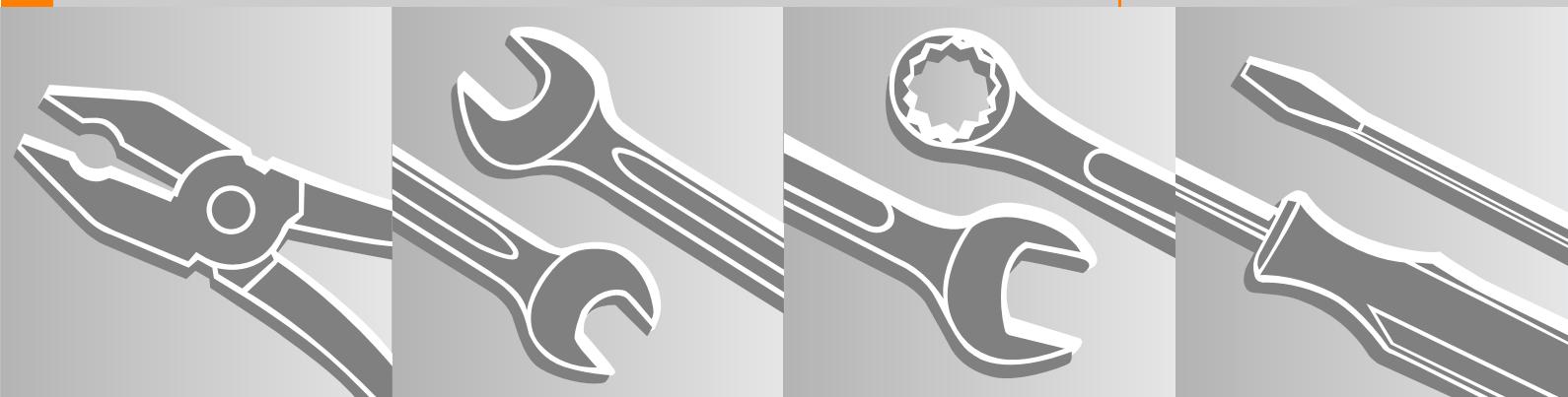


**STIHL**®

## STIHL MS 780, 880

2009-08



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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 chapter on "Troubleshooting" and the "STIHL Service Training System" for all assemblies.

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:

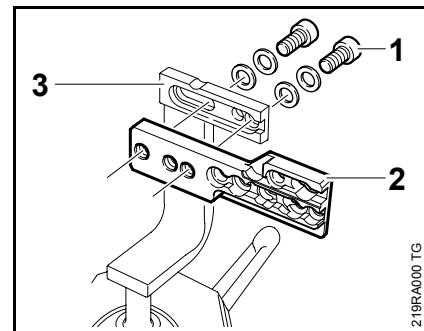
- = Action to be taken as shown in the illustration (above the text)
- = Action to be taken that is not shown in the illustration (above the text)

In the illustrations:

- Pointer
- Direction of movement

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

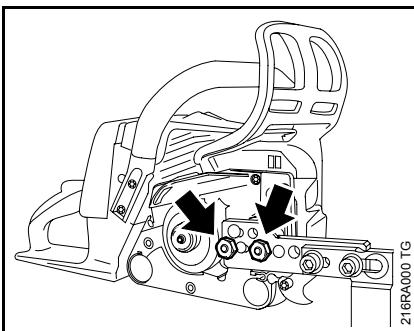
Service manuals and all technical information bulletins are intended exclusively for the use of properly equipped repair shops. They must not be passed to third parties.



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.



Engage the bar mounting studs in the outer bores in the mounting plate and secure the saw in position with the nuts (arrows).

### Preparations for servicing

Remove the chain sprocket cover, saw chain and guide bar before carrying out repairs or mounting the machine to the assembly stand.

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

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.

### Fuel system – hose barb connectors

Pull off or push on fuel hoses in line with the connector, preferably by hand, to ensure the tightness of the fuel system.

Avoid damaging the hose barb – do not use sharp-edged pliers, screwdrivers, etc.

Do not cut open fuel hoses with a knife or similar tool.

Do not re-use fuel hoses after removal. Always install new hoses – fuel hoses may be overstretched during removal.

Install new fuel hoses either dry or with the aid of STIHL press fluid,  16.

Other press fluids are not approved and may result in damage to the fuel hoses.

Coat the ends of the hoses and the connectors with STIHL press fluid and then push the new hoses on to the hose barbs,  16.

### 3. Specifications

#### 3.1 Engine

	MS 780	MS 880
Displacement:	121.6 cm <sup>3</sup>	121.6 cm <sup>3</sup>
Bore:	60 mm	60 mm
Stroke:	43 mm	43 mm
Engine power to ISO 7293:	5.6 kW (7.8 bhp) at 8,000 rpm	6.4 kW (8.7 bhp) at 8,500 rpm
Maximum permissible engine speed with bar and chain:	11,000 rpm	11,000 rpm
Idle speed:	2,700 rpm	2,700 rpm
Clutch:	Centrifugal, without linings	Centrifugal, without linings
Clutch engages at:	3,400 rpm	3,400 rpm
Crankcase leakage test at gauge pressure:	0.5 bar	0.5 bar
under vacuum:	0.5 bar	0.5 bar

#### 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 in instruction manual

#### 3.3 Ignition System

Air gap between ignition module and fanwheel:	0.20...0.30 mm
Spark plug (suppressed):	NGK BPMR 7 A
Electrode gap:	0.5 mm

#### 3.4 Chain Lubrication

Speed-controlled oil pump with reciprocating piston and  
manual flow control

Oil delivery rate:	at 10,000 rpm
Adjustable oil pump	14.0...36.0 (+/- 5.0) cm <sup>3</sup> /min
Ematic position	21.0 (+/- 3.0) cm <sup>3</sup> /min

#### Special accessory

Oil delivery rate:	at 10,000 rpm
Oil pump with increased delivery rate: (oil delivery rate is not adjustable)	50.0 (+/- 5.0) cm <sup>3</sup> /min

### 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 Nm	Remarks
Screw	M 4x8	Chain tensioner cover plate/crankcase	3.5	
Screw	B 3.9x13	Cover plate/chain sprocket cover	2.0	
Screw	M 4x12	Exhaust cover/muffler	4.0	4)
Screw	M 4x12	Brake band/crankcase	3.0	1), 4)
Screw	M 6x30	Collar stud/crankcase, for muffler (MS 780/ new MS 880)	12.0	1)
Screw	M 10x27	Collar stud / crankcase, for bar	30.0	1)
Screw	M 4x12	Cover, chain brake/crankcase	3.5	4)
Screw	M 4x12	Cover, oil pump/crankcase	3.5	4)
Screw	M 4x12	Cover, spur gear/crankcase	3.0	4)
	M 10x1	Decompression valve	14.0	
Nut	M 5	Filter cover, twist lock	1.0	
Nut	M 5	Flange/carburetor/tank housing	5.0	
Screw	P 6x32.5	Handlebar, right, stiffener/tank housing	8.0	2)
Screw	P 6x21.5	Handlebar, bottom/tank housing	8.0	2)
Screw	M 5x35	Hand guard/fan housing/crankcase	7.0	4)
Nut	M 6	Helper's handle/front handle/screw (2-man saw)	6.0	
Screw	M 5x20	Shroud/crankcase	7.0	4)
Nut	M 5	Shroud/cylinder	3.5	
Nut	M 5	Chain catcher/spiked bumper/crankcase	6.0	
Nut	M 6	Spiked bumper/chain sprocket cover	7.5	
Screw	M 6x16	Spiked bumper/crankcase, top/locknut	7.5	4)
Screw	M 6x18	Spiked bumper/crankcase, top/locknut	7.5	4)
Screw	M 6x16	Spiked bumper/crankcase, bottom	7.5	1), 4
Screw	M 6x18	Spiked bumper/crankcase, bottom (Z version)	7.5	1), 4)
Screw	M 5x25	Crankcase (old MS 880)	11.5	4)
Screw	M 5x28	Crankcase (MS 780/new MS 880)	10.0	4)
Screw	P 4x19	Bearing, switch shaft/tank housing	1.0	
Screw	M 5x20	Fan housing/crankcase	7.0	4)
Carrier	M 14x1 L	Carrier / crankshaft	80.0	6)
Screw	M 4x12	Oil pump/crankcase, front top	3.5	4), 7)
Screw	M 4x12	Oil pump/crankcase, front bottom and rear	3.5	4)

Fastener	Thread size	For component	Torque Nm	Remarks
Screw	M 6x40	Annular buffer, left top/retainer/tank housing	7.0	1), 4)
Screw	P 6x19	Annular buffer, bottom/tank housing	5.5	
Screw	M 5x12	Annular buffer plate, left top/crankcase	9.0	1), 4)
Screw	M 4x12	Rewind spring, fan housing	4.0	4)
Screw	M 5	Muffler/collar stud with spring washer (MS 780/new MS 880)	10.0	
Screw	M 5x16	Muffler/cylinder (MS 780/new MS 880)	10.0	1), 4), 5)
Screw	M 5x6	Muffler casing, top (MS 780/new MS 880)	6.5	1), 4)
Crankshaft	M 10x1	Flywheel/crankshaft	45.0	6)
Screw	M 4x12	Segment/fan housing	2.0	4)
Screw	M 4x8	Side plate/crankcase	3.0	4)
Screw	M 3x20	Clamp/manifold (MS 780/new MS 880)	0.5	
Stud	M 5x8.5	Stud/cylinder	3.5	3)
Screw	M 5x16	Support/crankcase (old MS 880)	10.0	4)
Screw	M 5x16	Support/muffler (old MS 880)	10.0	4)
Screw	P 4x19	Tank housing/handle molding	1.0	
Spark plug	M 14x1.25	Spark plug	25.0	
Screw	M 5x25	Ignition module/crankcase (old MS 880)	9.0	1), 4)
Screw	M 5x20	Ignition module/crankcase	8.0	5)
Screw	M 6x30	Cylinder/crankcase	15.0	4)

Remarks:

- 1) Loctite 242 or 243, medium strength
- 2) Loctite 649, high strength
- 3) Loctite 270, high strength
- 4) Screws with binding head
- 5) Micro-encapsulated screws
- 6) Degrease joint and mount oil-free
- 7) Use Hylomar HYL sealant

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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	Check carburetor settings and readjust properly if necessary
	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	Install new retainer or clutch
	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 does not release fully or sticks	Check freedom of movement and operation of brake band
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 Oil inlet hole in guide bar is blocked Intake hose or pickup body clogged or intake hose ruptured Valve in oil tank blocked Spur gear broken Oil pump damaged or worn	Fill up with oil and check setting of oil pump if necessary Clean oil inlet hole Fit new intake hose and pickup body Clean or replace valve Fit new spur gears Install new oil pump
Machine losing chain oil	Oil pump body damaged Oil pump damaged or worn Oil intake hose connection leaking or damaged Sealing ring on oil pump outlet damaged or missing	Install new oil pump Install new oil pump Install new oil intake hose Replace the sealing ring
Oil pump delivers insufficient oil	Oil pump worn Oil pump delivery rate set too low Pickup body in oil tank clogged	Install new oil pump Adjust oil pump (only on version with adjustable oil pump) Clean the pickup body or replace if necessary.

#### 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	Rewind spring 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 pegs on pawls or pawls themselves are worn	Fit new pawls
	Spring clip on pawl fatigued	Fit new spring clip
	Spring clip installed wrong	Install spring clip correctly
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 small amount of standard solvent-based degreasant (containing no chlorinated or halogenated hydrocarbons), then pull rope carefully several times until normal action is restored
	Decompression valve is not open	Open, check and replace decompression valve if necessary

## 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	Press boot firmly onto spark plug and fit new spring if necessary
	Spark plug sooted, smeared with oil	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 damaged or pole shoes have turned blue	Install new flywheel
	Ignition timing wrong, flywheel out of adjustment, key in flywheel 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

## 4.6 Carburetor

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
	Metered diaphragm deformed	Fit a new metering diaphragm
Poor acceleration	Air filter dirty	Clean air filter or replace if necessary
	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 or kinked	Install new impulse hose
	Tank vent faulty	Replace tank vent
	Leak on fuel hose from tank to carburetor	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
	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 on fuel hose from tank to carburetor	Seal connections or install new fuel hose
Saw chain rotates at idle speed	Engine idle speed too high	Reset low speed screw <b>L</b> correctly
	Clutch does not release even though idle speed is correct	Check the clutch

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 on fuel hose from tank to carburetor	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 or kinked	Install new impulse hose
	Ignition timing wrong, flywheel out of adjustment, key in flywheel has sheared off	Fit key if necessary and secure flywheel properly or install new flywheel

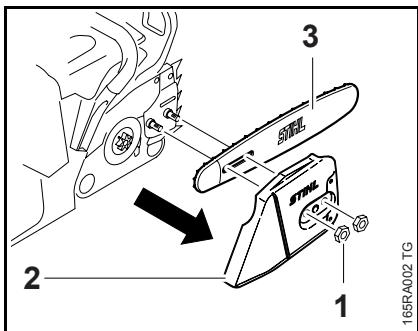
#### 4.7 Engine

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/impulse hose severely kinked or damaged	Fit new hoses or position them free from kinks
	Decompression valve is not closed	Close, check and replace decompression valve if necessary
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. Saw Chain / Guide Bar



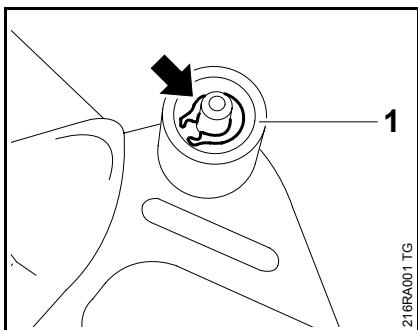
Wear work gloves to protect your hands from injury.

- Unscrew the hex nuts (1).
- Remove the chain sprocket cover (2).
- Remove the guide bar (3) with chain.
- Reassemble in the reverse sequence.

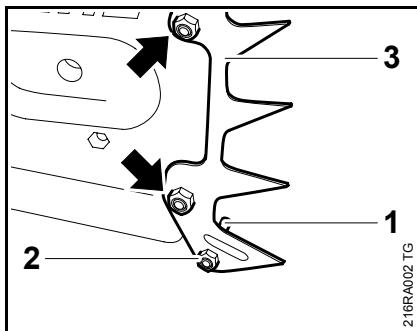
### 5.1 Spiked Bumper / Chain Catcher

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

#### Chain Catcher / Spiked Bumper on Chain Sprocket Cover



- Remove the E-clip (arrow).
- Pull off the roller (1).

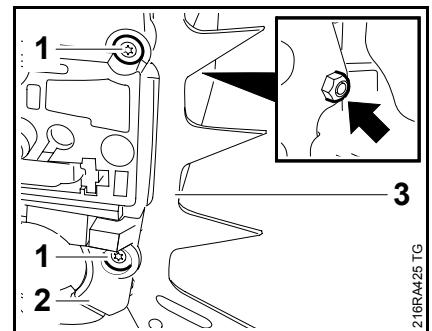


- Hold the guide lug (1) steady and unscrew the nut (2).

- Unscrew the nuts (arrows).
  - Remove the spiked bumper (3).

Always use new self-locking nuts.

- Reassemble in the reverse sequence.



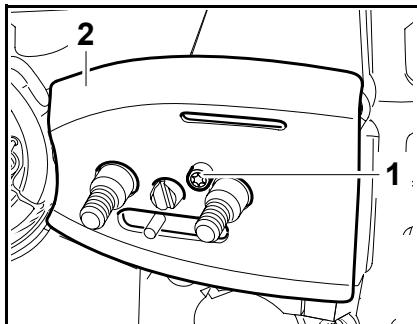
- Hold the nut (arrow) steady and take out the screws (1).

- Remove the deflector (2) and spiked bumper (3).

Always use new self-locking nuts.

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

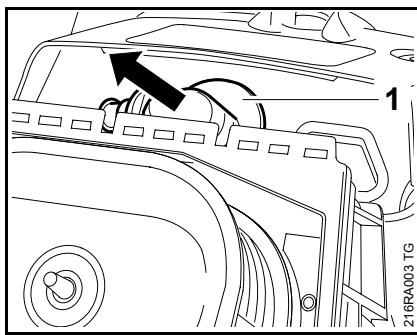
#### Spiked Bumper on Crankcase



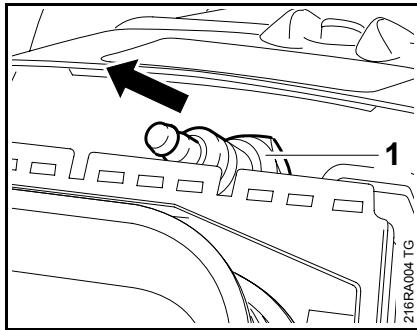
- Take out the screw (1).
- Remove the inner side plate (2).

## 6. Clutch

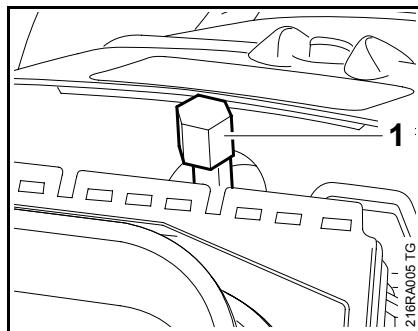
- Troubleshooting, **4.1**
- Remove the clutch drum, **6.1**
- Remove the carburetor box cover, **8.5**



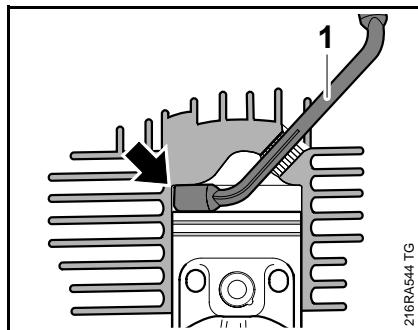
- Pull boot (1) off the spark plug.



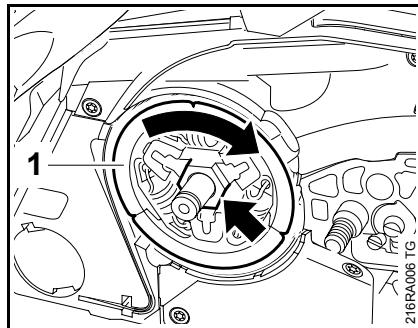
- Unscrew the spark plug (1).



- Push the locking strip (1) 0000 893 5903 into the spark plug hole, wide end first, so that "OBEN-TOP" faces up.



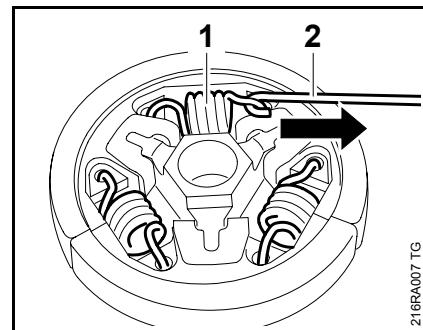
The locking strip (1) 0000 893 5903 must butt against the cylinder wall (arrow) as shown.



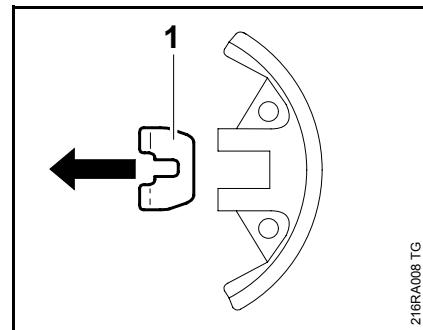
- Remove the retainers (1).

Note that the clutch has a left-hand thread.

## Disassembling

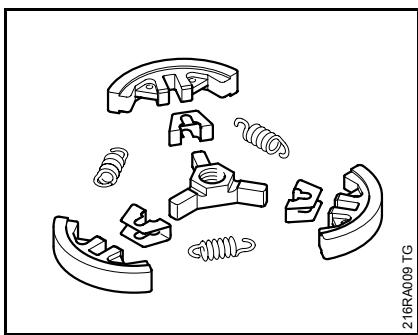


- Use hook (2) 5910 890 2800 to remove the clutch springs (1).



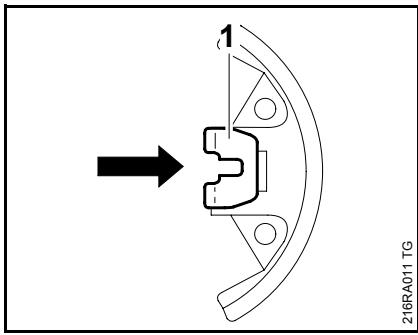
- Pull the clutch shoes off the carrier.

- Apply wrench to hexagon (arrow) and unscrew the clutch (1).



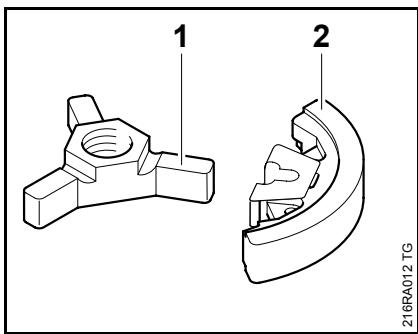
216RA009 TG

- Clean all parts.
- Replace any damaged parts.
- If the clutch is noticeably worn, replace all three clutch shoes at the same time – not individual shoes.  
– Runout may otherwise affect correct operation of the clutch.



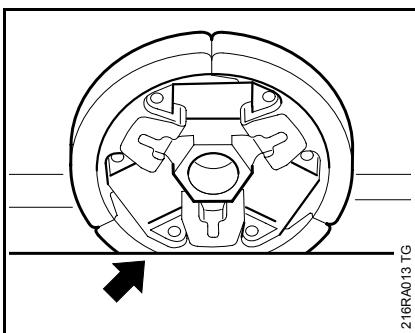
216RA011 TG

- Fit the retainers (1).



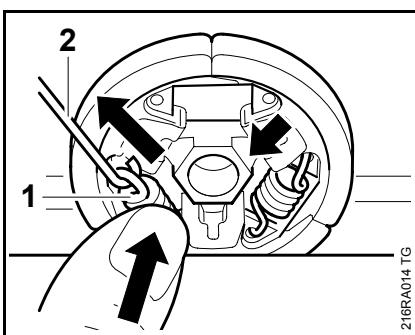
216RA012 TG

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



216RA013 TG

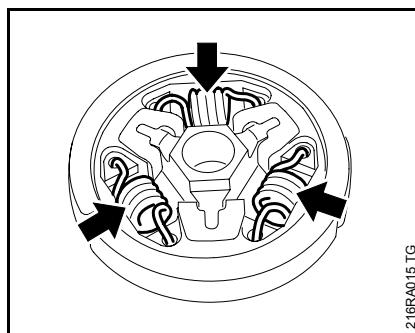
- Clamp the clutch in a vise (arrow).



216RA014 TG

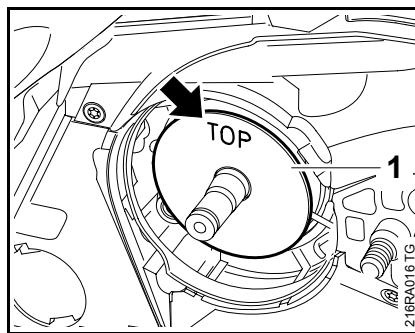
Attach the springs on the side with the raised hexagon (arrow).

- 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.



216RA015 TG

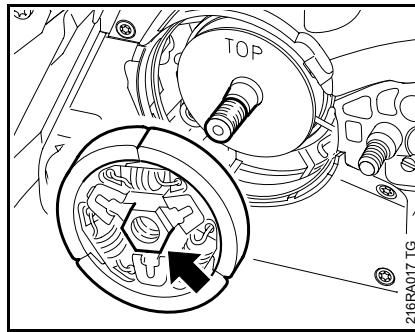
- Check the clutch – all springs (arrows) must be properly attached.



216RA016 TG

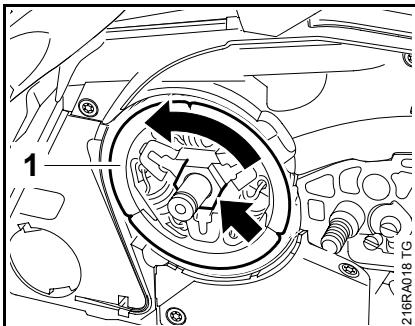
Make sure washer (1) is in place.

Installed position is correct when "TOP" (arrow) faces outwards.



216RA017 TG

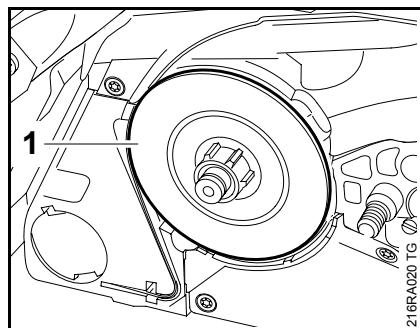
- Position the clutch on the crankshaft stub so that the raised hexagon (arrow) faces outwards.



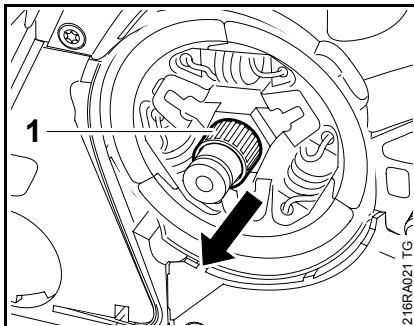
- Screw the clutch (1) on to the crankshaft stub and tighten down the hexagon (arrow) firmly – left-hand thread.
- Tightening torques, **3.5**
- Remove the locking strip from the cylinder.
- Reassemble all other parts in the reverse sequence.

## 6.1 Clutch Drum

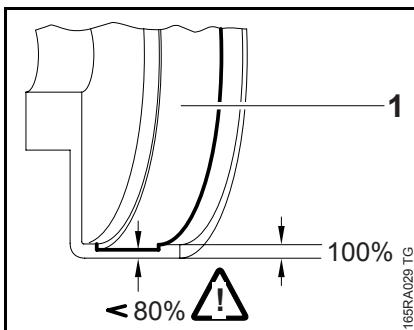
- Disengage the chain brake.



- Remove and install the clutch drum (1), see instruction manual.

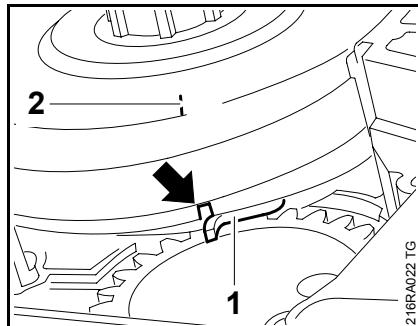


- Pull off the needle cage (1).
- Clean the needle cage and crankshaft stub, **16**
- Lubricate the needle cage and crankshaft stub, **16**



- 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.



- The notch (arrow) in the clutch drum must engage the spur gear's driver (1).

Use the mark (2) for orientation.

- Apply thin coating of oil to the outside diameter of the clutch drum and the inside of the brake band, **16**
- Push the clutch drum into position.
- Reassemble all other parts in the reverse sequence.

## 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.

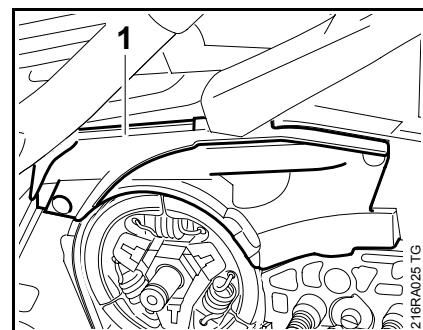
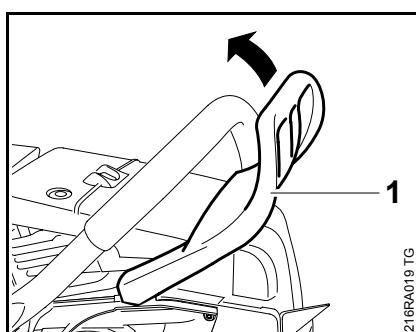
Contamination (with chain oil, chips, fine particles of abrasion, etc.) and smoothing of the friction surfaces of the brake band and clutch drum impair the coefficient of friction, which prolongs the braking time. A fatigued or stretched brake spring has the same negative effect.

- 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.

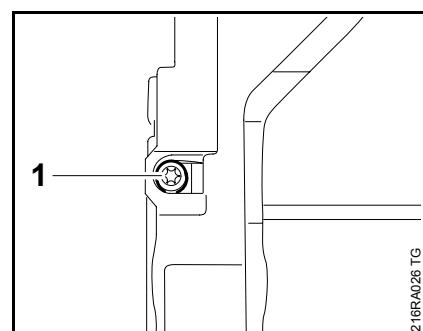
The braking time is in order if deceleration of the saw chain (less than a second) is imperceptible to the eye.

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

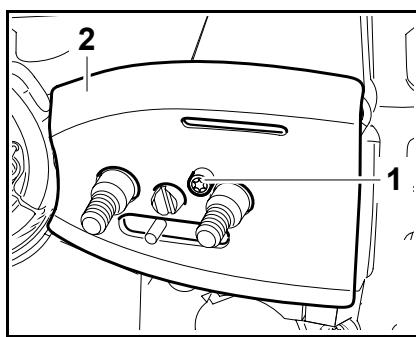
### 7.2 Removing and Installing the Brake Band



- Remove the cover (1).

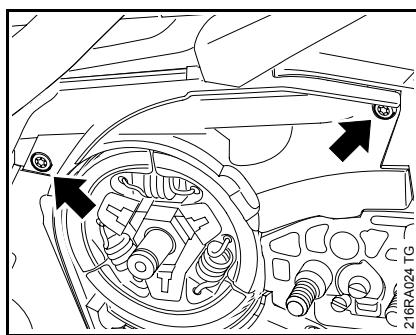


- Lock the saw chain.

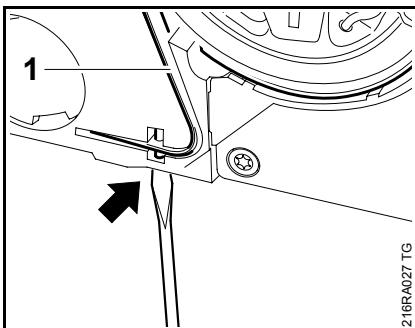


The brake band is no longer under tension.

- Remove the screw (1) from the underside of the machine.



- Take out the screws (arrows).



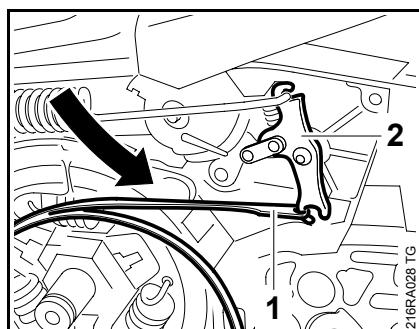
216RA027 TG

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

- Remove the brake band (1).

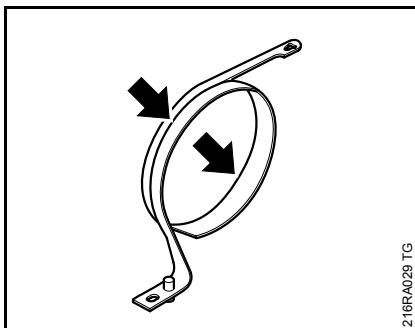
Do not overstretch the brake band.

- Release the saw chain.



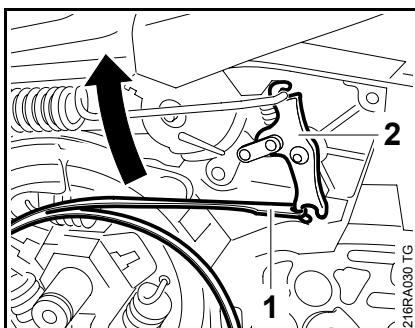
216RA028 TG

- Turn the brake band (1) to one side and disconnect it from the brake lever (2).



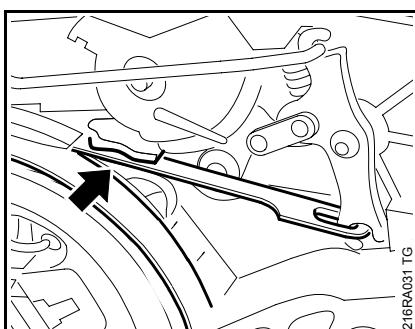
216RA029 TG

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.



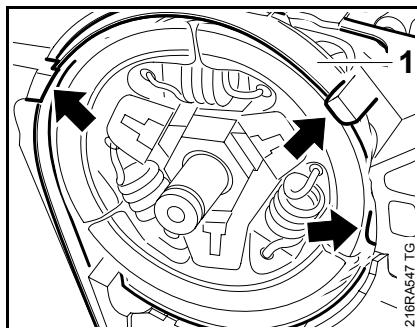
216RA030 TG

- Hold the brake band (1) sideways, attach it to the brake lever (2) and then swing it in the direction of its seat.



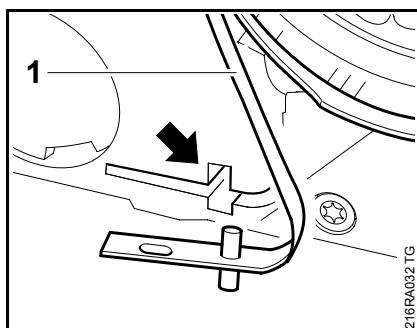
216RA031 TG

- Position the brake band (1) it the guide (arrow) first.
  - Lock the saw chain.



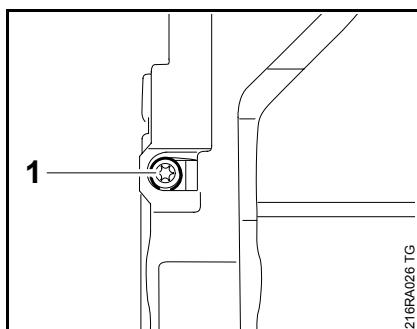
216RA032 TG

- Push the brake band (1) over the guide lugs (arrows) and into its seat.



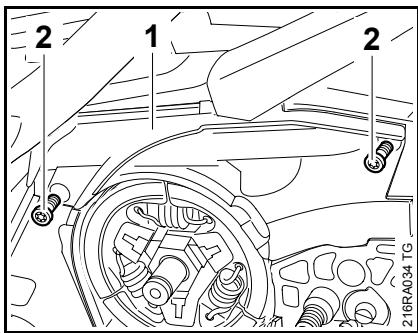
216RA032 TG

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



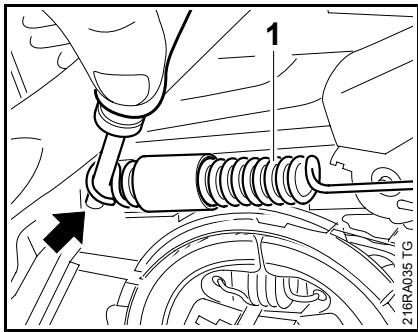
216RA026 TG

- Fit the screw (arrow) on the underside of the machine and tighten it down firmly.



- Place the cover (1) in position.
- Tighten down the screws (2) firmly.
- Tightening torques, **3.5**
- Install the clutch drum, **6.1**
- Check operation, **7.1**
- Reassemble all other parts in the reverse sequence.

### 7.3 Brake Lever

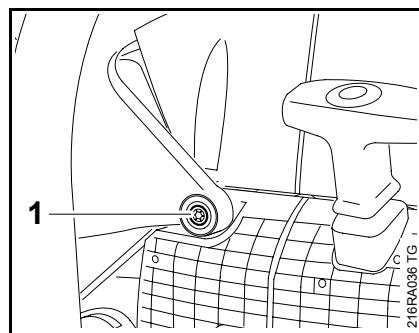


- Troubleshooting, **4.2**
- Remove the brake band, **7.2**
- Lock the saw chain.

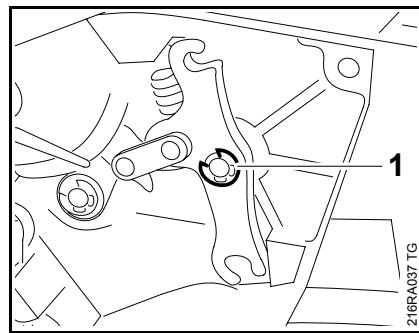
The brake spring is now relaxed.

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

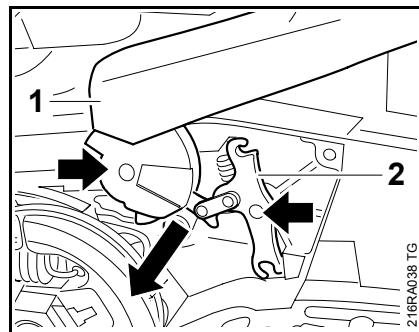
- Remove the brake spring from the brake lever.



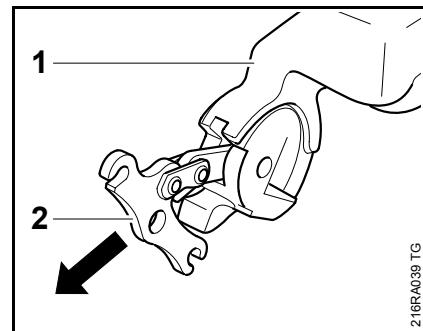
- Take out the screw (1).



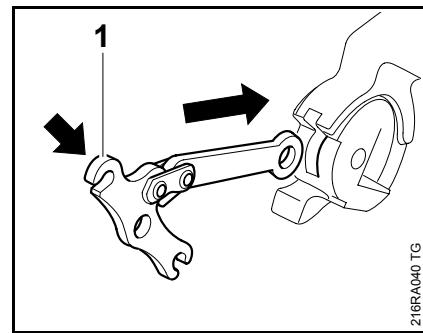
- Remove the E-clip (1).



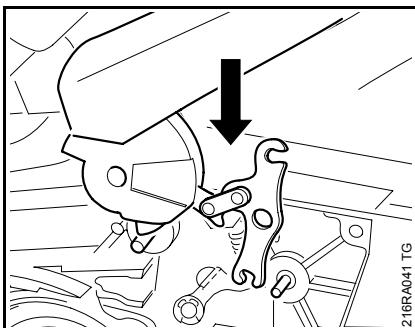
- Pull the hand guard (1) and brake lever (2) off the pivot pins (arrows) together.
- Remove the hand guard and brake lever.



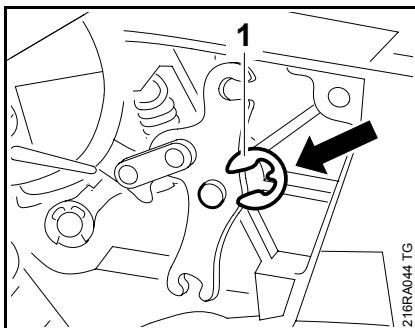
- Take the brake lever (2) out of the hand guard (1).
- Inspect the brake lever and hand guard and replace if necessary.



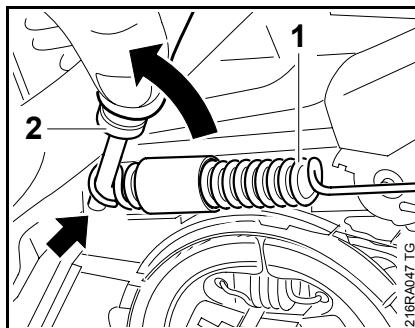
- Inspect the pivot pins and replace if necessary, **7.5**
- Inspect the cam lever and replace if necessary, **7.4**
- Clean all disassembled parts with a little standard commercial solvent-based degreasant containing no chlorinated or halogenated hydrocarbons.
- Hold the brake lever (1) so that the brake spring attachment point (arrow) is at the top.
- Push the brake lever (1) into the hand guard recess and line up the holes.



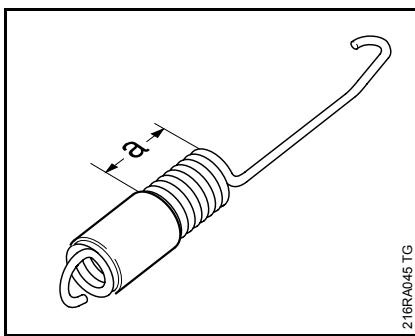
- Push the hand guard with brake lever over the machine until they are positioned against the pivot pins.



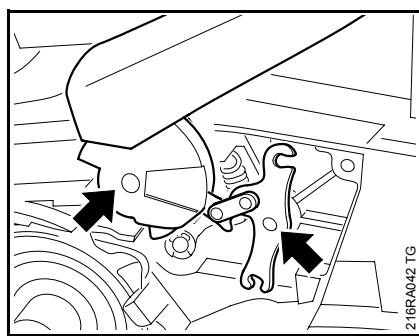
- Fit the E-clip (1).



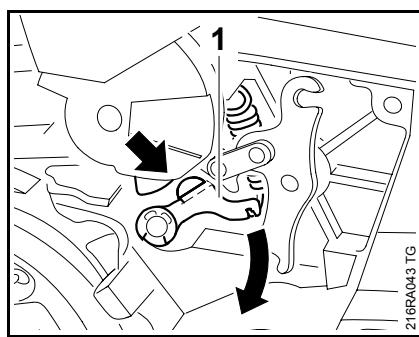
- Use the assembly tool (2) 1117 890 0900 to attach the brake spring (1) to the anchor pin (arrow).



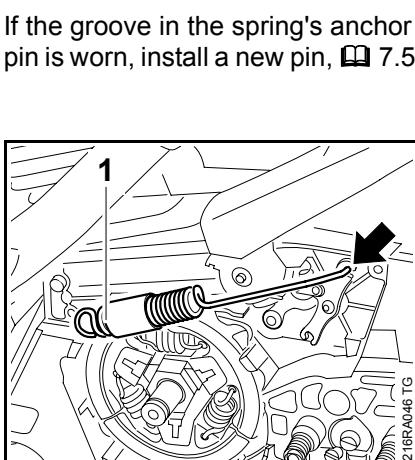
- Reassemble all other parts in the reverse sequence.
- Tightening torques, 3.5
- Lubricate the brake lever, 16



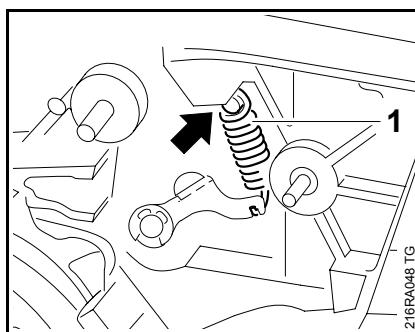
- Lift the bearing boss of the hand guard and the brake lever a little and position them over the pivot pins (arrows).



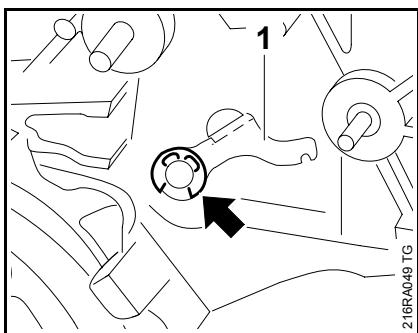
- Turn the cam lever (1) to one side until the cam of the hand guard (arrow) slips past it.
- Push the hand guard bearing boss and the brake lever on to the pivot pins.



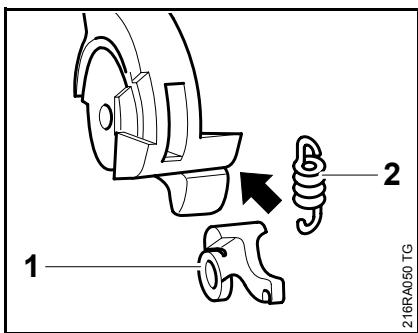
- Hook the brake spring (1) to the brake lever (arrow).



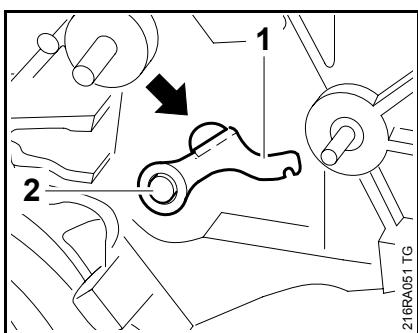
- Disconnect the spring (1) from the anchor pin (arrow).



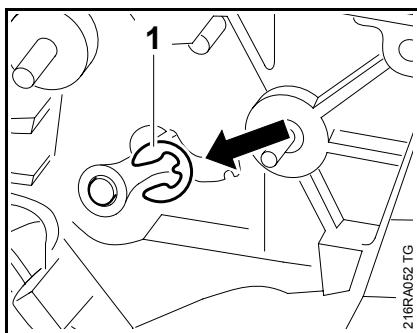
- Remove the E-clip (arrow).
- Pull the cam lever (1) off the pivot pin.



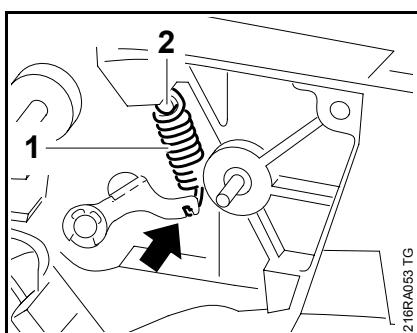
- Check the cam lever (1) and spring (2) and replace if necessary.
- Check the condition of the cam contour (arrow) and replace the hand guard if necessary.



- Position the cam lever (1) so that its cam (arrow) faces the cam on the hand guard.
- Push the cam lever on to the pivot pin (2).



- Fit the E-clip (1).



- Attach the spring (1) to the cam lever so that the open side of the spring hook (Pfeil) is visible.

If the groove in the spring's anchor pin is worn, install a new pin, **7.5**.

- Attach the spring (1) to the anchor pin (2).

The cam lever is not yet under tension – the spring may become detached.

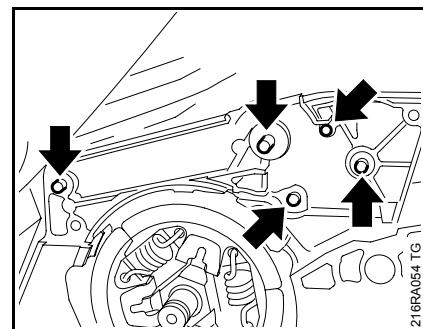
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**
- Lubricate the cam lever, **16**

## 7.5 Pins

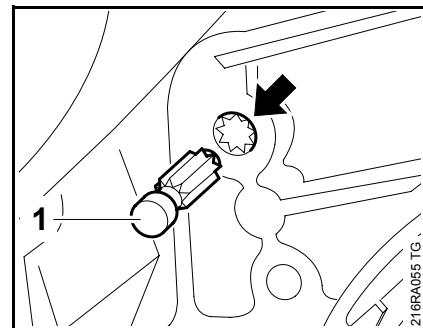
The anchor pins secure the springs. Worn pins must be replaced.

– The springs may otherwise become detached and pop out.

For greater clarity, all parts have been removed from the pins in the following illustrations.

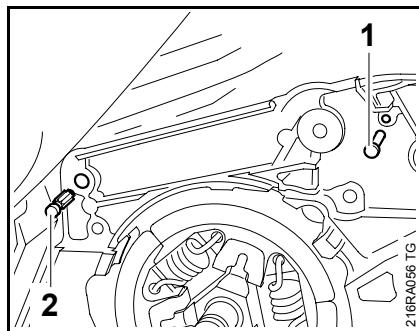


- Use a suitable tool to pull out the pins (arrows).

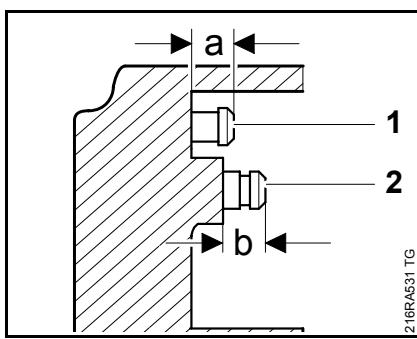


- Before installing the new pin (1), coat its knurled shank with threadlocking adhesive, **16**
- Position the new pin (1) in the bore (arrow) so that the knurling on the pin meshes with the existing knurling in the bore.

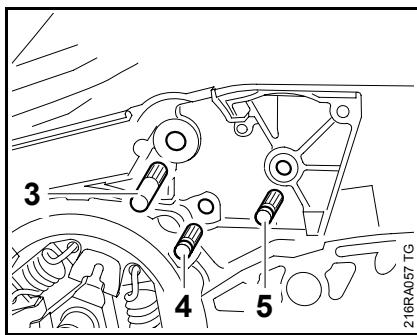
Turn pin back and forth as necessary.



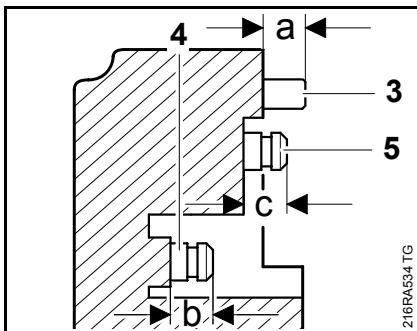
- Drive home the pins (1 and 2) as specified below.



- Carefully tap home the pin to obtain the following dimensions:  
Pin (1) a = about 2.9...0.30.1 mm  
Pin (2) a = about 4.5...40.7 mm



- Drive home the pins (3, 4 and 5) as specified below.



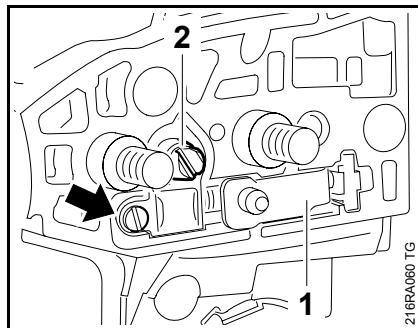
- Carefully tap home the pin to obtain the following dimensions:  
Pin (3) a = about 11.3...11.5 mm  
Pin (4) a = about 4.6...4.8 mm  
Pin (5) a = about 5.1...5.3 mm

The pins must be driven home squarely.

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

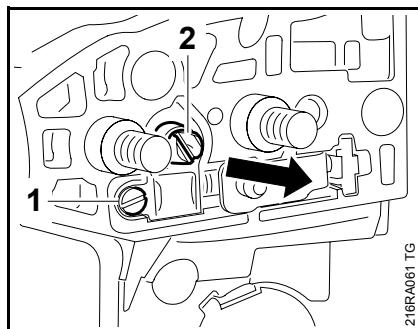
## 7.6 Chain Tensioner

- Troubleshooting, **4.2**

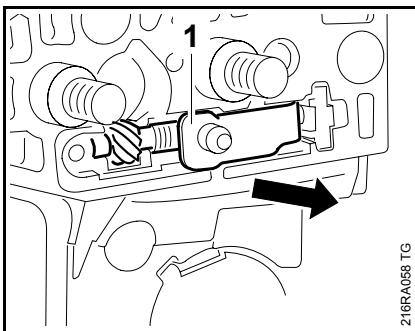


- Remove the side plate, **7.2**

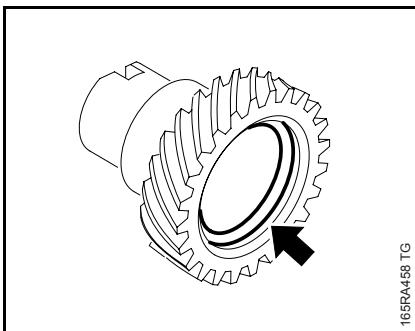
- Turn the spur gear (2) clockwise until the tensioner slide (1) butts against the right-hand end and the screw (arrow) is visible.



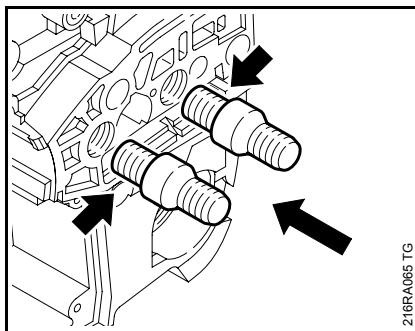
- Take out the screw (1).
- Pull out the spur gear (2) with cover plate and support.



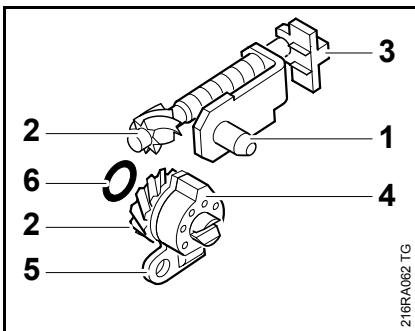
- Take out the tensioner slide (1) with adjusting screw.



- Fit the O-ring in the spur gear recess (arrow).



- Before installing, coat threads (arrow) of collar studs with threadlocking adhesive, **16**
- Fit collar studs and tighten them down firmly.
- Tightening torques, **3.5**
- Reassemble all other parts in the reverse sequence.

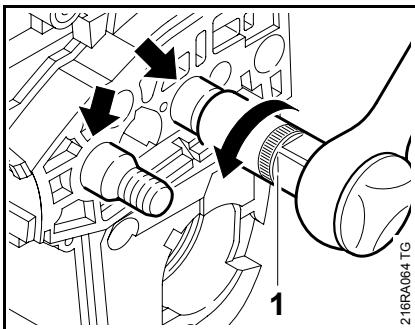


- Inspect the thrust pad (3), support (4), tensioner slide (1), cover plate (5), spur gear set (2) and O-ring (6) and replace as necessary.

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

- Lubricate the threads, gears and O-ring with STIHL multipurpose grease, **16**
- Reassemble in the reverse sequence.

## 7.7 Bar Mounting Studs



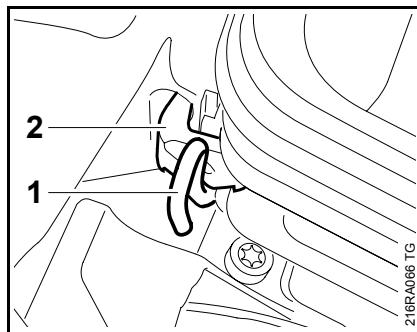
- Remove the side plate, **7.2**
- Push stud puller 5910 893 0506 (1) over the collar studs as far as it will go and unscrew the studs (arrows) counterclockwise.

## 8. Engine

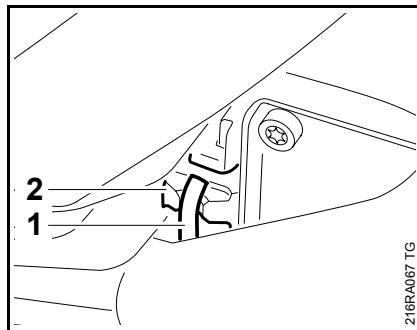
### 8.1 Muffler with Spring Clip/Spark Arresting Screen

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

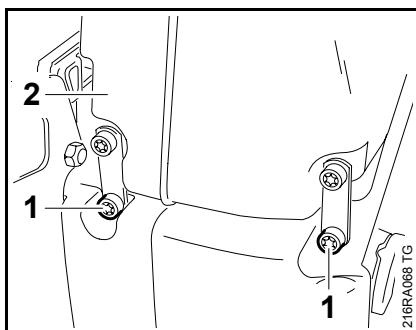
- Troubleshooting, **4**
- Remove the shroud, **8.6**



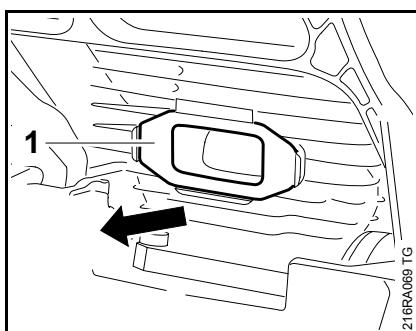
- Carefully push the spring clamp (1) in the direction of the crankcase until it snaps out of the tension wedge (2).  
– The spring clamp is under tension.
- Remove the tension wedge (2).



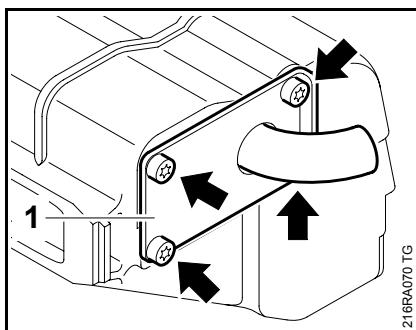
- Remove the spring clamp (1) from the tension wedge (2) at the other side and pull it out between the cylinder and muffler.
- Remove the tension wedge (2).



- Take out the screws (1).
- Remove the muffler (2).
- Move the piston in direction of top dead center until it closes the cylinder exhaust port – this prevents loose parts falling into the cylinder.

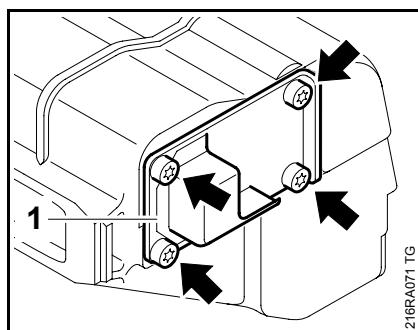


- Remove the exhaust gasket (1).

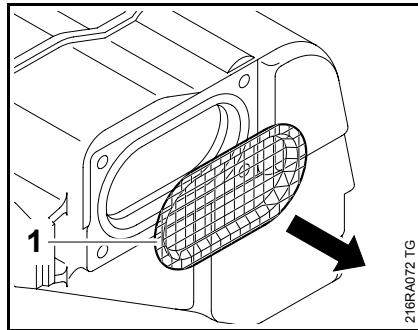


- Take out the screws (arrows).
- Remove the exhaust cover (1), check and replace if necessary.

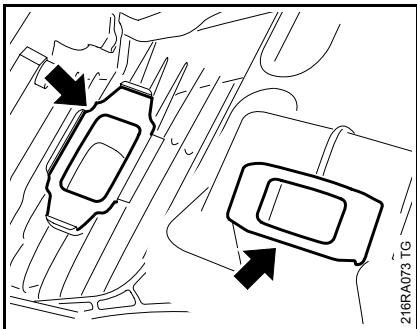
### Spark arresting screen (if fitted)



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

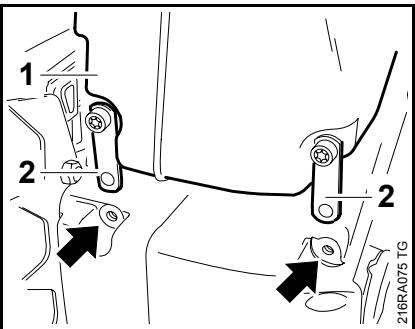


- Remove the spark arresting screen (1).
- Clean the spark arresting screen (1) or replace if necessary.
- Reassemble in the reverse sequence.

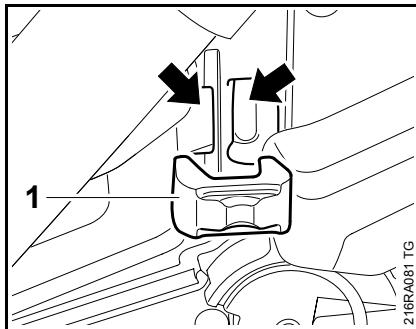


- Close the cylinder exhaust port with the piston – set the piston to top dead center.
- Hold the machine upright.
- Inspect and clean the sealing faces (arrows) and remove any gasket residue.

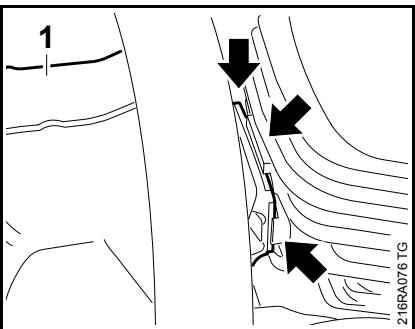
Always replace components with damaged sealing faces.



- Position the muffler (1) so that the straps (2) line up with the holes (arrows).

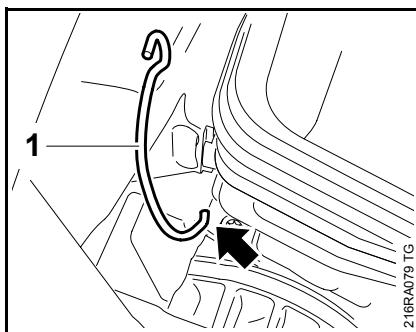


- At the clutch side, push the tension wedge (1) into the recesses (arrows) in the cylinder and muffler.

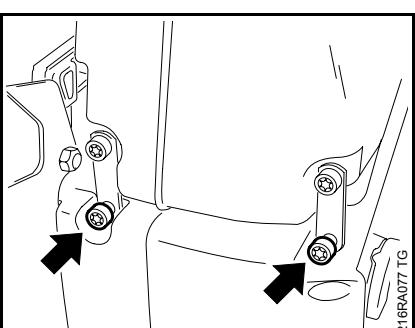


- Place the muffler (1) against the cylinder exhaust port so that its flange engages the guides (arrows).

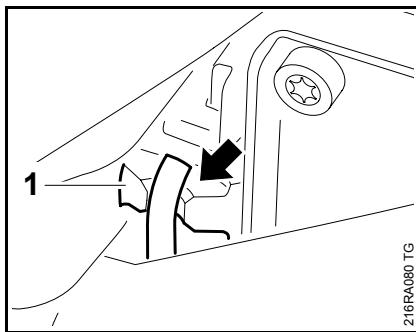
The muffler flange must locate squarely.



- At the ignition side, pass the spring clamp, straight end (arrow) first, under the muffler.

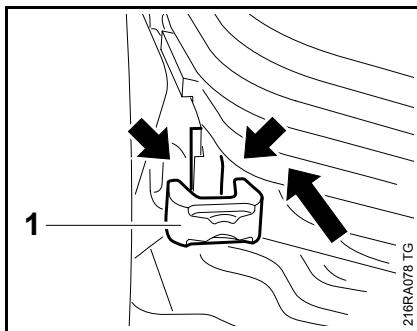


- Fit the screws (arrows) – do not tighten down yet.

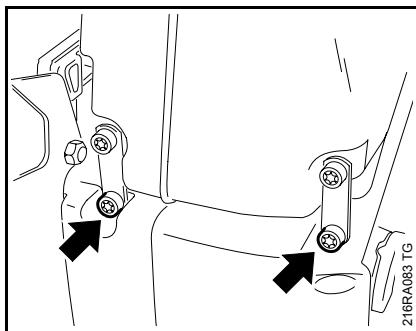


- At the clutch side, position the spring clamp in its seat (arrow) in the the tension wedge (1) and hold it there.

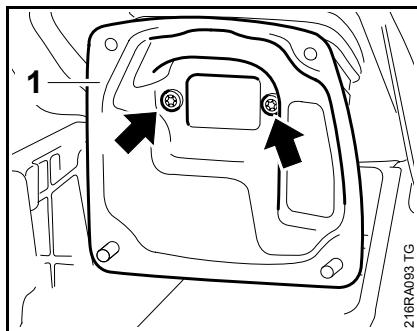
The muffler is now held in position.



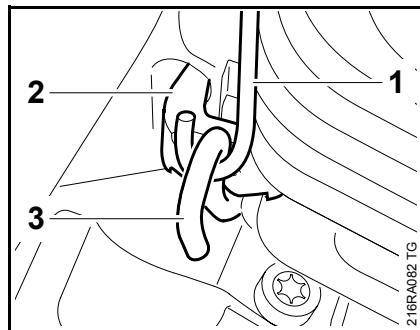
- At the ignition side, push the tension wedge (1) into the recesses (arrows) in the cylinder and muffler.



- Tighten down the screws (arrows) firmly.
  - Reassemble all other parts in the reverse sequence.
  - Tightening torques, **3.5**



- Move the piston in direction of top dead center until it closes the cylinder exhaust port – this prevents loose parts falling into the cylinder.



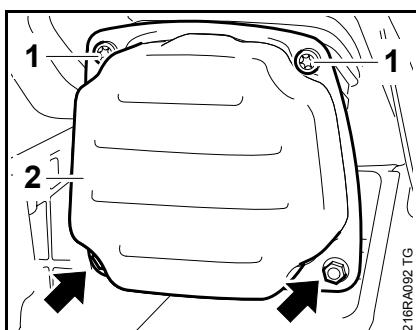
- Hold the spring clamp at the other side.
- Attach the hook (1) 5910 893 8800 to the spring loop (3).
- Pull the loop (3) of the spring clamp over its seat in the tension wedge (2) and locate it in position.

The spring clamp must locate firmly in the tension wedges at both sides.

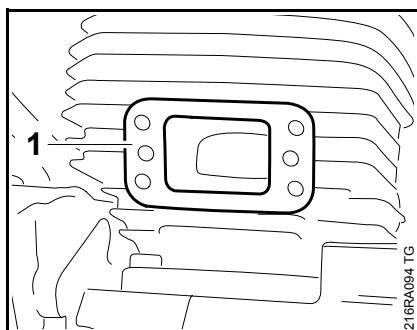
## 8.2 Screw Mounted Muffler / Spark Arresting Screen

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

- Troubleshooting, **4**



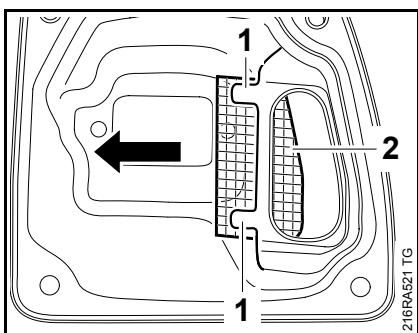
- Take out the screws (1).
- Unscrew the nuts (arrows) and remove the washers.
- Remove the exhaust casing (2).



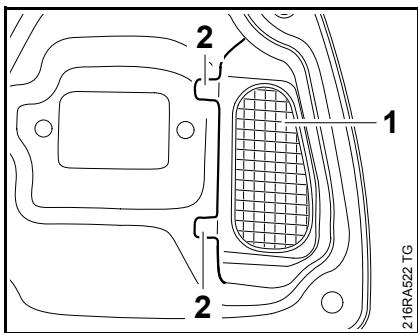
- Remove the exhaust gasket (1).

Always install a new exhaust gasket.

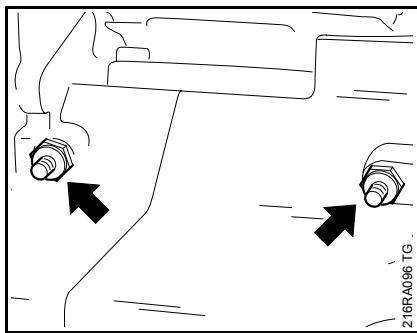
## Spark arresting screen (if fitted)



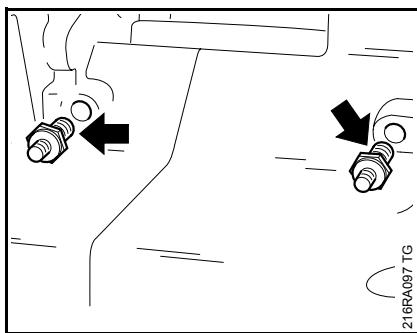
- Bend the retaining tabs (1) open.
- Pull out the spark arresting screen (2).
- Clean the spark arresting screen (2) or replace if necessary.



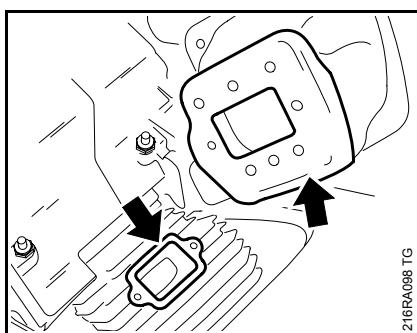
- Push home the spark arresting screen (1).
- Bend the retaining tabs (2) down as far as stop.
- Reassemble in the reverse sequence.



- Check the studs (arrows) and replace if necessary
- Unscrew the studs (arrows).



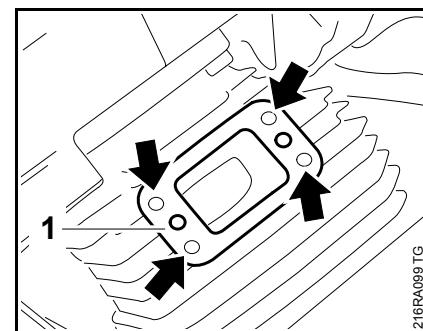
- Before installing the studs, coat their threads (arrows) with threadlocking adhesive, **16**
- Insert the studs and tighten them down firmly.
- Close the cylinder exhaust port with the piston – set the piston to top dead center.



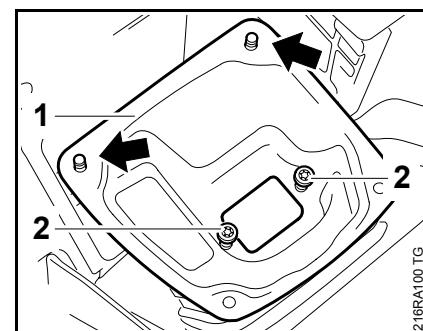
- Hold the machine upright.

- Inspect and clean the sealing faces (arrows) and remove any gasket residue.

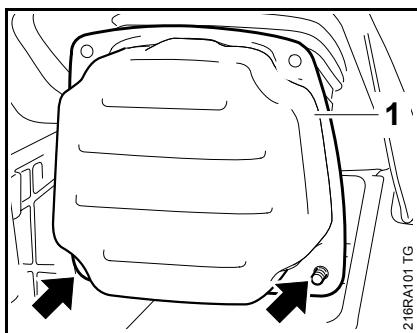
Always replace components with damaged sealing faces.



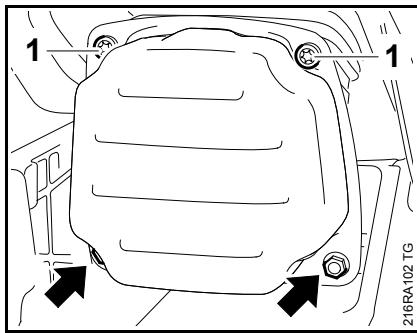
- Position the exhaust gasket (1) so that the beads (arrows) point towards the cylinder and engage over the threads.
- Exhaust gasket is now held in position.



- Carefully push the muffler (1) over the studs (arrows) and against the cylinder exhaust port.
- Check correct position of exhaust gasket and fit the screws (2).
- Tighten down the screws (2) firmly.



- Carefully push the exhaust casing (1) over the studs (arrows) and against the muffler.



Always use new self-locking nuts.

- Tighten down the screws (1) firmly.
- Fit the washers, screw on the nuts (arrows) and tighten them down firmly.
- Tightening torques, **3.5**

### 8.3 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.

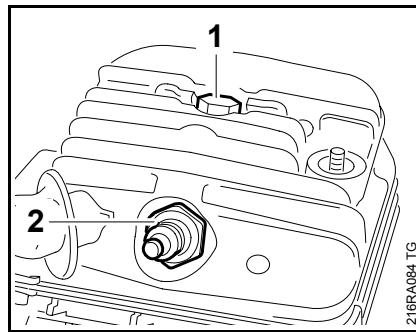
Moreover, the transition from idle speed to part or full throttle is not smooth.

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

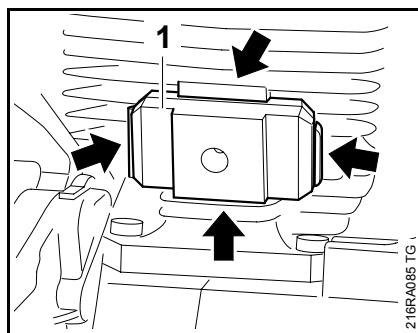
The engine can be checked thoroughly for leaks with the pump 0000 850 1300.

#### 8.3.1 Preparations

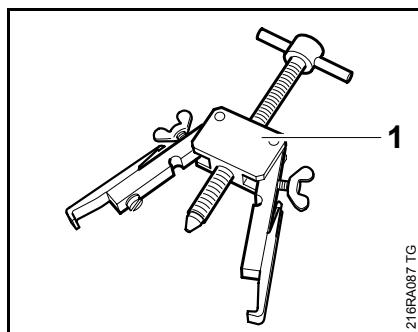
##### Models with muffler secured with spring clamp



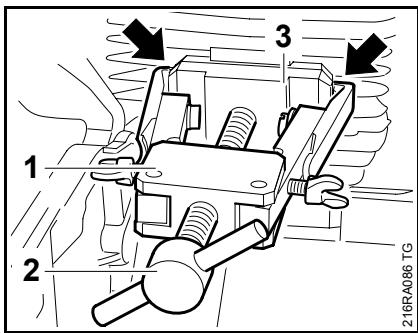
- Remove the muffler, **8.1**
- Pull off the boot and unscrew the spark plug.
- Set the piston to top dead center. This can be checked through the spark plug hole.
- Remove the decompression valve, **8.11**
- Fit the plug (1) 1122 025 2200 and tighten it firmly.
- Fit the spark plug (2) and tighten it down firmly.
- Tightening torques, **3.5**



- Remove the exhaust gasket.
- Line up flange (1) 1124 850 4205 with guides (arrows) and fit it in position.

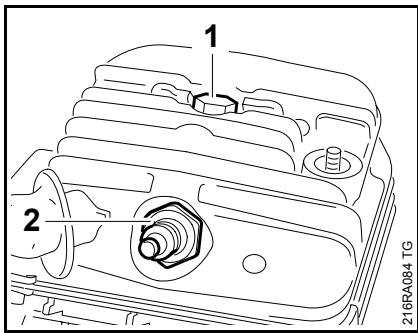


- Equip puller (1) 5910 890 4400 with No. 2 jaws 0000 893 3700.



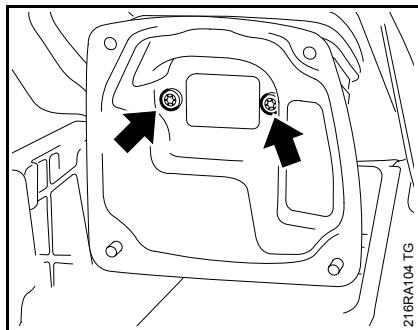
- Apply puller (1) 5910 890 4400 with jaws to the recesses (arrows) in the cylinder for the tension wedges.
- Position the spindle (2) against the centering bore in the flange (3).
- Screw home the spindle (2) until the flange (3) is tight and completely seals the cylinder exhaust port.

#### Models with screw mounted muffler

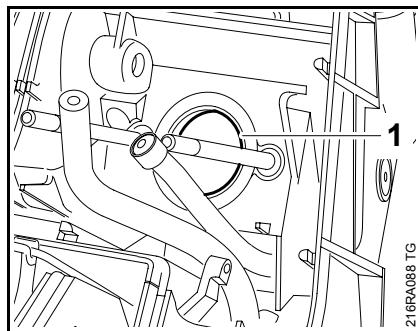


- Remove the filter cover, **14.1**
- Unscrew the spark plug, **6**
- Remove the shroud, **8.6**
- Set the piston to top dead center. This can be checked through the spark plug hole.
- Remove the decompression valve, **8.11**

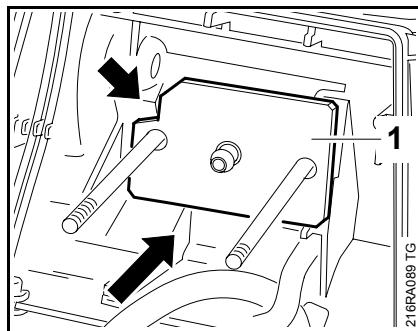
- Fit the plug (1) 1122 025 2200 and tighten it firmly.
- Fit the spark plug (2) and tighten it down firmly.
- Tightening torques, **3.5**



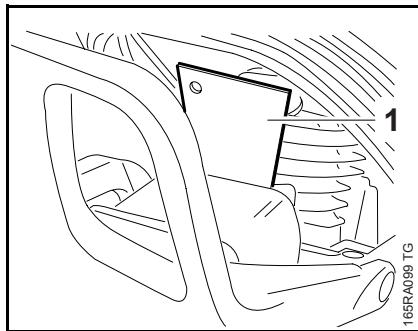
- Remove the muffler exhaust casing, **8.2**
- Loosen the screws (arrows).



- Make sure the sleeve (1) is in place.



- Line up the flange (1) and fit it over the studs  
– the cutout (arrow) must be top left.
- Fit the test flange (1) 1106 850 4201.

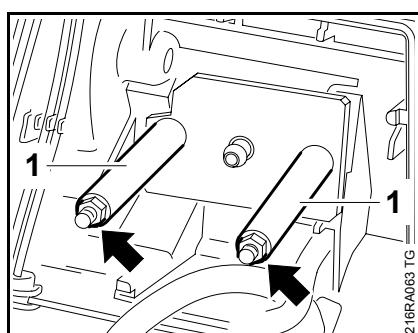


- Fit the sealing plate (1) 0000 855 8106 between the muffler and gasket and tighten down the screws moderately.

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

#### All models

- Remove the carburetor, **14.3**

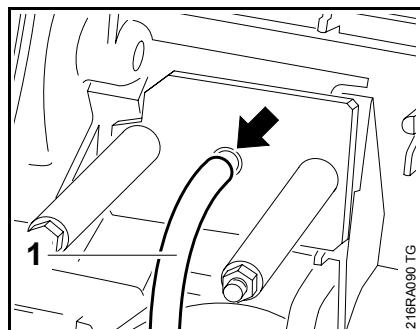


- Fit the sleeves (1) 1124 893 7100.
- Fit the nuts (arrows) and tighten them down firmly.

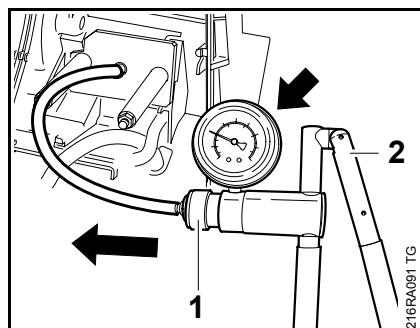
### 8.3.2 Vacuum Test

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.



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



- 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.

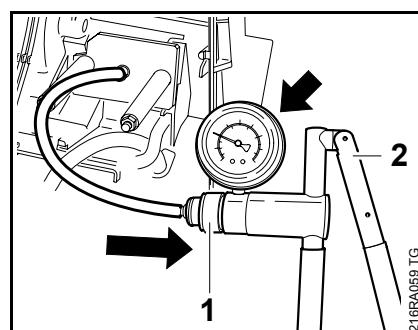
However, if the pressure continues to rise (reduced vacuum in the engine), the oil seals must be replaced, **8.4**.

- After finishing the test, push the ring to the right to vent the pump.
- Continue with pressure test, **8.3.3**

### 8.3.3 Pressure Test

Carry out the same preparations as for the vacuum test, **8.3.2**

- Always carry out the pressure test after the vacuum test, **8.3.2**



- 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 crankcase 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 crankcase again. 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 flange 1106 850 4201.
- Install the carburetor, **14.3**

#### Models with muffler secured with spring clamp

- Loosen and remove the puller.
- Remove the flange.
- Install the muffler, **8.1**

#### Models with screw mounted muffler

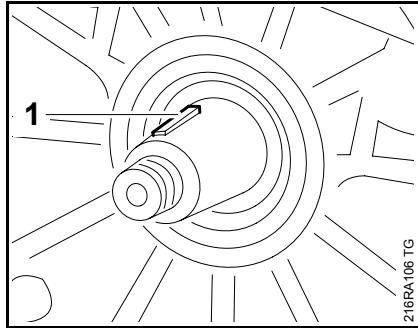
- Loosen the screws and pull out the sealing plate.
- Install the muffler, **8.2**
- Tightening torques, **3.5**

## 8.4 Oil Seals

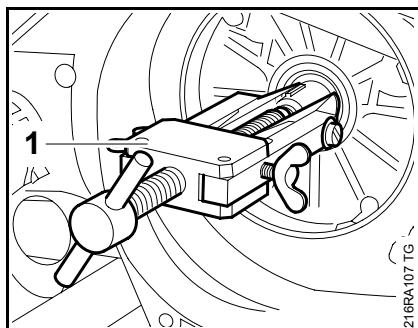
It is not necessary to disassemble the engine to replace the oil seals.

### Ignition side

- Remove the fan housing, [10.2](#)
- Remove the flywheel, [9.5](#)



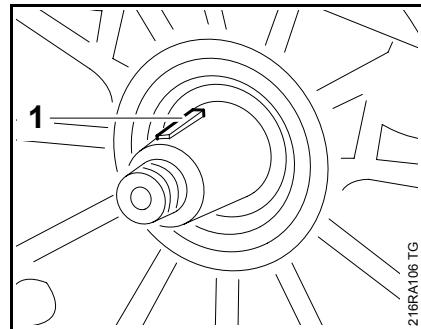
- Remove and check the key (1) and replace if necessary.



- 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 No. 3.1 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 with standard solvent-based degreasant containing no chlorinated or halogenated hydrocarbons.
- Lubricate sealing lips of new oil seal with grease, [16](#)

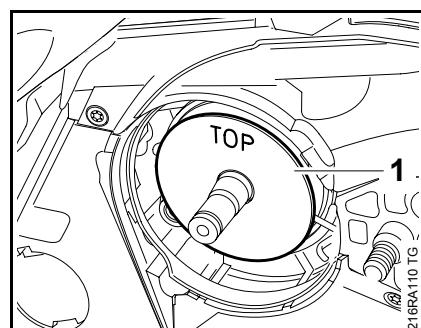


- Install the Woodruff key (1).  
– Make sure it is properly seated.

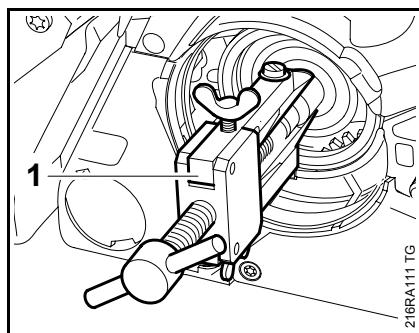
- Reassemble all other parts in the reverse sequence.

### Clutch side

- Remove the clutch, [6](#)



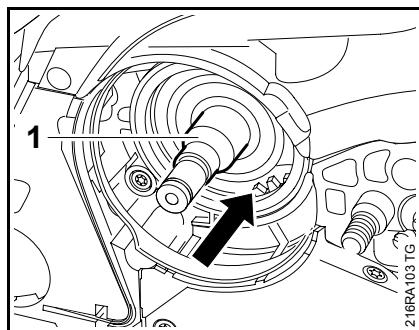
- Remove the washer (1).
- Remove the spur gear, [13.3](#)



- 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 No. 3.1 jaws 0000 893 3706.
- Clamp the puller arms.
- Pull out the oil seal.

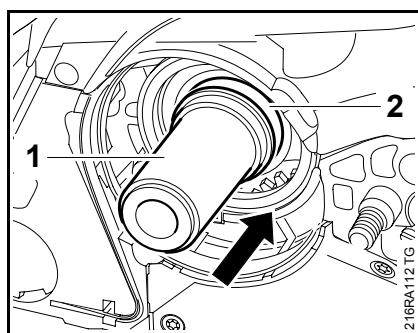
The crankshaft stub and oil pump spur gear must not be damaged.

- Clean the sealing face with a little standard solvent-based degreasant containing no chlorinated or halogenated hydrocarbons.
- Lubricate sealing lips of new oil seal with grease, 16

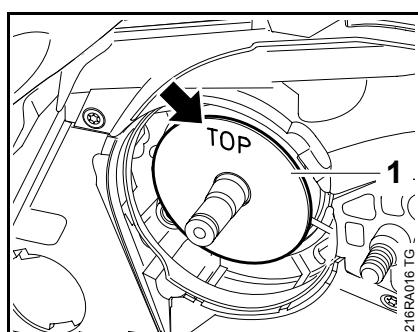


- Fit the installing sleeve (1) 1124 893 4600.

- Apply a thin coating of sealant to the outside diameter of the oil seal, 16
- Slip the oil seal, open side facing the crankcase, over the installing sleeve.
- Remove the installing sleeve (1).

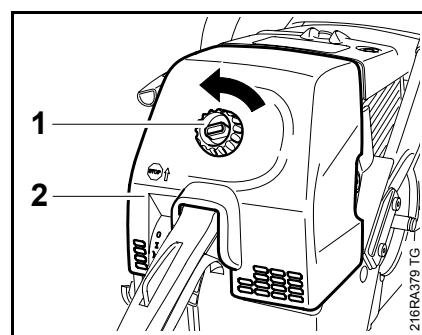


- Use press sleeve (1) 1127 893 2400 to install the oil seal (2).

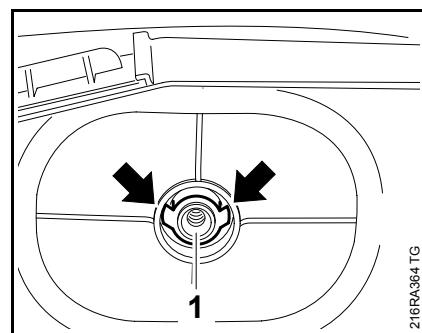


- Wait about one minute, then rotate the crankshaft several times.
- Remove the spur gear, 13.3
- Fit the cover washer (1) so that the word **TOP** (arrow) faces outwards.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, 3.5

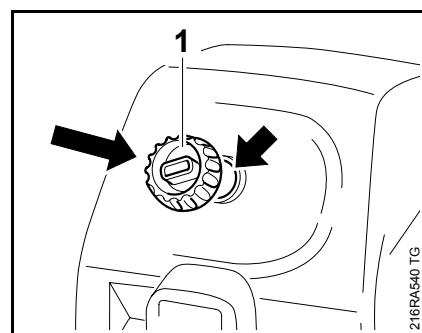
## 8.5 Carburetor Box Cover



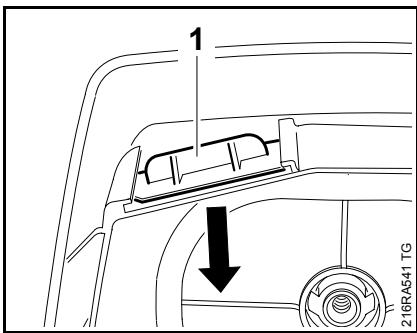
- Turn twist lock (1) counterclockwise.
- Remove the carburetor box cover (2).



- Squeeze the retaining tabs (arrows) together.
- Push out the twist lock (1).



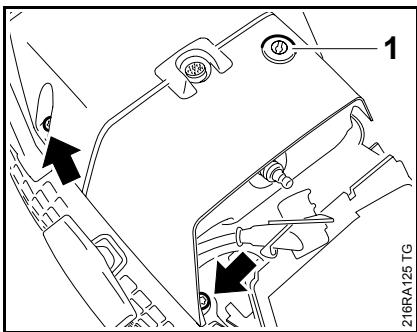
- Push the twist lock (1) into the hole (arrow) until it snaps into position.



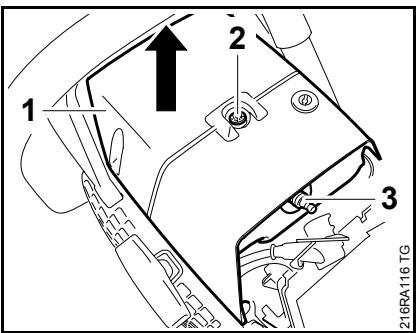
- Check the shutter (1) for summer/winter operation, remove it and replace if necessary.
- Reassemble all other parts in the reverse sequence.

## 8.6 Removing and Installing the Shroud

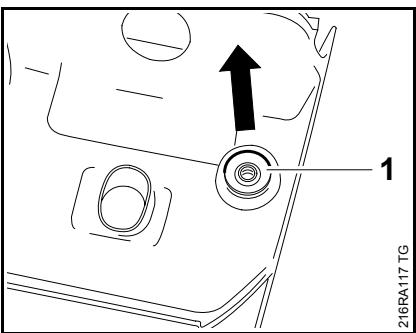
- Engage the chain brake.
- Remove the filter cover, **14.1**
- Pull the boot off the spark plug.



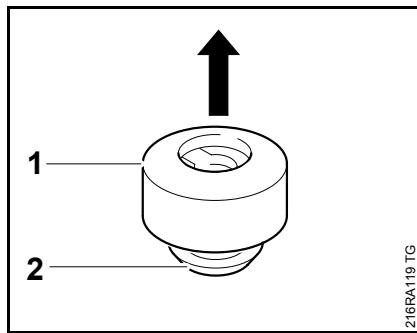
- Take out the screws (arrows).
- Unscrew the slotted nut (1).



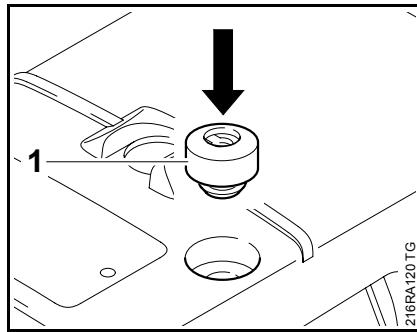
- Lift off the shroud (1) over the decompression valve (2) and spark plug (3).



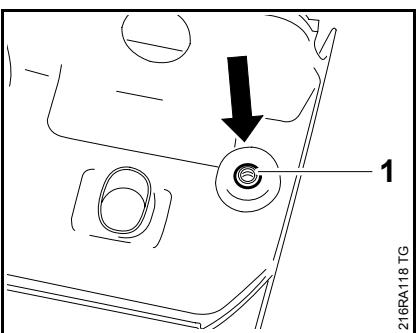
- Pull off the shim (1), check it and replace if necessary.



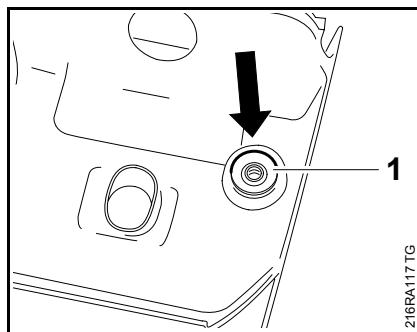
- Pull the insulator (1) off the slotted nut (2).
- Check the individual parts and replace if necessary.
- Reassemble in the reverse sequence.



- Push the slotted nut (1) with insulator into the bore until it engages in position.

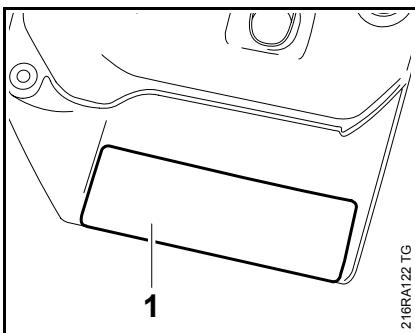


- Push out the slotted nut (1) with insulator.

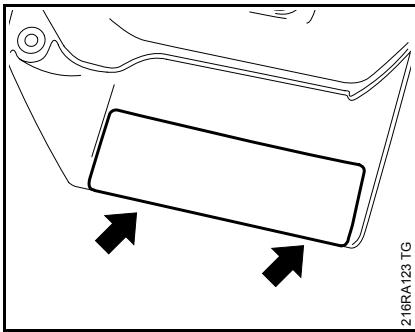


- Push the shim (1) onto the slotted nut so that it fully engages the nipple.

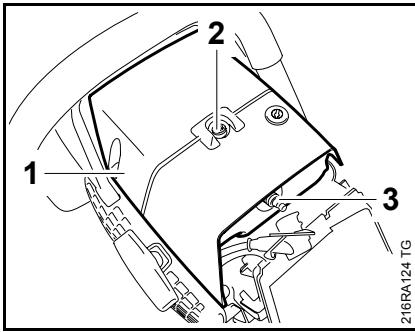
## Models with screw mounted muffler



- Inspect the reflector foil (1) and replace it if it is damaged.

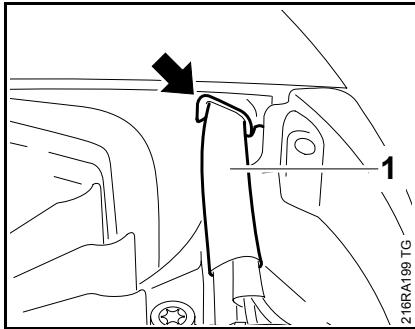


- Bond the new reflector foil in position along the edge of the shroud (arrows).

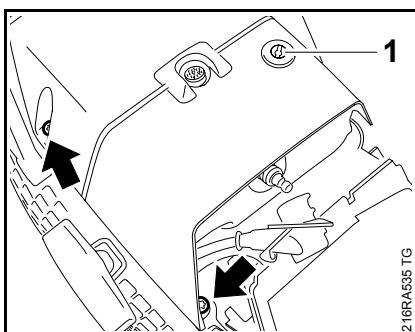


- Fit the shroud (1) over the decompression valve (2) and spark plug (3).

Make sure the cylinder's stud is located against the slotted nut.



Wiring harness (1) must be in the guide (arrow) when the shroud is fitted.



- Fit the screws (arrows)
  - do not tighten down yet.
- Screw in the slotted nut (1) and tighten it down firmly.
- Tighten down the screws (arrows) firmly.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **8.1**

## 8.7 Cylinder

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

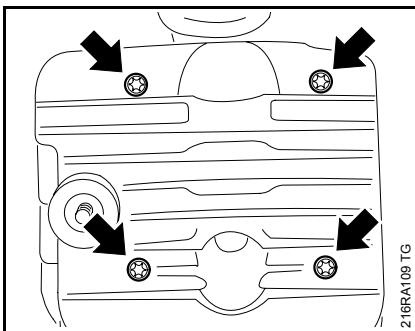
### Cylinder installed

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

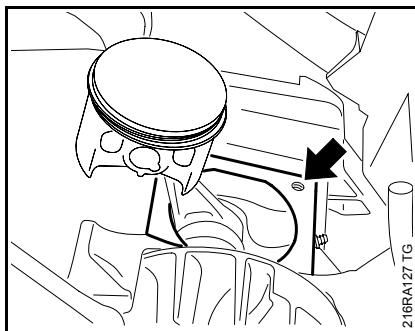
### Cylinder removed

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

- Remove the shroud, **8.6**
- Pull off the boot and unscrew the spark plug, **6**
- Remove the fan housing, **10.2**
- Remove the carburetor, **14.3**
- Push the manifold out of the tank housing, **14.7.3**
- Remove the muffler, **8.1**
- Remove the decompression valve, **8.11**



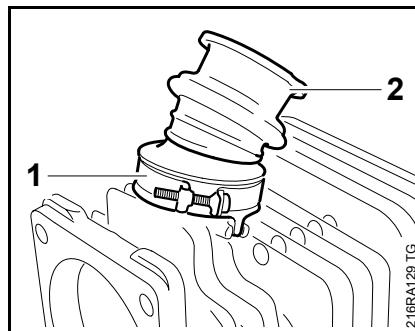
- Take out the four cylinder base screws through the holes (arrows) in the cylinder.



- 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.

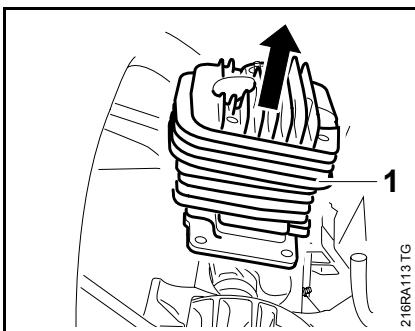


- Inspect the intake manifold (2) and replace it if necessary – even very minor damage can result in engine running problems, **4.7**

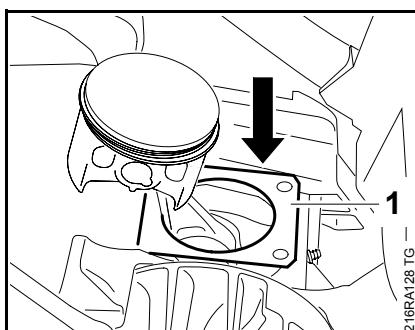
- Loosen the hose clamp (1) and pull off the manifold (2).

- Inspect the sealing face on the cylinder intake port.

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

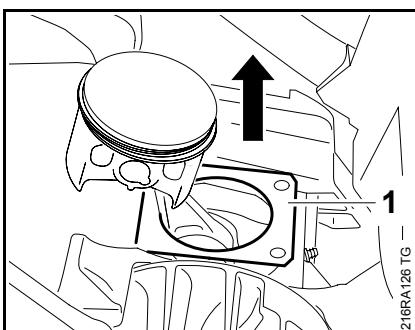


- Carefully lift the cylinder (1) away.

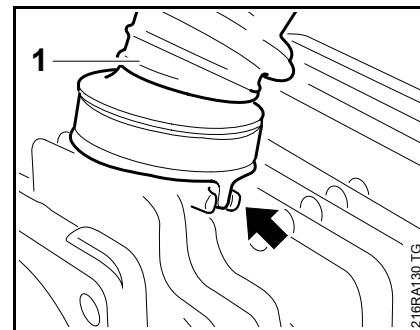


- Line up the cylinder gasket (1) with the holes in the crankcase.

- Place the cylinder gasket (1) in position.

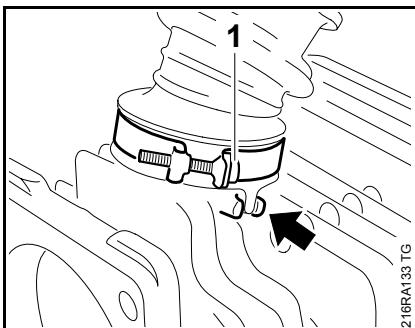


- Remove the cylinder gasket (1).



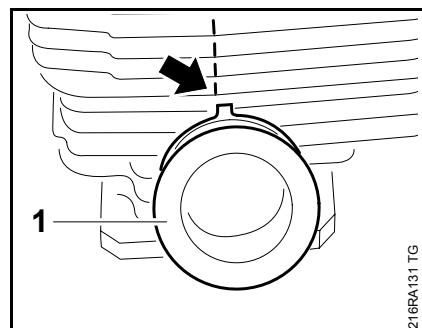
- Push the manifold (1) on to the intake stub.

- Line up the manifold (1) – the tab must be engaged as shown (arrow).

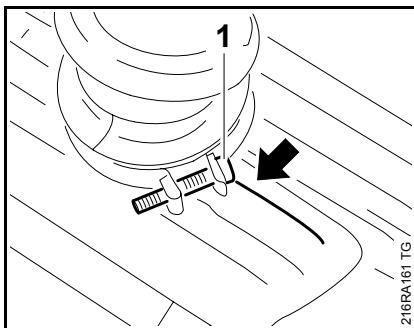


- Position the hose clamp so that its screw head is at the same side as the recess (arrow) and push it on to the manifold.
- Turn the hose clamp until the screw head is below the recess (arrow).
- Tighten down the clamp screw (1) firmly.
- Tightening torques, **3.5**

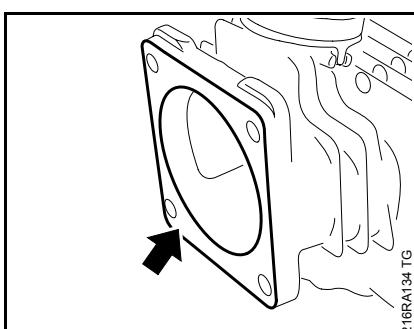
#### Models with muffler secured with spring clamp



- Push the manifold (1) on to the intake stub.
- Line up the manifold (1)
  - the tab must be positioned to the right of the seam (Pfeil).

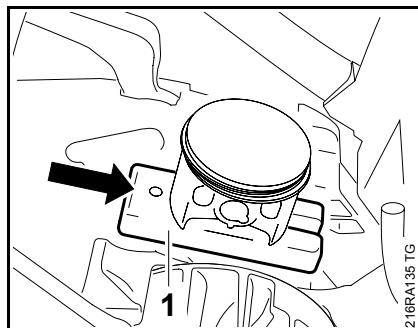


- Position the hose clamp so that its screw head is on the right-hand side of the intake manifold and lines up with the third cylinder fin from the bottom (arrow).
- Tighten down the clamp screw (1) firmly.
- Tightening torques, **3.5**



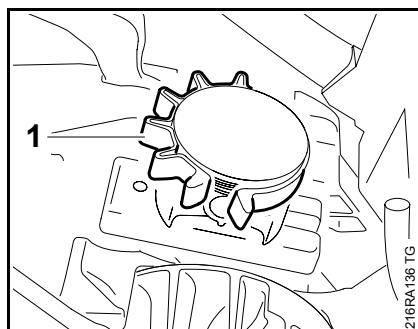
- Inspect and clean the sealing face (arrow) and remove any gasket residue.
- Also check the sealing face on the cylinder exhaust port.

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



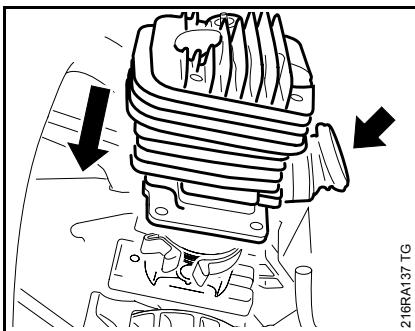
- Slide the wooden assembly block (1) 1108 893 4800 between the piston and crankcase.

Take care not to 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, **8.10**

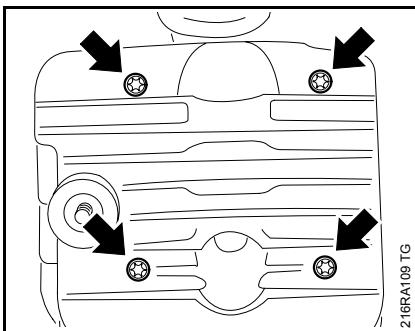
Apply the clamping strap (1) so that the piston rings do not project beyond the cylinder wall.



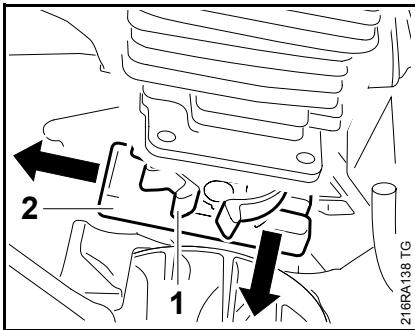
- Align the cylinder so that the intake port (arrow) points toward the tank housing.

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.



- Push the cylinder fully home.
- Insert the screws (arrows) to hold the cylinder and gasket in position..
- Tighten down the screws through the holes (arrows) in the cylinder in a crosswise pattern.
- Tightening torques, **3.5**
- Reassemble all other parts in the reverse sequence.



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

Make sure the cylinder gasket is properly seated.

- Wind a piece of string around the manifold and pull it into tank housing, **14.7.3**

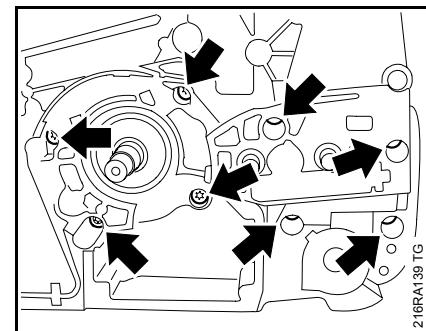
## 8.8 Crankshaft

### 8.8.1 Removing and Installing

- Remove the brake band, **7.2**
- Remove the oil pump, **13.3**
- Remove the brake lever, **7.3**
- Drain the fuel and oil tanks, **1**
- Remove the tank housing, **14.9.3**
- Remove the flywheel, **9.5**
- Remove the cylinder, **8.7**
- Remove the piston, **8.9**

Always install new bearings and oil seals after removing the crankshaft, **8.8.2** and **8.4**

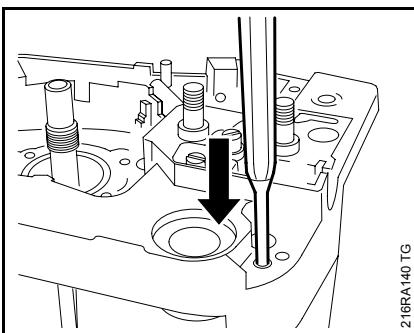
### Clutch side of crankcase



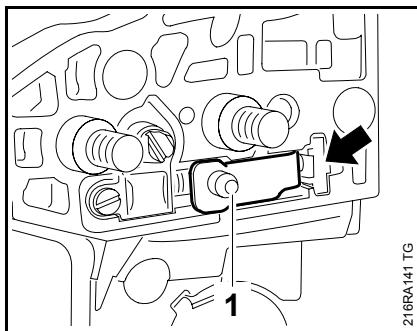
Use the tools in the service tool set 5910 007 2205 for removing and installing.

- Take out the screws (arrows).

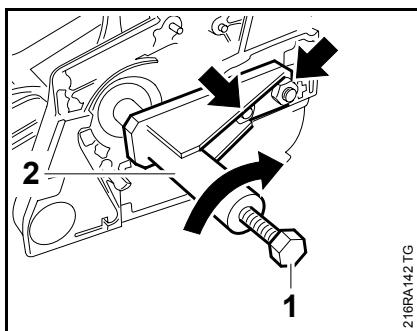
## Models with muffler secured with spring clamp



- Use a 4 mm diameter drift to drive out the cylindrical pin at the chain tensioner side.



The tensioner slide (1) must butt against the thrust pad (arrow).



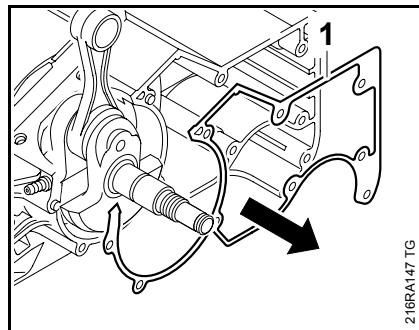
- Back off the spindle (1) in service tool until it is clear of the crankshaft stub.

- Push the service tool (2) 5910 890 2205 over the collar screws (arrows), fit the nuts and tighten them down firmly.

- Turn the spindle (1) clockwise until the crankshaft stub is pushed out of the ball bearing.

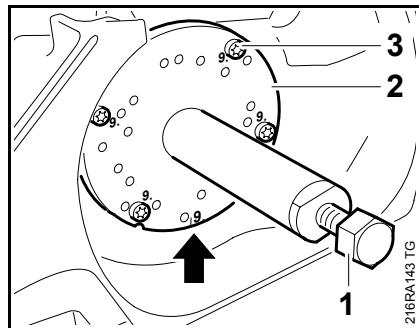
This operation releases the clutch side of the crankcase and separates the two halves.

- Install new ball bearings and oil seals, 8.8.2 and 8.4



- Remove the gasket (1).

### Ignition side of crankcase

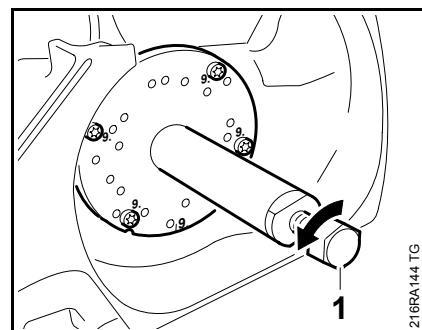


Use the tools in the service tool set 5910 007 2200 for removing and installing.

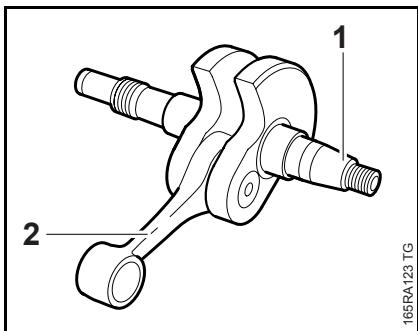
- Unscrew spindle (1) of service tool 5910 007 2200 until the drilled plate (2) butts against the crankcase – left-hand thread.

- Fit the plate (2) 5910 893 2101 against the ignition side of the crankcase so that the number "9" (arrow) is at the bottom.

- Insert three M5x72 screws (3) in the holes marked "9" and tighten them down against the drilled plate.



- Turn the spindle (1) counter-clockwise until the crankshaft is pushed out of the ignition side of the crankcase.

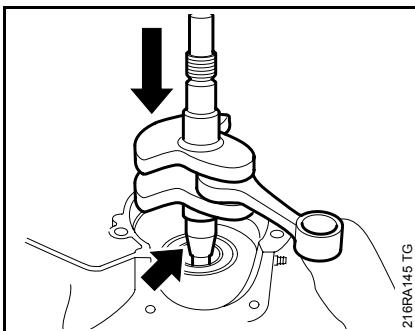


- The crankshaft (1), connecting rod (2) and needle bearing form an inseparable unit. Always replace as a complete unit.
- Check the two halves of the crankcase and ball bearings and replace if necessary, **8.8.2**
- Before installing, clean the crankshaft with a standard commercial, solvent-based degreasant containing no chlorinated or halogenated hydrocarbons.

#### Installing ignition side of crankcase

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.

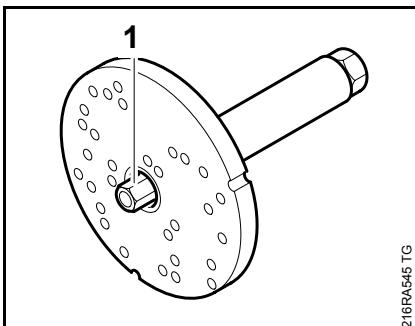


- Position the tapered stub of the crankshaft (arrow) above the ball bearing at the ignition side.

Wear protective gloves to reduce risk of burn injury.

- Heat the inner bearing race to about 150°C (300°F).
- Push the crankshaft into the ball bearing at the ignition side as far as a stop.

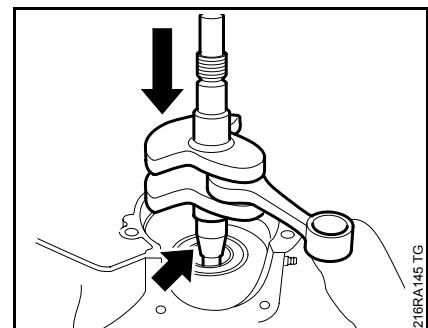
This operation must be carried out very quickly because heat is absorbed by the crankshaft, and the inner bearing race shrinks.



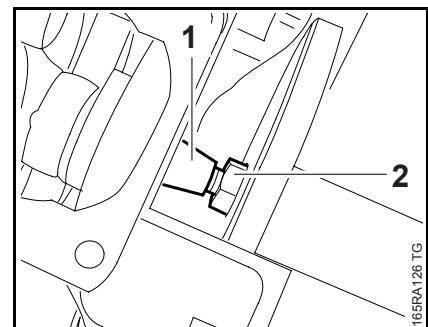
If it is not possible to heat the inner bearing race, use service tool 5910 893 2101 to install the crankshaft.

- Screw the threaded sleeve (1) 5910 893 2421 onto the spindle as far as stop.

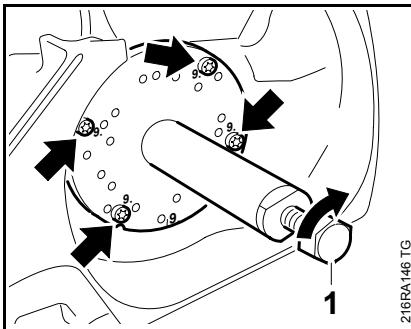
- Coat tapered stub of crankshaft with oil.



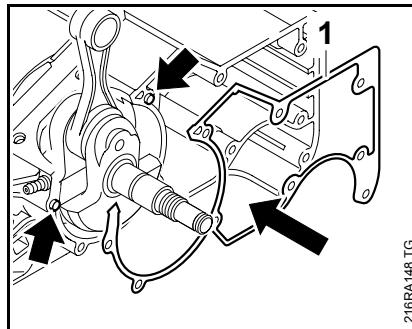
- Position the tapered stub of the crankshaft (arrow) above the ball bearing at the ignition side and push it home.



- Position the screw sleeve (2) on the crankshaft thread (1) and screw it into place.



- Turn the spindle (1) until the drilled plate 5910 893 2101 butts against the ignition side of the crankcase.
- Fit the M5x72 screws (arrows) through the holes marked "9" and tighten them down.
- Turn the spindle (1) clockwise.
- Install the ignition side of the crankcase as far as stop.

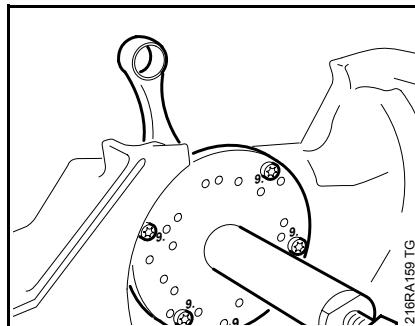


- Fit a new gasket (1) and locate it on the sleeves (arrows).

#### Installing clutch side of crankcase

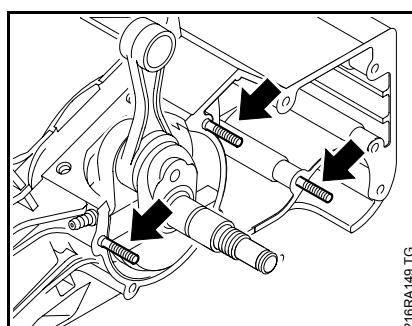
Take care not to damage the crankshaft stub.

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.

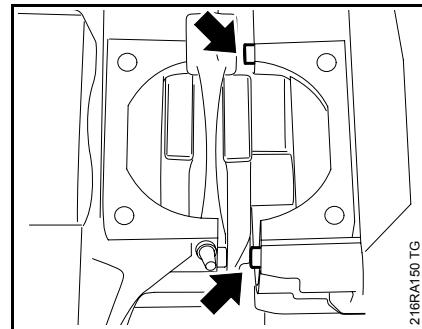


The crankshaft turns when it is being pulled into place with the service tool. Therefore, make sure the small end of the connecting rod always points upward to the cylinder.

- Remove the service tool.

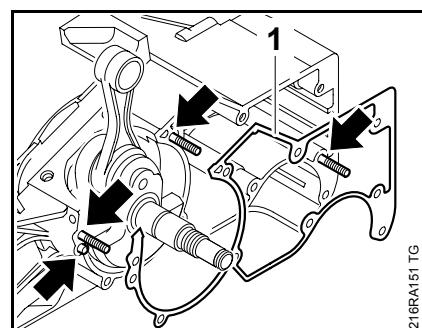


- At the ignition side, fit three M5x72 screws (arrows) in the holes to help alignment and avoid twisting.
- Coat straight stub of crankshaft with oil.

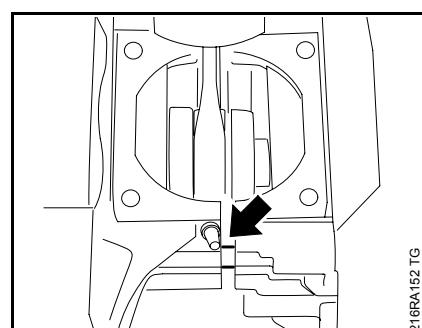


Make sure the sleeves (arrows) engage the holes and the gasket is not pinched or twisted.

#### Models with muffler secured with spring clamp

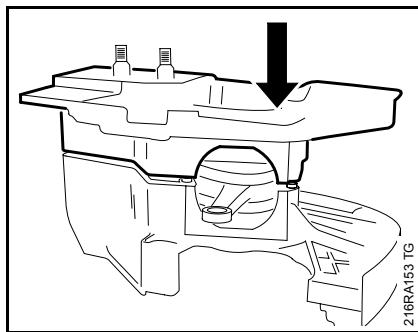


- Fit a new gasket (1) and locate it on the pin and screws (arrows).



Make sure the pin (arrow) slips into the hole.

## All models



- Position the clutch side of the crankcase on the straight crankshaft stub and the screws.

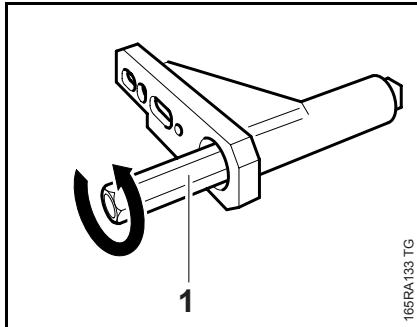
Wear protective gloves to reduce risk of burn injury.

- Heat the inner bearing race to about 150°C (300°F).
- Push the crankcase fully home.

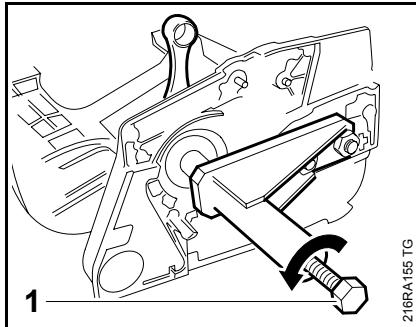
This operation must be carried out very quickly because heat is absorbed by the crankshaft, and the inner bearing race shrinks.

If it is not possible to heat the inner bearing race, use service tool 5910 890 2205 to install the crankcase.

- Coat straight stub of crankshaft with oil.
- Position the clutch side of the crankcase on the straight crankshaft stub and the two screws.

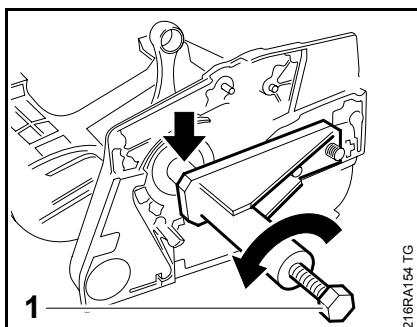


- Screw the spindle (counter-clockwise, left-hand thread) fully into the service tool.
- Screw the threaded sleeve (1) 5910 893 2409 onto the spindle as far as stop (left-hand thread).

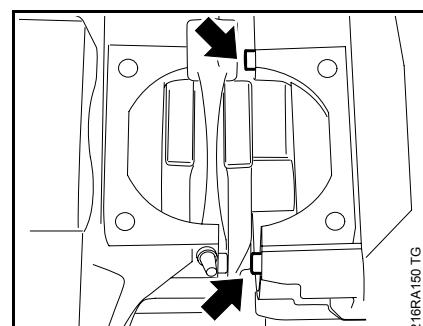


The crankshaft turns when it is being pulled into place with the service tool. Therefore, make sure the small end of the connecting rod always points upward to the cylinder.

- Turn the spindle (1) counter-clockwise until the crankcase locates against the guide sleeves.



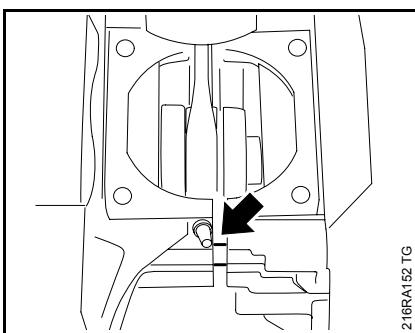
- Push the service tool over the bar mounting studs.
- Screw the threaded sleeve onto the straight crankshaft stub (arrow).
- Turn the spindle (1) counter-clockwise to locate the service tool against the crankcase.
- Fit the sprocket cover mounting nuts on the bar studs and screw them down finger-tight.



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

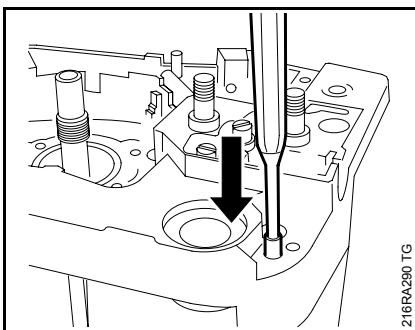
- Continue turning the service tool's spindle until the gap between the two halves of the crankcase is closed.
- Remove the service tool.
- Take out the M5x72 screws.

## Models with muffler secured with spring clamp



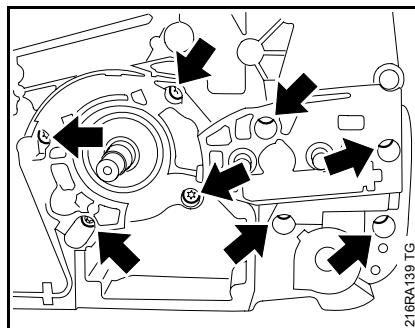
Make sure the pin (arrow) engages the hole and the gasket is not pinched or twisted.

- Continue turning the service tool's spindle until the gap between the two halves of the crankcase is closed.
- Remove the service tool.
- Take out the M5x72 screws.



- Use a 4 mm dia. drift to drive home the dowel pin at the chain tensioner side until the pin is flush with the hole at the other side.

## All models



- Insert the screws (arrows) and tighten them down firmly in a crosswise pattern.
- Tightening torques, **4.7**
- Check and install the piston, **8.9**
- Check and install the cylinder, **8.7**
- Reassemble all other parts in the reverse sequence.

### 8.8.2 Bearings / Crankcase

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

Replace both halves of the crankcase if they are damaged.

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

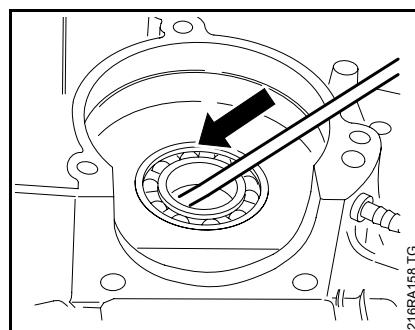
Parts not supplied with the new crankcase must be transferred from the original crankcase – check the parts and replace if necessary.

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

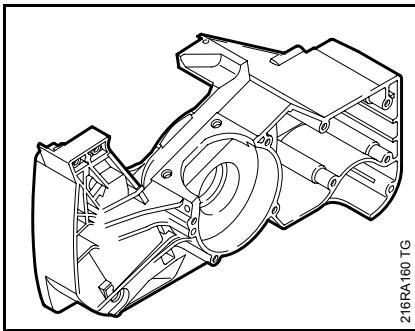
If the original crankcase is used again, replace the oil seals and ball bearings, remove any gasket residue and clean the sealing surfaces thoroughly. The sealing faces must be clean to guarantee a perfect seal.

- See also Troubleshooting, **4.7**
- Remove the crankshaft, **8.8**
- Wear protective gloves to reduce risk of burn injury.

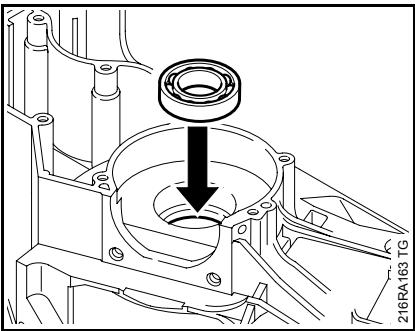
## Ignition side of crankcase



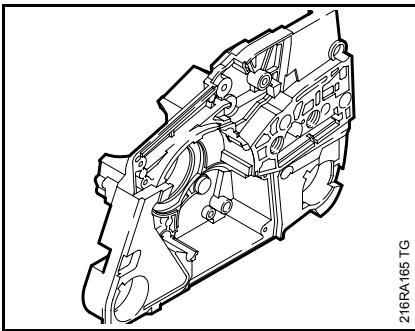
- Use a suitable punch to carefully drive out the oil seal.



216RA160 TG



216RA163 TG



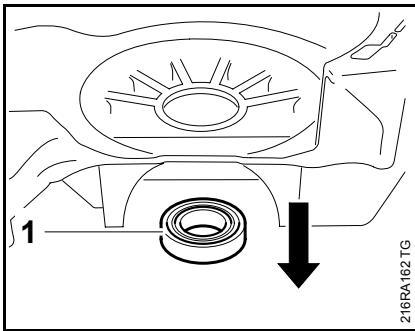
216RA165 TG

- Check and clean the crankcase or replace if necessary.
- If this half of the crankcase is in order, install a new ball bearing.

- Heat area of bearing seat to approx. 150°C (300°F).
- Position the ball bearing so that its open side (balls visible) faces the inside of the crankcase.
- Push the ball bearing home as far as stop.

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

- Check that the bearing is properly seated. If necessary, use press arbor 1127 893 2400 to press the bearing fully home.

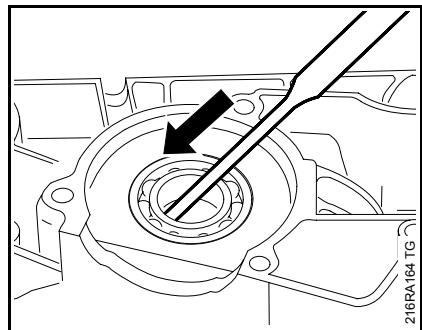


216RA162 TG

- Heat area of bearing seat to approx. 150°C (300°F).

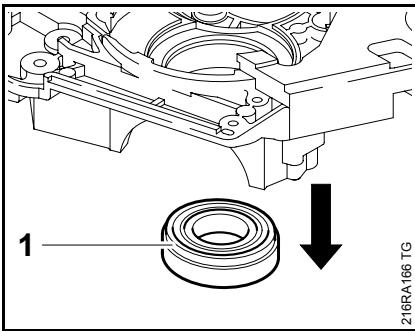
The bearing (1) drops out as soon as this temperature is reached.

#### Clutch side of crankcase



216RA164 TG

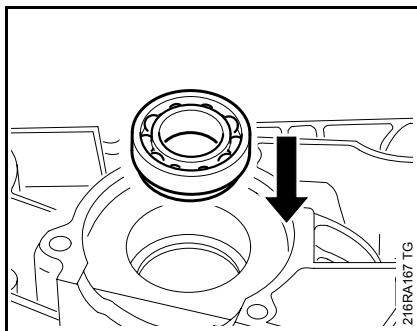
- Use a suitable punch to carefully drive out the oil seal.



216RA166 TG

- Heat area of bearing seat to approx. 150°C (300°F).

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



- Heat area of bearing seat to approx. 150°C (300°F).
- Position the ball bearing so that the shoulder faces the outside of the crankcase.
- Push the ball bearing home as far as stop (snap ring).

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

- Check that the bearing is properly seated. If necessary, use press arbor 1127 893 7200 to press home the bearing until it butts against the snap ring.
- Install the crankshaft, 8.8
- Install the oil seals, 8.4
- Reassemble all other parts in the reverse sequence.
- Tightening torques, 3.5

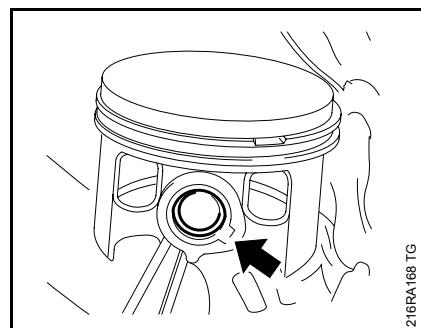
## 8.9 Piston

### 8.9.1 Removal

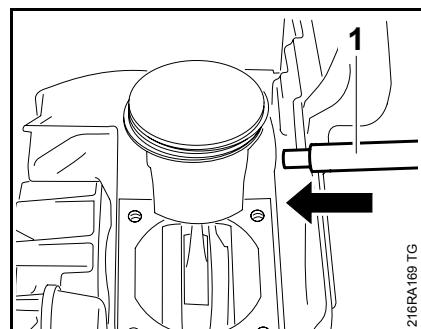
Before removing the cylinder, decide whether or not the crankshaft has to be removed as well, 8.8

- Remove the cylinder, 8.7

Note when removing the snap rings that the installing tool 5910 890 2213 is easier to apply at the ignition side – the snap ring at the clutch side may be left in position.

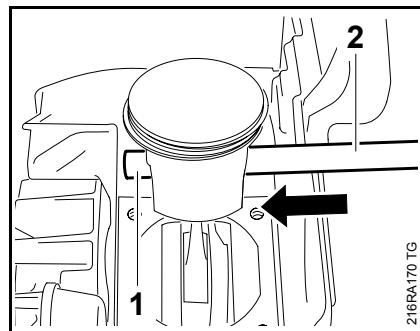


- At the ignition side, use a suitable tool at the recess (arrow) to remove the hookless snap ring from the piston boss.



The assembly drift can be pushed through the installed snap ring.

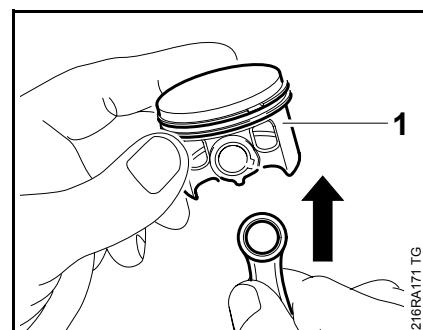
- Push the assembly drift (1) 1111 893 4700 through the installed snap ring.



- Use the assembly drift (2) 1111 893 4700 to push the piston pin out of the piston.

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

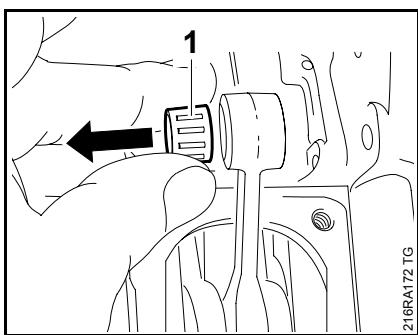
Hold the piston steady during this process to ensure that no jolts are transmitted to the connecting rod.



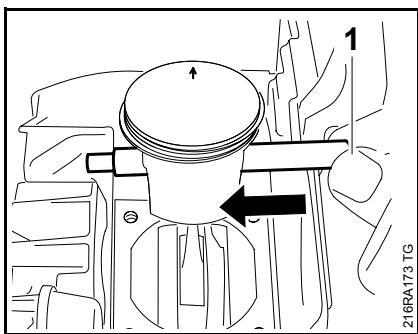
- Remove the piston (1) from the connecting rod.

- Inspect the piston rings and replace if necessary, 8.10

## 8.9.2 Installing

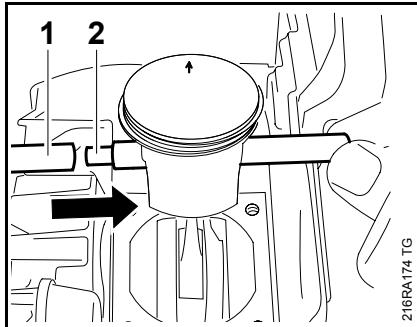


- Pull out the needle cage (1), check it and replace if necessary.
- Lubricate the needle cage (1) with oil and push it into the connecting rod.

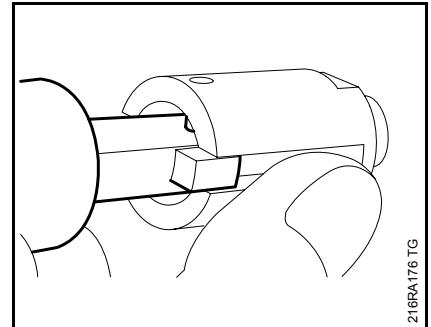


The assembly drift can be pushed through the installed snap ring.

- Line up the piston so that the arrow on the piston crown points toward the exhaust port/muffler.
- Place the piston on the connecting rod.
- Push the assembly drift (1) 1110 893 4700, small diameter first, through the piston and small end (needle cage) and line up the piston.

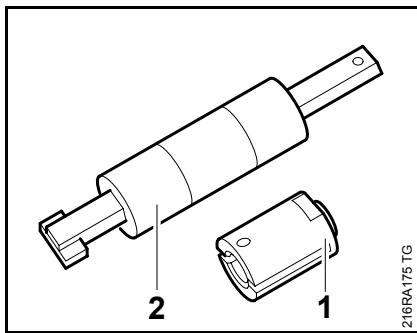


- Lubricate the piston pin with oil.
- Fit the piston pin (1) on the assembly drift (2) and slide it into the piston.

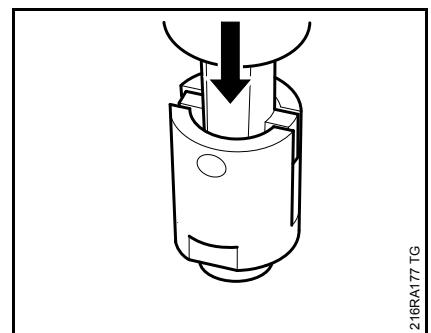


- Push the large slotted diameter of the sleeve over the magnet and snap ring.

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

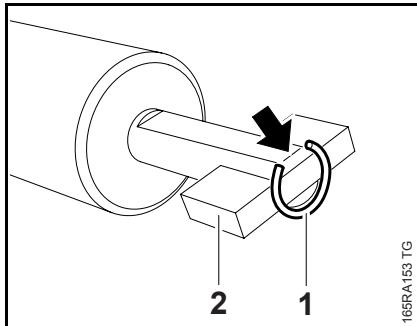


- Remove the sleeve (1) from the installing tool (2) 5910 890 2213.

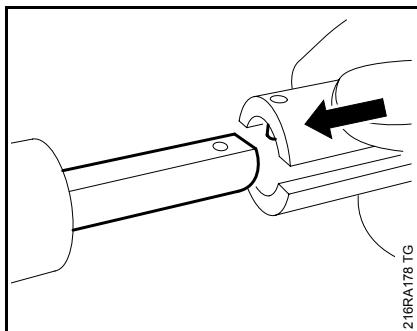


- Press the installing tool downwards into the sleeve until the magnet butts against the end of the guide slot.

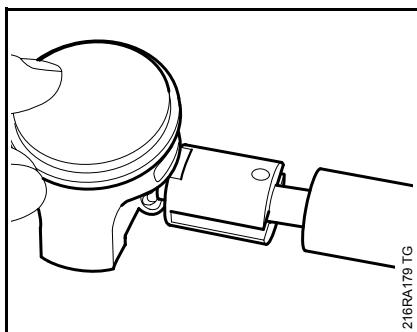
Use a suitable base.



- 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).



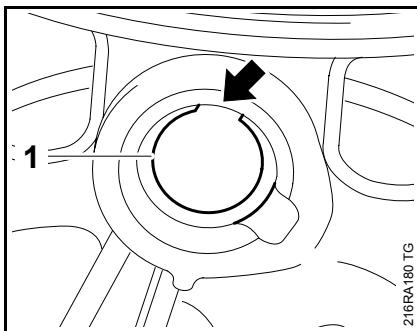
- Remove the sleeve and slip it onto the other end of the shank – the inner pin must point towards the flat face.



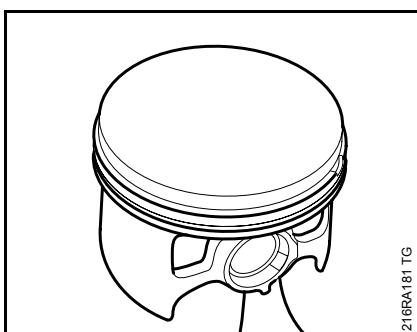
- Apply the installing tool 5910 890 2213 with the sleeve's taper against the piston boss, hold the piston steady, center the tool shank exactly and press home until the snap ring slips into the groove.

Make sure the tool shank is held square on the piston pin axis.

The piston has a snap ring at both sides. The snap ring at the clutch side must be installed first.



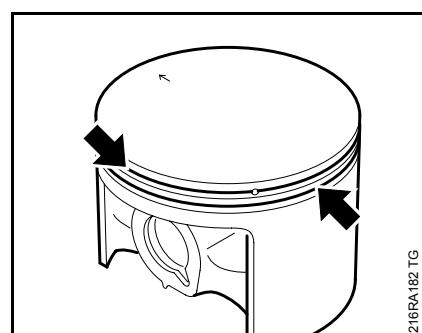
Fit the snap ring (1) so that its gap (arrow) points either up or down.



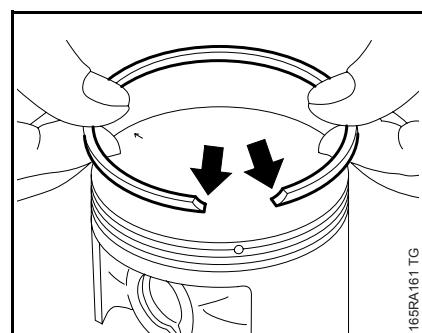
- Inspect the piston rings and replace if necessary, **8.10**
- Install the cylinder, **8.7**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

## 8.10 Piston Rings

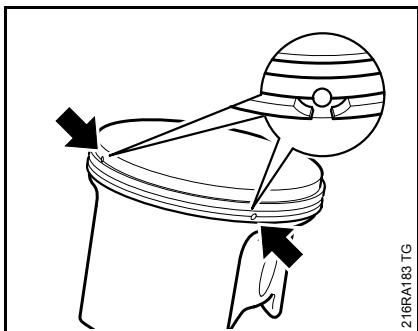
- Remove the piston, **8.9.1**
- Remove the piston rings from the piston.



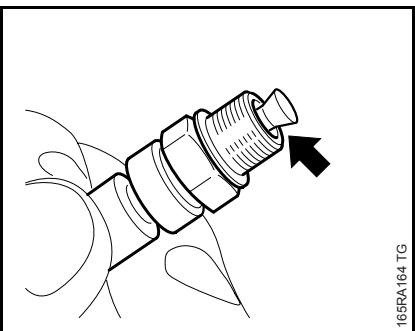
- Use a piece of old piston ring to scrape the grooves (arrows) clean.



- Install the new piston rings in the grooves so that the radii face upward (arrows).



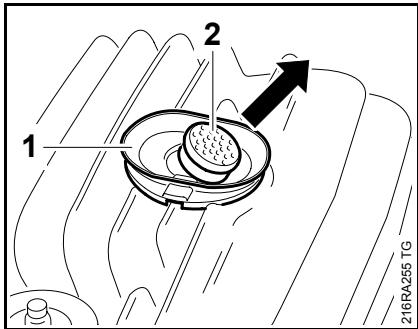
216RA183 TG



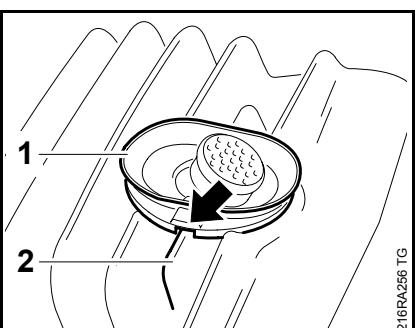
165RA164 TG

- 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, **8.9.2**
  - Reassemble all other parts in the reverse sequence.
- Check the sealing cone (arrow) on the decompression valve for damage.
  - If the sealing cone does not close completely or shows signs of damage, install a new decompression valve.
  - Fit the decompression valve and screw it home by hand.
  - Tighten down the decompression valve firmly.
  - Tightening torques, **3.5**

## 8.11 Decompression Valve



216RA255 TG



216RA256 TG

- Remove the shroud, **8.6**
- Remove the cover (1).
- Unscrew the decompression valve (2).
  - Position the choke lever (1) so that the recess (arrow) engages the fin (2).
  - Push the cover (1) fully home.
  - Reassemble all other parts in the reverse sequence.

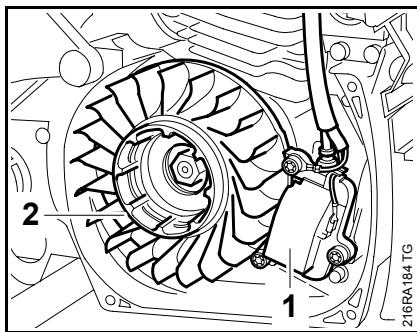
## 9. Ignition System

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.

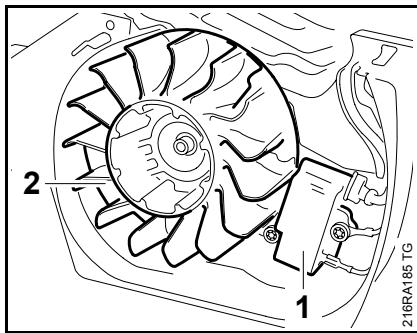
Troubleshooting on the ignition system should always begin at the spark plug, **4.5**.

- Remove the fan housing, **10.2**

### Version with three mounting screws



### Version with two mounting screws



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

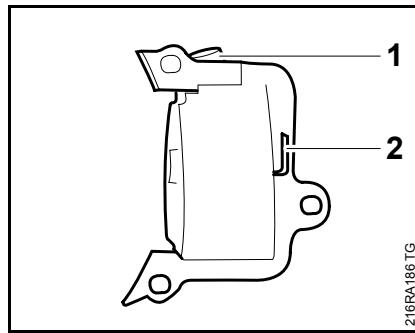
### 9.1 Ignition Timing

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

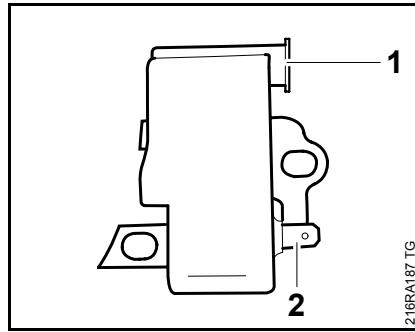
Since there is no mechanical wear in these systems, ignition timing cannot get out of adjustment during operation.

### 9.2 Ignition Module

#### Version with three mounting screws



#### Version with two mounting screws



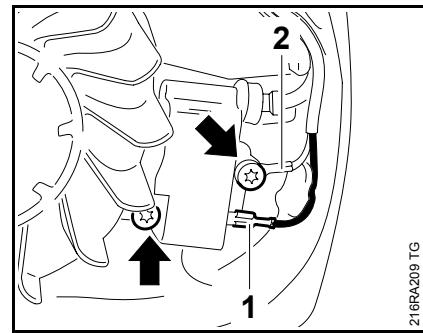
The ignition module accommodates all the components required to control ignition timing. There are two electrical connections on the coil body:

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

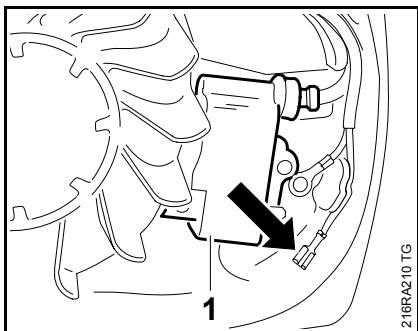
Testing in the workshop is limited to a spark test. A new ignition module must be installed if no ignition spark is obtained (after checking that wiring and stop switch are in good condition). Version with two mounting screws **9.2.1**, version with three mounting screws **9.2.2**.

#### 9.2.1 Removing and Installing – Version with two mounting screws

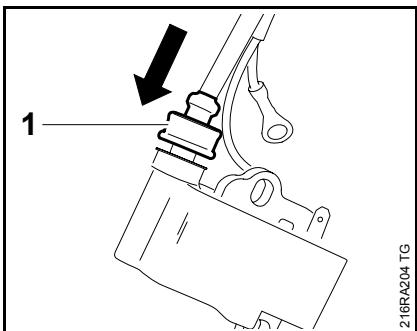
- Remove the fan housing, **10.2**
- Remove the carburetor box cover, **14.1**
- Pull off the spark plug boot and remove the shroud, **8.6**



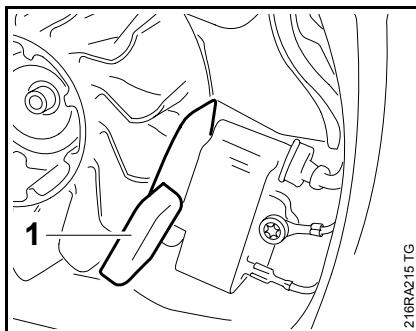
- Disconnect the short circuit wire (1).
- Take out the screws (arrows).
- Remove the ground wire (2).



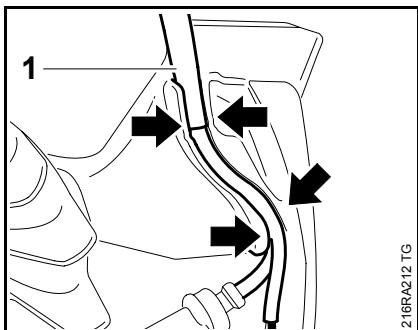
- Remove the ignition module (1).



- Before installing the ignition lead, pack the high voltage output with STIHL multipurpose grease **16**.



- Push the ignition module back and slide the setting gauge (1) 1111 890 6400 between the arms of the ignition module and the flywheel magnet.



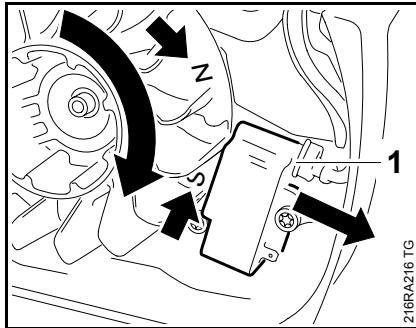
- Pull the wiring harness (1) out of the cable channel (arrows).

Do not use either graphite grease or silicone insulating paste.

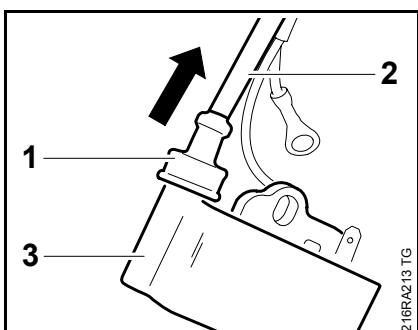
- Screw the ignition lead into the ignition module.

- Push the grommet (1) into position.

Make sure the grommet (1) is fitted properly to avoid ignition system problems that may be caused by contamination or moisture.

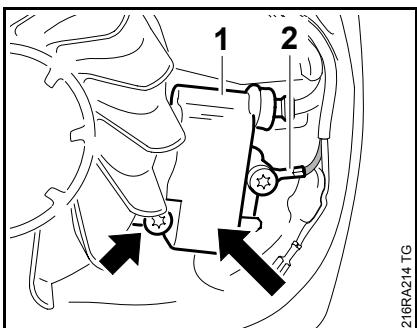


The setting gauge is not shown in the illustration.

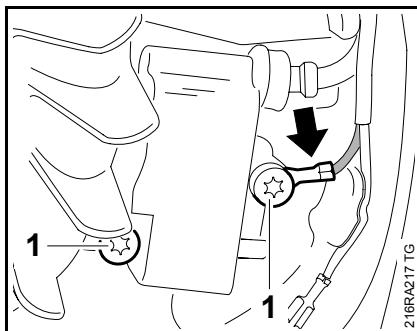


- Pull the grommet (1) off the ignition module.
- Unscrew the ignition module (3) from the ignition lead (2).
  - Check the spark plug boot and ignition lead, and replace if necessary, **9.4**
  - Troubleshooting, **4.5**

Position the ignition lead under the short circuit wire, **9.4**.

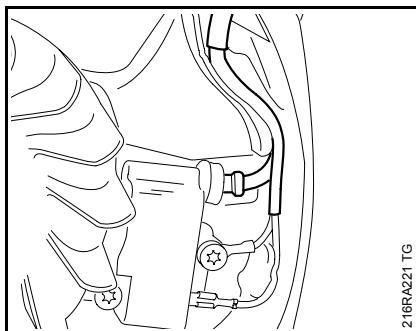


- Fit the ignition module (1) and insert the screw (arrow) – do not tighten down yet.
- Fit the ground wire (2) and insert the screw – do not tighten down yet.

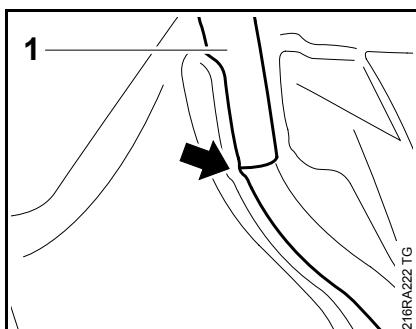


- Hold the ground wire terminal (arrow) horizontal and tighten down the screws (1) firmly.

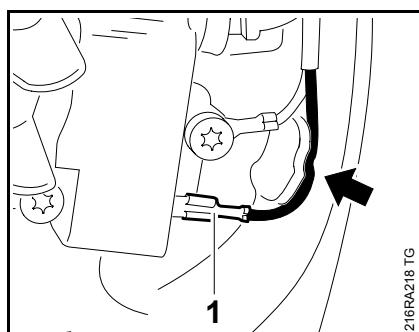
- Tightening torques, **3.5**
- Remove the setting gauge.
- Check operation
  - rotate the flywheel and make sure it does not touch the ignition module.



- Starting at the ignition module, push the ignition lead and short circuit wire into the cable channel
  - the ignition lead must be under the short circuit wire.



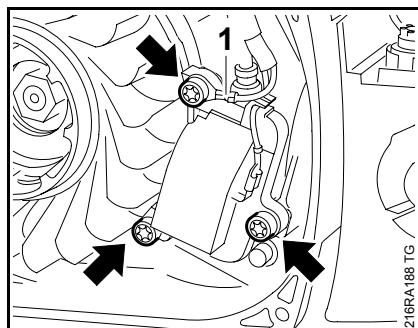
- Position the insulating tube (1) as far as the notch (arrow)
  - this protects the short circuit wire and ignition lead from chafing.
- Push the insulating tube (1) with wiring harness into the cable channel.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**



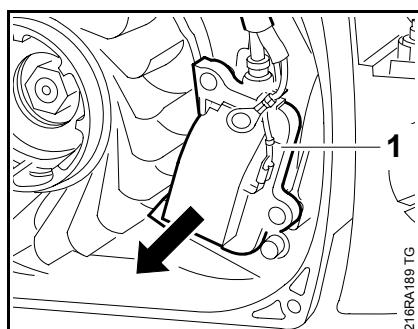
- Connect the short circuit wire (1).
  - The terminal must be pushed fully home.
- Push short circuit wire into guide (arrow).

## 9.2.2 Removing and Installing – Version with three mounting screws

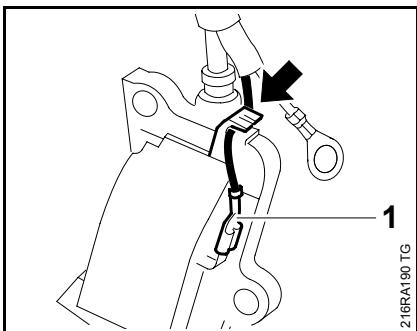
- Remove the fan housing, **10.2**
- Remove the carburetor box cover, **14.1**
- Pull off the spark plug boot and remove the shroud, **8.6**



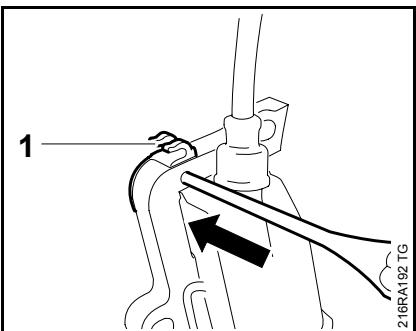
- Take out the screws (arrows).
- Remove the ground wire (1).



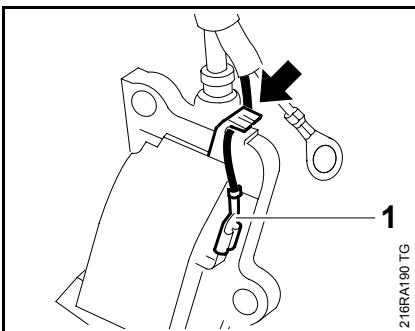
- Remove the ignition module (1).



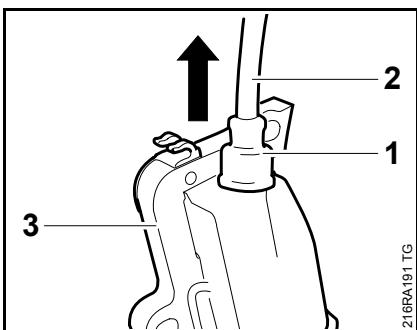
- Unlock and remove the short circuit wire's terminal (1).
- Remove the short circuit wire from the retainer (arrow).



- Check the retainer and replace if necessary
- Use a suitable punch to drive out the retainer (1).
- Reassemble in the reverse sequence.
- Check the spark plug boot and ignition lead, and replace if necessary, **9.4**

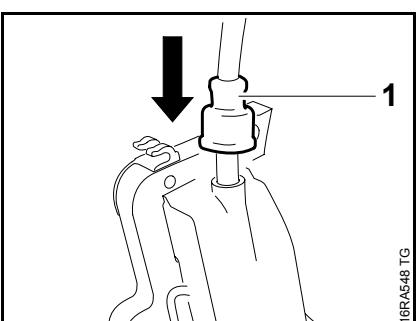


- Connect the short circuit wire (1).
  - The terminal must be pushed fully home.
- Push the short circuit wire into the retainer (arrow) as far as stop.

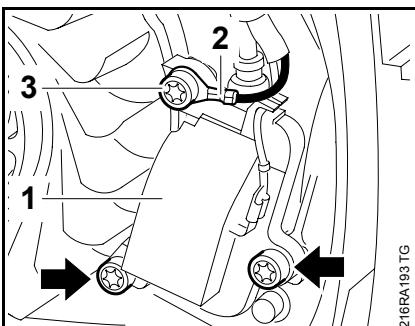


- Pull the grommet (1) off the ignition module (3).
- Unscrew the ignition module (3) from the ignition lead (2), check and replace if necessary

A new ignition module is supplied with ignition lead, grommet and cable retainer.



- Before installing the ignition lead, pack the high voltage output with STIHL multipurpose grease **16**.

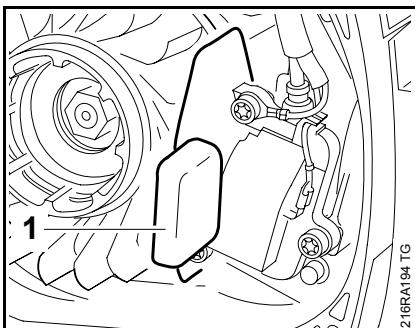


- Fit the ignition module (1) and insert the screws (arrows)
  - do not tighten down yet.
- Fit the ground wire (2) and insert the screw (arrow)
  - do not tighten down yet.

Do not use either graphite grease or silicone insulating paste.

- Screw the ignition lead into the ignition module.
- Push the grommet (1) into position.

Make sure the grommet (1) is fitted properly to avoid ignition system problems that may be caused by contamination or moisture.

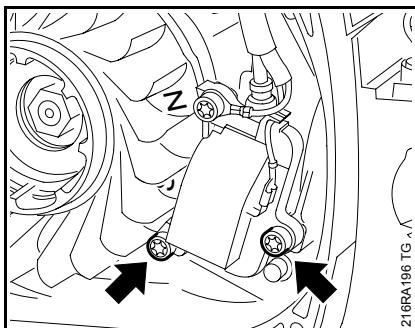


- Push the ignition module back and slide the setting gauge (1) 1111 890 6400 between the arms of the ignition module and the flywheel magnet.

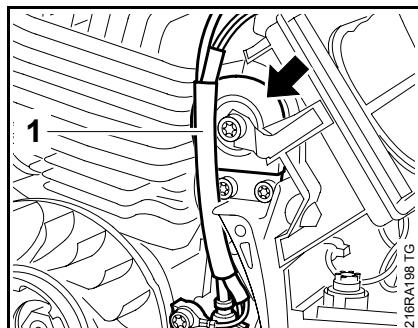


The setting gauge is not shown in the illustration.

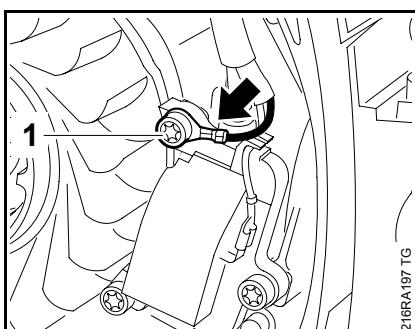
- Push the ignition module (1) back and hold it there
- the flywheel must move freely.
- Rotate the flywheel until the magnet poles (arrows) are next to the ignition module.
- Press the ignition module (1) against the setting gauge.



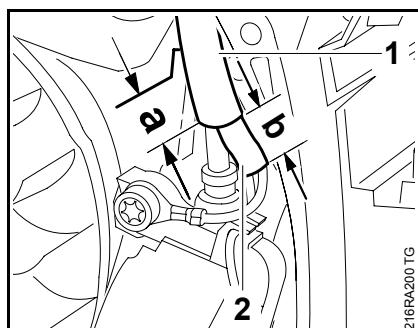
- Tighten down the screws (arrows) firmly.



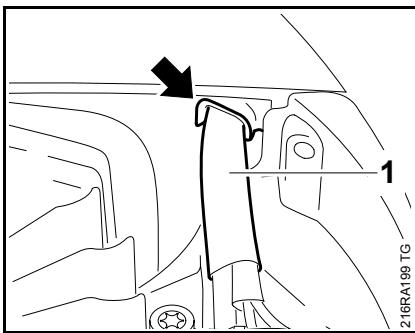
- Position the wiring harness (1) to the left (see illustration) of the annular buffer (arrow).



- Hold the ground wire terminal (arrow) horizontal and tighten down the screw (1) firmly.
  - Tightening torques, **3.5**
  - Remove the setting gauge.
  - Check operation
    - rotate the flywheel and make sure it does not touch the ignition module.



- Position the large insulating tube (1) so that it projects about 2 - 5 mm (a) beyond the edge of the housing.
- Position the small insulating tube (2) so that it projects 10 mm (b)
  - the ignition lead can be damaged by chafing.



Wiring harness (1) must be in the guide (arrow) when the shroud is fitted.

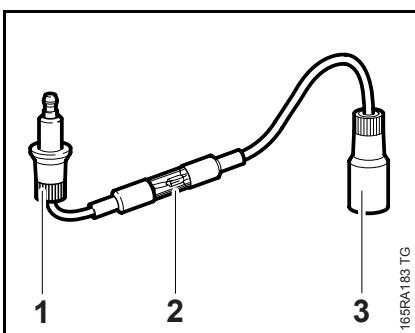
- Reassemble all other parts in the reverse sequence.

### 9.3 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 ZAT 4 ignition system 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 terminal (2).
- Attach the ground terminal (1) to the spark plug.

- 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.

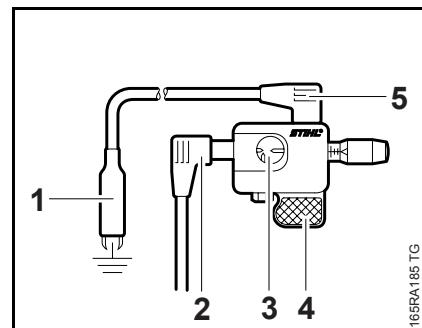
- Crank the engine quickly with the rewind starter and check spark in the tester's window (2).

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, **9.7**

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



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).

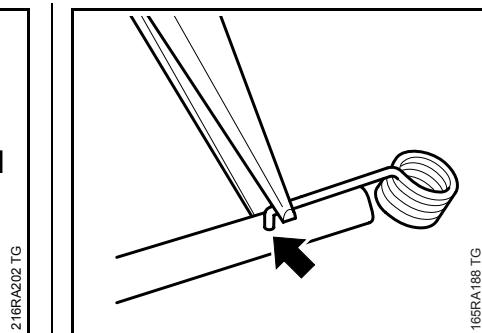
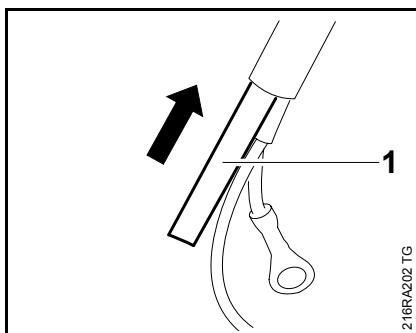
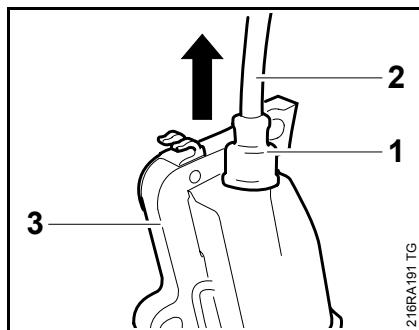
The engine may start and accelerate during the test.

If a spark is visible in the window (3), 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, **9.7**

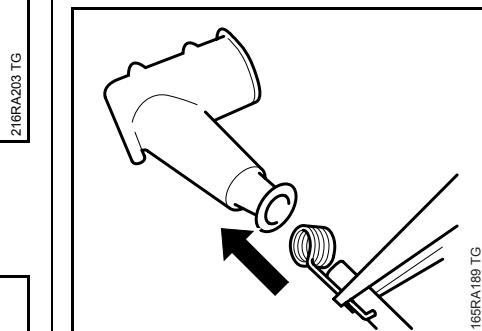
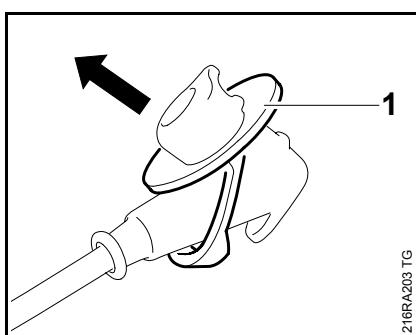
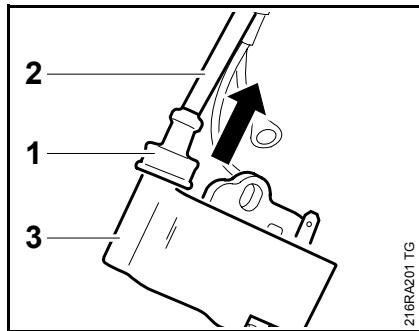
## 9.4 Spark Plug Boot / Ignition Lead

### Version with three mounting screws

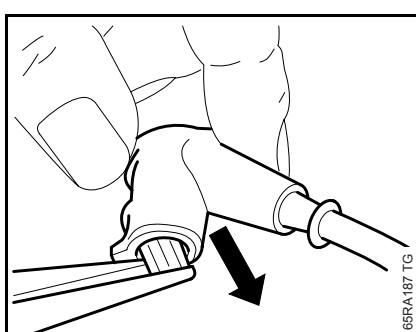


- Pull the ignition lead (1) out of the insulating tube.

### Version with two mounting screws



- Remove the cover (1).



- 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.
- Cut a new ignition lead to the specified length, see parts list.

– Remove the ignition module, [9.2.1](#), [9.2.2](#)

● Pull the grommet (1) off the ignition module (3).

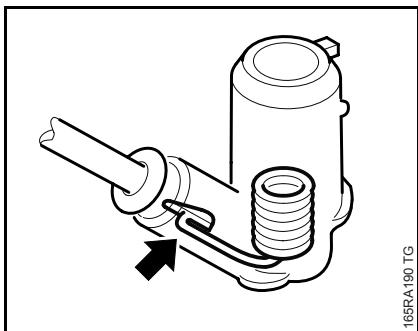
– Unscrew the ignition lead (2) from the ignition module (3).

– Pull the grommet (1) off the ignition lead (2).

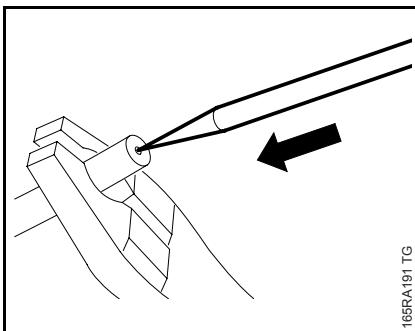
- Use a pointed tool to pierce the center of the new ignition lead's insulation, about 12 mm from the end of the lead.
- Pinch the hook of the leg spring into the pierced hole in the center of the lead (arrow).

– 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.

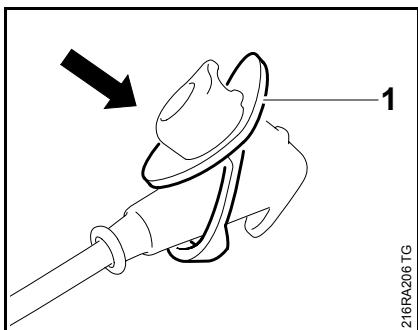


Make sure the leg spring (arrow) locates properly inside the spark plug boot.

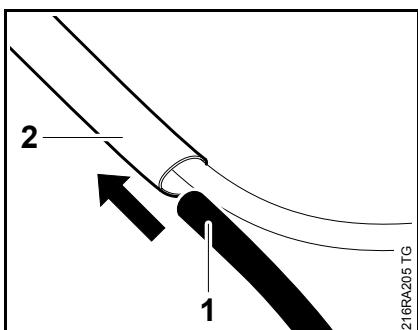


Do not use either graphite grease or silicone insulating paste.

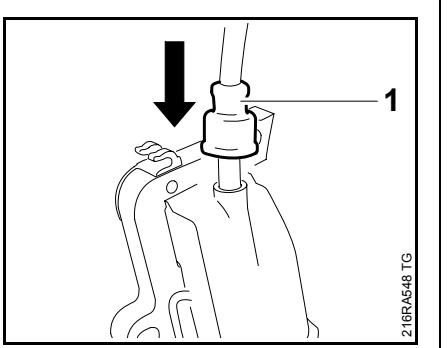
- Screw the ignition lead into the ignition module.
- Push the grommet (1) into position.
- Install the ignition module and set the air gap between the module and flywheel,  
Version with two mounting screws **9.6.2**,  
Version with three mounting screws **9.6.3**
- Reassemble all other parts in the reverse sequence.



- Fit the cover (1) over the spark plug boot.

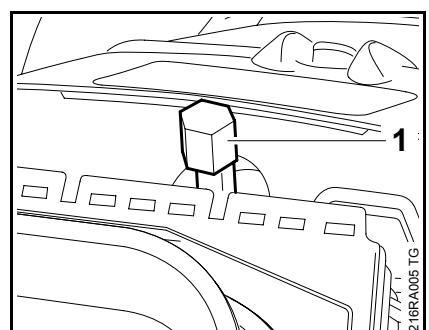


- Push the end of the ignition lead (1) through the insulating tube (2).

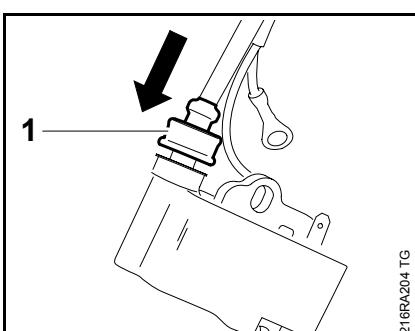


#### Version with three mounting screws

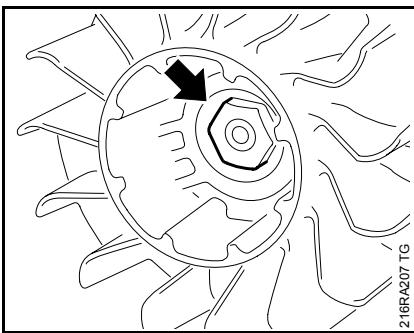
#### 9.5 Flywheel



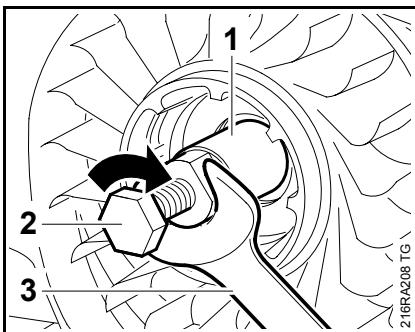
- Remove the carburetor box cover.
- Remove the shroud, **8.6**
- Use locking strip (1) to block the piston, **6**



- Before installing the ignition lead, pack the high voltage output with STIHL multipurpose grease **16**.

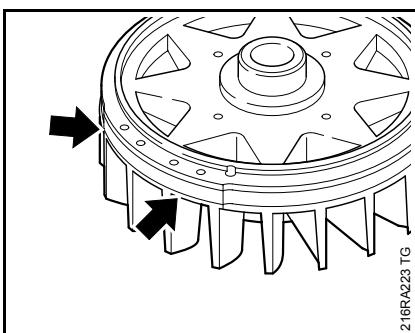


- Unscrew the flywheel nut (arrow).

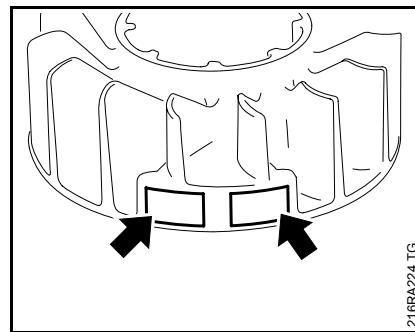


- Screw the puller (1) 1106 890 4501 clockwise into the flywheel as far as stop.
- Use 24 mm open end wrench (3) to hold the puller steady and screw home the thrust bolt (2) clockwise until the flywheel is released from the crankshaft.
- Remove the puller (1) 1106 890 4501 from the flywheel.

#### Polymer version



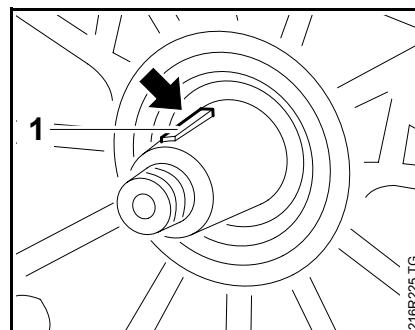
#### Aluminium version



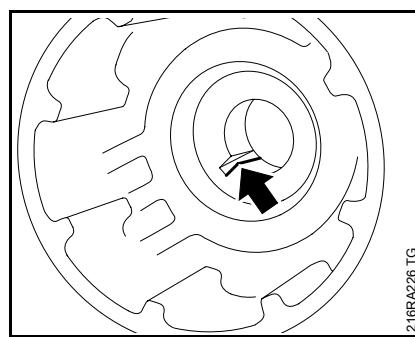
216RA224 TG

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.



216RA225 TG



216RA226 TG

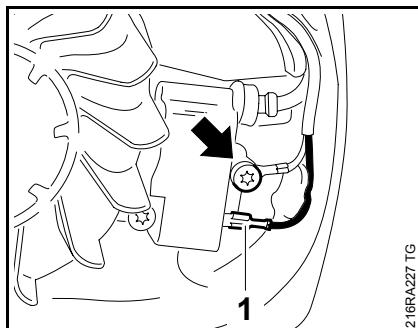
Make sure the key engages the slot (arrow) in the flywheel.

- Adjust air gap between ignition module and flywheel. Version with two mounting screws [9.6.2](#), Version with three mounting screws [9.6.3](#)
- Reassemble all other parts in the reverse sequence.
- Tightening torques, [3.5](#)

- Check the key (1) and replace if necessary
- Make sure the key (1) is properly seated (arrow).
- Degrease the crankshaft stub and bore in flywheel with a standard solvent-based degreasant containing no chlorinated or halogenated hydrocarbons.

## 9.6 Short Circuit Wire

### 9.6.1 Testing



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

- Remove the fan housing, **10.2**
- Disconnect the short circuit wire (1).
- 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, **9.6**.

- Set the switch shaft to "I".

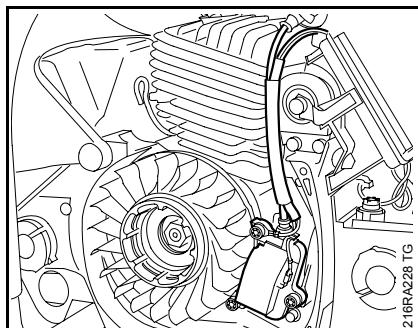
The resistance measured must be infinitely high. If not, fit a new short circuit wire, **9.6.2**.

A faulty ground wire may impair or prevent operation of the short circuit wire. The ground wire must therefore be tested for good contact and continuity.

If no fault can be found, check the ignition system with the aid of the troubleshooting chart, **9.7**.

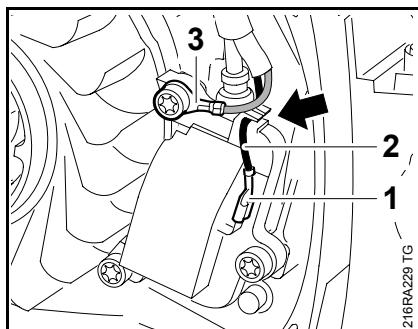
- Reassemble in the reverse sequence.

### 9.6.2 Removing and Installing – Version with three mounting screws

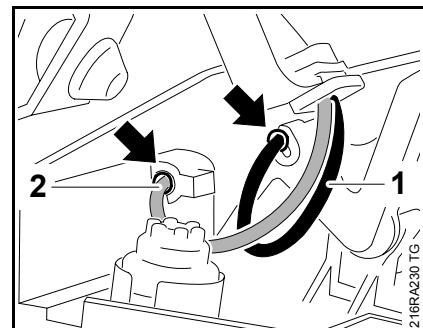


- Remove the filter base, **14.2**
- Pull the boot off the spark plug.
- Remove the shroud, **8.6**
- Remove the fan housing, **10.2**

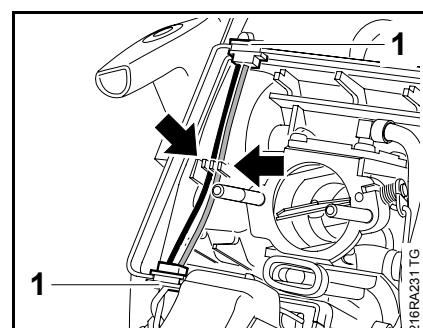
The ground wire and short circuit wire are combined in a wiring harness and fitted in an insulating tube along with the ignition lead.



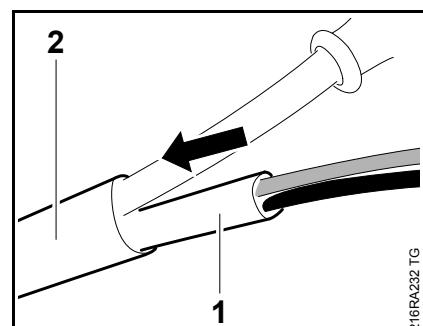
- Disconnect the terminal (1) and pull the short circuit wire (2) out of the retainer (arrow).
- Take out the screw and remove the ground wire (3).



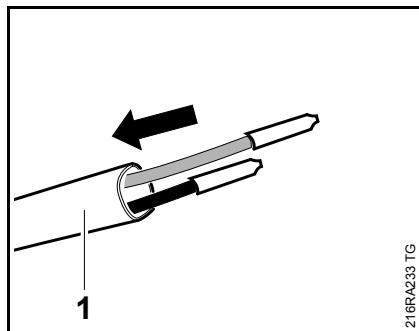
- Pull out the contact sleeves (arrows) of the short circuit wire (1) and ground wire (2).



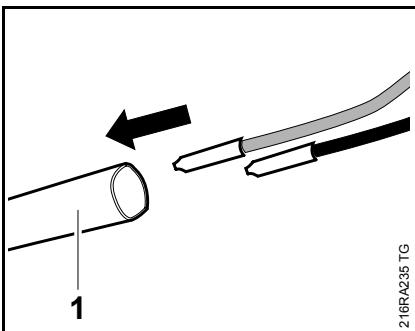
- Pull the wires out of the guides (arrows).
- Remove the grommets (1).
- Pull the grommets (1) off the wires.



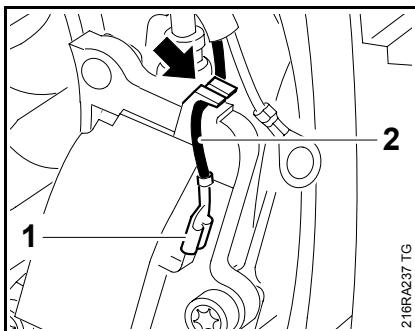
- Pull the short circuit and ground wires with small insulating tube (1) out of the large insulating tube (2) in the direction of the ignition module.



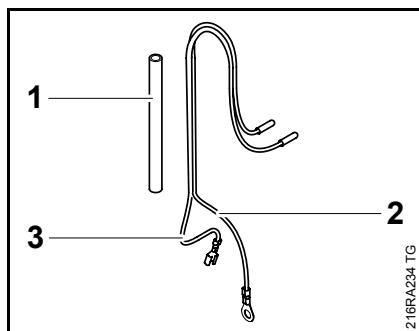
- Arrange the wires so that the contact sleeves are behind one another
  - if left next to one another, the contact sleeves may stick and not slide easily out of the insulating tube.
- Pull the ground wire and short circuit wire out of the insulating tube (1).



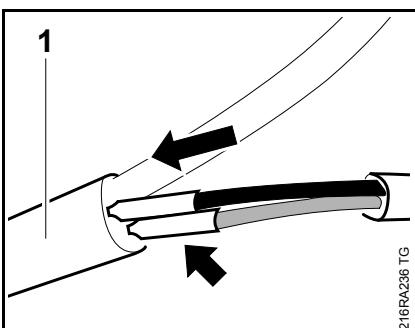
- Arrange the wires so that the contact sleeves are behind one another
  - if left next to one another, the contact sleeves may stick and not slide easily through the insulating tube.
- Push the ground wire and short circuit wire, contact sleeves first, through the small insulating tube (1).



- Push the short circuit wire terminal (1) fully onto the tag and push the short circuit wire (2) into the retainer (arrow).

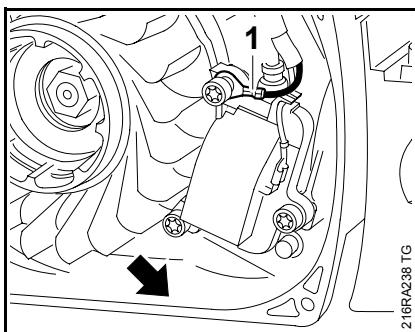


- Check the insulating tube (1), ground wire (2) and short circuit (3) and replace if necessary.

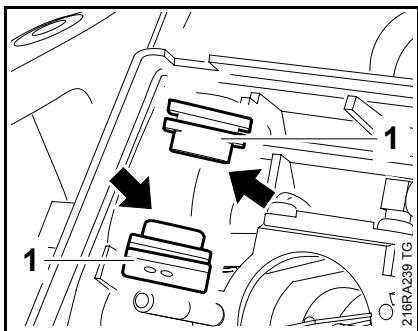


- Push the preassembled wiring harness, contact sleeves (arrow) first, through the large insulating tube (1) in the direction of the spark plug boot.

Connect the wires at the ignition module first.

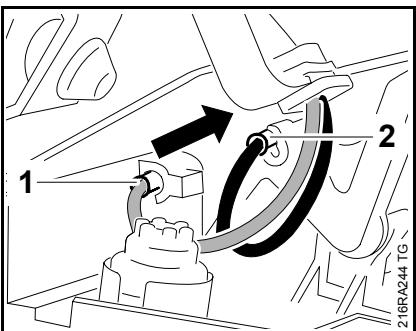


- Line up the terminal (1) parallel to the housing edge (arrow) so that it points in the direction of the insulating tube.
- Fit the ground wire terminal (1) and insert the screw.
- Check air gap on ignition module and reset if necessary, 9.2.2
- Hold the terminal (1) steady and tighten down the screw firmly.

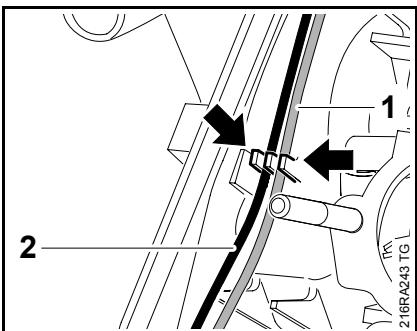


- Position the grommets (1) so that their guides (arrows) face into the carburetor box.

The holes in the grommets must face the outer edge of the carburetor box.

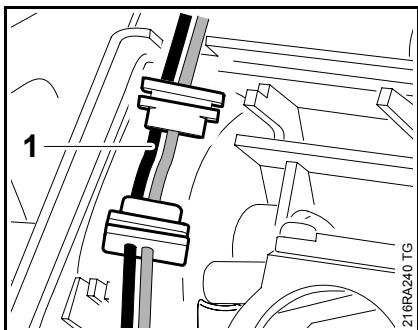


- Push ground wire connector sleeve (1) into contact spring as far as stop.
- Push short circuit wire connector sleeve (2) into the switch shaft as far as stop.



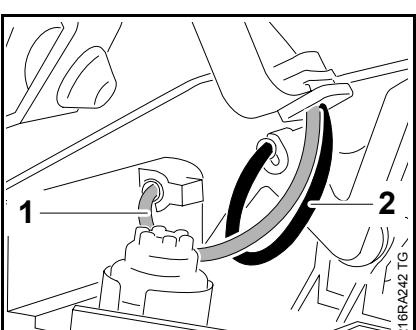
Position the wires next to one another and straight.

- Push the short circuit wire (2) and ground wire (1) into the guides (arrows).

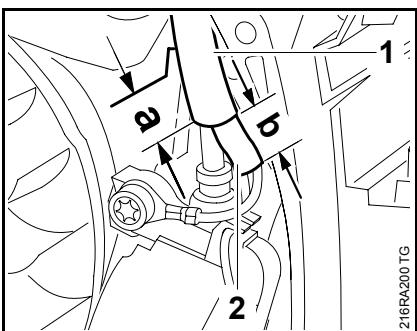


Make sure the wiring harness is straight.

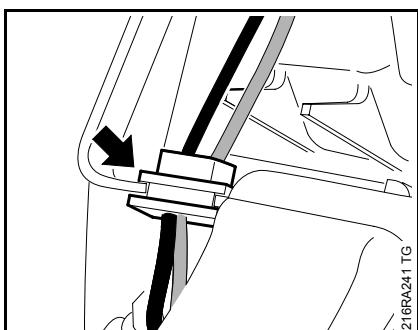
- Thread the wires through the grommets so that the short circuit wire (1) is next to the edge of the carburetor box.



- Arrange the ground wire (1) in relation to the contact spring so that it cannot be kinked.
- Arrange the short circuit wire (2) in relation to the switch shaft so that it forms a loop
  - the short circuit wire can move along with the switch shaft.

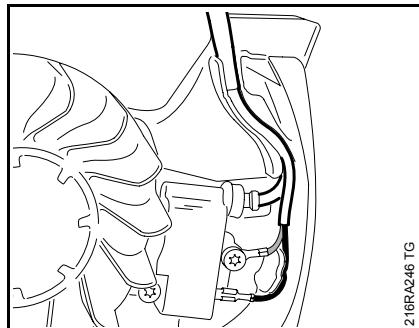


- Position the large insulating tube (1) so that it projects 2 - 5 mm (a) beyond the housing edge.
- Position the small insulating tube (2) so that it projects 10 mm (b)
  - the ignition lead can be damaged by chafing.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

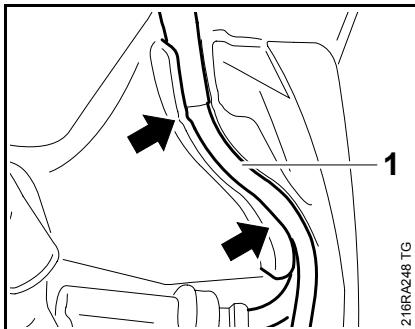


- Press both grommets into their seats (arrow) so that they engage fully.

### 9.6.3 Removing and Installing – Version with cable channel

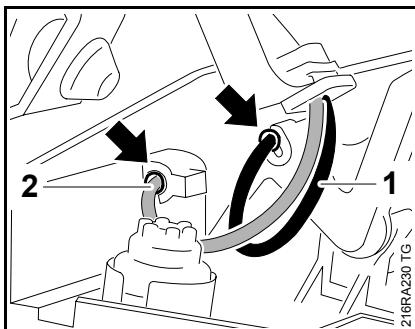


216RA246 TG



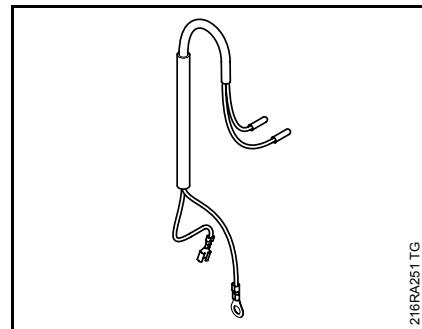
216RA248 TG

- Pull the wiring harness (1) out of the cable channel (arrows).



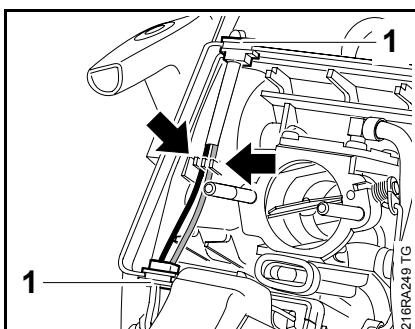
216RA230 TG

- Pull the wiring harness (1) out of the insulating tube (2) in the direction of the ignition module.



216RA251 TG

- Pull out the contact sleeves (arrows) of the short circuit wire (1) and ground wire (2).

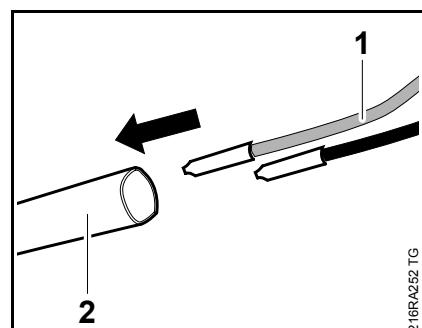


216RA249 TG

- Disconnect the terminal (1) and pull the short circuit wire (2) out of the guide (arrow).
- Take out the screw and remove the ground wire (3).
- Pull the wires out of the guides (arrows).
- Remove the grommets (1).
- Pull the grommets (1) off the wiring harness.

- Check the wiring harness and replace it if necessary

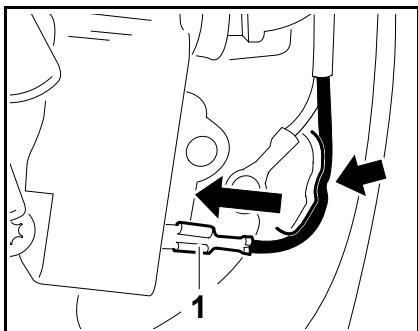
If the ground wire is damaged, the complete wiring harness must be replaced.



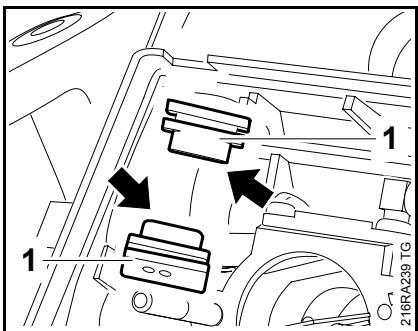
216RA252 TG

- Starting from the ignition module, push the wiring harness (1), contact sleeves first, through the insulating tube (2).

Connect the short circuit and ground wires to the ignition module first.

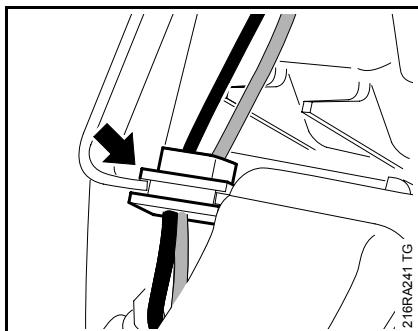


- Connect the short circuit wire terminal (1)
  - the terminal must be pushed fully home.
- Push the short circuit wire into the guide (arrow).

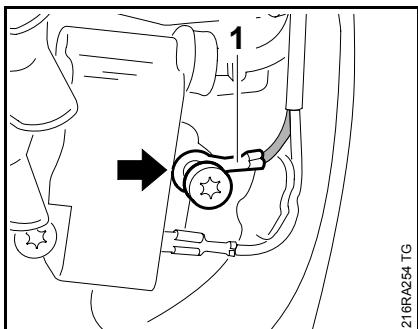


- Position the grommets (1) so that their guides (arrows) face into the carburetor box.

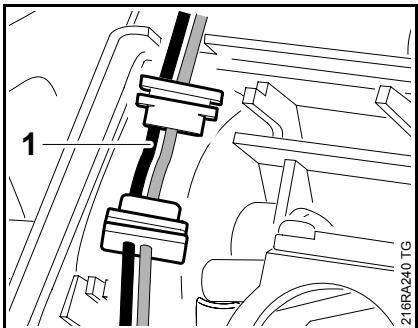
The holes in the grommets must face the outer edge of the carburetor box.



- Press both grommets into their seats (arrow) so that they engage fully.

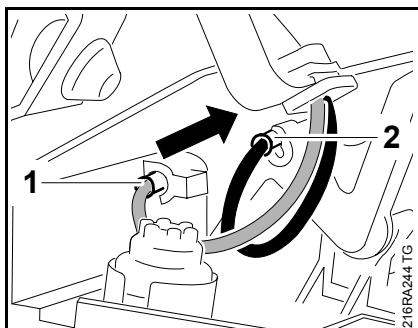


- Position terminal (1) of ground wire horizontally in direction of tank housing.
- Fit the terminal (1) and insert the screw (arrow)
- Check air gap on ignition module and reset if necessary,  
Version with two mounting screws 9.2.1,  
Version with three mounting screws 9.2.2
- Hold the terminal (1) steady and tighten down the screw (arrow) firmly.

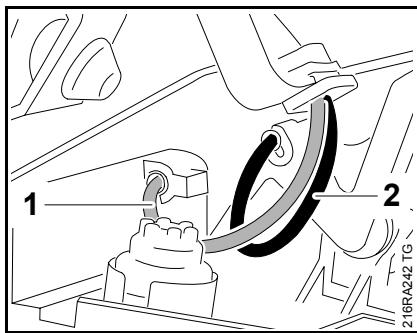


Make sure the wiring harness is straight.

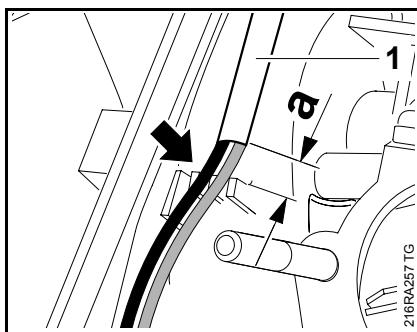
- Thread the wires through the grommets so that the short circuit wire (1) is next to the edge of the carburetor box.



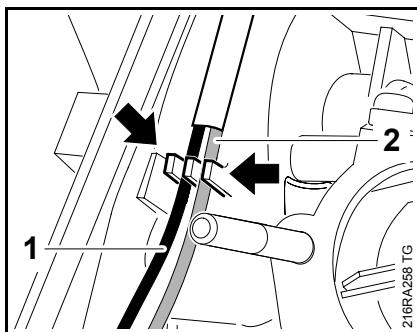
- Push ground wire connector sleeve (1) into contact spring as far as stop.
- Push short circuit wire connector sleeve (2) into the switch shaft as far as stop.



- Arrange the ground wire (1) in relation to the contact spring so that it cannot be kinked.
- Arrange the short circuit wire (2) in relation to the switch shaft so that it forms a loop
  - the short circuit wire can move along with the switch shaft.

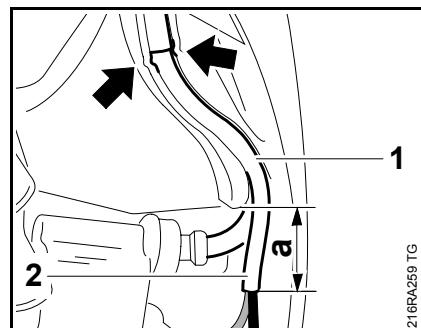


- Position the wiring harness (1) so that the end of the insulating tube is 5 mm (a) above the guides (arrows).

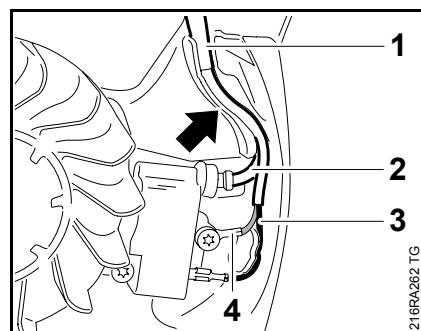


Position the wires next to one another and straight.

- Push the short circuit wire (2) and ground wire (1) into the guides (arrows).



- Position the wires in the insulating tube parallel so that the ignition lead is under the short circuit wire.
- Position the large insulating tube (1) so that it is in line with the notches (arrows).
- Position the wiring harness so that the insulating tube (2) projects 20 mm (a).



- Fit the ignition lead (2), short circuit wire (3) and ground wire (4) with insulating tube (1) in the cable channel (arrow).

Ignition lead (2), short circuit wire (3) and ground wire (4) must be laid without loops and fit snugly against the crankcase.

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

#### 9.6.4 Ground Wire

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

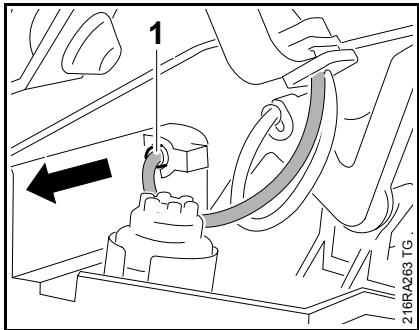
The ground wire is combined with the short circuit wire in a wiring harness. If damaged, the complete wiring harness must be replaced

- Check for contact and continuity and install a new wiring harness if necessary, **9.6.2**, **9.6.3**

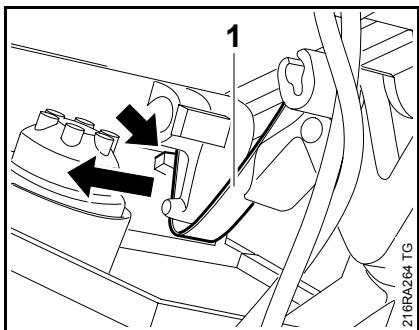
On versions with separate ground and short circuit wires, only the ground wire needs to be replaced, **9.6.2**.

## 9.6.5 Contact Spring

Remove the contact spring only if it is damaged – a new contact spring must be installed after removal.



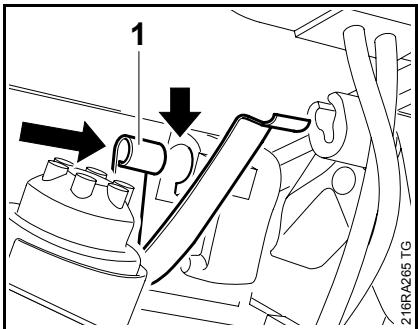
- Remove the switch shaft, [12.1.1](#)
- Remove the ground wire (1).



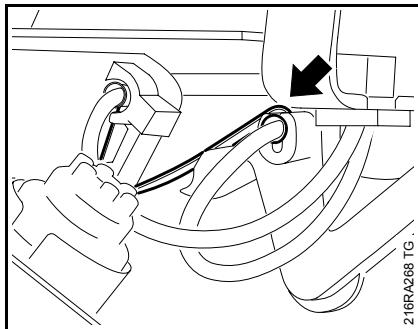
Take care not to damage the contact spring's seat.

A new tank housing must be installed if the contact spring's seat is seriously damaged.

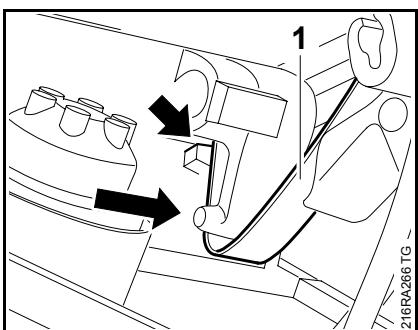
- Lift the contact spring (1) over the retaining lug (arrow) and pull it out.
- Install a new contact spring.



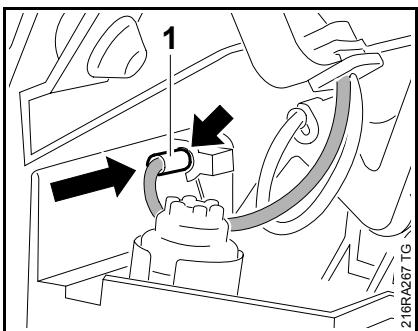
- Push the contact spring into the guide so that the loop (1) engages the seat (arrow).



- Check operation
  - short circuit wire's connector must touch the contact spring (arrow) in position "0".
- Reassemble all other parts in the reverse sequence.

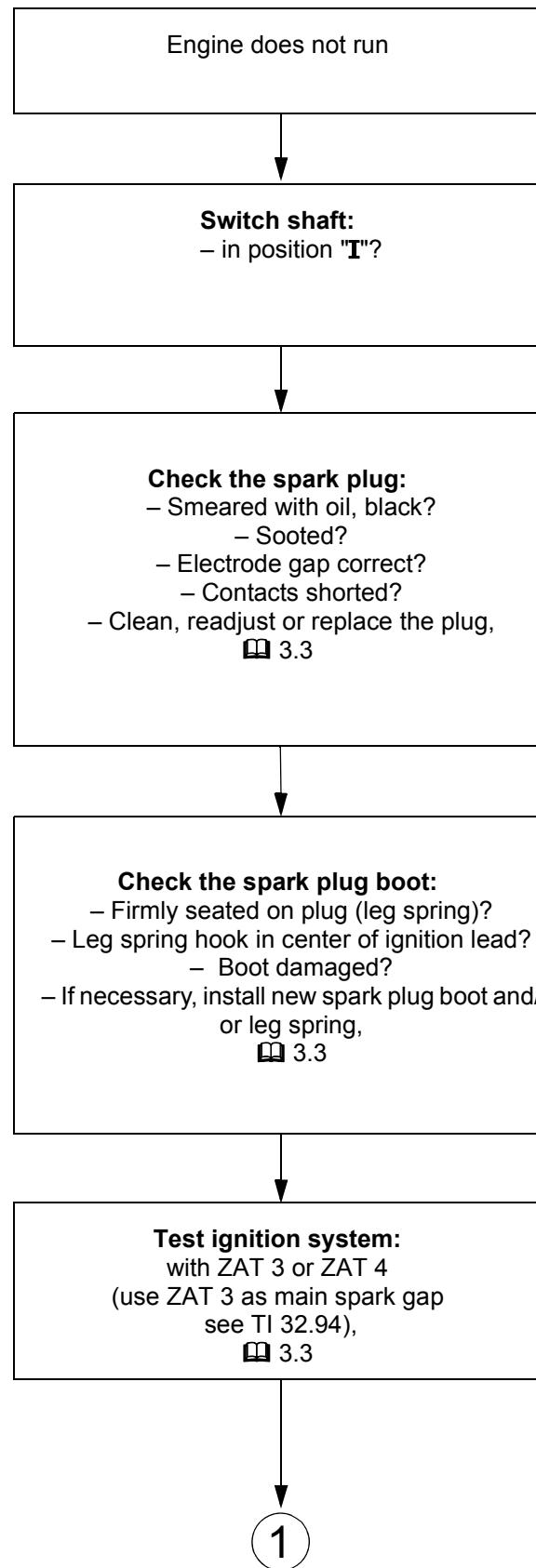


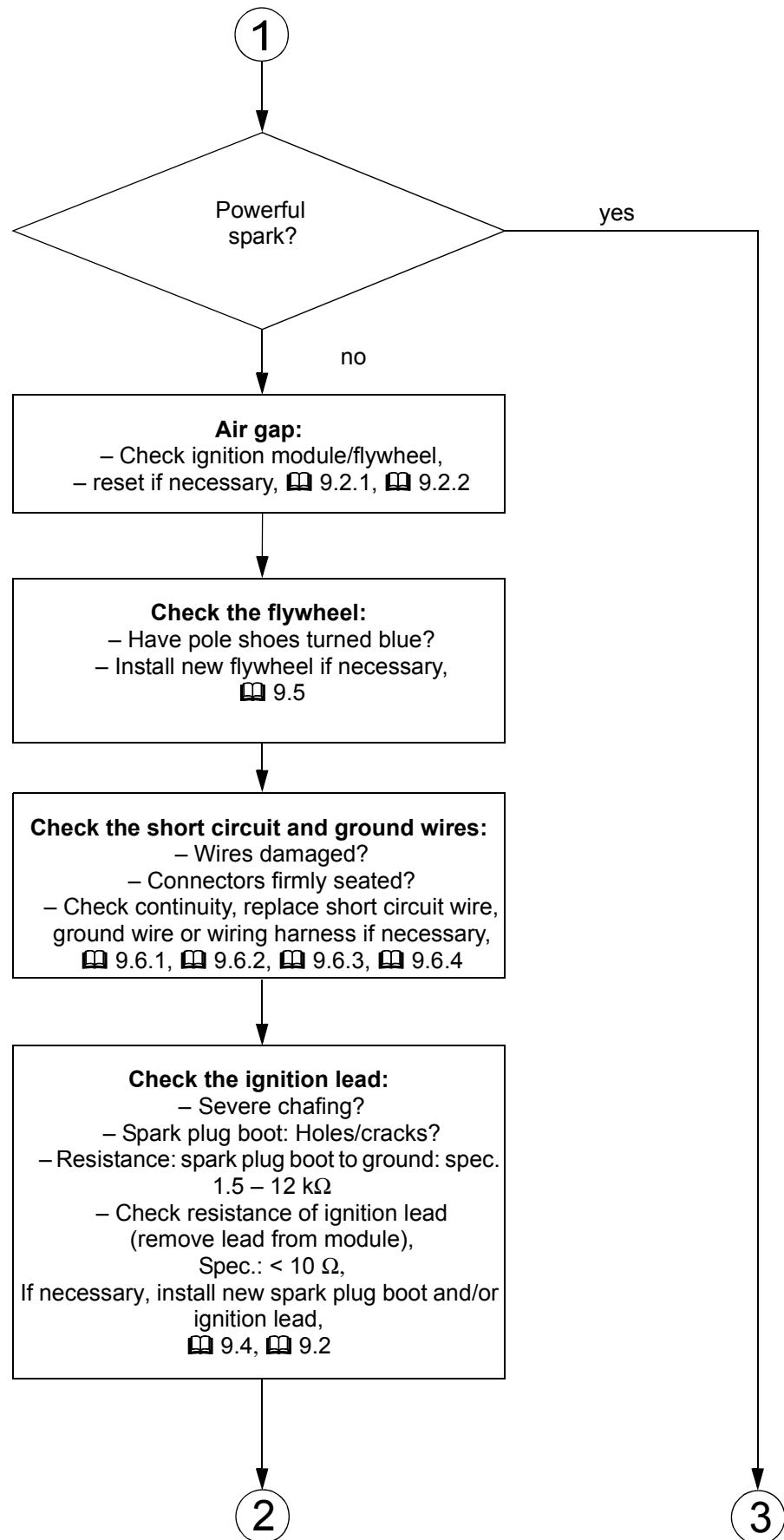
- Push the contact spring (1) into its seat until it engages behind the retaining lug (arrow).

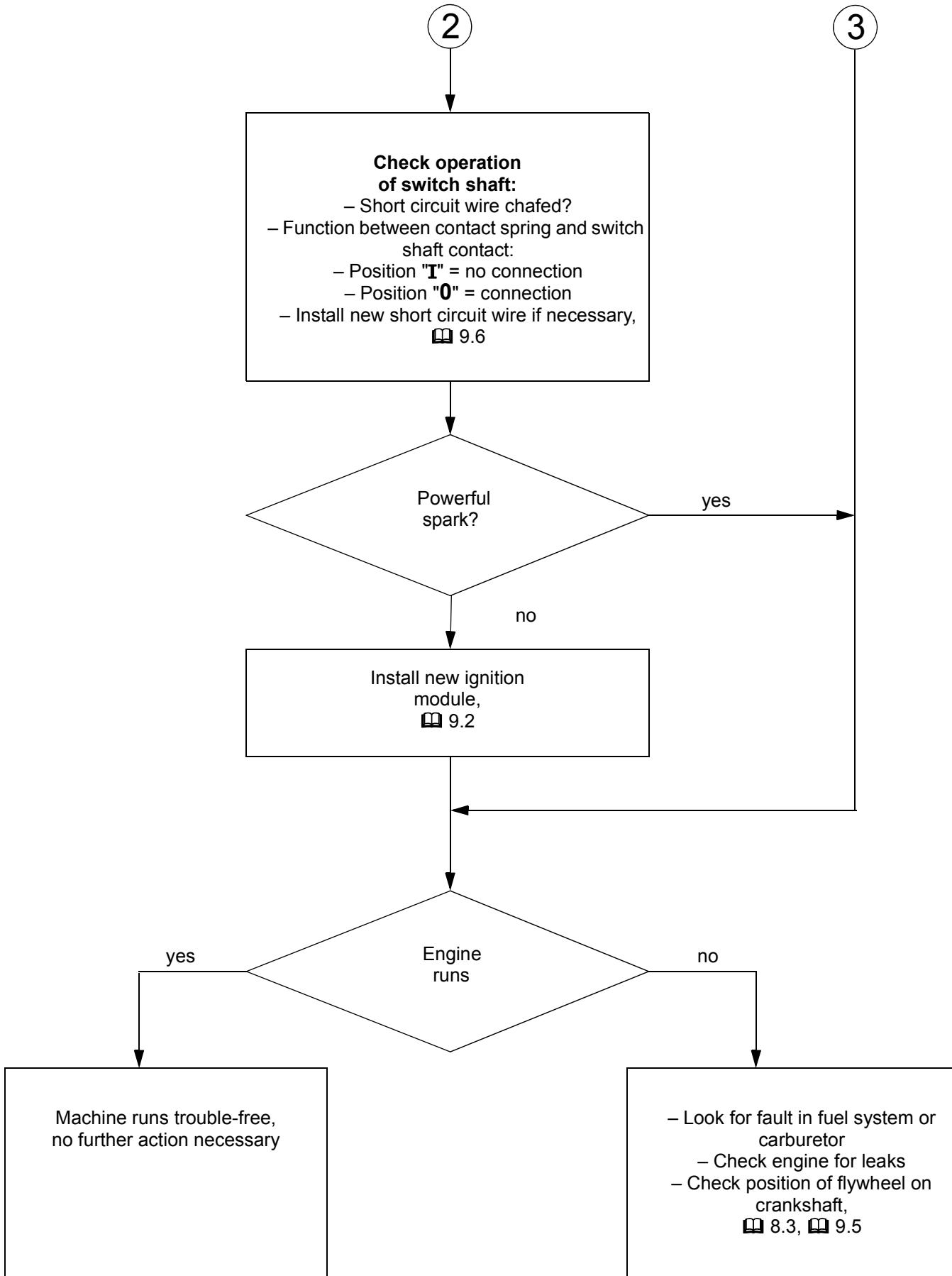


- Install the switch shaft, [12.1.1](#)
- Push ground wire contact sleeve (1) into the contact spring's loop (arrow).

## 9.7 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.

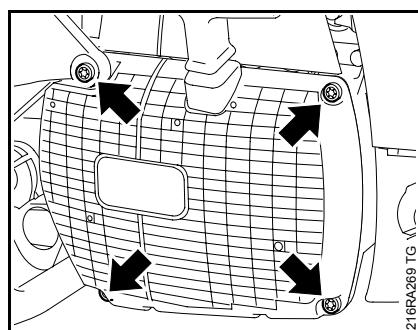
Carefully pull out the starter rope several times and allow it to rewind until its normal smooth action is restored.

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

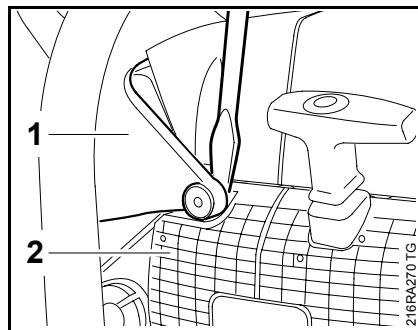
If clogged with dirt or pitch, the entire starter mechanism, including the rewind spring, must be removed and disassembled. Take particular care when removing the spring.

- Clean all components.

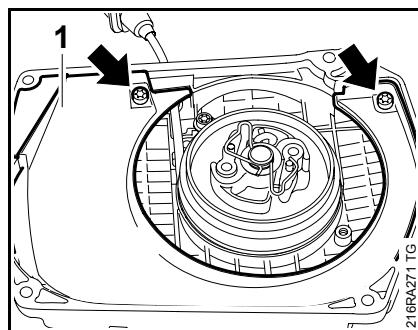
### 10.2 – Removing and Installing



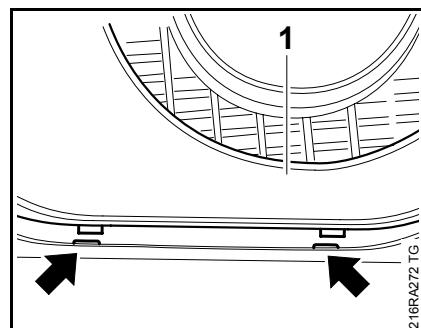
- Take out the screws (arrows).



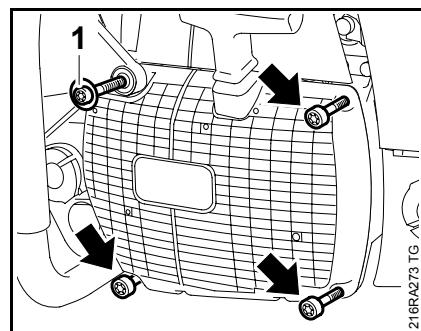
- Lift the hand guard (1) a little and remove the fan housing (2).



- Take out the screws (arrows) and remove the segment (1).
- Examine the fan housing and segment and replace if necessary.

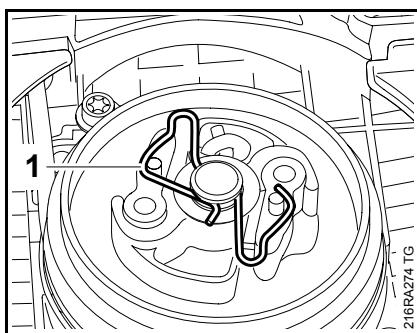


- Engage the segment (1) in the slots (arrows) in the fan housing first and then swing it into position.
- Insert the screws and tighten them down firmly.

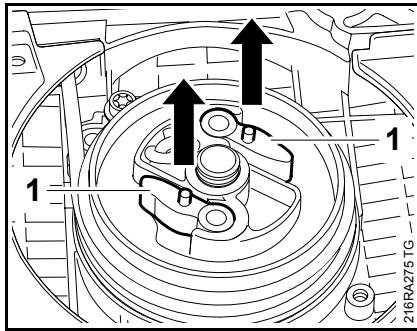


- Fit the screws (arrows)
- Insert the screw (1) through hand guard and fan housing – the hand guard is secure.
- Tighten down the screws firmly.
- Tightening torques, **3.5**

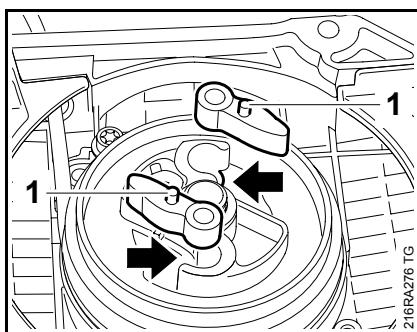
## 10.3 Pawls



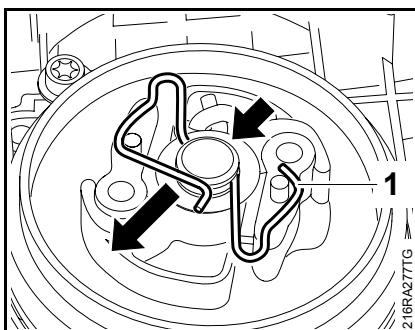
- Remove the fan housing, [10.2](#)
- Carefully ease the spring clip (1) off the starter post.



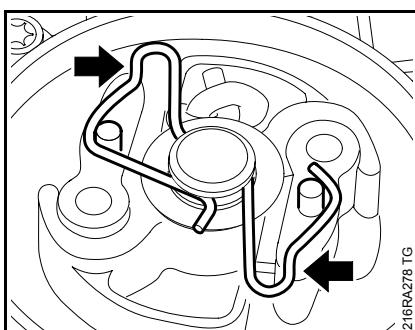
- Remove the pawls (1).



- Fit the new pawls in the bores (arrows) and lubricate the pegs (1), [16](#)



- Position the spring clip (1) so that its loops engage the pegs on the pawls. The rounded part of the spring clip (arrow) must engage the starter post's groove.
- Push the straight part of the spring clip over the starter post until it snaps into the groove.

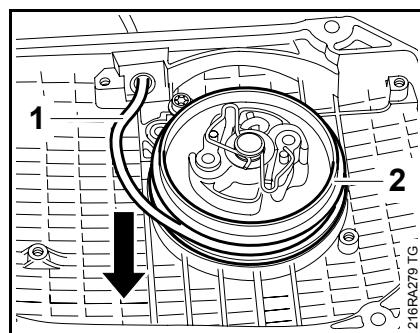


The spring clip's guide loops must be in line with the pawls (arrows).

### Check operation.

- Pull the starter rope, the rotor turns and the pegs on the pawls move in the direction of spring loops – the pawls move outwards.
- Reassemble all other parts in the reverse sequence.

## 10.4 Rope Rotor

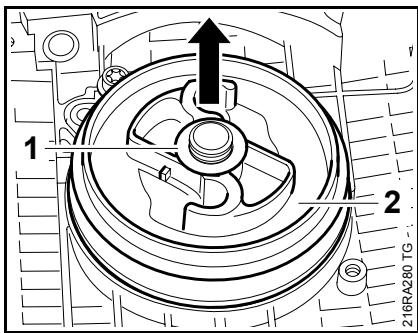


### Relieving tension of rewind spring

- 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.
  - take three full turns of the rope 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 pawls, [10.3](#)

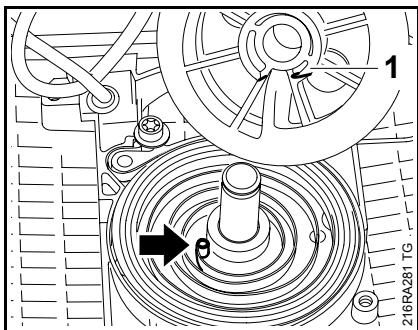


- Remove the washer (1).

Rewind spring must be relaxed.

- Carefully remove the rope rotor (2).

- 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 pawls and spring clip, **10.3**
- Install the starter rope, **10.5**

- Tension the rewind spring, **10.6**

- Lubricate pegs on pawls with grease, **16**

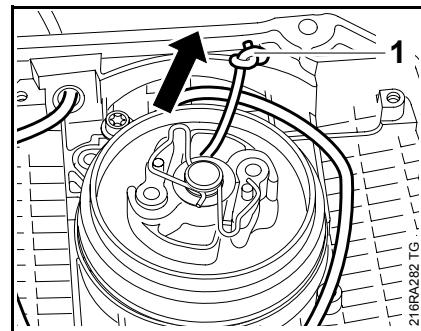
## 10.5 Starter Rope / Grip

- 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.

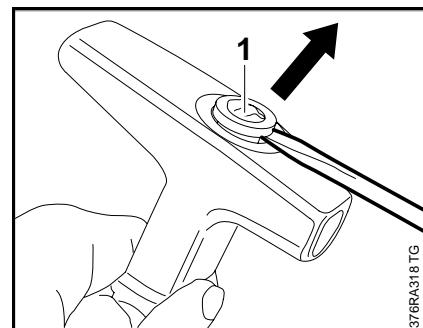
Do not shorten the starter rope.



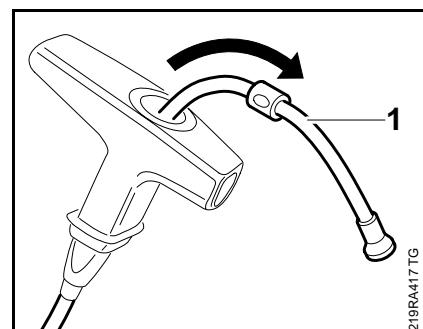
- Push the end of the starter rope (1) out a little and undo the knot.

- Pull the starter rope out of the rope rotor and fan housing.

## Machines with Elastostart grip



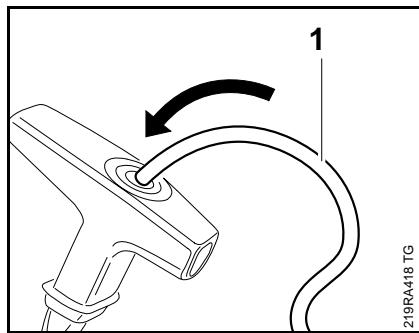
- Use a suitable tool to pry the nipple (1) out of the starter grip.



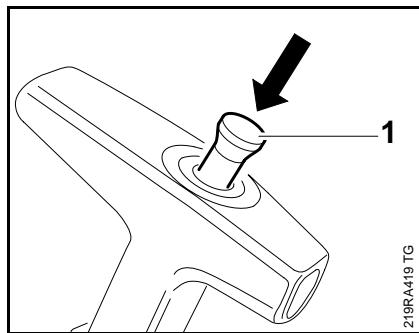
- Pull the starter rope (1) out of the grip.

- Check the starter rope and replace if necessary.

Do not shorten the starter rope.

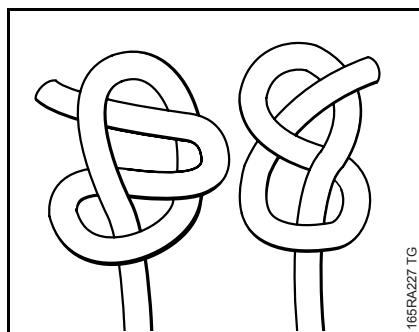


- Straighten the starter rope – thread the end without nipple through the grip.
- Thread the new starter rope (1) through the top of the grip as far as stop.



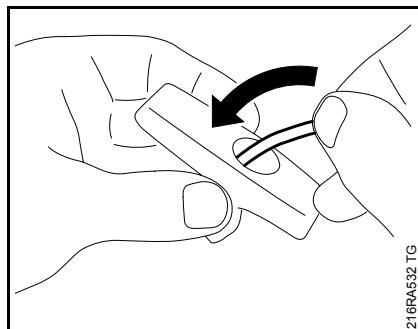
- Press the nipple (1) into the starter grip until it engages.

#### Machines without Elastostart grip

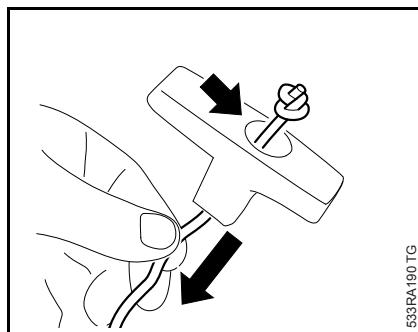


- Pull the old rope out of the starter grip.

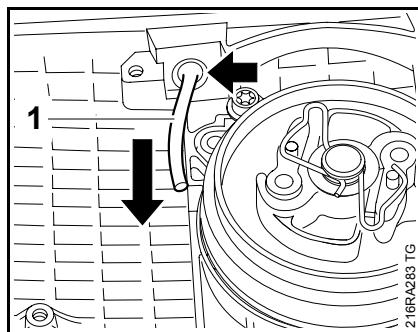
- Tie one of the special knots shown in the end of the rope.



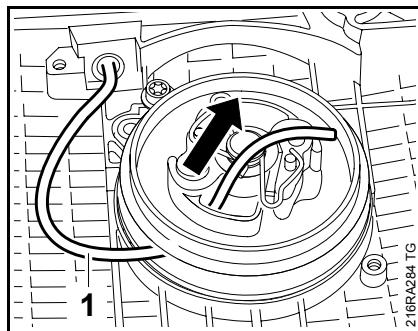
- Thread the rope through the top of the starter grip.



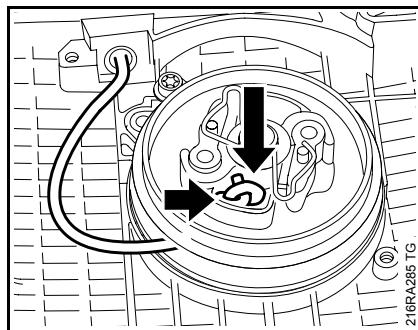
- Pull the rope into the starter grip until the knot is properly seated in the grip (small arrow).



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

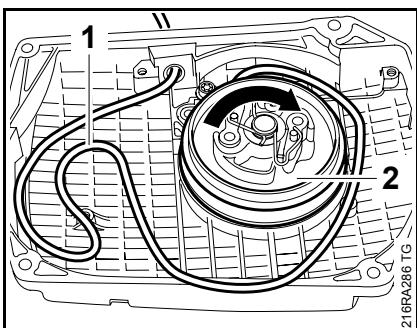


- Thread the starter rope (1) through the side of the rope rotor.
- Secure the rope (1) with a simple overhand knot.



- Pull rope back until knot locates in recess (arrow) in rope rotor.
  - Tension the rewind spring, **10.4**
  - Install the segment and fan housing, **10.2**
  - Tightening torques, **3.5**

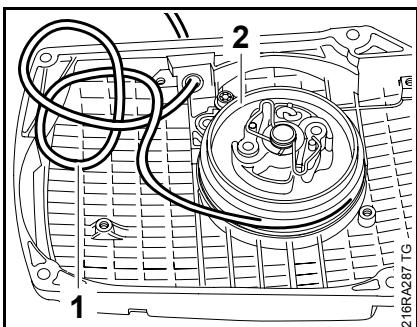
## 10.6 Tensioning the Rewind Spring



- Remove the fan housing, **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,

The rewind spring is now tensioned.

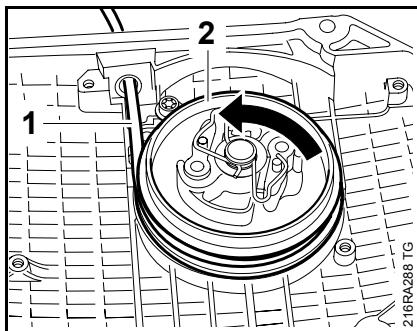
Hold the rope rotor steady since it will otherwise spin back and may damage the rewind spring.



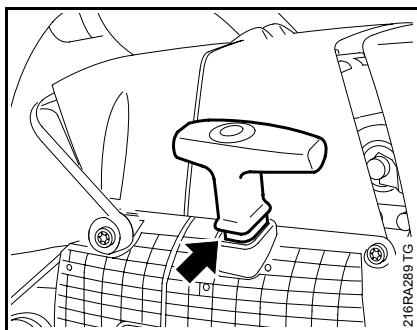
- Hold the rope rotor (2) steady.

Rotating the rope and rope rotor causes the rope to become twisted.

- 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 (2) and slowly release the starter rope (1) 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 another full 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 fan housing, **10.2**
- Tightening torques, **3.5**

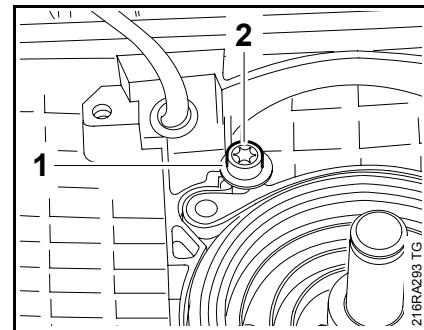
## 10.7 Replacing the Rewind Spring

- Troubleshooting, **3.5**

The replacement spring, in a spring housing, comes ready for installation.

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**

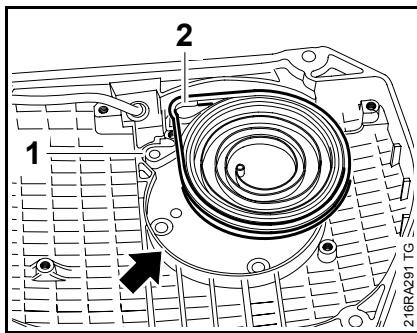


- Take out the screw (2).
- Remove the washer (1).
- Pull out the outer anchor loop and remove any remaining pieces of the old spring.

If the rewind spring can no longer be properly tensioned or is heavily corroded, install a new spring.

Even a worn rewind spring is still pre-loaded in the installed condition.

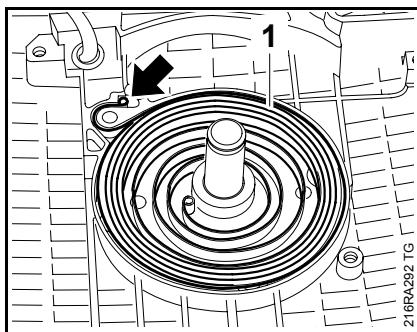
- Place a blanket over the work area and pull the rewind spring out of the fan housing.



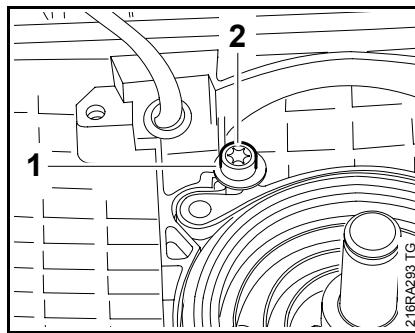
- Lubricate the new spring with a few drops of STIHL special lubricant before installing, **16**
- Line up the replacement rewind spring with frame
  - the anchor loop (2) must be above the lug (1).
- Push the rewind spring with frame into its seat (arrow) in the fan housing.  
The frame slips off during this process.

The rewind spring may pop out and unwind.

- Remove the frame.

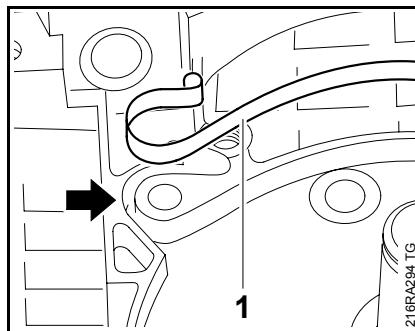


Make sure that the new rewind spring (1) is properly seated and the outer anchor loop is engaged on the lug (arrow). If necessary, use suitable tools to push the rewind spring fully into its seat in the fan housing.

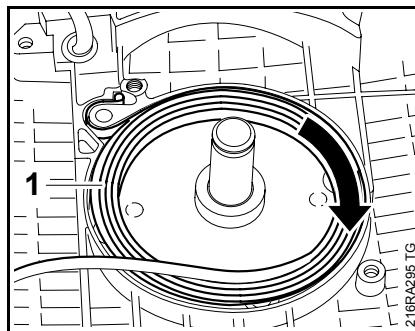


- Fit the washer (1).
- Insert and tighten down the screw (2) firmly.

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

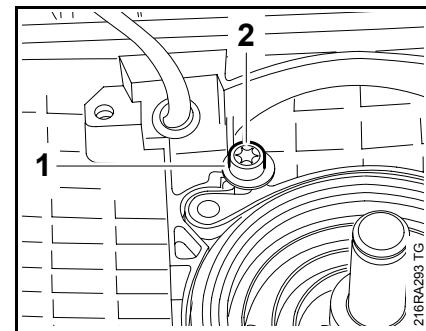


- Arrange the spring (1) in its original position.
- Fit the anchor loop in its seat (arrow) in the fan housing.



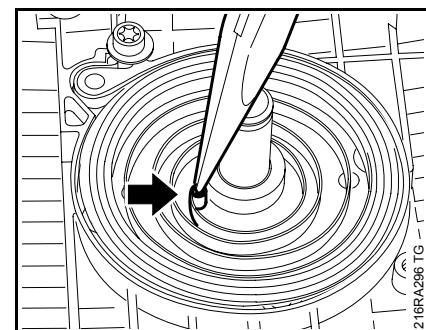
- Fit the rewind spring (1) clockwise in the housing.

- Hold the spring windings so that they cannot pop out.



- Fit the washer (1).
- Insert and tighten down the screw (2) firmly.

Make sure that the rewind spring (1) is properly seated. If necessary, use suitable tools to push the rewind spring fully into its seat in the fan housing



- Secure the spring so that it cannot pop out.
- Use suitable pliers to position the inner spring loop (1) so that it is against the starter post.
- Install the rope rotor, **10.4**
- Reassemble all other parts in the reverse sequence.

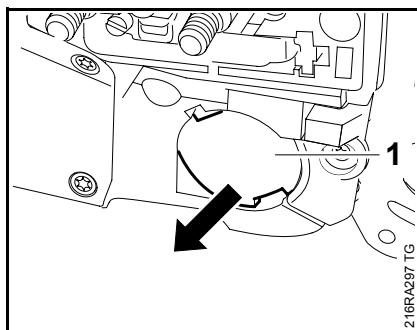
## 11. Servicing the AV System

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

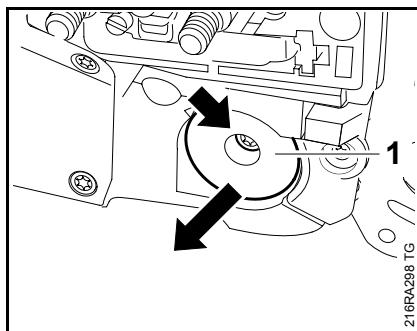
Damaged rubber buffers (annular buffers) must always be replaced.

### 11.1 Annular Buffer on Oil Tank at Clutch Side

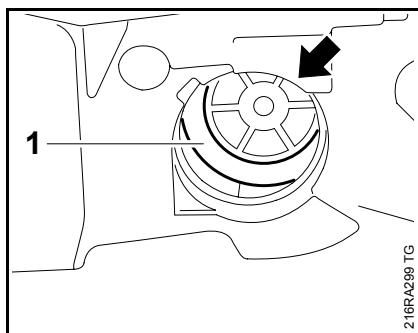
- Remove the chain sprocket cover, bar and chain, **5**



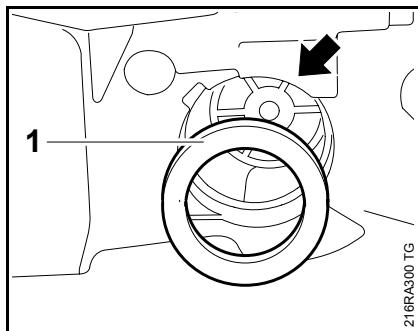
- Pry out the plug(1).



- Take out the screw (arrow).
- Pry out the annular buffer (1).

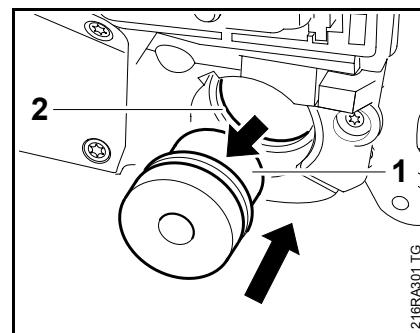


- Pull the rubber ring (1) off the tank housing stub and out through the crankcase bore (arrow).
- Examined the rubber ring and replace if necessary.

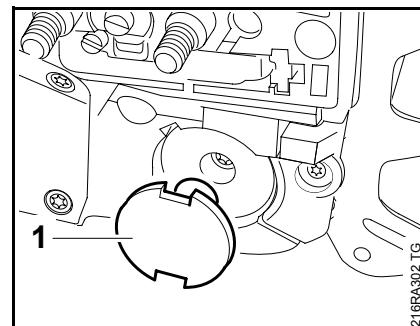


- Push the rubber ring (1) through the crankcase bore (arrow) and onto the tank housing stub until it is properly seated.

The rubber ring must not be pinched between the annular buffer and tank housing.



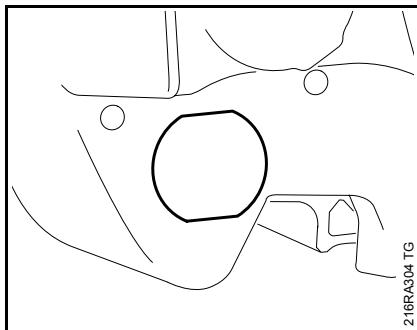
- Use STIHL press fluid to simplify assembly, **16**
- Hold the annular buffer with its small diameter (1) facing the housing.
- Push the annular buffer into the bore until its groove (arrow) engages the housing rib (2).
- Insert screw and tighten it down firmly.



- Push the plug (1) into the annular buffer as far as stop.
- Use STIHL press fluid to simplify assembly, **16**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

## 11.2 Annular Buffer on Oil Tank at Ignition Side

Always replace a damaged annular buffer.

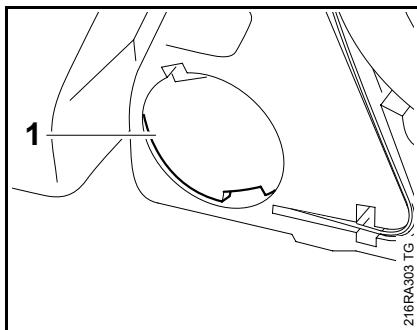


Remove and install as described for the annular buffer on the oil tank at the clutch side, **11.1**.

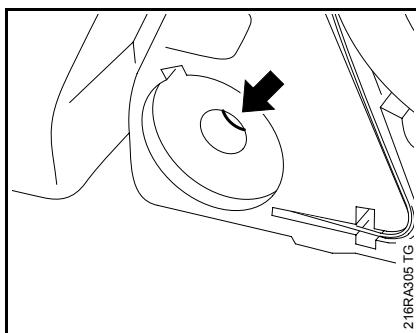
## 11.3 Annular Buffer at Clutch Side

Always replace a damaged annular buffer.

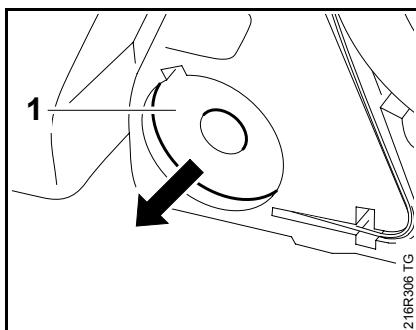
- Remove the chain sprocket cover, bar and chain, **5**



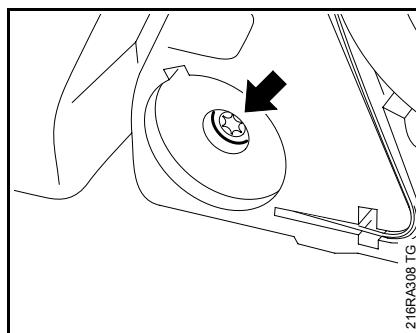
- Pry out the plug(1).



- Take out the screw (arrow).

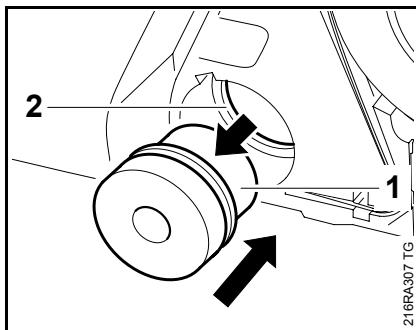


- Pry out the annular buffer (1).
- Check the annular buffer and replace if necessary



- Position the tank housing on the annular buffer – the holes must line up.

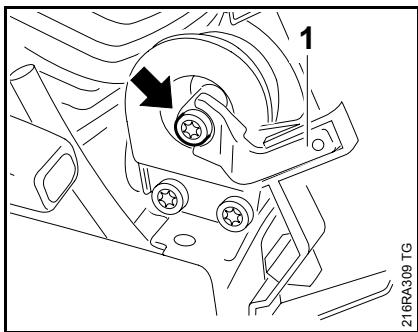
- Insert screw (arrow) and tighten it down firmly.
- Push the plug into the annular buffer as far as stop.
- Use STIHL press fluid to simplify assembly, **16**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**



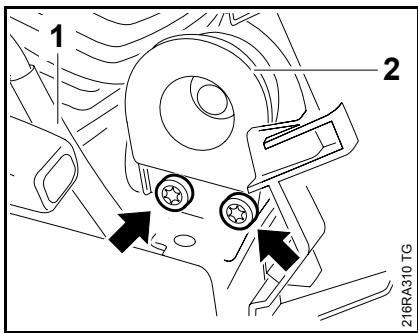
- Line up the annular buffer (1)
  - small diameter facing the crankcase.
- Use STIHL press fluid to simplify assembly, **16**
- Push the annular buffer (1) into the bore until its groove (arrow) engages the housing rib (2).

## 11.4 Annular Buffer at Ignition Side

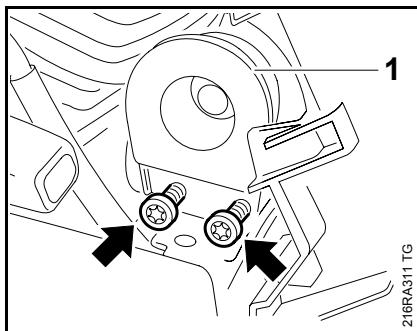
- Remove the shroud, **8.6**



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



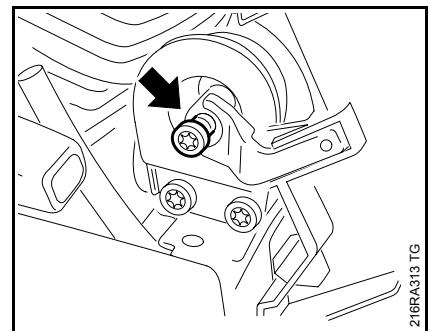
- Push the wiring harness (1) to one side.
- Take out the screws (arrows).
- Remove the annular buffer (2).
- Check the annular buffer and replace if necessary



- Line up the annular buffer (1)
  - tapered side facing the crankcase.
- Fit the annular buffer (1) in position.

Make sure the wiring harness is not pinched.

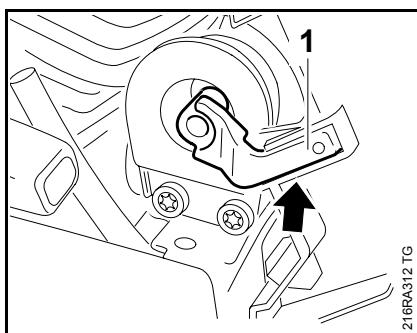
- Insert the screws (arrows) and tighten them down firmly.



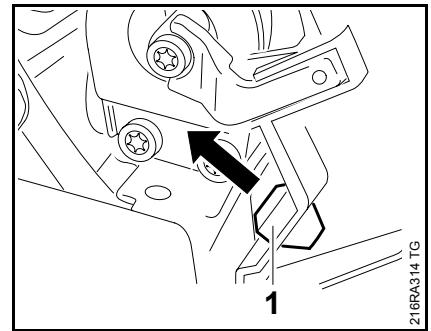
- Position the tank housing on the annular buffer – the holes must line up.
- Coat screw with threadlocking adhesive, **16**
- Insert screw (arrow) and tighten it down firmly.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

## 11.5 Stop Buffer at Ignition Side

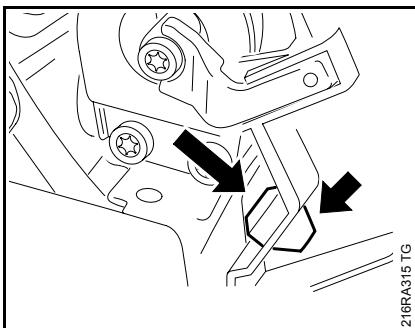
- Remove the shroud, **8.6**



- Push support (1) into its seat (arrow) that its cylindrical part engages the annular buffer.



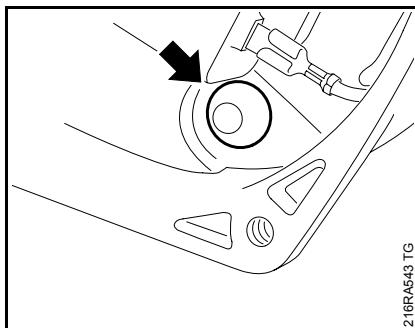
- Ease the stop buffer (1) out of the bore.
- Check the stop buffer and replace if necessary.



- Position the stop buffer so that its conical end (arrow) faces the tank housing.
- Use STIHL press fluid to simplify assembly, **16**
- Push the stop buffer into the bore and make sure it is properly seated.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

## 11.6 Stop Buffer on Ignition Module

- Remove the tank housing, **14.9.3**

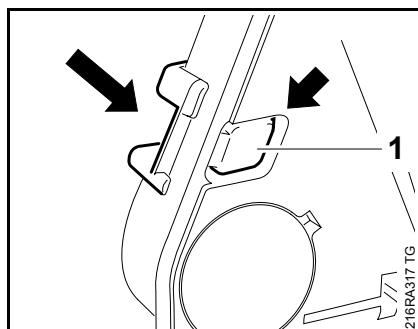


- Position the stop buffer so that its conical end (arrow) faces the ignition module.
- Use STIHL press fluid to simplify assembly, **16**
- Push the stop buffer into the bore and make sure it is properly seated.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

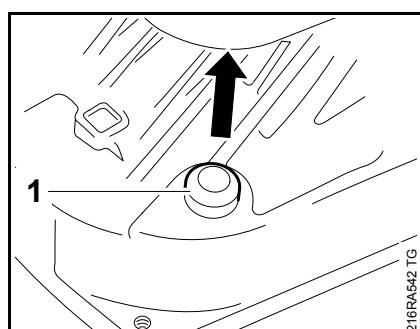
## 11.7 Stop Buffer at Clutch Side

- Remove the tank housing, **14.9.3**

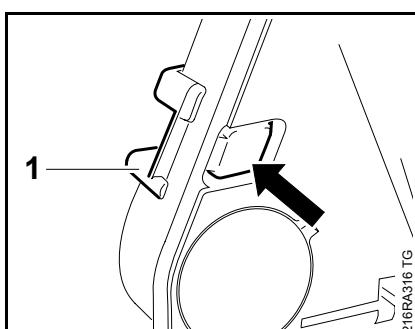
- Check the stop buffer and replace if necessary.



- Position the stop buffer so that the lug (1) faces the opening (arrow) in the tank housing.
- Use STIHL press fluid to simplify assembly, **16**
- Push the stop buffer into its seat and the lug (1) into the opening – the lug (1) be properly seated in the opening.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

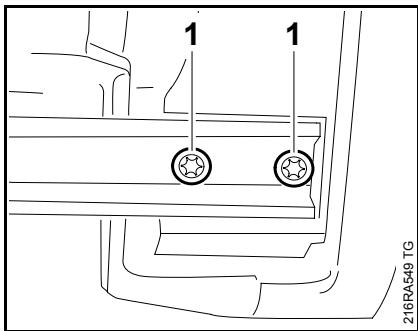


- Check the stop buffer and replace if necessary.
- Pry out the stop buffer (1).

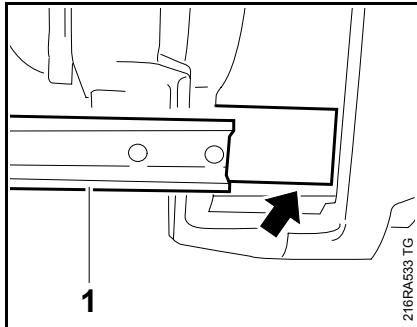


- Push out the stop buffer (1), from the outside inwards.

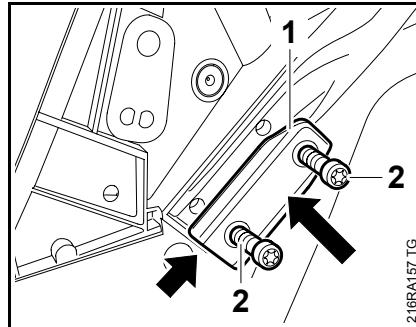
## 11.8 Handlebar



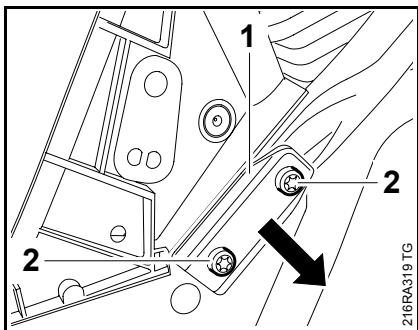
- Remove the screws (1) from the underside of the machine.



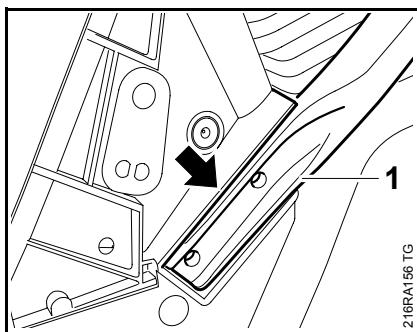
- Position the handlebar (1) in its seat (arrow) on the underside of the machine and insert the screws.



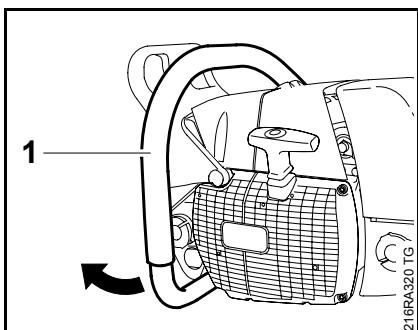
- Position the stiffener (1) so that its straight end (arrow) faces the end of the handlebar.



- Take out the screws (2).
  - Remove the stiffener (1).



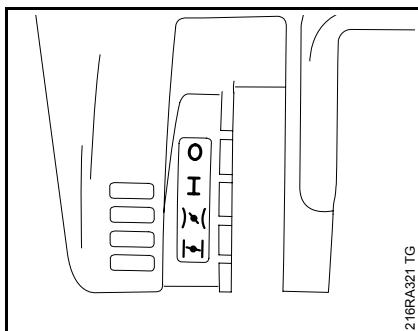
- Position the handlebar (1) in its seat on the side of the machine (arrow).



- Take the handlebar (1) off the machine.
  - Check the handlebar and replace it if necessary

## 12. Control Levers

### 12.1 Switch Shaft



The following positions can be selected with the switch shaft:

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

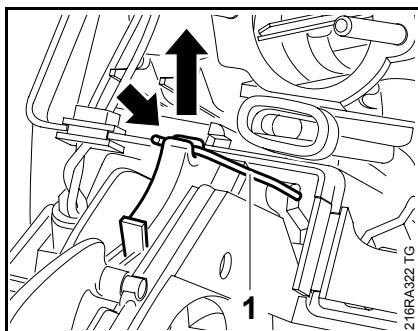
To move the switch shaft from **I** to **0** or **1** depress the interlock lever and throttle trigger at the same time.

- Position **1** = warm start  
– warm engine is started in this position

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

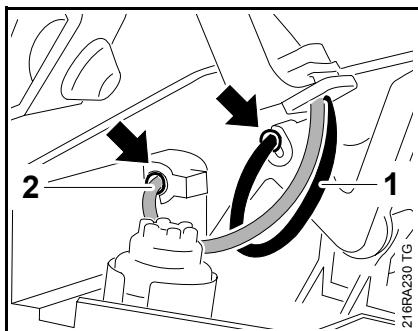
- Position **0** = cold start  
– cold engine is started in this position

#### 12.1.1 Removing and Installing

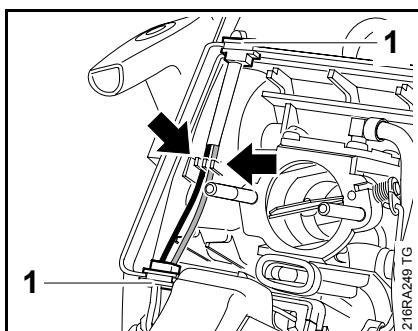


- Remove the filter base, **14.2**
- Remove the handle molding, **12.1.2**
- Disconnect the throttle rod (1) from the trigger (arrow).

The interlock lever may pop out.

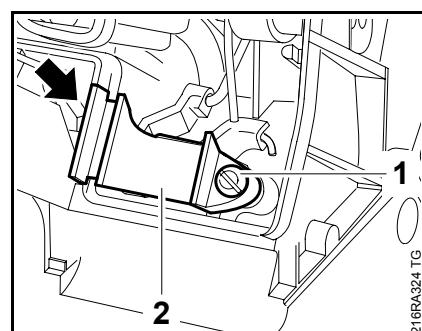


- Pull out the contact sleeves (arrows) of the short circuit wire (1) and ground wire (2).

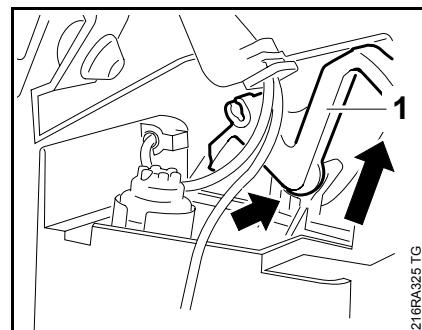


- Pull the wires out of the guides (arrows) to simplify assembly.

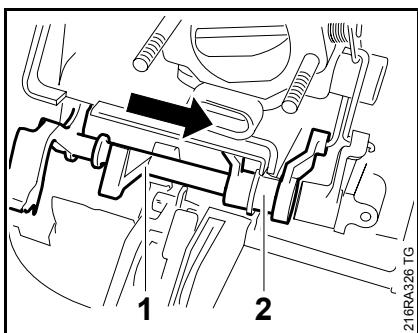
- Remove the grommets (1).



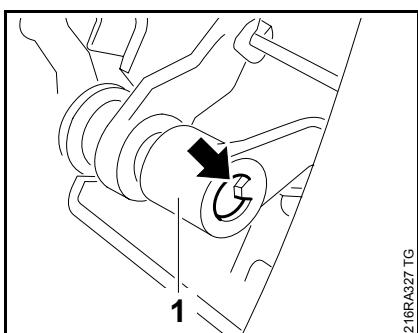
- Take out the screw (1).
- Pull the mount (2) out of the guide (arrow).



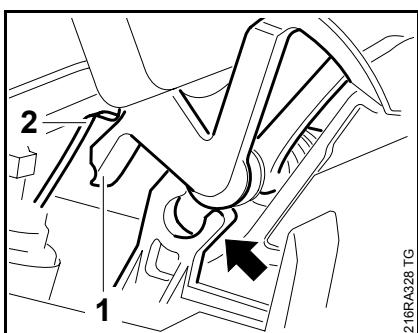
- Pry the switch shaft (1) out of its mount (arrow).
- Lift the switch shaft (1) slightly and pull it out in the direction of the tank cap.
- Check the switch shaft and replace it if necessary,



- Push the switch shaft (1) through the double lever (2).

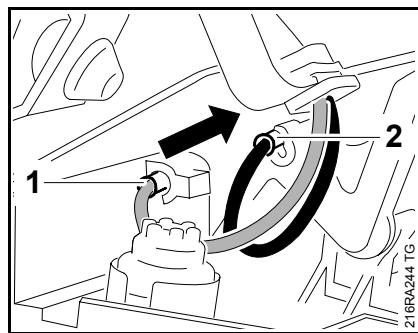


- Secure the choke rod on the carburetor – the choke rod can be connected or disconnected at the carburetor only when the choke lever is removed.
- Lift the contact spring.
- Push the switch shaft into the choke lever (1) so that the lug (arrow) engages the groove.
- Take care not to damage the contact spring.

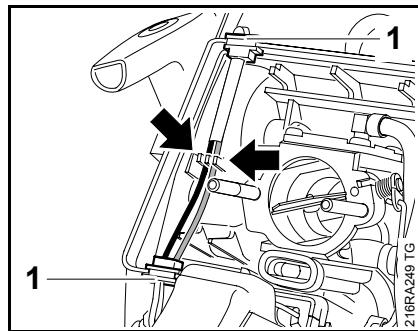


- The lug (1) must be under the contact spring (2).

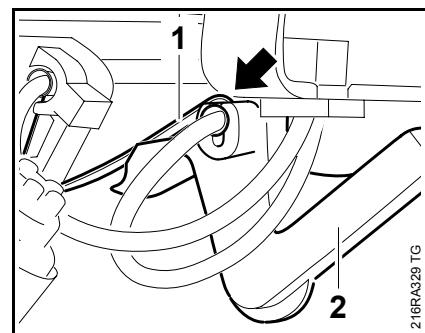
- Press the switch shaft into the mount (arrow) until it snaps into position.



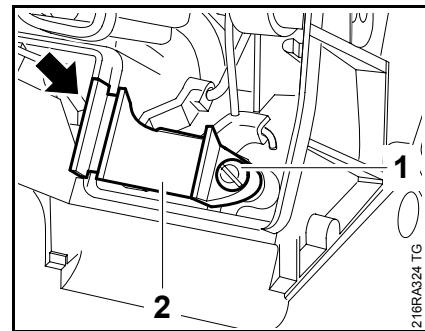
- Push the contact sleeves of the short circuit wire (2) and ground wire (1) fully home.



- Do not cross the wires.
- Line up the wiring harness and push the wires into the guides (arrows),  
earlier version 9.6.2, latest version 9.6.3
- Push the grommets (1) fully into position, making sure they are properly seated, 9.6.2



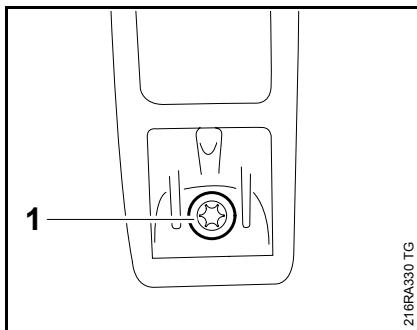
- The contact spring (1) must butt against the switch shaft's (2) guide.
- Move the switch shaft to "0" – contact between the short circuit wire and contact spring (arrow) must be made.



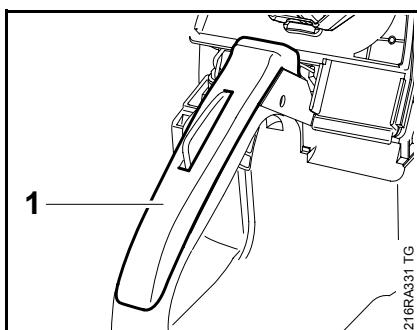
- Push the mount (2) into the guide (arrow).
- Insert and tighten down the screw (1) firmly.
- Attach the throttle lever.
- Check operation.
- Reassemble all other parts in the reverse sequence.

## 12.1.2 Throttle Trigger/Interlock Lever

- Remove the air filter,  14.1

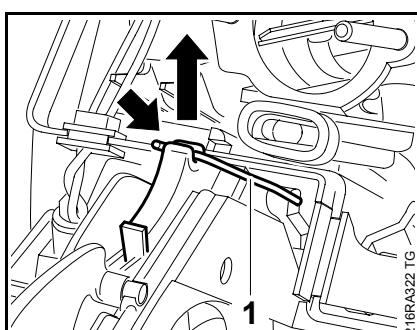


- Remove the screw (1) from the underside of the machine.

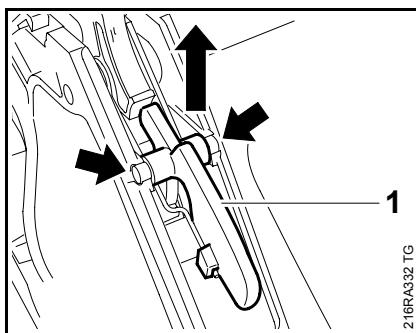


- Remove the handle molding (1).

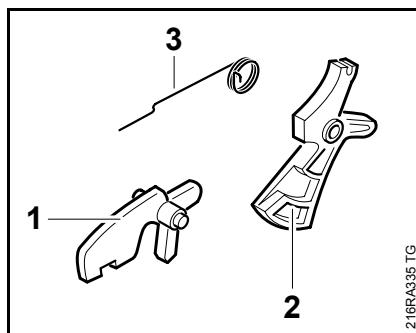
The interlock lever may pop out.



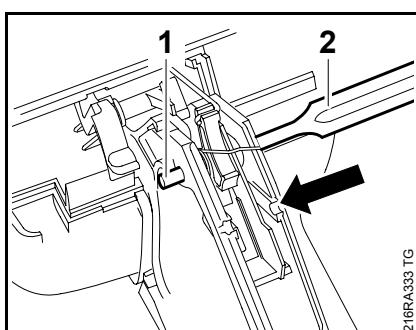
- Disconnect the throttle rod (1) from the trigger (arrow).



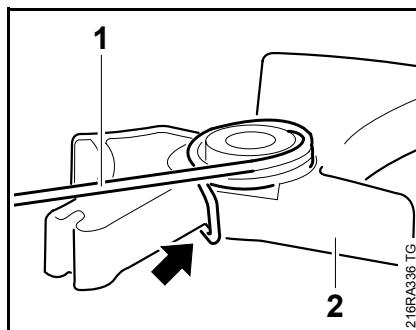
- Pull the interlock lever (1) out of its mounts (arrows).
- Disconnect the torsion spring and remove the interlock lever.



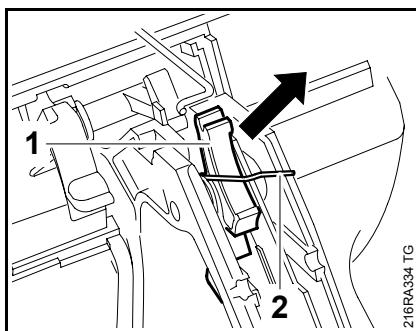
- Check the interlock lever (1), throttle trigger (2) and torsion spring (1) and replace if necessary



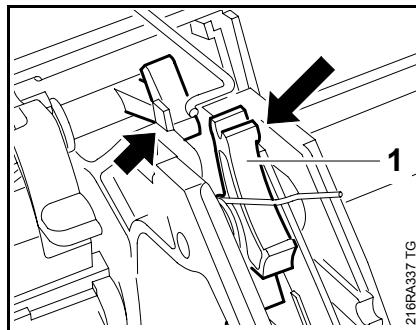
- Use a drift (2) to drive out the pin (1).



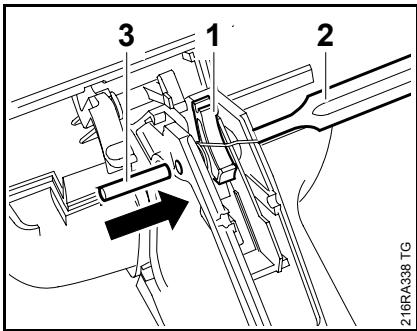
- Attach the torsion spring (1) to the trigger (2)
  - note the installed position (arrow).



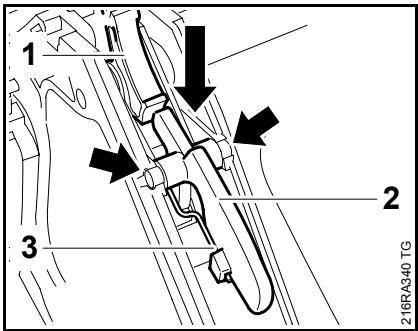
- Set the switch shaft to "0".
- Remove the throttle trigger (1) with torsion spring (2).



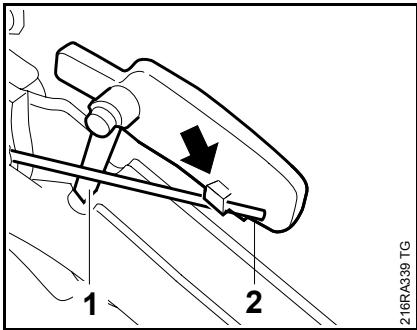
- Fit the throttle trigger (1) in the rear handle so that its lug engages behind the lever (arrow) on the switch shaft.



- Use a drift (2) to line up the throttle trigger (1).
- Drive home the pin (3) until it is centered (recessed by same amount at both sides).

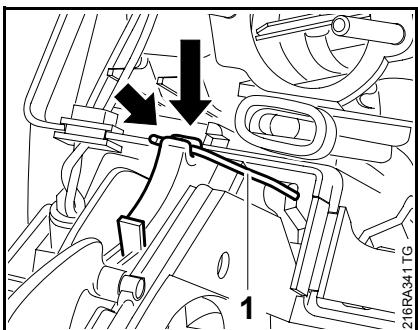


- Squeeze the throttle trigger (1) until the lever is vertical and hold it there.
- Push the interlock lever (2) into its pivot mounts (arrows) until it snaps into position – check that torsion spring (3) is in position.



When installing the interlock lever, make sure its stop (1) engages the recess in the throttle trigger.

- Attach the torsion spring (2) to the interlock lever (arrow).

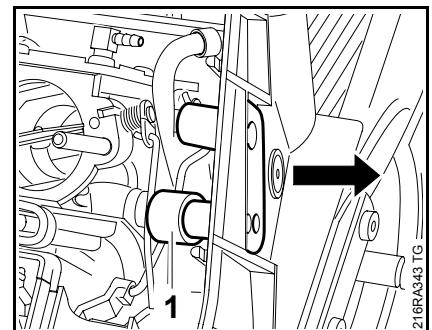


- Attach the throttle rod (1) to the trigger (arrow).

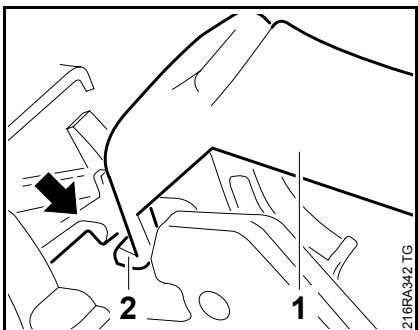
- Place the handle molding in position and hold it steady.
- Insert screw from below and tighten it down firmly.
- Check operation.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

### 12.1.3 Choke and Throttle Rods with Levers

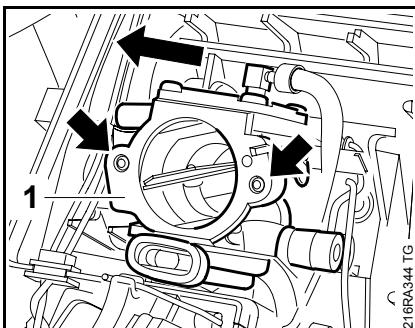
- Remove the filter base, **14.2**
- Remove the switch shaft, **12.1.1**
- Disconnect the throttle rod from the trigger, **12**



- Push out the grommet (1).

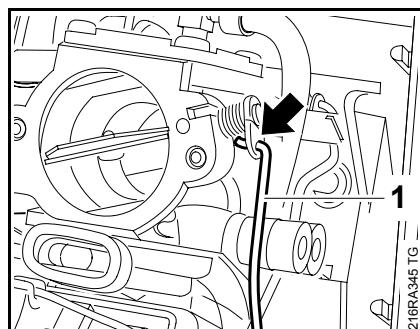


- Engage lugs (2) at front end of handle molding (1) in the recesses (arrow).

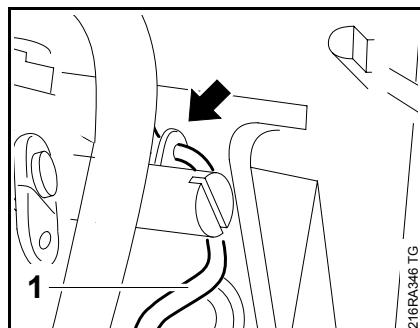


- Pull out carburetor (1) no further than the ends of the studs (arrows).

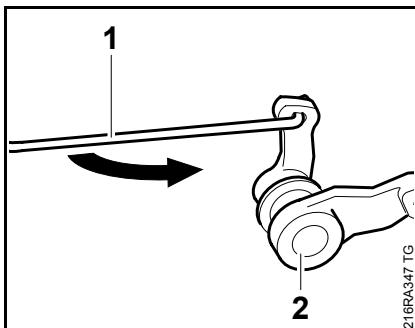
Fuel hoses must not be damaged or overstretched.



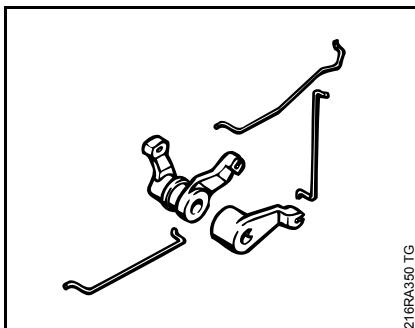
- Disconnect the choke rod (1) from the choke lever (arrow).



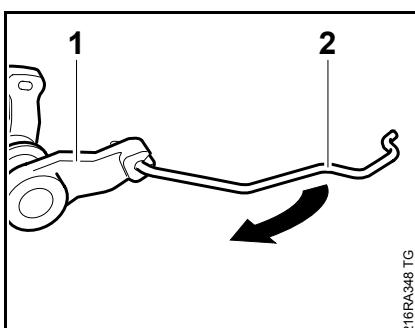
- Disconnect the throttle rod (1) from the trigger (arrow).



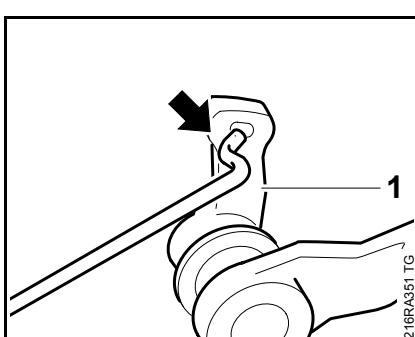
- Turn the straight throttle rod (1) slightly and disconnect it from the double lever (2).



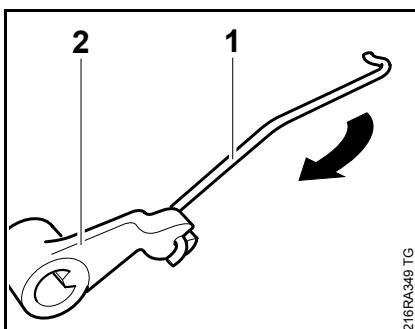
- Check the individual parts and replace if necessary.



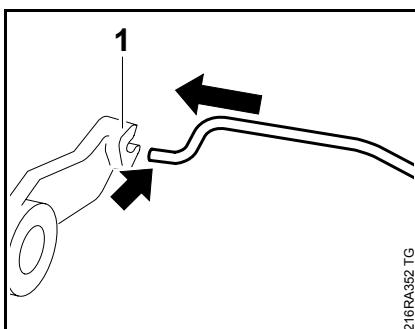
- Turn the bent throttle rod (2) to ease it out of the double lever (1).



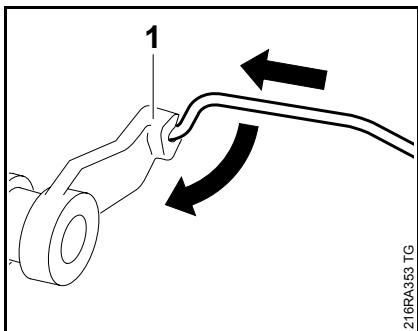
- Attach bent end (arrow) of straight throttle rod to inside of double lever (1) (see illustration).



- Turn the choke rod (1) to ease it out of the choke lever (2).

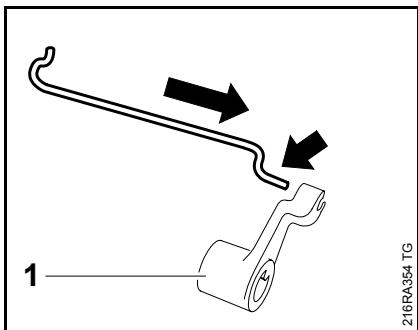


- Push the right angled end (arrow) of the bent throttle rod into the double lever (1) (see illustration).

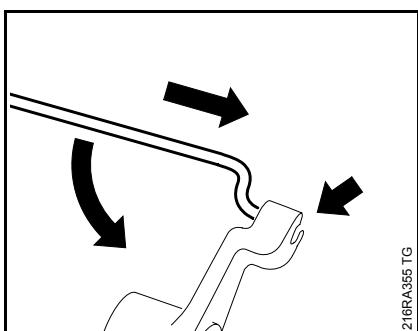


- Turn the bent throttle rod slightly and push it into its seat (1).

Check that the lever is properly seated (1).

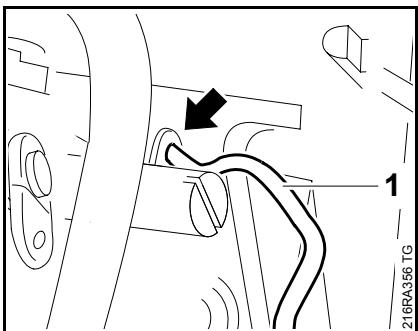


- Push the right angled end (arrow) of the bent throttle rod into the choke lever (1) (see illustration).

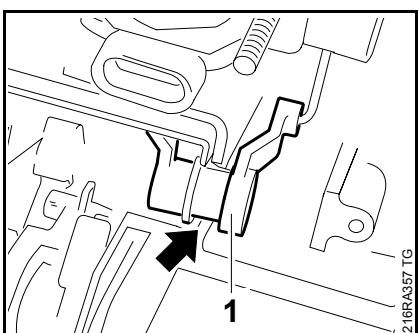


- Turn the choke rod slightly and push it into its seat (arrow).

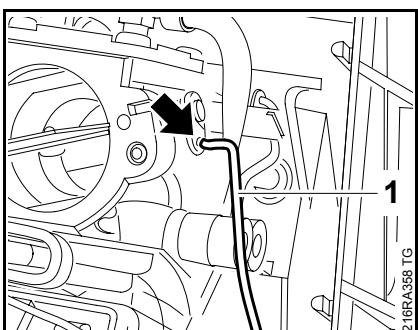
Check that the lever is properly seated (arrow).



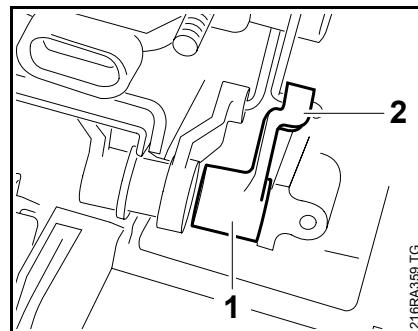
- Attach the throttle rod (1) to the trigger (arrow).



- Position the double lever (1) in its pivot mount (arrow).



- Attach the choke rod (1) to the choke shaft (arrow).



- Position the choke lever (1) so that its arm (2) points into the housing.

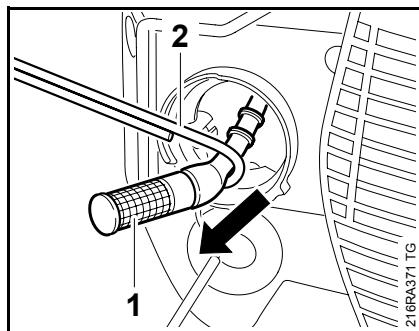
- Install the switch shaft, [10.2](#)
- Check operation.
- Reassemble in the reverse sequence.

## 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, **6**
- Troubleshooting, **4.7**
- Open the oil tank cap and drain the oil tank.
- Collect chain oil in a clean container, **1**



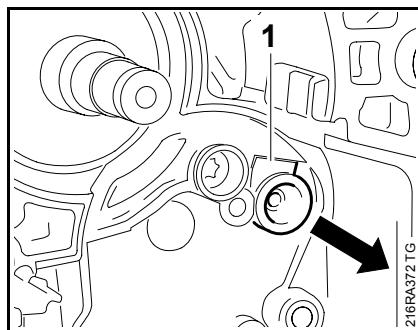
- Use hook (2) 5910 893 8800 to remove the pickup body (1) from the oil tank.

Do not overstretch the suction hose.

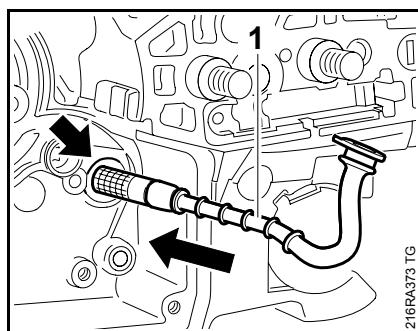
- Pull off the pickup body (1), check it and replace if necessary.
- Reassemble in the reverse sequence.

### 13.2 Oil Suction Hose

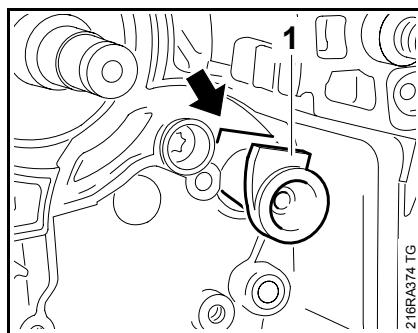
- Remove the clutch, **6**
- Remove the brake band, **7.2**
- Open the oil tank cap and drain the oil tank.
- Collect chain oil in a clean container, **1**
- Remove the oil pump, **13.3**



- Remove the oil suction hose (1).
- Check the oil suction hose and pickup body and replace if necessary.
- Fit the pickup body, **13.1**



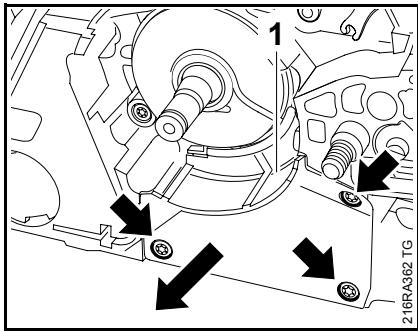
- Push the oil suction hose (1), pickup body first, through the housing bore (arrow).



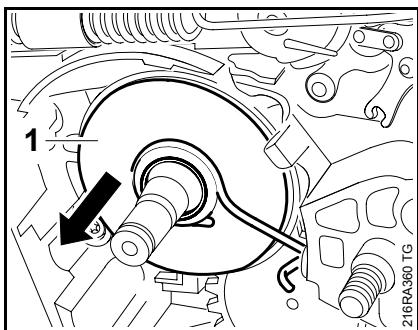
- Position the oil suction hose correctly
  - the tab (1) must be in the guide (arrow).
- Push home the oil suction hose until its groove is properly seated in the crankcase.
- Check position of the pickup body and, if necessary, use the hook 5910 893 8800 re-position it.
- Install the oil pump, **13.3**
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

### 13.3 Removing and Installing the Oil Pump

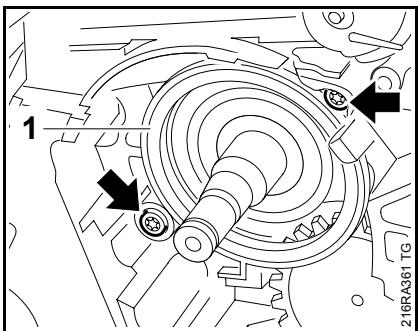
- Troubleshooting, **4.7**
- Remove the clutch, **6**
- Remove the brake band, **7.2**



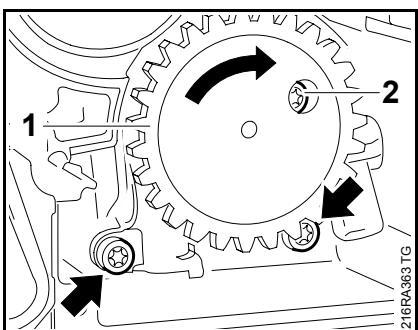
- Take out the screws (arrows).
- Remove the cover (1).



- Remove the spur gear (1).
- Check the spur gear and drive spring and replace if necessary.

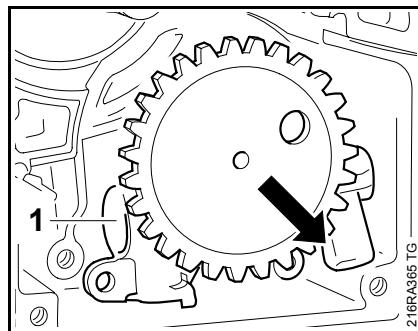


- Take out the screws (arrows).
- Remove the cover (1).
- Check the cover and replace if necessary.

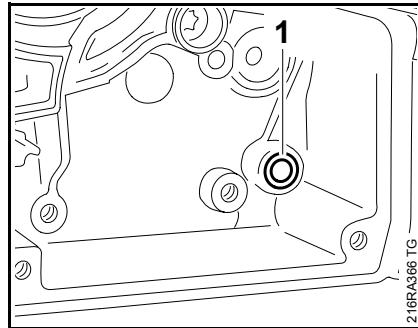


Two screws are accessible through the bore in the spur gear – pay attention to the size of the screw head.

- The large screw head is the crankcase mounting screw.
- Rotate the spur gear (1) until the screw (2) with the small head is accessible. Take out the screw (2).
- Take out the screws (arrows).

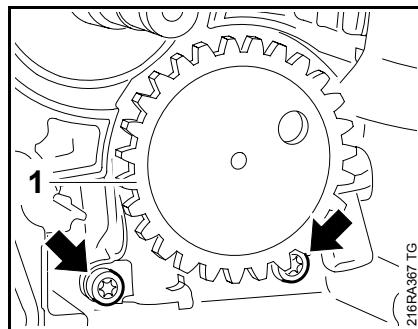


- Remove the oil pump (1).
- Check the oil pump and replace it if necessary.

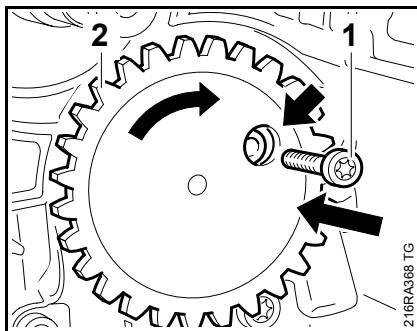


- Fit a new sealing ring (1).

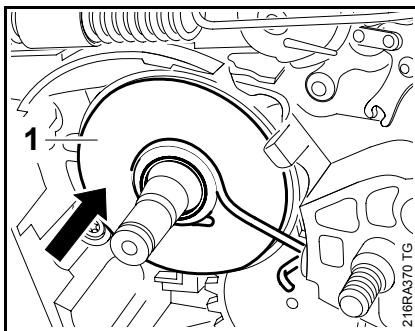
Always use a new sealing ring.



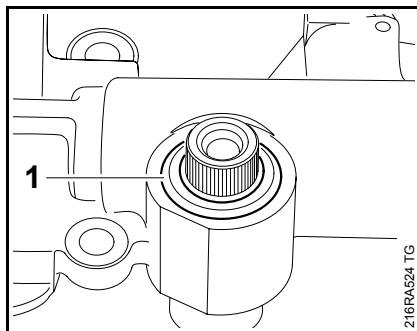
- Place the oil pump (1) in position.
- Fit the screws (arrows)  
– do not tighten down yet.



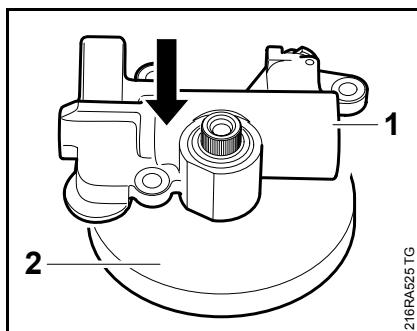
- Rotate the spur gear (2) until the upper hole in the oil pump is accessible through the bore (arrow).
- Coat the screw with threadlocking adhesive, **16**
- Fit the screw (1).
- Tighten down all three screws firmly.



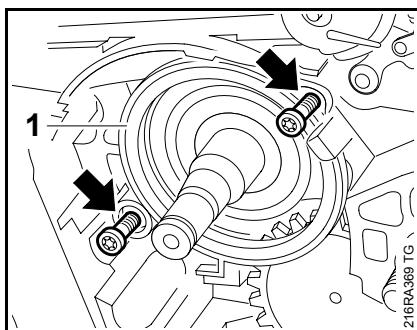
- Push the spur gear (1) on to the crankshaft stub as far as stop.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**
- Check adjustment of oil pump and readjust if necessary – see instruction manual.



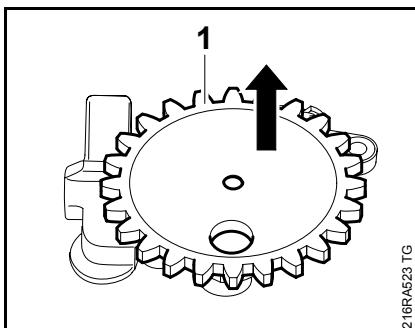
- Use a suitable tool to remove the oil seal (1).



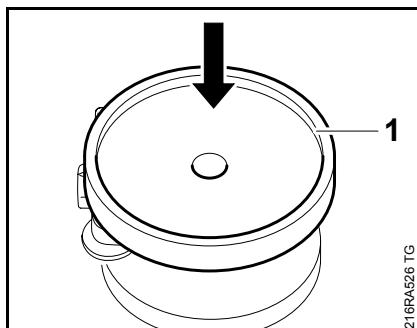
- Place the oil pump (1) on the plate (2) 1124 893 5200.



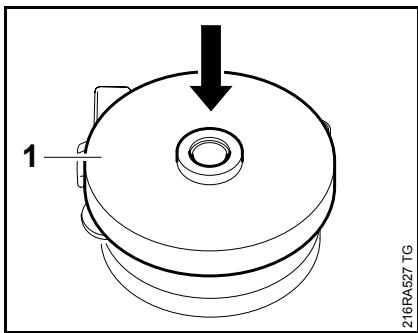
- Place the cover (1) in position.
- Insert the screws (arrows) and tighten them down firmly.



- Remove the spur gear (1).

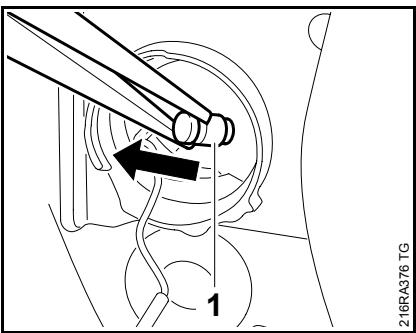


- Slip the oil seal, open side facing the oil pump, over the shaft.
- Use press sleeve (1) 1124 893 5100 to install the oil seal (1).



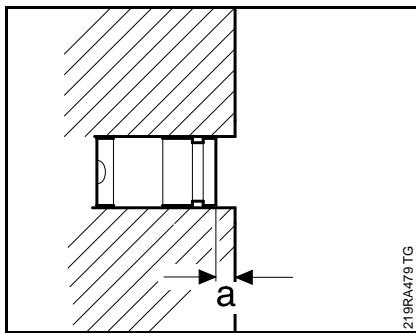
216RA527 TG

- Use press sleeve (1) 1124 893 5100 to install the spur gear.
- Reassemble all other parts in the reverse sequence.



216RA376 TG

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



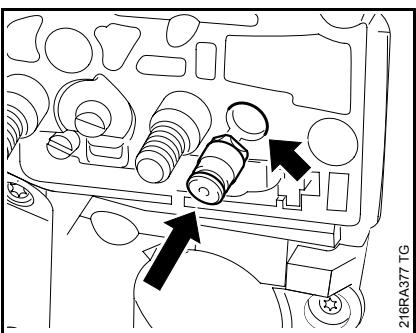
219RA479 TG

- Drive the new valve into the bore to a depth of 2 - 3 mm (a).
- Reassemble all other parts in the reverse sequence.

#### 13.4 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.

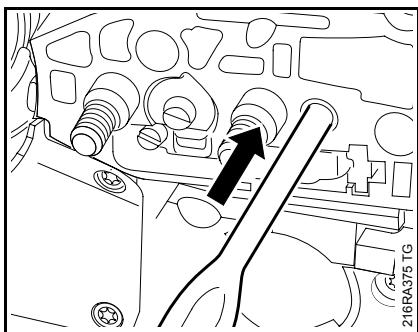
- Open the oil tank cap and drain the oil tank.
- Collect chain oil in a clean container, ■ 1



216RA377 TG

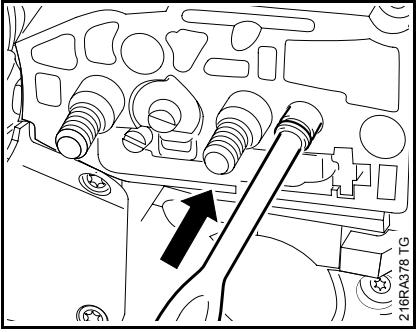
Check correct installed position.

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



216RA375 TG

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



216RA378 TG

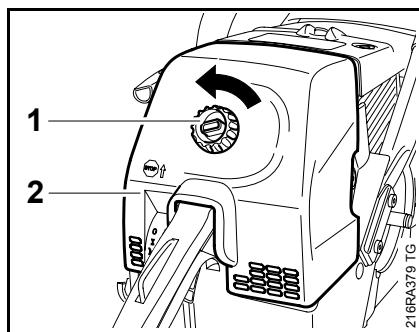
- Use a 6 mm drift to carefully drive in the new valve from outside – note installed depth.

## 14. Fuel System

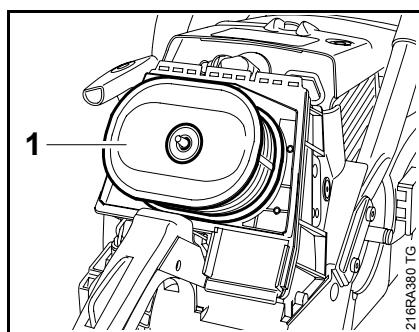
### 14.1 Air Filter

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, **4.6**, **4.7**



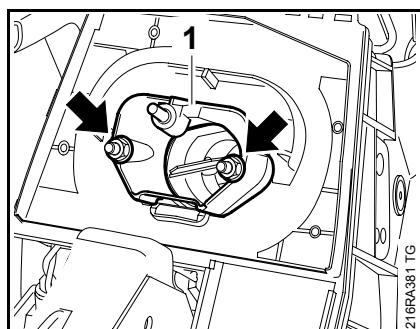
- Turn twist lock (1) counterclockwise.
- Remove the carburetor box cover (2).



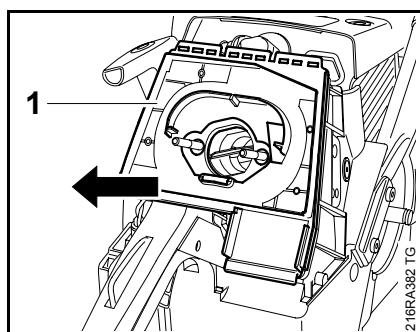
- Remove the air filter (1).
- Check the air filter (1) and clean or replace if necessary – see instruction manual.
- Reassemble in the reverse sequence.

### 14.2 Removing and Installing the Filter Base

- Remove the air filter, **14.1**



- Unscrew the nuts (arrows).
- Pull off the flange (1).



- Pull off the filter base (1).
- Check the individual parts and replace if necessary.

Always use new self-locking nuts.

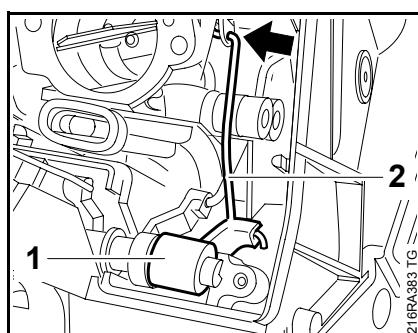
- Reassemble in the reverse sequence.
- Tightening torques, **3.5**

### 14.3 Carburetor – Removing and Installing

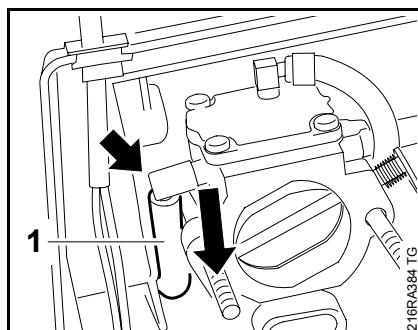
- Remove the filter base, **14.2**

- Open the fuel tank cap and drain the fuel tank.
- Collect the fuel in a clean container, **1**

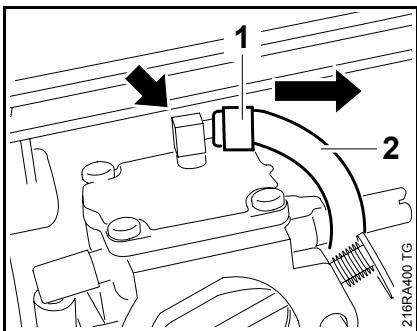
Disconnect the fuel hose only when the tank cap is open.



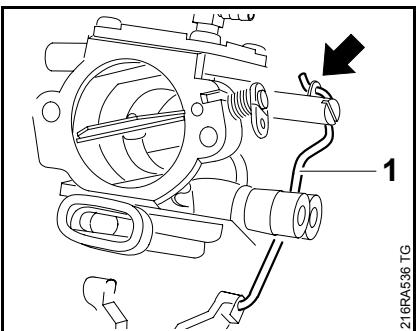
- Remove the handle molding, **12.1.2**
- Remove the switch shaft, **12.1.1**
- Take the choke lever (1) out of the carburetor box and disconnect the choke rod (2).



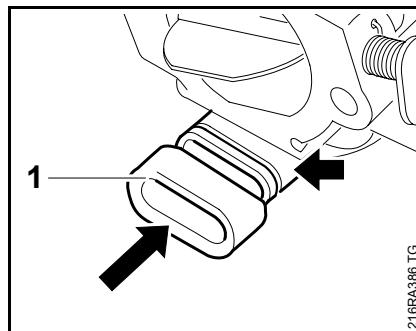
- Pull the fuel hose (1) off the nipple (arrow).



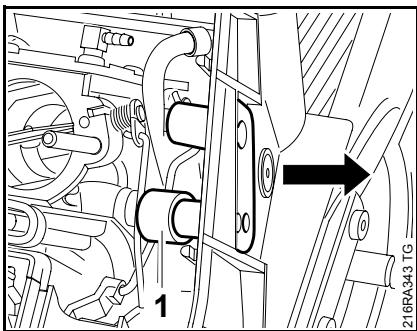
- Push back the sleeve (1).
- Pull the impulse hose (2) off the nipple (arrow).



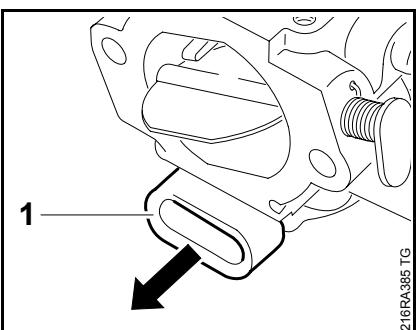
- Disconnect the throttle rod (1) with double lever from the carburetor (arrow).



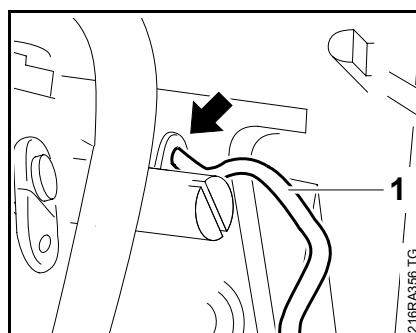
- Push the sleeve (1) on to the stub (arrow) as far as stop.



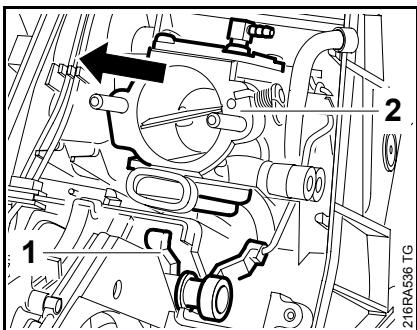
- Push out the grommet (1).



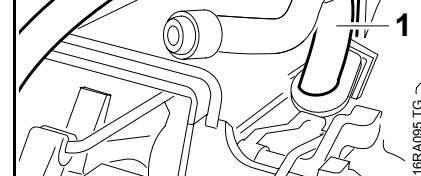
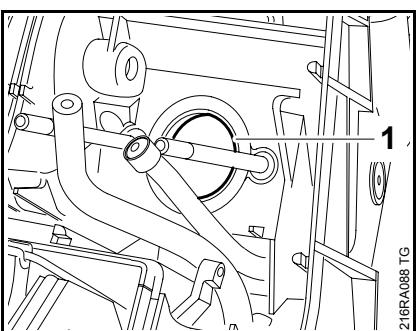
- Pull off the sleeve (1), check it and replace if necessary.
  - Check the carburetor and service or replace if necessary.
  - Check the throttle and choke rods and replace if necessary,



- Attach the throttle rod (1) to the carburetor (arrow).



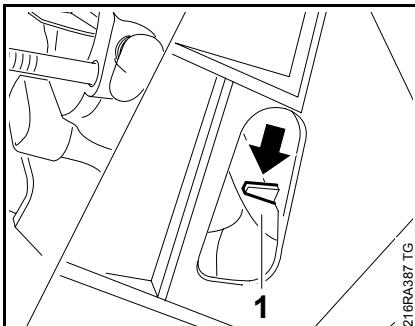
- Pull the double lever (1) out of its seat.
- Pull out the carburetor (2).



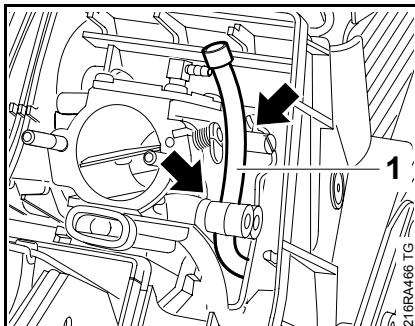
- Position the fuel hose (1) in the recess (arrow).

The fuel hose must not be pinched between the carburetor and carburetor box.

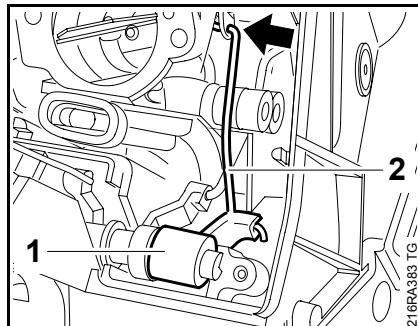
Make sure the sleeve (1) is in place.



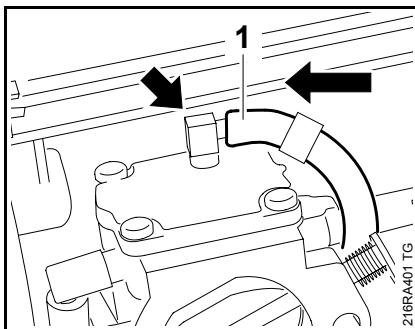
- Push the carburetor into position and pass the impulse hose between the carburetor and throttle rod at the same time.
- Make sure the impulse hose (1) is behind the guide (arrow).



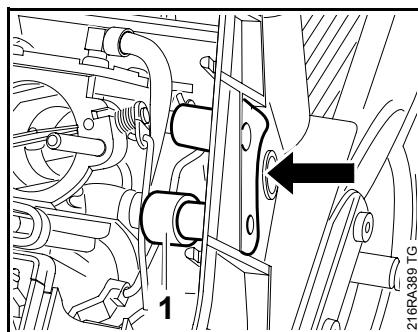
- Fit the impulse hose (1) on the carburetor (arrow).



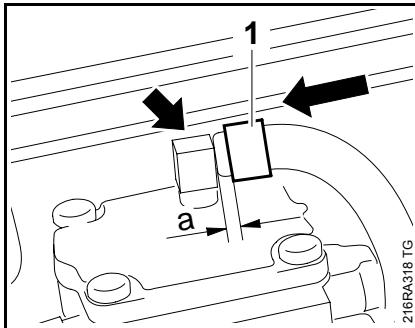
- Attach the choke rod (2) to the carburetor (arrow) and position the choke lever (1) so that it points into the carburetor box.



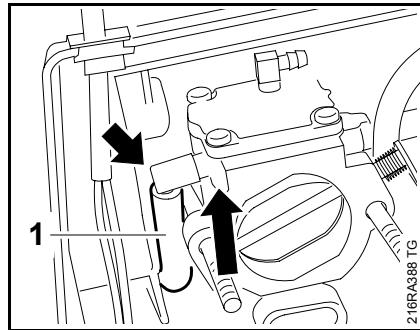
- Push the fuel hose (1) fully on to the stub (arrow).



- Push the grommet (1) into handle housing until it is properly seated.



- Coat the sleeve (1) with a little STIHL press fluid and push it on in the direction of the nipple (arrow), **16**
- Push the sleeve (1) on until it is 2 mm (a) from the end of the hose.



- Push the fuel hose (1) fully on to the stub (arrow).
- Check that the carburetor is properly seated.

If the carburetor does not fit perfectly flat against the carburetor box, the fuel hose is stuck behind the carburetor.

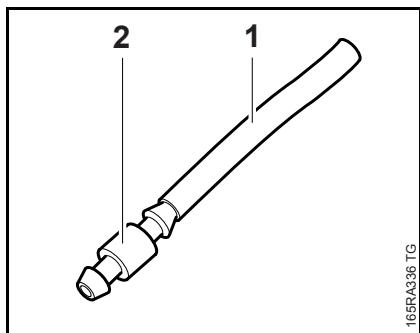
- Reposition the fuel hose and push the carburetor into place.

## 14.4 Leakage test

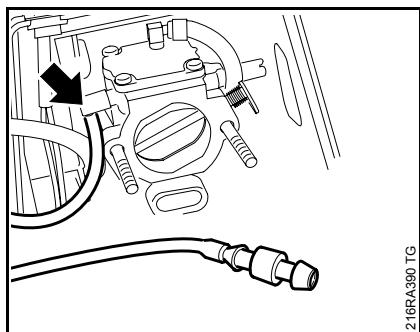
In the case of problems with the carburetor or fuel supply system, also check and clean or replace the tank vent, **14.8**.

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

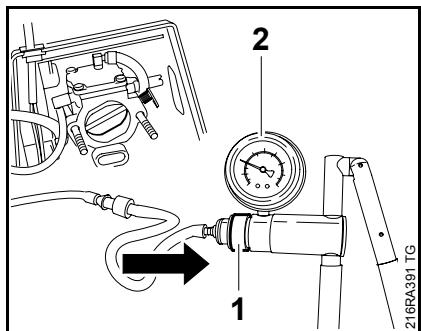
- Remove the filter base, **14.2**



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



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



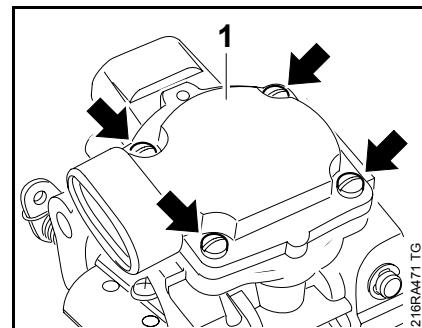
- Push the pressure hose of pump 0000 850 1300 onto the nipple.
- Push the ring (1) to the right and pump air into the carburetor until the pressure gauge (2) indicates a pressure of about 0.8 bar (80 kPa).

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, **14.5.2** or **14.6.2**
2. Metering diaphragm or gasket damaged, replace if necessary, **14.5.1** or **14.6.1**
3. Pump diaphragm or gasket damaged, replace if necessary, **14.5.4** or **14.6.4**
- 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 filter base, **14.3**
- Tightening torques, **3.5**
- Reassemble all other parts in the reverse sequence.

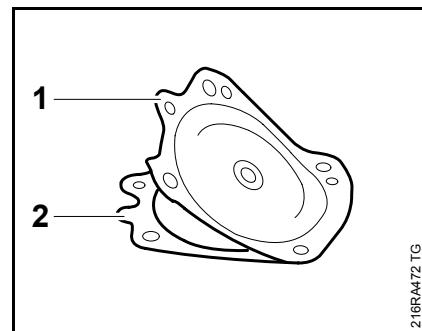
## 14.5 Servicing the Carburetor Tillotson Carburetor

### 14.5.1 Metering Diaphragm



- Troubleshooting, **4.6**
- Remove the carburetor, **14.3**
- Take out the screws (arrows).
- Remove the end cover (1).

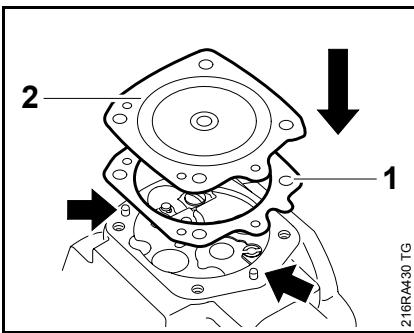
If the gasket and diaphragm are stuck to the carburetor, remove them very carefully.



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

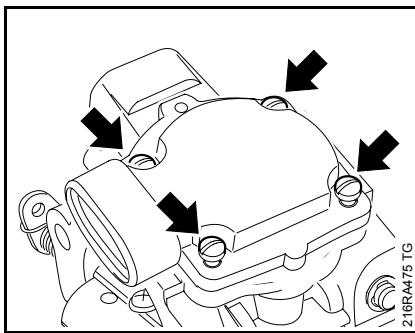
The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue, i.e. the diaphragm distorts and swells and has to be replaced.

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



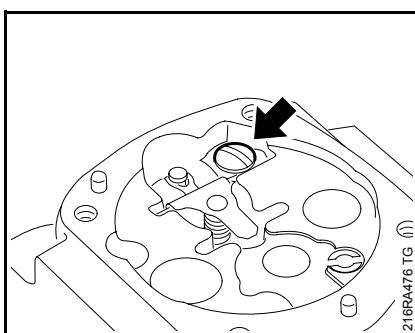
Note installed positions of metering diaphragm (2) and gasket (1).

- Fit the gasket (1) and metering diaphragm (1) on the pegs (arrows).

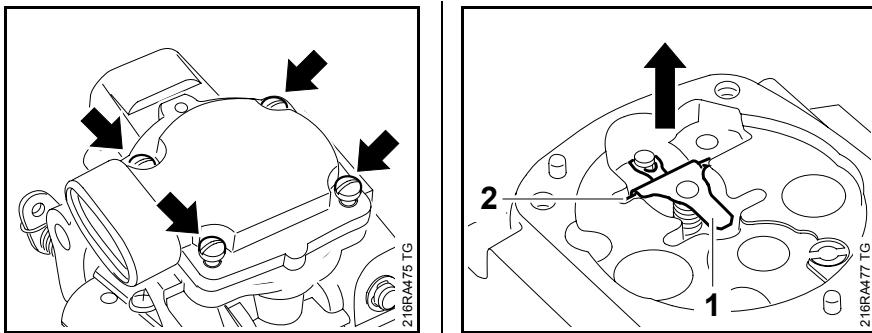


- Fit the screws (arrows).
  - Check position of metering diaphragm and gasket, then tighten down the screws firmly in a crosswise pattern.
  - Reassemble all other parts in the reverse sequence.

#### 14.5.2 Inlet Needle

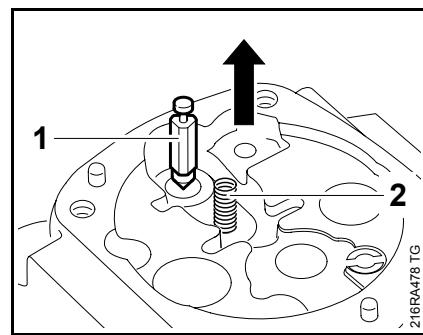


- Position the end cover (1) so that the stub (arrow) points in the direction of the choke shutter.
- Move the end cover (1) a little until the pegs on the carburetor body engage the holes in the end cover.

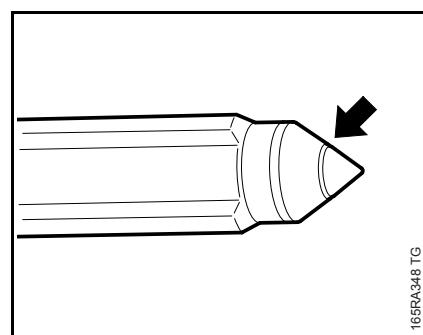


- Remove the inlet control lever (1) with spindle (2) out of the inlet needle's groove.

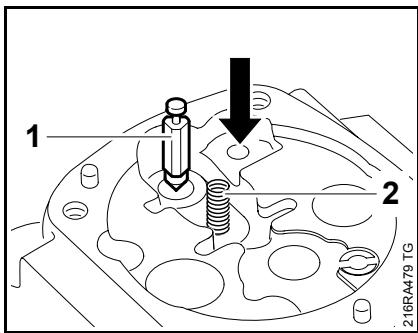
The small spring under the inlet control lever may pop out.



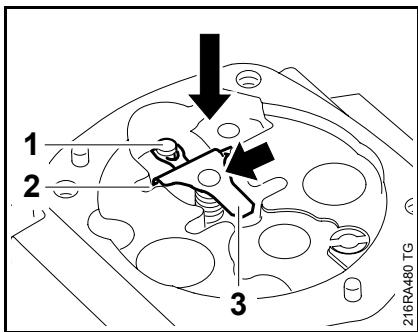
- Remove the inlet needle (1).
  - Remove the spring (2). Inspect and replace if necessary.



- 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.

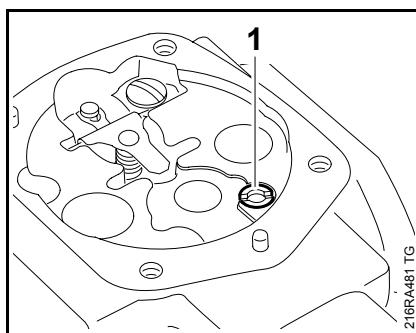


- Position the inlet control lever (3) with spindle (2) on the spring's seat (arrow) first, then slide the inlet control lever's clevis into the groove in the inlet needle (1).

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, **14.5.1**

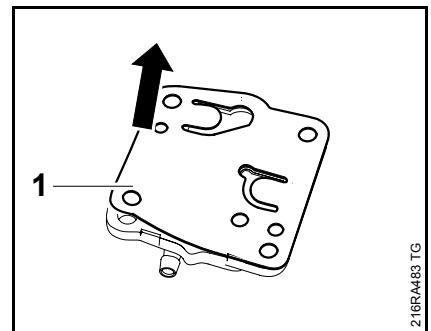
### 14.5.3 Fixed Jet



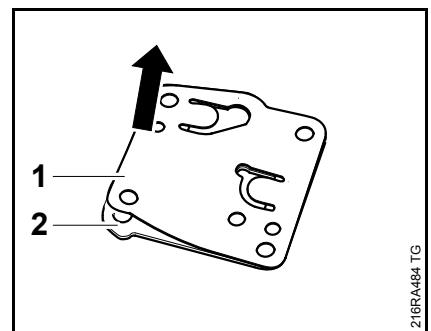
- Remove the metering diaphragm, **14.5.1**
- Unscrew the fixed jet (1) with a suitable screwdriver.

Take care not to damage the jet.

- Check the fixed jet and replace it if necessary
- Reassemble in the reverse sequence.



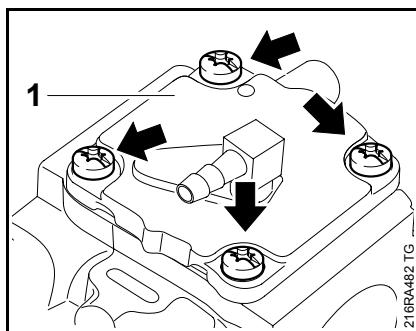
- Remove the pump diaphragm and gasket (1).



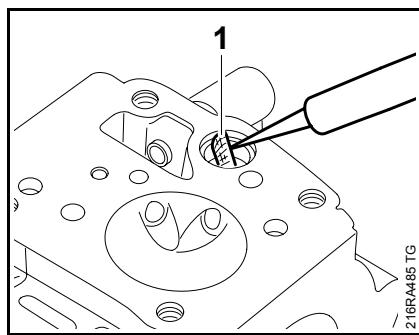
- Carefully separate the pump diaphragm (1) and gasket (2).

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.

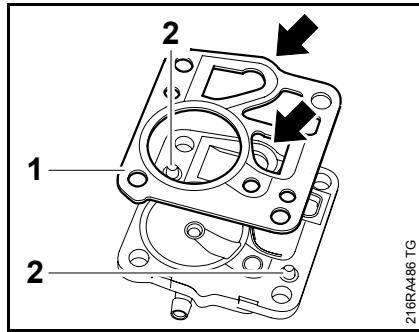
### 14.5.4 Pump Diaphragm



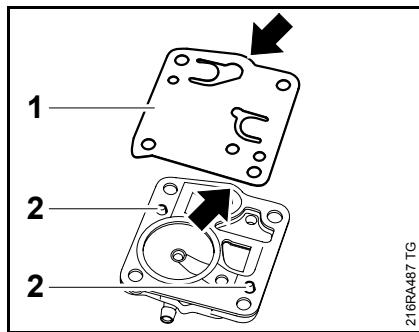
- Troubleshooting, **4.6**
- Remove the carburetor, **14.3**
- Take out the screws (arrows).
- Remove the end cover (1).
- If the gasket and pump diaphragm are stuck to the carburetor, remove them very carefully.



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

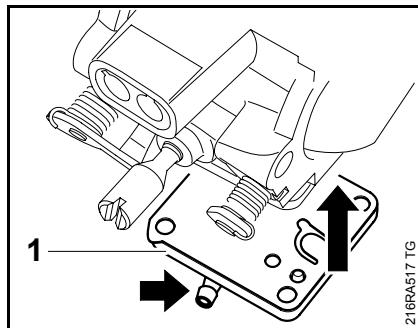


- Position the gasket (1) so that the contours (arrows) are in alignment.
- Fit the gasket (1) over the pegs (2) – the gasket is held in position.



- Position the pump diaphragm (1) on the gasket so that the contours (arrows) are in alignment.

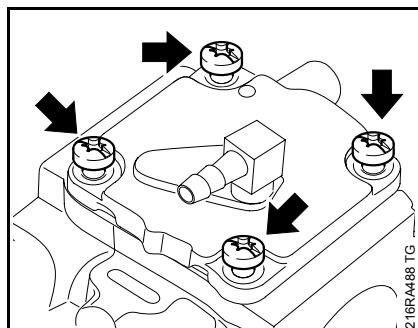
- Fit the pump diaphragm (1) on the pegs (2) – the pump diaphragm is held in position.



- Align the end cover (1) so that the nipple (arrow) points in the direction of the adjusting screws.

To ensure that the pump diaphragm and gasket do move out of position, fit the end cover (1) on the carburetor body from below.

- Move the end cover (1) a little until its pegs engage the holes in the carburetor body.

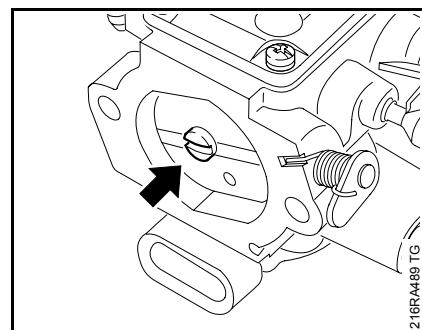


- Check that pump diaphragm and gasket are properly seated.
- Insert the screws (arrows) and tighten them down firmly.
- Reassemble all other parts in the reverse sequence.

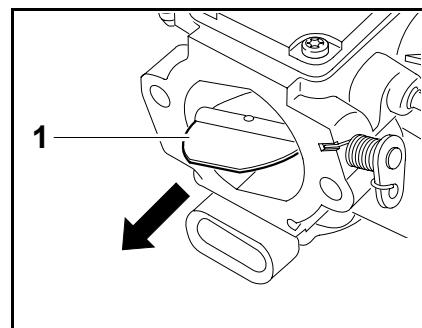
#### 14.5.5 Choke Shaft / Choke Shutter

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

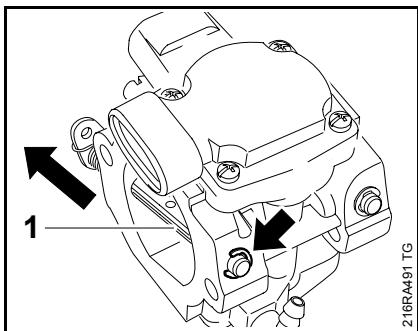
- Remove the carburetor, [14.3](#)
- Carburetor troubleshooting, [4.6](#)



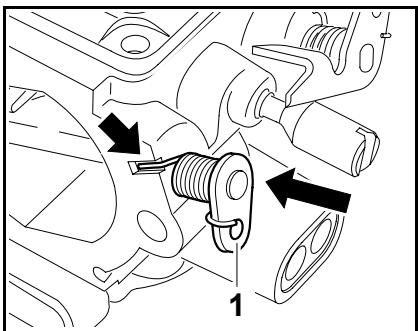
- Turn the choke shaft until the choke shutter is closed.
- Take out the screw (arrow).



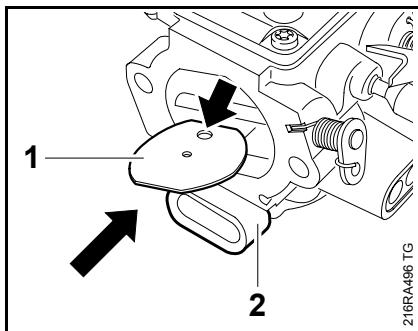
- Turn the choke shaft a little and pull out the choke shutter (1).



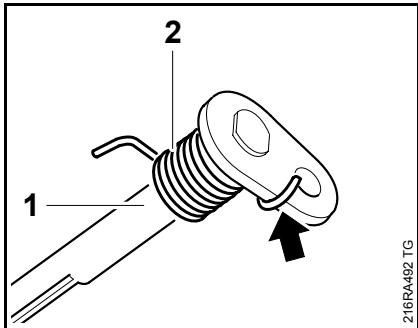
- Remove the E-clip (arrow) and washer.
- Pull out the choke shaft (1), disconnect and relax the torsion spring at the same time.



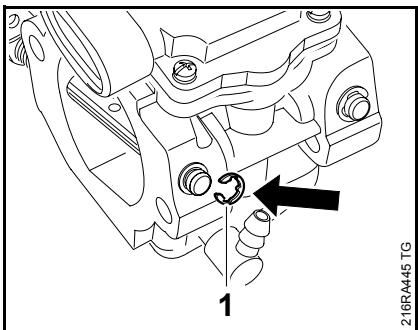
- Push the choke shaft (1) into the carburetor, making sure the torsion spring engages the recess (arrow).



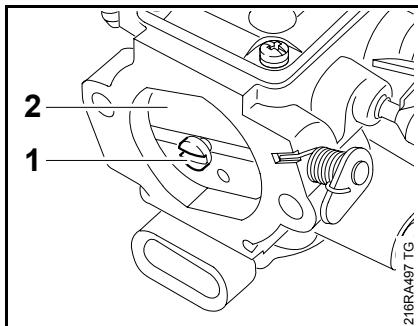
- Hold the choke shaft in the pre-tensioned position.
- Push the choke shutter (1), hole (small arrow) first, into the slot in the choke shaft so that the marking points towards the sleeve (2) (see illustration).



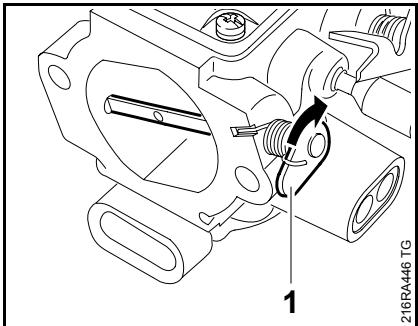
- Check the choke shaft (1) and torsion spring (2) and replace if necessary
- Note installed position (arrow) of the torsion spring (2).
- Clean the choke shaft and guides, **16**



- Fit the washer.
- Fit the E-clip (1).



- Coat the screw with threadlocking adhesive, **16**
- Fit new screw (1) and tighten it moderately.
- Close the choke shutter (2) and center it in the carburetor body's bore.
- Tighten down the screw firmly.
- Check freedom of movement.
- Reassemble all other parts in the reverse sequence.

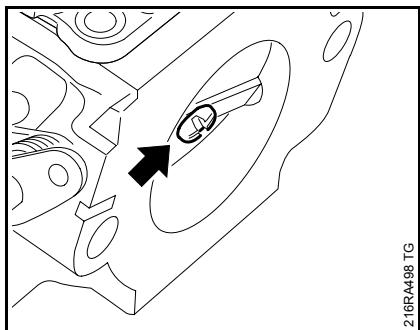


- Turn the choke shaft (1) clockwise until its flat side faces forwards.
- The choke shaft is now pre-tensioned.

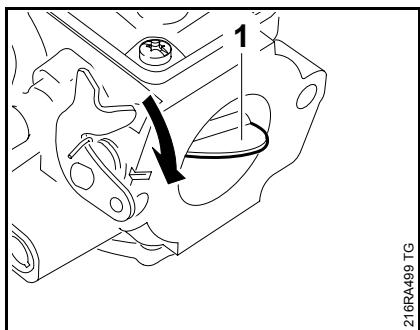
#### 14.5.6 Throttle Shaft / Throttle Shutter

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

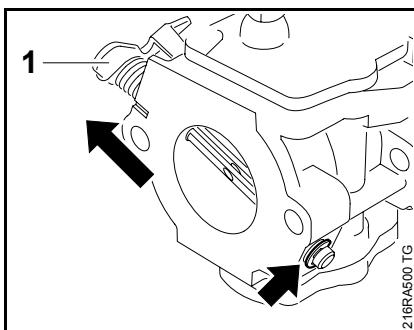
- Remove the carburetor, 14.3
- Carburetor troubleshooting, 4.6



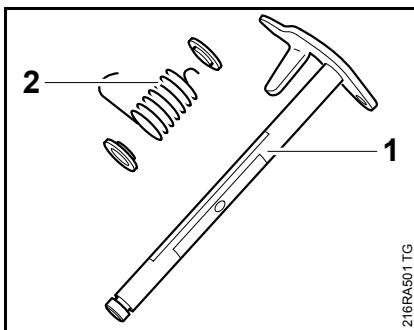
- Take out the screw (arrow).



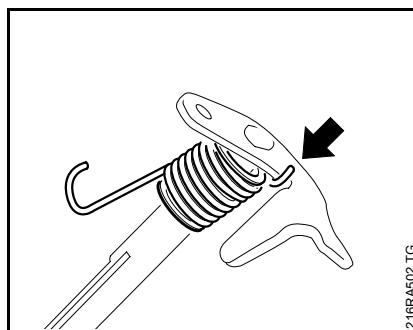
- Turn the throttle shaft a little and pull out the throttle shutter (1).



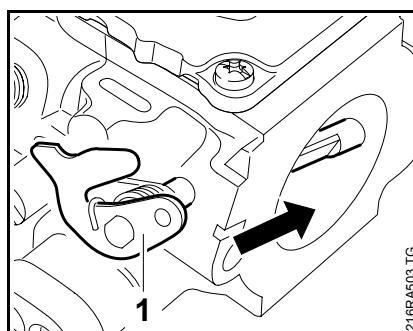
- Remove the E-clip (arrow) and washer.
- Pull out the throttle shaft (1), disconnect and relax the torsion spring at the same time.



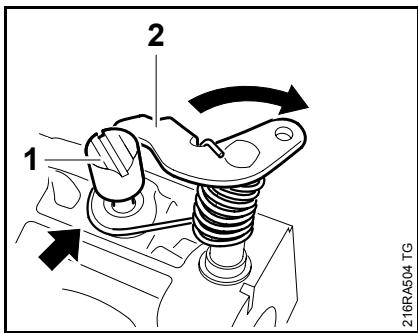
- Remove the torsion spring with bushings.
- Check the throttle shaft (1), torsion spring (2) and bushings and replace if necessary
- Clean the throttle shaft and guides, 16



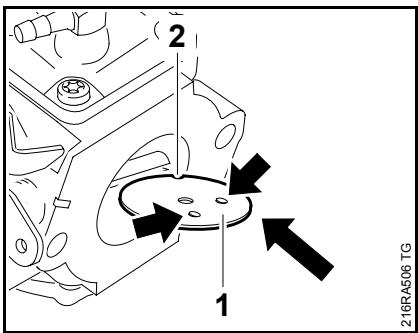
- Push the torsion spring with bushings into position – the bushings must engage the torsion spring.
- Note installed position (arrow) of the torsion spring.



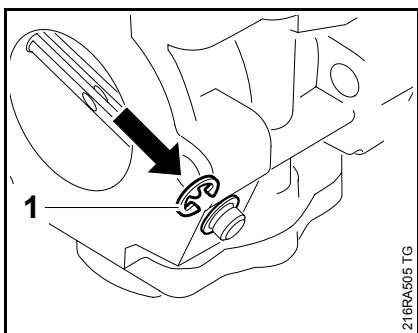
- Push the throttle shaft (1) with torsion spring into the carburetor at the same side as the adjusting screws.



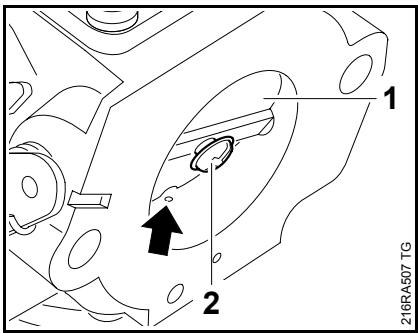
- Locate torsion spring against shoulder (arrow).
- Turn the throttle shaft clockwise until the lever (2) is above the idle speed screw (1) – the torsion spring is pre-tensioned.
- Push the throttle shaft fully home.



- Turn the throttle shaft a little and hold it in position.
- Push the throttle shutter (1), notch (2) first, into the slot in the throttle shaft so that the indentations (arrows) are above the throttle shaft.



- Fit the washer.
- Fit the E-clip (1).



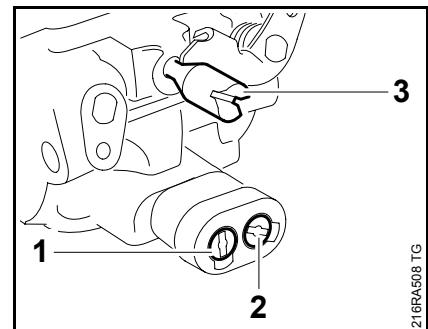
- Coat the screw with threadlocking adhesive, **16**
- Fit new screw (2) and tighten it moderately.
- Close the throttle shutter (1) and center it in the carburetor body's bore.

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

- Tighten down the screw firmly.

- Check freedom of movement.
- Reassemble all other parts in the reverse sequence.

#### 14.5.7 Adjusting Screws



There are three adjusting screws on the carburetor:

- H** = high speed screw (1)  
**L** = low speed screw (2)  
**LA** = idle speed screw (3)

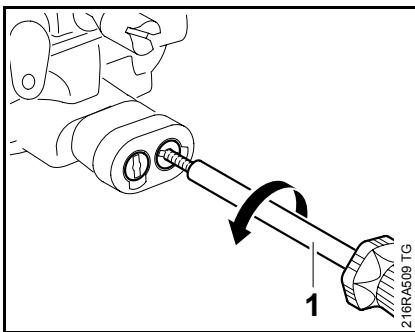
If the carburetor cannot be adjusted properly, the problem may be the adjusting screws.

The high speed screw **H** and low speed screw **L** have limiter caps, which have to be removed before the screws are removed.

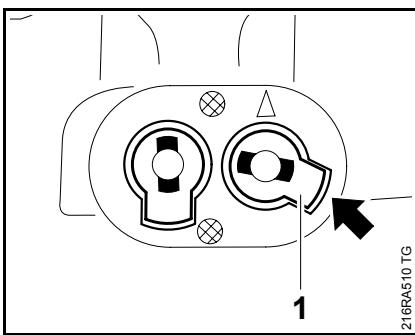
Always install new limiter caps.

- Remove the carburetor, **14.3**
- See also carburetor troubleshooting, **4.6**

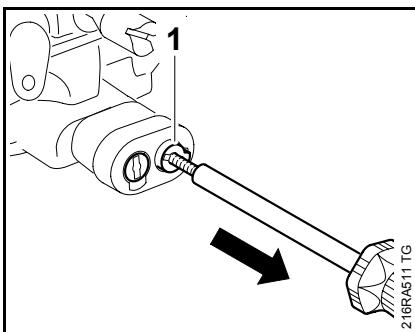
## Low speed screw



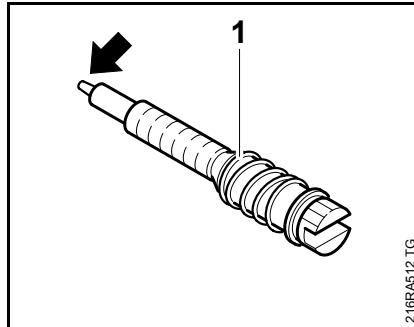
- Screw the puller (1) 5910 890 4500 counterclockwise into the limiter cap – left-hand thread.



- Rotate the limiter cap until the lug (1) is in line with the slot (arrow).



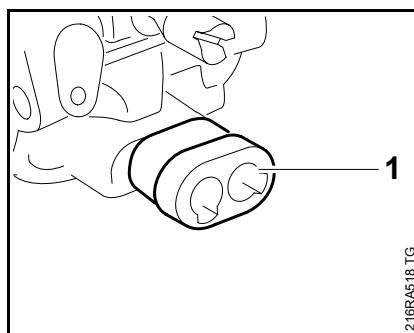
- Pull out the limiter cap (1).
  - Remove the low speed screw (L).



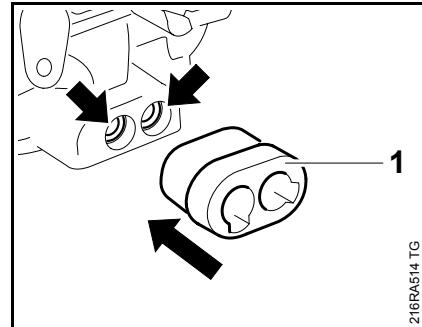
- Check the spring (1).
- Inspect the tip (arrow) for damage or wear and replace the low speed screw (L) if necessary.
  - Screw down the low speed screw (L) as far as stop.

### Carburetors with polymer housing

Sealing rings are fitted between the housing and carburetor on this version.

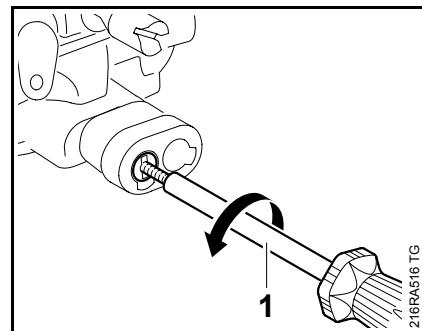


- Remove the low speed screw (L) and high speed screw (H).
- Remove the housing (1).
- Take out the sealing rings and install new ones.

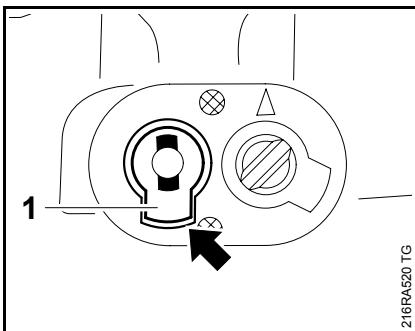


- Center the new sealing rings in the bores (arrows).
- Place the housing (1) in position and hold it there.
  - Screw down the low speed screw (L) and high speed screw (H) as far as stop.
  - Continue with the high speed screw.

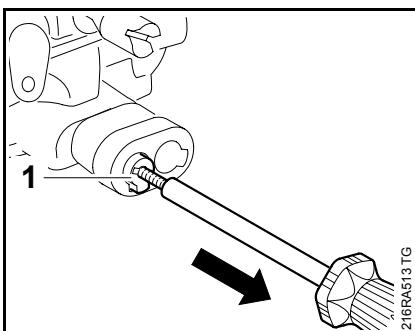
### High speed screw



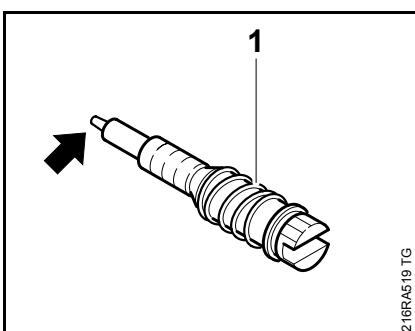
- Screw the puller (1) 5910 890 4500 counterclockwise into the limiter cap – left-hand thread.



- Rotate the limiter cap until the lug (1) is in line with the slot (arrow).



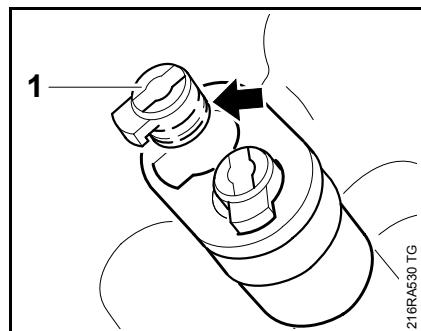
- Pull out the limiter cap (1).
- Take out the high speed screw (H).



- Check the spring (1).
- Inspect the tip (arrow) for damage or wear and replace the high speed screw (H) if necessary.

- Screw down the high speed screw (H) as far as stop.
- On carburetor versions with polymer housing, install new sealing rings – see low speed screw.
- Continue with installing limiter caps.

#### Pre-installing limiter caps



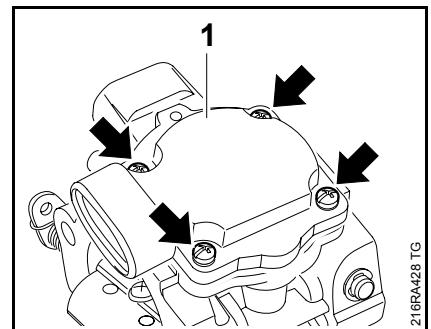
- Position the new limiter caps (1) so that the lugs are in line with the slots in the carburetor.
- Push the new limiter caps (1) into the adjusting screw holes as far as the first detent (arrow) – do not push fully home.

If the screwdriver 5910 890 2304 is not available, the basic setting must be carried out without pre-installed limiter caps.

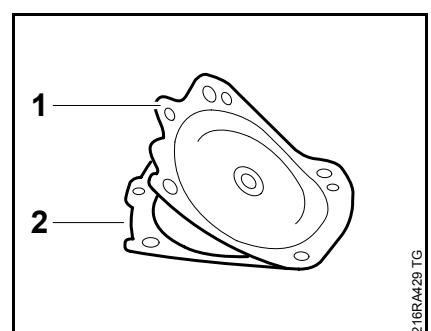
- Reassemble in the reverse sequence.
- Carry out basic setting, **4.6**

### 14.6 Servicing the Carburetor – Walbro Carburetor

#### 14.6.1 Metering Diaphragm



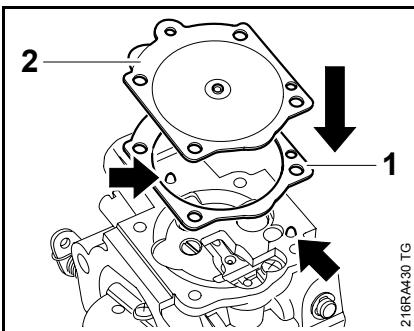
- Troubleshooting, **4.6**
- Remove the carburetor, **14.3**
- Take out the screws (arrows) with spring washers.
- Remove the end cover (1).
- If the gasket and diaphragm are stuck to the carburetor, remove them very carefully.



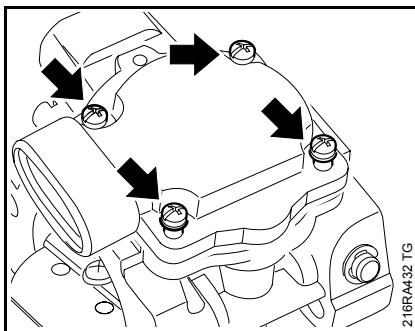
- Carefully separate the metering diaphragm (1) and gasket (2).

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.

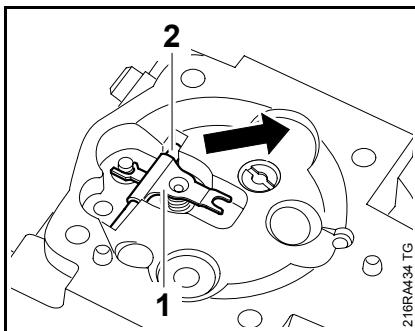
- Check the metering diaphragm for signs of damage and wear. Install a new gasket.



- Note installed positions of metering diaphragm (2) and gasket (1).
- Fit the gasket (1) and metering diaphragm (1) on the pegs (arrows).

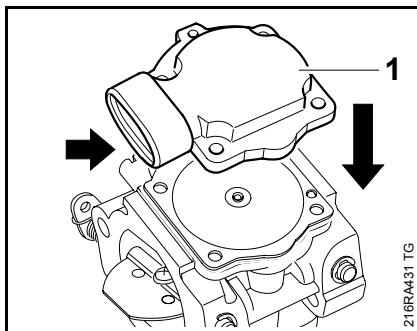


- Fit the screws (arrows) with spring washers.
- Check position of metering diaphragm and gasket, then tighten down the screws firmly in a crosswise pattern.
- Reassemble all other parts in the reverse sequence.



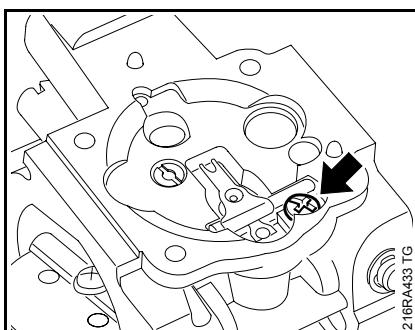
- Remove the inlet control lever (1) with spindle (2) out of the inlet needle's groove.

The small spring under the inlet control lever may pop out.

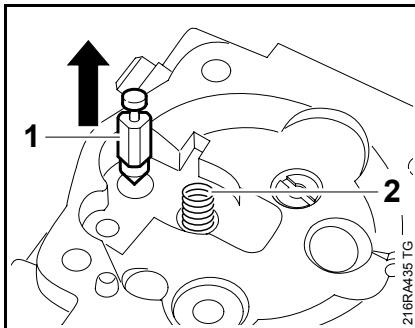


- Position the end cover (1) so that the stub (arrow) points in the direction of the choke shutter.
- Move the end cover (1) a little until the pegs on the carburetor body engage the holes in the end cover.

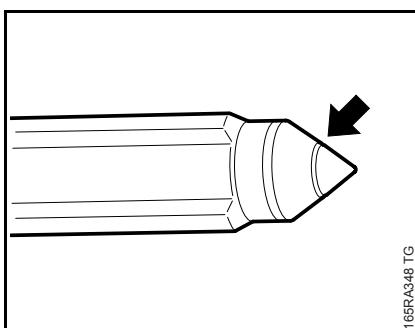
#### 14.6.2 Inlet Needle



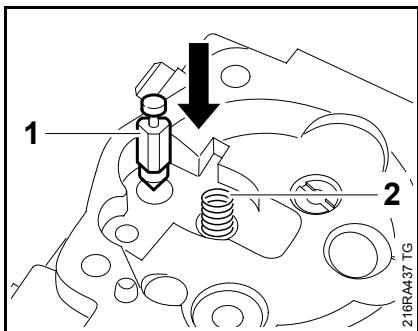
- Remove the metering diaphragm, 14.6.1
- Take out the screw (arrow).



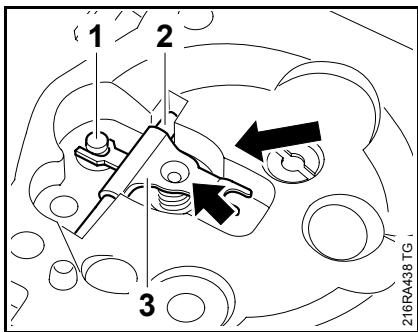
- Remove the inlet needle (1).
- Remove the spring (2). Inspect and replace if necessary.



- 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.

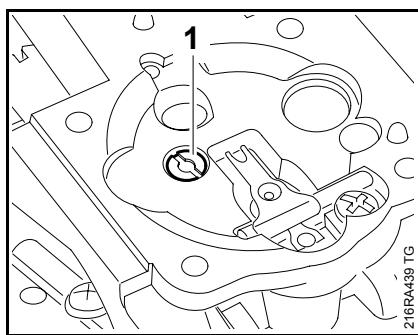


- Position the inlet control lever (3) with spindle (2) on the spring's seat (arrow) first, then slide the inlet control lever's clevis into the groove in the inlet needle (1).

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

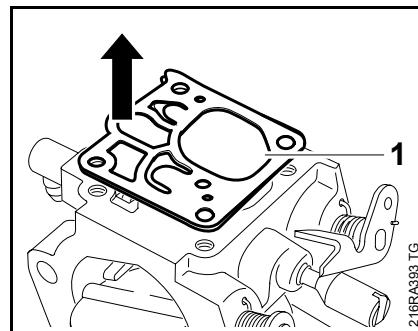
- Press the inlet control lever down and secure it with the screw.
- Check that inlet control lever moves freely.
- Install the metering diaphragm, **14.6.1**

### 14.6.3 Fixed Jet

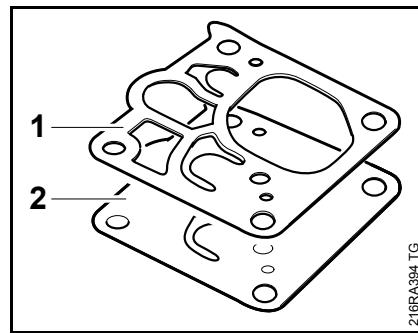


- Remove the metering diaphragm, **14.6.1**
  - Unscrew the fixed jet (1) with a suitable screwdriver.
- Take care not to damage the jet.

- Check the fixed jet and replace it if necessary
- Reassemble in the reverse sequence.



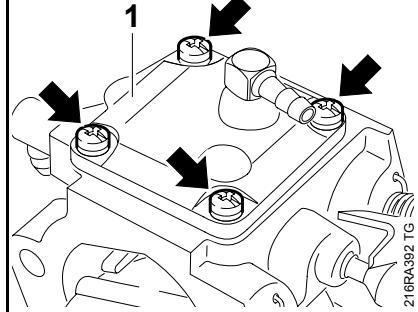
- Remove the pump diaphragm and gasket (1).



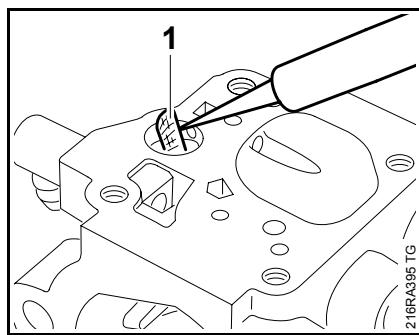
- Carefully separate the pump diaphragm (1) and gasket (2).

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.

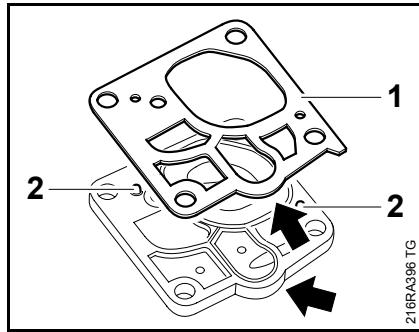
### 14.6.4 Pump Diaphragm



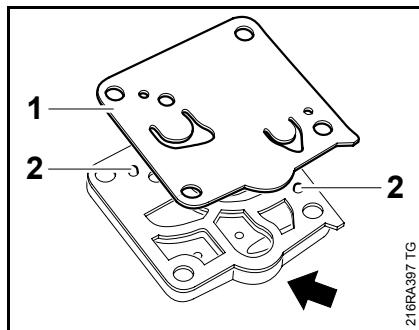
- Troubleshooting, **4.6**
- Remove the carburetor, **14.3**
- Take out the screws (arrows).
- Remove the end cover (1).
- If the gasket and pump diaphragm are stuck to the carburetor, remove them very carefully.



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

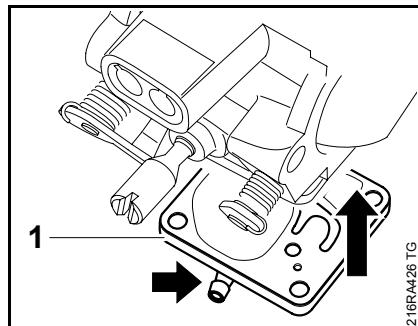


- Position the gasket (1) on the end cover so that the contours (arrows) are in alignment.
- Fit the gasket (1) over the pegs (2) – the gasket is held in position.



- Position the pump diaphragm (1) on the gasket so that the contours (arrows) are in alignment.

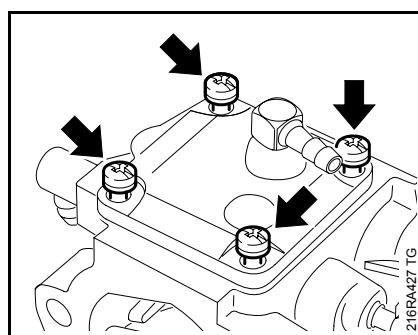
- Fit the pump diaphragm (1) on the pegs (2)
  - the pump diaphragm is held in position.



- Align the end cover (1) so that the nipple (arrow) points in the direction of the adjusting screws.

To ensure that the pump diaphragm and gasket do move out of position, fit the end cover (1) on the carburetor body from below.

- Move the end cover (1) a little until its pegs engage the holes in the carburetor body.

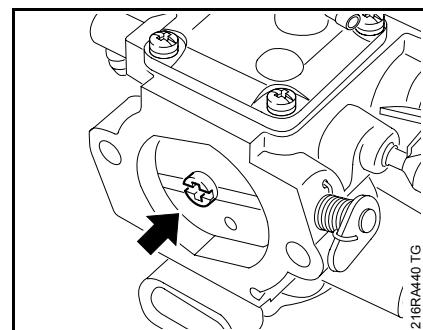


- Check that pump diaphragm and gasket are properly seated.
- Insert the screws (arrows) and tighten them down firmly.
- Reassemble all other parts in the reverse sequence.

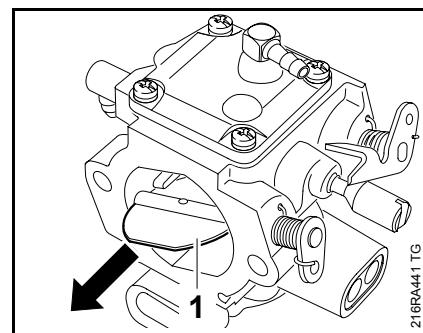
#### 14.6.5 Choke Shaft / Choke Shutter

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

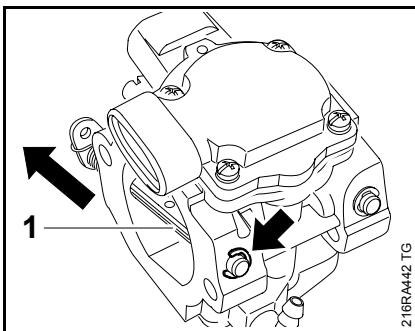
- Remove the carburetor, [14.3](#)
- Carburetor troubleshooting, [4.6](#)



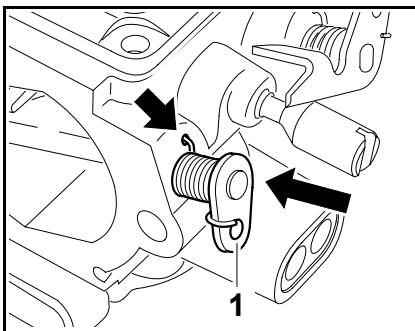
- Turn the choke shaft until the choke shutter is closed.
- Take out the screw (arrow).



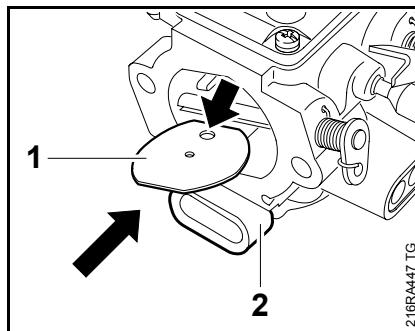
- Turn the choke shaft a little and pull out the choke shutter (1).



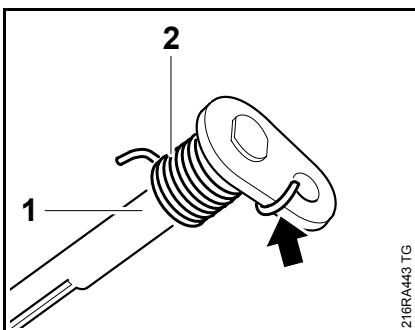
- Remove the E-clip (arrow).
- Pull out the choke shaft (1), disconnect and relax the torsion spring at the same time.



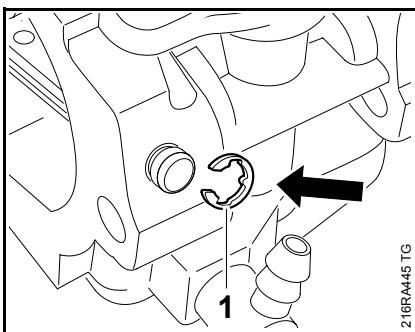
- Push the choke shaft (1) into the carburetor, making sure the torsion spring engages the hole (arrow).



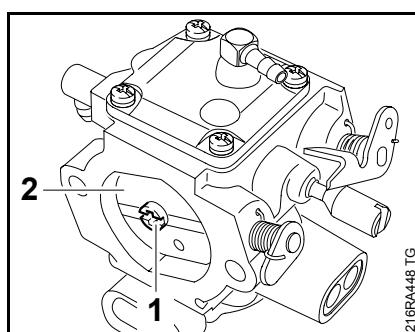
- Turn the choke shaft back a 1/4 turn and hold it in this pre-tensioned position.
- Push the choke shutter (1), hole (small arrow) first, into the slot in the choke shaft so that the digits point towards the sleeve (2) (see illustration).



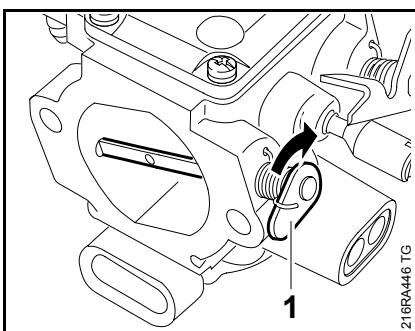
- Check the choke shaft (1) and torsion spring (2) and replace if necessary
- Note installed position (arrow) of the torsion spring (2).
- Clean the choke shaft and guides, **16**



- Fit the E-clip (1).



- Coat the screw with threadlocking adhesive, **16**
- Fit new screw (1) and tighten it moderately.
- Close the choke shutter (2) and center it in the carburetor body's bore.
- Tighten down the screw firmly.
- Check freedom of movement.
- Reassemble all other parts in the reverse sequence.

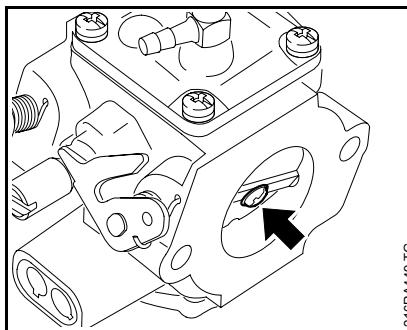


- Turn the choke shaft (1) clockwise until its flat side faces forwards.
- The choke shaft is now pre-tensioned.

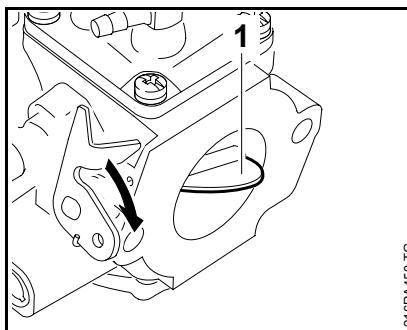
#### 14.6.6 Throttle Shaft / Throttle Shutter

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

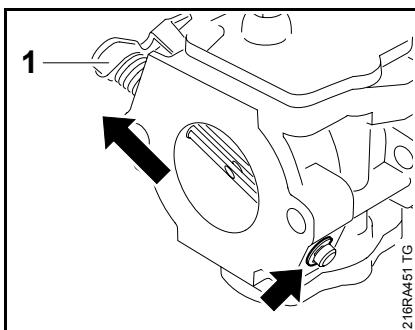
- Remove the carburetor, **14.3**
- Carburetor troubleshooting, **4.6**



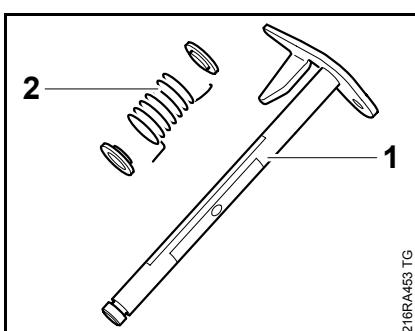
- Take out the screw (arrow).



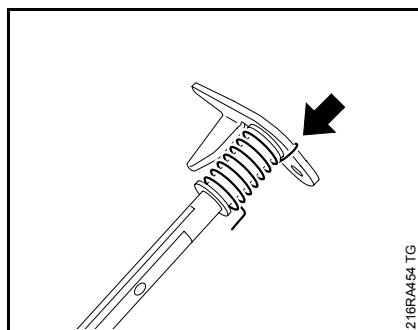
- Turn the throttle shaft a little and pull out the throttle shutter (1).



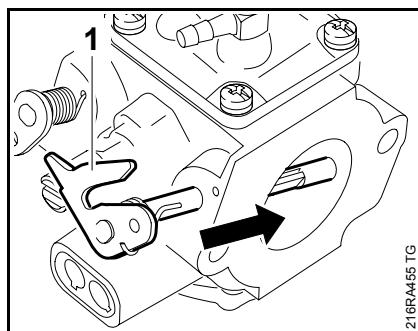
- Remove the E-clip (arrow).
- Pull out the throttle shaft (1), disconnect and relax the torsion spring at the same time.
- Clean the throttle shaft and guides, **16**



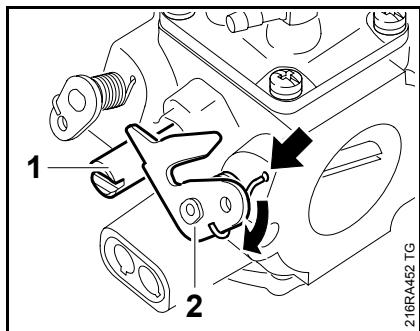
- Remove the torsion spring with bushings.
- Check the throttle shaft (1), torsion spring (2) and bushings and replace if necessary



- Push the torsion spring with bushings into position – the bushings must engage the torsion spring.
- Note installed position (arrow) of the torsion spring.

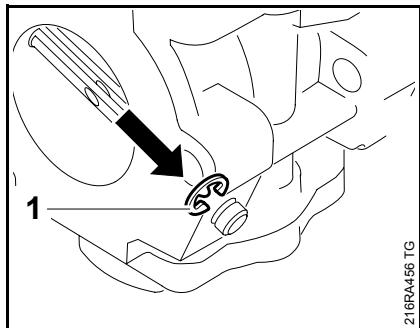


- Push the throttle shaft (1) with torsion spring into the carburetor at the same side as the adjusting screws.

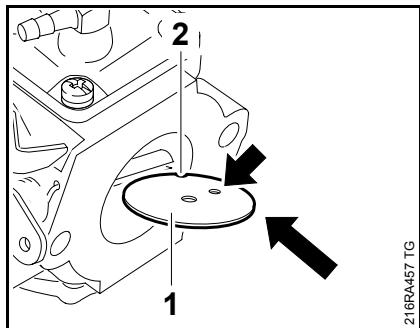


- Push the throttle shutter (1), notch (2) first, into the slot in the throttle shaft so that the hole (small arrow) is on the right.

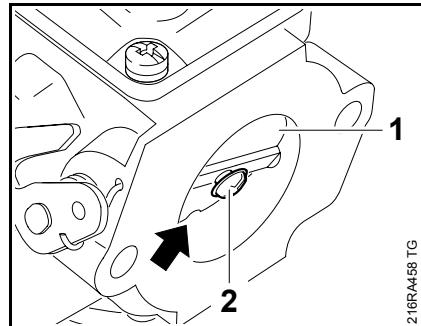
- Engage the torsion spring in the hole (arrow) – the torsion spring is held in position.
- Turn the throttle shaft clockwise until the lever (2) is above the idle speed screw (1) – the torsion spring is pre-tensioned.
- Push the throttle shaft fully home.



- Fit the E-clip (1).



- Turn the throttle shaft a little and hold it in position.

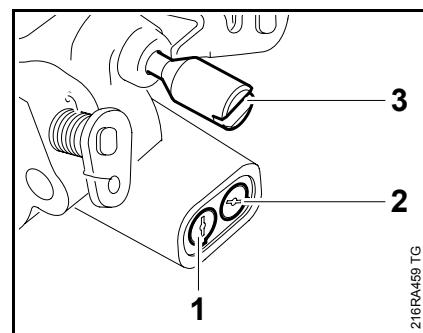


- Coat the screw with threadlocking adhesive, [16](#)
- Fit new screw (2) and tighten it moderately.
- Close the throttle shutter (1) and center it in the carburetor body's bore.

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

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

#### 14.6.7 Adjusting Screws



There are three adjusting screws on the carburetor:

**H** = high speed screw (1)  
**L** = low speed screw (2)  
**LA** = idle speed screw (3)

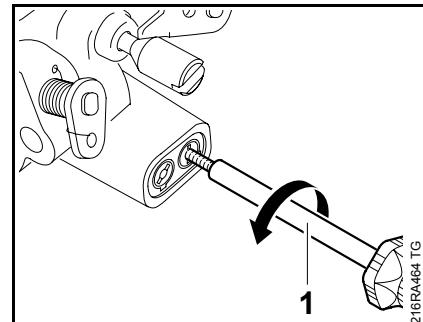
If the carburetor cannot be adjusted properly, the problem may be the adjusting screws.

The high speed screw **H** and low speed screw **L** have limiter caps, which have to be removed before the screws are removed.

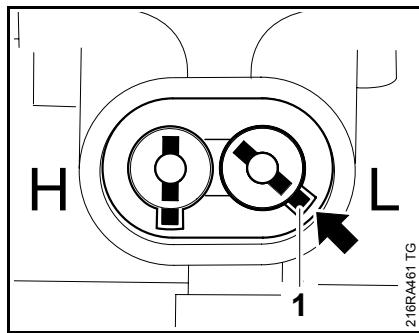
Always install new limiter caps.

- Remove the carburetor, [14.3](#)
- See also carburetor troubleshooting, [4.6](#)

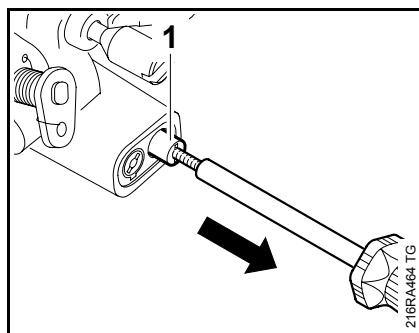
#### Low speed screw



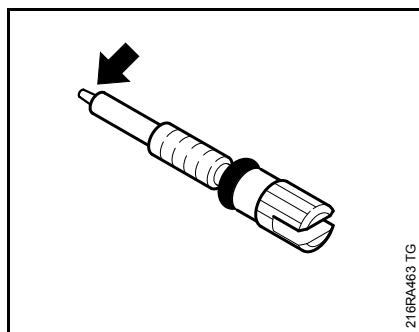
- Screw the puller (1) 5910 890 4500 counterclockwise into the limiter cap – left-hand thread.



- Rotate the limiter cap until the lug (1) is in line with the slot (arrow).

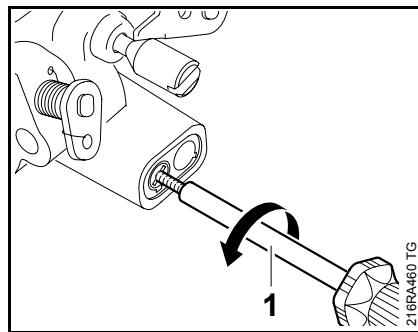


- Pull out the limiter cap (1).
- Remove the low speed screw L.

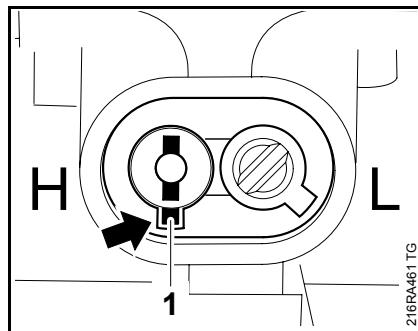


- Inspect the tip (arrow) for damage or wear and replace the low speed screw (L) if necessary.
- Screw down the low speed screw (L) as far as stop.
- Continue with the high speed screw.

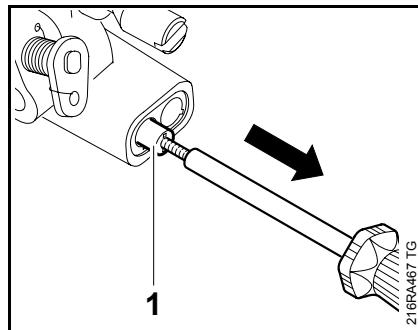
### High speed screw



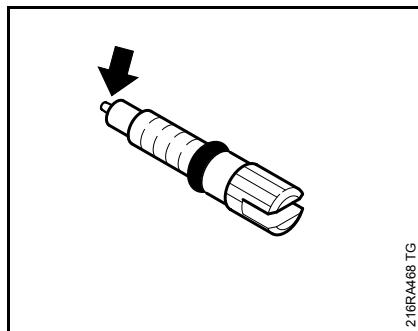
- Screw the puller (1) 5910 890 4500 counterclockwise into the limiter cap – left-hand thread.



- Rotate the limiter cap until the lug (1) is in line with the slot (arrow).

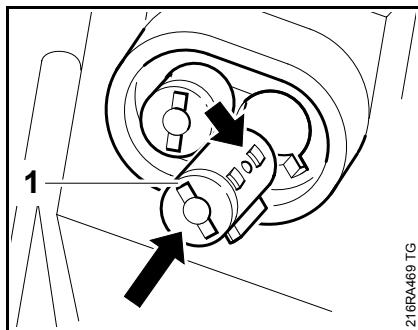


- Pull out the limiter cap (1).
- Take out the high speed screw (H).



- Inspect the tip (arrow) for damage or wear and replace the high speed screw (H) if necessary.
  - Screw down the high speed screw (H) as far as stop.
  - Continue with installing limiter caps.

## Pre-installing limiter caps



- Position the new limiter caps (1) so that the lugs are in line with the slots in the carburetor.
- Push the new limiter caps (1) into the adjusting screw holes as far as the first detent (arrow)  
– do not push fully home.

If the screwdriver 5910 890 2304 is not available, the basic setting must be carried out without pre-installed limiter caps.

- Reassemble in the reverse sequence.
- Carry out basic setting, **14.7.1**

## 14.7 Adjusting the Carburetor

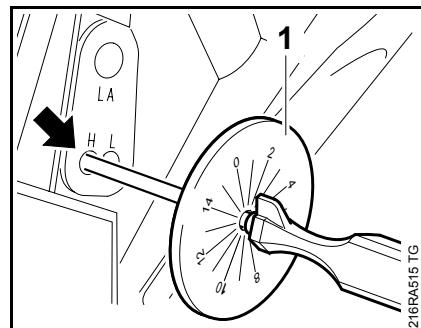
### 14.7.1 Basic Setting

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 caps.

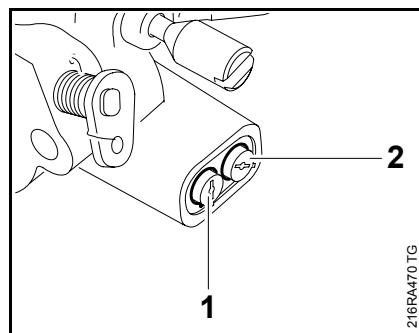
The carburetor, air filter and grommet are installed, the adjusting screws fitted and the new limiter caps pre-installed.

- Check chain tension and adjust if necessary.
- Inspect the spark arresting screen (if fitted) and clean or replace if necessary, **8.1** or **8.2**
- Check the air filter and clean or replace if necessary, **14.1**



- Push the screwdriver (1) 5910 890 2304 through the opening (arrow) and the pre-installed limiter caps on the high speed screw (**H**) and low speed screw (**L**).

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



For the sake of clarity the adjusting screws with pre-installed limiter caps are shown on a carburetor without ancillaries.

- Starting with the high speed screw **H** (1) against its seat, open it counterclockwise, **1 full turn** **on Tillotson carburetors** or **1.5 turns** **on Walbro carburetors**  
– this is the basic setting.
- Starting with the low speed screw **L** (2) against its seat, open it **1 full turn** counterclockwise  
– this is the basic setting.
- Warm up the engine.

The setting disc 5910 893 6600 may be fitted on the screwdriver 5910 890 2304 to aid adjustment.

1. Adjust engine speed with idle speed screw (**LA**), to 3,300 rpm on **Tillotson carburetor** or 3,500 rpm on **Walbro carburetor**.

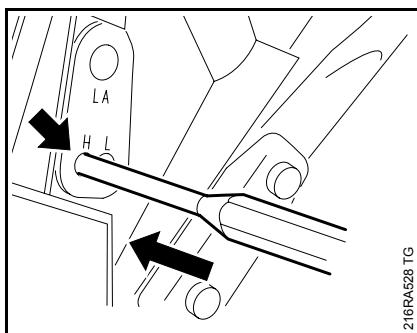
2. Turn the low speed screw (**L**) counterclockwise or clockwise to obtain maximum engine speed.

If this speed is higher than 3,700 rpm, abort the procedure and start again with step 1.

3. Use the idle speed screw (**LA**), to set the engine idle speed again, to 3,300 rpm on **Tillotson carburetor** or 3,500 rpm on **Walbro carburetor**.

4. Use the low speed screw (**L**) to set engine speed to 2,700 rpm.

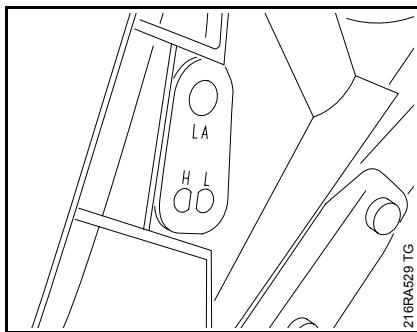
5. Use the high speed screw (**H**) to set the maximum engine speed to 11,000 rpm.



- Insert a suitable drift through the opening (arrow) and push home the limiter caps until they are flush with the carburetor body.

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

#### 14.7.2 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.
- Inspect the spark arresting screen (if fitted) and clean or replace if necessary, **8.1** or **8.2**

- 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 a 1/4 turn.

Check running behavior:

- Warm up the engine.

The engine must idle and accelerate smoothly.

#### Adjusting engine idle speed

- Carry out standard setting.
- Warm up the engine.

#### Engine stops while idling

- 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 runs while engine is idling

- 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.

- Warm up the engine.
- 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.
- Warm up the engine.
- Turn the high speed screw (**H**) clockwise (leaner) – no further than stop.

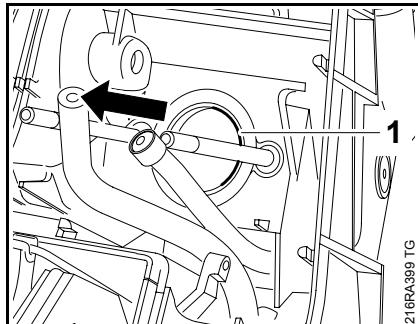
Turn the adjusting screws only very slightly. Even minor adjustments can noticeably affect engine running behavior.

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

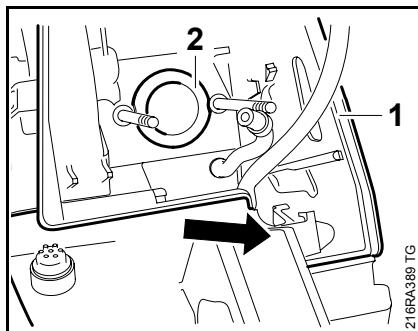
### 14.7.3 Intake Manifold – Removing and Installing

A damaged intake manifold can cause engine running problems.

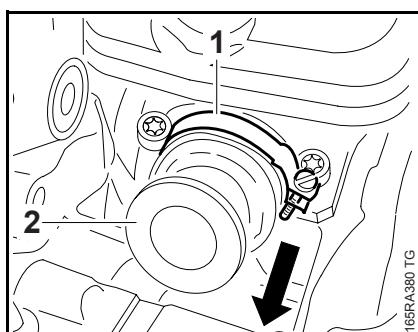
- Troubleshooting, **4.6** or **4.7**
- Remove the shroud, **8.6**
- Disconnect the short circuit and ground wires from the switch shaft and contact spring and remove the wiring harness from the tank housing,  
earlier version **9.6.2**,  
latest version **9.6.3**
- Remove the carburetor, **14.3**
- Remove the antivibration system mounting screws, **11**



- Remove the sleeve (1).



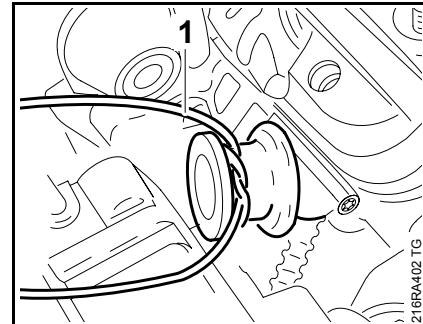
- Pull the tank housing (1) out slightly and push the manifold flange (2) out of the tank housing in the direction of the cylinder at the same time.
- Pull the impulse hose off the connector.
- Pull out the tank housing (1).



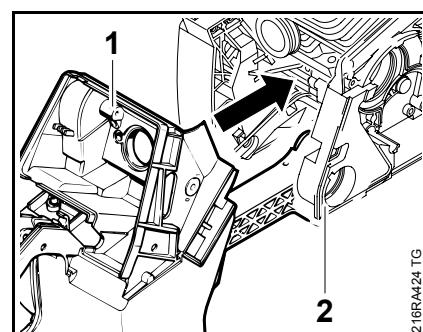
- Loosen and remove the hose clamp (1).
- Pull off the intake manifold (2).
- Inspect the intake manifold (2) and replace it if necessary – even very minor damage can result in engine running problems, **4.7**
- Coat manifold flanges with STIHL press fluid, **16**

### Installing

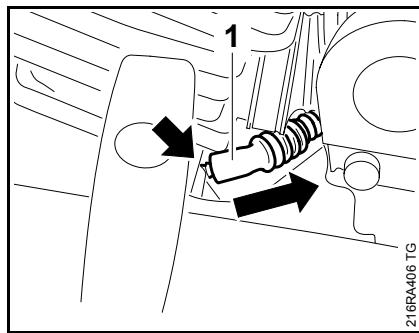
- Push on the intake manifold, line it up and secure it in position, **8.7**



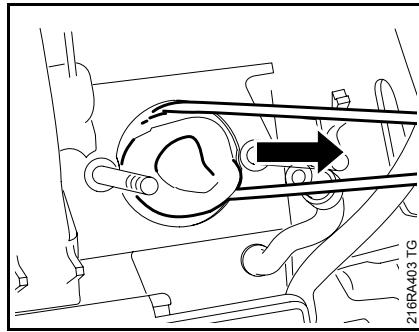
- To pull the manifold flange through the intake opening in the tank housing, wind a piece of string (1) (about 15 cm long) around the back of the flange and pass the ends of the string through the opening.
- Position the manifold flange against the tank housing.



- Slide the tank housing (1) into the crankcase (2).

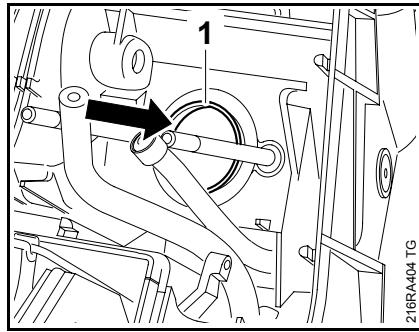


- Push the impulse hose (1) on to the connector (arrow).



- Use the string to pull the manifold flange through the opening.

This method ensures that the manifold flange is pulled into place without any damage.

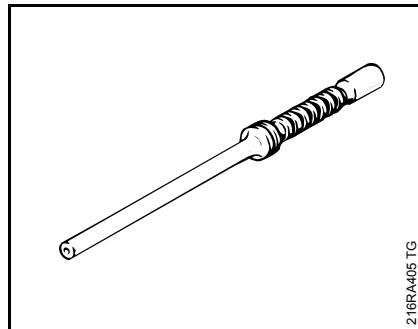


- Remove the string.
- Fit the sleeve (1).

When reassembling, check that all wires are properly seated in their guides.

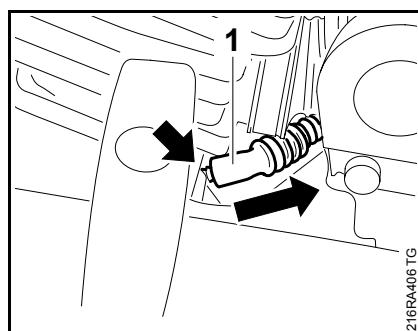
- Reassemble all other parts in the reverse sequence.
- Tightening torques, **3.5**

#### 14.7.4 Impulse Hose

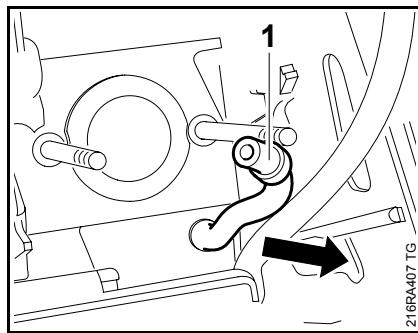


A damaged impulse hose can result in engine running problems.

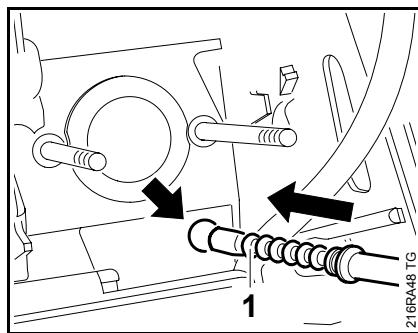
- Remove the carburetor, **14.3**
- Remove the antivibration system mounting screws, **11**
- Push the manifold flange out of the tank housing, and pull the tank housing out slightly.  
**14.9.3**



- Pull the impulse hose (1) off the connector (arrow).

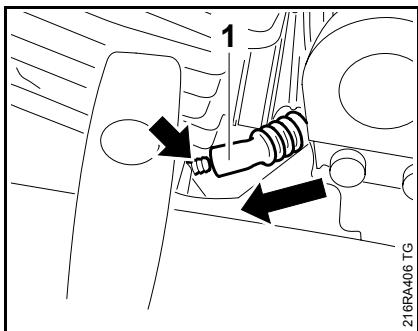


- Pull the impulse hose (1) out of the tank housing in the direction of the throttle trigger.
- Examine the impulse hose and replace it if necessary – take the sleeve off the old hose and fit it on the new one.



- Push the impulse hose (1) through the hole (small arrow) and pull it in until its rubber lip is properly seated.

- Coat with STIHL press fluid, **16**



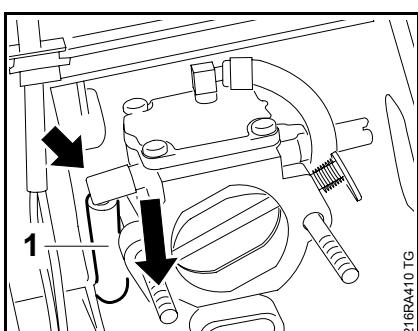
- Push the impulse hose (1) on to the connector (arrow).
- Connect the impulse hose to the carburetor, **14.3**
- Reassemble all other parts in the reverse sequence.

## 14.8 Tank Vent

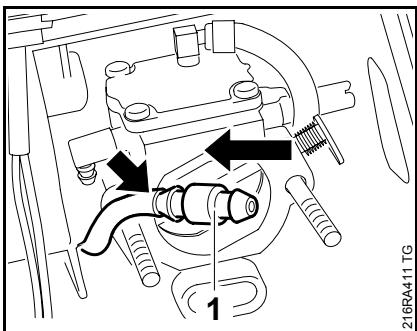
### 14.8.1 Testing

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.

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

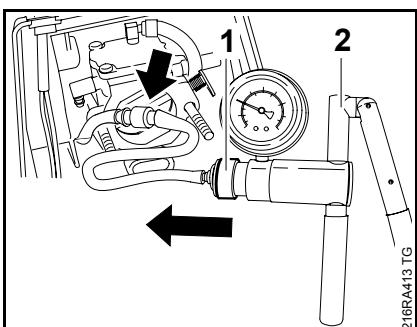


- Pull the fuel hose (1) off the stub (arrow).



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

### Vacuum test

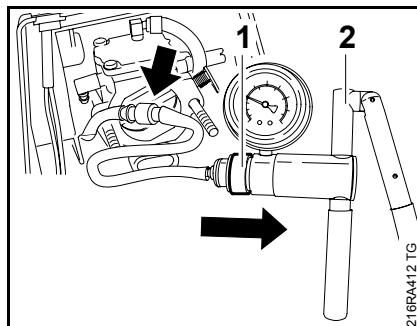


- Push the ring (1) to the left and connect the pump (2) 0000 850 1300 to the nipple (arrow)
- subject the fuel tank to a vacuum.

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, install a new tank vent or tank, **14.8** or **14.9.3**

### Pressure test

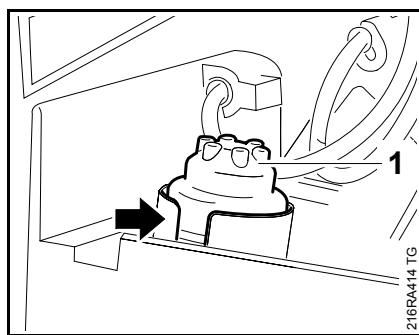


- Push the ring (1) to the right and connect the pump (2) 0000 850 1300 to the nipple (arrow)
- pressurize the fuel tank.

- 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.

## 14.8.2 Removing and Installing



- Remove the carburetor box cover, **14.1**
- Pry out the tank vent (1) at the recess (arrow).

Always install a new tank vent.

- Coat sealing ring of new tank vent with STIHL press fluid, **16**
- Press the new tank vent into the bore as far as stop.
- Reassemble all other parts in the reverse sequence.

## 14.9 Fuel Intake

### 14.9.1 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.

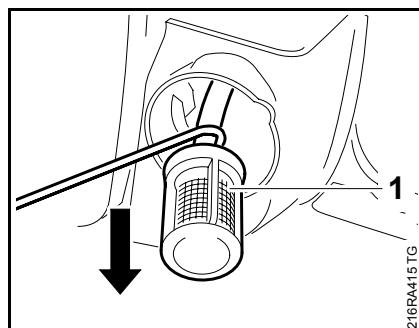
In the event of problems with the fuel supply system, always check the fuel tank and the pickup body first.

- 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**

Use only unleaded fuel in machines with a catalytic converter.

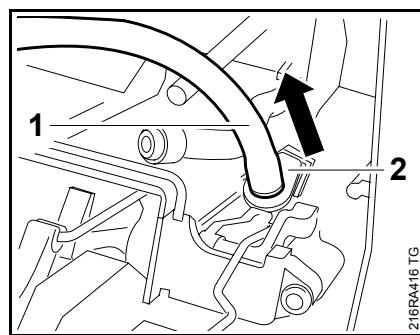


- Open the tank cap.
- Use hook 5910 893 8800 to remove the pickup body (1) from the fuel tank.

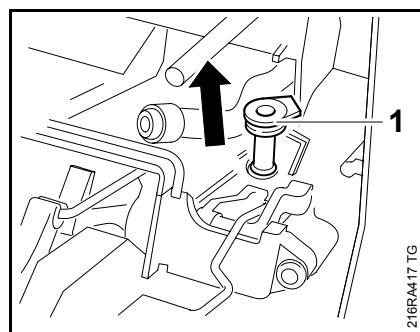
Do not overstretch the fuel hose.

- Pull off the pickup body (1), check it and replace if necessary.
- Reassemble in the reverse sequence.

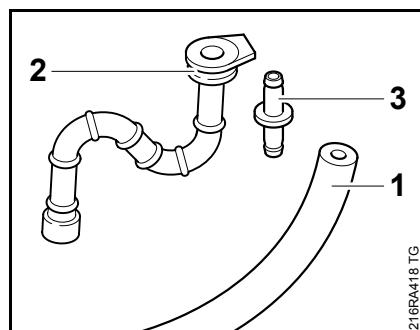
### 14.9.2 Fuel Hose



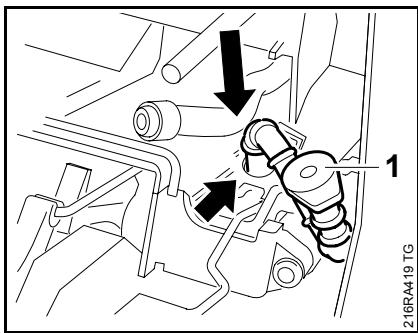
- Remove the carburetor, **14.3**
- Remove the pickup body, **14.9.1**
- Pull the fuel hose (1) with connector out of the fuel suction hose (2).



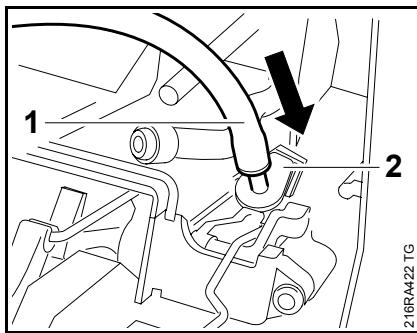
- Pull the fuel suction hose (1) out of the fuel tank.



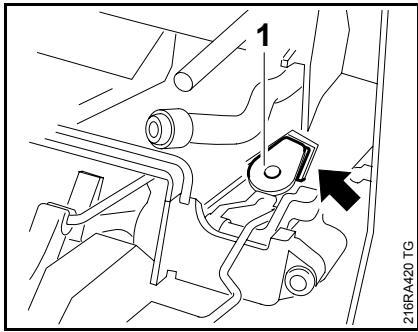
- Inspect the fuel hose (1), fuel suction hose (2) and connector (3) and replace as necessary.



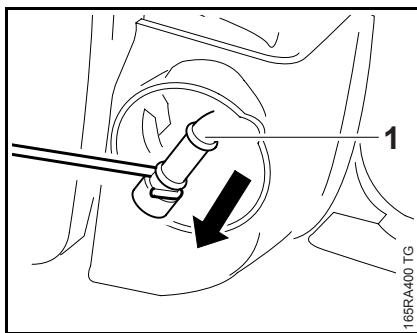
- Push the fuel hose (1) through the bore (arrow) in the fuel tank.



- Push the fuel hose (1) with connector into the fuel suction hose (2).



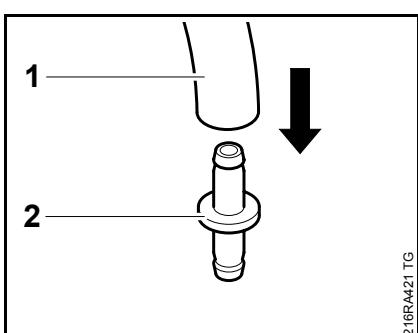
- Line up the fuel suction hose (1) and push it into the housing bore – the flange must engage the guide (arrow).
- Coat with STIHL press fluid, **16**



- Use hook 5910 893 8800 to pull the fuel suction hose (1) out of the fuel tank.

Do not overstretch the fuel suction hose.

- Fit the pickup body, **14.9.1**
- Close the tank cap.

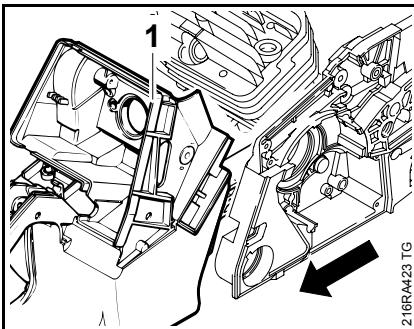


- Push the fuel hose (1) onto the connector (2).

### 14.9.3 Tank Housing – Removing and Installing

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 handlebar, **11.8**
- Remove the carburetor, **14.3**
- Remove the antivibration system mounting screws, **11**
- Push the manifold flange out of the tank housing and pull the impulse hose off the connector, **14.7.4**
- Remove the control levers, **12**
- Remove the short circuit wire, **9.2.1** or **9.2.2**



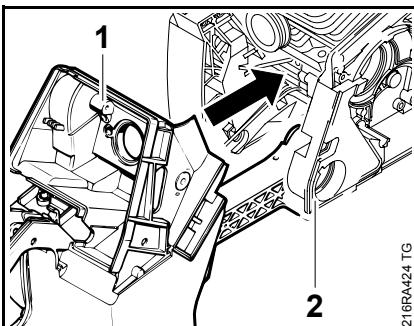
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- Pull out the tank housing (1).

- Inspect the tank housing and replace if necessary

Only transfer those parts from the old tank housing that are not included with the replacement – see parts list.

- Check condition of parts before re-using and replace as necessary.



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- Fit the front end (2) of the tank housing (1) between the two halves of the crankcase and line it up with annular buffer bores.

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

## 15. Special Servicing Tools

No.	Description	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	Hook	5910 890 2800	Detaching springs on clutch shoes	
4	Assembly tube	1117 890 0900	Attaching springs	
5	Locking strip	0000 893 5903	Blocking the crankshaft	
6	Stud puller	5910 893 0506	Removing bar mounting studs	
7	Pump	0000 850 1300	Testing engine and carburetor for leaks	
8	Flange	1124 850 4205	Leakage test	
	- Plug for leakage test	1122 025 2200	Leakage testing decompression valve	
	- Nipple	0000 855 9200	Testing carburetor for leaks	
	- Hose for leakage test	1110 141 8600	Testing carburetor for leaks	
	- Sleeve	1124 893 7100	Testing carburetor for leaks	
9	Puller	5910 890 4400	Removing oil seal(s)	
	- Jaws (No. 2)	0000 893 3700	Removing oil seal(s)	
	- Jaws (No. 3.1)	0000 893 3706	Removing oil seal(s)	
10	Sealing plate	0000 855 8106	Sealing the exhaust port	
11	Test flange	1106 850 4201	Sealing cylinder exhaust port	
12	Installing sleeve	1124 893 4600	Protects oil seal at clutch side	
13	Press sleeve	1127 893 2400	Installing oil seals	
14	Clamping strap	0000 893 2600	Compressing the piston rings	
15	Wooden assembly block	1108 893 4800	Supporting the piston	
16	Service tool AS (set)	5910 890 2205	Removing and installing crankshaft (clutch side)	
	- Screw sleeve	5910 893 2409	Pulling two halves of crankcase together	
17	Service tool ZS (set)	5910 007 2200	Removing and installing crankshaft (ignition side)	
	- Drilled plate	5910 893 2101	Add-on for service tool	
	- Screw sleeve	5910 893 2421	Installing crankshaft	
18	Assembly drift	1111 893 4700	Removing and installing the piston pin	
19	Installing tool 13	5910 890 2213	Installing hookless snap rings in piston	
20	Setting gauge	1111 890 6400	Adjusting air gap between the ignition module and flywheel	
21	Ignition system tester, ZAT 4	5910 850 4503	Testing ignition system	
22	Ignition system tester, ZAT 3	5910 850 4520	Testing ignition system	
23	Puller	1106 890 4501	Releasing flywheel	
24	Hook	5910 893 8800	Removing pickup body	

No.	Description	Part No.	Application	Rem.
25	Screwdriver - Setting disk	5910 890 2304 5910 893 6600	Adjusting the Carburetor Adjusting the Carburetor	
26	Puller	5910 890 4500	Removing limiter cap	
27	Installing plate	1124 893 5100	Installing oil pump oil seal	
28	Base	1124 893 5200	Supporting oil pump housing	
29	Press arbor	1127 893 2400	Removing and installing ball bearing (ignition side)	
30	Press arbor	1124 893 7200	Removing and installing ball bearing (clutch side)	
31	Torque wrench	5910 890 0302	0.5 to 18 Nm	
32	Torque wrench	5910 890 0312	6 to 80 Nm	
33	Screwdriver bit T 27 x 125	0812 542 2104	Removing and installing spline socket screws with electric or pneumatic screwdrivers; tightening down screws with torque wrench	
34	T-handle screwdriver T 27 x 150	5910 890 2400	IS-P screws (4 mm)	1
35	Socket, 17 mm	5910 893 5610	Flywheel nut	
36	Socket, 21 mm	5910 893 5615	Removing and installing the clutch	

**Remarks:**

- 1) Use for releasing only.

## 16. Servicing Aids

No.	Description	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 components, AV buffers
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	
	Medium-strength threadlocking adhesive (Loctite 243)	0786 110 0101	
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



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