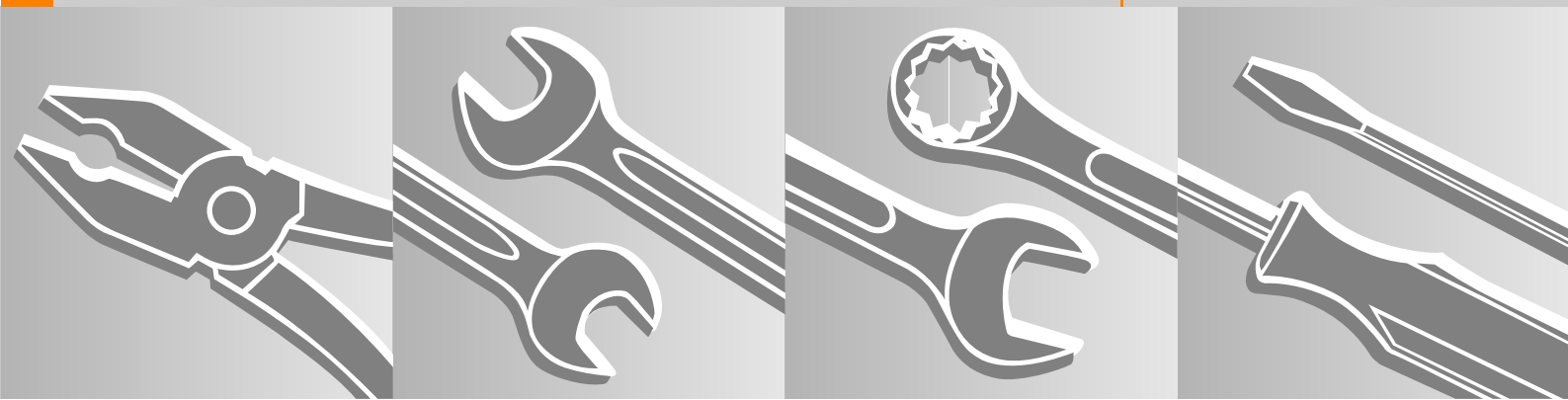


STIHL MSE 220, 220 C

2005-02



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1. Introduction

This service manual contains detailed descriptions of all the typical repair and servicing procedures for this power tool.

As the design concept of models MSE 220 and MSE 220 C is almost identical, the descriptions and servicing procedures in this manual generally apply to both models. Differences are described in detail.

You should make use of the illustrated parts lists while carrying out repair work. They show the installed positions of the individual components and assemblies.

Important:

Observe all applicable national safety regulations and ordinances when performing servicing and repair work on electric saws.

Refer to the latest edition of the relevant parts list to check the part numbers of any replacement parts.

A fault on the machine may have several causes. To help locate the fault, consult the chapter on "Troubleshooting" and the "STIHL Service Training System" for all assemblies and systems.

Refer to the "Technical Information" bulletins for engineering changes which have been introduced since publication of this service manual. Technical information bulletins also supplement the parts list until an updated edition is issued.

The special tools mentioned in the descriptions are listed in chapter "Special Servicing Tools" of this manual. Use the part numbers to identify the tools in the "STIHL Special Tools" manual which lists all the special servicing tools currently available from STIHL.

ZSymbols are included in the text and pictures for greater clarity. The meanings are as follows:

In the descriptions:

- = Action to be taken as shown in the illustration (above the text)
- = Action to be taken that is not shown in the illustration (above the text)

In the illustrations:


➔ Pointer

➡ Direction of movement

📖 4.2 = Reference to another chapter. i.e. chapter 4.2 in this example

Service manuals and technical information bulletins are intended exclusively for the use of properly equipped repair shops. They must not be passed to third parties.

Always use original STIHL replacement parts.

They can be identified by the STIHL part number, the **STIHL** logo and the STIHL parts symbol . This symbol may appear alone on small parts.

2. Safety Precautions

If the power tool is started up in the course of repairs or maintenance work, observe all local and country-specific safety regulations as well as the safety precautions and warnings in the instruction manual.

Repairs to electrical parts of the saws may only be performed by qualified electricians. All local and country-specific safety regulations as well as the safety precautions and warnings in the instruction manual must be observed.

Improper handling may result in serious injuries.

3. Specifications

3.1 Motor

	MSE 220 C	MSE 220 (US/CA version only)
Power consumption:	2200 W	1700 W
Voltage/frequency:	230 V / 50 Hz	120 V / 60 Hz
Type of enclosure (EN 60529):	IP 20	IP 20
Safety class (insulation):	II	II
Rated current:	10 A	15 A
Required fuse:	16 A	15 A
Rated off-load speed with cutting attachment:	7200 rpm	7000 rpm

3.2 Tightening Torques

P (Plastoform) screws are used in polymer components. These screws form a permanent thread when they are installed for the first time. They can be removed and installed as often as necessary without impairing the strength of the screwed assembly, providing the specified tightening torque is observed.

For this reason it is **essential to use a torque wrench**.

Fastener	Thread size	For component	Torque		Remarks
			Nm	kpm	
Screw	IS-M4x8	Cover plate on chain tensioner	3.0	0.3	
Pan head screw	IS-M6x25	Brake band	6.0	0.6	
Collar screw	IS-M8x21.5	For guide bar	23.0	2.3	1)2)
Screw	IS-P4x16	Electronic module	1.5	0.15	3)
Screw	IS-5x32	Gear housing	4.0	0.4	
Screw	IS-P4.5x25	Commutator cover	3.0	0.3	
Screw	IS-P4x19	Handle molding	2.0	0.2	
Screw	IS-B6.3x32	Hand guard	4.5	0.46	
Screw	IS-P4x16	Cable clamp	1.5	0.15	
Locknut	IS-M5	Spiked bumper/chain sprocket cover	2.4	0.24	
Screw	IS-B3.9x16	Fan screen	2.0	0.2	3)
Screw	IS-P4x19	Oil pump	2.5	0.25	
Screw	IS-M4x12LI	Pinion/motor shaft	3.0	0.3	1)2)
Collar nut	IS-M6x8LI	Friction clutch/chain sprocket/spur gear	10.0	1.0	
Screw	IS-P5x80	Stator	4.5	0.46	

Remarks:

- 1) Secure screw with medium-strength Loctite 243
- 2) Secure screw with medium-strength Loctite 242 (US/CA version only)
- 3) Model MSE 220 C only

Screws secured with adhesive are easier to release if they are heated beforehand with a hot air blower.

Be careful with polymer components!

Use the following procedure when refitting a DG or P screw in an existing thread:

- Place the screw in the hole and rotate it counterclockwise until it drops down slightly.
- Tighten the screw clockwise to the specified torque.

This procedure ensures that the screw engages properly in the existing thread and does not form a new thread and weaken the assembly.

Power screwdriver setting for polymer: max. 500 rpm

4. Troubleshooting

4.1 Motor

Condition	Cause	Remedy
Motor does not run	Overload cut-out has tripped	Wait for motor to cool down. On MSE 220, also press in overload cut-out's reset button
	Chain brake engaged	Disengage chain brake
	Chain brake snap switch defective	Replace snap switch
	Carbon brushes worn	Replace carbon brushes
Mains circuit breaker keeps tripping	Starting current limiter faulty	Fit a new starting current limiter/ electronic module

4.2 Chain Drive, Chain Brake

Condition	Cause	Remedy
Chain sprocket wears rapidly	Chain not properly tensioned	Tension chain properly as specified
	Insufficient chain lubrication	Check chain lubrication
	Chain sprocket worn	Fit new chain sprocket
Saw chain does not stop immediately when brake is activated	Brake spring broken	Fit new brake spring
	Brake band stretched or broken	Fit new brake band

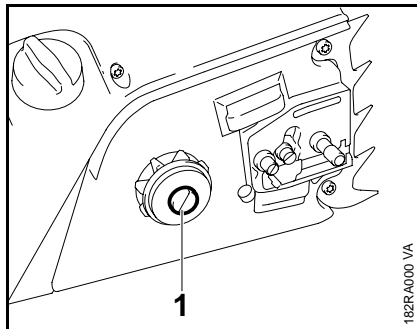
4.3 Chain Lubrication

In the event of trouble with the chain lubrication system, check and rectify other sources of faults before removing the oil pump.

Condition	Cause	Remedy
Chain receives no oil	Oil tank empty	Fill up with oil
	Oil inlet hole in guide bar is blocked	Clean oil inlet bore
	Pickup hose or strainer clogged or pickup hose ruptured	Fit new pickup hose and strainer
	Valve in oil tank cap blocked	Fit a new oil tank cap
	Teeth on pump piston and/or drive pinion worn	Install new oil pump
Machine losing chain oil	Oil pump damaged or worn	Install new oil pump
	Pickup hose not fitted properly in oil tank	Fit pickup hose properly or replace if necessary
	Pickup hose porous/brittle	Install a new pickup hose
Oil pump delivers insufficient oil	Oil pump worn	Install new oil pump

5. Chain Drive, Chain Brake, Chain Lubrication and Chain Tensioner

5.1 Chain Sprocket

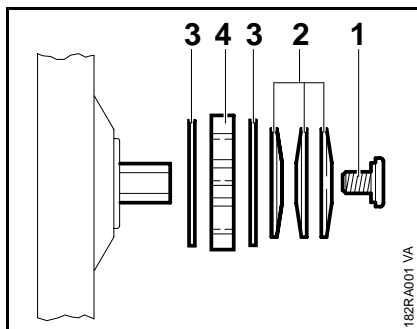


Wear work gloves to protect your hands from injury.

- Remove the chain sprocket cover.
- Remove the guide bar and chain.
- Take out the collar screw (1) – left-hand thread.
- Remove the washers, cup springs and chain sprocket.

Install in the reverse sequence.

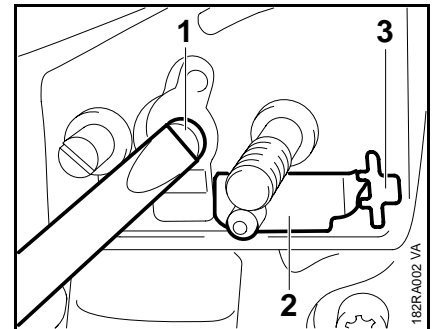
Pay attention to the correct installed positions of the cup springs and washers.



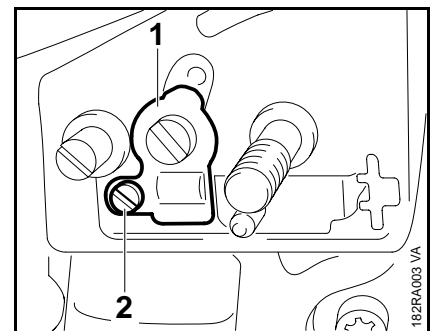
- Push the washer (3) and chain sprocket (4) into position, then fit the washer (3) and the cup springs (2).
- Tighten down the collar screw (1) firmly, 3.2

Assemble all other parts in the reverse sequence.

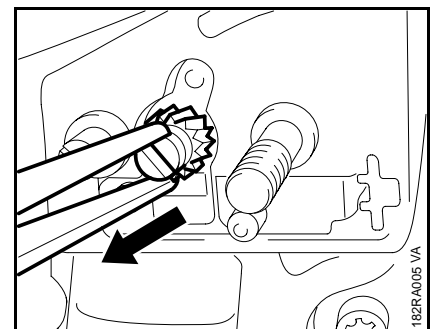
5.2 Chain Tensioner



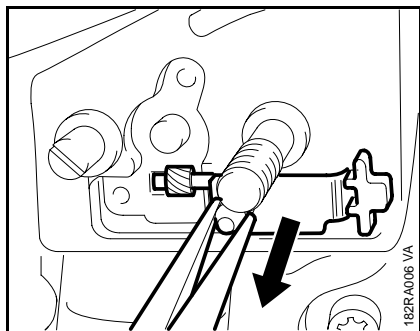
- Remove the chain sprocket cover.
- Rotate the spur gear (1) clockwise until the tensioner slide (2) butts against the thrust pad (3).



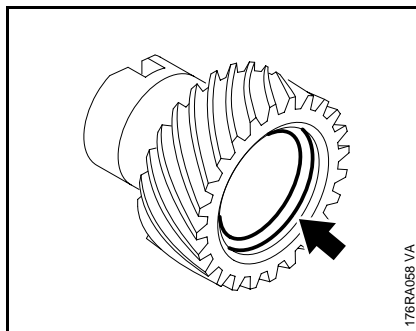
- Take out the screw (2).
- Remove the cover plate (1).



- Pull out the spur gear.

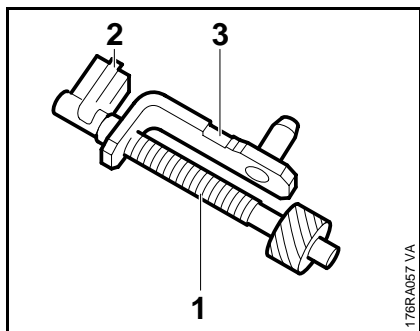


- Remove the tensioner slide with adjusting screw and thrust pad.



- When installing, check that the O-ring (arrow) is fitted in the spur gear. Coat the O-ring with oil before pushing the spur gear into position.

Assemble all other parts in the reverse sequence.

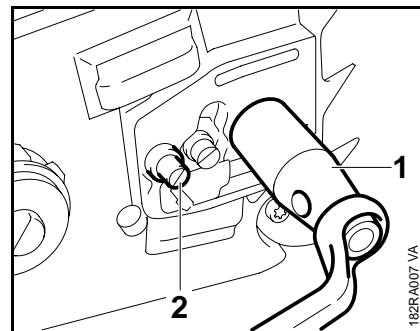


- Inspect teeth on spur gear and adjusting screw (1), replace both parts if necessary. To do this, pull off the thrust pad (2) and unscrew the adjusting screw from the tensioner slide (3).

Install in the reverse sequence.

The adjusting screw and spur gear must always be replaced as a matching pair.

- Coat teeth of adjusting screw and spur gear with grease, 10, before refitting.



- Remove the chain sprocket cover and cutting attachment, 5.1

- Push the stud puller (1) 5910 893 0501 onto the longer collar screw as far as stop. Use a 15 mm wrench to unscrew the collar screw counterclockwise.

- Take out the collar screw (2).

Install in the reverse sequence.

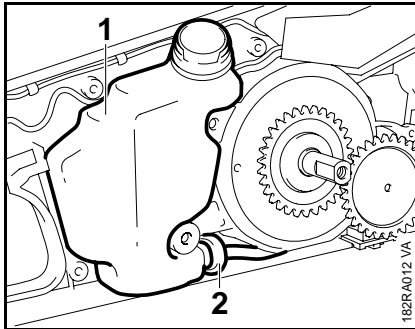
- Coat the thread of the longer collar screw with Loctite, 10.
- Fit the new collar screw and tighten it down firmly, 3.2

- Fit collar screw (2) and tighten it down firmly, 3.2

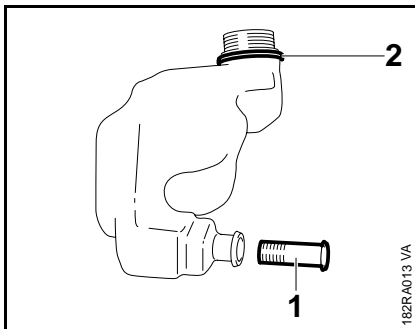
Assemble all other parts in the reverse sequence.

5.4 Chain Lubrication

5.4.1 Oil Tank



- Drain the oil tank.
- Remove outer half of gear housing, [8.2](#)
- Pull out the oil tank (1).
- Remove the pickup hose (2).



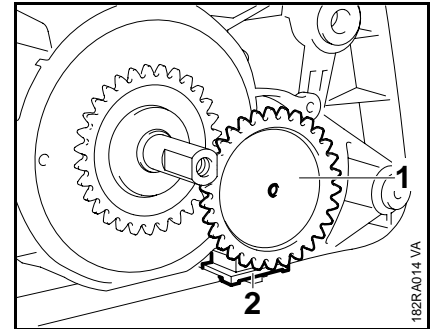
- Pull out the strainer (1).
- Remove the O-ring (2).
- Check parts for damage and replace as necessary.

Install in the reverse sequence.

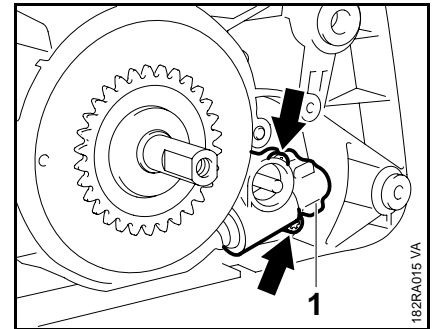
Use new seals.

Check that O-ring is properly seated.

5.4.2 Oil Pump

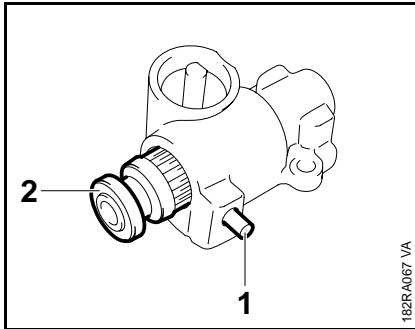


- Remove outer half of gear housing, [8.2](#)
- Remove the spur gear (1).
- Remove the grommet (2).



- Take out the screws (arrows).
- Remove the oil pump (1).

5.4.3 Pickup Hose



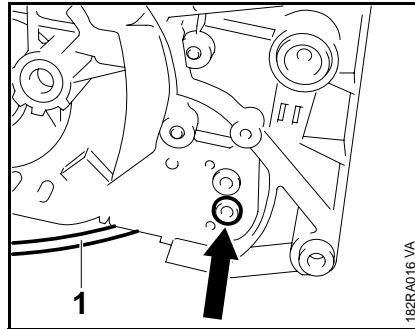
- Pull out the needle roller (1) about 4 mm or drive it out by tapping the pump housing.

- Pull out the pump piston (2).

Install in the reverse sequence.

- Lubricate pump piston (2) with lubricating grease, 10, before installing.

Assemble all other parts in the reverse sequence.



- Remove inner half of gear housing, 8.3
- Remove the oil pump, 5.4.2

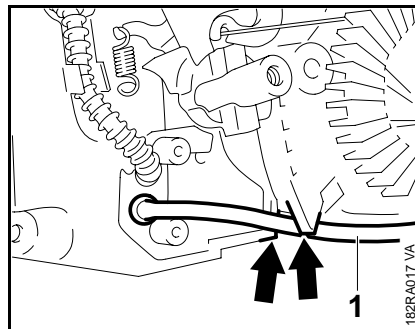
- Pry the pickup hose (1) out of the housing.

- Remove the pickup hose (1).

- Check pickup hose for damage and replace if necessary.

Install in the reverse sequence.

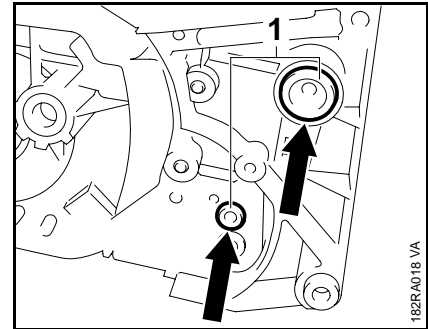
- Coat pickup hose with Press Fluid OH 723, 10.
- Fit the pickup hose in the gear housing, from the inside outwards, so that the annular groove locates in the housing seat.



- Route the pickup hose (1) between the guide and gear housing (arrows).

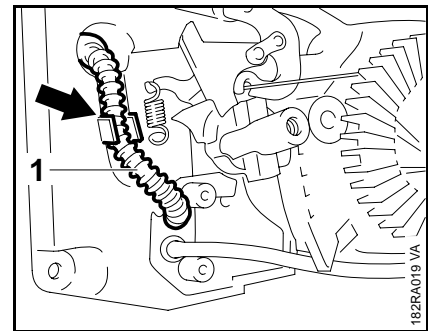
Assemble all other parts in the reverse sequence.

5.4.4 Delivery Hose



- Remove inner half of gear housing, 8.3
- Remove the oil pump, 5.4.2

- Pry the ends (1) of the hose out of the housing.



- Take the delivery hose (1) out of the retainer (arrow).

- Check delivery hose for damage and replace if necessary.

Install in the reverse sequence.

- Coat delivery hose with Press Fluid OH 723, 10.
- Fit the delivery hose in the gear housing, from the inside outwards, so that the annular groove locates in the housing seat.

- Push the delivery hose (1) into the retainer (arrow).

Assemble all other parts in the reverse sequence.

5.5 Chain Brake


5.5.1 Testing

The chain brake is one of the most important safety devices on the chain saw. Its efficiency is measured in terms of the chain braking time, i.e. the time that elapses between activating the brake and the saw chain coming to a complete standstill. The shorter the braking time, the better the efficiency and protection offered against being injured by the rotating chain.

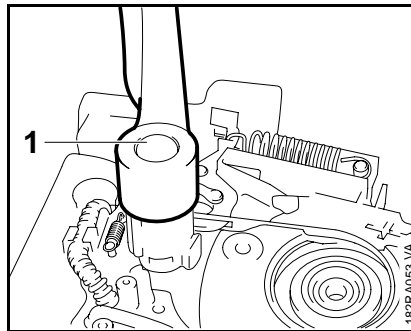
Contamination and smoothing of the friction surfaces of the brake band and clutch drum impair the coefficient of friction. This, in turn, reduces the frictional forces and prolongs the braking time. A fatigued or stretched brake spring has the same negative effect.


- With the chain brake released, switch on the saw and activate the brake manually – the chain must come to an abrupt stop.

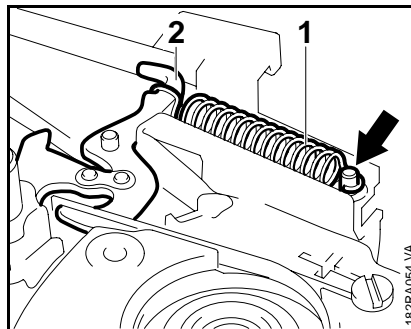
The braking time is in order if deceleration of the saw chain is imperceptible to the eye.

If the brake does not operate properly, see troubleshooting chart,  • .

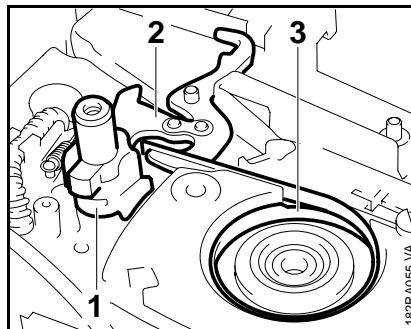
5.5.2 Removing and Installing



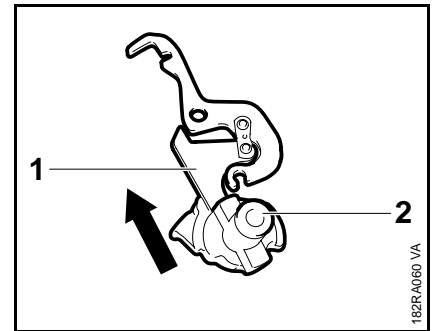
- Remove the rotor,  7.3
- Fit the hand guard (1) in place and engage the chain brake.
- Remove the hand guard (1).



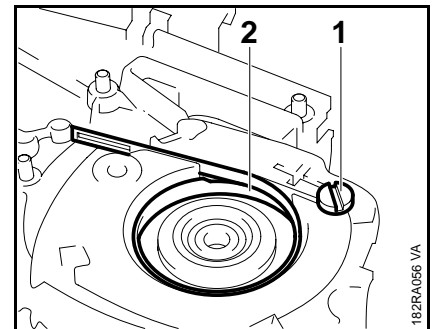
- Pry the brake spring (1) off the pin (arrow).
- Take the brake spring (1) off the lever (2).



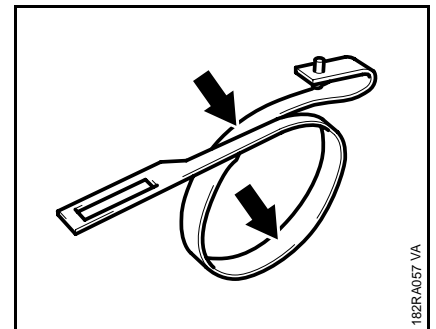
- Pry the carrier (1) and lever (2) out of the housing.
- Remove the lever from the brake band (3).



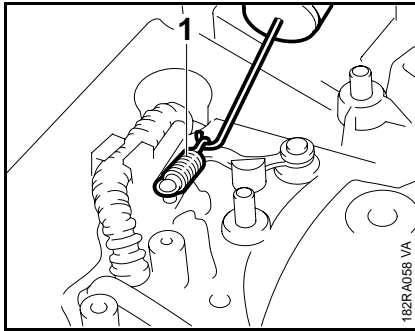
- Pull the lever (1) out of the opening in the side of the carrier (2).



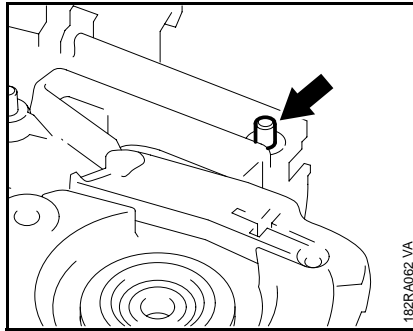
- Take out the screw (1).
- Pry the brake band (2) out of the housing.



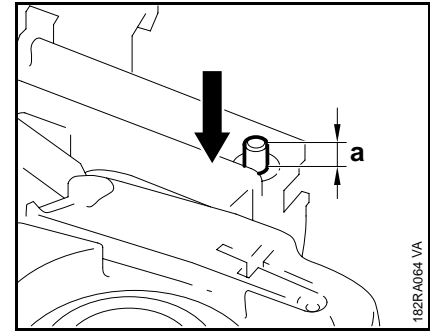
Install a new brake band if there are definite signs of wear are visible (large areas of inside diameter and/or parts of outside diameter) and remaining band thickness is less than 0.6 mm (0.025").



- Use hook 5910 890 2800 to disconnect and remove the spring (1).



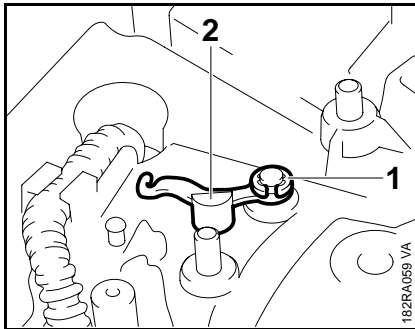
- If the groove in the brake spring anchor pin (arrow) is worn, replace the pin as follows:



- Position the new pin in the bore (outside of housing) so that its knurled shank meshes with the existing knurling in the bore. Turn pin back and forth as necessary.
- Carefully tap home the pin until dimension "a" is about 6 – 8 mm (1/4").

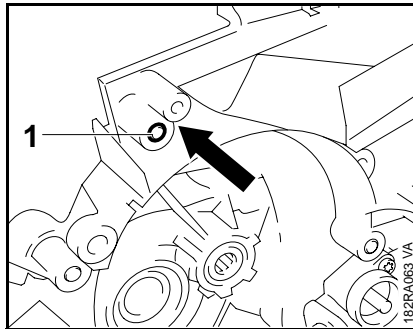
Make sure the pin is installed completely square.

Assemble all other parts in the reverse sequence.




- Carefully pry the E-clip (1) off the pin.
- Remove the lever (2).

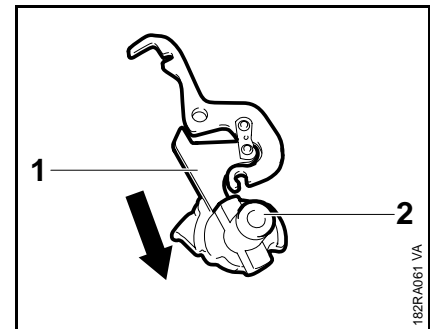
Clean all removed parts with a little with standard solvent-based degreasant containing no chlorinated or halogenated hydrocarbons. Replace damaged and worn parts.



- Use a suitable punch to drive out the pin (1) – from the inside of the housing outwards.

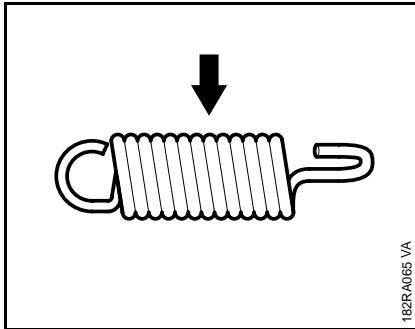
Install in the reverse sequence.

- Before installing, coat the knurled part of the new pin with Loctite,  10.

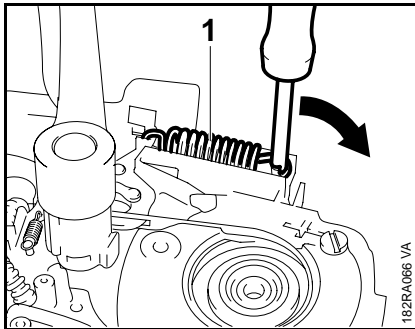


- Slide the lever (1) into the opening in the side of the carrier (2).

Assemble all other parts in the reverse sequence.



- The turns of the brake spring (arrow) must be tightly against one another in the relaxed condition. If this is not the case, replace the brake spring.



- Use assembly tool 1117 890 0900 to attach the brake spring (1) to the anchor pin.

Assemble all other parts in the reverse sequence.

- Check operation of chain brake, 5.5.1

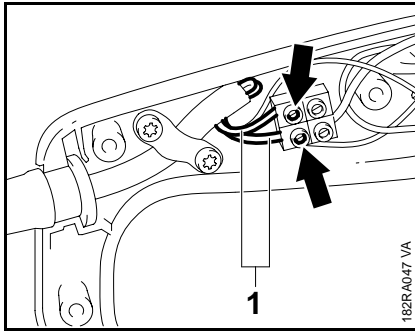
To avoid the risk of electric shock, always disconnect the plug from the power supply before carrying out any repairs.


The following descriptions deal with the differences between the 220–240V MSE 220 C and the 120V MSE 220.

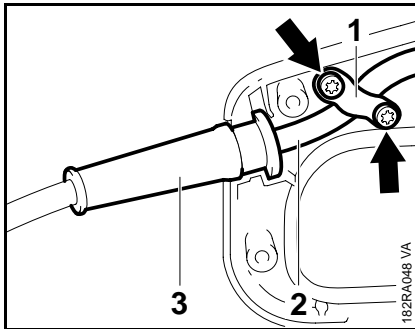
Appliances with electronic controls are at risk from static electricity. This means that electronic components (the electronic module in this saw) can be destroyed by electrostatic discharge, e.g. when touched. Special precautions are necessary to reduce the risk of this happening. It is important to ensure that the person carrying out the repair is connected to ground, e.g. by an anti-static wrist band, or touches a grounded object (e.g. metal water pipe or radiator) before starting the repair.

This precaution also applies when the electronic module is passed to other persons.

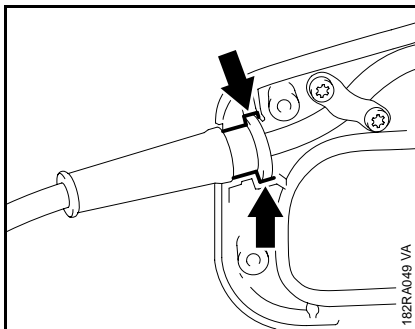
6.2.2 Connecting Cord



- Remove the handle molding,  8.1
- Loosen the screws (arrows).
- Pull out the wires (1).



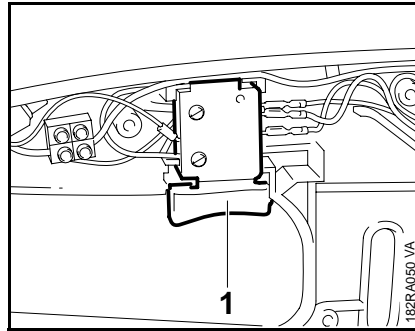
- Take out the screws (arrows).
- Remove the cord clamp (1).
- Remove the connecting cord (2) with cord protector (3).




- Check that cord protector is properly seated (arrows).

Assemble all other parts in the reverse sequence.

6.2.3 On/Off Switch



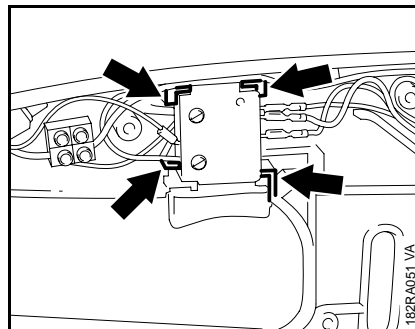
- Remove the handle molding,  8.1

Make a sketch that clearly shows the assignment of the individual wires (note the colors) to the terminals.

- Pull the switch (1) out of its seat.
- Loosen the screws on the switch and disconnect all wires.
- Remove the switch.

Install in the reverse sequence.

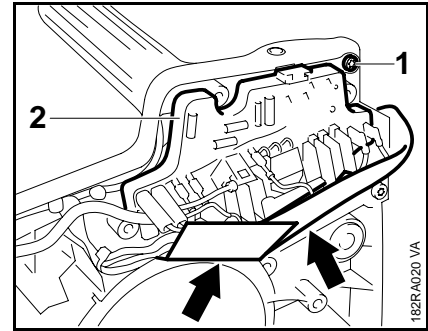
To avoid the risk of a short circuit, make sure that all wires are re-connected to the correct terminals.





- Position the new switch in its seat (arrows).

Assemble all other parts in the reverse sequence.

6.2.4 Electronic Module



Pay attention to good grounding before working on the electronic module,  6.2.1

- Remove the oil tank,  5.4.1
- Take out the screw (1).

Make a sketch that clearly shows the assignment of the individual wires (note the colors) to the terminals.

- Pull out the electronic module (2) and disconnect the wires.

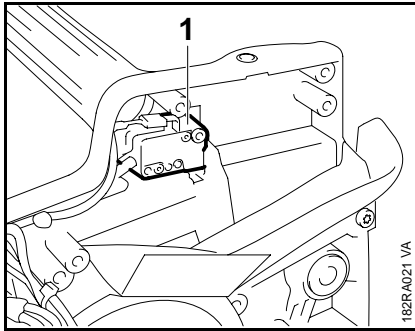
- If necessary, remove the insulating foil (arrows).

Install in the reverse sequence.

The insulating foil must always be replaced if it is damaged.

To avoid the risk of a short circuit, make sure that all wires are re-connected to the correct terminals.

6.2.5 Chain Brake Switch



- Remove the electronic module,
📖 6.2.4

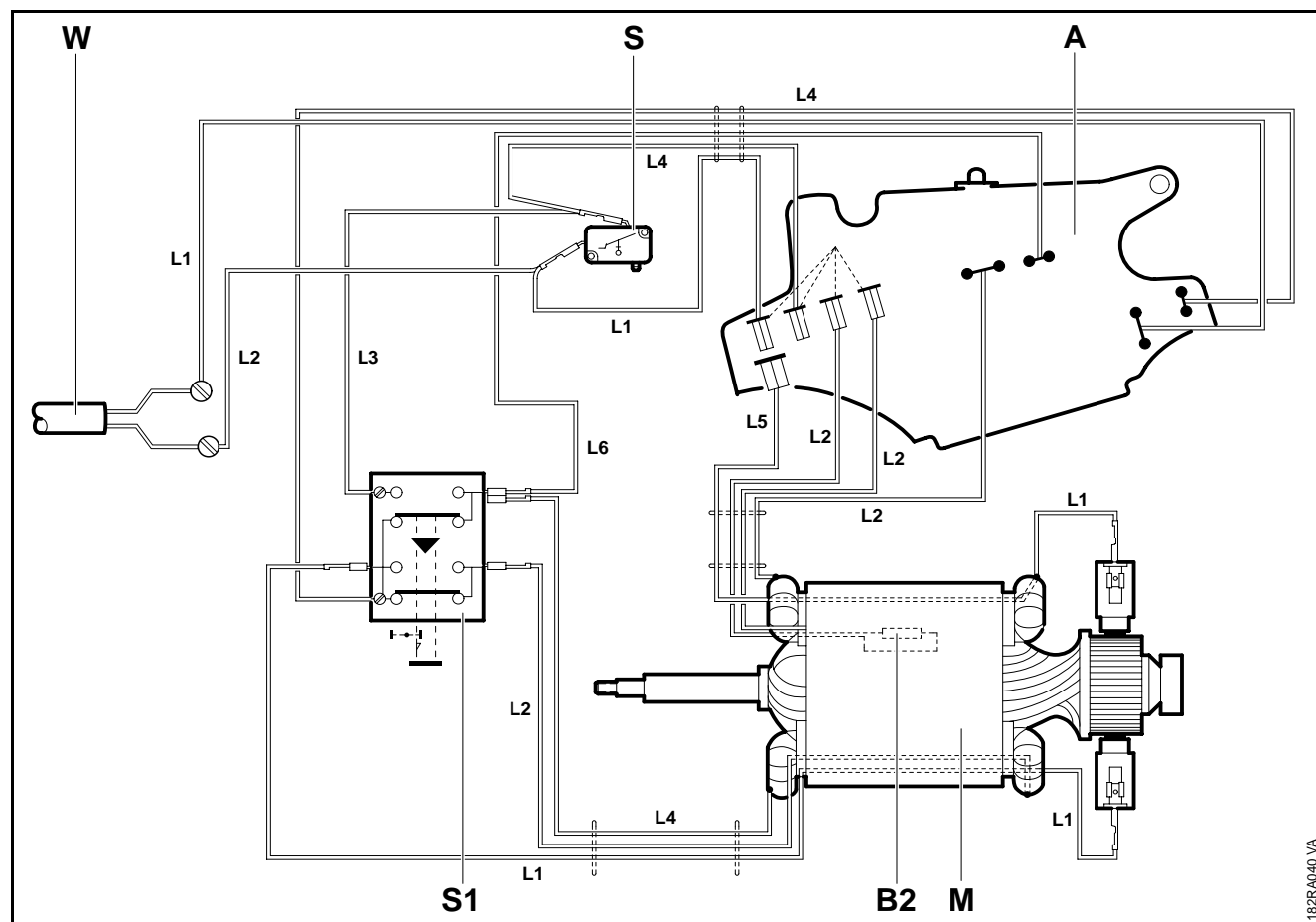
Make a sketch that clearly shows the assignment of the individual wires (note the colors) to the terminals.

- Pull out the quick-action switch (1) and disconnect the wires.

Install in the reverse sequence.

Check that the wires are re-connected to the correct terminals.

6.2.6 Circuit Diagram of MSE 220 C

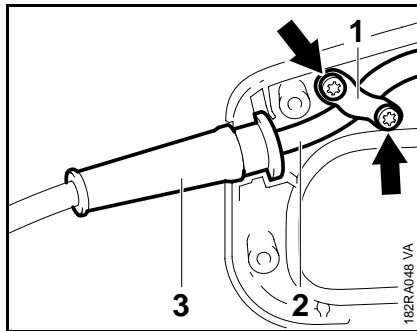


182R/A040 VA

- A Electronic module
- B2 Thermal protector
- S Snap switch (chain brake)
- S1 On/off switch
- M Motor
- W Connecting cord
- L1 Brown
- L2 Blue
- L3 White
- L4 Black
- L5 Red
- L6 Green

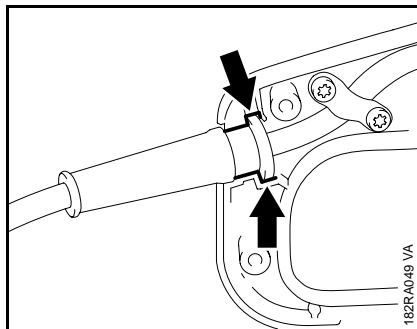
6.3 MSE 220

6.3.1 Connecting Cord



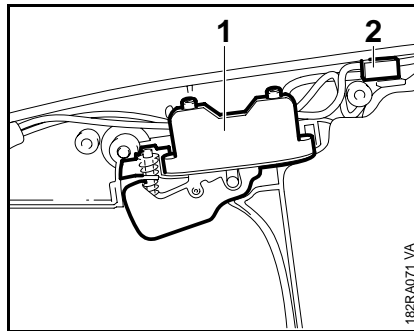
- Remove the handle molding, 8.1
- Take out the screws (arrows).
- Remove the cord clamp (1).
- Disconnect the wires from the on/off switch, 6.3.2
- Remove the connecting cord (2) with cord protector (3).

Install in the reverse sequence.

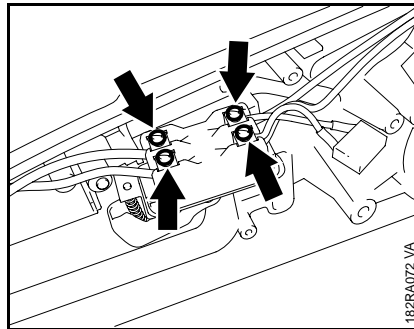


- Check that the cord protector is properly seated (arrows).

6.3.2 On/Off Switch



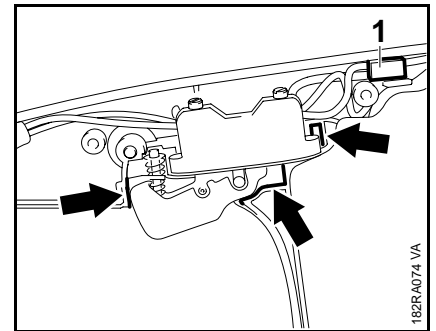
- Remove the handle molding, 8.1
- Pull out the on/off switch (1) with capacitor (2).



Make a sketch that clearly shows the assignment of the individual wires (note the colors) to the terminals.

- If the switch has to be replaced, remove the capacitor, 6.3.4
- Loosen the screws (arrows) and disconnect the wires.

Install in the reverse sequence.

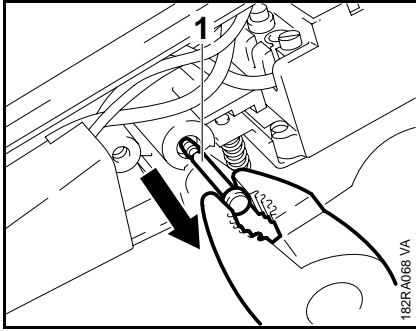


To avoid the risk of a short circuit, make sure that all wires are re-connected to the correct terminals.

- Position the new switch in its seat (arrows).
- Note correct installed position of the capacitor (1).

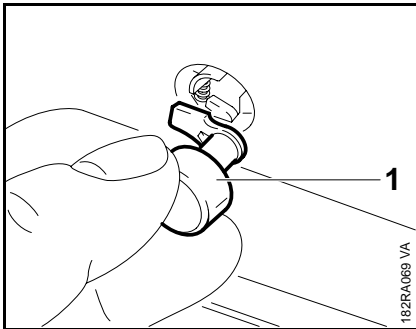
Assemble all other parts in the reverse sequence.

6.3.3 Interlock Button

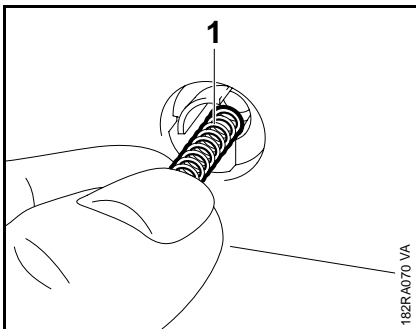


– Remove the handle molding, 8.1

- Pull the pin (1) out of the interlock button.



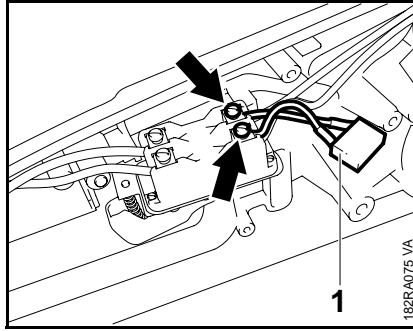
- Remove the interlock button (1) from the motor housing.



- Take the spring (1) out of the motor housing.

When installing, fit the interlock button and the spring at the same time.

6.3.4 Capacitor



– Pull out the on/off switch with capacitor, 6.3.2

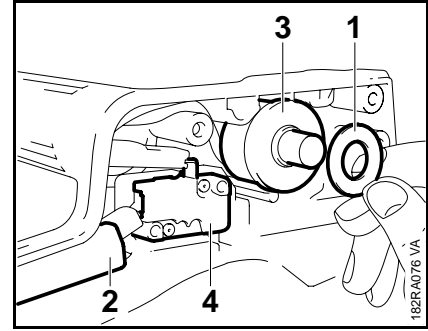
- Loosen the screws (arrows).
- Remove the capacitor (1).

Make a sketch that clearly shows the assignment of the individual wires (note the colors) to the terminals.

Install in the reverse sequence.

To avoid the risk of a short circuit, make sure that all wires are re-connected to the correct terminals.

6.3.5 Overload Circuit Breaker



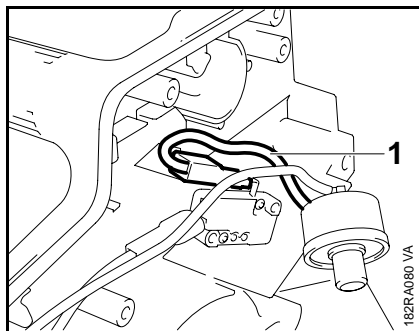
The overload circuit breaker interrupts the power supply to protect the motor in the event of mechanical overload, e.g. cutting for extended period with excessive feed force, suddenly stopping the chain by pinching it in the cut, etc.

– Remove the handle molding, 8.1

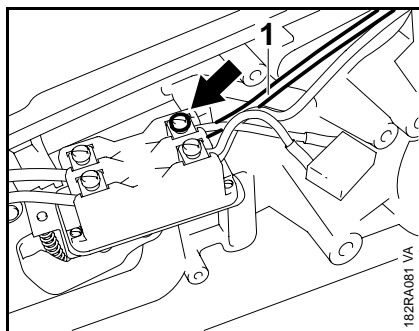
– Remove the oil tank, 5.4.1

- Remove the sealing washer (1) – if fitted.
- Pull out the insert (2).
- Pull the overload circuit breaker (3) out of the housing.
- Take out the chain brake snap switch (4).

Make a sketch that clearly shows the assignment of the individual wires (note the colors) to the terminals.

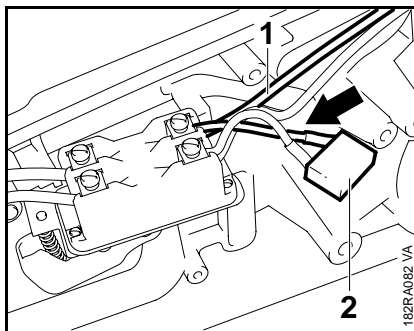


- Disconnect wire (1) from the snap switch.



- Loosen the screw (arrow).
- Disconnect the wire (1) coming from the overload circuit breaker.

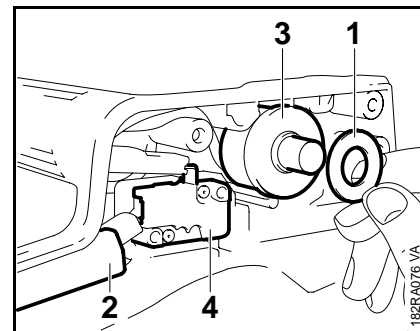
Install in the reverse sequence.



- When installing the wire (1) for the overload circuit breaker, also connect the wire (arrow) from the capacitor (2) to the same terminal.

Assemble all other parts in the reverse sequence.

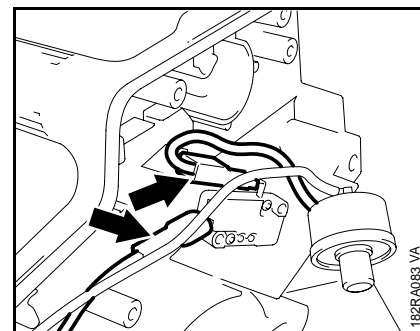
- Check correct positions of wires.



- Remove the handle molding, 8.1
- Remove the sealing washer (1) – if fitted.
- Pull the insert (2) out a little.
- Pull out the overload circuit breaker (3).
- Pull the chain brake snap switch (4) out of its seat.

Make a sketch that clearly shows the assignment of the individual wires (note the colors) to the terminals.

Do not mix up the wire connections.



- Disconnect the wires (arrows).

Install in the reverse sequence.

Check correct positions of wires.

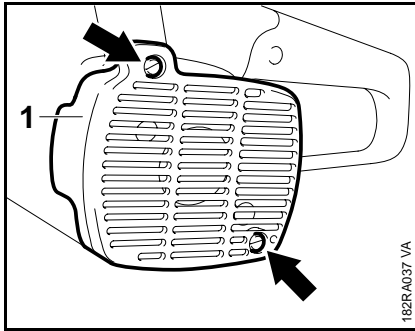
6.3.7 Circuit Diagram of MSE 220



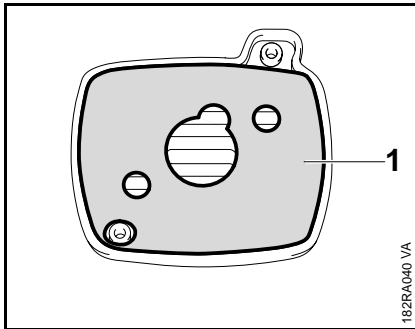
C	Capacitor
K	Overload cut-out
M	Motor
S	On/off switch
S1	Snap switch (chain brake)
W	Connecting cord
L1	Blue
L2	White
L3	Black

7. Motor

7.1 Filter (MSE 220 C only)



- Take out the screws (arrows).
- Remove the fan screen (1).

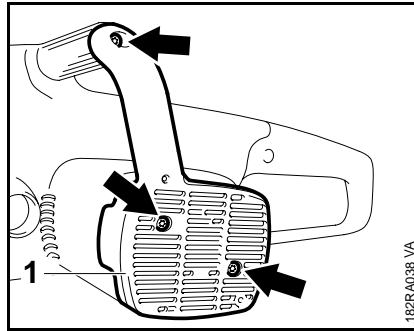


- Remove and clean the filter (1). Replace the filter if it is damaged or very dirty.

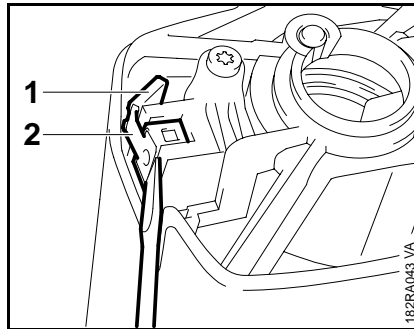
Install in the reverse sequence.

Install the filter in an absolutely dry and clean condition.
A damp filter can cause a short circuit.

7.2 Carbon Brushes

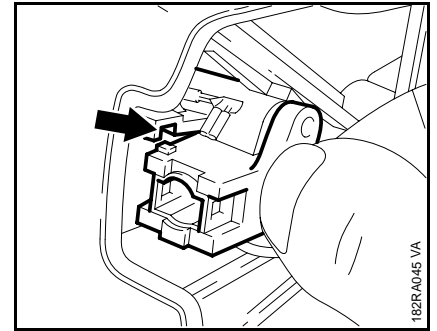


- On MSE 220 C, remove the filter, 7.1
- Take out the screws (arrows).
- Remove the commutator cover (1).



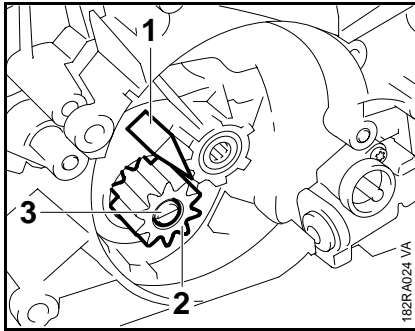
- Remove the connector (1) with wire.
- Carefully ease the spring clip off the carbon brushes (2) and pull out the carbon brushes.
- If necessary, remove the brush holder upwards.
- Inspect carbon brushes for serious scores, erosion and wear and replace if necessary.
- Inspect commutator for serious scores, erosion and wear and replace if necessary, 7.3

Install in the reverse sequence.

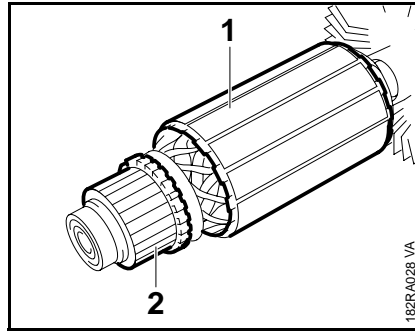


- If the brush holder has been removed, make sure when refitting it that its lugs engage the slots (arrow) in the housing.

Assemble all other parts in the reverse sequence.

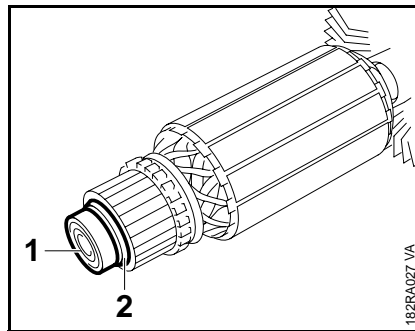


- Remove the inner half of the gear housing, 8.3
- Block the drive pinion (2) by fitting a wooden wedge (1) between it and the housing.
- Remove the screw (3) clockwise (**left-hand thread**) together with the washer.
- Use suitable tools to carefully pry the drive pinion (2) off the shaft.

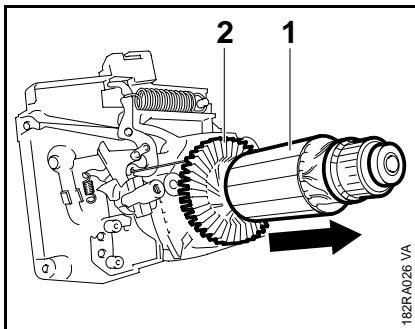


- Examine the rotor (1) and commutator (2) for damage and wear and replace if necessary.

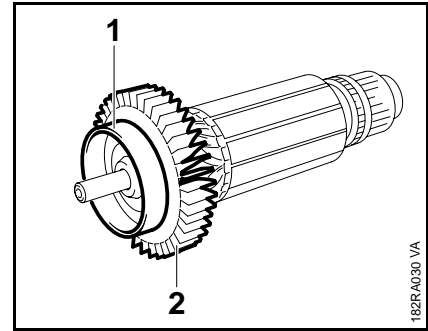
If the rotor has to be replaced, carry out the following operations:



- Examine ball bearing (1) for damage and wear and remove with puller if necessary.
- Remove the washer (2) and check it for damage and replace if necessary.



- Pull out the rotor (1) together with the fanwheel (2) or, if necessary, use suitable tools to drive it out.

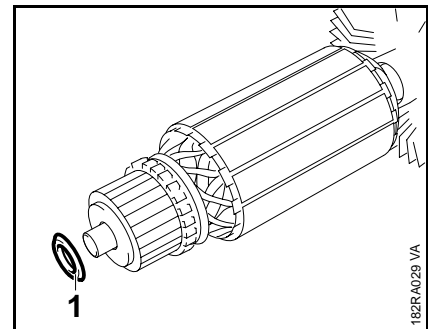


- Examine the brake drum (1) and fanwheel (2) for damage and wear and remove with puller if necessary.

Install in the reverse sequence.

The fanwheel must be installed with its closed side facing outwards.

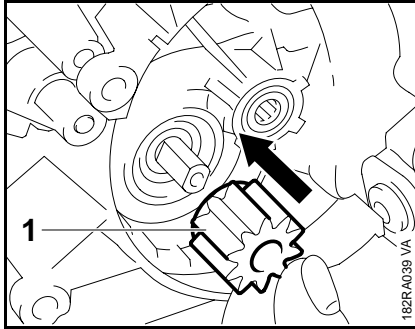
The brake drum must be installed with its open side facing outwards.



- Flat side of washer (1) must face the commutator.

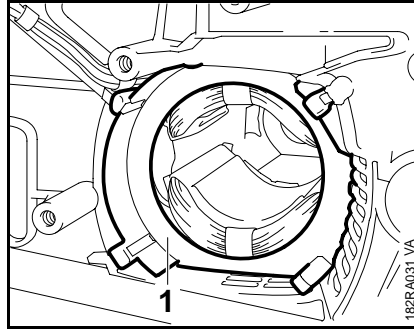
Assemble all other parts in the reverse sequence.

7.4 Stator



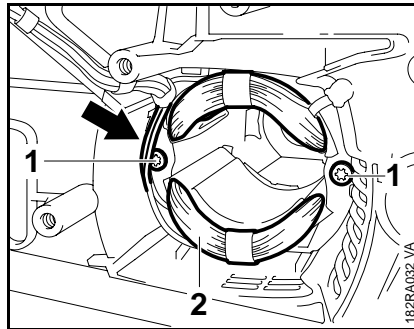
- Push the pinion (1) (bevelled end first) onto the shaft as far as stop.

Assemble all other parts in the reverse sequence.



- Remove the rotor, 7.3

- Pull the air baffle (1) out of the housing.



- Take out the screws (1).

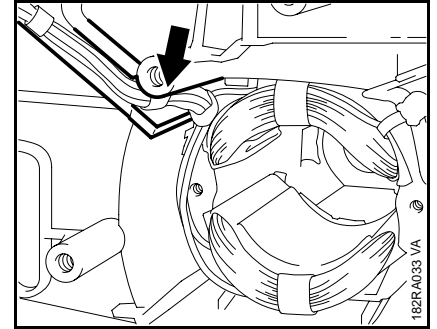
Take care not to damage the wires (arrow).

- Carefully pull out the stator (2).

Make a sketch that clearly shows the assignment of the individual wires (note the colors) to the terminals.

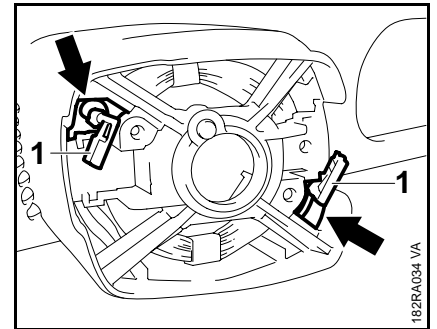
- Disconnect the wires from the electronic module and the on/off switch.

Install in the reverse sequence.

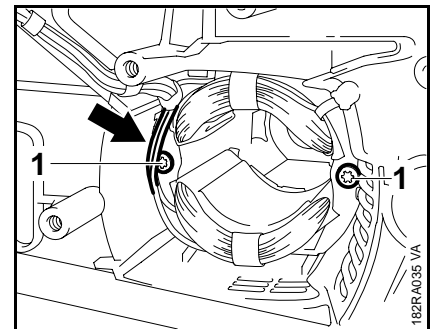


- Install the stator in the motor housing so that the wires are at the top left.

- Position the wires in the guide (arrow).



- Carefully pull the connectors (1) for the carbon brushes through the housing openings (arrows).



- Tighten down the screws (1) firmly.

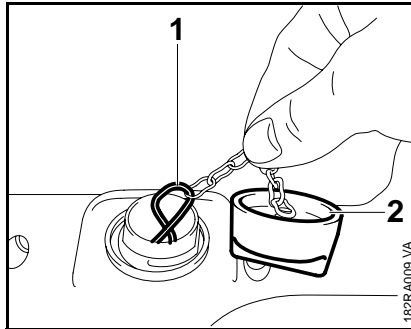
When fitting and tightening the screws, take care not to damage the wires (arrow).

8. Housing

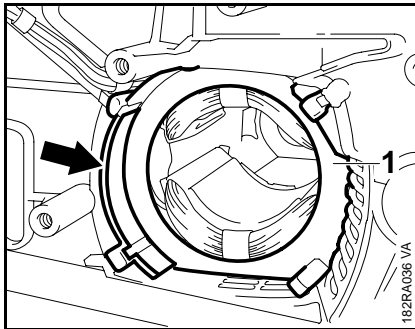
8.1 Handle Molding

Carefully push the wires outwards to avoid any subsequent contact with the rotor.

Check correct positions of wires.



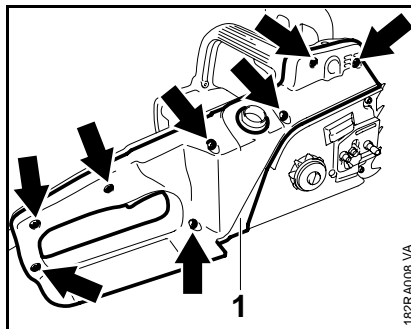
- Remove the guide bar and chain.
- Unscrew the oil tank cap.
- Squeeze the cap retainer (1) together and pull it out of the oil tank.
- Remove the oil tank cap (2) with cap retainer (1).



- Fit the air baffle (1) so that its closed side wall (arrow) is on the left.

Check correct positions of wires.

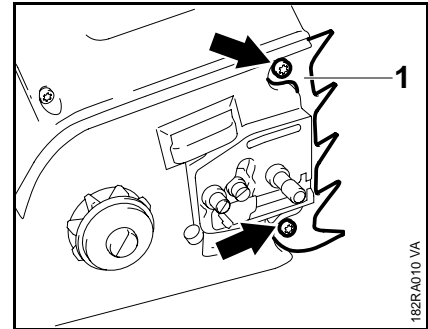
Assemble all other parts in the reverse sequence.



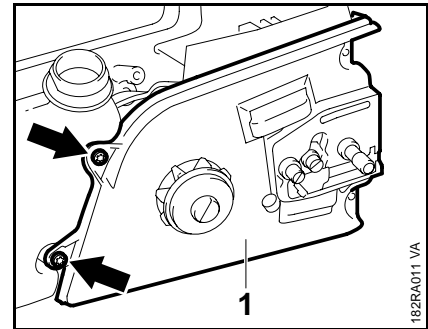
- Take out the screws (arrows).
- Remove the handle molding (1).

Install in the reverse sequence.

8.2 Outer Gear Housing



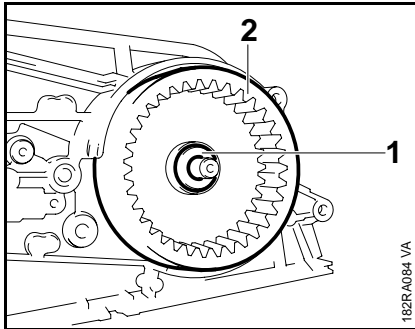
- Remove the handle molding, [8.1](#)
- Take out the screws (arrows).
- Remove the spiked bumper (1).



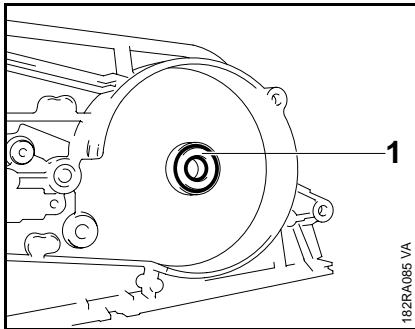
- Take out the screws (arrows).
- Lift away the outer gear housing (1).

If the gear housing has to be replaced, carry out the following additional operations:

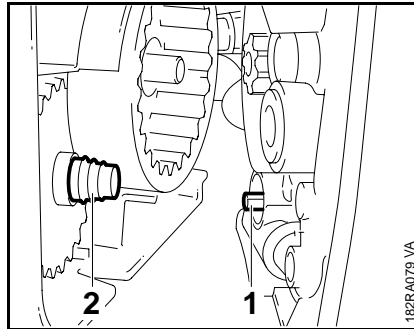
- Remove the chain tensioner, [5.2](#)
- Remove the collar screws, [5.3](#)
- Remove the chain sprocket, [5.1](#)



- Remove the washer (1).
- Pull off the ring gear (2).

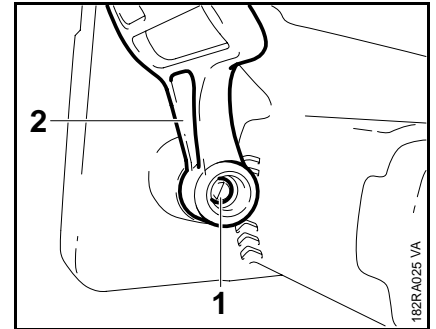


- Remove the washer (1).
- Install in the reverse sequence.

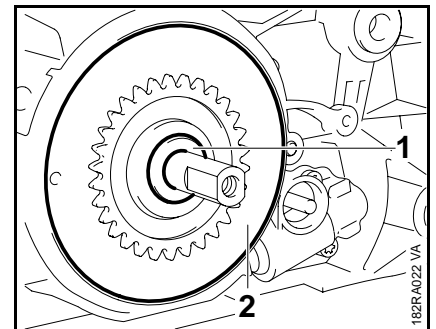


- Fit spur gear for oil pump drive under the ring gear as shown in the illustration.
- Peg of spur gear (2) must engage the oil pump (1).
- If necessary, turn the chain sprocket slowly back and forth while fitting the outer gear housing.

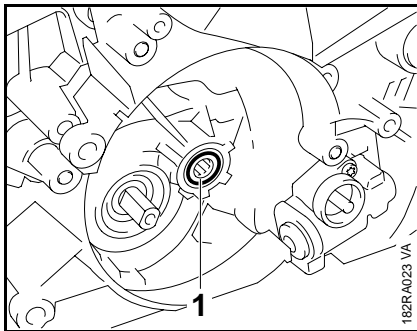
Assemble all other parts in the reverse sequence.



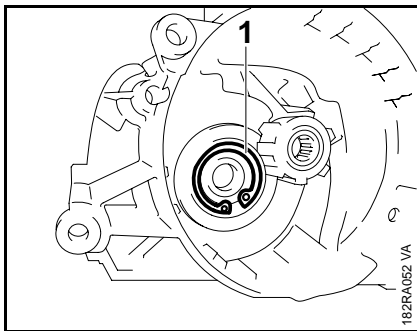
- Remove the carbon brushes, 7.2
- Take out the screw (1).
- Remove the hand guard (2).
- Remove the outer gear housing, 8.2
- Remove the chain brake, 5.5



- Remove the washer (1).
- Remove the gear (2) together with the washer behind it.



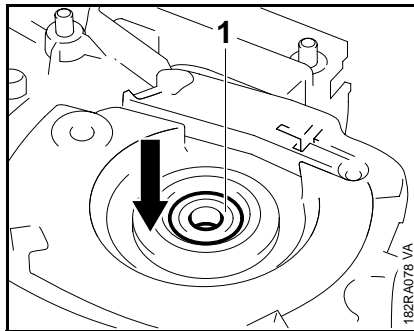
- Inspect needle bearing (1) for damage and wear. Remove with a puller if necessary.



- Inspect ball bearing for damage and wear.

If the ball bearing has to be replaced, carry out the two following operations:

- Remove the circlip (1) from the outside of the inner gear housing.



- Push out the ball bearing (1) from inside the housing.

Install in the reverse sequence.

If the inner half of the gear housing has to be replaced, carry out the following additional operations:

- Remove the oil pickup hose, [182RA054 VA](#)
- Remove the oil delivery hose, [182RA055 VA](#)
- Remove the rotor, [182RA056 VA](#)
- Remove the chain brake, [182RA057 VA](#)

Install in the reverse sequence.

If the motor housing is damaged and has to be replaced, it is not necessary to remove the rotor from the inner gear housing. The wires (on electronic module, switch and stator) do not have to be disconnected in this case.

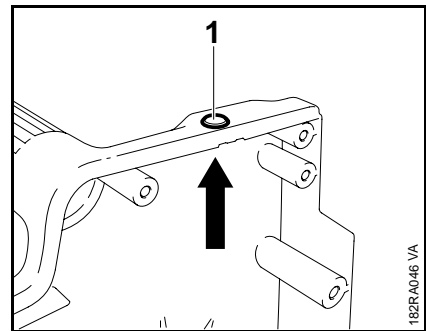
Model MSE 220

- Remove the connecting cord with cord protector, [182RA058 VA](#)
- Remove the on/off switch, [182RA059 VA](#)
- Remove the stator, [182RA060 VA](#)

Install in the reverse sequence.

Model MSE 220 C

- Remove the connecting cord with cord protector, [182RA061 VA](#)
- Remove the on/off switch, [182RA062 VA](#)
- Remove the stator, [182RA063 VA](#)



- Push out the cap (1) from inside the housing and remove it.

Install in the reverse sequence.

9. Special Servicing Tools

No.	Part Name	Part No.	Application	Rem.
1	Torque wrench	5910 890 0311	6 – 80 Nm; torque wrench 5910 890 0312 with optical/acoustic signal may be used as an alternative	
2	Torque wrench	5910 890 0301	0.5 – 18 Nm; torque wrench 5910 890 0302 with optical/acoustic signal may be used as an alternative	
3	Assembly tool	1117 890 0900	Attaching spring	
4	Circlip pliers DIN 5254-C19	0811 641 8380	Removing/installing internal circlips	
5	Hook	5910 890 2800	Removing/installing brake spring	
6	Spline screw socket T20 x 125	0812 542 2041	Removing/fitting spline socket head screws with electric or pneumatic screwdrivers. Tighten down with torque wrench.	

10. Servicing Aids

No.	Part Name	Part No.	Application	Rem.
1	Lubricating grease (225 g tube)	0781 120 1111	Pickup hose, delivery hose	
2	STIHL Press Fluid OH 723	0781 957 9000		
3	STIHL special lubricant	0781 417 1315		
4	Standard commercial solvent-based degreasant containing no chlorinated or halogenated hydrocarbons			
5	Loctite 243	0786 110 0101	Medium-strength threadlocking adhesive	
6	Loctite 242	0786 110 0116	Medium-strength threadlocking adhesive	

