Husqvarna®

Workshop manual

DMS 240

HUSQVARNA CONSTRUCTION PRODUCTS

HUSQVARNA
DMS 240

CONTENTS

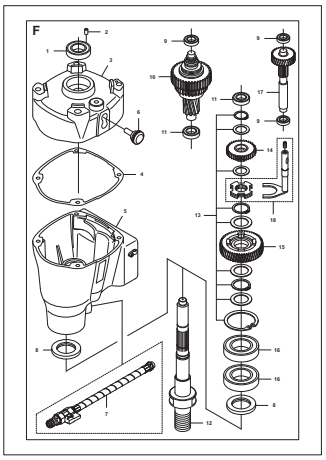
Workshop manual

This workshop manual covers virtually all work in the workshop that involves the DMS 240. 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 – IPL

Spare parts DMS 240

The folder covers all spares for the Husqvarna DMS 240.

The folder contains complete exploded drawings for the whole machine where the location, spare part 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.

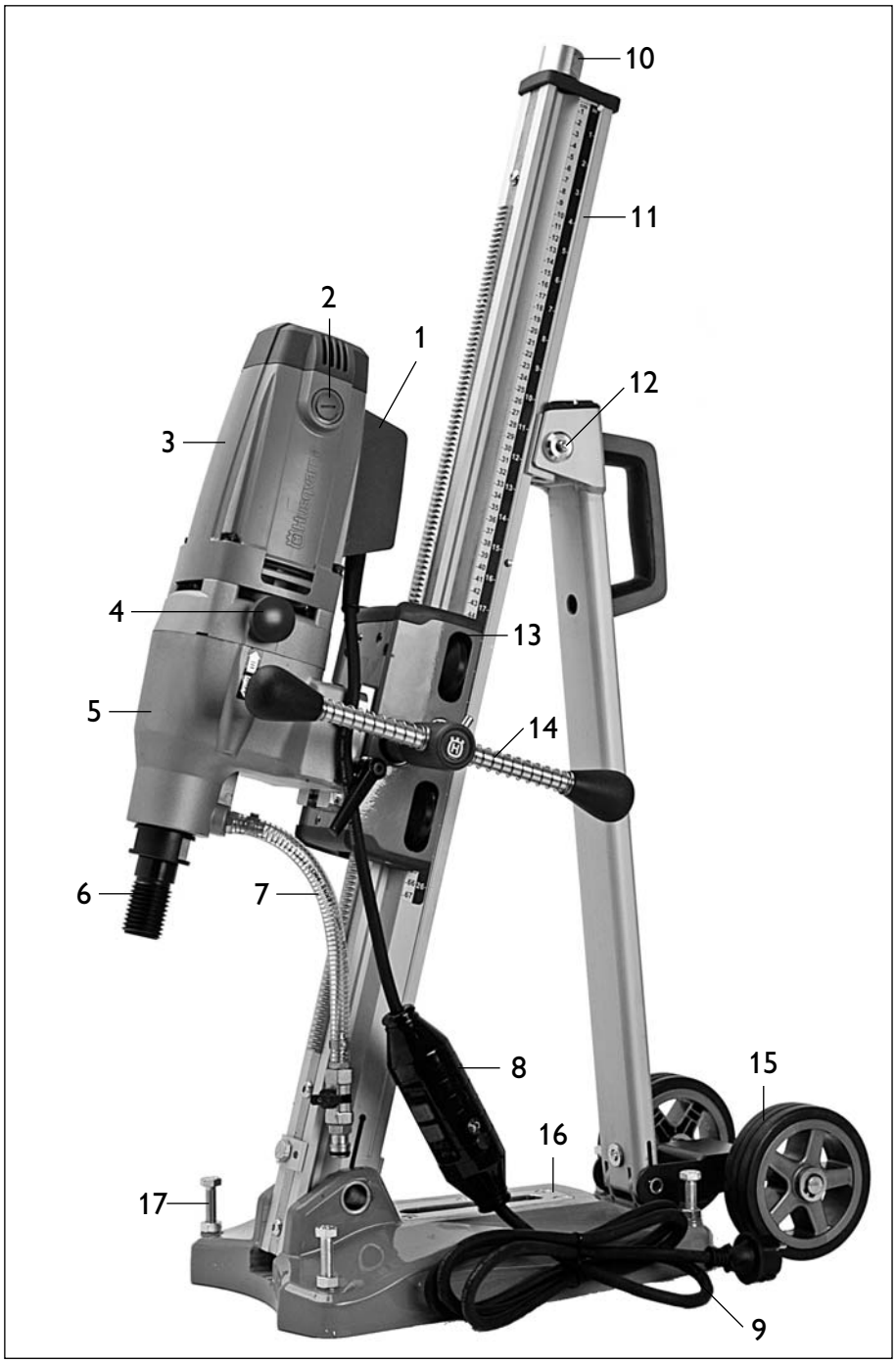
It is extremely important that service personnel are well acquainted with how the machine is used and follow the instructions given in the manual.

Driller

1. Circuit breaker
2. Carbon brushes
3. Electric motor
4. Gear selector
5. Gear housing
6. Drill spindle
7. Water connection
8. Earth fault breaker (PRCD)
9. Mains cable

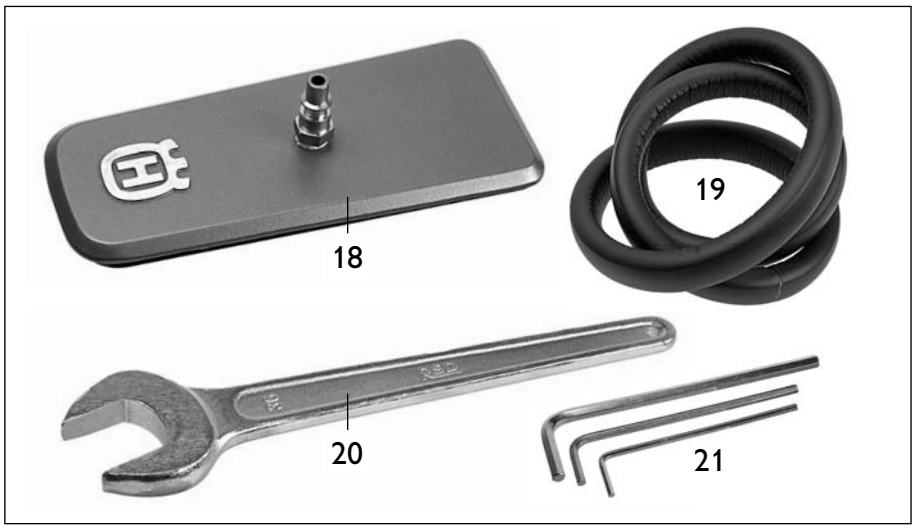
Stand

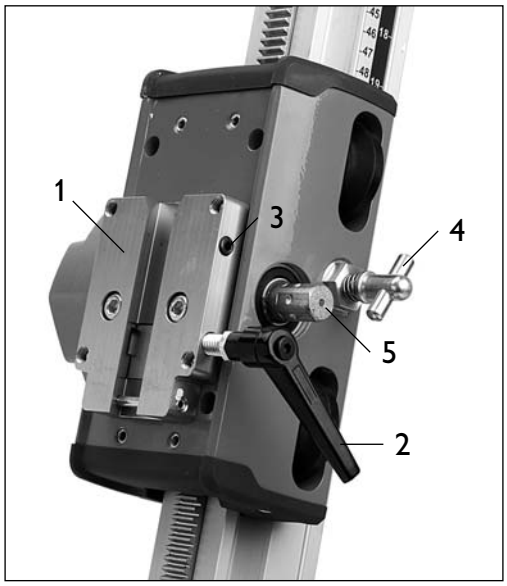
10. Tensioning screw
11. Column with measurement scale
12. Angle adjustment, locking screw
13. Feeder housing
    - components, see next page
14. Feed wrench
15. Transport wheels (folding)
16. Base plate with vacuum function
17. Set screws

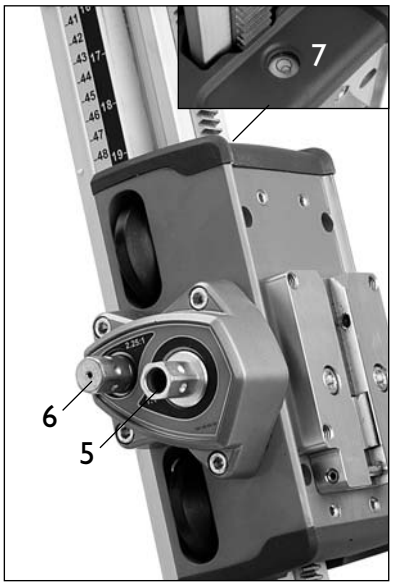


Accessories

18. Vacuum cap
19. Vacuum gasket for base plate
20. Spanner to the spindle shaft
21. Allen keys







Feeder housing

1. Machine bracket
2. Locking knob for drilling machine
3. Additional locking screw, Allen head 4 mm
4. Feeder housing lock
5. Feed screw – high gear
6. Feed screw – low gear
7. Spirit level

Work tip

The easiest and most convenient way of executing virtually all service work on the DMS 240 is with the machine in a vertical position with the drill spindle facing downwards.

Do it yourself

A fixture for securing the machine in a vice is easily made using a wood block and a pair of steel plates.

The wood block should be at an equal height to the drill spindle, about 55 mm. Drill a hole with a diameter of 1 1/4 inches, corresponding to around 32 mm, in the wood block.

The two steel plates secure the wood block horizontally in the vice.

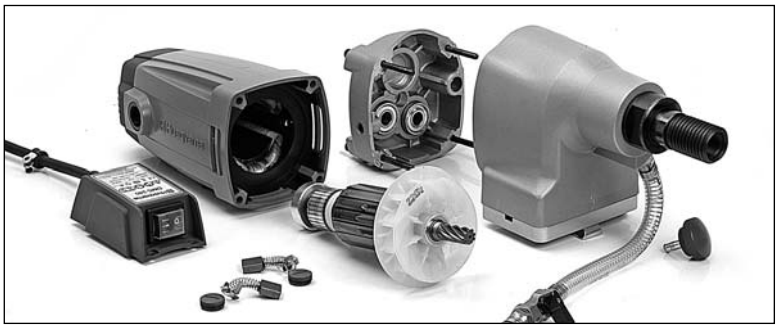
It is even easier to drill a hole in the work bench.

Warning

A workshop often has a range of electrical tools at the workplace. It is not uncommon for the wrong contact to be connected to the mains – perhaps to the very machine you are working with!

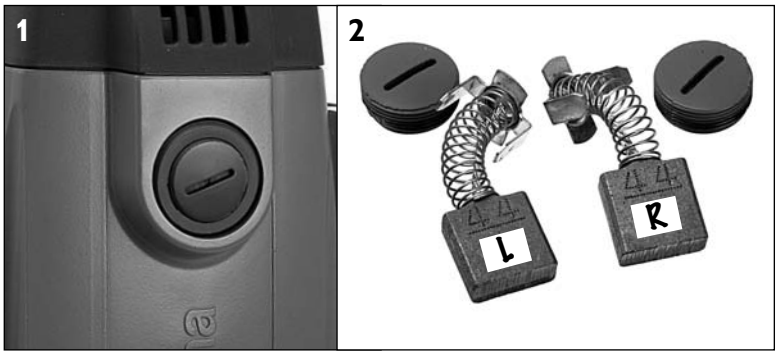
A simple way of highlighting this and preventing unintentional connections is to tape over the contact pin.

Note: A machine that has been dismantled must not be connected to the mains supply. Functional tests must not, and do not need to be made on a dismantled machine that is connected to the mains.



Basic modules

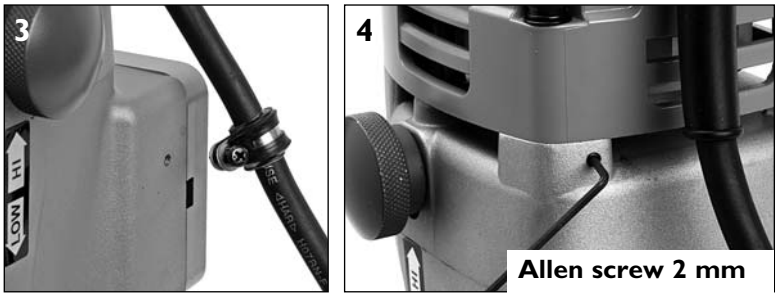
This chapter describes the disassembly of the machine into its basic modules. It only describes the disassembly of the large units. This knowledge forms the basis for performing work at the component level as described later in the workshop manual under the relevant heading.



Electric motor – gear housing

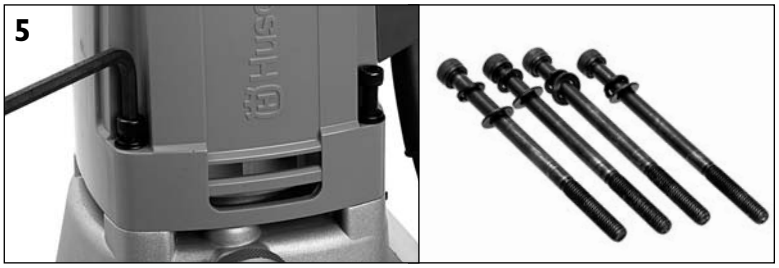
1. Remove both covers of the carbon brushes with a screwdriver.

2. Pull both carbon brushes out of the holders.
Worn carbon brushes should be given the same position as when they were dismantled when reassembling. Therefore mark the carbon.
If the carbon needs to be changed, these also need to be run in, see the “Carbon brushes” chapter.



3. Disconnect the mains cable from the strain relief clip.

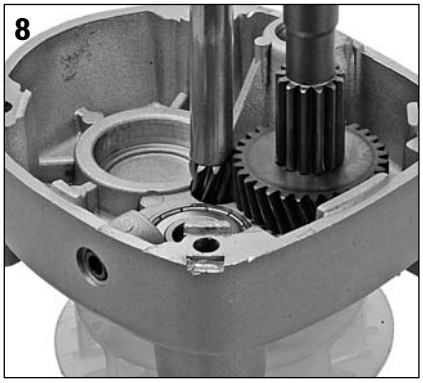
4. The motor's earth cable is fixed to the gear housing cover with an Allen screw, 2 mm. Release the cable by unscrewing the Allen screw.



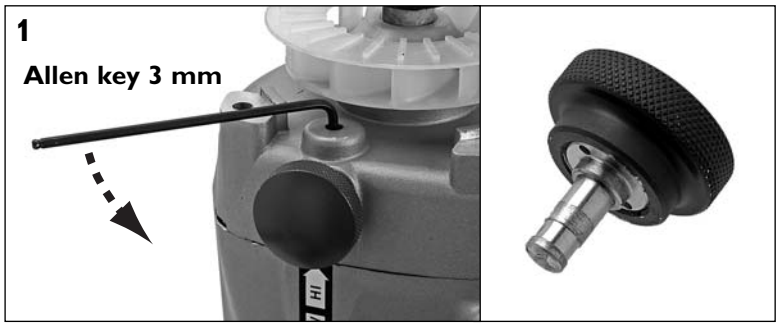
5. Remove the four screws around the motor housing.

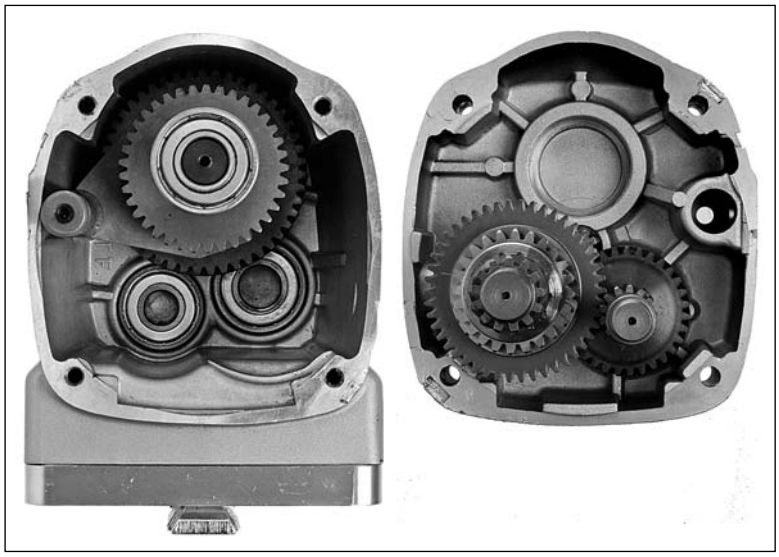
6. It requires minimal force to lift the motor from the gear housing. A pair of breaking irons, positioned as shown, helps removal.

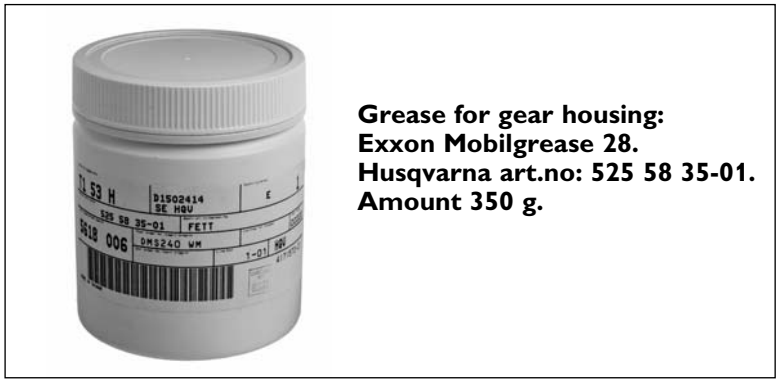
7. The rotor remains in the gear housing cover, and the motor housing is then lifted out.

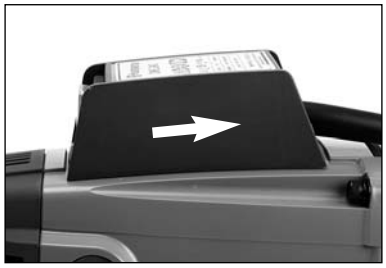


8. The rotor cannot be removed undamaged from the outside of the cover.
The rotor can only be removed when the gear housing has been divided, after which the rotor can be knocked out or pressed out using a hydraulic press. Use a brass mandrel to prevent damage to the rotor shaft.
Dividing the gear housing is shown in the next section.









Dividing the gear housing

Start by performing steps 1–7 in the previous section.

1. The gear selector must first be removed. This has a locking screw, 3 mm Allen key, which is accessible through a hole in the gear housing cover. Set the gear selector lever to "HI" to reach the screw with the tool. Loosen the locking screw a few turns and pull out the gear selector.

2. The division is greatly simplified if the gear housing cover is heated to about 100 °C/200 °F. The bearings then release with a little force from the cover.

3. There are two break slots between cover and gear housing. Insert suitable screwdrivers in these and work off the cover alternately using the screwdrivers.

Gear housing appearance after division

Depending on the variations to the press-fitting between shafts and bearings, the components may have a different position after the division, i.e. the two lower shafts could just as well be located in the gear housing and not as pictured on the cover.

Between the gear housing and the cover there is a gasket that is missing in the illustrations. This must always be replaced following dismantling.

Dismantling of the gear housing components is described later in the manual.

Note: The bearing housing is filled with a large amount of grease which for the sake of clarity has been removed in the illustrations.

Gear housing – grease

The gear housing is filled with a generous amount of grease that does not need to be replaced over the lifetime of the machine.

If individual components are replaced/adjusted in the gear housing, it is sufficient to move the grease to the component being fixed. Exception: if an accident has led to contamination of the grease with metal shavings, the gear housing must be cleaned and the old grease must be replaced with new.

Original grease: Exxon Mobilgrease 28 (Synthetic Aviation Grease). Quantity: 350 g. Grease is sold as spare part, art.no. 525 58 35-01.

Connection box – electricity

Remove the three screws that hold the connection box. Press the box slightly towards the spindle shaft to release the hooks. Lift up the connection box.

Function

The gear housing contains a transmission that reduces the high speed of the electric motor to a lower speed on the spindle shaft. The transmission has two gear positions. Change gear when the motor is off.

The transmission is based on three shafts:

A. The primary shaft is driven by the electric motor which in turn drives shaft B.

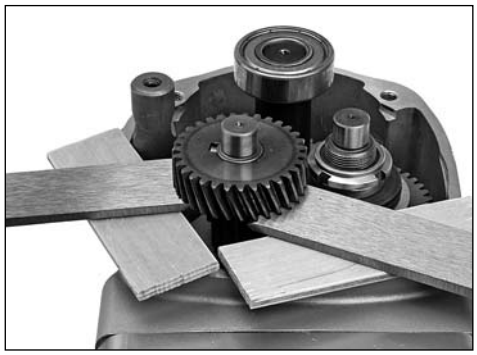
B. The secondary shaft reduces the speed to the spindle shaft C and has an adjustable slip clutch to protect the operator and the machine in the event of jamming.

C. The spindle shaft is driven by the secondary shaft and has a gear function.

Service work

The work procedure dictates that the complete primary shaft and secondary shaft must always be dismantled first. The spindle shaft is then removed.

The spindle shaft with attendant components, is dismantled into individual parts from the gear housing. Following dismantling of the components, the spindle shaft can be removed from the gear housing.



Primary shaft

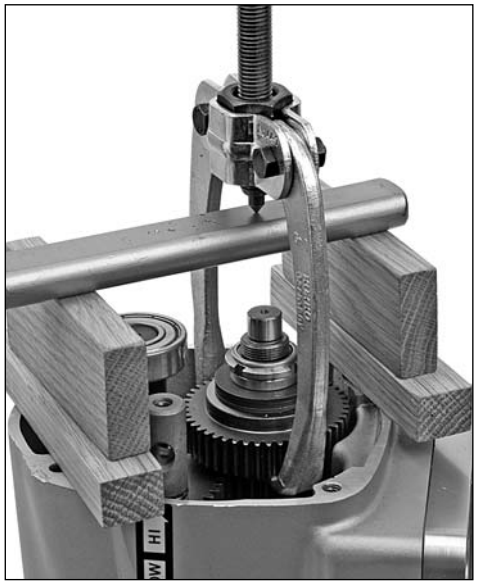
Removal

The primary shaft is force fitted on the ball bearings at the bottom of the gear housing and cover. When removing the cover, the primary shaft can jam in this instead, as shown in the gear housing illustration.

Add a few pieces of wood to prevent damage to the gear housing seal planes. Force the primary shaft with a couple of breaking bars.

Fitting

Fit the primary shaft is fitted last in the gear housing. If the shaft end is cooled and the bearing is heated to about 100 °C/200 °F, the shaft can be fitted with or without minimum press force.



Secondary shaft

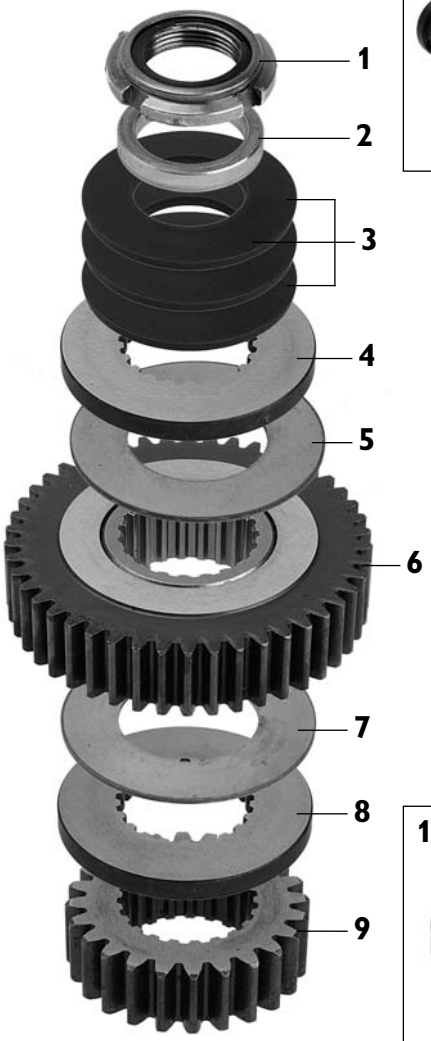
Removal

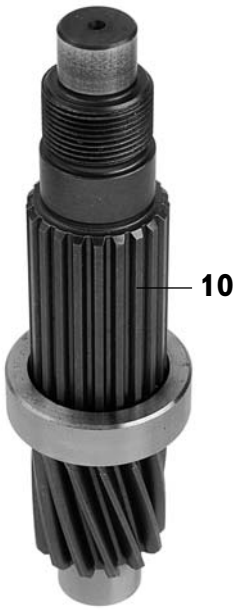
The secondary shaft is force fitted on the ball bearings at the bottom of the gear housing and cover. When removing the cover, the secondary shaft can jam unlike as shown in the gear housing illustration.

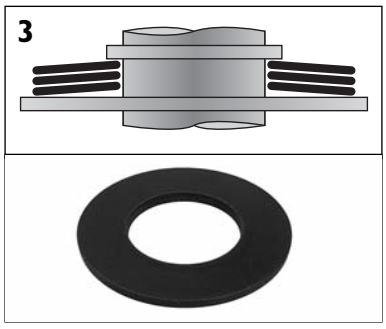
The shaft can often be lifted using a small force with a couple of breaking bars. If it is firmly jammed, it can be removed with a standard puller arranged as shown. Add pieces of wood to the gear housing and make a bridge with a sturdy iron object such as a cold chisel. Lift the shaft with the puller.

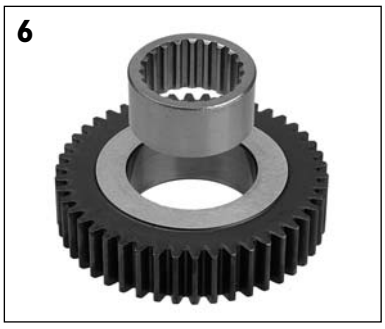
Fitting

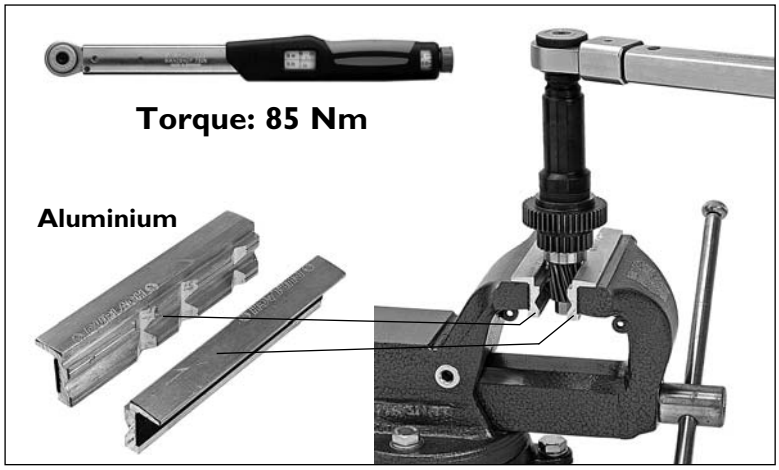
The primary shaft is fitted second last in the gear housing. If the shaft end is cooled and the bearing is heated to about 100 °C/200 °F, the shaft can be fitted with or without minimum press force.











Secondary shaft – slip clutch

Components

The components in the secondary shaft are shown in the adjacent illustration. The top gear wheel has a slip function. The torque is given by the spring washers being compressed by the hook nut at the top. On both sides of the gear wheel there are friction washers made of specific material.

For removal and adjustment, a special socket is used together with a torque wrench. This can be ordered from Husqvarna, art.no: 523 05 77-02.

The secondary shaft with its components are only supplied as a complete spare part, and therefore there is usually no need to dismantle it into its component parts. If you suspect damage, it needs to be disassembled for visual inspection.

Note the following

Item 1: The hook nut has a lock spring on the upper side. The nut is fitted with this side facing up.

Item 2: Press ring for spring washers.

Item 3: This machine has the three spring washers turned in the same direction. See separate illustration.

Item 4 and 8: Support washers.

Item 5 and 7: Friction washers.

Item 6: This gear wheel is driven by the primary shaft's straight-cut lower gears. Note the inner bushing which allows slip between the shaft and the gear.

Item 9: The gear wheel drives the spindle shaft.

Item 10: The secondary shaft with rigidly mounted support ring.

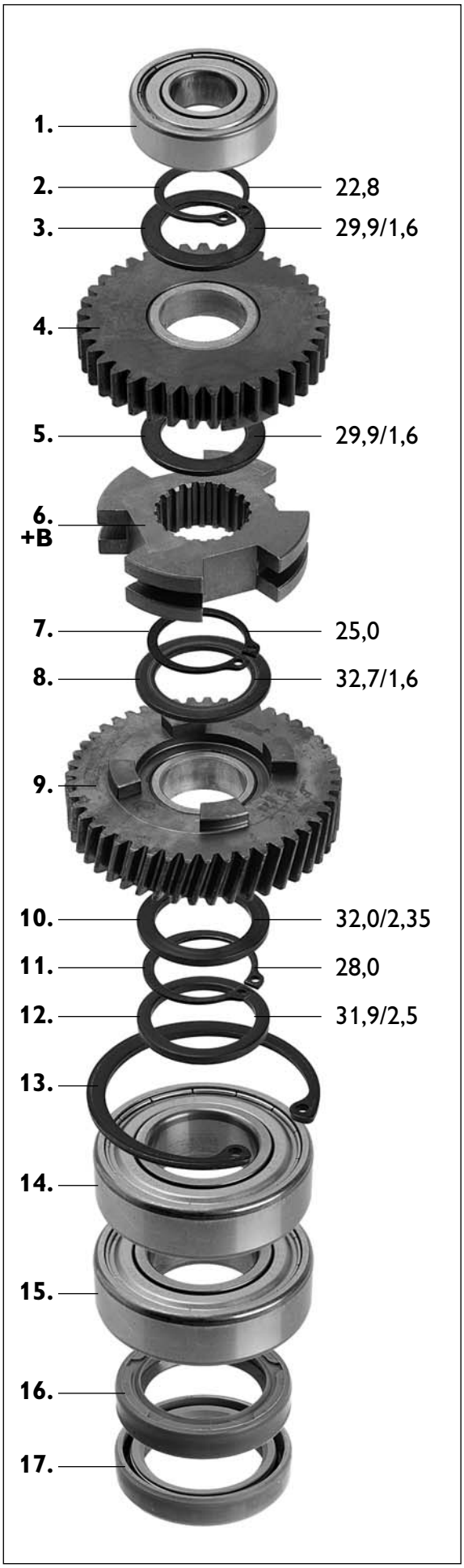
Adjustment

The actual slip torque is not measured for this slip clutch. Tightening the hook nut to a specified torque, 85 Nm, gives sufficient accuracy for the slip torque which is proportional to the tightening force. Hook nut (1) and compression ring (2) must be greased.

The adjustment is made as follows: Fasten the secondary shaft's helical drives in a vice. **Use protective jaws of aluminium** to avoid damaging the shaft.

Place the socket on the torque wrench and tighten the hook nut a half turn counter-clockwise to slightly loosen the nut. Set the torque wrench torque and tighten in an even, slow and continuous motion clockwise until the torque wrench trips.

Tightening torque: 85 Nm.



Spindle shaft

The complete spindle shaft contains a large number of parts, including axially moving gear wheels for the gear function. The illustration on the left shows the components.

The transmission in this machine is rarely the cause of any problems. Incorrect handling of the machine could, however, cause the actual shaft to bend, or damage the tool bracket. In these cases, all units on the spindle shaft are removed first, items 1-12, in order to change the actual shaft.

Service work

The handbook's introductory chapter describes the disassembly of the basic modules where it shows the main components that must be removed to access the spindle shaft.

Washers and retaining rings

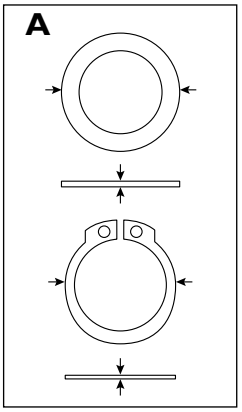
The spindle shaft has several washers and retaining rings with similar appearances and dimensions that are easy to confuse. We recommend laying out the components in an orderly manner in the order they were removed to ensure you put them back in the correct order, as shown by way of suggestion in the following numbering sequence. The dimensions to the right side of the components show the outer diameter and thickness in millimetres off the washers/retaining rings.

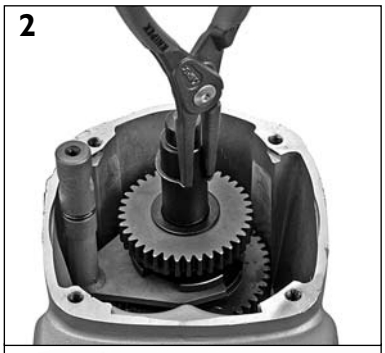
Illustration A. Be aware that design changes may cause the dimensions to not agree for all time.

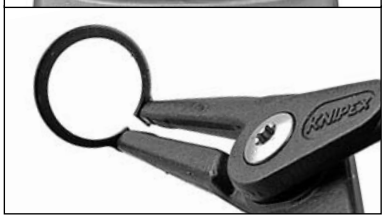
Illustration B: The selector fork is not included in the compilation of the spindle shaft components. It engages the gear wheel, item 6.

Illustration C: These components, items 13-17, are mounted in the gear housing and remain in place when the shaft is removed. The ball bearings are identical and symmetrical. Note that the sealing rings are mounted from each side of the gear housing with the spring sides facing each other.

Illustration D: The spindle shaft after removal of the components.







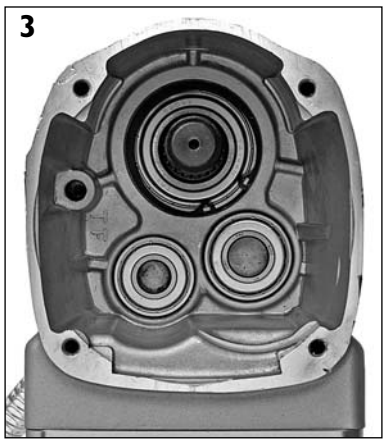
Remove the spindle shaft
The steps according to the handbook's opening chapter "Dismantling in basic modules":
- disconnect the motor from the gear housing
- divide the gear housing

Remove the primary and secondary shaft as per Page 8.

1. Remove the spindle shaft's upper bearing using a standard puller.

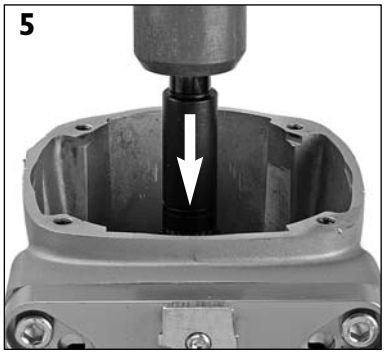
Remove the spindle shaft's components as per items 2-12.

2. A suitable pair of circlip pliers are required for the retaining rings.
Other components are lifted without any tools.



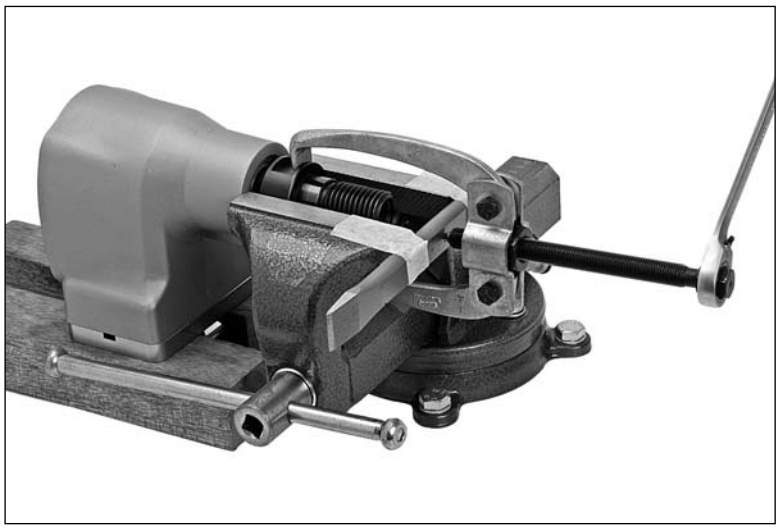
3. Starting position for removing the spindle shaft.

The two bearings at the bottom of the gear housing will be exposed to axial forces when the shaft is removed. It is therefore important not to knock out the shaft as this is likely to damage the bearings. Removal using a press is the correct method.
The spindle shaft has a press fit against two rings and can therefore get really jammed. Heating around the bearing seat reduces the press force considerably.



4. Create a counterhold for the gear housing that does not damage it. Hard wood or hard plastic works well.

5. Push out the shaft.



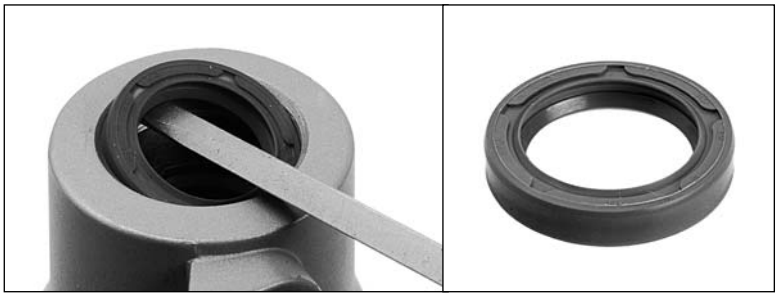
Alternative method
If a hydraulic press is not available, the adjoining described method can be applied. You need a vice, puller and a sturdy iron object for this method.

Place the gear housing against one side of the vice. Jack up the gear housing so that the shaft is level with the vice jaws. Tighten so that the shaft can just move.
You need a sturdy iron object on the opposite side which serves as a bridge and counterhold for the puller. Insert the puller claw at the spindle shaft's wrench attachment and pull the shaft out with the puller.

Bearings

Both bottom bearings are press-fitted in the gear housing and on the shaft. A retaining ring in the gear housing secures the position of the bearings. Radial seals for water distribution to the drill are located at the bottom of the gear housing.

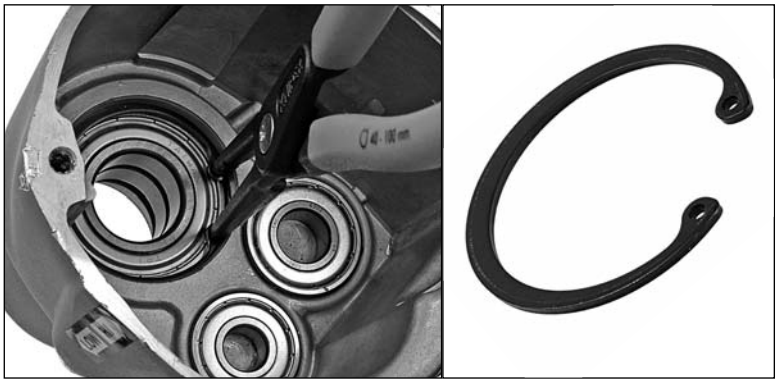
When removing the spindle shaft, the bearings are subject to major axial forces which may damage them. The recommendation is to replace bearings when the shaft is removed. The radial seals should always be replaced in connection with bearing replacement.



Removal

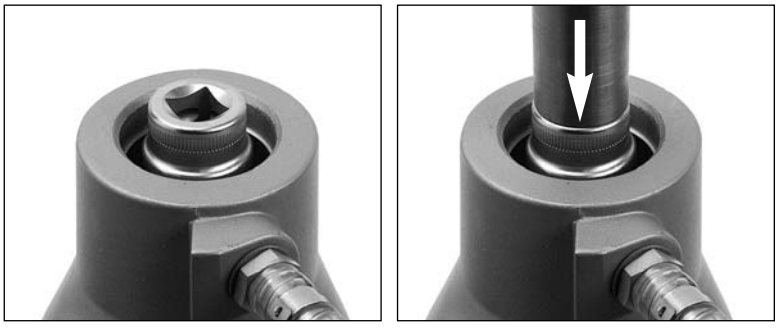
Remove the outer sealing ring

The seal rings are pressed in from each side of the gear housing. Remove the upper seal.



Remove the circlip

The large circlip, which locks the bearings in place, is removed using a large circlip pliers.



Remove the bearings

Both bearings for the spindle shaft are pressed out in the direction towards the gear housing. The easiest way to remove is by using a hydraulic press.

Put a tool sleeve, 22mm usually fits, on the bearing of the inner ring, (pushed past the radial seal). Press down the bearings from the gear housing.

Heating around the bearing seat, about 100 °C/200 °F, reduces the press force considerably.

Bearings

Both bearings are identical and symmetrical. Preferably replace the bearings once they are removed. Alternatively, a careful check should be made that the bearings are not damaged during removal.

Remove the inner sealing ring

The inner sealing ring is accessible when the bearings have been removed. Skew a mandrel facing the ring and knock around to remove it.

The sealing rings will be damaged during removal and must always be replaced with new ones.

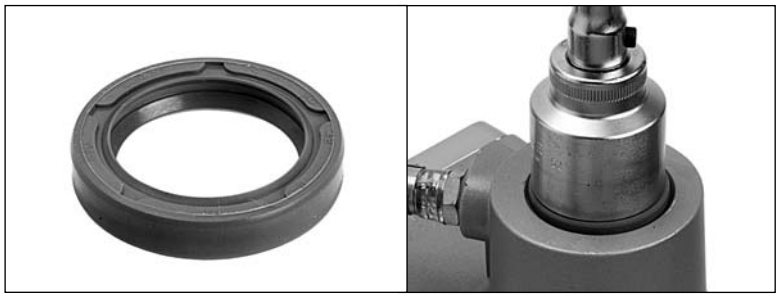
Fitting

The mounting of the bearings, spindle shaft and associated components can basically be performed in two ways:
– use a hydraulic press to fit the components with a press fit.
– use heat/cold to expand/shrink the components and assemble without press forces. If a heat gun or freezer is available, this method is the easiest and gentlest method for the bearings.

Inner sealing ring

Do not forget to fit the inner radial seal from the inside of the gear housing. Lubricate the seal ring's sealing lip which will later be in contact with the spindle shaft.

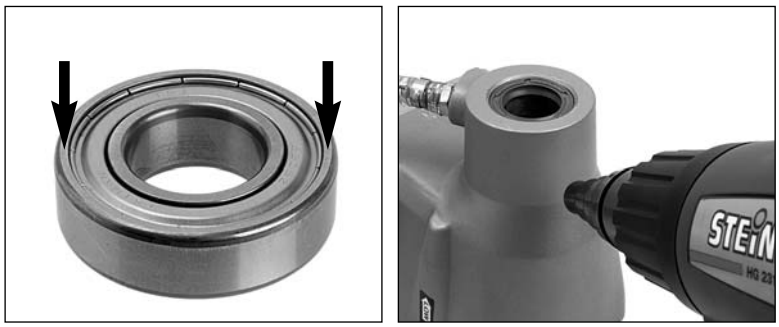
Turn the seal with the spring side down. A suitable tool sleeve with extender serves excellently as an installation tool. Check that the seal is placed against the stop after installation.



Outer sealing ring

The radial seal is fitted using the same method as the inner seal, but assembled from the outside of the gear housing.

Note: Both radial seals will lie with their spring sides facing each other after installation!



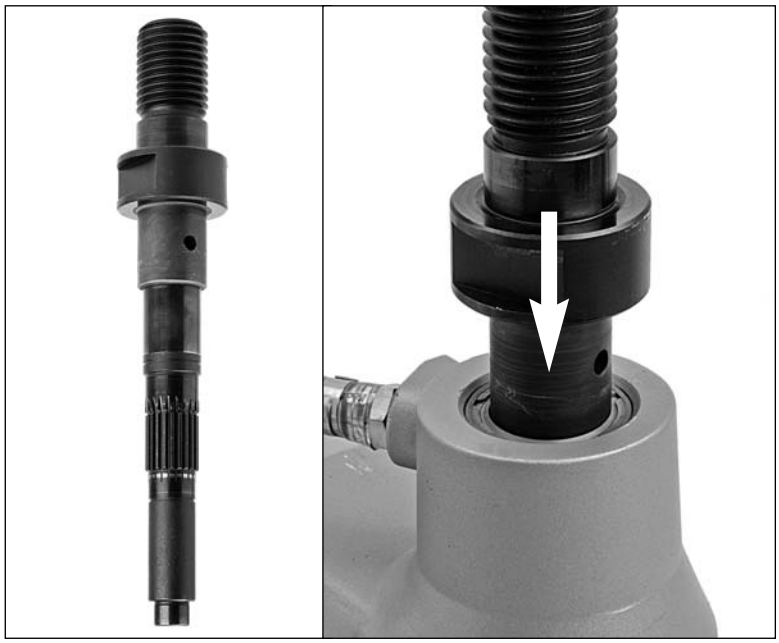
Spindle shaft bearings

Both bearings are fitted from the inside of the gear housing. The bearings can be fitted using a hydraulic press, one bearing at a time. A socket with an extension serves as a tool. It is important that you apply pressure to the outer ring of the bearings.

The alternative method is to place the bearings in a freezer (put the spindle shaft in at the same time) and heat the gear housing to about 100 °C/200 °F. The bearings are then usually simply lowered into place without any press force.

Fit the retaining ring

Fit the circlip using circlip pliers.



Fitting the spindle shaft
The spindle shaft usually sits with a heavy press fit against the two ball bearings. The problem is that during assembly the bearings are subjected to great axial forces between the outer and inner bearing rings. The shaft must not, under any circumstances, be knocked on site as this will inevitably result in bearing damage. Two methods remain:

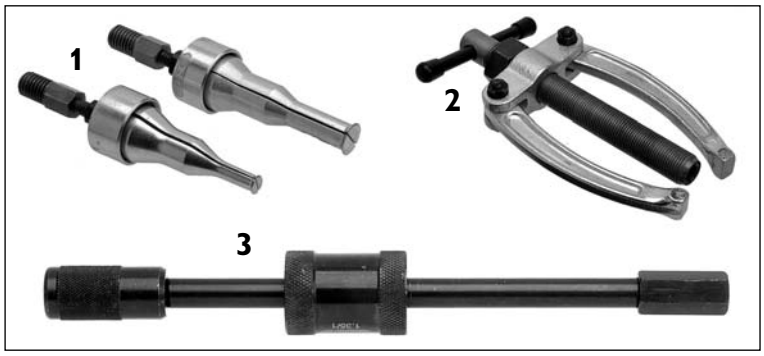
1. Fitting with hydraulic press.

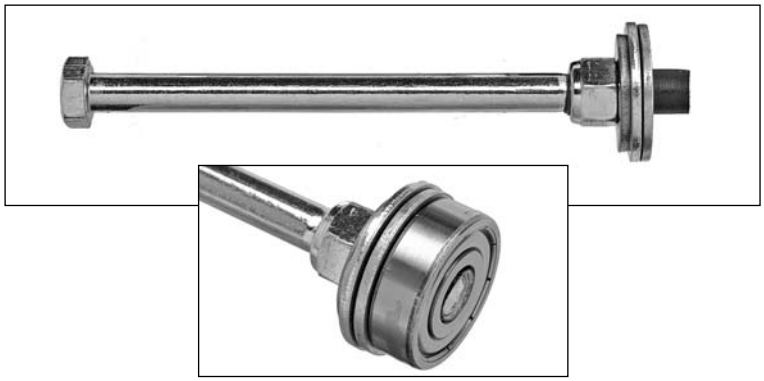
2. The best method is to put the shaft in a freezer and heat the bearing inner races to about 100 °C/200 °F, heat from inside the gear housing. The shaft can then usually be pushed into place by hand without any press forces. Perform this stage quickly! Have a plastic mallet to hand if necessary to supplement with a few light taps on the shaft.

Fitting spindle shaft components
Fit spindle shaft components. Exact description, see page 10. Do not forget to fit the shift fork at the same time as the gear wheel!

Install gear shifter
See page 7.

Fit the primary and secondary shafts in the gear housing
These shafts sit in place with a light press fit in the bearings and can normally be installed with a few light taps using a small plastic hammer. A slight warming of the bearings reduces the press force. See page 8.





Tools

Removal

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.

Fitting

Since replacement of these bearings rarely occurs, there is no fitting device. A suitable assembly tool can be very easily produced using a screw of an appropriate length, nut, washer and tape. Tape the threads ensuring the bearings are held in place.

It is important that the washers have a large enough diameter to support the ball bearing's outer ring when fitting.

Press or knock down the bearing in place. Heating of the bearing seats reduces the press force.

Bearing replacement

Ball bearing in cover:

Removal

The cover has good support surfaces for the counter stay device and is the most appropriate tool for removal in this case. The extractor is applied under the bearing.

Fitting

Fitting the needle bearings in the end is most easily achieved using a press. Alternatively, you can knock the bearings in place. The assembly tool facilitates making the bearings horizontal.

Regardless of the assembly method, it is important that press force is applied to the bearing's outer ring. Heating of the bearing seat and cooling of bearings reduces the press force.

Ball bearings in gear housing

In order to lift the bearings, all the spindle components down to the large gear wheel must be removed. The spindle shaft can remain in place.

Removal

The bearings can be removed using the same method as used for the bearings in the cover. A more convenient method is to create a bridge with a few pieces of wood to support the puller, arranged as shown in the illustration.

Fitting ball bearings

The bearings are mounted using the same method described above for the cover.

Electrical system

The DMS 240 is fitted with a traditional electric motor, i.e. both stator and rotor have windings and the current is fed to the rotor via carbon brushes to the rotor's collector.

The machine's logical and basic electrical design means that checks and servicing can be carried out quickly and easily. Electronic components and connection points are well positioned and grouped in a housing that is easy to remove from the machine.

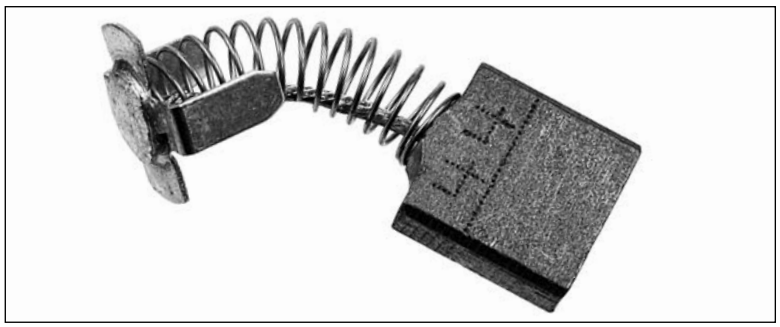
Carbon brushes

Inspection/replacement

Checks and replacement of carbon brushes is very simple on this machine, simply unscrew the covers with a screwdriver and pull out the carbon brushes.

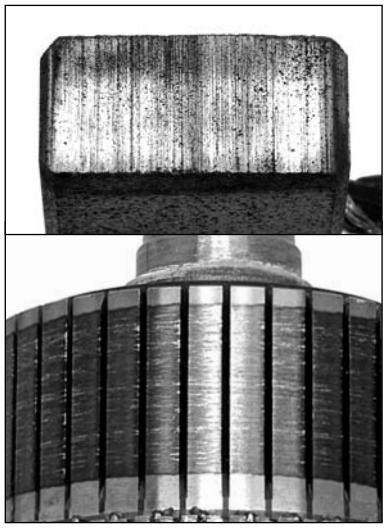
The carbon brushes are wear parts that are checked regularly; every week if the machine is used daily. When checking the carbon brushes, it is important that these are reinstalled in the same direction in order to retain the worn surface to the collector, see text below about running in.

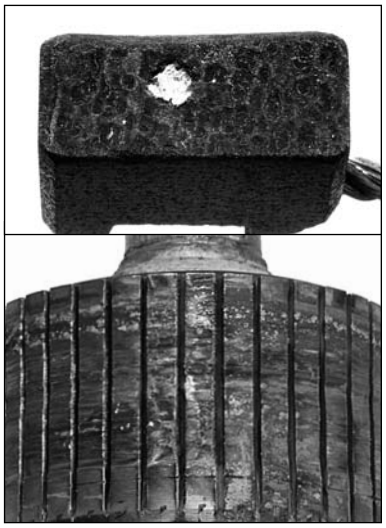
Replace the carbon brushes when at least 6 mm of carbon brushes remain. Note that the carbon brushes have a mark for this minimum dimension.



Running in

After replacing the carbon brushes, the machine shall run without load around 10 minutes to allow the carbon brushes to abut to the collector.





Worn carbon brushes – checking

The importance of replacing the brushes in good time is demonstrated by the adjoining illustrations, the example is taken from another type of machine.

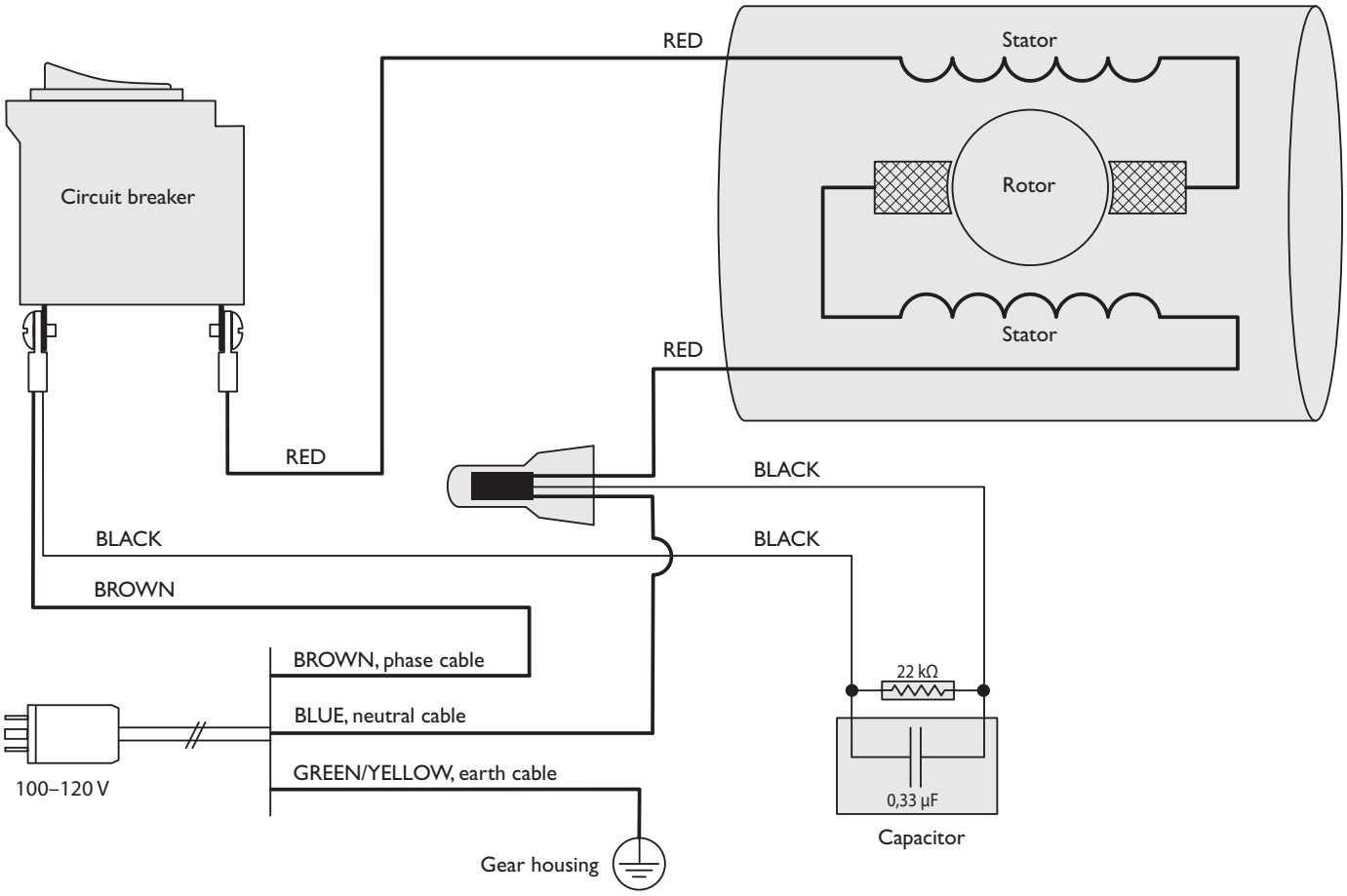
The illustrations to the left show a brush that is worn but still operable. Both the brush and the collector have minor scratches in the direction of rotation which is entirely normal.

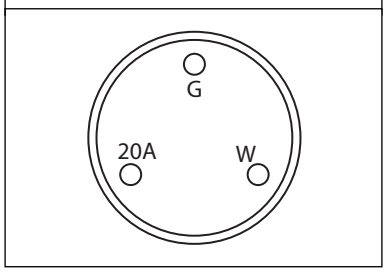
The illustrations to the right show the results when the brush is so worn that the spring, which presses the collector down, has reached its end position and no longer gives the brush the correct pressure to the collector. Sparking occurs which damages both brushes and, even worse, the collector in a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

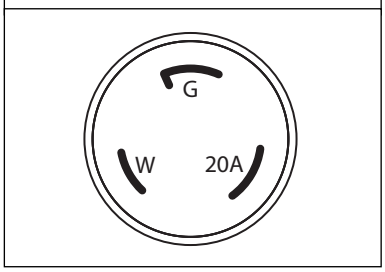
Pay attention to sparking near the collector

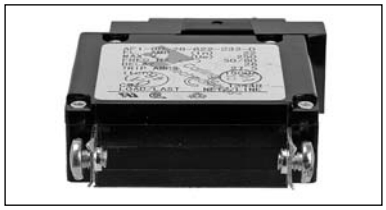
If the brushes are not worn, sparking could be due to the brushes being unable to move in their holders as a result of, for example, dirt. This must be rectified.

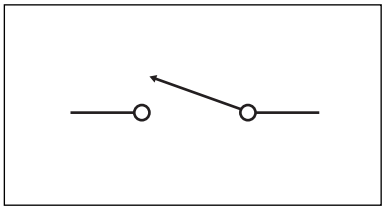
Sparking at the collector also occurs if the stator or rotor has short-circuited windings that cause power surges.











The phase and neutral cables
The contact has standardised connector pins for phase, neutral and earth cables. The contact can only be connnected in one way to the power source.

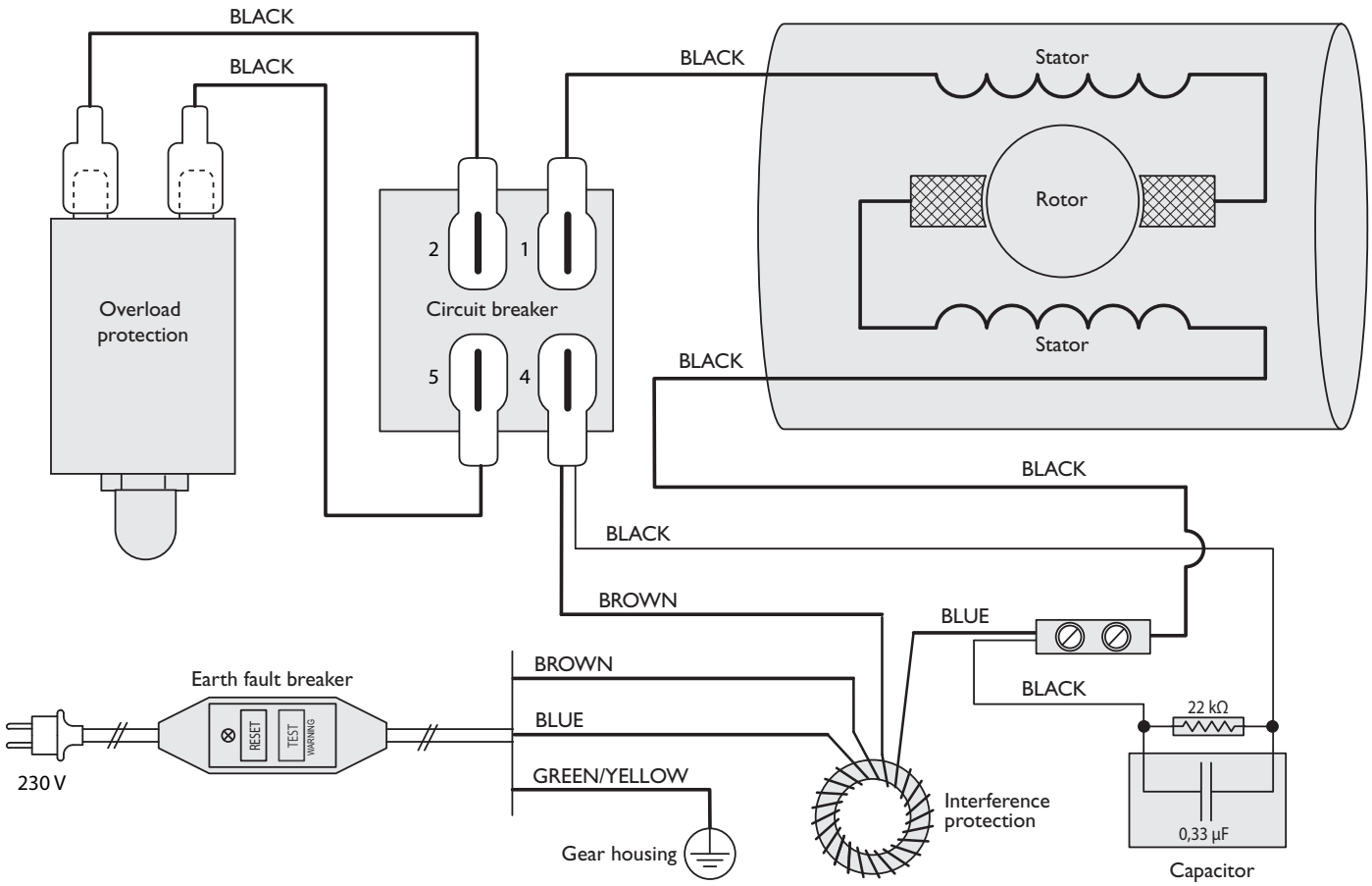
If any intervention is made to the electrical system, such as a cable replacement, it is important that the phase and neutral conductors are connected to the right place and do not switch places.

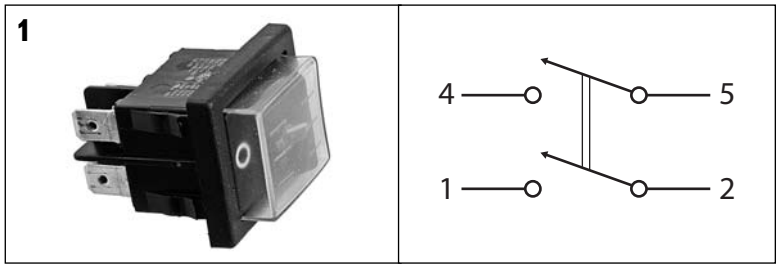
Marking
The following marking on the connectors and cable colours must be observed:

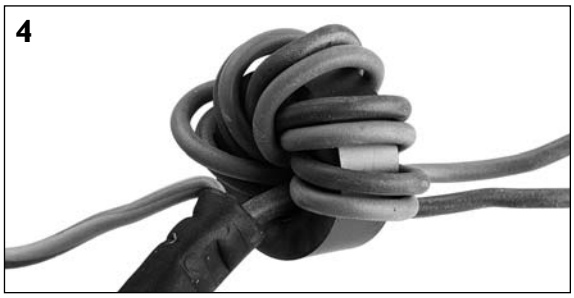
G = Earth cable, yellow/green
20A = Phase cable, brown
W = Neutral cable, blue

Circuit breaker
The switch is single pole and opens/closes the phase connection from/to the network. In closed position, it is to provide contact between the two pins.

Capacitor
This protects the switch from sparks when switching on and off. The parallel connected resistor empties the capacitor when the motor is switched off.





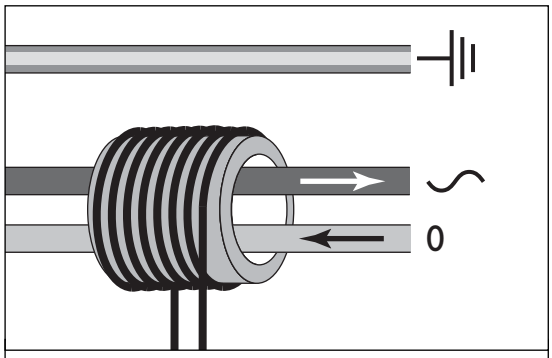


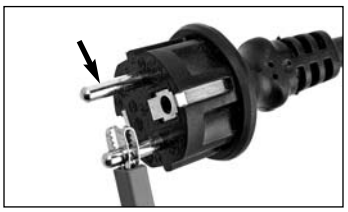
Switch, 1
The switch is double pole and opens/closes both connections from/to the network. In closed position, it is to provide the contact between pins 1 and 2 for one conductor, and pins 4 and 5 for the other conductor.

Overload protection, 2
This unit cuts the power to the motor when overloaded, e.g. caused by excessively high feed pressure. Fully intact and untripped (reset button pressed), there must be contact between the connections.

Capacitor, 3
This protects the switch from sparks when switching on and off. The parallel connected resistor empties the capacitor when the motor is switched off.

Radio interference, 4
The two mains cords are wound five turns around an iron core. If the mains cord is replaced, a sufficient length of cable must be made available for this. The earth wire is not to be wound in the core.





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

The cables run through a coil and if the sane 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.

Mains cable
Supply cables which have been “driven over” or abused are a relatively common cause of interference. If the mains supply does not reach the machine, a broken cable or faulty earth fault breaker is the possible cause. Carry out a visual check of the outside of the cable for damage due to trapping. Also check that the contact pins are undamaged. The mains cable with earth fault breaker is available as a complete spare part.

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.

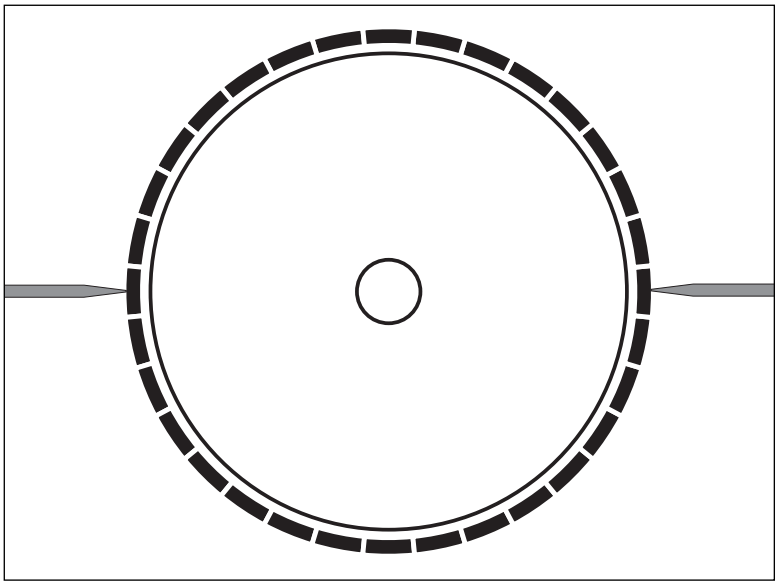
Measuring instruments
For the tests below, a multimeter is used that is set for measuring a broken/closed electric circuit. A closed circuit is normally marked with a buzzer signal in the multimeter.

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

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

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

Cable: earth fault breaker – switch
Make the same measurement between the earth fault breaker and incoming cables to the machine's switches. Remove the connection box to access the cables. The connection points differ between versions 120 V and 230 V, as shown by the circuit diagrams on pages 17 and 18.



Functional test

Starting position
– Remove the motor housing from the gear housing, see page 6.

Check of rotor
A rotor is mainly examined with regard to the condition of the collector and the windings.

Short-circuited windings reduce motor power and create a surge of current that overloads the carbon brushes' contact surfaces. Sparking at the collector can be a sign of a short circuit. Overload manifests itself as burns/colour changes to the collector. Another common cause of damage to the collector is that dirt stops the carbon from producing the correct pressure and engagement with the collector.

Measurement of rotor winding
Measuring the rotor winding provides the answer to the rotor condition. The safest measurement gives an inductance (H = Henry, 1H = 1000 mH). Short-circuited windings are indicated most clearly using this measurement. The resistance measurement (ohms, Ω) generally provides a usable result.

Measurement
The rotor has 32 poles. The measurement is made by inserting measurement probes opposite each other on the collector and by reading the results with a multimeter. A complete measurement means 16 measurements must be made. Rarely is a complete measurement needed as defective windings tend to become evident after a few measurements.

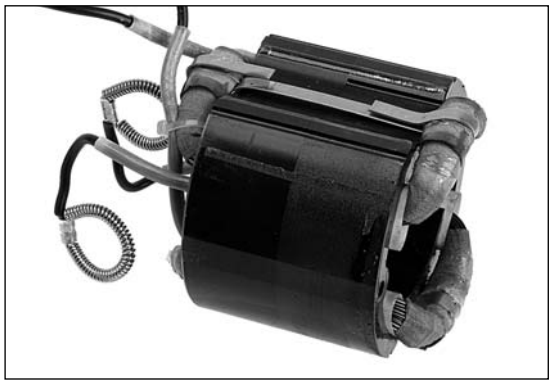
Measured values
120 V: Typical measurement values for an intact rotor is around 0.65 mH and 0.3 ohms respectively for resistance measurement.

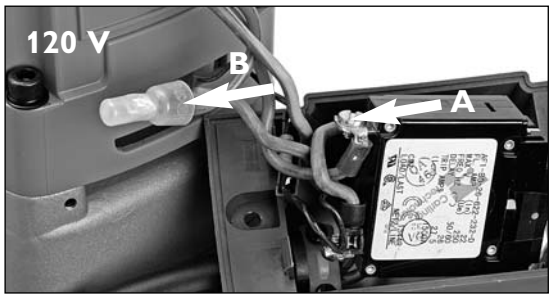
230 V: Typical measurement values for an intact rotor is around 2.6 mH and 0.9 ohms respectively for resistance measurement.

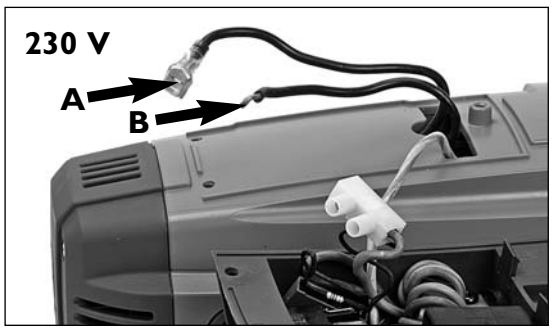
Short-circuited winding turns provide lower inductance and resistance values. Broken winding turns cause immeasurable inductance and maximum resistance value.

Rotor bearing holder
Remove the rotor's bearing holder and bearing if necessary using a standard puller. When installing, start by pressing the bearing in place followed by the bearing holder.

Remember when reassembling that the bearing holder has a bevel to be aligned with the motor housing.







Functional test

Breaks in the stator winding are detected easily with the following functionality check. 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 hardly any 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.

Preparing for inspection

Checking the stator condition requires minimal preparation:
- Remove the carbon brushes
- Remove the connection box

Measurement

The stator has two windings which are measured separately. Connect one test lead to the carbon brush holder for this winding and the other to the stator cable. Repeat for the other winding. 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 induction values. Unfasten the switch to access the cable connections.

120 V: Disconnect the cable at switch A. Use a pointed test probe and insert it into connection point B. Measure between the carbon brush holder A and B.
Measured values 120 V: Typical measurement values for a full stator are around 2.9 mH and 0.1 ohms respectively for resistance measurement.
A disassembled stator that is measured without installed rotor gives about 0.5 mH.

230 V: Remove one cable lug from the switch and the other cable from the terminal block. Measure between the carbon brush holder A and B.
Measured values 230 V: Typical measurement values for a intact stator are around 9.5 mH and 0.4 ohms respectively for resistance measurement.
A disassembled stator that is measured without installed rotor gives about 1.8 mH.

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

Short-circuited winding turns bring down the inductance and resistance. If the difference is greater than 30 % of the typical value, the stator is defective.

IMPORTANT! When measuring the inductance, it is extremely important that no large iron or steel objects are in the immediate vicinity. If the stator is placed on a plate covered workbench the measurement readings will be affected.

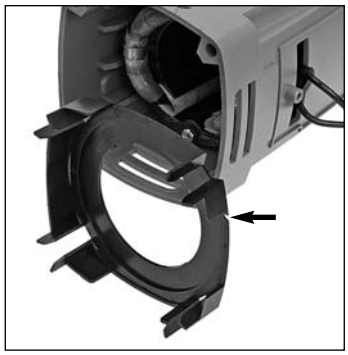
STATOR

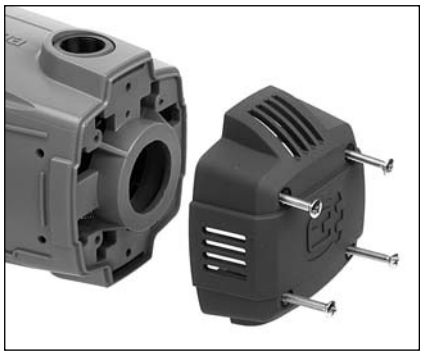
Removal

Starting position

– Remove the motor housing from the gear housing, see page 6.
– Remove the connection box from the motor housing and remove the two cables running to the stator. Also disconnect the earth wire from the motor housing. The illustration shows stator 230 V.

The model for 120 V has ring terminals to the stator cables. One stator cable is spliced and connected to a sleeve with three cables. The easiest way is to cut the stator cable and splice it when reassembling with a moisture-tight joint sleeve.

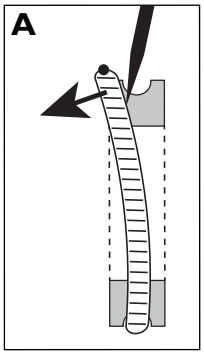


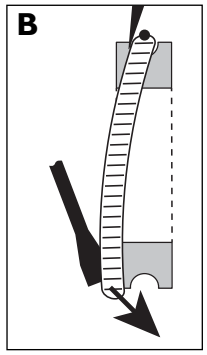


Remove the air guide and cover

Pull out the air guide.
Note when reassembling: The air guide has an outlet for the earth cable that must be turned to suit the earth connection in the gear housing.

Remove the cover.





The connections to the carbon brush holders

A – removal: Insert a screwdriver and press off the spring at the carbon brush holders.

B – assembly: Fit the spring in the groove at the top and hold in place with a screwdriver. Press the spring down in the groove bottom with a screwdriver.

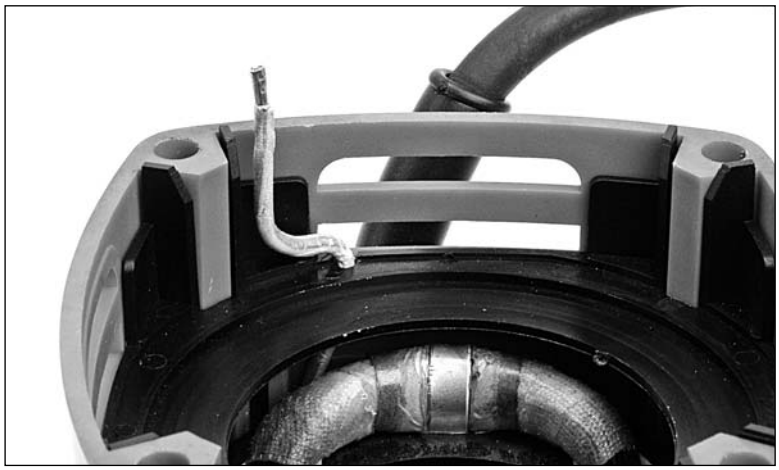
Remove the stator

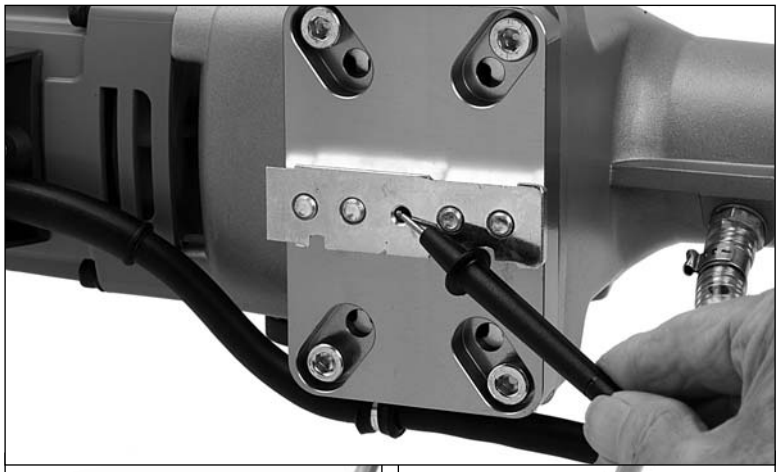
The stator is attached to the motor housing with two screws. Remove these.

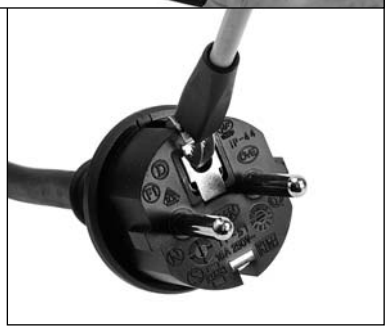
The stator is fitted with a light force fit to the motor housing. Use a mandrel and knock alternately on both sides of the stator to drive this out of the motor housing.

Mount the stator

The stator is pressed in place by hand. Fit the bolts and tighten them to about 3 Nm.







Fitting

The motor housing components are fitted in principle in the reverse order of removal.

Note!
The earth cable to the gear housing is very close to the fan impeller. If the cable is fitted incorrectly, or is too long, you run the risk that the impeller will abrade the earth wire during operation.

Follow these steps: Bend the earth cable at an angle and adjust the cable length above the air guide so that it fits and can be screwed into the gear housing without an excessive cable length.

Check that the earth cable is free from the impeller after the motor housing is mounted to the gear housing.

Earth continuity test

This **safety test** is the last thing done when the service actions have been completed and the machine has been reassembled.

Earth continuity testing shows that the machine's earthing is fault-free. Current must flow between an earthed metallic part which can be touched and the earth pin of the contact. Measure between a non-coated part of the gear housing, for example, the stand mount and the contact's earth pin. Set the multimeter for connection testing with buzzer.

Drill stand

Maintenance

The drill stand requires minimal maintenance. However, it is essential that the stand is kept clean for proper operation. It is particularly important that the rack and pinion is free from pollutants and that the set and locking screws are clean and lubricated. The machine bracket must also be thoroughly cleaned and carefully inspected for damage and screw connections.

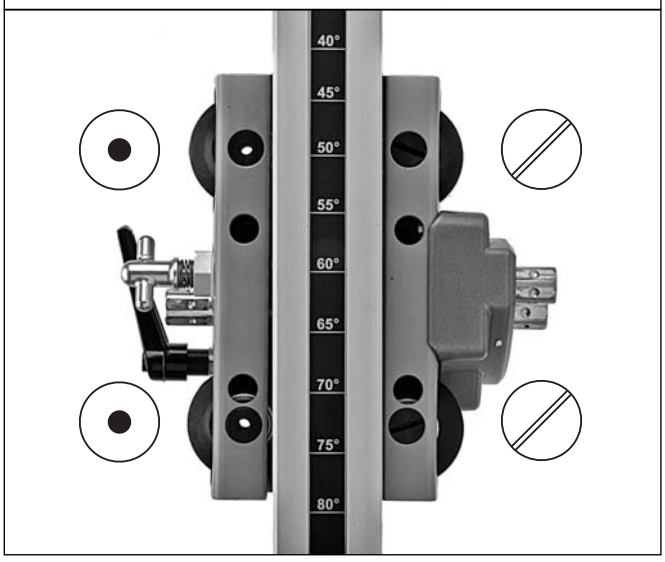
Feeder housing

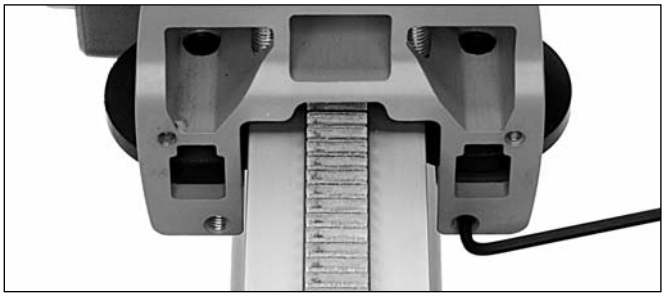
It must be possible to move the feeder housing without any glitches or inertia along the entire column length. The feeder housing has four rollers which abut against the column, two of the rollers are adjustable in relation to the column. After a period of use, the roller's abutment to the column needs to be adjusted, as described in this chapter.

Adjustment

Rollers

Note that only the rollers on one side are to be adjusted. These have an eccentric shaft with screwdriver grooves that change the contact to the column when turning. The rollers are symmetrical and identical in design.





Remove the panels

The panels at the top and bottom of the feeder housing are removed to access the stop screws to the roller shafts.

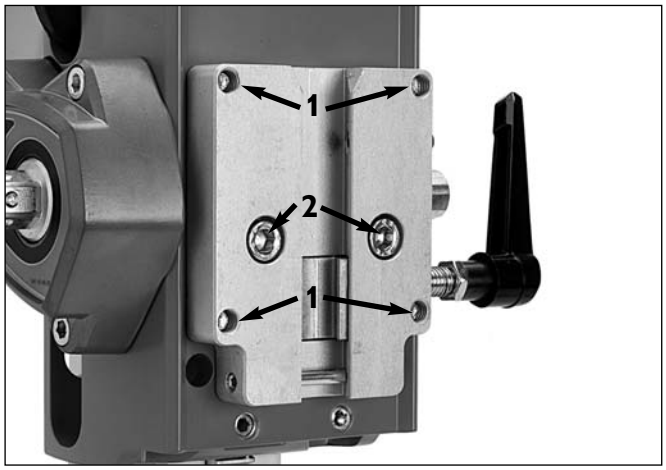
The illustration below shows the stop screw placement underneath. The stop screw on the top side has the corresponding placement.

The illustrations only show the adjustment of the lower roller. The corresponding adjustment must of course also be made for the upper roller.

Adjust the roller's abut to the drilling column
Use a screwdriver and turn this clockwise to apply the roller to the drilling column. Application is to be made at a level where the roller can be made to slide against the drilling column by hand.

Tighten the set screw
Tighten the locking screw to the adjuster roller firmly.

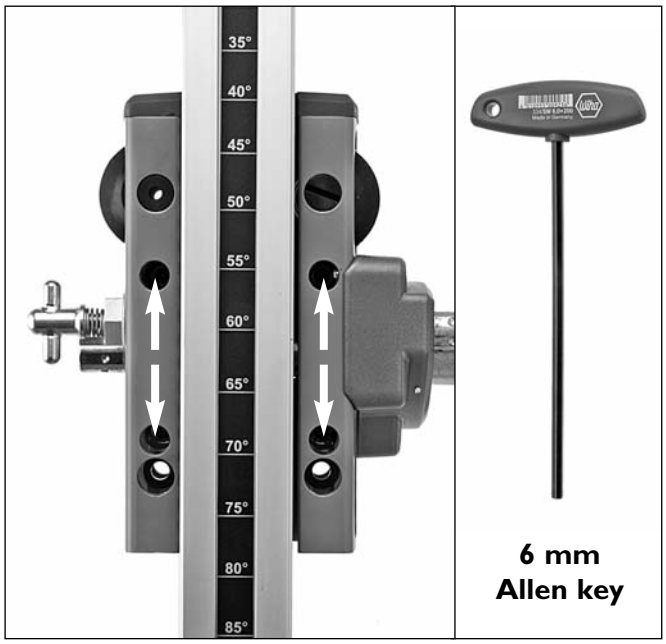
Fitting panels
Refit the panels of the feeder. Apply Loctite 243 to the screws.



Machine bracket

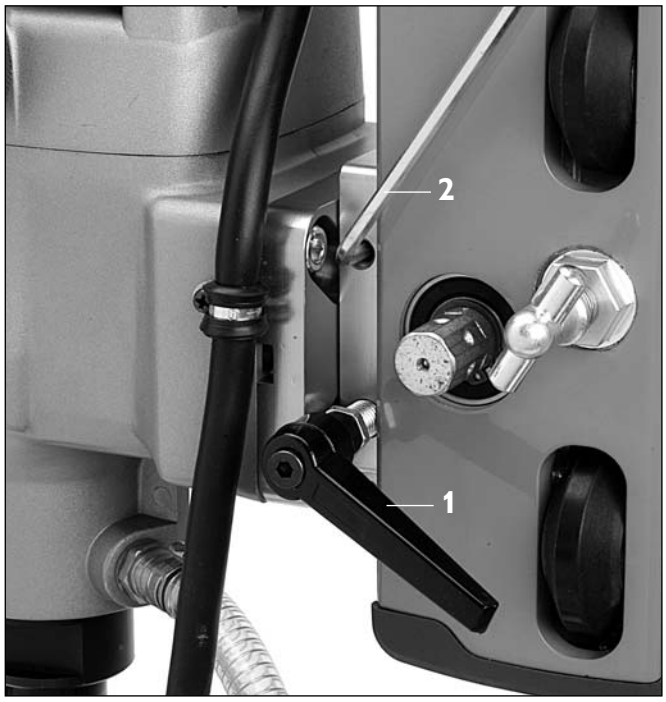
A machine bracket that shows signs of wear or other damage must be unconditionally replaced for reasons of safety.

The machine bracket is bolted to the feeder housing with four screws (1) that are mounted from the back and two (2) screws that are accessible from the front.



The illustration shows the location of the screws accessible from the back. Note that the lower pair of wheels must be removed to access the lower two screws.

IMPORTANT: When reassembling, lock the screws with Loctite 243.



Mounting machine on drill stand
The machine is lowered into place in the machine bracket and locked with two screws, one with a locking lever and one with an Allen screw. A machine that is removed from the stand **must always be locked with two screws** when reassembling.

1. Locking lever
Screw in the locking lever to secure the machine to the mount.

2. Security screw, 4 mm Allen key
This is completely screwed into the stop position and now represents an extra lock for the machine's attachment to the drill stand.

● = Service stage

The tools below can be obtained from Husqvarna.

523 05 77-02
Socket for hook nut

● Adjustment of the gear box's slip clutch.

581 54 15-01
Multimeter

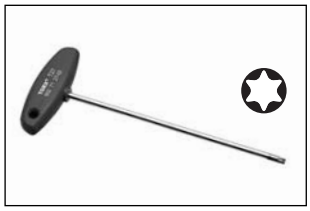
Make: Amprobe 37XR-A.
One of few universal instruments that can also measure inductance (H, Henry).

● Checking of the electric motor's functions.

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

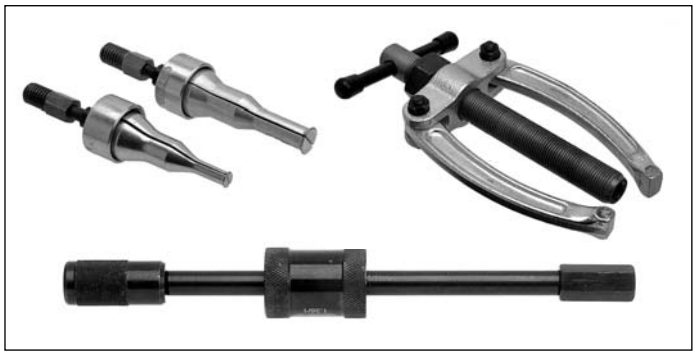
504 90 90-02
Universal puller

● Bearing dismantling.

The special tools below are needed for service work to DMS 240 but are not sold by Husqvarna.

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

● Removal of ball bearings from the gear housing and cover.



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