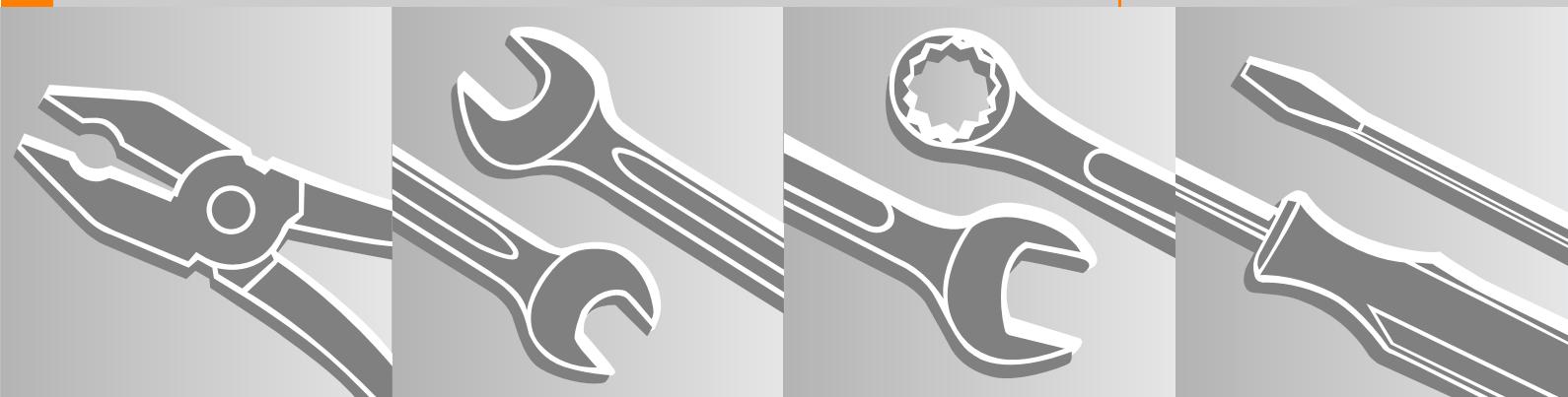


STIHL®

STIHL MS 311, 391

2009-06



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1. Introduction and Safety Precautions

1.1 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:

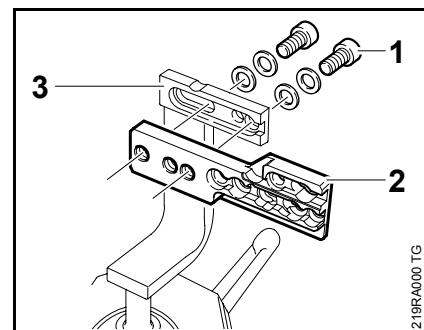
In the descriptions:

- 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.

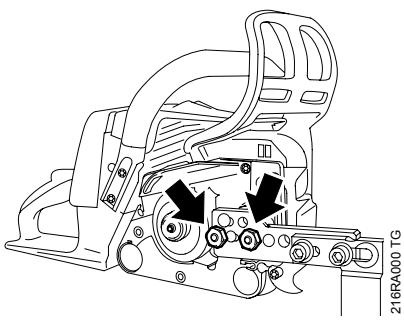


219R400 TG

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 machine 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.

1.2 Safety Precautions

If the machine 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.

Always replace damaged parts. Check disassembled parts for wear or damage before re-installing – replace as necessary.

Run the machine only with the shroud mounted in position – there is otherwise a risk of injury from the fanwheel and a risk of engine damage due to overheating.

The chapter on tightening torques lists all machine components that have to be tightened to a specific torque or coated with threadlocking adhesive. The specifications must be maintained when tightening down screws, nuts and other fasteners in all the procedures described in this service manual.

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 can be overstretched during removal.

Install new fuel hoses either dry or with the aid of STIHL press fluid, 14.

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, 14.

2. Specifications

2.1 Engine

	MS 311	MS 391
Displacement:	59 cm ³	64.1 cm ³
Bore:	47 mm	49 mm
Stroke:	34 mm	34 mm
Engine power to ISO 7293:	3 kW (4 bhp) at 9,500 rpm	3.2 kW (4.4 bhp) at 9,500 rpm
Maximum permissible engine speed with guide bar and chain:	13,000 rpm	13,000 rpm
Idle speed:	2,800 rpm	2,800 rpm
Clutch:	Centrifugal clutch without linings	Centrifugal clutch without linings
Clutch engages at:	3,500 rpm	3,500 rpm
Engine housing leakage test at gauge pressure: under vacuum:	0.5 bar 0.5 bar	

2.2 Fuel System

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

2.3 Ignition System

Air gap between ignition module and fanwheel:	0.20...0.30 mm
Spark plug (resistor type):	NGK BPMR 7 A BOSCH WSR6F
Electrode gap:	0.5 mm

2.4 Chain Lubrication

Speed-controlled oil pump with reciprocating piston and manual flow control	
Oil delivery rate: Ematic oil pump	11.5 (+2.5) cm ³ /min at 10,000 rpm
Oil delivery rate: Adjustable oil pump	6.0 (+/-2.0)...17.5 (+3.0 / -4.5) cm ³ /min at 10,000 rpm

2.5 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	P 4x14	Chain tensioner cover/engine housing	1.5	
Screw	P 4x12	Brake band/engine housing	2.0	
Collar screw	M 10	Collar stud for bar / engine pan	30.0	1)
Collar screw	D 8x24	Collar stud for bar / engine housing	16.0	
Screw	P 5x16	Cover, chain brake / engine housing	4.0	
	M 10x1	Decompression valve	14.0	
Screw	P 5x16	Handlebar/plug, AV spring	3.0	
Screw	P 6x26.5	Handlebar / tank housing, right (polymer)	7.0	
Screw	P 6x26.5	Handlebar / tank housing, bottom (polymer)	7.0	
Screw	P 6x25	Hand guard / fan housing	8.0	
Screw	M 6x30	Shroud / engine housing	10.0	
Screw	P 6x38	Chain catcher / bearing plug	6.0	
Screw	P 5x16	Spiked bumper / engine housing	4.0	
Screw	M 4x12	Manifold/cylinder	4.0	3)
Screw	P 6x21.5	Bearing plug / engine housing	6.0	
Screw	M 5x16	Bearing plug/cylinder	10.0	4)
Screw	P 5x20	Fan housing / engine housing	4.0	
Screw	P 4x12	Air baffle / engine housing	2.0	
Carrier	M 12x1 LH	Carrier / crankshaft	50.0	
Screw	M 6x25	Engine housing / cylinder, stage 1	4.0	3)
Screw	M 6x25	Engine housing / cylinder, stage 2	12.0	3)
Screw	D 4x18	Oil pump	4.0	3)
Screw	M 5x16	Muffler / cylinder	10.0	1) 3)
Screw	M 8x1	Flywheel/crankshaft	33.0	5)
Nut	M 5	Carburetor/collar stud	3.5	
Screw	P 4x14	Pre-separator / engine housing	2.0	
Screw	P 4x12	Cover plate/fan housing	2.0	
Spark plug	M 14x1.25	Spark plug	25.0	
Screw	D 4x18	Ignition module / engine pan	4.0	3)

Remarks:

- 1) Loctite 242 or 243, medium strength
 - 2) Loctite 648, high strength
 - 3) Screws with antifriction coated binding head
 - 4) Screws with micro-encapsulated binding head
 - 5) Degrease crankshaft/flywheel and mount oil-free
-

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

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

Coat micro-encapsulated screws with medium-strength threadlocking adhesive before re-installing.

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

Power screwdriver setting for polymer: 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.

3. Troubleshooting

3.1 Clutch

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

3.2 Chain Drive, Chain Brake, Chain Tensioner

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

3.3 Chain Lubrication

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

Condition	Cause	Remedy
Chain receives no oil	Oil tank empty	Fill up with oil and check setting of oil pump if necessary
	Oil inlet hole in guide bar is blocked	Clean oil inlet hole
	Intake hose or pickup body clogged or intake hose ruptured	Fit new intake hose and pickup body
	Valve in oil tank blocked	Clean or replace valve
	Teeth on worm worn	Install new worm
	Worm drive spring broken	Install new worm
	Oil pump damaged or worn	Install new oil pump
Machine losing chain oil	Oil pump body damaged	Install new oil pump
	Oil pump damaged or worn	Install new oil pump
	Oil intake hose connection damaged	Install new oil intake hose
Oil pump delivers insufficient oil	Oil pump worn	Install new oil pump
	Worm drive spring not engaged in clutch drum	Engage drive spring in notch in clutch drum
	Oil pump delivery rate set too low	Adjust oil pump (only on version with adjustable oil pump)

3.4 Rewind Starter

Condition	Cause	Remedy
Starter rope broken	Rope pulled out too vigorously as far as stop or over edge, i.e. not vertically	Fit new starter rope
	Normal wear	Fit new starter rope
Starter rope does not rewind	Very dirty or corroded	Clean or replace rewind spring
	Insufficient spring tension	Check rewind spring and increase tension
	Rewind spring broken	Fit new rewind spring
Starter rope cannot be pulled out far enough	Spring overtensioned	Check rewind spring and reduce tension
Starter rope can be pulled out almost without resistance (crankshaft does not turn)	Guide peg on pawl or pawl itself is worn	Fit new pawl
	Spring clip on pawl fatigued	Fit new spring clip
Starter rope is difficult to pull or rewinds very slowly	Starter mechanism is very dirty	Thoroughly clean complete starter mechanism
	Lubricating oil on rewind spring becomes viscous at very low outside temperatures (spring windings stick together)	Coat rewind spring with a 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

3.5 Ignition System

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

Condition	Cause	Remedy
Engine runs roughly, misfires, temporary loss of power	Spark plug boot is loose Spark plug sooted, smeared with oil	Press boot firmly onto spark plug and fit new spring if necessary Clean the spark plug or replace if necessary. If sooting keeps recurring, check air filter
	Ignition lead loose in ignition module	Secure ignition lead properly
	Fuel/oil mixture – too much oil	Use correct mixture of fuel and oil
	Incorrect air gap between ignition module and flywheel	Set air gap correctly
	Flywheel cracked or damaged or pole shoes have turned blue	Install new flywheel
	Ignition timing out of adjustment, flywheel warped, machined key in flywheel sheared	Install new flywheel, check crankshaft stub for damage and replace crankshaft if necessary
	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.
	Engine housing damaged (cracks)	Install new engine housing

3.6 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 needle worn	Replace the inlet needle
	Inlet control lever sticking on spindle	Check the inlet control lever and 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	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
	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 LA	Reset idle speed screw LA correctly
	Oil seals/engine housing leaking	Seal or replace oil seals/engine housing
	Throttle shutter does not close	Replace throttle shutter and shaft
	Air valve does not close	Replace end cover with air valve.
Engine stops while idling	Idle jet bores or ports blocked	Clean the carburetor
	Low speed screw too rich or too lean	Reset low speed screw L correctly
	Setting of idle speed screw LA incorrect – throttle shutter completely closed	Reset idle speed screw LA 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	Readjust with idle speed screw LA (counterclockwise)
	Clutch springs stretched or fatigued	Replace the clutch springs or install new clutch
	Clutch spring hooks broken	Replace the clutch springs

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 H 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
	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
Engine running extremely rich, has no power and a very low maximum speed	Air valve does not open	Check the carburetor and service or replace if necessary.
Engine running too rich, loss of power and maximum speed too low	Air valve does not open fully in full throttle position	Check the carburetor and service or replace if necessary.
Erratic idle – too lean	Air valve does not close completely	Check the end cover with air valve and replace if necessary
	Intake manifold faulty	Install new intake manifold

3.7 Engine

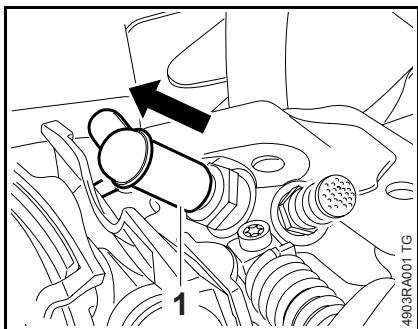
Always check and, if necessary, repair the following parts before looking for faults on the engine:

- Air filter
- Fuel system
- Carburetor
- Ignition system

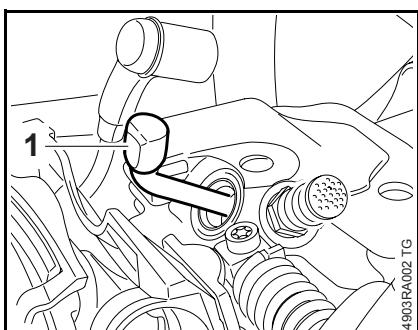
Condition	Cause	Remedy
Engine does not start easily, stalls at idle speed, but operates normally at full throttle	Oil seals in engine housing damaged	Replace the oil seals
	Engine housing leaking/damaged (cracks)	Seal or replace the engine housing
Engine does not deliver full power or runs erratically	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

4. Clutch

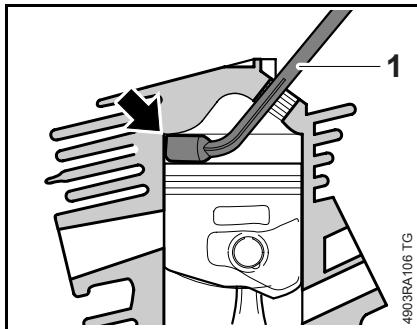
- Troubleshooting, **3.1**
- Remove the shroud, **6.4**.
- Remove the clutch drum, **4.1**



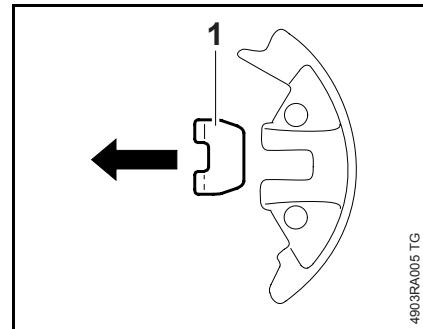
- Pull boot (1) off the spark plug.
- Unscrew the spark plug.



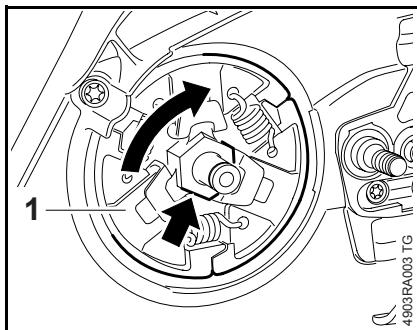
- Push the locking strip (1) 0000 893 5903 into the spark plug hole, wide end first, so that "OBEN-TOP" faces up.



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

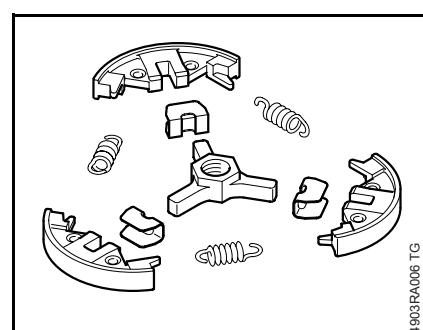


- Pull the clutch shoes off the carrier.
- Remove the retainers (1).



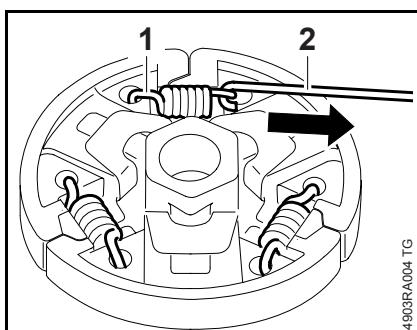
- Apply wrench to hexagon (arrow) and unscrew the clutch (1).

Note that the clutch has a left-hand thread.

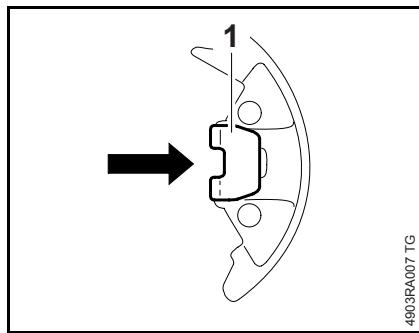


- Clean all parts, **14**
- Replace any damaged parts.

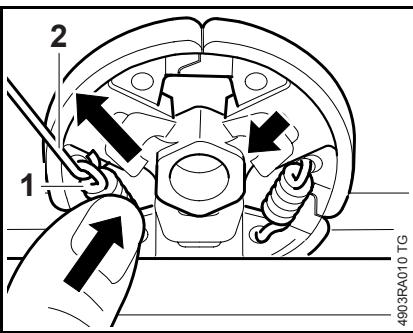
If the clutch is noticeably worn, replace all three clutch shoes at the same time – not individual shoes – since runout may otherwise affect correct operation of the clutch.



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

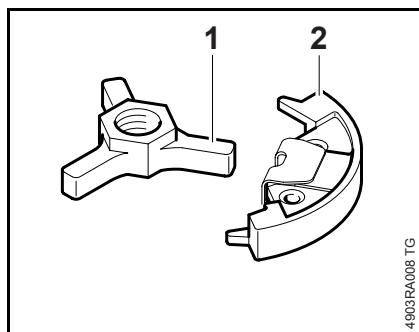


- Fit the retainers (1).

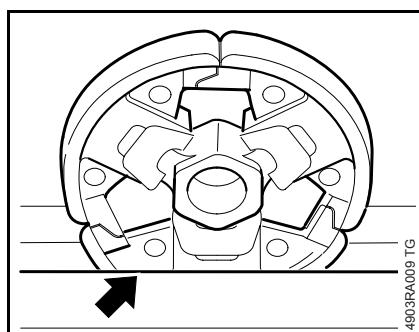


Attach the springs (1) on the side with the raised hexagon (arrow).

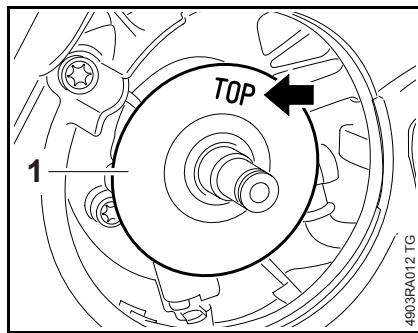
- Attach one end of each spring (1) to the clutch shoes.
- Use the hook (2) 5910 890 2800 to attach the other ends of the springs and press them firmly into the clutch shoes.



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

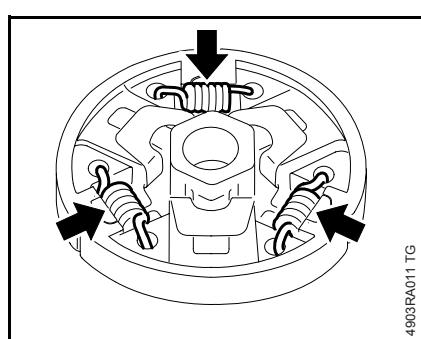
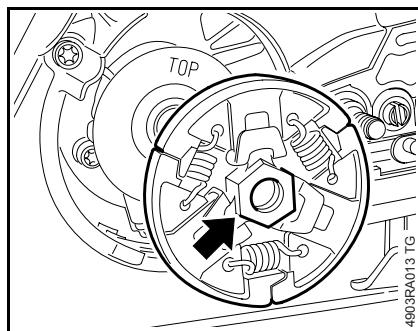


- Clamp the clutch in a vise (arrow).



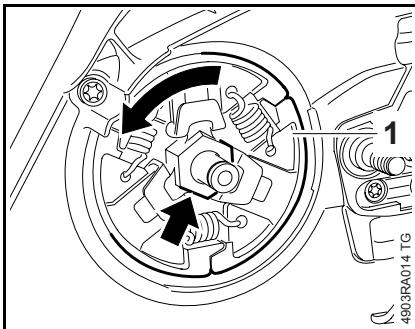
Make sure the washer (1) is in place.

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



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

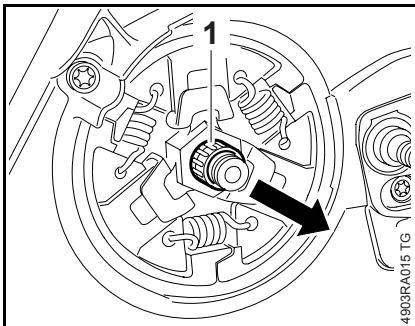
- Position the clutch on the crankshaft stub so that the raised hexagon (arrow) faces outwards.



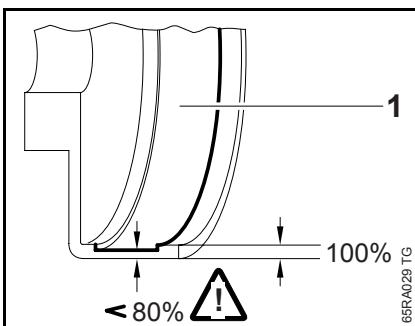
- Screw the clutch (1) on to the crankshaft stub and tighten down the hexagon (arrow) firmly – left-hand thread.
- Remove the locking strip from the cylinder.
- Reassemble all other parts in the reverse sequence.

4.1 Clutch Drum

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



- Pull off the needle cage (1).
- Clean the needle cage and crankshaft stub, 14
- Lubricate the needle cage and crankshaft stub, 14



- 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.

- Install the clutch drum.

5. Chain Brake

5.1 Checking Operation

The chain brake is one of the most important safety devices on the machine. 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.

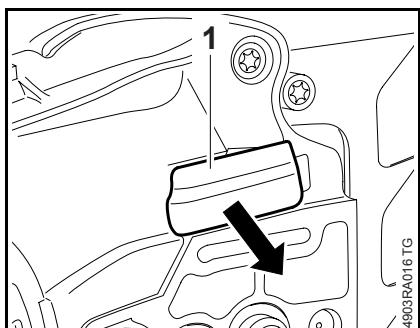
- Starting the engine
- With the chain brake activated (locked), open the throttle wide for a brief period (max. 3 seconds) – the chain must not rotate.
- With the chain brake released, open the throttle wide and activate the brake manually – the chain must come to an abrupt stop.

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

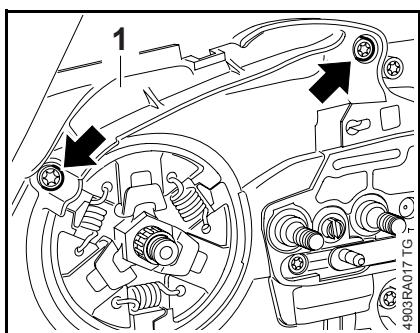
If the chain brake does not operate properly, refer to troubleshooting, **3.2**.

5.2 Brake Band

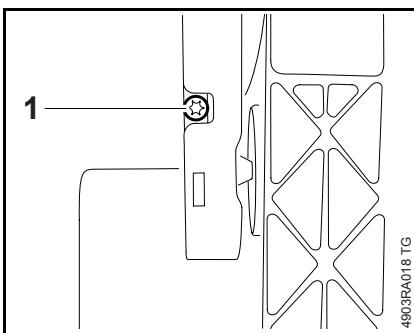
- Remove the clutch drum, **4.1**
- Troubleshooting, **3.2**



- Pull off the bumper strip (1).



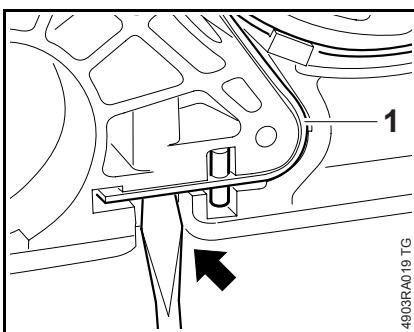
- Take out the screws (arrows).
- Remove the cover (1).



- Engage the chain brake.

The brake band is now tensioned.

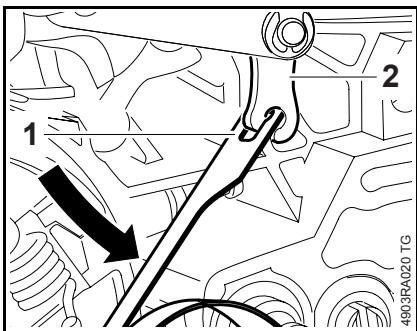
- Remove the screw (1) from the underside of the machine.



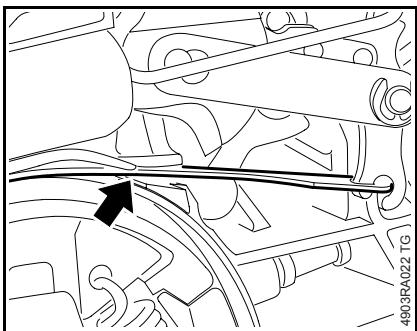
- Pry the brake band (1) out of its seat (arrow).
- Remove the brake band (1).

Do not overstretch the brake band.

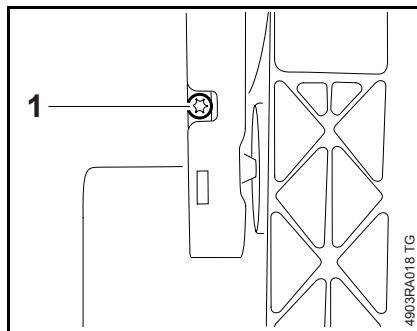
- Pull the hand guard towards the handlebar to simplify assembly of the brake band.



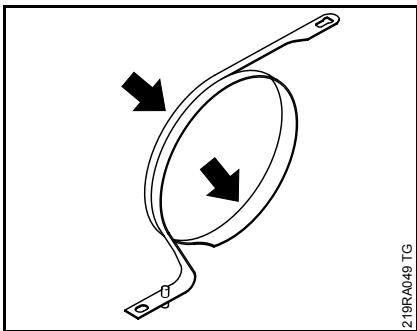
- Turn the brake band (1) to one side and disconnect it from the brake lever (2).



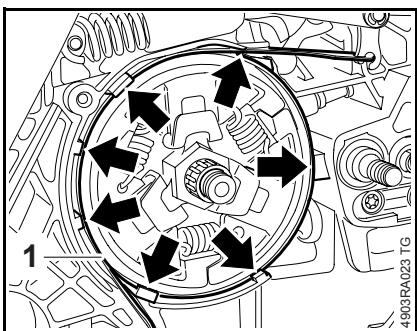
- Position the brake band (1) it the guide (arrow) first.
 - Disengage the chain brake.



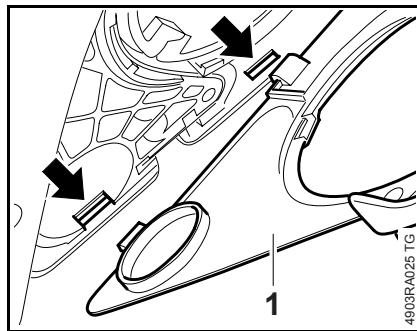
- Fit the screw (1) on the underside of the machine and tighten it down firmly.



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.

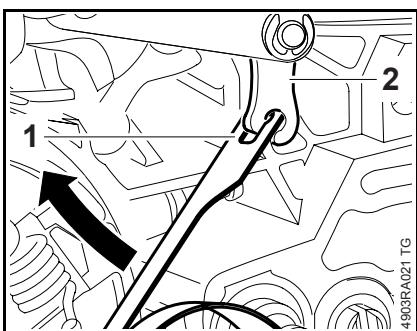


- Push the brake band (1) over the guide lugs (arrows) and into its seat.

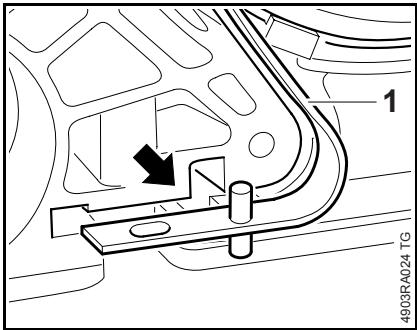


- Engage the cover (1) in the slots (arrows) first and then swing it into position.

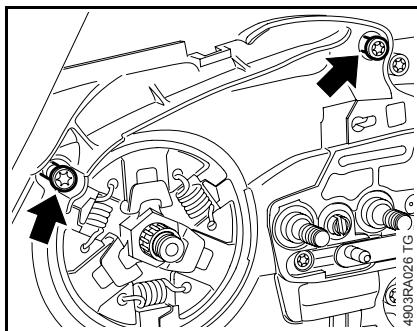
Installing



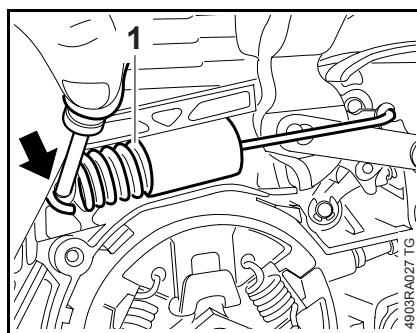
- Hold the brake band (1) sideways, attach it to the brake lever (2) and then swing it in the direction of its seat.



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



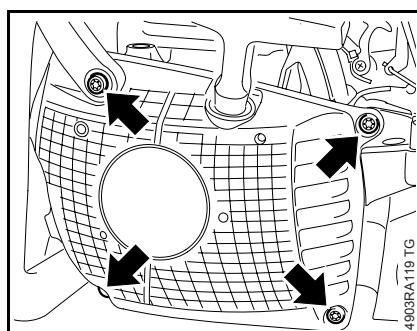
5.3 Brake Lever



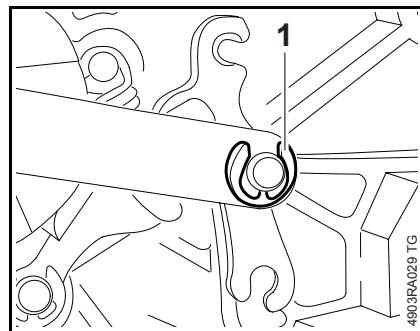
- Insert the screws (arrows) and tighten them down firmly.
- Fit the bumper strip.
- Install the clutch drum, **4.1**
- Check operation, **5.1**
- Reassemble all other parts in the reverse sequence.
- Troubleshooting, **3**
- Remove the brake band, **5.2**
- Engage the chain brake.

The brake spring is now relaxed.

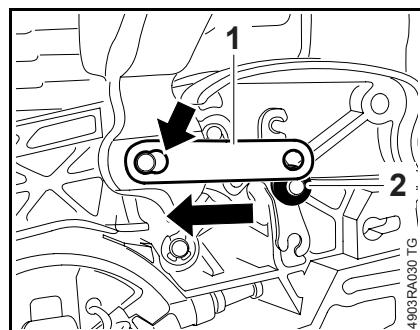
- Use the assembly tool 1117 890 0900 to disconnect the brake spring (1) from the anchor pin (arrow).
- Remove the brake spring from the brake lever.



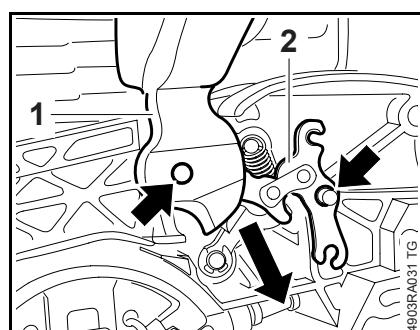
- Remove the shroud, **6.4**
- Take out the screws (arrows).
- Remove the sleeve (1).
- Lift the hand guard a little and remove the fan housing.



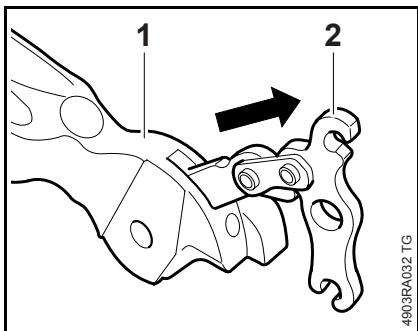
- Remove the E-clip (1).



- Lift and turn the strap (1) slightly, push it towards the hole (arrow) and remove it.
- Remove the spacer sleeve (2) from the brake lever.

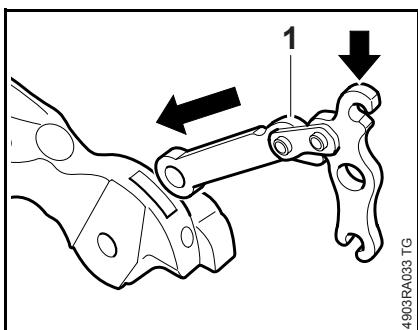


- Pull the hand guard (1) and brake lever (2) off the pivot pins (arrows) together.
- Remove the hand guard and brake lever.

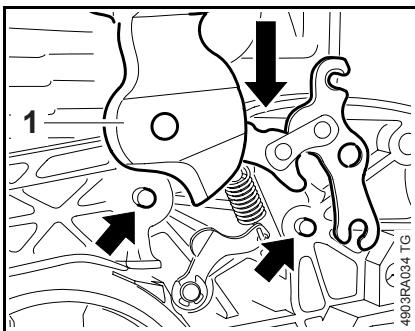


- Take the brake lever (2) out of the hand guard (1).
- Inspect the pivot pins and replace if necessary, **5.5**
- Inspect the cam lever and replace if necessary, **5.4**

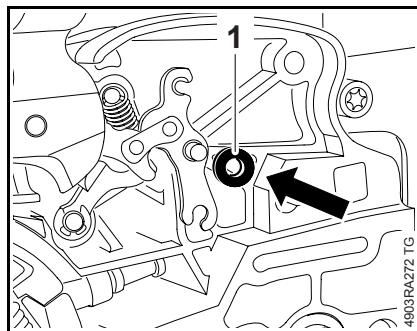
Installing



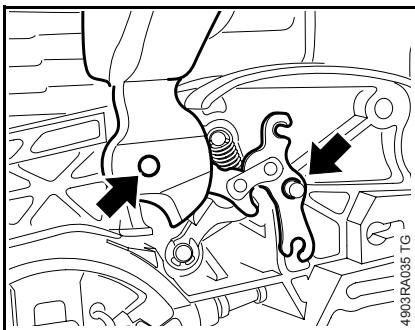
- Clean all disassembled parts, **14**
- Hold the brake lever (1) so that the brake spring attachment point (arrow) is at the top.
- Push the brake lever (1) into the hand guard recess and line up the holes.



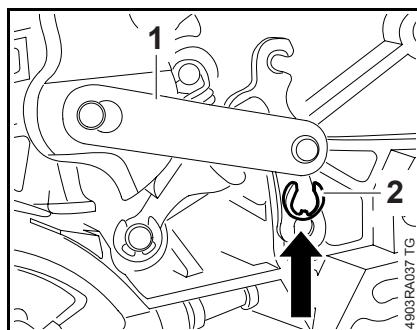
- Push the hand guard with brake lever (1) over the machine until they are positioned against the pivot pins (arrows).



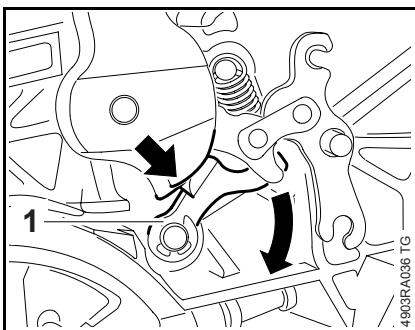
- Fit the spacer sleeve (1).



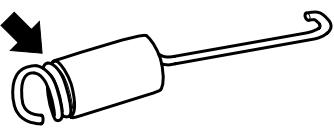
- Lift the bearing boss of the hand guard and the brake lever a little and position them over the pivot pins (arrows).



- Fit the strap (1).
- Fit the E-clip (2).



- 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.



4903RA038 TG

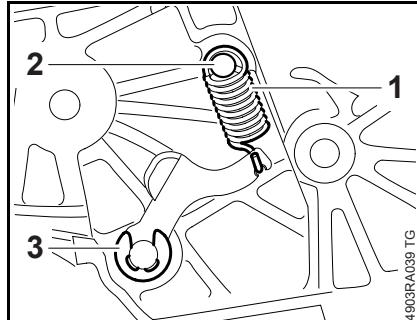
The turns of brake spring must be tightly against one another in the relaxed condition. If this is not the case, replace the brake spring.

- Position the protective tube so that it leaves the first two turns (arrow) free.
- If the groove in the spring's anchor pin is worn, install a new pin, **5.5**

5.4 Cam Lever

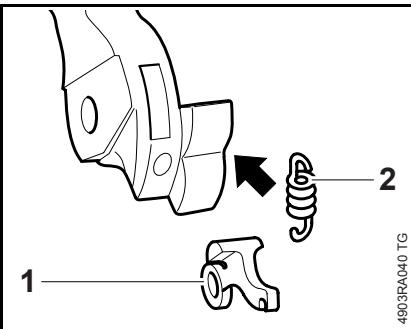
The cam lever defines the locked position of the hand guard.

- Remove the brake lever, **5.3**



4903RA039 TG

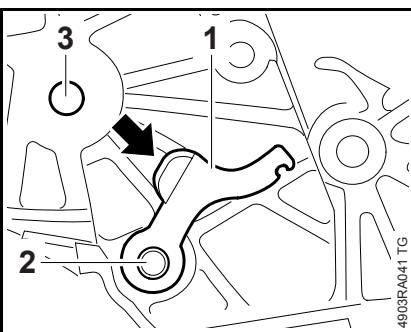
- Disconnect the spring (1) from the anchor pin (2).
- Remove the E-clip (3).
- Pull off the cam lever.



4903RA040 TG

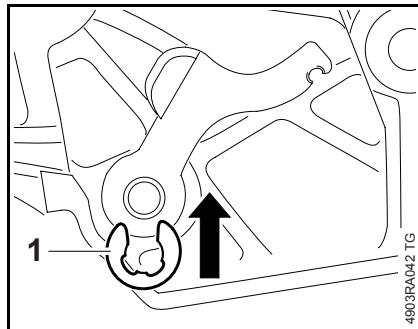
- Check the cam lever (1) and spring (2) and replace if necessary.
- Check the condition of the cam contour (arrow) and replace the hand guard if necessary.

Installing



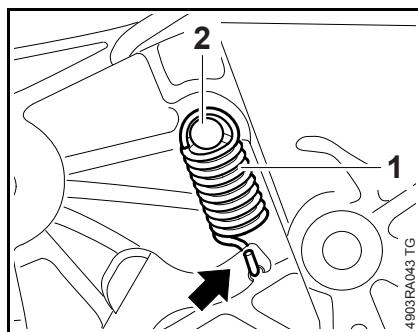
4903RA041 TG

- Position the cam lever (1) so that its cam (arrow) faces the pin (3).
- Push the cam lever (1) on to the pivot pin (2).



4903RA042 TG

- Fit the E-clip (1).



4903RA043 TG

- Attach the spring (1) to the cam lever so that the open side of the spring hook (arrow) points away from the housing.

If the groove in the spring's anchor pin is worn, install a new pin, **5.5**

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

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

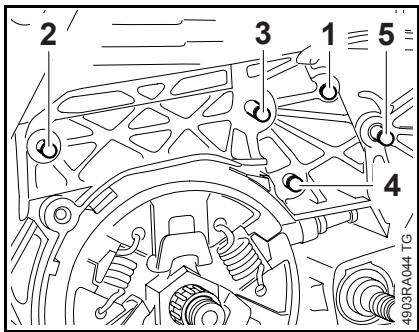
- Reassemble all other parts in the reverse sequence.
- Lubricate the cam lever, **14**

5.5 Pins

The anchor pins secure the springs. Worn pins must be replaced – the springs may otherwise become detached and pop out.

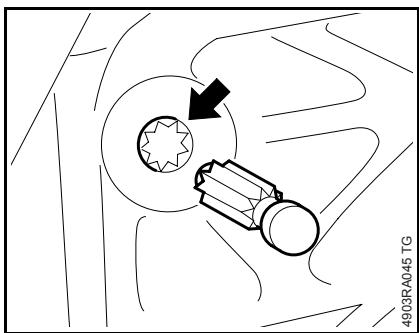
The pins must be driven home squarely.

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



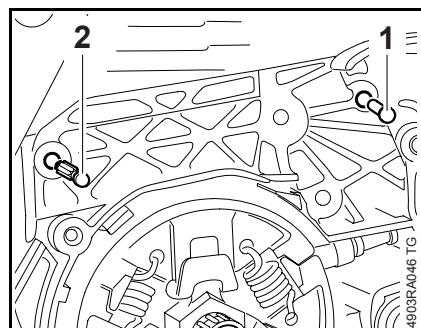
- Use suitable tool to remove the pins (1 - 5).

Installing

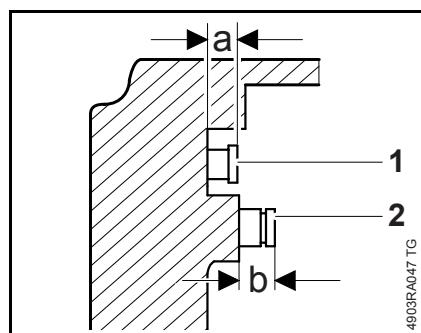


- Before installing the new pin, coat its knurled shank with threadlocking adhesive, 14
- Position the new pin in the bore (arrow) so that the knurling on the pin meshes with the existing knurling in the bore.

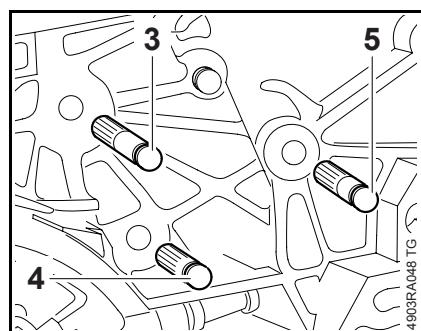
Turn pin back and forth as necessary.



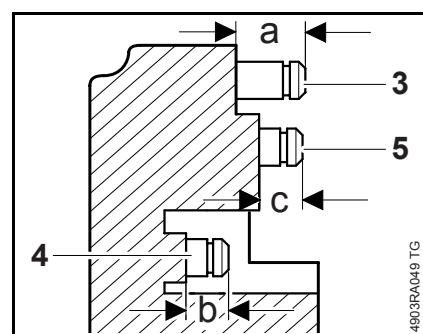
- Drive home the pins (1 and 2) as shown in the illustrations.



- Pin (1) a = about 2.9 - 3.3 mm
Pin (2) b = about 4.3 - 4.7 mm



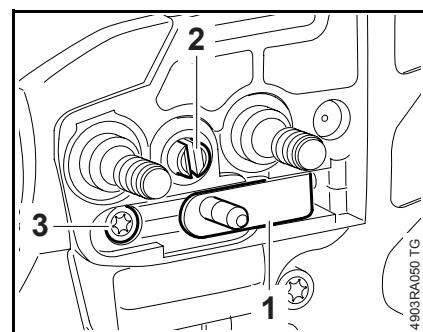
- Drive home pins (3, 4 and 5) as specified below.



- Pin (3) a = about 11.6 - 11.8 mm
Pin (4) b = about 4.6 - 4.8 mm
Pin (5) c = about 9.1 - 9.3 mm

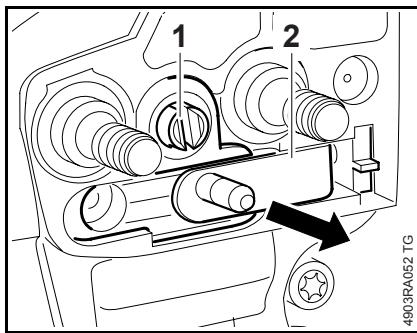
5.6 Chain Tensioner

- Troubleshooting, 3.2

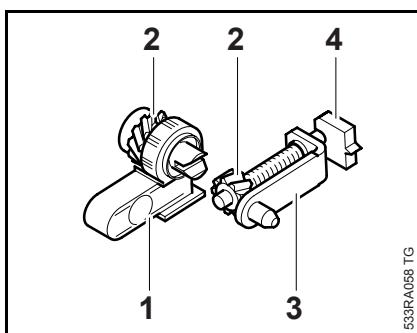


- Turn the spur gear (2) clockwise until the tensioner slide (1) butts against the right-hand end and the screw (3) is visible.

- Take out the screw (3).

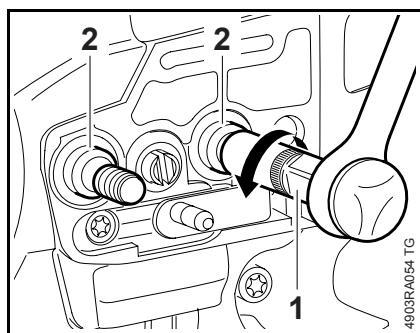


- Pull out the spur gear (1) and tensioner slide (2).

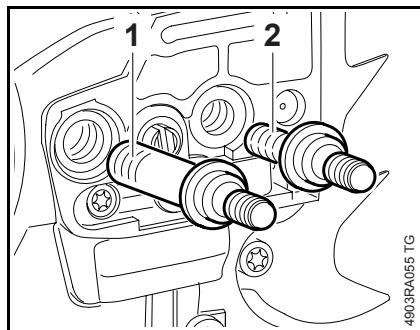


- Inspect the thrust pad (3), support (4), tensioner slide (1), spur gear set (2) and replace as necessary.
- Clean all disassembled parts, [14](#)
- Lubricate thread with STIHL multipurpose grease, [14](#)
- Reassemble in the reverse sequence.

5.7 Bar Mounting Studs



- Push stud puller 5910 893 0501 (1) over the collar studs (2) as far as it will go and unscrew the studs counterclockwise.



- Before installing, coat threads (1) and (2) of collar studs with threadlocking adhesive, [14](#)
- Fit the collar studs and tighten them down firmly.
- Reassemble all other parts in the reverse sequence.

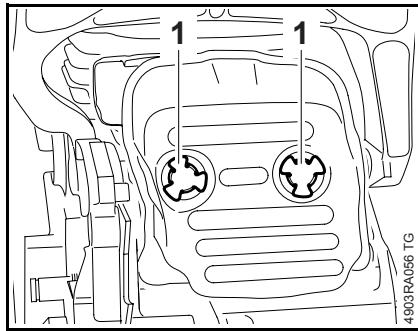
6. Engine

6.1 Muffler

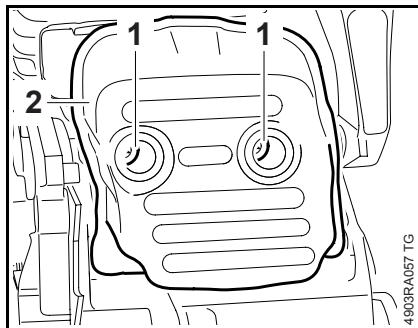
Always check and, if necessary, repair the fuel system, carburetor, air filter and ignition system before looking for faults on the engine.

- Troubleshooting, **3.7**
- Remove the shroud, **6.4**

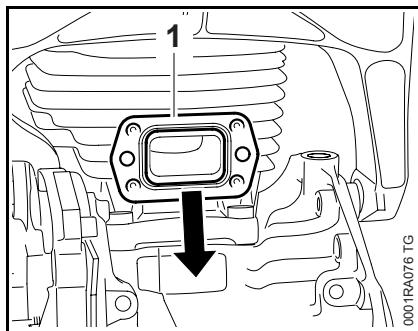
Before removing the muffler, set the piston to top dead center to ensure that no dirt falls into the cylinder.



- Pry the plug (1) out of the drive tube.
 - Do not refit old plugs, always fit new ones.

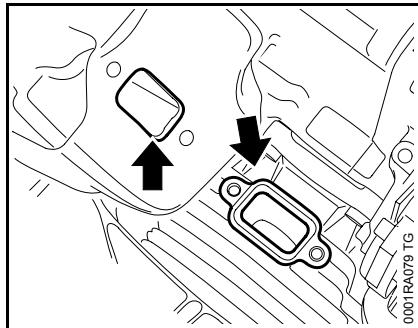


- Take out the screws (1).
- Remove the muffler (2).



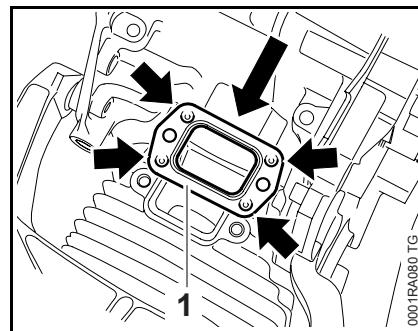
- Remove the exhaust gasket (1).
 - Remove and install the spark arresting screen – see instruction manual.

Installing

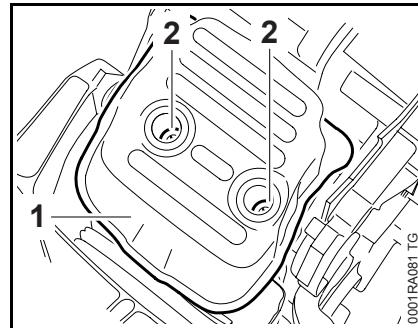


- Hold the machine upright.
- Inspect and clean the sealing faces (arrows) and remove any gasket residue.

Always replace components with damaged sealing faces.



- Position the exhaust gasket (1) so that the warts (arrows) point towards the cylinder.
- Fit the exhaust gasket (1) and line it up with the warts (arrows) against the cylinder exhaust port.



- Carefully place the muffler (1) in position.
- Check the position of the gasket and fit the screws (2).
- Fit and tighten down the screws (2) firmly.
- Fit new plugs.

6.2 Leakage Test

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

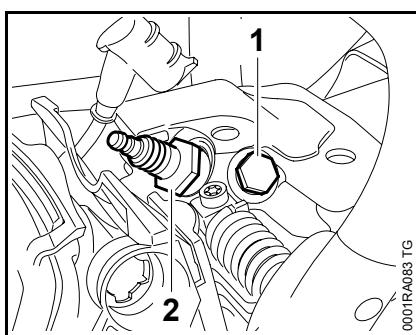
This makes adjustment of the prescribed idle speed difficult, if not impossible.

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

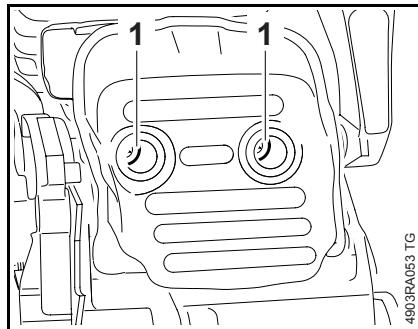
Always perform the vacuum test first and then the pressure test.

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

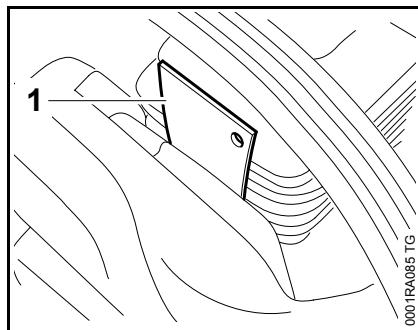
6.2.1 Preparations



- Remove the shroud, **6.4**
- 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, **6.9**
- Fit the plug (1) 1122 025 2200 and tighten it down firmly.
- Fit the spark plug (2) and tighten it down firmly.



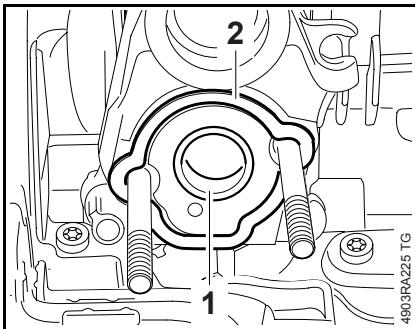
- Pry out the plugs.
 - Do not refit old plugs, always fit new ones.
- Loosen the screws (1).



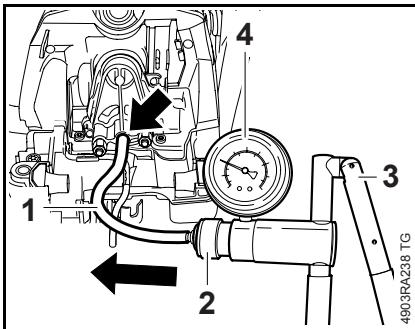
- Fit the sealing plate (1) 0000 855 8107 between the cylinder exhaust port and muffler and tighten down the screws moderately.

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

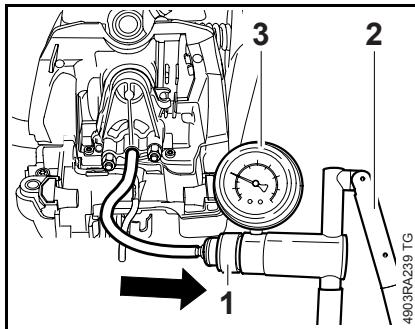
- Remove the carburetor, **12.5**



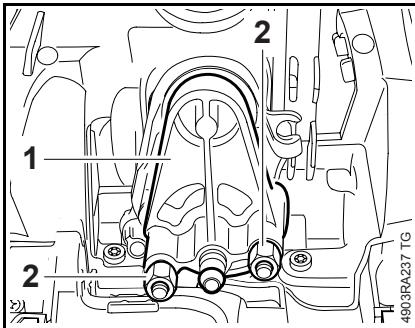
- Check that the sleeve (1) and washer (2) are in place.



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



- Push ring (1) to the right.
- Operate the lever (2) until the pressure gauge (3) indicates a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the engine housing is airtight.
 - If the pressure drops, the leak must be located and the faulty part replaced.



- Line up the flange (1) 1140 890 1200 and fit it over the studs
- Fit the test flange (1) 1140 890 1200.
- Fit the nuts (2) and tighten them down firmly.

6.2.2 Vacuum Test

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

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

- Push ring (2) to the left.
- Operate the lever (3) until the pressure gauge (4) 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, **6.3**.

- After finishing the test, push the ring to the right to vent the pump.
- Continue with pressure test, **6.2.3**

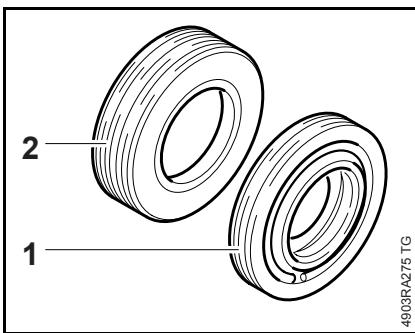
6.2.3 Pressure Test

Carry out the same preparations as for the vacuum test, **6.2.2**

To find the leak, coat the suspect area with oil and pressurize the engine housing 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.
- Loosen the screws on the muffler and pull out the sealing plate.
- Tighten down muffler screws firmly and fit new plugs.
- Install the carburetor, **12.5**
- Reassemble all other parts in the reverse sequence.

6.3 Oil Seals

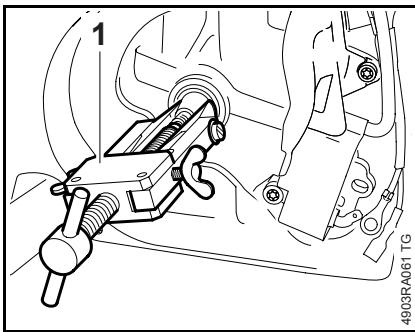


Use oil seal (1) 9638 003 1581 for replacement on closed engine.
Use oil seal (2) 9639 003 1585 for replacement on opened engine.

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

Ignition side

- Remove the fan housing, **8.2**
- Remove the flywheel, **7.6**



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

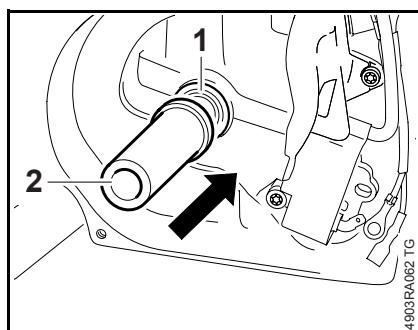
- Apply puller (1) 5910 890 4400 with No. 3.1 jaws 0000 893 3706.

- Clamp the puller arms.
- Pull out the oil seal.

Take care not to damage the crankshaft stub.

- Clean the sealing face, **14**
- Lubricate sealing lips of new oil seal with grease, **14**

Installing



- Slip the oil seal, open side (snap ring) facing outwards, over the crankshaft stub.
- Use press sleeve (2) 1122 893 2405 to install the oil seal (1).

The seating face must be flat and free from burrs.

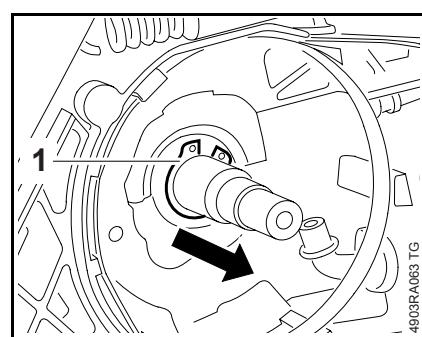
- Wait about one minute, then rotate the crankshaft several times.

Degrease the crankshaft taper, **14**

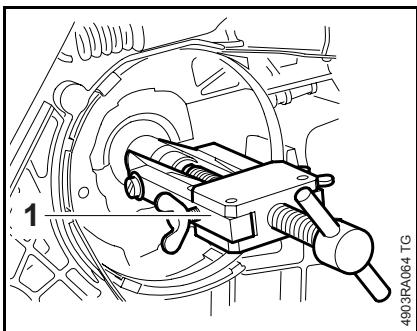
- Reassemble all other parts in the reverse sequence.

Clutch side

- Remove the clutch, **4**
- Remove the oil pump, **11.3**



- Remove the E-clip (1).

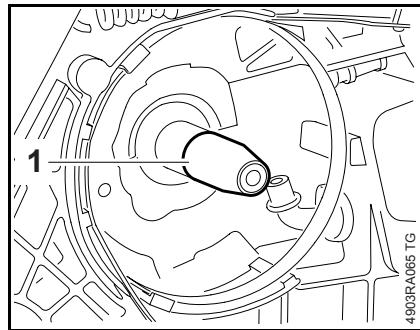


- Free off the oil seal in its seat by tapping it with a suitable tube or a punch.
- Apply puller (1) 5910 890 4400 with No. 3.1 jaws 0000 893 3706.
- Clamp the puller arms.
- Pull out the oil seal.

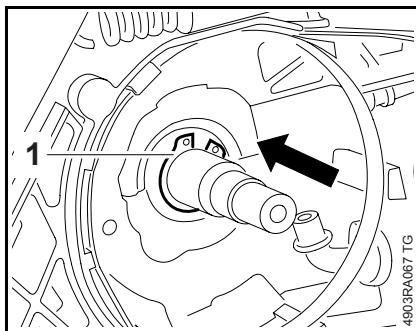
The crankshaft stub and oil pump spur gear must not be damaged.

- Clean the sealing face, 14
- Lubricate sealing lips of new oil seal with grease, 14

Installing



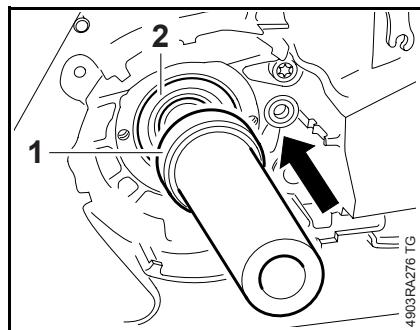
- Fit the installing sleeve (1) 1122 893 4600.
- Slip the oil seal, open side (snap ring) facing outwards, over the installing sleeve.
- Remove the installing sleeve (1).



- Fit the E-clip (1).
- Wait about one minute, then rotate the crankshaft several times.
- Reassemble all other parts in the reverse sequence.

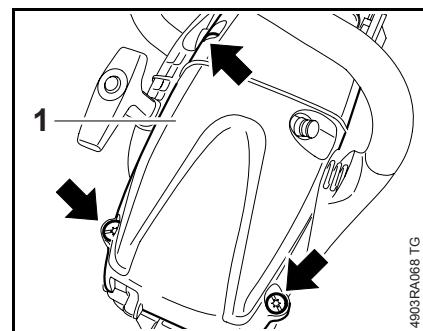
6.4 Shroud

- Set the Master Control lever to "0".
- Push the front hand guard forwards to engage the chain brake.

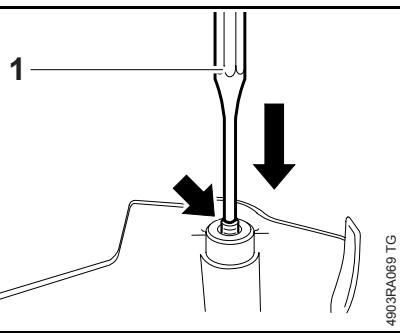


- Use press sleeve (1) 1122 893 2405 to install the oil seal (2).

The seating face must be flat and free from burrs.

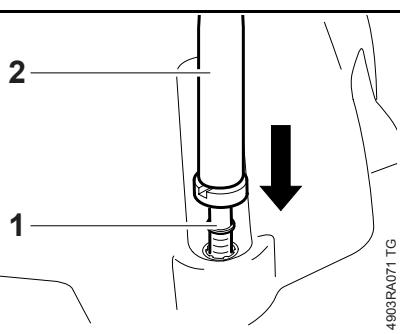


- Take out the screws (arrows).
- Remove the shroud (1).



- Use a suitable drift (1) to drive out the screws (arrow).

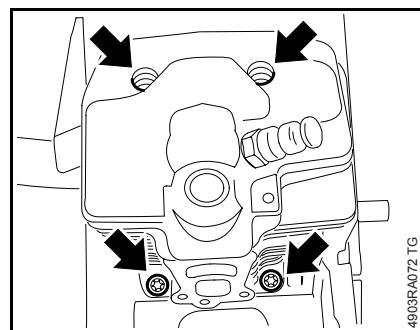
Installing



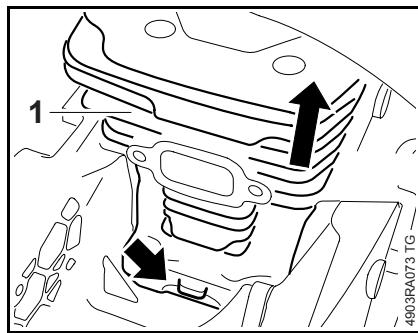
- Use a suitable drift (2) to drive home the screws (1).
- Reassemble in the reverse sequence.

6.5 Cylinder / Crankshaft

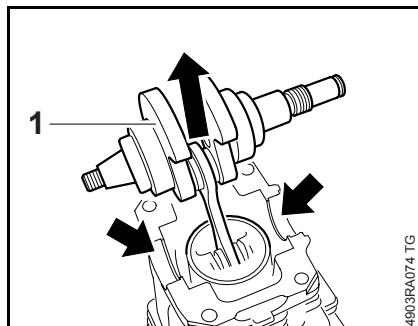
- Remove the shroud, **6.4**
- Pull off the boot and unscrew the spark plug,
- Remove the fan housing, **8.2**
- Remove the filter base, **12.3**
- Remove the carburetor, **12.5**
- Remove the manifold, **12.9**
- Remove the muffler, **6.1**
- Remove the decompression valve, **6.9**
- Remove AV spring from handlebar, **9.4**



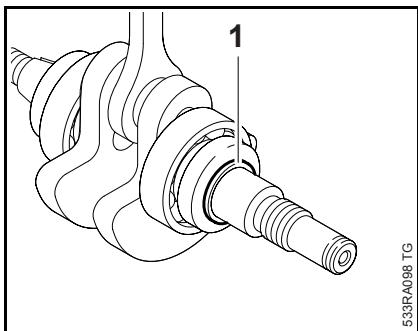
- Take out the screws (arrows).



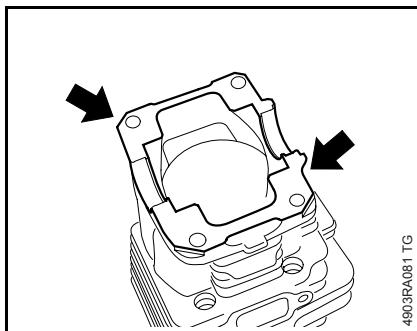
- Use the lug (arrow) to pry the cylinder (1) upwards.
- Remove the cylinder with crankshaft.



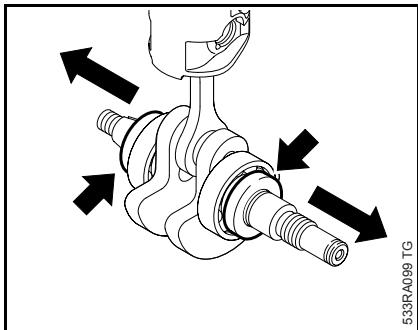
- Pull the crankshaft (1) out of the bearing seats (arrows).
- Carefully pull the crankshaft (1) with piston out of the cylinder.
- Check the crankshaft and ball bearings and replace if necessary, **6.6**
- Inspect the piston and piston rings and replace if necessary, **6.7**, **6.8**



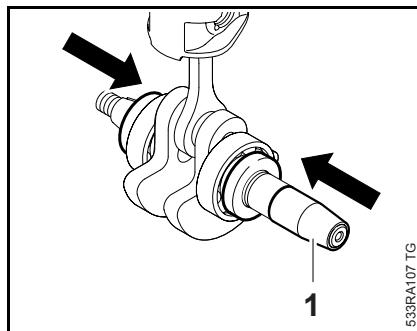
- Remove the E-clip (1).



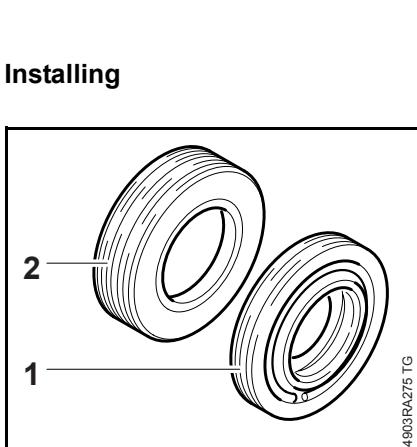
- Inspect and clean the sealing faces (arrows) and remove any gasket residue, 14



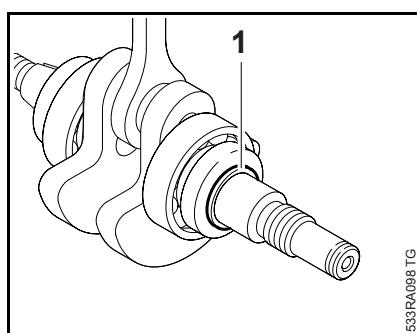
- Pull the oil seals (arrows) off the crankshaft stubs.



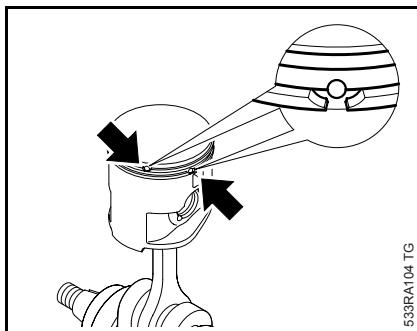
- Fit the installing sleeve (1)
1118 893 4602.
- Push the new oil seals, open side facing inwards, on to the crankshaft stubs.



Use oil seal (1) 9638 003 1581 for replacement on closed engine.
Use oil seal (2) 9639 003 1585 for replacement on opened engine.



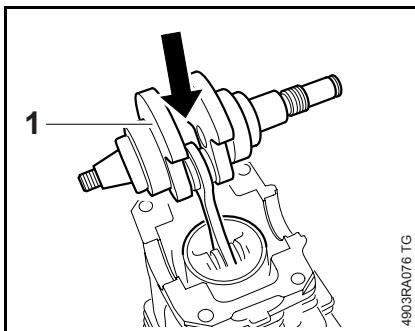
- Fit the E-clip (1).



- Lubricate the piston, piston rings and cylinder wall with oil.

- Position the piston rings so that the radii at the ring gap meet at the fixing pin in the piston groove (arrows) – there is otherwise a risk of ring breakage.

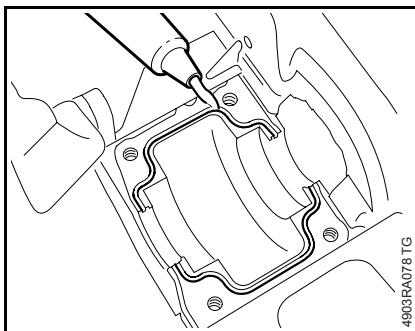
533RA104 TG



When properly aligned, the piston rings are compressed by the cylinder's taper.

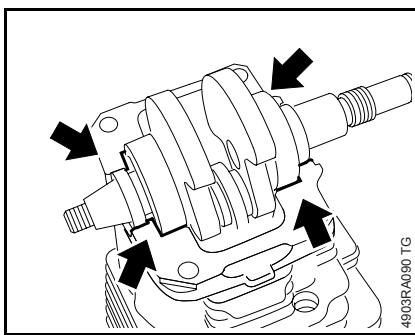
- Carefully push the piston with crankshaft (1) into the cylinder.

4903RA076 TG



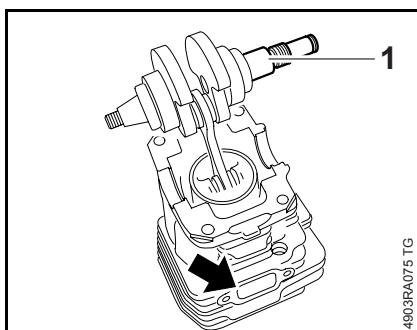
- Inspect and clean the sealing face on the engine housing and remove any gasket residue, 14

4903RA078 TG



4903RA090 TG

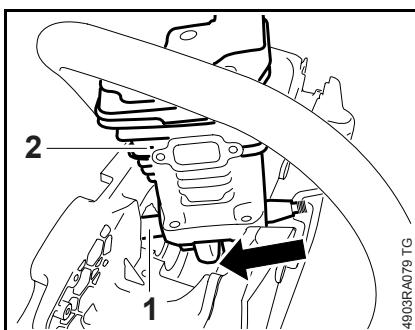
- Place the crankshaft with bearings and oil seals in the bearing seats, making sure the oil seals are firmly against their stops (arrows) in the cylinder.



4903RA075 TG

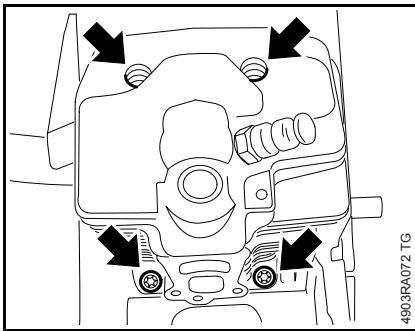
- Line up the piston with crankshaft before fitting them in the cylinder.

Viewed from the exhaust port (arrow), the long crankshaft stub (1) must be on the right.



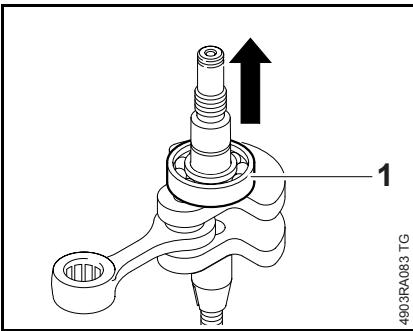
4903RA079 TG

- Hold the crankshaft (1) steady.
- Fit the cylinder (2) with crankshaft (1) in the engine housing.



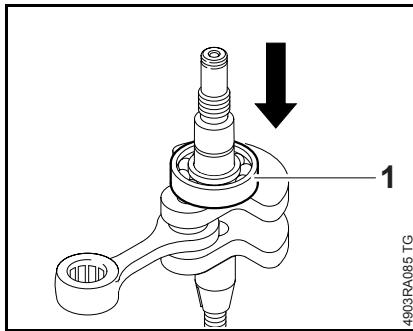
4903RA072 TG

- Fit the screws (arrows).
- Tighten down the screws (arrows) in an alternate pattern.
- Reassemble all other parts in the reverse sequence.



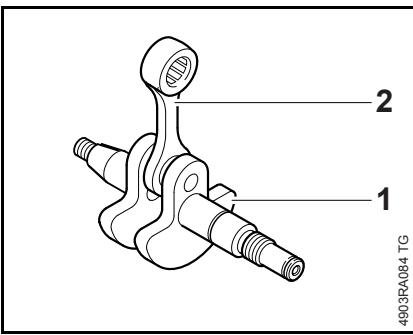
4903RA083 TG

- Pull the ball bearing (1) off the straight crankshaft stub.



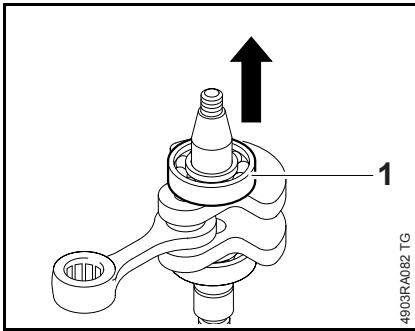
4903RA085 TG

- Heat the bearing inner race to about 150°C (300°F).
- Push the ball bearing onto the straight crankshaft stub as far as stop.



4903RA084 TG

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



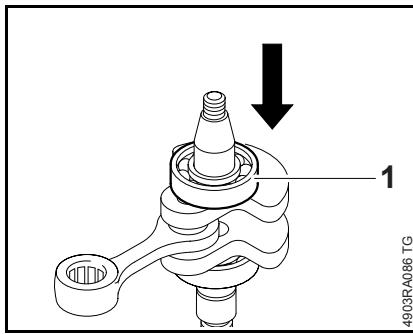
4903RA082 TG

- Pull the ball bearing (1) off the tapered crankshaft stub.

When fitting a replacement crankshaft, always install new ball bearings and oil seals.

Before installing, clean the crankshaft, [6.14](#)

Heated ball bearings must be installed quickly because the crankshaft stubs absorb heat and expand.



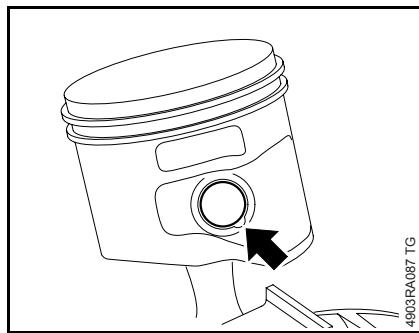
4903RA086 TG

- Heat the bearing inner race to about 150°C (300°F).
- Push the ball bearing onto the tapered crankshaft stub as far as stop.
- Lubricate the needle bearing with oil.
- Install the piston, [6.7](#)
- Install the crankshaft and oil seals, [6.5](#)

6.7 Piston

- Remove the cylinder, **6.5**

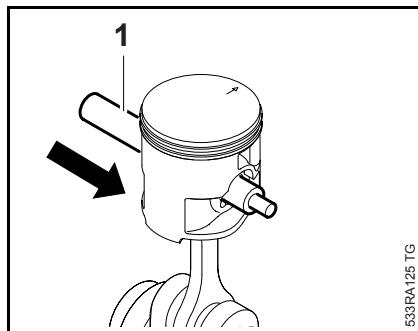
The snap ring at the clutch side cannot be removed.



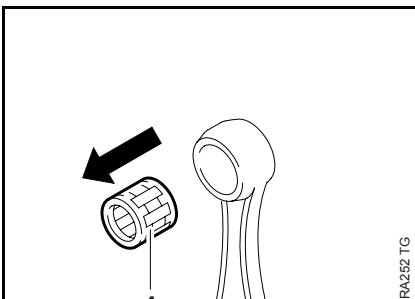
If the piston pin is stuck, release it by tapping the end of the drift lightly with a hammer.

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

- Remove the piston.
- Inspect the piston rings and replace if necessary, **6.8**

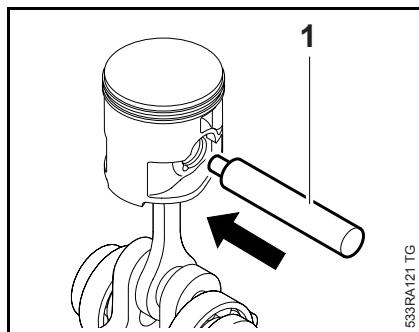


533RA125 TG



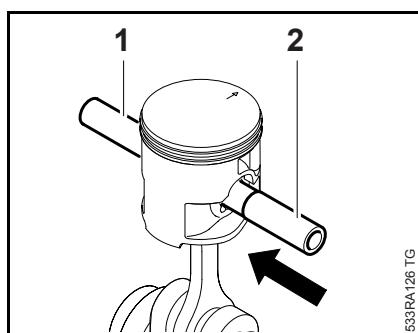
4903RA252 TG

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



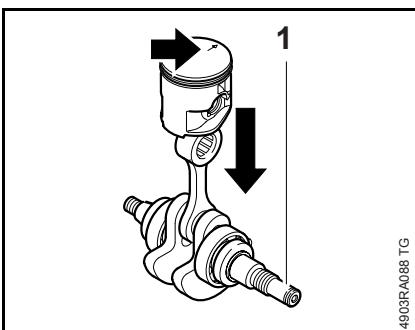
533RA121 TG

- Pull out the needle cage (1), check it and replace if necessary, **14**



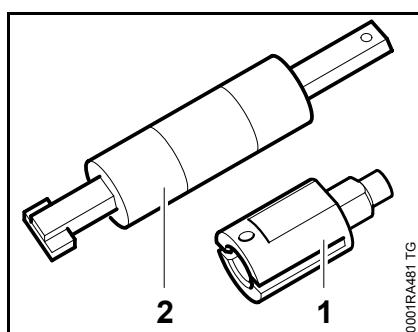
533RA126 TG

Installing



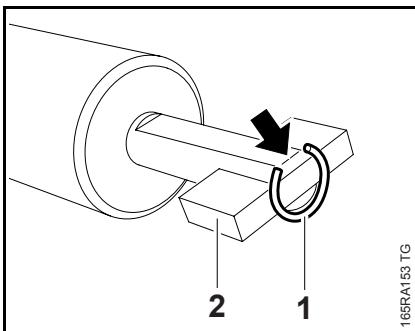
4903RA088 TG

- Lubricate the needle cage with oil and push it into the connecting rod.
- Position the piston as shown so that the mark (arrow) points to the rear and the long crankshaft stub (1) is on the right.
- Place the piston on the connecting rod.



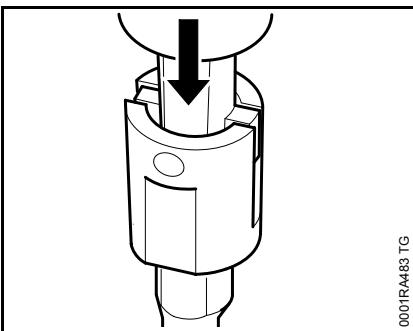
0001RAA481 TG

- Remove the sleeve (1) from the installing tool (2) 5910 890 2212.



165RA153 TG

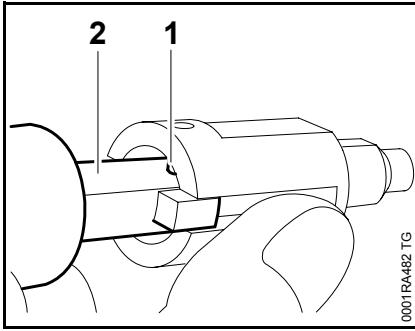
- Attach the snap ring (1) to the magnet (2) so that the snap ring gap is on the flat side of the tool's shank (arrow).



0001RA483 TG

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

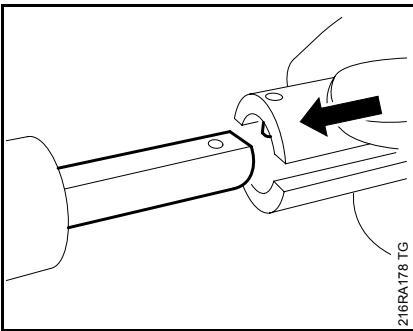
Use a suitable base.



0001RA482 TG

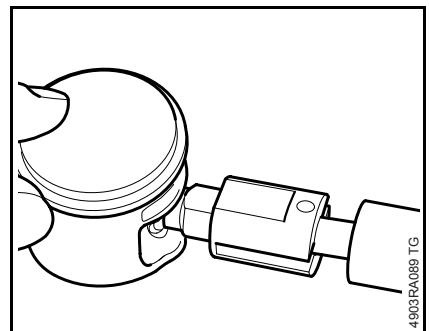
- Push the large slotted diameter of the sleeve over the magnet and snap ring.

The inner pin (1) must point towards the flat face (2) of the tool's shank.



216RA178 TG

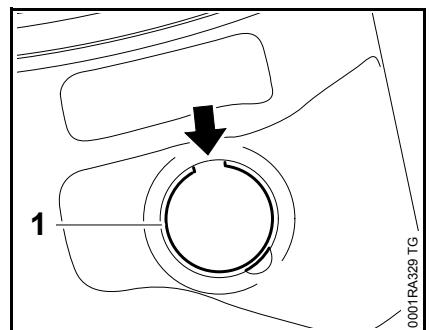
- Remove the sleeve and slip it onto the other end of the shank – the inner pin must point towards the flat face.



4903RA089 TG

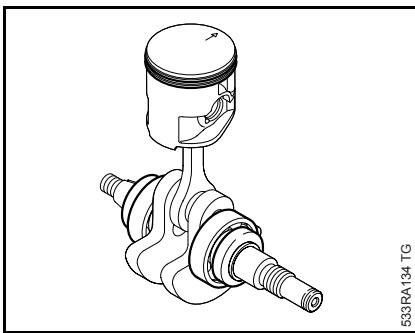
- Apply the installing tool 5910 890 2212 with the sleeve's taper against the piston boss, hold the piston steady, center the tool shank exactly and press home until the snap ring slips into the groove.

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



0001RA329 TG

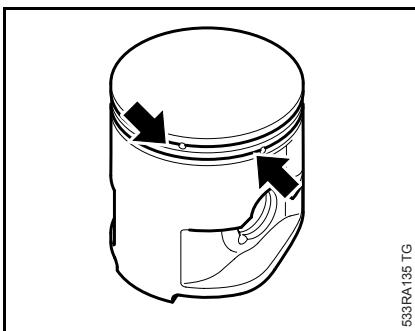
- Fit the snap ring (1) so that its gap (arrow) points either up or down.



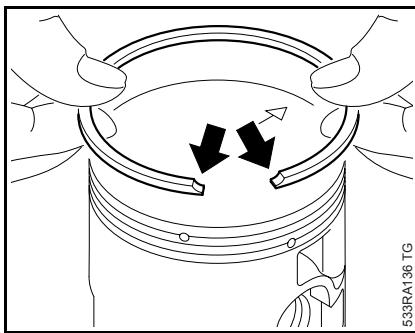
- Inspect the piston rings and replace if necessary, **6.8**
- Check the oil seals and ball bearings and replace if necessary, **6.5**
- Install the cylinder, **6.5**
- Reassemble all other parts in the reverse sequence.

6.8 Piston Rings

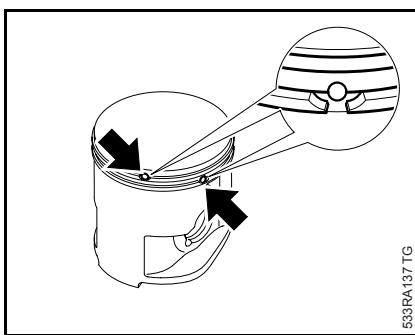
- Remove the piston, **6.7**
- Remove the piston rings from the piston.



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

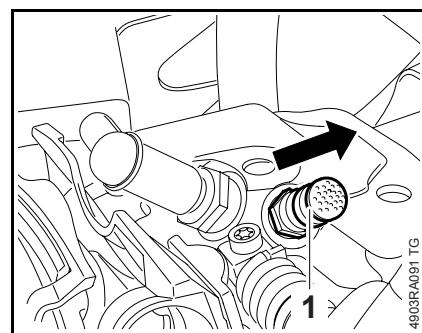


- Install the new piston rings in the grooves so that the radii face upward (arrows).

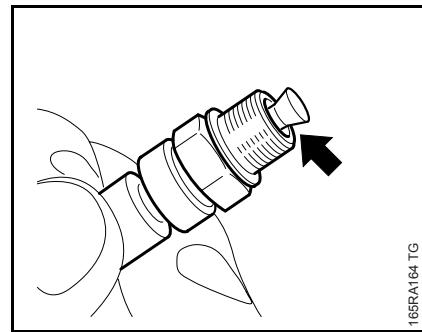


- Position the piston rings so that the radii at the ring gap meet at the fixing pin in the piston groove (arrows).
- Check correct installed position of the piston rings (arrows).
- Install the piston, **6.7**
- Reassemble all other parts in the reverse sequence.

6.9 Decompression Valve



- Remove the shroud, **6.4**
- Unscrew the decompression valve (1).



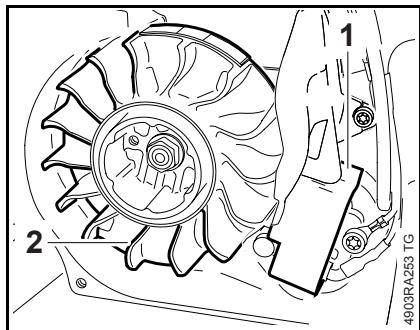
- Check the sealing cone (arrow) on the decompression valve for damage.
 - If the sealing cone does not close completely or shows signs of damage, install a new decompression valve.
 - Fit the decompression valve and tighten it down firmly.
 - Reassemble all other parts in the reverse sequence.

7. 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, **2.3**

- Remove the fan housing, **8.2**



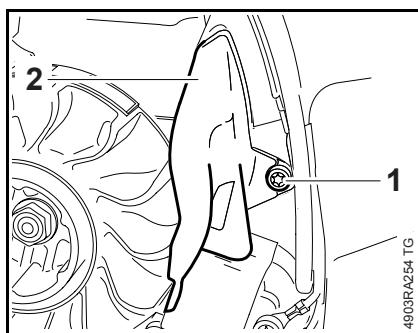
The electronic (breakerless) ignition system basically consists of an ignition module (1) and flywheel (2).

7.1 Ignition Timing

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

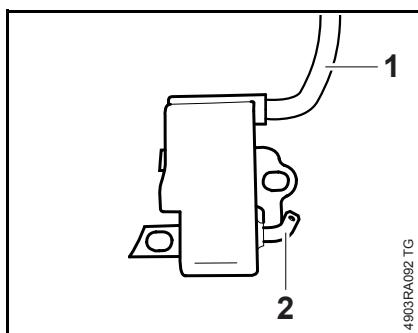
Since there is no mechanical wear in these systems, ignition timing cannot get out of adjustment during operation.

7.2 Preseparator



- Remove the fan housing, **8.2**
- Take out the screw (1).
- Remove the preseparator (2).
- Reassemble in the reverse sequence.

7.3 Ignition Module



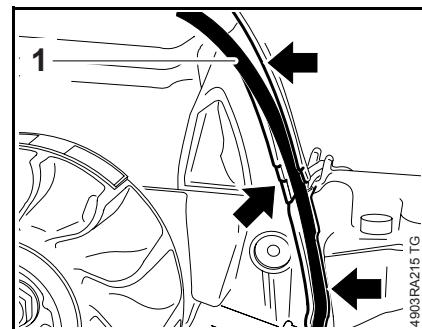
The ignition module accommodates all the components required to control ignition timing. There are two electrical connections on the coil body:

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

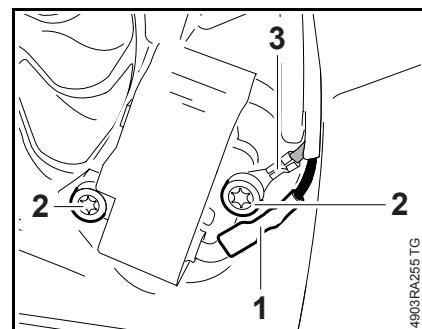
Testing in the workshop is limited to a spark test. A new ignition module must be installed if no ignition spark is obtained (after checking that wiring and stop switch are in good condition).

Removing

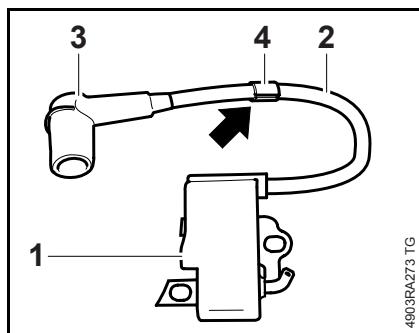
- Remove the shroud and pull off the spark plug boot, **6.4**
- Remove the fan housing, **8.2**
- Remove the preseparator, **7.2**



- Pull the ignition lead (1) out of the cable channel (arrows).



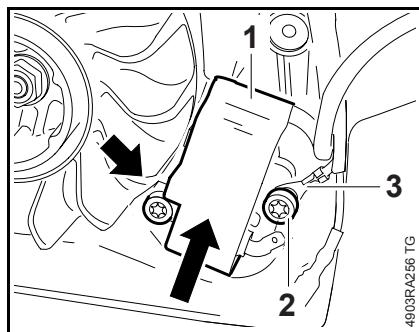
- Disconnect the short circuit wire (1).
- Take out the screws (2).
- Remove the ground wire (3).
- Remove the ignition module.



The ignition module (1) and ignition lead (2) form a unit.

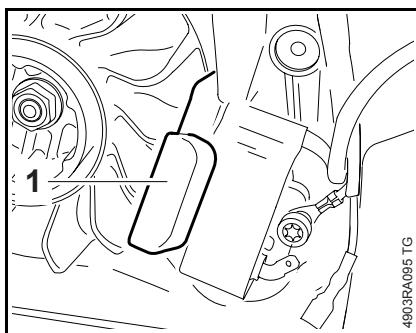
- Before installing, check that the sleeve (4) is on the ignition lead (2) and its opening (arrow) is pointing in the same direction as the spark plug boot.
- Inspect the spark plug boot (3) and replace if necessary, **7.5**
- Troubleshooting, **2.3**

Installing

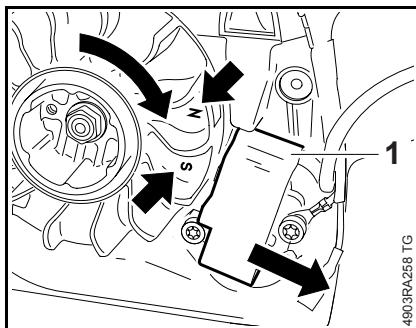


- Fit the ignition module (1) and insert the screw (arrow) – do not tighten down yet.
- Fit the ground wire (3) and insert the screw (2) – do not tighten down yet.

Crimped side of terminal must face the screw head.



- 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.



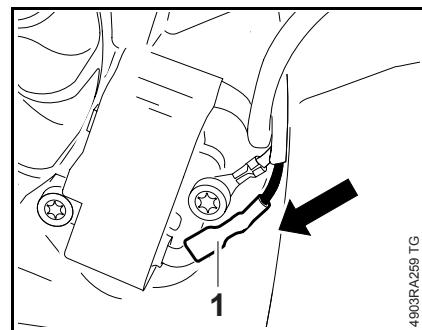
The setting gauge is not shown in the illustration.

- 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 (1).
- Press the ignition module (1) against the setting gauge.

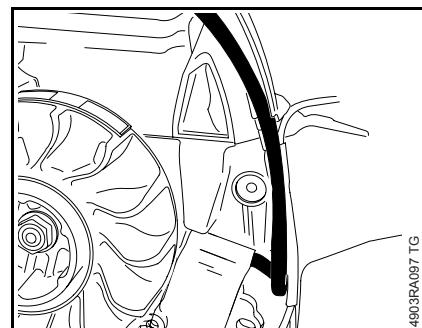
Hold the ground wire terminal steady – it must point towards the cable guide.

- Tighten down the screws firmly.
- Remove the setting gauge.

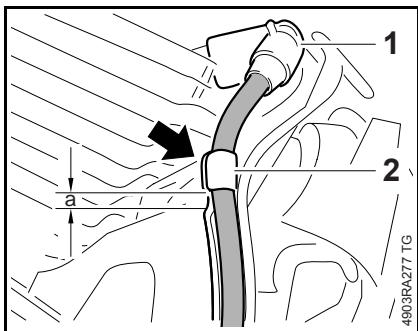
- Check operation – rotate the flywheel and make sure it does not touch the ignition module.



- Connect the short circuit wire terminal (1) – the terminal must be pushed fully home.



- Starting at the ignition module, push the ignition lead into the cable channel.



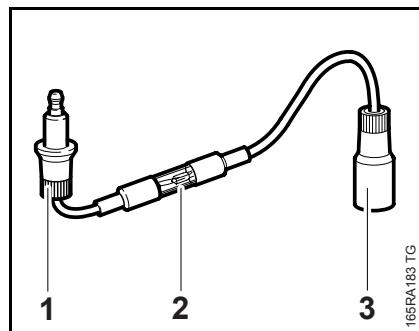
- Fit the boot (1) on the spark plug.
- Line up the sleeve (2) – distance 'a' about 3 mm to the edge of the housing and its open side (arrow) facing the cylinder.
- Reassemble all other parts in the reverse sequence.

7.4 Testing the Ignition Module

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

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

Using the ZAT 4 ignition tester 5910 850 4503



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

High voltage – risk of electric shock.

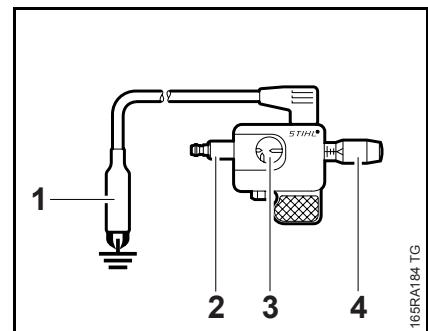
- Crank the engine quickly with the rewind starter and check spark in the tester's window (2).

The engine may start and accelerate during the test.

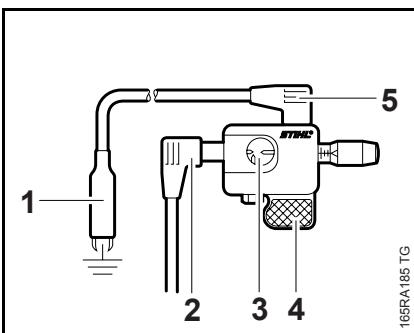
If a spark is visible, the ignition system is in order.

- If no spark is visible in the window (2), check the ignition system with the aid of the troubleshooting chart, 7.8

Using the ZAT 3 ignition tester 5910 850 4520



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



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

High voltage – risk of electric shock.

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

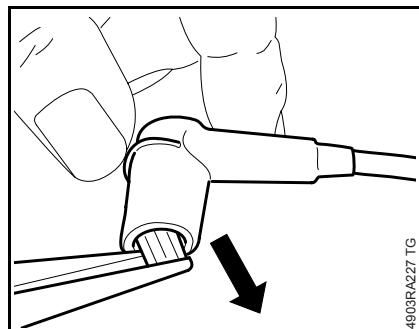
The engine may start and accelerate during the test.

If a spark is visible 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, **6.4**

7.5 Spark Plug Boot / Ignition Lead

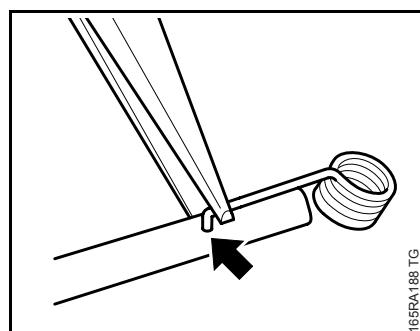
The ignition module (1) and ignition lead (2) form a unit. A new ignition module must be installed if the ignition lead is damaged.



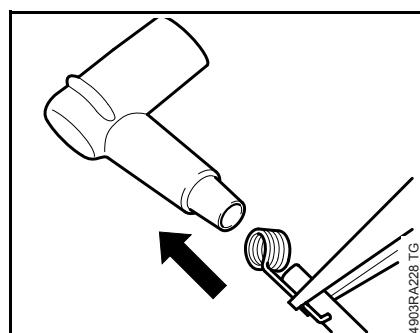
- Remove the shroud, **6.4**
- Use suitable pliers to pull the leg spring out of the spark plug boot.
- Unhook the leg spring from the ignition lead.
- Pull the boot off the ignition lead.
- Remove the sleeve.

Installing

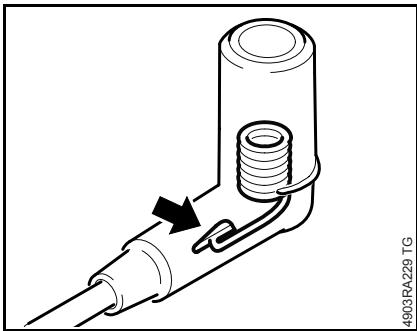
Do not shorten the ignition lead.



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



- Coat the inside of the spark plug boot with STIHL press fluid, **14**
- Hold the ignition lead and leg spring together and push them into the spark plug boot.



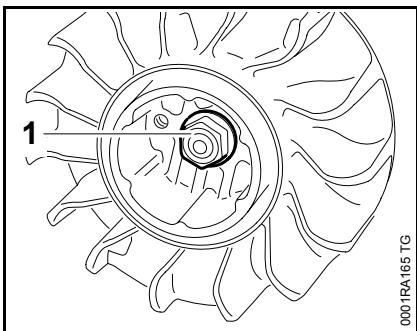
- Make sure the leg spring (arrow) locates properly inside the spark plug boot.

Do not use either graphite grease or silicone insulating paste.

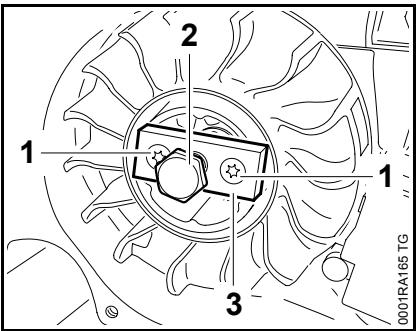
- Reassemble all other parts in the reverse sequence.

7.6 Flywheel

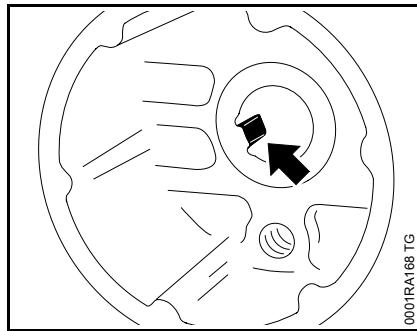
- Remove the shroud, [6.4](#)
- Use locking strip to block the piston, [4](#)



- Unscrew the flywheel nut (1).

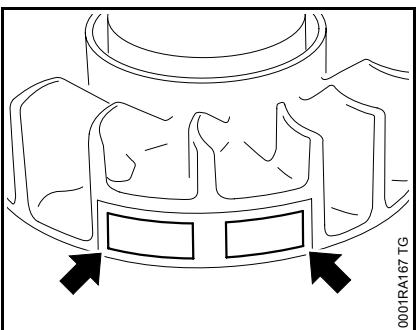


- Fit the puller (3) 1135 890 4500 on the flywheel and tighten the screws (1) as far as stop.
 - Tighten the screws uniformly.
- Screw home the thrust bolt (2) clockwise until the flywheel is released from the crankshaft.
- Remove the puller (3) 1135 890 4500 from the flywheel.



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

- Set the air gap between the ignition module and flywheel, [7.3](#)
- Reassemble all other parts in the reverse sequence.

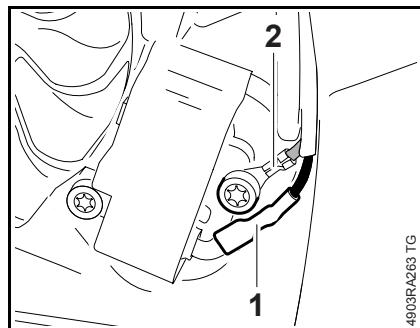


The flywheel and magnet poles (arrows) must not be damaged or have turned blue. Replace flywheel if necessary.

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

7.7 Short Circuit Wire

7.7.1 Testing



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

- Remove the fan housing, **8.2**
- Disconnect the short circuit wire (1).
- Connect the ohmmeter to ground (2) and the short circuit wire (1).
- Set the Master Control lever to "0".

The resistance measured must be about 0Ω . If it is much higher, the reason is a break and the wiring harness has to be replaced, **7.7**.

- Set the Master Control lever to "I".

The resistance measured must be infinitely high. If not, fit a new short circuit wire, **7.7**.

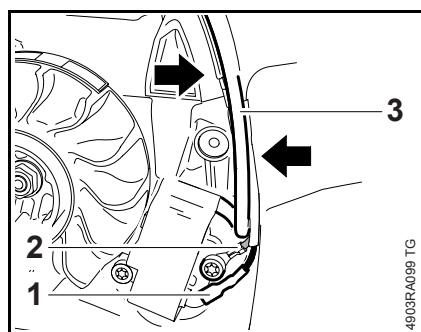
Perform the contact and continuity test on the ground wire too.

- If no fault can be found, check the ignition system with the aid of the troubleshooting chart, **7.8**.
- Reassemble in the reverse sequence.

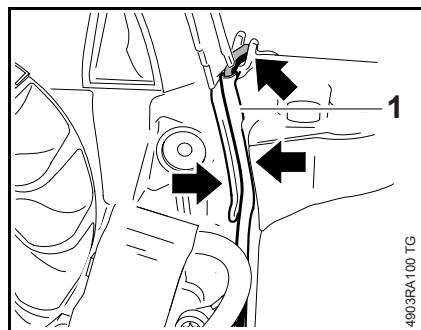
7.7.2 Removing and Installing

- Pull the boot off the spark plug.
- Remove the shroud, **6.4**
- Remove the fan housing, **8.2**
- Disconnect the choke rod, **10.2.1**
- Remove the contact spring, **7.7.4**

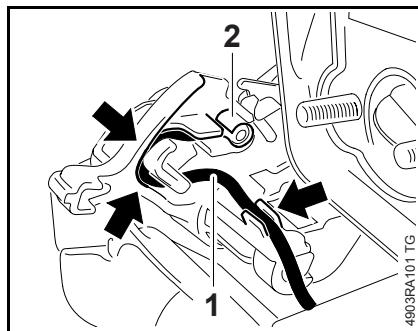
The ground and short circuit wires are combined in a wiring harness.



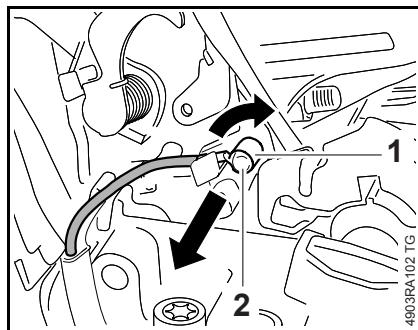
- Pull the ignition lead (3) out of the guide (arrows).
- Remove the connector (1).
- Take out the screw and remove the ground wire (2).



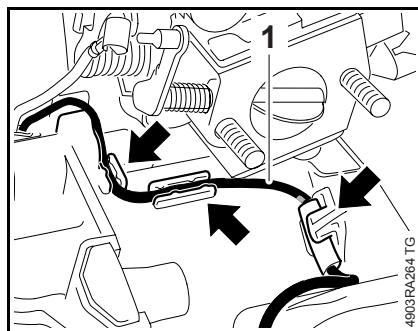
- Pull the wiring harness (1) out of the guides (arrows).



- Pull the short circuit wire (1) out of the guides (arrows).
- Pull the ring terminal (2) off the pin.

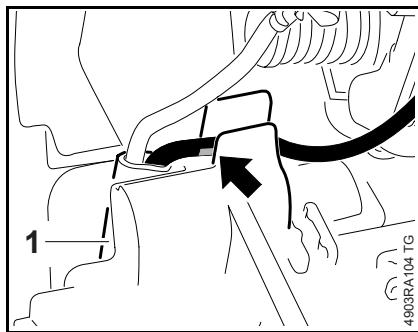


- Lift the ring terminal (1) a little and pull it off the pin (2).
- Remove the filter base, **12.3**

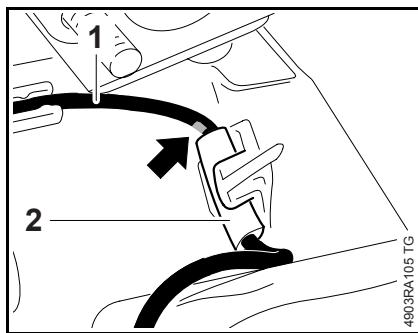


- Pull the short circuit wire (1) out of the guides (arrows).

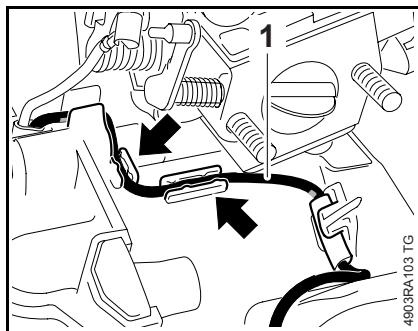
Installing



- Position the short circuit wire so that the yellow mark lines up with the edge (arrow).
- Push the wiring harness (1) into the guide.



- Position the protective tube (2) so that it is in line with the yellow mark (arrow).
- Push the protective tube (2) with short circuit wire (1) into the guide (centered as shown).



The wire must be laid straight and fit snugly against the housing.

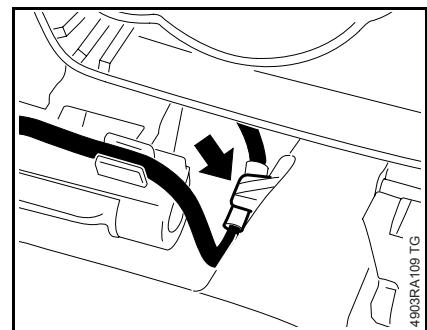
- Push the short circuit wire (1) into the guides (arrows).



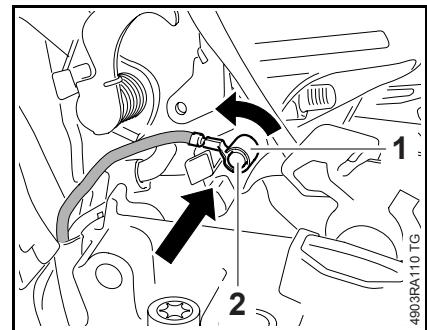
- Install the filter base, 12.3

- Position the ring terminal (1) so that its crimped side faces up.
- Push the ring terminal (1) onto the pin (arrow) as far as stop.

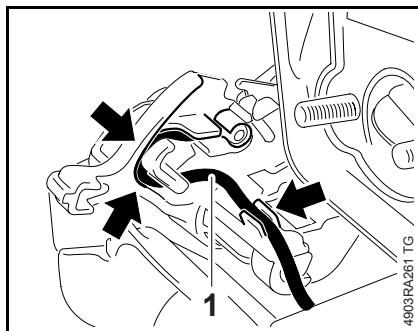
Position the short circuit wire so that it forms a loop and can move along with the switch shaft.



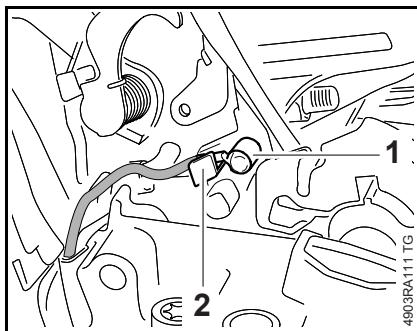
- Check that short circuit wire is properly seated, push it fully into the guide (arrow) if necessary.



- Position the ring terminal (1) so that its crimped side faces up.
- Fit the ring terminal (1) of the ground wire on the pin (2) and swing it down.



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

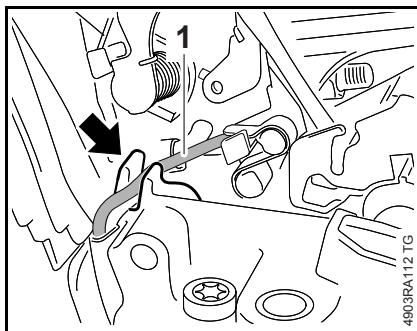


7.7.3 Ground Wire

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

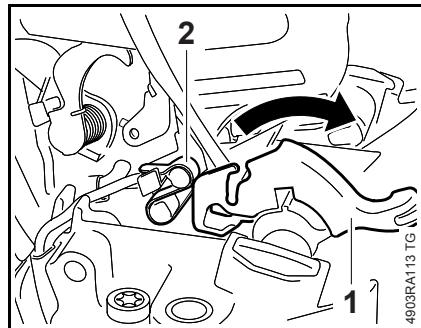
The ground wire is combined with the short circuit wire in a wiring harness. If damaged, the wiring harness must be replaced

- The ring terminal (1) must locate behind the lug (2).
- Check for contact and continuity and replace the wiring harness, [7.7](#)

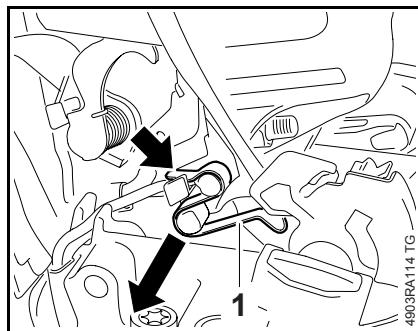


7.7.4 Contact Spring

- Remove the shroud, [6.4](#)
- Remove the choke rod, [10.2.1](#)

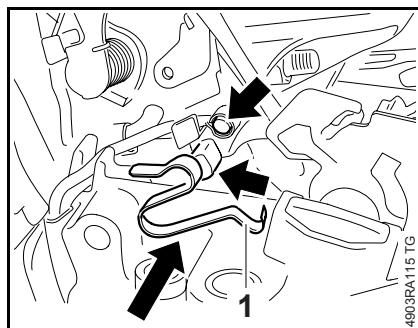


- Move the switch shaft (1) towards the tank housing until the contact spring (2) is free.

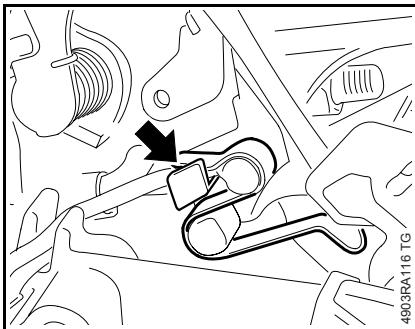


- Lift the contact spring (1) over the lug (arrow) and pull it out.
- Check the ground wire ring terminal and replace it if necessary, [7.7.3](#)

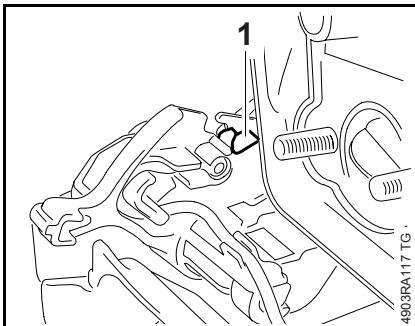
Installing



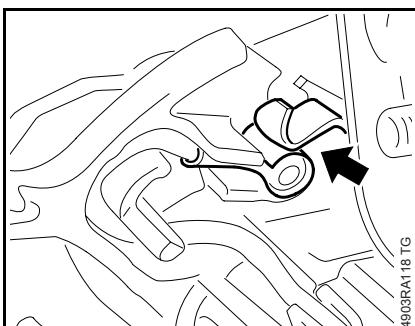
- Place the contact spring (1) in position at a slight angle.
- Push the contact spring (1) onto the pins (arrows) as far as stop.



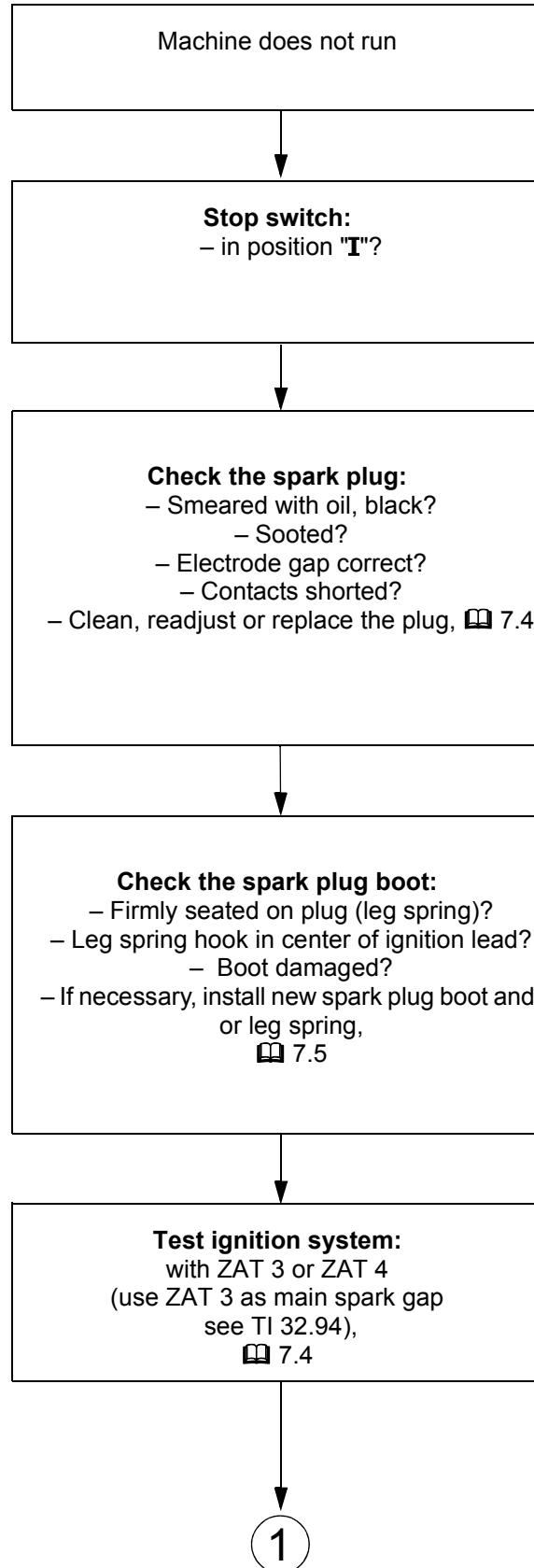
Make sure the lug (arrow) locks the contact spring in position.

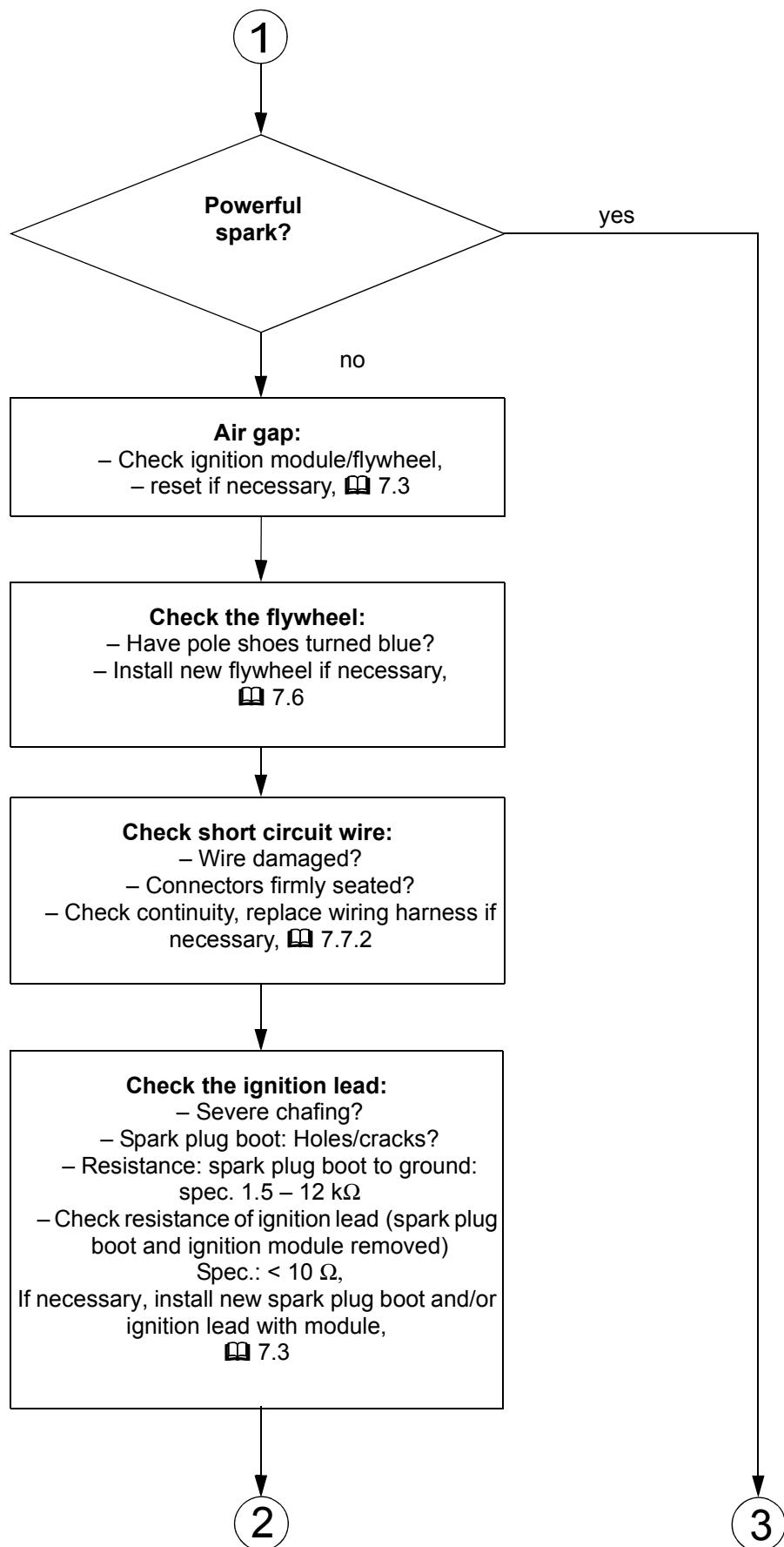


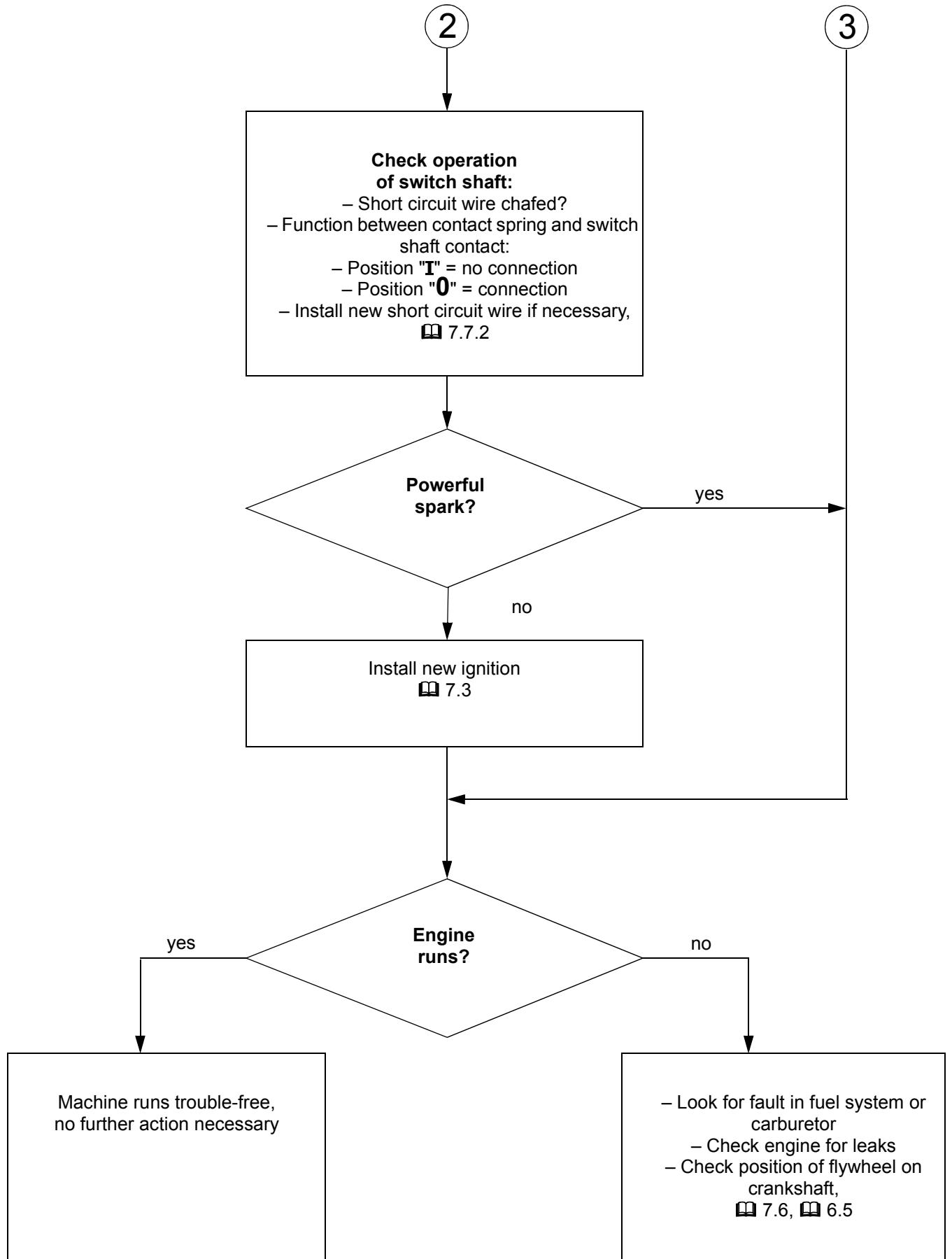
- Lift the contact spring (1) and push it over the switch shaft.



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







8. Rewind Starter

8.1 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.

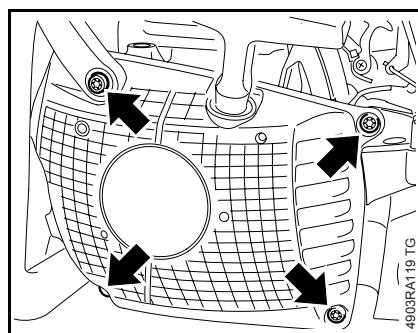
Carefully pull out the starter rope several times and allow it to rewind until its normal smooth action is restored.

Before installing, lubricate the rewind spring and starter post with STIHL special lubricant, **14.**

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, **14**

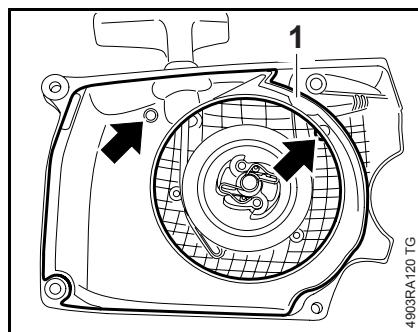
8.2 Fan housing



- Remove the shroud, **6.4**
- Take out the screws (arrows).
- Lift the hand guard a little and remove the fan housing.
- Reassemble in the reverse sequence.

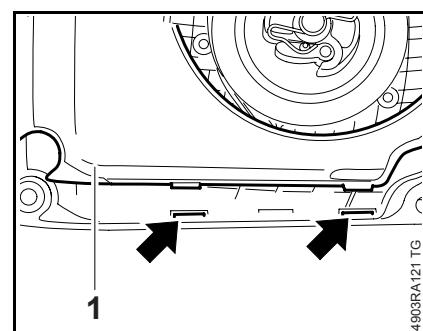
8.2.1 Segment

- Remove the fan housing, **8.2**



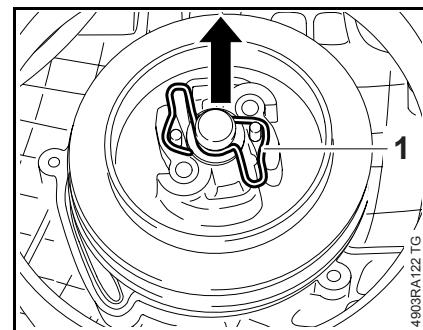
- Pry the segment (1) off the lugs (arrows) and lift it away.

Installing

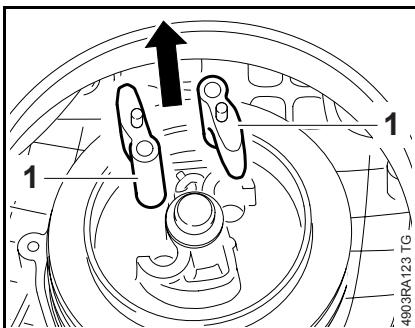


- Engage the segment (1) in the slots (arrows) in the fan housing first and then swing it into position.
- Push the segment (1) into the lugs as far as stop.
- Reassemble in the reverse sequence.

8.3 Pawls

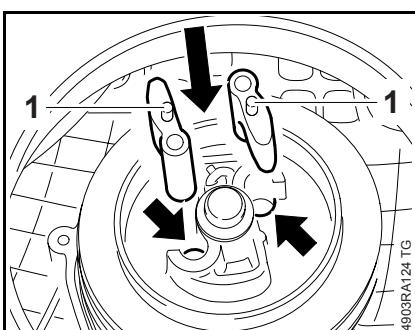


- Remove the fan housing, **8.2**
- Relieve tension of rewind spring, **8.4**
- Carefully ease the spring clip (1) off the starter post.

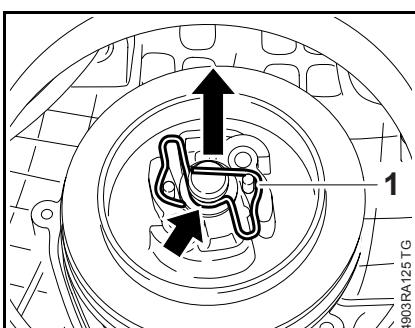


- Remove the pawls (1).

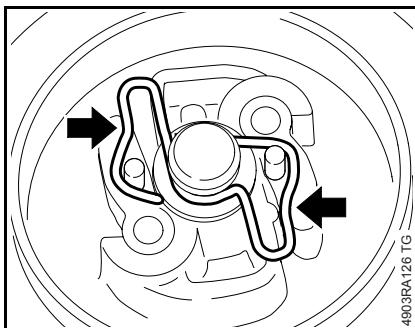
Installing



- Fit the new pawls in the bores (arrows) and lubricate the pegs (1), **14**



- Position the spring clip (1) so that its loops engage the pegs on the pawls. The rounded part of the spring clip (short 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.

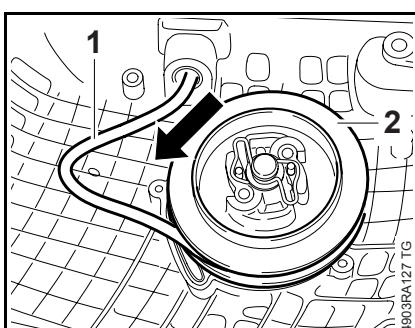


The spring clip's guide loops must be in line with the pawls (arrows).

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.

8.4 Rope Rotor

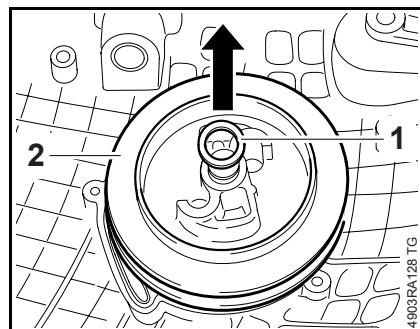


Relieving tension of rewind spring

The system will not be under tension if either the starter rope or rewind spring is broken.

- Remove the fan housing and the segment, **8.2**
- 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, **8.5**
- Remove the spring clip and pawls, **8.3**

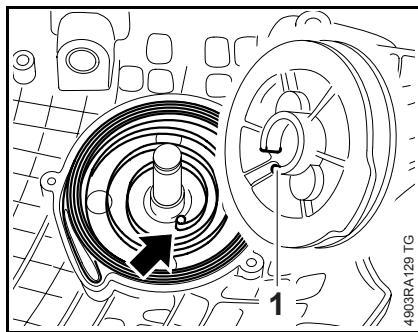


- Remove the washer (1).

Rewind spring must be relaxed.

- Carefully remove the rope rotor (2).
- Coat bore in rope rotor with STIHL special lubricant, **14**

Installing



- 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 cover washer.
- Install the pawls and spring clip, **8.3**
- Install the starter rope, **8.5**
- Tension the rewind spring, **8.6**
- Lubricate pegs on pawls with grease, **14**
- Reassemble all other parts in the reverse sequence.

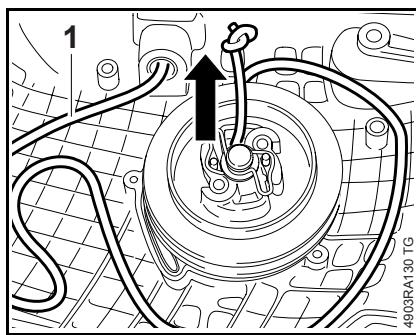
8.5 Starter Rope / Grip

- Remove the fan housing and the segment, **8.2**
- Relieve tension of rewind spring, **8.4**

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

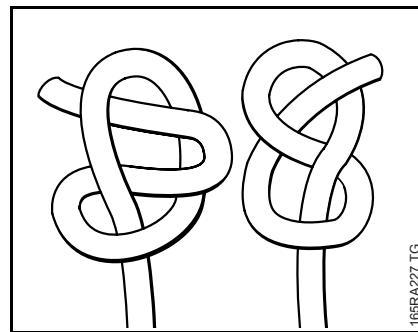
- Remove remaining rope from the rope rotor and starter grip.

Do not shorten the starter rope.

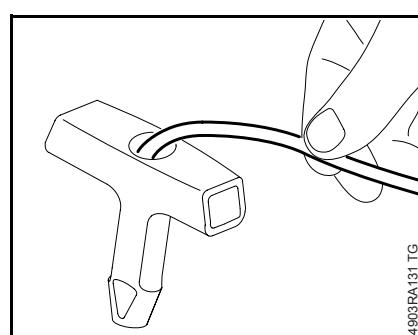


- Push the end of the starter rope (1) out a little and undo the knot.
- Pull the starter rope out of the rope rotor and fan housing.
- Pull the old rope out of the starter grip.

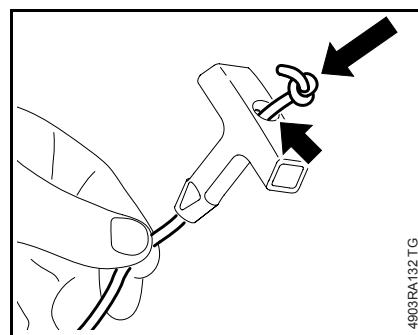
Installing



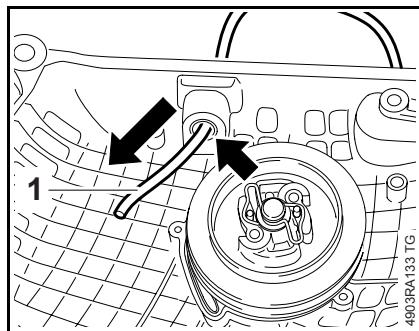
- Tie one of the special knots shown in the end of the rope.



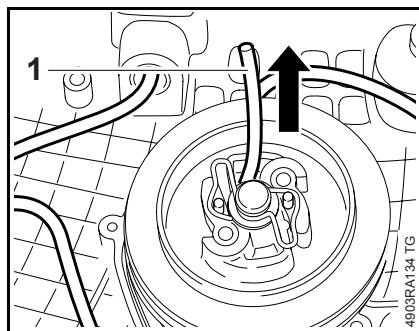
- Thread the rope through the top of the starter grip.



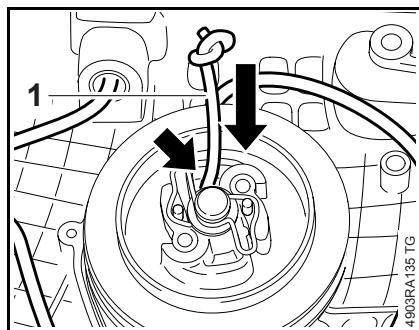
- Pull the rope into the starter grip until the knot is properly seated in the grip (small arrow).



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



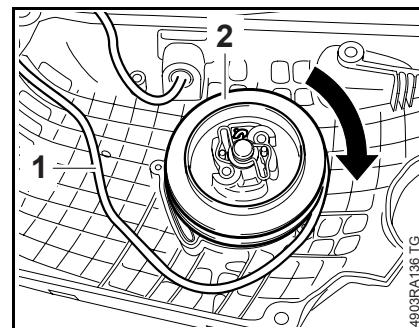
- Thread the starter rope (1) through the side of the rope rotor.
- Secure the rope (1) with a simple overhand knot.



- Pull the rope (1) back into the rotor until the knot locates in the recess (arrow).

- Tension the rewind spring, **8.6**
- Install the segment and fan housing, **8.2**
- Reassemble all other parts in the reverse sequence.

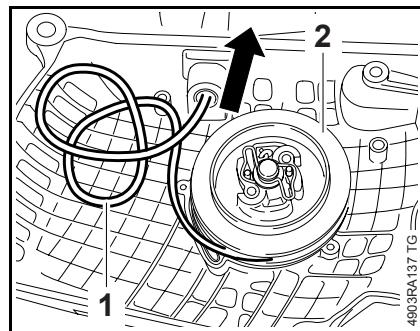
8.6 Tensioning the Rewind Spring



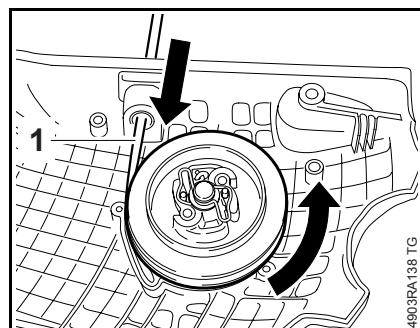
- Remove the fan housing and the segment, **8.2**
- Pull out a short length of starter rope (1).
- Use the starter rope (1) to rotate the rope rotor (2) six turns clockwise.

The rewind spring is now tensioned.

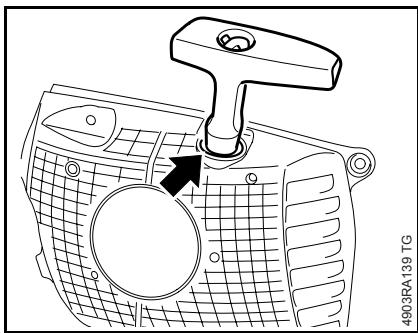
Hold the rope rotor steady since it will otherwise spin back and may damage the rewind spring.



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



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



8.7 Replacing the Rewind Spring

- Troubleshooting, **3.4**

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

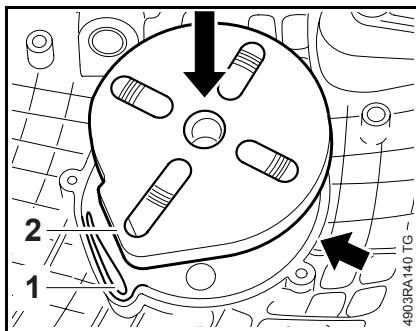
The rewind spring is correctly tensioned when the starter grip sits firmly in the rope guide bushing (arrow) without drooping to one side. If this is not the case, tension the spring by one additional turn.

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, **8.2**



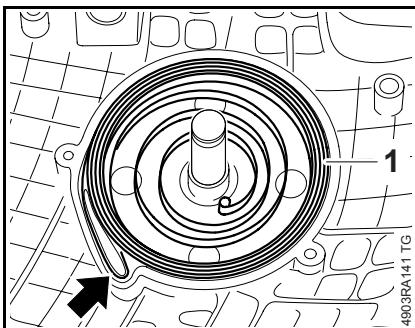
- Lubricate the replacement spring with frame with a few drops of STIHL special lubricant before installing, **14**

- Position the replacement spring with frame in the fan housing – 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.

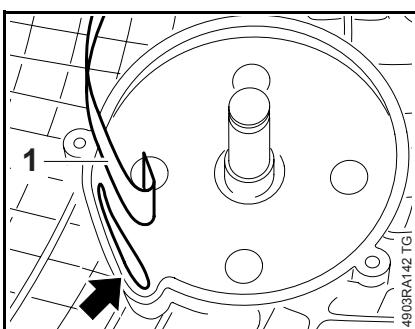
The rewind spring may pop out and unwind.

- Remove the frame.

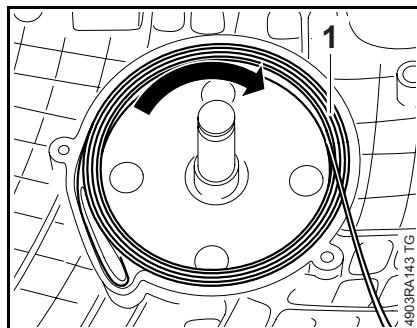


Make sure that the new rewind spring (1) is properly seated and the outer anchor loop is engaged on the lug (arrow). If necessary, use suitable tools to push the rewind spring fully into its seat in the fan housing.

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.

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.
- Install the rope rotor, 8.4
- Reassemble all other parts in the reverse sequence.

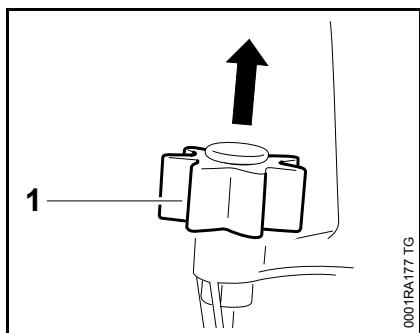
9. Servicing the AV System

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

Damaged springs and buffers must always be replaced.

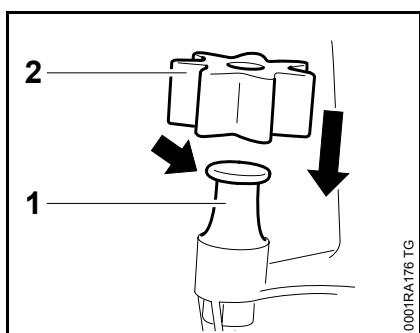
9.1 Buffer on Oil Tank

- Remove the handlebar, [9.7](#)



- Pull off the buffer (1).

Installing



- Use STIHL press fluid to simplify assembly, [14](#)
- Push the buffer (2) onto the peg (1) on the handlebar as far as stop.

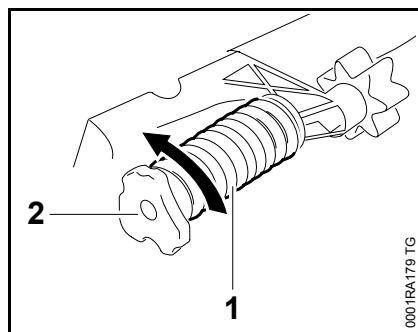
The peg's head (arrow) must locate properly on the buffer.

- Reassemble all other parts in the reverse sequence.

9.2 AV Spring on Oil Tank

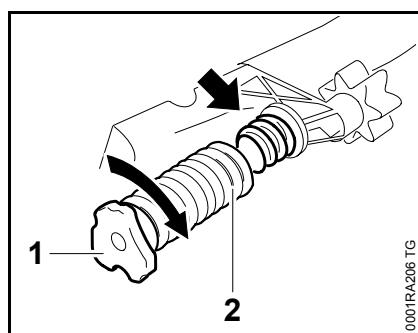
The antivibration spring is at the forward end of the oil tank and is secured to the underside of the machine.

- Remove the handlebar, [9.7](#)



- Unscrew the AV spring (1).

- Unscrew the bearing plug (2).

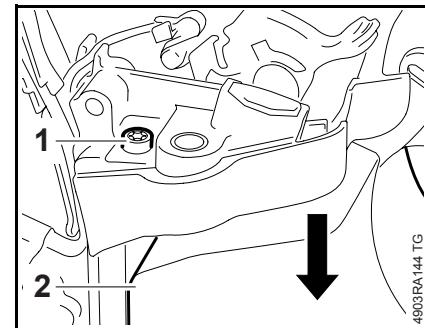


- Pry out the AV spring (1).
- Screw home the bearing plug (1) as far as stop.
- Screw the AV spring (2) into the handlebar (arrow) as far as stop.

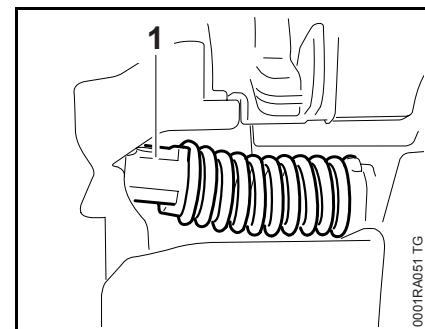
- Reassemble all other parts in the reverse sequence.

9.3 AV Spring on Fuel Tank

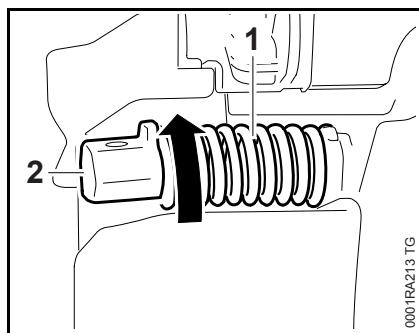
- Remove AV spring from handlebar, [9.4](#)
- Remove the stop buffer, [9.6](#)



- Take out the screw (1).
- Lower the tank housing (2).

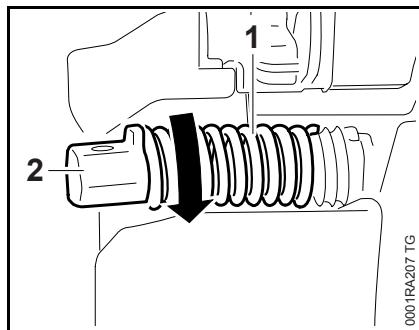


- Pry out the AV spring (1).

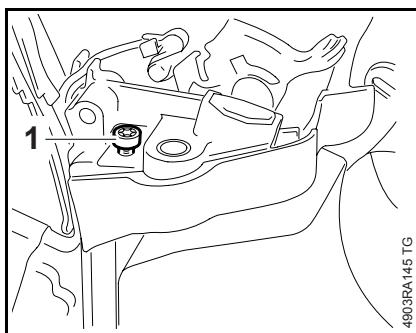


- Unscrew the AV spring (1).
- Unscrew the bearing plug (2).

Installing

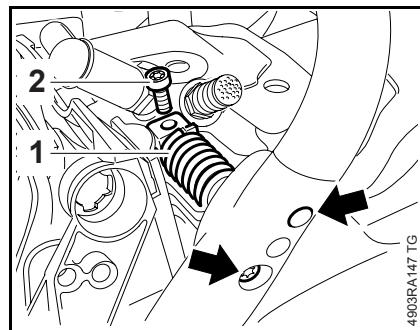


- Screw home the bearing plug (2) as far as stop.
- Screw the AV spring (1) into the plug (arrow) on the tank housing as far as stop.
 - Push the AV spring (1) into its seat.



- Fit and tighten down the screw (1) firmly.
 - Reassemble all other parts in the reverse sequence.

Installing

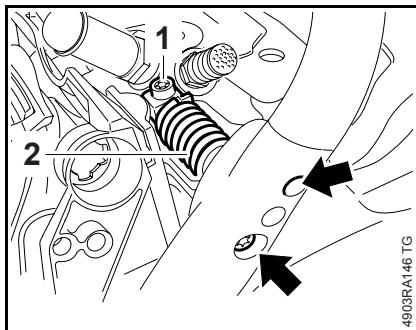


- Push the complete AV spring (1) into the handlebar.
- Insert the screws (arrows) and tighten them down firmly.
- Coat the screw (2) with threadlocking adhesive, fit it and tighten it down firmly, 14
- Reassemble all other parts in the reverse sequence.

9.4 AV Spring on Front Handle

The AV spring is located between the handle frame and cylinder.

- Remove the shroud, 6.4

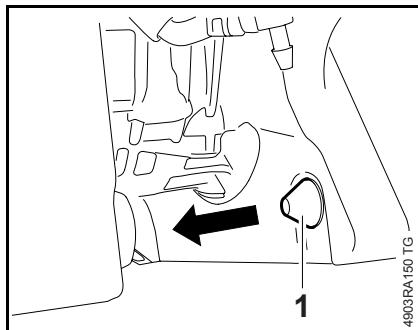


- Take out the screws (1 and arrows).
- Remove the complete AV spring (2).

9.5 Stop Buffer at Clutch Side

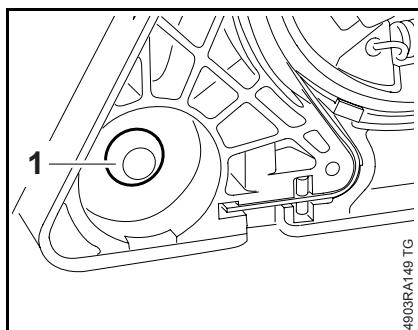
The stop buffers are located between the tank housing and engine housing. They are fitted at the ignition and clutch sides.

- Remove the tank housing, [12.11.4](#)
- Remove the cover, [5.2](#)



- Ease the stop buffer (1) out of the bore.

Installing



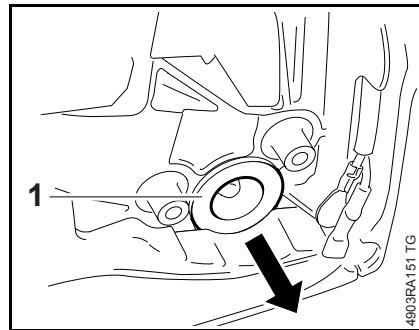
- Position the stop buffer (1) with its short end facing the engine housing.
- Use STIHL press fluid to simplify assembly, [14](#)

- Push the stop buffer (1) into the bore and make sure it is properly seated.

- Reassemble all other parts in the reverse sequence.

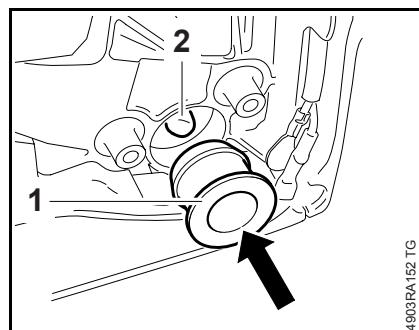
9.6 Annular Buffer at Ignition Side

- Remove the ignition module, [7.3](#)



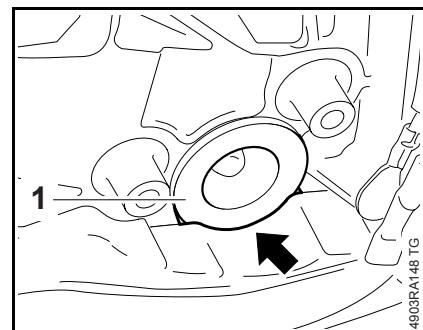
- Pry out the annular buffer (1).

Installing



- Line up the annular buffer (1) with its tapered end facing the engine housing.
- Use STIHL press fluid to simplify assembly, [14](#)

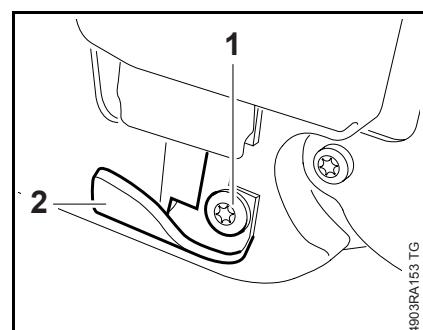
- Push home the annular buffer (1) so that its bore engages the peg (2) in the tank housing.



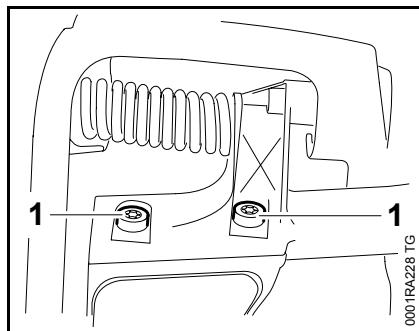
- Annular buffer (1) must be properly seated in the recess (arrow).
- Reassemble all other parts in the reverse sequence.

9.7 Handlebar

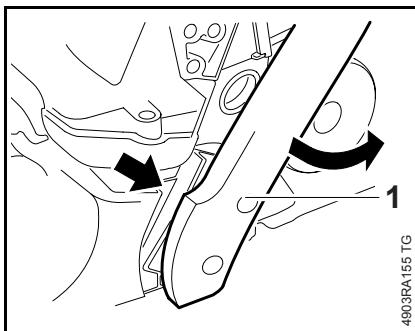
- Remove the shroud, [6.4](#)
- Remove AV spring from handlebar, [9.4](#)



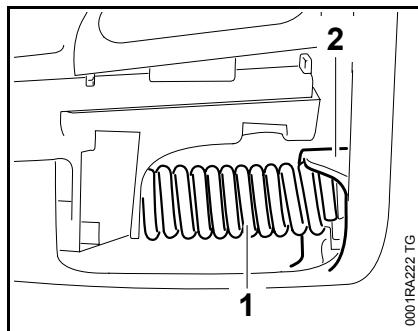
- Take out the screw (1) and remove the chain catcher (2).



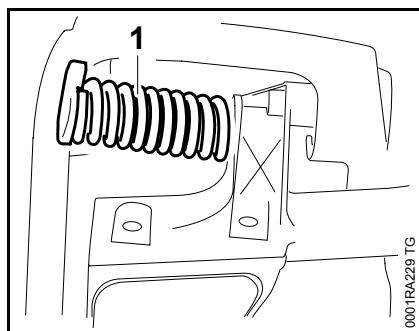
- Remove the screws (1) from the underside of the machine.



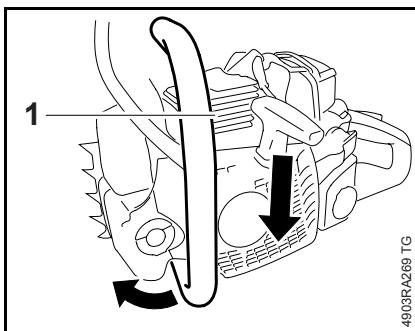
- Ease the handlebar (1) sideways and take it out of the guide (arrow).



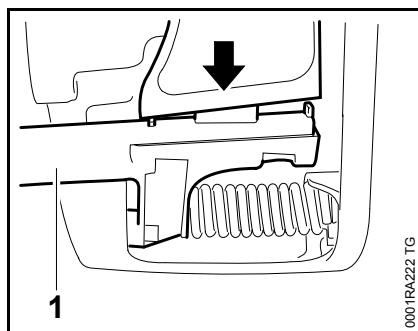
- Push the AV spring (1) into its seat (2).



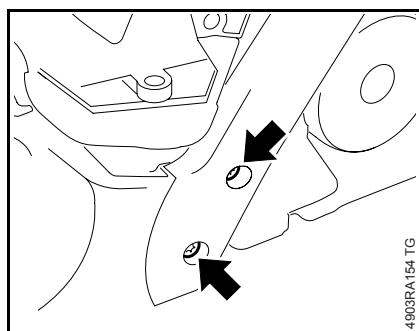
- Ease the tank housing to one side and pry out the AV spring (1).



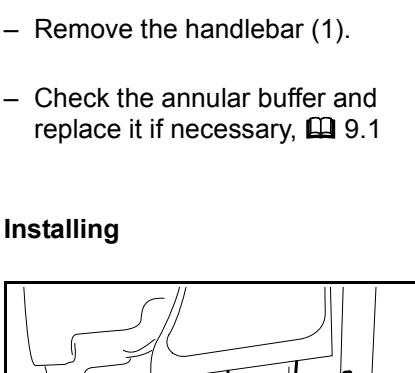
- Push the handlebar (1) out of the lower guide.



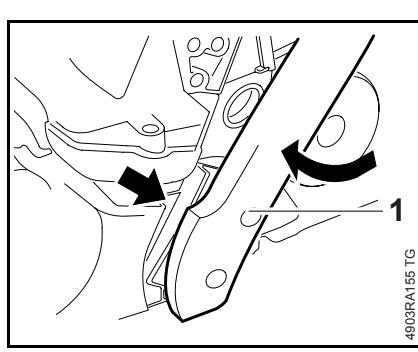
- Position the handlebar (1) against the guide (arrow).



- Take out the screws (arrows).



Installing

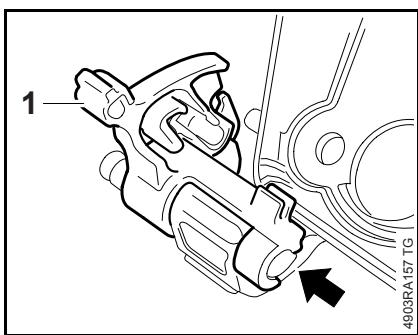


- Ease the handlebar (1) sideways and place it in the guide (arrow).
- Insert the screws and tighten them down firmly.
- Reassemble all other parts in the reverse sequence.

- Push the handlebar, buffer (1) first, into the engine housing.

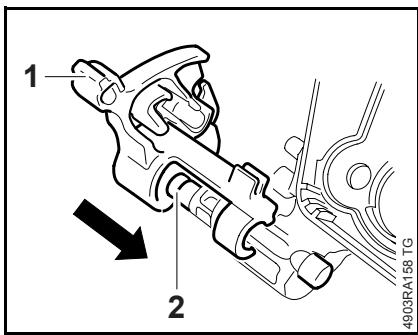
10. Control Levers

10.1 Master Control Lever

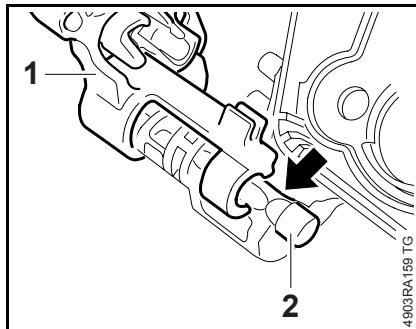


- Remove the filter base, **12.3**
- Pry the switch shaft (1) out of its mount (arrow).
- Lift the switch shaft (1) a little and pull it away.

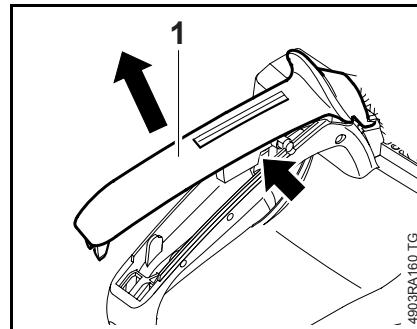
Installing



- Push the switch shaft (1) onto the pin (2).

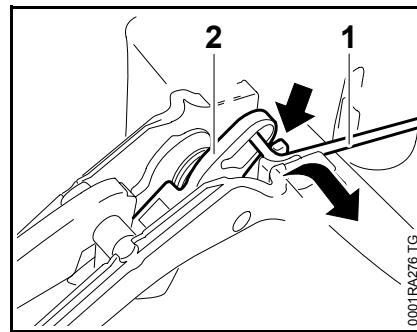


- Carefully push the switch shaft (1) over the taper (arrow).
- Push the switch shaft (1) onto the pin (2) until it snaps into position.
- Install the filter base, **12.3**
- Reassemble all other parts in the reverse sequence.
- Check operation.

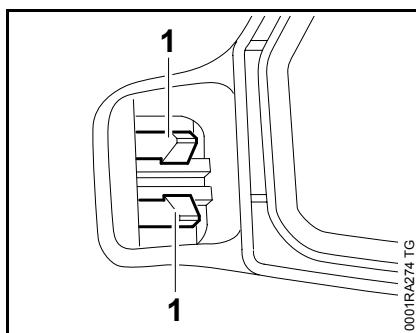


- Remove the handle molding (1).

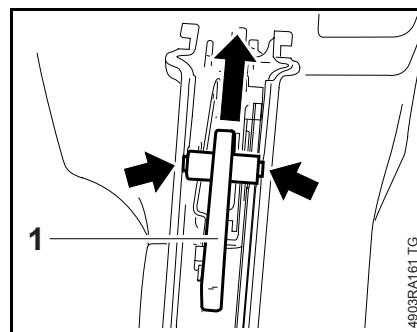
The interlock lever (arrow) may pop out.



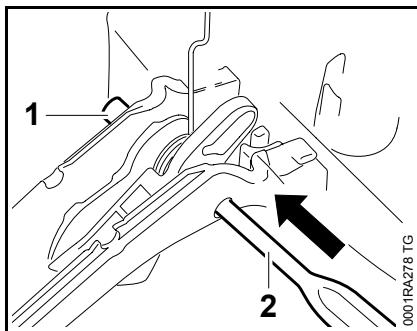
- Take the throttle rod (1) out of the guide (arrow) and disconnect it from the throttle trigger (2).



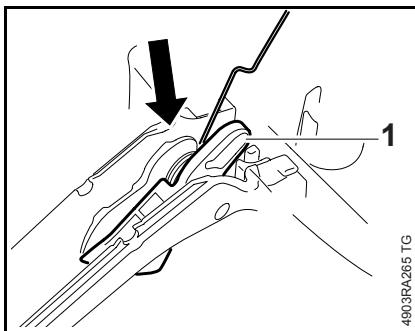
- Push the tabs (1) apart and through the tank housing.



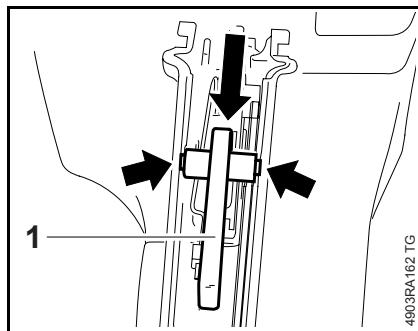
- Ease the interlock lever (1) out of its mounts (arrows).
- Disconnect the torsion spring and remove the interlock lever.



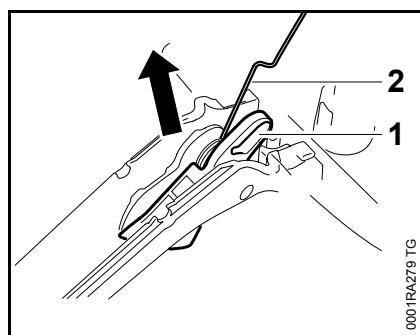
- Use a suitable drift (2) to drive out the pin (1).



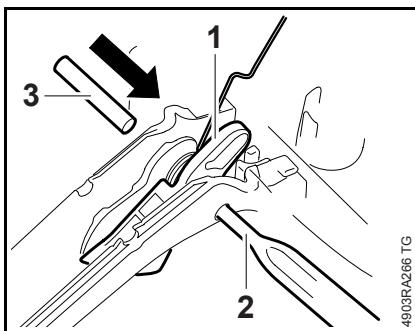
- Place the throttle trigger (1) in the handle and line up the holes in the trigger and handle.



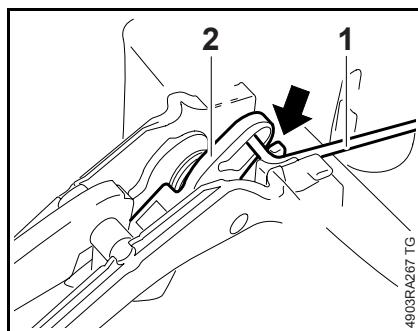
- Push the interlock lever (1) into its pivot mounts (arrows) until it snaps into position – check that torsion spring is in position.



- Remove the throttle trigger (1) with torsion spring (2).

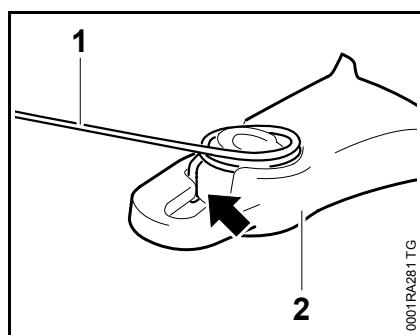


- Use a suitable drift (2) to center the throttle trigger (1).
- Drive home the pin (3) until it is recessed by same amount at both sides.

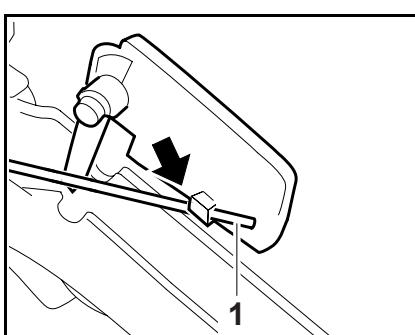


- Attach the throttle rod (1) to the trigger (2) and fit it in the guide (arrow).

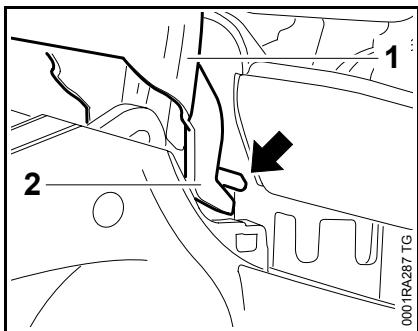
Installing



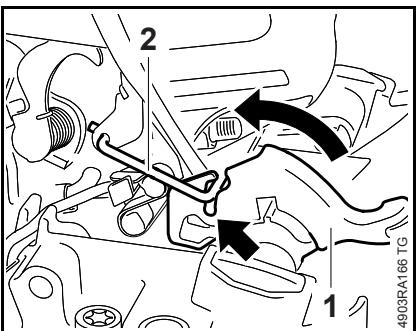
- Attach the torsion spring (1) to the trigger (2) – note the installed position (arrow).



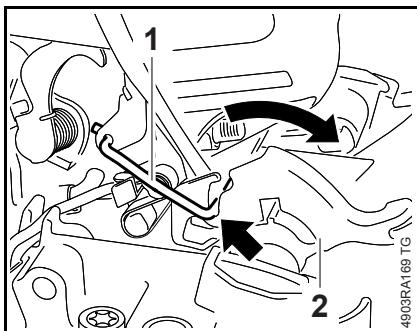
- Attach the torsion spring (1) to the interlock lever (arrow).



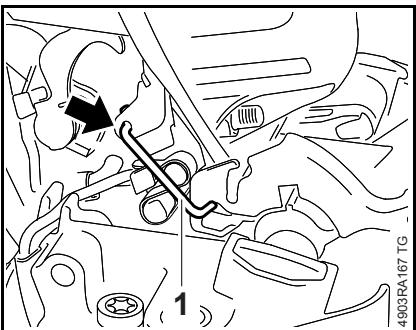
- Engage tabs of handle molding (1) in the openings (arrow).
 - Push down the handle molding (1) until it snaps into position.
 - Check operation.
 - Reassemble all other parts in the reverse sequence.



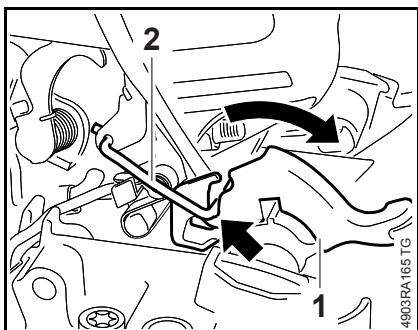
- Move the switch shaft (1) in the direction of the carburetor and disconnect the choke rod (2).
 - Take the choke rod (2) out of the guide.



- Position the choke rod (1) in the guide (arrow).
 - Rotate the switch shaft (2) and push the choke rod (1) fully into the guide.
 - Check operation – rotate the switch shaft. If necessary, push home the choke rod until it is properly seated.

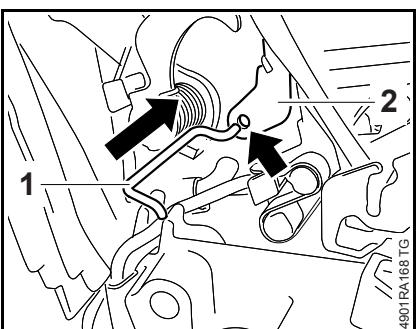


- Disconnect the choke rod (1) from the choke shaft (arrow).



- Carefully pry the choke rod (2) out of its seat in the guide (arrow) and move the switch shaft (1) in the direction of cold start at the same time.

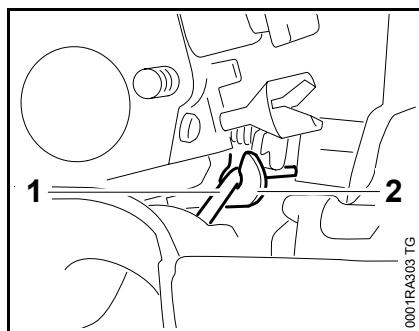
Installing



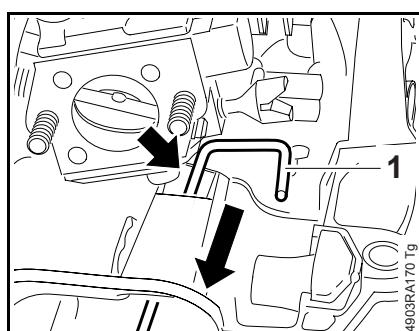
- Engage the choke rod (1) in the bore (arrow) in the choke shaft (2).

10.2.2 Throttle Rod

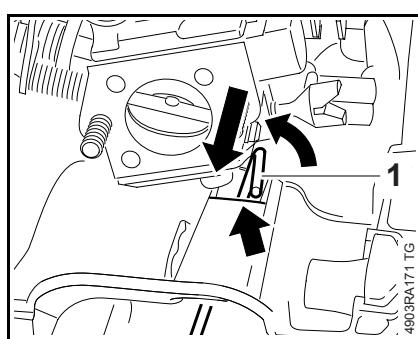
- Disconnect the throttle rod from the trigger, **10.2**
- Remove the filter base, **12.3**



- Pry the throttle rod (1) out of the carburetor carrier (2).

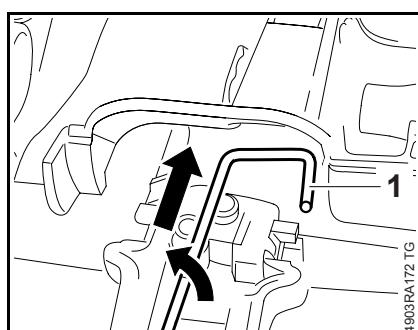


- Pull the throttle rod in the direction of the handle until its bent end (1) is in front of the opening (arrow).

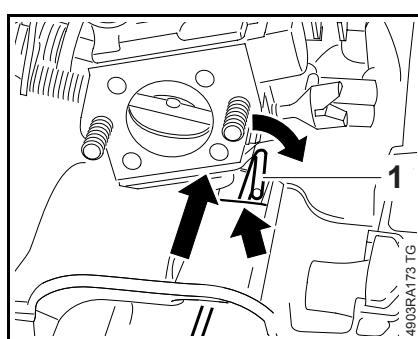


- Rotate the throttle rod (1) about 90° counterclockwise. Pass the throttle rod (1) through the opening (arrow) in the direction of the tank housing and remove it.

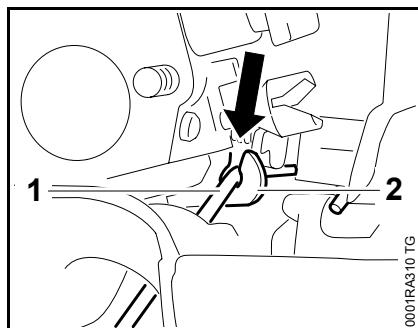
Installing



- Line up the throttle rod (1) (see illustration).
- Push the throttle rod (1) between the tank housing and air guide shroud and rotate it about 90° at the same time.



- Pass the throttle rod (1) through the opening (arrow).
- Rotate the bent end (1) clockwise and push it under the throttle trigger.



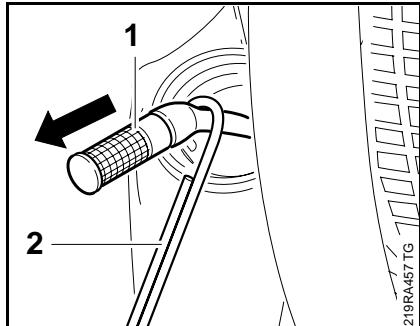
- Push the throttle rod (1) into the guide (2) in the carburetor carrier until it snaps into position.
 - Check operation – the throttle lever on the carburetor must move upwards when the throttle trigger is pulled.
 - Reassemble in the reverse sequence.

11. Chain Lubrication

11.1 Pickup Body

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

- Troubleshooting, **3.3**
- Open the oil tank cap and drain the oil tank.
- Collect chain oil in a clean container, **1**



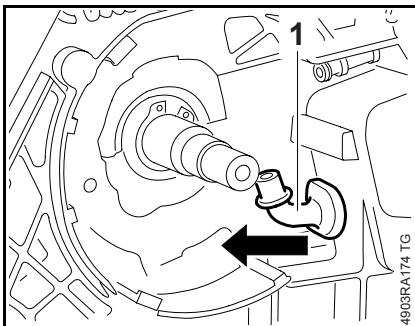
- Use hook (2) 5910 893 8800 to remove the pickup body (1) from the oil tank.

Do not overstretches the suction hose.

- Pull off the pickup body (1).
- Reassemble in the reverse sequence.

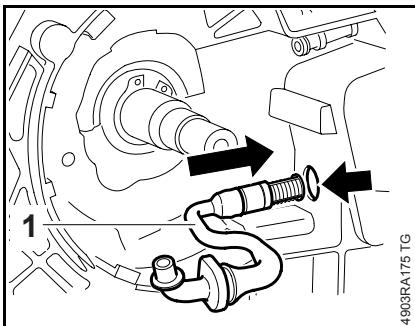
11.2 Oil Suction Hose

- Remove the clutch, **4**
- Remove the brake band, **5.2**
- Open the oil tank cap and drain the oil tank **1**.
- Remove the oil pump, **11.3**

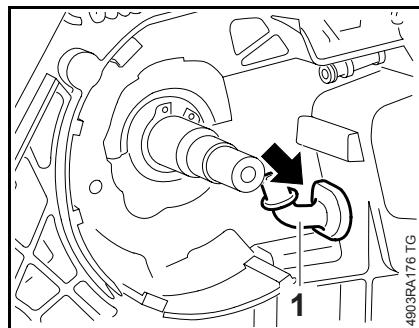


- Remove the oil suction hose (1).
- Fit the pickup body, **11.1**

Installing



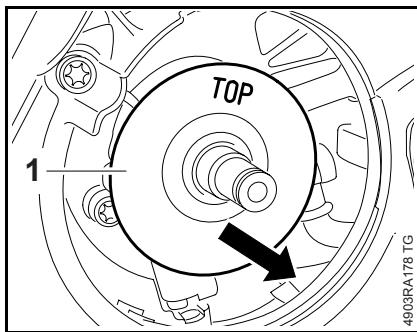
- Push the oil suction hose (1), pickup body first, through the housing bore (arrow).



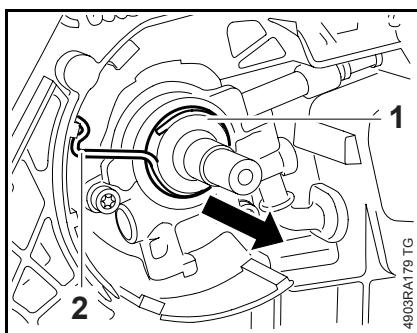
- Line up the oil suction hose (1)
– the tab (arrow) must locate against the housing.
- Use STIHL press fluid to simplify assembly, **14**
- Push home the oil suction hose (1) until its groove is properly seated in the engine housing.
- Check position of pickup body. If necessary, use hook 5910 893 8800 to position it properly.
- Install the oil pump, **11.3**
- Reassemble all other parts in the reverse sequence.

11.3 Oil Pump

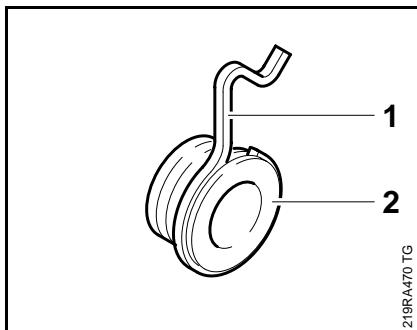
- Troubleshooting, **3.3**
- Remove the brake band, **5.2**
- Remove the clutch, **4**



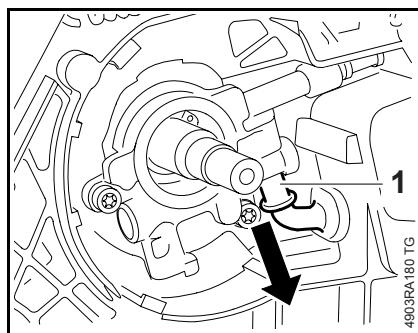
- Remove the washer (1).



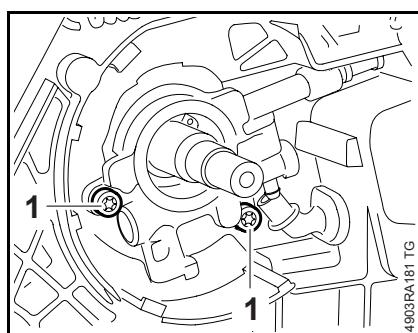
- Pull the worm (1) with drive spring (2) out of the oil pump.



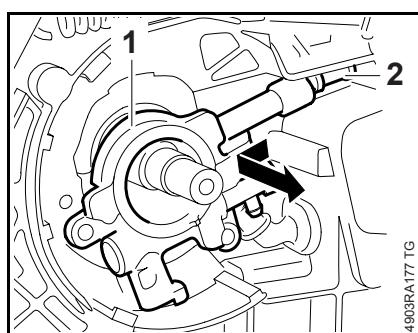
- The spring (1) and worm (2) form a single unit and must be replaced if damaged.



- Pull off the oil suction hose (1).

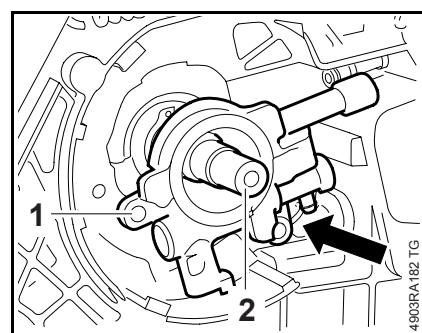


- Take out the screws (1).

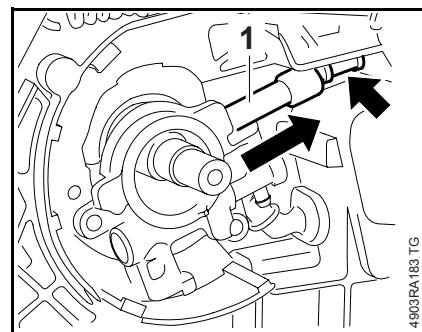


- Pull the oil pump (1) off the nipple (2) and then lift it off over the crankshaft stub.

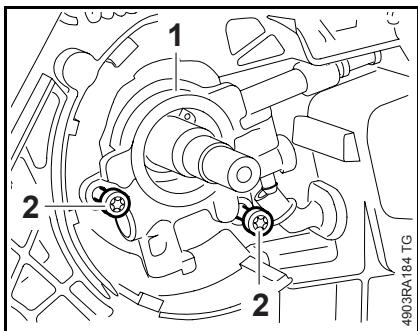
Installing



- Fit the oil pump (1) over the crankshaft stub (2).



- Push the connector (1) onto the nipple (arrow).

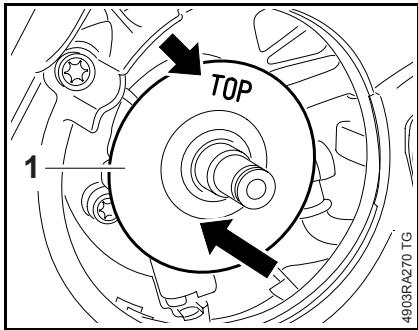


11.4 Valve

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 1.

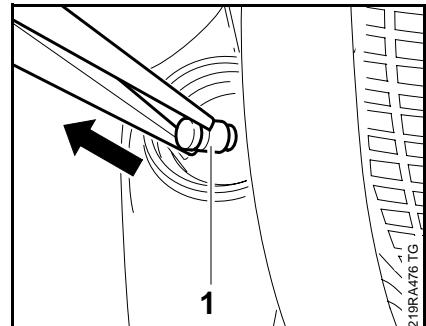
- Place the oil pump (1) in position.
- Fit and tighten down the screws (2) firmly.
- Connect the oil suction hose to the oil pump.
- Push the worm fully home.



- Fit the cover washer (1) so that the word **TOP** (arrow) faces outwards.
- Check adjustment of oil pump and readjust if necessary – see instruction manual.
- Reassemble all other parts in the reverse sequence.

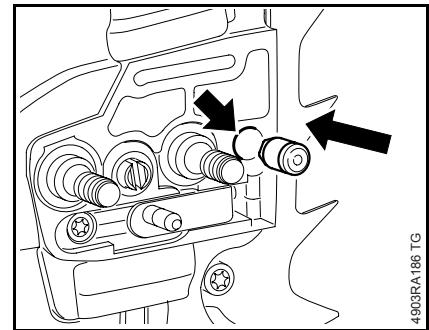


- Use a 6 mm drift to carefully drive the valve out of its seat in the housing and into the oil tank.



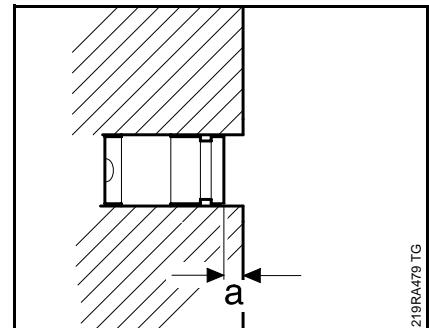
- Remove the old valve (1) from the oil tank.

Installing



Check correct installed position.

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



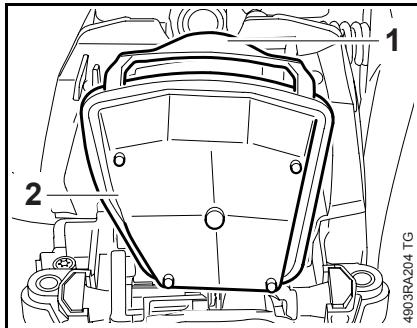
- Installed depth of new valve:
 $a = 1 \text{ mm } +/- 0.1$.
- Reassemble all other parts in the reverse sequence.

12. Fuel System

12.1 Air Filter

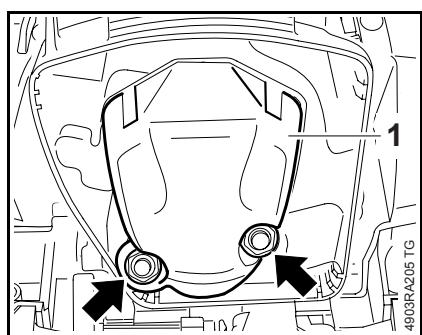
Dirty air filters reduce engine power, increase fuel consumption and make starting more difficult. The air filter should be checked when there is a noticeable loss of engine power.

- See also Troubleshooting, **3.6**, **3.7**
- Remove the shroud, **6.4**



- Lift the retaining tab (1) a little and remove the air filter (2).
- Check the air filter and clean or replace if necessary
– see instruction manual.
- Reassemble in the reverse sequence.

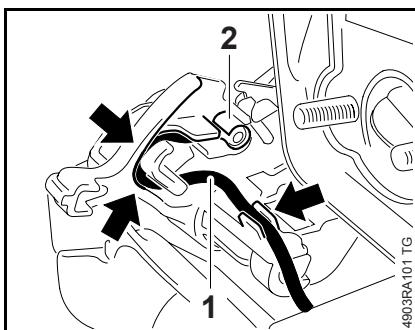
12.2 Baffle



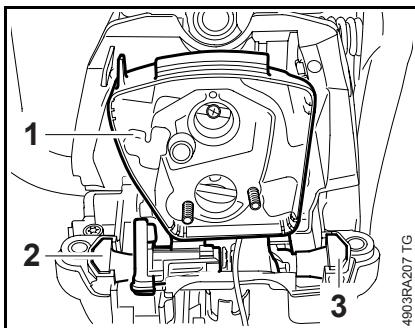
- Remove the air filter, **12.1**
- Unscrew the nuts (arrows).
- Remove the baffle (1).
- Reassemble in the reverse sequence.

12.3 Filter Base

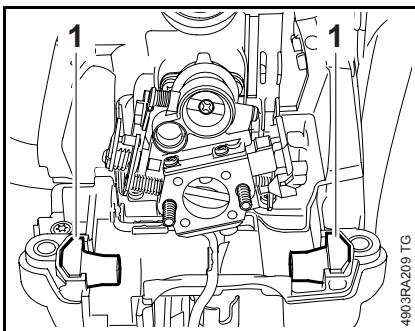
- Remove the air filter, **12.1**
- Remove the baffle, **12.2**
- Remove the choke rod, **10.2.1**
- Disconnect the ground wire from the contact spring, **7.7.4**.



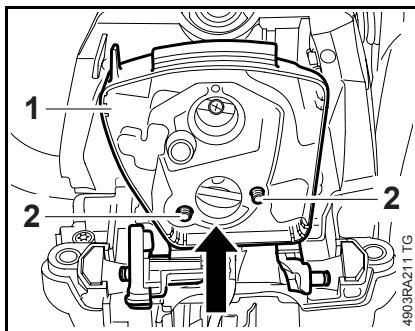
- Pull the short circuit wire (1) out of the guides (arrows).
- Pull the ring terminal off the pivot pin (2).



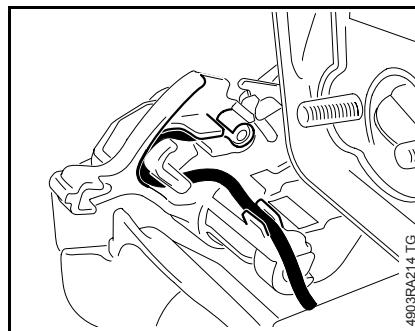
- Pull the filter base (1) out of rubber buffer (3) first and then rubber buffer (2).
- Remove the filter base (1).



- Pry out the rubber buffer (1).

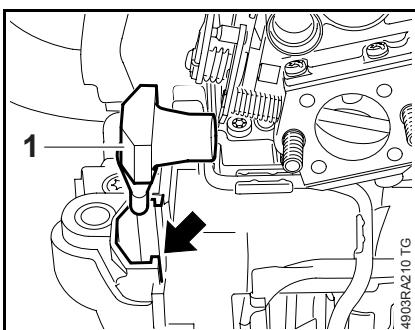


- Slide the filter base (1) over the studs.

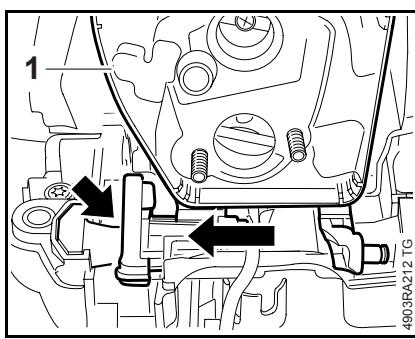


- Install the short circuit wire, [7.7.2](#)
- Reassemble all other parts in the reverse sequence.

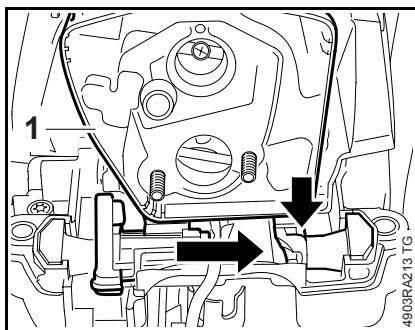
Installing



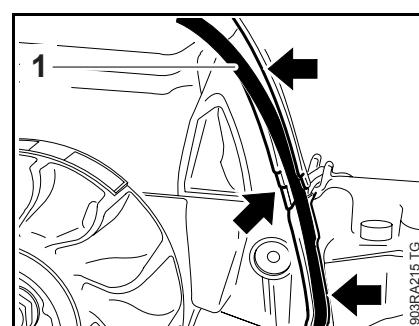
- Use STIHL press fluid to simplify assembly, [14](#)
- Push the rubber buffer (1), tapered end first, into the bore (arrow) as far as stop – the tapered end must slide fully home and engage the bore.



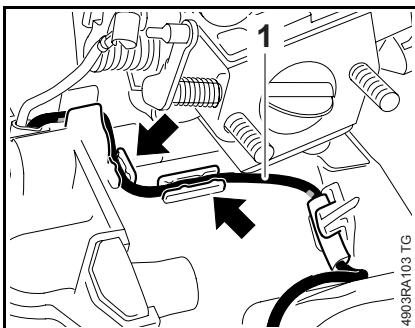
- Push the filter base (1) fully into the rubber buffer (arrow).



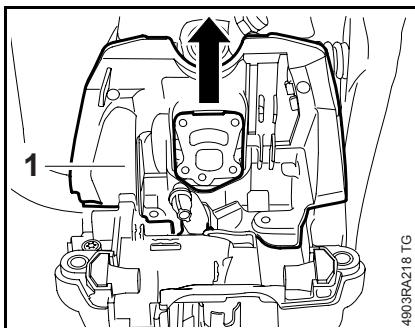
- Push the filter base (1) fully into the rubber buffer (arrow).



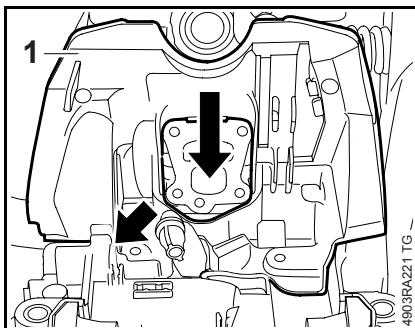
- Pull the ignition lead (1) out of the guides (arrows).



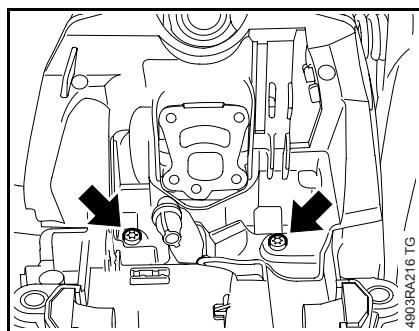
- Pull the short circuit wire (1) out of the guides (arrows).



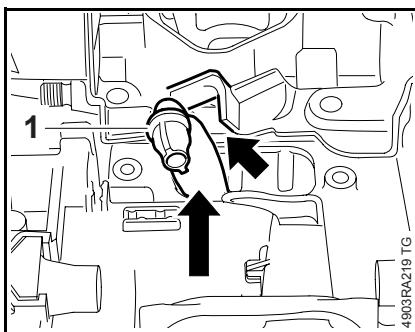
- Remove the air guide shroud (1) upwards.



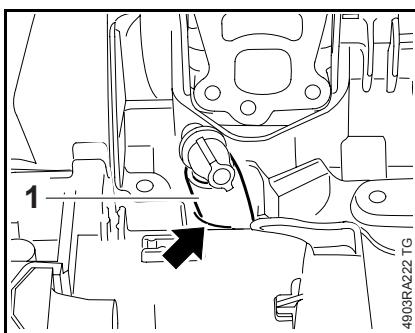
- Push the (1) fully into its seat (arrow) until it snaps into position.



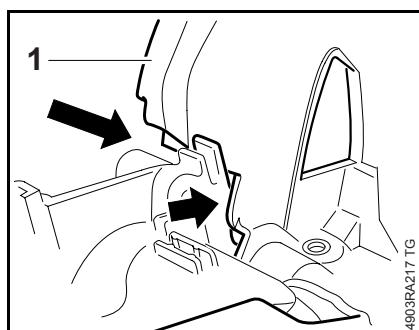
- Take out the screws (arrows).



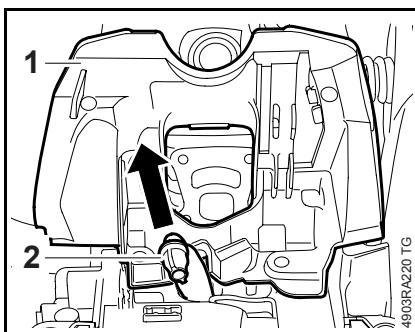
- Position the fuel hose (1) in the recess in the air guide shroud (arrow).



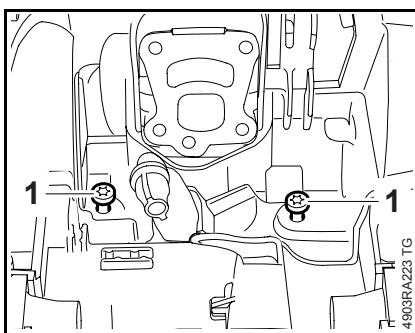
- Make sure the protective tube (1) covers the opening (arrow).



- Push the air guide shroud (1) in the direction of the intake port until it engages the edge (arrow).



- Line up the air guide shroud (1) and hold the fuel hose (2) at the same time.



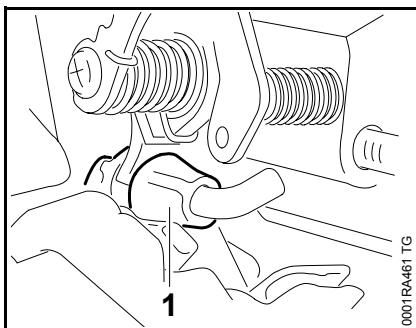
- Fit and tighten down the screws (1) firmly.

- Pay attention to mark when installing the short circuit wire,
 Book 7.7.2
- Reassemble all other parts in the reverse sequence.

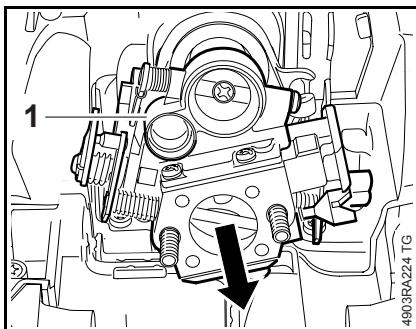
12.5 Carburetor

- Remove the filter base, **12.3**
- 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.

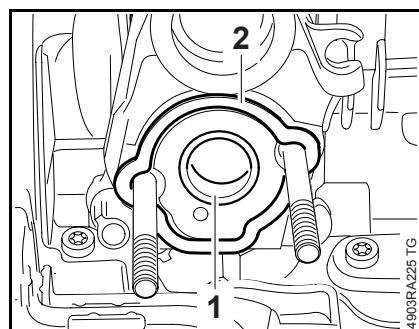


- Push the fuel hose (1) back a little
– the fuel hose is disconnected.

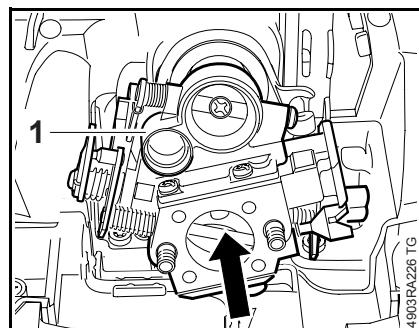


- Remove the carburetor (1).
- Install a new fuel hose, **12.11.2**

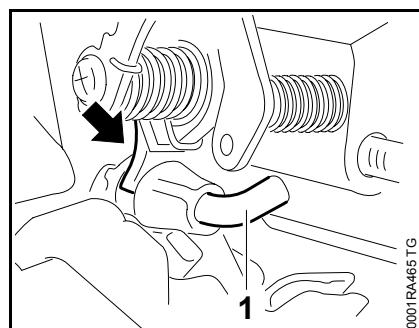
Installing



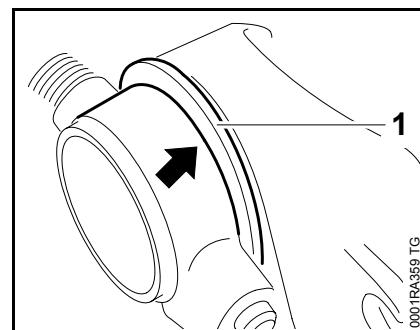
- Check that the sleeve (1) and washer (2) are in place.



- Push the carburetor (1) into position.



- The fuel hose must be located in its seat (arrow).
- When positioning the carburetor, make sure the stub (1) is pushed into the fuel hose.



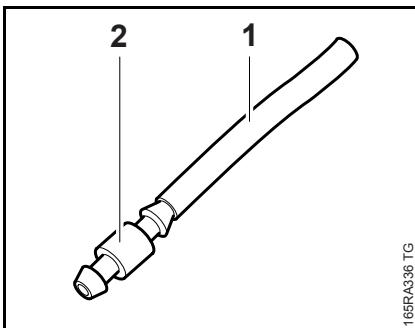
- Shoulder (arrow) must fully engage the intake manifold (1).
- Use STIHL press fluid to simplify assembly, **14**
- Install the filter base, **12.3**
- Install the air filter, **12.1**
- Check operation.
- Reassemble all other parts in the reverse sequence.

12.5.1 Leakage Test

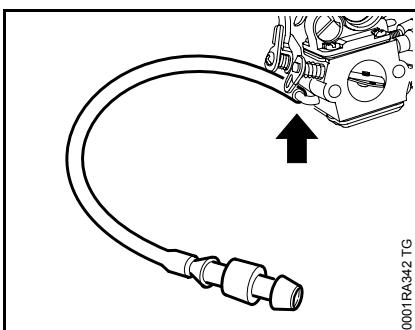
In the case of problems with the carburetor or fuel supply system, also check and clean or replace the tank vent, **12.10**

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

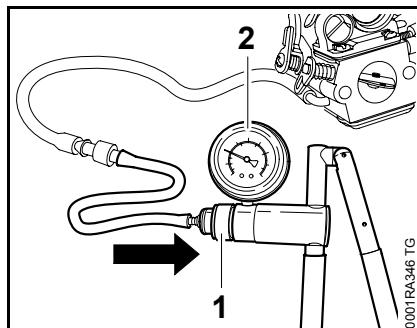
- Remove the filter base, **12.3**



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



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



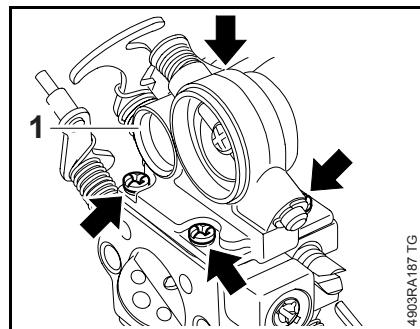
- Push the pressure hose of pump 0000 850 1300 onto the nipple.
- Push the ring (1) to the right and pump air into the carburetor until the pressure gauge (2) indicates a pressure of about 0.8 bar (80 kPa).

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

- 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, **12.6.2**
 - Metering diaphragm or gasket damaged, replace if necessary, **12.6.1**
 - Pump diaphragm or gasket damaged, replace if necessary, **12.6.3**
- After completing the test, push the ring (1) to the left to vent the system and then pull the fuel hose off the carburetor.
 - Install the filter base, **12.3**
 - Reassemble all other parts in the reverse sequence.

12.6 Servicing the Carburetor

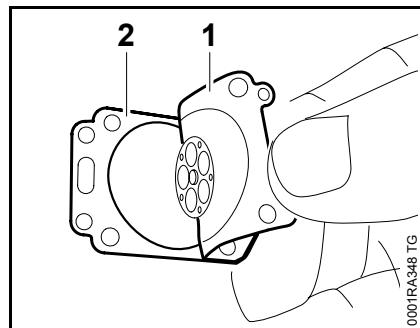
12.6.1 Metering Diaphragm



4903RA187 TG

- Troubleshooting, **3.6**
- Remove the carburetor, **12.5**
- Take out the screws (arrows).
- Remove the end cover (1).

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



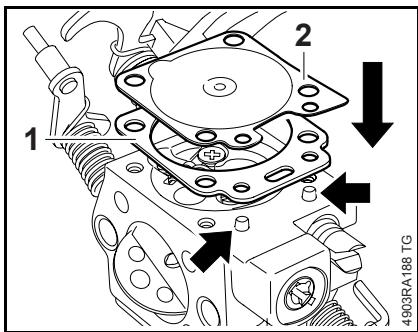
0001RA348 TG

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

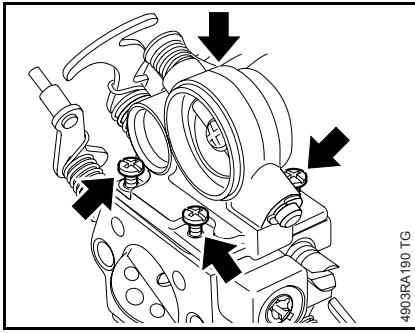
The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue. i.e. the diaphragm distorts and swells and has to be replaced.

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

Installing

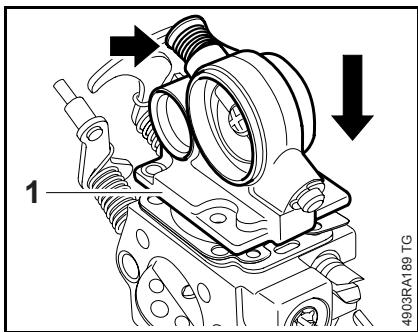


- Note installed positions of metering diaphragm (2) and gasket (1).
- Fit the gasket (1) and metering diaphragm (2) on the pegs (arrows).

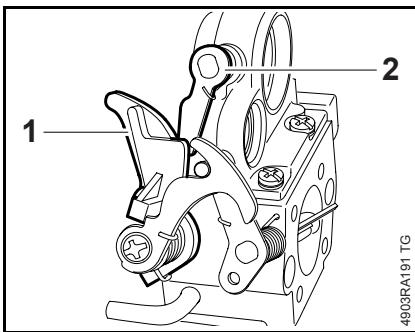


- Fit the screws (arrows).
- Check position of metering diaphragm and gasket, then tighten down the screws firmly in a crosswise pattern.

The end cover must be in line with the edge of the carburetor body.

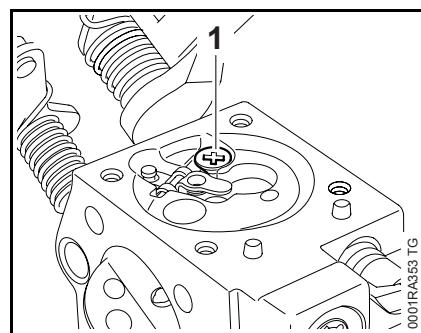


- Position the end cover (1) so that the lever (arrow) points in the direction of the choke shutter.
- Move the end cover (1) a little until the pegs engage the holes in the end cover.

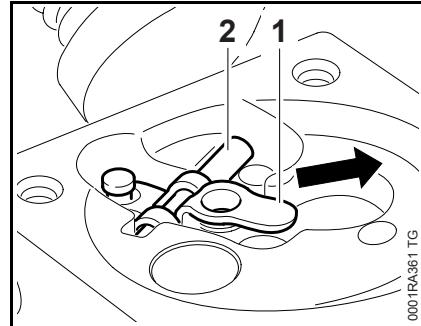


- Check operation – throttle shaft lever (1) must engage the air valve lever (2).
- Reassemble all other parts in the reverse sequence.

12.6.2 Inlet Needle

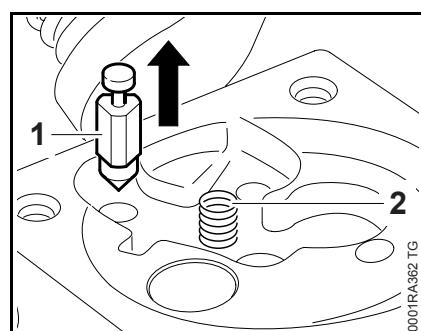


- Remove the metering diaphragm, **12.6.1**
- Take out the screw (1).

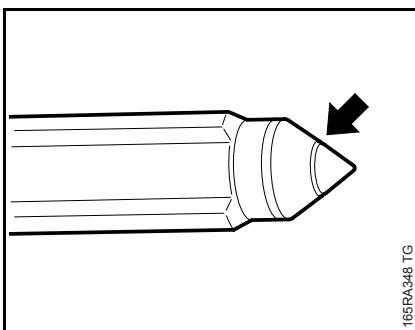


- Pull the inlet control lever (1) with spindle (2) out of the inlet needle's groove.

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

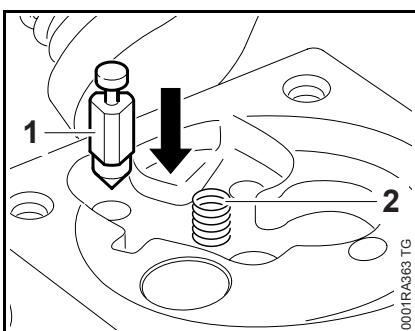


- Remove the inlet needle (1).
- Remove the spring (2).

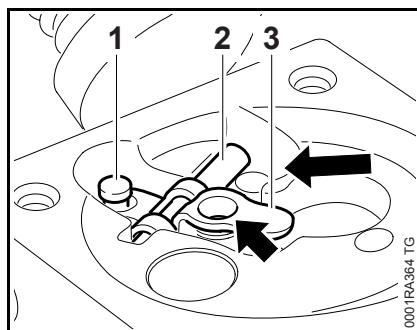


- If there is an annular indentation (arrow) on the sealing cone of the inlet needle, fit a new inlet needle.

Installing



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

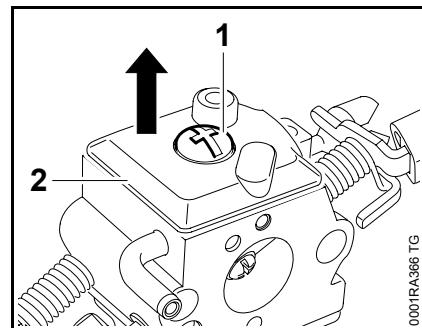


- Position the inlet control lever (3) with spindle (2) on the spring (arrow) first, then slide the inlet control lever's clevis into the groove in the inlet needle (1).

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 the inlet control lever moves freely.
- Install the metering diaphragm, **12.6.1**

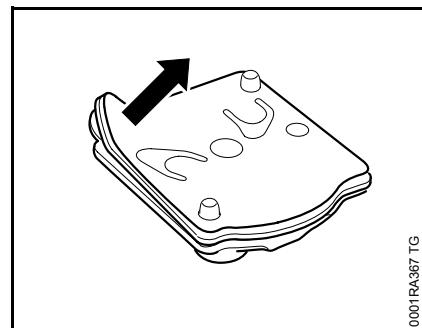
12.6.3 Pump Diaphragm



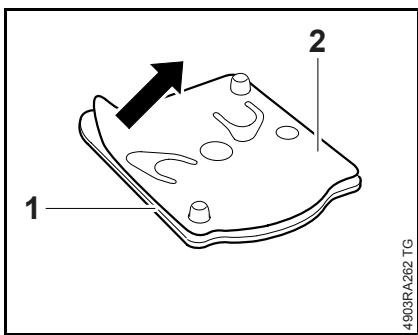
- Troubleshooting, **3.6**
- Remove the carburetor, **12.5**
- Take out the screw (1).

- Remove the end cover (2).

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



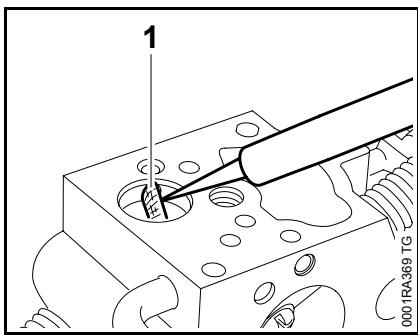
- Carefully remove the pump diaphragm with gasket.



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

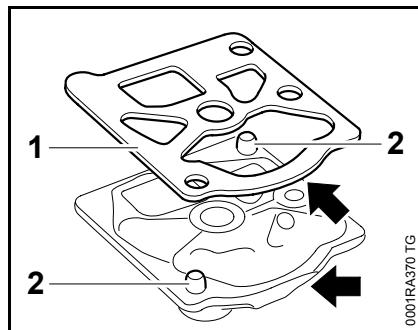
The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue. i.e. the diaphragm distorts and swells and has to be replaced.

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

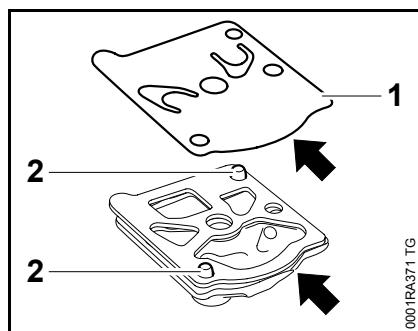


- Use a needle to remove the fuel strainer (1) from the carburetor body. Clean or replace the fuel strainer.
- Reassemble in the reverse sequence.

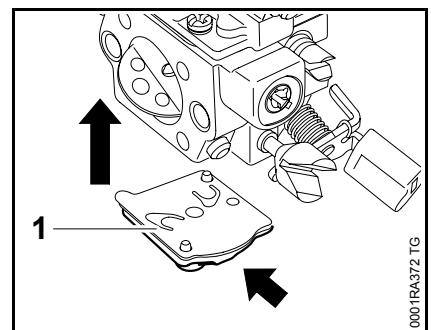
Installing



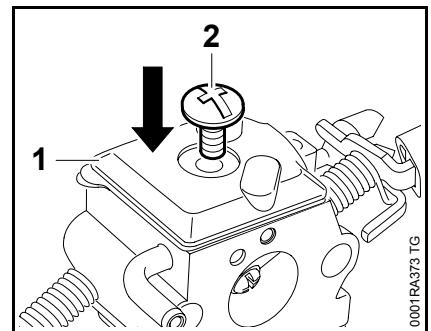
- Fit the new gasket (1) so that the contours (arrows) match and it is held in position by the pegs (2).



- Fit the pump diaphragm on the gasket (1) so that the contours (arrows) match and it is held in position by the pegs (2).



- Position the end cover (1) so that the lever (arrow) points in the direction of the adjusting screws.
- Fit the end cover (1) from below so that the pump diaphragm and gasket are still held in position.



- Move the end cover (1) a little until its pegs engage the holes in the carburetor body.
- Check that the pump diaphragm and gasket are properly seated.
- Fit and tighten down the screw (2) firmly.
- Reassemble all other parts in the reverse sequence.

12.6.4 Air Valve

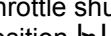
Air valve shaft stiff or air valve cannot be closed or opened properly:

The air valve matches the end cover. If it is damaged, the complete end cover must be replaced.

- Carburetor troubleshooting, [3.6](#)

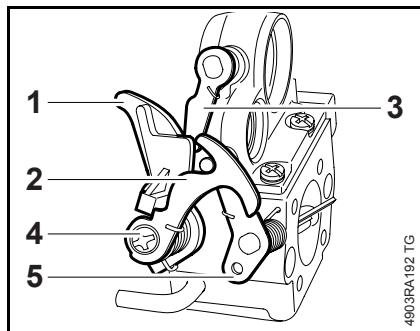
Position of throttle shutter/air valve

The correct position of the air valve can be checked visually as follows.

- Throttle shutter in idle position
 - air valve fully closed.
- Throttle shutter in idle position / full throttle position – air valve closed / wide open.
- Throttle shutter in full throttle position – air valve wide open.
- Throttle shutter in cold start position 
 - air valve fully closed.
- Throttle shutter in warm start position 
 - air valve open about 5°

The air valve must move freely in both directions (open and closed) and always return to the idle position.

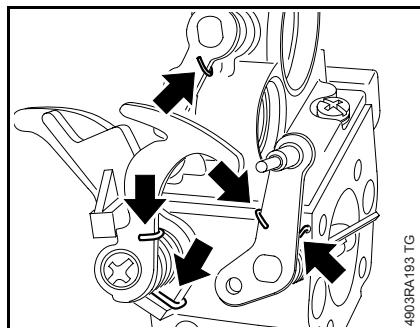
The air valve is fully closed in the idle position.



Lever (1) must butt against lever (2) and engage lever (3).

Lever (5) must engage lever (2) for cold and warm starts
– the choke lever (5) returns to the idle position when the throttle is opened.

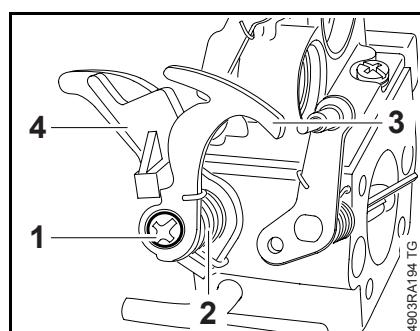
- Screw (4) must be tightened down firmly.



The torsion springs (arrows) must be preloaded and attached to the levers.

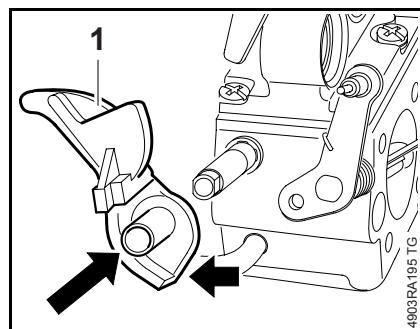
12.6.5 Levers on Throttle Shaft

- Remove the carburetor, [12.5](#)
- Carburetor troubleshooting, [3.6](#)

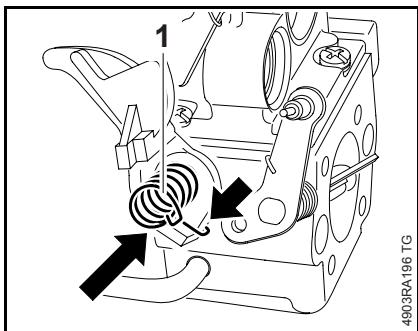


- Take out the screw (1).
- Relieve tension of the torsion spring (2) and remove the lever (3).
- Pull off the torsion spring (2) and lever (4).

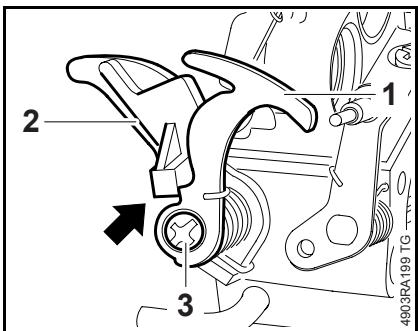
Installing



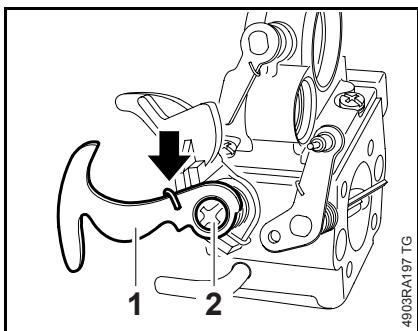
- Push the lever (1) onto the throttle shaft as shown (arrow).



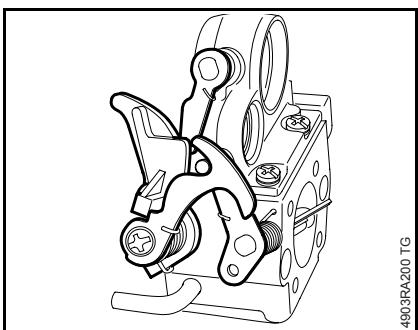
- Fit the torsion spring (1) so that its leg locates against the lever (arrow).



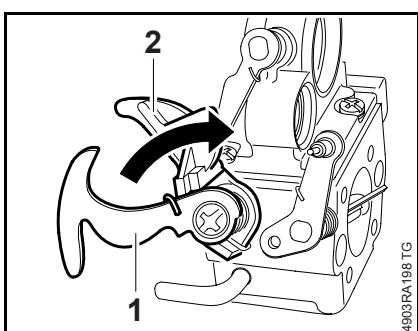
- Hold lever (1) and lever (2) together against the stop (arrow).
- Tighten down the screw (3) firmly.



- Attach the torsion spring to the lever (arrow).
- Fit the lever (1) and tighten the screw (2) moderately
– the lever must still turn freely.

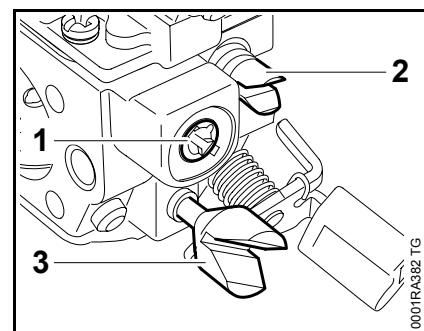


- Check operation.
- Reassemble all other parts in the reverse sequence.



- Hold the lever (2) steady.
- Rotate the lever (1) clockwise until it butts against the stop on lever (2) and engages the end of the throttle shaft.

12.6.6 Adjusting Screws



Grommet has been removed for the sake of clarity.

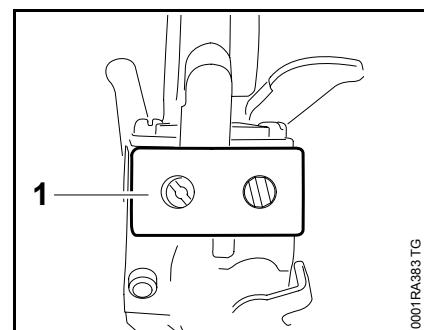
There are three adjusting screws on the carburetor:

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

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

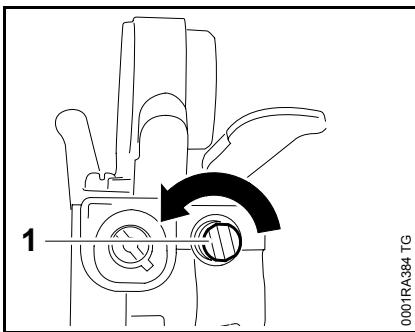
The high speed screw **H** has a limiter cap, which has to be removed before the screw is removed.

- Remove the carburetor, **12.5**
- See also carburetor troubleshooting, **3.6**

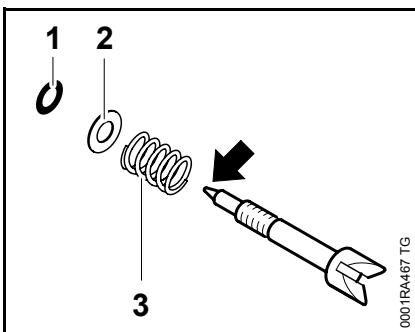


- Pull off the grommet (1).

Low speed screw



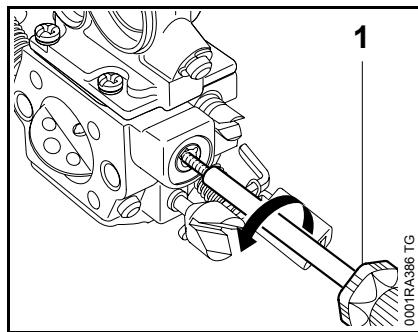
- Take out the low speed screw L (1).



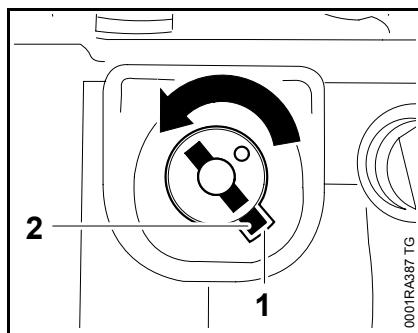
- Inspect the sealing ring (1), washer (2) and spring and replace if necessary.
- Inspect the tip (arrow) for damage or wear and replace the low speed screw (L) if necessary.
- Screw down the low speed screw (L) as far as stop.
- Continue with the high speed screw (H).

High speed screw

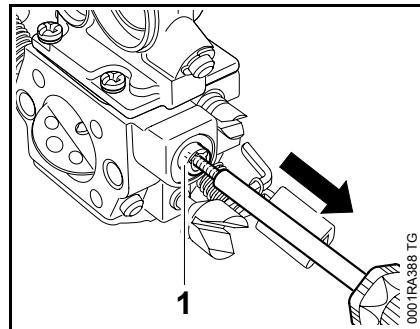
The high speed screw (H) has a limiter cap, which has to be removed before the screw is removed.



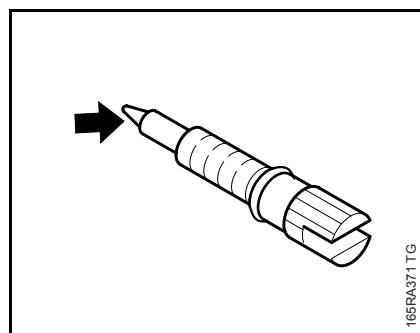
- Screw the puller (1) 5910 890 4500 counterclockwise into the limiter cap – left-hand thread.



- Rotate the limiter cap until the lug (2) is in line with the slot (1).

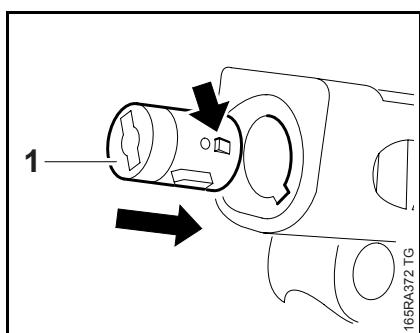


- Pull out the limiter cap (1).
- Take out the high speed screw (H).



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

Pre-installing limiter cap



Always install a new limiter cap.

- Push the new limiter cap (1) on to the high speed screw (H) as far as the detent (arrow)
 - do not push fully home.

The basic setting is performed through the pre-installed limiter cap with screwdriver 5910 890 2304.

- Reassemble in the reverse sequence.
- Carry out the basic setting, **12.7.1**

12.7 Carburetor Adjustment

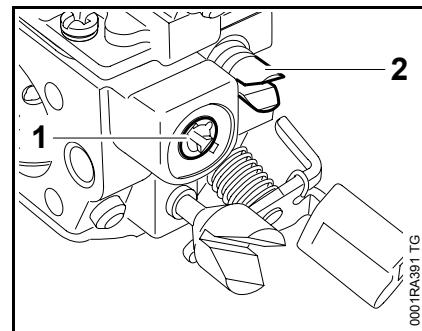
12.7.1 Basic Setting

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 cap.

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

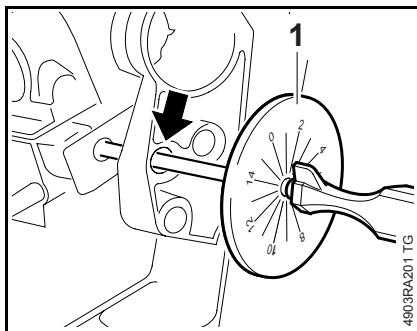
- Check chain tension and adjust if necessary.
- Inspect the spark arresting screen (if fitted) and clean or replace if necessary, **3.7** or **6.1**
- Check the air filter and clean or replace if necessary, **12.1**



For the sake of clarity the adjusting screw is shown on the exposed carburetor.

- Starting with the high speed screw H (1) against its seat, open it **one full turn** counter-clockwise
 - this is the basic setting.
- Starting with the low speed screw L (2) against its seat, open it **one full turn** counter-clockwise
 - this is the basic setting.
- Warm up the engine.

Setting disk 5910 893 6600 may be fitted on the screwdriver 5910 890 2304 to simplify adjustments.



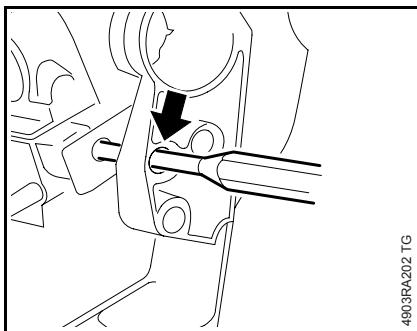
- To adjust the high speed screw (**H**), insert the screwdriver (1) 5910 890 2304 through the opening (arrow) and push the pre-installed limiter cap into the high speed screw (**H**).

Adjust idle speed with a tachometer. Adjust specified engine speeds within a tolerance of ± 200 rpm.

1. Adjust engine speed idle speed screw (**LA**) to 3,300 rpm.
2. Turn the low speed screw (**L**) clockwise or counterclockwise to obtain the maximum engine speed.

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

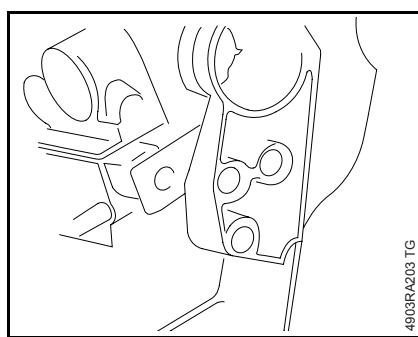
3. Use the idle speed screw (**LA**) to set the engine speed again to 3,300 rpm.
4. Set the engine speed to 2,800 rpm with the low speed screw (**L**).
5. Set engine's maximum speed to 13,000 rpm with the high speed screw (**H**).



- Push a suitable drift through the opening (arrow) and push home the limiter cap until it is flush with the carburetor body.

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

12.7.2 Standard Setting



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

Always perform the following steps before carrying out any adjustments:

- Troubleshooting, **3.6**
- Check chain tension and adjust if necessary.
- Inspect the spark arresting screen (if fitted) and clean or replace if necessary, **3.7** or **6.1**
- Check the air filter and clean or replace if necessary, **12.1**

Standard Setting

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

Adjusting engine idle speed

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

Engine stops while idling

- Turn the idle speed screw (**LA**) clockwise until the chain begins to run, then turn it back 1/2 a turn.

Saw chain runs while engine is idling

- Turn the idle speed screw (**LA**) counterclockwise until the chain stops running, then turn it back 1/2 a turn.

Erratic idling behavior, poor acceleration (although standard setting is correct)

Idle setting too lean.

- Warm up the engine.
- Turn the 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 (**L**) after every correction to the low speed screw (**L**).

Adjustment for operation at high altitude

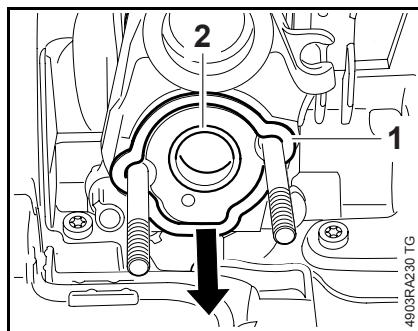
A minor correction may be necessary if engine power is not satisfactory when operating at high altitude.

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

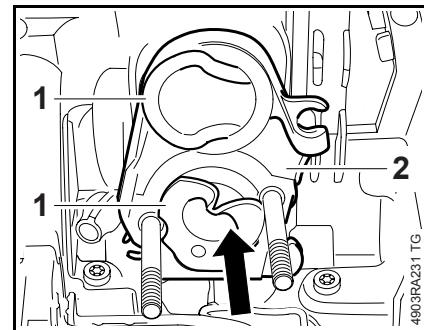
Turn the adjusting screws only very slightly. Even minor adjustments can noticeably affect engine running behavior.

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

12.8 Carburetor Carrier

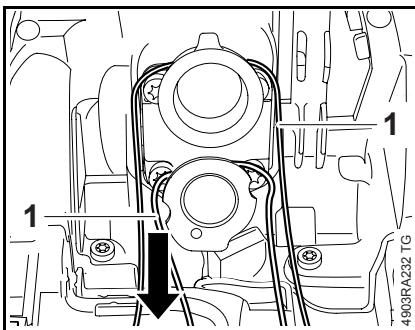


- Remove the carburetor, [12.5](#)
- Take out the sleeve (2) and washer (1).

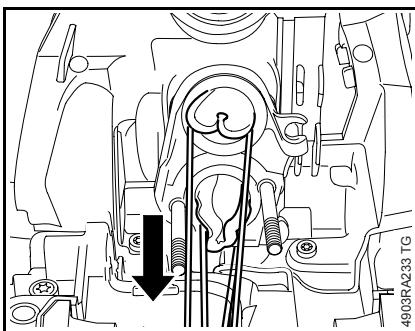


- Disconnect fuel suction hose from the carburetor carrier.
- Push the manifold flanges (1) out of the carburetor carrier (2) in the direction of the cylinder.
- Remove the carburetor carrier (2).

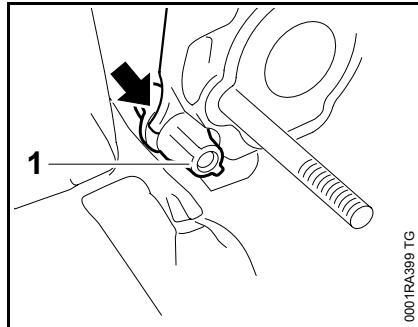
Installing



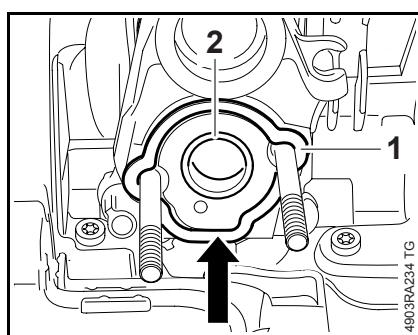
- To pull the manifold flanges through the openings in the carburetor carrier, wind pieces of string (1) (about 15 cm long) around the backs of the flanges and pass the ends of the strings through the openings.



- Pull the ends of the strings with the manifold flanges through the intake opening.
- Pull the manifold flanges into the openings in the carburetor carrier with the string.
- Remove the string.



- Fit the fuel hose (1) in the guide (arrow).



- Take out the sleeve (2) and ring (1).

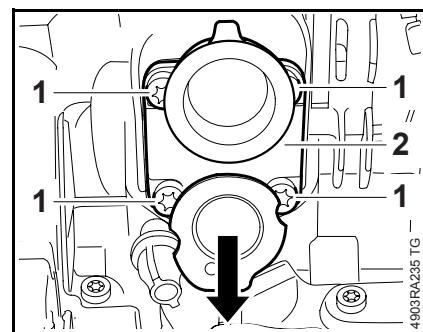
When reassembling, check that all wires are properly seated in their guides.

- Reassemble all other parts in the reverse sequence.

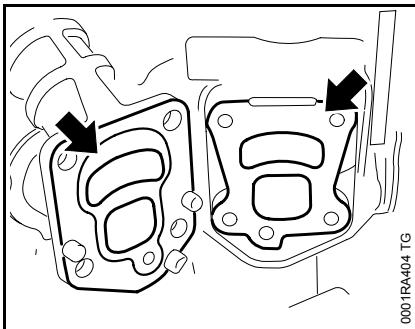
12.9 Intake Manifold

A damaged intake manifold can result in engine running problems.

- Troubleshooting, **3.6** or **3.7**
- Remove the shroud, **6.4**
- Remove the carburetor, **12.5**
- Remove the carburetor carrier, **12.8**



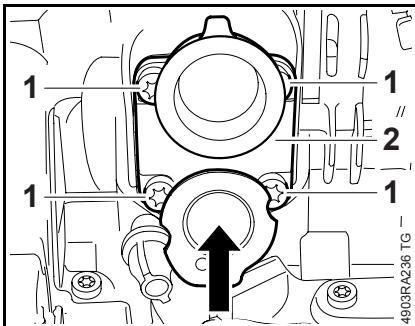
- Take out the screws (1).
- Remove the intake manifold (2).
- Inspect the intake manifold (2) and replace it if necessary – even very minor damage can result in engine running problems, **3.7**



- Inspect and clean the sealing faces (arrows), **14**

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

Installing



- Position the manifold (2) on the cylinder.
- Fit and tighten down the screws (1) firmly.
- Install the carburetor carrier, **12.8**
- Reassemble all other parts in the reverse sequence.

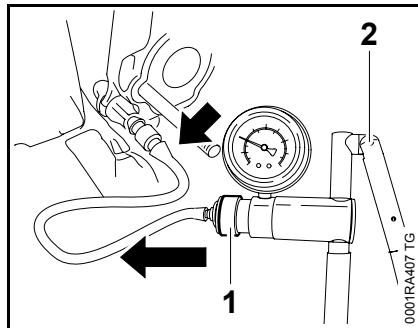
12.10 Tank Vent

12.10.1 Testing

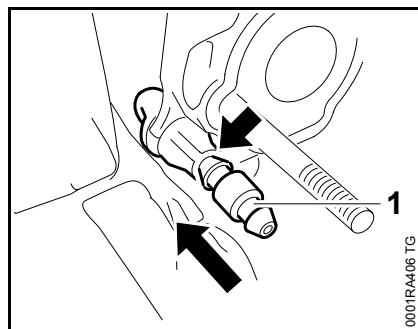
If problems occur on the carburetor or the fuel supply system, also check and clean the tank vent and replace it if necessary. Check function by performing pressure and vacuum tests on the tank via the fuel hose.

- Open the fuel tank cap and drain the fuel tank, **1**.
- Close the tank cap.
- Remove the carburetor, **12.5**

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.

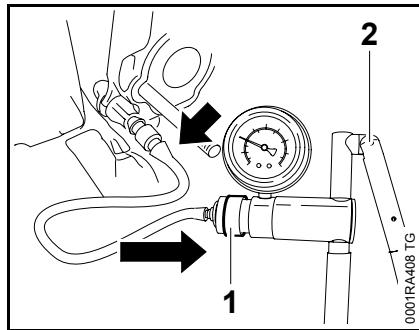


- Push the nipple (1) 0000 855 9200 into the fuel hose (arrow).

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

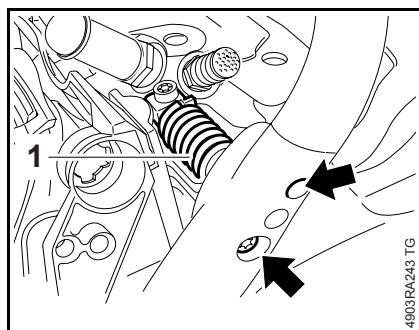
- Clean the area around the tank vent.
- Always install a new fuel hose.
- If necessary, install a new tank vent or fuel tank, **12.10** or **12.11.4**

Pressure test

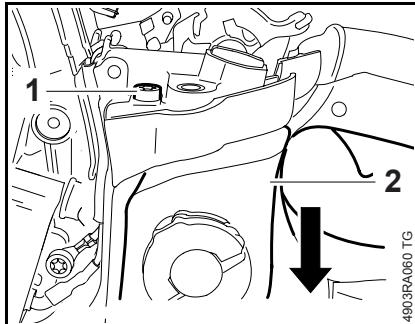


- Push the ring (1) to the right and connect the pump (2) 0000 850 1300 to the nipple (arrow)
– pressurize the fuel tank.
- Operate the pump until the pressure gauge indicates a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the fuel tank, including the tank vent, is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

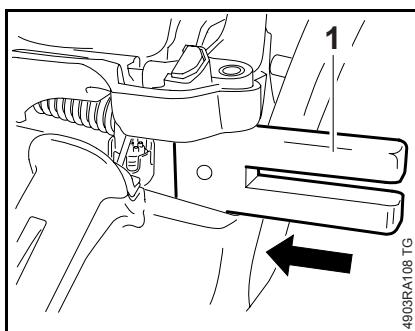
12.10.2 Removing and Installing



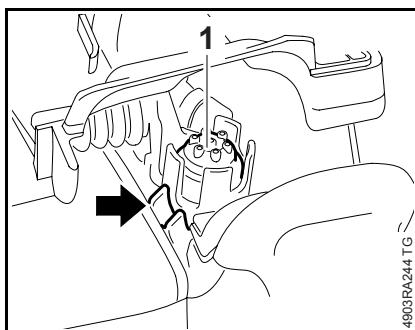
- Take out the screws (arrows) and pry the AV spring (1) out of the handlebar.



- Take out the screw (1).
- Lower the tank housing (2).



- Slide the wooden assembly block (1) between the engine housing and tank housing.



- Pry the tank vent (1) out of its seat using the rib (arrow) for leverage.

Always install a new tank vent.

- Coat sealing ring of new tank vent with STIHL press fluid, **14**
- Push home the tank vent by hand until it snaps into position.
- Reassemble all other parts in the reverse sequence.

12.11 Fuel Intake

12.11.1 Pickup Body

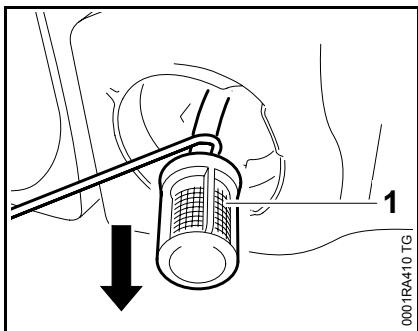
Any impurities mixed with the fuel are retained by the pickup body (filter). The fine pores of the filter eventually become clogged with minute particles of dirt. This restricts the passage of fuel and results in fuel starvation.

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

- Troubleshooting, **3.6** or **3.7**

Clean the fuel tank if necessary,

- Open the tank cap and drain the fuel tank.
- Pour a small amount of clean gasoline into the fuel 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**



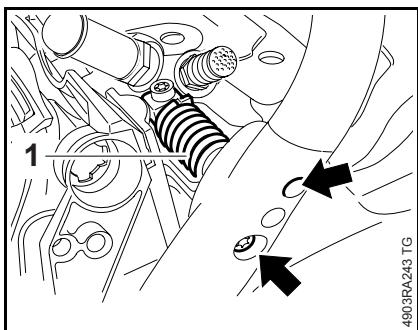
0001RA410 TG

- 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.

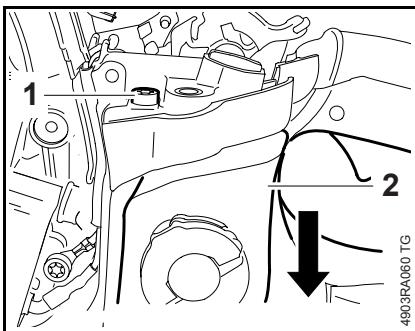
- Pull off the pickup body (1).
- Reassemble in the reverse sequence.

12.11.2 Fuel Hose



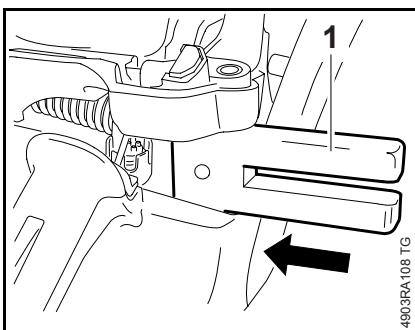
4903RA243 TG

- Take out the screws (arrows) and pry the AV spring (1) out of the handlebar.



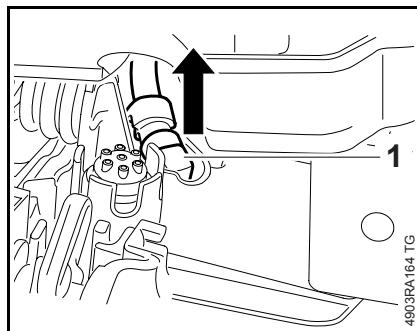
4903RA060 TG

- Remove the shroud, **6.4**
- Remove the air guide shroud, **12.4**
- Take out the screw (1).
- Lower the tank housing (2).



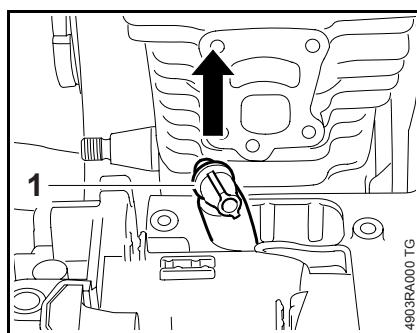
4903RA108 TG

- Slide the wooden assembly block (1) between the engine housing and tank housing.



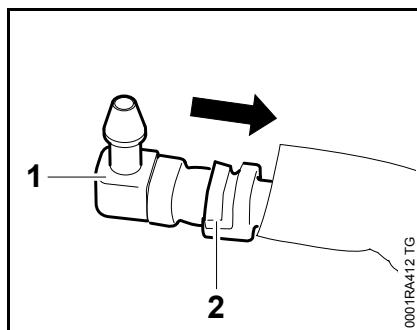
4903RA164 TG

- Pull out the fuel hose (1) with connector.



4903RA000 TG

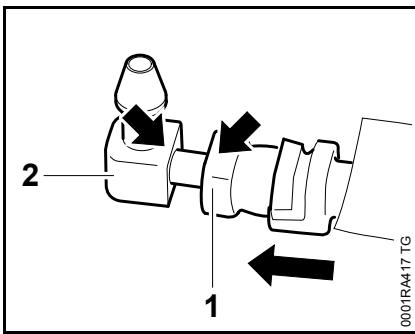
- Remove the fuel hose (1).



0001RA412 TG

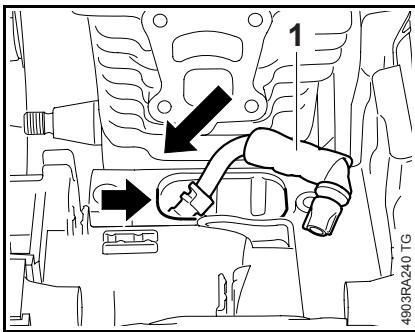
- Pull the fuel hose (2) off the connector (1).

Installing

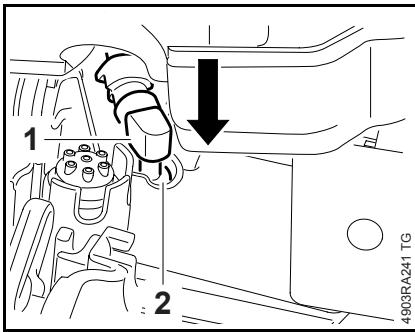


- Push the fuel hose (1) onto the connector (2) as far as stop.

Note position of the hose – the flats (arrows) must be in alignment.

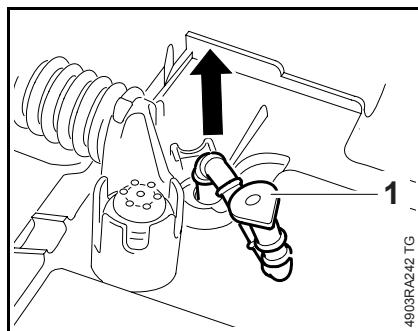


- Push the fuel hose (1) through the opening (arrow) in the engine housing.



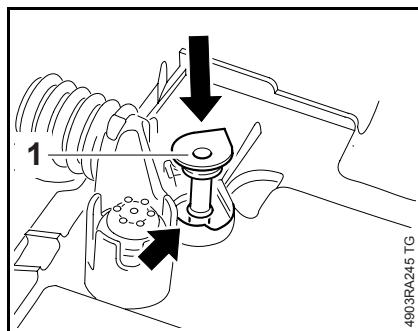
- Push the fuel hose (1) with connector into the fuel suction hose (2).
- Reassemble all other parts in the reverse sequence.

12.11.3 Fuel Suction Hose

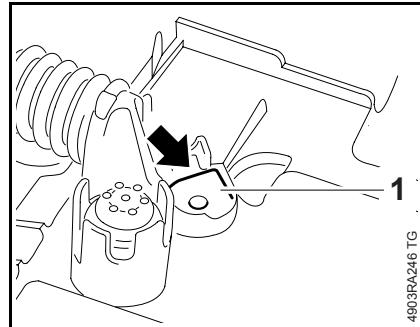


- Remove the pickup body, [12.11.1](#)
- Remove the tank housing, [12.11.4](#)
- Pull the fuel suction hose (1) out of the fuel tank.

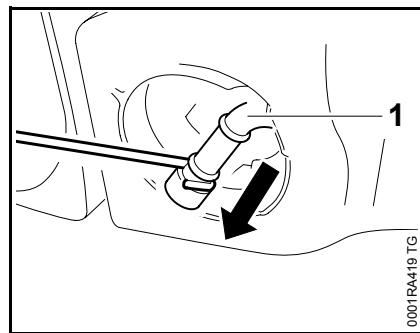
Installing



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



- Line up the fuel suction hose (1) and push it into the housing bore as far as stop – the flange must engage the guide (arrow).
- Use STIHL press fluid to simplify assembly, [14](#)
- Install the tank housing, [12.11.4](#)



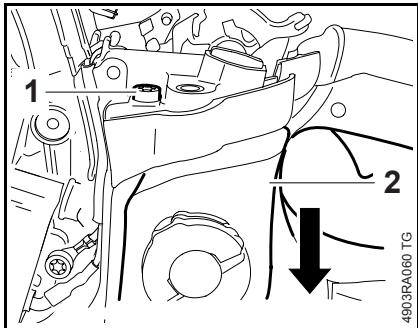
- Use hook 5910 893 8800 to remove the fuel suction hose (1) from the fuel tank.

Do not overstretch the fuel suction hose.

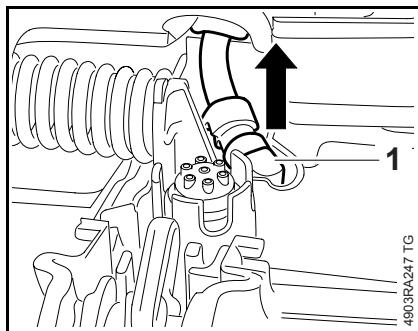
- Fit the pickup body, [12.11.1](#)
- Close the tank cap.

12.11.4 Tank Housing

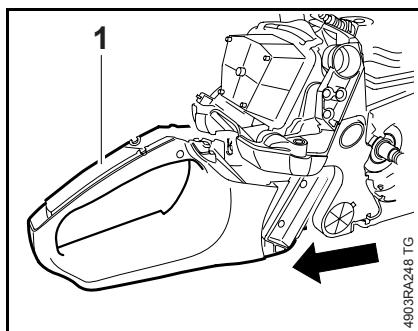
- Drain the fuel tank, **1**
- Remove the handlebar, **9.7**
- Remove the stop buffer, **9.5**
- Remove the control levers, **10**



- Take out the screw (1).
- Lower the tank housing (2).



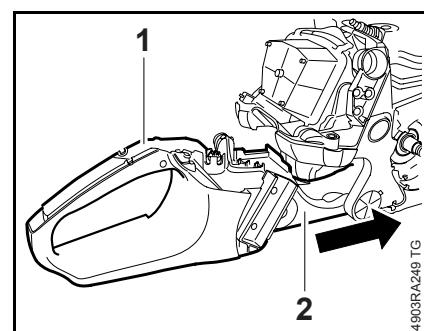
- Pull out the connector (1) with fuel hose.



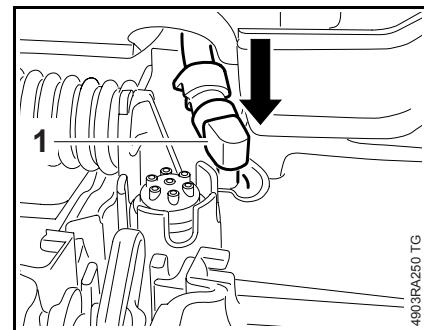
- Pull out the tank housing (1).

Only transfer those parts from the old tank housing that are not included with the replacement
– see parts list.

Installing



- Slide the tank housing (1), narrow part (2) first, into the engine housing.



- Push the connector (1) with fuel hose into the fuel suction hose.
- Reassemble all other parts in the reverse sequence.

13. Special Servicing Tools

New Special Tools

No.	Description	Part No.	Application	Rem.
1	Test flange	1140 890 1200	Leakage Test	

Existing Special Tools

No.	Description	Part No.	Application	Rem.
1	Pump - Sealing plate - Nipple - Hose for leakage test - Plug for leakage test	0000 850 1300 0000 855 8107 0000 855 9200 1110 141 8600 1122 025 2200	Testing engine and carburetor for leaks Testing carburetor for leaks Testing carburetor for leaks Testing carburetor for leaks Leakage testing decompression valve	
2	Installing tool	0000 890 2201	Installing rope guide bushing	
3	Locking strip	0000 893 5903	Blocking the crankshaft	
4	Pliers DIN 5254-A 19	0811 611 8380	Removing and installing external circlips	
5	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	
6	Wooden assembly block	1108 893 4800	Installing tank vent	
7	Setting gauge	1111 890 6400	Adjusting air gap between the ignition module and flywheel	
8	Assembly drift	1108 893 4700	Removing and installing piston pin	
9	Assembly tube	1117 890 0900	Attaching springs	
10	Installing sleeve	1118 893 4602	Protecting the oil seal	
11	Installing sleeve	1122 893 2405	Installing oil seal	
12	Installing sleeve	1122 893 4600	Protecting the oil seal (clutch side)	
13	Combination wrench	1129 890 3401	Spark plug	1)
14	Puller	1135 890 4500	Removing flywheel	
15	Ignition system tester, ZAT 4	5910 850 4503	Testing ignition system	
16	Ignition system tester, ZAT 3	5910 850 4520	Testing ignition system	
17	Torque wrench	5910 890 0302	0.5 to 18 Nm	
18	Torque wrench	5910 890 0312	6 to 80 Nm	
19	Installing tool 12	5910 890 2212	Installing hookless snap rings in piston	

No.	Description	Part No.	Application	Rem.
20	Screwdriver - Setting disk	5910 890 2304 5910 893 6600	Adjusting carburetor Add-on for screwdriver (adjusting carburetor)	
21	Screwdriver bit, T 27 x 150	5910 890 2400	IS-P screws (4 mm)	
22	Hook	5910 890 2800	Detaching springs on clutch shoes	
23	Assembly stand	5910 890 3101	Holding machines for repairs	
24	Puller - Jaws (No. 3.1)	5910 890 4400 0000 893 3706	Removing oil seals Removing oil seal(s)	
25	Puller	5910 890 4500	Removing limiter caps	
26	Stud puller M8	5910 893 0501	Removing bar mounting studs	
27	Socket, 13 mm, long	5910 893 2804	Removing and installing decompression valve	
28	Hook	5910 893 8800	Removing pickup body	

Remarks:

- 1) Use for releasing only.

14. 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 elements
4	STIHL multipurpose grease	0781 120 1109	
5	Dirko HT red sealant	0783 830 2000	Engine housing
6	Medium-strength threadlocking adhesive (Loctite 242 or 243)	0786 111 2101	
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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