill machine connection:
   - Supplies power switch functionality for drill machine via AD10
2. Y-branch, power connection to:
   - Power mains, 230V/(110V)
   - Outlet for drill machine connection
3. Control panel on machine rear
4. Machine body with electric motor and electronics
5. Air valve with water protective membrane
6. Gear house
7. Knob for drive spindle
8. Gear house lid
9. Drill feeding shaft

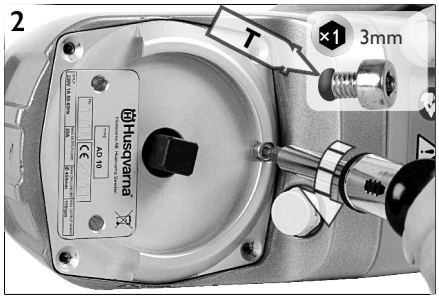
Feeder drive attachment

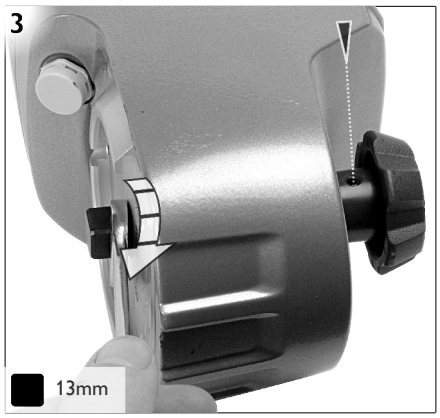
10. Automatic drill feed driver
    - Reversible attachment piece with fasteners

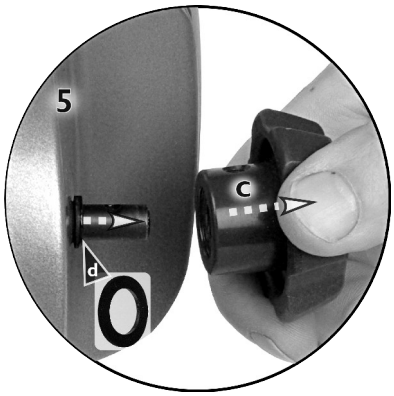
Control panel

11. Emergency stop
12. LED - On/(Off) indicator
13. On/Off button
14. Potentiometer







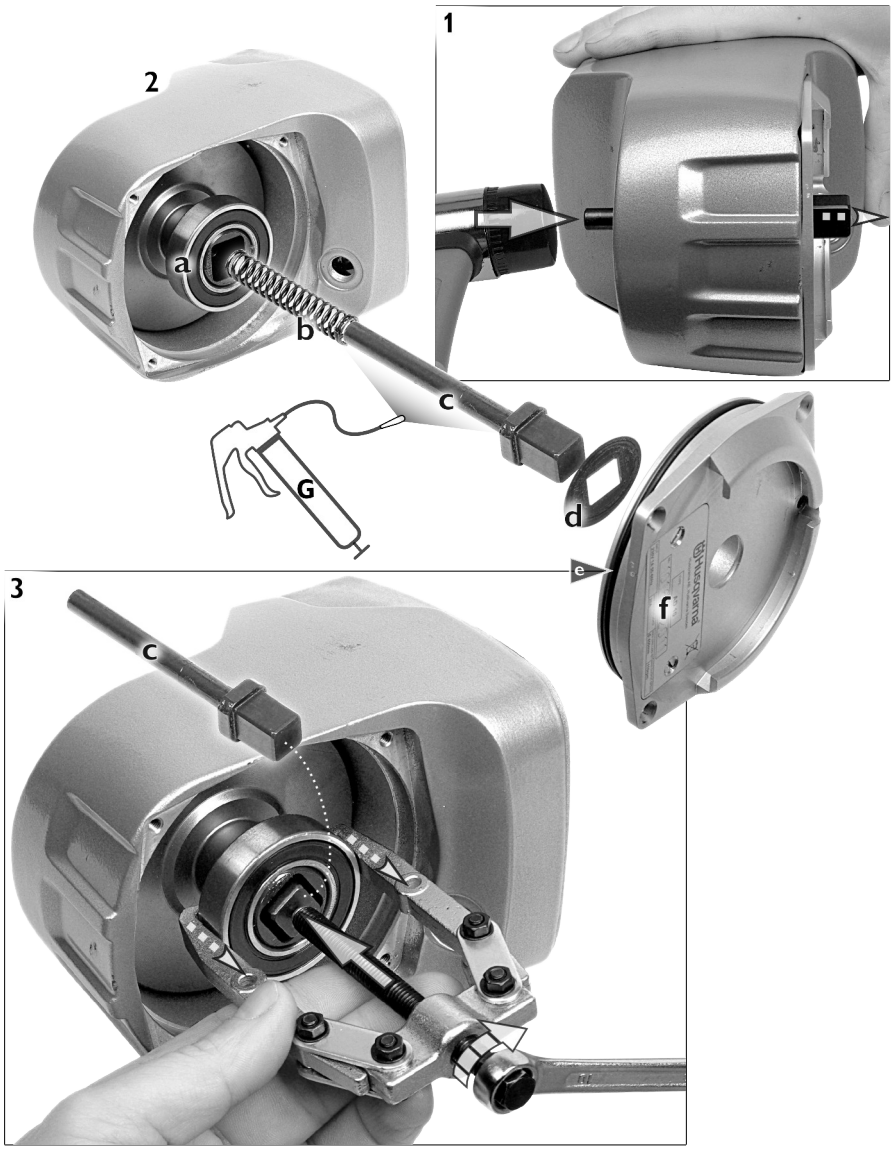


Dismantling

GEAR HOUSE LID AND AIR VALVE

1. Remove the following:
   (a) each of the four fasteners
   – 2,5mm Allen wrench
   (b) air valve
   • check O-ring:
   – replace if worn or cracks are visible

2. Remove inner fastener:
   • *Reassembling; use thread lock compound (T) - see chap. 10, "Tools"*
   – 3mm Allen wrench
3. Turn feeding shaft knob to access its fastener
   • rotate knob (or feeding shaft by means of a 13mm spanner)
4. Remove the knob fastener
   – 2,5mm Allen wrench
5. Disassemble as follows:
   (c) feeding shaft knob
   (d) V-ring
   – replace if worn or cracks are visible



DRIVE SHAFT

1. Knock out the drive shaft
   - use a rubber mallet
2. Remove drive shaft with the following parts:
   (a) exterior drive bearing
   (b) shaft spring
   (c) drive shaft

   – Reassembling: apply lubricator grease (G) along the entire drive shaft - see chap. 10, "Tools"

   (d) stop washer
   (e) O-ring:
   - replace if worn or cracks are visible

   (f) gear house lid

Dismantling drive bearings

EXTERIOR BEARING

3. Insert drive shaft (c)
   - remove exterior bearing from gear wheel by means of a universal puller

GEAR WHEEL

4. Dismantling the gear wheel
   - use a internal bearing puller Ø 10–14mm

5. Remove and expose the gears:
   (g) crown wheel unit
   (h) pinion

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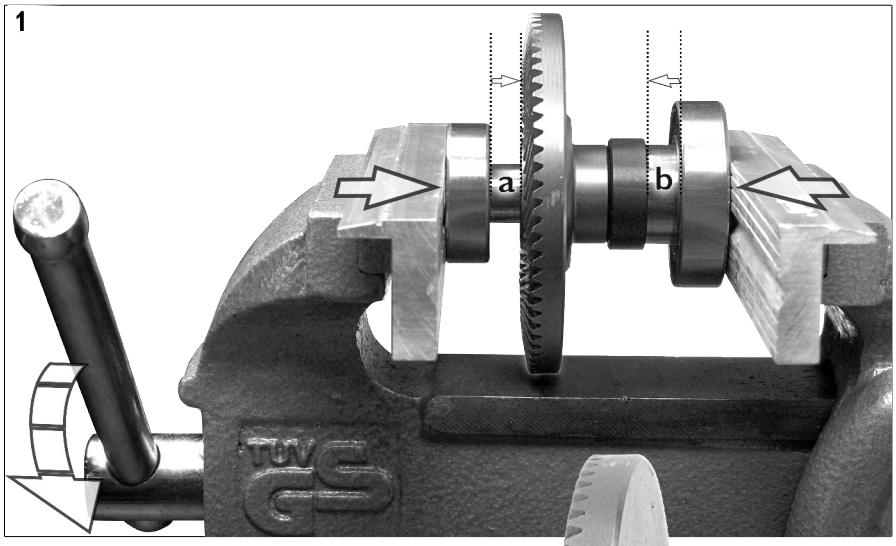
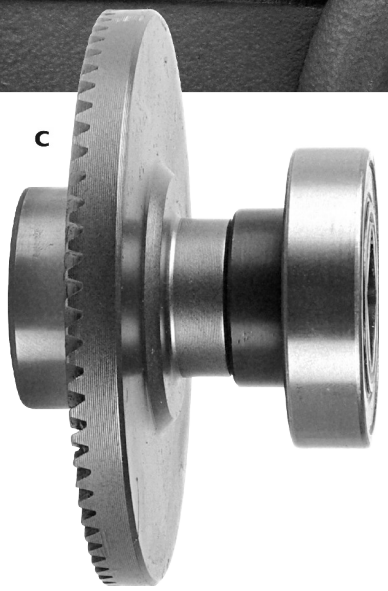
INTERIOR BEARING

6. Dismantling of interior drive shaft bearing
   - internal bearing puller Ø 14–19mm
7. Pull out interior bearing



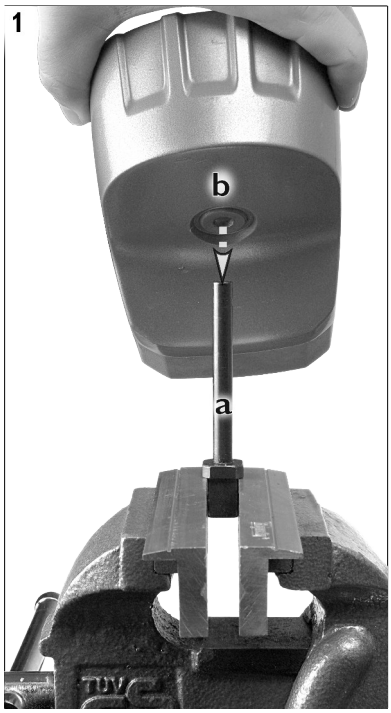


Reassembling

Start by joining the crown wheel and drive shaft bearing.

REASSEMBLING DRIVE SHAFT BEARING

1. The bearings can be pressed on to the crown wheel bearing seats by means of a vise
   (a) interior drive shaft bearing
   (a) exterior drive shaft bearing
   (b) crown wheel unit with mounted bearings



FIXATE INTERIOR DRIVE SHAFT BEARING

Crown wheel with mounted drive shaft bearings is fixated inside the gear house

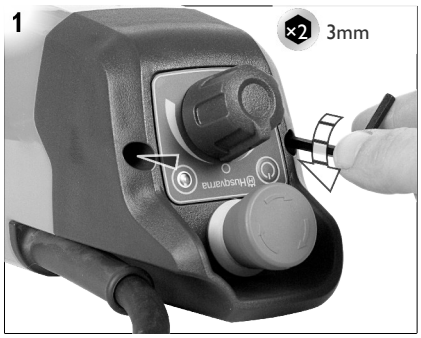
1. Use the drive shaft as support by fixing it in a vice
   (a) fixate drive shaft vertically
   (b) lower gear house on to the drive shaft

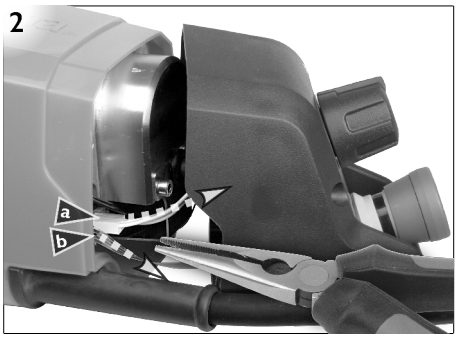
2. Apply plenty of grease lubricator (G) over the crown wheel gears - *see chap. 10, "Tools"*
   - lower the crown wheel into the gear house with the interior (smaller) drive shaft bearing facing downwards

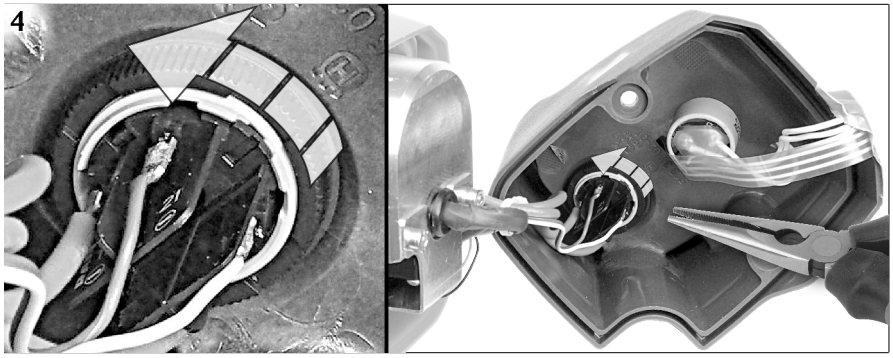
3. Gently knock interior bearing into the gear house cast bearing seat
   (c) use a mallet and cylinder (e.g. a socket key) as means to knock inner ring of exterior bearing into position
   (d) check through the gear house pinion hole that the bearing has sunk all the way into its seat

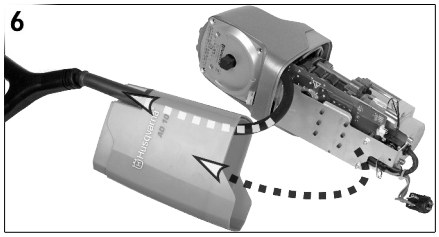
CONTINUED REASSEMBLING

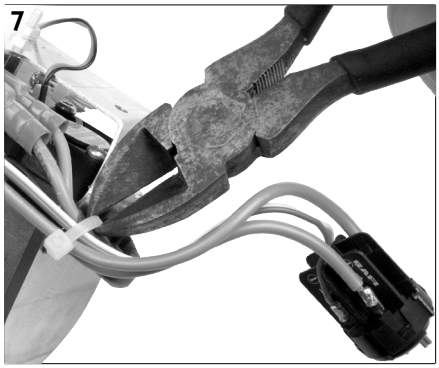
Continue reassembling by reversing the dismantling procedure from step 2, page 10.

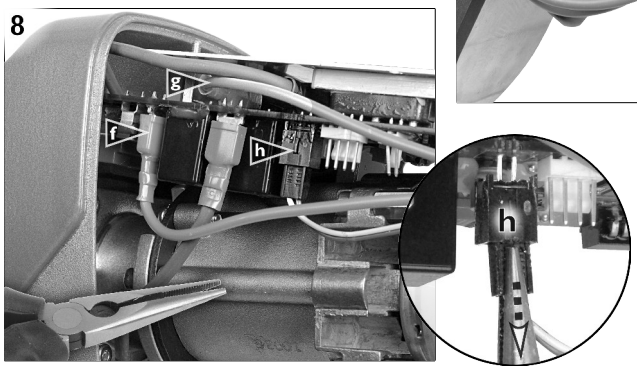












CONTROL PANEL

1. Remove the two fasteners
   - Allen key: 3mm
2. Disconnect the following cables:
   (a) cables for the potentiometer
   (b) flat cable for On/Off button and LED
   - pull the cable contactor with long nose pliers

Emergency stop button

3. The emergency stop is attached as follows:
   (c) plug with contact pins
   (d) threaded fastening ring
   (e) emergency stop button with female contact

4. Unscrew the fastening ring
   - use long nose pliers

5. Pull out the button and depress the four snap fasteners
   - use a small screw driver and pull apart
6. Thread the contact plug back through the panel hole and remove the machine cover

Emergency stop contacts in the circuit board

(see chapter 8, "Electrics and electric diagram")

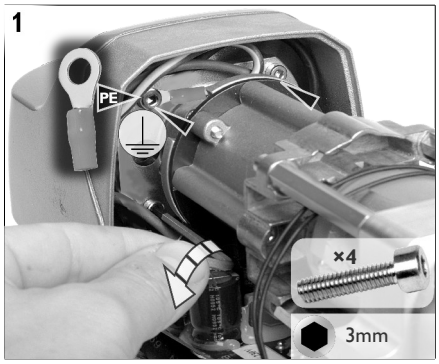
Removal of these will provide better access for further dismantling

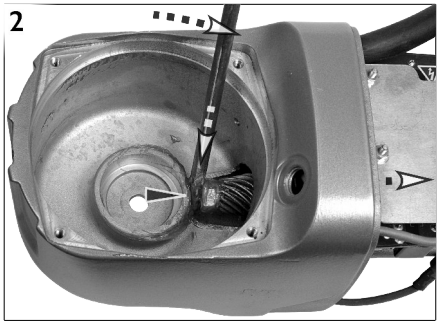
7. Cut the cable tie next to the emergency stop plug

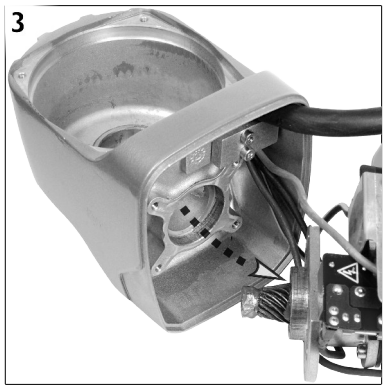
8. Remove the following contacts using long nose pliers:
   (f) electric cable, red
   (g) electric cable, red
   (h) electric cables, white+brown

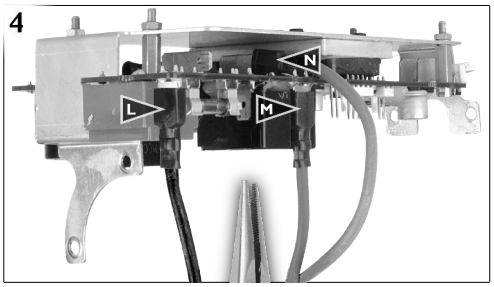
REASSEMBLING

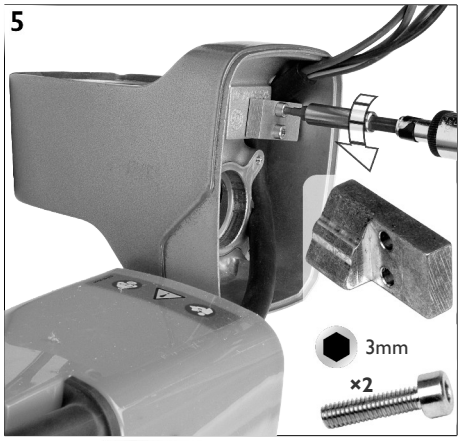
Reassembling is done by reversing the dismantling process as above.











Preparations

First, dismantle control panel and motor cover according to previous chapter.

SEPARATE MOTOR UNIT FROM GEAR HOUSE

1. Remove the fasteners, one in each corner:

   PE. Power cable to earth (yellow/green)

   – is secured with a cable lug (next to an engraved earth symbol)

   • Allen wrench: 3mm
2. Press out the pinion
   • normally, gear house and motor unit can be pulled apart by hand
   – optionally, insert a slotted screw driver between bearing seat and pinion and gently pry
3. Separate motor unit from gear house

ELECTRIC CABLE

Connection to circuit board

4. Remove the female cable lugs from the circuit board:

   – use long nose pliers

   L. black

   M. brown

   N. grey

   – *the illustration shows circuit board dismantled from motor unit - see chapter 8, "Electronics & electric diagram"*

Attachment to gear house

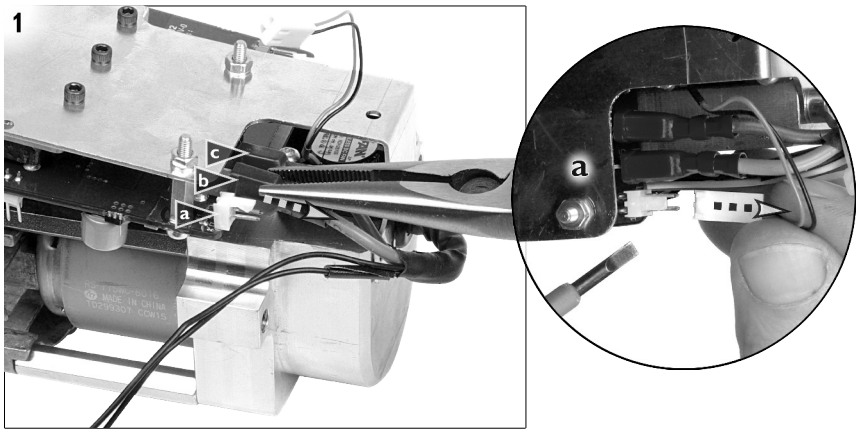
5. Remove the power cable's strain relief fasteners

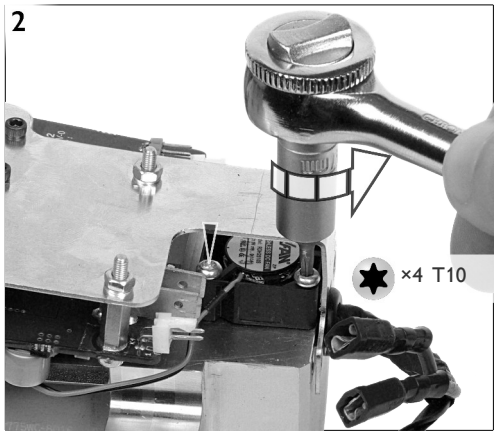
   – Allen wrench: 3mm

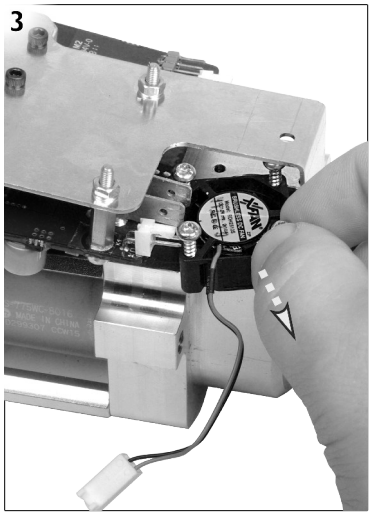
6. Motor cover and power cable with strands and Y-branch comprising outlet for drill machine

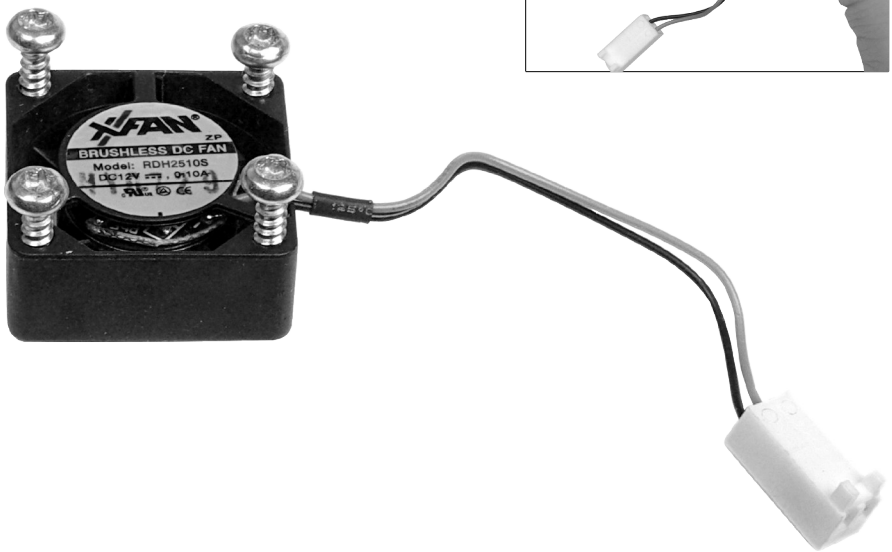
REASSEMBLING

Reverse dismantling process as in step 1–6 above.









Preparations

Start by separating motor unit from gear house, see chapter *7, "Dismantling motor unit..."*.

Cooling fan

1. **Connection to circuit board**

   (a) cooling fan

   Also remove these for better access:

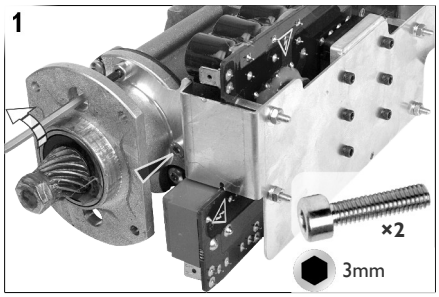
   (b) red, machine motor cable

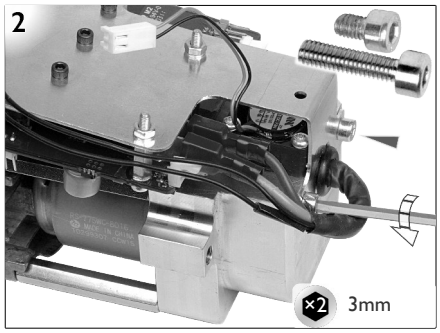
   (c) blue, machine motor cable

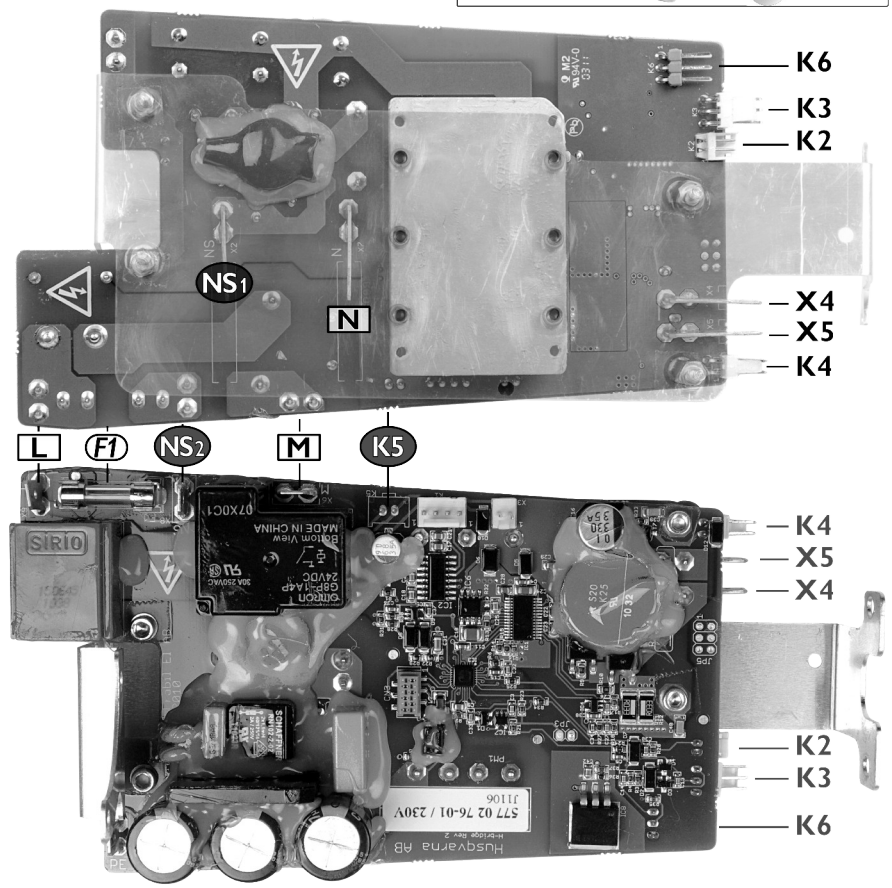
2. Remove the fasteners from each corner of the cooling fan
   - unscrew about 4–5 turns
     - Torx wrench: T10
3. Remove the cooling fan

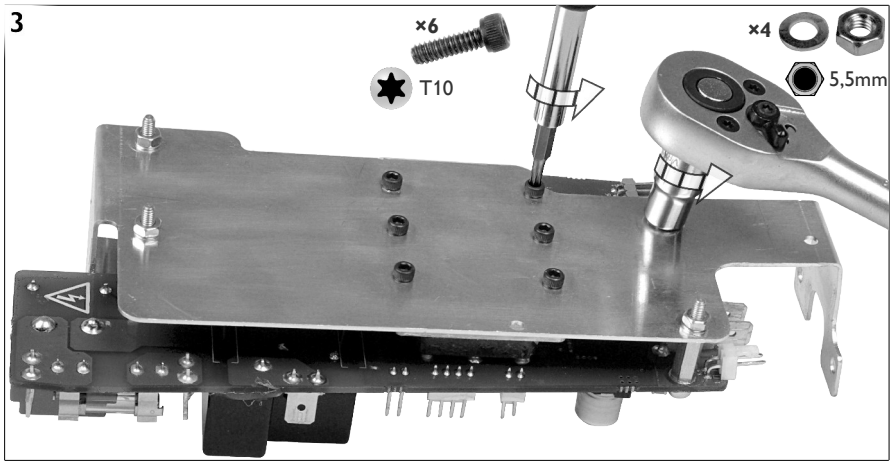
REASSEMBLING OF COOLING FAN

Reverse step 1–3 as above.









Preparations

Start by separating motor unit from gear house, *see chapter 7, "Dismantling of motor unit...".*

Circuit board

This is mounted on a cooling plate that is attached to each end of the motor unit:

1. Remove fasteners of pinion end
   - Allen wrench: 3mm
2. Remove fasteners of control panel end:
   - Allen wrench: 3mm

OVERVIEW OF CONNECTIONS:

K6. Flat cable, On/Off button and LED
K3. cables, potentiometer, 3×white
K2. temperature sensor, motor, black
X4. motor, electric cable, blue
X5. motor, electric cable, red
K4. Cooling fan, electric cable

Power cable to outlet/drill machine

L: black
M: brown
N: grey

Fuse

F1: 230V=2A, quick, 5×20mm

Emergency stop button

NS1. electric cable, red
NS2. electric cable, red
K5. cables, white, brown

110V: cable colours and fuse type

See electric diagram on next page.

Cooling plate/circuit board console

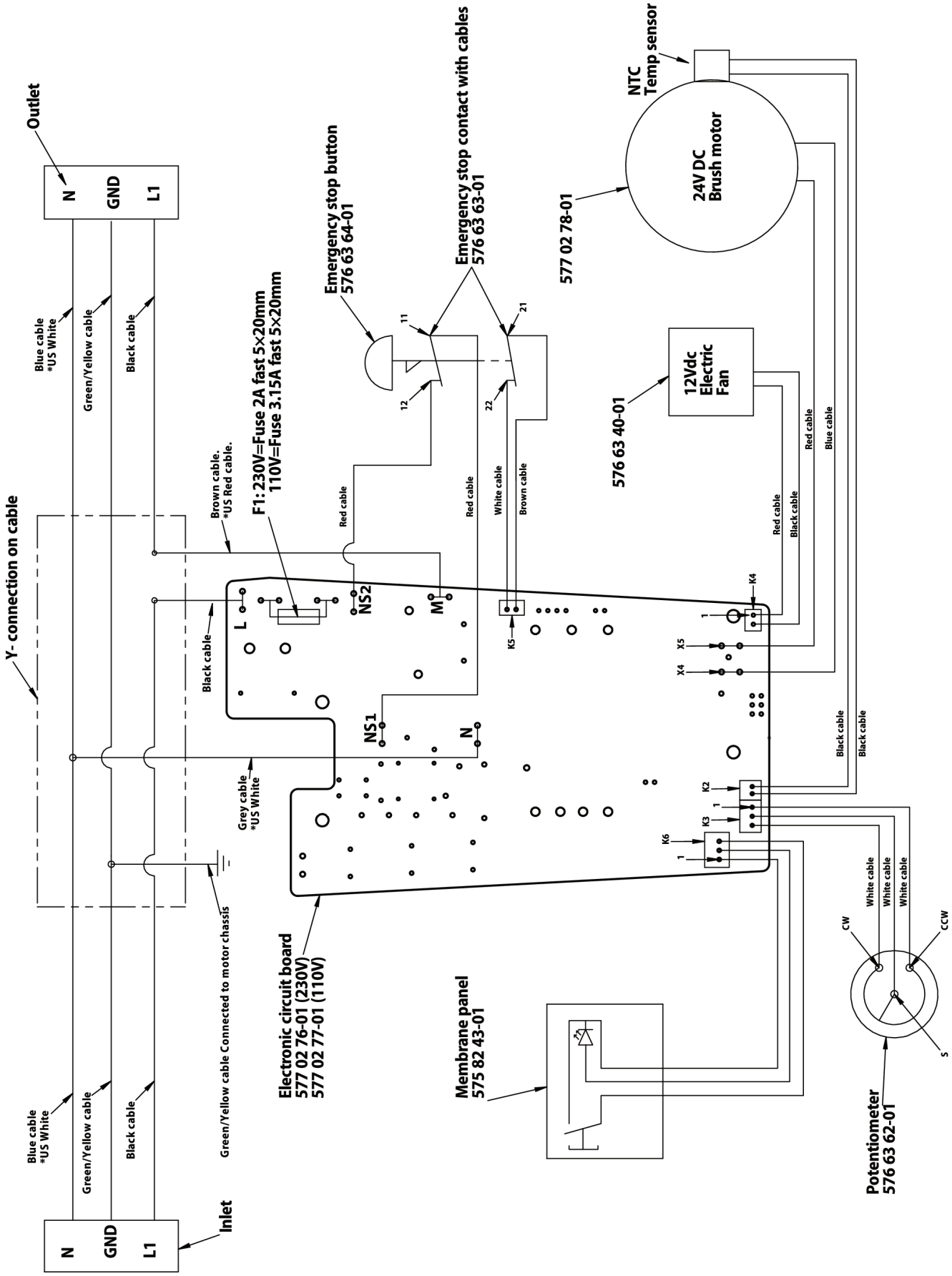
3. Remove the six fasteners of the cooling bridge and the spacer nuts with washers
   - Torx: T10
   - spanner: 5,5mm

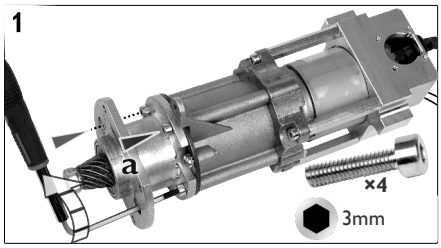
   – *Reassembling: Apply cooling paste between cooling bridge and cooling plate.*

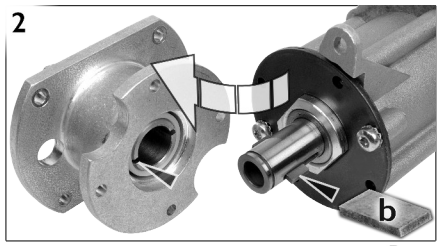
REASSEMBLING

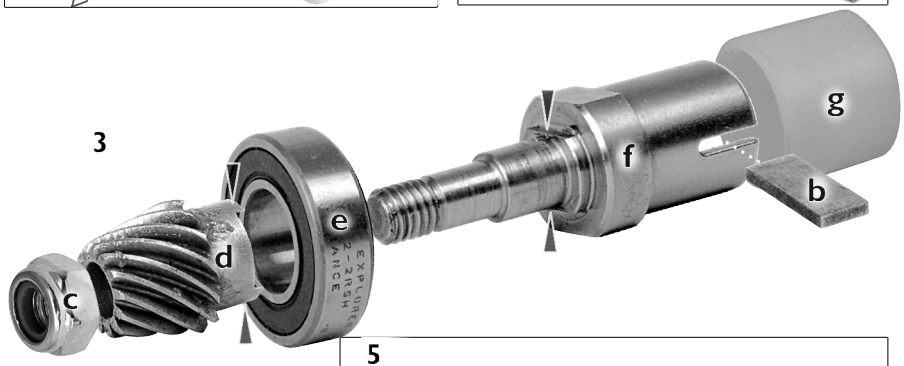
Reverse step 1–3 as above.

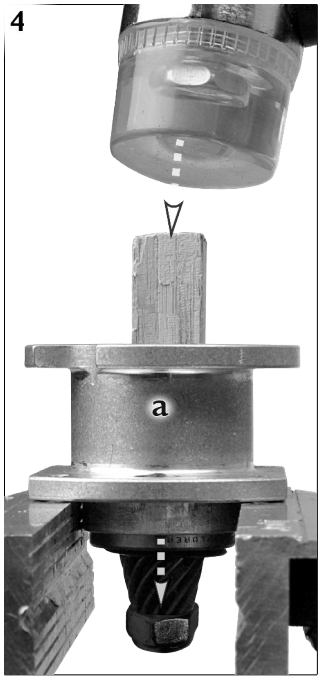
Electric diagram

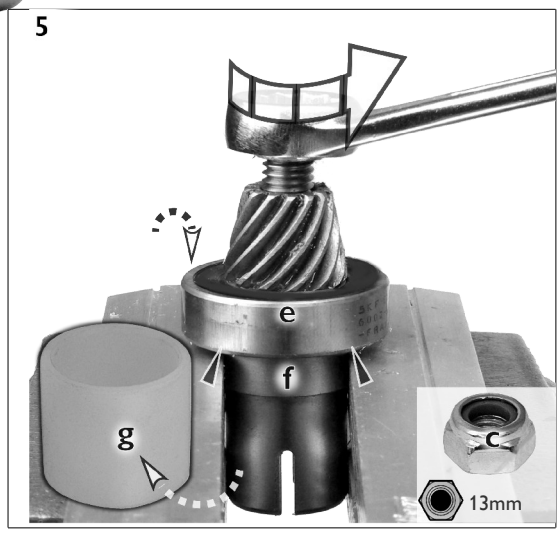


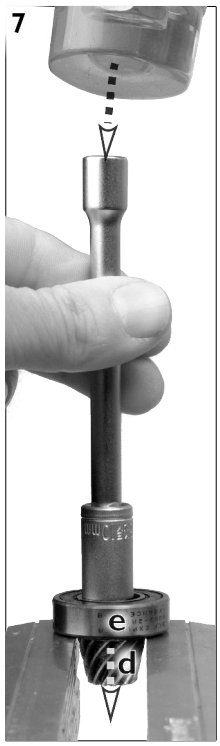












Pinion and machine motor unit are supplied as one spare part unit and thus these steps are rarely necessary.

Preparations

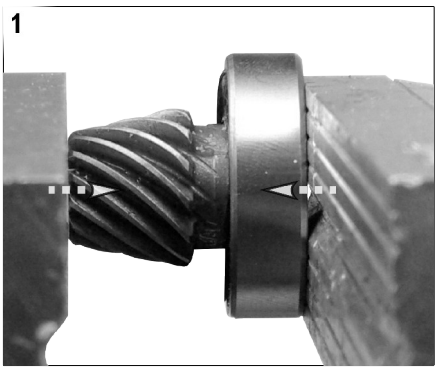
Start by separating motor unit from gear house, *see chapter 7, "Disassembling of motor unit..." and then chapter 8, "Electronics...".*

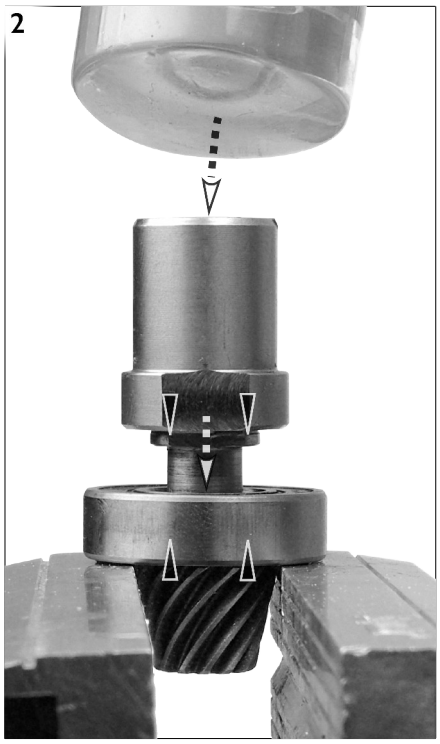
Pinion

1. **Disassemble the pinion house:**
   (a) remove the four pinion house fasteners (Allen wrench: 3mm)
2. **Pull off pinion house from motor shaft:**
   (b) wedge through motor shaft fits inside slots in pinion coupling
3. **Pinion unit parts:**
   (c) nyloc nut
   (d) pinion with fixation tabs
   (e) pinion bearing
   (f) pinion coupling with fixation seat for pinion (d) and slot for wedge (b)
   (g) nylon tube
4. Knock off pinion coupling from pinion house
   - fit pinion house in a vise with pinion facing downwards
     – use e.g. a wooden block and knock with a mallet
5. Remove the pinion nyloc nut:
   - remove the nylon tube (g)
   - fit pinion coupling (f) with fixation tabs inside a vise
     – spanner: 13mm
6. Knock out pinion coupling:
   - fit pinion bearing over a vise
     – use e.g. the gear drive shaft and a mallet
7. Knock pinion out through pinion bearing:
   - fit pinion bearing over a vice
     – use e.g. a socket of suitable diameter and a mallet.

REASSEMBLING OF PINION

Follow the steps on next page and complete reassembling by reversing step 1–5 as above.





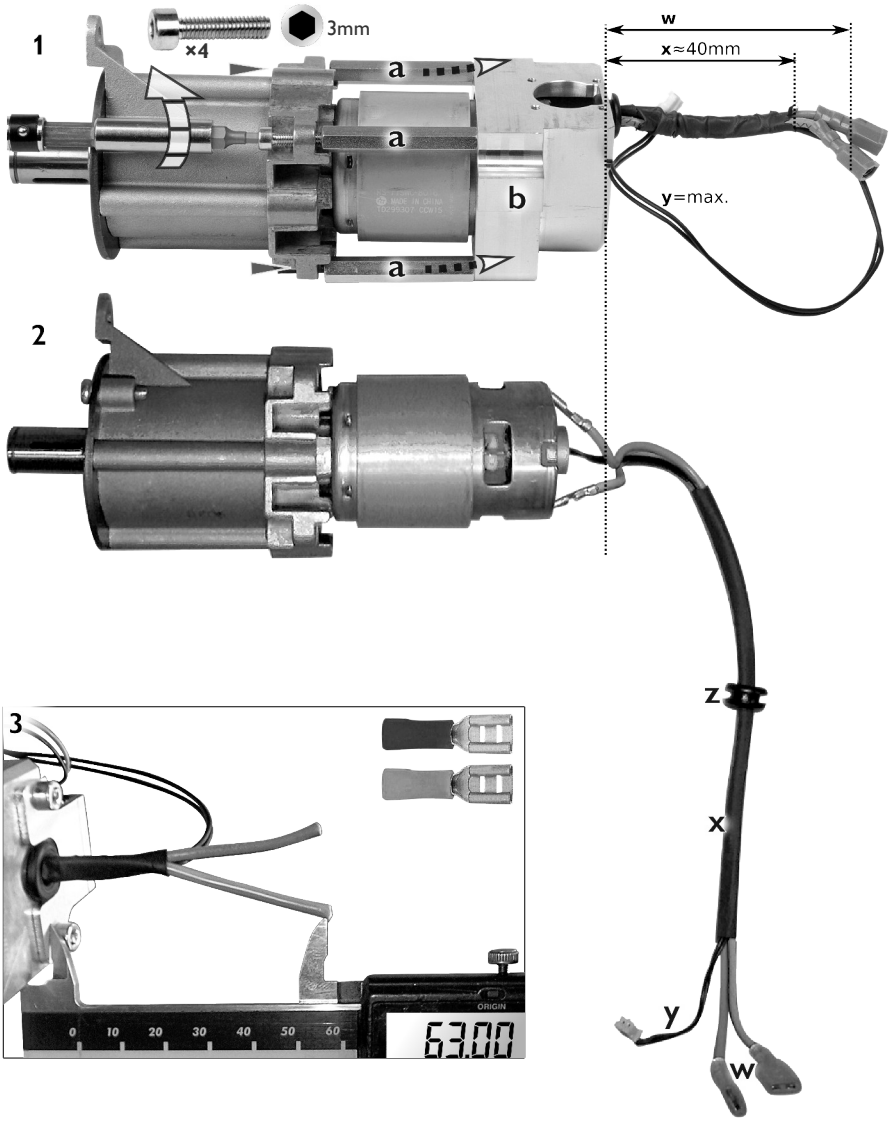
Assembling the pinion

Assemble the pinion as follows:

1. **Press pinion inside pinion bearing**
   - a sturdy vice with aluminium jaws will do
2. **Align and knock pinion coupling in position:**
   - fit pinion with pinion bearing in a vise
   - insert pinion coupling through the pinion centre hole with fixation tabs and seats merge correctly
     - gently knock the pieces together using a mallet

CONTINUED ASSEMBLING

Follow the steps above and complete assembling by reversing step 1–5 on previous page.



Pinion and machine motor with cooling block are supplied as a complete spare part Therefore the following steps are rarely needed.

Motor

Preparations: disassemble pinion unit following step 1–2 in the beginning of this chapter.

DISASSEMBLE AN OLD MOTOR

Disassemble cooling unit

1. Remove spacer fasteners (a) of cooling unit (b)
   - Allen wrench: 3mm
   - cut cable lugs and disengage the cooling unit

ASSEMBLING A NEW MOTOR

2. Prepare cables as follows:
   (w) red and blue cables; cut off any existing cable lugs
   (x) remove existing heat shrink tube and fit on a new as follows:
   - shrink new Ø6mm heat shrink tube (x) approx. 40mm covering red cable
   - shrink new Ø6mm heat shrink tube (x) approx. 40mm covering all cables

   (y) black cables for temperature sensor; keep existing length with cable lug
   (z) rubber cable padding; fixate cooling unit and thread cable bundle through (w+y)

Assembling cooling unit

- assemble motor to cooling unit (b) with spacers (reverse step 1a above)

3. cut red and blue cable at 63mm from cooling unit
   - fit new cable lugs to red and blue cables

CONTINUED REASSEMBLING

After step 2 above; complete assembling of pinion house as in s[illegible]-2 in the beginning of this chapter.

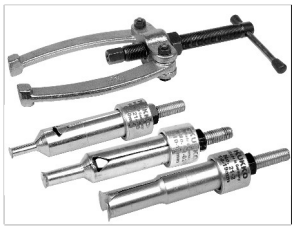
● = Service action

Recommended tools

BEARING AND GEAR (CHAPTER 5)

Universal puller

● Dismantling of bearings in the gear house



Internal bearing puller

6–10, 10–14, 14–19 (mm)

● Dismantling of components in the gear house

Grease lubricator

Peerless OG2 (or equiv.)

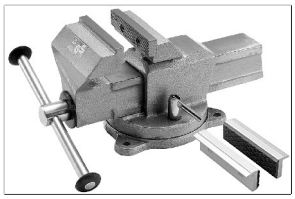
● Lubrication of gear

Thread-lock compound

Loctite 243 (or equiv.)

● Gear house lid

VARIOUS SERVICE

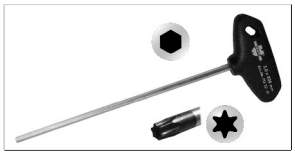


Vise

With aluminium and soft jaws

● Fixation of work pieces

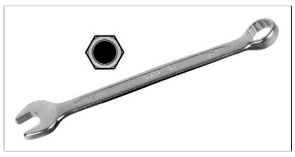
● Pressing of bearings etc.



Workshop wrenches/bits

Allen: 2,5–3 (mm)
Torx: T10

● Occurring fasteners



Spanners

Hexagonal: 13 (mm)

● Occurring nuts and bolt heads

ELECTRICS (CHAPTER 6—8)

Side cutter

● Cutting of cables and cable ties

Cable pliers

● Cable work

Cable lugs

Blue, Red, female: 2,5–3,5mm

● Cable work

Heat shrink tube

Ø 6mm

● Cable work

Heat gun

● Cable work

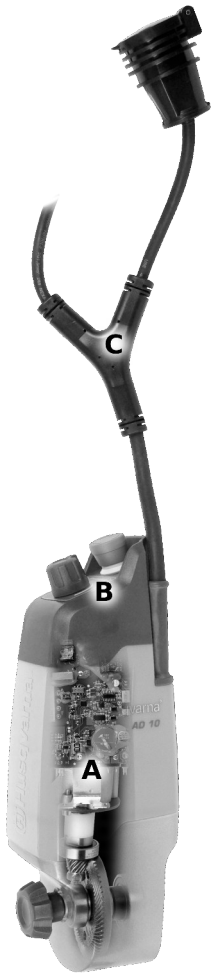
● Heating of female pieces for press work

Heat paste (HTC)

● Applied for heat transmission from circuit board

Digital multimeter

● Checks and troubleshooting, (chapter 2)



CONTROL SYSTEM

This chapter describes how to upgrade the machine firmware in the circuit board. The control system of a Husqvarna AD10 comprises the following:

A) **Drill feeder** containing circuit board (H-bridge) with micro controller (ATMega-328P) that controls the behaviour of the connected drill machine.

B) **Control panel** with potentiometer knob that allows for manual adjustment of how aggressively the automatic drill feeder should work.

C) **Cable connection** (Y-branch) to external drill machine to be controlled.

To connect a computer to the circuit board, a special adapter is needed with software and cables. Dismantling to access the circuit board is described in chapter 8. Please visit Husqvarna support site for further information.

Ordering of programming unit and software can only be done through a Husqvarna authorised service workshop.

Equipment needed

See instructions on next page.

RECOMMENDED HARDWARE

Programming unit: Atmel STK 500 or AVRISP mkII

Connection cable: Male: Tyco 7-215083-6
Pin-contacts: 1-1, 2-2, 3-3, 4-4, 5-5, 6-6

SUITABLE SOFTWARE

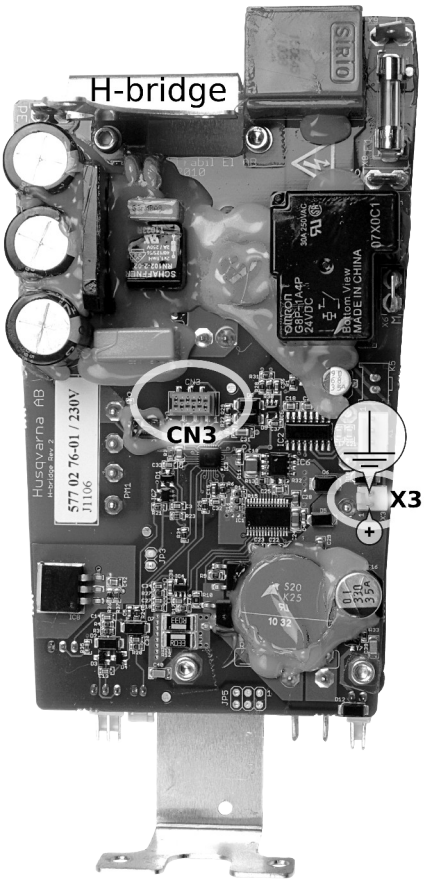
PC-program: AVR Studio 4.xx
For operating system Windows XP, or later.

Hex-files: ”af_h-bridge_r1_v1.1_230v.hex” for 230V version.
(or ”af_h-bridge_r1_v1.1_110v.hex” for 110V version).
”af_h-bridge_r1_v1.1_eeprom.hex”

PROGRAMMING METHOD

ISP-programming via 6-pin-contact

Fuses:	1.	EXTENDED:	0xFC
	2.	HIGH:	0xD9
	3.	LOW:	0xE2
Lock-bits:	1.	LOCKBIT:	0xFF



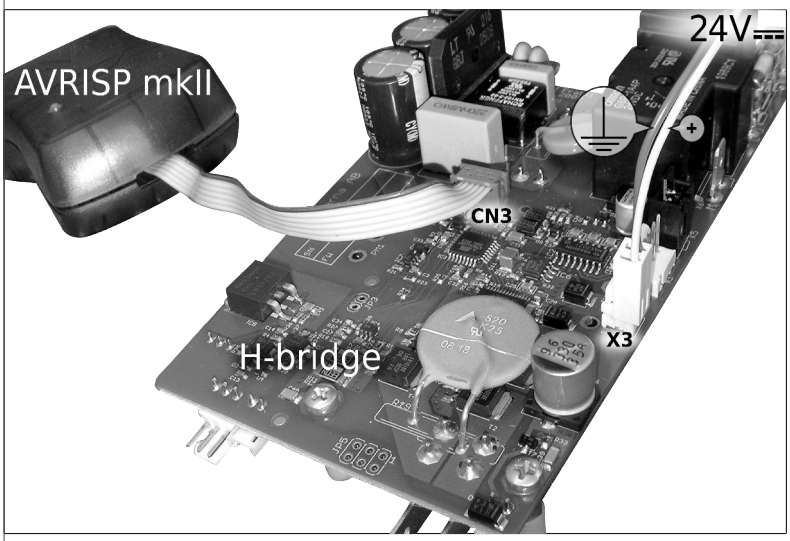
Programming micro controller ATMega328P

PROGRAMMING UNIT: AVRISP MKII

Complete service kit for programming comprising hardware and software can be ordered via Husqvarna support site. To obtain the hardware by other means, do as follows:

- Use a 6-pin flat cable
- Connect to the H-bridge card (contact CN3 for male: Tyco 7-215083-6)
- Connect pins as follows: 1-1, 2-2, 3-3, 4-4, 5-5, 6-6

NB. In order to perform any programming, the H-bridge card must be connected to external 24V DC over X3-1 (+) and X3-2 (-).



SOFTWARE: AVR STUDIO 4.18

1. Start *"AVR STUDIO"*
2. Select tab **Fuses** and set the following:
    1. EXTENDED: 0xFC
    2. HIGH: 0xD9
    3. LOW: 0xE2
3. Select tab **Lockbits** and set the following:
    1. LOCKBIT: 0xFF
4. Click **Tools** > **Program AVR** > **Connect**
5. Select **AVRISP MkII** (on the left)
6. Select tab **Main** and set:
    Device = Atmega328P
    Programming Mode = ISP mode
7. Select tab **Program** and section **Flash**:
    Select: **Erase device before flash programming**
    Select: **Verify device after programming**
    Select: **Input HEX file:**
    "af_h-bridge_r1_v1.1_230v.hex"
    (eller "af_h-bridge_r1_v1.1_110v.hex")
    – *The old software is erased and the new one is installed to the processor. A check is performed afterwards to ensure the software is correctly installed.*
8. Select tab **Program** and section **EEPROM**:
    Select: **Erase device before flash programming**
    Select: **Verify device after programming**
    Select **Input HEX file:**
    "af_h-bridge_r1_v1.1_eeprom.hex"
    Click: **Program** to activate flash process
    – *The memory chip is erased and the new parameters are installed (reset).*
    This ensures that nothing goes wrong after a software update and adjusted parameters.

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English

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