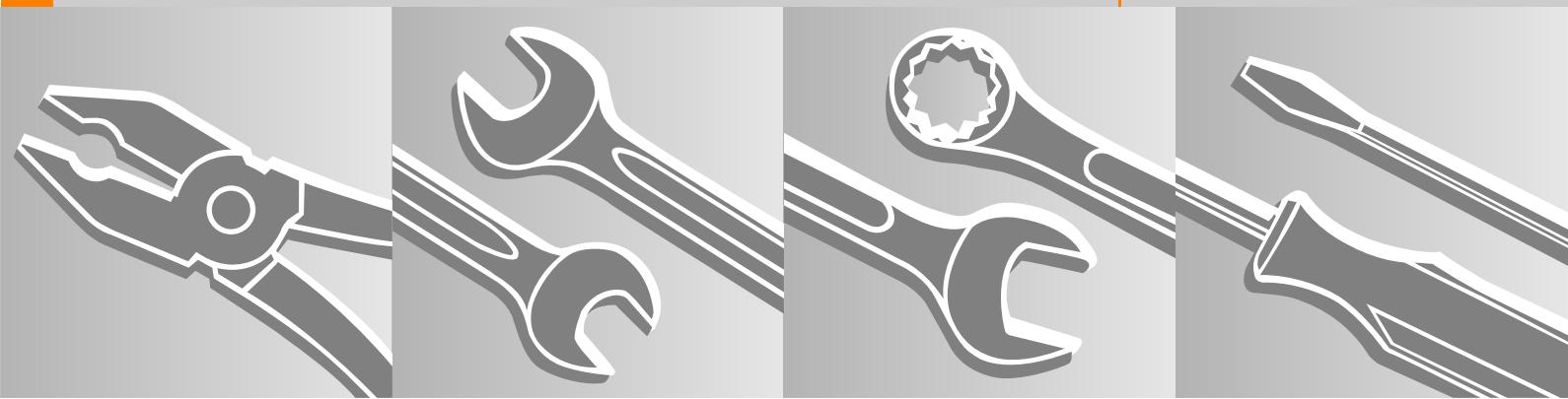


**STIHL**®

## STIHL MS 200, 200 T

2008-04



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## 1. Introduction

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

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.

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 troubleshooting charts for all assemblies and systems in this manual and the "STIHL Service Training System".

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 a revised edition is issued.

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

Symbols 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

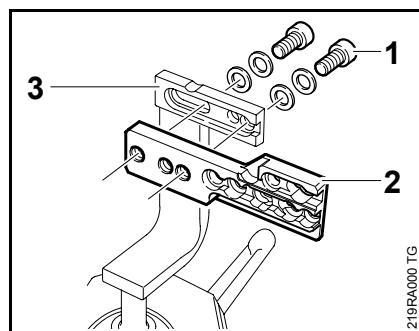
In the illustrations:

→ Pointer

→ Direction of movement

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

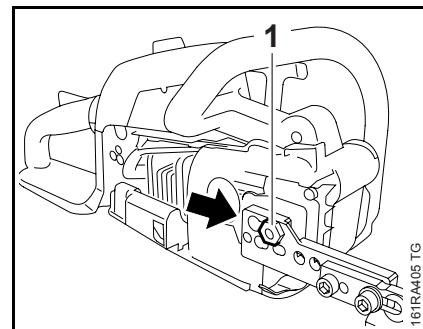
Service manuals and all technical information bulletins are intended exclusively for the use of properly equipped repair shops. They must not be passed to third parties.



Servicing and repairs are made considerably easier if the machine is mounted to assembly stand (3) 5910 890 3100. To do this, secure the mounting plate (2) 5910 850 1650 to the assembly stand with two screws (1) and washers.

The screws must not project since they, depending on the machine, may damage housings when the machine is clamped in position.

The above operation is not necessary with the new assembly stand 5910 890 3101 since the mounting plate is already fitted.



After removing the chain sprocket cover, bar, chain and clutch drum, the bar stud is pushed through the upper hole (arrow) in the mounting plate and secured with the nut (1).

The machine is held in position on the mounting plate by the screw head on the crankcase.

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.

### Storing and disposing of oils and fuels

Collect fuel or lubricating oil in a clean container and dispose of it properly in accordance with local environmental regulations.

## **2. Safety Precautions**

If the engine 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.

Gasoline is an extremely flammable fuel and can be explosive in certain conditions.

Always wear suitable protective gloves for operations in which components are heated for assembly or disassembly.

Improper handling may result in burns or other serious injuries.

Do not smoke or bring any fire, flame or other source of heat near the fuel. All work with fuel must be performed outdoors only. Spilled fuel must be wiped away immediately.

Always perform leakage test after working on the fuel system and the engine.

### **3. Specifications**

#### **3.1 Engine**

	MS 200	MS 200 T
Displacement:	35.2 cm <sup>3</sup>	35.2 cm <sup>3</sup>
Bore:	40 mm	40 mm
Stroke:	28 mm	28 mm
Engine power to ISO 7293:	1.7 kW (2.3 bhp) at 10,000 rpm	1.7 kW (2.3 bhp) at 10,000 rpm
Maximum permissible engine speed (with bar and chain):	14,000 rpm	14,000 rpm
Idle speed:	2,800 rpm	2,800 rpm
Clutch:	Centrifugal clutch without linings	Centrifugal clutch without linings
Clutch engages at:	3,700 rpm	3,700 rpm
Crankcase leakage test at gauge pressure: under vacuum:	0.5 bar 0.5 bar	

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#### **3.2 Fuel System**

Carburetor leakage test at gauge pressure:	0.8 bar
Operation of tank vent at gauge pressure:	0.5 bar
Fuel:	as specified in instruction manual

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#### **3.3 Ignition System**

Air gap between ignition module and fanwheel:	0.25 mm
Spark plug (suppressed):	Bosch WSR6F
Electrode gap:	0.5 mm

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#### **3.4 Chain Lubrication**

Speed-controlled oil pump with reciprocating piston and manual flow control	
Oil pump with adjustable delivery rate:	3.5 - 9.5 cm <sup>3</sup> /min at 10,000 rpm

### 3.5 Tightening Torques

DG and P (Plastoform) screws are used in polymer and light metal 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	
Screw	M 4x12	Chain tensioner cover/crankcase	1.8	
Screw	P 6x19	Stop buffer/tank housing (MS 200)	5.5	
Collar screw	M 8x17	Bar mounting	22.0	5)
Screw	M 4x12	Cover, oil pump/crankcase	1.8	
Screw	P 4x14	Cover/chain sprocket cover	1.7	
Screw	D 4x15	Spark arrestor/muffler	4.0	1)
Collar nut	M 5	Filter base/carburetor	3.3	
Collar screw	P 5x25	Handle housing/stop buffer (MS 200)	2.0	
Screw	P 6x32.5	Handle housing/front handle (MS 200)	5.3	
Screw	P 6x21.5	Handle housing/front handle (MS 200 T)	5.3	
Screw	M 5x12	Front handle/annular buffer	5.5	
Screw	P 4x14	Handle molding/handle housing	1.7	
Screw	P 6x19	Retainer, ring/tank housing	5.5	
Screw	M 5x16	Chain catcher/spiked bumper/crankcase	7.0	
Screw	M 5x16	Spiked bumper/crankcase	7.0	
Screw	M 4x16	Crankcase, sprocket side/fan side	5.5	
Screw	M 4x16	Fan housing/crankcase	4.5	
Screw	P 5x20	Fan housing/tank housing	4.2	
	M 8x1L	Carrier (clutch)	33.0	
Screw	M 4x12	Oil pump/crankcase	3.5	5)
Screw	P 4x14	Annular buffer, rear/tank housing	1.7	4)
Screw	M 4x16	Annular buffer, front/crankcase	4.5	
Screw	P 5x29.6	Annular buffer/handle housing, front and rear	3.5	
	M 5	Annular buffer/crankcase	2.7	
Screw	D 4x15	Muffler, top and bottom	4.0	3)
Screw	M 5x20	Muffler/cylinder	11.5	4)
Screw	P 4x10	Control lever/switch shaft (MS 200 T)	1.3	
Screw	B 2.9x9.5	Shutter/handle housing	1.0	
Screw	M 5x12	Bar mounting/crankcase	7.0	5)
Nut	M 8x1	Flywheel/crankshaft	25.0	6)
Screw	P 4x10	Segment/fan housing	1.0	
Screw	M 4x16	Tank housing/crankcase	4.5	
	M 14x1.25	Spark plug	25.0	

Fastener	Thread size	For component	Torque Nm	Remarks
Screw	M 4x20	Ignition module/crankcase	4.5	5)
Screw	M 5x16	Cylinder/crankcase	10.0	

Remarks:

- 1) Loctite 242 or 243, medium strength
- 2) Loctite 270, high strength
- 3) Scotch Weld, high strength
- 4) Loctite 649, high strength
- 5) Loctite 272, high strength up to 250°C
- 6) Degrease crankshaft/flywheel and mount oil-free

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.

Coat micro-encapsulated screws with medium strength Loctite 242 or 243 before reinstalling.

Power screwdriver setting for polymer: DG and P screws max. 500 rpm  
Do not use an impact wrench for releasing or tightening screws.

Do not mix up screws with and without binding heads.

## 4. Troubleshooting

### 4.1 Clutch

Condition	Cause	Remedy
Saw chain stops under load at full throttle	Clutch shoes badly worn	Install new clutch
	Clutch drum badly worn	Install new clutch drum
Saw chain rotates at idle speed	Engine idle speed too high	Readjust with idle speed screw <b>LA</b> (counterclockwise)
	Clutch springs stretched or fatigued	Replace the clutch springs or install new clutch
	Clutch spring hooks broken	Replace the clutch springs
Loud noises	Clutch springs stretched or fatigued	Replace all clutch springs
	Needle cage damaged	Fit new needle cage
	Clutch shoe retainer broken	Fit new retainer
	Clutch shoes and carrier worn	Install new clutch

## 4.2 Chain Drive, Chain Brake, Chain Tensioner

Condition	Cause	Remedy
Chain sprocket wears rapidly	Chain not properly tensioned	Tension chain as specified
	Wrong chain pitch	Fit chain of correct pitch
	Insufficient chain lubrication	Check chain lubrication
	Chain sprocket worn	Fit new chain sprocket
Saw chain stops under load at full throttle	Clutch shoes badly worn	Install new clutch
	Clutch drum badly worn	Install new clutch drum
	Brake band blocked	Check freedom of movement and operation of brake band
Saw chain rotates at idle speed	Engine idle speed too high	Readjust with idle speed screw <b>LA</b> (counterclockwise)
	Clutch springs stretched or fatigued	Replace the clutch springs or install new clutch
	Clutch spring hooks broken	Replace the clutch springs
Saw chain does not stop immediately when brake is activated	Brake spring stretched or broken	Fit new brake spring
	Brake band stretched or worn	Fit new brake band
	Clutch drum worn	Install new clutch drum

#### 4.3 Chain Lubrication

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

Condition	Cause	Remedy
Chain receives no oil	Oil tank empty	Fill up with oil and check setting of oil pump if necessary
	Oil inlet hole in guide bar is blocked	Clean oil inlet hole
	Intake hose or pickup body clogged or intake hose ruptured	Fit new intake hose and pickup body
	Connector blocked	Clean connector or replace if necessary
	Valve in oil tank blocked	Clean valve or replace if necessary
	Teeth on worm worn	Install new worm
	Oil pump damaged or worn	Install new oil pump
Machine losing chain oil	Oil pump body damaged	Install new oil pump
	Oil pump damaged or worn	Install new oil pump
	Oil intake hose damaged	Install new oil intake hose
Oil pump delivers insufficient oil	Oil pump worn	Install new oil pump
	Oil pump delivery rate set too low	Adjust oil pump

#### 4.4 Rewind Starter

Condition	Cause	Remedy
Starter rope broken	Rope pulled out too vigorously as far as stop or over edge, i.e. not vertically	Fit new starter rope
	Normal wear	Fit new starter rope
Starter rope does not rewind	Very dirty or corroded	Clean or replace rewind spring
	Insufficient spring tension	Check rewind spring and increase tension
	Rewind spring broken	Fit new rewind spring
Starter rope cannot be pulled out far enough	Spring overtensioned	Check rewind spring and reduce tension
Starter rope can be pulled out almost without resistance (crankshaft does not turn)	Guide peg on pawl or pawl itself is worn	Fit new pawl
	Spring clip on pawl fatigued	Fit new spring clip
Starter rope is difficult to pull or rewinds very slowly	Starter mechanism is very dirty	Thoroughly clean complete starter mechanism
	Lubricating oil on rewind spring becomes viscous at very low outside temperatures (spring windings stick together)	Coat rewind spring with a little standard solvent-based degreasant (containing no chlorinated or halogenated hydrocarbons), then pull rope carefully several times until normal action is restored

## 4.5 Ignition System

Exercise extreme caution while carrying out maintenance and repair work on the ignition system. The high voltages which occur can cause serious or fatal accidents.

Condition	Cause	Remedy
Engine runs roughly, misfires, temporary loss of power	Spark plug boot is loose  Spark plug sooted, smeared with oil	Press boot firmly onto spark plug and fit new spring if necessary  Clean the spark plug or replace if necessary. If sooting keeps recurring, check air filter
	Ignition lead loose in ignition module	Secure ignition lead properly
	Fuel/oil mixture – too much oil	Use correct mixture of fuel and oil
	Incorrect air gap between ignition module and flywheel	Set air gap correctly
	Flywheel cracked or has other damage or pole shoes have turned blue	Install new flywheel
	Ignition timing wrong, flywheel out of adjustment, key in flywheel missing or has sheared off	Fit key if necessary and secure flywheel properly or install new flywheel
	Weak magnetization in flywheel	Install new flywheel
	Irregular spark	Check operation of switch shaft/contact springs and ignition module. Faulty insulation or break in ignition lead or short circuit wire. Check ignition lead/ignition module and replace ignition module if necessary. Check operation of spark plug. Clean the spark plug or replace if necessary.
	Crankcase damaged (cracks)	Install new crankcase

Condition	Cause	Remedy
No spark	Spark plug faulty	Install new spark plug
	Faulty insulation or short in short circuit wire	Check short circuit wire for short circuit to ground
	Break in ignition lead or insulation damaged	Check ignition lead and replace if necessary
	Ignition module faulty	Install new ignition module

Condition	Cause	Remedy
Carburetor floods; engine stalls	Inlet needle not sealing – foreign matter in valve seat or cone	Remove and clean the inlet needle, clean the carburetor
	Inlet control lever sticking on spindle	Check inlet control lever, replace if necessary
	Helical spring not located on nipple of inlet control lever	Remove the inlet control lever and refit it correctly
	Perforated disc on diaphragm is deformed and presses constantly against the inlet control lever	Fit a new metering diaphragm
	Metering diaphragm deformed	Fit a new metering diaphragm
Poor acceleration	Setting of low speed screw too lean	Check basic carburetor setting, correct if necessary
	Setting of high speed screw too lean	Check basic carburetor setting, correct if necessary
	Inlet needle sticking to valve seat	Remove inlet needle, clean and refit
	Diaphragm gasket leaking	Fit new diaphragm gasket
	Metering diaphragm damaged or shrunk	Fit a new metering diaphragm
	Impulse hose damaged, kinked or not pushed onto stub below handle housing	Fit impulse hose correctly or replace if necessary
	Tank vent faulty	Replace tank vent
	Leak in fuel hose between tank and fuel pump	Seal connections or install new fuel hose

Condition	Cause	Remedy
Engine will not idle, idle speed too high	Throttle shutter opened too wide by idle speed screw <b>LA</b>	Reset idle speed screw <b>LA</b> correctly
	Oil seals/crankcase leaking	Seal or replace oil seals/crankcase
Engine stalls at idle speed	Idle jet bores or ports blocked	Clean the carburetor
	Setting of low speed screw too rich or too lean	Reset low speed screw <b>L</b> correctly
	Setting of idle speed screw <b>LA</b> incorrect – throttle shutter completely closed	Reset idle speed screw <b>LA</b> correctly
	Tank vent faulty	Replace tank vent
	Leak in fuel hose between tank and fuel pump	Seal connections or install new fuel hose

Condition	Cause	Remedy
Engine speed drops quickly under load – low power	Air filter dirty	Clean air filter or replace if necessary
	Throttle shutter not opened fully	Check throttle cable and rod
	Tank vent faulty	Replace tank vent
	Fuel pickup body dirty	Install new pickup body
	Fuel strainer dirty	Clean fuel strainer in carburetor, replace if necessary
	Leak in fuel hose between tank and fuel pump	Seal connections or install new fuel hose
	Setting of high speed screw <b>H</b> too rich	Check basic carburetor setting, correct if necessary
	Main jet bores or ports blocked	Clean the carburetor
	Pump diaphragm damaged or fatigued	Fit new pump diaphragm
	Impulse hose damaged, kinked or not pushed onto stub below handle housing	Fit impulse hose correctly or replace if necessary
	Ignition timing wrong, flywheel out of adjustment, key in flywheel is missing or has sheared off	Fit key if necessary and secure flywheel properly or install new flywheel

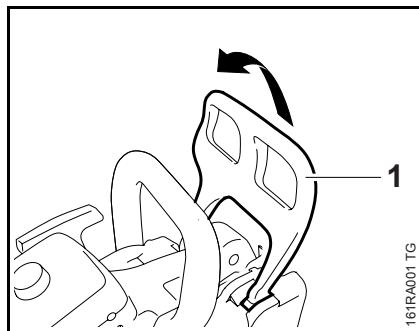
## 4.7 Engine

Always check and, if necessary, repair the following parts before looking for faults on the engine:

- Air filter
- Fuel system
- Carburetor
- Ignition system

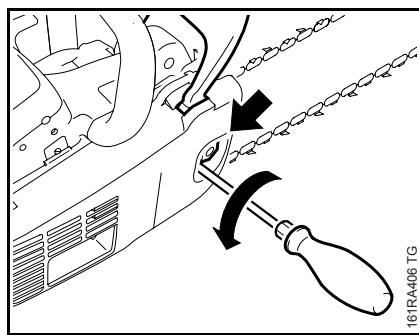
Condition	Cause	Remedy
Engine does not start easily, stalls at idle speed, but operates normally at full throttle	Oil seals in crankcase damaged	Replace the oil seals
	Crankcase leaking or damaged (cracks)	Seal or replace the crankcase
Engine does not deliver full power or runs erratically	Piston rings worn or broken	Fit new piston rings
	Muffler / spark arresting screen carbonized	Clean the muffler (inlet and exhaust), replace spark arresting screen, replace muffler if necessary
	Air filter dirty	Replace air filter
	Fuel hose severely kinked or damaged	Fit new hose or position it free from kinks
Engine overheating	Insufficient cylinder cooling. Air inlets in fan housing blocked or cooling fins on cylinder very dirty	Thoroughly clean all cooling air openings and the cylinder fins

## 5. Cutting Attachment

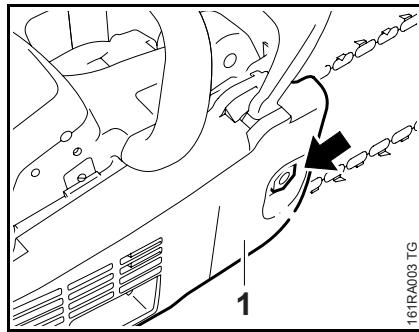


Wear gloves to protect your hands from injury.

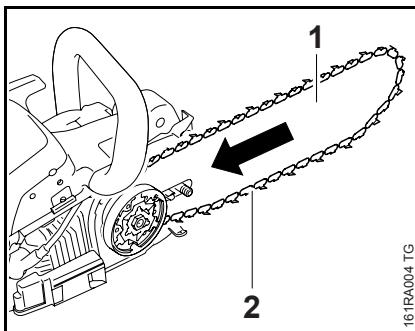
- Disengage the chain brake by pulling the hand guard (1) towards the front handle.



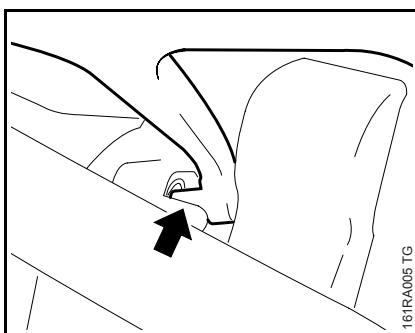
- Loosen the collar nut (arrow).
- Slacken the chain by turning the screw counterclockwise.



- Unscrew the collar nut (arrow) and remove the chain sprocket cover (1).



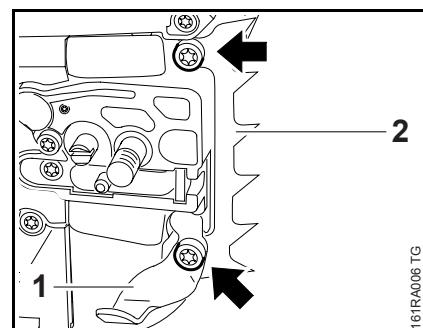
- Push the guide bar (1) in the direction of the clutch and take the chain off the bar.
- Remove the guide bar (1).
- Remove the chain (2) from the sprocket.
- Reassemble in the reverse sequence.



- Fit the chain sprocket cover. Make sure the peg (arrow) engages the hole.
- For adjustment of chain tension see MS 200, MS 200 T instruction manual.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

### 5.1 Chain Catcher / Spiked Bumper

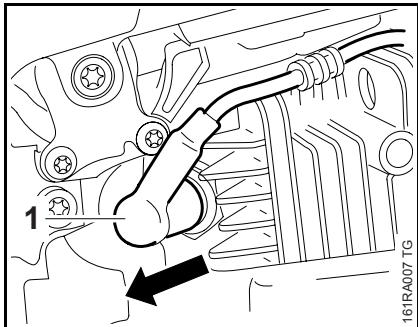
- Remove the chain sprocket cover, bar and chain, **5**



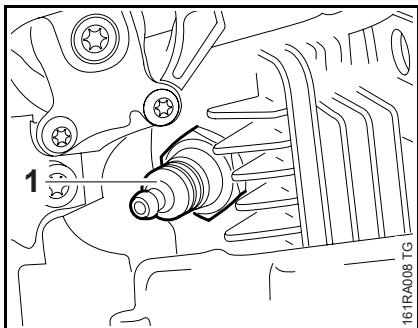
- Take out the screws (arrows).
- Remove the chain catcher (1) first and then the spiked bumper (2).
- Reassemble in the reverse sequence.
- Tightening torques, **3.5**

## 6. Clutch

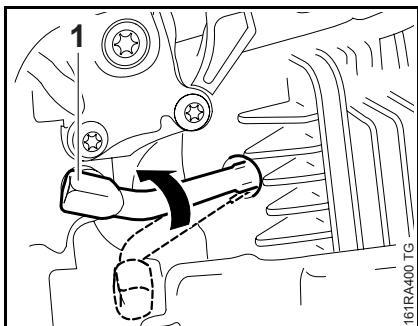
- Troubleshooting, **4.1**
- Remove the chain sprocket cover, bar and chain, **5**



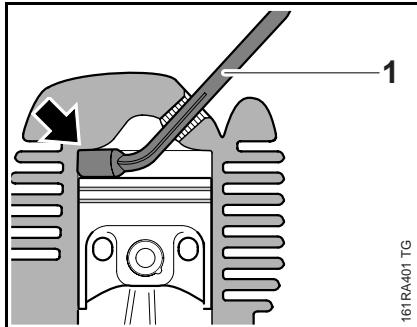
- Pull boot (1) off the spark plug.



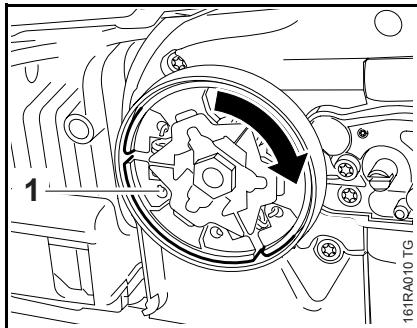
- Unscrew the spark plug (1).



- Insert the locking strip (1) 0000 893 5903 – wide end first – into the cylinder and then turn it 180°.

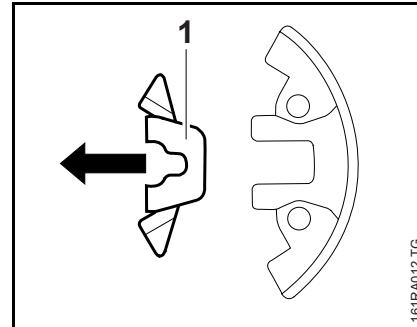


- Push the locking strip (1) 0000 893 5904 into the spark plug hole until it butts against the cylinder wall (arrow) as shown.

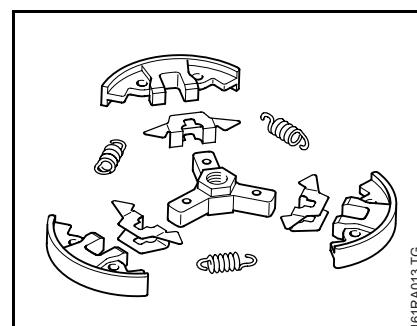


- Unscrew the clutch (1).

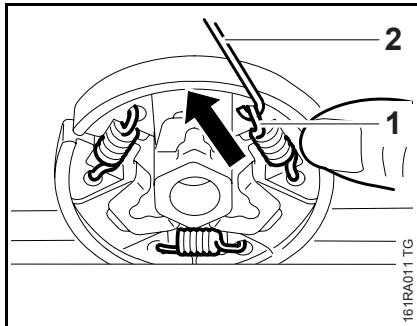
Note that the clutch has a left-hand thread.



- Pull the clutch shoes off the carrier.
- Pull the retainers (1) off the clutch shoes.

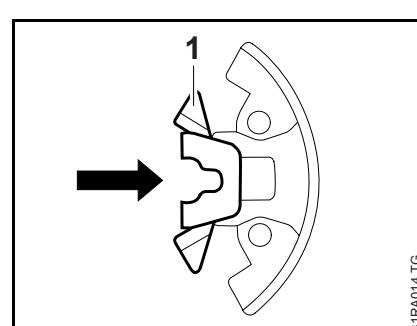


- Clean all parts, **16**
- Replace any damaged parts.

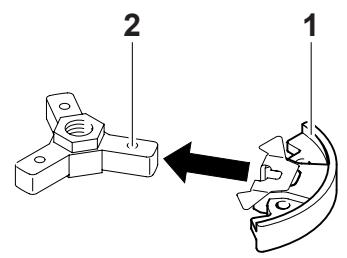


### Disassembling

- Clamp the clutch in a vise.
- Use hook (2) 5910 890 2800 to remove the clutch springs (1).

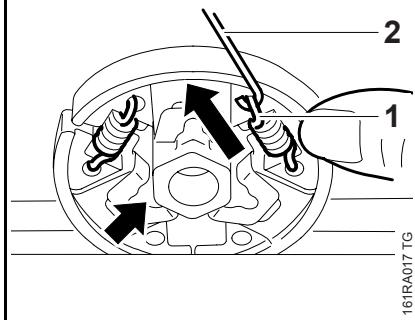


- Slip the retainers (1) onto the clutch shoes.



161RA015 TG

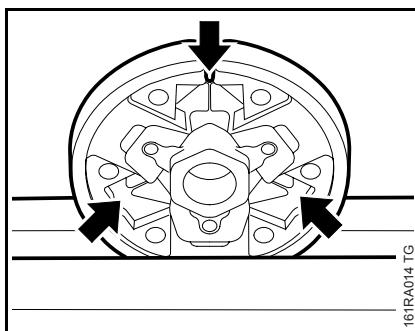
- Fit the clutch shoes (1) over the arms (2).



161RA017 TG

Attach the springs on the side opposite the raised hexagon (arrow).

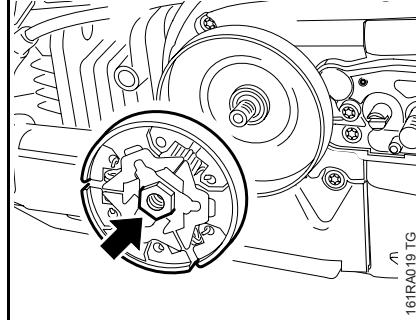
- Attach one end of each spring (1) to the clutch shoes.
- Use the hook (2) 5910 890 2800 to attach the other ends of the springs and press them firmly into the clutch shoes – do not overstretch the springs.



161RA014 TG

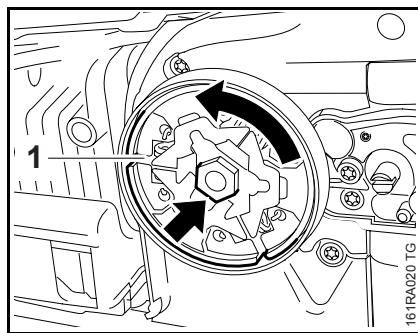
- Clamp the clutch in a vise.

The tips (arrows) must match up and the series numbers on the clutch shoes must be on the same side as the raised hexagon.



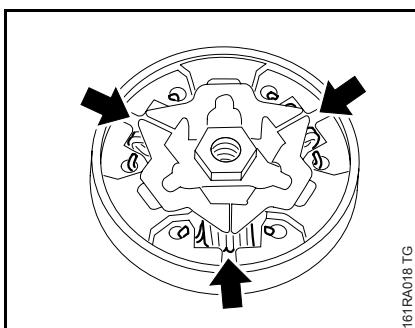
161RA019 TG

- Position the clutch on the crankshaft stub so that the raised hexagon (arrow) faces outwards.



161RA020 TG

- Use the hexagon (arrow) to screw the clutch (1) onto the crankshaft. Check position of the locking strip and then tighten down the clutch firmly – left-hand thread.



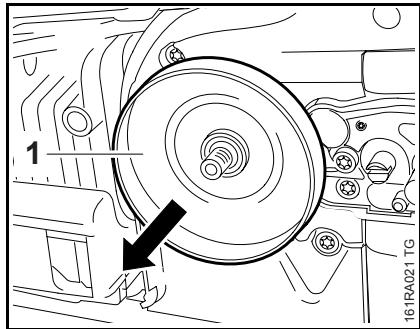
161RA018 TG

- Check the clutch – all springs (arrows) must be properly attached.

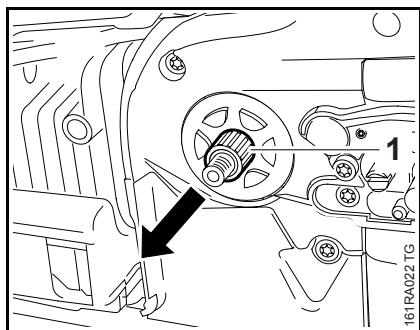
- Tightening torques, **3.5**
- Remove the locking strip from the cylinder.
- Reassemble all other parts in the reverse sequence.

## 6.1 Clutch Drum

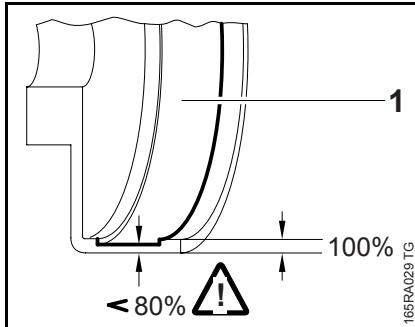
- Remove the chain sprocket cover, bar and chain, **5**
- Remove the clutch, **6**



- Pull off the clutch drum (1).

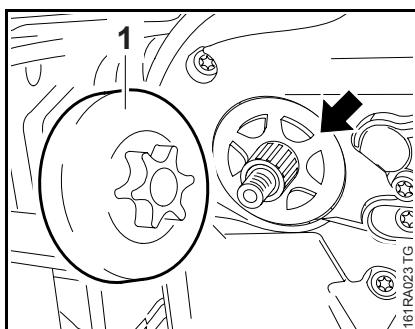


- Pull off the needle cage (1).
- Clean the needle cage and crankshaft stub, **16**
- Lubricate the needle cage and crankshaft stub, **16**



- Inspect the clutch drum (1) for signs of wear.

If there are signs of serious wear on the inside diameter of the clutch drum (1), check the remaining wall thickness. If it is less than about 80% of the original thickness, install a new clutch drum.



- Push the needle cage on to the crankshaft stub.
- Fit the clutch drum (1) so that it engages the worm gear (arrow).
- Install the clutch, **6**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

## 7. Chain Brake

### 7.1 Checking Operation

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.

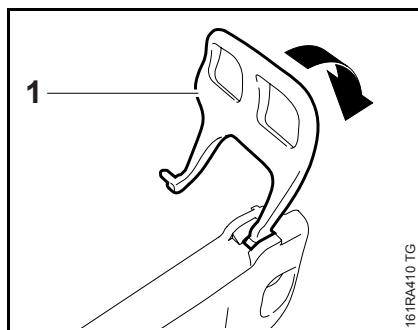
Contamination (with chain oil, chips, fine particles of abrasion, etc.) and smoothing of the friction surfaces of the brake band and clutch drum impair the coefficient of friction, which prolongs the braking time. A fatigued or stretched brake spring has the same negative effect.

- Chain sprocket cover must be secured with collar nut.
- Start the engine.
- With the chain brake activated (locked), open the throttle wide for a brief period (max. 3 seconds) – the chain must not rotate.
- With the chain brake released, open the throttle wide 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.

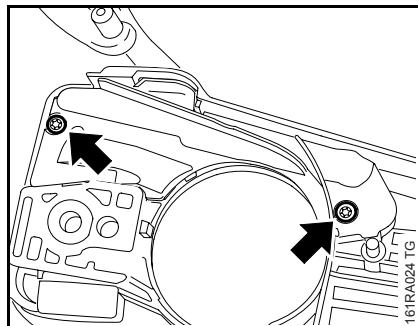
If the chain brake does not operate properly, refer to troubleshooting, **4.2**.

### 7.2 Removing and Installing the Brake Band

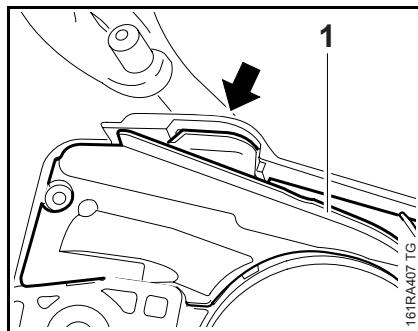


- Troubleshooting, **4.2**
- Remove the chain sprocket cover, bar and chain, **5**
- Engage the chain brake by pushing the hand guard (1) forwards.

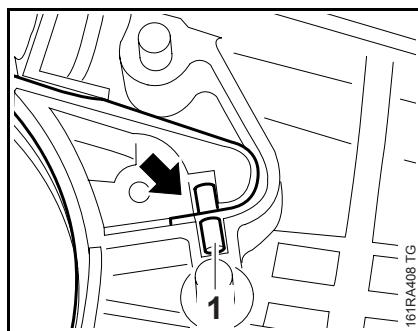
The brake spring on the brake band is now relaxed.



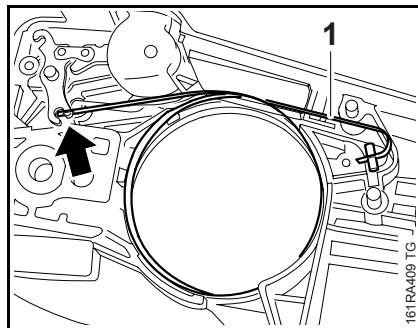
- Take out the screws (arrows).



- Ease the cover (1) out of its seat (arrow) and lift it away.

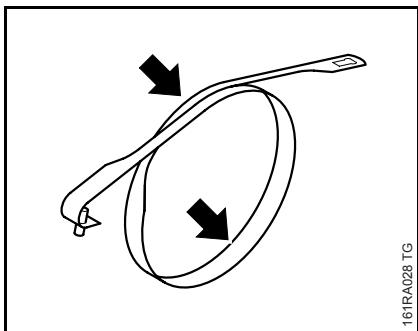


- Pry the brake band (1) out of its seat (arrow).



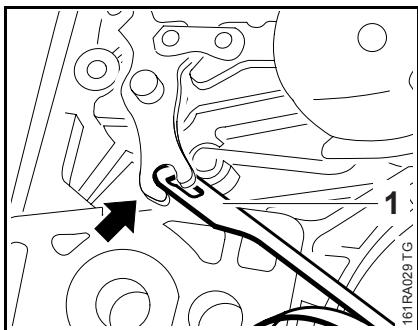
- Swing the brake band (1) outwards and disconnect it from the brake lever (arrow).

Do not over-stretch the brake band.



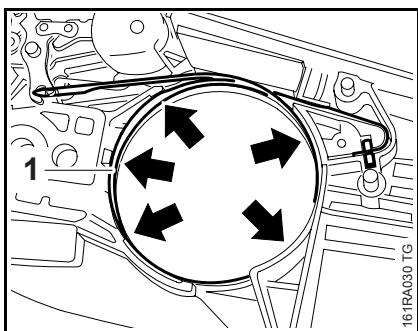
161RA028 TG

Install a new brake band if there are noticeable signs of wear (large areas on inside diameter and/or parts of outside diameter – arrows) and its remaining thickness is less than 0.6 mm.



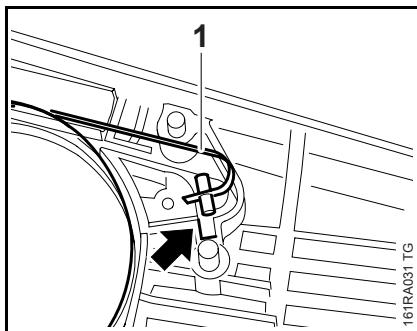
161RA029 TG

- Attach the brake band (1) to the brake lever (arrow).



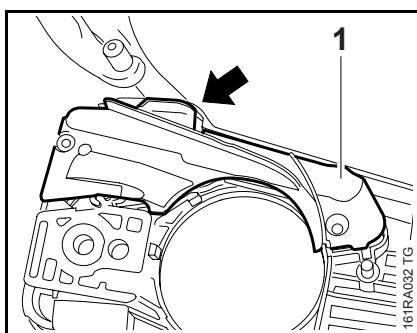
161RA030 TG

- Push the brake band (1) into its guides (arrows).



161RA031 TG

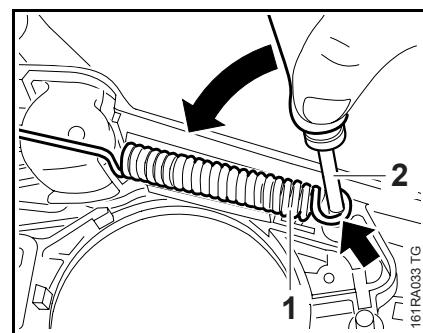
- Push the brake band (1) into its seat (arrow) as far as stop.



161RA032 TG

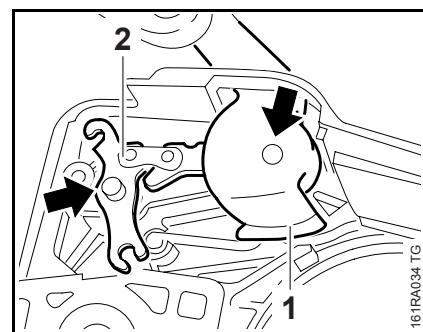
- Push cover (1) into its seat until it snaps into position (arrow).
  - Insert screws and tighten them down firmly.
  - Tightening torques, **4.2**
  - Reassemble all other parts in the reverse sequence.
  - Check operation.

### 7.3 Brake Lever



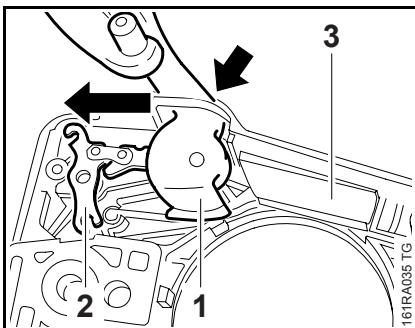
161RA033 TG  
1  
2

- Troubleshooting, **4.2**
- Remove the brake band, **7.2**
- Use the assembly tool (2) 1117 890 0900 to disconnect the brake spring (1) from the anchor pin (arrow) – the spring may pop out during this operation.
- Disconnect the brake spring from the brake lever.



161RA034 TG  
1  
2

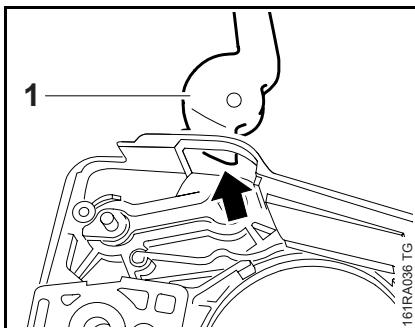
- Pull the hand guard (1) and brake lever (2) off the pivot pins (arrows) together.



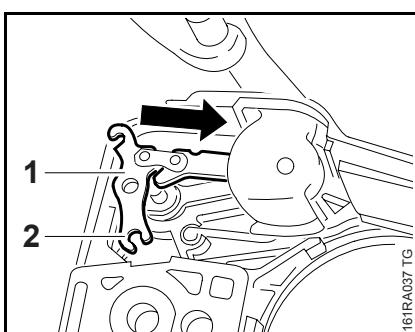
- Take the brake lever (2) out of the hand guard (1).
- Pull the hand guard (1) out through the opening in the chain sprocket cover (arrow).
- Check the stop (3) and replace if necessary
- Inspect the brake lever and hand guard and replace if necessary.

When installing the stop, make sure it is properly positioned in the sprocket cover guide and lies flat.

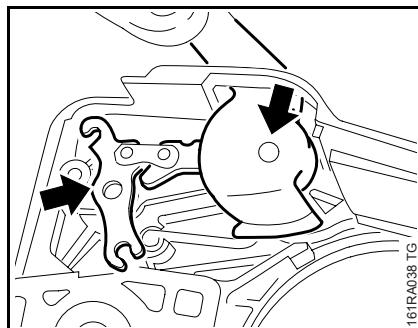
- Inspect the pivot pins and replace if necessary, **7.5**
- Inspect the flat spring and replace if necessary, **7.4**
- Clean all disassembled parts, **16**



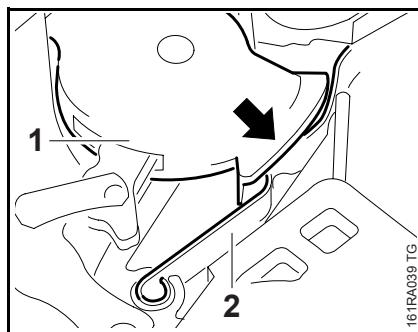
- Lubricate the pivot pins, **16**
- Push the hand guard (1) through the opening (arrow) in the chain sprocket cover.



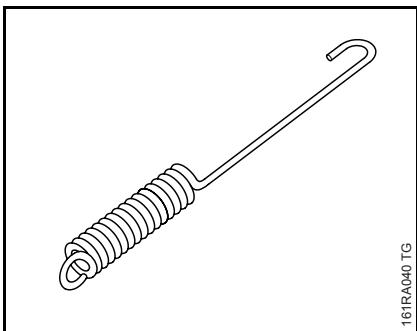
- Line up the brake lever
  - the forked end (arrow) must point towards the brake band.
- Push the brake lever (1) into the hand guard recess and line up the holes.



- Lift the bearing boss of the hand guard and the brake lever a little and position them on the pivot pins (arrows).

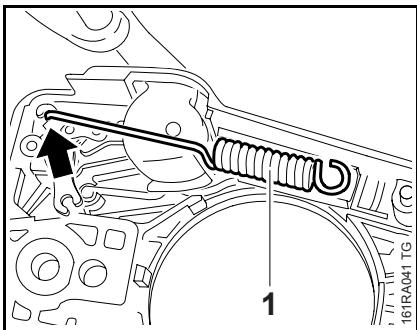


- Ease the cam (arrow) of the hand guard (1) past the flat spring (2).
- Push the hand guard and brake lever onto the pivot pins, moving the hand guard to and fro at the same time.

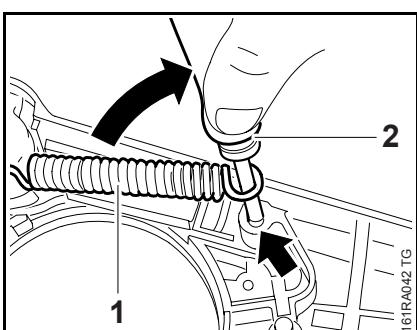


- The turns of brake spring must be tightly against one another in the relaxed condition. If this is not the case, replace the brake spring.

If the groove in the brake spring anchor pin is worn, install a new pin, **7.5**



- The stop must be installed.
- Attach the brake spring (1) to the brake lever (arrow).



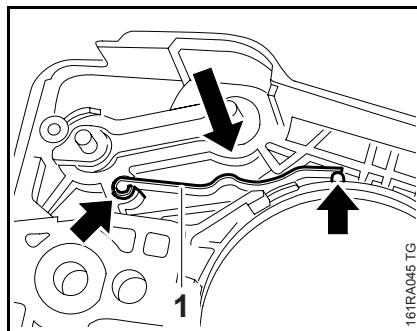
- Use the assembly tool (2) 1117 890 0900 to attach the brake spring (1) to the anchor pin (arrow).

- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**
- Lubricate the brake lever, **16**

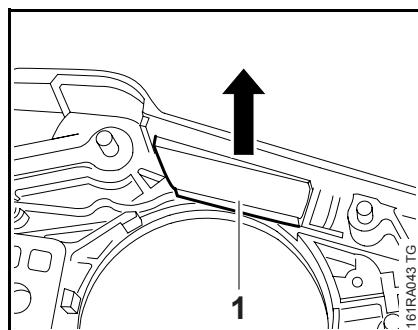
#### 7.4 Flat Spring

The flat spring and hand guard cam hold the hand guard in position.

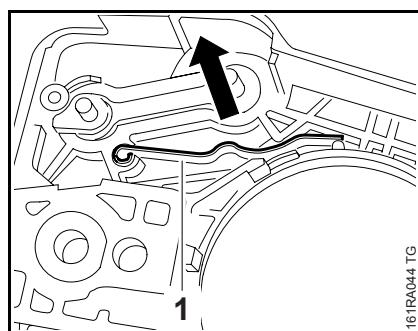
- Remove the brake lever, **7.3**



- Push the flat spring (1) into the guides (arrows).
- Lubricate the flat spring, **16**
- Install the stop.
- Reassemble all other parts in the reverse sequence.



- Remove the stop (1).

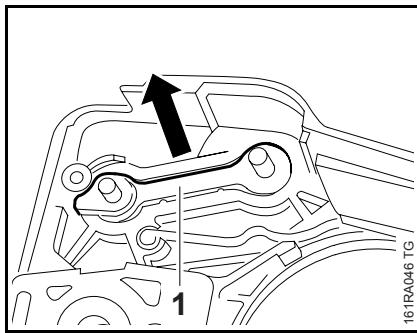


- Pull out the flat spring (1), check it and replace if necessary.

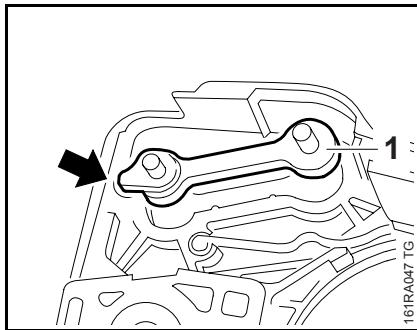
## 7.5 Pins

The anchor pins secure the springs. Worn pins must be replaced – the brake spring may pop out during this operation.

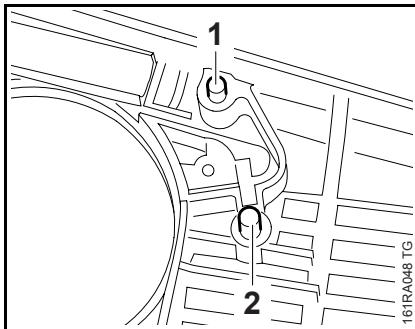
All parts have been removed from the pins in the following illustrations for greater clarity.



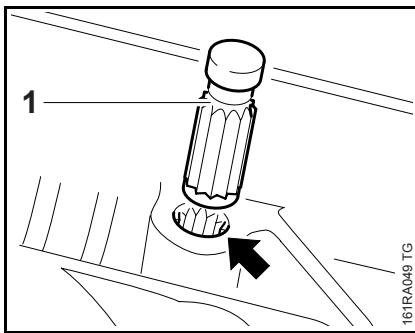
- Use a suitable tool to pull out the pin bar (1), check it and replace if necessary.



- Line up the pin bar – the lug (arrow) must point towards the edge of the cover.
- Push the pin bar (1) into its seat in the cover as far as stop.

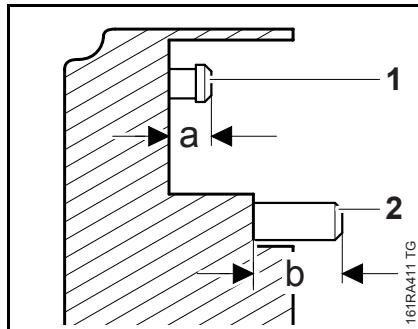


- Use a suitable tool to pull the pins (1 and 2) out of the cover.



- Before installing the new pin (1), coat its knurled shank with Loctite, 16
- Position the new pin (1) in the bore (arrow) so that the knurling on the pin meshes with the existing knurling in the bore.

Turn pin back and forth as necessary.



View from air filter side.

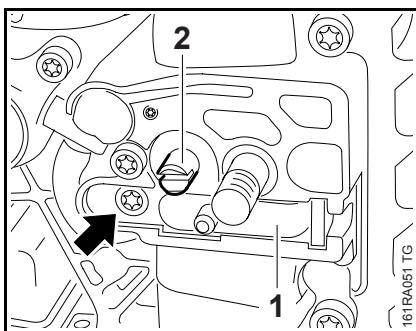
- Carefully tap home the pins (1 and 2) to obtain the following dimensions:  
Pin (1) a = 6.3 mm  
Pin (2) b = 13.4 mm

The pins must be driven home squarely.

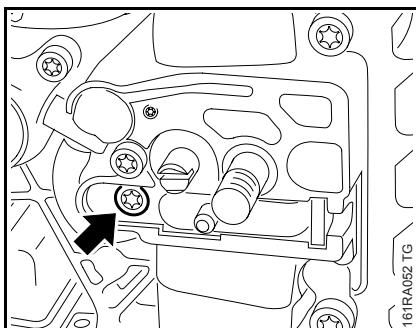
- Reassemble all other parts in the reverse sequence.
- Lubricate the brake lever and flat spring, 16

## 7.6 Chain Tensioner

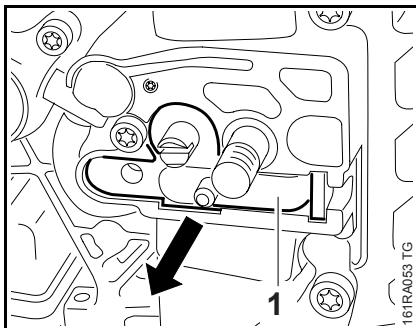
- Remove the chain sprocket cover, bar and chain, **5**
- Troubleshooting, **4.2**



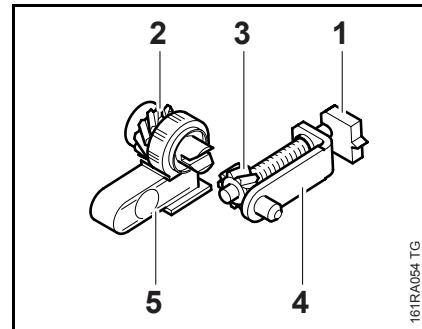
- Turn the spur gear (2) clockwise until the tensioner slide (1) butts against the right-hand end and the screw (arrow) is visible.



- Take out the screw (arrow).



- Use a suitable tool to pull out the complete chain tensioner (1).

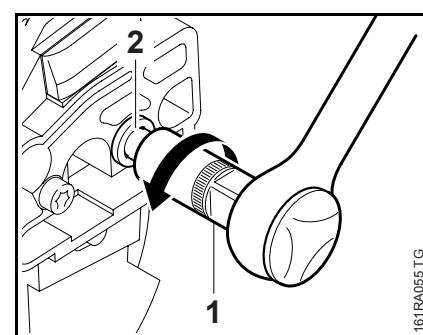


- Inspect the thrust pad (1), spur gear (2), adjusting screw (3), tensioner slide (4) and cover (5) and replace if necessary.
- Clean all disassembled parts with a little standard commercial solvent-based degreasant containing no chlorinated or halogenated hydrocarbons. Replace any damaged or worn parts.

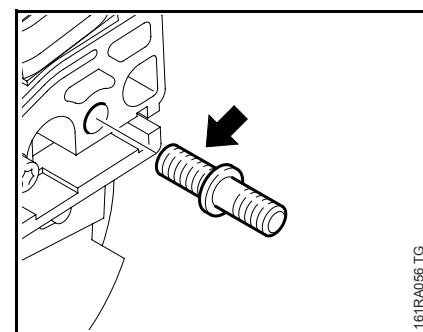
Always replace the adjusting screw and spur gear as a matching pair.

- Check operation.
- Lubricate the chain tensioner with STIHL multipurpose grease, **16**
- Reassemble in the reverse sequence.

## 7.7 Bar Mounting Stud



- Remove the chain sprocket cover, bar and chain, **5**
- Push stud puller 5910 893 0501 (1) over the collar stud (2) as far as it will go. Unscrew the stud.



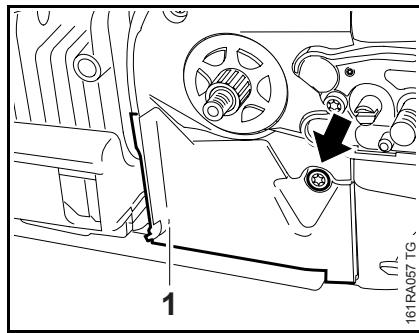
- Before installing, coat thread (arrow) of collar stud with Loctite, **16**
- Fit collar stud and tighten it down firmly.
- Tightening torques, **3.5**
- Reassemble all other parts in the reverse sequence.

## 8. Engine

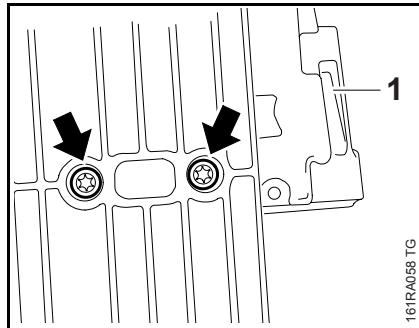
### 8.1 Muffler / Spark Arresting Screen

Always check and, if necessary, repair the fuel system, carburetor, air filter and ignition system before looking for faults on the engine.

- Troubleshooting, **4**

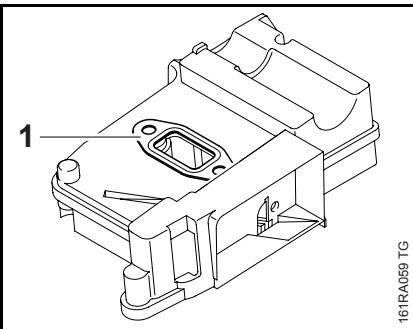


- Take out the screw (arrow).
- Remove the cover (1).



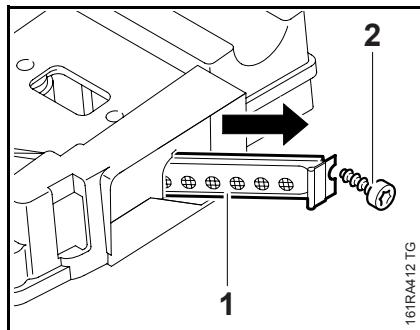
- Take out the screws (arrows).
- Remove the muffler (1), check and replace if necessary.

The muffler must not be opened – the upper and lower casings and screws are bonded in position.

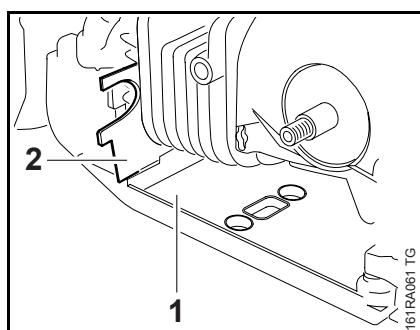


- Remove the exhaust gasket (1).

#### Spark arresting screen (if fitted)



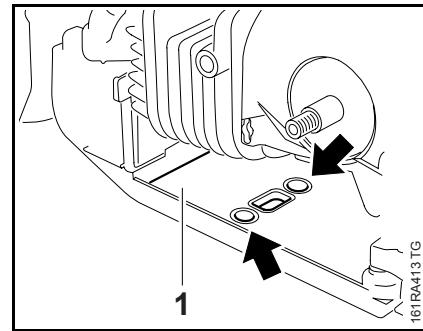
- Take out the screw (arrow) and use suitable pliers to pull out the spark arresting screen (1).
- Clean the spark arresting screen (1) and replace if necessary.
- Reassemble in the reverse sequence.



- Check the heat shield (1) and replace if necessary

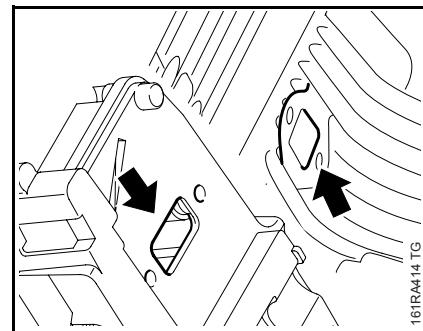
- Pull out the insulating plate (2), check and replace if necessary.

- Reassemble in the reverse sequence.

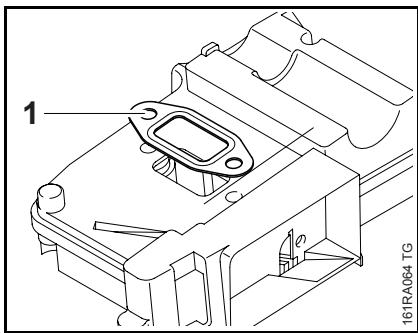


Surface must be clean and free from grease.

- Line up the new heat shield (1) with the holes (arrows) and bond it in position.

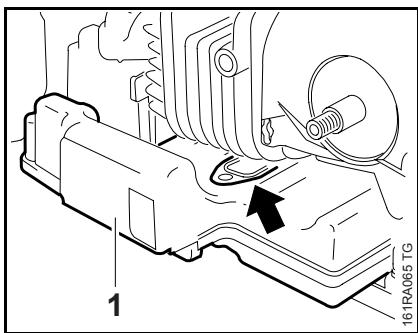


- Inspect and clean the sealing faces (arrows), **16**



Use a new exhaust gasket.

- Fit the exhaust gasket (1).



- Carefully push the muffler (1) into position.
- Check that the exhaust gasket (arrow) has not shifted.
- Fit the screws with washers and check correct position of exhaust gasket again.
- Insert screws and tighten them down firmly.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

## 8.2 Leakage Test

Defective oil seals and gaskets or cracks in castings are the usual causes of leaks. Such faults allow supplementary air to enter the engine and upset the fuel-air mixture.

This makes adjustment of the prescribed idle speed difficult, if not impossible.

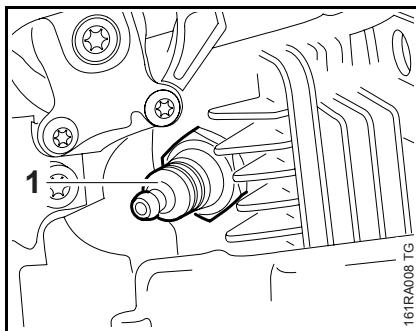
Moreover, the transition from idle speed to part or full throttle is not smooth.

Always perform the vacuum test first and then the pressure test.

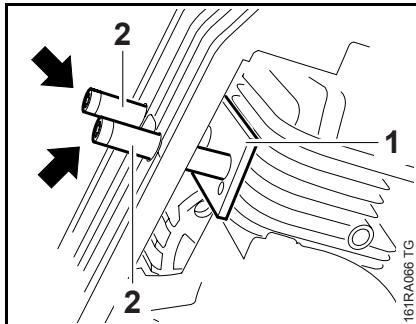
The engine can be checked thoroughly for leaks with the pump 0000 850 1300.

### 8.2.1 Preparations

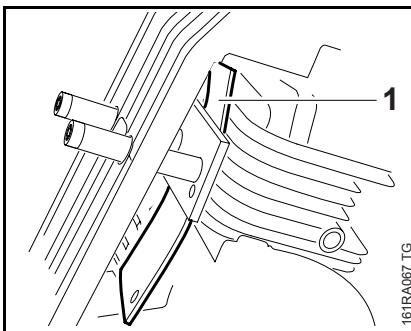
The preparations are the same for the MS 200 and MS 200 T even though their handle housings and the position of the carburetor are different.



- Remove the chain sprocket cover, bar and chain, **5**
- Pull off the spark plug boot.
- Unscrew the spark plug (1).
- Set the piston to top dead center. This can be checked through the spark plug hole.
- Fit the spark plug (1) and tighten it down firmly.
- Tightening torques, **3.5**
- Remove the muffler, **8.1**



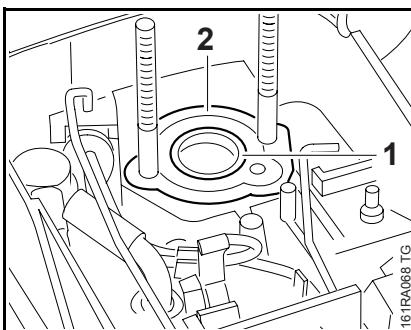
- Fit the flange (1) 1123 855 4200.
- Fit the spacer sleeves (2) 1124 893 7100.
- Fit the M5 x 65 screws (arrows).



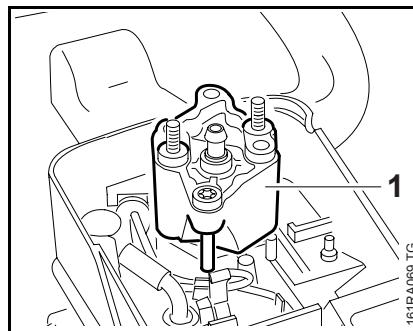
- Fit the sealing plate (1) 0000 855 8106 between the cylinder exhaust port and flange and tighten down the screws moderately.

The sealing plate must completely fill the space between the two screws.

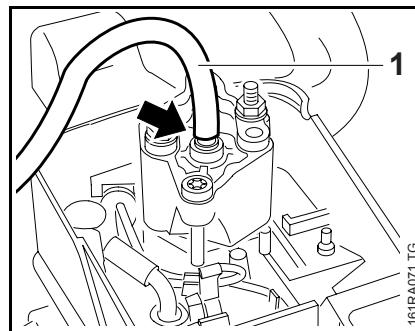
- Remove the carburetor, MS 200 14.2  
MS 200 T 14.2.1



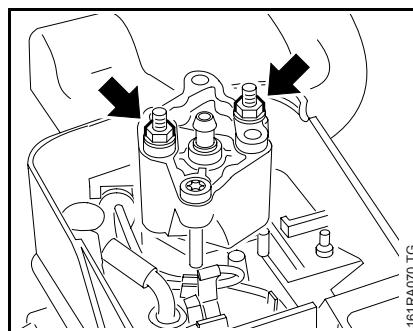
Check that the sleeve (1) and washer (2) are in place.



- Fit the test flange 1128 850 4200 (1).



- Connect suction hose (1) of pump 0000 850 1300 to nipple (arrow).

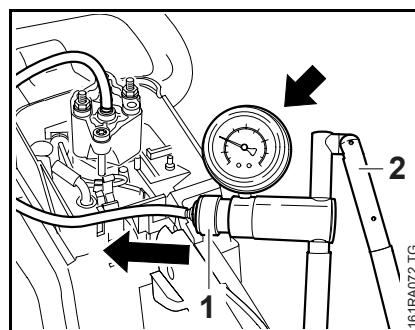


- Fit the nuts (arrows) and tighten them down firmly.

## 8.2.2 Vacuum Test

Oil seals tend to fail when subjected to a vacuum, i.e. the sealing lip lifts away from the crankshaft during the piston's induction stroke because there is no internal counterpressure.

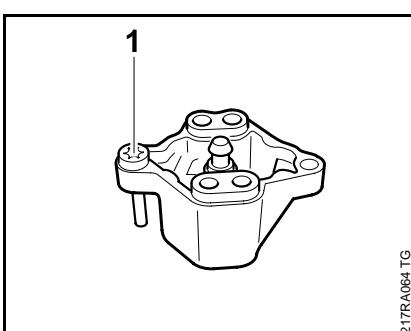
A test can be carried out with pump 0000 850 1300 to detect this kind of fault.



- Push ring (1) to the left.
- Operate the lever (2) until the pressure gauge (arrow) indicates a vacuum of 0.5 bar.

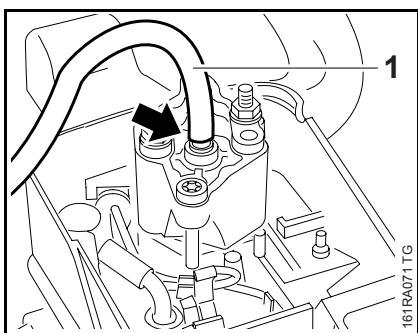
If the vacuum reading remains constant, or rises to no more than 0.3 bar within 20 seconds, it can be assumed that the oil seals are in good condition. However, if the pressure continues to rise (reduced vacuum in the engine), the oil seals must be replaced, 8.3.

- After finishing the test, push the ring to the right to vent the pump.
- Continue with pressure test, 8.2.3



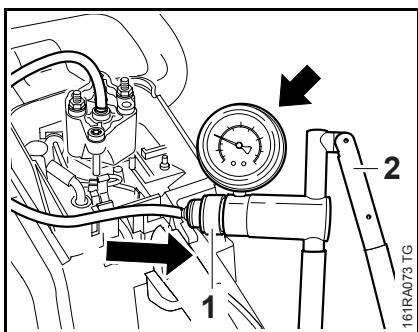
- MS 200 T: Take the screw (1) out of the test flange.

### 8.2.3 Pressure Test



Carry out the same preparations as for the vacuum test, **8.2.2**

- Always carry out the vacuum test before the pressure test, **8.2.2**
- Connect pressure hose (1) of pump 0000 850 1300 to nipple (arrow).



- Push ring (1) to the right.
- Operate the lever (2) until the pressure gauge (arrow) indicates a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the engine is airtight.

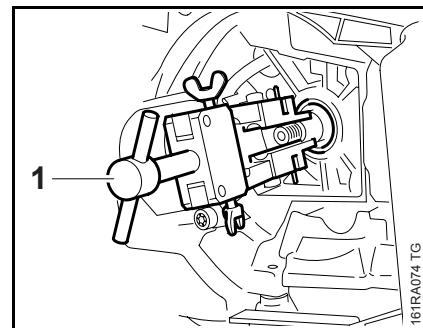
- If the pressure drops, the leak must be located and the faulty part replaced.

To find the leak, coat the suspect area with oil and pressurize the engine. Bubbles will appear if a leak exists.

- After finishing the test, push the ring to the left to vent the pump – disconnect the hose.
- Remove the test flange.
- Install the carburetor, MS 200 **14.2**  
MS 200 T **14.2.1**
- Remove the flange and sealing plate.
- Install the muffler, **8.1**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

### 8.3 Oil Seals

It is not necessary to disassemble the engine to replace the oil seals.



- Free off the oil seal in its seat by tapping it with a suitable tube or a punch.

- Apply puller (1) 5910 890 4400 with jaws 0000 893 3706.

- Clamp the puller arms.

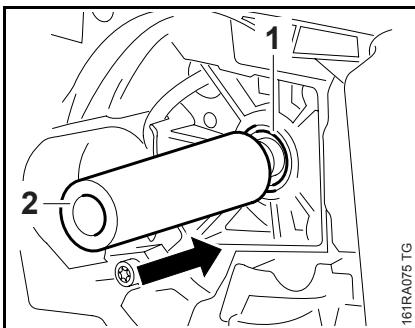
- Pull out the oil seal.

Take care not to damage the crankshaft stub.

- Clean the sealing face, **16**

Install only new oil seals.

- Lubricate sealing lips of new oil seal with grease, **16**

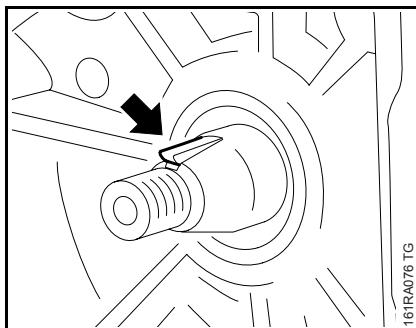


- Apply a thin coating of sealant to the outside diameter of the oil seal, **16**
- Slip the oil seal, lip facing outwards, over the crankshaft stub.
- Use press sleeve (2) 1123 893 2400 to install the oil seal (1).

The seating face must be flat and free from burrs.

- Wait about one minute, then rotate the crankshaft several times.

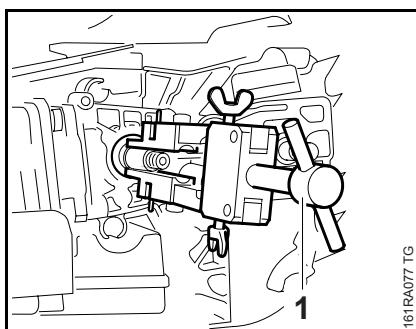
Degrease the crankshaft taper with a little standard commercial solvent-based degreasant containing no chlorinated or halogenated hydrocarbons.



- Check key (arrow) and replace if necessary – make sure it is properly seated.
- Reassemble all other parts in the reverse sequence.

#### Clutch side

- Remove the chain sprocket cover, bar and chain, **5**
- Remove the clutch, **6**
- Remove the oil pump, **13.4**



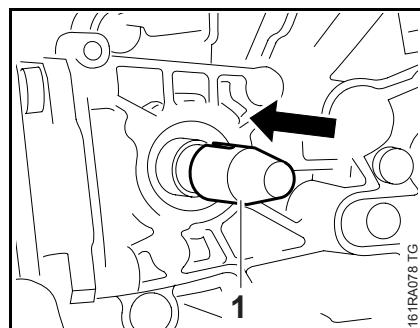
- Free off the oil seal in its seat by tapping it with a suitable tube or a punch.
- Apply puller (1) 5910 890 4400 with jaws 0000 893 3706.
- Clamp the puller arms.
- Pull out the oil seal.

Take care not to damage the crankshaft stub.

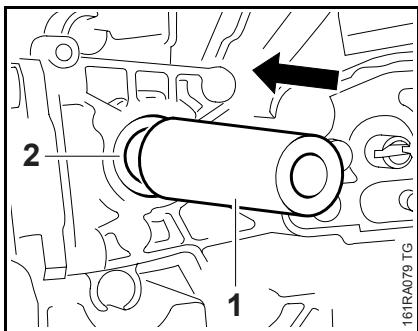
- Clean the sealing face, **16**

Install only new oil seals.

- Lubricate sealing lips of new oil seal with grease, **16**



- Fit the installing sleeve (1) 1129 893 4600.
- Apply a thin coating of sealant to the outside diameter of the oil seal, **16**
- Slip the oil seal, lip facing outwards, over the installing sleeve.
- Remove the installing sleeve (1).



- Use press sleeve (1) 1123 893 2400 to install the oil seal (2).

The seating face must be flat and free from burrs.

- Wait about one minute, then rotate the crankshaft several times.
- Reassemble all other parts in the reverse sequence.

#### 8.4 Cylinder

Before removing the piston, decide whether or not the crankshaft has to be removed as well.

##### Cylinder installed

To remove the flywheel and clutch, the crankshaft has to be blocked by inserting the locking strip in the spark plug hole.

##### Cylinder removed

To remove the flywheel and clutch, the crankshaft has to be blocked by resting the piston on the wooden assembly block.

- Remove the chain sprocket cover, bar and chain, 8 5
- Pull off the boot and unscrew the spark plug, 8 6

– Remove the muffler, 8 1

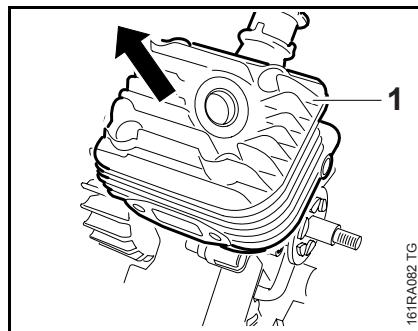
– Remove the fan housing, 10.2

– Remove the carburetor, MS 200 14.2  
MS 200 T 14.2.1

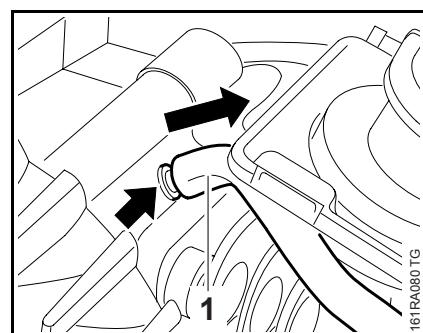
– Remove the handle housing, MS 200 12.4  
MS 200 T 12.5

– Drain the fuel and oil tanks, 1

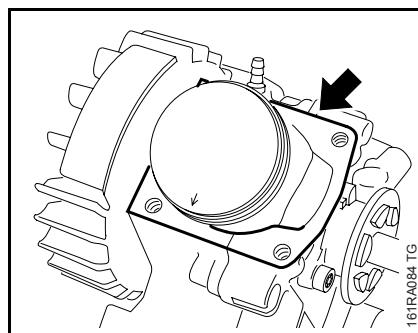
– Remove the tank housing, 14.8



- Carefully lift the cylinder (1) away.



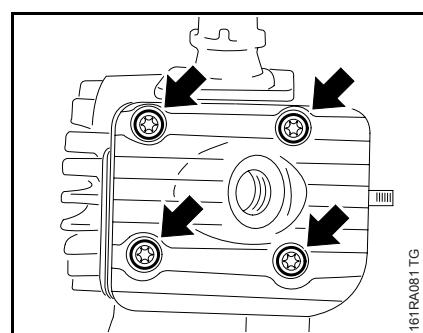
- Remove the cylinder gasket (1).



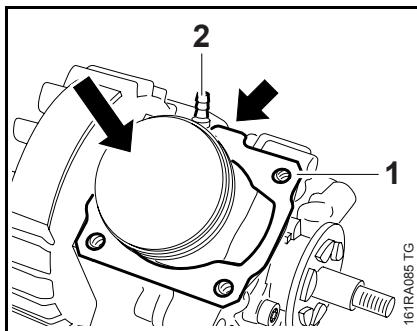
- Inspect and clean the sealing face (arrow), 16

The sealing face must be in perfect condition. Always replace components with damaged sealing faces, 4.7.

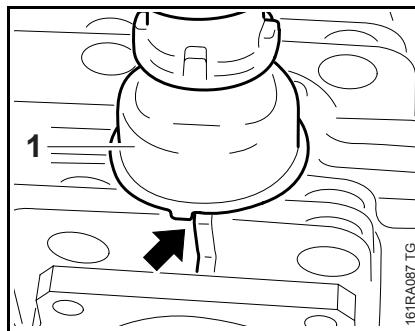
Always use a new cylinder gasket when re-installing the cylinder.



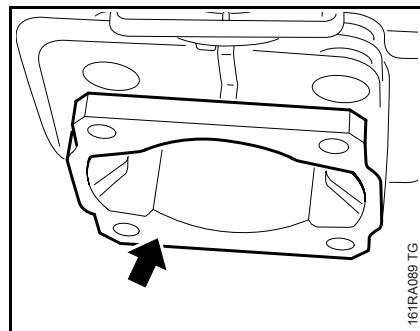
- Take out the four cylinder base screws through the holes (arrows) in the cylinder.



- Line up the cylinder gasket (1) so that its tab (arrow) is on the same side as the nipple (2) for the impulse hose.
- Place the cylinder gasket (1) in position.

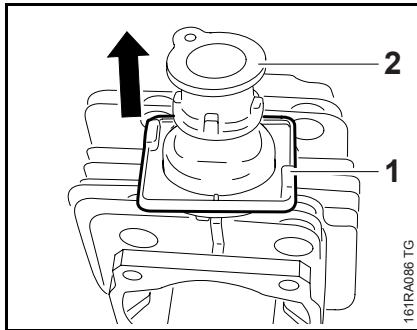


- Push the manifold (1) on to the intake stub.
- Line up the manifold.
- The tab on the manifold must locate against the left side (see illustration) of the lug (arrow).

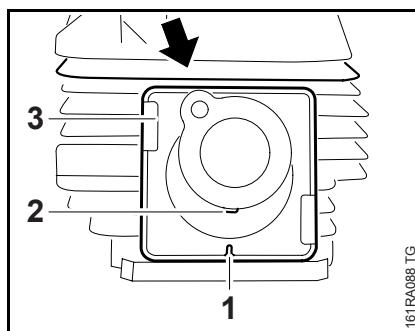


- Inspect and clean the sealing face (arrow) and remove any gasket residue.
- Also check the sealing faces on the cylinder intake and exhaust ports.

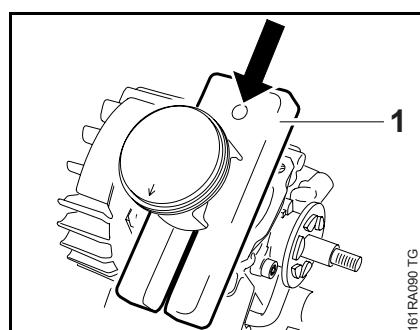
The sealing faces must be in perfect condition. If the sealing faces are damaged, install a new cylinder.



- Inspect the intake manifold (2) and replace it if necessary – even very minor damage can result in engine running problems, 4.7
- Remove the retaining plate (1).
- Pull off the intake manifold (2).

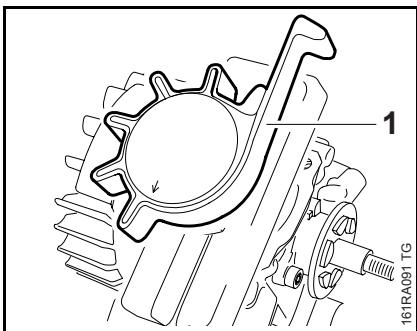


- Position the retaining plate (3) so that the rib (1) lines up with the raised molding on the manifold (2).
- Push the retaining plate (3) on as far as stop – the edge (arrow) must be in line with the cylinder fin.



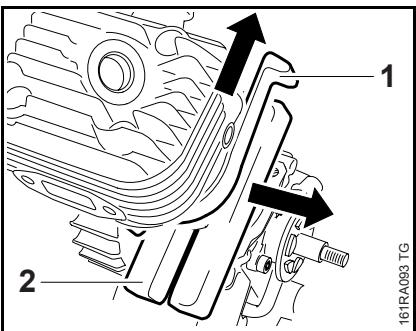
- Slide the wooden assembly block (1) 1108 893 4800 between the piston and crankcase.

Take care not to displace or damage the cylinder gasket.



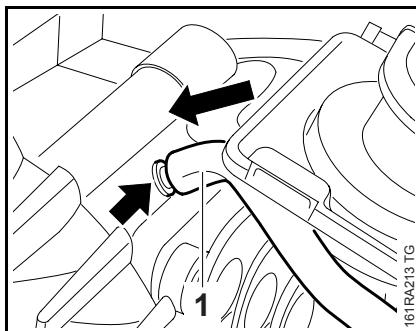
- Lubricate the piston, piston rings and cylinder wall with oil, **16**
- Use the clamping strap (1) 0000 893 2600 to compress the rings around the piston.
- Check correct installed position of rings, **8.7**

Apply the clamping strap (1) so that the piston rings do not project beyond the cylinder wall.



- Remove the clamping strap (1) and wooden assembly block (2).

Make sure the cylinder gasket is properly seated.

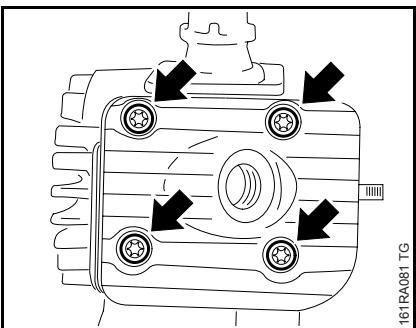


- Push the impulse hose (1) on to the nipple (arrow).

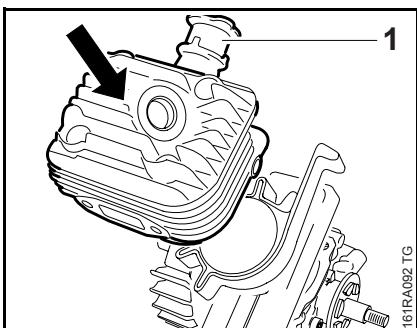
- Install the tank housing, **14.8**

When installing the handle housing, check that the impulse hose is properly fitted on the nipple, MS 200 **12.4**, MS 200 T **12.5**.

- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**



- Push the cylinder fully home.
- Insert the screws (arrows) to hold the cylinder and gasket in position.
- Tighten down the screws in an alternate pattern.
- Tightening torques, **3.5**



- Align the cylinder so that the intake port (1) points towards the nipple for the impulse hose.

While sliding the cylinder over the piston, hold the clamping strap tightly around the piston so that the rings do not project – they might otherwise break.

- Slide the cylinder over the piston, the clamping strap moves downwards at the same time.

## 8.5 Crankshaft

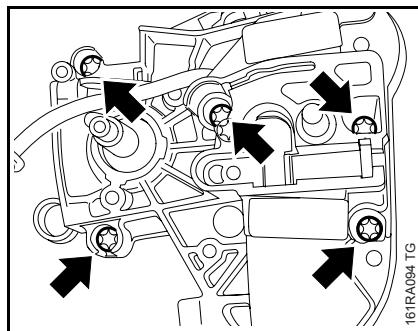
### 8.5.1 Removing and Installing

The crankshaft bearings are not press-fitted. The two halves of the crankcase can therefore be separated without a puller.

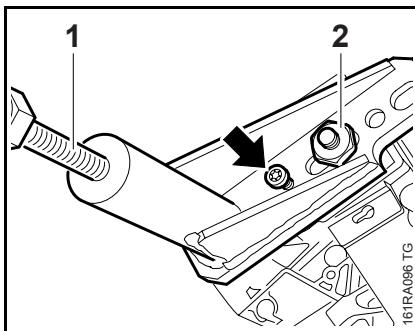
If the two halves of the crankcase are stuck, use service tool 5910 007 2205 to ease them apart.

- Remove the chain sprocket cover, bar and chain, **5**
- Remove the flywheel, **9.4**
- Remove the ignition module, **9.2.1**
- Remove the clutch drum, **6.1**
- Remove the oil pump, **13.4**
- Remove annular buffer from the oil tank, **11.1**
- Remove the cylinder, **8.4**
- Remove the piston, **8.6**
- Remove the spiked bumper and chain catcher, **5.1**
- Remove the chain tensioner, **7.6**

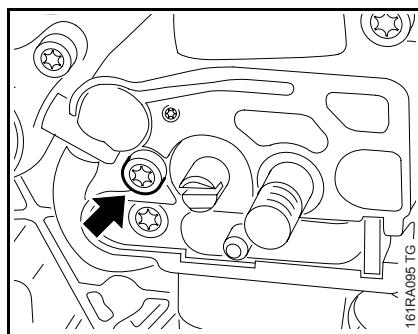
Always install new bearings and oil seals after removing the crankshaft, **8.5.2**



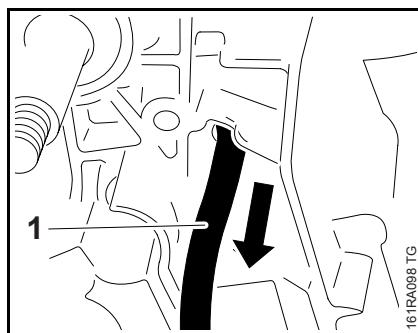
- Take out the screws (arrows).



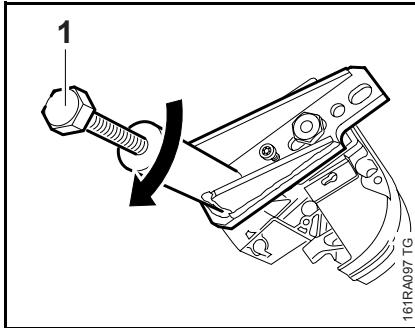
- Back off the spindle (1) in service tool until it is clear of the crankshaft stub.



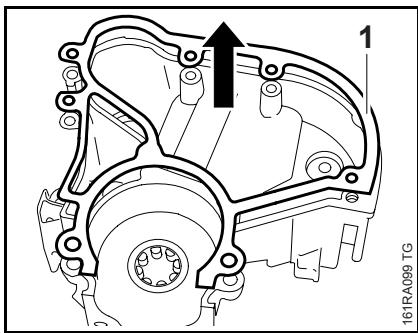
- Take out the screw (arrow).



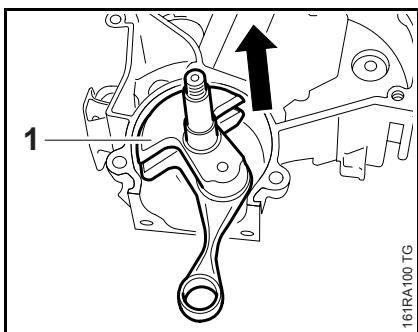
- Pull out the ignition lead (1) at the clutch side.



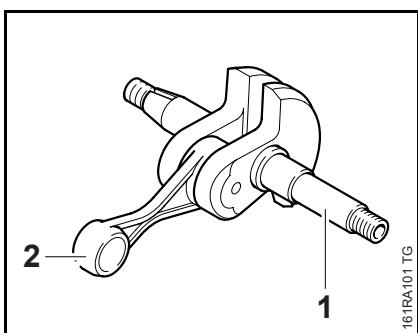
- Turn the spindle (1) clockwise until the crankcase is released.
- Remove the service tool.
- Pull off the clutch side of the crankcase.



- Remove the gasket (1).



- Pull out the crankshaft (1).



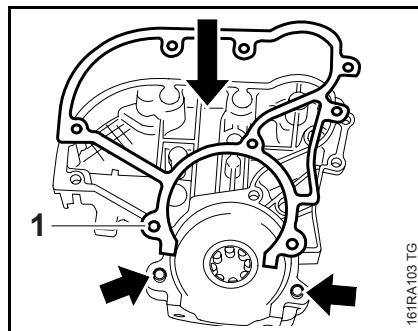
The crankshaft (1), connecting rod (2) and needle bearing form an inseparable unit.

- Inspect both halves of the crankcase and replace if necessary, 8.5.2
- Install new roller bearings, 8.5.2

Before installing, clean the crankshaft with a standard commercial, solvent-based degreasant containing no chlorinated or halogenated hydrocarbons.

Take care not to damage the crankshaft stub.

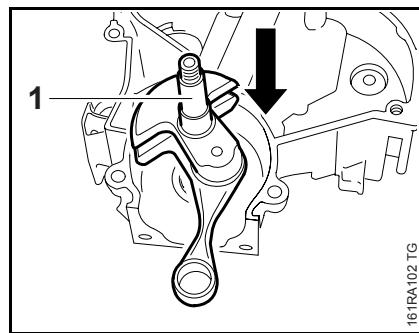
Inspect and clean the sealing faces on the ignition side of the crankcase (including the cylinder sealing face)  
– the sealing faces must not be damaged in any way.



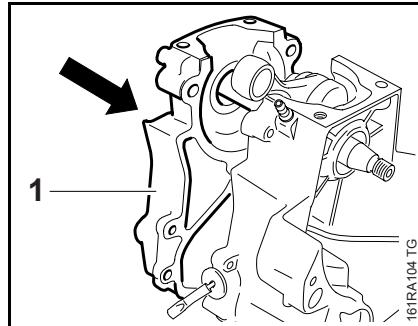
- Place the new gasket (1) on the clutch side of the crankcase and over the guide sleeves (arrows)  
– the gasket is now held in position.

Inspect and clean the sealing faces on the clutch side of the crankcase (including the cylinder sealing face)  
– the sealing faces must not be damaged in any way.

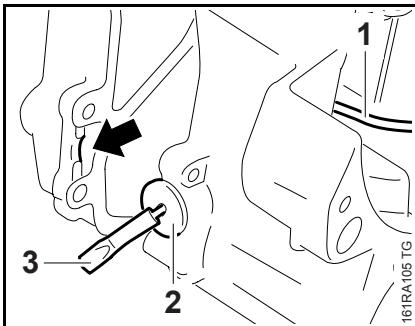
- Coat straight stub of crankshaft with oil.



- Coat tapered stub of crankshaft with oil.
- Line up the tapered stub of the crankshaft (1) with the roller bearing at the ignition side.
- Push the crankshaft (1) into the roller bearing as far as stop.

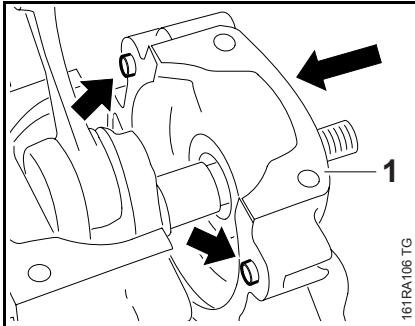


- Position the clutch side of the crankcase (1) on the straight stub of the crankshaft.



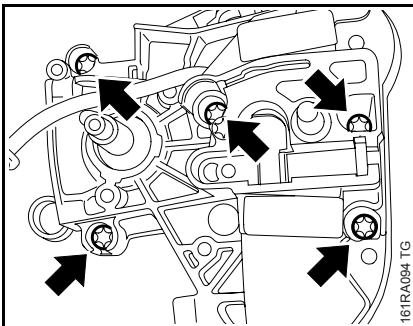
The short circuit wire (1) with grommet (2) must be positioned kink-free in the ignition side of the crankcase so that the connector (3) locates against the grommet.

The grommet must engage the clutch side of the crankcase (arrow).



Make sure the sleeves (arrows) engage the holes and the gasket is not pinched or twisted.

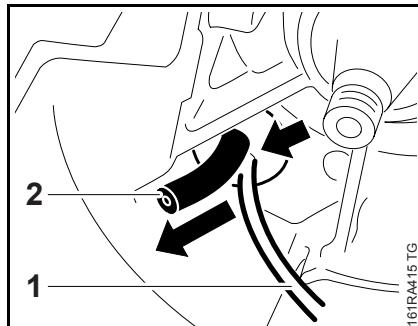
- Hold the oil suction hose in the crankcase so that it is not pinched during assembly.
- Push the clutch side (1) of the crankcase into position as far as stop.



- Insert the screws (arrows) and tighten them down firmly in an alternate pattern.
- Tightening torques, **3.5**



- Push the ignition lead (1) through the hole (arrow) in the clutch side of the crankcase.



- The short circuit wire must be in the smaller hole (arrow) in the grommet.
- Using STIHL Press Fluid simplifies the job of pushing the ignition lead (1) through the grommet, **16**
- Push the ignition lead (1) through the grommet (2).
- Check and install the piston, **8.6.2**
- Check and install the cylinder, **8.4**
- Reassemble all other parts in the reverse sequence.

## 8.5.2 Bearings / Crankcase

Each half of the crankcase can be replaced separately if it is damaged.

New crankcase halves are supplied with the main parts preassembled – see the parts list.

Parts not supplied with the new crankcase must be transferred from the original crankcase – check the parts and replace if necessary.

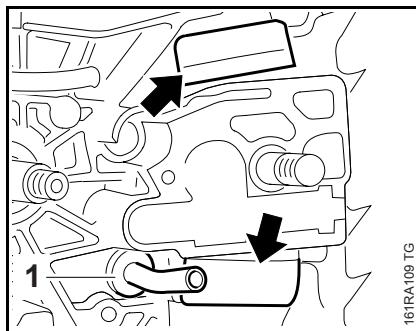
If a new crankcase is installed, the machine's serial number must be stamped on it with 2.5 mm figure stamps.

If the original crankcase is used again, replace the oil seals and roller bearings, remove any gasket residue and clean the sealing surfaces thoroughly. The sealing faces must be clean to guarantee a perfect seal.

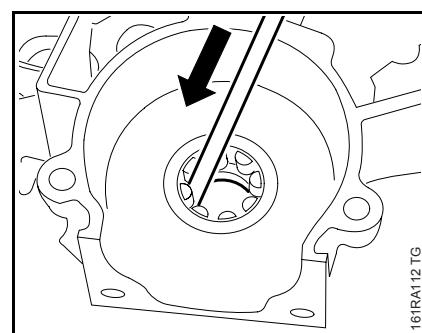
Inspect both halves of the crankcase for cracks and all sealing faces for signs of damage.

- See also Troubleshooting, [4.7](#)
- Pull out the ignition lead and remove the crankshaft, [8.5.1](#)
- Wear protective gloves to reduce the risk of burn injury.

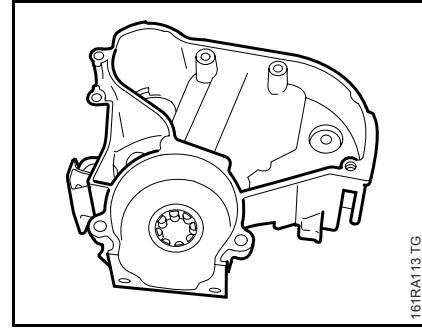
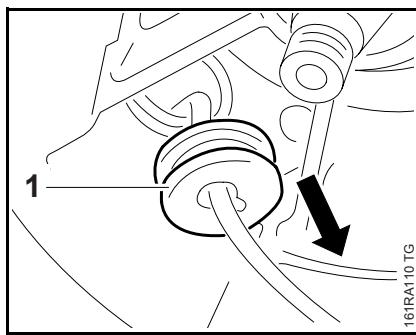
As the crankcase halves have to be heated to remove and install the roller bearings, all heat-sensitive parts have to be removed.



**Ignition side of crankcase**

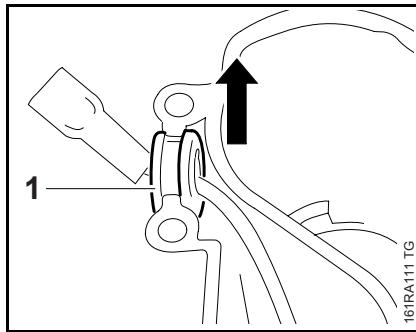


- Use a suitable punch to carefully drive out the oil seal.

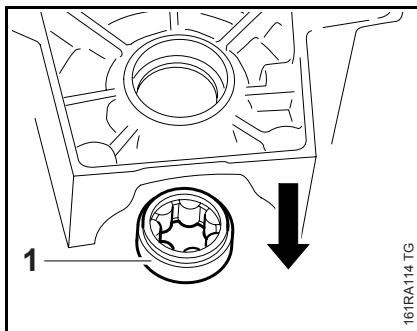


- Check and clean the crankcase or replace if necessary.

If this half of the crankcase is in order, install a new roller bearing.

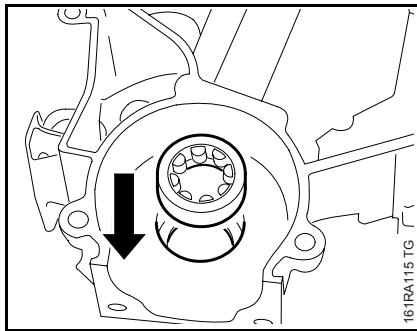


- Pull out the grommet (1) and take it out of the crankcase with the short circuit wire.
- Remove and disconnect the oil tank cap, [13.1](#)
- Unscrew the annular buffer, [11.3](#)



- Heat the area of the bearing seat to about 230°C (446°F).

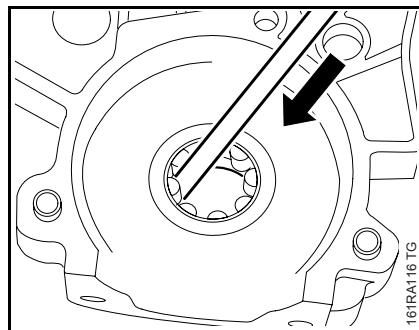
The roller bearing (1) drops out as soon as this temperature is reached.



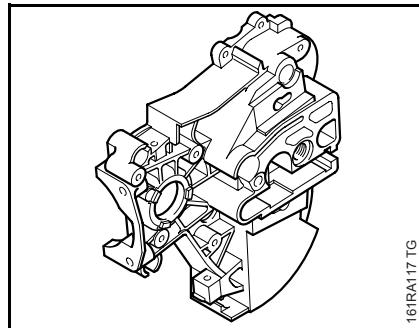
- Heat the area of the bearing seat to about 230°C (446°F).
- Position the roller bearing so that the nylon ring faces outwards.
- Push the roller bearing home as far as stop.

This operation must be carried out quickly because the bearing absorbs heat and begins to expand.

### Clutch side of crankcase

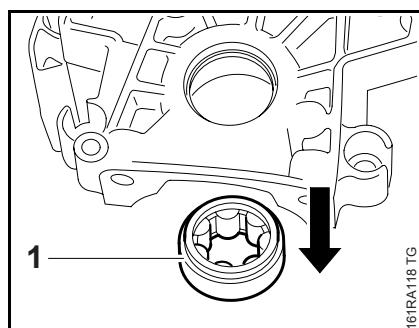


- Use a suitable punch to carefully drive out the oil seal.



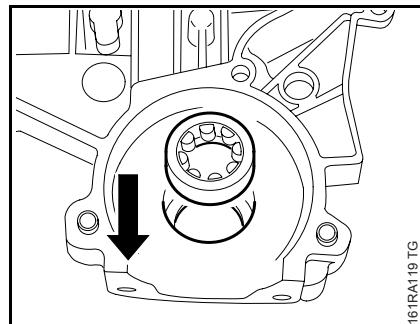
- Check and clean the crankcase or replace if necessary.

If this half of the crankcase is in order, install a new roller bearing.



- Heat the area of the bearing seat to about 230°C (446°F).

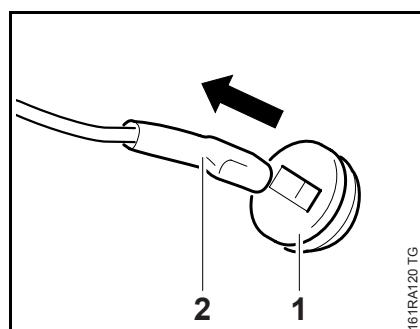
The roller bearing (1) drops out as soon as this temperature is reached.



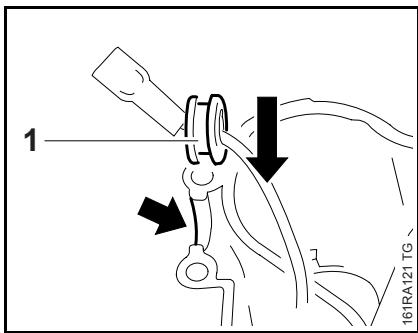
- Heat the area of the bearing seat to about 230°C (446°F).
- Position the roller bearing so that the nylon ring faces outwards.
- Push the roller bearing home as far as stop.

This operation must be carried out quickly because the bearing absorbs heat and begins to expand.

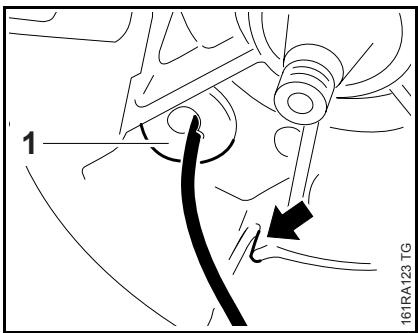
After the crankcase halves have cooled, fit the short circuit wire in the ignition side of the crankcase.



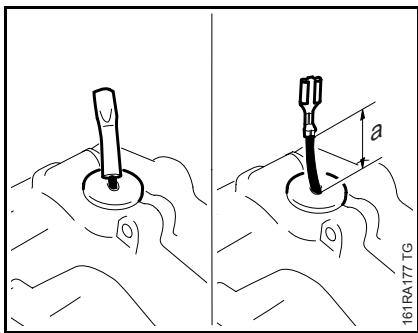
- Push the grommet (1) – rectangular opening first – over the connector (2).



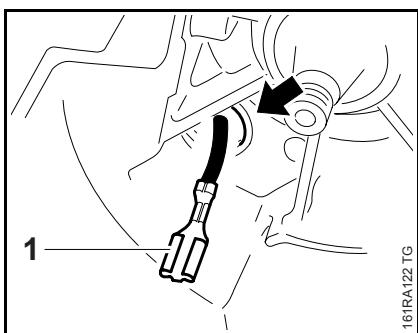
- Push the grommet (1) with short circuit wire into its seat (arrow).



- Fit the grommet (1) for the ignition lead and short circuit wire.
- Push the grommet (1) fully into the hole and line it up so that the notched opening for the short circuit wire points to the cable guide (arrow).
- Install the crankshaft and the ignition lead, **8.5.1**
- Install the oil seals, **8.3**
- Reassemble all other parts in the reverse sequence.



- MS 200 (above left)**  
Connector with sleeve butts against the grommet.
- MS 200 T (above right)**  
Connector without sleeve, distance from grommet  
 $a = \text{about } 2.5 \text{ cm}$



- Pull short circuit wire connector (1) through the hole (arrow) at the opposite side.

## 8.6 Piston

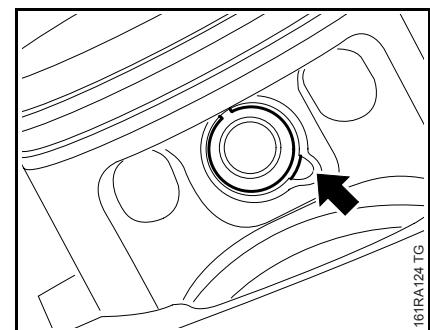
### 8.6.1 Removal

Before removing the cylinder, decide whether or not the crankshaft has to be removed as well, **8.5**

- Remove the cylinder, **8.4**

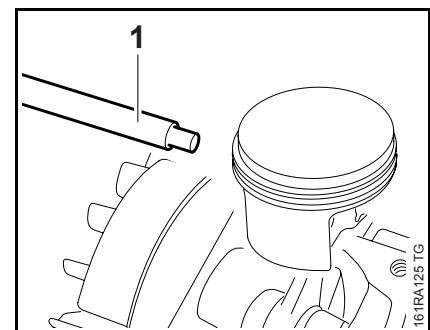
The assembly drift

1114 893 4700 can be pushed through the installed snap ring. Therefore, it is not necessary to remove both snap rings in order to remove and install the piston pin.

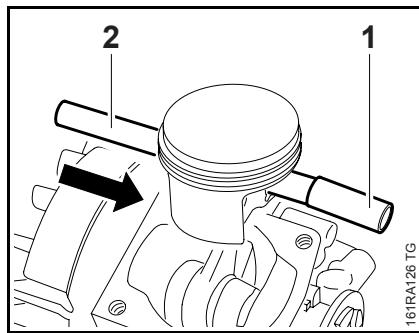


Remove the snap ring at the clutch side of the piston.

- Use a suitable tool to grip the snap ring at the recess (arrow) and ease it out.



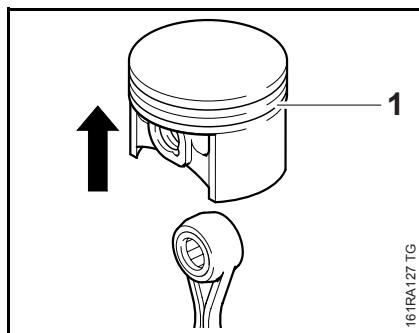
- Place the assembly drift (1) 1114 893 4700 in position.



- Use the assembly drift (2) 1114 893 4700 to push the piston pin (1) out of the piston.

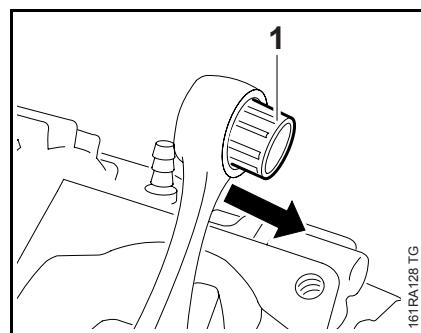
If the piston pin is stuck, release it by tapping the end of the drift lightly with a hammer.

Hold the piston steady during this process to ensure that no jolts are transmitted to the connecting rod.

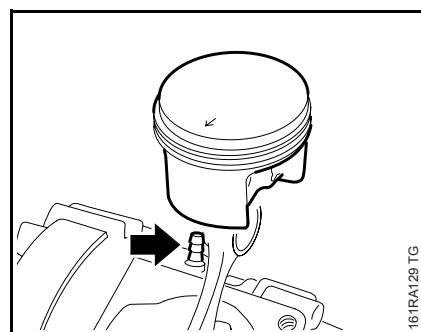


- Remove the piston (1) from the connecting rod.
- Inspect the piston rings and replace if necessary, 8.7

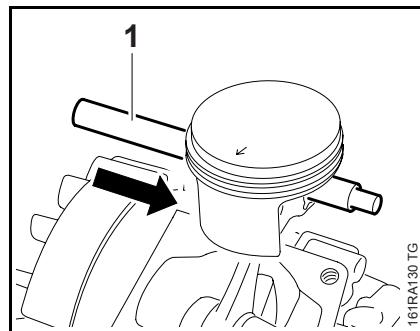
## 8.6.2 Installing



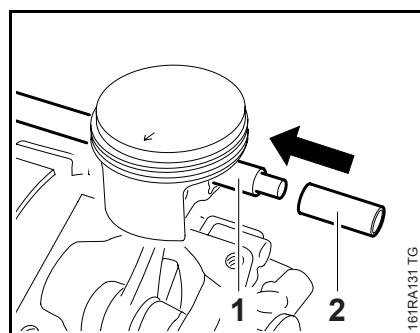
- Pull out the needle cage (1), check it and replace if necessary.
- Lubricate the needle cage with oil and push it into the connecting rod.



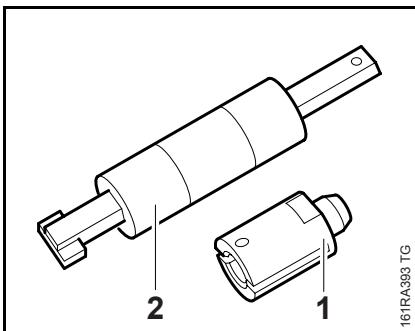
- Line up the piston so that the arrow on the piston crown points away from the nipple (arrow).
- Place the piston on the connecting rod.



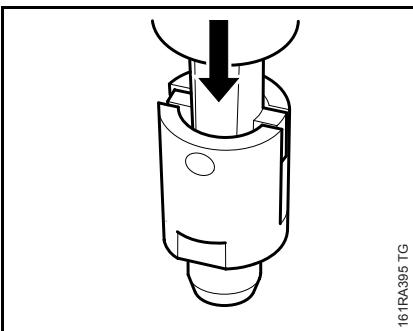
- Apply the assembly drift to the side with the installed snap ring – the assembly drift 1114 893 4700 can be pushed through the installed snap ring.
- Push the assembly drift (1) 1114 893 4700, small diameter first, through the piston and small end (needle cage) and line up the piston.



- Lubricate the piston pin with oil.
- Fit the piston pin (2) on the assembly drift (1) 1114 893 4700 and slide it into the piston.

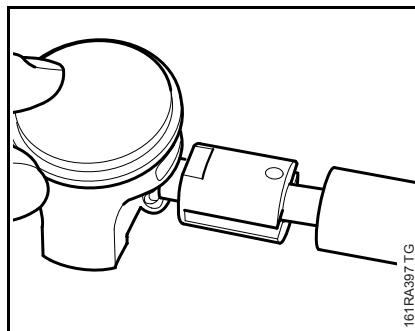


- Remove the sleeve (1) from the installing tool 5910 890 2210.

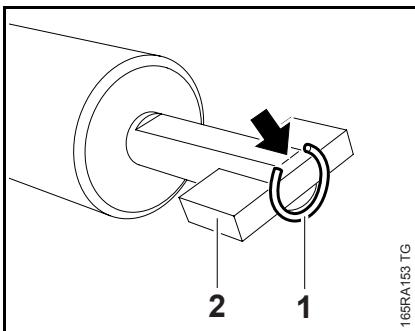


- Press the installing tool downwards into the sleeve until the magnet butts against the end of the guide slot.

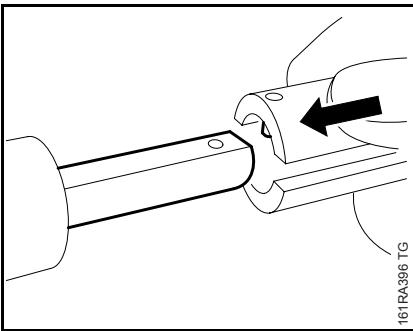
Use a suitable base.



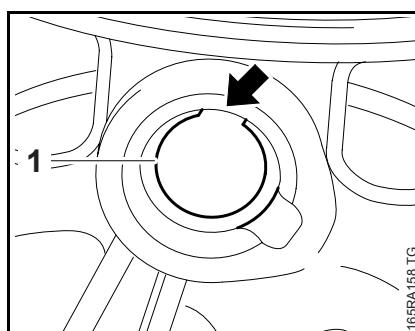
- Apply the installing tool 5910 890 2210 with the sleeve's taper against the piston boss, hold the piston steady, center the tool shank exactly and press home until the snap ring slips into the groove.



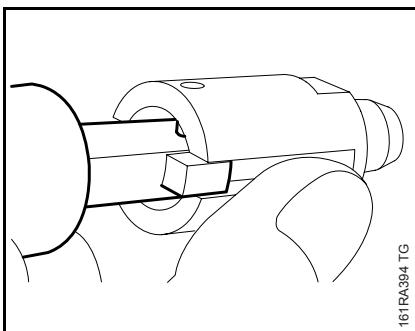
- Attach the snap ring (1) to the magnet (2) so that the snap ring gap is on the flat side of the tool's shank (arrow).



- Remove the sleeve and slip it onto the other end of the shank – the inner pin must point towards the flat face.

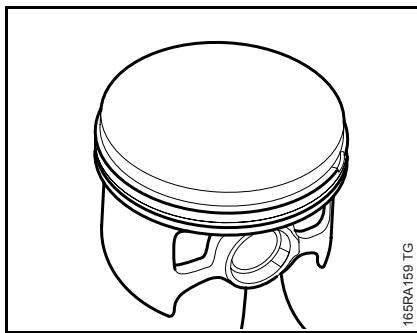


Fit the snap ring (1) so that its gap (arrow) points up.

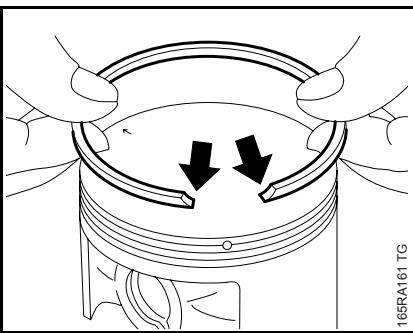


- Push the large slotted diameter of the sleeve over the magnet and snap ring.

The inner pin must point towards the flat face of the tool's shank.



165RA159 TG



165RA161 TG

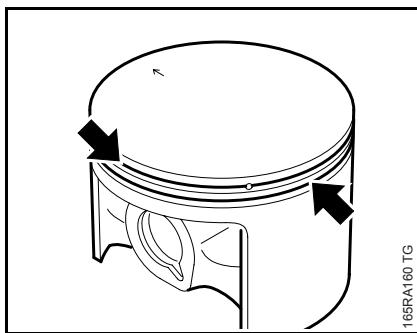
- Inspect the piston rings and replace if necessary, **8.7**

- Remove the cylinder, **8.4**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

## 8.7 Piston Rings

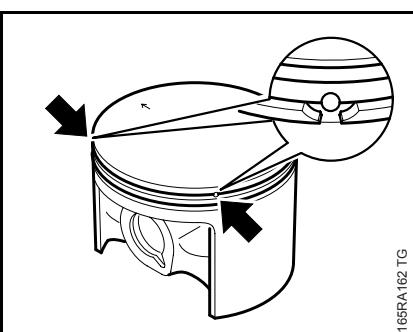
- Remove the piston, **8.6.1**

- Remove the piston rings from the piston.



165RA160 TG

- Use a piece of old piston ring to scrape the grooves clean.



165RA162 TG

- Position the piston rings so that the radii at the ring gap meet at the fixing pin in the piston groove (arrows).

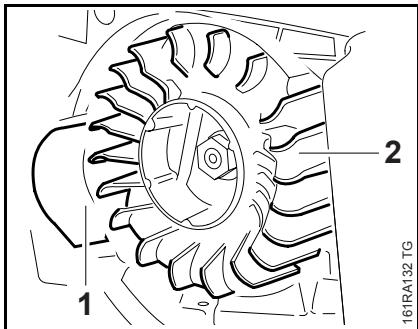
- Check correct installed position of the piston rings (arrows).
- Install the piston, **8.6.2**
- Reassemble all other parts in the reverse sequence.

## 9. Ignition System

Exercise extreme caution when troubleshooting and carrying out maintenance or repair work on the ignition system. The high voltages which occur can cause serious or fatal accidents.

Troubleshooting on the ignition system should always begin at the spark plug, [4.5](#)

- Remove the fan housing, [10.2](#)



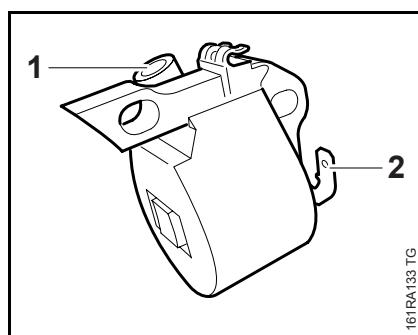
The electronic (breakerless) ignition system basically consists of an ignition module (1) and flywheel (2).

### 9.1 Ignition Timing

Ignition timing is fixed and cannot be adjusted during repair work.

Since there is no mechanical wear in these systems, ignition timing cannot get out of adjustment during operation.

### 9.2 Ignition Module



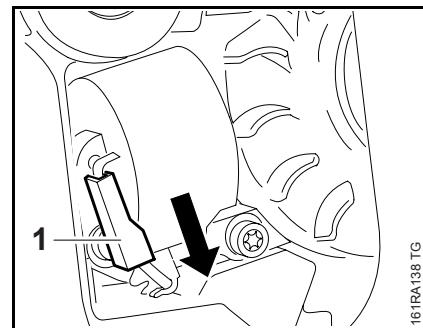
The ignition module accommodates all the components required to control ignition timing. There are two electrical connections on the coil body:

- the high voltage output (1) for the ignition lead
- the connector tag (2) for the short circuit wire

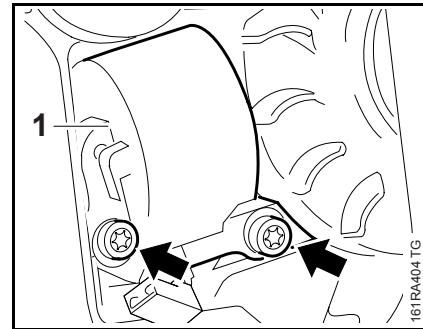
Testing in the workshop is limited to a spark test. A new ignition module must be installed, [9.2.1](#), if no ignition spark is obtained (after checking that the wiring, stop switch and flywheel are in good condition).

#### 9.2.1 Removing and Installing

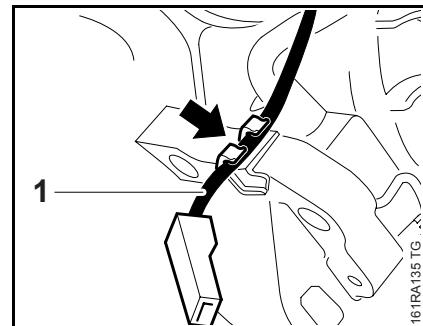
- Remove the fan housing, [10.2](#)



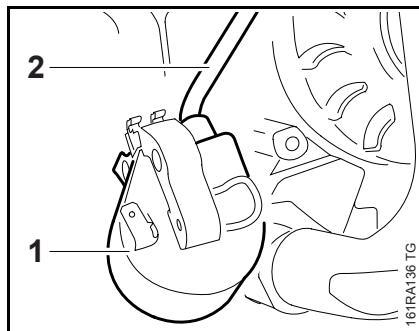
- Remove the connector (1).



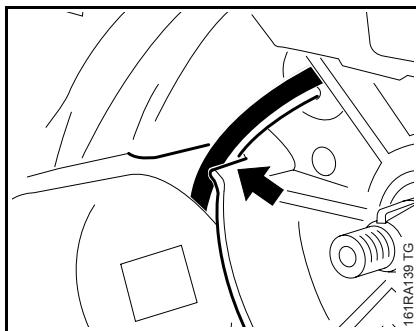
- Take out the screws with washers (arrows).
- Pull the ignition module (1) out a little.



- Disconnect the short circuit wire (1) from the retainer (arrow).



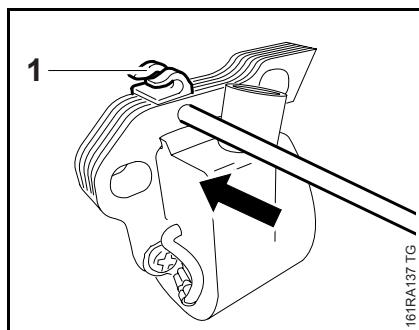
- Unscrew the ignition module (1) from the ignition lead (2).
  - Check the ignition module (1) and replace if necessary



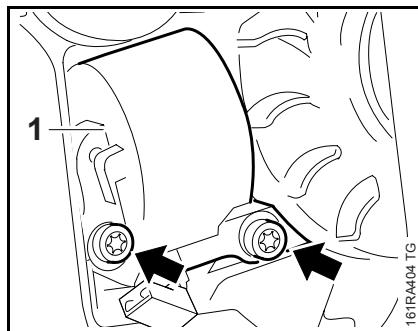
The flywheel is not shown in the illustration.

Before installing the ignition module, check that the ignition lead and short circuit wire are properly seated in the recess (arrow) and do not touch the flywheel

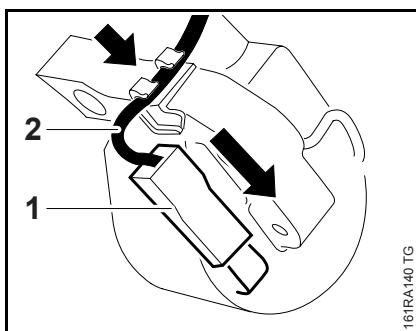
– there is otherwise a risk of damaging the insulation and causing a short circuit.



- Use a suitable punch to drive out the retainer (1).
  - Check the retainer and replace if necessary
  - Check the spark plug boot and ignition lead, and replace if necessary, **9.3**
  - Reassemble in the reverse sequence.
  - Troubleshooting, **4.5**



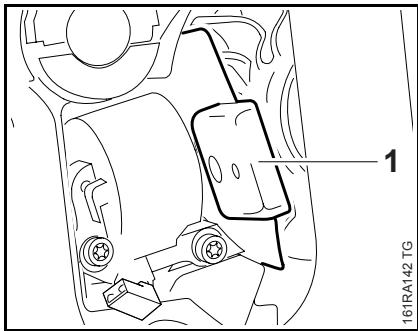
- Place the ignition module (1) in position and insert the screws with washers (arrows) – do not tighten down yet.



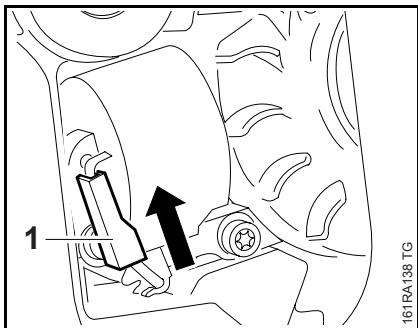
- Attach the connector (1) to the tag and push the short circuit wire (2) into the retainer (arrow).
  - The short circuit wire is now held in position and can be disconnected again from the ignition module.



- Push the ignition module (1) back – the flywheel must turn freely.
- Rotate the flywheel until the magnet poles (arrows) are next to the ignition module.



- Slide the setting gauge (1) 1111 890 6400 between the arms of the ignition module and the flywheel magnet.
- Press the ignition module against the setting gauge.
- Tighten down the screws firmly.
- Tightening torques, **3.5**
- Remove the setting gauge.
- Check operation
  - rotate the flywheel and make sure it does not touch the ignition module.



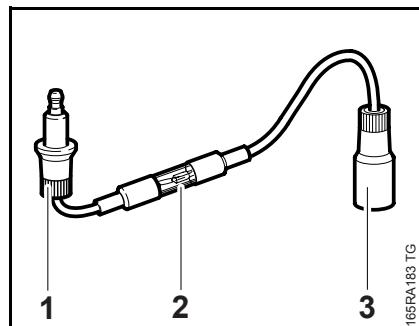
- Reconnect the short circuit wire (1).
- Make sure the connector is pushed fully on to the tag.
- Reassemble all other parts in the reverse sequence.

## 9.2.2 Testing the Ignition Module

To test the ignition module, use either the ZAT 4 ignition system tester 5910 850 4503 or the ZAT 3 ignition system tester 5910 850 4520.

The ignition test refers only to a spark test, not to ignition timing.

### Using the ZAT 4 ignition tester 5910 850 4503



- Before starting the test, install a new spark plug in the cylinder and tighten it down firmly.
- Tightening torques, **3.5**
- Connect spark plug boot to the input terminal (1). Push the tester's output terminal (3) on to the spark plug.

High voltage – risk of electric shock.

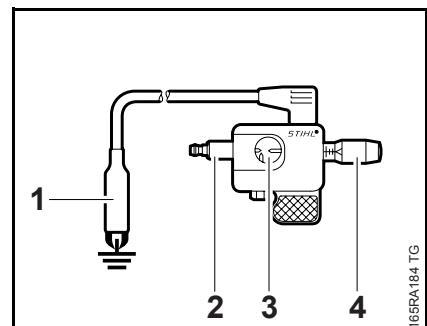
- Crank the engine quickly with the rewind starter and check spark in the tester's window (2).

The engine may start and accelerate during the test.

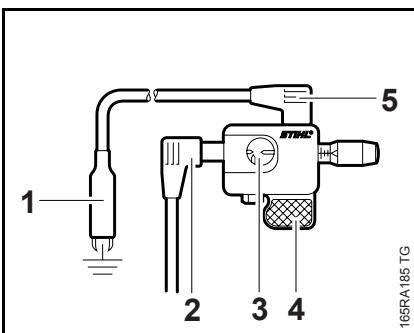
If a spark is visible, the ignition system is in order.

If no spark is visible in the window (2), check the ignition system with the aid of the troubleshooting chart, **9.6**.

### Using the ZAT 3 ignition tester 5910 850 4520



- Before starting the test, install a new spark plug in the cylinder and tighten it down firmly.
- Tightening torques, **3.5**
- Connect spark plug boot to the terminal (2).
- Attach the ground terminal (1) to the spark plug.
- Use adjusting knob (4) to set the spark gap to about 2 mm, see spark window (3).



While using the ZAT 3, hold it only by the handle (4) or position it in a safe place. Keep fingers or other parts of your body at least 1 cm away from the spark window (3), high voltage connection (2), ground connection (5) and the ground terminal (1).

High voltage – risk of electric shock.

- Crank the engine quickly with the rewind starter and check spark in the tester's window (3).

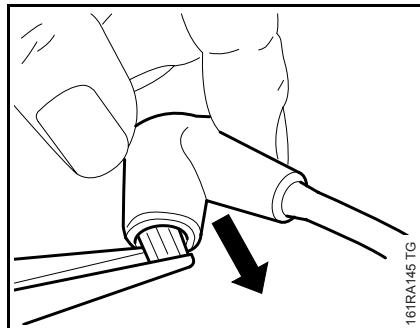
The engine may start and accelerate during the test.

If a spark is visible, the ignition system is in order.

If no spark is visible in the window (3), check the ignition system with the aid of the troubleshooting chart, **9.6**

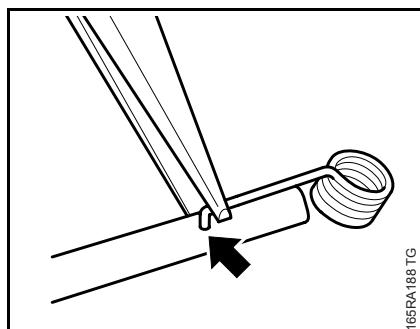
### 9.3 Spark Plug Boot / Ignition Lead

- Pull the boot off the spark plug.



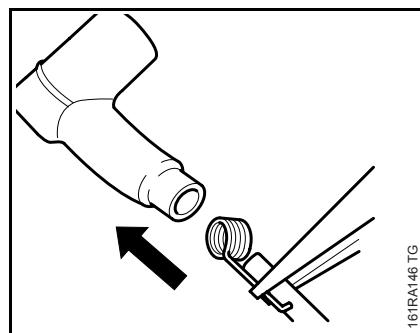
- Use suitable pliers to pull the leg spring out of the spark plug boot.

- Unhook the leg spring from the ignition lead.
- Pull the boot off the ignition lead.



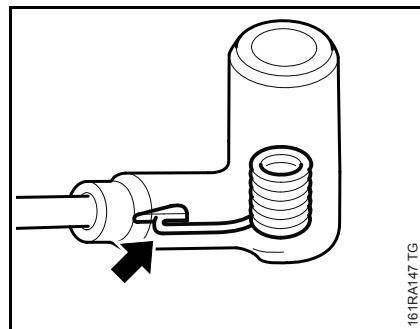
It is advisable to install a new ignition lead to ensure that the leg spring is firmly seated.

- Use a pointed tool to pierce the center of the new ignition lead's insulation, about 15 mm from the end of the lead.
- Pinch the hook of the leg spring into the center of the lead (arrow).



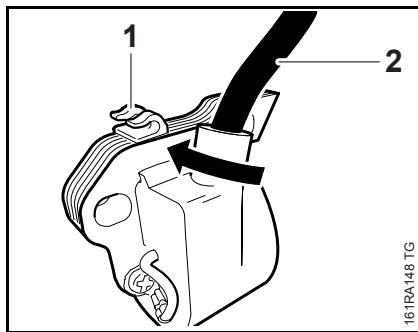
- Coat the inside of the spark plug boot with STIHL Press Fluid, **16**

- Hold the ignition lead and leg spring together and push them into the spark plug boot.

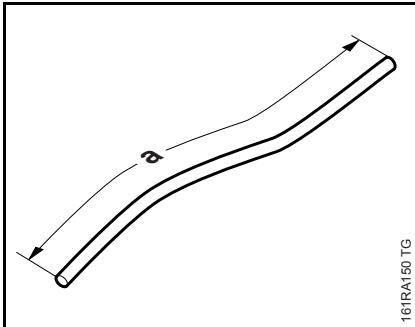


- Make sure the leg spring (arrow) locates properly inside the spark plug boot.

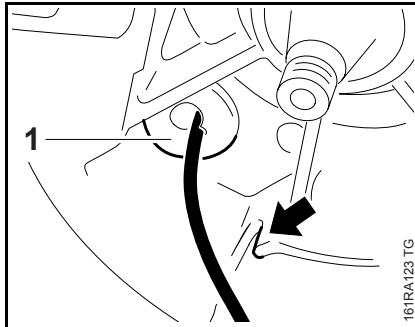
## Ignition Lead



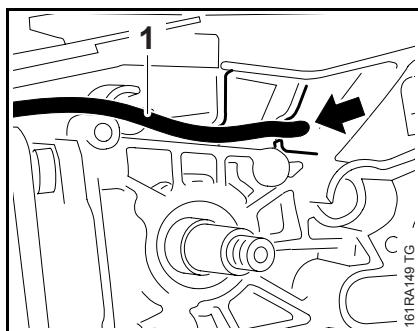
- Remove the flywheel, **9.4**
- Remove the ignition module, **9.2.1**
- Unscrew the ignition module (1) from the ignition lead (2).



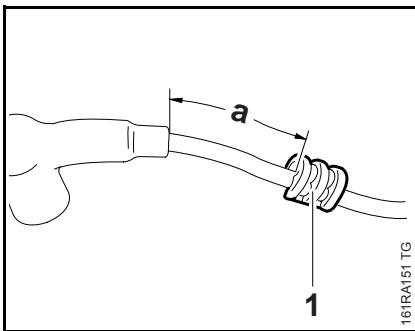
- Cut new ignition lead to a length of 290 mm (a).
- Fit the spark plug boot.



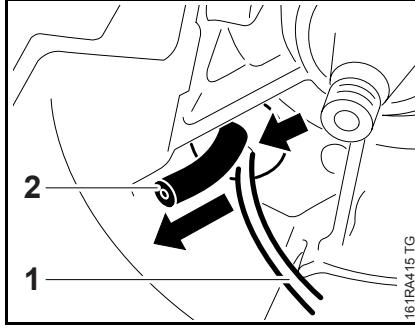
- Position the grommet (1) so that the hole for the short circuit wire points towards the cable guide (arrow).



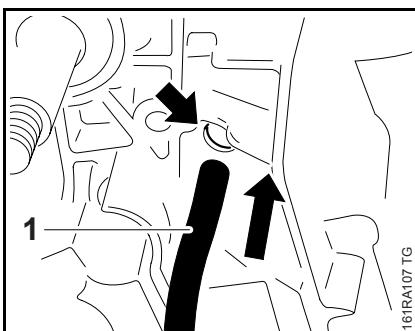
- Pull the boot off the spark plug.
- Remove the oil pump, **13.4**
- Take the ignition lead (1) out of the guides.
- Coat the ignition lead with STIHL Press Fluid and pull it slowly out of the bore (arrow) – the grommet may slip into the crankcase, **16**
- Check ignition lead and replace if necessary



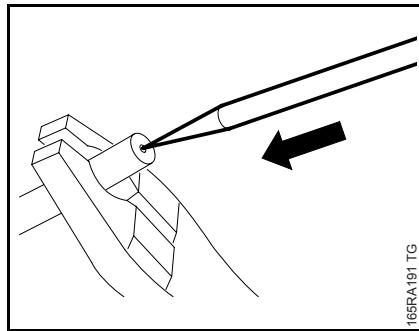
- Pull the cable retainer (1) off the ignition lead, or replace if necessary.
- Fit the cable retainer (1) on the ignition lead at a distance of about 3.8 cm (a) from the spark plug boot.



- Thread the short circuit wire through the smallt hole (arrow) in the grommet.
- Using STIHL Press Fluid, **16**, simplifies the job of pushing the ignition lead (1) through the grommet.
- Push the ignition lead (1) through the grommet (2).



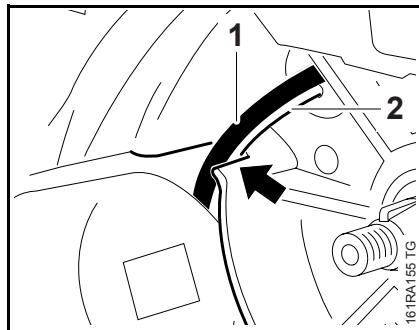
- Push the other end of the ignition lead (1) through the hole (arrow) in the clutch side of the crankcase.



- Use a pointed tool to pierce the center of the other end of the ignition lead which screws into the module.

Do not use either graphite grease or silicone insulating paste.

- Install the ignition module, **9.2.1**

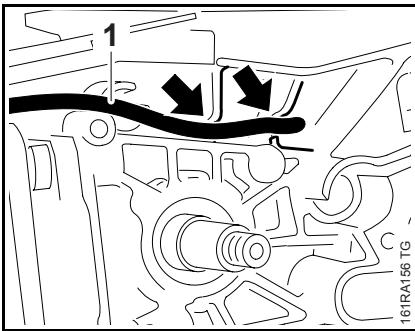


- Pull out the ignition lead (1) at the clutch side until the ignition lead is properly seated at the ignition side of the crankcase.

The ignition lead (1) and short circuit wire (2) must lie in the guide (arrow) and not project

– there is otherwise a risk of damaging the insulation and causing a short circuit.

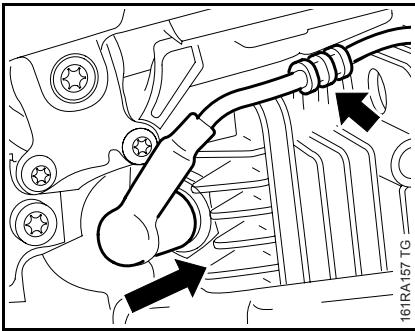
- Install the flywheel and adjust the air gap, **9.4**, **9.2.1**



- Push the ignition lead (1) into the guides (arrows).

The ignition lead must be properly seated to avoid it being pinched when the oil pump is installed.

- Install the oil pump, **13.4**

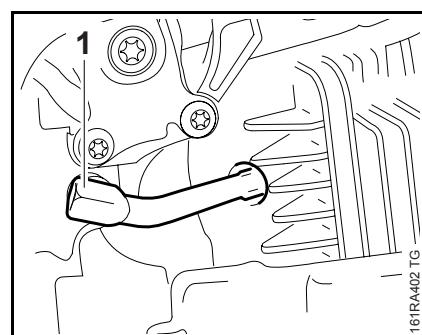


- Fit the boot on the spark plug and push the retainer (arrow) between the cylinder fin and tank housing.

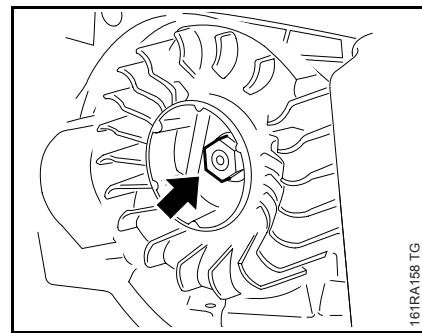
- Reassemble all other parts in the reverse sequence.

- Tightening torques, **3.5**

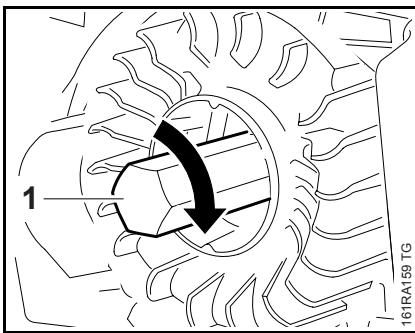
## 9.4 Flywheel



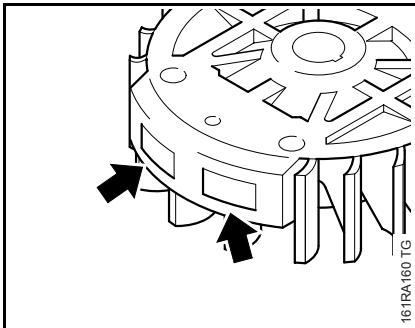
- Remove the chain sprocket cover, bar and chain, **5**
- Remove the fan housing, **10.2**
- Use locking strip (1) to block the piston, **6**



- Unscrew the flywheel nut (arrow).  
If the flywheel is stuck, use a puller.



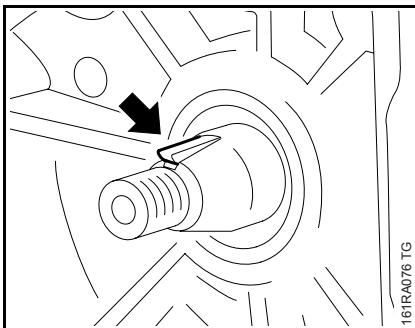
- Screw the puller (1) 1116 893 0800 clockwise on to the crankshaft as far as stop, then back it off a 1/4 turn.
- Tap the end of the puller to release the flywheel.



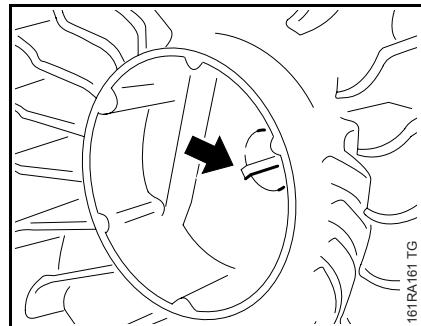
The flywheel and magnet poles (arrows) must not be damaged or have turned blue. Replace flywheel if necessary.

The flywheel and crankshaft stub must be free from grease before assembly.

Degrease the crankshaft stub and bore in flywheel with a standard solvent-based degreasant containing no chlorinated or halogenated hydrocarbons.



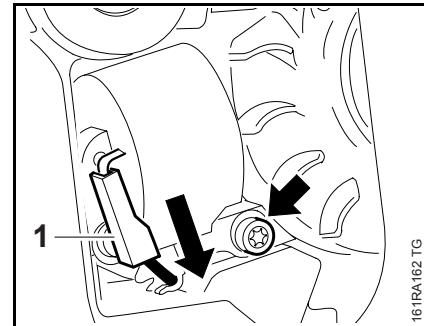
- Check the key (arrow) and replace if necessary
- Make sure the key is properly seated.



- Make sure the key engages the slot (arrow) in the flywheel.
- Set the air gap between the ignition module and flywheel, **9.2.1**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

## 9.5 Short Circuit Wire

### 9.5.1 Testing (MS 200, MS 200 T)



If the spark plug, ignition lead and spark plug boot are in order, check the short circuit wire.

On the MS 200, this test is performed on the short circuit wire and wiring harness. If a fault is found, the wiring harness must be tested separately, **9.5.2**.

- Remove the fan housing, **10.2**
- Disconnect the short circuit wire (1) and push back the sleeve on the connector.
- Connect the ohmmeter to ground (arrow) and the short circuit wire (1).
- Set the switch shaft to "0".

The resistance measured must be about  $0 \Omega$ . If it is much higher, the reason is a break and the wire has to be replaced, **9.5.3**.

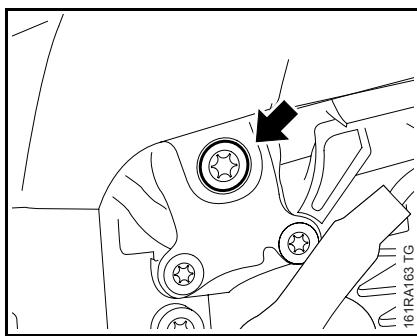
- Set the switch shaft to "I".
- The resistance measured must be infinitely high. If not, fit a new short circuit wire, **9.5.3**.
- If no fault can be found, check the ignition system with the aid of the troubleshooting chart, **9.6**

## 9.5.2 Testing the Wiring Harness (MS 200)

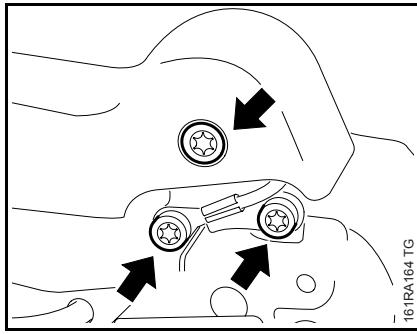
- Remove the chain sprocket cover, bar and chain, **5**

In this model a wiring harness is installed in the handle housing to extend the short circuit wire. It is possible that the break may be in either the short circuit wire or the wiring harness.

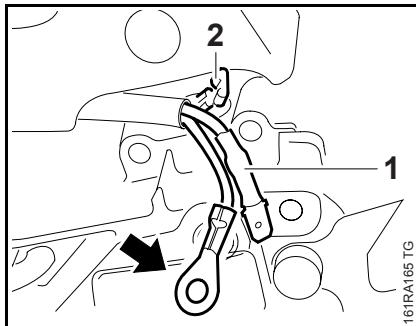
Test the wiring harness separately to determine which wire is damaged.



- Take out the screw (arrow).



- Take out the screws (arrows) and pull out the annular buffer, **11.2**
- Lift the handle housing slightly.



- Pull short circuit wire connector (2) off the wiring harness (1).
- Connect the ohmmeter to the ground wire (arrow) and the wiring harness (1).
- Set the switch shaft to "0".

The resistance measured must be about  $0 \Omega$ . If it is much higher, the reason is a break and the wiring harness has to be replaced, **9.5.3**.

If the wiring harness is in order, the fault is in the short circuit wire. Install a new short circuit wire, **9.5.3**.

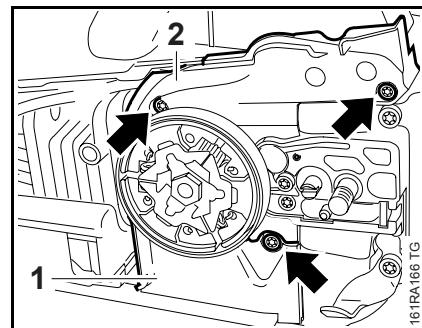
- Set the switch shaft to "I".

The resistance measured must be infinitely high. If not, fit a new short circuit wire or wiring harness, **9.5.3**, **9.5.4**.

- Reassemble in the reverse sequence.

## 9.5.3 Removing and Installing

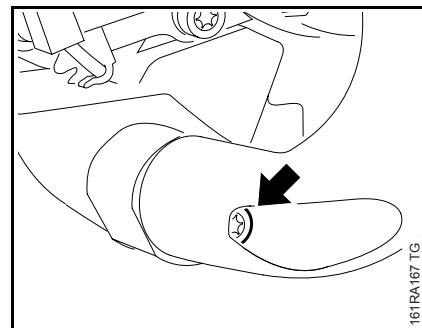
- Remove the chain sprocket cover, bar and chain, **5**



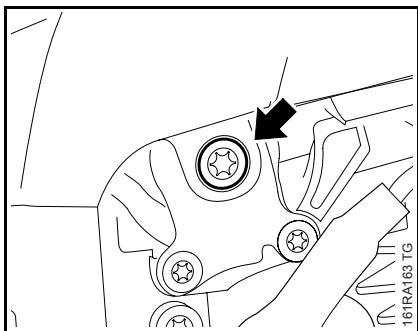
- Take out the screws (arrows).
- Remove the covers (1 and 2).
- Remove the fan housing, **10.2**
- Remove the flywheel, **9.4**
- Remove the ignition module, **9.2.1**

On a MS 200, a wiring harness if installed to extend the short circuit wire. Apart from the preparations, the procedure for removing and installing the short circuit wire is the same on both models.

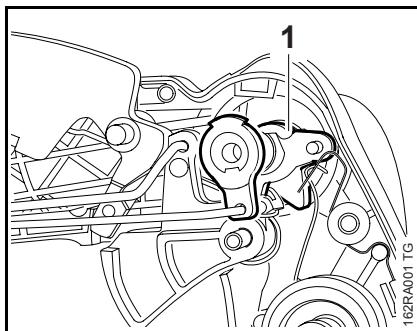
### MS 200



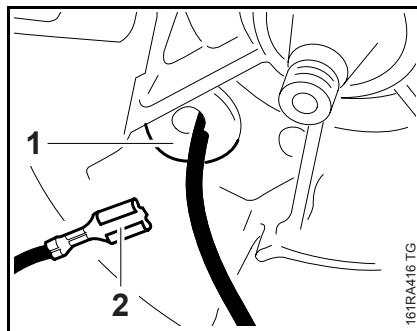
- Take out the screw (arrow) and loosen the handlebar.



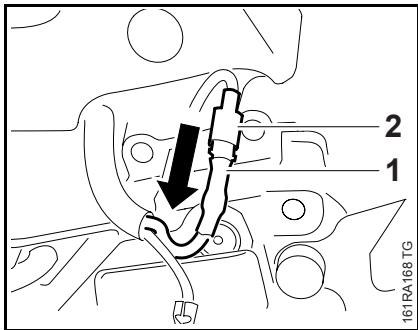
- Take out the screw (arrow).
- Remove annular buffer from the oil tank, **11.2**



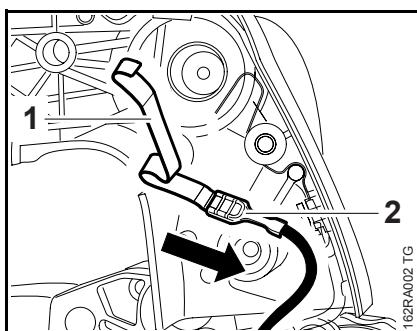
- Remove the switch shaft (1), **12.1.2**
- Remove the annual buffer from the oil tank, **11.2.1**



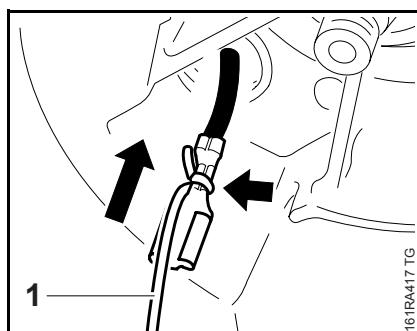
- Pull out the ignition lead, **9.3**
- Pry out the grommet (1) and take it off the connector (2).



- Lift the handle housing slightly and pull out the wiring harness.
- Disconnect wiring harness (1) from the short circuit wire connector (2).

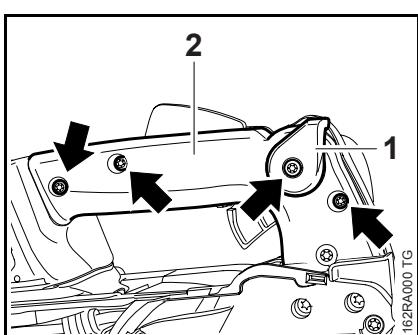


- Pull out the contact spring (1).
- Disconnect the short circuit wire (2).

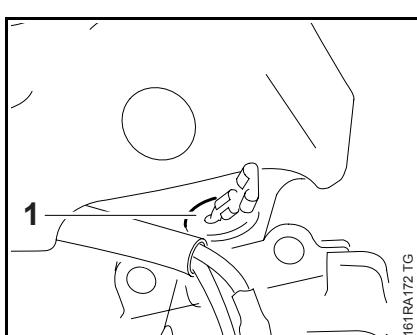


- Tie a piece of string to the connector (arrow).

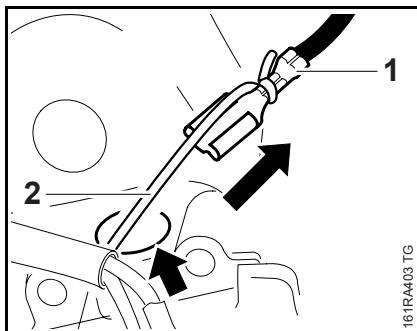
## MS 200 T



- Take out the screws (arrows).
- Remove the control lever (1) and handle molding (2).

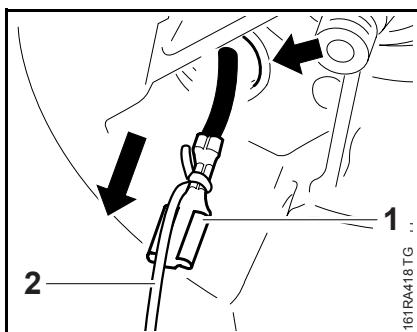


- Pry out the grommet (1).

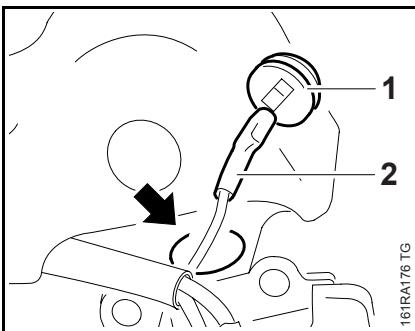


- Pull the short circuit wire (1) out of the crankcase (arrow) and untie the string (2).
- Remove the grommet.
- Check both grommets and replace if necessary

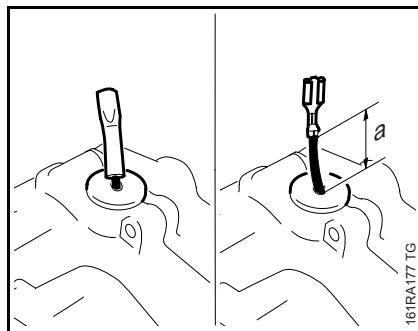
### Installing



- Tie the string (2) to the connector of the new short circuit wire (1).
- Pull the short circuit wire (1) out of the hole (arrow) in the ignition side of the crankcase.



- Push the grommet (1) – rectangular opening first – over the connector (2).
- Fit the grommet (1) in the hole (arrow) and make sure it is properly seated.



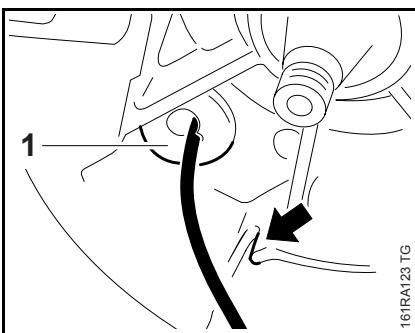
- Position the short circuit wire.

#### **MS 200 (above left)**

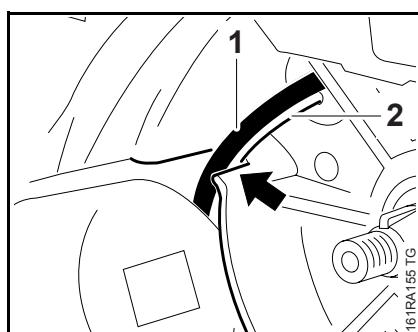
Connector with sleeve butts against the grommet.

#### **MS 200 T (above right)**

Connector without sleeve, distance from grommet  
a = about 2.5 cm

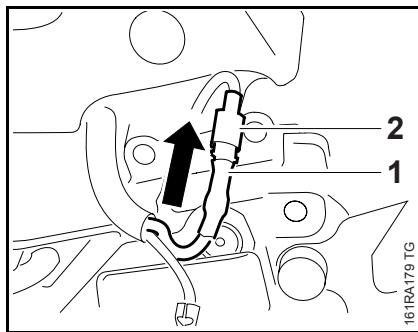


- Remove the string.
- Fit the grommet (1) for the ignition lead and short circuit wire.
- Push the grommet (1) fully into the hole and line it up so that the notched opening for the short circuit wire points to the cable guide (arrow).

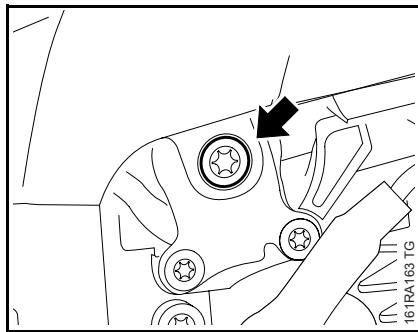


- Install the ignition lead, **9.3**
- Install the ignition module, **9.2.1**
- The ignition lead (1) and short circuit wire (2) must lie in the guide (arrow) and not project – there is otherwise a risk of damaging the insulation and causing a short circuit.
- Install the flywheel and adjust the air gap, **9.4**, **9.2.1**

## MS 200

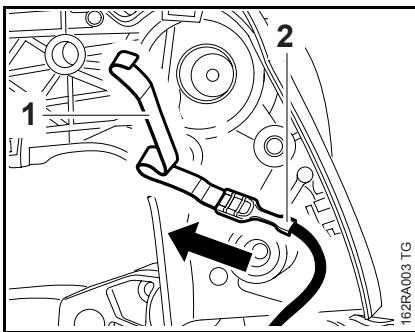


- Connect the wiring harness (1) to the short circuit wire (2).
- Push the wiring harness into the handle housing – wiring harness must locate in the guide on the underside of the handle housing  
☞ 9.5.4

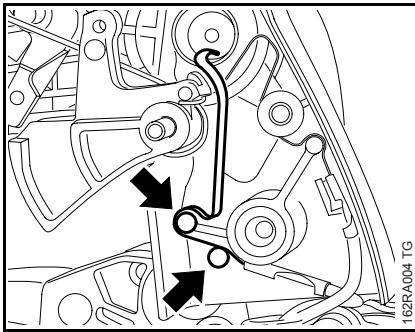


- Mount the annular buffer on the oil tank and fit the ground wire,  
☞ 11.2
  - do not pinch the wires.
- Insert screw in handlebar and tighten it down firmly.
- Insert screw (arrow) and tighten it down firmly.

## MS 200 T



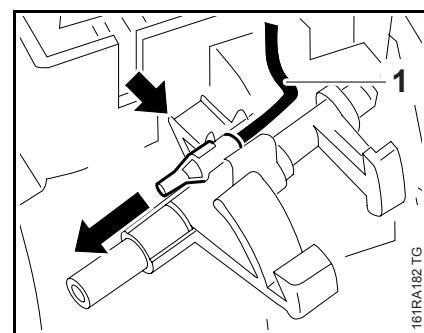
- Check the contact spring (1) and replace if necessary
- Push short circuit wire connector (2) on to contact spring (1).



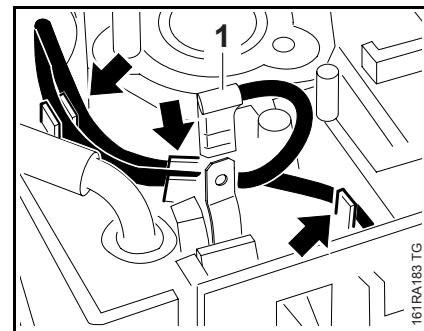
- Push the contact spring with short circuit wire into the guides (arrows).
- Mount the annular buffer on the oil tank and fit the ground wire,  
☞ 11.2.1
  - do not pinch the wires.
- Install the switch shaft, ☞ 12.1.2
- Fit the handle molding, ☞ 12.3
- Reassemble all other parts in the reverse sequence.
- Tightening torques, ☞ 3.5

## 9.5.4 Removing and Installing the Wiring Harness (MS 200)

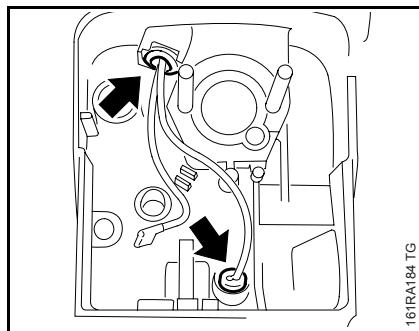
The short circuit and ground wires are combined in a wiring harness. If either wire is damaged, the complete wiring harness must be replaced



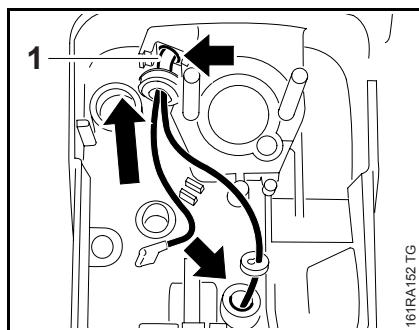
- Remove the handle housing,  
☞ 12.4
- Remove the switch shaft and pull off the choke lever, ☞ 12.1.1
- Push the short circuit wire (1) out of the switch shaft (arrow).



- Disconnect the ground wire (1) from the contact spring.
- Pull the wires out of the guides (arrows).



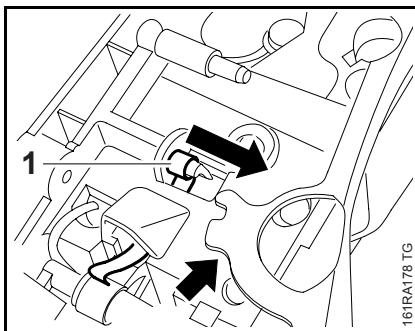
- Pry out the grommets (arrows).
- Pull the wiring harness out of the guide on the underside of the handle housing.



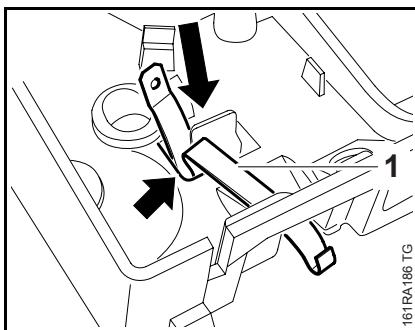
- Pull the wiring harness (1) out of the holes (arrows).
- Check the wiring harness and grommets and replace if necessary.

A faulty ground wire may impair or prevent operation of the short circuit wire.

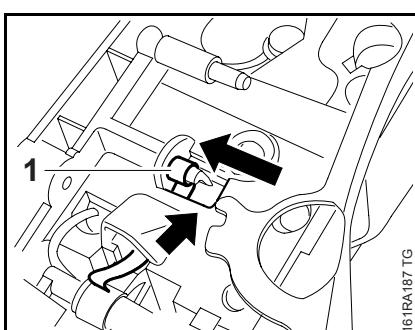
Perform the contact and continuity test on the ground wire too.



- Turn the handle housing over.
  - Pull out the cover's tab (arrow).
  - Inspect the cover and replace if necessary, **12.4**
- Push the contact spring (1) off the peg and remove it.



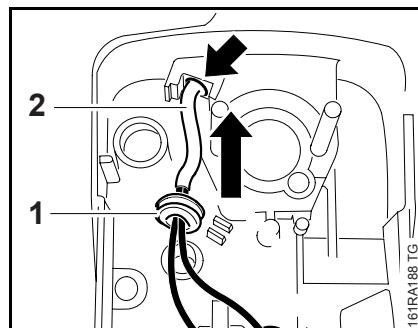
- Push the contact spring (1) into the opening (arrow).



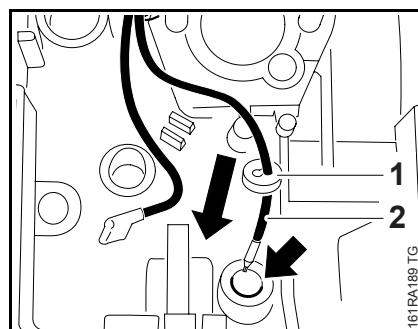
- Turn the handle housing over.

  - Push the contact spring (1) on to the peg as far as stop.

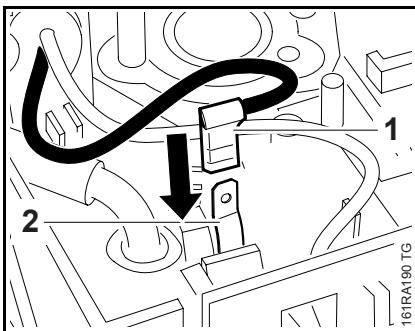
- Push the cover's tab into the opening (arrow) until it is properly seated – this secures the contact spring in position.



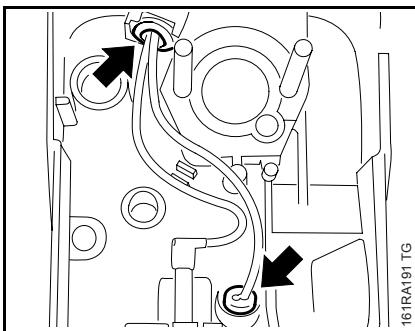
- Slip the large grommet (1) over the wiring harness (2).
- Push the wiring harness (2), protective tube first, into the bore (arrow).



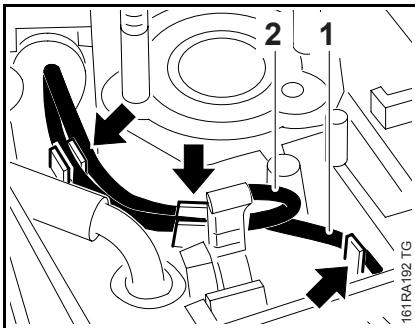
- Slip the small grommet (1) over the short circuit wire (2).
- Push the short circuit wire, round terminal first, through the bore (arrow).



- Push the ground wire (1) on to the contact spring (2) as far as stop.
- Pull the short circuit wire into the switch shaft and install the switch shaft, **12.1.1**

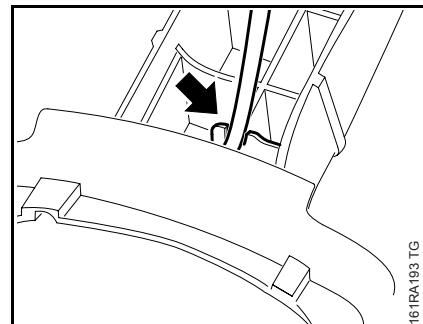


- Fit the grommets (arrows) in the holes and make sure they are properly seated.



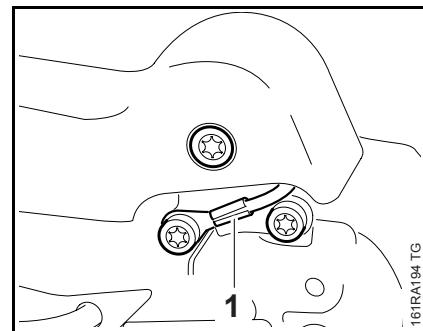
- Fit the short circuit wire (1) and ground wire (2) in the guides (arrows).

The wires must be pressed firmly into the guides and fit snugly against the handle housing.



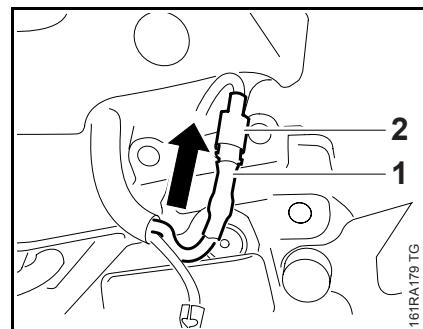
- Press the wiring harness into the guide (arrow) on the underside of the housing.
- Install the handle housing, **12.4**

The impulse hose must be fitted on the nipple on the handle housing.



The short circuit and ground wires must be routed over the annular buffer to ensure they are not pinched between the annular buffer and handle housing.

- Lift the handle housing slightly and place annular buffer in position. Fit the ground wire (1) and insert the screws, **11.2**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**
- Check operation.



- Connect the wiring harness (1) to the short circuit wire (2).
- Push the wiring harness into the handle housing.

## 9.5.5 Ground Wire

A faulty ground wire may impair or prevent operation of the short circuit wire.

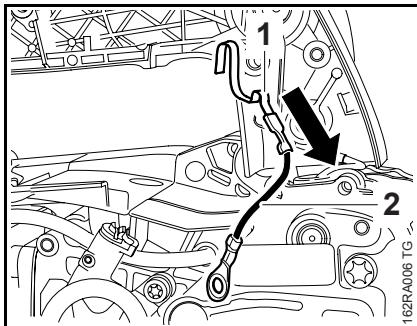
### MS 200

The ground wire is combined with the short circuit wire in a wiring harness. If damaged, the complete wiring harness must be replaced

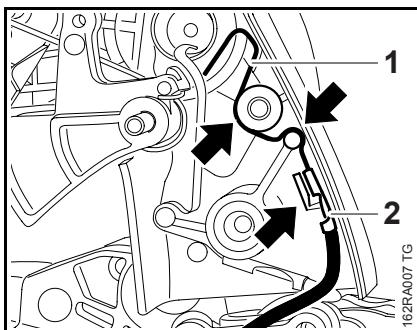
- Check for contact and continuity and replace wiring harness if necessary, [9.5.3](#)

### MS 200 T

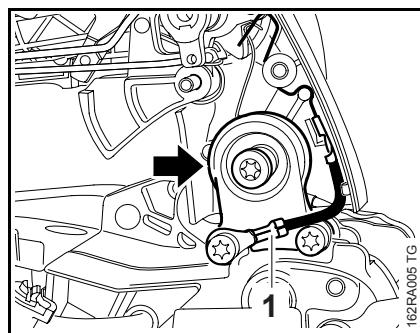
The ground wire is fitted to the handle housing and can be removed and installed separately.



- Pull out the contact spring (1).
  - Disconnect the ground wire (2).
  - Check the contact spring (1) and ground wire and replace if necessary

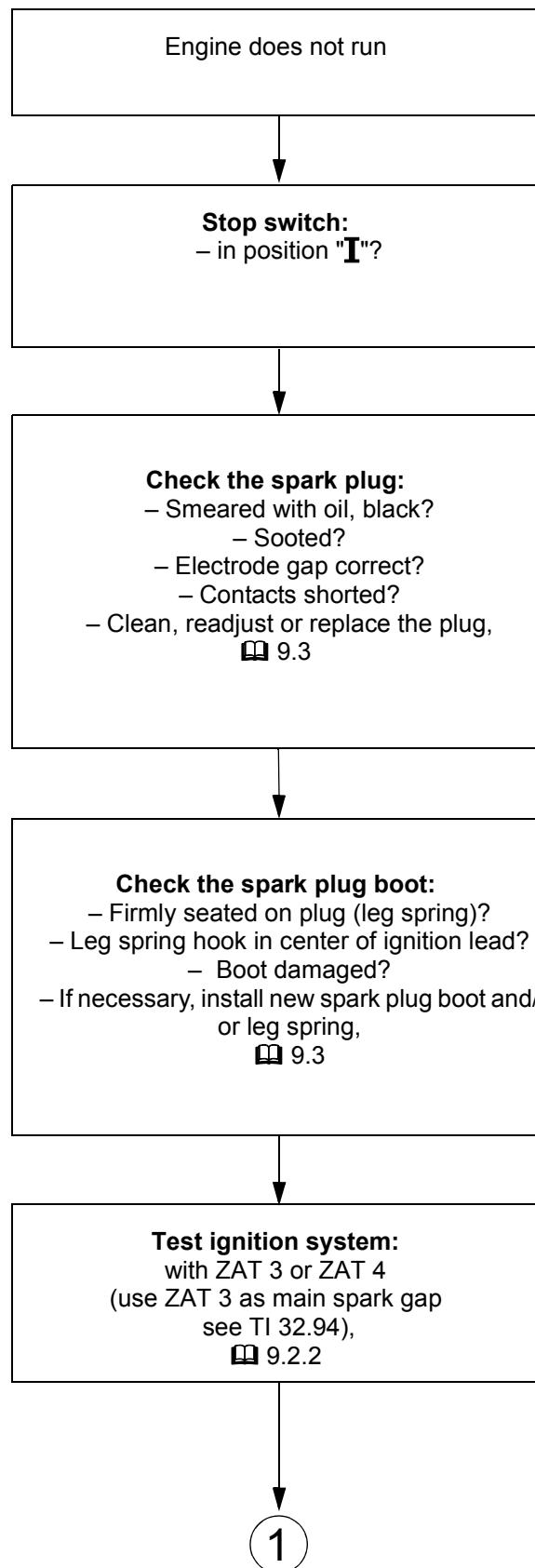


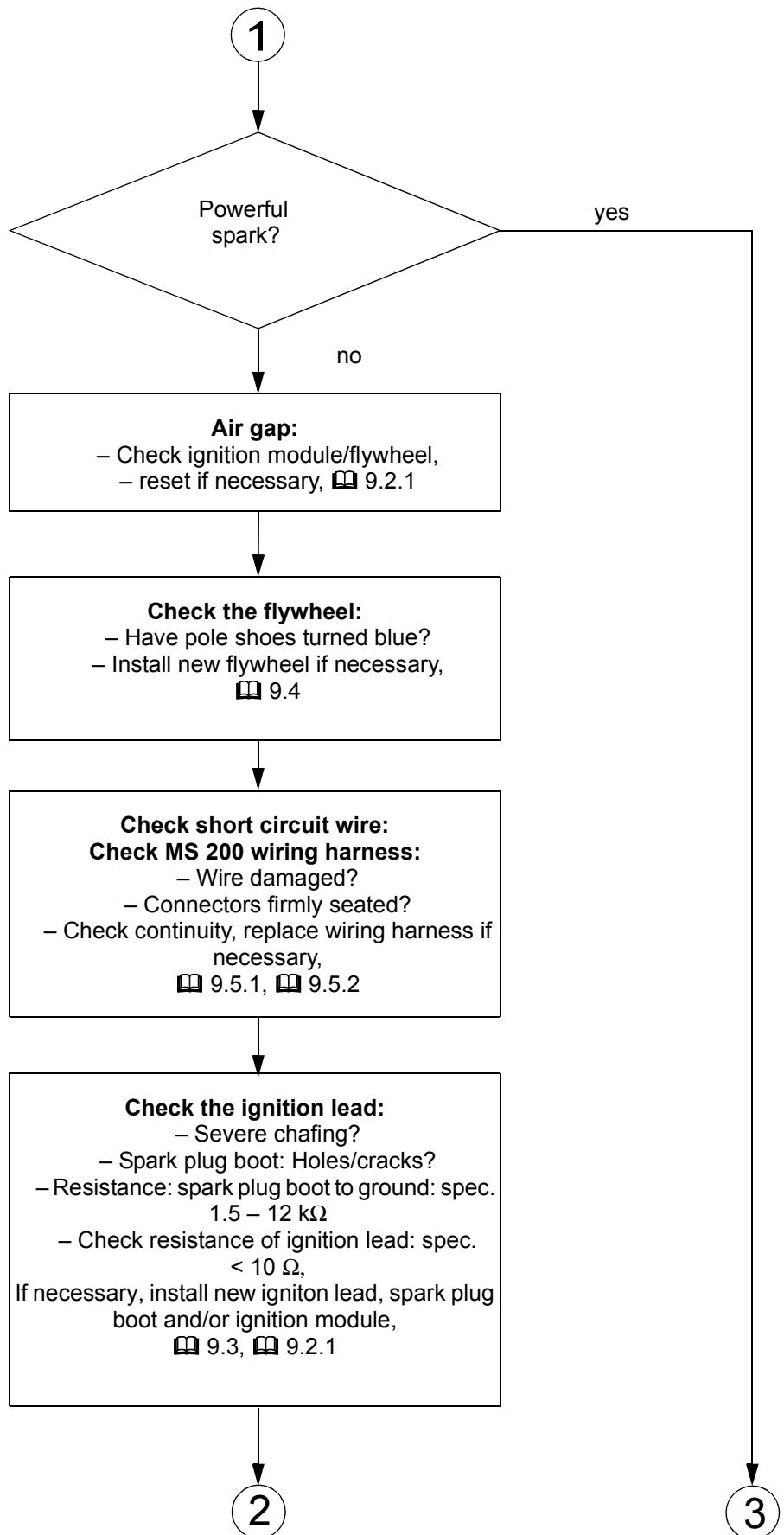
- Push the ground wire on to the contact spring as far as stop.
- Push the contact spring (1) with ground wire (2) into the guides (arrows).
  - Install the annular buffer, [11.2.1](#)
  - Reassemble all other parts in the reverse sequence.
  - Tightening torques, [3.5](#)

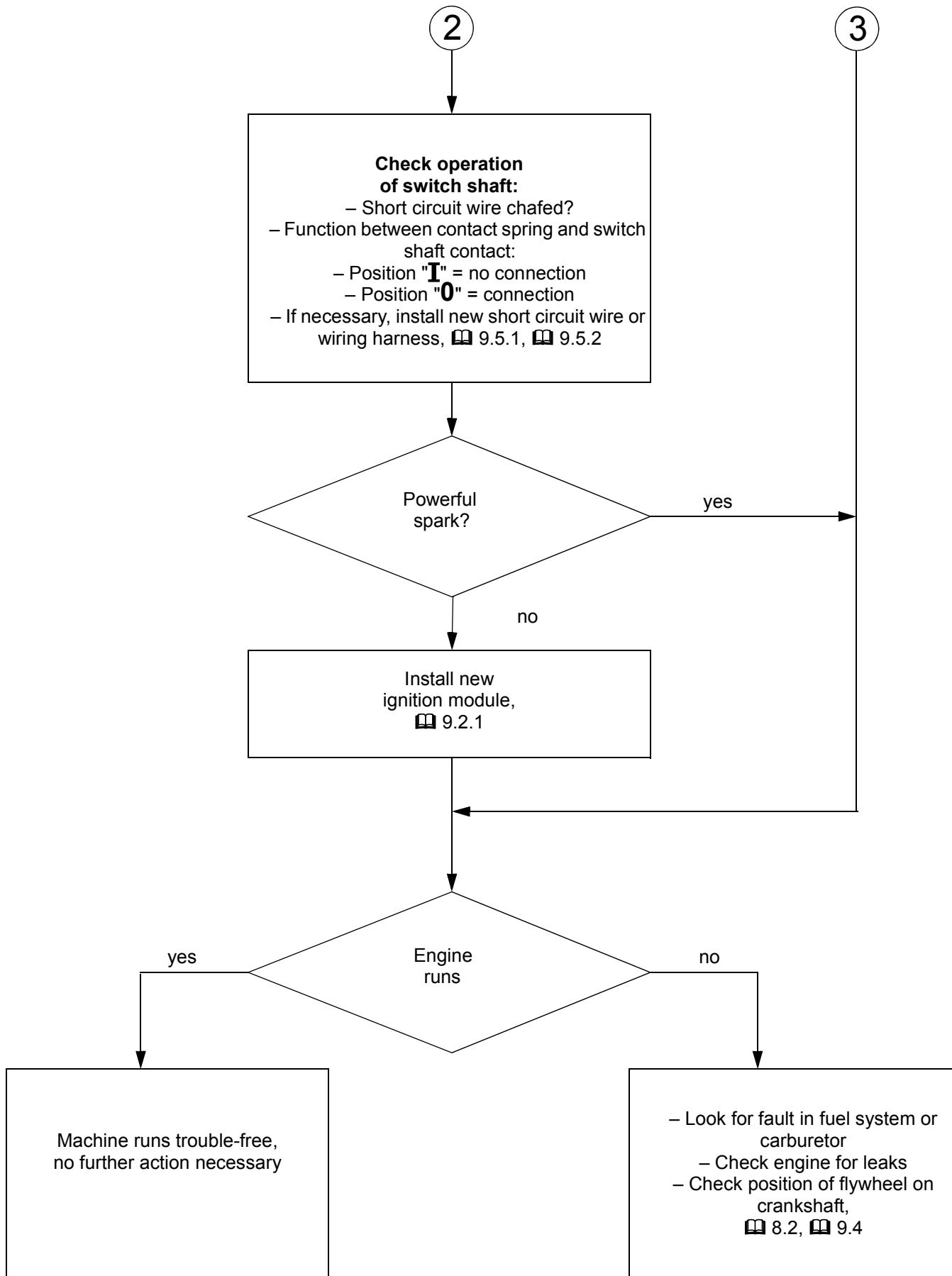


- Take out the screws and remove the control lever and handle molding, [12.3](#)
- Remove the annular buffer (arrow) and ground wire (1), [11.2.1](#)

## 9.6 Ignition System Troubleshooting







## 10. Rewind Starter

### 10.1 General

If the action of the starter rope becomes very stiff and the rope rewinds very slowly or not completely, it can be assumed that the starter mechanism is in order but plugged with dirt. At very low outside temperatures the lubricating oil on the rewind spring may thicken and cause the spring windings to stick together. This has a detrimental effect on the function of the starter mechanism.

In such a case it is sufficient to apply a few drops of a standard solvent-based degreasant (containing no chlorinated or halogenated hydrocarbons) to the rewind spring.

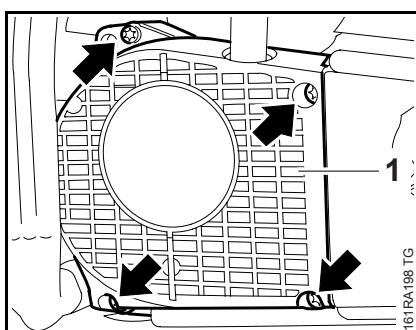
Carefully pull out the starter rope several times and allow it to rewind until its normal smooth action is restored.

Before installing, lubricate the rewind spring and starter post with STIHL special lubricant.

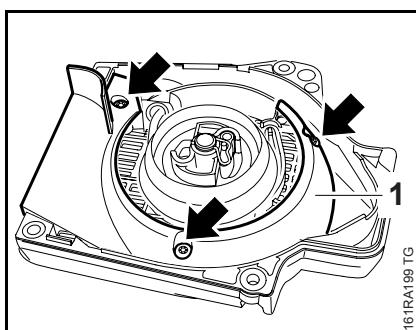
If clogged with dirt or pitch, the entire starter mechanism, including the rewind spring, must be removed and disassembled. Take particular care when removing the spring.

- Clean all components.

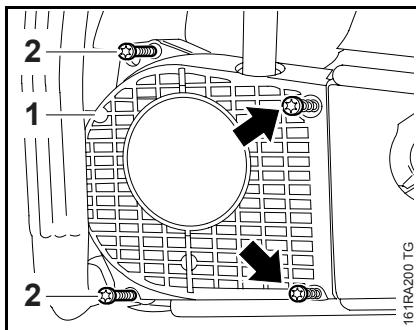
### 10.2 Removing and Installing



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



- Take out the screws (arrows).
- Remove the segment (1), check and replace if necessary.
- Reassemble in the reverse sequence.

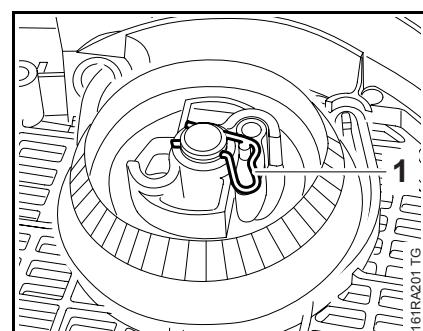


- Place the fan housing (1) in position.
- Fit the metric screws (2) and Plastoform screws (arrows).

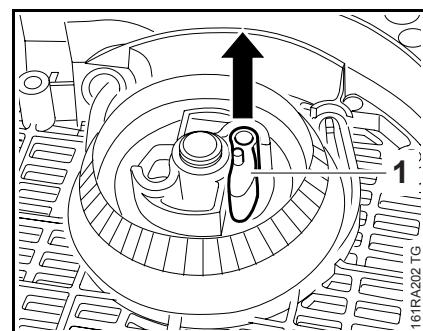
- Tighten down the screws firmly.

- Tightening torques, [Book 3.5](#)

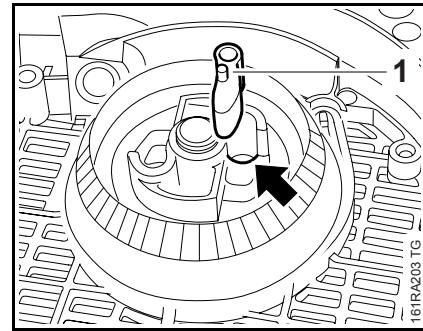
### 10.3 Pawl



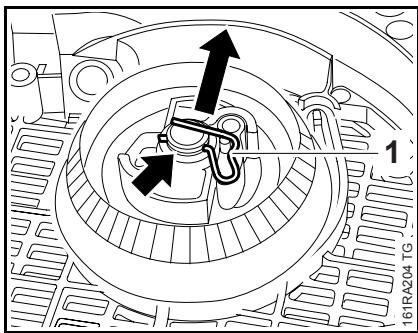
- Remove the fan housing, [Book 10.2](#)
- Carefully ease the spring clip (1) off the starter post.



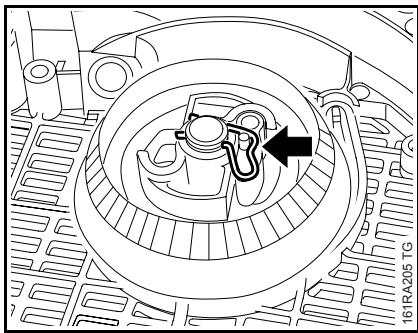
- Remove the pawl (1).



- Fit the new pawl in the bore (arrow) and lubricate its peg (1), [Book 16](#)



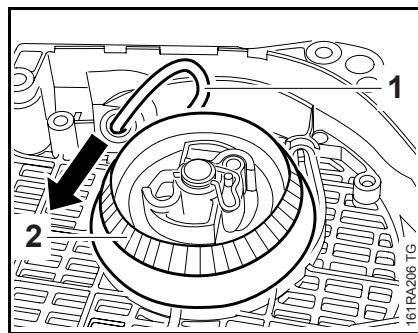
- Position the spring clip (1) so that its loop engages the peg on the pawl and its curved end (arrow) is in the starter post's groove.
- Push the straight part of the spring clip over the starter post until it snaps into the groove.



The spring clip's guide loop must be in line with the pawl (arrow).

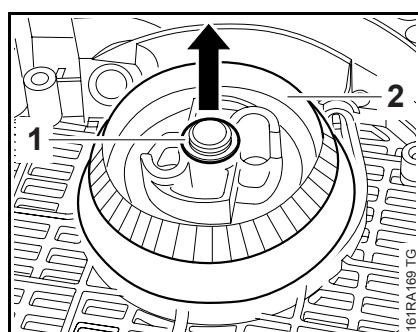
- Reassemble all other parts in the reverse sequence.

## 10.4 Rope Rotor



### Relieving tension of rewind spring

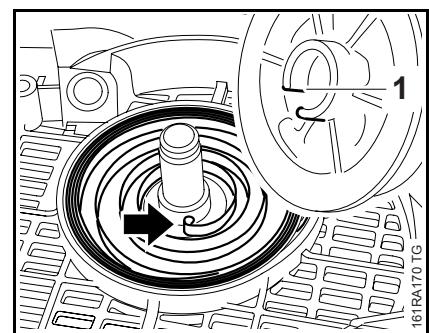
- Remove the fan housing and the segment, **10.2**
  - Pull out the starter rope (1) about 5 cm and hold the rope rotor (2) steady.
  - While still holding the rope rotor steady, take three full turns off the rope rotor.
  - Pull out the rope with the starter grip and slowly release the rope rotor.
  - Remove the starter rope or remaining rope from the rotor, **10.5**
- The system will not be under tension if either the starter rope or rewind spring is broken.
- Remove the spring clip and pawl, **10.3**



- Remove the washer (1).

Rewind spring must be relaxed.

- Carefully remove the rope rotor (2) – the rewind spring may pop out and uncoil.
- Check the rope rotor and replace if necessary.
- Coat bore in rope rotor with STIHL special lubricant, **16**



- Fit the rope rotor on the starter post so that the inner spring loop (arrow) engages the recess (1).

The recess in the hub of the rope rotor is the anchor point for the spring.

- Fit the washer.
- Install the pawl and spring clip, **10.3**
- Install the starter rope, **10.5**
- Tension the rewind spring, **10.6**
- Lubricate peg on pawl with grease, **16**
- Reassemble all other parts in the reverse sequence.

## 10.5 Starter Rope / Grip

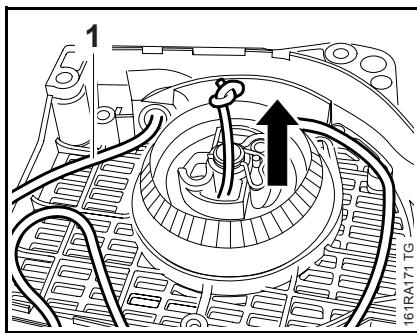
- Remove the fan housing and the segment,  
10.2

- Relieve tension of rewind spring,  
10.4

The system will not be under tension if the starter rope is broken.

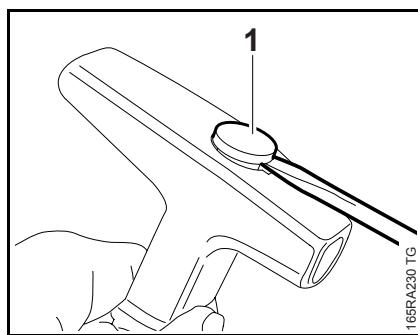
- Remove remaining rope from the rope rotor and starter grip.

Do not shorten the starter rope.

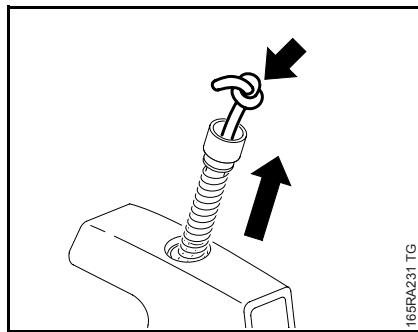


- Push the end of the starter rope (1) out a little and undo the knot.
- Pull the starter rope out of the rope rotor and fan housing.

### Elastostart Starter Grip

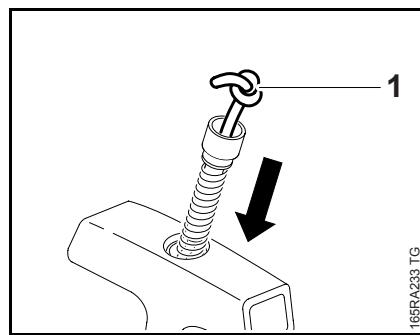


- Use a suitable tool to pry the cap (1) out of the starter grip.



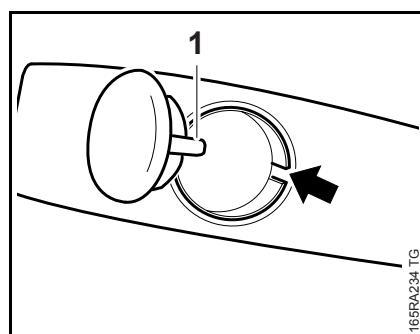
- Pull the sleeve, washers, spring and remaining rope (arrow) out of the grip.
  - Pull any remaining rope out of the sleeve. Inspect the individual parts and replace if necessary.

Do not shorten the starter rope.

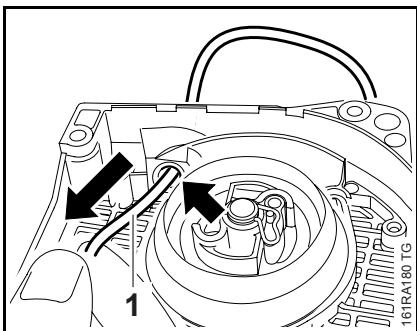


- Thread the new starter rope (1) through the sleeve.
- Tie a simple overhand knot in the end of the rope.
- Fit the washers and spring.
- Pull the starter rope with sleeve, spring and washers into the starter grip (1).

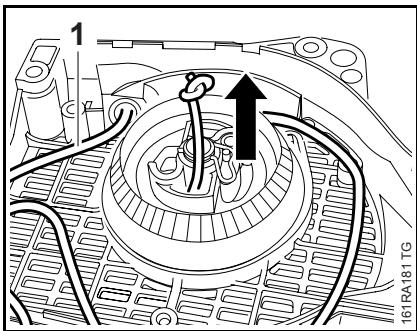
Make sure the washers and spring remain on the sleeve while the rope is being pulled into the grip.



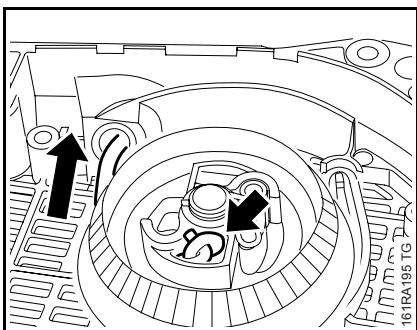
- Position cap so that its lug (1) engages the slot (arrow) in the starter grip.
- Press the cap into the starter grip.



- Thread the starter rope (1) through the guide bushing (arrow).



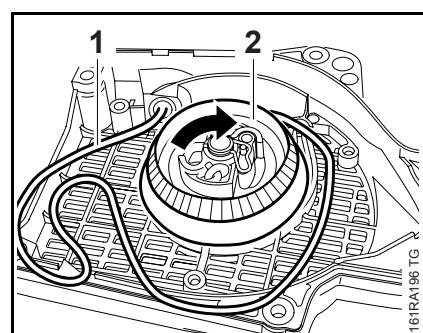
- Thread the starter rope (1) through the side of the rope rotor.
- Secure the rope (1) with a simple overhand knot.



- Pull rope back until knot locates in recess (arrow) in rope rotor.

- Tension the rewind spring, [10.6](#)
- Install the segment and fan housing, [10.2](#)
- Tightening torques, [3.5](#)

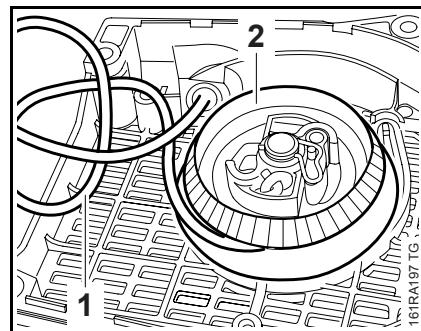
## 10.6 Tensioning the Rewind Spring



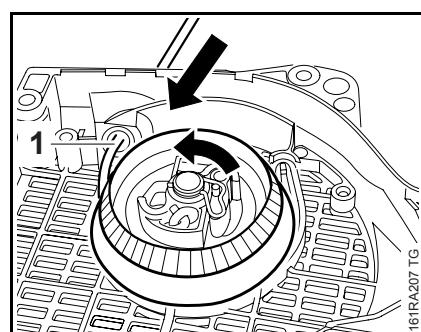
- Remove the fan housing and the segment, [10.2](#)
- Pull out a short length of starter rope (1).
- Use the starter rope (1) to rotate the rope rotor (2) six turns clockwise,

Rotating the rope and rope rotor causes the rope to become twisted. The rewind spring is now tensioned.

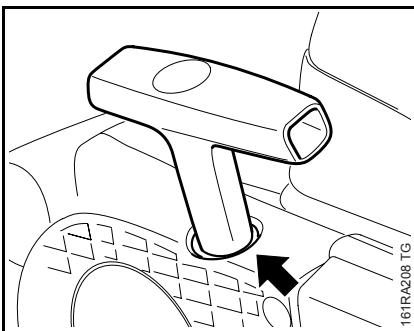
Hold the rope rotor steady since it will otherwise spin back and may damage the rewind spring.



- Hold the rope rotor (2) steady.
- Pull out the twisted rope (1) with the starter grip and straighten it out.



- Hold the starter grip (1) firmly to keep the rope tensioned.
- Let go of the rope rotor and slowly release the starter rope so that it can rewind properly.



The rewind spring is correctly tensioned when the starter grip sits firmly in the rope guide bushing (arrow) without drooping to one side. If this is not the case, tension the spring by one additional turn.

When the starter rope is fully extended, it must still be possible to rotate the rope rotor at least another half turn before maximum spring tension is reached. If this is not the case, reduce spring tension since there is otherwise a risk of breakage.

**To reduce** spring tension:  
Pull the rope out, hold the rope rotor steady and take off one turn of the rope.

- Install the segment and fan housing, 4.10.2
- Tightening torques, 4.3.5

## 10.7 Replacing the Rewind Spring

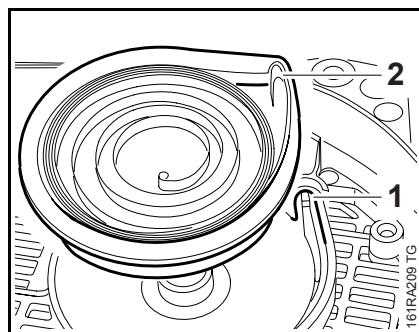
- Troubleshooting, 4.4

The replacement spring comes ready for installation and is secured in a frame.

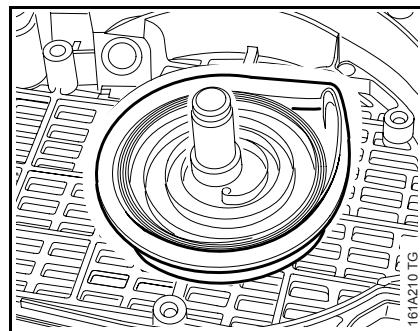
Wear a face shield and work gloves.

- Remove the fan housing and the segment, 10.2
- Relieve tension of rewind spring if necessary and remove the rope rotor, 10.4
- Remove any remaining pieces of old spring.
- Lubricate the spring with a few drops of STIHL special lubricant before installing, 16

### Version with anchor loop pointing inwards



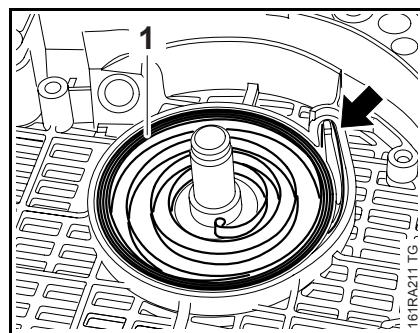
- Line up the replacement spring with frame – the anchor loop (2) must be above the lug (1).



- Fit the rewind spring with frame in position.

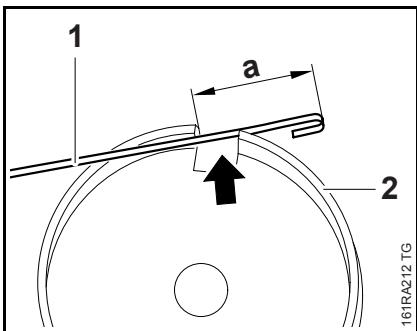
Make sure the starter post does not touch the inner spring loop in this process – the spring may pop out and uncoil.

- Push the rewind spring through the frame and into its seat in the fan housing.



Check that the rewind spring (1) is properly seated and the anchor loop engages the lug (arrow).

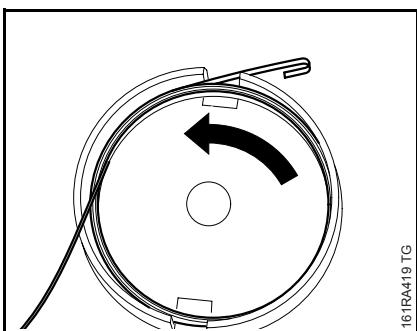
If the rewind spring has popped out, refit it in the fan housing as follows:



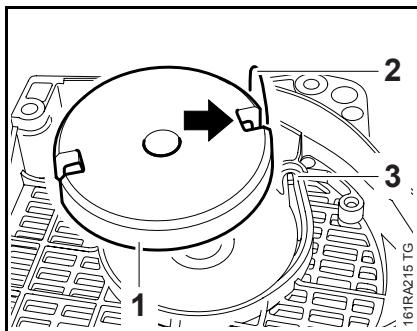
- Place anchor loop (1) in the opening (arrow) in the installing tool (2) 1116 893 4800 – the anchor loop must point inwards.

Make sure the anchor loop does not project too far. It cannot be pushed back after it is fitted in the installing tool – but it can be pulled out.

Distance from end of anchor loop to edge of spring housing  
 $a = 20 \text{ mm}$ .



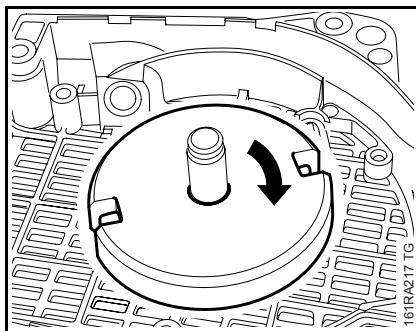
- Fit the rewind spring counterclockwise in the tool.
- Hold the spring windings so that they cannot pop out.



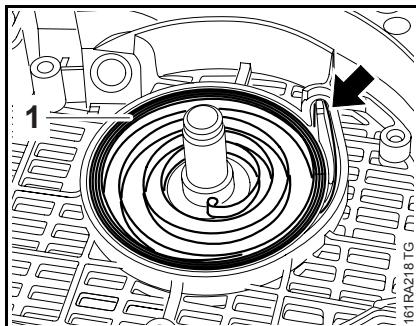
- Push the installing tool (1) with spring on to the starter post.

Line up the installing tool so that the anchor loop (2) is above the lug (3) and the opening in the installing tool is in the position shown (arrow).

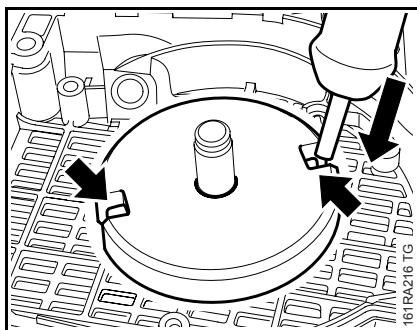
- Use a suitable tool to engage the anchor loop (2) on the lug (3) – pull out the loop a little if necessary.



- Press the installing tool against the spring and rotate it slightly clockwise until the spring is properly seated.
- Remove the installing tool.



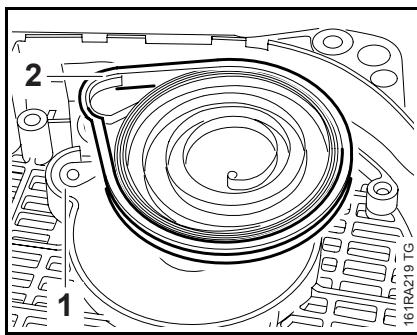
Check that the rewind spring (1) is properly seated and the anchor loop engages the lug (arrow).



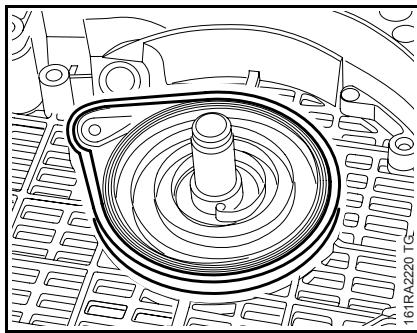
- Apply tool to openings (arrows) to push the spring into its seat in the fan housing.

## Version with anchor loop pointing outwards

The same procedures are used here as for the 'version with anchor loop pointing inwards'. The differences are the anchor loop and the installed position of the spring.



- Line up the replacement spring with frame – the anchor loop (2) must be above the lug (1).

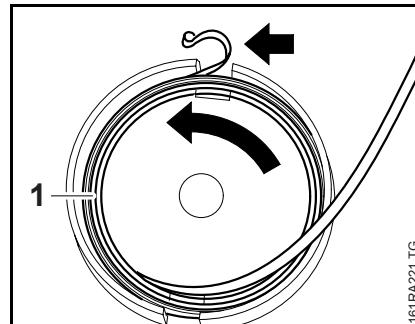


- Fit the rewind spring with frame in position.

Make sure the starter post does not touch the inner spring loop in this process – the spring may pop out and uncoil.

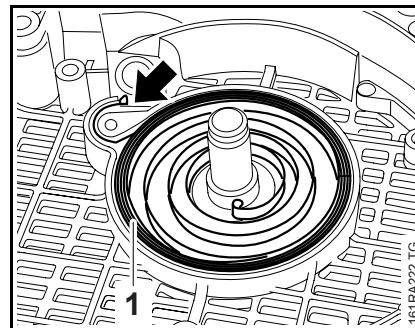
- Push the rewind spring through the frame and into its seat in the fan housing.

If the rewind spring has popped out, refit it in the fan housing as follows:



- The open side of the anchor loop (arrow) must face outwards. Then fit the rewind spring (1) counterclockwise.

The procedure is now the same as for the 'version with anchor loop pointing inwards'.



Check that the rewind spring (1) is properly seated and the anchor loop engages the lug (arrow).

- Secure the spring so that it cannot pop out.
- Remove the rope rotor, [10.4](#)
- Install the pawl, [10.3](#)
- Lubricate peg on pawl with grease, [16](#)
- Tension the rewind spring, [10.6](#)
- Reassemble all other parts in the reverse sequence.
- Tightening torques, [3.5](#)

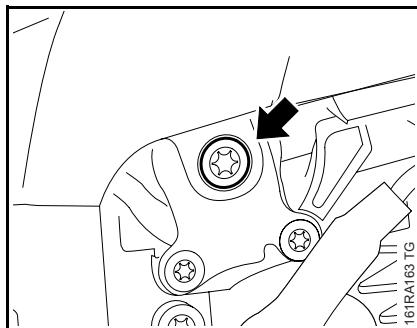
## 11. Servicing the AV System

Vibration-damping rubber buffers are used for the connection between the handlebar, tank housing and engine housing.

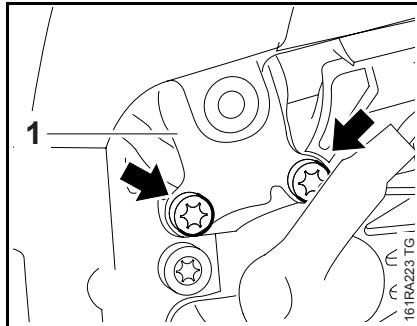
Damaged rubber buffers (annular buffers) must always be replaced.

### 11.1 Annular Buffer on Fuel Tank

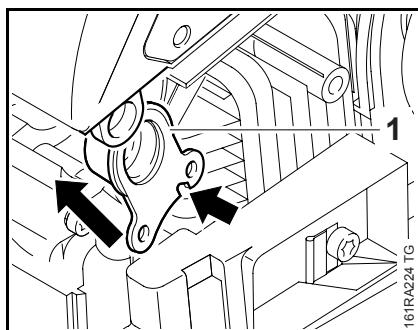
- Remove the chain sprocket cover, bar and chain, **5**



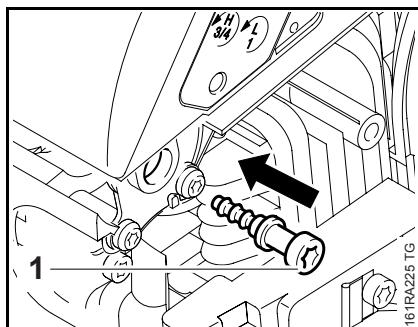
- Take out the screw (arrow).



- Screws (arrows) are secured with Loctite. Heat with a hot air blower if necessary.
- Take out the screws (arrows).
- Pull the annular buffer (1) downwards and out, check it and replace if necessary.



- Line up the rubber buffer so that it faces the handle housing – the notch (arrow) must engage the rib on the tank housing.
- Push the buffer (1) into position between the handle housing and crankcase.
- Coat the two bottom screws with Loctite, fit them and tighten them down firmly, **16**

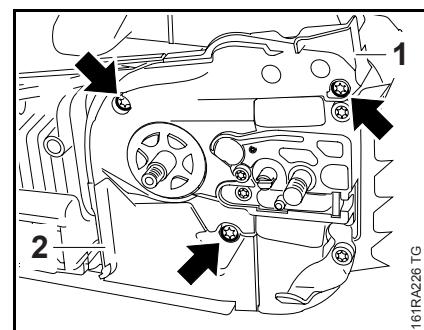


- Insert screw (1) through lug on handle housing and into the annular buffer.
- Tighten down the screw (1) firmly.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

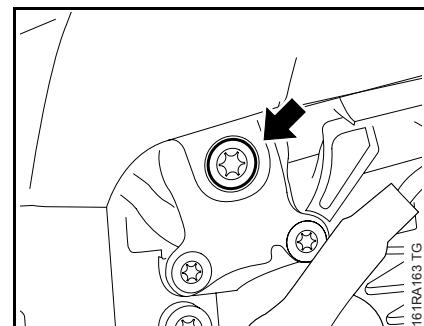
### 11.2 Annular Buffer on Oil Tank (MS 200)

On this model the handle housing has to be raised slightly to remove and install the annular buffer.

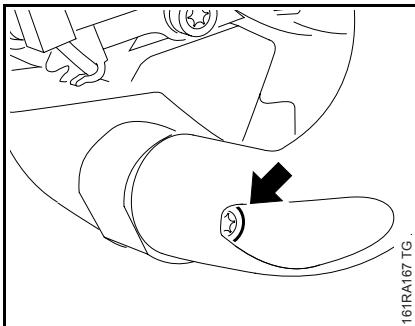
- Remove the chain sprocket cover, bar and chain, **5**



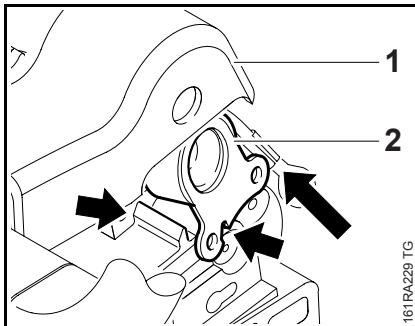
- Take out the screws (arrows).
- Remove the covers(1 and 2).



- Remove screw (arrow) from annular buffer on fuel tank.

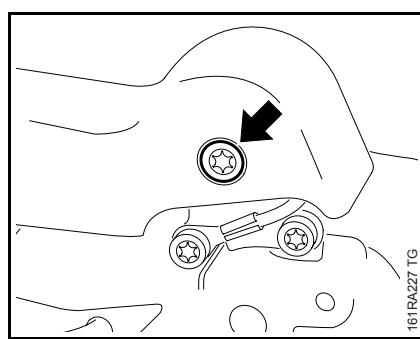


- Remove screw (arrow) from handlebar.

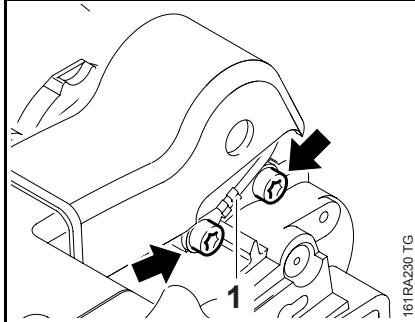


- Line up the buffer so that it faces the handle housing and the notch engages on the rib (arrows).
- Lift the handle housing (1) slightly and push the annular buffer between the handle housing and crankcase.

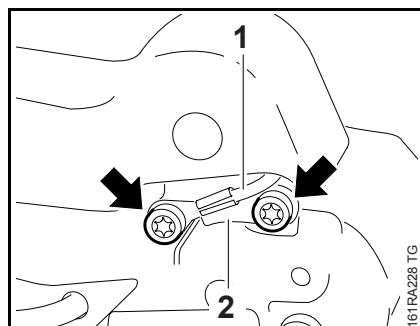
The short circuit and ground wires must be routed over the annular buffer to ensure they are not pinched between the annular buffer and handle housing.



- Take out the screw (arrow).



- Fit the ground wire (1) in position.
- Coat the screws (arrows) with Loctite, fit them and tighten them down firmly, **16**



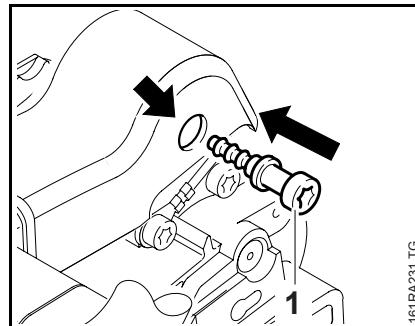
- Screws (arrows) are secured with Loctite. Heat with a hot air blower if necessary – take care not to damage insulation of ground wire.

- Take out the screws (arrows).

- Remove the ground wire (1).

- Lift the handle housing slightly and pull out the annular buffer (2).

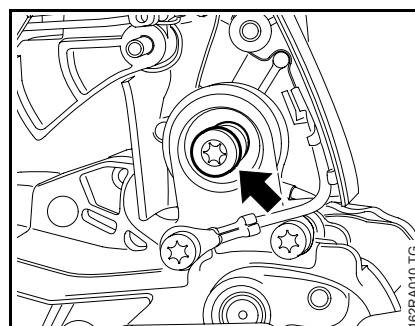
- Check the annular buffer and replace if necessary



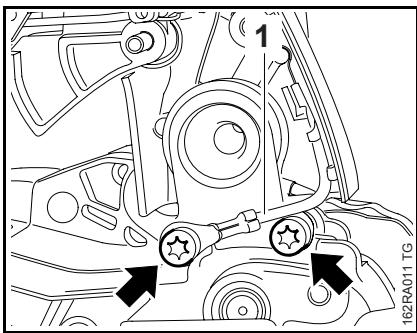
- Push the screw (1) through the handle housing (arrow).
- Tighten down the screw (1) firmly.
- Fit the screws in the annular buffer on the oil tank and the handlebar and tighten them down firmly.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

#### 11.2.1 Annular Buffer on Oil Tank (MS 200 T)

- Remove the chain sprocket cover, bar and chain, **5**
- Remove the handle molding, **12.3**

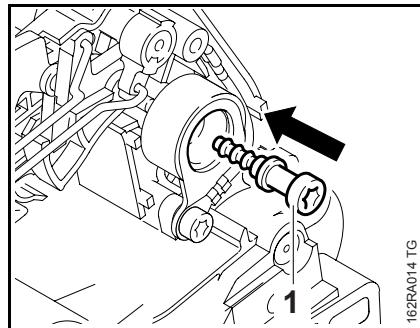


- Take out the screw (arrow).



- Take out the screws (arrows).
- Remove the ground wire (1).
- Check the annular buffer and replace if necessary

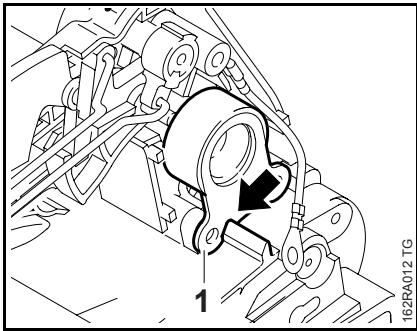
The ground wire must butt against the rib (2).



- Tighten down the screw (1) firmly.

Do pinch the short circuit wire.

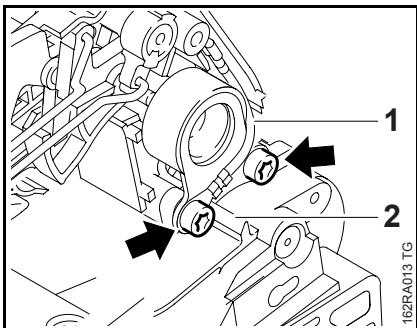
- Fit the handle molding, **12.3**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**



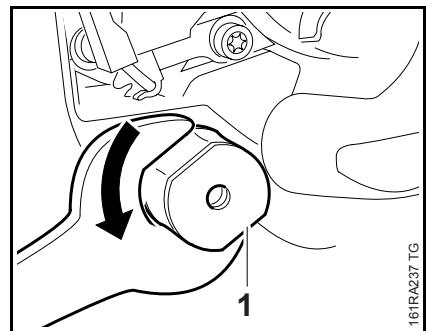
- Line up the buffer so that it faces the handle housing and the notch engages on the rib (arrow).
- Fit the annular buffer (1) in position.

### 11.3 Annular Buffer on Handlebar

- Remove the fan housing, **10.2**



- Fit the ground wire (1) in position.
- Insert screws (arrows) and tighten them down firmly.



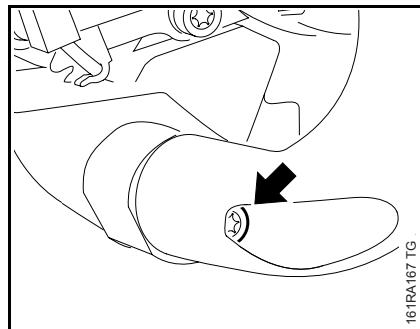
Do not use wrench at the side with the tapped hole

– it would damage the annular buffer.

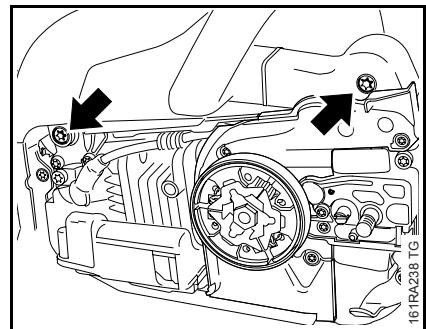
- Apply 20 mm open end wrench, loosen and unscrew the annular buffer (1).
- Check the annular buffer (1) and replace if necessary
- Reassemble in the reverse sequence.

### 11.4 Stop Buffer (MS 200)

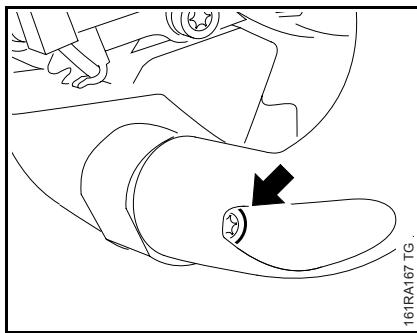
- Remove the chain sprocket cover, bar and chain, **5**



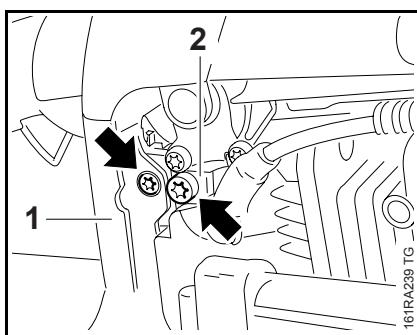
- Take out the screw (arrow).
- Ease the handlebar to one side.



- Remove the screws (arrows) from the annular buffers on the fuel and oil tanks.

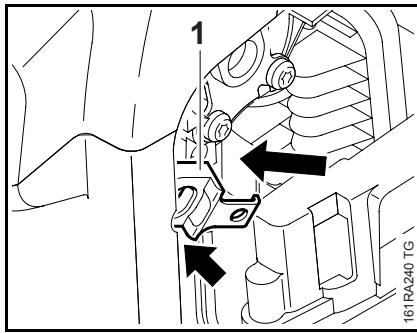


- Remove screw (arrow) from handlebar.



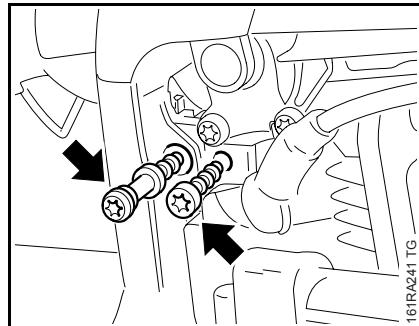
- Take out the screws (arrows).

- Ease the handle housing (1) sideways and pull out the stop buffer (1).
- Check the stop buffer and replace if necessary.



- Line up the stop buffer (1) so that its tab engages the tank housing.

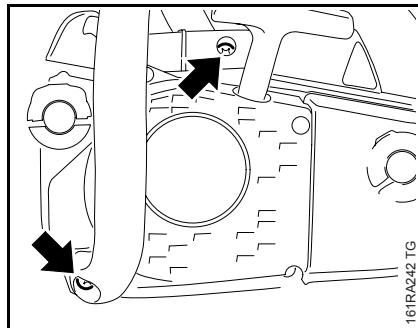
- Push the stop buffer (1) between the handle and tank housings (arrow) until it locates in its seat in the handle housing.



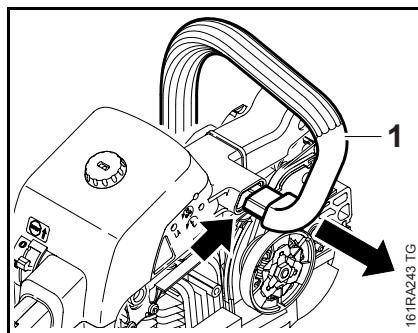
- Insert screws (arrows) and tighten them down firmly.
  - Fit the screws in the annular buffers on the oil and fuel tanks and the handlebar and tighten them down firmly.
  - Reassemble all other parts in the reverse sequence.
  - Tightening torques, **3.5**

## 11.5 Handlebar

### MS 200

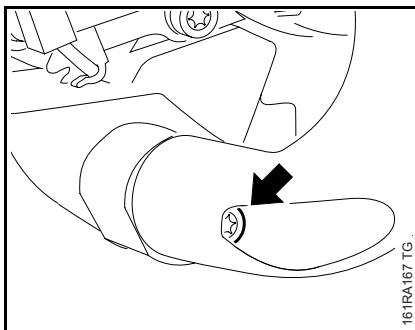


- Take out the screws (arrows).

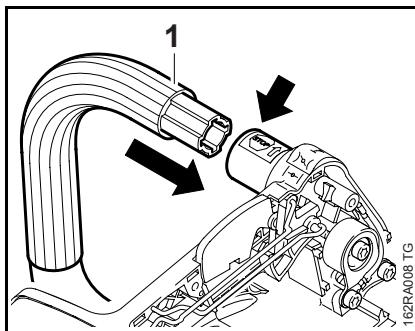


- Ease the handlebar (1) past the annular buffer and pull it out of the handle housing (arrow).
  - Check the handlebar and replace if necessary
  - Reassemble in the reverse sequence.

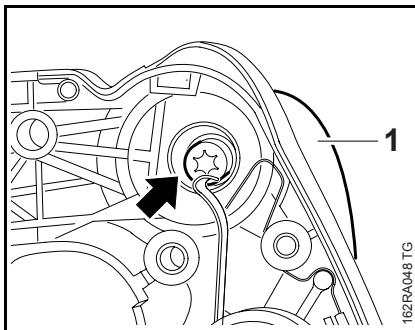
## MS 200 T



- Take out the screw (arrow).
  - Remove the handle molding and switch shaft, **12.1.2**



- Push the handlebar (1) into its seat (arrow).
  - Reassemble all other parts in the reverse sequence.
  - Tightening torques, **3.5**

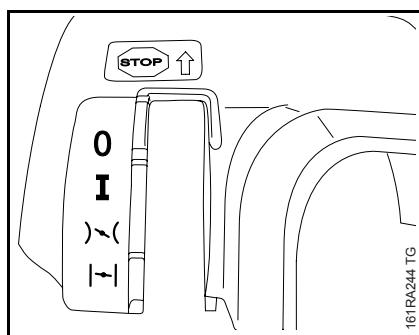


- Take out the screw (arrow).
  - Pull the handlebar (1) out of the handle housing. Check and replace if necessary.

## 12. Master Control Lever

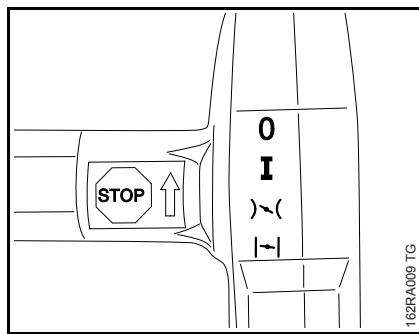
### 12.1 Switch Shaft / Control Lever

#### MS 200



The following positions can be selected with the switch shaft:

#### MS 200 T



The following positions can be selected with the control lever:

- Position **0** = engine off  
– ignition is switched off
- Position **I** = normal run position  
– engine runs or may start in this position

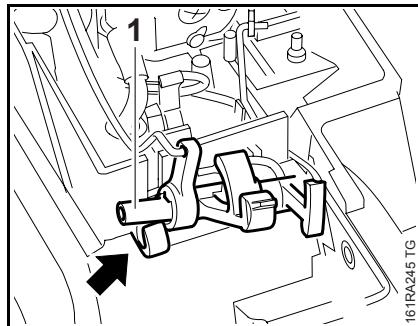
To move the switch shaft from **I** to **|** or **|** depress the interlock lever and throttle trigger at the same time.

- Position **|** = warm start  
– warm engine is started in this position

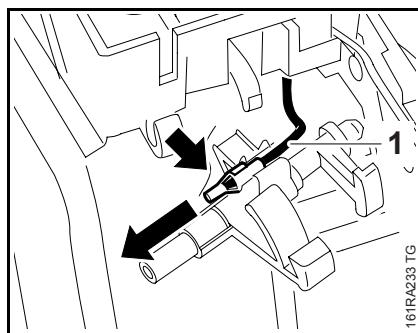
The switch shaft returns to the run position when the throttle trigger is operated.

- Position **|** = cold start  
– cold engine is started in this position

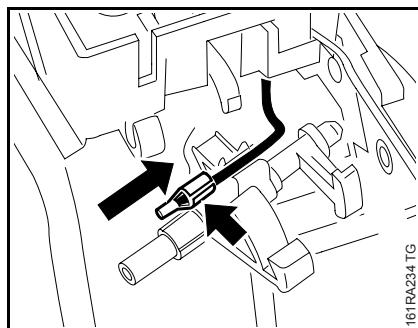
#### 12.1.1 Removing and Installing (MS 200)



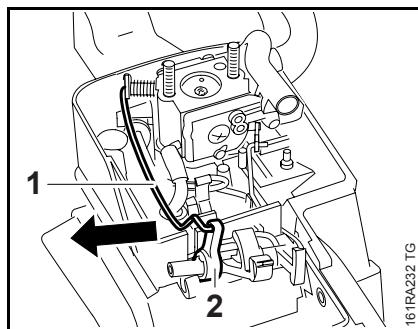
- Remove the air filter, **14.1**
- Remove the handle molding, throttle trigger and interlock lever, **12.2**
- Pry the switch shaft (1) out of its mount (arrow).



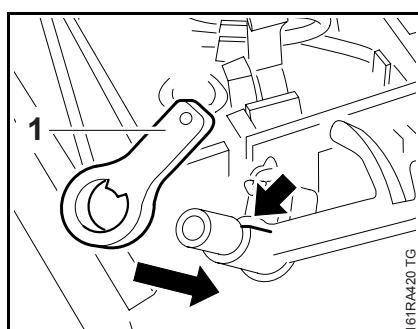
- Push terminal sleeve (arrow) of short circuit wire (1) out of the switch shaft.
- Check the switch shaft and choke lever and replace if necessary.



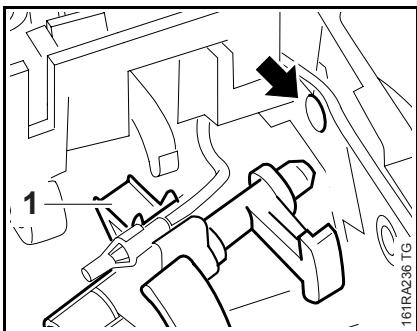
- Position the short circuit wire in its seat and fit the terminal sleeve (arrow) as far as stop.



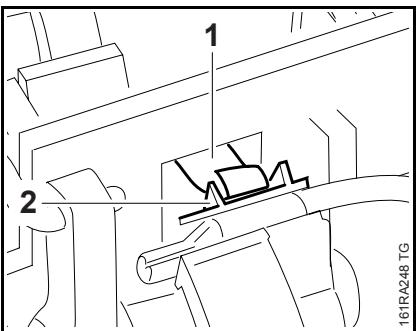
- Lift the switch shaft a little and disconnect the choke rod (1) from the choke lever (2).
- Pull the switch shaft out of the right-hand mount.



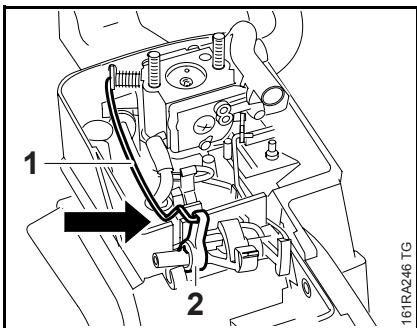
- Push the choke lever (1) on to the switch shaft so that the lug engages the slot (arrow).



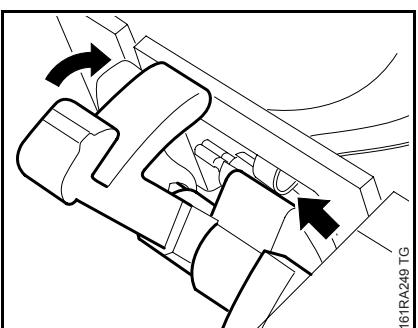
- Push the switch shaft into the right-hand mount (arrow), making sure the lobe (1) is under the contact spring.



The contact spring (1) must be in the switch shaft's (2) guide.



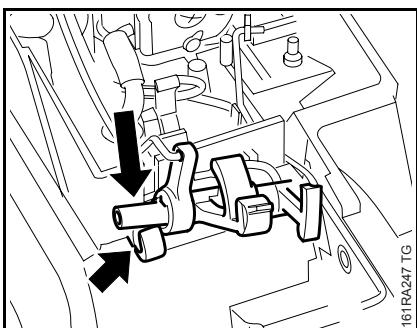
- Lift the switch shaft a little and attach the choke rod (1) to the choke lever (2).



- Check operation.

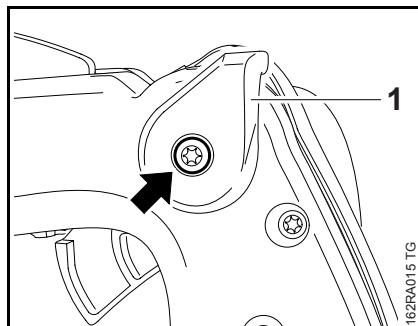
- Move switch shaft to "0" – contact between the short circuit wire and contact spring (arrow) must be made.

- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

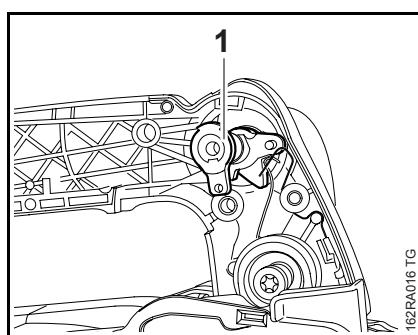


- Press the switch shaft into the mount (arrow) until it snaps into position.

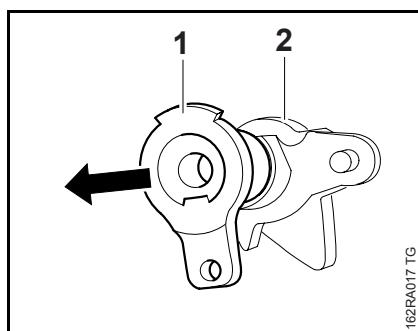
## 12.1.2 Removing and Installing (MS 200 T)



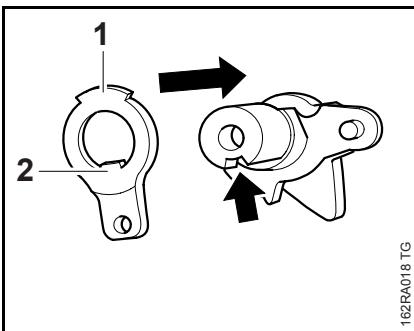
- Take out the screw (arrow).
- Remove the control lever (1).
- Remove the handle molding, throttle trigger and interlock lever, **12.3**



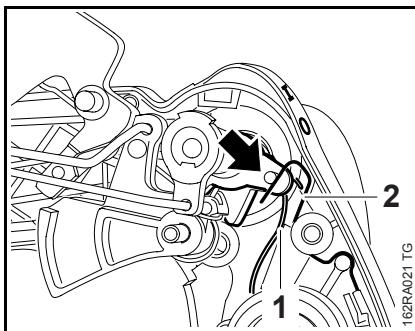
- Pull out the switch shaft (1).



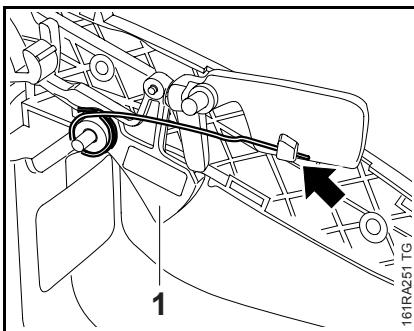
- Pull off the choke lever (1).
- Check the choke lever (1) and switch shaft (2) and replace if necessary



162RA018 TG



162RA021 TG



161RA251 TG

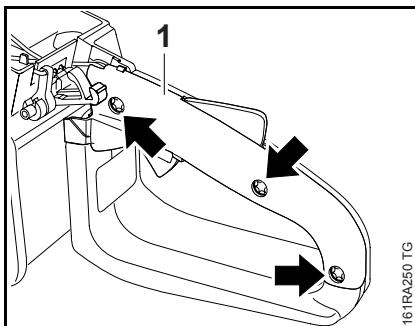
- Position the choke lever (1) so that the lug (2) engages the slot (arrow).
- Push the choke lever (1) on to the shaft.

- Check operation.
- Fit the control lever to simplify selection of the switch position.
- Move switch shaft to "0" – the contact springs (1+2) must touch the switch shaft's pin (arrow) – contact is made.

The throttle trigger and interlock lever may pop out.

- Reassemble all other parts in the reverse sequence.
- Tightening torques, [3.5](#)

## 12.2 Throttle Trigger/Interlock Lever (MS 200)



161RA250 TG

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

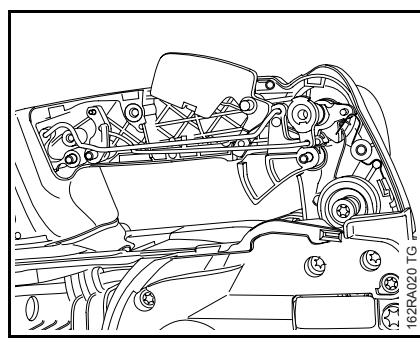
The throttle trigger and interlock lever may pop out.



161RA421 TG

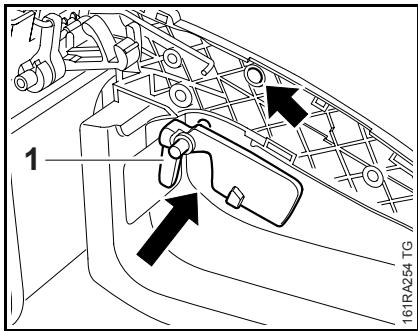
- Push the contact spring (1) to the side.
- Push the switch shaft, pin (2) first, into its mount (arrow).

- Attach the torsion spring (1) to the throttle trigger
  - note installed position (arrow).

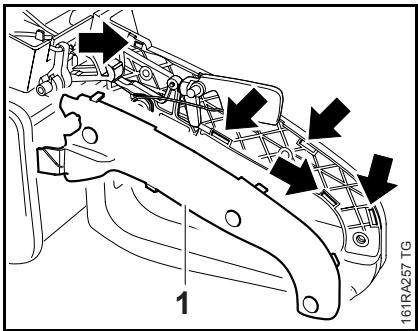


162RA020 TG

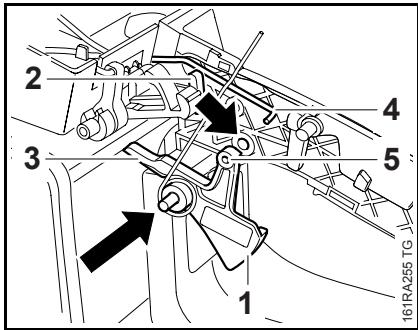
- Install the throttle trigger and interlock lever, [12.3](#)
- Install the choke and throttle rods, [12.3.2](#)



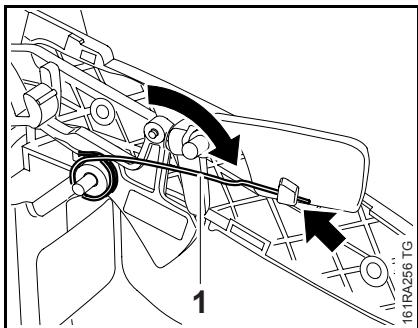
- Push the interlock lever (1) into its mount (arrow).



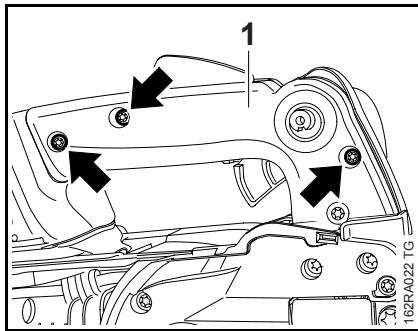
- Position the handle molding (1) so that the lugs engage the seats (arrows).



- Push the throttle trigger (1) into the bore (arrow) in the handle so that the arm (3) is under the switch shaft's lever (2) and its hole (5) engages the throttle rod (4).

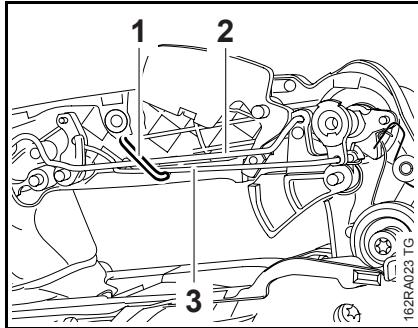


- Attach the torsion spring (1) to the interlock lever (arrow).

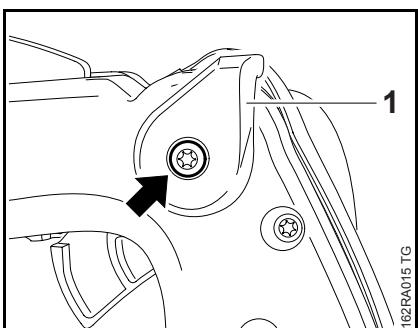


- Take out the screws (arrows).
  - Carefully remove the handle molding (1).

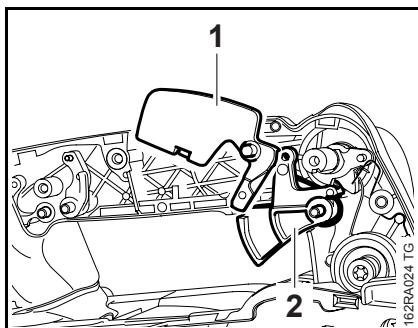
The throttle trigger and interlock lever may pop out.



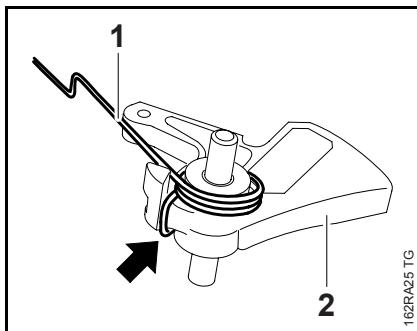
- Remove the link (1).
  - Pull out the throttle rod (2) and long choke rod (3), **12.3.2**



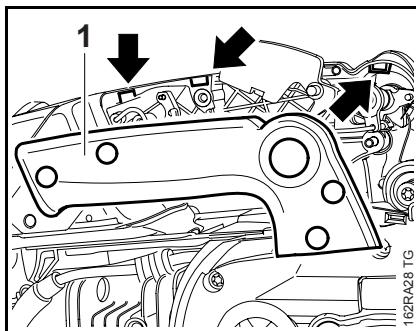
- Take out the screw (arrow).
  - Remove the control lever (1).



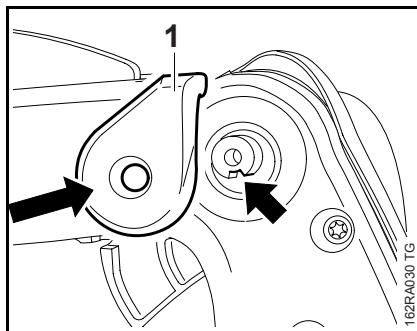
- Remove the interlock lever (1) and throttle trigger (2).
  - Check the individual parts and replace if necessary.



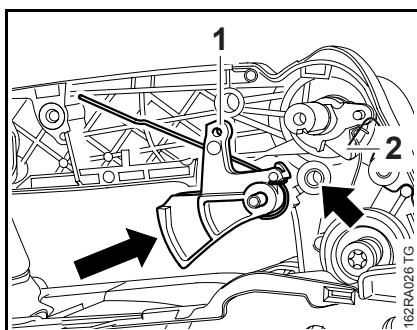
- Attach the torsion spring (1) to the throttle trigger (2)
  - note installed position (arrow).



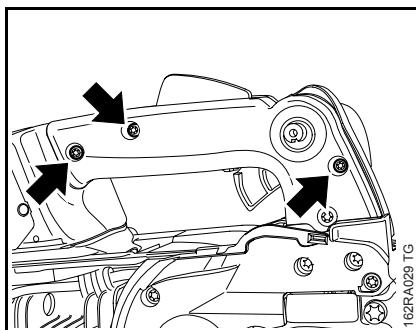
- Install the long throttle and choke rods, **12.3.2**



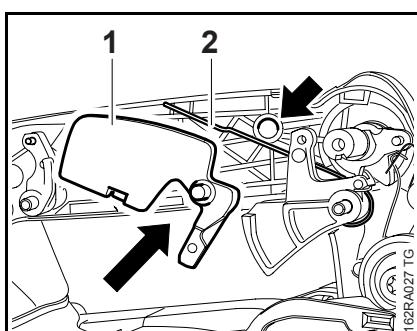
- Position the control lever (1) so that its lugr engages the slot (arrow) in the switch shaft.



- Position the handle molding (1) so that the lugs engage the seats (arrows).
- Carefully push the handle molding (1) into place – the throttle trigger and interlock lever may pop out.

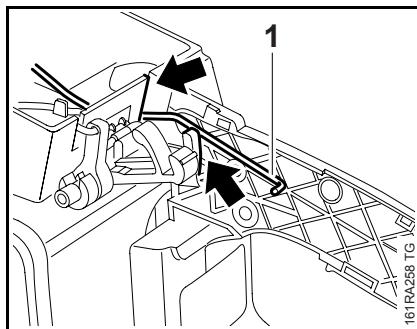


- Insert screws (arrows) and tighten them down firmly.

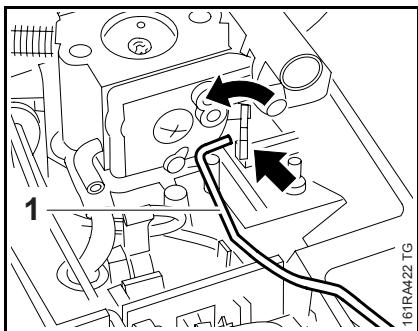


- Attach the interlock lever (1) to the torsion spring (2).
- Push the interlock lever (1) with torsion spring into the bore (arrow).

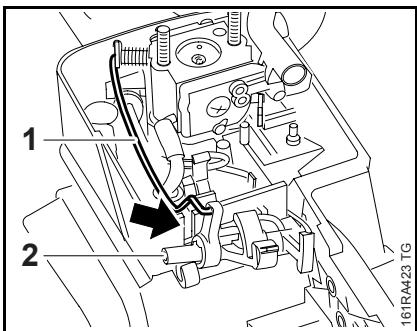
### 12.3.1 Choke and Throttle Rods (MS 200)



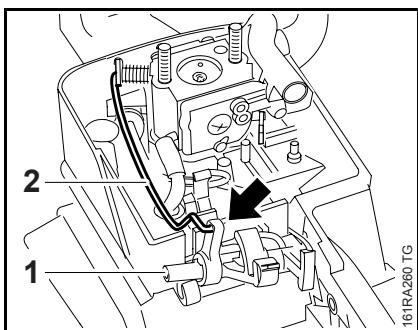
- Remove the interlock lever and throttle trigger, **12.2**
- Take the throttle rod (1) out of its guides (arrows).



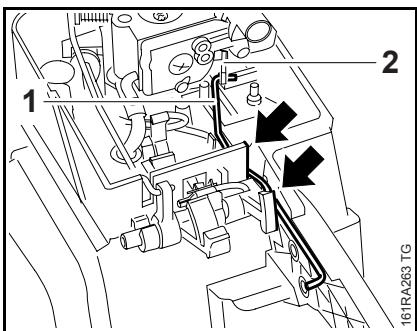
- Turn the throttle rod (1) slightly and disconnect it from the lever on the carburetor (arrow).
- Remove the throttle rod (1).



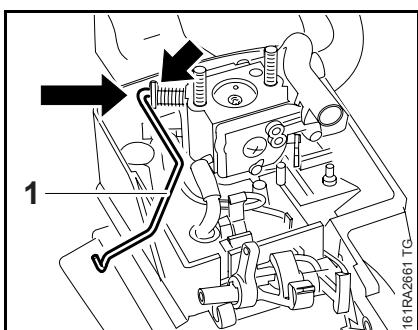
- Attach choke rod (1) to choke lever.
- Push the switch shaft (2) into its mount until it snaps into position.



- Pry the switch shaft (1) out of its mount.
- Disconnect the choke rod (2) from the choke lever (arrow) first, then from the carburetor.
- Check the choke and throttle rods and replace if necessary.



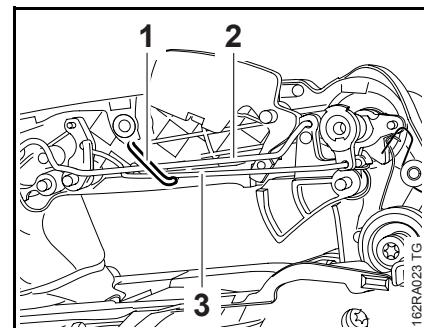
- Attach throttle rod (1) to lever (2) on throttle shaft.
- Place the throttle rod (1) in the guides (arrows) and push it over the edge of the handle.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**
- Check operation.



- Attach choke rod (1) to lever (arrow) on choke shaft first.

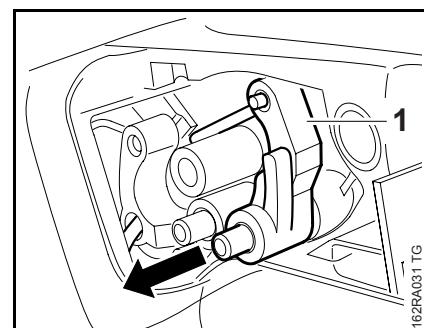
### 12.3.2 Choke and Throttle Rods (MS 200 T)

Color-coding of rods and levers:  
Choke: lever white, rod silver-colored  
Throttle: lever orange, rod copper-colored

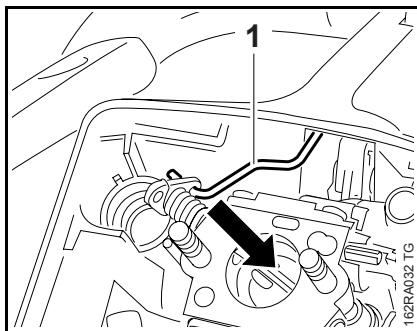


- Remove the control lever and handle molding, **12.1.2**
- Pull out the link (1).
- Carefully pull out the long throttle rod (2) and choke rod (3).

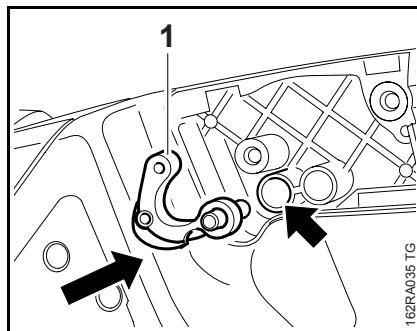
The throttle trigger and interlock lever may pop out.



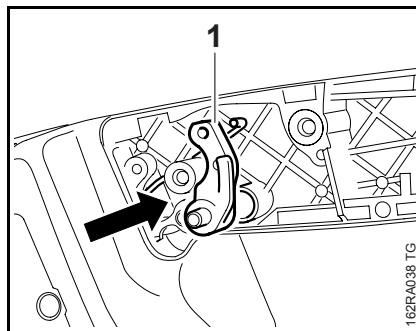
- Pull the double choke lever (1) out of the handle housing and choke rod.



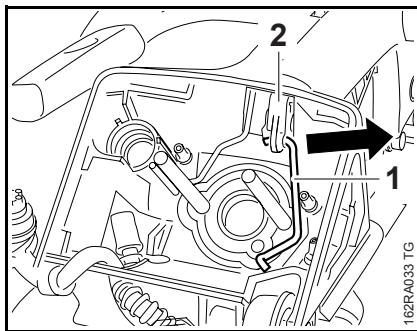
- Remove the filter base, **14.1.1**
- Disconnect the short choke rod (1) from the carburetor.



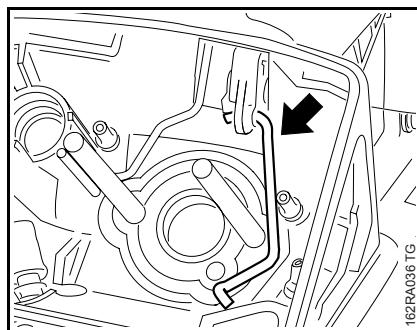
- Position the double throttle lever so that its outer curvature is facing the carburetor.
- Push the double throttle lever (1) into the bore (arrow).



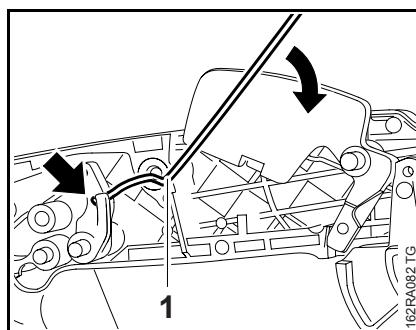
- Push the double choke lever (1) into the bore and the short choke rod.



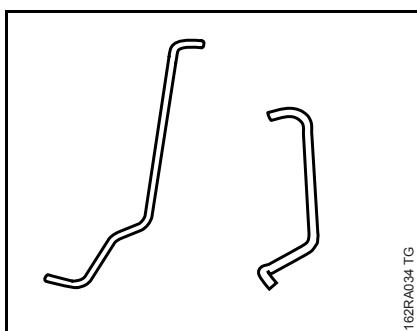
- Pull out the carburetor and disconnect the short throttle rod, **14.2.1**
- Disconnect the short throttle rod (1) and pull the double throttle lever (2) out of the handle housing.



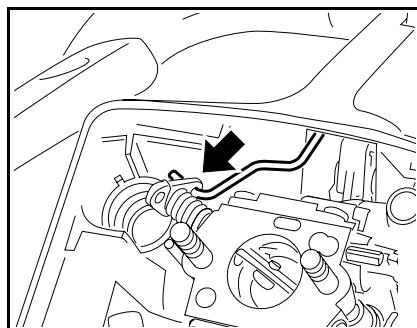
- Attach the short throttle rod (arrow) to the double throttle lever.
- Push the carburetor into position and attach the short throttle rod, **14.2.1**



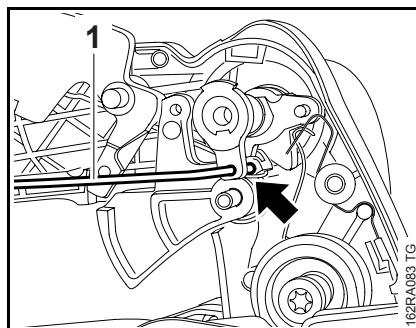
- Line up long choke rod (1) in the vertical position.
- Hold the double choke lever steady.
- Push the long choke rod (1) into the double choke lever and turn it clockwise until it is seated in the guide (arrow).



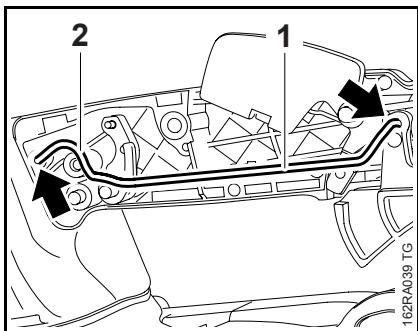
- Check the individual parts and replace if necessary.



- Attach the short choke rod (arrow) to the carburetor and insert it into the handle housing.



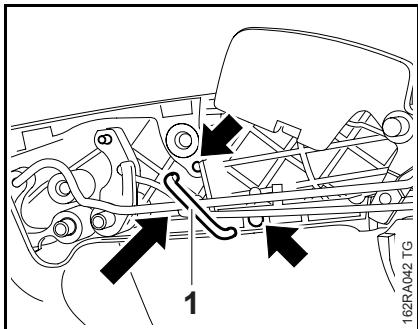
- Push the long choke rod (1) into the choke lever (arrow).



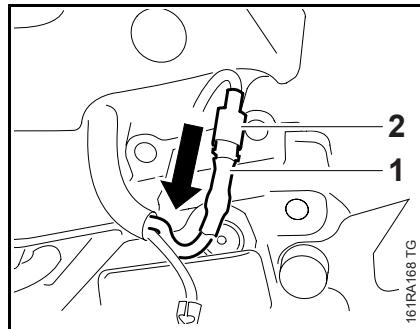
#### 12.4 Removing and Installing the Handle Housing (MS 200)

- Line up the long throttle rod (1) – the curved end (2) must be one the double throttle lever.
- Carefully push the long throttle rod (1) into the double throttle lever and throttle trigger (arrows).

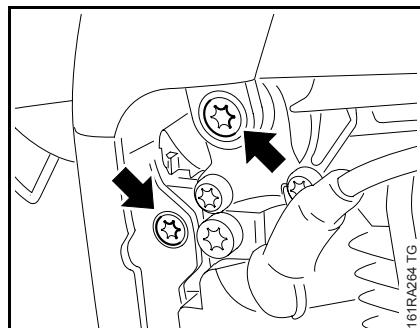
The double throttle lever may fall out or the interlock lever and throttle trigger may pop out.



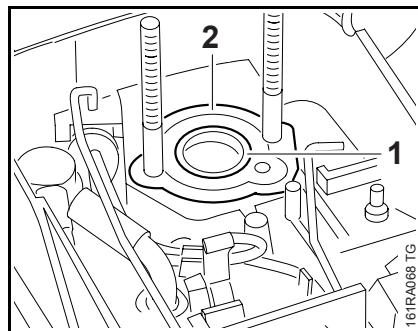
- Check all rods – the levers must be seated in the guides and rods attached to the levers.
- Push the link (1) into the holes (arrows) as far as stop.
- Fit the handle molding and switch lever, 12.1.2
- Tightening torques, 3.5
- Check operation.



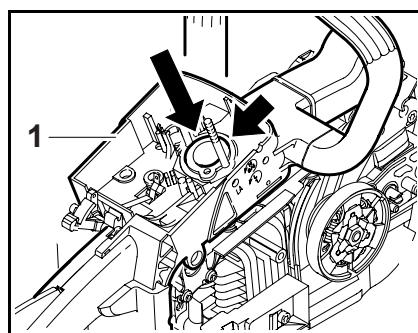
- Remove annular buffer from the oil tank, 11.2
- Disconnect wiring harness (1) from the short circuit wire connector (2).



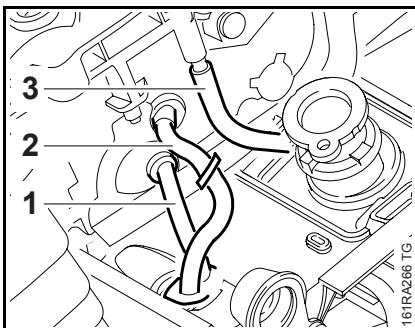
- Take out the screws (arrows).
- Remove screw from handlebar.



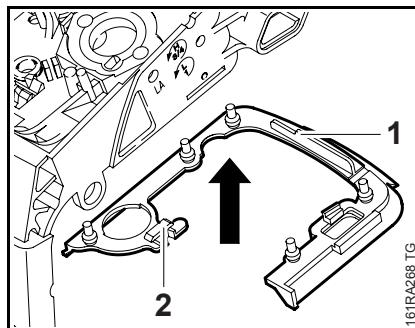
- Remove the sleeve (1) and washer (2).



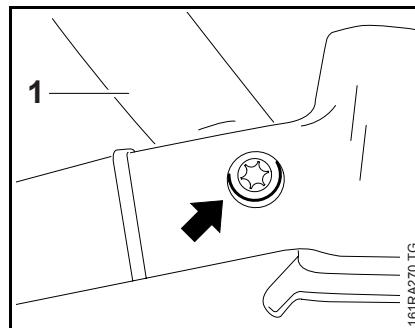
- Lift the handle frame (1) and push out the manifold (arrow).



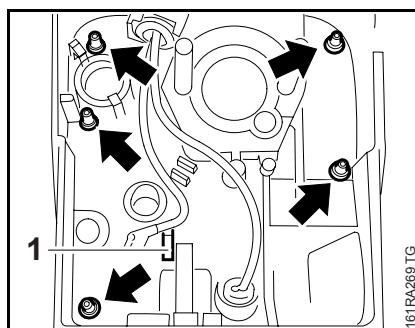
- Pull the tank vent hose (1) and the fuel hose (2) out of the handle housing.
- Disconnect the impulse hose (3).
  - Remove the handle housing, check and replace if necessary
  - Check the wiring harness and contact spring and replace if necessary. **9.5.4**
  - Check the interlock lever and throttle trigger and replace if necessary. **12.2**
  - Check the choke and throttle rods and replace if necessary, **12.3.1**
  - Check the switch shaft and replace if necessary, **12.1.1**



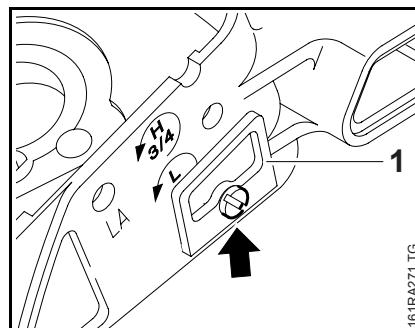
- Push on the cover (1). The pegs must engage the holes and the lug (2) the opening.



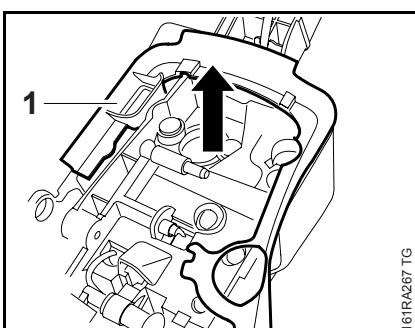
- Take out the screw (arrow).
  - Pull out the handlebar (1), check it and replace if necessary.
  - Reassemble in the reverse sequence.



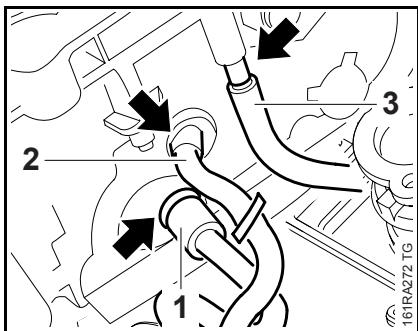
- Pull the pegs (arrows) into the holes and make sure they are properly seated.
  - The cover's lug (1) must completely fill the opening – it secures the contact spring in position.



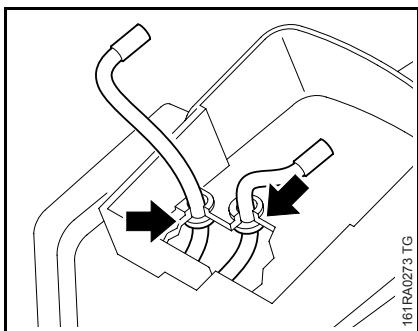
- Take out the screw (arrow).
  - Pull out the shutter (1) for summer/winter operation, check it and replace if necessary.
  - Reassemble in the reverse sequence.



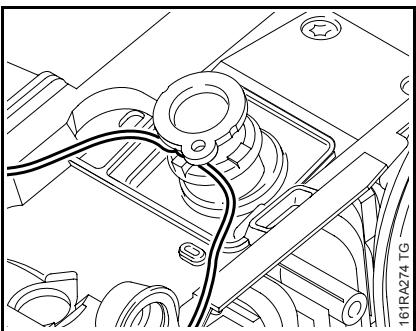
- Pull the cover (1) out of the handle housing.
  - Inspect the cover and replace if necessary,



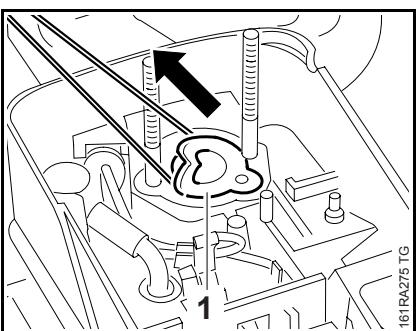
- Place the handle housing in position.
- Push the tank vent hose (1) and fuel hose (2) through the holes (arrows).
- Push the impulse hose (3) on to the nipple (arrow)
  - and make sure it does not slip off during the following operations.



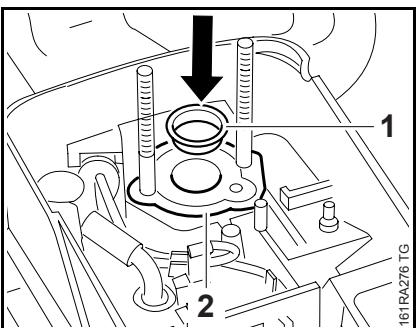
Do not pull the hose flanges (arrows) through the holes  
– they are intended to act as stops.



- Coat the flange of the manifold with STIHL Press Fluid, 14.6
- Position the handle housing against the manifold.
- Wind a piece of string around the manifold flange.

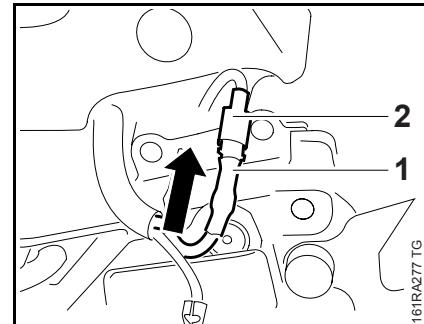


- Pass the ends of the string through the opening in the handle housing and then pull the manifold flange (1) through the opening.

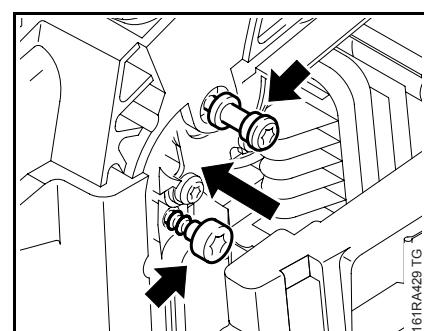


- Fit the sleeve (1) and washer (2).

- Install the tank vent, 14.6.2
  - not necessary on versions with "tank vent installed in tank housing".



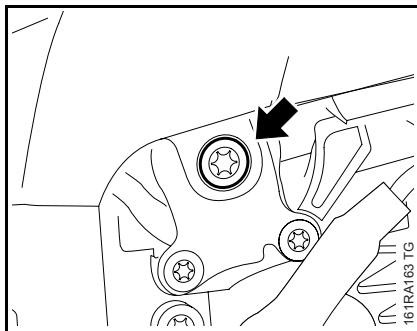
- Connect the wiring harness (1) to the short circuit wire (2).
- Install annular buffer on the oil tank, 11.2



- Fit the screws (arrows).
- Fit the screw on the handlebar.
- Install the carburetor, 14.2
- Reassemble all other parts in the reverse sequence.
- Tightening torques, 3.5
- Check operation.

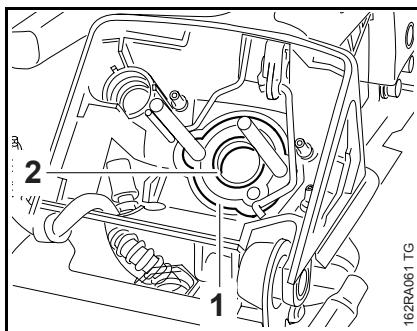
## 12.5 Removing and Installing the Handle Housing (MS 200 T)

- Remove the carburetor, [14.2.1](#)
- Remove the tank vent, [14.6.4](#)  
– not necessary on versions with "tank vent installed in tank housing".
- Remove annular buffer from the oil tank, [11.2.1](#)
- Disconnect the short circuit wire, [9.5.3](#)

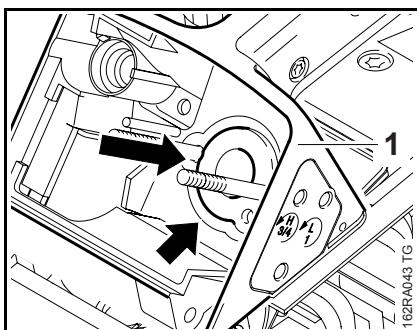


- Take out the screw (arrow).

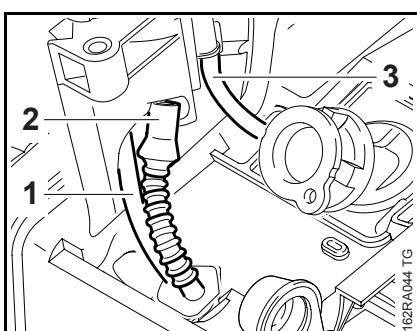
- Remove screw from handlebar, [11.5](#)



- Remove the sleeve (2) and washer (1).



- Lift the handle frame (1) and push out the manifold (arrow).



- Pull the tank vent hose (1) and the fuel hose (2) out of the handle housing.

- Disconnect the impulse hose (3).

- Remove the handle housing, check and replace if necessary

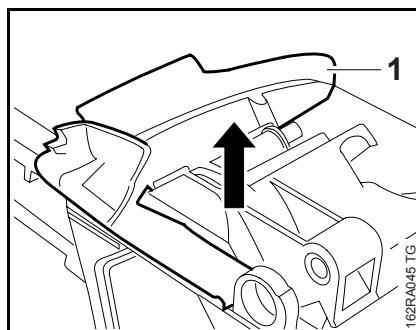
- Check the ground wire and contact spring and replace if necessary, [9.5.5](#)

- Check the interlock lever and throttle trigger and replace if necessary, [12.3](#)

- Check the choke and throttle rods and replace if necessary, [12.3.2](#)

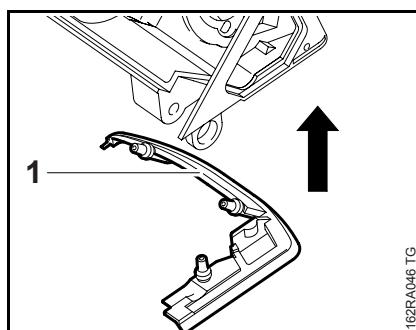
- Check the switch shaft and replace if necessary, [12.1.2](#)

- Check shutter for summer/winter operation and replace if necessary, [14.2.1](#)

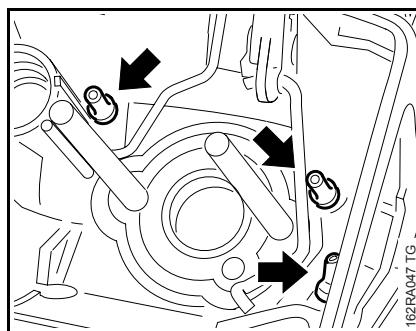


- Pull the cover (1) out of the handle housing.

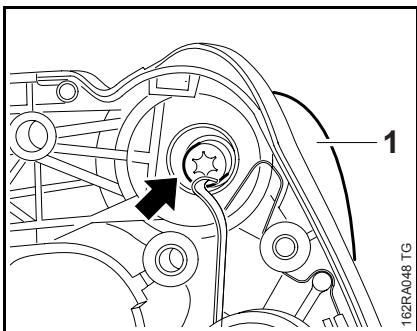
- Inspect the cover and replace if necessary.



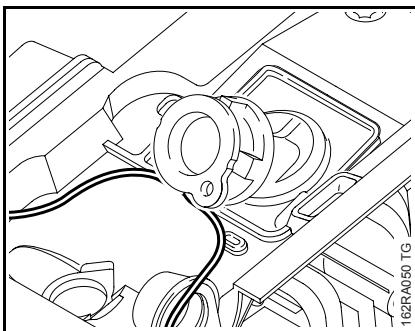
- Fit the cover (1). Push the pegs into the holes.



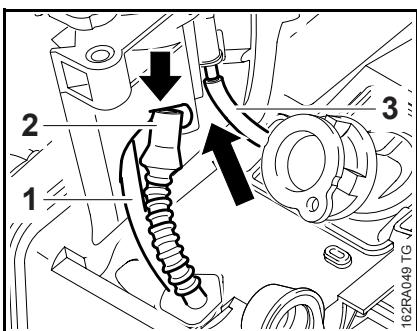
- Pull the pegs (arrows) into the holes and make sure they are properly seated.



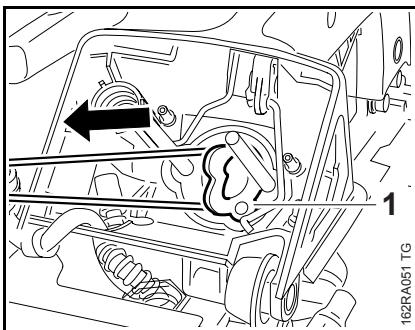
- Remove the switch shaft, [12.1.2](#)
- Take out the screw (arrow).
- Pull out the handlebar (1), check it and replace if necessary.
- Reassemble in the reverse sequence.



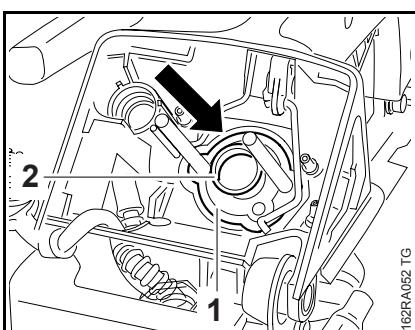
- Coat the flange of the manifold with STIHL Press Fluid, [16](#)
- Position the handle housing against the manifold.
- Wind a piece of string around the manifold flange.



- Place the handle housing in position.
- Push the tank vent hose (1) and fuel hose (2) through the opening (arrow).
- Push the impulse hose (3) on to the nipple – and make sure it does not slip off during the following operations.



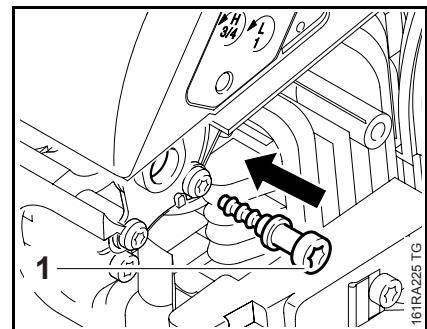
- Pass the ends of the string through the opening in the handle housing and then pull the manifold flange through the opening.



- Fit the sleeve (2) and washer (1).

– Install the tank vent, [14.6.4](#)  
– not necessary on versions with "tank vent installed in tank housing".

– Push the short circuit wire on to the contact spring, [9.5.3](#)



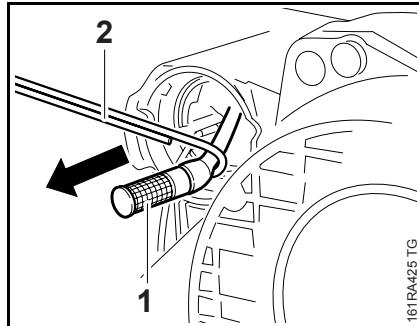
- Install annular buffer on the oil tank, [11.2.1](#)
- Fit the screw on the handlebar, [11.5](#)
- Fit the screw (1).
- Install the carburetor, [14.2.1](#)
- Reassemble all other parts in the reverse sequence.
- Tightening torques, [3.5](#)
- Check operation.

## 13. Chain Lubrication

### 13.1 Pickup Body

Impurities gradually clog the fine pores of the filter with minute particles of dirt. This prevents the oil pump from supplying sufficient oil. In the event of problems with the oil supply system, first check the oil tank and the pickup body. Clean the oil tank if necessary, **1**

- Troubleshooting, **4.3**
- Open the oil tank cap and drain the oil tank.
- Collect chain oil in a clean container, **1**



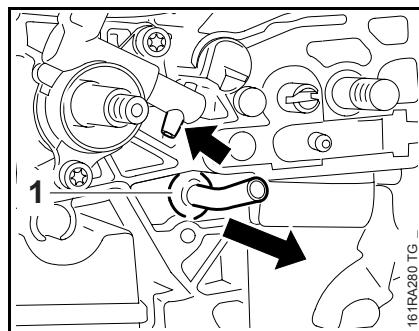
- Use hook (2) 5910 893 8800 to remove the pickup body (1) from the oil tank.

Do not overstretch the suction hose.

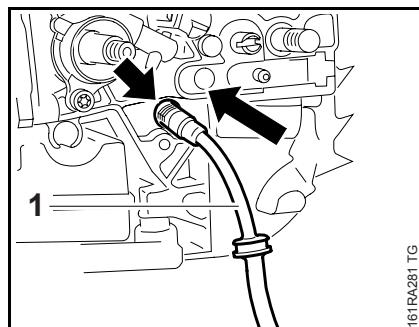
- Check the pickup body (1) and clean or replace if necessary.
- Reassemble all other parts in the reverse sequence.

### 13.2 Oil Suction Hose

- Remove the chain sprocket cover, bar and chain, **5**
- Remove the clutch drum, **6**
- Remove the cover and pull off the worm, **13.4**
- Open the oil tank cap and drain the oil tank.
- Collect chain oil in a clean container, **1**

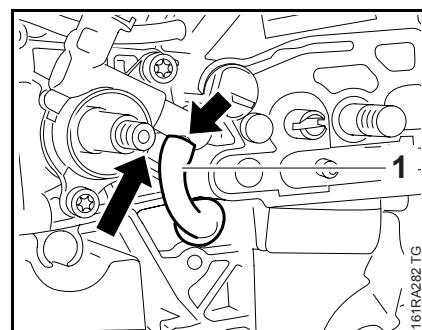


- Disconnect the oil suction hose (1) from the oil pump (arrow) and pull it out of the crankcase.
- Check the oil suction hose (1) and pickup body and replace if necessary.



- Push the oil suction hose (1), pickup body first, through the housing bore (arrow).

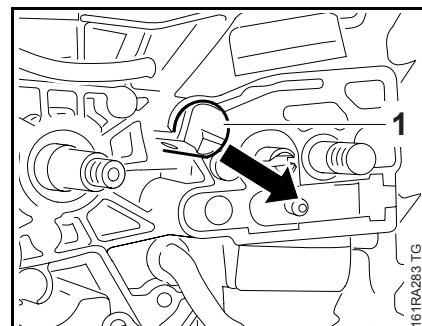
- Press home the oil suction hose until the groove locates properly in the bore.



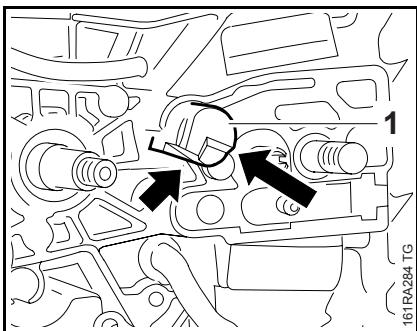
- Push the oil suction hose (1) on to the oil pump's stub (arrow).
- Check position of pickup body. If necessary, use hook 5910 893 8800 to position it properly.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

### 13.3 Connector / Oil Pressure

- Remove the oil pump, **13.4**



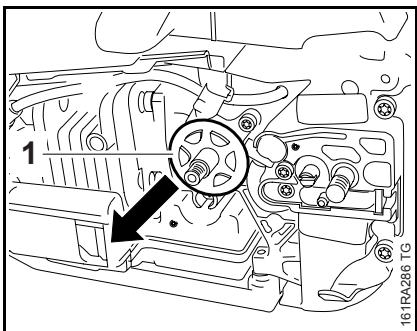
- Use a suitable tool to pry the connector (1) off the oil pump.
- Check the connector (1) and replace if necessary



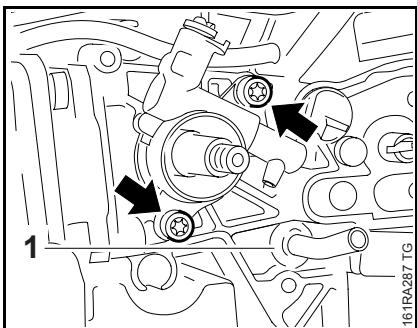
- Line up the connector (1) so that the shoulder (arrow) is visible and points towards the oil pump's stub.
- Push the connector (1) into its seat as far as stop.
- Install the oil pump and push the worm into position, **13.4**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

#### 13.4 Oil Pump

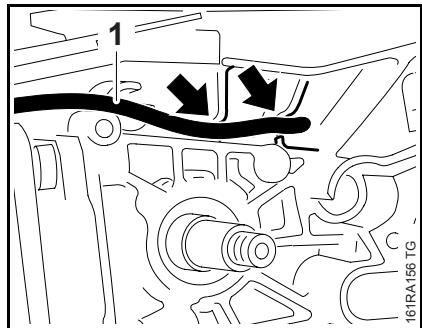
- Troubleshooting, **4.3**
- Remove the clutch drum, **6**



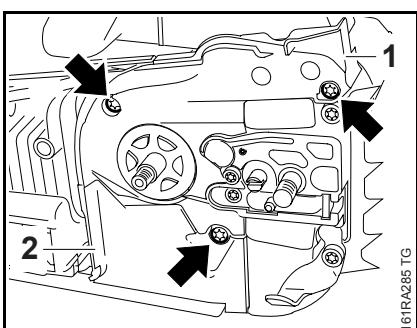
- Pull the worm (1) out of the oil pump.
  - Check the worm (1) and replace if necessary



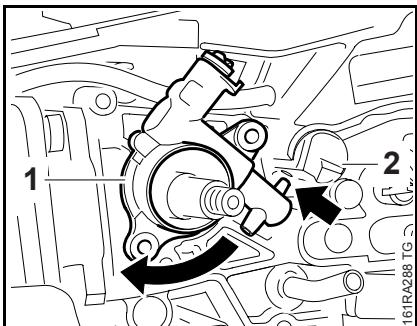
- Check the oil pump (1) and replace if necessary
- Inspect the oil suction hose and replace if necessary, **13.2**
- Check the connector (2) and replace if necessary, **13.3**



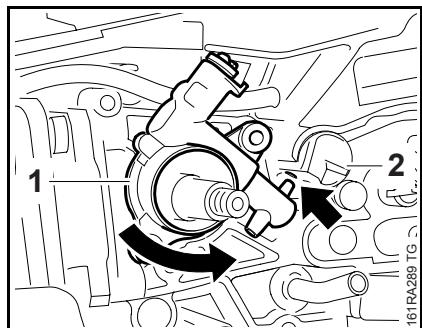
The ignition lead (1) must be properly seated in the guides (arrows) since it might otherwise be pinched.



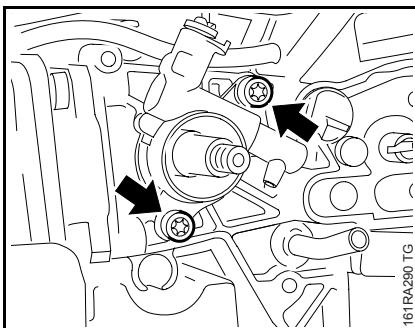
- Take out the screws (arrows).
- Remove the covers(1 and 2).



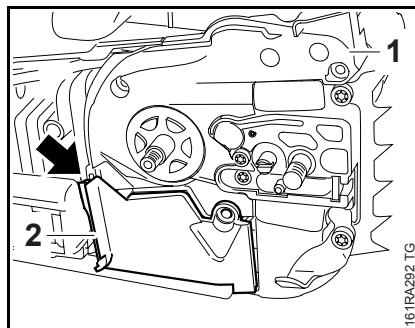
- Turn the oil pump (1) clockwise until the stub (arrow) slips out of the connector (2).



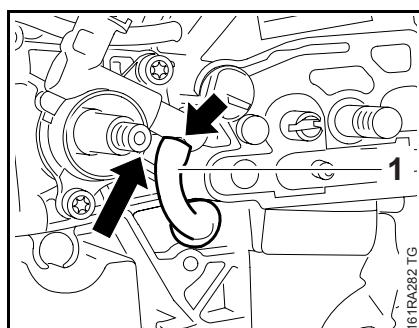
- Place the oil pump in position.
- Turn the oil pump (1) counterclockwise until the stub (arrow) is properly seated in the connector's bore (2).



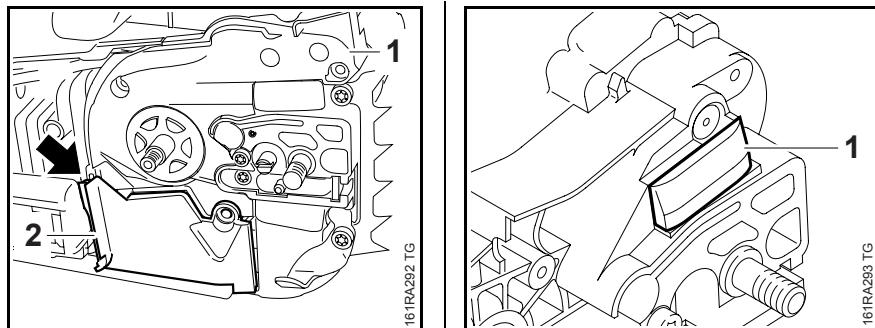
- Line up the oil pump with the holes.
- Insert screws (arrows) and tighten them down firmly.



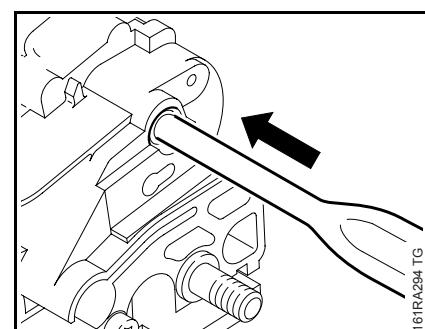
- Place the cover (1) in position.
- Position the bottom edge of the cover (2) first, then push lug (arrow) into its seat in the cover (1).
- Insert screws and tighten them down firmly.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**



- Push the oil suction hose (1) on to the stub (arrow).



- Pry out the bumper strip (1).

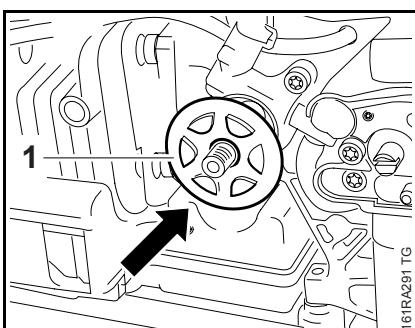


- Use a 6 mm drift to carefully drive the valve out of its seat in the housing and into the oil tank.

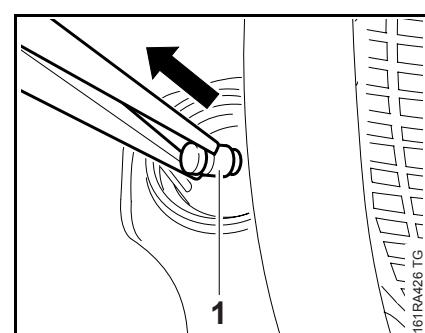
### 13.5 Valve

A valve is installed in the tank wall to keep internal tank pressure equal to atmospheric pressure. The valve must be replaced if it is faulty.

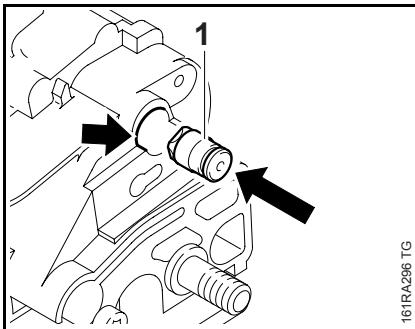
- Remove the chain sprocket cover, bar and chain, **5**
- Open the oil tank cap and drain the oil tank.
- Collect chain oil in a clean container, **1**
- Remove the cover, **13.4**



- Push the worm (1) into the oil pump.

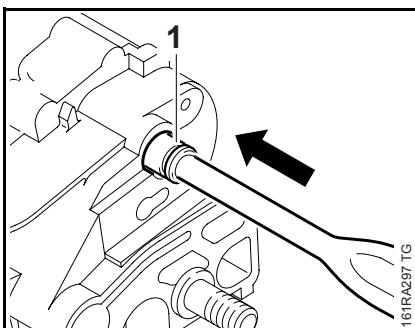


- Remove the old valve (1) from the oil tank.

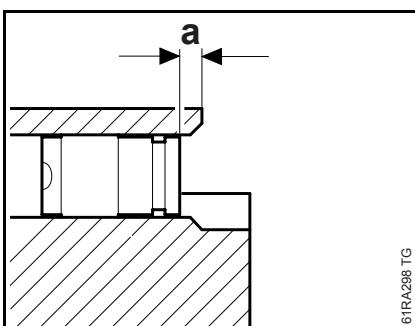


Check correct installed position.

- Insert the valve (1) in the housing bore (arrow).



- Use a 6 mm drift to carefully drive in the new valve (1) from outside – note installed depth.



- Installed depth of new valve:  
a = about 2 - 3 mm
- Reassemble all other parts in the reverse sequence.

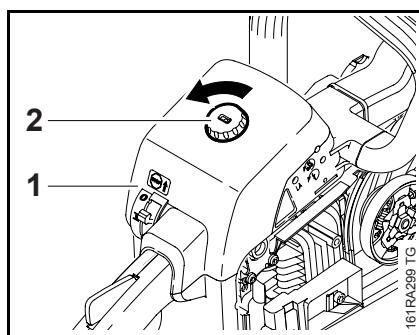
## 14. Fuel System

### 14.1 Air Filter

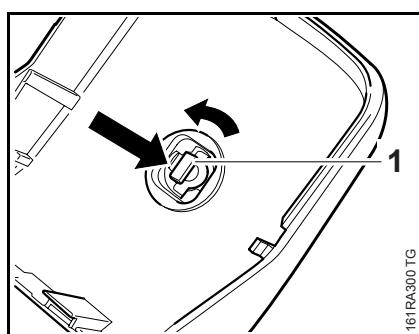
Dirty air filters reduce engine power, increase fuel consumption and make starting more difficult. The air filter should be checked when there is a noticeable loss of engine power.

- See also Troubleshooting, **4.5**, **4.6**

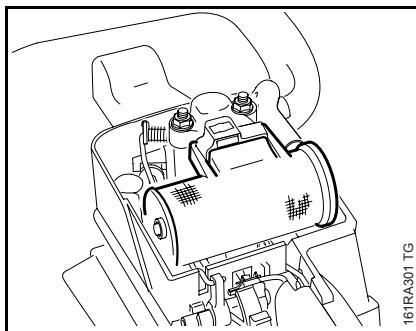
#### MS 200



- Turn twist lock (1) counterclockwise.
- Remove the carburetor box cover (2).

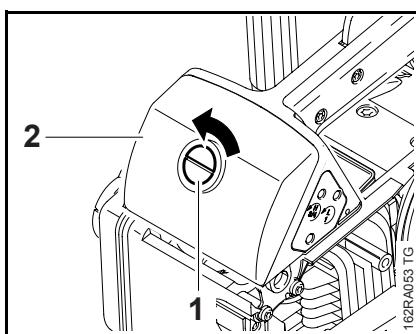


- Turn the twist lock until the bar (1) is on the carburetor box cover's centerline.
- Press the twist lock out of the cover.

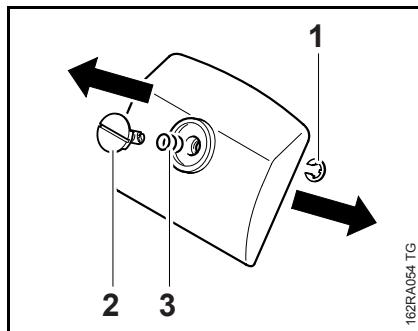


- Remove and install the air filter – see MS 200 instruction manual.
- Clean the air filter – see MS 200 instruction manual.
- Reassemble in the reverse sequence.

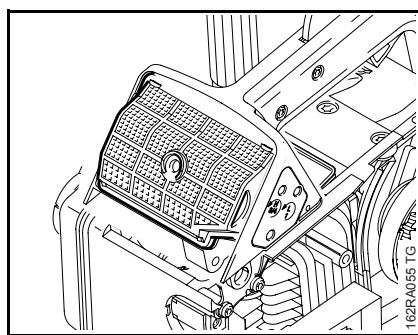
#### MS 200 T



- Turn twist lock (1) counterclockwise.
- Remove the carburetor box cover (2).



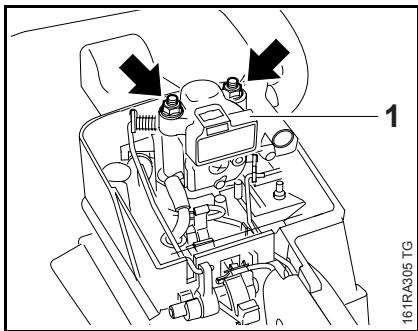
- Remove the E-clip (1).
- Remove the twist lock (2) and spring (3).



- Remove and install the air filter – see MS 200 T instruction manual.
- Clean the air filter – see MS 200 T instruction manual.
- Reassemble in the reverse sequence.

#### 14.1.1 Removing and Installing the Filter Base (MS 200)

Remove the air filter, [14.1](#)



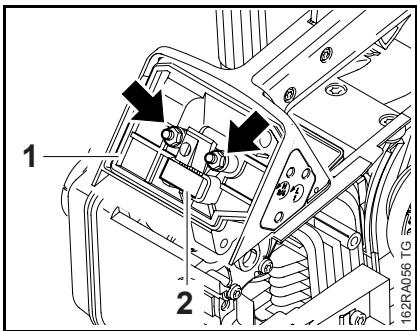
- Unscrew the nuts (arrows).
- Pull off the filter base (1), check it and replace if necessary.

Always use new self-locking nuts.

- Reassemble in the reverse sequence.
- Tightening torques, [3.5](#)

#### 14.1.2 Removing and Installing the Filter Base (MS 200 T)

Remove the air filter, [14.1](#)

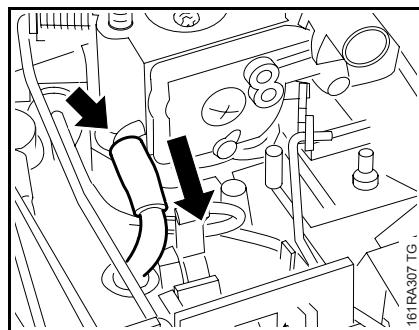


- Unscrew the nuts (arrows).
- Pull off the filter base (1), check it and replace if necessary.
- Check the foam element (2) and clean or replace if necessary.
- Always use new self-locking nuts.
- Reassemble in the reverse sequence.
- Tightening torques, [3.5](#)

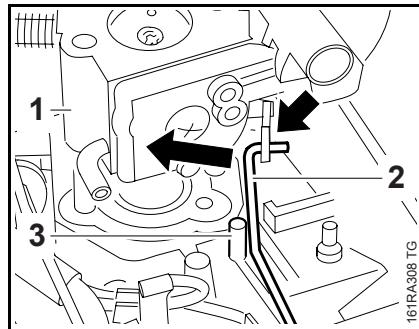
#### 14.2 Removing and Installing the Carburetor (MS 200)

- Remove the air filter, [14.1](#)
- Remove the filter base, [14.1.1](#)
- Open the fuel tank cap and drain the fuel tank.
- Collect the fuel in a clean container, [1](#)

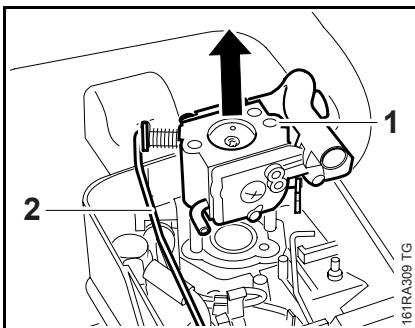
Pull off the carburetor only when the tank cap is open.



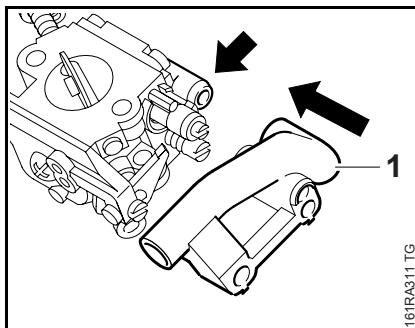
- Disconnect the fuel hose (arrow).



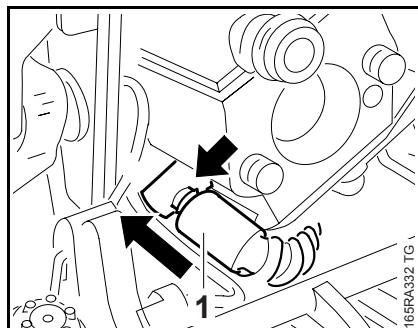
- Pull out the carburetor (1) until the throttle rod (2) is above the peg (3).
- Push the throttle rod (2) in direction of tank vent and disconnect it from the throttle lever (arrow).



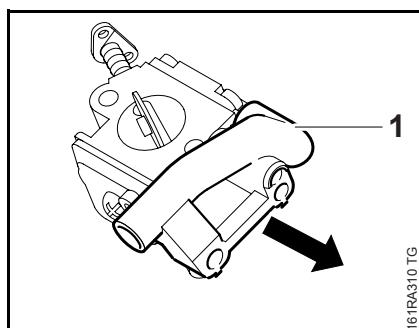
- Pull out the carburetor (1).
- Disconnect the choke rod (2) from the carburetor.



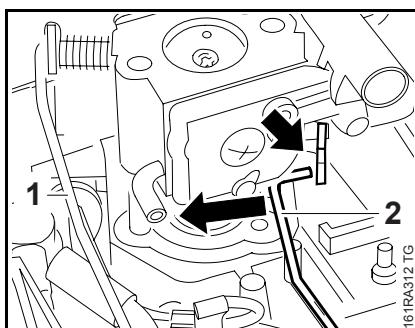
- Push the grommet (1) on to the stub (arrow) and adjusting screws as far as stop.



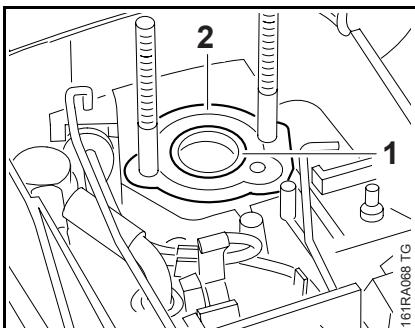
- Push the fuel hose (1) on to the stub (arrow).
- Install the filter base, [14.1.1](#)



- Pull off the grommet (1), check it and replace if necessary.
- Check the carburetor and service or replace if necessary.
- Check the choke and throttle rods and replace if necessary, [12.3.1](#)



- Attach the choke rod (1) to the carburetor, [12.3.1](#)
- Push the carburetor into position.
- Push the throttle rod (2) in direction of tank vent and connect it to the throttle lever (arrow).



Check that the sleeve (1) and washer (2) are in place.

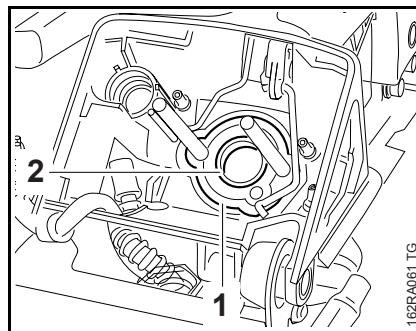
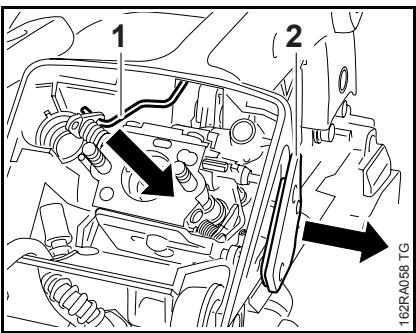
Always use new self-locking nuts.

- Check operation.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, [3.5](#)

#### 14.2.1 Removing and Installing the Carburetor (MS 200 T)

- Remove the air filter, **14.1**
- Remove the filter base, **14.1.2**
- Open the fuel tank cap and drain the fuel tank.
- Collect the fuel in a clean container, **1**

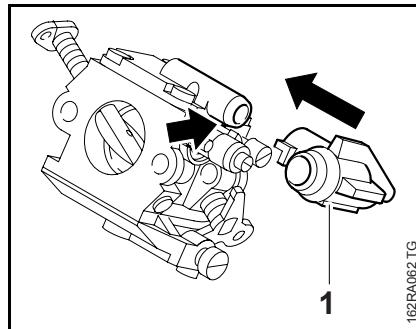
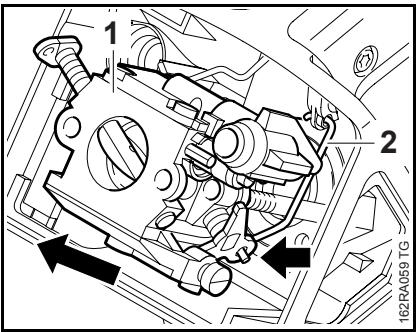
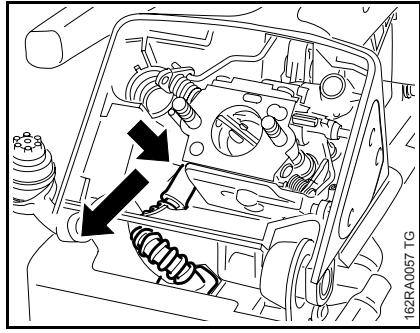
Pull off the carburetor only when the tank cap is open.



- Disconnect the choke rod (1).
- Push out the grommet (2).

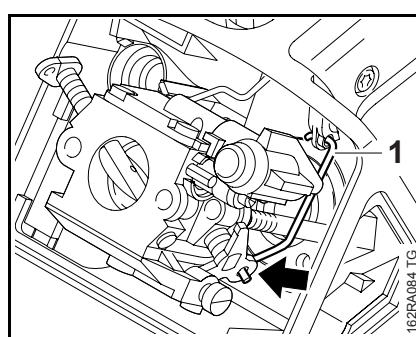
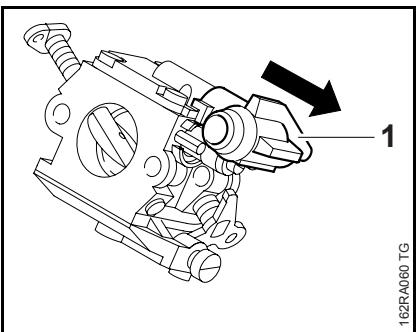
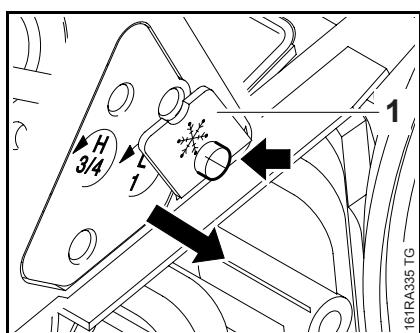
Check that the sleeve (2) and washer (1) are in place.

- Check the choke and throttle rods and replace if necessary, **12.3.2**



- Pull out the carburetor (1) until the throttle rod (2) can be disconnected.

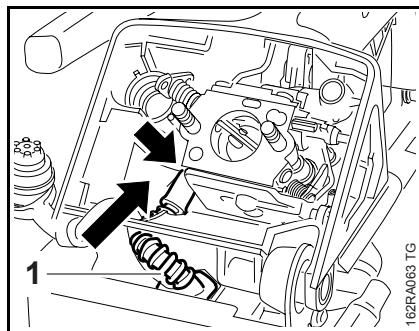
- Push the grommet (1) on to the stub (arrow) as far as stop.



- Take out the screw (arrow).
- Pull out the shutter (1) for summer/winter operation, check it and replace if necessary.

- Pull off the grommet (1), check it and replace if necessary.
- Check the carburetor and service or replace if necessary.

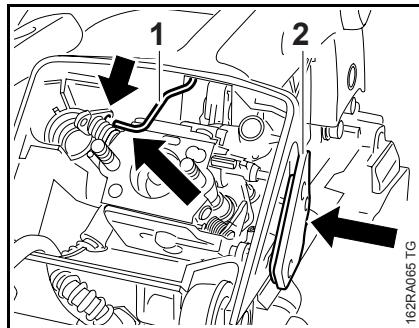
- Place the carburetor on the collar studs.
- Attach throttle rod (1) to lever (arrow) on throttle shaft.



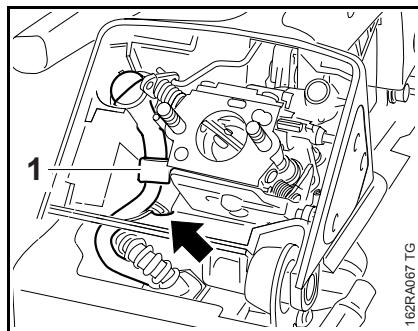
- Push the fuel hose (1) on to the stub (arrow).

Choke rod must not be between the carburetor and intake manifold.

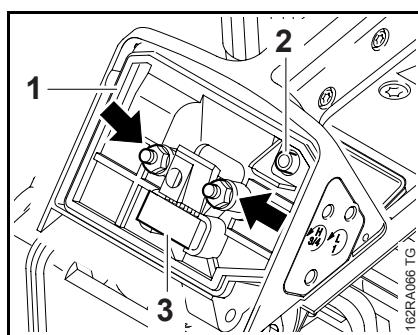
- Push the carburetor fully home.



- Turn the choke rod (1) slightly and attach it to the lever (arrow) on the choke shaft.
- Push the grommet (2) into handle housing until it is properly seated.



- Install the tank vent (1), **14.6.4**



- Push the filter base (1) into position.

Stub (2) must engage bore in filter base.

- Fit the nuts (arrows) and tighten them down firmly.

Always use new self-locking nuts.

Make sure foam element (3) is in place.

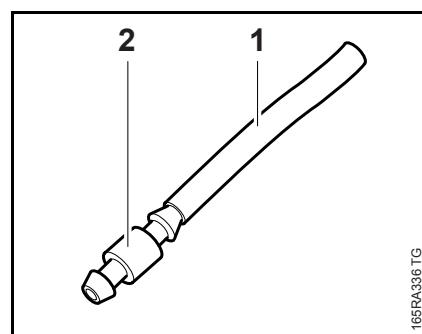
- Check operation.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

### 14.3 Leakage Test

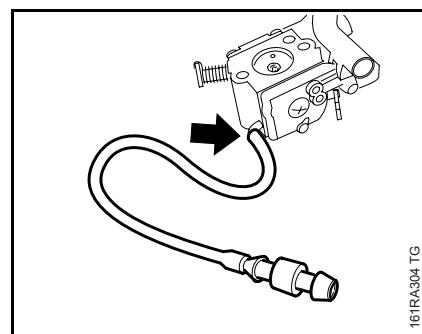
In the case of problems with the carburetor or fuel supply system, also check and clean or replace the tank vent, **14.6**.

The carburetor can be tested for leaks with the pump 0000 850 1300.

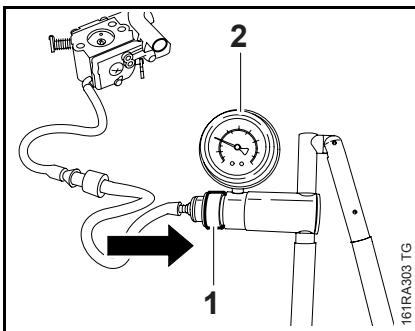
- Remove the carburetor, MS 200 **14.2**, MS 200 T **14.2.1**



- Push the fuel hose (1) 1110 141 8600 on to the nipple (2) 0000 855 9200.



- Push the fuel line with nipple onto the carburetor's fuel stub (arrow).



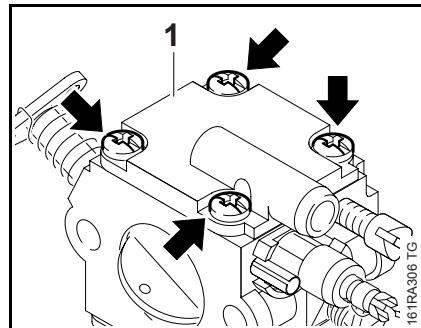
- Push the pressure hose of pump 0000 850 1300 on to the nipple.
- Push the ring (1) to the right and pump air into the carburetor until the pressure gauge (2) indicates a pressure of about 0.8 bar (80 kPa).

If this pressure remains constant, the carburetor is airtight. However, if it drops, there are three possible causes:

1. The inlet needle is not sealing (foreign matter in valve seat, sealing cone of inlet needle is damaged or inlet control lever is sticking). Remove to clean, **14.4.2**
  2. Metering diaphragm or gasket damaged, replace if necessary, **14.4.1**
  3. Pump diaphragm or gasket damaged, replaced if necessary, **14.4.3**
- After completing the test, push the ring (1) to the left to vent the system and then pull the fuel hose off the carburetor.
  - Install the carburetor, MS 200 **14.2**, MS 200 T **14.2.1**
  - Tightening torques, **3.5**
  - Reassemble all other parts in the reverse sequence.

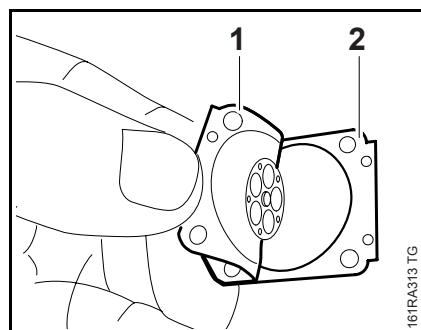
## 14.4 Servicing the Carburetor

### 14.4.1 Metering Diaphragm



- Troubleshooting, **4.6**
- Remove the carburetor, MS 200 **14.2**, MS 200 T **14.2.1**
- Take out the screws (arrows).
- Remove the end cover (1).

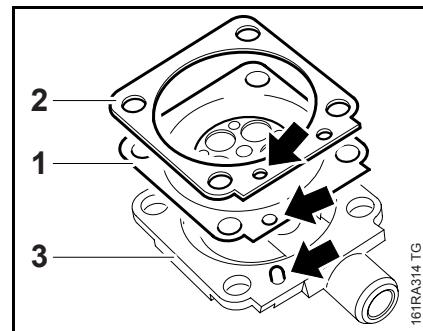
If the gasket and diaphragm are stuck to the carburetor, remove them very carefully.



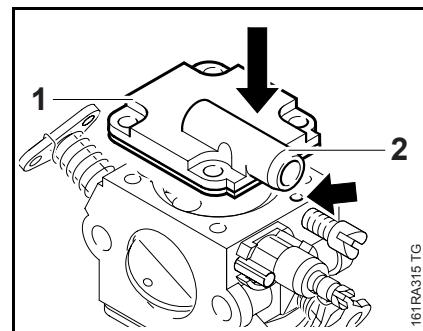
- Carefully separate the metering diaphragm (1) and gasket (2).

The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue, i.e. the diaphragm distorts and swells and has to be replaced.

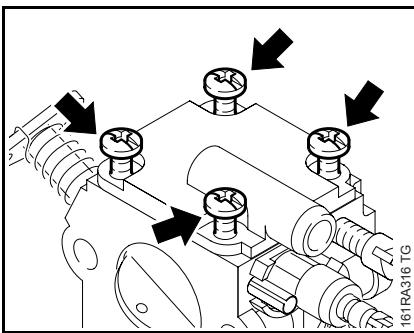
- Check the metering diaphragm for signs of damage and wear. Install a new gasket.



- Note correct positions of metering diaphragm (1) and gasket (2), and place them on the end cover (3).
- Fit the metering diaphragm (1) on the peg (arrow) first, then the gasket (2).

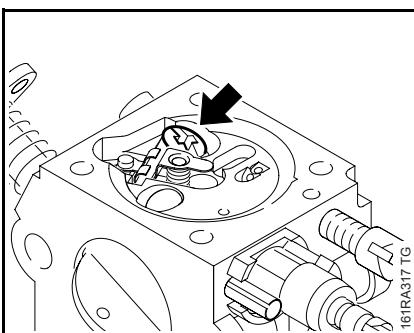


- Position the end cover (1) so that the stub (2) points towards the adjusting screws.
- Hold the end cover (1) so that the metering diaphragm and gasket remain in position. Carefully fit the end cover
  - the peg on the end cover must engage the bore (arrow) in the carburetor.

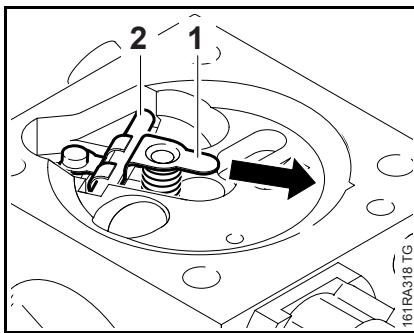


- Fit the screws (arrows).
- Check position of diaphragm and gasket, then tighten down all screws firmly in a crosswise pattern..
- Reassemble all other parts in the reverse sequence.

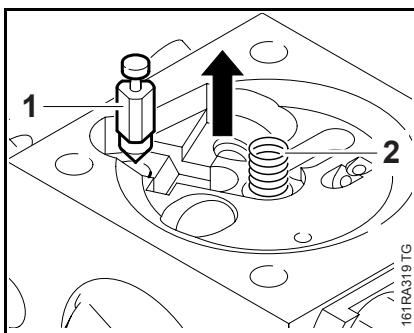
#### 14.4.2 Inlet Needle



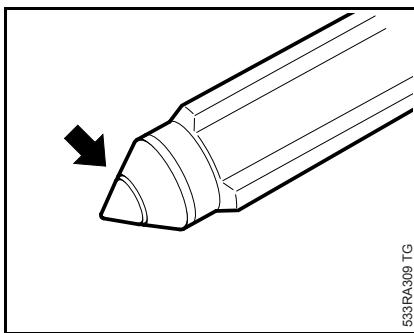
- Remove the metering diaphragm, 14.4.1
- Take out the screw (arrow).



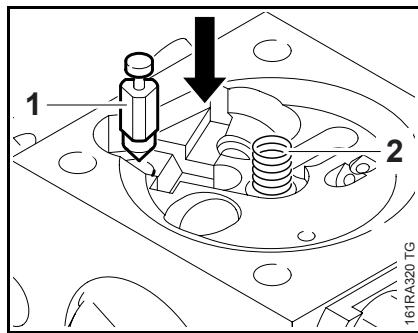
- Pull the inlet control lever (1) with spindle (2) out of the inlet needle's groove.
- The small spring under the inlet control lever may pop out.



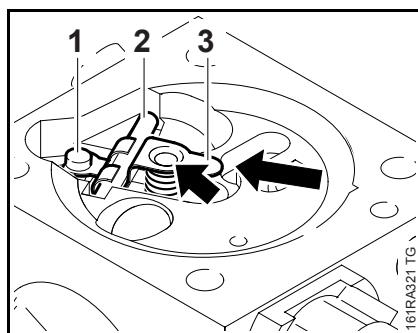
- Remove the inlet needle (1).
- Remove the spring (2). Inspect and replace if necessary.



- If there is an annular indentation (arrow) on the sealing cone of the inlet needle, fit a new inlet needle.



- Fit the inlet needle (1).
- Fit the spring (2) in the bore.

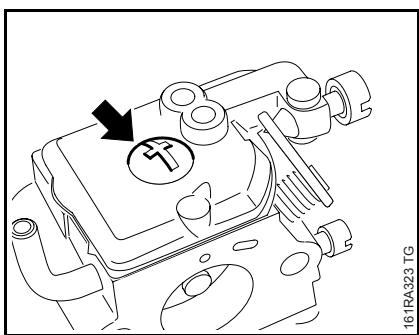


- Position the inlet control lever (3) with spindle (2) on the spring's seat (arrow) first, then slide the inlet control lever's clevis into the groove in the inlet needle (1).

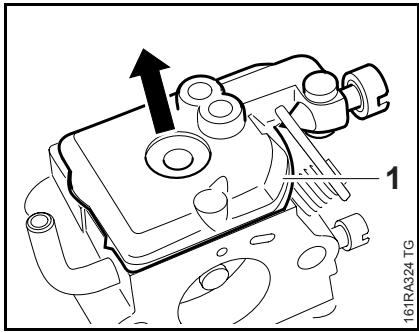
Make sure the spring locates on the control lever's nipple.

- Press the inlet control lever down and secure it with the screw.
- Check that inlet control lever moves freely.
- Install the metering diaphragm, 14.4.1

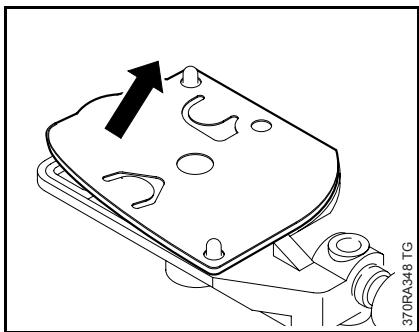
#### 14.4.3 Pump Diaphragm



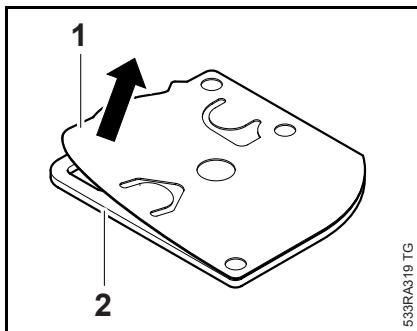
- Remove the carburetor, MS 200 14.2,  
MS 200 T 14.2.1
- Take out the screw (arrow).



- Carefully remove the end cover (1).



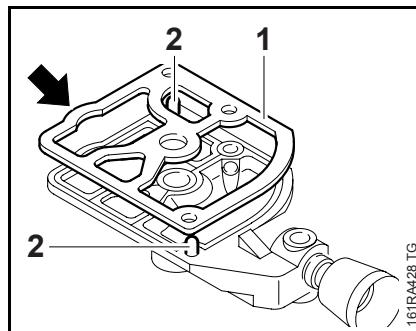
- Carefully remove the gasket with pump diaphragm from the end cover.



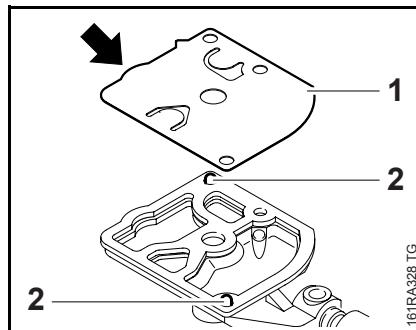
- Carefully separate the pump diaphragm (1) and gasket (2).

The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue, i.e. the diaphragm distorts and swells and has to be replaced.

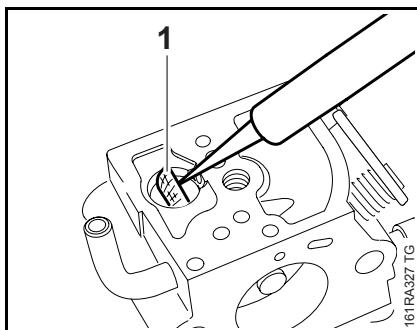
- Check the pump diaphragm for signs of damage and wear. Install a new gasket.
- Check fuel strainer for contamination and damage. Clean or replace if necessary.



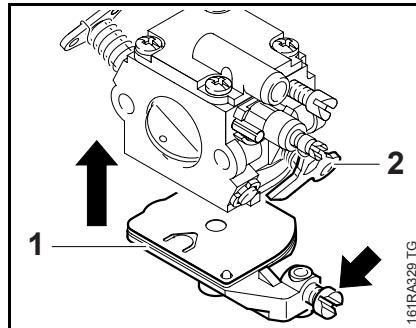
- Fit the gasket (1) so that the tab (arrow) is opposite the idle speed screw and is held in position by the pegs (2).



- Fit the diaphragm (1) so that the tab (arrow) is opposite the idle speed screw and is held in position by the pegs (2).

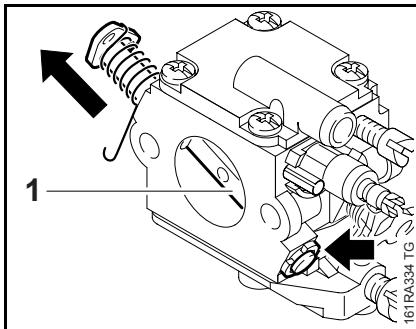
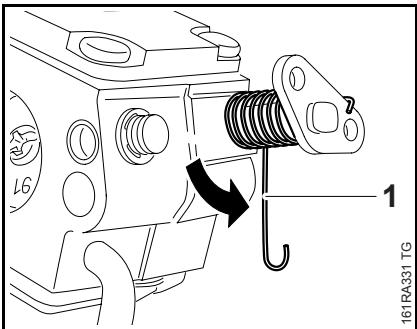


- Use a needle to remove the fuel strainer (1) from the carburetor body.
- Reassemble in the reverse sequence.

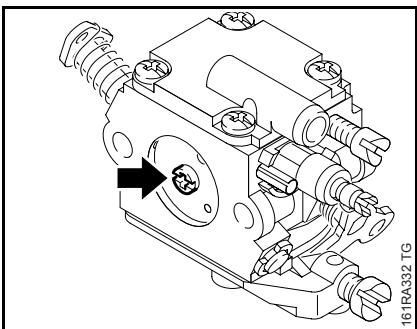


- Position the end cover (1) so that the idle speed screw (arrow) is at the same side as the adjusting screws.

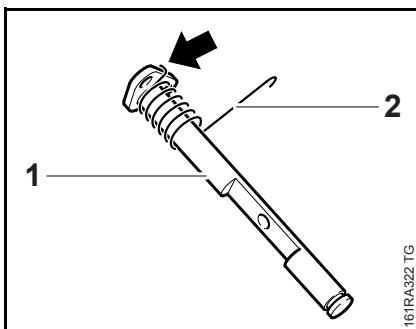
- Turn lever (2) on throttle shaft a little and place the end cover (1) against the carburetor body from below so that the gasket and pump diaphragm remain in position on the end cover.
- Align the end cover (1) so that its pegs engage the holes in the carburetor body.



- Disconnect and relax the torsion spring (1).



- Remove the E-clip (arrow).
- Pull out the choke shaft (1) in the direction of the lever.

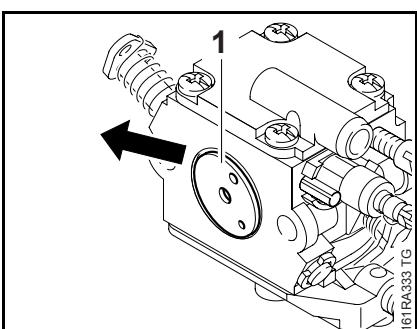


- Check that diaphragm and gasket are properly seated.
- Insert screw and tighten it down firmly.
- Reassemble all other parts in the reverse sequence.

#### 14.4.4 Choke Shaft / Choke Shutter

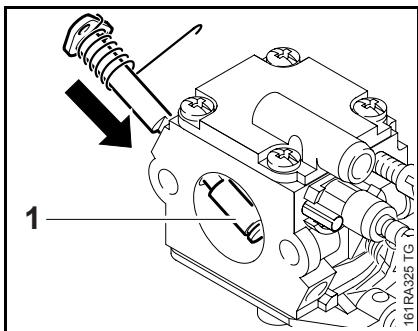
Choke shaft stiff or choke shutter cannot be closed or opened properly:

- Remove the carburetor, MS 200 **14.2**, MS 200 T **14.2.1**
- Carburetor troubleshooting, **4.6**

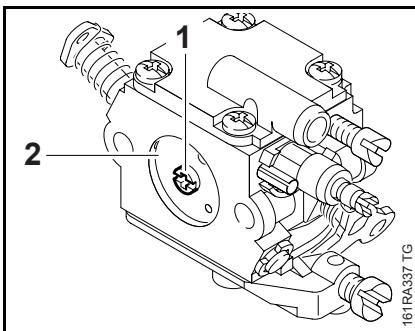


- Turn the choke shaft a little and take out the shutter (1).

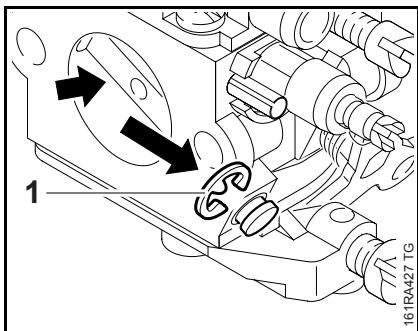
- Check the choke shaft (1) and torsion spring (2) and replace if necessary
- Note installed position (arrow) of the torsion spring (2).
- Clean the choke shaft and guides, **16**
- Reassemble in the reverse sequence.



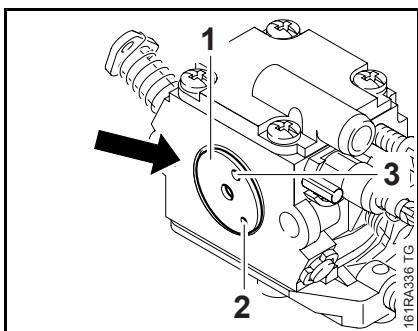
- Push the choke shaft (1) into the carburetor.



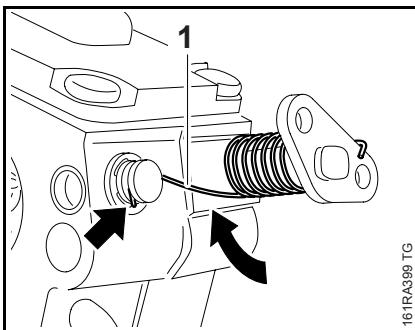
- Coat screw with threadlocking adhesive,  
■ 16



- Fit the E-clip (1) and let go of the choke shaft.
- Turn the choke shaft (arrow) until its flat side faces forwards.



- Position the choke shutter (1) in the carburetor bore so that the hole (2) is on the right and the hole (3) is at the top.

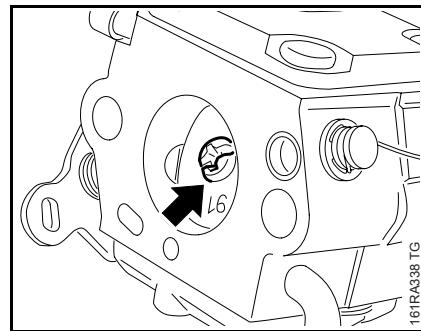


- Turn leg (1) of spring about one turn clockwise and attach it to the throttle shaft (arrow).
- Check freedom of movement.
- Reassemble all other parts in the reverse sequence.

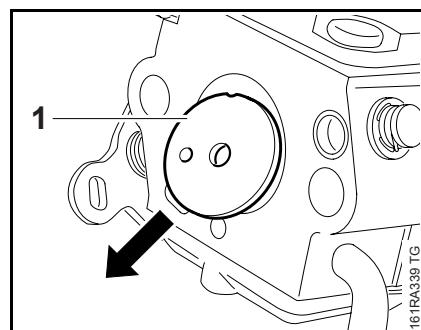
#### 14.4.5 Throttle Shaft / Throttle Shutter

Throttle shaft stiff or throttle shutter cannot be closed or opened properly:

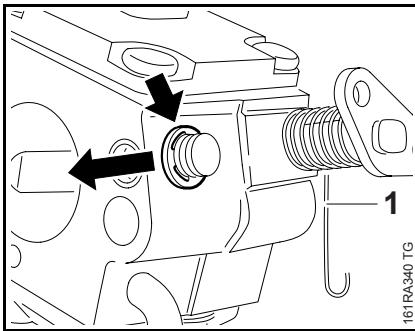
- Remove the carburetor,  
MS 200 ■ 14.2,  
MS 200 T ■ 14.2.1
- Carburetor troubleshooting,  
■ 4.6



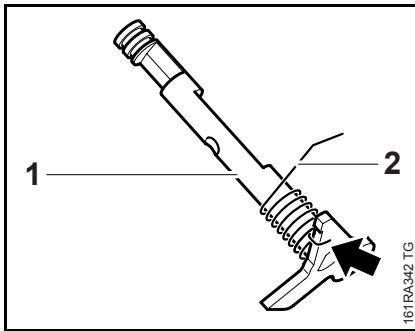
- Take out the screw (arrow).



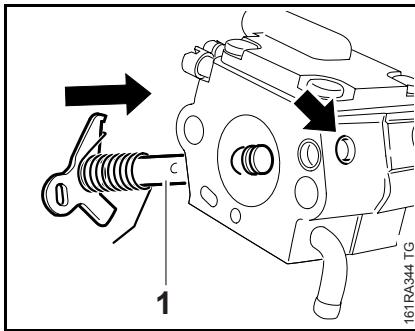
- Turn the throttle shaft a little and pull out the throttle shutter (1).



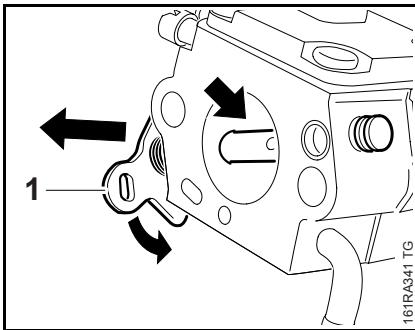
- Remove the torsion spring (1).
- Remove the E-clip (arrow).



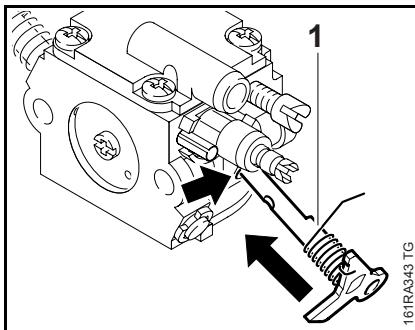
- Check the throttle shaft (1) and torsion spring (2) and replace if necessary
- Note installed position (arrow) of the torsion spring.



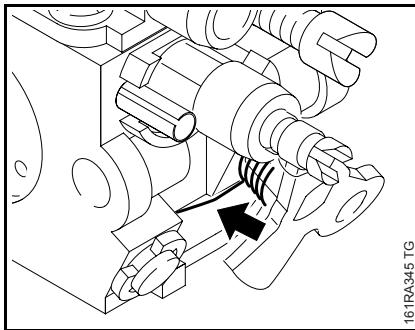
- Use a suitable tool to press the accelerator pump piston into the bore (arrow) in direction of choke shaft and then push the throttle shaft (1) all the way through.



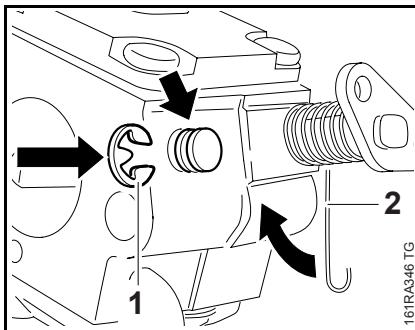
- Hold the throttle shaft and remove the pump diaphragm end cover, **14.4.3**
- Turn the throttle shaft (1) clockwise and relax the torsion spring
  - the flat side of the shaft (arrow) must face into the carburetor bore to ensure the accelerator pump's piston is not blocked.
- Pull out the throttle shaft (1).
- Clean the throttle shaft and guides, **16**



- Check the accelerator pump and replace if necessary, **14.4.6**
- Push the throttle shaft (1) with torsion spring into the carburetor body (arrow).

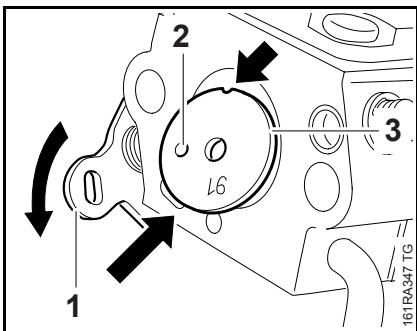


- Position torsion spring on carburetor body's shoulder (arrow).

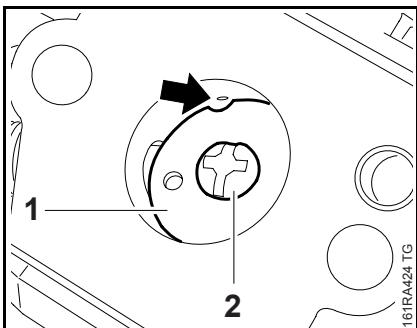


- Fit the E-clip (1).

Turn leg (2) of spring about one turn clockwise and attach it to the throttle shaft.



- Turn the throttle shaft (1) counterclockwise until its flat side is visible.
- Hold the throttle shaft in the preloaded position, fit the end cover and position the lever against the idle speed screw, **14.4.3**
- Place the throttle shutter (3), notch (arrow) first and the hole (2) on the left, on the flat side of the shaft – the marking must be visible.

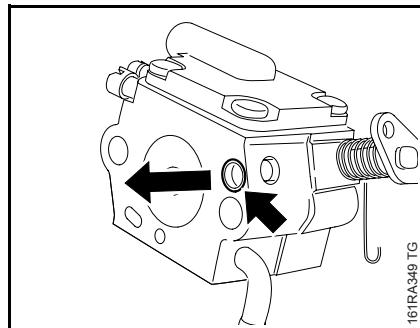


- Coat screw with threadlocking adhesive, **16**
- Fit new screw (2) and tighten it moderately.
- Close the throttle shutter (1) and center it in the carburetor body's bore.

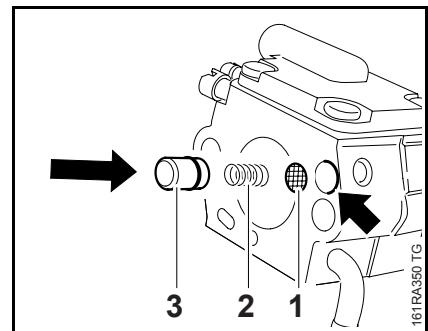
The notch (arrow) in the throttle shutter (1) must line up with the small hole in the carburetor body.

- Tighten down the screw firmly.
- Check freedom of movement.
- Check operation.
- Reassemble all other parts in the reverse sequence.

#### 14.4.6 Accelerator Pump

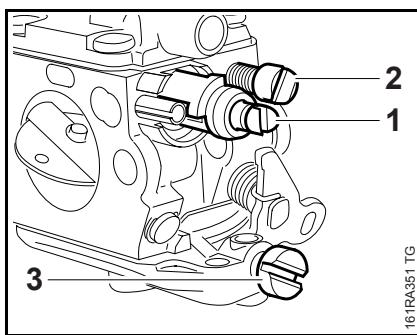


- Remove the throttle shaft, **14.4.5**
- Remove the plug (arrow) – hold bore closed to prevent pump piston popping out.
- Remove the pump piston with sealing ring, spring and strainer. Inspect parts and replace pump piston kit if necessary.



- Fit the strainer (1) in the bore (arrow) first, then the spring (2) and pump piston (3).
- Press a new sealing plug, concave side facing outwards, into the bore (arrow) until it is flush with the carburetor's sealing face
  - the plug must not project.
- Install the throttle shaft, **14.4.5**
- Reassemble all other parts in the reverse sequence.

#### 14.4.7 Adjusting Screws



Grommet has been removed for the sake of clarity.

There are three adjusting screws on the carburetor:

**H** = high speed screw (1)

**L** = low speed screw (2)

**LA** = idle speed screw (3)

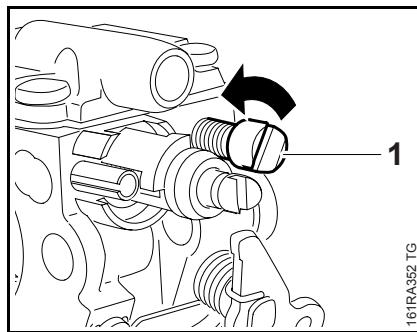
If the carburetor cannot be adjusted properly, the problem may be the adjusting screws.

The high speed screw **H** has a limiter cap, which has to be removed before the screw is removed.

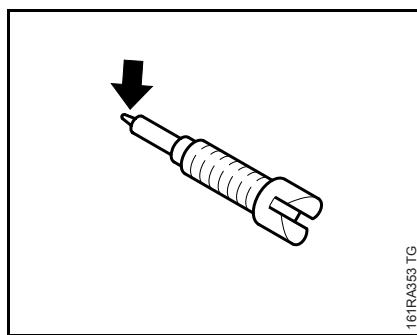
Always install a new limiter cap.

- Remove the carburetor and pull off the grommet,  
MS 200 14.2,  
MS 200 T 14.2.1
- See also carburetor troubleshooting, 4.6

#### Low speed screw

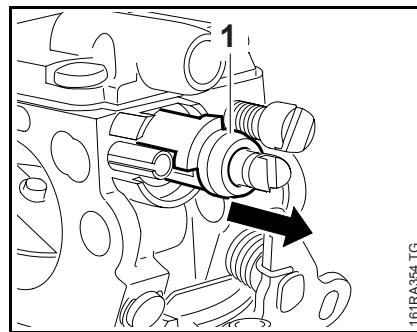


- Take out the low speed screw (1).



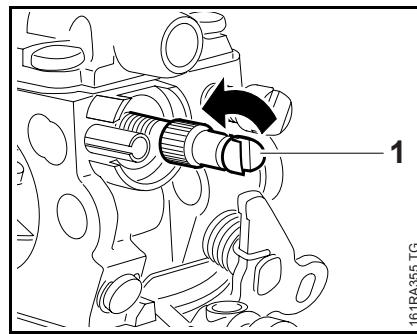
- Inspect the tip (arrow) for damage or wear and replace the screw (**L**) if necessary.
- Screw down the low speed screw (**L**) as far as stop.
- Continue with high speed screw.

#### High speed screw

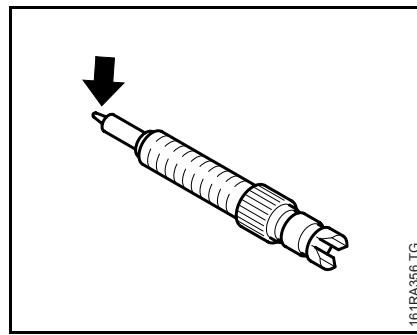


- Pull off the limiter cap (1).

Always install a new limiter cap.



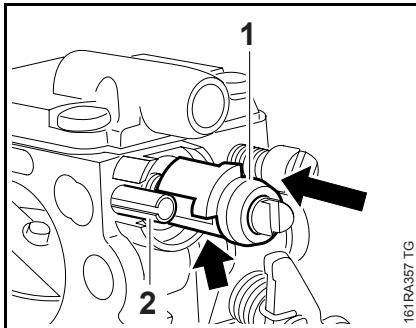
- Take out the high speed screw (1).



- Inspect the tip (arrow) for damage or wear and replace the screw (**H**) if necessary.

- Screw down the high speed screw (**H**) as far as stop.
- Continue with installing limiter cap.

### Installing limiter cap



The basic setting is carried out without the limiter cap.

- Carry out basic setting, **14.5.1**
- Line up the new limiter cap (1) so that the recess (arrow) engages the pin (2).
- Push the new limiter cap (1) over the high speed screw (**H**) until it snaps into position.
- Reassemble in the reverse sequence.

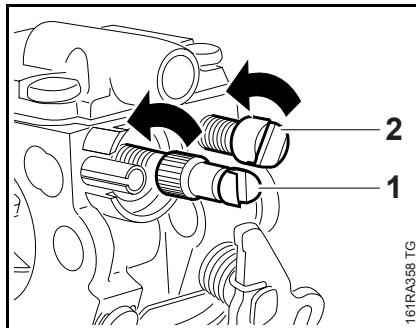
## 14.5 Adjusting the Carburetor

### 14.5.1 Basic Setting

The basic setting is necessary only if the high speed screw (**H**) or low speed screw (**L**) has to be replaced or after cleaning and adjusting the carburetor from scratch.

It is necessary to carry out the basic setting after removing the limiter cap.

The carburetor and air filter are installed, the adjusting screws fitted.



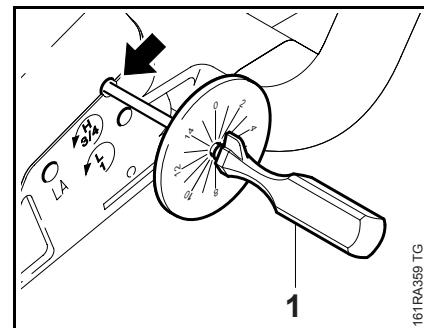
Starting with the low speed and high speed screws against their seats, turn them counterclockwise.

- Turn the high speed screw **H** (1) one full turn Turn the low speed screw **L** (2) one full turn

This completes the basic setting of the high speed screw (**H**) and the low speed screw (**L**).

- Install the carburetor, **MS 200 14.2, MS 200 T 14.2.1**
- Check chain tension and adjust if necessary, **5**
- Check spark arresting screen (if fitted) and clean or replace if necessary, **8.1**
- Check the air filter and clean or replace if necessary, **14.1**
- Allow engine to warm up.

Setting disk 5910 893 6600 may be fitted on the screwdriver 5910 890 2305 to simplify adjustments.



- Insert screwdriver (1) 5910 890 2305 through the grommet (arrow) and into the adjusting screws.

Adjust idle speed with a tachometer. Adjust specified engine speeds within tolerance of  $\pm 200$  rpm.

1. Adjust engine speed idle speed screw (**LA**) to 3,600 rpm.
2. Turn the low speed screw (**L**) clockwise or counterclockwise to obtain the maximum engine speed.

If this speed is higher than 4,000 rpm, abort the procedure and start again with step 1.

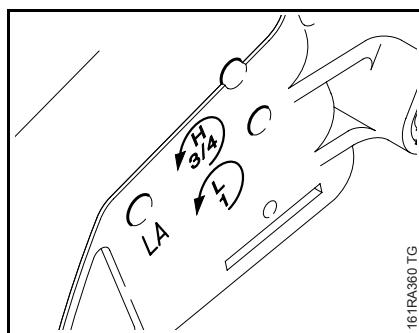
3. Use the idle speed screw (**LA**) to set the engine speed again to 3,600 rpm.
4. Set the engine speed to 2,800 rpm with the low speed screw (**L**)
5. Set engine's maximum speed to 14,000 rpm with the high speed screw (**H**)

Remove the carburetor, **MS 200 14.2, MS 200 T 14.2.1**

Install the limiter cap, **14.4.7**

The basic setting of the high speed screw (**H**) is now fixed.

## 14.5.2 Standard Setting



The limiter caps must not be removed for the standard setting.

Always perform the following steps before carrying out any adjustments:

- Troubleshooting, **4.6**
- Check chain tension and adjust if necessary, **5**
- Inspect the spark arresting screen (if fitted) and clean or replace if necessary. **8.1**
- Check the air filter and clean or replace if necessary, **14.1**

### Standard Setting

- Shut down the engine.
- Turn the high speed screw (**H**) slowly counterclockwise as far as stop, but not more than a 3/4 turn.
- Turn the low speed screw **L** slowly clockwise as far as stop, then turn it back 1 full turn.

Check running behavior:  
The engine must idle and accelerate smoothly.

### Adjusting engine idle speed

- Carry out standard setting.
- Allow engine to warm up.

### Engine stalls at idle speed

- Turn the idle speed screw (**LA**) clockwise as far as stop or until the saw chain begins to move. Then turn it back one quarter turn.

### Saw chain rotates at idle speed

- Turn the idle speed screw (**LA**) counterclockwise until the chain stops running, then turn it back one quarter turn.

### Erratic idling behavior, poor acceleration

(although standard setting is correct)

Idle setting too lean.

- Allow engine to warm up.
- Turn low speed screw (**L**) counterclockwise until the engine runs and accelerates smoothly.

It is usually necessary to change the setting of the idle speed screw (**LA**) after every correction to the low speed screw (**L**).

### Adjustment for operation at high altitude

A minor correction may be necessary if engine power is not satisfactory when operating at high altitude.

- Check standard setting.
- Allow engine to warm up.
- Turn the high speed screw (**H**) clockwise (leaner) – no further than stop.

Turn the adjusting screws only very slightly. Even minor adjustments can noticeably affect engine running behavior.

If the setting is made too lean there is a risk of engine damage as a result of lack of lubrication and overheating.

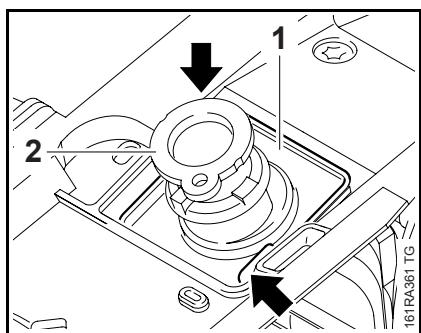
If the adjustments produce no improvement, see the troubleshooting charts for the ignition system, carburetor and engine, **4.5**, **4.6** and **4.7**

### 14.5.3 Removing and Installing the Intake Manifold

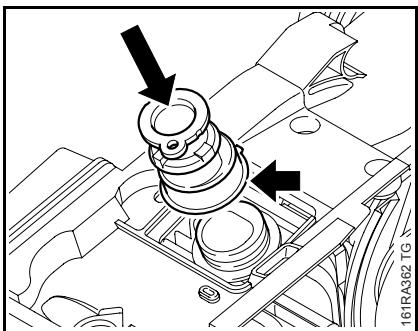
A damaged intake manifold can result in engine running problems.

- Troubleshooting, **4.6** or **4.7**
- Remove the carburetor, MS 200, **14.2**  
MS 200 T, **14.2.1**
- Remove the handle housing, MS 200, **12.4**  
MS 200 T, **12.5**

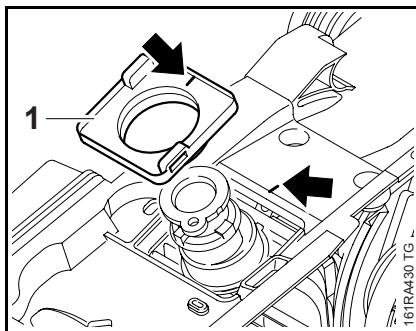
An angled intake manifold is installed in the MS 200 T, but the procedure for removing and installing is the same as for the MS 200.



- Pry the retaining plate (1) out of its seat by applying tool to lugs (arrows).
- Remove and inspect the intake manifold (2) and replace it if necessary – even very minor damage can result in engine running problems, **4.7**

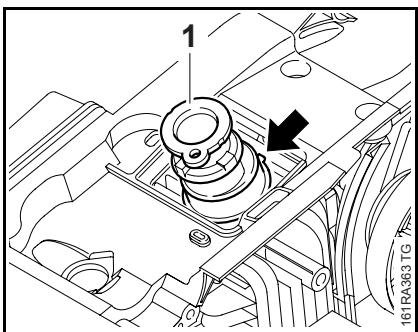


- Coat the flange (arrow) of the manifold with STIHL Press Fluid, **16**
- Push the manifold flange (arrow) on to the cylinder intake port.

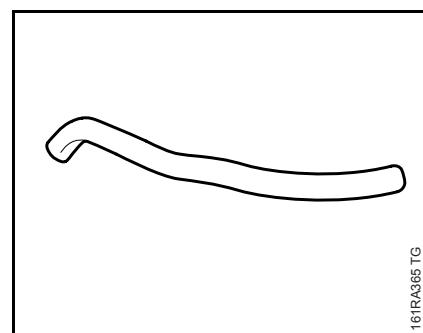


- Position the retaining plate (1) – the ribs (arrows) on the retaining plate (1) and tank housing must be in line.
- Push the retaining plate (1) over the manifold as far as stop.
- Install the handle housing, MS 200, **12.4**  
MS 200 T, **12.5**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

### 14.5.4 Impulse Hose

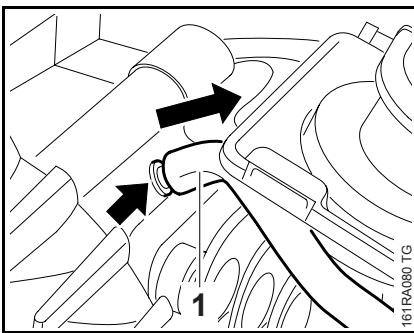


- Position the intake manifold (1) so that its tab butts against the right-hand side (see illustration) of the cylinder rib (arrow).

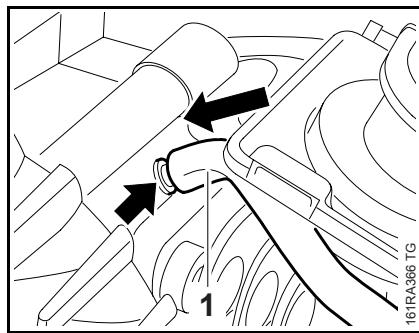


A damaged impulse hose can result in engine running problems.

- Remove the handle housing, MS 200, **12.4**  
MS 200 T, **12.5**
- Remove the tank housing, **14.8**



- Pull the impulse hose (1) off the nipple (arrow).
- Check the impulse hose and replace if necessary.



- Push the impulse hose (1) on to the nipple (arrow) as far as stop.
- Install the tank housing, push the impulse hose through the hole in the tank housing at the same time, **14.8**
- Reassemble all other parts in the reverse sequence.

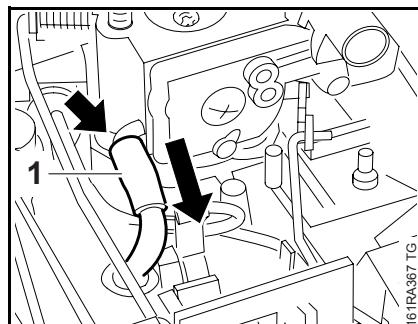
## 14.6 Tank Vent

### 14.6.1 Testing

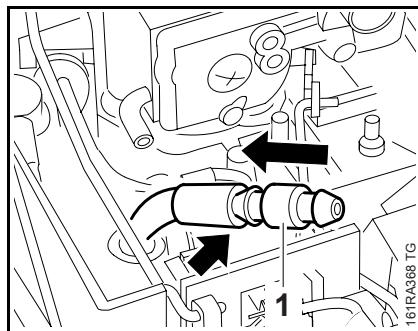
If problems occur on the carburetor or the fuel supply system, also check and clean the tank vent and replace it if necessary. Check function by performing pressure and vacuum tests on the tank via the fuel hose.

The following preparations describe the MS 200, but also apply to the MS 200 T.

- Open the fuel tank cap and drain the fuel tank.
- Collect the fuel in a clean container, **1**
- Close the tank cap.
- Remove the air filter, **14.1**

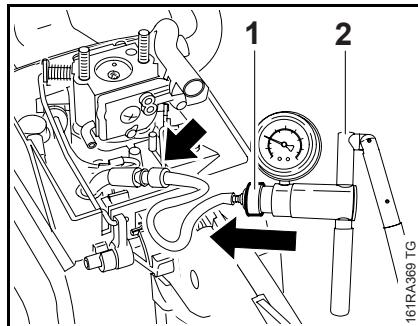


- Pull the fuel hose (1) off the stub (arrow).



- Push the nipple (1) 0000 855 9200 into the fuel hose (arrow).

### Vacuum test

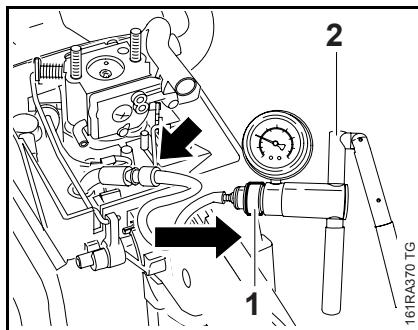


- Push the ring (1) to the left and connect the pump (2) 0000 850 1300 to the nipple (arrow)
- subject the fuel tank to a vacuum.

Equalization of pressure takes place via the tank vent. There must be no buildup of vacuum in the tank.

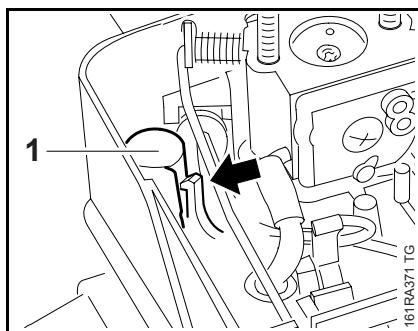
- Clean the area around the tank vent.
- If necessary, fit a new tank vent MS 200, **14.6.2**, **14.6.3** MS 200 T, **14.6.4**, **14.6.5**

## Pressure test



- Push the ring (1) to the right and connect the pump (2) 0000 850 1300 to the nipple (arrow) – pressurize the fuel tank.
- Operate the pump until the pressure gauge indicates a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the tank, including the tank vent, is airtight. If the pressure drops, the leak must be located and the faulty part replaced.
- Reassemble in the reverse sequence.

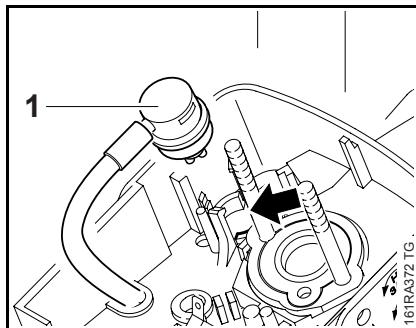
### 14.6.2 Removing and Installing (MS 200) Version with one-part tank vent system



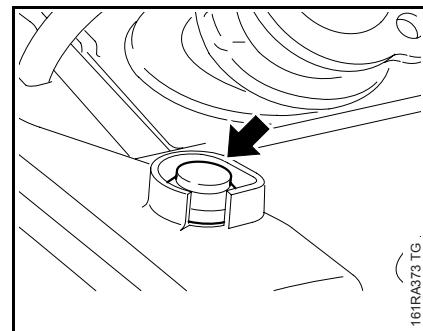
- Remove the air filter, **14.1**
- Pry the tank vent (1) out of its seat (arrow).

- Pull the tank vent (1) out of the hose.

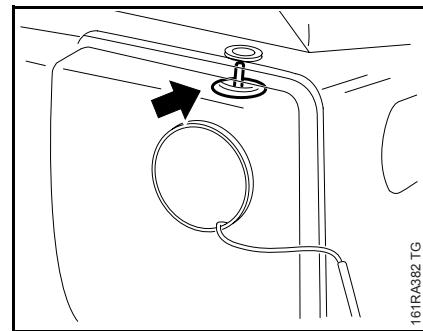
Always install a new tank vent.



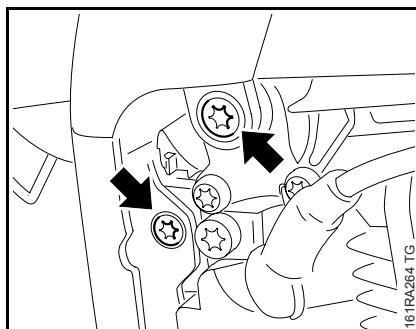
- Position the tank vent (1) so that it points toward the seat.
- Push the tank vent (1) into the hose and into its seat (arrow) as far as stop.
- Reassemble all other parts in the reverse sequence.



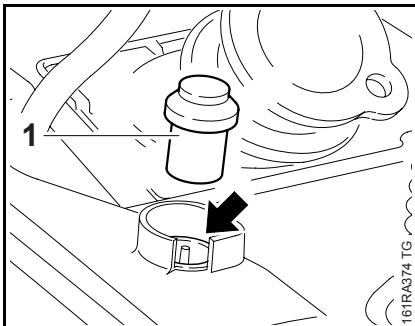
- Pry out the filter (arrow).
- Check the filter and replace if necessary.



- Pull the valve (arrow) out of its seat inside the tank.
- Check the valve (arrow) and replace if necessary.
- Reassemble in the reverse sequence.
- Press home the valve (arrow) until it snaps into its seat.

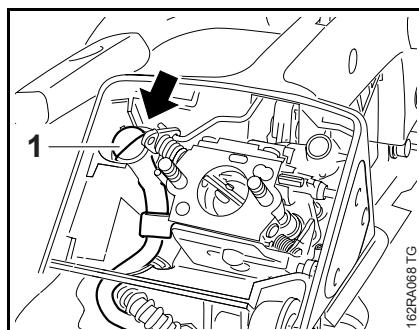


- Remove the chain sprocket cover, bar and chain, **5**
- Take out the screws (arrows).
- Lift the handle housing slightly.



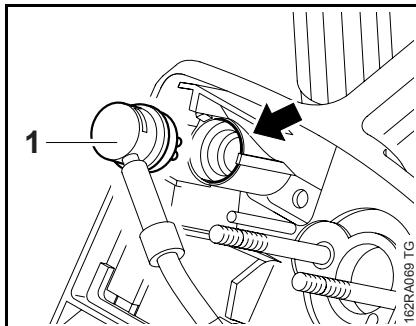
- Position the filter (1) on the seat (arrow) and press it in as far as stop.
- Reassemble all other parts in the reverse sequence.

#### 14.6.4 Removing and Installing (MS 200 T) Version with one-part tank vent system



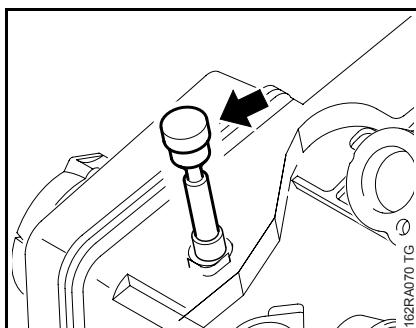
- Remove the air filter, **14.1**
- Pry the tank vent (1) out of its seat (arrow).
- Pull the tank vent (1) out of the hose.

Always install a new tank vent.



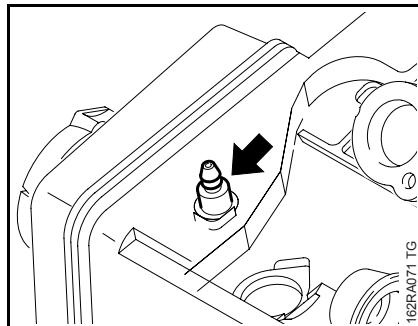
- Position the new tank vent (1) so that it fits the hose and points towards the seat.
- Push the tank vent (1) into the hose and into its seat (arrow) as far as stop.
- Reassemble all other parts in the reverse sequence.

#### 14.6.5 Removing and Installing (MS 200 T) Version with multi-part tank vent system

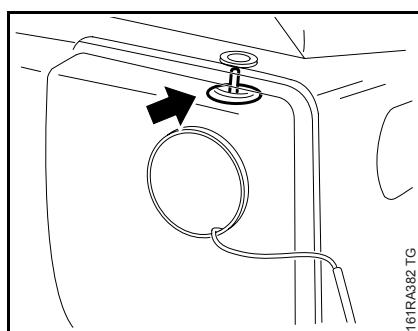


- Remove the chain sprocket cover, bar and chain, **5**
- Remove the handle housing, **12.4**
- Disconnect the tank vent (arrow).
- Check the tank vent and replace if necessary.

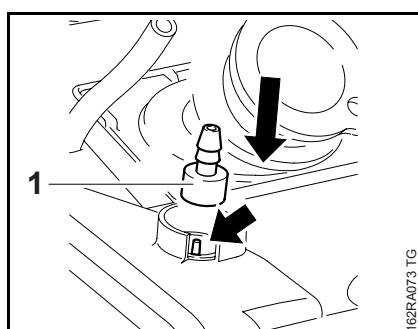
Always install a new tank vent – the new tank vent is supplied with an installing sleeve.



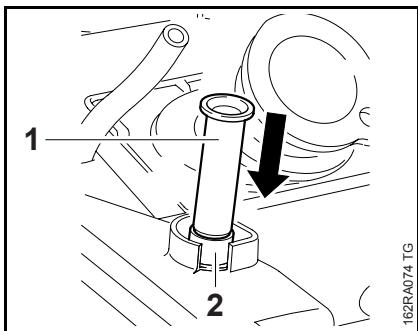
- Pull out the stub (arrow).



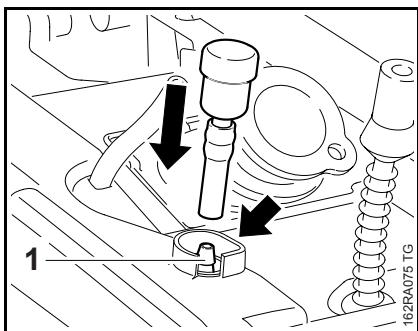
- Pull the valve (arrow) out of its seat inside the tank.
- Check the valve (arrow) and replace if necessary.
- Reassemble in the reverse sequence.
- Press home the valve (arrow) until it snaps into its seat.



- Fit the stub (1) so that the mushroom valve's rubber nipple (arrow) engages the stub's opening.



- Place the supplied installing sleeve (1) in position and drive home the stub (2) as far as stop.



The stub (1) must not project beyond the collar (arrow).

- Push the tank vent with hose on to the stub.
- Reassemble all other parts in the reverse sequence.

## 14.7 Fuel Intake

### 14.7.1 Pickup Body

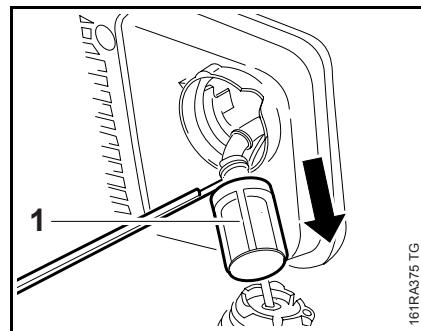
Any impurities mixed with the fuel are retained by the pickup body (filter). The fine pores of the filter eventually become clogged with minute particles of dirt. This restricts the passage of fuel and results in fuel starvation.

In the event of problems with the fuel supply system, always check the fuel tank and the pickup body first.

- Troubleshooting, **4.6** or **4.7**

Clean the fuel tank if necessary,

- Open the tank cap and drain the tank.
- Pour a small amount of clean gasoline into the tank. Close the tank and shake the saw vigorously.
- Open the tank again and drain it.
- Dispose of fuel properly in accordance with environmental requirements, **1**

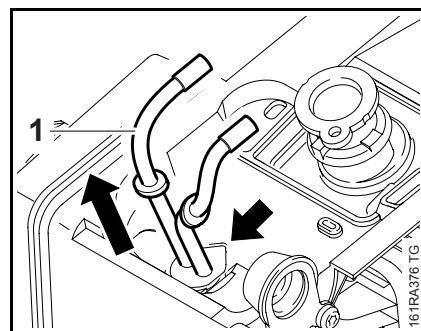


- Open the tank cap.
- Use hook 5910 893 8800 to remove the pickup body (1) from the fuel tank.

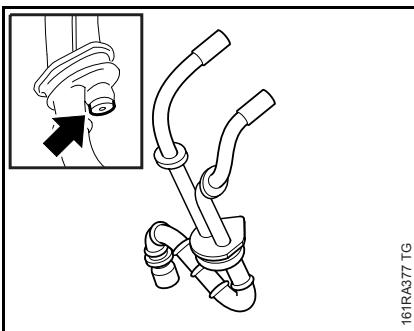
Do not overstretch the fuel hose.

- Check the pickup body (1) and replace if necessary
- Reassemble in the reverse sequence.

### 14.7.2 Fuel hose (MS 200) Version with one-part tank vent system

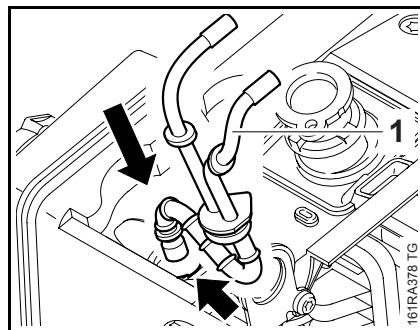


- Remove the pickup body, **14.7.1**
- Remove the handle housing, **12.4**
- Pry the fuel hose (1) out of its seat (arrow).
- Pull the fuel hose (1) out of the tank housing.

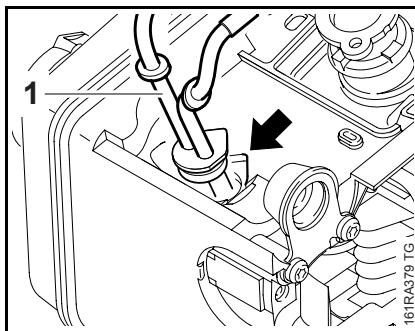


- Check the fuel hose and replace if necessary.

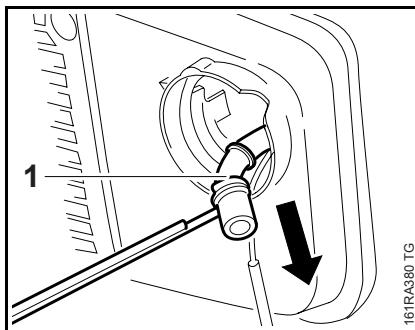
Stub (arrow) must be fitted in the fuel hose.



- Push the fuel hose (1) through the hole (arrow) in the fuel tank.



- Line up the fuel hose (1) – the flange must match the contour of the hole (arrow).
- Coat the grommet on the fuel hose with STIHL Press Fluid, **16**
- Push the fuel hose into the hole until the rubber lip is properly seated.
- Install the handle housing, **12.4**
- Reassemble all other parts in the reverse sequence.



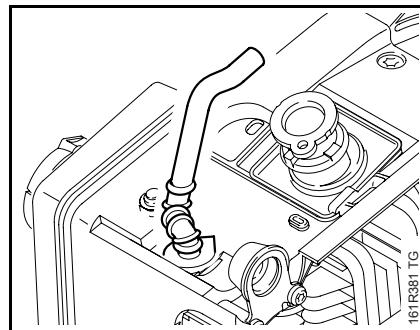
- Use hook 5910 893 8800 to remove the fuel hose (1) from the fuel tank.

Do not overstretches the fuel hose.

- Fit the pickup body, **14.7.1**
- Close the tank cap.

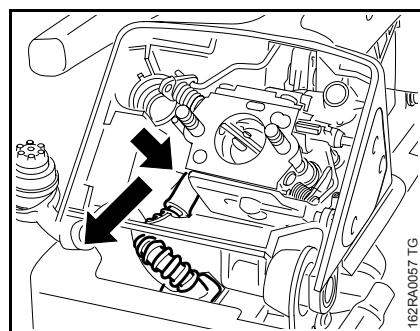
### 14.7.3 Fuel hose (MS 200) Version with multi-part tank vent system

In the previous tank vent system the tank vent is fitted separately in the tank housing. A single fuel hose is used.

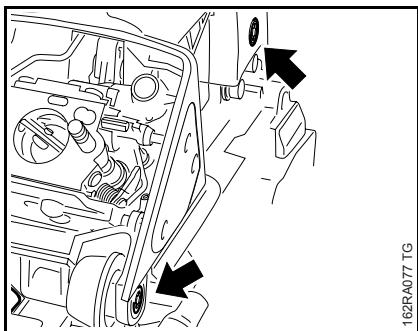


The procedure for removing and installing the fuel hose is the same as for the new tank vent system, **14.7.2**

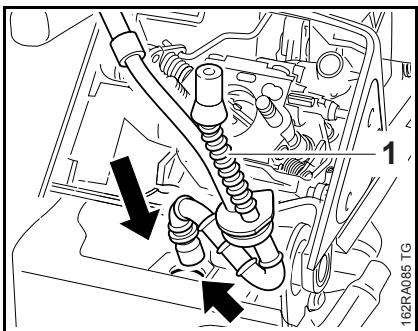
### 14.7.4 Fuel hose (MS 200 T) Version with one-part tank vent system



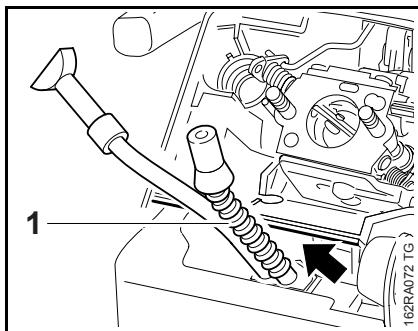
- Remove the pickup body, **14.7.1**
- Remove the chain sprocket cover, bar and chain, **5**
- Remove the tank vent, **14.6.4**
- Disconnect the fuel hose (arrow).



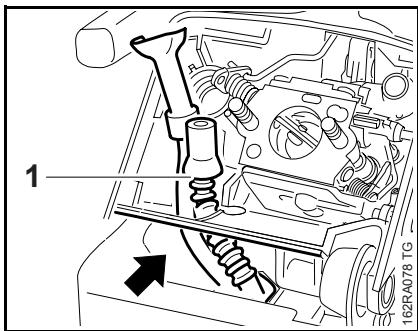
- Take out the screws (arrows).
  - Remove screw (1) from handlebar.



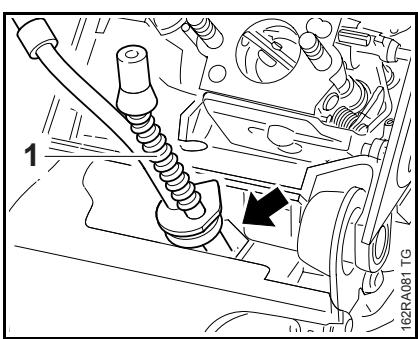
- Push the fuel hose (1) through the hole (arrow) in the fuel tank.



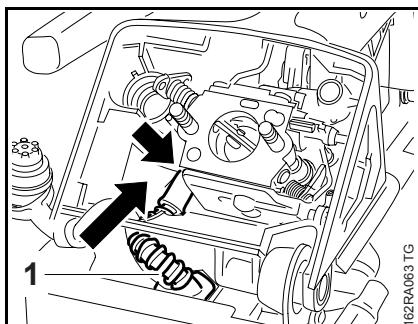
- Push the fuel hose (1) between the handle and tank housings (arrow).



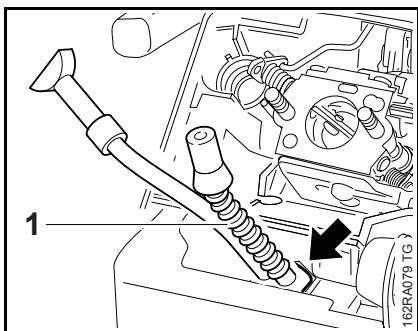
- Lift the handle housing slightly.
  - Pull out the fuel hose (1) between the handle and tank housings (arrow).



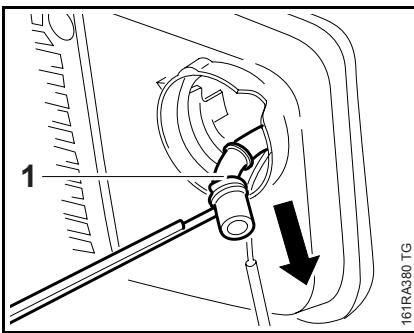
- Line up the fuel hose (1) – the flange must match the contour of the hole (arrow).
  - Coat the grommet on the fuel hose with STIHL Press Fluid, **16**
  - Push the fuel hose into the hole until the rubber lip is properly seated.



- Position the hoses in the handle housing.
  - Push the fuel hose (1) on to the stub (arrow).
    - Install the tank vent, **14.6.4**
    - Reassemble all other parts in the reverse sequence.



- Pry the fuel hose (1) out of its seat (arrow).
  - Pull the fuel hose (1) out of the tank housing, check it and replace if necessary.



- Use hook 5910 893 8800 to remove the fuel hose (1) from the fuel tank.

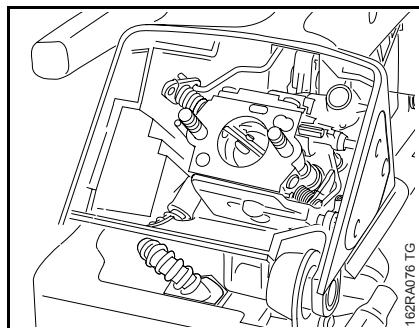
Do not overstretch the fuel hose.

- Fit the pickup body, 14.7.1
- Close the tank cap.

#### 14.7.5 Fuel hose (MS 200 T) Version with multi-part tank vent system

In the previous tank vent system the tank vent is fitted separately in the tank housing. A single fuel hose is used.

The tank vent does not need to be removed.

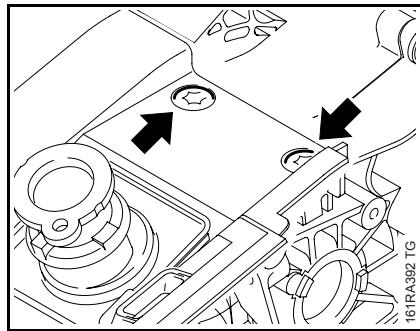


The procedure for removing and installing the fuel hose is the same as for the new tank vent system, 14.7.4

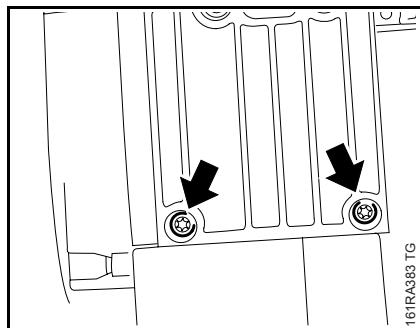
## 14.8 Removing and Installing the Tank Housing

If a mounting thread for plastic tapping screws is damaged, the tank housing can be repaired by fitting a thread insert.

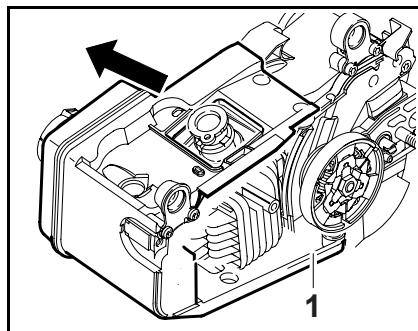
- Drain the fuel tank, 1
- Remove the muffler, 8.1
- Remove the handle housing, MS 200, 12.4  
MS 200 T, 12.5



- Take out the screws (arrows).

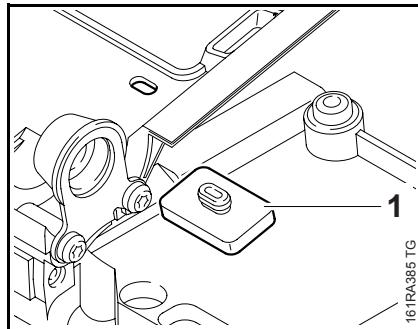


- Turn the machine over.
- Take out the screws (arrows).

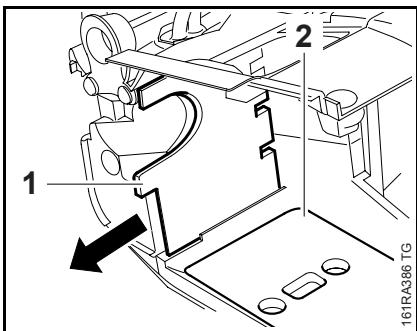


- Turn the tank housing (1) slightly and lift it over the intake manifold.
- Pull the tank housing (1) out of the impulse hose.
- Inspect the tank housing (1) and replace if necessary

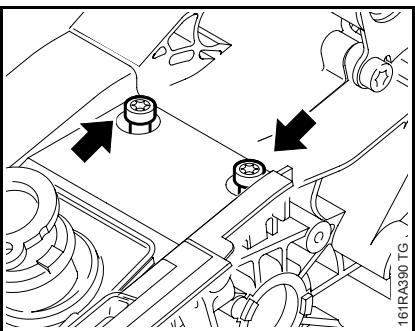
Only transfer those parts from the old tank housing that are not included with the replacement – see parts list.



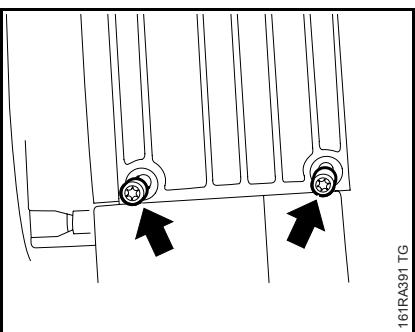
- Pry out the stop buffer (1).
- Check the stop buffer (1) and replace if necessary.
- Coat the stop buffer (1) with STIHL Press Fluid, 16
- Reassemble in the reverse sequence.



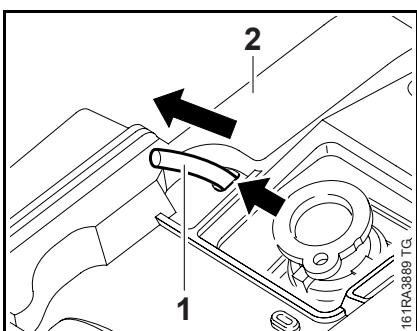
- Pull out the insulating plate (1).
  - Inspect the insulating plate (1) and heat shield (2) and replace if necessary, **8.1**



- Fit the screws (arrows).



- Turn the machine over.
  - Fit the screws (arrows).
    - Check that tank housing is properly seated, line up if necessary and then tighten down the top and bottom screws firmly.
    - Reassemble all other parts in the reverse sequence.
    - Tightening torques, **3.5**



- Push the impulse hose (1) through the hole (arrow).
  - Line up tank housing (2) with holes.

## 15. Special Servicing Tools

No.	Part Name	Part No.	Application	Rem.
1	Assembly stand	5910 890 3101	Holding saw for repairs (includes mount 5910 850 1650)	
2	Mount for assembly stand	5910 850 1650	Clamping saw to assembly stand (only for assembly stand 5910 890 3100)	
3	Pump	0000 850 1300	Testing engine and carburetor for leaks	
4	Sealing plate	0000 855 8106	Sealing the exhaust port	
5	Test flange	1128 850 4200	Leakage test	
6	Flange	1123 855 4200	Leakage test	
	- Sleeve	1124 893 7100	Securing the flange/leakage test	
	- Hose for leakage test	1110 141 8600	Testing carburetor for leaks	
	- Plug for leakage test	5910 007 2200	Leakage testing decompression valve	
	- Nipple	0000 855 9200	Testing carburetor for leaks	
7	Screwdriver	5910 890 2305	Adjusting carburetor	
	- Setting disk	5910 893 6600	Add-on for screwdriver (adjusting carburetor)	
8	Locking strip	0000 893 5903	Blocking the crankshaft	
9	Socket DIN 3124-S 19 x12.5L	5910 893 5613	Spark plug	
10	Hook	5910 890 2800	Detaching springs on clutch shoes	
11	Socket DIN 3124, 13 mm	5910 893 5608	Removing flywheel nut	
12	Puller	1116 893 0800	Releasing flywheel	1
13	Setting gauge	1111 890 6400	Adjusting air gap between the ignition module and flywheel	
14	Ignition system tester, ZAT 4	5910 850 4503	Testing ignition system	
15	Ignition system tester, ZAT 3	5910 850 4520	Testing ignition system	
16	Puller	5910 890 4400	Removing oil seals	1
	- Jaws	0000 890 3700	Removing oil seals	1
17	Press sleeve	1129 893 2400	Installing oil seals	
18	Installing sleeve	1129 893 4600	Protects oil seal at ignition side	
19	Assembly drift	1114 893 4700	Removing and installing piston pin	
20	Installing tool 9	5910 890 2209	Installing hookless snap rings in piston	
21	Clamping strap	0000 893 2600	Compressing the piston rings	
22	Wooden assembly block	1108 893 4800	Supporting the piston	

No.	Part Name	Part No.	Application	Rem.
23	Service tool AS (set) - Service tool	5910 007 2205 5910 890 2205	Separating the crankcase halves	
24	Assembly tube	1117 890 0900	Attaching springs	
25	Stud puller M8	5910 893 0501	Removing bar mounting studs	
26	Installing tool	1116 893 4800	Refitting rewind spring	
27	Installing tool	0000 890 2201	Installing rope guide bushing	
28	Hook	5910 893 8800	Removing pickup body	
29	Screwdriver, T 20 x 100	5910 890 2301	Spline socket screws, installing and removing (4 mm)	
30	Screwdriver, T 27 x 150	5910 890 2302	Spline socket screws, installing and removing (5 mm)	
31	Screwdriver, Q-SW 8 x 200	5910 890 2420	Nuts on carburetor	
32	Torque wrench	5910 890 0302	0.5 to 18 Nm	
33	Torque wrench	5910 890 0312	6 to 80 Nm	
34	Screwdriver bit, T 27 x 125	0812 542 2104	Removing and installing spline socket screws with electric or pneumatic screwdrivers; tighten down screws with torque wrench (5 mm)	
35	Screwdriver bit, T 20 x 125	0812 542 2041	Removing and installing spline socket screws with electric or pneumatic screwdrivers; tighten down screws with torque wrench (4 mm)	
36	Screwdriver bit, T 27 x 150	5910 890 2400	IS-P screws (5 mm)	

#### Remarks

- 1) Use for releasing only.

## 16. Servicing Aids

No.	Part Name	Part No.	Application
1	Lubricating grease (225 g tube)	0781 120 1111	Oil seals, sliding and bearing points
2	STIHL special lubricant	0781 417 1315	Bearing bore in rope rotor, rewind spring in fan housing
3	STIHL Press Fluid OH 723	0781 957 9000	Rubber elements of AV system
4	STIHL multipurpose grease	0781 120 1109	High voltage output on ignition module
5	Dirko HT red sealant	0783 830 2000	Crankcase, oil seals (outside)
5	Medium-strength threadlocking adhesive (Loctite 242)	0786 111 2101	
6	High-strength threadlocking adhesive (Loctite 270)	0786 111 2109	
7	High-strength threadlocking adhesive (Loctite 648)	0786 111 2117	
8	Standard commercial solvent-based degreasant containing no chlorinated or halogenated hydrocarbons		Cleaning sealing faces and carburetor, crankshaft stubs and flywheel taper

**englisch / english**

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