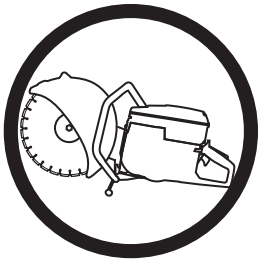
Husqvarna®

Workshop manual

K7000



HUSQVARNA CONSTRUCTION PRODUCTS

HUSQVARNA K7000

CONTENTS

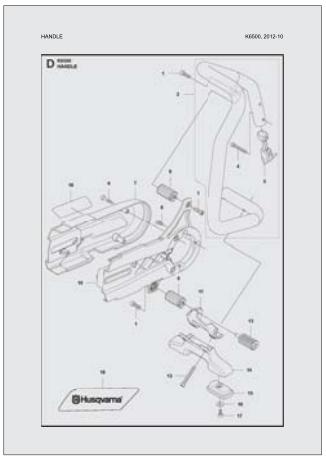
Workshop manual

This workshop manual covers virtually all work in the workshop that involves the K7000. Some very simple and rather obvious repair work has been omitted.

Arrangement – illustrations and text

This manual is divided into numbered chapters as well as chapter headings that are specified in bold at the top of each page.

The list of contents at the beginning of the manual also has a page reference to the beginning of each chapter.



Spare parts

The folder includes all spare parts for Husqvarna K7000.

The folder contains complete exploded drawings for the whole machine where the location, spare parts number and appearance of each component is easy to identify.

Information on spare parts, called IPL (Illustrated Parts List), can be downloaded from Husqvarna Construction Products' website or from Husqvarna EPC.

Service bulletins

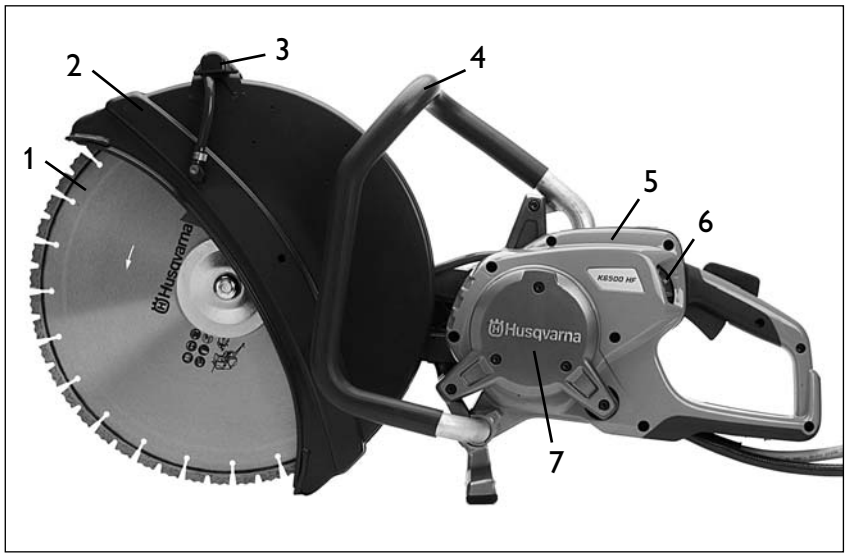
Service bulletins are issued when important design modifications have taken place, for example, or when amended service actions have been introduced. The service bulletins are available to download from the Husqvarna website under “Service bulletins, SB”.

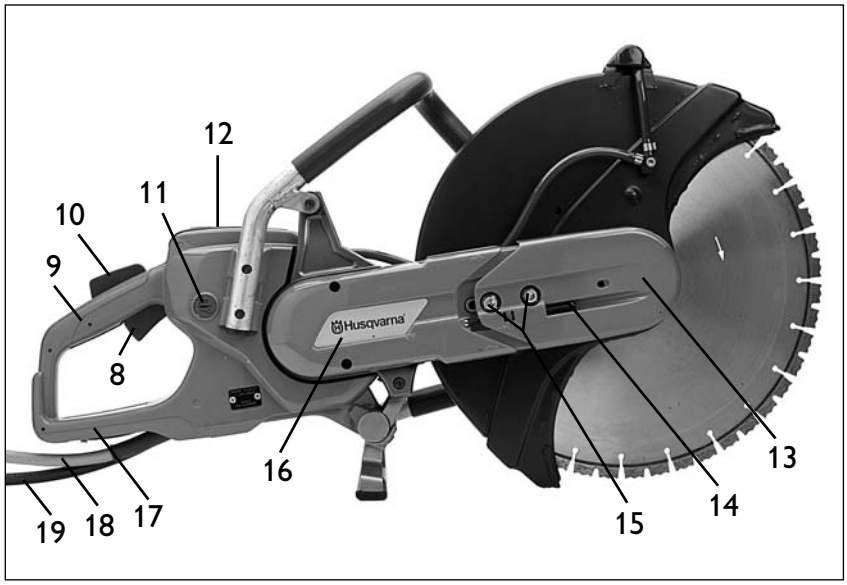
Operators manual

The operators manual describes how the machine is to be used, the functions of the machine, and the maintenance the operator normally carries out.

This manual also contains important instructions for the safe handling of the machine.

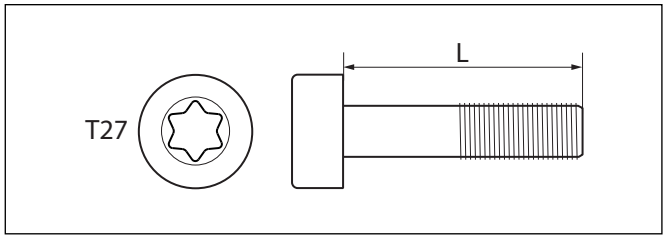
It is extremely important that service personnel are well acquainted with how the machine is used and follow the instructions given in the manual.





Components

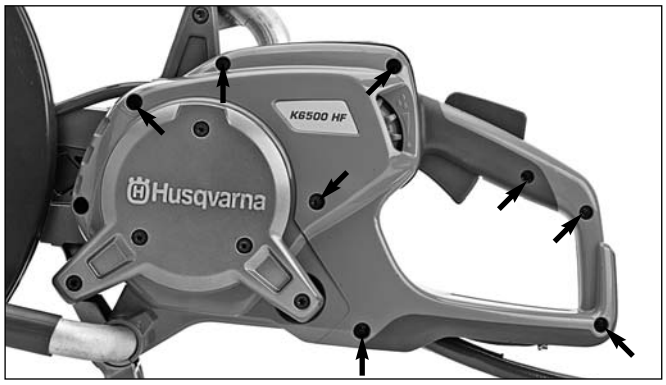
1. Cutting blade
2. Blade guard
3. Adjustment handle for the blade guard
4. Front handle
5. Motor guard
6. Water valve
7. Motor bracket
8. Throttle
9. Rear handle
10. Starter lock
11. Valve – cooling water
12. Display
13. Front belt guard
14. Belt adjuster screw
15. Locking screws for belt adjustment
16. Rear belt guard
17. Return water hose (hidden under handle)
18. Electrical connection for HF unit
19. Water connection



Screws – dimensions and torques

Information on screw type and recommended tightening torque is given in brackets – e.g. (M5x26, 7–8 Nm) – in a number of places in this workshop manual.

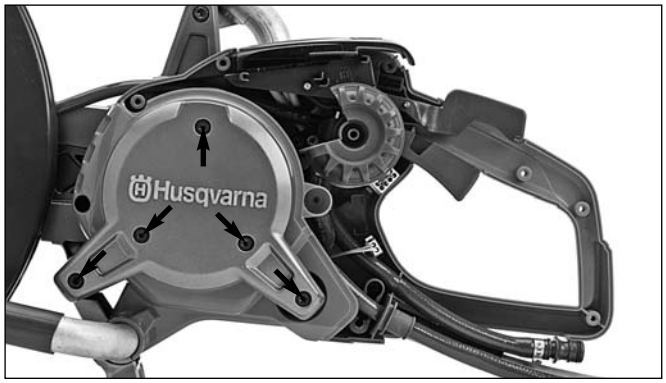
M= standard millimetre thread for fitting in metal.
MT= coarse thread for fitting in plastic.
5x26 indicates the coarseness x the length in millimetres. Note that the length is calculated minus the screw head.
7–8 Nm indicates the tightening torque in Newton metres.
Practically all screws of smaller dimensions have Torx T27 screw heads.



Removal

Rear motor guard

Remove the screws indicated with arrows, then remove the guard. (7 x MT5x14, 3-4 Nm. 1 x MT5x40, 3-4 Nm)



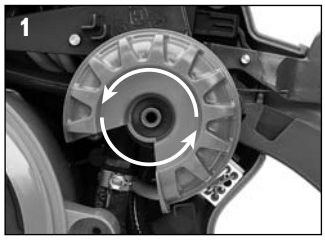
When the guard has been removed, most components are accessible, such as the control unit with electrical connections, the water valve and hoses.

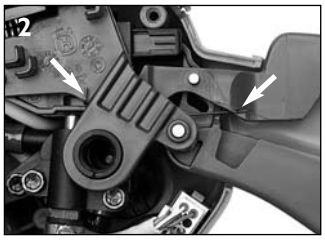
Motor bracket

The motor bracket connects the motor to the low-vibration handle unit.

1. Remove the three inner screws. (3 x M5x26, 7-8 Nm)
2. Remove the two outer screws. (2 x M6x40, 5-6 Nm)
3. Lift off the motor bracket.

To continue removal, see page 7.





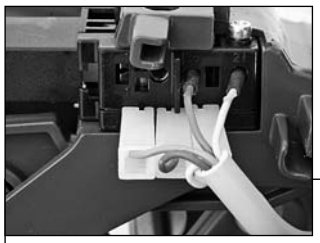
Control unit

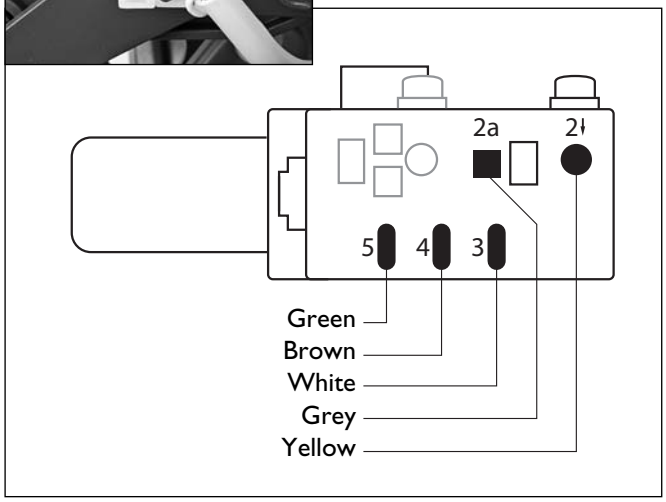
1. Remove the knob for the water valve by unscrewing it.

2. Note how the return spring for the starter inhibitor is fitted and tensioned.

3. Lift off the control unit.

4. Turn the control unit so that the electrical connections on the back can be accessed.

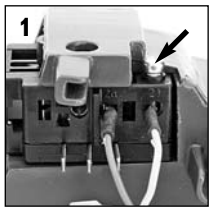


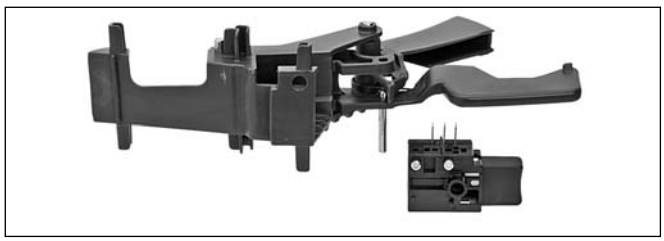


Electrical connections

Pay attention to the cable colours on the connections so that these can be connected to the correct contact positions when refitted.

The three pin connectors 3, 4 and 5 are removed by pulling them out.



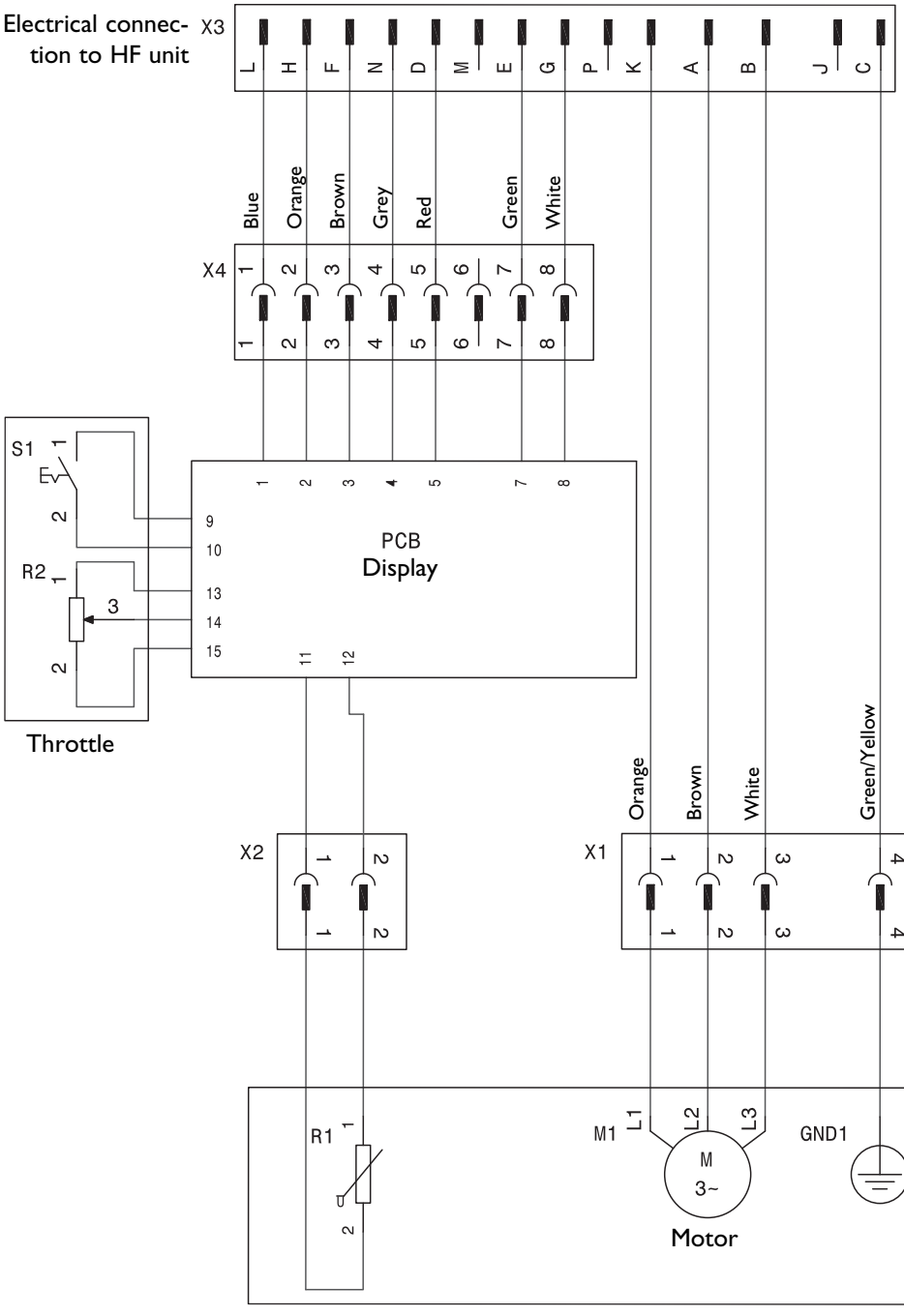


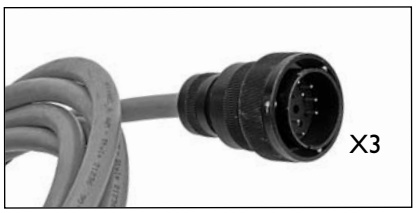
1. The yellow cable on the right is removed by undoing the locking screw on the top.

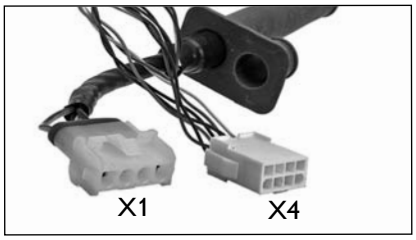
2. The grey cable on the left is locked with a spring. Insert a small screwdriver in the recess just to the right of the cable and pull this out. Also fitted in a similar way.

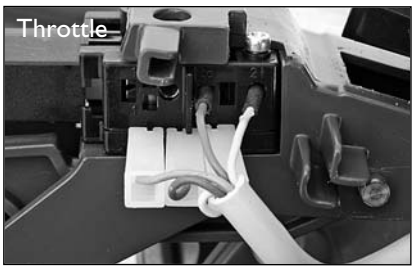
Switch
The switch can be replaced. Push out the shaft of the starter inhibitor and fold this back. The switch cam then be pulled out of the control unit.

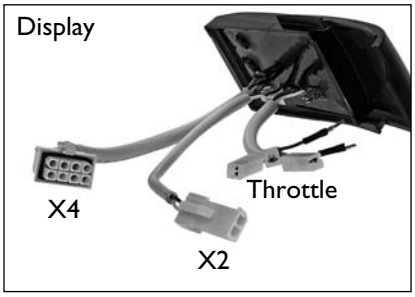
Wiring diagram

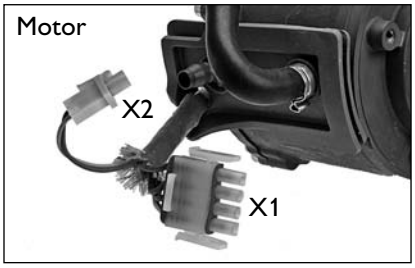


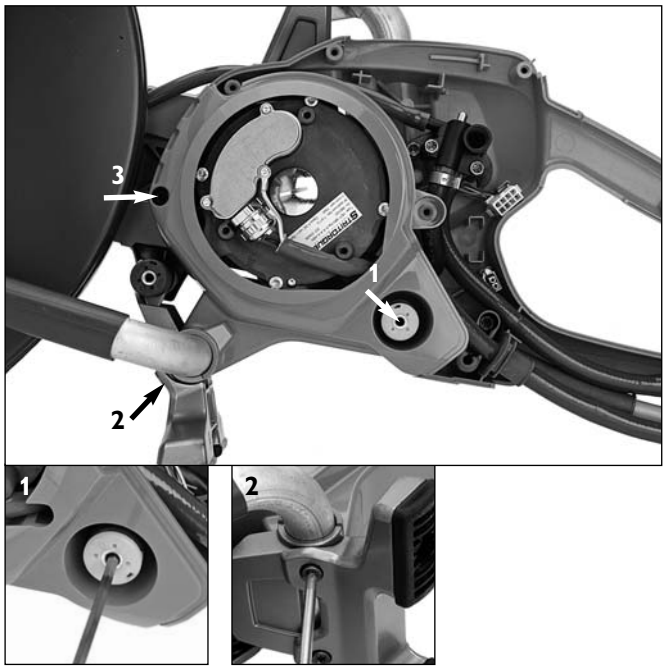












Removal

Front motor guard

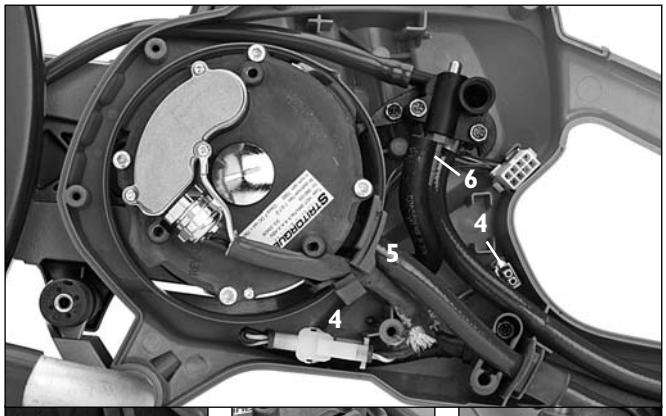
The front motor guard must be removed in order to access the motor itself and the electrical connections to it.

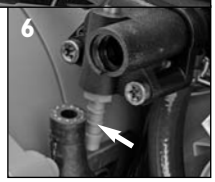
First, remove the rear guard and the control unit as described on page 5.

1. Remove the vibration element's inner screw, 4 mm Allen. (3–4 Nm)

2. Remove the screw by the ground support. (MT6x45, 4–5 Nm)

3. Remove the screw for the guard. (MT5x14, 3–4 Nm). Lift off the guard.

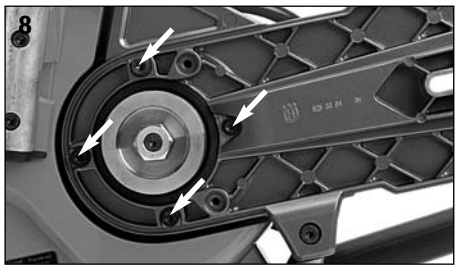




4. Split the connectors to the motor.

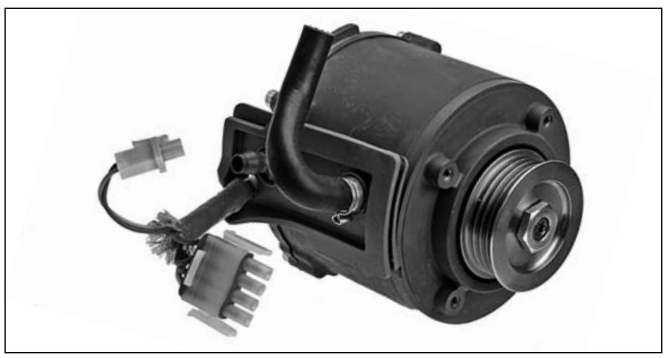
5. Remove the hose clip and pull off the hose that passes to the water connection.

6. Remove the hose to the motor from the water valve.



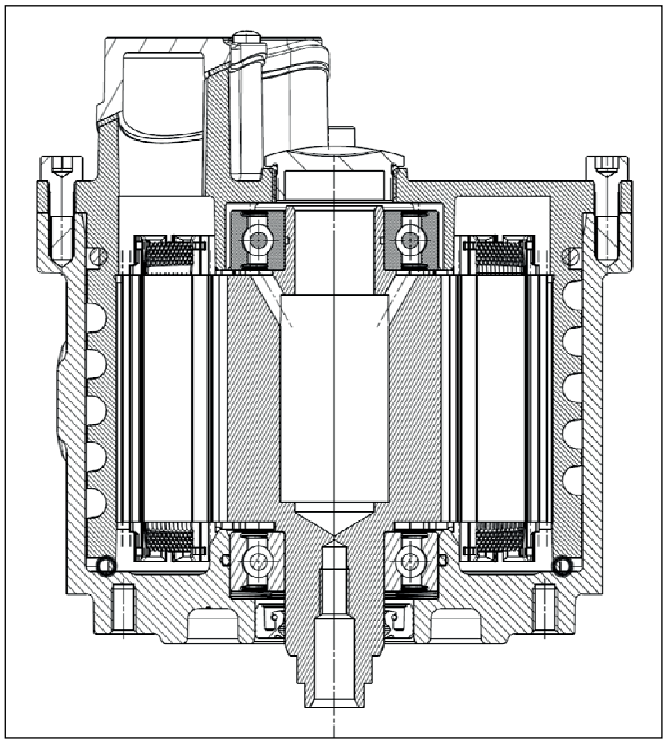
7. Turn the machine. Remove the two belt guard guards and lift off the cutting head. This is described on page 9.

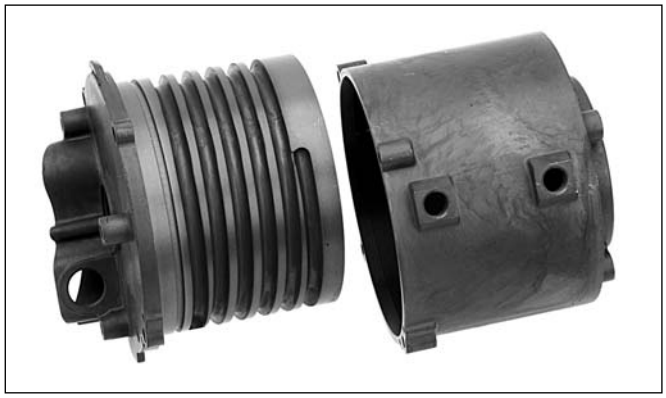
8. The motor is secured to the cutting arm with four screws. Remove the screws. The motor can then be lifted out. (M5x12, 7–8 Nm)

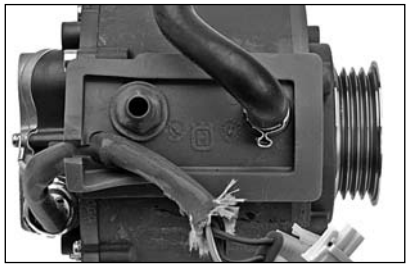


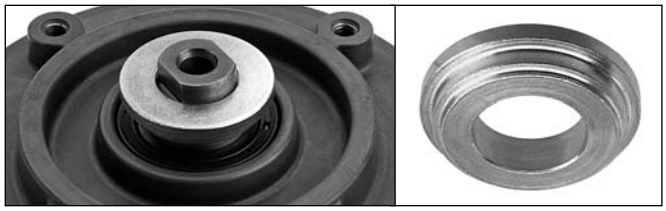
Do not dismantle the motor!

A defective motor cannot be reconditioned without specialist expertise and special tools. The entire motor must be replaced if the motor is defective.









Function

Working method

The way in which the high frequency motor works differs significantly from a traditional motor with rotor windings and collector/carbon brushes.

The rotor in the high frequency motor consists of permanent magnets with high magnetic force, known as neodymium magnets. In other words, the rotor has no windings or electrical components.

The stator has several field windings. The high frequency unit, which is connected to the motor, generates a rotating magnetic field in the stator and the rotor follows this movement.

In comparison with the traditional motor, the rotor and stator have essentially swapped functions.

The high frequency motor is considerably more efficient than a carbon brush motor and its output, in relation to its weight, is significantly higher, which is why it is ideal for handheld machines.

Cooling

The cavity between the stator and the rotor is filled with oil. This oil leads and distributes the heat out towards the motor housing. An outer jacket surrounds the motor housing and the space has channels for cooling water. The photo below shows the structure of the motor housing and cooling jacket.

During wet cutting, the water passes first through the motor and then on to the blade guard's spray nozzles.

During dry cutting, the water flow is rerouted so that the water flows out through the hose located beneath the rear handle after having cooled the motor. This hose has a Gardena coupling for connection of an extension hose.

Testing in the workshop

Water does not need to be connected for motor cooling for short-term testing with the motor without load.

Service actions

The motor will probably not require any service actions during the service life of the machine. Repairs to this type of motor are complicated and require both special knowledge and special tools, and this work is not really of a type which can be carried out at a regular service workshop. Therefore, a failed motor will be replaced by a complete new motor.

Turn the gasket the right way

If the gasket is removed, note how this is to be turned when refitting. Make sure also that the plastic guard rests correctly in the grooves against the gasket during fitting.

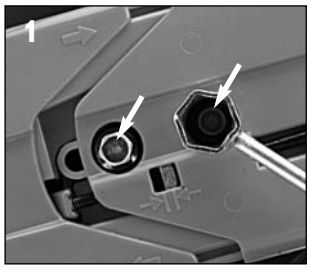
Nipples for cooling water

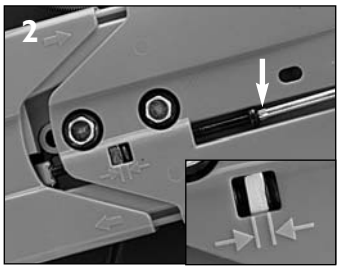
Two nipples are connected to the motor for the cooling water supply. New ones are fitted without sealant. (3–4 Nm)

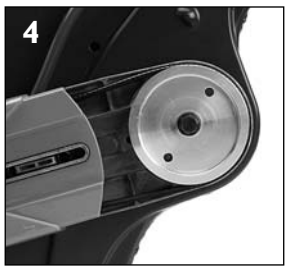
Belt pulley

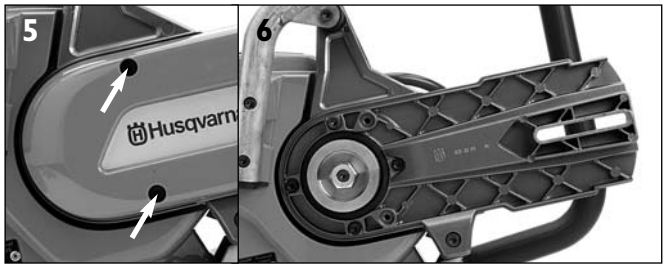
The belt pulley is removed by locking the rotation using a 19 mm wrench and removing the centre screw, Torx 27. (M6x30, 10–12 Nm)

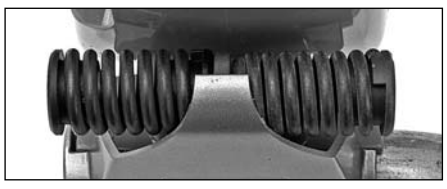
Note that there is a supporting ring under the belt pulley.











Cutting head

Removal

The wet unit for the blade guard must first be separated from the machine. The easiest way to do this is to remove the spray nozzles and handle from the blade guard. If the rear motor guard has been removed, the easiest thing to do is to remove the hose from the water valve and pull out the hose through the front guard.

1. Loosen the screws to the cutting head. (M8x42, 25–30 Nm)

2. Loosen the tension of the belt with the adjuster screw.

When refitting, do not forget to adjust the belt tension to the correct level (inset).

3. Remove the screws to the cutting head. Remove the front belt guard by pushing it forward.

4. Lift off the belt from the belt pulley and remove the cutting head.

5. Remove the rear belt guard screws. (M5x25, 3–5 Nm)

6. Lift off the guard.
At this stage, the belt can be replaced.

Cutting arm

The K7000 has a cutting arm which is permanently fitted to the motor and has brackets to the handle unit with vibration elements. A damaged cutting arm can easily be replaced.

Remove the four screws around the belt pulley (M5x12, 7–8 Nm) which are screwed into the motor. Remove the two screws to the upper and lower vibration elements (M6x20, 5–6 Nm). The cutting arm can then be removed.

Vibration elements

The inner screws on the two front vibration elements are connected to a screw, Torx 27, from one side. A normal Torx 27 wrench is too large to be passed in through the spring. The combination wrench, supplied with the machine, is thinner and suitable for this task. (5-6 Nm)

Dismantling – blade guard/bearing housing

Remove the cutting head from the machine as shown on the previous page.

This section describes dismantling of the components in the cutting unit and ends with an instruction on how to replace the blade shaft bearings.

The centre bush for the blade can be replaced and is available in different diameters.

Press up the centre bush with two open ended spanners. Now remove the inner flange washer.

Remove the spacer together with the bearing seal.

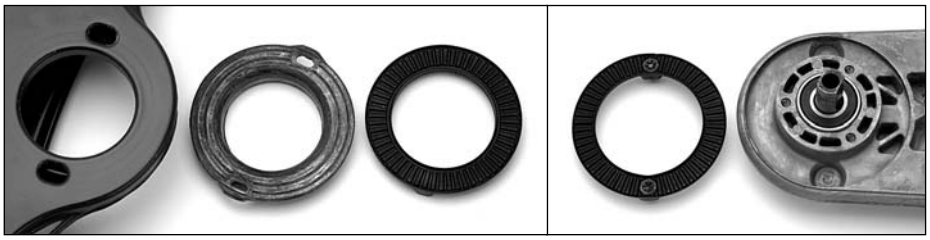
Check that the seal is intact. Dirt under this indicates defective seals and these should be replaced.

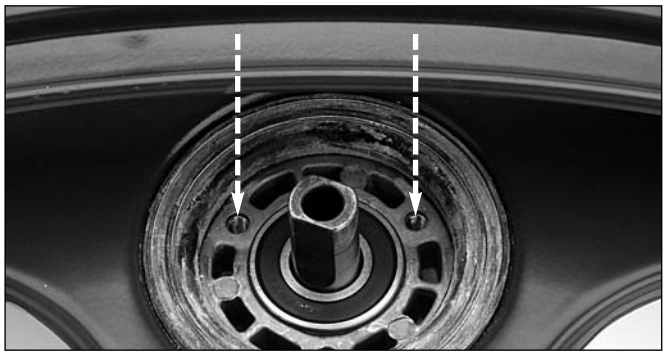
The washer and the three screws hold the blade guard against the bearing housing. Remove the screws and the washer.

Lift off the disk protection from the bearing housing.

Check that the screen rings for locking the disk protection are intact.

Also check that the rubber ring under the screen ring is in good condition. The rubber ring serves as a spring to keep the gears engaged.

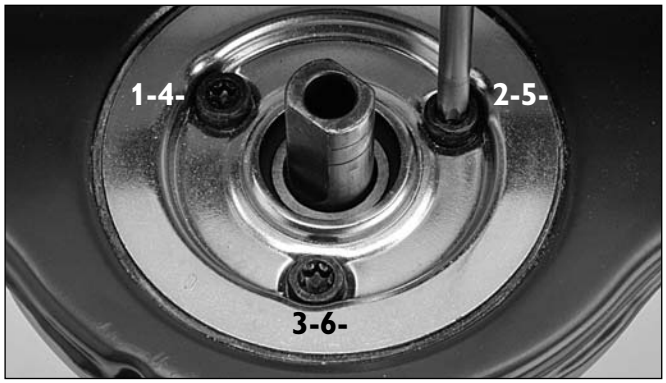




Assembly – blade guard /bearing housing

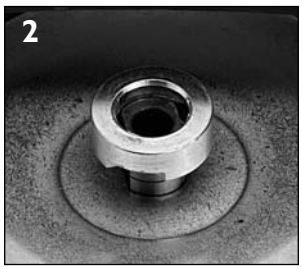
Make sure the rubber seal has the right fit in relation to the bearing housing and blade guard.

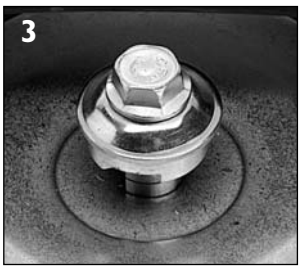
Turn the bearing housing so that the screw holes are accessible from above with the tool.

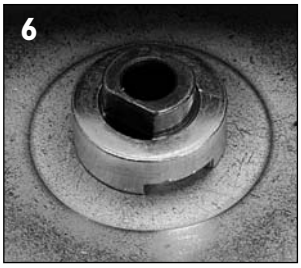


Fit the blade guard – tighten the screws alternately
The soft rubber ring under the washer is pressed together when the plate washer is fitted. The three screws must then be tightened alternately to avoid deforming the plate washer. (M5x16, 5-6 Nm)

Fit the seal ring
Press the seal ring fully down onto the plate washer. The axle bushing has slots for the seal ring that ensures secure engagement when the seal is in the right position.

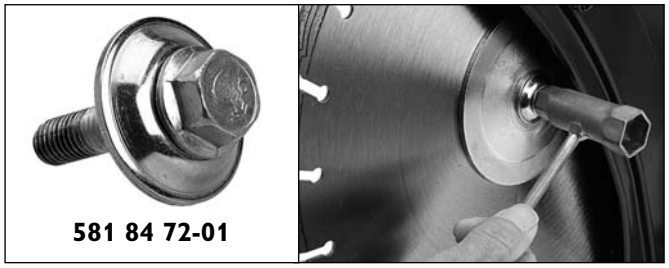






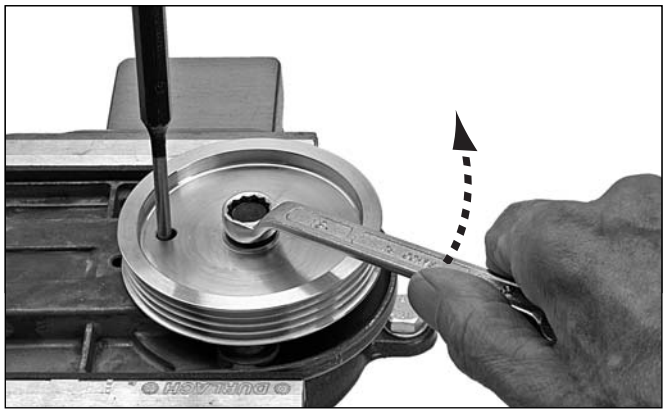
Centre bush
Fit as follows:

1. Position the inner flange washer.
2. Position the centre bush.
3. Fit the screw for the blade's attachment.
4. Press down the bush until the screw bottoms.
5. Dismantle the screw and place it on the other flange washer "turned the wrong way". Refit the screw and press down the bush against the inner flange washer.
6. The bush is fitted.



Fit the blade
Fit the blade using the screw 581 84 72-01. This is a specially designed flange screw with a special washer, and it must never be replaced with a different screw.

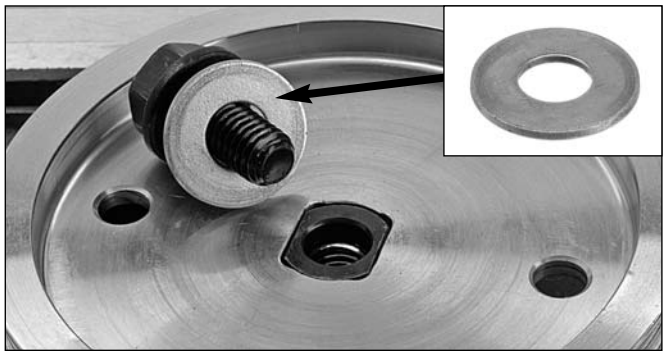
Tightening torque: 15–25 Nm (11–18 lbf·ft)



Belt pulley

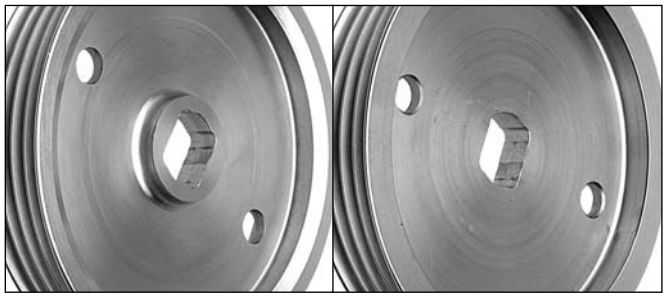
Removal

Attach the bearing holder in a vice with soft jaws. Lock the belt pulley rotation with a pin punch or a screwdriver. Remove the centre screw.



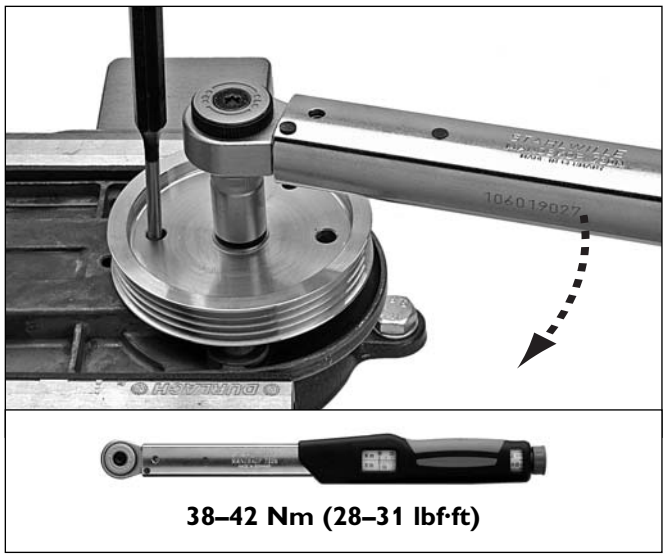
Washer

Note that there must be a washer on the upper side of the belt pulley.



Asymmetrical belt pulley

Note that the belt pulley is asymmetrical. The side with the elevation, as shown on the left, should be facing the ball bearing.

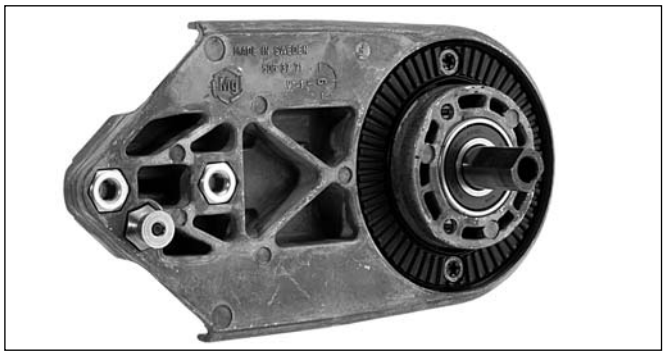


38–42 Nm (28–31 lbf·ft)

Assembly

Place the belt pulley with the raised side facing the bearing housing. Put on the washer and fit the screw.

The screw must be tightened firmly with a torque wrench to a value of 38–42 Nm.



Blade shaft bearing housing
The bearing housing carries dual ball bearings for the blade's drive shaft.

Blade shaft, bearings
The blade shaft has a fixed machined spacer which the bearings' inner rings must be in contact with after assembly in the bearing housing. The bearing's inner rings are press-fitted against the shaft and the outer rings are press-fitted against the bearing housing.

It is very important not to expose the bearing to clamping forces between the inner and outer rings during assembly. With the help of special tools and assembly methods described here, the bearings are fitted without any risk of the forces damaging the ball bearings.

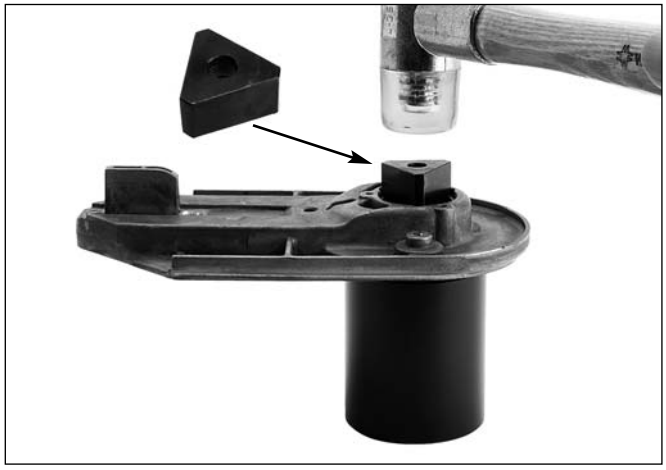
575 96 20-01

506 37 61-02

Bearing replacement

Tools
To replace the blade shaft bearings you need tool kit 575 96 20-01 if the bearing replacement is made by hydraulic press. The tools are used for both dismantling and assembly.

If the hydraulic press is missing, the bearings can be replaced in the manner described below, in which case tool kit 506 37 61-02 is required.

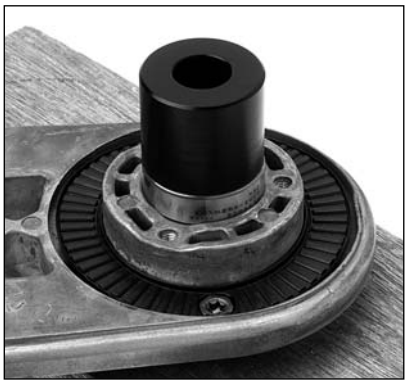


Dismantling
Turn the dismantling support A with shoulder up and put the bearing housing on the device.

Put the triangle in the tool kit 506 37 61-02 or assembly support B in kit 575 96 20-01 on top of the bearing.

Press or knock out the bearing unit as far as possible. Then extend with a suitable tool socket to push out the complete bearing unit fully from the housing.

Remove the bearings from the axle
Remove the bearings using a universal puller.

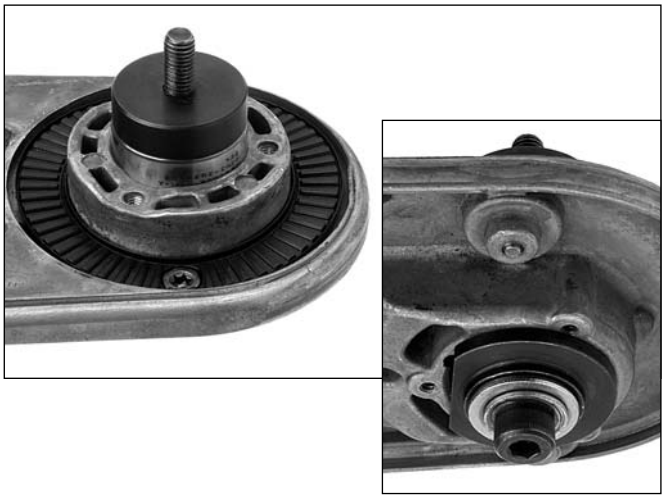


Fitting with press

Support the bearing housing under the area for the bearing with, for example, a piece of wood so that the bearing housing is horizontal.

Put the bearing in place and position the pressing device C on top of the bearing. Push down the bearing fully to the stop in the bearing housing.

If the bearing is knocked into place, there is a great risk that the bearing will enter at an angle into the bearing housing causing damage. Use screw press 506 37 61-02 instead



Fitting with screw press

The bearing press 506 37 61-02 is the best assembly tool for fitting the first bearing if the hydraulic press is not available.

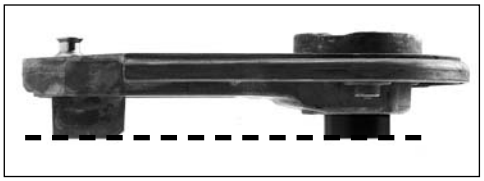
Fit the tool as per the illustrations. Note that the support washer, shown in the bottom illustration, have different guides. The larger diameter provides firm support to the bearing housing.

Screw in the bearing fully to the stop in the bearing housing.

Fit bearing on the axle

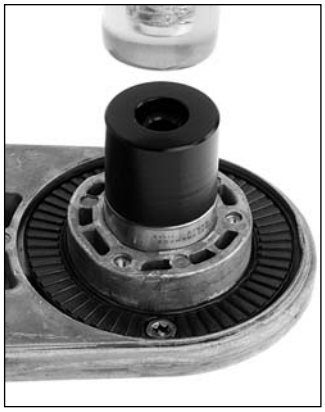
Place the bearing on the axle and place the axle in pressing device C. This bearing provides support to the inner ring, which is important here.

Use a plastic hammer to push or knock the axle down until the spacer meets the bearing's inner ring.



Fit axle with bearing

Use the assembly support B to make the bearing housing horizontal. Place the support on the first fitted bearing.



Turn the axle correctly!

Put the axle with the fitted bearing in place in the bearing housing with the spacer downwards.

Put pressing device C above the axle. The device provides support to both bearing rings during assembly.

Press or knock down the bearing together with the axle. When the spacer on the axle reaches the first fitted bearing, you can clearly feel the stop and the units are in their proper position in the bearing housing.

Hose clips

Oetiker system

The machine is originally fitted mainly with a single-use Oetiker ear clip. This type of clip has the advantage of being able to give small-dimension hoses even clamping force all round with a minimal risk of leakage. Never replace with any other type of hose clip.

Tools

Standard cutting pliers are used to remove the ear clip.

Oetiker's special pliers are the best tool for fitting. These are manufactured by Knipex but are normally sold by Oetiker distributors only. These pliers are labelled: SYSTEM OETIKER, KNIPEX 1099.

Alternatively, cutting pliers can be used which are modified by grinding down the edge.

Note that the special pliers are designed to be able to fit the ear clip in two directions.

Removal

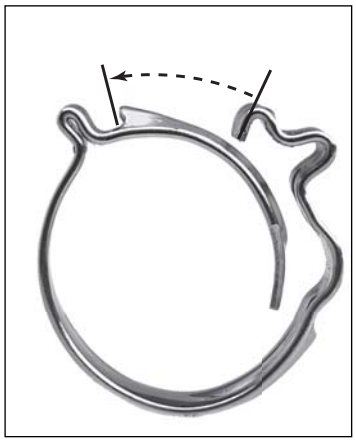
Use cutting pliers and cut the hose clip right across the ear.

Separate the clip and remove it.

Assembly

Place the hose clip in the right position on the hose, then compress the clip with the pliers.

The photo on the right shows a hose clip fitted correctly.

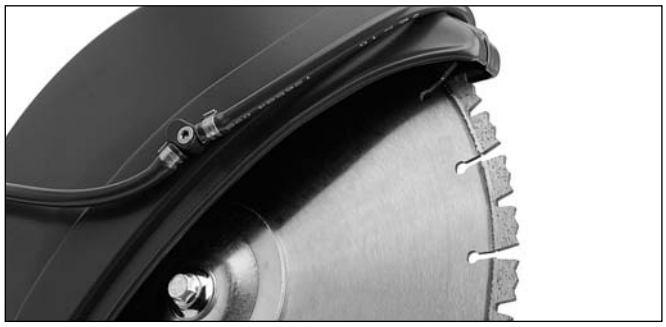


Hose clips for spray nozzles

The hose clips for the spray nozzles are of reusable type.

Open the hose clip by pushing up the lock catch with a screwdriver.

Close the hose clip by pressing it together with some pliers.



Wet system

Design

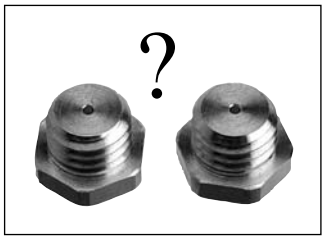
A spray nozzle is located on each side of the blade guard. The water strikes a section of the cutting blade and the centrifugal force carries it out towards the blade's diamond segment.

The spray nozzles are available with several different hole diameters depending on the type of machine and application. Find the right nozzle in the spare parts list.

Replacing the spray nozzles

The intake is located with special screws that direct the water to the spray nozzles underneath.

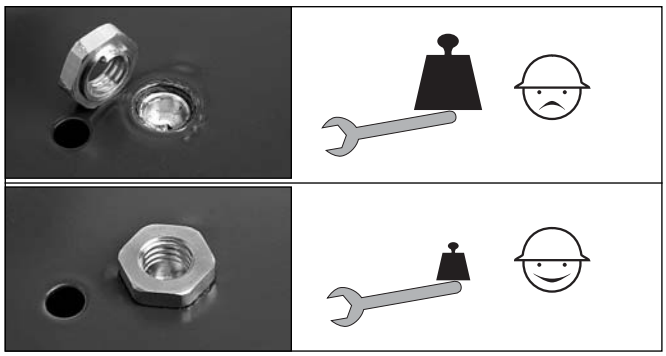
Remove the screw.



Remove the spray nozzle.

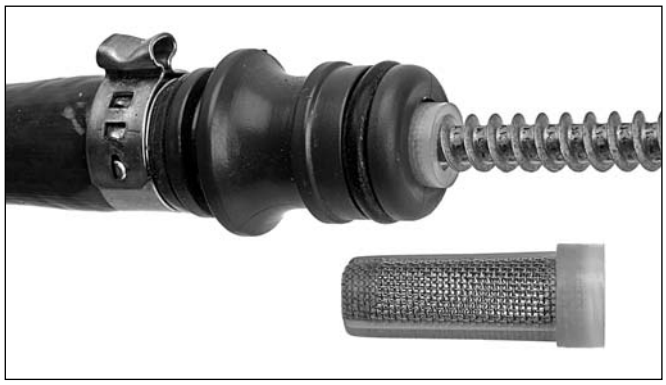
Fit the right dimension

Check in the spares list that the spray nozzle with the correct dimension is
fitted.



Light tightening

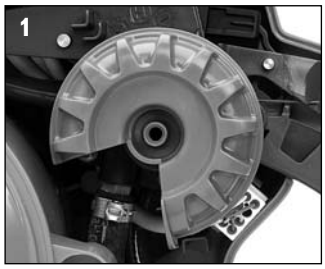
The spray nozzles have a thin material between the outer and inner thread. Tighten the spray nozzles with a light force.

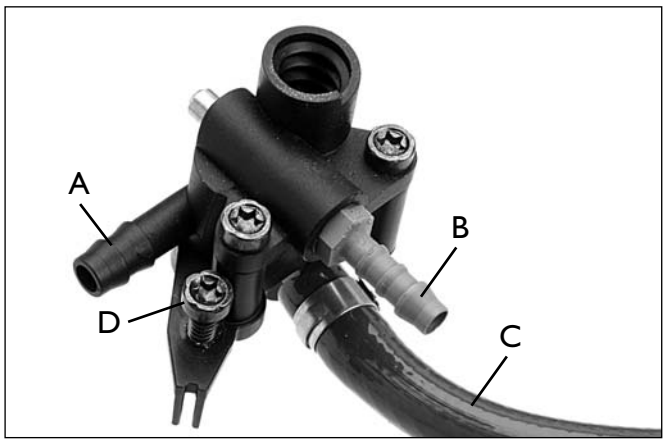


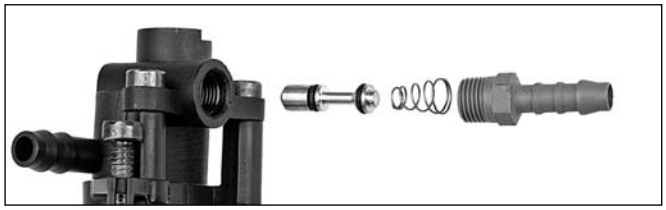
Filter replacement

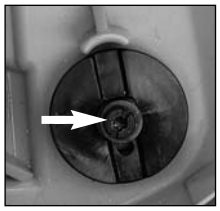
A normal wood screw works excellently as a removal tool for the filter. Screw the screw into the filter and pull this out.

Fit the filter by pressing it in on a flat surface.









Water valve

Function

The motor requires water cooling so as not to overheat. The water is fed from the water valve to the motor's cooling ducts, and normally on to the spray nozzles on the blade guard. If dry cutting is necessary, the flow is rerouted, and the water is fed to the hose beneath the rear handle once it was cooled the motor. The hose has a Gardena coupling for a further hose connection and the water is fed out to an appropriate drain.

The water valve has two functions:
The water flow to the blade is set using the blue knob (1), removed in the upper photo. The valve is closed during dry cutting.

The adjustment control (2) is located on the opposite side and has two positions:
– The water is fed to the blade guard after cooling the motor.
– The water is fed to the hose beneath the rear handle after cooling the motor.

Testing in the workshop

Water does not need to be connected for motor cooling for short-term testing with the motor without load.

Connections

A. To the blade guard's spray nozzles.

B. To the motor's cooling water outlet side.

C. To an outlet pipe (during dry cutting) at the rear handle.

D. Screw which secured the valve unit to the guard.
(M5x14, 3–4 Nm)

Removal

Remove the hoses at A and B. Undo the screw D, and then the valve unit can be lifted off.

Maintenance

The water valve is available as a complete spare part. It does not normally require any service actions.

Valves may sometimes jam, especially if they have not been used for any length of time. Valves which jam can often be made to work by cleaning and lightly greasing the sliding surfaces.
The adjacent photos show removed valves.

Adjustment control

The control is removed using the centre screw, Torx 10.
(PW3, 5x9.5 T10, 3–4 Nm)

Tools

Multimeter

A multimeter is needed for most of the tests in order to measure resistance (ohm) and inductance (H = Henry). The multimeter's connection test with a buzzer is used to check switches, cables, contacts, etc. (The Husqvarna range of tools includes an efficient multimeter; see page 22.)

Insulation and continuity tester

The motor works with a voltage of just over 500 V AC. Even if simple measurement with a multimeter shows that the motor is demonstrating no insulation faults at stator windings or in connected cabling, it is not possible to rule out faults in these. Defective insulation can cause arcing at high voltages. This can be tested using an insulation tester. Megger and Fluke are just two examples of common makes.

Insulation is conveniently measured at 1,000 V over 3 seconds with a maximum of 5 mA.

Note that connected test cables and test probes must be designed for 1,000 V or more.

Carefully read the instrument's operators manual for use!

Tachometer and screwdriver

The strength of the rotor's magnetic field is tested by rotating the motor to 1,000 rpm and measuring the voltage it emits at this speed. A simple tachometer is needed for this: an optical laser seeker is suggested. The easiest way to achieve rotation is to use a screwdriver.

IMPORTANT: No measurements should or must be carried out with the machine connected to a power source!

Rules of procedure for troubleshooting

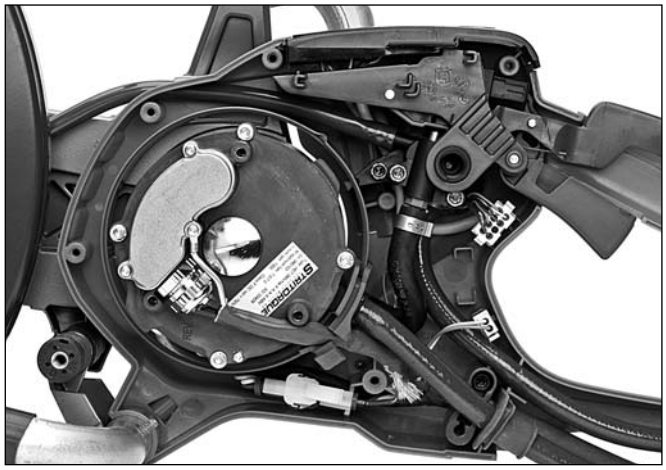
Defective HF unit or cutting machine?

When troubleshooting, it is important to remember that the fault may be in either the cutting machine K7000 or the unit PP70. If you have access to another working PP70 and machine, these can be used in order to identify the faulty unit.

If you have no other PP70 or machine to hand, the easiest way to go about troubleshooting is to start with the cutting machine, as this is made up of relatively few components.

Troubleshooting K7000

The troubleshooting order can often be decided in each individual case depending on the symptoms, signs of external damage, operating conditions, number of hours of operation, etc.



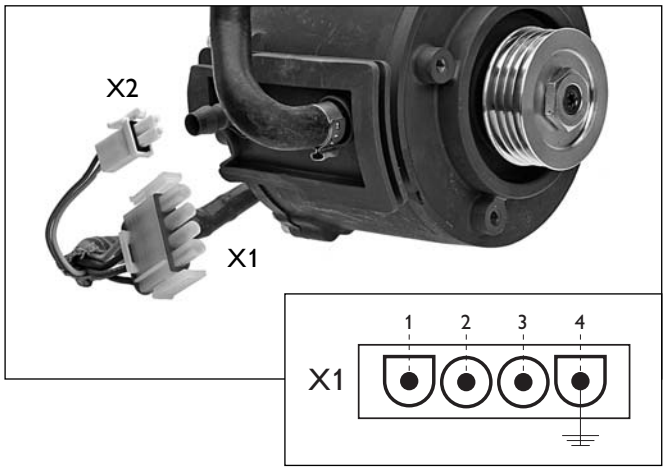
The motor will not start

If the history of the cutting machine is not known and there are no further external signs of damage visible, the components of the machine must be tested. There are few components to test:

- Cabling, between the HF unit and the cutting machine
- The motor unit with built-in thermistor
- The throttle unit
- The display unit

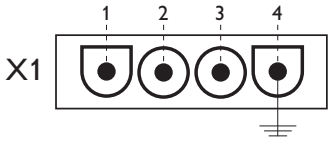
Dismantling

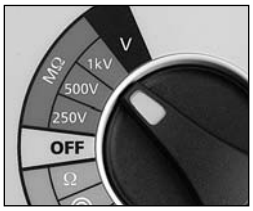
For all checks, it is necessary to remove the cutting machine guards as illustrated in order to make the electrical components accessible.



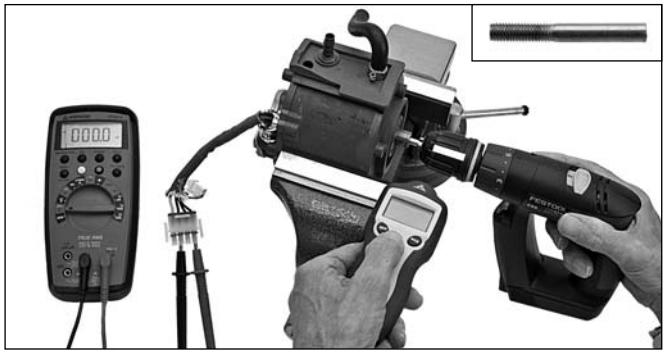
Short-circuit testing
Measure between 1–4, 2–4 and 3–4

Testing stator windings
Measure between 1-2, 2-3 and 3-1
Resistance measurement approx. 2 Ohm
Inductance measurement approx. 10–12 mH





Insulation testing
Measure between 1-4, 2-4 and 3-4



Rotor testing
Measure between 1-2, 2-3 and 3-1
Normal value: 73 volts rms at 1,000 rpm
Minimum value: 65 volts rms at 1,000 rpm

Motor

Dismantle the cutting machine so that the motor's connectors are accessible. The motor does not need to be removed from the machine.

Short-circuit testing

Check first to make sure that the motor does not have **shorted windings to earth** (motor material). This is easy to do using a multimeter on the contact X1. Set the multimeter in position for connection testing with a buzzer. A shorted motor gives a closed circuit between the earth cable (4) and one of the phases (1, 2, 3).

If no fault is indicated, the test must be extended to include insulation testing as indicated below.

Resistance and induction measurement

The following test shows whether the motor has **shorted winding turns**. A small number of shorted winding turns means that the motor loses power but can work for a short time. Fully shorted windings mean that the motor will not start.

The check is carried out with resistance measurement in Ω (Ohm), and inductance measurement in mH (milliHenry). An intact motor gives values of approx. 2 Ohm or 10–12 mH. Measure between 1–2, 2–3 and 3–1. If the deviation is more than 20 % lower, the motor must be regarded as defective.

Note: Measurement instruments may give incorrect readings. Therefore, place greater emphasis on the relative values between the windings than on the absolute readings.

Insulation testing

The insulation test is a test which indicates where there is inadequate insulation between the motor's **windings and earthing**.

Insulation measurement takes place in the same way as the initial check between the earth cable (4) and phases 1, 2 and 3. The insulation tester is set for a 1,000-volt voltage. The test must show maximum resistance for the result to be approved.

Rotor magnets

The rotor in the motor has permanent magnets with high magnetic energy, known as neodymium magnets. As with all permanent magnets, high temperature, blows, vibration and powerful external fields “wear out” the magnetic force. The service life of the machine is probably not limited by the rotor. A defective rotor will reduce motor output.

Neodymium is an earth metal, and the magnetic strength varies slightly from magnet to magnet at the time of manufacture. It is therefore impossible to set a precise limit as to when the rotor is considered to be consumed. If the phase voltage in the test below **exceeds 65 volts, the rotor must be considered usable**.

The rotor magnets are tested as follows:
Remove the belt pulley from the motor and replace the screw with a long screw from which the head has been cut off. Connect a screwdriver to the screw.

Connect test cables between **two phases** and set the multimeter to read **alternating current**. Rotate the motor to 1,000 revolutions per minute, and check this with a tachometer. **The typical normal value is 73 volts at 1,000 revolutions per minute**.

Repeat the test for all three phases: these must all give the same value, otherwise there is a fault in the stator windings.

		Min.	Typical	Max.
20 °C	68 °F	555 Ω	581 Ω	607 Ω
25 °C	77 °F	577 Ω	603 Ω	629 Ω
30 °C	86 °F	599 Ω	626 Ω	652 Ω

Thermistor

The thermistor is the motor's temperature monitor. It breaks the current to the motor if the temperature is too high. A defective thermistor may prevent the motor from starting. The thermistor is connected to the display unit on the cutting machine, which issues a warning if the motor temperature is too high.

The thermistor is integrated in the motor unit and cannot be replaced separately.

The thermistor changes resistance according to temperature, which can be measured with a multimeter. The machine must not have been run recently: it must be at room temperature as shown in the table. Measure at the contact X2, as shown in the photo at the top. The adjacent table shows typical values, as well as minimums and maximums.

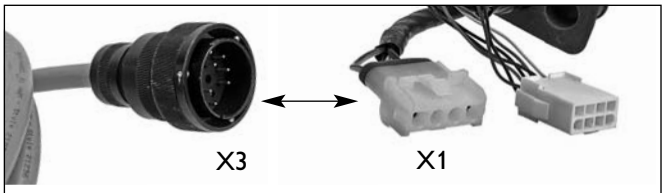
If measured values are outside the tolerance ranges, the thermistor is defective.

Cable between PP70 and K7000

Supply cables which have been "driven over" or abused are a relatively common cause of interference. Carry out a visual check of the outside of the cable for damage due to trapping. Also check that the contact pin is undamaged.

The cables to the motor are examined first with connection testing at both cable connections. This test shows whether there is any cable failure. Insulation testing is then carried out, which shows whether there is any damage to the cable insulation.

The signal cables, which work with low voltage, are examined only with a multimeter for cable failure and insulation faults.

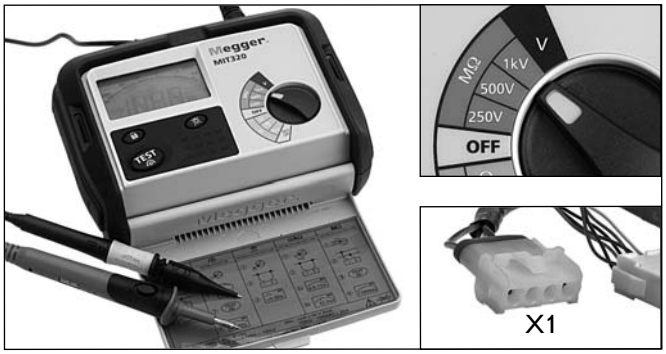


Pin	Cable
K	Red
A	Brown
B	White
C earth	Green/yellow

Motor cables – connection testing

Set the multimeter for connection testing with a buzzer.

Check that the three phase lines and the earth cable are connected to the contacts on the cable ends. The labelling and cable colours for the contact pins are shown in the adjacent photo (see also the diagram on page 6).



Motor cables – insulation testing

Set the insulation tester to give a voltage of 1,000 volts.

It is suggested that the test pins should be connected to the cable's connector at the motor side, X1. The arrangement for the test may look like this:

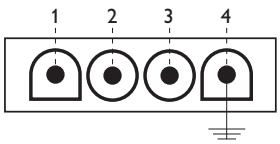
- connect the first test pin to phase 1, the second test pin to phase 2, then to phase 3 and then to earth.
- connect the first test pin to phase 2, the second test pin to phase 1, then to phase 3 and then to earth.
- continue according to the same pattern until all cables have been tested. See the adjacent table.

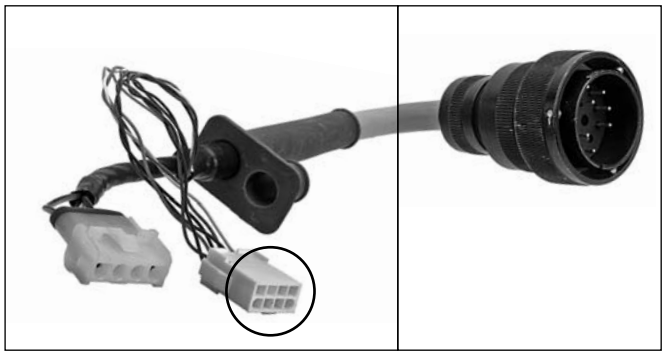
The insulation tester measures resistance during testing. The measurement must indicate the maximum ohm value if the cabling is fault-free. Poor insulation between the cables results in reduced resistance.

The cable must be replaced if the connection test and insulation test indicate broken cables or defective insulation.

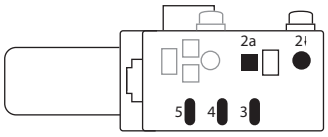
Insulation testing of motor cables

Test pin A	Test pin B
1	2, 3 and 4
2	1, 3 and 4
3	1, 2 and 4
4	1, 2 and 3



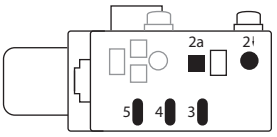


Throttle, passive

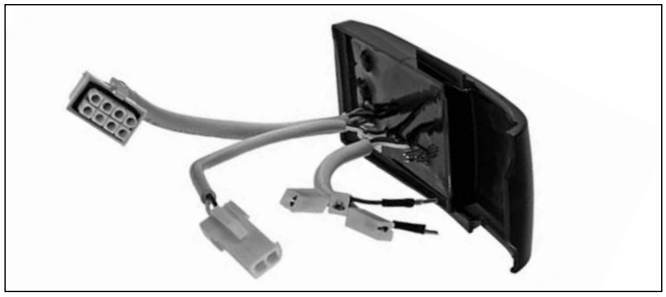


5–4: <20 kΩ
4–3: approx. 220 kΩ ± 20
2a–2↓: ∞ Ω

Throttle, active



5–4: approx. 220 kΩ ± 20
4–3: approx. 0 Ω
2a–2↓: approx. 0 Ω



Insulation testing 1,000 volts
Measure against phase pins K, A and B and earth point

Earth continuity testing
Measure against earth pin C and earth point

Signal cables, connection testing and insulation testing
This test is used to check whether any cable is broken and whether there is any damaged insulation which is causing the wires to come into contact with one another.

This test is carried out with a multimeter set for connection testing with a buzzer signal. The cabling does not need to be removed from the machine for this test.

Test methodically. The easiest way to proceed is to start from the rectangular connector. Place the first test pin in any terminal. Use the second test pin to test against all pins in the round contact. If the cabling is intact, there must be a connection with one of the pins, but not with any of the others. Proceed using the same method to test the other cables. Note that there are pins with no cable connections: see the wiring diagram on page 6.

There is very little likelihood of any of the signal cables coming into contact with the motor cables due to damaged insulation, but this can be tested by also including the motor's connector in the test.

Switch

The cable connectors and removal of the switch from the control unit are described on Pages 5 and 6.

Switch functions can be checked using a multimeter set for resistance measurement. Check the resistance values across the terminals, numbered as illustrated, in passive and active modes. The values are typical for a functional switch.

Display card

If the HF unit and cabling are complete, the cutting machine's display must be shown. If the information “UNKNOWN UNIT” is displayed, the display unit is defective. If this is the case, replace it.

Note: even if the display shows communication between the cutting machine and the HF unit, this is not proof that the cabling between the two is fault-free.

Insulation and earth continuity testing

IMPORTANT
Legislation on insulation and earth continuity testing differs from country to country. Hence it is important to find out about applicable regulations in the country in which the service is carried out.

These **safety tests** are the last things done when the service actions have been completed and the machine has been reassembled.

Insulation testing
Measure with 1,000 volts between an earthed metallic part which can be touched and the phases (K, A and B) of the contact. There must be no current flowing between earth and the phases (max. ohm value).

Earth continuity testing
Earth continuity testing shows that the machine's earthing is fault-free. Set the instrument for continuity measurement. Current must flow between an earthed metallic part which can be touched and the earth pin C of the contact (min. ohm value).

● = Service stage

581 54 15-01
Multimeter
Make: Amprobe 37XR-A.
One of few universal instruments that can also measure inductance (H, Henry).

● Checking of the electric motor's functions

506 37 61-02
Bearing press

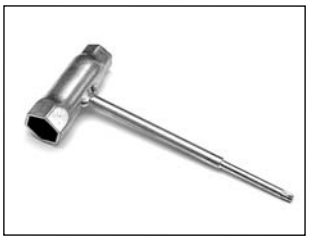
● Dismantling and assembling of blade shaft bearings and axle

575 96 20-01
Pressing device

● Dismantling and assembling of blade shaft bearings and axle

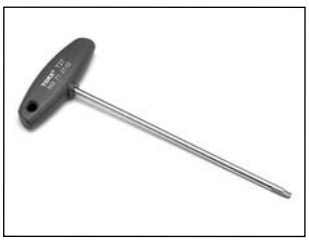
504 90 90-02
Universal puller

● Removal of blade shaft bearings



506 38 26-01
Combination wrench
(Supplied with the machine)

● Vibration dampers' inner screw, Torx T27. Blade diameter 5 mm



502 71 27-03
Workshop wrench, Torx T27

● Universal use for all Torx T27, except for the vibration dampers' inner screw. See the tool above

Workshop wrench, Allen

● Universal use

502 50 19-01	3 mm
502 50 18-01	4 mm
502 50 64-01	5 mm
504 90 00-01	6 mm

504 90 00-06
Workshop kit, mm dimensions

● Universal use

Allen: 3, 4, 5 and 6 mm.
Socket: 8 mm

The special tools below are needed for servicing work on the K7000 but are not sold by Husqvarna:

Insulation and continuity tester
Common makes: Megger, Fluke, etc.

● Checking of the motor's windings and cabling

Tachometer
A number of optical tachometer makes are available.

● Checking of the motor's magnets

Oetiker special pliers
Recommended tool. Sold by distributors of Oetiker hose clips.

● Fitting of Oetiker hose clips

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