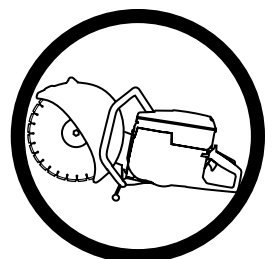




Workshop manual

K 3000- Electric, Wet, Cut-n-Break



HUSQVARNA K 3000

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Workshop manual

The workshop manual covers virtually all work in the workshop that involves the K3000 Electric, Wet and Cut-n-Break. Some very simple and rather obvious repair work has been omitted.

Disposition

The machines have identical electric motors. The workshop manual begins with the chapter for service and repair work on the electric motor which is common to the machines.

The cutting unit and transmission are identical for Electric and Wet. Only the wet kit differs between the machines. The Cut-n-Break has a totally different cutting unit. The work in the workshop that is specific to each machine is therefore handled in a separate chapter which appears later in the workshop manual.

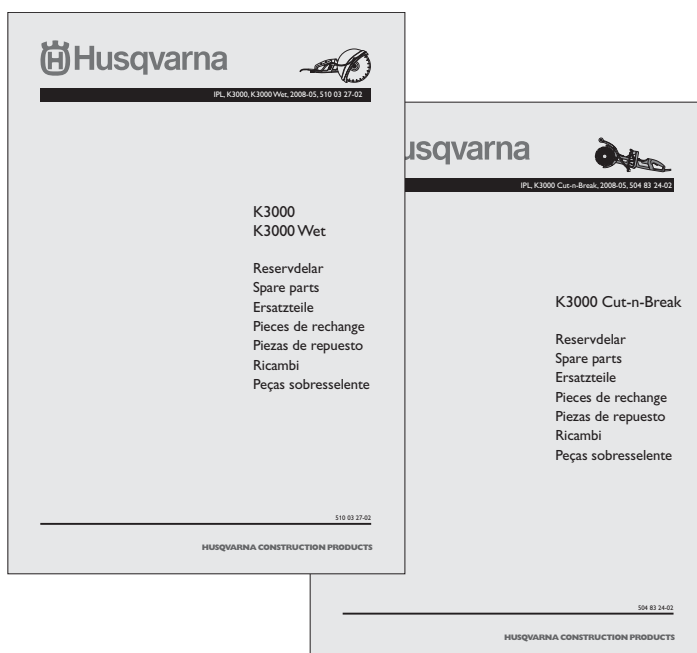
Arrangement – illustrations and text

In addition to graphics and illustrations, there are generally two text columns. The left-hand text column gives a brief explanation and is intended for experienced mechanics, whereas the right-hand column is a more detailed description and is intended for mechanics with less experience of repair work for this type of machine.

Contents

The 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 also has page references to the start of each chapter.



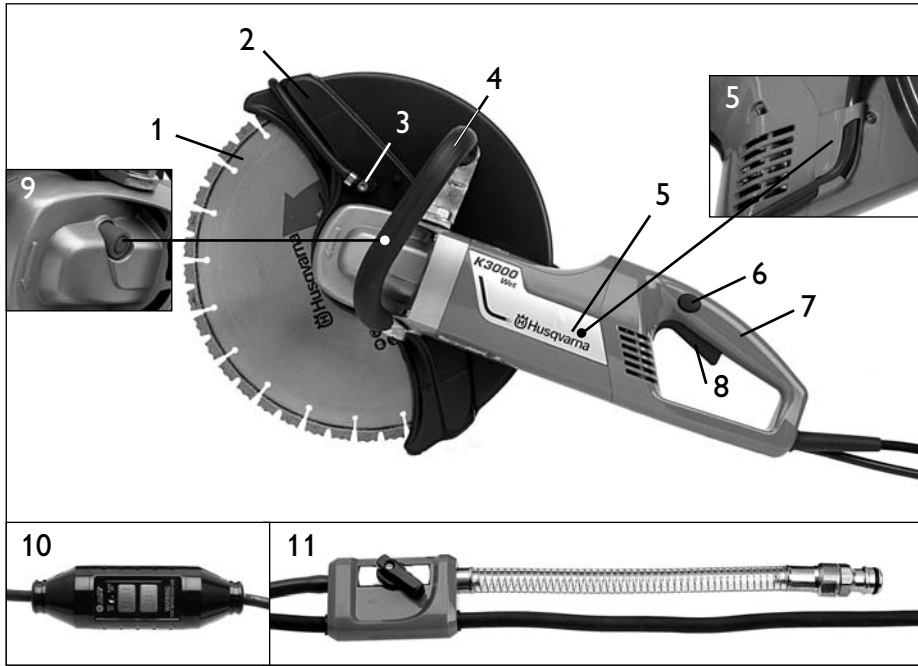
Spares

Spares K3000

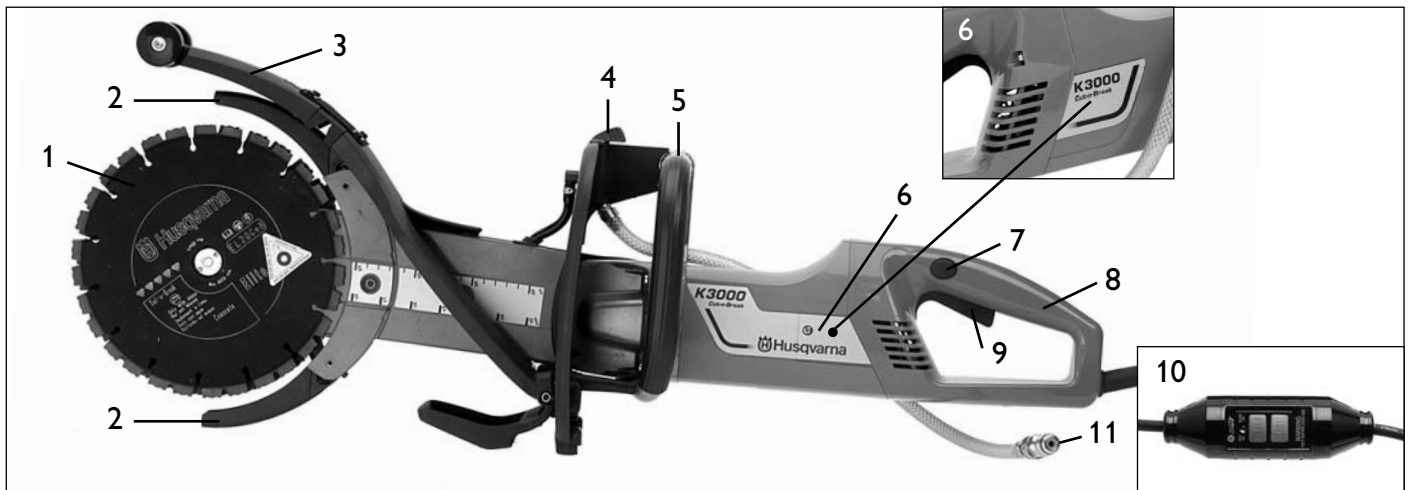
The folders include all spares for Husqvarna K3000.

The K3000 Electric and Wet have a common spares folder, while the K3000 Cut-n-Break has a separate folder.

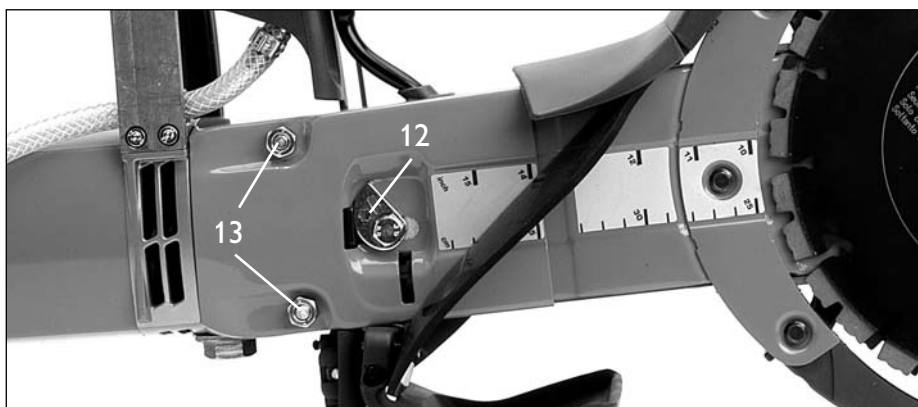
The folders contain complete exploded drawings for the machines where the location, spares number and appearance of each component is easy to identify.

**K3000 Electric, Wet**

1. Cutting blade
2. Blade guard
3. Spray nozzle, on each side (not Electric)
4. Front handle
5. Inspection cover for carbon brushes
6. Starter lock
7. Rear handle
8. Circuit breaker
9. Rotation lock
10. Earth fault breaker
11. Water coupling with valve (not Electric)

**K3000 Cut-n-Break**

1. Cutting blades
2. Blade guard
3. Splash guard
4. Water valve
5. Front handle
6. Inspection cover for carbon brushes
7. Starter lock
8. Rear handle
9. Circuit breaker
10. Earth fault breaker
11. Water coupling
12. Belt tensioner
13. Lock nuts for belt adjustment



K3000

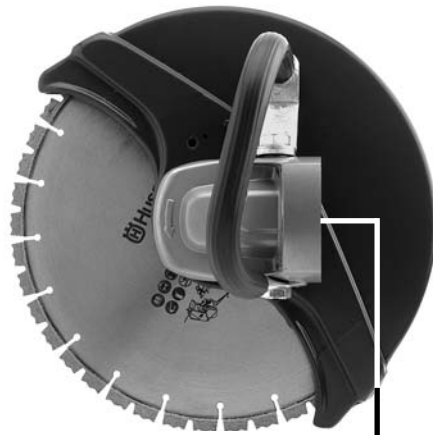
Husqvarna's electrically driven power cutters are based on a common motor unit that allows wet cutting with a limited amount of water. The machine versions are shown in the illustration below.

The workshop manual deals with the motor unit in a common section and the distinct parts for each machine in a chapter for each type of machine.

Note: The machines cannot be divided in practice as shown in the illustration below.

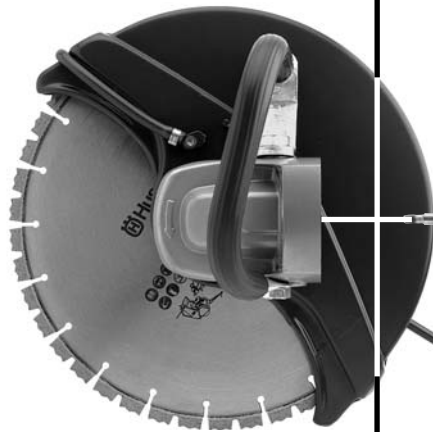
K3000 Electric

The basic design with cutting unit for 300 or 350 mm cutting blade. Only intended for dry cutting.



K3000 Wet

The machine is identical to the K3000 Electric but the blade guard has a wet cutting attachment with spray nozzles on both sides of the blade. 350 mm cutting blade.



K3000 motor

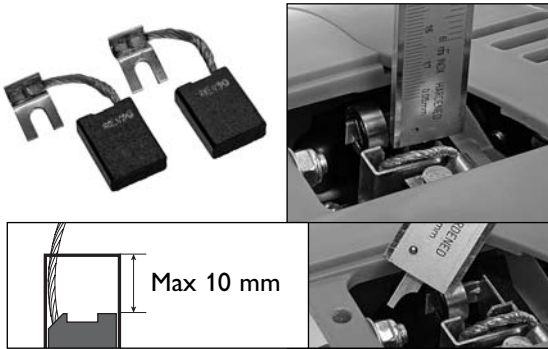
The motor unit is identical for the machines. Available for 230 V (220-240 V) and 120 V (110-130 V).



K3000 Cut-n-Break

Cutting unit with double blades. Blade water coolant. Blade diameter 230 mm, cutting depth 400 mm.





Replacing the carbon brushes

The two carbon brushes transfer electric current to the motor's rotor.

The carbon brushes are wear parts that must be checked regularly; every week if the machine is used daily.

You should replace the carbon brushes when around half is left. You can easily measure this using a slide gauge without removing the brushes. Replace the carbon brushes when the distance from the brush holder to the top level of the brush exceeds 10 mm/.4 in.

Worn carbon brushes – checking

The importance of replacing the brushes in good time is demonstrated by the adjoining illustrations.

The illustrations to the left show a brush that is worn but still operable. Both the brush and the collector have minor scratches in the direction of rotation which is entirely normal.

The illustrations to the right show the results when the brush is so worn that the spring, which presses the brush down on the collector, has reached its end position and no longer gives the brush the correct pressure to the collector. Sparking occurs which damages both brushes and, even worse, the collector in a very short time.

Pay careful attention to sparking near the collector

The information given above shows that it is important to avoid sparking around the collector. If the brushes are not worn, sparking could be due to the brushes being unable to move in their holders as a result of, for example, dirt. Sparking normally occurs when running in new brushes.

Replacing the carbon brushes

1. K3000 Wet: Remove the screw and take off the cover.

2. K3000 Electric, Cut-n-Break: Uncover the screw and remove the cover.

3. K3000 all: Uncover the screw as above. Cut the decal and remove the cover.

4. Loosen the screw one turn.

5. Pull out the cable lug.

6. Lift the spring and pull out the carbon brush.

Clean the holder.

7. Fit new carbon brushes.

Replacing the carbon brushes

1. K3000 Wet, right side: Remove the screw by the hose holder. Remove the cover.

2. K3000 Electric, Cut-n-Break, right side: Cut the decal by the round mark to uncover the screw. Remove the cover.

3. K3000 all, left side: Uncover the screw as above. Cut the decal with a knife by the mark in the decal. Remove the cover.

4. Loosen the screw and screw it out one turn. Let the screw remain in place.

5. Pull out the cable lug from the screw.

6. Lift the spring with an angle hook. Lift off the carbon brush.

Clean the holder from carbon particles and dirt.

7. Fit new carbon brushes. Check that the carbon brush cable runs over the spring.



Replacing the carbon brush holder

In order to replace the carbon brush holders, both the rear handle halves must be removed from the motor housing.

Remove right handle

Remove the inspection cover to the carbon brushes.

Remove the screws as shown in the illustration.

Remove right handle

Remove the inspection cover to the carbon brushes as per previous chapter.

Remove the screws as per the illustration and take off the handle half.

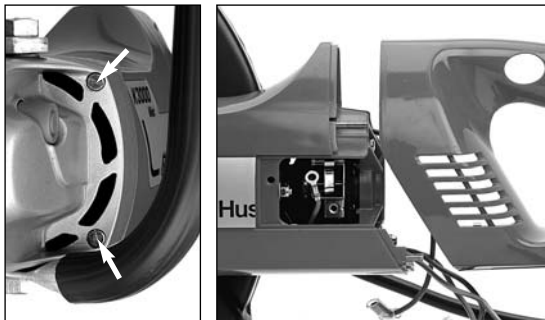


Pull the circuit board from the handle.

Remove the switch.

Pull the circuit board from the guide slots in the handle.

Remove the switch by initially pulling it outwards from the attachment in the bracket and then move it backwards from the handle.



Remove left handle half

Two long screws link the gear housing to the left handle half. Undo the screws at the gear housing so that they release from the handle half.

Remove both carbon brushes and the screws to the cable lugs.

Remove left handle half

Two long screws link the gear housing to the left handle half. Undo the screws at the gear housing so that they release from the handle half.

Remove both carbon brushes and the screws to the cable lugs.



Remove the carbon brush holders

Remove the carbon brush holder screws.

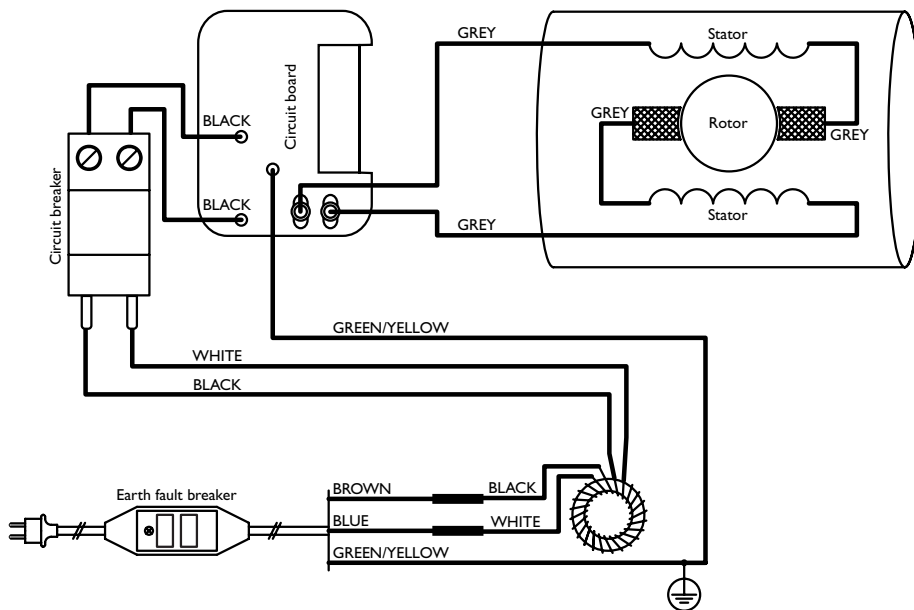
Remove the carbon brush holders

Remove the screws that hold the carbon brush holders, two screws per brush holder.

Lift out the carbon brush holders.

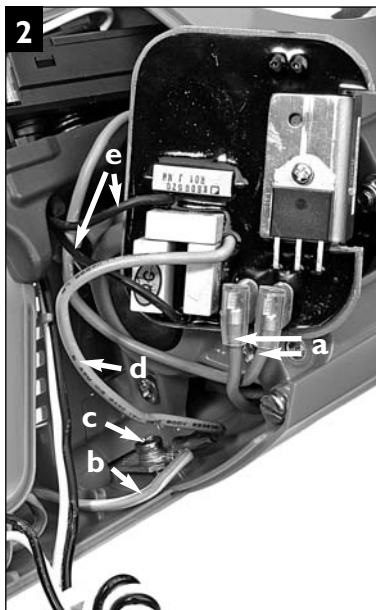
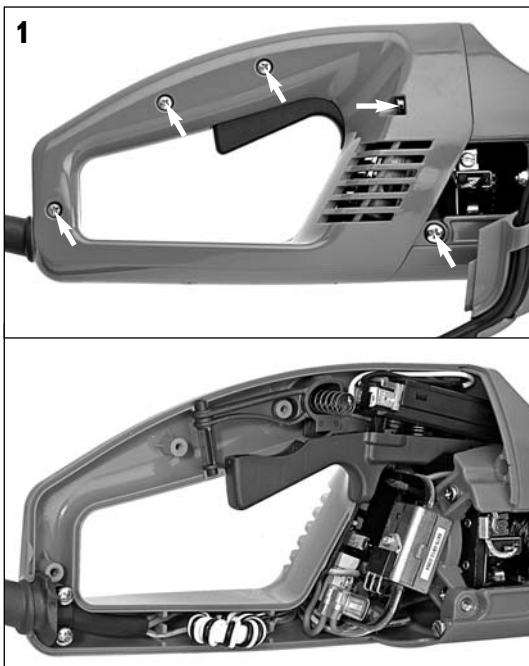
Lift the carbon brush holders upwards and out through the area shown in the illustration.





Assembly diagram

The assembly diagram shows the colours and positions of the connection cables for the electrical connections.



Components/cables

Illustration 1. Removal

Remove the cover to the carbon brushes, see “carbon brushes” chapter, page 6.

Remove the screws as shown in the illustration.

The illustration below shows the position of the components and cables in the handle.

Illustration 2

a. The flat pin contacts connect to the stator windings.

b. Earth connector from mains cable.

c. Screw for earth connection.

d. Earth connector from earth point to circuit board.

e. Outgoing from switch.

Illustration 3

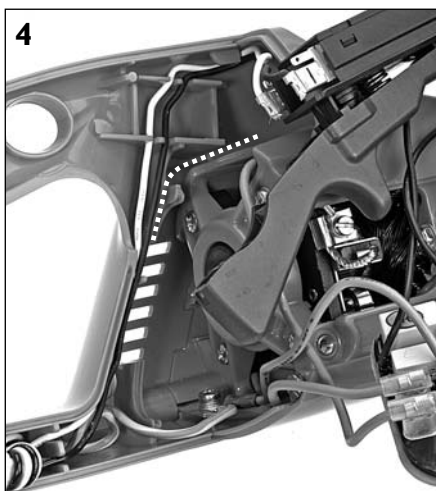
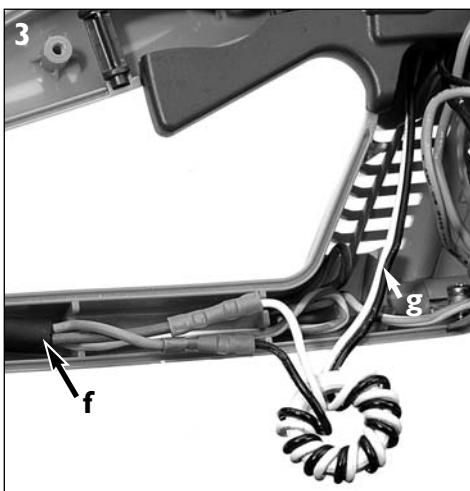
f. Incoming earthed mains cable.

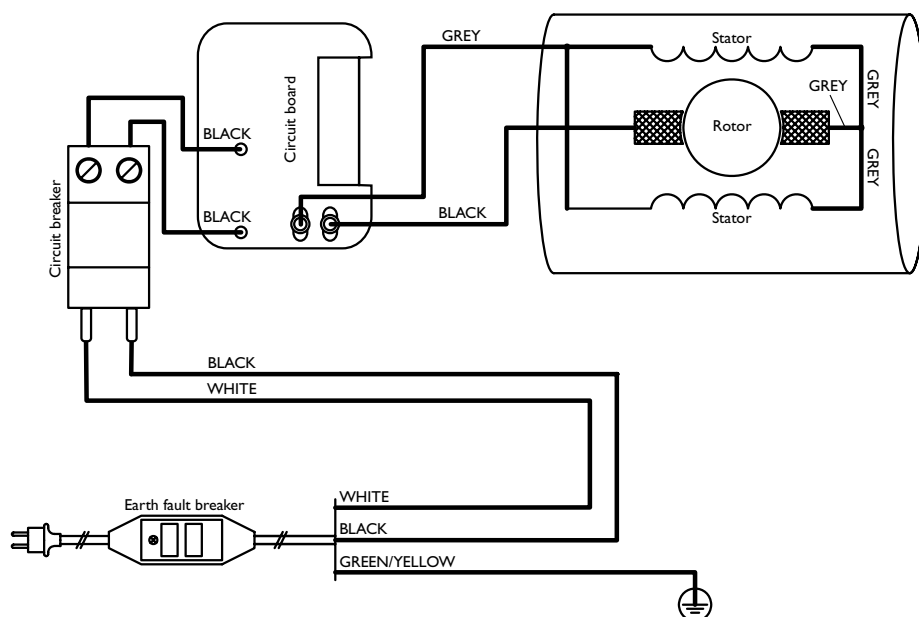
g. Incoming cables to switch.

Illustration 4

The illustration shows the attachment of the circuit breaker cables (black and white).

The dashed line shows the routing for the cables between the circuit board and the switch (e). Note that the cables must be behind the circuit board guide slot.





Assembly diagram

The assembly diagram shows the colours and positions of the connection cables for the electrical connections.

Components/cables

Illustration 1. Removal

Remove the cover to the carbon brushes, see “carbon brushes” chapter, page 6.

Remove the screws as shown in the illustration.

The illustration below shows the position of the components and cables in the handle.

Illustration 2

a. Incoming from mains current.

b. From switch to circuit board.

c. Screw for earth connection and earth connector.

d. From circuit board to stator winding.

e. From circuit board to right connection for the carbon brush, see illustration 3 position f.

Illustration 3

The illustration shows the position and attachment of the cables in the handle.

f. Connection of black cable from circuit board.

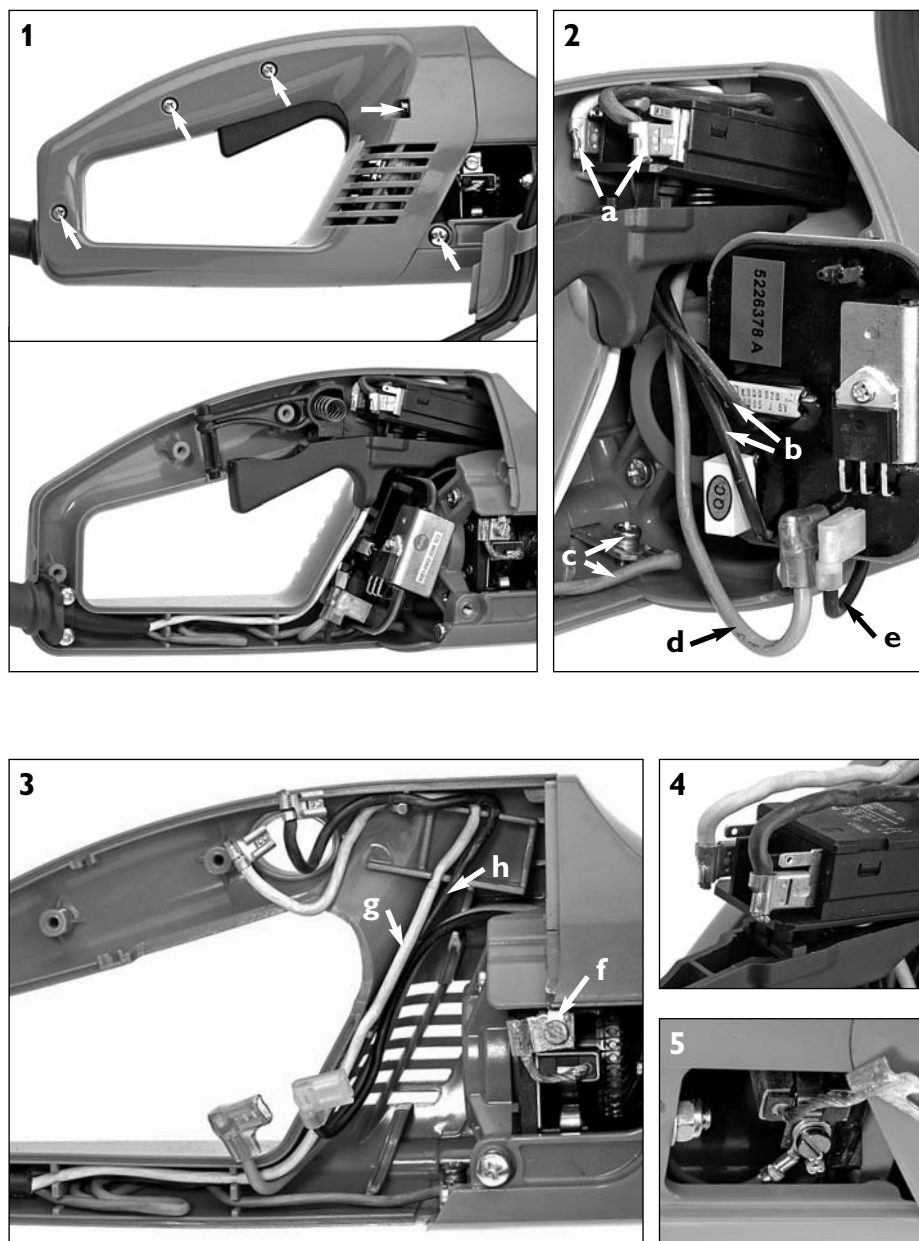
g. and **h.** From mains cable to switch, white and black.

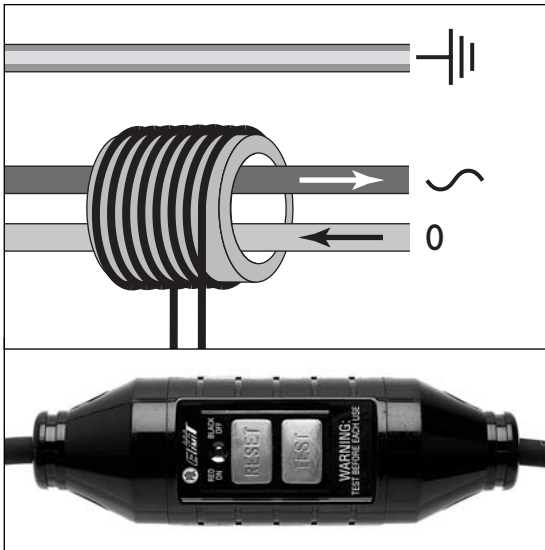
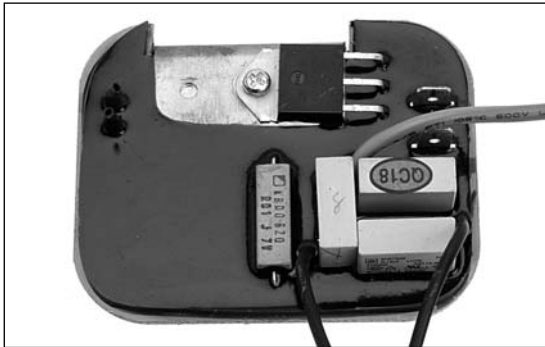
Illustration 4

Turn the switch's cable lug as per illustration.

Illustration 5

Both the stator's ring cable lugs are connected to the left carbon brush. See illustration on page 15.





Work procedure

The electrical function is checked in the following chapter exclusively with a multimeter.



No checks are made with the machine connected to the mains!

The only exception is the function check of the earth fault breaker that is done without the machine or earth fault breaker being dismantled.

Circuit board

The circuit board gives the machine two functions:

- Softstart, which gives a soft start with less current surge.
- Elgard™ is a guard that gives a warning by varying the speed in the event of overload.

The circuit board in the machine cannot be checked without specialist skills and special measuring equipment. Here the process of elimination method must be applied. If the power supply (whole cables and switches) are said to be intact and the stator and rotor are in working order, the fault must be with the circuit board which is then replaced.

Earth fault breaker function

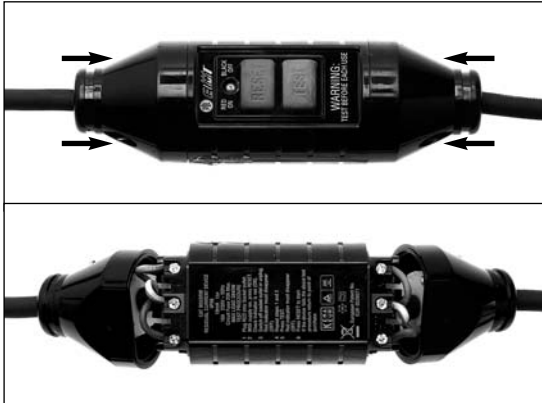
The earth fault breaker's principle function is fairly simple. The current that comes in through the phase conductor must also pass the 0 conductor unless the current takes other routes, e.g. creeping current that is carried on to the earth conductor.

The conductors run through a coil and if the same current goes in the opposite direction, no current is generated in the coil. If the difference is greater than 10 mA between the phase and 0 conductor, a breaker trips the current to the machine. Note that the earth conductor has nothing to do with the earth fault breaker.

Function test

Each time the power plug is connected to the mains supply, the RESET button must be pressed. A relay connects the current and is held in position as long as there is mains current, or if the earth fault breaker trips due to a fault. A signal above the button shows that the current is connected.

The TEST button is used to check that the earth fault breaker is working. Start the machine and press the TEST button. The earth fault breaker must trip and the machine must stop.



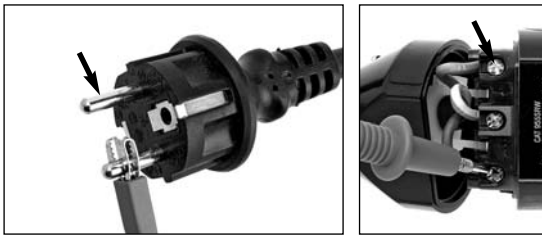
Test of mains cable

The earth fault breaker does not allow the current to pass this when it is not connected to the mains supply. In order to check the mains cable with a multimeter, the earth fault breaker ends must be pulled apart to access the connection points. Remove the two screws on each end.

Measuring instruments

For the tests below, a multimeter is used that is set for measuring a broken/closed electric circuit. A closed circuit is normally marked with a buzzer signal in the multimeter.

The illustrations below show: left illustration one contact point, right illustration other contact point when measuring.



Cable: contact – earth fault breaker

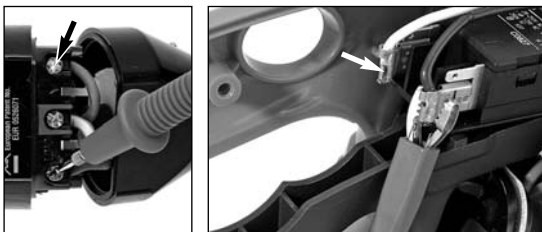
Cable: contact – earth fault breaker

Measure between the contact pin and earth fault breaker's connection point. Repeat the measurement on the other pin/connection point (arrows).



Check that the earth cable is intact.

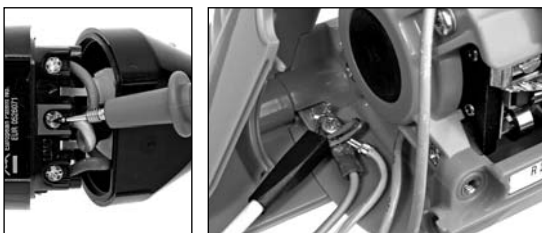
Check in a similar way that the earth cable is intact.



Cable: earth fault breaker – switch

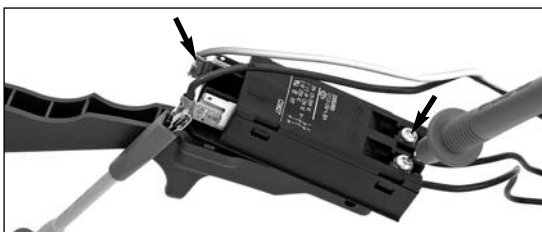
Cable: earth fault breaker – switch

Measure between the earth fault breaker's contact points and both switch connections.



Check that the earth cable is intact.

Check that the earth cable is intact. The earth cable connections are located under the circuit board.

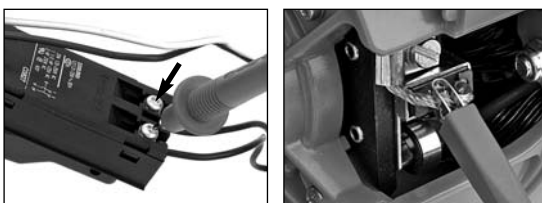


Circuit breaker

Press the switch to check that it connects to the electric circuit.

Circuit breaker

Measure between the switch's incoming and outgoing contact points. Press the switch to check that it connects to the electric circuit.



Cable: switch – motor

The measurement method to exclusively check the cable between the switch and the circuit board is not present as there are no uninsulated areas on the circuit board. The only way of checking the cable is to measure it in series with the stator winding which must then be intact. Measure between the switch and one of the carbon brushes. Resistance measurement gives the clearest results.



Functional test

Preparations

Remove the inspection cover to the carbon brushes.

Connect a measuring cable to each carbon brush. (You do not need to be concerned that the stator is connected at the carbon brushes as the stator's circuit board is broken at the circuit board and is therefore not affected by the measurement.)

Measuring cables

Use short measuring cables and lay these close to each other: the easiest way is to twist them. Cables run in a coiled way give incorrect readings.

Inductance measurement – Henry (H)

Inductance measurement is applied to check the condition of the rotor. The dimension is "Henry", abbreviated H (1H = 1000 mH). Resistance measurement (ohm) produces no usable results.

Testing

Set the measuring instrument to measure mH. Turn the rotor shaft once by turning the blade slowly ensuring you obtain the measured values for each winding of the rotor.

Measured values

230 Volt: Typical measured value for a correct rotor is around 13–14 mH.

120 Volt: Typical measured value for a correct rotor is around 2.6–3.0 mH.

The inductance values may vary a lot between the measurement instruments and machines. Pay special attention therefore to the differences in the values during the test, rather than the absolute values. Major differences indicate a defective rotor.

Rotor assembly

The gear housing and motor unit of both machines are designed according to the same principle.

Four long screws link the motor unit with the gear housing. Two screws are reached from the gear housing and two from the rear of the motor. The screws also attach the handles to the motor housing.

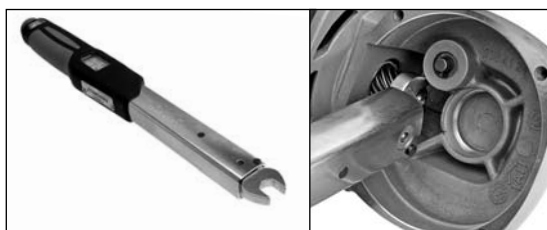
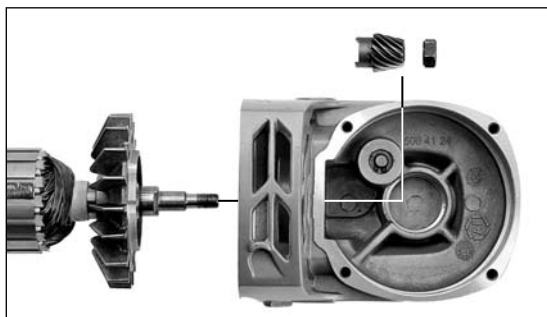
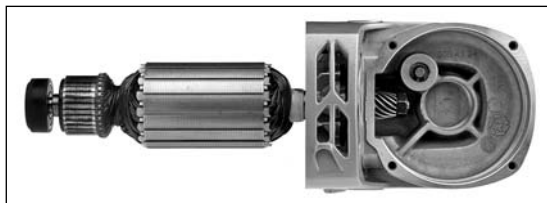
In order to remove the rotor, the gear housing cover must be removed. Both machines must have a number of components removed in order to access the four screws that hold the cover with its crown gear.

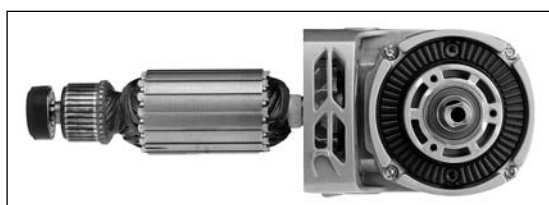
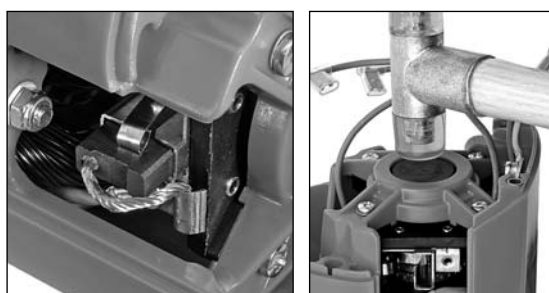
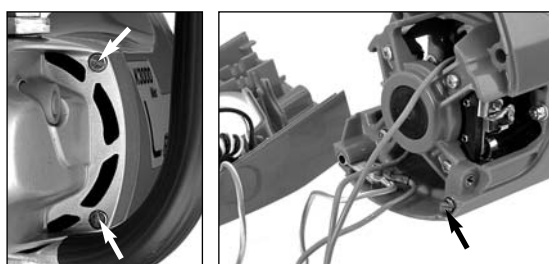
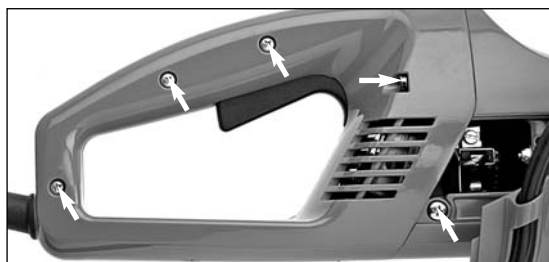
When the drive pinion on the rotor shaft has been removed, the rotor can then be pulled out of the gear housing. Note that the rotor shaft is left threaded and therefore the nut must be removed in a clockwise direction.

The rotor's rear bearing is fitted with a light force fit into the motor housing. A rubber sleeve is located between the rotor bearing and motor housing.

Tightening torque 33–35 Nm

When refitting, the nut must be tightened using a torque wrench at a value of 33–35 Nm. A torque wrench with a U-grip insert must be used due to the confined space. The rotor shaft is left threaded and the nut is therefore tightened in an anticlockwise direction.





Preparations

K3000 Electric, Wet

Removing the blade guard, see page 24.

K3000 Cut-n-Break

Removing the cutting unit and handle unit, see page 30.

Remove right handle

Remove the inspection cover to the carbon brushes.

Remove the screws as shown in the illustration.

Pull the circuit board from the handle.

Remove the switch.

Remove left handle

Remove the screws at the gear housing.

Remove the screw in the motor housing.

Hint

Release the motor housing from the electrical components by detaching the cables at the circuit board and pulling out the earth rod.

Divide the gear and motor housing

Lift the carbon brushes and lock with the spring.

Turn the machine with the gear housing down and knocking a few times against the bearing to divide the motor and gear housing.

Divide the gear housing

In order to pull the gear housing out of the rotor, the cover to the gear housing must be lifted and the drive pinion removed from the rotor shaft. Go to following pages:

K3000 Electric, Wet: page 17.
K3000 Cut-n-Break: page 21.

Remove right handle

Remove the inspection cover to the carbon brushes as per previous chapter.

Remove the screws as per the illustration and take off the handle half.

Pull the circuit board from the guide slots in the handle.

Remove the switch by first pulling it outwards from the attachment in the bracket and then move it backwards from the handle.

Remove left handle

Two long screws link the gear housing to the left handle half. Remove the screws

Remove the screw at the bottom of the motor housing's right side.

Hint

Release the motor housing from the circuit board and switch by detaching the cables to the circuit board and pulling out the earth rod.

Divide the gear and motor housing

Lift the carbon brushes and lock with the spring lying to the side.

The rear bearing is fitted with a light force fit to the motor housing. Turn the machine with the gear housing freely suspended downwards and knocking a few times against the bearing to divide the motor and gear housing.



Functional test

Fractures to the stator winding are easiest to indicate using the check below. In general, short-circuited windings can also be identified, particularly if the short circuit eliminates current in several winding turns. If the short circuit only eliminates a few turns, the measurement is unlikely to record this. A fault like this has no noticeable effect on the performance of the motor either.

Resistance measurement – Ohm (Ω)

Resistance measurement provides an unequivocal answer as to whether the stator winding is fractured. However, the method gives unclear indications for short-circuited winding turns.

Inductance measurement – Henry (H)

The dimension is “Henry”, abbreviated H (1H = 1000 mH). Inductance measurement is best applied to both identify fractures in the stator winding or short-circuited winding turns.

Use short measuring cables and lay these close to each other: the easiest way is to twist them. Cables run in a coiled way give incorrect readings.

Preparations, illustration 1

Remove the inspection covers for the carbon brushes and right handle half, see “Wiring diagram, cabling” chapter, page 8.

The stator winding is divided at the circuit board and is connected in the following way: Pull out the contacts to the stator at the circuit board. Connect the contacts using a cable fitted with flat pin contacts.

Preparations, illustration 2

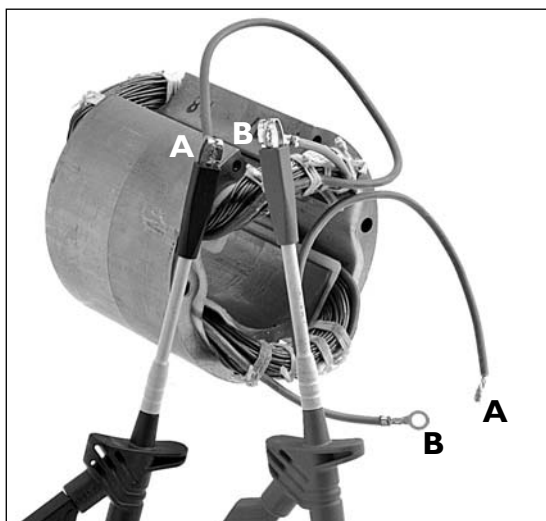
You do not need to remove the carbon brushes. Lift these up and lock with the spring to the side. Connect the test pins to the cables on the carbon brushes.

Measured values

Typical measured values for a correct stator is 40 mH. Resistance measurement gives around 0.8 ohm.

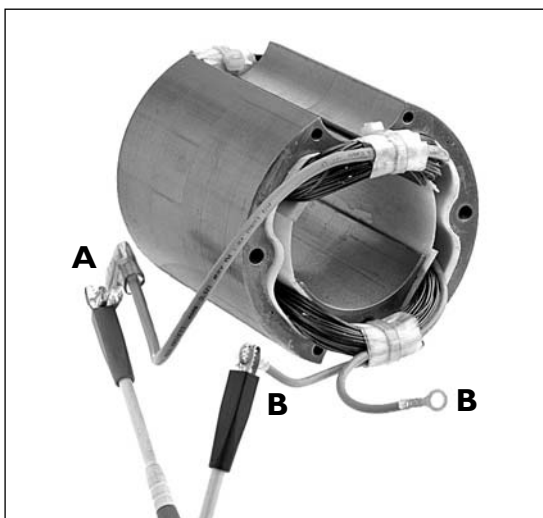
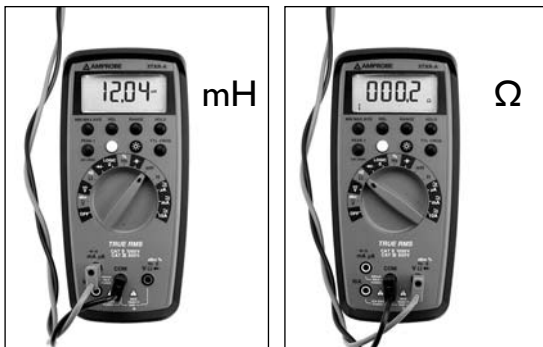
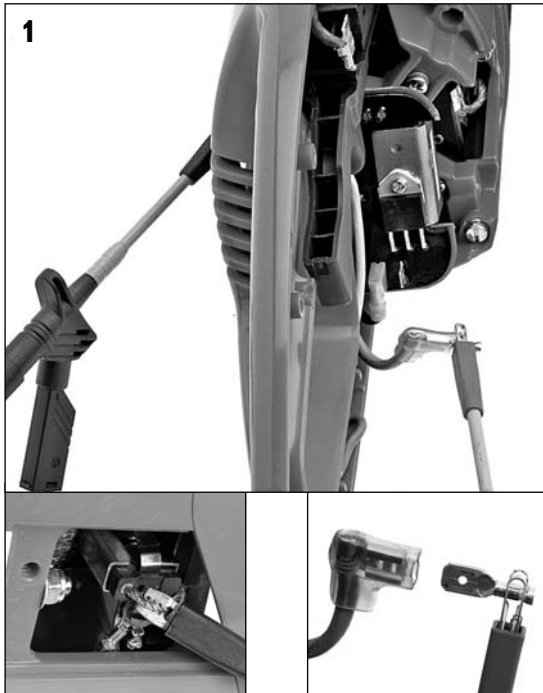
If the stator winding is fractured you get the value 0 mH. Resistance measurement gives a maximum, or immeasurable ohm figure.

Short-circuited winding turns reduce the inductance value. If the value is 30 % (around 30 mH) below the typical value, the stator is unfit for use.



A dismantled stator is best tested by measuring both stator windings individually. Connect the measurement cables to one of the winding's flat pin sleeve (A) and ring cable lug (B). Repeat the measurement on the other winding (A/B).

Typical values for a winding (one of two) is 2.8 mH and 0.4 ohm. Major deviations between the windings indicate a defect stator.



Functional test

Fractures to the stator winding are easiest to indicate using the check below. In general, short-circuited windings can also be identified, particularly if the short circuit eliminates current in several winding turns. If the short circuit only eliminates a few turns, the measurement is unlikely to record this. A fault like this has no noticeable effect on the performance of the motor either.

Resistance measurement – Ohm (Ω)

Resistance measurement provides an unequivocal answer as to whether the stator winding is fractured. However, the method gives unclear indications for short-circuited winding turns.

Inductance measurement – Henry (H)

The dimension is “Henry”, abbreviated H (1H = 1000 mH). Inductance measurement is best applied to both identify fractures in the stator winding or short-circuited winding turns.

Use short measuring cables and lay these close to each other: the easiest way is to twist them. Cables run in a coiled way give incorrect readings.

Preparations, illustration 1

Remove the inspection cover to the carbon brushes.

Break the electric circuit to the rotor by pulling out both the carbon brushes a little and lock with the spring to the side. Connect one of the test pins to the carbon brush's cable on the left side.

Disconnect the contact to the stator (grey cable) at the circuit board and connect to the other test pin.

Measured values

Typical measured values for a correct stator are around 10–12 mH. Typical value for resistance measurement is around 0.2–0.3 ohm.

If the stator winding is fractured you get the value 0 mH. Resistance measurement gives a maximum, or immeasurable ohm figure.

Short-circuited winding turns reduce the inductance value. If the value is 30 % (around 7 mH) below the typical value, the stator is unfit for use.

A dismantled stator is best tested by measuring both stator windings individually. Connect the measurement cables to the flat pin sleeve (A) and one of the ring cable lugs (B). Repeat the measurement on the other ring cable lug.

Typical values for a winding (one of two) are for an inductance measurement 4–4.5 mH and for a resistance measurement 0.5–0.6 ohm. Major deviations between the windings indicate a defect stator.

**Remove right handle**

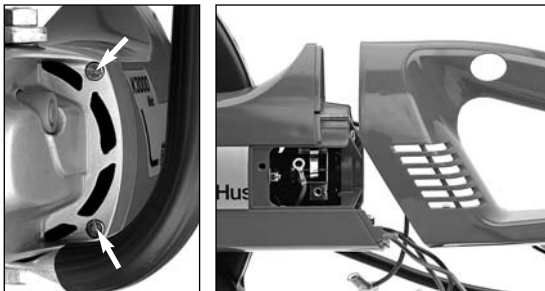
Remove the inspection cover to the carbon brushes.

Remove the screws as shown in the illustration.



Pull the circuit board from the handle.

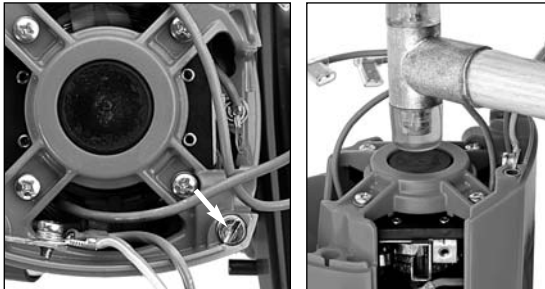
Remove the switch.

**Remove left handle**

Remove the screws at the gear housing.

Cut-n-Break: Removing the cutting unit, see page 30.

Remove the carbon brushes and the screws to the cable lugs.

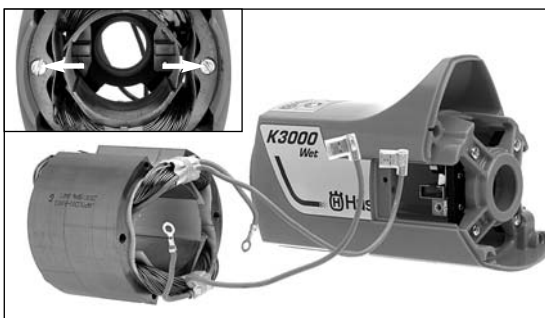
**Remove the rotor**

Remove the last long screw, marked with an arrow.

Knock carefully to remove the rotor from the motor housing.



Pull the rotor out of the motor housing.

**Remove the stator**

Remove the screws as shown in the illustration.

Pull the stator out of the motor housing.

Remove right handle

Remove the inspection cover to the carbon brushes as per previous chapter.

Remove the screws as per the illustration and take off the handle half.

Pull the circuit board from the guide slots in the handle.

Remove the switch by first pulling it outwards from the attachment in the bracket and then move it backwards from the handle.

Remove left handle

Two long screws link the gear housing to the left handle half. Remove the screws

Cut-n-Break: Removing the cutting unit, see page 30.

Remove both carbon brushes and the screws to the cable lugs.

Remove the rotor

Remove the last long screw of four that link the gear housing to the motor housing.

Turn the machine with the gear housing facing down and carefully knock the rotor out of the motor housing.

Pull the rotor out of the motor housing.

Remove the stator

The stator is attached with two long screws in the motor housing. Nut on opposite side. Remove the screws

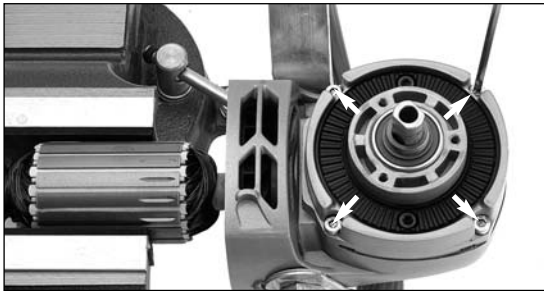
Pull the stator out of the motor housing by hand. If it is difficult to move, a few light knocks on an even surface will get the stator to release.



Alternative for dismantling

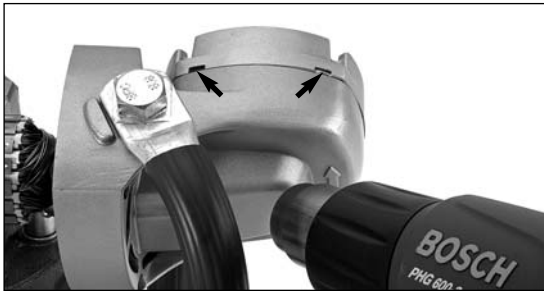
The gear housing is accessible for dividing when the blade guard has been removed. Inspection of the crown gear and drive pinion, replacement of the blade shaft crown gear bearing and re-greasing the bearing housing can be done without removing any other parts.

Replacement of rotor, the front bearing or drive pinion of the rotor requires that the gear housing together with the rotor is separated from the motor unit as shown in the illustration. This is described on page 13.



Remove the cover

Remove the screws.



Four break slots between cover and gear housing. Break alternatively between the break slots using a screwdriver.

Heating with a hot air gun reduces the press force.



Gear housing and cover after removal.

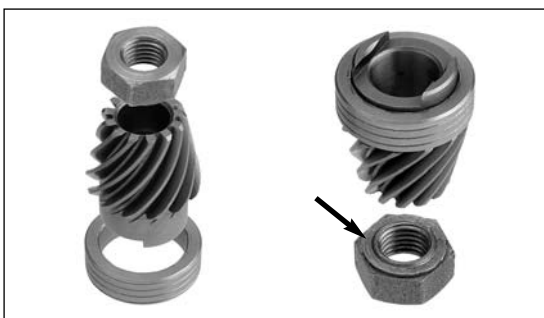
Grease missing in the illustration

For the sake of clarity the grease has been taken away from the gear housing.



Remove the drive pinion

The nut is left threaded!



Pull the drive pinion off the shaft.

Turn the nut correctly!

Turn the side with the shoulder to the drive pinion when reassembling.

Later designs have a nut with shoulder on both sides.

Remove the cover

Remove the four screws holding the cover.

Four break slots between cover and gear housing. Add a couple of screwdrivers diagonally to the cover and break alternatively between the break slots to remove the cover.

Heating with a hot air gun under the gear housing reduces the press force in the bearing seat and the cover is then easy to lift off.

Gear housing and cover after removal.

Grease missing in the illustration

For the sake of clarity the grease that fills most of the gear housing has been taken away.

Remove the drive pinion

Attach the rotor in a vice with rubber jaws.

The nut is left threaded!

Remove the nut in a clockwise direction.

When the nut has been removed the drive pinion can be pulled off the shaft by hand.

Turn the nut correctly!

When refitting note that the nut is not symmetrical. Turn the side with the shoulder to the drive pinion.

Later designs have a nut with shoulder on both sides.

**Remove the gear housing**

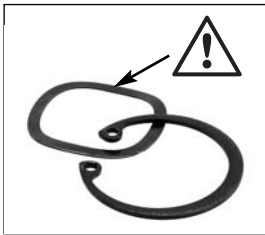
Attach the rotor in a vice with rubber jaws.

Press a heavy metal object against one corner of the gear housing. Knock the opposite corner with a small plastic hammer.

Remove the gear housing

Attach the rotor in a vice with rubber jaws.

Press a heavy metal object against one corner of the gear housing. Knock a few light strokes with a small plastic hammer on the opposite corner to release the gear housing from the rotor.

**Remove the circlip****Warning – wear safety goggles!**

There is a wave shaped spring washer under the circlip.

Remove the circlip

Remove the circlip using circlip pliers.

Warning – wear safety goggles!

There is a wave shaped spring washer under the circlip that comes with force when the circlip has released its grip.

**Tools****Removal of gear housing bearing**

The following tools are required for dismantling the gear housing's bearing:

1. Internal bearing extractor to grip behind the bearings.
2. Use a counter stay device where there is a counterhold.
3. A slide hammer is an alternative to the counter stay device if there is no counterhold available.

**Remove the bearing**

Remove the ball bearing using a counter stay device.

Heating around the bearing seat reduces the press force considerably.

Remove the bearing

Remove the ball bearing in the gear housing using a counter stay device.

Heating around the bearing seat using a hot air gun reduces the press force considerably.

Felt seal

There is felt seal under each bearing surrounded by washers on both sides. Replace felt seal when replacing bearing.

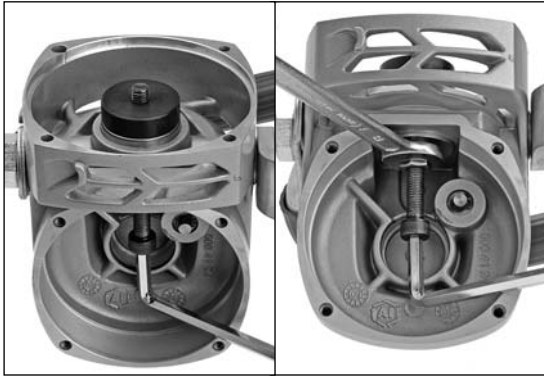
Felt seal

There is felt packing under each bearing surrounded by washers on both sides. Replace felt seal when replacing bearing.

**Tools****Fitting of gear housing bearing**

Fitting of the gear housing's bearings is best done using the tool kit 506 37 61-02.

(The tool kit is also used on the petrol-driven power cutters for replacing the main bearings, replacing the blade shaft bearing and driving wheel bearing on K960 Ring.)



Fit gear housing bearings

Fit the tool as per the illustrations. Place a large washer with the nut.

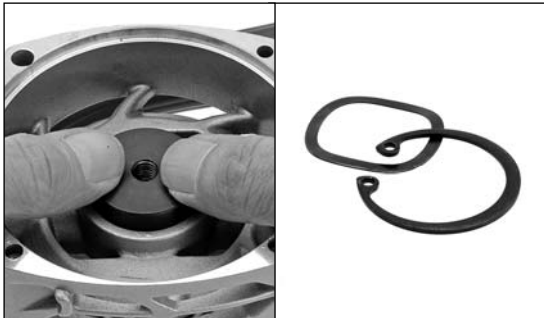
Pull the bearing in by screwing the nut.

Fit gear housing bearings

Fit the tool as per the illustrations. Place a large washer above the nut (not included in the tool kit).

Hold the hexagon head screw in place and pull the bearing in by screwing the nut.

Heating around the bearing seat reduces the press force.



Reassembly

The wave spring makes the circlip difficult to fit.

Place the wave spring in place and fit the circlip as far down as possible. Press the circlip down in its groove using the tool as shown in the illustration.

Reassembly

The wave spring makes the circlip difficult to fit.

Place the wave spring in place and centre ensuring it is not in the groove for the circlip. Fit the circlip above the wave spring as far down as possible. Press the circlip down in its groove using the tool as shown in the illustration.



Remove the crown gear

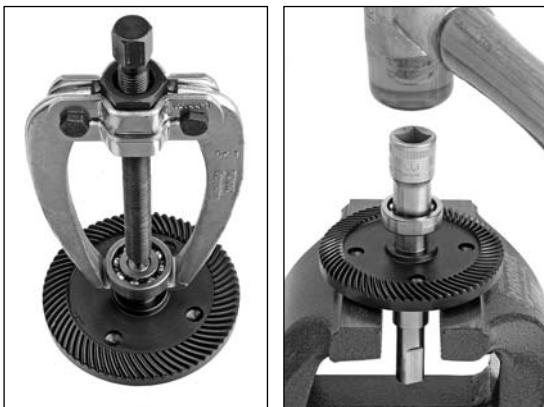
Remove the crown gear using a universal puller.

Note the seal ring that is located furthest up on the shaft.

Remove the crown gear

Press the crown gear shaft out of its bearing using a universal puller as shown in the illustration.

Note the seal ring that is located furthest up on the shaft.



Crown gear bearing

Remove the bearing using a standard puller.

Fit by pressing or knocking against the bearing's inner ring using a suitable socket

Crown gear bearing

Remove the bearing using a standard puller.

Fit by pressing or knocking against the bearing's inner ring using a suitable socket. Cooling the end of the shaft and heating the bearing facilitates assembly.



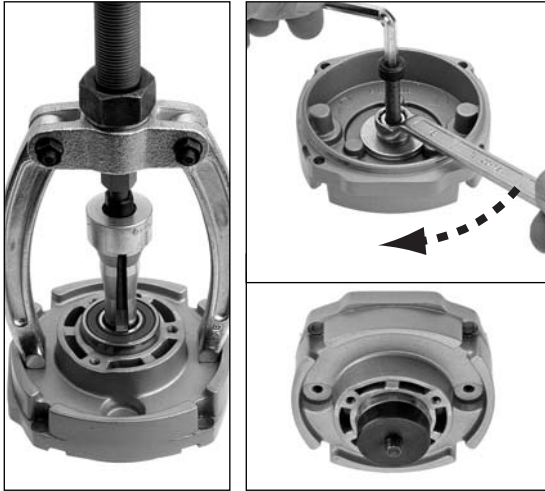
Crown gear and shaft – removal/assembly

The crown gear and shaft are fitted in the factory through shrinking (heat/cold). The shaft is installed with a very firm force fit and removal can only be done in practice using a hydraulic press. Heating around the crown gear closest to the shaft reduces the press force.

Fit the shaft in the crown gear is significantly easier. Apply heat around the crown gear to around 200 °C (400 °F) and cool the shaft with coolant spray. Fitting can then normally be done by hand, and if necessary with a few light knocks using a plastic hammer. You must fit quickly.

Crown gear/drive pinion

If the crown gear is replaced due to damage, a new drive pinion must be fitted.



Bearing replacement in cover

Remove the bearing using a counter stay device.

Fit the bearing using the tool kit 506 37 61-02. Add some large washers to give support to the nut on the inside.

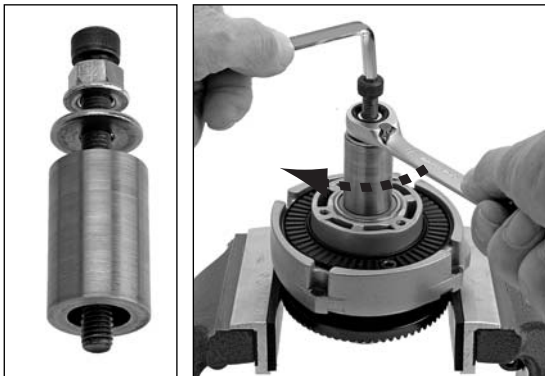


Fit the crown gear

Use parts of the tool kit 506 37 61-02 and socket 525 30 02-01.

Put the socket on the shaft and screw in the screw, fitted with nut and washer, in the crown gear shaft.

Pull the shaft in by turning the nut.



Fit the seal ring

The seal ring is fitted on the shaft using socket 525 30 22-01. Turn the seal ring with flange facing the bearing.

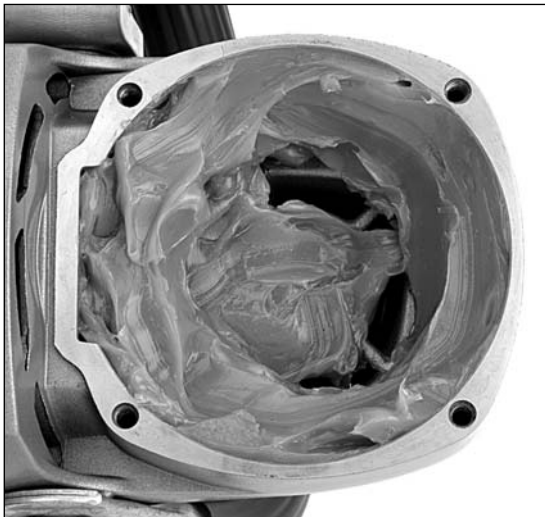


Lubricate the gear housing

The correct type and amount of grease is packed under spares no. 574 20 62-01. Otherwise apply 90 g of grease: Shell Albida EMS 2 or equivalent quality.

Above all apply the grease to the drive pinion and fill the ball bearing area.

Fit a new gasket and fit the cover with the crown gear. Tighten the four screws at a torque of 10–12 Nm.



Bearing replacement in cover

Remove the annular gear for the blade guard. Remove the bearing using a counter stay device. Heating around the bearing seat helps if the bearing is firmly in place.

Fit the bearing using the tool kit 506 37 61-02, and add some large washers.

Place the bearing on the support plate. Place the washers on the opposite side as support for the screw, with nut, which is screwed into the support plate. Hold the screw in place and pull the bearing in by turning the nut.

Fit the crown gear

An uneven load between the bearing rings may damage the bearing. The following method gives secure results.

Use parts of the tool kit 506 37 61-02 and socket 525 30 02-01 which gives support to the bearing's inner ring.

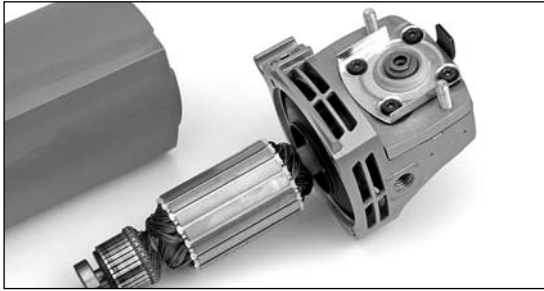
Put the socket on the shaft and screw in the screw, fitted with nut and washer, in the crown gear shaft.

Hold the screw in place and pull the shaft in by turning the nut.

Fit the seal ring

The seal ring is fitted on the shaft using socket 525 30 22-01. Turn the seal ring with flange facing the bearing.

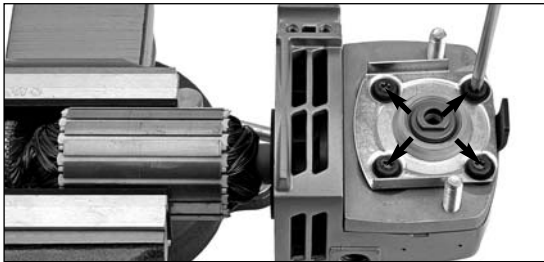
Support the opposite shaft end and knock the seal ring in place.



Alternative for dismantling

The gear housing is accessible for division once the cutting unit has been removed, see page 30. Inspection of the crown gear unit and drive pinion, as well as re-greasing of the bearing housing is possible without removing any more parts.

Replacement of rotor, the front bearing or drive pinion of the rotor requires that the gear housing together with the rotor is separated from the motor unit as shown in the illustration. This is described on page 13.



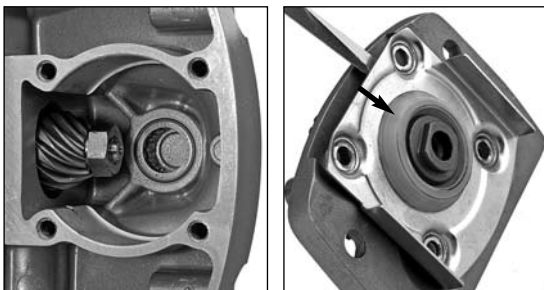
Remove the cover

Remove the four screws.

Remove the cover

Remove the four screws holding the cover.

Note that there are break slots on the gear housing to lift the cover.



Remove the crown gear unit

Lift out the crown gear unit.

Remove the crown gear unit

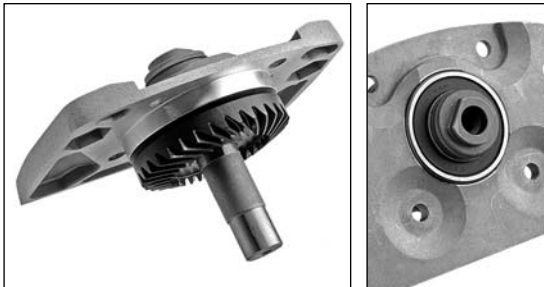
The crown gear bearing has a needle bearing in the base of the gear housing and the crown gear unit can therefore easily be lifted off.

Grease missing in the illustration

For the sake of clarity the grease has been taken away from the gear housing.

Grease missing in the illustration

For the sake of clarity the grease has been taken away from the gear housing.

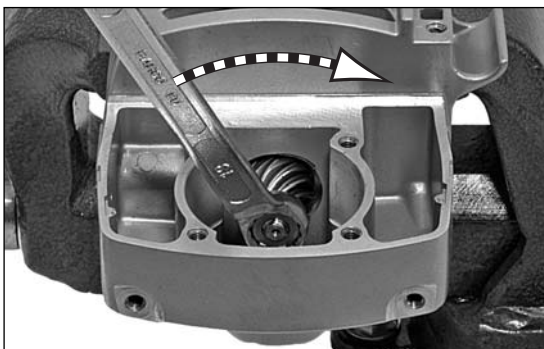


Crown gear unit

You cannot dismantle this unit for overhaul as it must be replaced in full. Replace the drive pinion at the same time.

Crown gear unit

The gear housing cover with crown gear, shaft, bearing and seal ring is a complete unit that cannot be dismantled for overhaul. You must replace the whole unit if any component is damaged. Always replace the drive pinion at the same time.



Remove the drive pinion

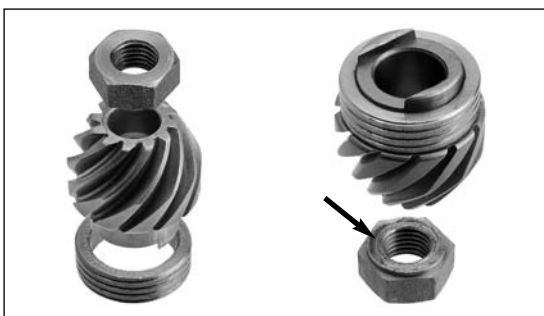
The nut is left threaded!

Remove the drive pinion

Attach the rotor in a vice with rubber jaws.

The nut is left threaded!

Remove the nut in a clockwise direction.



Pull the drive pinion off the shaft.

Turn the nut correctly!

Turn the side with the shoulder to the drive pinion when reassembling.

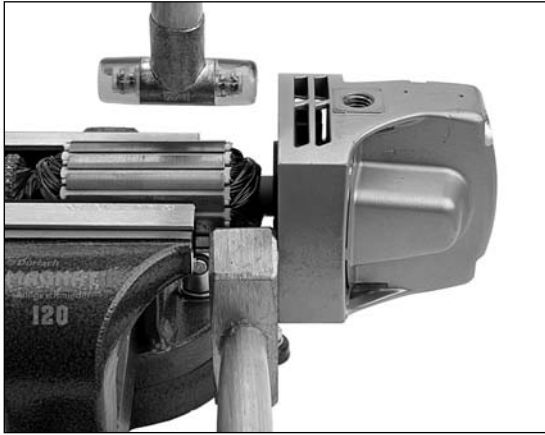
Later designs have a nut with shoulder on both sides.

When the nut has been removed the drive pinion can be pulled off the shaft by hand.

Turn the nut correctly!

When refitting, note that the nut is not symmetrical. Turn the side with the shoulder to the drive pinion.

Later designs have a nut with shoulder on both sides.

**Remove the gear housing**

Attach the rotor in a vice with rubber jaws.

Press a heavy metal object against one corner of the gear housing. Knock the opposite corner with a small plastic hammer.

**Remove the circlip****Remove the washers****Remove the gear housing**

Attach the rotor in a vice with rubber jaws.

Press a heavy metal object against one corner of the gear housing. Knock a few light strokes with a small plastic hammer on the opposite corner to release the gear housing from the rotor.

Remove the circlip

Remove the circlip using circlip pliers.

Remove the washers

There are two flat washers located under the circlip.

**Tools****Removal of gear housing bearing**

The following tools are required for removing the gear housing's bearing:

1. Internal bearing extractor to grip behind the bearings.
2. Use a counter stay device where there is a counterhold.
3. A slide hammer is an alternative to the counter stay device if there is no counterhold available.

**Remove the bearing**

Remove the ball bearing using a counter stay device. Heating around the bearing seat reduces the press force considerably.

Felt seal

There is a felt seal under the bearing surrounded by washers on both sides. Replace felt seal when replacing bearing.

Remove the bearing

Remove the ball bearing in the gear housing using a counter stay device. Heating around the bearing seat using a hot air gun reduces the press force considerably.

Felt seal

There is a felt seal under the bearing surrounded by washers on both sides. Replace felt seal when replacing bearing.

**Tools****Fitting of gear housing bearing**

Fitting of both of the gear housing's bearings is best done using the tool kit 506 37 61-02.

(The tool kit is also used on the petrol-driven power cutters for replacing the main bearings, replacing the blade shaft bearing and driving wheel bearing on K960 Ring.)



Fit gear housing bearings

Fit the tool as per the illustrations.

Place a large washer with the nut.

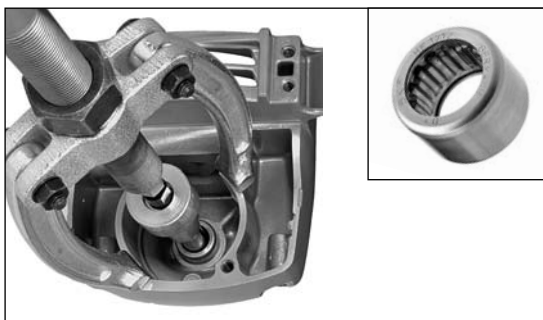
Pull the bearing in by screwing the nut.

Fit gear housing bearings

Fit the tool as per the illustrations.

Place a large washer with the nut which serves as a dolly device in the gear housing.

Pull the bearing in by screwing the nut.



Remove the gear housing's needle bearing

Use a counter stay device to remove the needle bearing.

Heating under the bearing seat reduces the press force.

Remove the gear housing's needle bearing

Use a counter stay device to remove the needle bearing.

Fit the device so that it attaches under the bearing or needles. Place the device's legs as shown in the illustration.

Heating under the bearing seat reduces the press force.



Fitting needle bearings

Make an assembly tool as per the adjoining illustration. Place tape or shrink tubing over the threads.

Fitting needle bearings

Make an assembly tool simply by following the adjoining illustration. Put tape or shrink tubing over the thread to avoid damaging the bearing and keeping it in place.

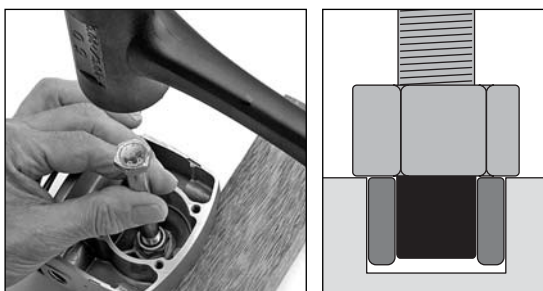


Text side upwards

Turn the flat side with the text upwards, towards the nut.

Text side upwards

Turn the flat side with the text upwards, towards the nut. The opposite side is rounded in order to facilitate removal and assembly.



Heat the bearing seat, cool the bearing

Knock the bearing down

Use a heavy and soft mallet. Knock the bearing down so that it is level with the top edge of the bearing seat.

Heat the bearing seat, cool the bearing

Fitting is facilitated if you heat the bearing seat to around 100 °C (200 °F) and cool the bearing with coolant spray.

Knock the bearing down

Use a heavy and soft mallet. Knock the bearing down so that it is level with the top edge of the bearing seat.



Lubricate the gear housing – 574 20 30-01

The correct type and amount of grease, 20 g, is packed under spares number 574 20 30-01. The grease is low viscosity with special properties that have been tested to work on this kind of gear wheel, and may not be replaced by any other grease.

Apply the grease to the drive pinion and fill the needle bearing with grease.

Fit a new gasket and fit the cover with the crown gear. Tighten the four screws at a torque of 10-12 Nm.



Remove the blade guard

The blade guard must be removed to access the gear housing's screws and divide the gear housing.

You must divide the gear housing to be able to separate the motor from the gear housing, e.g. if the rotor is to be replaced.



Remove the bushing

Press the bushing up with two fixed U wrenches. Now remove the inner flange washer.

Remove the bushing

Press the centre bushing up with two fixed U wrenches. Now remove the inner flange washer.

The centre bushing for the cutting blade is interchangeable and is available in a range of diameters.



Remove the washer

Remove the screws. Lift out the blade guard.

Remove the washer

The washer with the three screws holds the blade guard to the gear housing and adjusts the gear rings for the blade guard setting. Remove the screws.



Lift off the blade guard

Lift off the blade guard

Lift up the blade guard from the gear housing. The white seal ring releases from the shaft and follows up with the washer under.



Check that the white plastic seal is intact.

Check that the screen rings are intact and that the rubber ring is in good condition.



Check that the white plastic seal is intact. Contaminants under this indicate a defective seal which must then be replaced.

Check that the screen rings for the blade guard lock are intact.

Check also that the rubber ring under the cog ring in the blade guard is in good condition. The rubber ring serves as a spring to keep the cogs engaged.



Fit the blade guard – tighten the screws alternately

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.



Fit the seal ring

Fit the seal ring

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



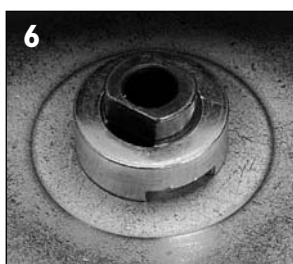
Centre bushing

Fit it this way.

1. Add an inner flange washer.

2. Insert the centre bushing.

3. Fit the screw to attach the cutting blade.

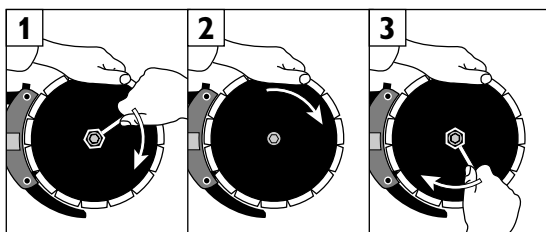
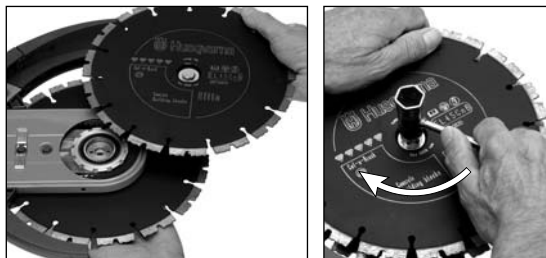
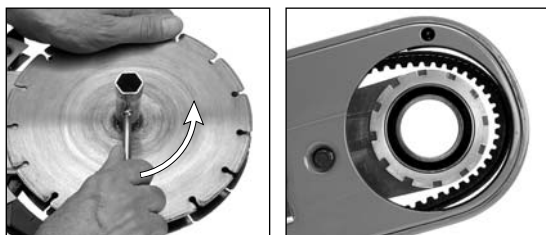
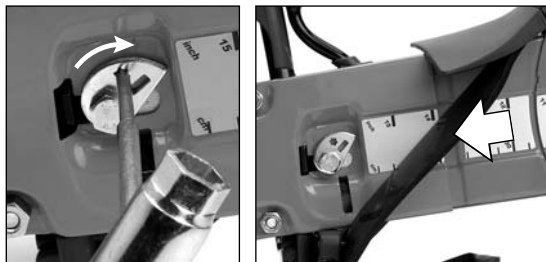
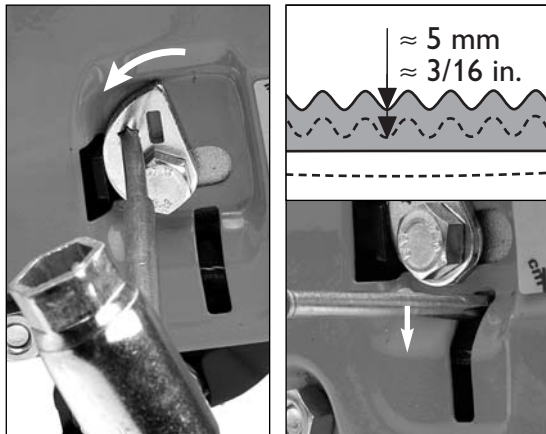
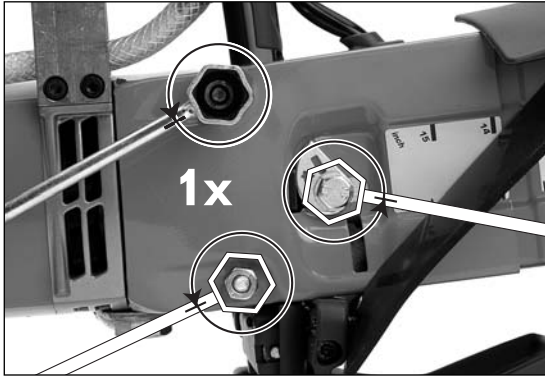


4. Press the bushing down by screwing the screw down until it reaches the bottom.

5. Remove the screw and add the other flange washer “turned the wrong way”.

Refit the screw and press the bushing down towards the inner flange washer with the screw.

6. Bushing fitted.



Belt tensioning

Loosen one turn

Tighten the belt

Turn the adjustment washer to tension the belt. Adjust to a position where the belt can be pressed down around 5 mm (3/16 in.) with a screwdriver.

Tighten the screw and the nuts as per the illustration above.

Blade replacement

Loosen the belt

Loosen the nuts and the screw as per the illustration above.

Turn the adjustment washer clockwise and press the cutting arm back.

Remove the blade

Press the belt out as far as possible from the centre of the blade.

Fit the blade

Keep one blade with the nut underneath. Fit the other with the screw on the top.

Screw and turn the blade alternately

To avoid risking the belt jamming between the blades, they are to be tightened at short intervals while you rotate the blade alternately.

Belt tensioning

Loosen one turn

Loosen both nuts that hold the cutting arm and the screw that locks the adjustment washer.

Tighten the belt

Turn the adjustment washer using a screwdriver or Torx 27 to tension the belt at the right level. Check the tension of the belt using a screwdriver that is pressed into the belt downwards. Adjust to a position where the belt can be pressed down around 5 mm (3/16 in.) with moderate hand power.

Tighten the screw to the adjustment washer and both nuts on the cutting arm.

Blade replacement

Loosen the belt

Loosen the nuts and the screw as per the illustration above.

Turn the adjustment washer clockwise and press the cutting arm back to loosen the belt.

Remove the blade

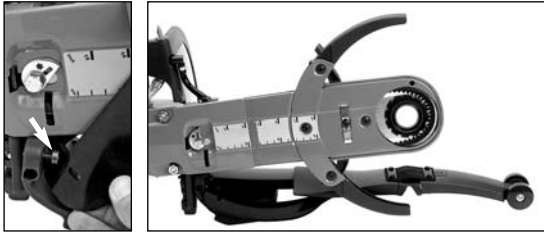
Press the belt out as far as possible from the centre of the blade. This is to be done to avoid risking the belt getting jammed between the blades when fitting.

Fit the blade

Fit with the machine in a horizontal position. Keep one blade with the nut underneath. Fit the other blade with the screw on the top.

Screw and turn the blade alternately

To avoid risking the belt jamming between the blades when tightening the blade's centre screw, they are to be tightened at short intervals while you rotate the blade alternately.

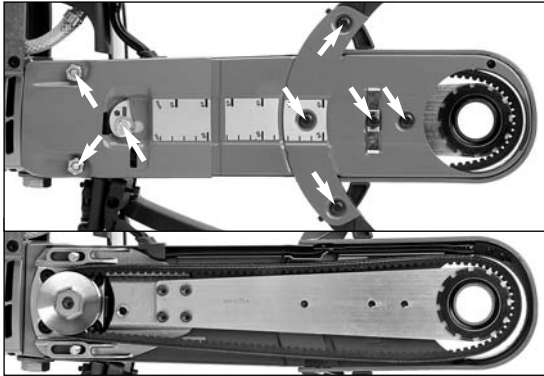


Belt replacement

Fold aside the splash guard

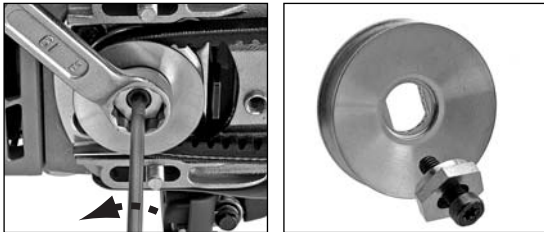
Force off the rubber guard from the screw.

Fold down the splash guard.



Remove belt guards

Remove the screws and nuts as shown in the illustration.



Remove the belt wheel

Lock the dog and remove the centre screw.

Belt replacement

Fold aside the splash guard

Force off the rubber guard from the screw.

Push the splash guard into smooth cutting position and fold down the splash guard.

Remove belt guards

When the screws and nuts have been removed as shown in the picture, the cover plates can be removed.

Remove the belt wheel

Lock the dog and remove the centre screw. Lift off the belt wheel.

When refitting note that the belt wheel is not symmetrical.



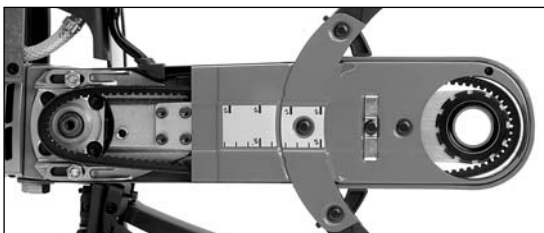
Reassembly

Attach the cutting arm to the gear housing provisionally with both nuts.



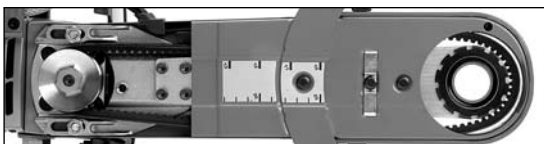
Fit the belt

Apply the belt to the belt guard.

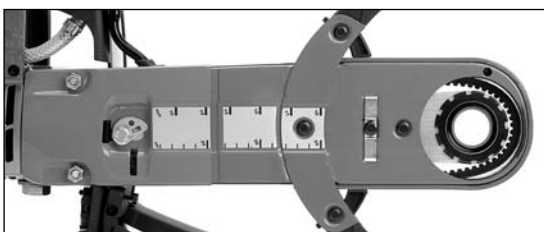


Fit the front belt guard

Fit the front belt guard. Fit the four screws. Place the spring catches on both sides of the belt guard and fit the fifth screw.



Fit the belt wheel

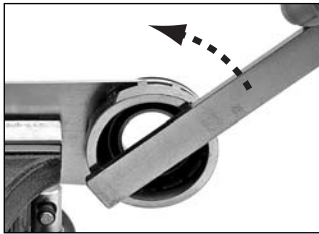
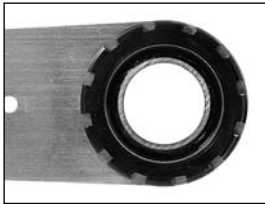


Fit the rear belt guard

Remove the provisionally mounted nuts and fit the rear belt guard. Fit the nuts and tighten by hand. Fit the screw and adjustment washer for belt tensioning.

Fit the blade, tension the belt

See page 26.



Bearing replacement

Remove the belt guards.

Attach the cutting arm.

Tools

The special tool 502 53 15-01 is needed for removal.

Remove the bearing holder

Remove the bearing holder using tool 502 53 15-01.

Remove the bearing

Support the tool ring as shown in the illustration. Press or knock out the bearing using a suitable socket.

Fit the bearing

The bearing is best fitted by pressing.

Alternatively you can fit the bearing using a vice. Place the bearing holder in the special tool.

Remove the fixed bearing holder

The bearing holder in the cutting arm is positioned with a force fit.

The following method for removal works:

Bearing replacement

The cutting arm, where the bearing is fitted, is now accessible when the belt guards are removed. See the "Belt replacement" chapter where this work is described.

Attach the cutting arm in a vice.

Tools

The special tool 502 53 15-01 is needed for removal which is used to remove and fit the threaded bearing holder.

Remove the bearing holder

Remove the bearing holder using tool 502 53 15-01. The bearing holder has a fine thread.

Remove the bearing

Also use the special tool to press the bearing out of the holder. Support the tool ring with a pair of wood blocks as shown in the illustration. Press or knock out the bearing using a suitable socket.

Fit the bearing

The bearing is best fitted by pressing. Apply press force to the bearing's outer ring.

Alternatively you can fit the bearing using a vice as shown in the illustration. Place the bearing holder in the special tool to give the bearing holder good support all around.

Remove the fixed bearing holder

The bearing holder in the cutting arm is positioned with a force fit. It is difficult to remove as there is no chance of achieving a good counter hold

The following method works:



Removal

Add a wooden block under the cutting arm. Place the ball bearing on the bearing holder and knock so that a gap appears between the bearing holder and cutting arm.

Turn the cutting arm and break up the bearing holder.

Fit the bearing holder

The bearing is best fitted by pressing.

Alternatively the bearing holder can be knocked into place with a small plastic hammer.



Removal

Add a wooden block under the cutting arm right next to the bearing holder.

Place the ball bearing on the bearing holder and knock the outer ring so that a gap appears between the bearing holder and cutting arm.

Turn the cutting arm and break up the bearing holder gradually with a screwdriver all around.

Fit the bearing holder

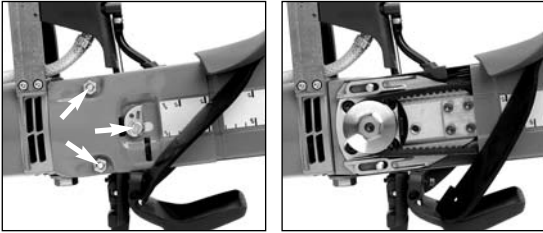
The bearing is best fitted by pressing.

Alternatively the bearing holder can be knocked into place with a small plastic hammer. Knock a few light strokes around the ring so that it drops down parallel to the cutting arm.



Removal of complete cutting unit

The cutting unit can be easily dismantled and refitted as a unit. This is appropriate if work is to be carried out in the gear housing or if the motor unit is to be divided from the gear housing, for example, when replacing the rotor or stator.



Remove the belt guard

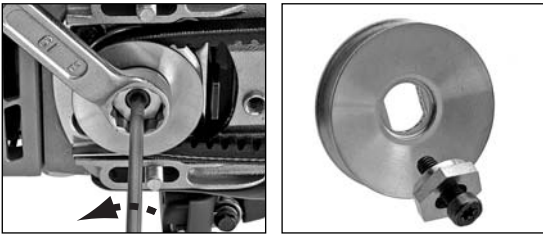
Remove the belt tensioner and belt guard nuts.

Force off the rubber guard from the screw.

Remove the belt guard

Remove the belt tensioner screw and eccentric washer. Remove both nuts holding the belt guard.

Force off the rubber guard from the screw.



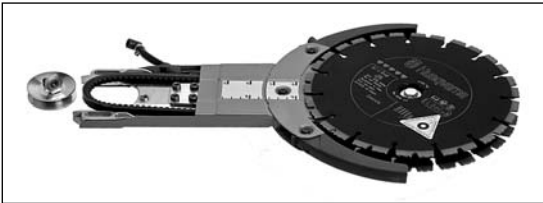
Remove the belt wheel

Lock the dog and remove the centre screw.

Remove the belt wheel

Lock the dog and remove the centre screw. Lift off the belt wheel.

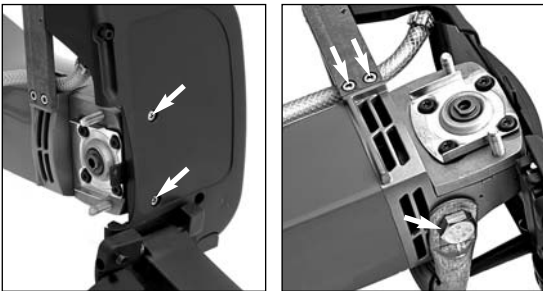
When refitting, note that the wheel belt is not symmetrical.



Lift off the cutting unit

Lift off the cutting unit

Note that the cutting blades do not need to be removed.



Remove the handle unit

Remove the two screws in the shield.

Remove both screws at the handle and nut on the underside of the gear housing.

Remove the handle unit

Remove the two screws in the shield that hold this against the gear housing.

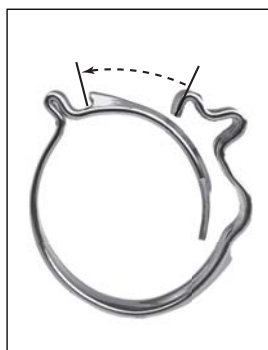
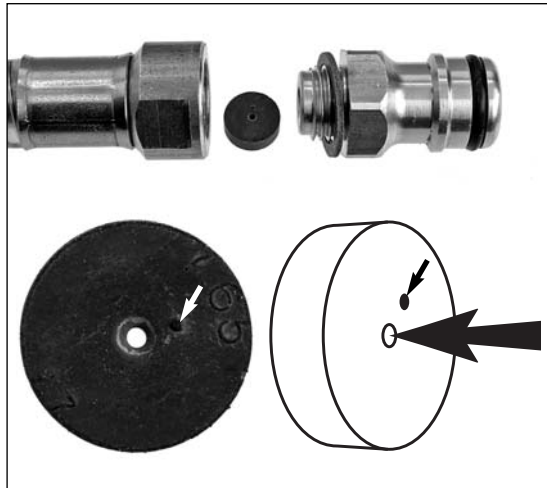
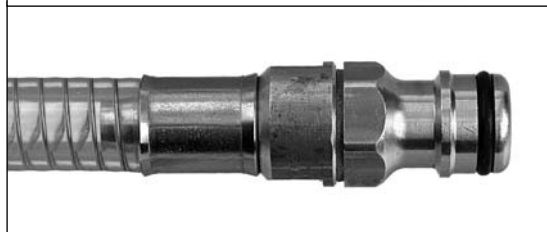
Remove both screws at the handle and nut on the underside of the gear housing.



Separate the units

Separate the units

The handle frame, shield and splash guard can now be separated from the machine as one unit.



Water coupling with flow control

The water coupling with flow control is identical for all K3000 with wet systems.

The water coupling is adapted to suit the Gardena® system.

The coupling in the machines for wet cutting have a flow control that regulates to a virtually constant flow at varying water pressures. The water flow is turned on and off by the valve at the handle.

A filter in the water coupling prevents particles of dirt from sealing the flow control and spray nozzles.

Filter replacement

Remove with a wood screw.

Fit on an even surface.

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.

Flow control

The flow control is accessible when the water coupling is divided as shown in the illustration.

The flow control consists of a rubber cylinder with a hole for water passage. The hole varies in size according to how hard the flat surface on the pressure side is exposed to pressure.

Turn the control correctly

The side with a mark and text must be turned to the pressure side.

Turn the control correctly

The side with a mark and text must be turned to the pressure side, that is the side where the water comes in through the coupling.

Hose clips

The hose clips can be reused.

Open the hose clip using a screwdriver.

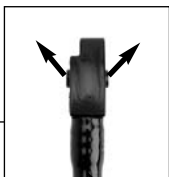
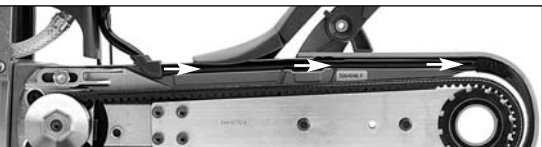
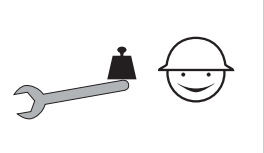
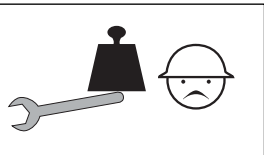
Close the hose clip using pliers.

Hose clips

Virtually all hose clips in the wet cutting system are of the type that can be reused.

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

Close the hose clip by pressing it together with pliers.



K3000 Wet

Construction

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 segments.

The spray nozzles have a smaller diameter for the water spray compared to the petrol-driven cutters in order to restrict the amount of water.

Replacing the spray nozzles

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

Tighten the spray nozzles with moderate force.

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. The nozzles with several different hole diameters are available depending on the machine and application.

Light tightening

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

K3000 Cut-n-Break

Construction

A plastic hose directs the water up to the nozzle which distributes the water towards both cutting blades.

The wet system is accessible when the belt guards have been removed. See page 27.

● = Service action

The tools below can be acquired from Husqvarna:



**506 37 61-02
Bearing press**

- Fitting of gear housing bearing.



**525 30 02-01
Mounting sleeve**

- Electric, Wet: Fitting of crown gear and seal ring.



**525 30 02-01
Spanner**

- Cut-n-Break: Replacement of blade bearings.



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



**502 71 27-02
Workshop wrench, Torx T27**

- Universal use.



**504 90 00-06
Workshop kit, mm dimensions**

- Universal use.

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



**504 90 90-02
Universal puller**

- Electric, Wet: Fitting of crown gear and bearing.

The special tools below are needed for servicing work on the K3000 but are not sold by Husqvarna:



Multimeter

Make: Amprobe 37XR-A.

One of few universal instruments that can also measure inductance (H, Henry).

- Check of the electrical system's functions.



Counter stay device

There are a number of manufacturers, e.g.: Kukko (Germany), Snap-On (USA).

- Removal of ball bearings and needle bearings in gear housing.



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2009-06