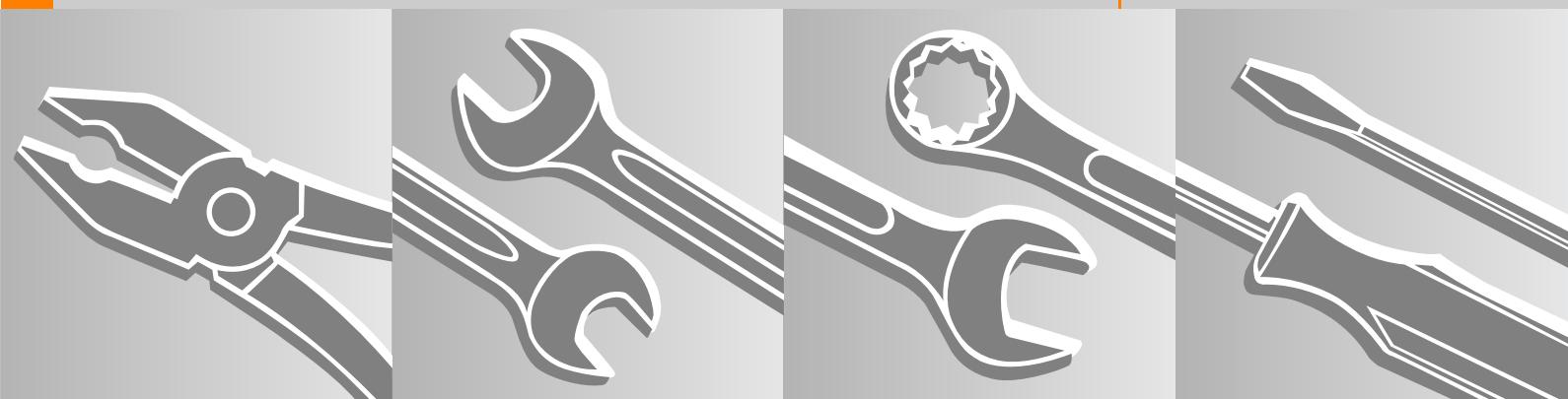


STIHL®

STIHL TS 410, 420

2007-09



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1. Introduction

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

Refer to the illustrated spare parts lists during all repair work. These lists show the installation position and order in which the individual parts and modules should be assembled.

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

A fault on the machine may be due to several causes. To help locate the fault, consult the chapter on "Troubleshooting" and the "STIHL Service Training System" for all function groups.

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 and service manual until an updated edition is issued.

The special tools mentioned in the descriptions are listed in the chapter "Special Servicing Tools" of this manual. Use the part numbers to identify the tools in the STIHL Special Tools manual.

It lists all the special servicing tools currently available from STIHL.

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

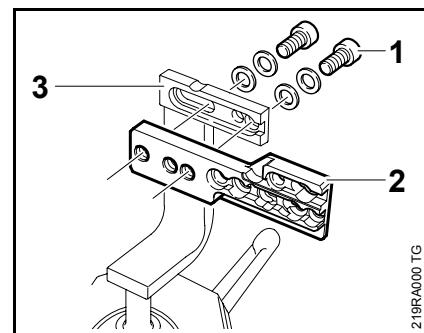
In the text:

- = Action to be taken as shown in the illustration above the text
- = Action to be taken but not shown in the illustration above the text

In the illustrations:

- Item pointer (short arrow)
- Direction of movement (long arrow)
- ☞ 4.2 = Reference to another chapter, i.e. to chapter 4.2 in this case

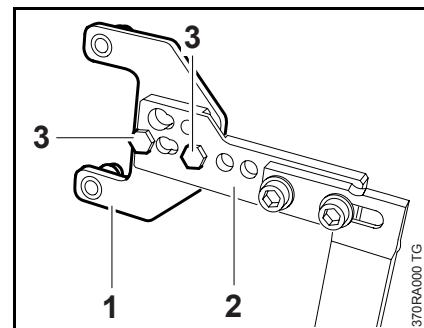
Service manuals and technical information bulletins are intended exclusively for the use of properly equipped repair shops. They must not be passed on to third parties.



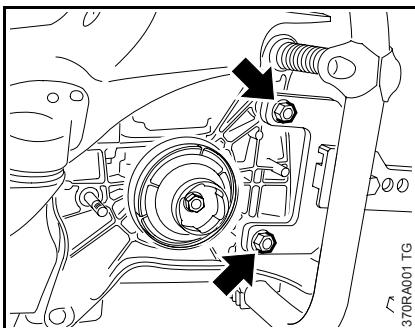
Servicing and repairs are made considerably easier by mounting the machine on the assembly stand (3) 5910 890 3100. For this purpose, secure the support (2) 5910 850 1650 to the assembly stand with two screws (1) and washers.

The screws must not protrude, as they may damage the housing when the machine is clamped, depending on model.

This step is not necessary when using the new assembly stand 5910 890 3101, as the support is already mounted on it.



The clamping plate (1) 4238 890 2100 is secured to the support (2) with two M8x20 screws (3) and washers.



The machine is secured to the clamping plate by means of the two front studs on the crankcase.

Guide the studs on the machine through the bushings on the clamping plate and secure them with the nuts (arrows).

The cast arm with guard must be removed first.

Always use original STIHL replacement parts.

They can be identified by the STIHL part number, the **STIHL** logo and the parts symbol

The symbol may appear alone on small parts.

Storage and disposal of oil and fuel

Lubricating oil and fuel must be collected in a clean container and disposed of in accordance with the regulations and without harming the environment.

2. Safety precautions

Specific national safety regulations and the safety instructions in the instruction manual must be observed if the machine has to be started up during maintenance or repair work.

Gasoline is highly inflammable and can also be explosive under certain conditions.

Protective gloves must be worn when components have to be heated for assembly/removal purposes.

Improper handling may result in burns and other serious injuries.

Do not bring any fire, flame, spark 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 test for leaks after working on the fuel system and shortblock.

3. Specifications

3.1 Shortblock

	TS 410	TS 420
Displacement:	66.7 cm ³	66.7 cm ³
Bore:	50 mm	50 mm
Stroke:	34 mm	34 mm
Engine power to ISO 7293:	3.2 kW (4.4 HP) at 9000 rpm	3.2 kW (4.4 HP) at 9000 rpm
Permissible maximum speed:	10300 rpm	10300 rpm
Idle speed:	2500 rpm	2500 rpm
Clutch:	Centrifugal clutch without linings	
Clutch engages at:	3800 rpm	3800 rpm
Crankcase leakage test at gauge pressure: under vacuum	$p_{\bar{U}} = 0.5 \text{ bar}$ $p_U = 0.5 \text{ bar}$	

3.2 Fuel system

Carburetor leakage test at gauge pressure:	$p_{\bar{U}} = 0.8 \text{ bar}$
Operation of tank vent at gauge pressure:	$p_{\bar{U}} = 0.3 \text{ bar}$
Fuel:	as specified in instruction manual

3.3 Ignition system

Air gap between ignition module and flywheel:	0.15...0.35 mm
Spark plug (suppressed):	Bosch WSR6F
Electrode gap:	0.5 mm

3.4 Cutting wheels

TS 410

Composite and diamond cutting wheels	Diameter	300 mm
	Cutting depth	approx. 100 mm

TS 420

Composite and diamond cutting wheels	Diameter	350 mm
	Cutting depth	approx. 125 mm

3.5 Tightening torques

DG and P screws are fitted in plastic and light alloy metal parts. These screws form a permanent thread when they are installed for the first time. The material is permanently deformed. Screws can be removed and installed as often as necessary without impairing the strength of the screwed assembly, provided that the specified tightening torque is observed.

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

Fastener	Thread size	For component	Tightening torque	Remarks
			Nm	
Bolt	M 6x28	Cast arm/flange	8.0	
Nut	M 8	Cast arm/starter cover/stud	20.0	
	M 10x1	Decompression valve	14.0	
Bolt	M 5x20	Filter cover/tank housing	6.0	
Bolt	P 5x16	Handle molding/shroud	4.0	
Bolt	D 5x20	Rubber buffer/support	6.0	
Bolt	P 5x16	Holder/switch/shroud	3.0	
Bolt	P 6x19	Holder/water attachment/tank housing	6.0	
Bolt	P 6x19	Shroud/tank housing	6.0	
Bolt	M 5x17	Cap, spark plug cover/shroud	3.5	
Nut	M 10x1 L	Poly V-belt pulley, front	38.0	
Bolt	P 6x40	Clamp/handlebar/tank housing	6.0	
Bolt	P 6x26	Clamp/tank housing	6.0	
Bolt	D 5x45	Clamp (AV system)/handlebar support	4.0	
Bolt	P 6x19	Crankcase/bearing plug (AV system)	6.0	
Bolt	M 5x32	Crankcase/cylinder	9.0	
Bolt	M 5x25	Crankcase fan side/drive side	10.0	
	M 12x1 L	Driver	40.0	
Bolt	M 5x6	Bearing/rubber buffer	4.0	1)
Bolt	P 5x16	Bearing plug AV system/tank housing	4.0	
Bolt	M 5x20	Fan cover/crankcase	6.0	
Bolt	P 6x19	Air baffle/tank housing	6.0	
Bolt	M 5x20	Air guide shroud/crankcase	3.0	
Bolt	M 5x20	Muffler/crankcase	10.0	
Bolt	M 5x20	Muffler/cylinder	10.0	
Bolt	M 5x30	Belt guard/cast arm	6.0	
Nut	M 8x1	Flywheel/crankshaft	33.0	2)
Bolt	D 5x24	Clamping lever/cast arm	4.0	
Bolt	M 3x20	Hose clamp, manifold/cylinder	0.5	
Nut	M 8x1	Starter cup/crankshaft	33.0	
Bolt	M 8x53	Stud/crankcase	21.0	
Bolt	P 6x50	Support/clamp/handlebar/tank housing	6.0	

Bolt	P 6x19	Support/bearing plug AV system	6.0
Bolt	P 6x40	Support/tank housing	6.0
Bolt	M 5x48x22	Tank housing/flange	3.5
Bolt	M 10x18	Abrasive wheel	30.0
Bolt	M 5x30	Adjusting lever/guard	6.0
Bolt	M 8x24	Adjusting lever/guard/square nut, drive side	3.0
Bolt	M 8x17	Adjusting lever/guard/square nut, fan side	3.0
	M 14x1.25	Spark plug	28.0
Bolt	M 5x20	Ignition module/crankcase	8.0
Bolt	M 4x8	Pan head screw/banjo bolt	3.0

Remarks:

- 1) Loctite 243 medium strength
 - 2) Connection between crankshaft and flywheel must be degreased and oil-free
-

When inserting DG and P screws into an existing screw thread:

Insert the DG or P screw in the hole and turn counterclockwise until it gently drops into the hole in axial direction.

Tighten the screw clockwise to the specified torque.

DG screws must always be tightened with a torque wrench.

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

Coat micro-encapsulated screws with Loctite 243 medium strength before refitting them.

Screwdriver speed when used in plastic material: DG and P screws max. 500 rpm.
Do not use an impact wrench to release or tighten screw connections.

Screws with and without locking serration must not be confused.

4. Troubleshooting

4.1 Clutch

Problem	Cause	Remedy
Cutting wheel stops under load at full throttle	Clutch shoes badly worn	Install new clutch
	Clutch drum badly worn	Install new clutch drum
Cutting wheel rotates at idle speed	Idle speed too high	Readjust with idle speed screw LA (counterclockwise)
	Clutch springs stretched or fatigued	Replace tension springs, replace clutch if necessary
	Clutch spring hooks broken	Replace tension springs
Loud noises	Clutch springs stretched or fatigued	Replace all tension springs
	Grooved ball bearing on poly V-belt pulley/clutch drum damaged	Replace grooved ball bearing
	Clutch shoe retainer broken	Replace retainer
	Clutch shoes and carrier worn	Install new clutch

4.2 Cast arm with guard

Problem	Cause	Remedy
Cutting wheel does not run smoothly or vibrates	Axial or radial runout	Set axial or radial true running, replace cutting wheel if necessary
	Ribbed poly V-belt is loose	Check and tension ribbed poly V-belt, replace ribbed poly V-belt or tensioner if necessary
	Grooved ball bearing of the front poly V-belt pulley is worn	Replace grooved ball bearing
Cutting wheel stops under load at full throttle	Clutch shoes badly worn	Install new clutch
	Clutch drum badly worn	Install new clutch drum
	Ribbed poly V-belt not properly tensioned	Tension ribbed poly V-belt, replace if necessary
Cutting wheel rotates at idle speed	Idle speed too high	Readjust with idle speed screw LA (counterclockwise)
	Clutch springs stretched or fatigued	Replace tension springs, replace clutch if necessary
	Clutch spring hooks broken	Replace tension springs
Cutting wheel runs dry although shutoff cock is open	Shut-off cock or connector for hose is clogged	Check and clean shut-off cock/connector, replace if necessary
	Nozzles are clogged	Clean nozzles, replace if necessary

4.3 Rewind starter

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

4.4 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.

Problem	Cause	Remedy
Engine runs roughly, misfires, temporary loss of power	Spark plug boot is loose Spark plug sooted, smeared with oil Ignition lead loose in ignition module Fuel/oil mixture contains too much oil Incorrect air gap between ignition module and flywheel Flywheel cracked or has other damage or pole shoes have turned blue Ignition timing wrong, flywheel out of adjustment, key in flywheel has sheared off Weak magnetization in flywheel – pole shoes have turned blue Irregular spark	Press boot firmly onto spark plug and fit new spring if necessary Clean the spark plug or replace if necessary Secure ignition lead Use a fuel mixture with the correct mixing ratio Set the correct air gap Install new flywheel Install new flywheel Install new flywheel Check operation of switch shaft/ contact spring, switch and ignition module Insulation damaged or break in ignition lead or short circuit wire, check ignition lead/ignition module, replace if necessary Check operation of spark plug Clean the spark plug or replace if necessary

If the engine runs roughly, this may also be due to problems in the carburetor or shortblock.

Problem	Cause	Remedy
No spark	Spark plug defective	Replace spark plug
	Faulty insulation or short circuit in short circuit wire or short circuit switch	Check short circuit wire and switch, replace switch if necessary
	Break or damaged insulation in ignition lead	Check ignition lead, replace if necessary
	Ignition module defective	Replace ignition module

Problem	Cause	Remedy
Carburetor floods; engine stalls	Inlet needle not sealing. Foreign matter in valve seat or cone	Remove and clean inlet needle or clean carburetor
	Inlet control lever sticking on spindle	Restore easy movement of inlet control lever
	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	Replace metering diaphragm
Poor acceleration	Low speed adjusting screw "too lean"	Check basic setting of carburetor, correct if necessary
	High speed adjusting screw "too lean"	Check basic setting of carburetor, correct if necessary
	Inlet needle sticking to valve seat	Remove inlet needle, clean and refit
	Diaphragm gasket leaking	Replace diaphragm gasket
	Metering diaphragm damaged or shrunk	Replace metering diaphragm
	Manifold damaged	Replace manifold
	Impulse hose damaged or kinked	Straighten or replace impulse hose

Problem	Cause	Remedy
Engine will not idle, idle speed too high	Throttle shutter opened too wide by idle speed screw LA	Set idle speed screw LA correctly
	Oil seals/crankcase leaking	Seal oil seals/crankcase, replace if necessary
	Air valve soiled – air valve does not close	Clean air valve, replace if necessary
	Air valve moves stiffly	Check air valve, replace if necessary
	Throttle rod moves stiffly – throttle shutter does not close	Restore easy movement of throttle rod
Engine stops when idling	Idle jet bores or ports blocked	Clean the carburetor
	Low speed adjusting screw "too rich" or "too lean"	Correct setting of low speed adjusting screw L
	Setting of idle speed screw incorrect – throttle shutter completely closed	Correct setting of idle speed screw LA

Problem	Cause	Remedy
Engine speed drops quickly under load – low power	Air filter dirty	Replace air filter
	Throttle shutter not opened fully	Check linkage
	Tank vent faulty	Replace tank vent
	Pickup body soiled	Replace pickup body
	Fuel strainer dirty	Clean fuel strainer in carburetor, replace if necessary
	Leak in fuel line between tank and fuel pump	Seal connections or replace line
	High speed adjusting screw H "too rich"	Check basic setting of carburetor, correct if necessary
	Main jet bores or ports blocked	Clean the carburetor
	Pump diaphragm damaged or fatigued	Replace pump diaphragm
	Impulse hose damaged or kinked	Straighten or replace impulse hose
Engine runs extremely richly, lacks power and has very low final speed	Air valve does not open	Check lever and rod on air valve, adjust or replace if necessary
Engine runs too richly, loses power, final speed is too low	Air valve does not open completely at full throttle	Lever on air valve has been fitted incorrectly – the stamped number must not be visible Check lever, rod and air valve, adjust, clean or replace if necessary
Engine idles erratically – too lean	Air valve does not close completely	Check lever, rod and air valve, adjust, clean or replace if necessary

4.6 Engine

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

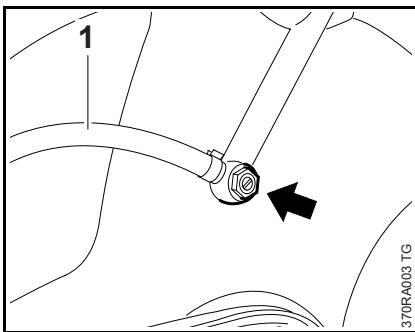
- Air filter
- Fuel supply
- Carburetor
- Ignition system

Problem	Cause	Remedy
Engine does not start easily, stalls at idle speed but operates normally at full throttle	Oil seals in crankgear damaged	Replace oil seals
	Crankcase leaking or damaged (cracks)	Seal/replace crankcase
Engine does not deliver full power or runs erratically	Piston rings worn or broken	Replace piston rings
	Muffler/spark arresting screen carbonized	Clean muffler (inlet and outlet openings), replace spark arresting screen, replace muffler if necessary
	Air filter dirty	Replace air filter
	Fuel/impulse hose severely bent, kinked or damaged	Fit new lines and ensure they are installed without kinking
	Tank vent faulty	Check tank vent and replace if necessary
	Air valve does not open	Check air valve, adjust or replace if necessary
	Decompression valve does not close	Replace decompression valve
Engine overheating	Insufficient cylinder cooling. Air inlet openings in fan cover clogged or cooling fins on cylinder severely fouled.	Thoroughly clean all cooling air openings and the cylinder fins.

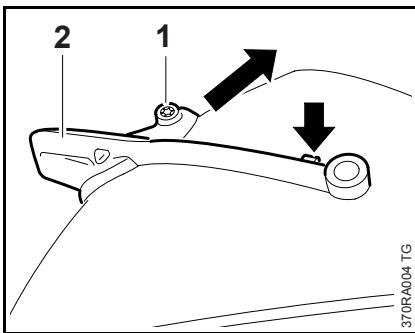
5. Cast arm with guard

5.1 Water system

Nozzles



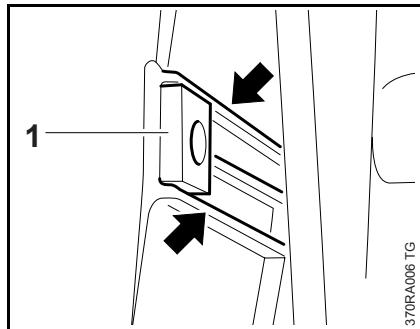
- Take out banjo bolts (arrow) on both sides – the square nuts inside the guard drop down.
- Disconnect and examine the hose (1), fit a new hose if necessary.



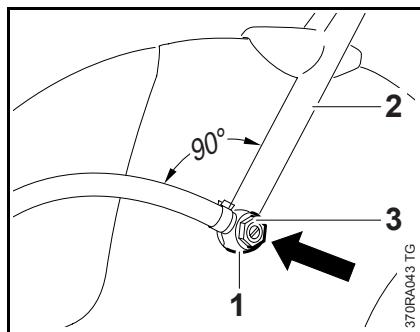
- Remove screw (1)
- Guide the adjusting lever (2) over the lift-off lugs (arrow) with a gentle turning movement and remove it.

When fitting the adjusting lever, it is simply pushed into place until it engages.

- Insert and tighten down the screw.
- Tightening torques, **3.5**.

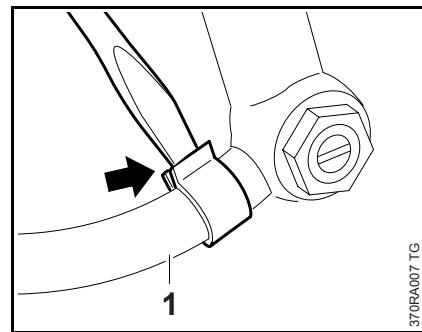


Fit the square nut (1) in the guides (arrows) inside the guard and hold it.

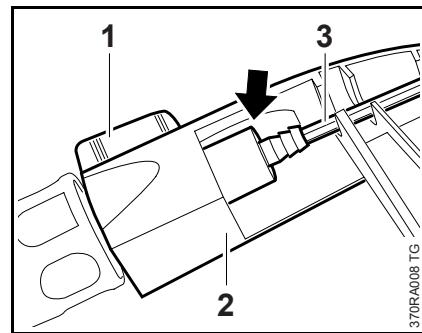


- Fit the connector (1) with water hose and align it at 90° to the adjusting lever (2).
- Insert the banjo bolt (3) and screw it tight.
 - Examine the sealing ring on the banjo bolt and replace it if necessary.
 - STIHL Press Fluid makes it easier to fit the sealing rings, **14**.
 - Fit the square nut on the inside of the guard and slide the banjo bolt through the hole in the adjusting lever from the other side with gasket and sealing ring.
 - Insert the banjo bolt and screw it tight.

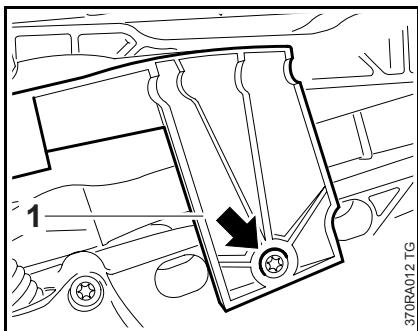
Water attachment



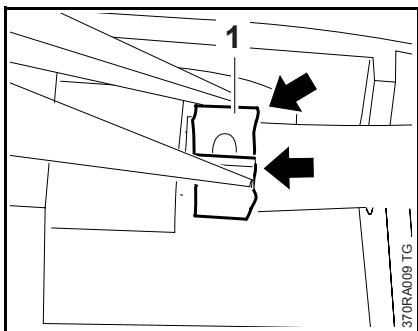
- Apply a screwdriver to the hose clip (arrow) and turn slightly to open the clip.
- Pull off the hose (1).



- Open the hose clip and remove the hose.
- Insert a hexagon socket head wrench (3) in the connector (arrow) and turn the connector down.
- Take the shut-off cock (1) from the holder (2) and examine it; fit a new part if necessary.

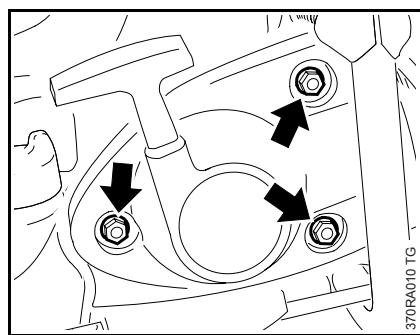


- Examine the holder (1) and replace it if necessary.
- Take out the screw (arrow) underneath the machine.
- Remove the holder (1).
- Reassemble parts in reverse order.

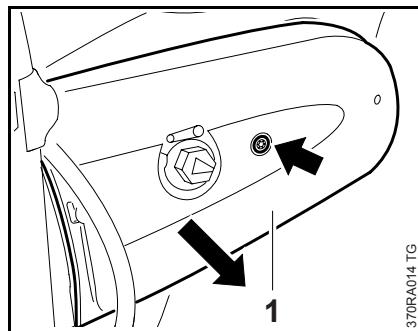


- Press the tabs (arrows) on the hose clip (1) together until it engages.
- Assemble remaining parts in reverse order.

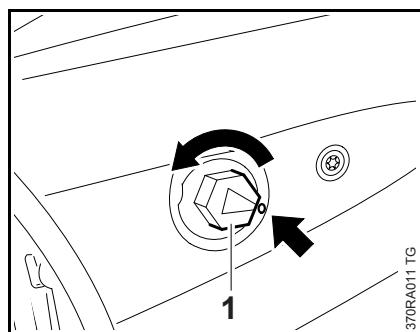
5.2 Cast arm with guard



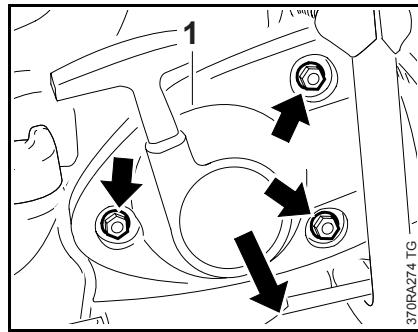
- Unscrew collar nuts (arrows).



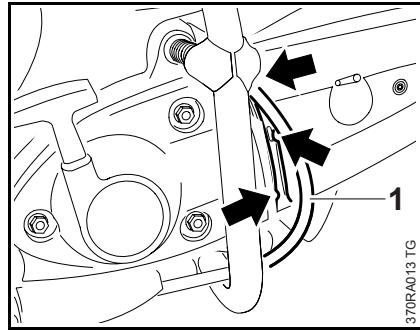
- Remove the screw (arrow).
- Remove the belt guard (1).



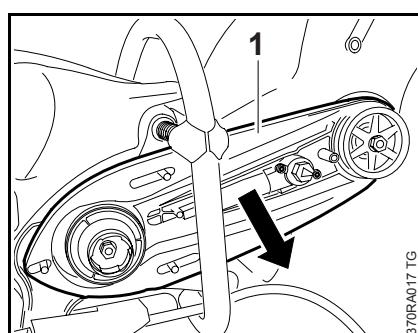
- Relax the ribbed poly V-belt by turning the hexagon (1) on the tensioner counterclockwise until the arrow points to "0" (arrow).



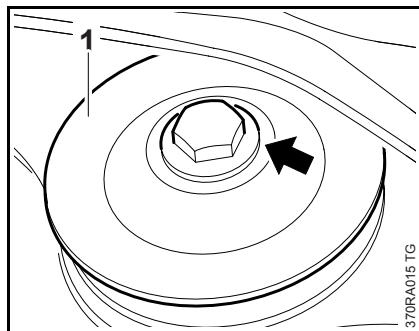
- Take out the collar nuts (arrows).
- Remove starter cover (1).
- Remove the ribbed poly V-belt, [5.5](#).



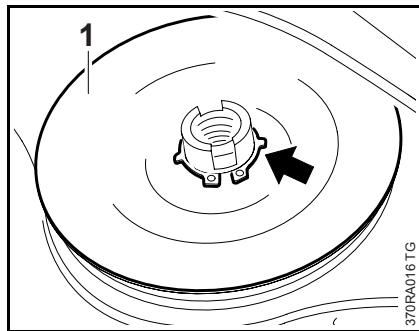
- Take out the banjo bolt on the guard and remove the connector with water hose.
- Take the hose (1) out of the guides (arrows).



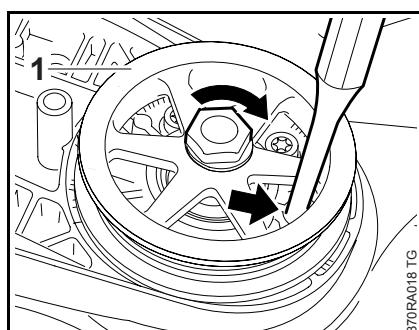
- Remove the cast arm with guard (1).



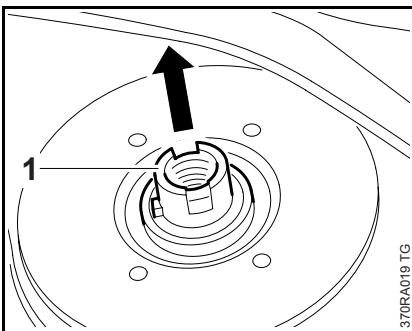
- Block the belt pulley.
- Take out the screw with washer (arrow).
- Remove thrust washer (1).



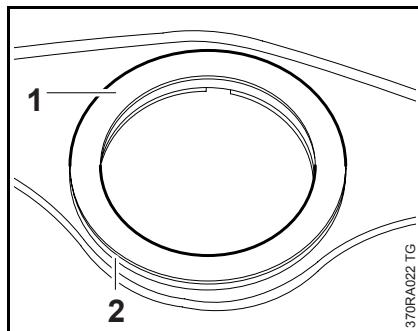
- Remove the axial clamping ring (arrow).
- Remove the other thrust washer (1).



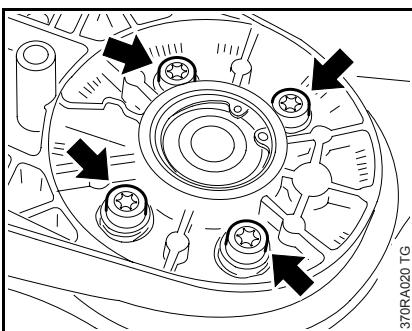
- Block the belt pulley (arrow).
- Unscrew the nut (left-hand thread) and remove the washer.
- Pull off the belt pulley (1).



- Draw the shaft (1) out on the other side.

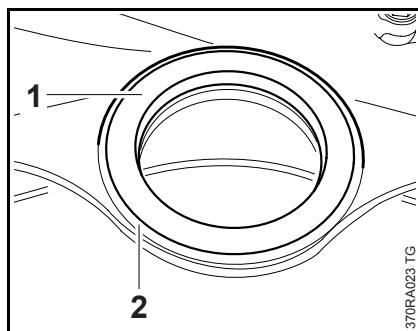


- Remove the washer (1) and rubber ring (2).

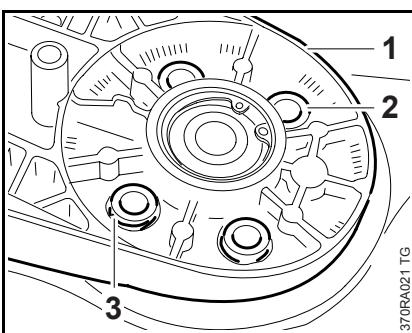


- Carefully take out the screws (arrows) – compression springs are tensioned.

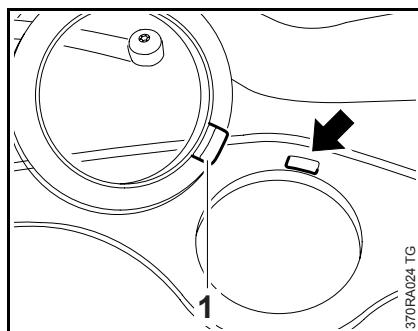
The flange drops down on the other side.



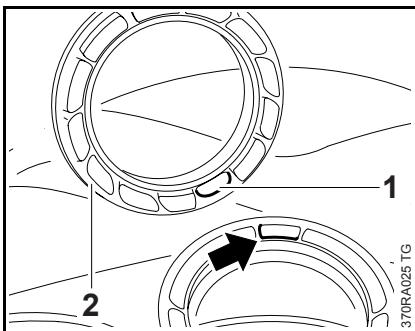
- Remove the washer (1) and rubber ring (2) on the other side.
- Examine the individual parts and replace them if necessary.



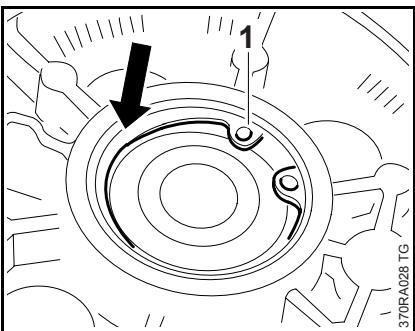
- Remove the cast arm (1).
- Remove the sleeves (2) and compression springs (3).



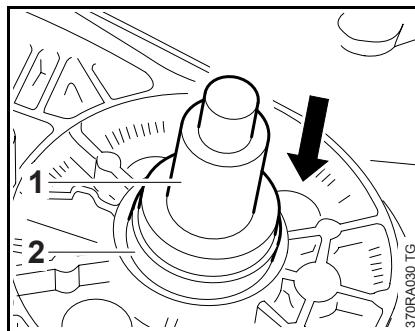
- Align the rubber ring so that the lug (1) engages in the opening (arrow).
- Press the rubber ring (1) into the hole in the guard until it lies flush.



- Align the rubber ring so that the lug (1) engages in the opening (arrow).
- Press the rubber ring (2) into the hole in the guard until it lies flush. The profile of the rubber lip must fit into the mount for the guard.



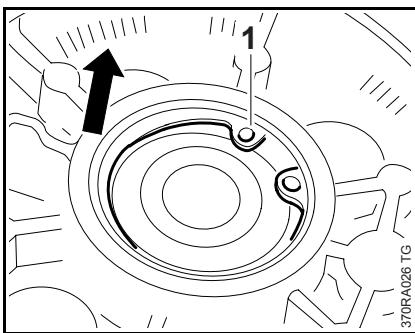
- Fit a circlip (1) as stop in the cast arm.



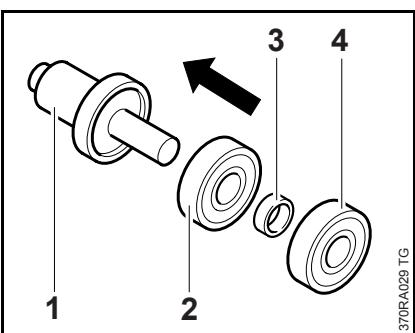
- Position the grooved ball bearing (2) with press arbor (1) 4224 893 7200 and press it as far as possible against the E-clip.

Do not press too hard, otherwise the E-clip which has been fitted as a stop will be jammed.

- Take out the press arbor.
- Fit the second circlip in the groove in the bearing.

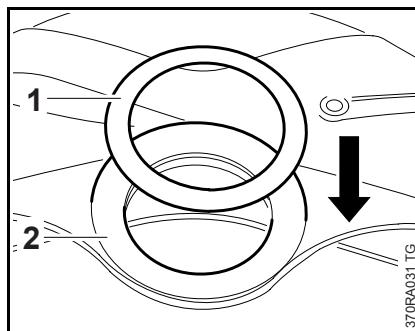


- Remove the E-clips (1) on both sides.

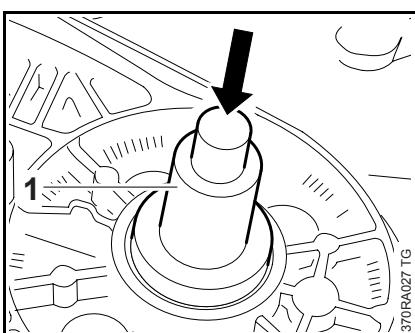


- Align the press arbor (1) 4224 893 7200 – the ball bearing and ring are pushed onto the long peg (arrow).
- Slide the first grooved ball bearing (2), ring (3) and second grooved ball bearing (4) onto the peg (arrow).

The seal on the deep groove ball bearing must not be damaged.

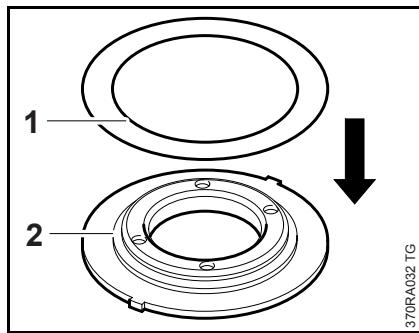


- Place washer (1) on the outside of the guard on the rubber ring (2).
- Slide the cast arm into the rubber bearing.

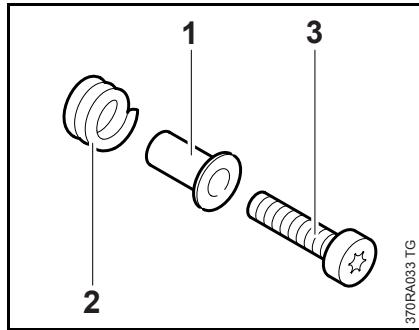


- Drive the ball bearing out of the cast arm with press arbor (1) 4224 893 7200.

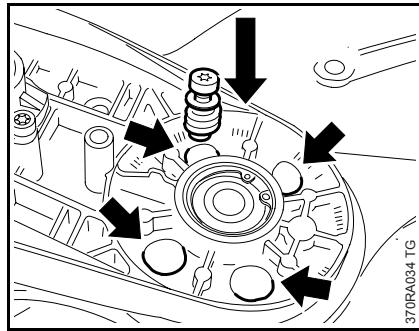
Always use new grooved ball bearings.



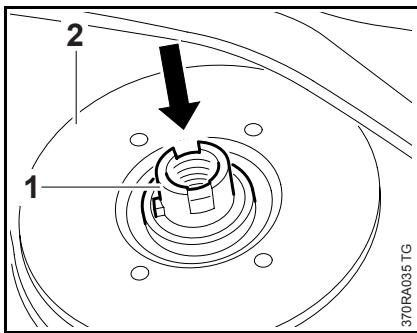
- Place washer (1) on the flange (2).
- Position the flange (2) on the opposite side and align it so that the holes are lined up.



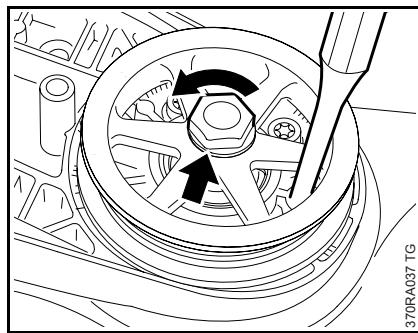
- Fit sleeves (1) and springs (2) over the screws (3).



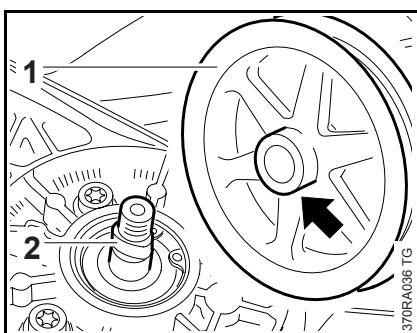
- Insert the screws with sleeves and springs in the holes (arrows) and position the parts.
- Insert and tighten down the screws.
- Tightening torques, **3.5**.



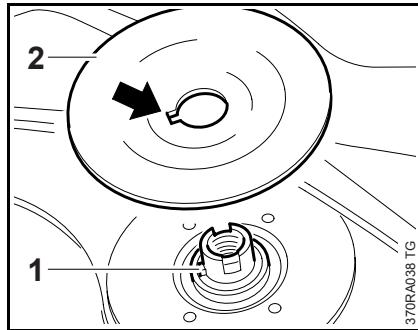
- Slide the shaft (1) into the ball bearings from the flange side (2).



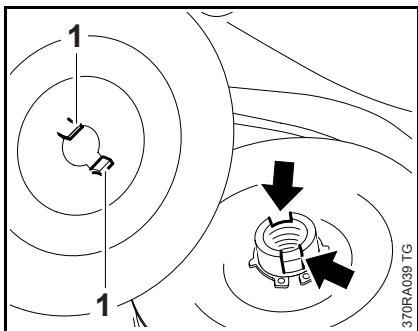
- Block the belt pulley.
- Fit the washer, screw on the nut (arrow) and tighten it down (left-hand thread).
- Tightening torques, **3.5**.



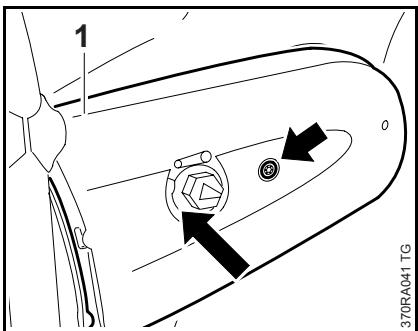
- Turn the cast arm with guard and hold the shaft.
- Slide the belt pulley (1) onto the shaft with the longer shoulder first (arrow) until the triangle engages in the shaft (2).



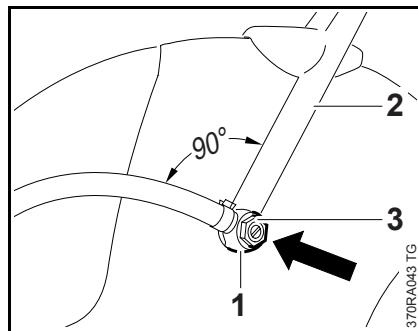
- Fit the thrust washer (2) so that the groove (arrow) engages the lug (1) on the shaft.
- Fit the axial clamping ring.



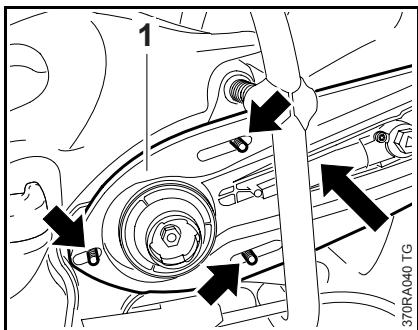
- Fit the thrust washer so that the lugs (1) engage the grooves (arrows) in the shaft.
- Insert the screw with washer.



- Fit the ribbed poly V-belt, **5.5**.
- Position the guard (1).
- Insert and tighten down the screw (arrow).

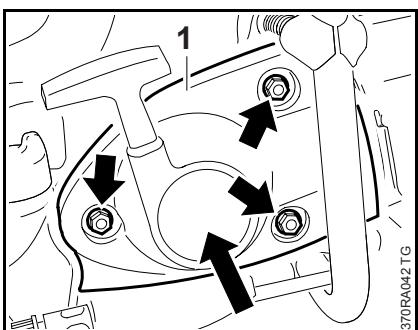


- Fit the connector (1) with water hose and align it at 90° to the adjusting lever (2).
- Insert the banjo bolt (3) and screw it tight. Fit the square nut.

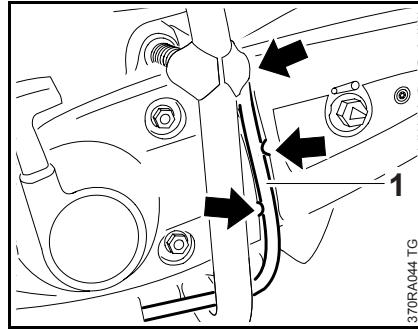


- Slide the cast arm with guard (1) onto the studs (arrows).

The tensioner must point to "0".



- Slide the starter cover (1) onto the studs.
- Lightly screw on the collar nuts (arrows), but do not tighten them down yet.
- Tension the ribbed poly V-belt, **5.5**.
- Screw all three collar nuts tight.



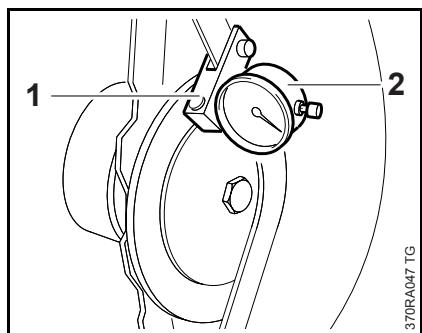
- Starting from the shut-off cock, route the water hose (1) without any tight bends or kinks.
- Press the hose (1) into the guides (arrows).
- Tightening torques, **3.5**.

5.3 Testing radial and axial truth of running

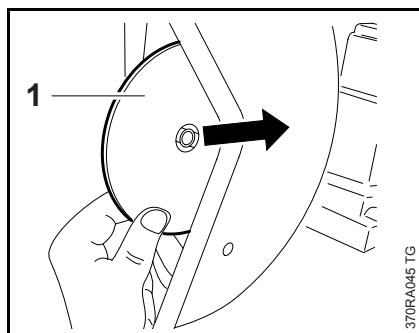
Since the radial truth of running of the cutting wheel changes if the shaft diameter changes (due to scoring, etc.), it is sufficient to carefully inspect the shaft around the mount for the cutting wheel.

The axial truth of running, on the other hand, depends on the condition of several parts and should therefore be determined by measurement.

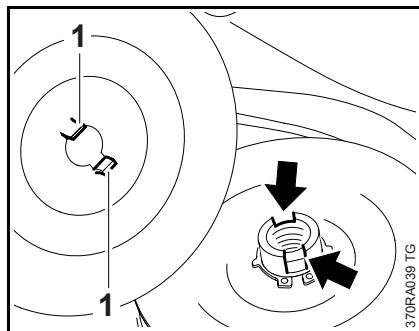
- Undo the screw and remove the thrust washer, see  5.2.



- Insert and tighten down the screw.
- Secure a dial gauge holder (1) with fitted dial gauge (2) on the guard so that the axial truth of running can be determined for a diameter of approx. 130 mm over one full revolution of the wheel, see test table.
- Remove the test equipment after testing.



- Fit a test wheel (1).

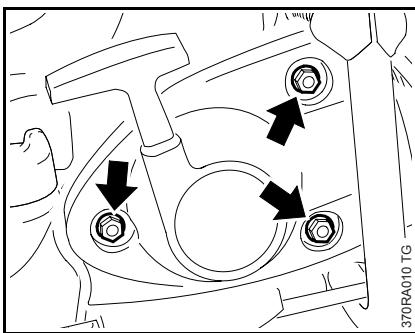


- Fit the thrust washer so that the lugs (1) engage the grooves (arrows) in the shaft.

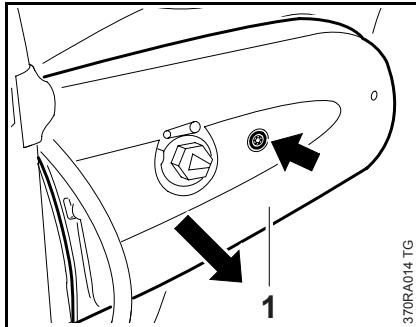
5.4 Test sequence

Sequence	Actual condition	Possible causes	Remedy
Radial truth of running:			
Visual inspection Spindle (shaft)	Wear marks or scoring around the mount for the cutting wheel	Operation with loose fastening screw, use of the wrong cutting wheels (mount dia. > 20 mm)	Replace spindle (shaft), use correct cutting wheel
Axial truth of running:			
Axial truth of running is tested with a STIHL test wheel or diamond abrasive wheel (on 130 mm diameter)	Axial runout $\leq 0.15 \text{ mm}$ $> 0.15 \text{ mm}$ Damage or unevenness in the mating faces of the thrust washers (particularly the inner thrust washer), mating faces are not plane, use of parts which are not original STIHL parts	None Dirt, incorrectly fitted thrust washers or cutting wheel, use of force when cutting or during transport	Replace the thrust washers Replace spindle (shaft)
	Spindle (shaft) damaged	Incorrect handling, use of force	
	Tangible radial backlash in the bearing seat → spindle bearing faulty	Grooved ball bearings damaged by dust and/or bearing seat worn at the spindle	Replace spindle and grooved ball bearings

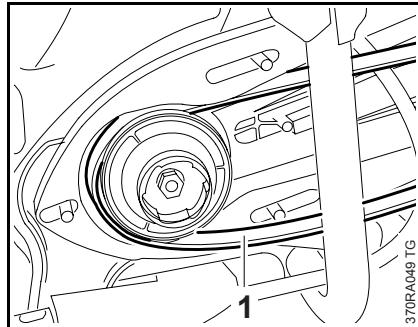
5.5 Ribbed poly V-belt



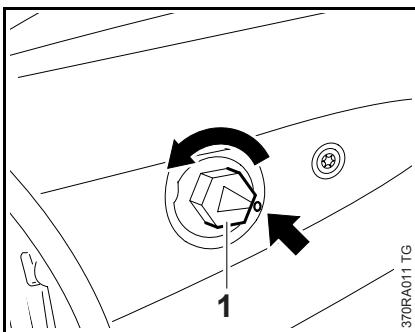
- Unscrew collar nuts (arrows).



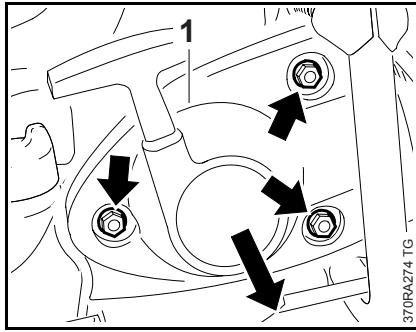
- Remove the screw (arrow).
- Remove the belt guard (1).



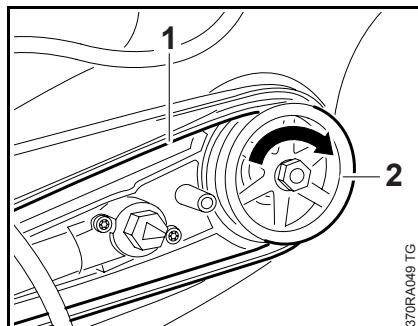
- Take the ribbed poly V-belt (1) off the belt pulley on the clutch side.
- Examine the belt and replace it if necessary.



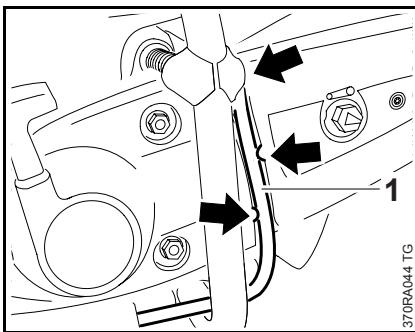
- Relax the ribbed poly V-belt by turning the hexagon (1) on the tensioner counterclockwise until the arrow points to "0" (arrow).



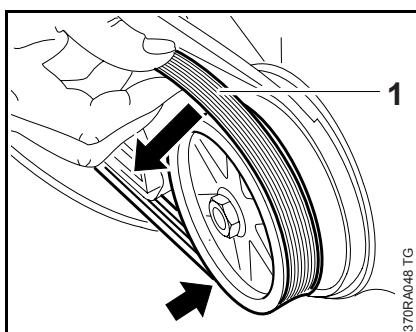
- Take out the collar nuts (arrows).
- Remove starter cover (1).



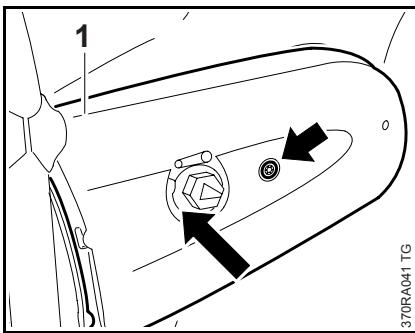
- First slide the ribbed poly V-belt (1) over the belt pulley on the clutch.
- Then fit the ribbed poly V-belt (1) over the front belt pulley (2) and turn the pulley (2) to draw the belt onto the pulley.



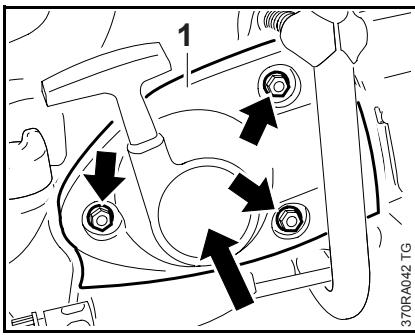
- Pull the hose (1) out of the guides (arrows).



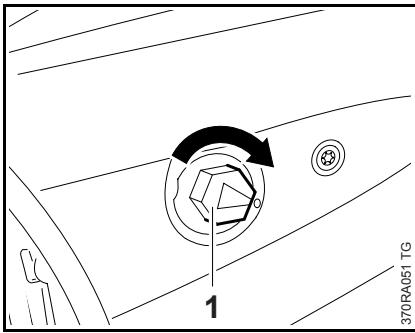
- Take the ribbed poly V-belt (1) off the front belt pulley (arrow).



- Fit the belt guard (1).
- Insert and tighten down the screw (arrow).



- Slide the starter cover (1) onto the studs.
- Lightly screw on the collar nuts (arrows), but do not tighten them down yet.



- Turn the hexagon (1) on the tensioner clockwise.

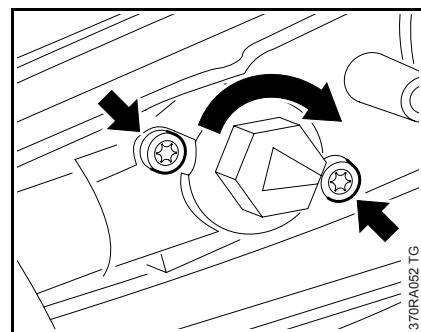
– After roughly 1/8 of a turn, the tensioner is caught by the force of the spring. The hexagon is now turned further by the spring tension until the ribbed poly V-belt is tensioned.

The hexagon must not be forced, as the belt tension is obtained through the spring tension.

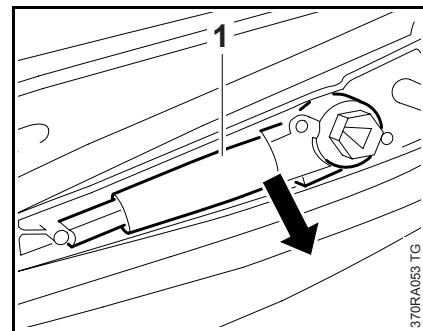
- Screw all three collar nuts tight.
- Insert the water hose in the guides, starting from the shut-off cock.
- Tightening torques, **3.5**.

5.6 Tensioner

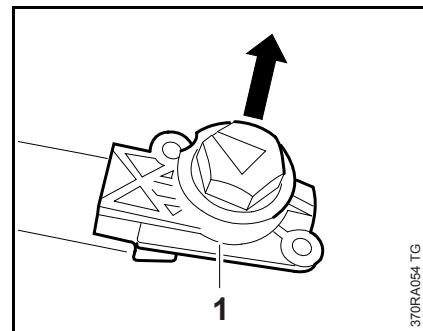
- Remove starter cover and belt guard, **5.2**.
- Relax and remove the ribbed poly V-belt, **5.5**.
- Remove the cast arm with guard, **5.2**.



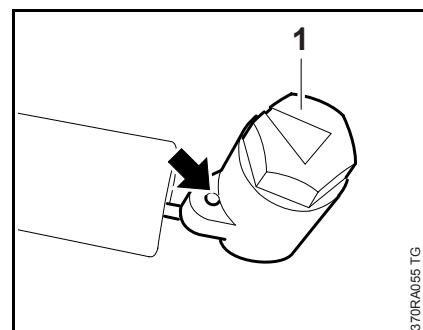
- Turn the hexagon 1/2 turn clockwise to relax the tensioner.
- Take out the screws (arrows).



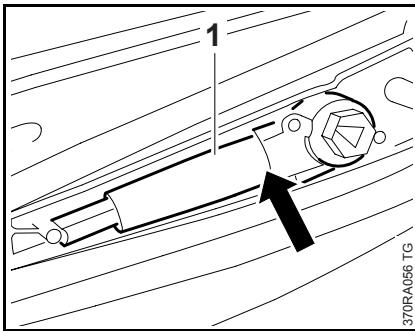
- Remove the complete tensioner (1).



- Remove the cover (1).
- Unhook the tensioner spring from the clamping lever.
- Examine the parts and replace them if necessary.



- Hook the spring of the tensioner into the hole (arrow) in the lever (1).
- Fit the cover.



- Fit the complete tensioner (1).

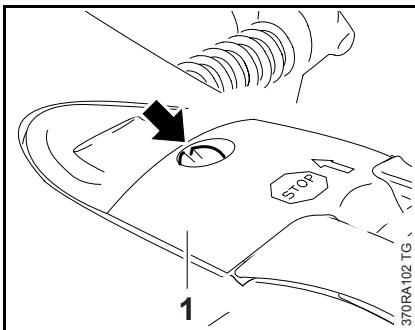
- Insert the fastening screws and tighten them down securely.

The tensioner must be set to the pre-tensioned position before installing the cast arm with guard.

Turn the hexagon of the tensioner as far as possible counterclockwise to pre-tension the tensioner.

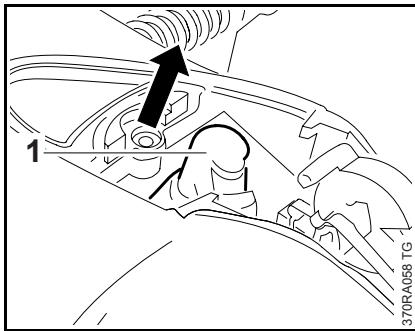
- Tightening torques, **3.5**.
- Reassemble remaining parts in reverse order.

5.7 Starter cup

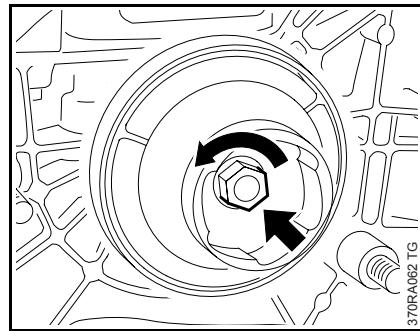


- Remove the screw (arrow).
Screw remains in cap.

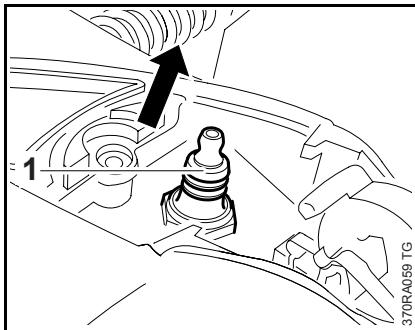
- Remove the cap (1) with screw.



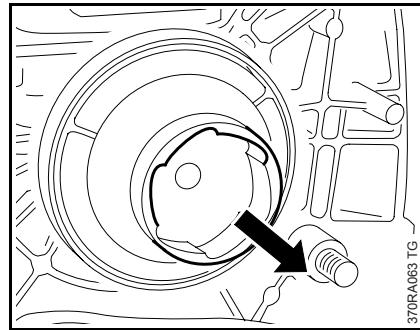
- Remove the spark plug boot (1).



- Unscrew the nut (arrow) from the starter cup.

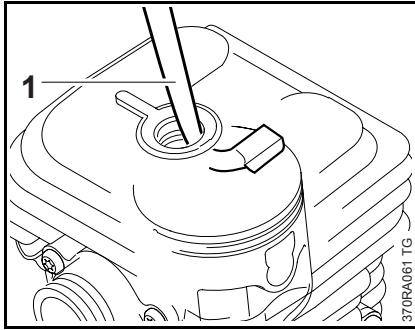


- Unscrew the spark plug (1).



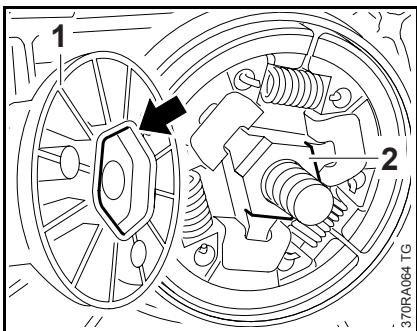
- Pull out starter cup.

- Examine the starter cup, replace if necessary.



- Push the locking strip (1)
0000 893 5903 as far as possible
into the cylinder.

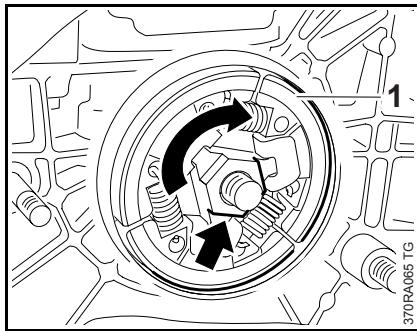
- Fit the piston.



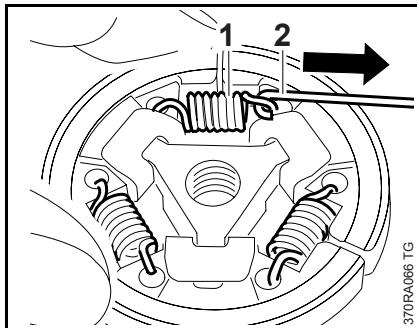
- Align the starter cup (1) so that the hexagon (arrow) engages hexagon (2) of the clutch.
 - Slide the starter cup into place and screw on the nut.
 - Block the piston and screw the nut tight.
 - Tightening torques,  3.5.
 - Reassemble remaining parts in reverse order.

6. Clutch

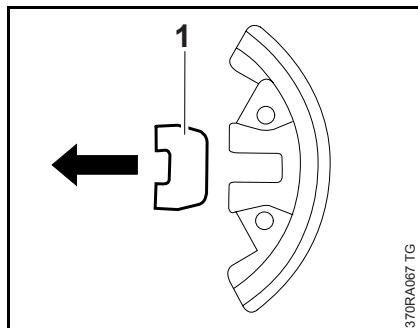
- Troubleshooting, **4.1.**
- Remove starter cover, **5.2.**
- Relax the ribbed poly V-belt, **5.2.**
- Remove starter cup, **5.7.**



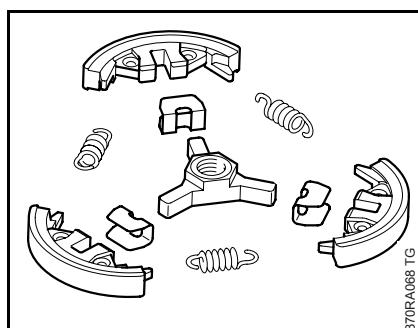
- Block the piston, **5.7.**
- Unscrew the clutch (1) with hexagon (arrow) – left-hand thread.



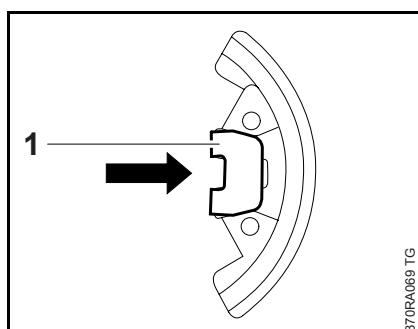
- Use hook (2) 5910 890 2800 to remove the clutch springs (1).



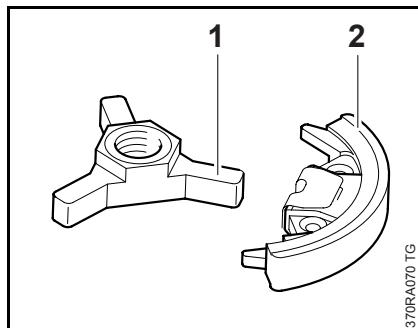
- Pull the clutch shoes off the carrier.
- Pull the retainers (1) off the clutch shoes.



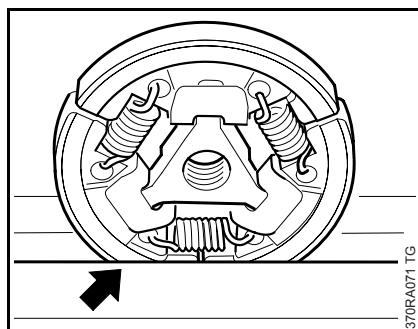
- Clean the individual parts, **14.**
- Replace any defective parts.



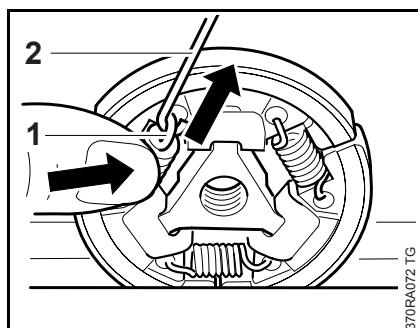
- Slip the retainers (1) onto the clutch shoes.



- Slide the clutch shoes (2) over the legs (1) on the carrier.

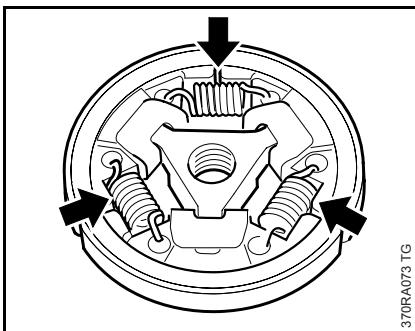


- Clamp the clutch in a vise (arrow).



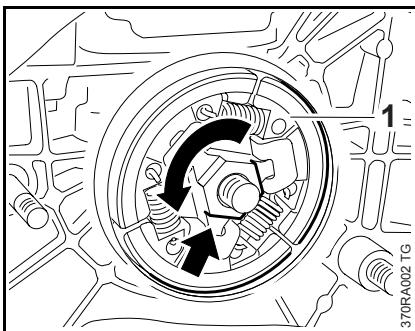
Hook the springs into the opposite side of the raised hexagon.

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



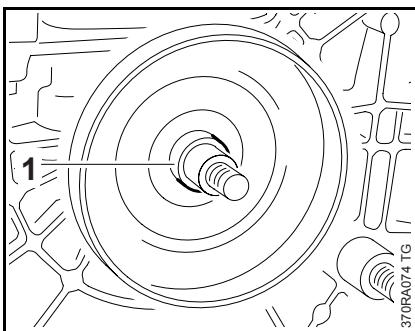
370RA073 TG

- Examine the clutch – all springs (arrows) must be hooked in properly.



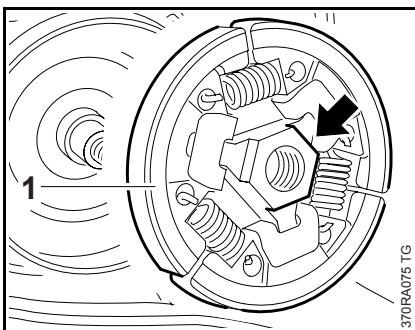
370RA002 TG

- Turn the clutch (1) with hexagon (arrow) onto the crankshaft stub and screw it tight – left-hand thread.



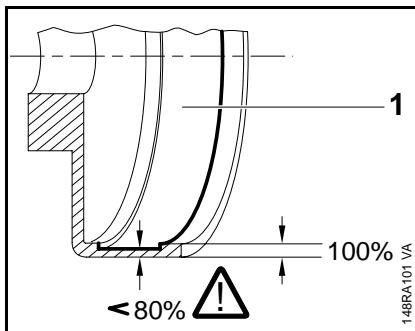
370RA074 TG

- Ring (1) must be in place.



370RA075 TG

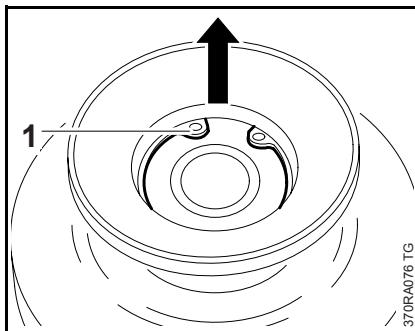
- Fit the clutch (1) on the crankshaft stub so that the raised hexagon (arrow) can be seen.
- Block the piston, **5.7.**



148RA101 VA

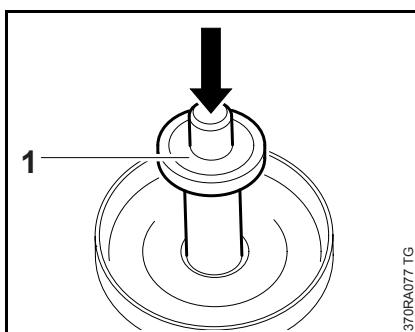
- Examine the clutch drum (1) for signs of wear.

The remaining thickness must be measured if there are distinct signs of wear on the inside diameter of the clutch drum (1). The clutch drum must be replaced if the remaining thickness is less than approx. 80 % of the original thickness.



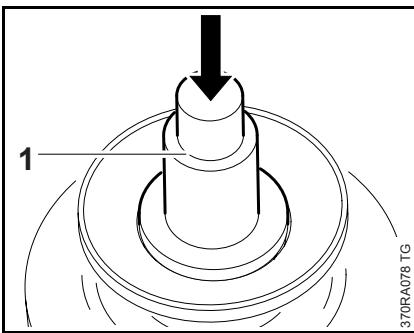
370RA076 TG

- Remove the circlip (1).

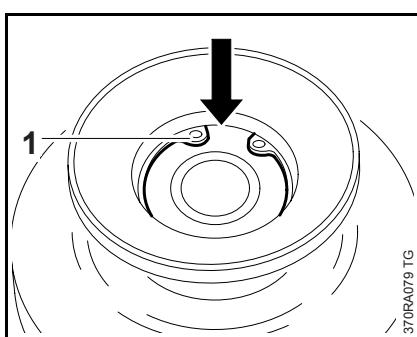


370RA077 TG

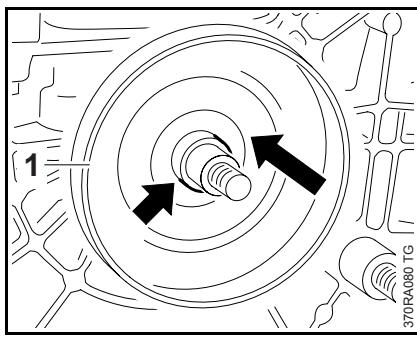
- Drive out the ball bearing with the drift pin (1) 4119 893 7200.



- Press the grooved ball bearing fully home with press arbor (1) 4224 893 7200.

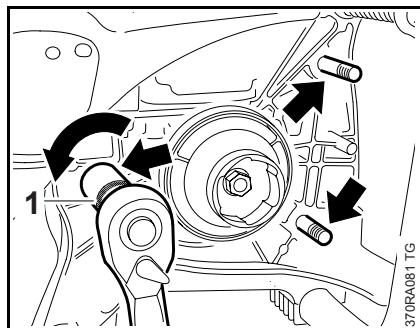


- Fit the circlip (1).

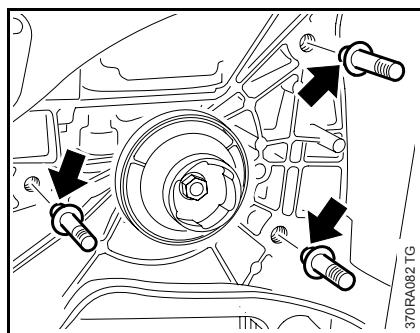


- Slide the clutch drum (1) into place.
- Slip on the ring (arrow).
- Tightening torques, **3.5**.
- Reassemble remaining parts in reverse order.

6.2 Studs for securing the cast arm with guard



- Remove the cast arm with guard, **5.2**.
- Fit the stud puller (1) 5910 893 0501 over the stud (arrows) as far as possible and unscrew it.



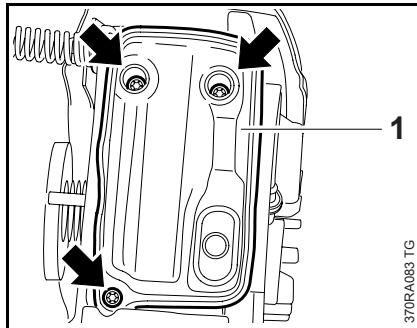
- Coat the thread (arrows) of the studs with Loctite before fitting them, **14**.
- Insert the studs and screw them tight.
- Tightening torques, **3.5**.
- Reassemble remaining parts in reverse order.

7. Shortblock

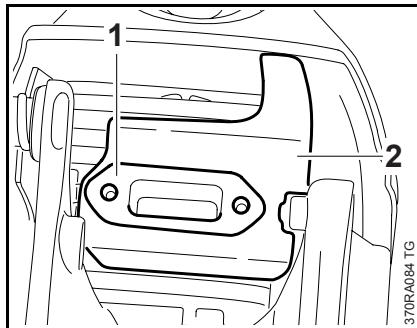
7.1 Muffler/spark arresting screen

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

- Troubleshooting, **4**.
- Remove the cast arm with guard, **5.2**.

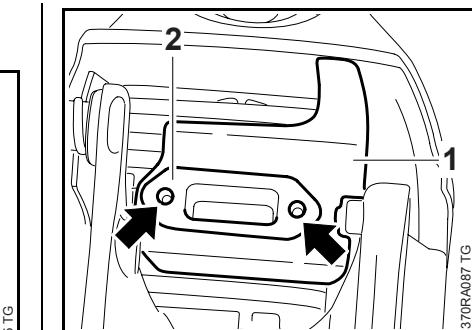
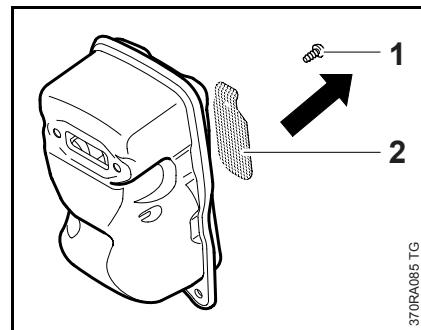


- Take out the screws (arrows).
- Take out and examine the muffler (1), replace if necessary.

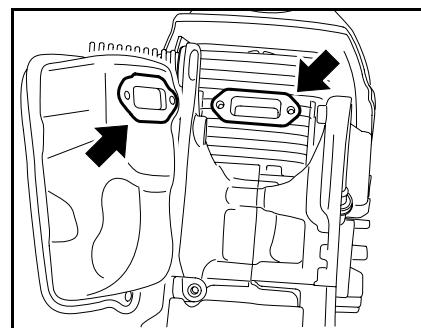


- Remove the exhaust gasket (1) and cooling plate (2).

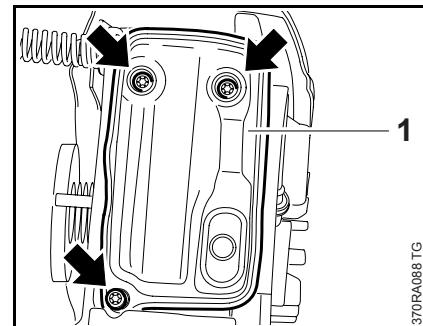
Spark arresting screen



- Place the machine in an upright position.
- Fit the cooling plate (1) and gasket (2) – the holes (arrows) must line up.



- Examine and clean the mating surfaces (arrows), **14**.



- Carefully fit the muffler (1).
- Fit the screws (arrows) and check that the cooling plate and gasket are correctly positioned.
- Insert the screws (arrows) and tighten them down.
- Tightening torques, **3.5**.

7.2 Leak testing

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

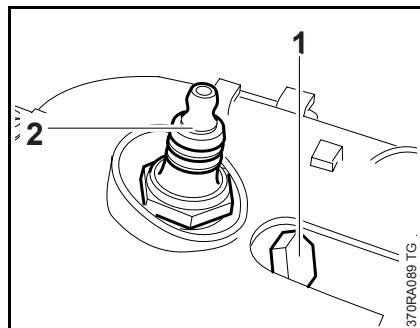
This makes adjustment of the prescribed idle speed difficult, if not impossible.

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

Always start with the vacuum test and then continue with the pressure test.

The shortblock can be thoroughly checked for leaks under vacuum and at gauge pressure using the pump 0000 850 1300.

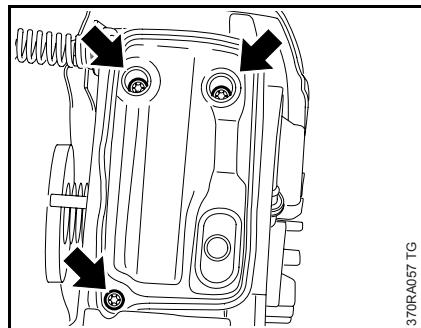
7.2.1 Preparatory steps



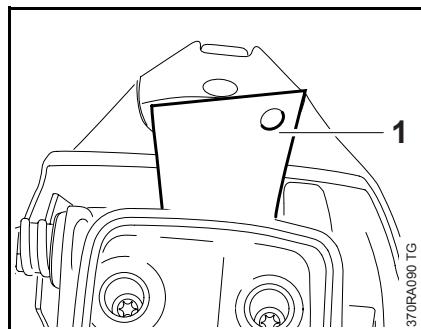
- Remove the shroud, **7.4.**

The spark plug (2) must be screwed tight.

- Remove the decompression valve, **7.9.**
- Fit the plug (1) 4221 025 2200 and screw it tight.
- Tightening torques, **3.5.**



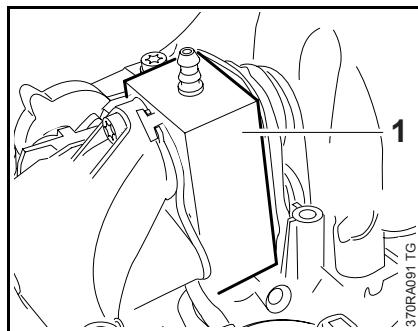
- Undo the screws (arrows).



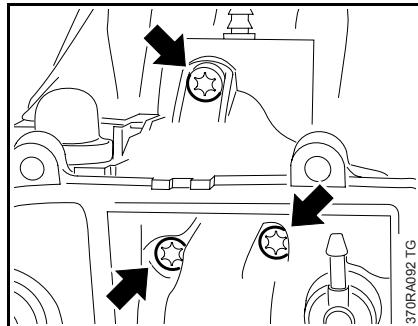
- Fit a sealing plate (1) 0000 855 8106 between the cylinder exhaust port and cooling plate, then tighten the screws down gently.

The sealing plate must fill the full width between the screws.

- Remove the carburetor, **12.2.**



- Slide a flange 4238 890 1200 (1) between tank housing and manifold.
- Adjust the flange: the holes in the manifold, flange and tank housing must be lined up.

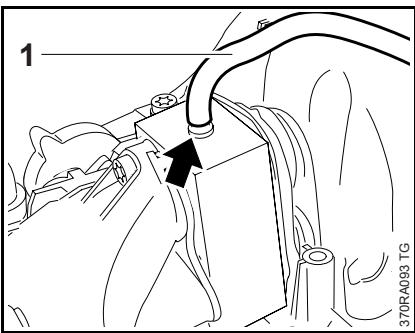


- Insert and tighten down the M5x48 screws (arrows).

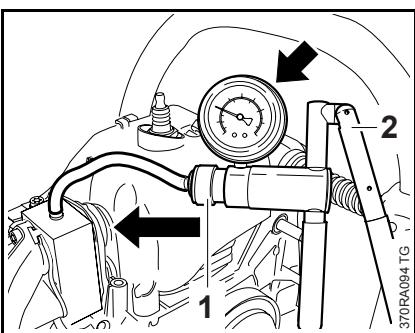
7.2.2 Vacuum test

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

This kind of fault can be detected by testing with pump 0000 850 1300.



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

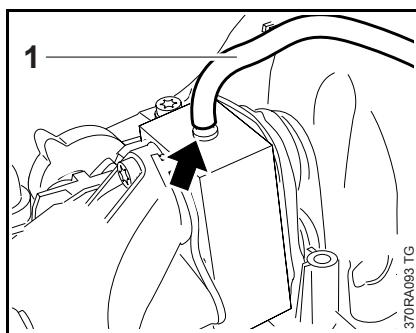


- Slide ring (1) to the left.
- Operate lever (2) until the pressure gauge (arrow) indicates a vacuum of 0.5 bar.

If the vacuum reading remains constant, or does not decrease by more than 0.3 bar within 20 seconds, it may be assumed that the oil seals are in good condition. If the vacuum in the crankcase is reduced further, the oil seals must be replaced, **7.3**.

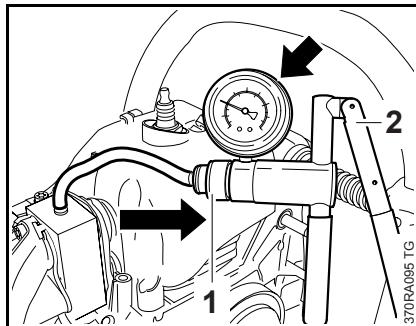
- After testing, slide the ring on the pump back to the right to vent the pump.
- Continue with pressure test, **7.2.3**.

7.2.3 Pressure test



The same preparatory steps are required as for the vacuum test, **7.2.2**.

- Test under vacuum before starting the pressure test, **7.2.2**.
- Connect the delivery hose (1) of the pump 0000 850 1300 to the nipple (arrow).



- Slide ring (1) to the right.
- Actuate the lever (2) until the pressure gauge (arrow) shows a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the crankcase is airtight.
- If the pressure drops, the leak must be located and the defective part replaced.

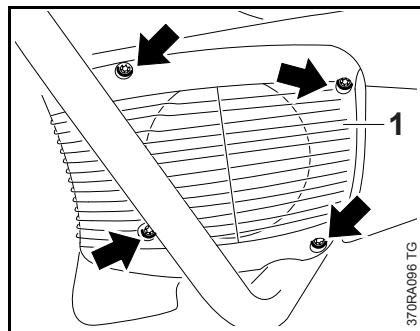
To find the leak, coat the suspect area with soapy water and pressurize the crankcase. Bubbles will appear if a leak exists.

- After testing, slide the ring on the pump to the left to vent the pump; disconnect the hose.
- Remove the flange.
- Install the carburetor, **12.2**.
- Release the muffler and pull out the sealing plate.
- Tighten down the muffler.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

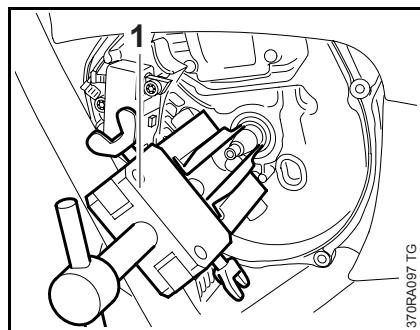
7.3 Oil seals

It is not necessary to dismantle the complete shortblock if only the oil seals need to be replaced.

Ignition side



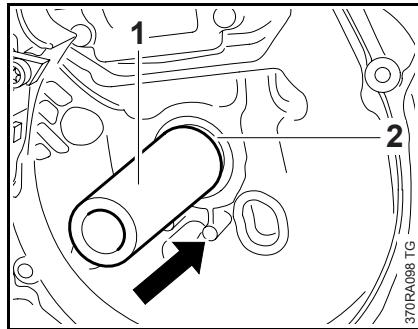
- Take out the screws (arrows).
- Remove fan cover (1).
- Remove the flywheel, **8.5**.



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

Avoid damage to the crankshaft stub.

- Clean the mating surfaces, **14**.
- Grease the sealing lips of the new oil seal, **14**.



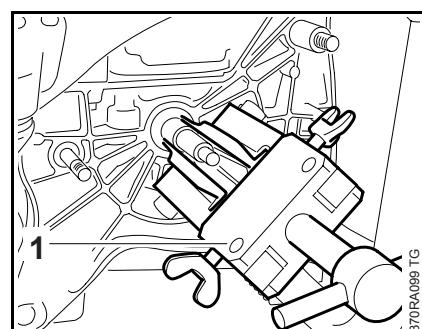
- Thinly coat the outer circumference of the oil seal with sealing compound, **14**.
- Slip the oil seal with the open side facing the crankcase over the crankshaft stub.
- Press the oil seal (2) in with press sleeve (1) 4238 893 2400.

The seating face must be flat and free from burrs.

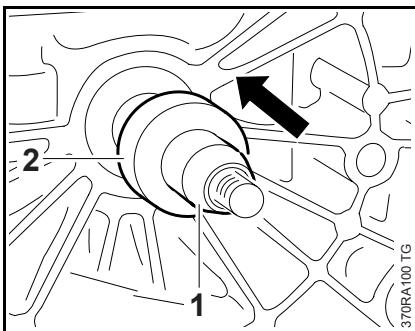
- Turn the crankshaft through several times after approx. 1 minute.
- Clean the cone of the crankshaft to ensure it is completely grease-free, **14**.
- Reassemble remaining parts in reverse order.

Clutch side

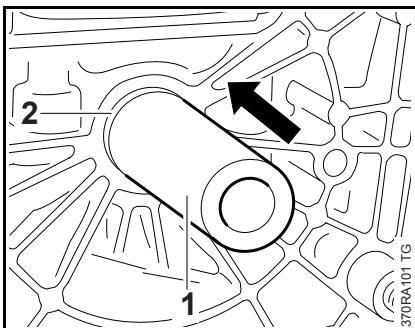
- Remove cast arm with guard, **5.2**.
- Remove the clutch, **6**.
- Remove the clutch drum, **6.1**.



- Free off the oil seal in its seat by tapping it with a suitable tube or a punch.
- Apply the puller (1) 5910 890 4400 with jaws (profile No. 3.1) 0000 893 3706.
 - Clamp the puller arms.
 - Pull out the oil seal.
- Avoid damage to the crankshaft stub.
- Clean the mating surfaces, **14**.
- Grease the sealing lips of the new oil seal, **14**.

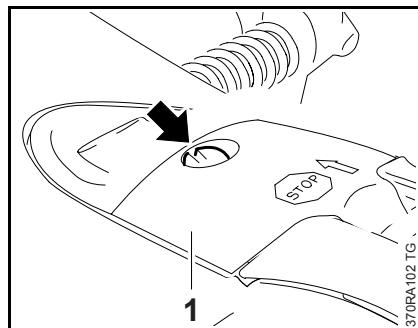


- Fit the installing sleeve (1) 1118 893 4602.
- Thinly coat the outer circumference of the oil seal with sealing compound, **14**.
- Slide the oil seal (2) over the installing sleeve (1) with the open side facing the crankcase.
- Remove the installing sleeve (1).

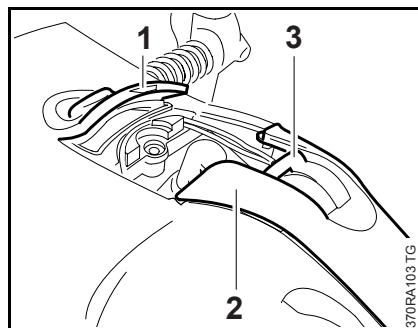


- Press in the oil seal (2) with press sleeve (1) 4238 893 2400.
- Turn the crankshaft through several times after approx. 1 minute.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

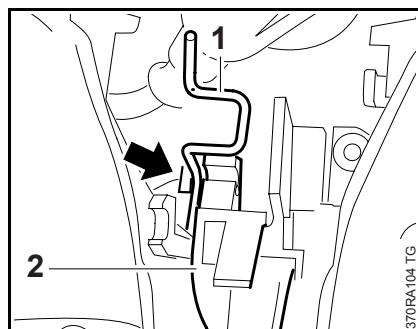
7.4 Removing and installing the shroud



- Remove the screw (arrow). Screw remains in cap.
- Remove the cap (1) with screw.

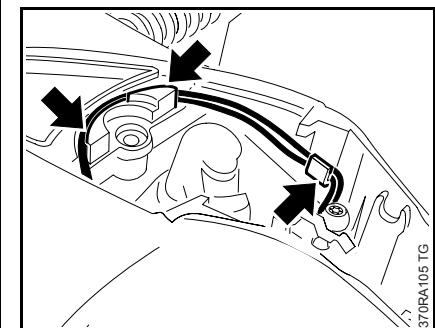


- Pull out the grommet (1).
- Remove the handle molding (2) and switch shaft (3), **11.1.1**.

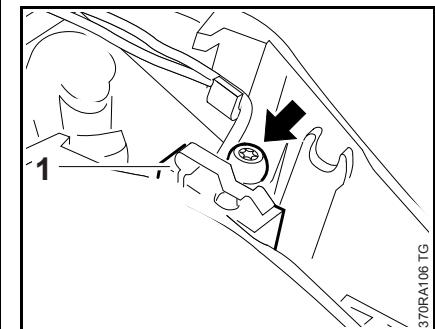


- Unhook the throttle rod (1) from the throttle trigger (2).

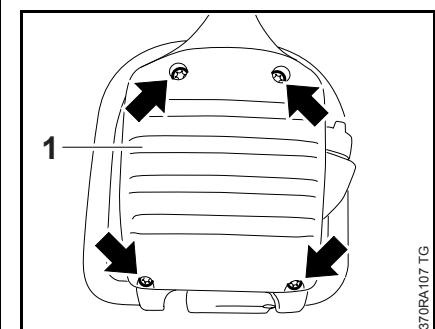
- Press the free throttle rod (1) into the mount (arrow); the throttle rod is now secure.



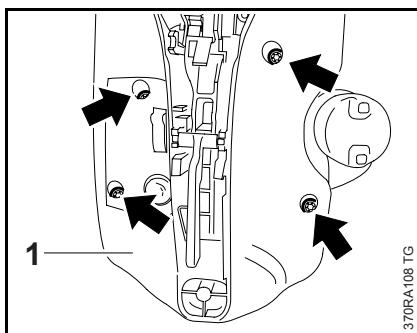
- Pull the short circuit and ground wires out of the guides (arrows).



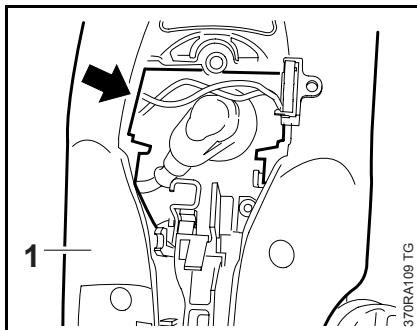
- Remove the screw (arrow).
- Take out the switch (1) with retainer.



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

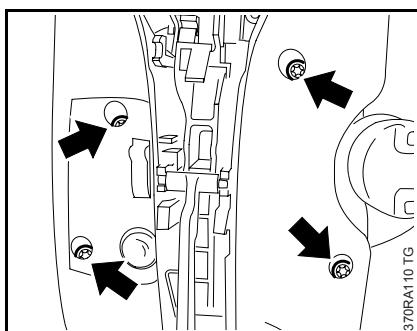


- Take out the screws (arrows).
- Remove the shroud (1).
- Examine the throttle trigger and trigger interlock, replace if necessary, **11.2.**

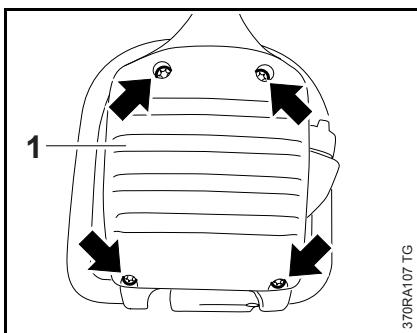


- Fit the shroud (1), guiding the short circuit and ground wire with switch through the opening (arrow).

The wiring harness must be routed in the guides in the air guide shroud, **7.4.**



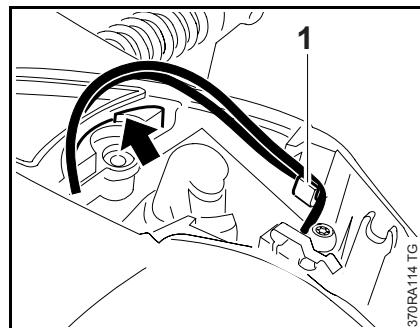
- Insert and tighten down the screws (arrows).



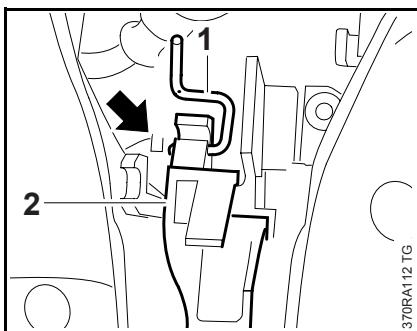
- Fit the filter cover (1).
- Insert and tighten down the screws (arrows).

The wires are routed through underneath the mount.

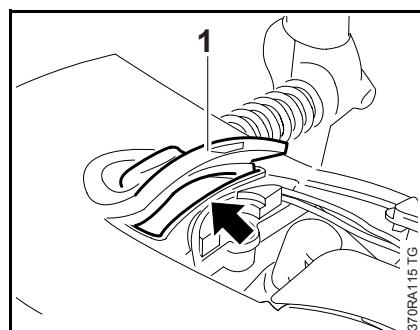
- Insert and tighten down the screw.



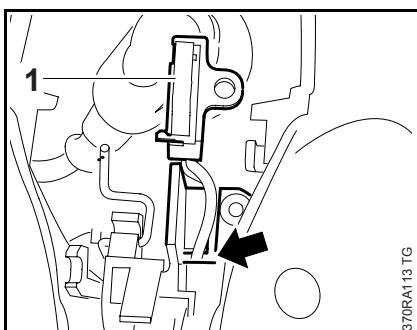
- First place the short circuit and ground wires in the guide (1), then in the other guide (arrow).
- Install the switch shaft and handle molding, **11.1.1.**



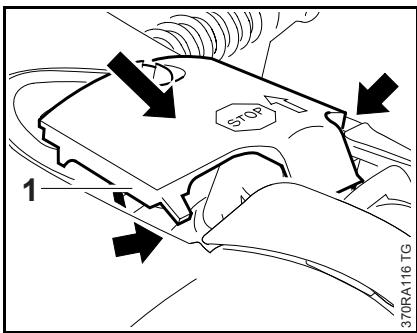
- Take the throttle rod out of the mount (arrow).
- Hook the throttle rod (1) into the throttle trigger (2).



- Press the grommet (1) into the mount (arrow) until it is fully home.



- Slide the switch (1) with retainer into the mount (arrow).



- First slide the pegs (arrows) on the cap (1) into the mount, then press it home.
- Insert and tighten down the screw.
- Tightening torques, **3.5**.

7.5 Cylinder

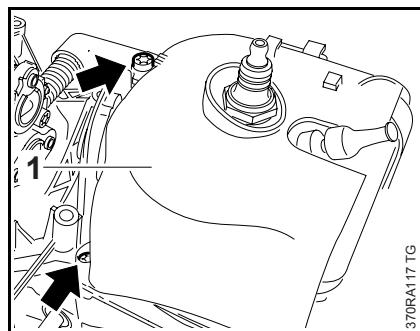
Before removing the cylinder, decide whether or not the crankshaft is to be removed.

With the cylinder in place:
The piston must be blocked to prevent the crankshaft turning in order to remove the flywheel and clutch, **5.7**.

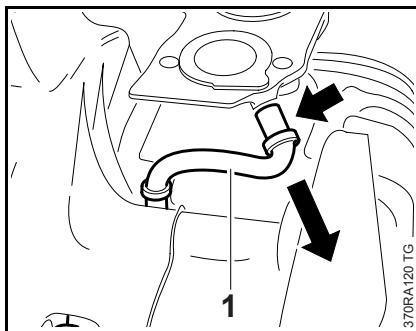
With the cylinder removed:
The crankshaft is blocked by placing the piston on the wooden assembly block in order to remove the flywheel and clutch.

- Remove the shroud, **7.4**.
- Take off the spark plug boot and remove the spark plug, **5.7**.
- Remove the fan cover, **7.3**.
- Remove the carburetor, **12.2**.
- Remove the muffler, **7.1**.

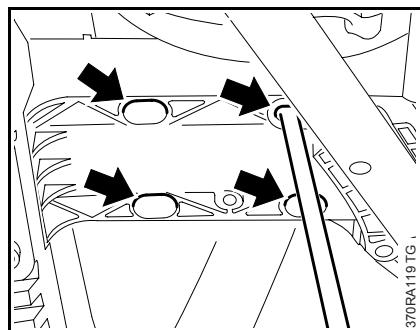
- Remove the decompression valve, **7.9**.
- Empty the fuel tank, **1**.



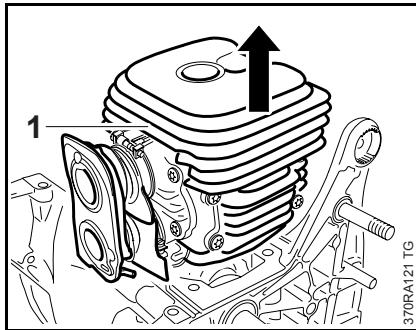
- Take out the screws (arrows).
- Remove the air guide shroud (1).



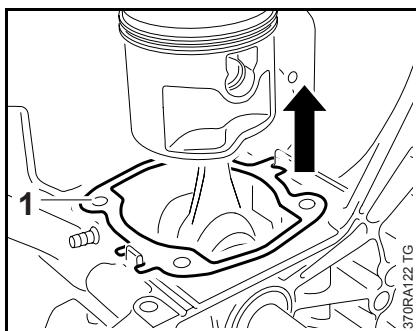
- Disconnect the impulse hose (1) from the stub (arrow).
- Check the impulse hose (1), replace if necessary. Engine operation may be impaired by the slightest damage, **12.6.1**.



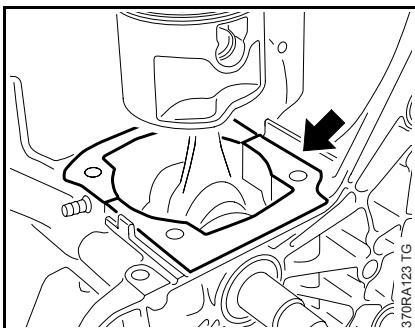
- Remove the clamp, **10.5**.
- Take out the pan head screws through the openings (arrows) in the tank housing and molded hosing underneath; the pan head screw in the molded hosing is not removed.



- Carefully pull off the cylinder (1).
- Do not use pointed or sharp-edged tools for this job.



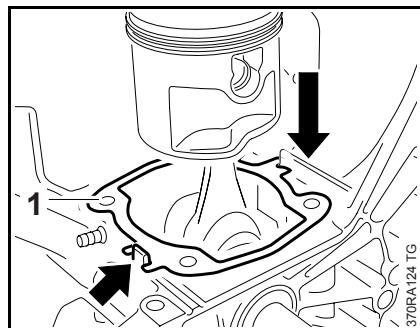
- Remove the cylinder gasket (1).



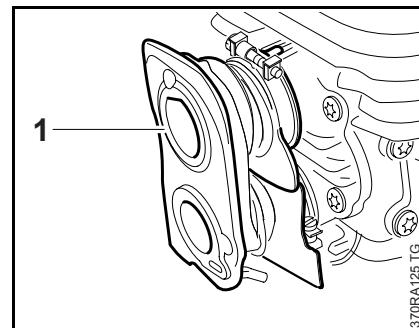
- Examine and clean the mating surface (arrow).

The mating surface must be in perfect condition and without any damage whatsoever. Parts with damaged mating surfaces must be replaced, **4.6**.

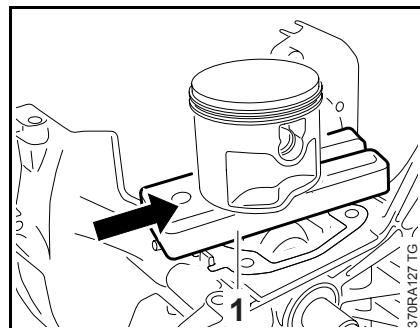
Always use a new cylinder gasket after removing the cylinder.



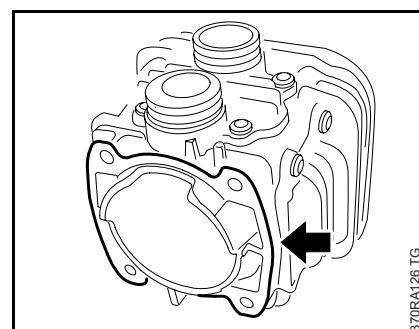
- Position the cylinder gasket (1) so that the forked tab engages the peg (arrow).
- Fit the cylinder gasket (1).



- Examine the intake elbow (1), replace if necessary. Engine operation may be impaired by the slightest damage, **4.6**.
- Remove the intake elbow (1), **12.6**.



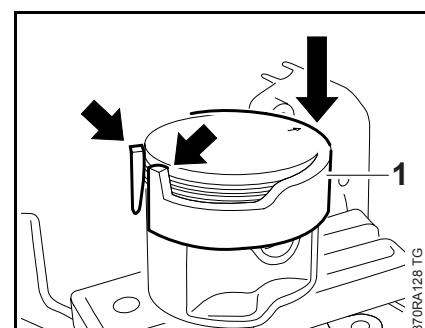
- Place wooden assembly block (1) 1108 893 4800 between piston and crankcase.



- Examine and clean the mating surface (arrow), remove any remaining gasket scraps.
- Check the mating surface on the cylinder exhaust port and intake fitting.

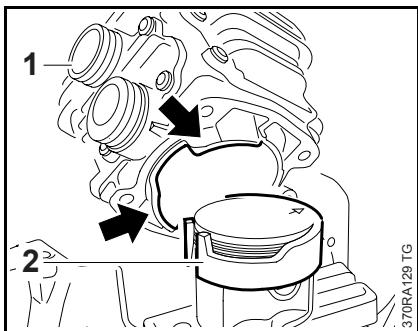
The mating surfaces must be in perfect condition and without any damage whatsoever. A new cylinder must be used if the mating surfaces are damaged.

Screws and cover on the cylinder are due to production and must not be removed; simply loosening the screws can cause problems in the form of leaks.



- Coat the piston, piston rings and inside of cylinder with oil, **14**.
- Ensure that the piston rings are correctly positioned, **7.8**.
- Align the tightening ring – the pegs (arrows) must point in the opposite direction to the arrow on the piston head.
- Slide the tightening ring (1) 4238 893 7000 over the piston until it encloses the piston rings completely.

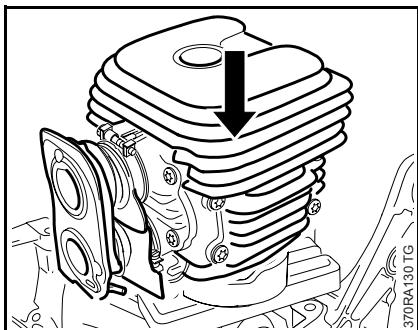
The tightening ring (1) must be fitted so that the piston rings do not protrude beyond the piston wall.



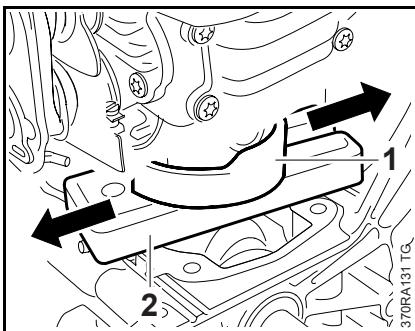
- Align the cylinder so that the cylinder inlet port (1) faces towards the handle and the recesses (arrows) engage in the tightening ring (2).

When fitting the cylinder over the piston, ensure that the tightening ring encloses the piston securely and that none of the piston rings protrudes, otherwise it may break.

- Install the intake elbow, **12.6**.

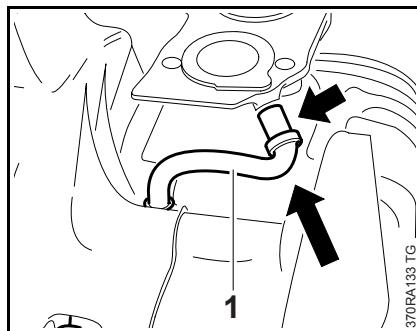


- Slide the cylinder over the piston, pushing the tightening ring downwards at the same time.



- Remove the tightening ring (1) and wooden assembly block (2).

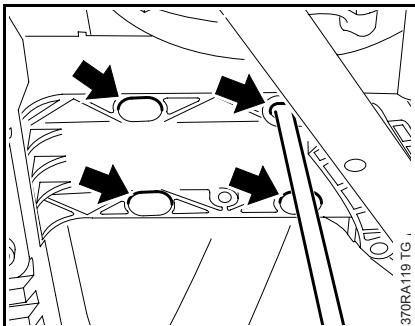
Ensure that the cylinder gasket is correctly positioned.



- Connect the impulse hose (1) to the connector (arrow).
- Reassemble remaining parts in reverse order.

7.6 Crankshaft

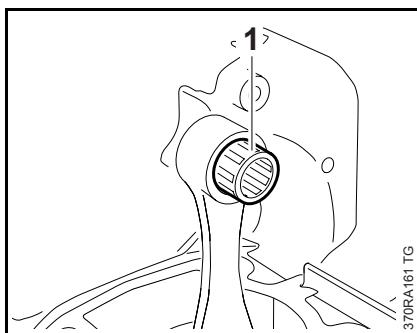
7.6.1 Removal and installation



- Slide the cylinder into position as far as possible and hold it there.
- Insert the pan head screws through the openings (arrows) in the tank housing and screw them in. Fit the pan head screw in the molded hosing.
- Check the position of the cylinder gasket.
- Tighten the screws down crosswise.
- Tightening torques, **3.5**.

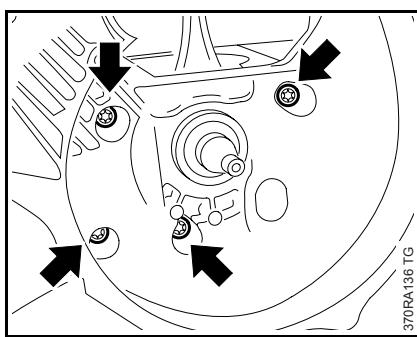
- Remove the cast arm with guard, **5.2**.
- Remove the ignition module, **8.1**.
- Remove the flywheel, **8.5**.
- Remove the clutch drum, **6.1**.
- Remove the handlebar, **10.5**.
- Empty the fuel tank, **1**.
- Remove the tank housing, **12.9**.
- Remove the cylinder, **7.5**.
- Remove the piston, **7.7**.

Always fit new grooved ball bearings and oil seals when removing the crankshaft.

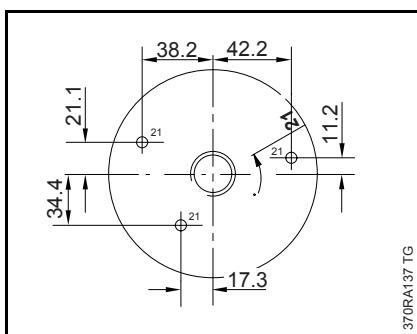


- Take out the needle bearing (1), examine and clean it, replace if necessary.

Removing the clutch-side half of the crankcase



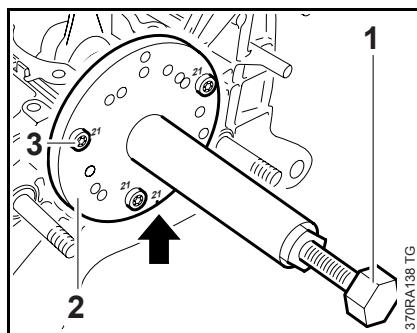
- Take out the screws (arrows).



Assembly tools without holes "21" can be reworked with 5.5 mm holes as illustrated.

The drilled plate is shown from above in the illustration.

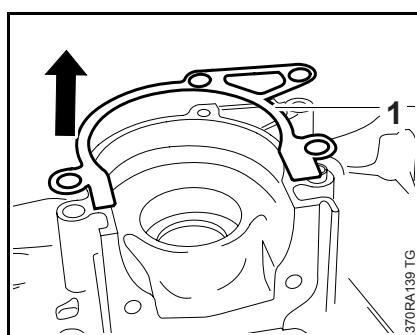
Dimensions are given in millimeters.



- Unscrew the spindle (1) of the installing tool 5910 893 2102 until the flange contacts the crankcase – left-hand thread.
- Align the installing tool with the flange (2) 5910 893 2102 with the clutch-side half of the crankcase so that the edge number "21" (arrow) is at the bottom.
- Insert three M5x72 screws (3) through the holes marked "21" and screw them as far as possible into the crankcase half.

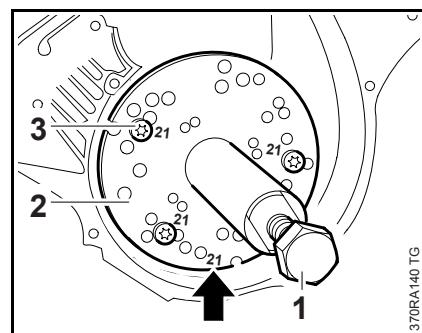
The clutch-side half of the crankcase is pulled off in this way and the two halves of the crankcase separated.

- Fit new grooved ball bearings and oil seals, [7.6.2](#).

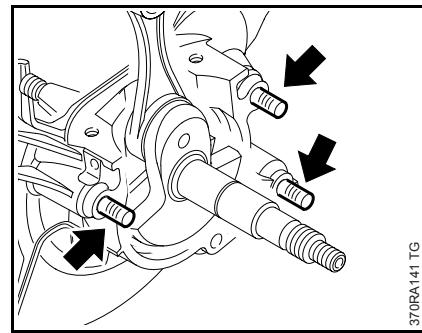


- Remove the gasket (1).

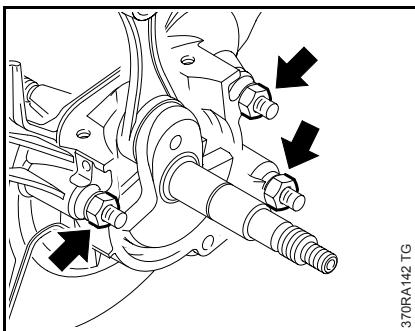
Removing the ignition-side half of the crankcase



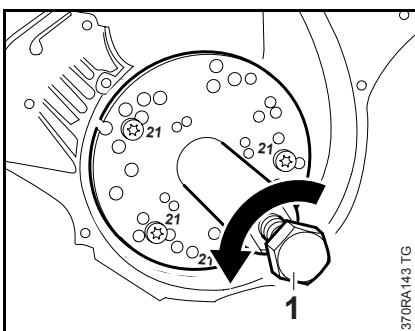
- Unscrew the spindle (1) of the installing tool 5910 893 2102 until the flange contacts the crankcase – left-hand thread.
- Align the installing tool with the flange (2) 5910 893 2102 with the ignition-side half of the crankcase so that the edge number "21" (arrow) is at the bottom.
- Insert three M5x72 screws (3) through the holes marked "21".



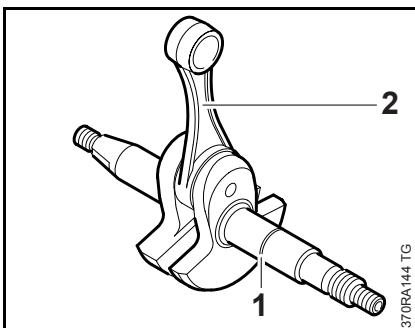
- Insert screws (arrows) through the holes in the crankcase half.



- Fit washers and nuts (arrows).
- Screw the nuts tight.



- Turn the spindle (1) counterclockwise until the crankshaft has been forced out of the ignition-side half of the crankcase.



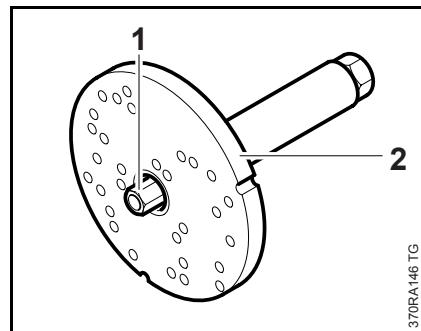
- The crankshaft (1), connecting rod (2) and the needle bearing between them make up a complete unit and must therefore always be replaced as a unit.
- Check the two halves of the crankcase and the grooved ball bearing, replace if necessary, **7.6.2.**

Before installing the crankshaft, it must be cleaned with standard solvent-based degreasant not containing any chlorinated or halogenated hydrocarbons.

Installing the ignition-side half of the crankcase

Avoid damage to the crankshaft stub.

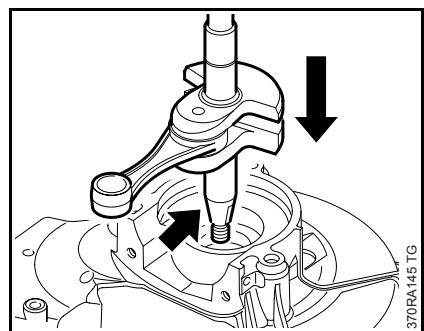
Examine and clean the mating surfaces of the ignition-side half of the crankcase (including the cylinder sealing surface). The mating surfaces must not be damaged in any way whatsoever.



If the inner race cannot be heated, the crankshaft can be drawn into the crankcase with the installing tool 5910 893 2102.

- Fit the screw sleeve (1) 5910 893 2421 as far as possible over the fully retracted spindle of the installing tool (2) 5910 893 2102.

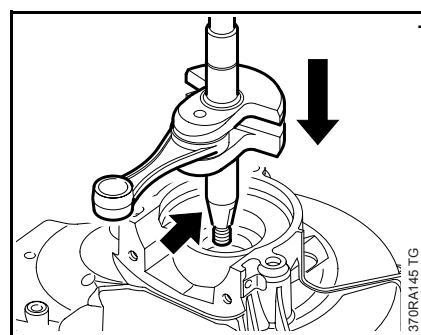
Coat the conical crankshaft stub with oil.



- Line the crankshaft up with the conical stub (arrow) pointing towards the grooved ball bearing on the ignition side.

Wear protective gloves – risk of burns.

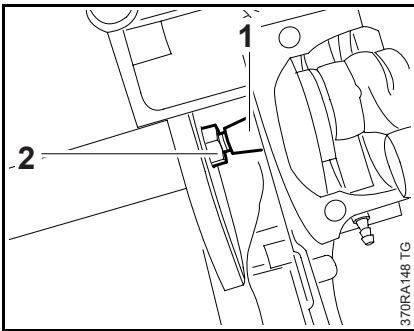
- Heat the inner race of the ball bearing to approx. 150 °C (300 °F).



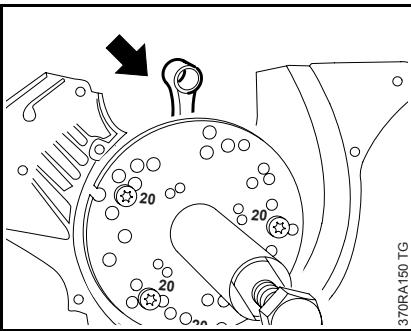
- Align the crankshaft with the conical stub (arrow) facing the ignition-side ball bearing and push it home.

Push the crankshaft home until the crankshaft stub makes contact.

The crankshaft must be fitted rapidly, as the heat is transmitted to the crankshaft stub and the inner bearing race contracts.

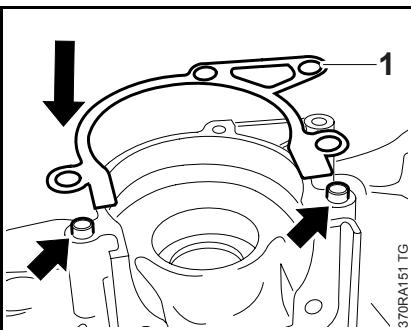


- Fit the screw sleeve (2) over the thread of the conical crankshaft stub (1) and screw it on.

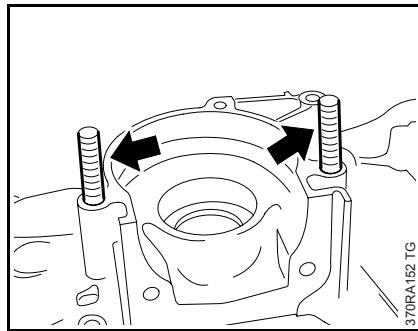


The crankshaft also turns when it is drawn in with the installing tool. For this reason, ensure that the small end (arrow) always faces upwards towards the cylinder.

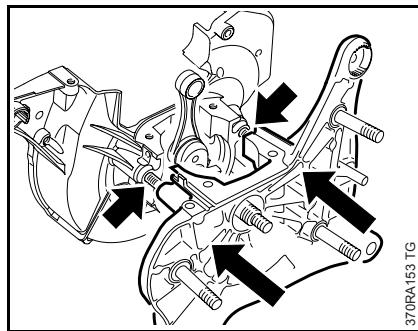
- Remove the installing tool.



- Turn the spindle screw (1) to draw the drilled plate towards the ignition-side half of the crankcase.
- Fit the installing tool with three M5x72 screws (arrows) through the holes marked "21" on the drilled plate and secure it to prevent it twisting; turn the spindle screw (1) in clockwise.
- Draw the ignition-side half of the crankcase in as far as possible.



- Turn the M5x72 screws (arrows) in as far as possible – for guidance and to prevent twisting.



- Coat the cylindrical crankshaft stub with oil.
- Align the crankcase half with the cylindrical crankshaft stub and the two screws and position it (arrows).

Installing the clutch-side half of the crankcase

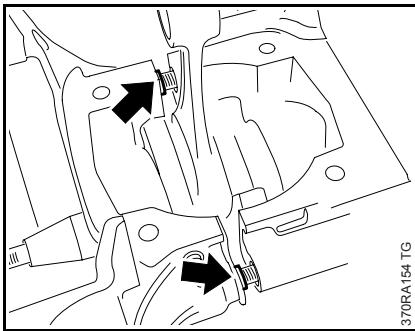
Avoid damage to the crankshaft stub.

Examine and clean the mating surfaces of the clutch-side half of the crankcase (including the cylinder sealing surface). The mating surfaces must not be damaged in any way whatsoever.

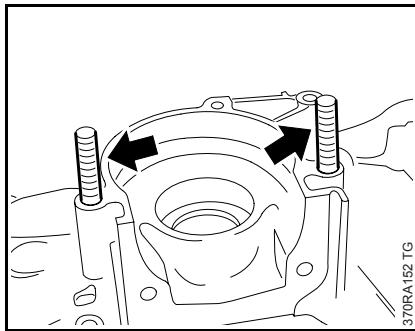
Wear protective gloves – risk of burns.

- Heat the inner race of the ball bearing to approx. 150 °C (300 °F).
- Push the crankcase home until it makes contact.

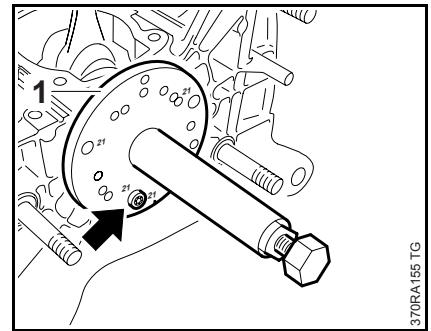
The crankcase must be fitted rapidly, as the heat is transmitted to the crankshaft stub and the inner bearing race contracts.



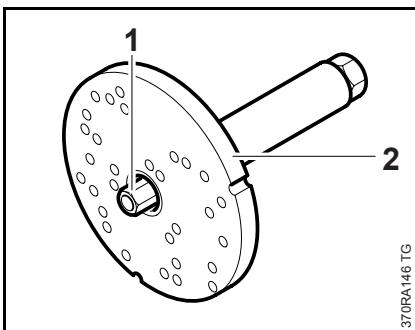
Ensure that the sleeves (arrows) enter the holes and that the gasket is not jammed or kinked.



Turn the M5x72 screws (arrows) in as far as possible – for guidance and to prevent twisting.

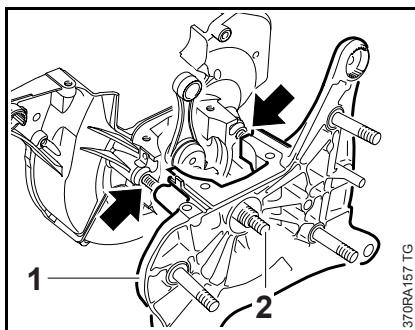


- Position the flange (1) on the crankcase and insert the M5x72 screw in the bottom hole "21" – to prevent the installing tool twisting.

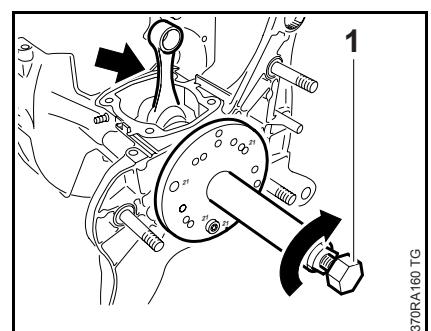


If the inner race cannot be heated, the crankshaft can be drawn into the crankcase with the installing tool 5910 893 2102.

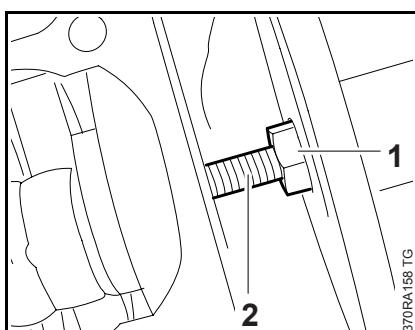
- Fit the screw sleeve (1) 5910 893 2421 as far as possible over the fully retracted spindle of the installing tool (2) 5910 893 2102.



- Coat the cylindrical crankshaft stub (2) with oil.
- Position the clutch-side half of the crankcase (1) on the cylindrical crankshaft stub (2) and align it with the two screws.



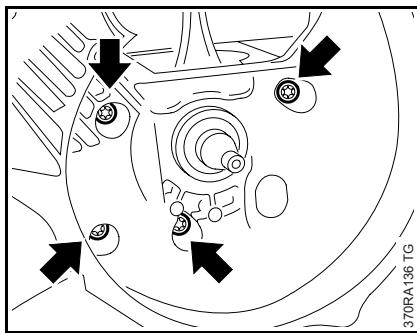
- Turn the spindle screw (1) in clockwise.
- Draw the clutch-side half of the crankcase home until it makes contact.



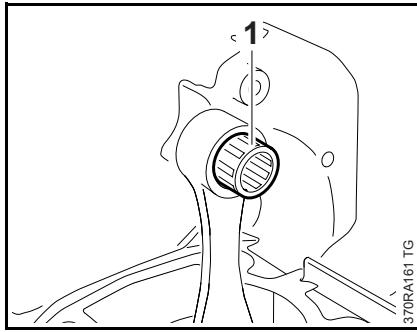
- Place the threaded sleeve (1) over the thread (2) of the cylindrical crankshaft stub and screw it on.

The crankshaft also turns when it is drawn in with the installing tool. For this reason, ensure that the small end (arrow) always faces upwards towards the cylinder.

- Remove the installing tool.



- Insert the screws (arrows) and tighten them down crosswise.
- Tightening torques, **3.5**.



- Coat the needle bearing (1) with oil.
- Slide the needle bearing (1) into the small end.
- Examine and install the piston, **7.7**.
- Examine and install the cylinder, **7.5**.
- Reassemble remaining parts in reverse order.

7.6.2 Grooved ball bearing/crankcase

The two halves of the crankcase can be replaced individually if they are defective.

New crankcases are delivered with the relevant components pre-assembled – see spare parts list. Those parts which are not supplied with the new crankcase must be removed from the old crankcase, examined and replaced if necessary.

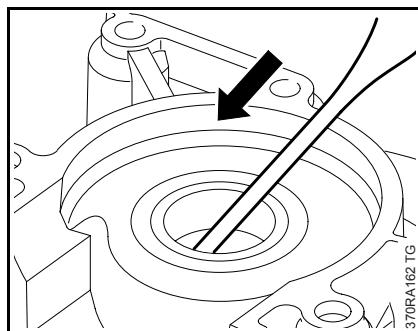
When fitting a new crankcase, the machine's serial number must be stamped on the crankcase with 2.5 mm figure stamps.

If the original crankcase is reused, the oil seals and grooved ball bearings must be replaced, all gasket residues removed and the mating surfaces cleaned thoroughly. The mating surfaces must be absolutely clean to guarantee a perfect seal.

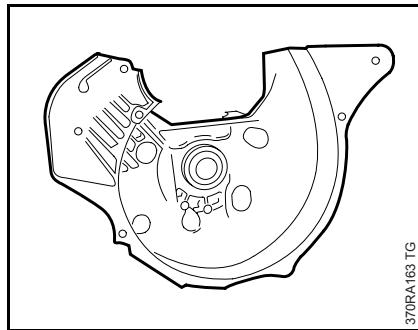
Examine both halves of the crankcase for cracks and check all mating surfaces for signs of damage.

- Refer also to troubleshooting, **4.6**.
- Remove the crankshaft, **7.6.1**.
- Wear protective gloves – risk of burns.

Ignition-side half of the crankcase

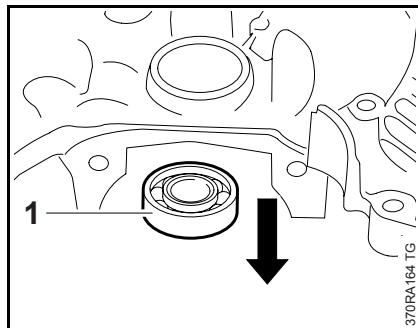


- Carefully drive the oil seal out with a suitable punch.



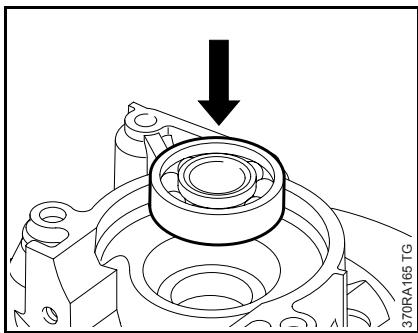
- Examine and clean the crankcase, replace if necessary.

Fit new grooved ball bearings if the crankcase is in good condition.



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

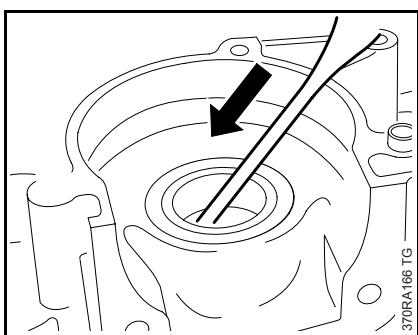
The bearing (1) drops out of its own accord when this temperature is reached.



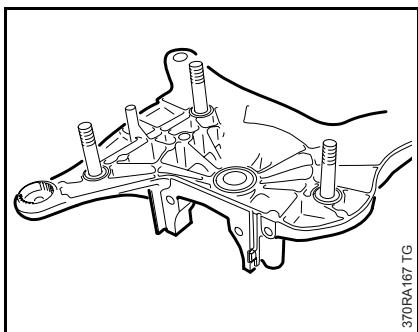
- Heat the area around the bearing seat to approx. 150 °C (300 °F).
- Press the grooved ball bearing home as far as possible.

The ball bearing must be fitted rapidly, as it absorbs heat and expands.

Clutch-side half of the crankcase

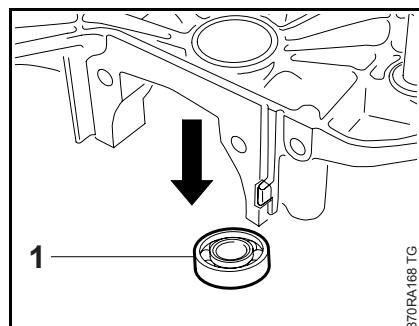


- Carefully drive the oil seal out with a suitable punch.



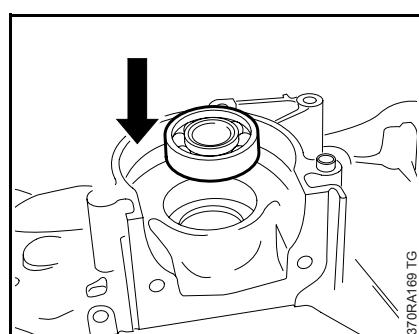
- Examine and clean the crankcase, replace if necessary.

Fit new grooved ball bearings if the crankcase is in good condition.



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

The bearing (1) drops out of its own accord when this temperature is reached.



- Heat the area around the bearing seat to approx. 150 °C (300 °F).
- Press the grooved ball bearing home as far as possible.

The ball bearing must be fitted rapidly, as it absorbs heat and expands.

- Install the crankshaft, **7.6.1**.
- Install the oil seals, **7.3**.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

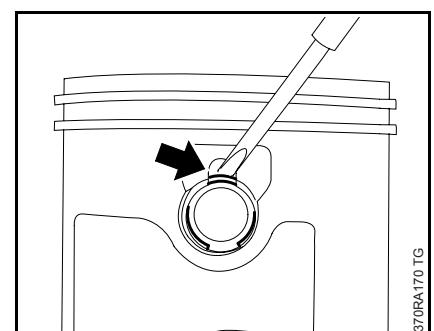
7.7 Piston

7.7.1 Removal

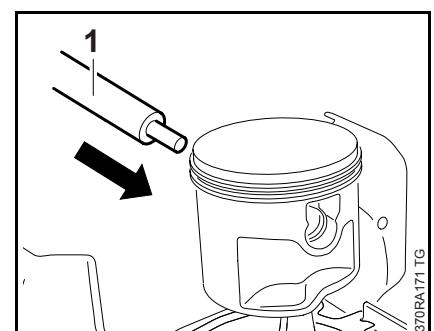
Before removing the cylinder, decide whether the crankshaft is to be removed, **7.6.1**.

- Remove the cylinder, **7.5**.

Two snap rings are fitted, but only one need be removed in order to remove the piston pin – their installation is the same on both sides.

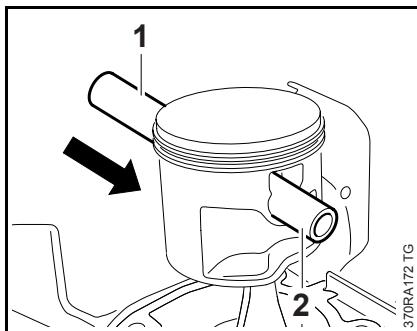


- Pry the hookless snap ring out of the recess (arrow) on the clutch side with a suitable tool.



- Fit the assembly drift (1) 1110 893 4700 on the ignition side.

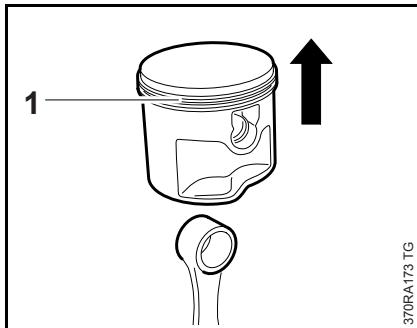
The assembly drift can be inserted through the fitted snap ring.



- Drive the piston pin (2) out of the piston with assembly drift (1)
1110 893 4700.

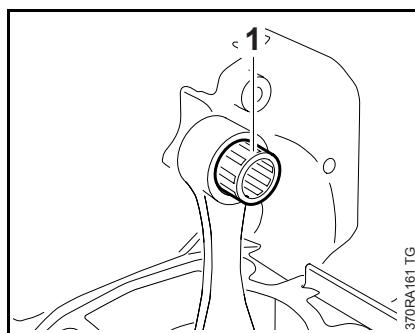
If the piston pin is stuck, tap the end of the assembly drift lightly with a hammer to loosen it.

The piston must be held steady during this process to ensure that jolts are not transmitted to the connecting rod.

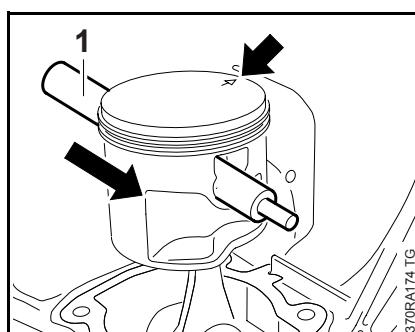


- Remove the piston (1) from the connecting rod.
- Examine the piston rings and replace if necessary, **7.8.**

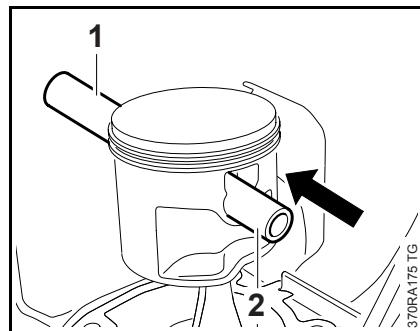
7.7.2 Installation



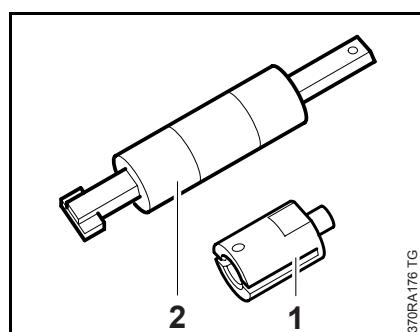
- Pull out the needle bearing (1), examine and clean it, replace if necessary.
- Coat the needle bearing (1) with oil and insert it in the small end.



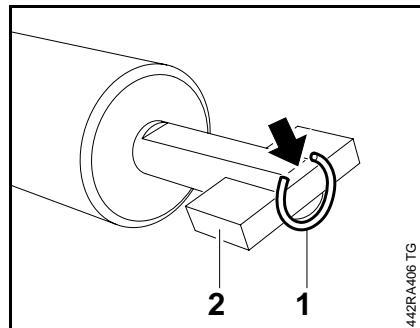
- Align the piston so that the arrow (arrow) on the piston head points towards the cutting wheel and the mount for the snap ring is on the clutch side.
- Position the piston on the small end.
- From the clutch side, fit the assembly drift (1) 1110 893 4700 with the small diameter first through the piston and small end (needle cage) and secure the piston.



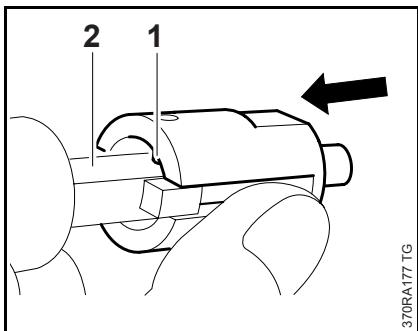
- Coat the piston pin with oil.
- Fit the piston pin (2) on the small diameter of the assembly drift (1) and slide it into the piston.



- Remove the sleeve (1) 5910 893 1707 from the installing tool (2) 5910 890 2210.

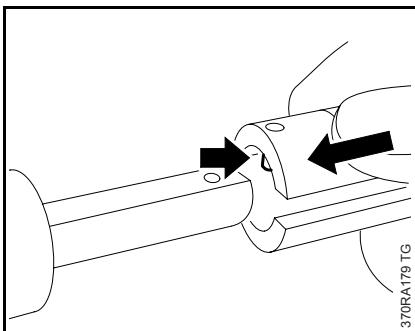


- Attach the snap ring (1) to the magnet (2) and align it so that the snap ring gap is on the flat side (arrow).

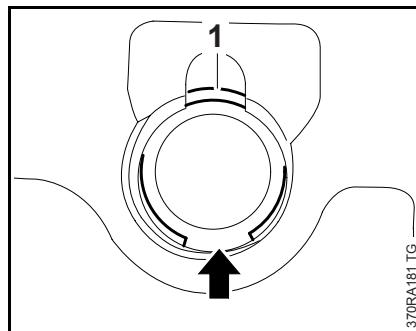


- Push the slotted diameter of the sleeve over the magnet (2) and snap ring (1).

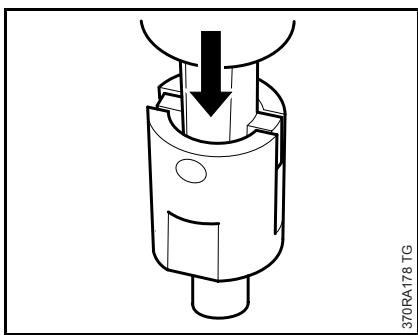
The inner pin (1) must point towards the flat face of the tool's shank.



- Remove the sleeve and push it over the opposite end of the installing tool's shank. The inner pin (arrow) must point towards the flat face.

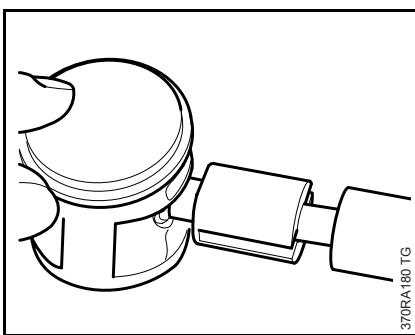


The snap ring (1) must be fitted in such a way that the gap (arrow) in the snap ring faces to the side or downwards.



- Press the assembly tool down in the sleeve until the magnet is at the end of the guide slits.

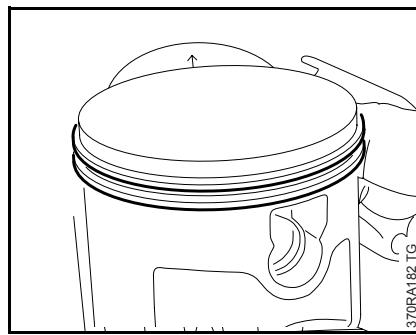
Stand the tool on a suitable surface.



Align the installing tool so that the gap in the snap ring faces downwards.

- Position the installing tool 5910 890 2210 on the piston boss with the taper sleeve, hold the piston steady and press the tool shank home until the snap ring slips into the groove.

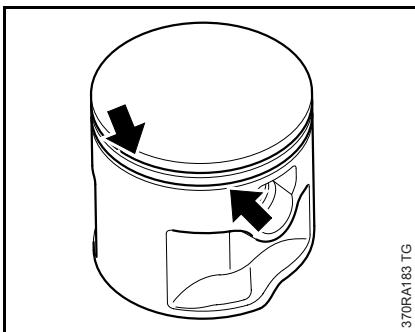
The tool must be precisely aligned in axial direction of the piston pin.



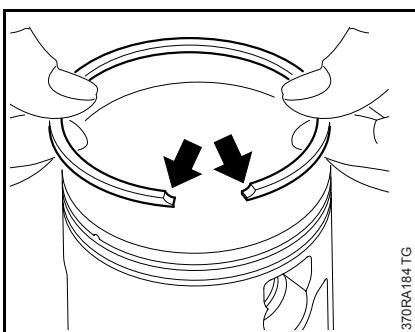
- Examine the piston rings, replace if necessary, **7.8**.
- Install the cylinder, **7.5**.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

7.8 Piston rings

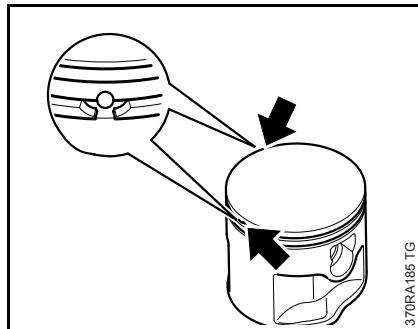
- Remove piston, **7.7.1.**
- Remove piston rings from piston.



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

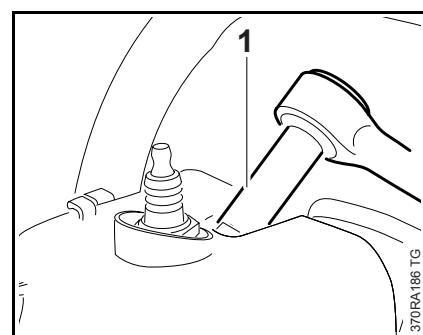


- Align the new piston rings so that the radii at the ends of the ring (arrows) face upwards.

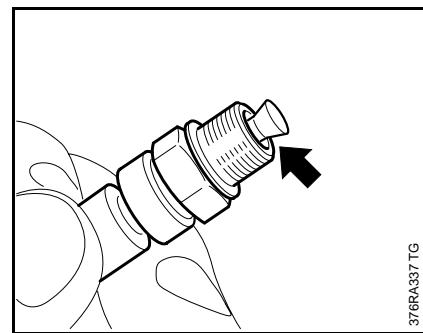


- Position the piston rings so that the radii at the ring gaps meet at the fixing pins (arrows) in the piston groove.
- Check the correct installed position of the piston rings again (arrows).
- Install the piston, **7.7.2.**
- Reassemble remaining parts in reverse order.

7.9 Decompression valve



- Remove the grommet, **7.4.**
- Unscrew the decompression valve (1) with socket, 13 mm, long reach, 5910 893 2804.



- Examine the sealing cone (arrow) on the decompression valve for signs of damage.

Use a new decompression valve if the sealing cone on the decompression valve does not seal tightly or is damaged.

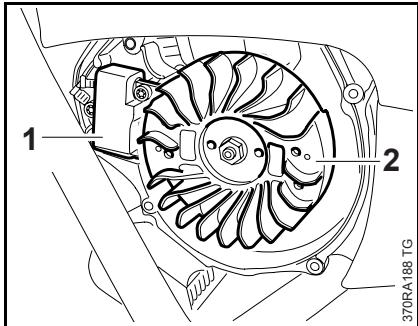
- Fit the decompression valve by hand and screw it in.
- Screw the decompression valve tight.
- Tightening torques, **3.5.**
- Reassemble remaining parts in reverse order.

8. 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.

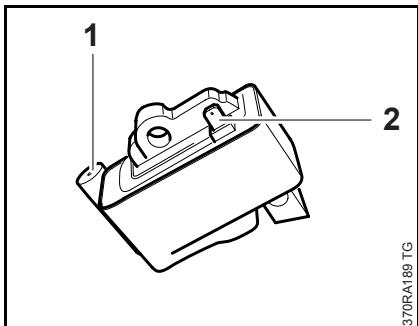
Troubleshooting on the ignition system should always start with the spark plug, **4.4**.

- Remove the fan cover, **7.3**.



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

8.1 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 permanently fitted ignition lead
- Connector tag (2) for the short circuit wire.

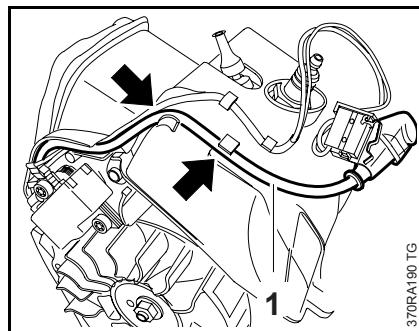
Testing in the workshop is limited to a spark test. A new ignition module must be installed if no ignition spark is obtained (after checking that the wiring and stop switch are in good condition), **8.1.1**.

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

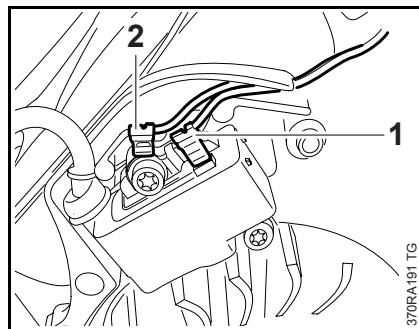
Since there is no mechanical wear in these systems, ignition timing cannot get out of adjustment during operation.

8.1.1 Removal and installation

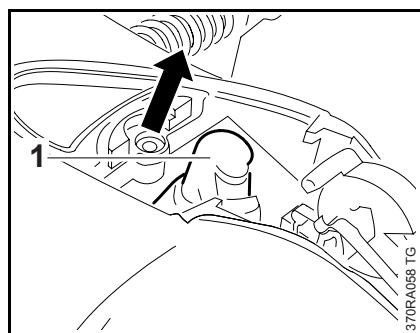
- Remove the shroud, **7.4**.
- Remove the fan cover, **7.3**.



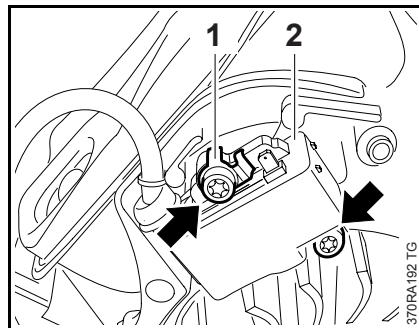
- Take the ignition lead (1) out of the cable guides (arrows).



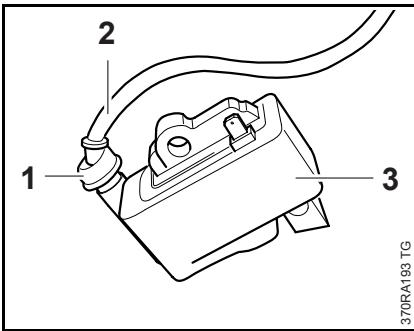
- Disconnect the short circuit wire (1) and ground wire (2).



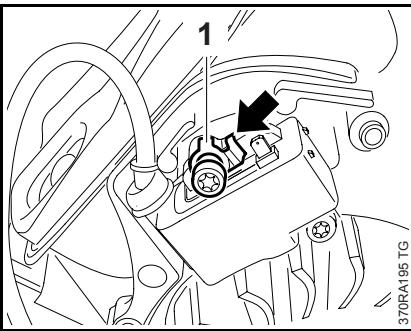
- Remove the spark plug boot (1).



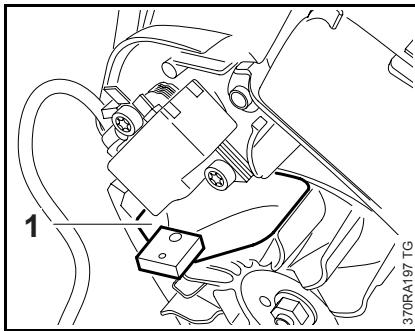
- Take out the screws (arrows).
- Remove the connector tag (1) and ignition module (2).



- Push the rubber cuff (1) off the ignition module (3).
- Unscrew the ignition module (3) from the ignition lead (2).
 - Examine the ignition module and ignition lead, replace if necessary.
 - Examine the spark plug boot, replace if necessary, **8.4**.
 - Troubleshooting, **4.4**.

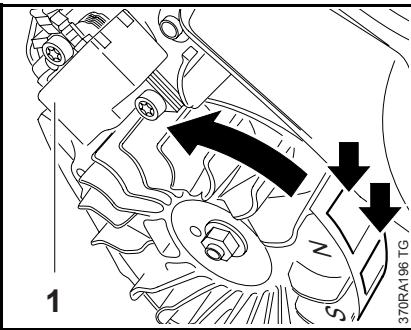


- Position the connector tag (1) so that the tab (arrow) makes contact and insert the screw, but do not tighten it down yet.

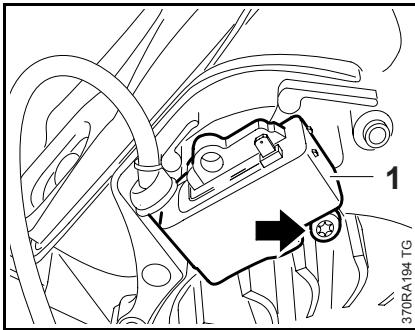


- Slide the setting gauge (1) 1127 890 6400 between the arms of the ignition module and the magnet pole of the flywheel.

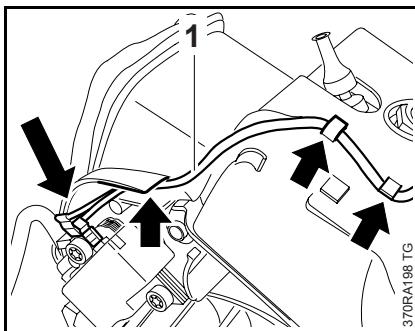
- Press the ignition module against the setting gauge.
- Tighten down the screws.
- Tightening torques, **3.5**.
- Remove the setting gauge.
- Turn the flywheel to check correct functioning: it must not touch the ignition module.



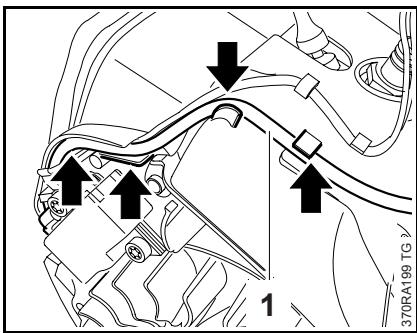
- Push the ignition module (1) back so that the flywheel runs freely.
- Turn the flywheel until the magnet poles (arrows) are on the ignition module.



- Position the ignition module (1) and insert the screw (arrow), but do not tighten it down yet.



- Reconnect the short circuit wire and ground wire (1) and fit the wiring harness in the retainers (arrows).



- Press the ignition lead (1) into the cable guides (arrows).
- Push the spark plug boot onto the spark plug.
- Reassemble remaining parts in reverse order.

8.2 Ignition timing

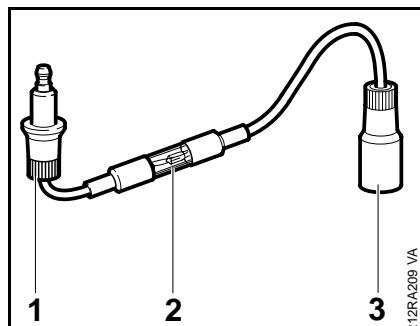
Ignition timing is fixed and cannot be adjusted during repair work.

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

8.3 Testing the ignition module

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

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



Using the ZAT 4 ignition system tester 5910 850 4503

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

Danger!

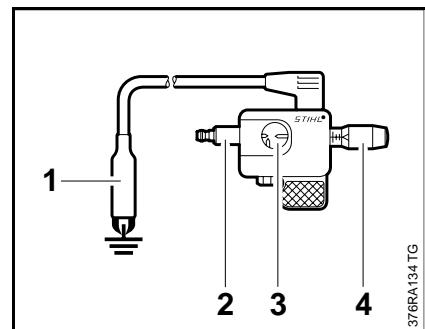
High voltage – risk of electrocution.

- Crank the engine quickly with the rewind starter and check sparkover in the window (2) of the ignition system tester.

The engine may start and accelerate during the test.

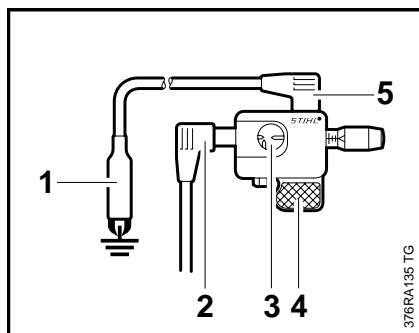
If a spark is visible, the ignition system is in order.

If no spark is visible in the window (2), check the ignition system with the aid of the troubleshooting chart, **8.7**.



Using the ZAT 3 ignition system tester 5910 850 4520

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

Danger!

High voltage – risk of electrocution.

- Crank the engine quickly with the rewind starter and check sparkover in the window (3) of the ignition system tester.

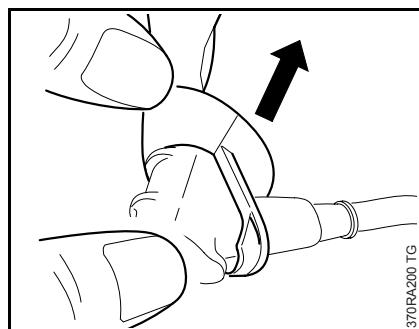
The engine may start and accelerate during the test.

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

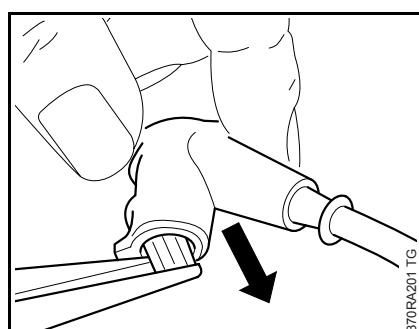
If no spark is visible in the window (3), check the ignition system with the aid of the troubleshooting chart, **8.7**.

8.4 Spark plug boot

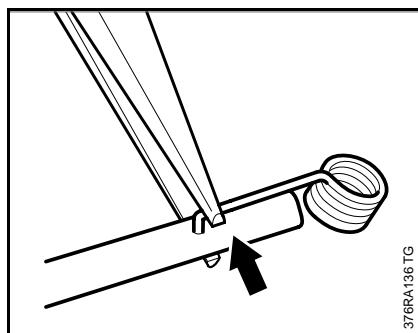
- Remove the shroud, **7.4**.
- Remove the ignition module, **8.1.1**.



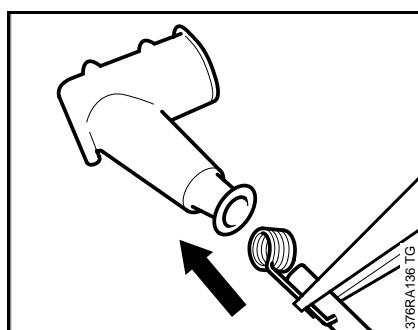
- Pull the cap off the spark plug boot.



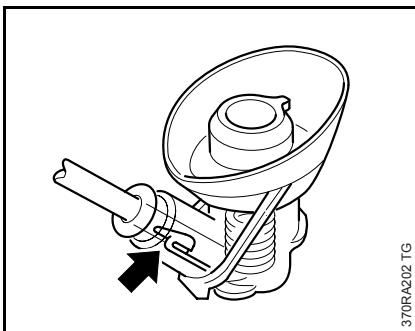
- Use suitable pliers to pull the torsion spring out of the spark plug boot.
- Unhook the torsion spring from the ignition lead.
- Pull the boot off the ignition lead.
- Use a pointed tool to pierce the center of the lead's insulation about 15 mm from the end of the ignition lead.



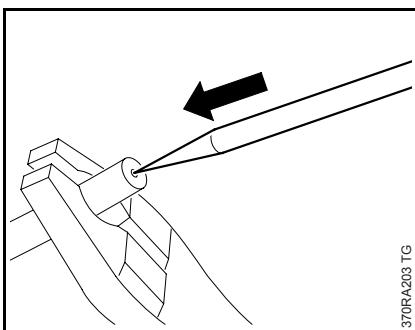
- Pinch the hook of the torsion spring into the center of the ignition lead (arrow).



- Coat the inside of the spark plug boot with Press Fluid, **14**.
- Push the ignition lead and torsion spring into the spark plug boot.



- Ensure that the torsion spring (arrow) is located in the recess.
- Push the cap back onto the spark plug boot.

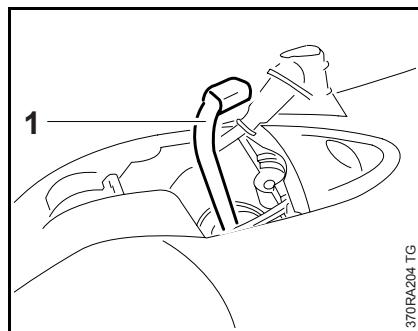


- Use a pointed tool to pierce the other end of the ignition lead, which is to be connected to the ignition module.
- Refit the grommet.

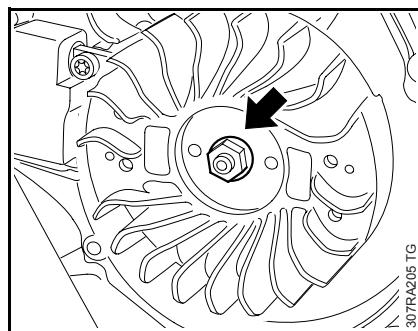
Do not use either graphite grease or silicone insulating paste.

- Install the ignition module and adjust the distance between ignition module and flywheel, **8.1.1**.
- Reassemble remaining parts in reverse order.

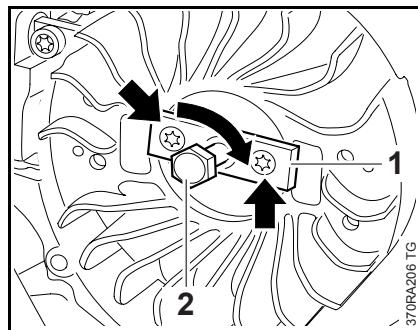
8.5 Flywheel



- Remove the cap, **7.4**.
- Remove the spark plug.
- Block the piston with the locking strip (1) 0000 893 5903.



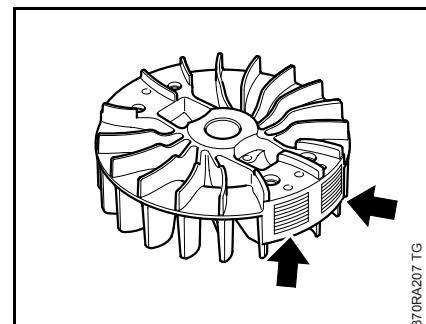
- Remove the flywheel nut (arrow).



- Uniformly screw the screws of the puller (1) 1135 890 4500 as far as possible into the holes in the flywheel until the puller makes contact.

- Turn screw (2) clockwise until the flywheel comes off the crankshaft stub.

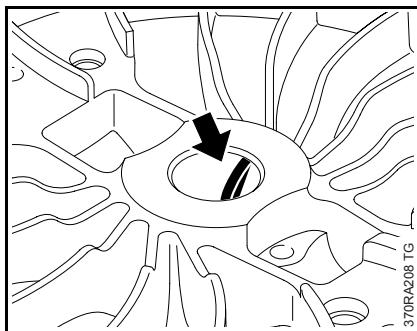
- Remove the puller (1) 1135 890 4500 with flywheel.



- Take out the screws and remove the puller from the flywheel.

The flywheel and magnet poles (arrows) must not display any signs of damage or discoloration, otherwise the flywheel must be replaced.

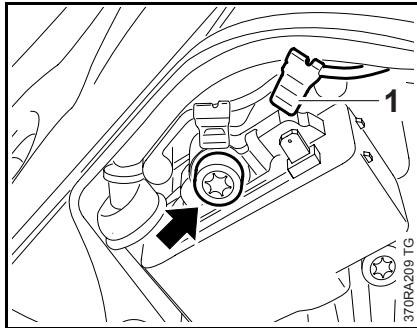
The hole of the flywheel hub and crankshaft stub must be grease-free for installation, **14**.



- Ensure that the machined key (arrow) engages in the groove on the crankshaft stub.
- Check the air gap between ignition module and flywheel, adjust if necessary, **8.1.1**.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

8.6 Short circuit wire/switch

8.6.1 Testing



Check the short circuit wire if the spark plug and ignition lead with spark plug boot are in order.

- Remove the fan cover, **7.3**.
- Disconnect the short circuit wire (1).

- Connect the ohmmeter to ground (arrow) and the short circuit wire (1).
- Set the switch shaft to "0".

The resistance measured must be about 0 ohm. If it is much higher, the reason is a break in the wire and the switch must be replaced, **8.6.2**.

- Set the switch shaft to "I".

The measured resistance must be infinitely high, otherwise replace the switch, **8.6.2**.

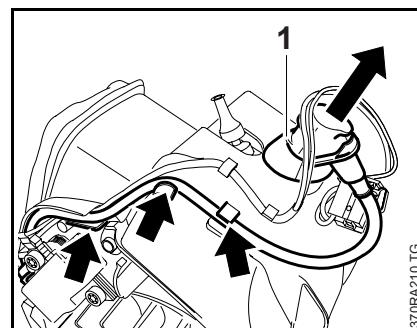
If no fault can be found, test the ignition system in accordance with flow chart, **8.7**.

- Test the complete switch unit for continuity.
- Reassemble parts in reverse order.

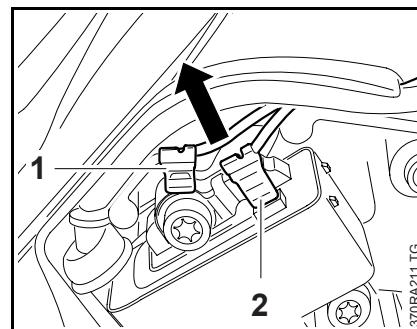
8.6.2 Removal and installation

The switch, short circuit wire and ground wire form a single unit. The complete switch must be replaced if there is any sign of damage.

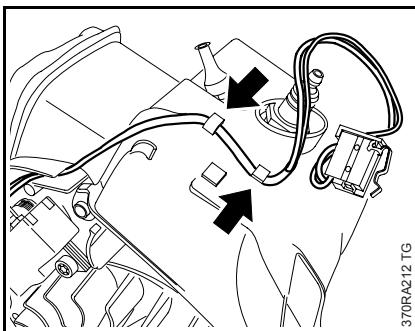
- Remove the shroud, **7.4**.
- Remove the fan cover, **7.3**.



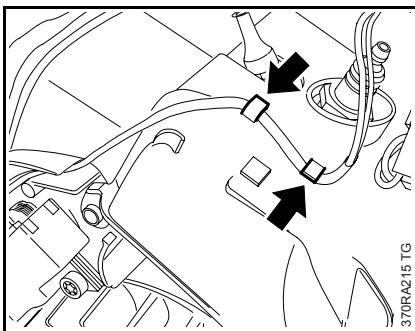
- Remove the spark plug boot (1).
- Pull the ignition lead out of the cable guides (arrows).



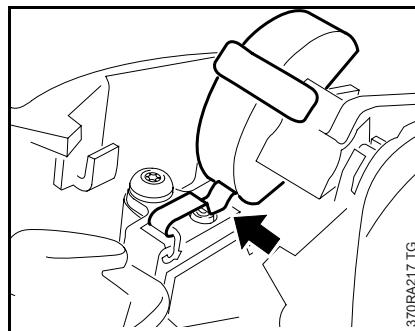
- Disconnect the ground wire (1) and short circuit wire (2).



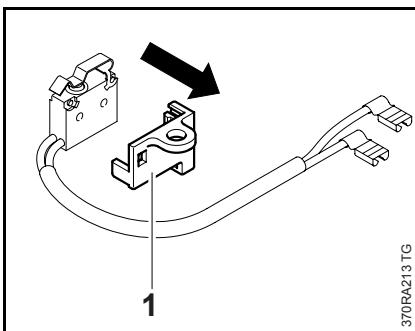
- Take the ground wire and short circuit wire out of the cable guides (arrows).



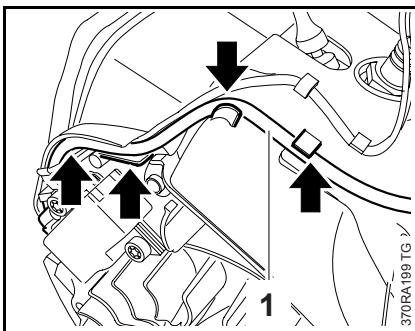
- Push the ground wire and short circuit wire into the cable guides (arrows).



- Install the shroud, **7.4**.
- Check correct functioning: the switch shaft must actuate the contact spring of the switch (arrow) when in position "0" so that the contact makes.

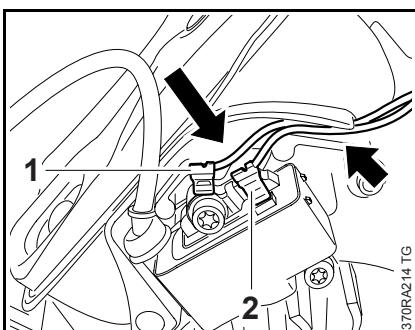


- Remove the retainer (1).
 - Examine the switch, replace if necessary.

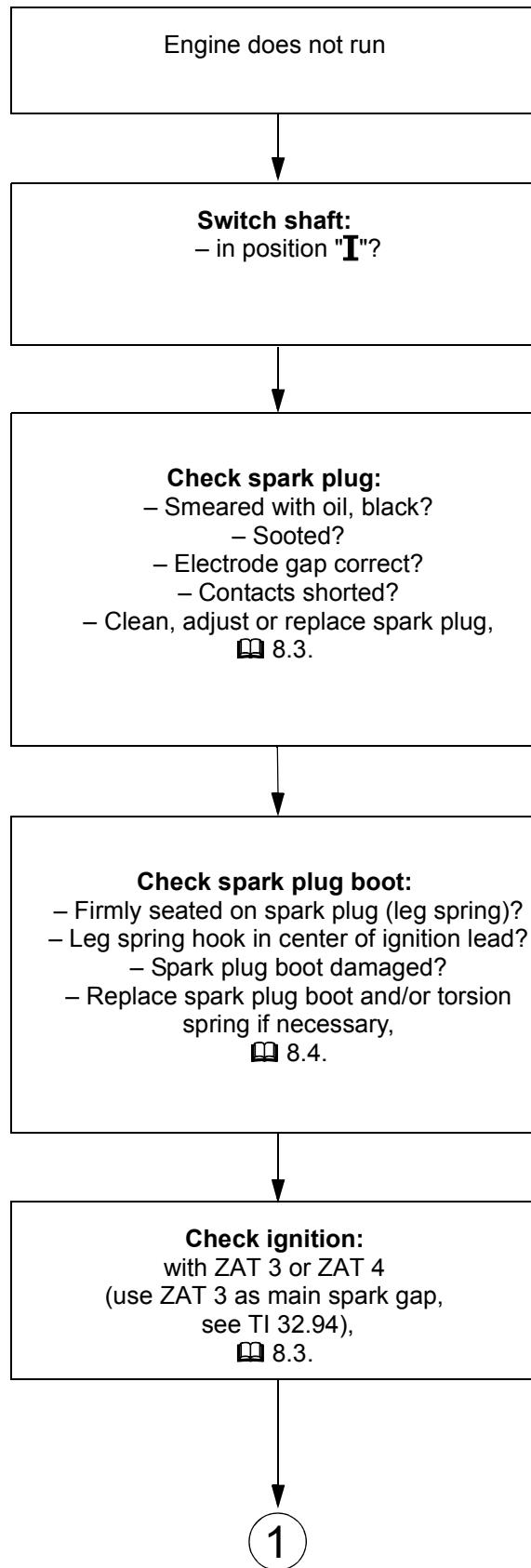


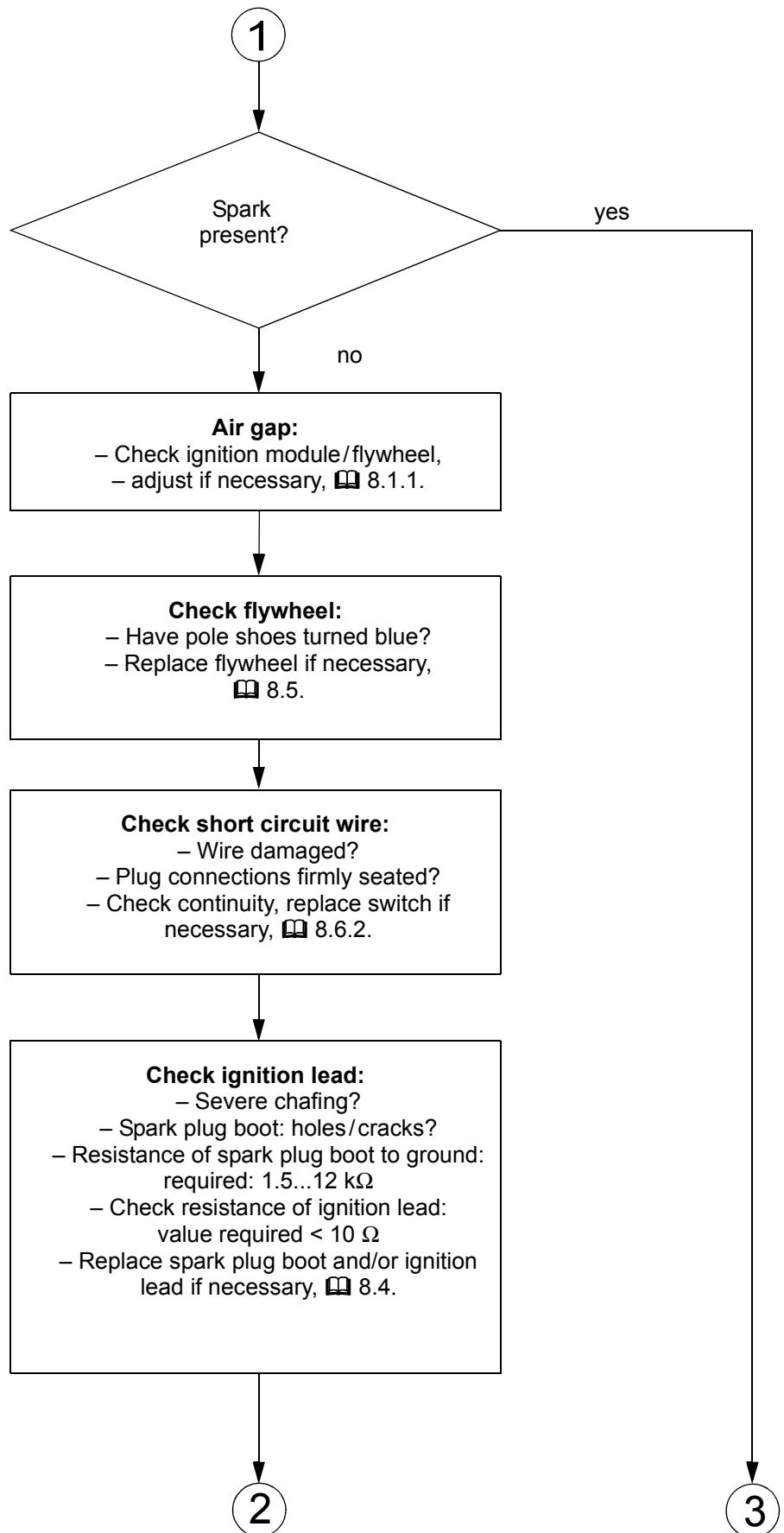
- Press the ignition lead (1) into the cable guides (arrows).
- Plug in the spark plug boot.

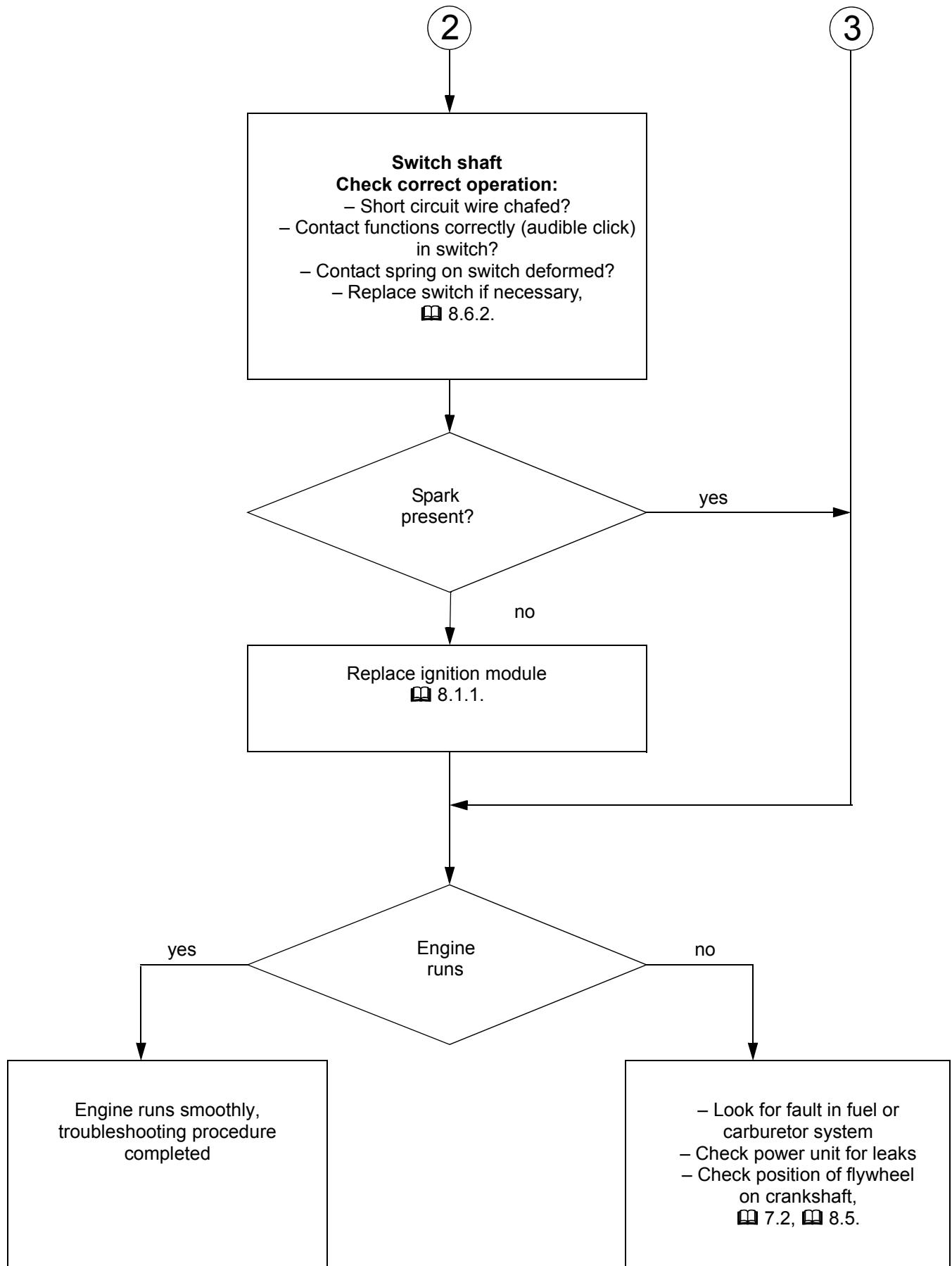
Installation



- Connect the ground wire (1) and short circuit wire (2) and insert them in the cable guide (arrow).







9. Rewind starter

9.1 General

If the action of the starter rope becomes very stiff and the rope rewinds very slowly or not completely, it may 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.

To clean the rewind spring, it is sufficient to apply a few drops of a standard solvent-based degreasant not containing any chlorinated or halogenated hydrocarbons to the rewind spring.

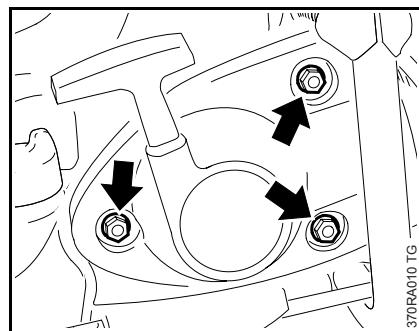
Carefully pull out the starter rope several times and allow it to rewind until its normal smooth action is restored.

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

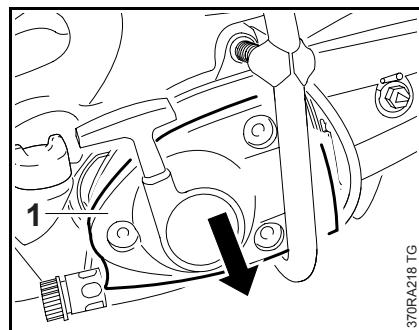
If clogged with dirt or pitch, the entire starter mechanism, including the rewind spring, must be removed and disassembled. Take particular care when removing the spring.

- Clean all parts, **9.14**.

9.2 Removal and installation

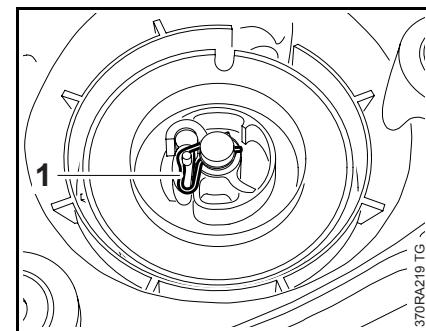


- Take out the collar nuts (arrows).

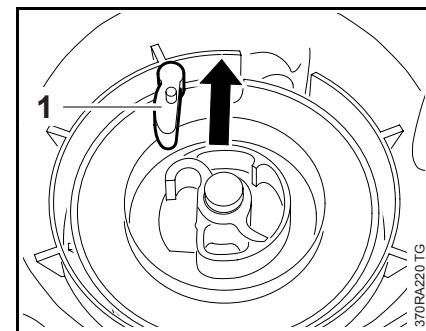


- Remove starter cover (1).
- Reassemble parts in reverse order.
- Tighten down the screws.
- Tightening torques, **9.3.5**.

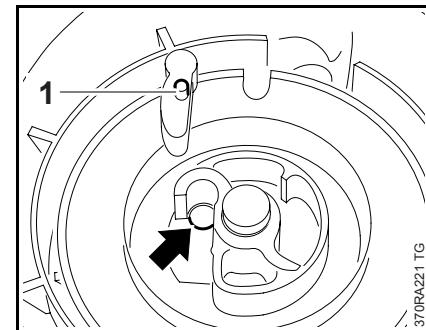
9.3 Pawl



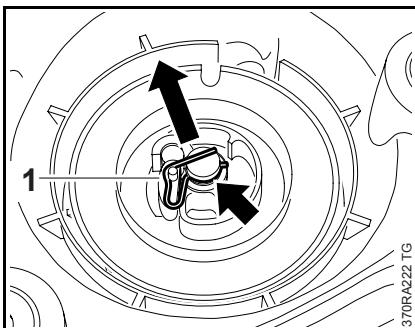
- Remove the starter cover, **9.2**.
- Carefully ease the spring (1) off the starter post. The rewind spring may pop out.



- Pull out the pawl (1).

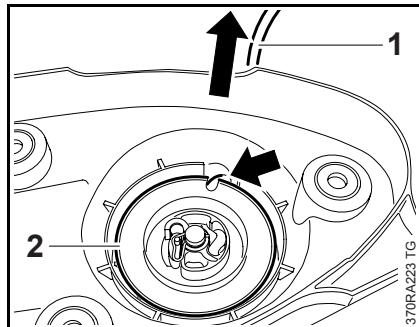


- Slide a new pawl into the hole (arrow) and grease the peg (1), **9.14**.



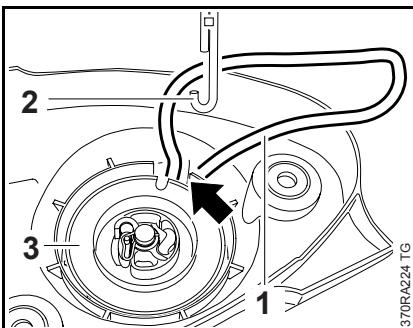
- Position the spring (1) so that the loop of the spring encloses the peg of the pawl and the curved part of the spring (arrow) is located in the groove in the starter post.
- Then slide the straight part of the spring over the starter post until it engages in the groove.
- Reassemble remaining parts in reverse order.

9.4 Rope rotor

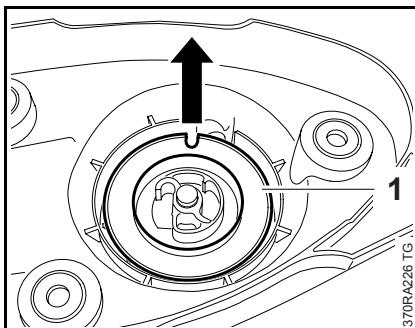


Relieve tension of rewind spring

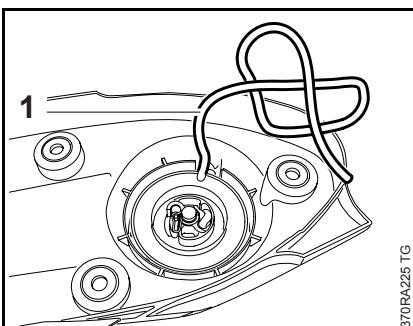
- Remove the starter cover, **9.2.**
- Pull out the starter rope (1) approx. 30 cm, then hold the rope rotor (2) steady. The recess (arrow) must point towards the rope guide.
- Remove the spring and pull out the pawl, **9.3.**



- Pull the starter rope (1) out between the recess and rope guide (arrow) with assembly hook (2) 5910 890 2800.
- Hold the rope rotor (3) so that it turns slowly until the tension of the rewind spring has been relieved.

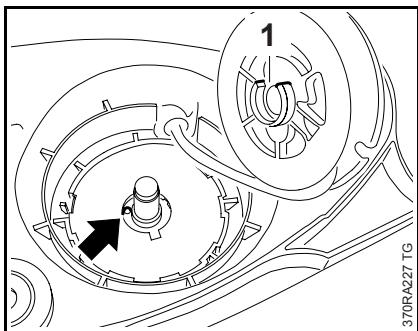


- Remove the washer.
The rewind spring must be relieved.
- Carefully pull off the rope rotor (1). The rewind spring may pop out.
- Examine the rope rotor, replace if necessary.
- Coat the hole in the rope rotor with STIHL special lubricant, **14.**



- Pull out the rope (1) with the starter grip and straighten it out.
- Remove the starter rope; remove any remaining scraps of rope, **9.5.**

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



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

The recess in the hub of the rope rotor acts as carrier for the spring loop.

- Fit the washer.
- Install the pawl and spring, **9.3.**
- Install the starter rope, **9.5.**
- Tension the rewind spring, **9.6.**
- Grease the pegs on the pawl, **14.**
- Reassemble remaining parts in reverse order.

9.5 Starter rope/starter grip

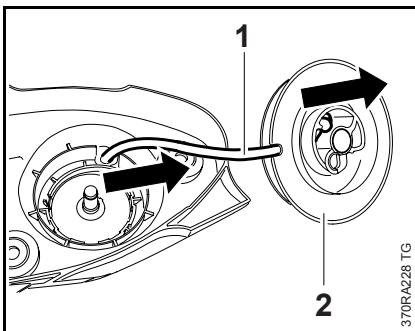
- Remove the starter cover, **9.2.**
- Relieve the tension of the rewind spring, **9.4.**

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

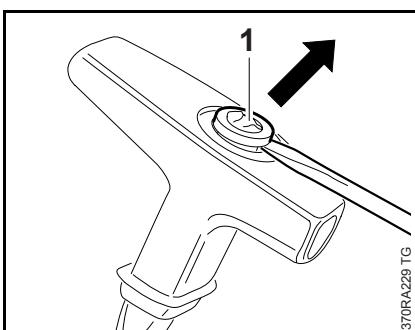
- Remove any remaining scraps of rope from the rope rotor and starter grip.

The starter rope must not be shortened.

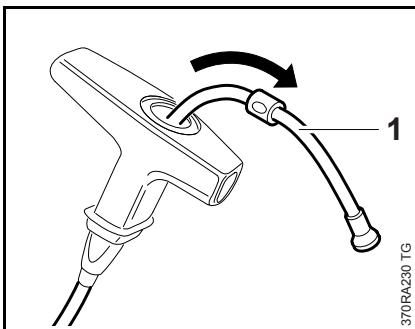
- Remove the rope rotor, **9.4.**



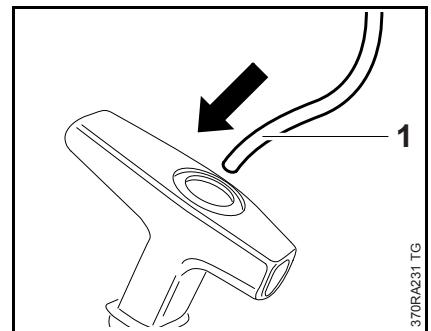
- Pull the starter rope (1) out of the rope rotor (2).
- Pull the starter rope out of the starter cover.



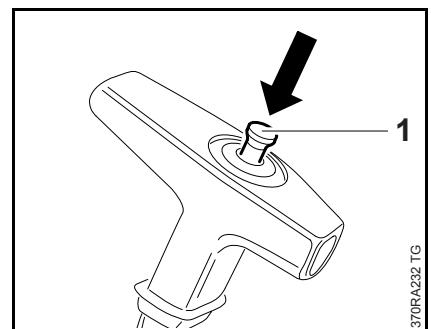
- Pry the nipple on the rope (1) out with a suitable tool.



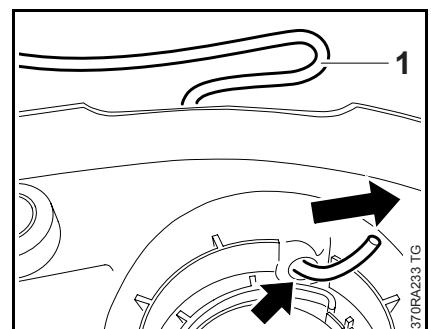
- Press the nipple (1) of the starter rope into the starter grip until it engages there.
- Then pull the starter rope (1) through the rope guide (arrow).



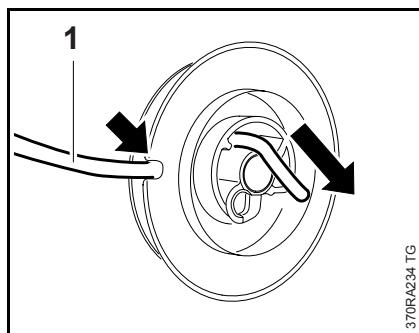
- Thread the new starter rope (1) into the starter grip from above.



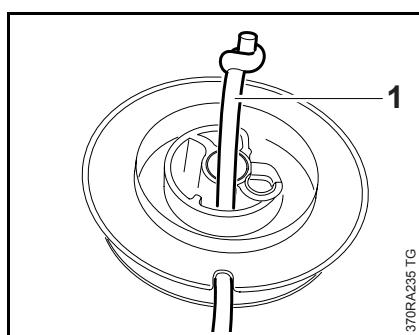
- Press the nipple (1) of the starter rope into the starter grip until it engages there.



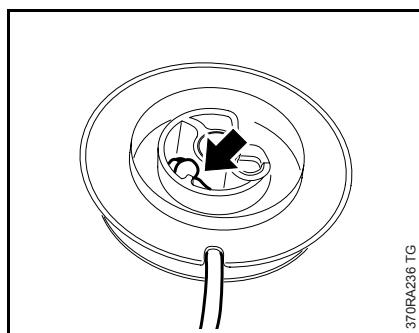
- Then pull the starter rope (1) through the rope guide (arrow).



- Slide the starter rope (1) into the rope rotor (arrow).

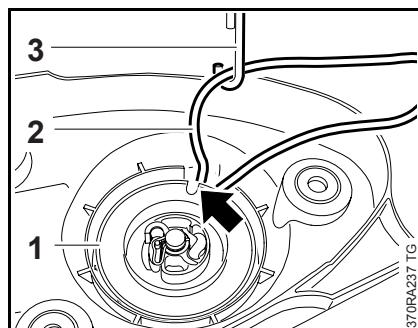


- Tie a simple knot in the end of the starter rope (1) to secure it and pull it into the rope rotor.



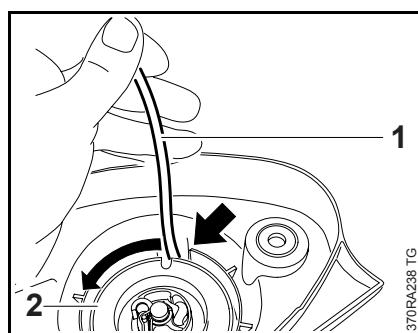
- Press the knot into the mount (arrow) of the rope rotor.
- Install the rope rotor and tension the rewind spring, 9.4, 9.6.
- Install the starter cover, 9.2.
- Tightening torques, 3.5.

9.6 Tensioning the rewind spring



- Hold the rope rotor (1) so that the recess (arrow) faces towards the rope guide.
- Pull the starter rope (2) out between the recess and rope guide (arrow) with assembly hook (3) 5910 890 8800.

Do not damage the starter rope.

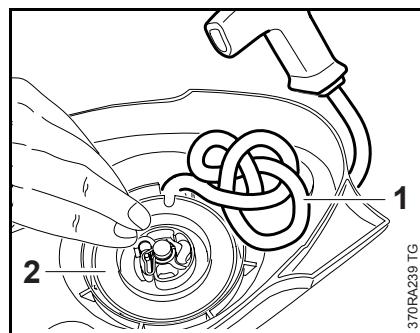


- Secure the starter rope (1) in the recess (arrow) and give the rope rotor (2) six turns counterclockwise.

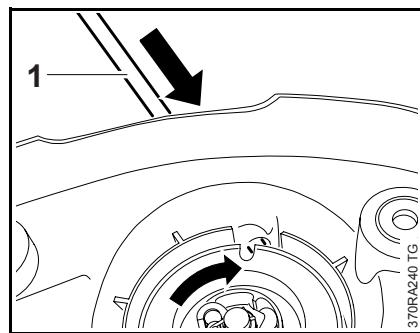
Pawl and spring must be installed.

The rope twists as the rope rotor and rope are turned. The rewind spring is now tensioned.

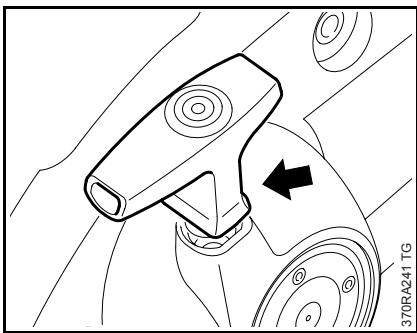
Hold the tensioned rope rotor firmly, as the rewind spring will be damaged if it jumps back suddenly.



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



- Hold the starter grip firmly to keep the rope (1) tensioned.
- Let the rope rotor go and slowly rewind the starter rope (1) on the rope rotor.



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, the spring must be tensioned by one additional turn.

When the starter rope is fully extended, it must still be possible to rotate the rope rotor at least another half turn before the maximum spring tension is reached. If not, the spring tension must be reduced, otherwise it will break.

Reduce spring tension

- Pull out the starter rope and turn the rope rotor with starter rope back one turn.
- Pull the twisted rope out with the starter grip and tidy it.
- Keep the starter rope tensioned with the starter grip.
- Let go of the rope rotor and let the starter rope rewind slowly.
- Install the starter cover, **9.2**.
- Tightening torques, **3.5**.

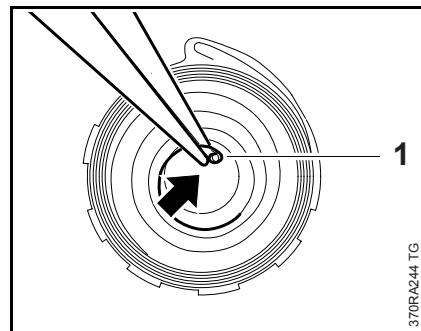
9.7 Replacing the rewind spring

- Troubleshooting, **4.3**.

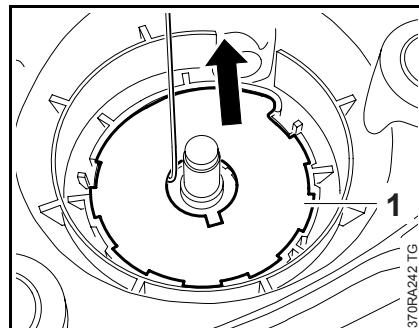
The replacement spring is supplied ready for installation and secured in a spring housing.

Wear a face shield and protective gloves.

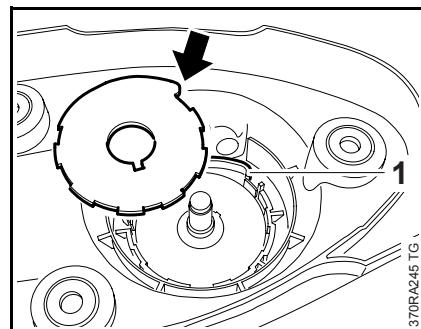
- Remove the starter cover, **9.2**.
- Relieve the rewind spring if necessary and remove the rope rotor, **9.4**.



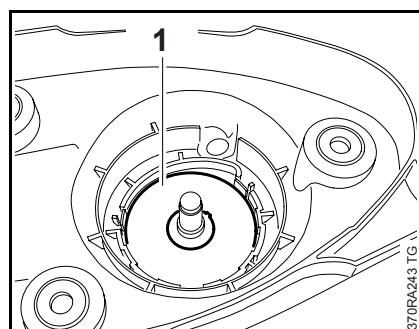
Ensure that the inner spring loop can be seen through the hole (arrow) so that it can subsequently be aligned.



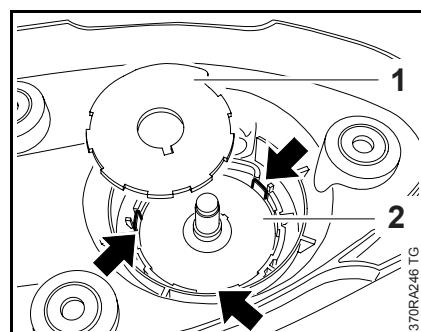
- Pull the old spring housing (1) out with assembly hook 5910 890 2800 and remove any remaining scraps of spring.



- Position the spring housing with replacement spring: the raised part on the outer spring loop (arrow) must be over the mount for the loop (1).

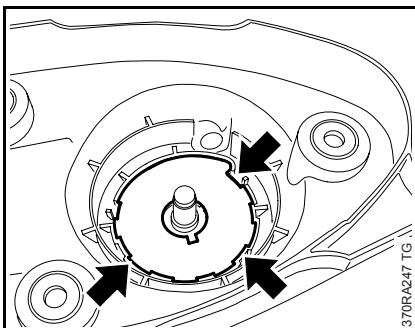


- Examine the washer (1) and clean or replace it if necessary.
- Before installation, coat the rewind spring and washer with a few drops of STIHL special lubricant, **14**.



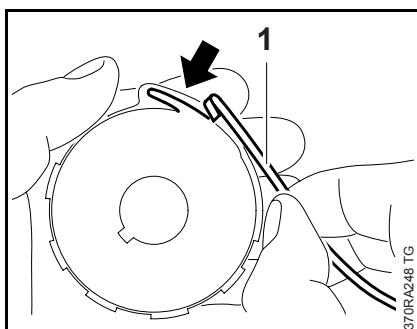
- Press the spring housing (1) as far as possible into the mount on the starter cover (2) until it engages in the detent lugs (arrows).

The rewind spring may pop out.

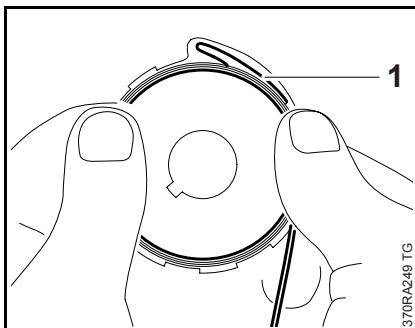


Ensure that the spring housing is properly seated in the mount (arrows).

If the rewind spring pops out during installation, fit it in the spring housing as follows:

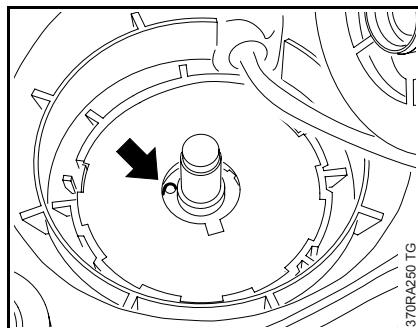


- Arrange the spring (1) as shown in the illustration.
- Position the anchor loop in the fixture (arrow) in the spring housing.



- Fit the rewind spring (1) completely in a circular fashion, working in clockwise direction.

- Secure the spring so that it cannot pop out.
- Slide the spring housing into the mount in the starter cover until it engages there.



- Secure the rewind spring so that it cannot pop out.

- If necessary, align the inner spring loop (arrow) with suitable pliers so that it rests against the starter post at a slight angle.
- Install the rope rotor, **9.4**.
- Install the pawl, **9.3**.
- Grease the pegs on the pawl, **14**.
- Tension the rewind spring, **9.6**.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

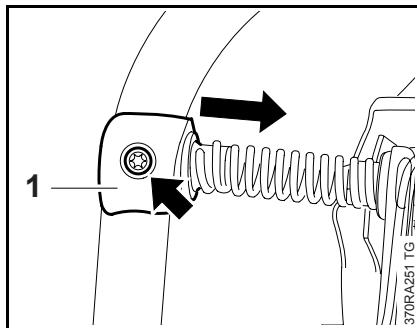
10. Repairing the AV system

The handle frame and engine housing are connected by vibration-damping springs.

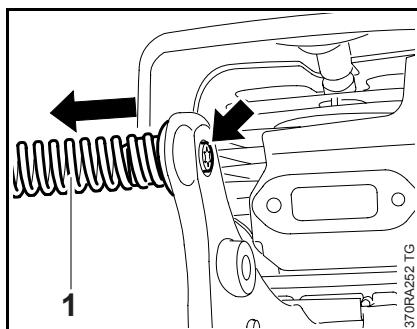
Damaged springs must be replaced as a matter of principle.

10.1 AV spring on the handlebar

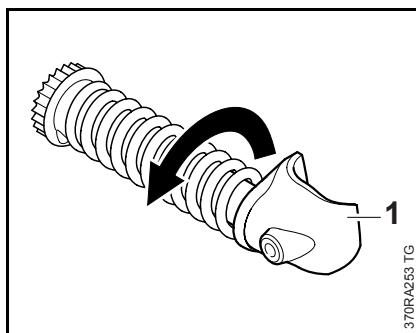
The AV spring is located between handlebar and crankcase on the clutch side and must be replaced if defective.



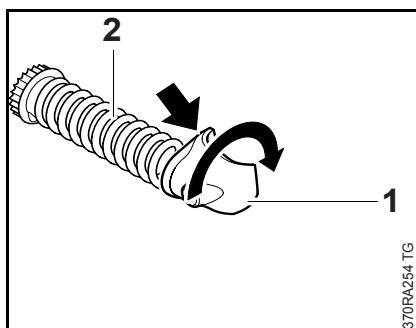
- Remove the screw (arrow).
- Remove the clamp (1).



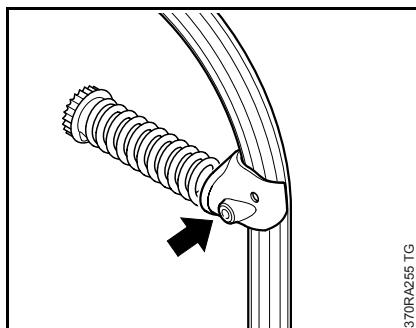
- Remove the muffler, **7.1**.
- Remove the screw (arrow).
- Remove the AV spring (1).



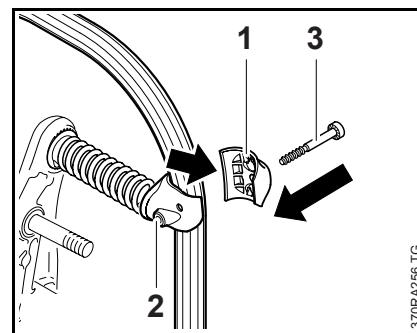
- Unscrew the handlebar support (1).
- Examine the spring, handlebar support and clamp, replace if necessary.



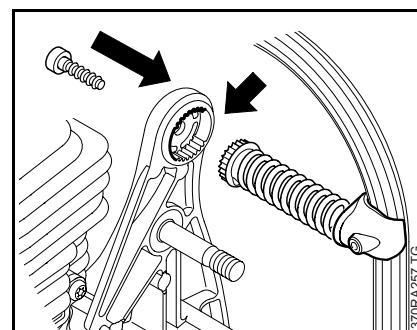
- Screw the handlebar support (1) into the AV spring (2) as far as possible (arrow).



- Fit the AV spring with handlebar support (arrow) on the handlebar and hold it in position.



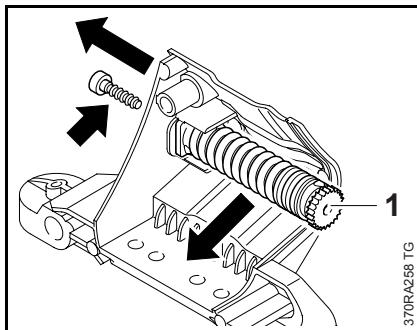
- Fit the clamp (1) on the opposite side so that the guide (arrow) is on the inside of the handlebar.
- Insert a screw (3) through the clamp and handlebar, and screw it tightly into the handlebar support (2).



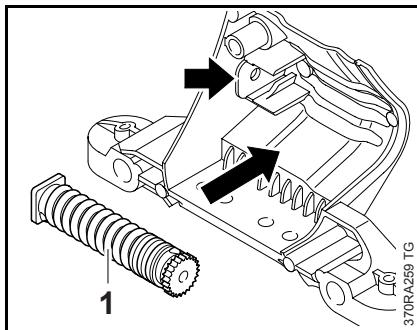
- Push the AV spring into the mount (arrow) with the serration.
- Insert and tighten the screw on the opposite side.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

10.2 AV spring in the support

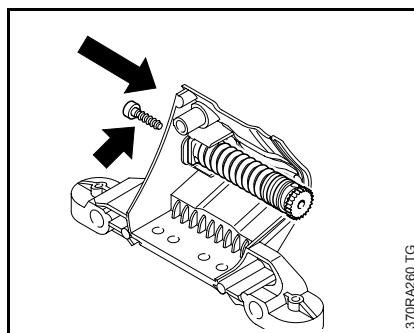
The AV spring is located between support and crankcase and must be replaced if defective.



- Remove the support, **10.6.**
- Remove the screw (arrow).
- Take out the AV spring (1).
- Examine the AV spring, replace if necessary.



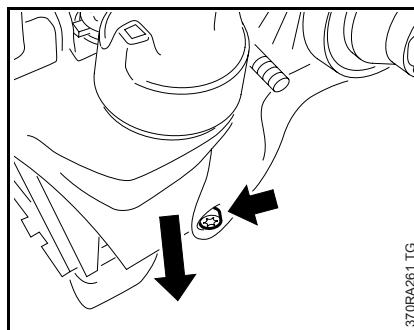
- Slide the AV spring (1) as far as possible into the mount (arrow) and hold it in position. The AV spring is prevented from twisting.



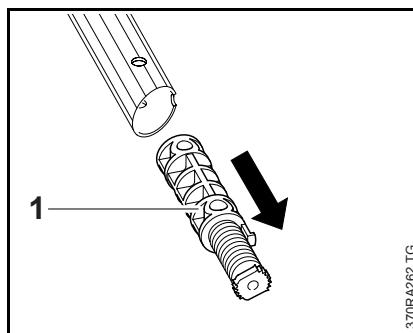
- Insert and tighten down the screw (arrow).
- Install the support, **10.6.**
- Tightening torques, **3.5.**

10.3 AV spring at the bottom of the crankcase

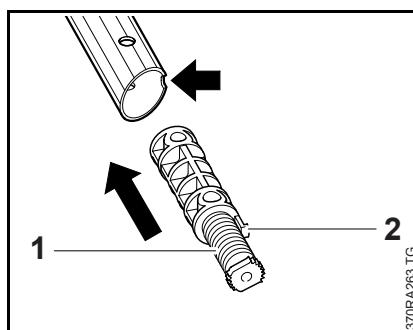
The AV spring is secured underneath the machine and must be replaced if defective.



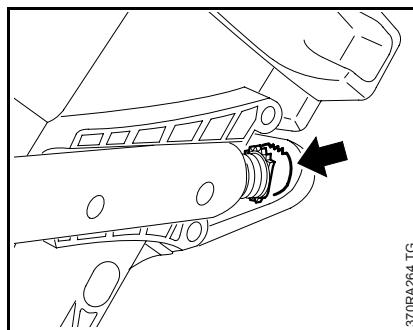
- Remove the screw (arrow).
- Remove the handlebar, **10.5.**



- Pull the AV spring (1) out of the handlebar.
- Examine the AV spring, replace if necessary.

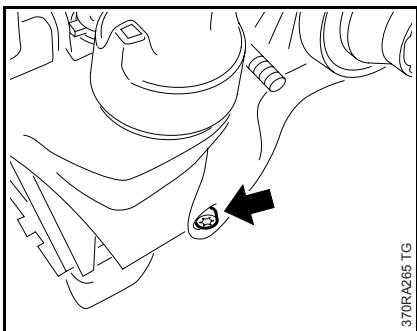


- Push the AV spring (1) into the handlebar so that the tab (2) engages in the notch (arrow).
- Mount the handlebar on the machine, **10.5.**



The AV spring must be screwed in as far as possible.

- Push the bearing plug into the mount (arrow) and hold it in position.

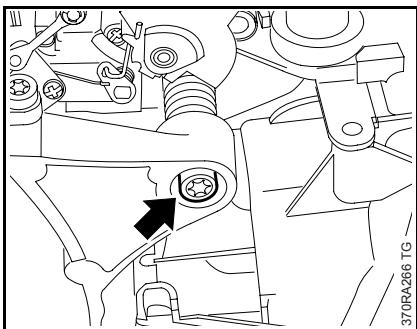


- Insert and tighten down the screw (arrow).
 - Install the handlebar, **10.5**.
 - Tightening torques, **3.5**.

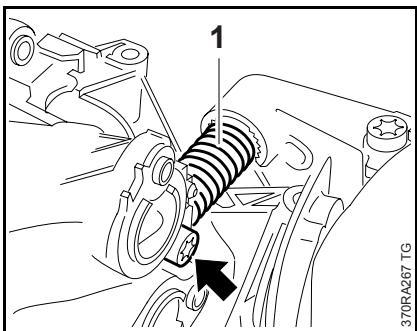
10.4 AV spring on the carburetor

The AV spring is located near the carburetor between tank housing and crankcase, and must be replaced if defective.

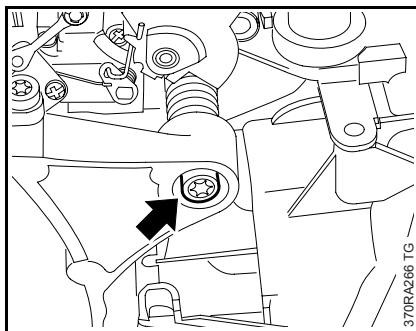
- Remove the carburetor, **12.2**.



- Remove the screw (arrow).

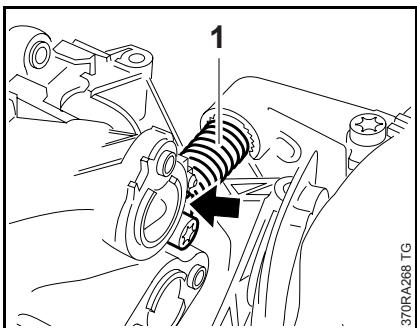


- Take out the screw (arrow) with an angled tool.
 - Remove and examine the AV spring (1), replace if necessary.

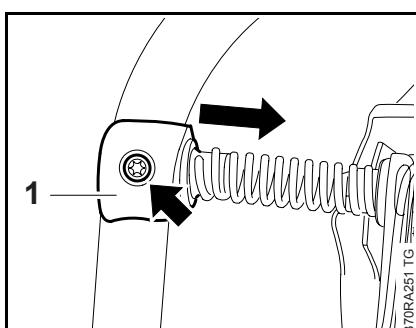


- Insert and tighten down the screw (arrow).
 - Reassemble remaining parts in reverse order.
 - Tightening torques, **3.5**.

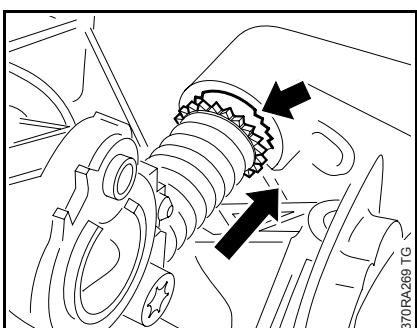
10.5 Handlebar



- Push the AV spring (1) into the mount (arrow).
 - Insert and tighten down the screw.

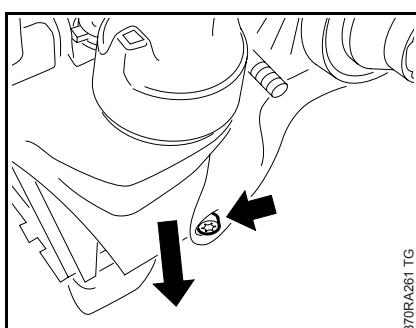


- Remove the support, **10.6**.
 - Remove the screw (arrow).
 - Remove the clamp (1).

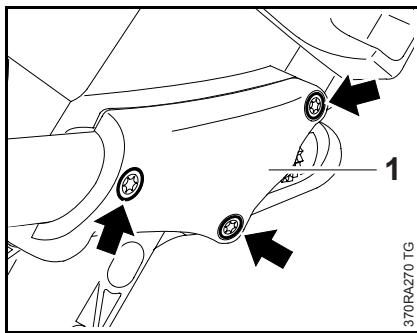


The AV spring must be screwed in as far as possible.

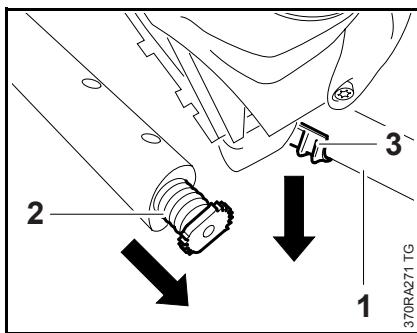
- Push the bearing plug into the mount (arrow) and hold it in position.



- Remove the screw (arrow).

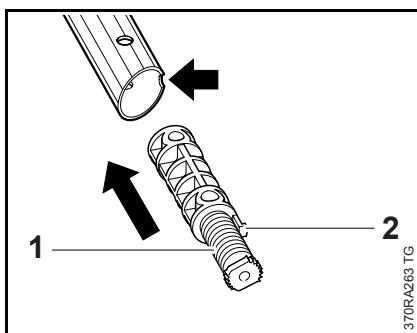


- Take out the screws (arrows) in the bottom.
- Remove the clamp (1).

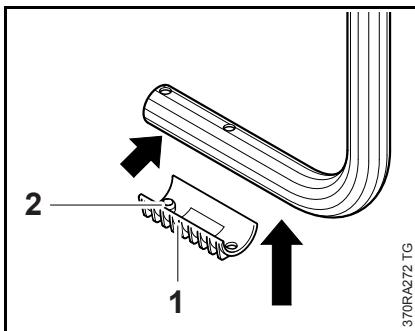


- Remove the handlebar (1).
- Pull out the AV spring (2).
- Remove the clamp (3).

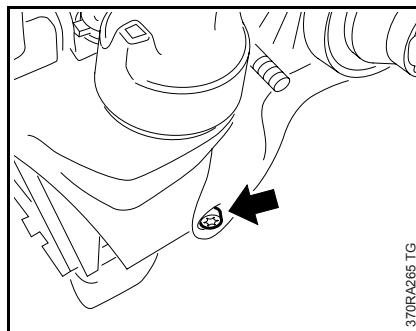
– Check the various parts and replace if necessary.



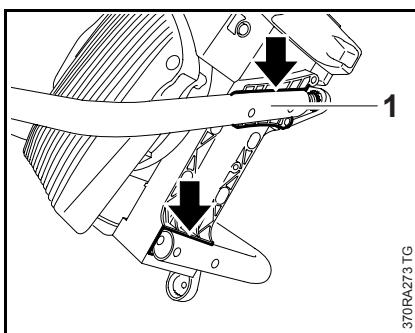
- Push the AV spring (1) into the handlebar so that the tab (2) engages in the notch (arrow).



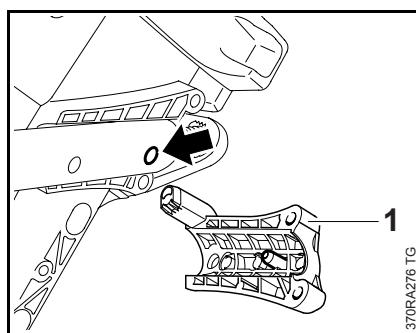
- Slide the clamp (1) onto the handlebar so that the guide (2) engages in the hole (arrow).



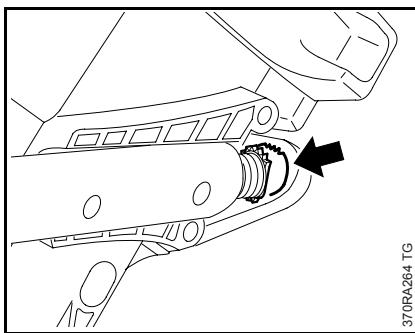
- Insert and tighten down the screw (arrow).



- Position the handlebar (1) over the machine.
- Push the handlebar (1) into the mounts (arrows).

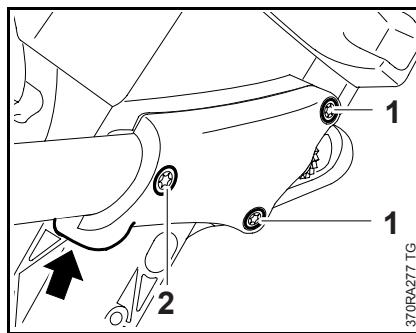


- Mount the support, [10.6](#).
- Fit the clamp (1) so that the peg engages in the hole (arrow). This secures the AV spring in the handlebar.



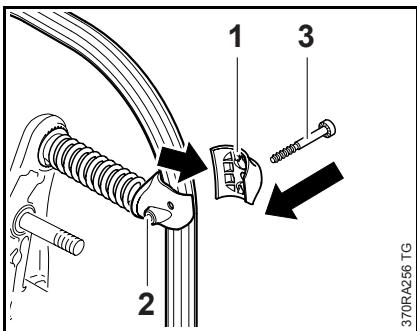
The AV spring must be screwed in as far as possible.

- Push the bearing plug into the mount (arrow) and hold it in position.



- Insert and tighten down the screws (1).
- Insert and tighten down the long screw (2).

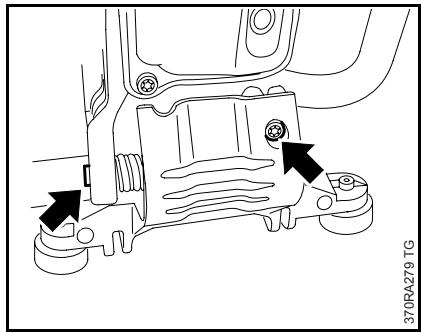
The peg (arrow) must engage in the hose.



370RA256 TG

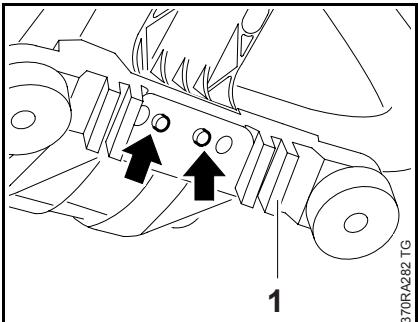
- Fit the clamp (1) on the opposite side so that the guide (arrow) is on the inside of the handlebar.
- Insert a screw (3) through the clamp and handlebar, and screw it tightly into the handlebar support (2).
- Tightening torques, **3.5**.

Support



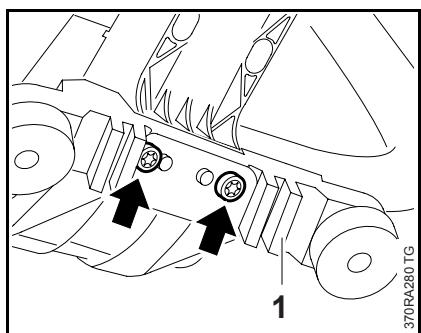
370RA279 TG

- Take out the screws (arrows).



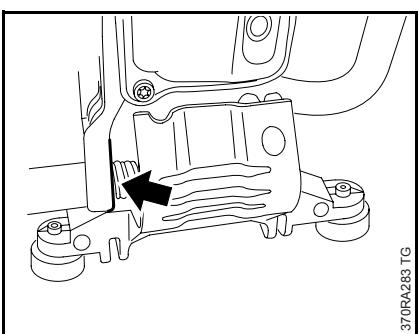
370RA282 TG

- Position the pre-assembled support (1) underneath the machine so that it engages in the pegs (arrows).



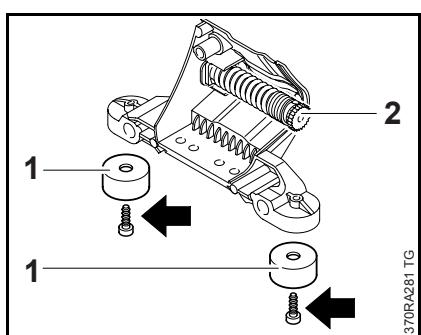
370RA280 TG

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



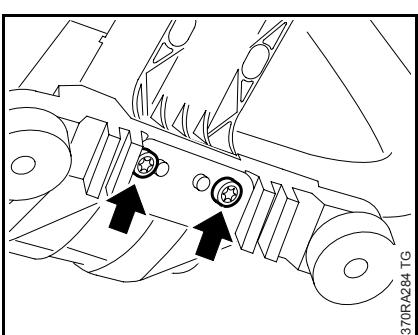
370RA283 TG

- Push the bearing plug of the AV spring into the mount (arrow).



370RA281 TG

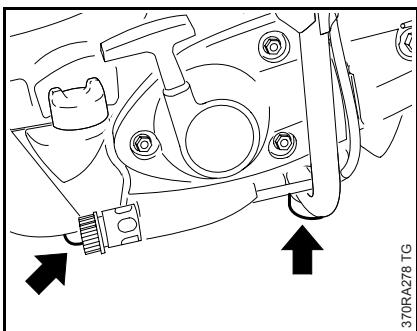
- Take out the screws (arrows).
- Remove the rubber buffers (1).
- Remove the AV spring (2), **10.2**.
- Check the various parts and replace if necessary.



370RA284 TG

- Insert and tighten down the screws (arrows).

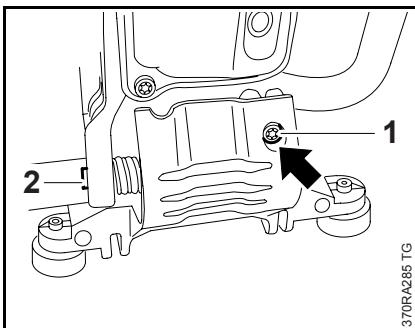
10.6 Rubber buffers/support



370RA278 TG

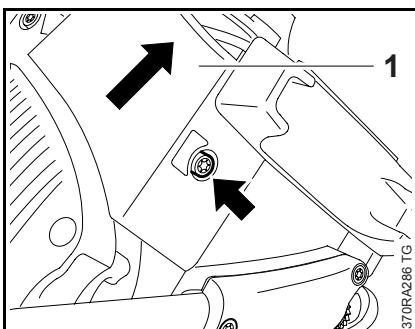
Rubber buffers are fitted on the support (arrow) and at the back of the tank housing (arrow) to give the machine stability.

The rubber buffers on the support must be replaced in pairs.

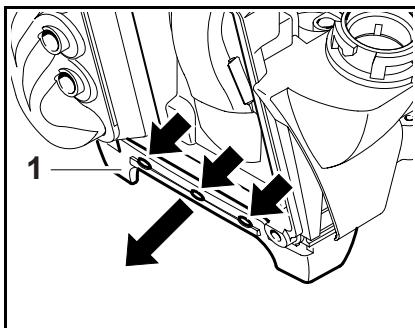


- Insert the long screw (1) in the hole (arrow) and tighten it down.
- Insert and tighten down the screw (2).

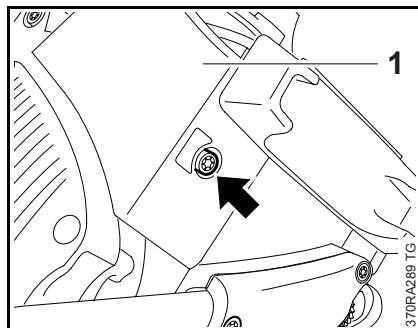
Support foot



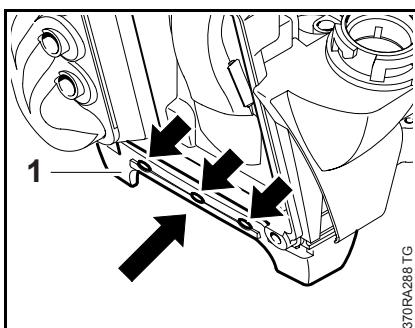
- Remove the filter cover, **12.1**.
- Remove the screw (arrow).
- Lift the air baffle (1).



- Pull the support foot (1) out of the air baffle and remove it from the retainers (arrows).
- Examine the support foot, replace if necessary.



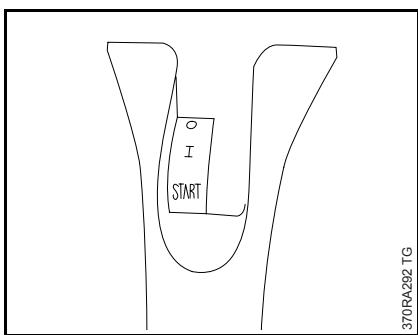
- Slide the air baffle (1) into position in the mount.
- Insert and tighten down the screw (arrow).
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.



- Push the support foot (1) into the air baffle and into the lateral guide on the tank housing (arrows).
- Then press the support foot (1) into the retainers.

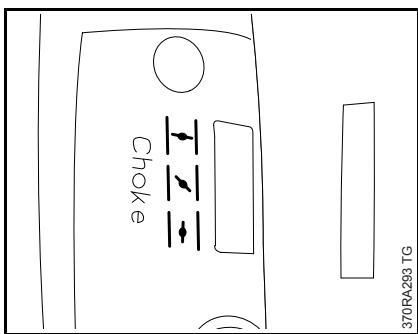
11. Actuating levers

11.1 Switch shaft/choke lever



The following operating conditions are set with the switch shaft:

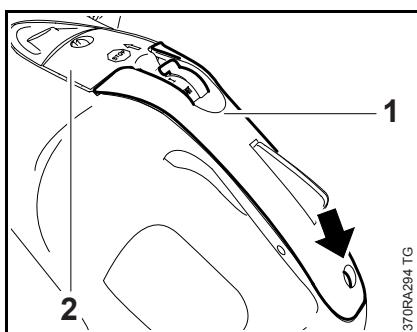
- Position **0** = Engine off, ignition off.
- Position **I** = Run position. Engine is running or can start.
- "START" position = Starting position; makes starting easier.



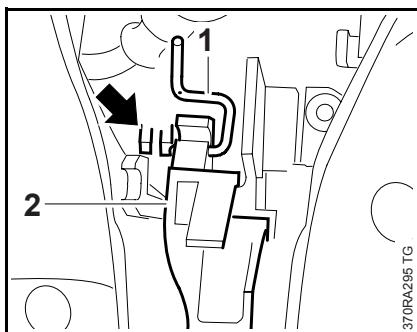
The following additional operating conditions are set with the choke lever:

- Position **|↓|** = Cold start: for starting the cold engine
- Position **|↑|** = Hot start: for starting the hot engine
- Position **|II|** = Engine is running, has reached operating temperature.

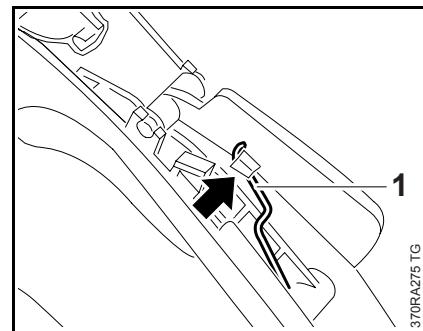
11.1.1 Switch shaft, removal and installation



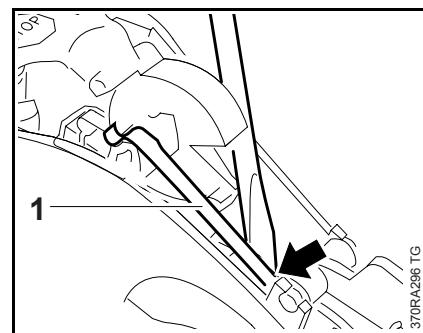
- Set the switch shaft to position "0".
- Remove the screw (arrow).
- Remove handle molding (1).
- Remove the cap (2).



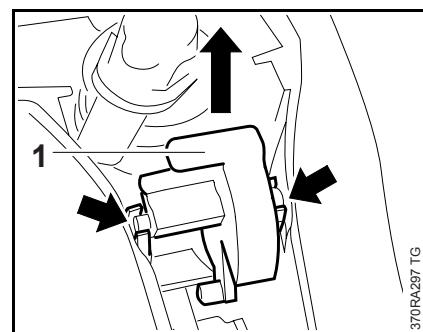
- Unhook the throttle rod (1) from the throttle trigger (2).
- Lay the throttle rod (1) in the guide (arrow) – it is now secured.



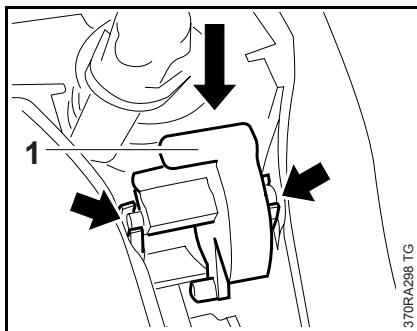
- Unhook the torsion spring (1) from the trigger interlock (arrow).



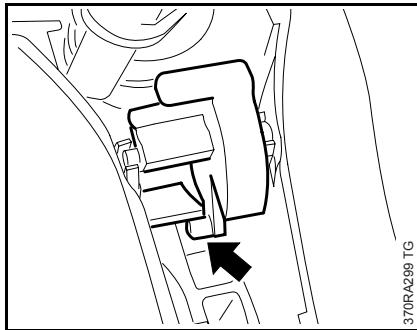
- Pry the leaf spring (1) out of the mount (arrow).



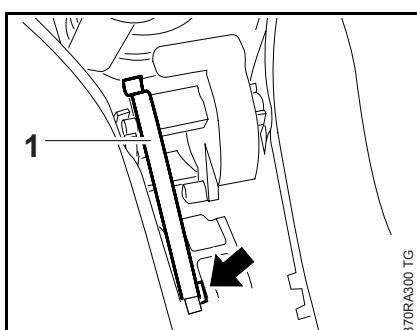
- Pull the switch shaft (1) out of the bearing points (arrows).
- Check the various parts and replace if necessary.



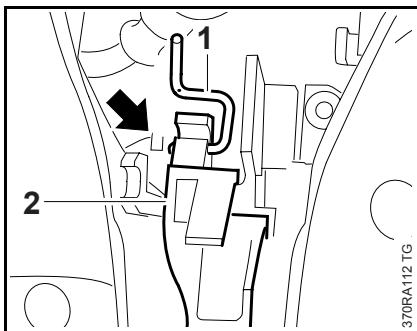
- Align the switch shaft. The larger bearing journal must point towards the switch.
- Press the switch shaft (1) into the bearing points (arrows) until it clicks into place.



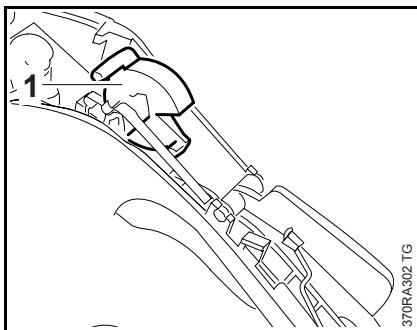
The peg (arrow) must engage in the throttle trigger.



- Lay the leaf spring (1) on the cams of the switch shaft and press it into the mount (arrow).
- Hook the torsion spring into the trigger interlock.



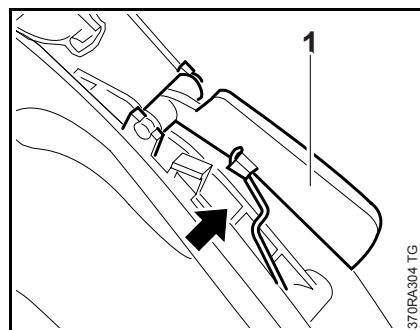
- Take the throttle rod out of the guide.
- Hook the throttle rod (1) into the throttle trigger (arrow).



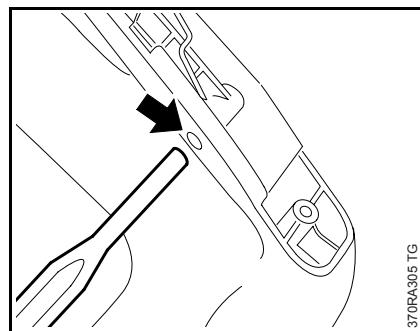
- Set the switch shaft (1) to position "0".

- Check correct functioning: the switch shaft must actuate the switch when in position "0"; it must engage and slightly lift the throttle trigger when in position "START".

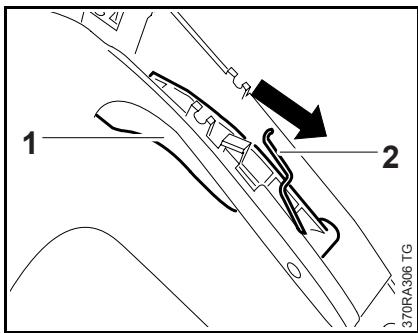
11.2 Throttle trigger/trigger interlock, removal and installation



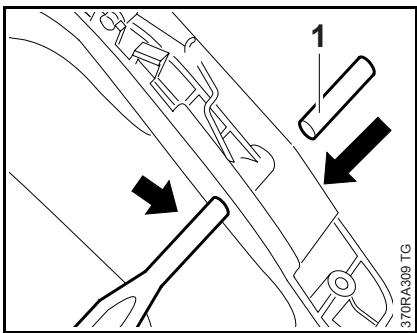
- Remove the handle molding, [11.1.1](#).
- Unhook the torsion spring (arrow).
- Pull the trigger interlock (1) out of the bearing points.



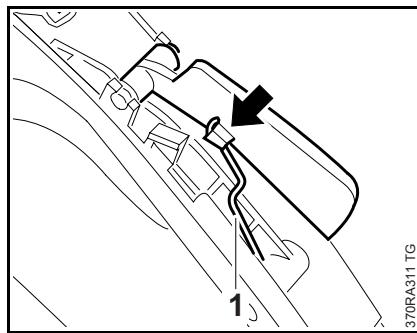
- Guide the handle molding (1) into position under the pegs (arrows).
- Insert and tighten down the screw.
- Tightening torques, [3.5](#).



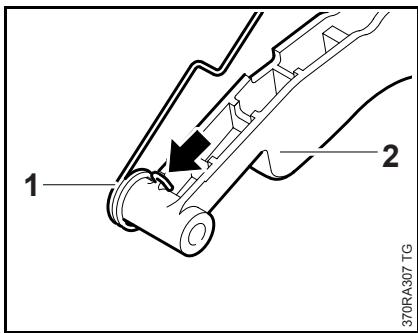
- Take out the throttle trigger (1) and torsion spring (2).
 - Check the various parts and replace if necessary.



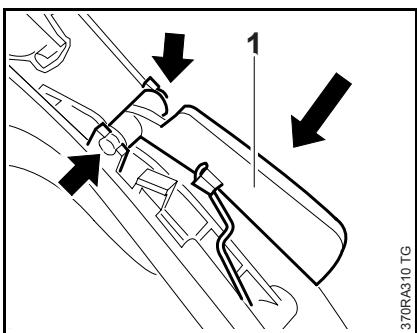
- Insert the drift in the hole (arrow) to secure the throttle trigger with torsion spring.
- Fit the pin (1) and drive it in until it is at the same distance on both sides.



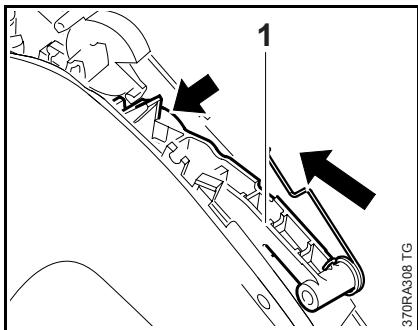
- Hook the torsion spring (1) into the trigger interlock (arrow).
- Install the handle molding, [11.1.1](#).
- Check correct functioning: when in "START" position, the switch shaft engages and slightly lifts the throttle trigger; the throttle trigger is blocked if the trigger interlock is not actuated.
- Tightening torques, [3.5](#).



- Hook the torsion spring (1) into the throttle trigger (2).
 - Note the installed position (arrow).

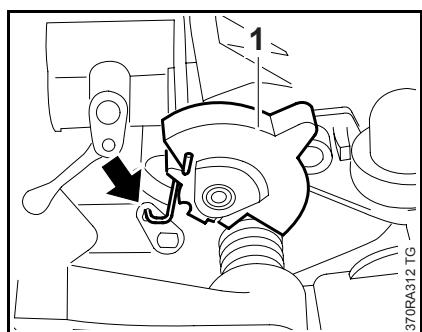


- Press the trigger interlock (1) into the bearing points (arrows) until it clicks into place.



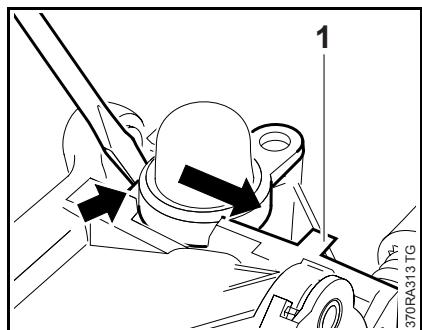
- Guide the throttle trigger (1) past the switch shaft (arrow) and place it in the shroud with the torsion spring.

11.2.1 Choke lever/holder, removal and installation

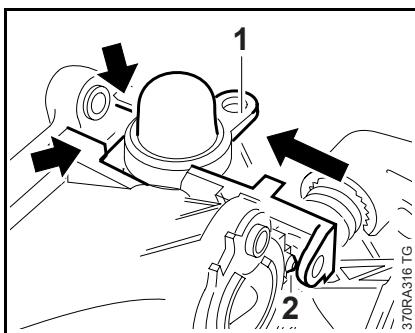


- Remove the shroud, **7.4.**
- Pull off the choke lever (1) and unhook the choke rod from the choke lever (arrow).

– Remove the leaf spring.

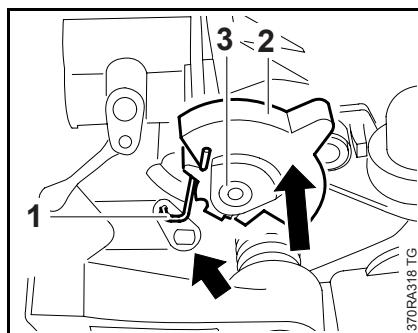


- Apply a screwdriver to the edge (arrow) and pry out the holder (1).
- Remove the manual fuel pump, **12.7.3.**
- Examine the choke lever, leaf spring and holder, replace if necessary.

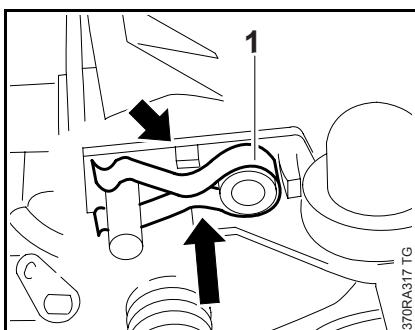


- Install the manual fuel pump **12.7.3.**
- Slide the holder (1) into the guide (arrows).

The holder must engage the peg (2).



- Hook the choke rod (1) into the choke lever (arrow).
- Slide the choke lever (2) onto the bearing journal (3), lifting the leaf spring slightly at the same time.
- Check correct functioning.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5.**



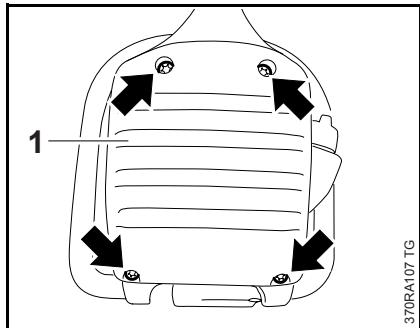
- Slide the leaf spring (1) into the guide (arrow).

12. Fuel system

12.1 Air filter

If engine performance deteriorates, the air filter must be checked and replaced if necessary.

- Refer also to troubleshooting, **4.5**.

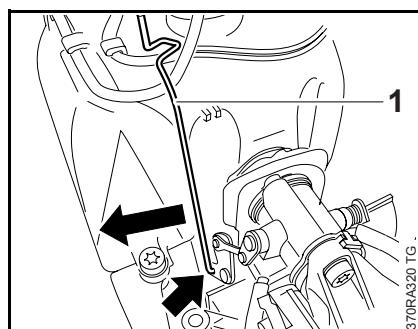


- Take out the screws (arrows).
- Remove the filter cover (1).
- Examine the air filter and auxiliary filter, replace if necessary. Refer to the user manual.
- Reassemble parts in reverse order.

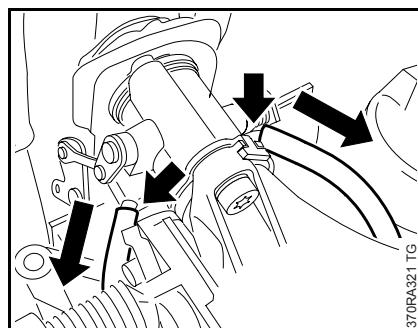
12.2 Carburetor, removal and installation

- Remove the shroud, **7.4**.
- Remove the air filter, **12.1**.
- Open the filler cap and drain the fuel tank in accordance with regulations, **1**.

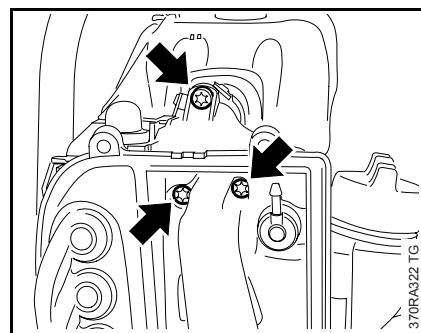
Fuel hoses should only be disconnected from the carburetor after opening the filler cap.



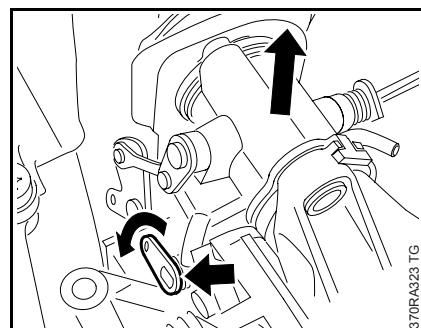
- Unhook the choke rod, **11.2.1**.
- Unhook the throttle rod (1) from the throttle shaft lever (arrow).



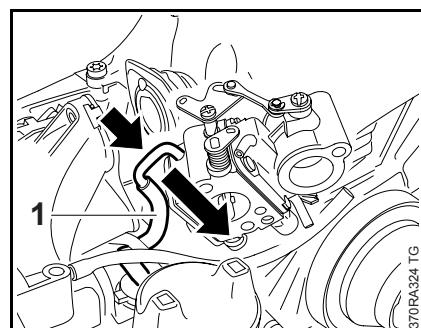
- Disconnect the fuel and compensator hose from the connectors (arrows).



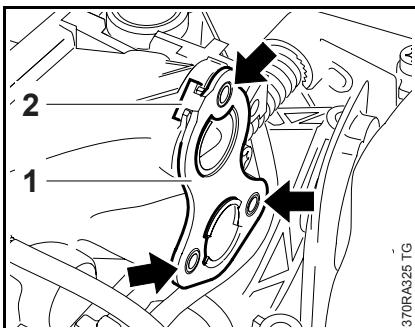
- Take out the screws (arrows).



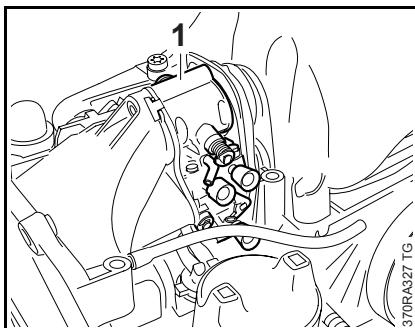
- Close the choke shutter at the lever (arrow) and pull out the carburetor.



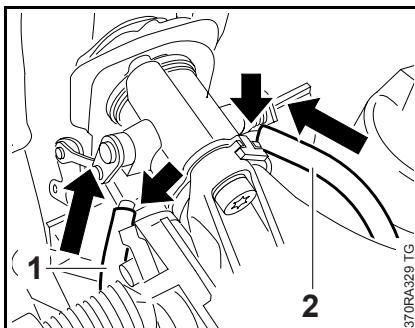
- Turn the carburetor to the side slightly and disconnect the fuel hose (1) from the connector (arrow).
- Examine the carburetor and repair or replace it if necessary.



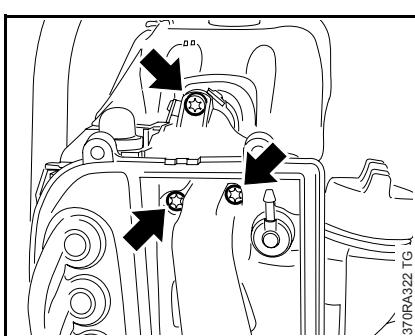
- Remove and examine the gasket (1), replace if necessary.
- Hook the gasket (1) into the mount (2) and fit it in the sleeves (arrows) to secure it.
- Examine the fuel hoses, replace if necessary, **12.8.2.**



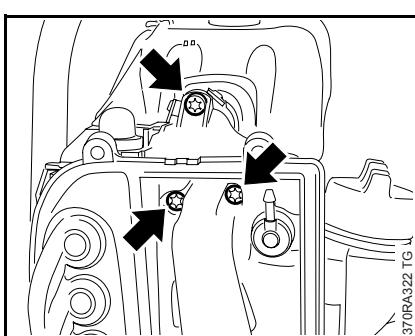
- Close the choke shutter.
- Slide the carburetor (1) between the tank housing and manifold so that the holes in the tank housing line up with those in the carburetor.
- Check and adjust the position of the gasket if necessary.



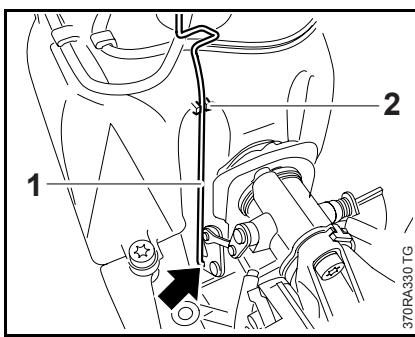
- Connect the fuel hose (1) and compensator hose (2) to the connectors (arrows).



- Position the carburetor and connect the fuel hose (1) to the connector (arrow).



- Insert screws (arrows) through the tank housing and carburetor.
- Insert and tighten down screws in the flange of the manifold.
- Check correct functioning and easy movement of the choke shutter.



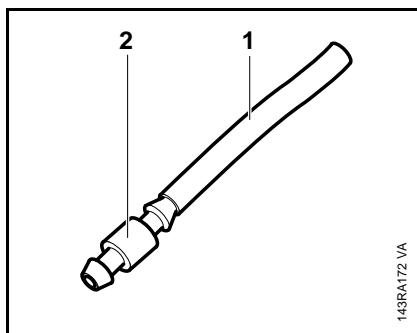
- Hook the throttle rod (1) into the throttle shaft lever (arrow).
- Place the throttle rod in the mount (2). It is now in position for the subsequent installation steps.
- Attach the choke rod, **11.2.1.**
- Reassemble remaining parts in reverse order.
- Check correct functioning.
- Tightening torques, **3.5.**

12.2.1 Leakage testing

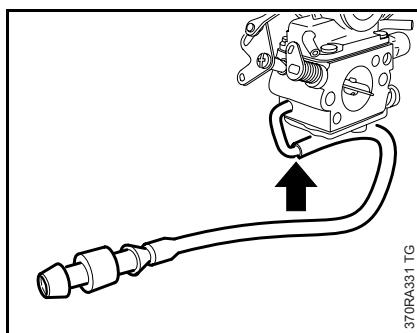
The tank vent must also be checked and replaced if problems develop with the carburetor or fuel supply, **12.7**.

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

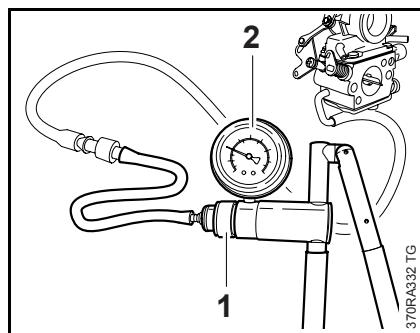
- Remove the carburetor, **12.2**.



- Push the fuel line (1) 1110 141 8600 onto the double connector (2) 0000 855 9200.



- Push the fuel line with double connector onto the fuel port (arrow).



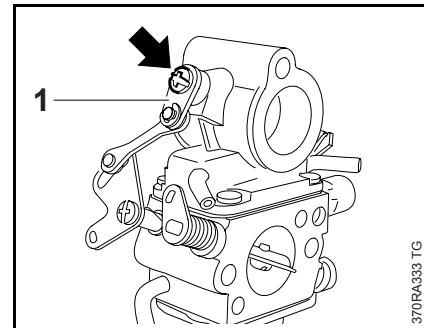
- Push the delivery hose of the pump 0000 850 1300 onto the double connector.
- Push ring (1) to the right and pump air into the carburetor until the pressure gauge (2) shows a pressure of approx. 0.8 bar (80 kPa).

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

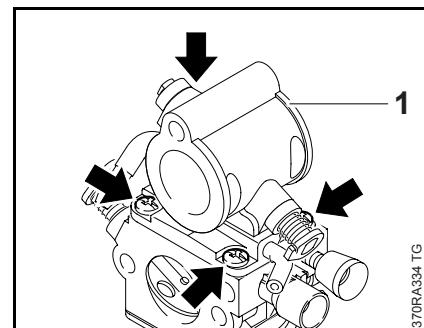
1. The inlet valve is not sealing (impurities in the valve seat, sealing cone of the inlet needle is damaged or inlet control lever is sticking). Remove to clean, **12.3.2**.
2. Metering diaphragm or gasket is damaged, replace if necessary, **12.3.1**.
3. Pump diaphragm or gasket is damaged, replace if necessary, **12.3.4**.
- After testing, push the ring (1) to the left to vent the pump, then disconnect the fuel line from the connector on the carburetor.
- Install the carburetor, **12.2**.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

12.3 Repairing the carburetor

12.3.1 Metering diaphragm

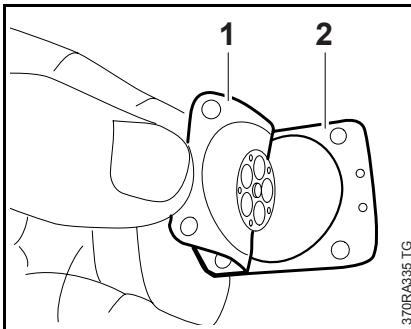


- Troubleshooting, **4.5**.
- Remove the carburetor, **12.2**.
- Remove the screw (arrow).
- Remove the lever (1).



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

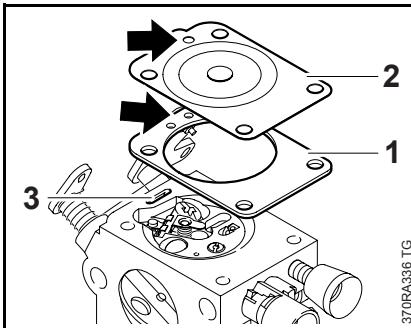
If the gasket and diaphragm are stuck to the carburetor, they must be removed very carefully.



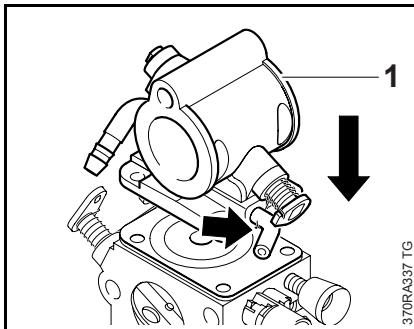
- Carefully separate the metering diaphragm (1) and gasket (2).

The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue. In other words, the diaphragm distorts and swells and must be replaced.

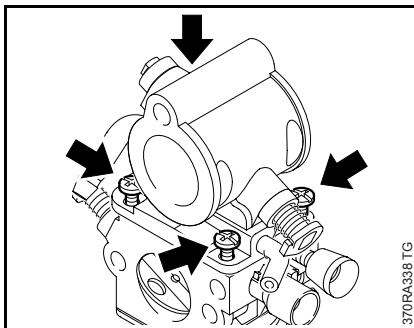
- Examine the metering diaphragm for signs of damage and wear, fit a new gasket.



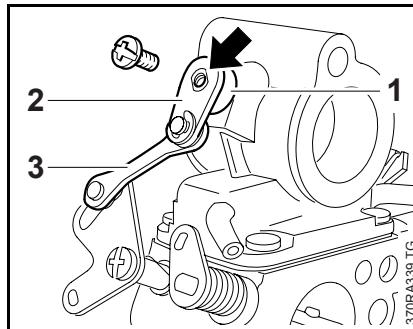
- Note the order in which the metering diaphragm (2) and gasket (1) are installed.
- Align the gasket (1) and metering diaphragm (2) so that the small holes (arrows) face the oblong hole (3).



- Align the end cover (1) so that the connector (arrow) points towards the adjusting screws.
- Carefully fit the end cover (1). The holes must line up.

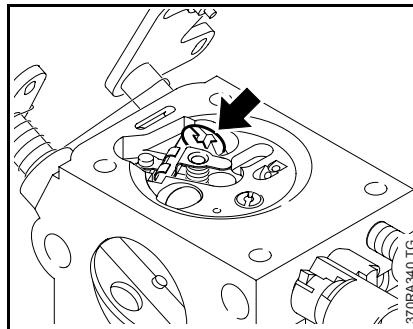


- Insert and tighten the screws (arrows).
- Check that the diaphragm and gasket are correctly seated, then tighten down the screws cross-wise.

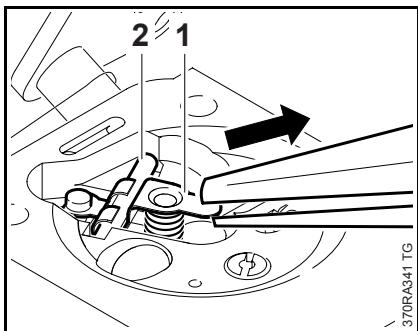


- Ring (1) and the sealing ring underneath must be in position.
- Line the lever (2) with rod (3) up with the hole (arrow).
- Insert and tighten down the screw.
- Check correct functioning: the air valve must begin to open when the throttle shutter is approx. $\frac{1}{4}$ open.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

12.3.2 Inlet needle

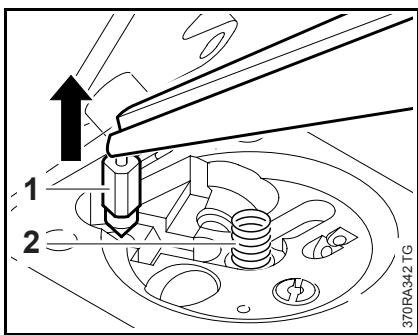


- Remove the metering diaphragm, **12.3.1**.
- Remove the screw (arrow).

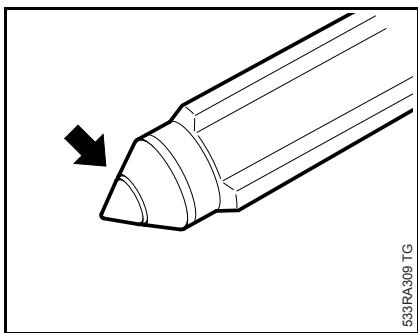


- Pull the inlet control lever (1) with spindle (2) out of the groove in the inlet needle.

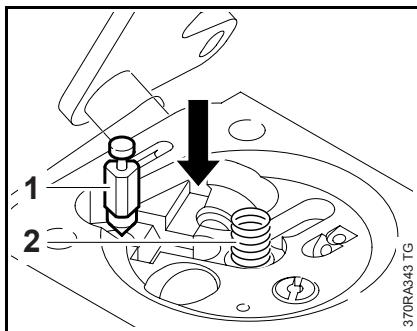
The spring under the inlet control lever may pop out.



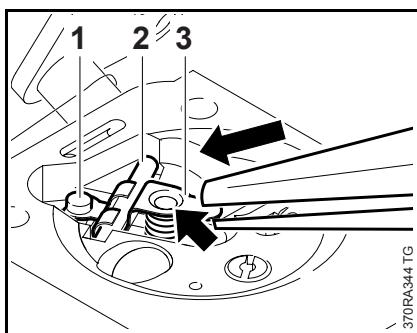
- Pull out the inlet needle (1).
 - Take out and examine the spring (2), replace if necessary.



- The inlet needle must be replaced if a circular indentation (arrow) is visible on the tip of its sealing cone.



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

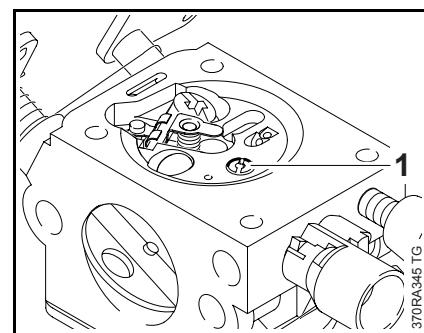


- First fit the spindle (2) of the inlet control lever (3) at the seat (arrow) of the spring, then slide the clevis on the inlet control lever into the groove on the inlet needle (1).

Ensure that the spring locates on the nipple of the inlet control lever.

- Press the inlet control lever down and secure it with the screw.
- Check that the inlet control lever moves easily.
- Install the metering diaphragm, **12.3.1**.
- Reassemble remaining parts in reverse order.

12.3.3 Fixed jet

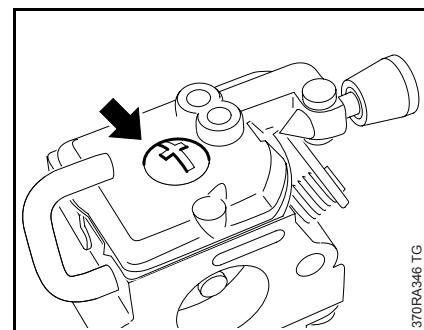


- Remove the metering diaphragm, **12.3.1**.
- Unscrew the fixed jet (1) with a suitable screwdriver.

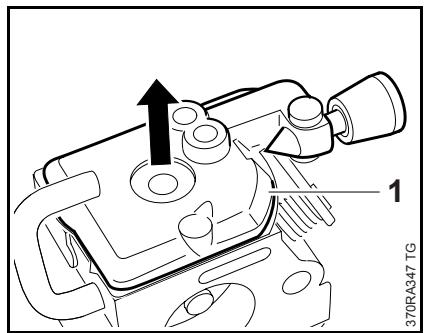
Take care not to damage the jet.

- Examine the fixed jet and replace if necessary.
- Reassemble parts in reverse order.

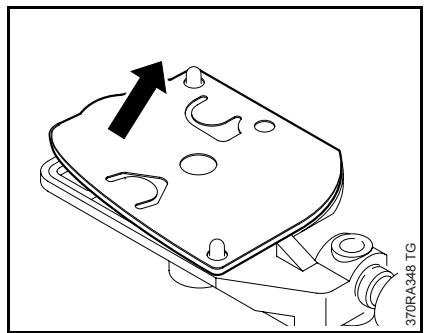
12.3.4 Pump diaphragm



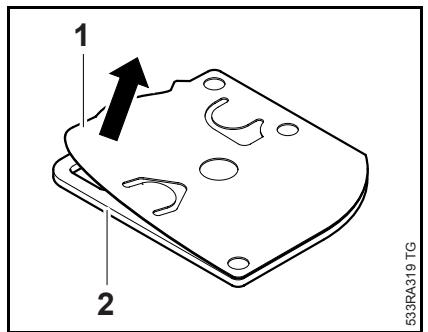
- Remove the carburetor, **12.2**.
- Remove the screw (arrow).



- Carefully remove the end cover (1).



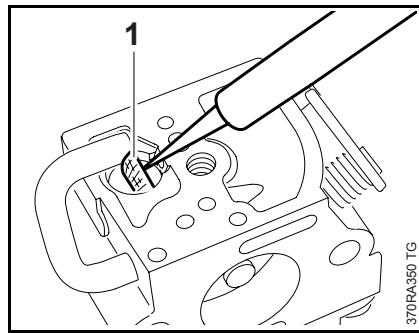
- Carefully remove the gasket and pump diaphragm from the end cover.



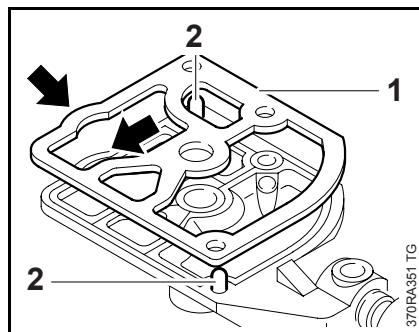
- Carefully separate the pump diaphragm (1) and gasket (2).

The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue. In other words, the diaphragm distorts and swells and must be replaced.

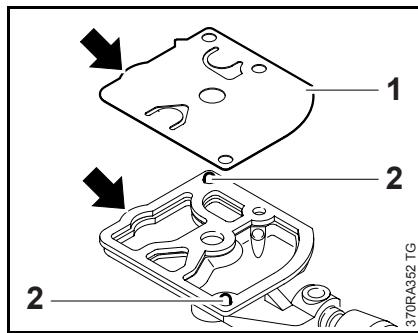
- Examine the pump diaphragm for signs of damage and wear, fit a new gasket.
- Examine the fuel strainer for signs of fouling and damage. Clean or replace it if necessary, **14**.



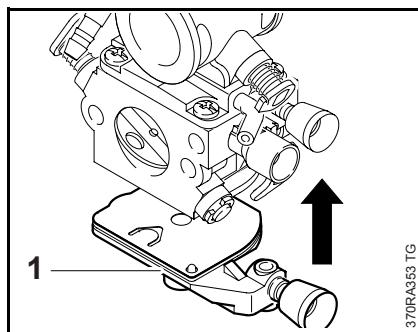
- Pull the fuel strainer (1) out of the carburetor housing with a needle.
- Reassemble parts in reverse order.



- Fit the gasket (1) so that it matches the contour of the end cover (arrows) and is secured in the pegs (2).



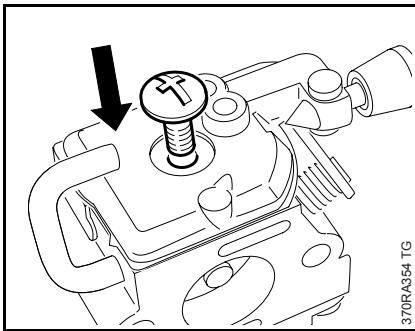
- Fit the diaphragm (1) so that it matches the contour of the gasket (arrows) and is secured in the pegs (2).



- Align the end cover (1) so that the idle speed screw (arrow) points towards the adjusting screws.
- Position the end cover (1) on the carburetor housing from below so that the gasket and pump diaphragm remain secured to the end cover.

Turn the throttle shaft slightly in open direction so that the end cover can be fitted without resistance.

- Move the end cover (1) back and forth slightly until the pegs on the end cover engage in the holes in the carburetor housing.



- Check that the diaphragm and gasket are correctly seated.
- Insert and tighten down the screw.
- Reassemble remaining parts in reverse order.

12.3.5 Air valve

If actuation of the air flap shaft is stiff and/or the air flap cannot be opened or closed properly:

As a rule, the air valve must begin to open when the throttle shutter is approx. ¼ open.

- Remove the carburetor, **12.2**.
- Troubleshooting on the carburetor, **4.5**.

Check position of throttle shutter (throttle trigger position)/air valve

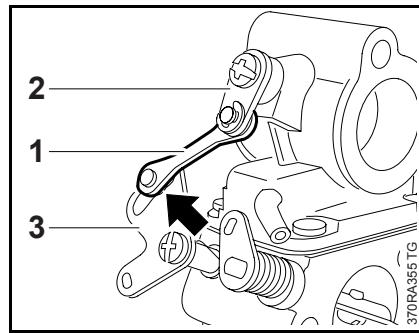
The correct position of the air valve can be visually checked as follows:

- Throttle shutter at idle speed – air valve is completely closed
- Throttle shutter between idle speed and full throttle – air valve is between closed and open wide¹⁾

– Throttle shutter in full throttle position – air valve is open wide¹⁾

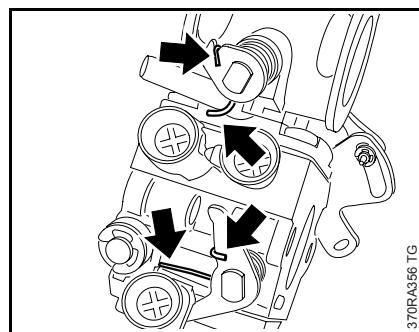
- Throttle shutter in cold start position ↘ – air valve is completely closed
- Throttle shutter in hot start position ↙ – air valve is open approx. 10°

- 1) The air valve must be able to move in both directions (open and closed) and must always return to its starting position.



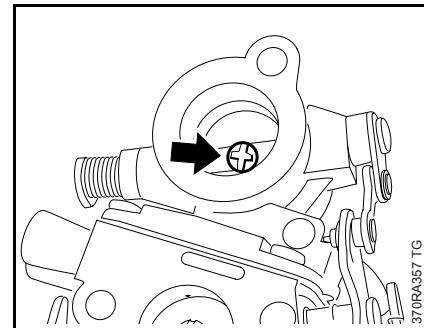
Rod (1) must be attached to lever (2) and the oblong hole (arrow) in the lever (3).

The rod must be secured to both levers with an E-clip.

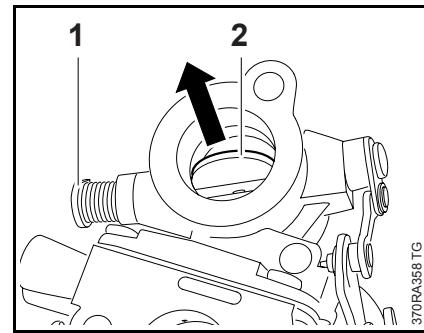


Torsion springs (arrows) must be pre-tensioned and attached to the levers.

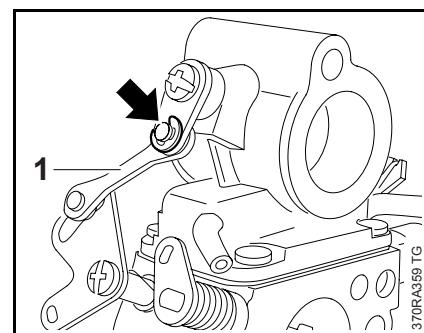
Removal and installation



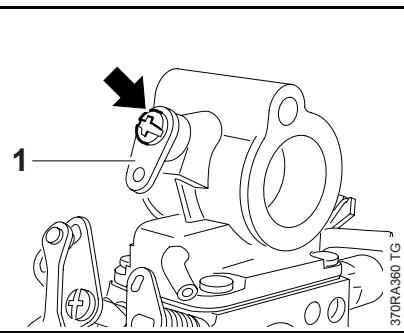
- Remove the screw (arrow).



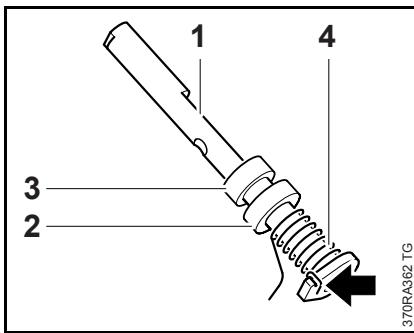
- Turn the air valve shaft (1) and pull out the air valve (2).



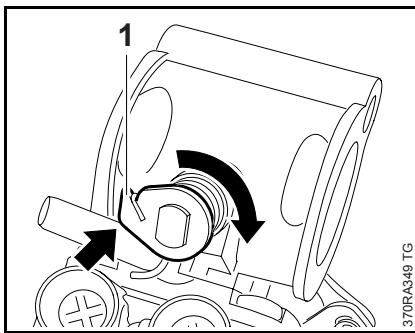
- Remove the E-clip (arrow).
- Unhook the rod (1).



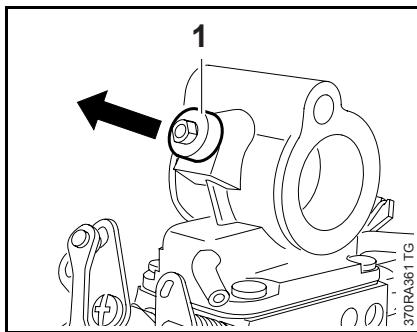
- Remove the screw (arrow).
- Remove the lever (1).



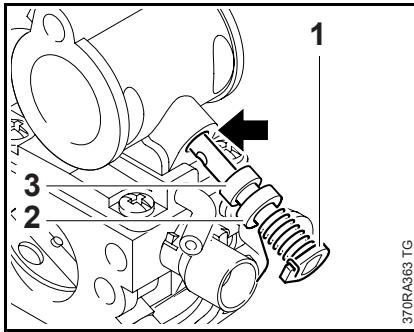
- Examine the air valve shaft (1), ring (2), sealing ring (3) and torsion spring (4), replace if necessary.
- Note the installed position (arrow) of the torsion spring.



- Turn the lever on the air valve shaft (1) clockwise until it is above the connector (arrow).
- Push the air valve shaft in as far as possible and hold it there.

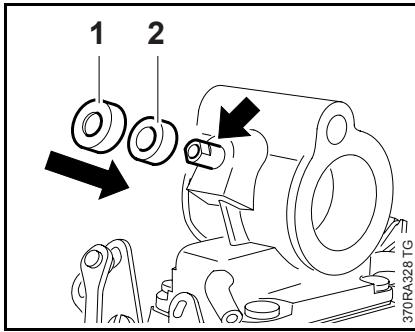


- Take off the ring (1) and the sealing ring underneath.
- Pull out the air valve shaft, unhooking and relieving the torsion spring at the same time.
- Clean the air valve shaft and guides, 14.

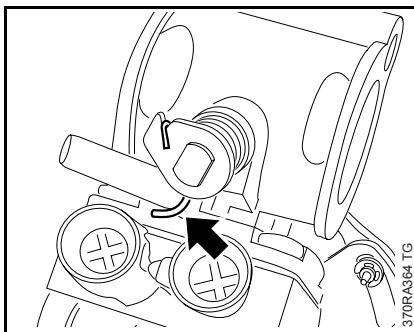


Ring (2) and sealing ring (3) must be present.

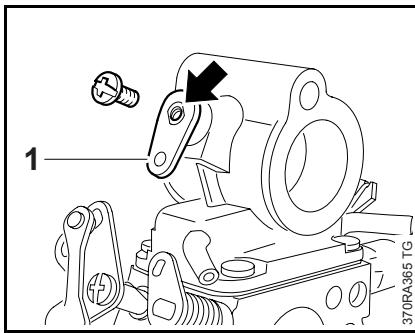
- Push the air valve shaft (1) into the air valve housing (arrow).



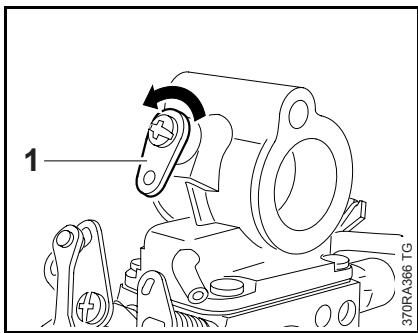
- Fit the sealing ring (2) and ring (1).



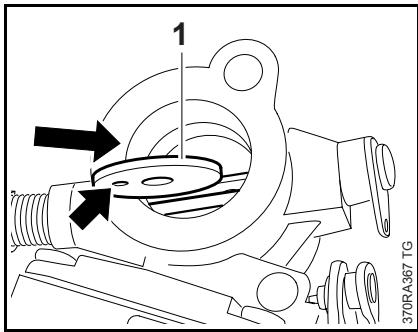
- Hook the leg of the torsion spring into the connector (arrow) on the air valve housing.



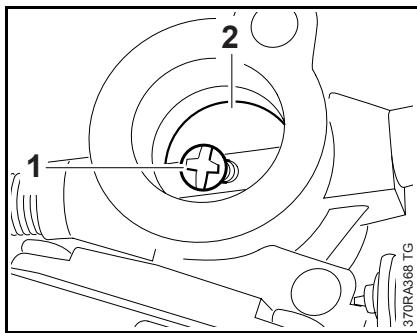
- Slide the lever (1) into the hole (arrow) on the air valve shaft so that the number is no longer visible.
- Insert and tighten down the screw.



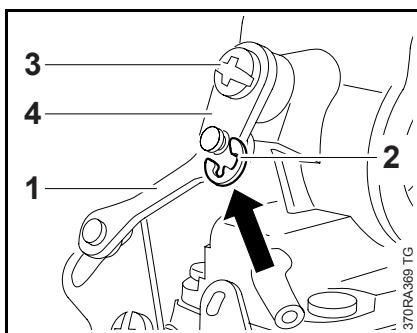
- Turn the air valve shaft (1) approx. $\frac{3}{4}$ turn counterclockwise until the flat side faces downwards. The air valve shaft is now pre-tensioned.



- Hold the air valve shaft in this pre-tensioned position.
- Slide the air valve (1) into the slit in the air valve shaft with the hole (arrow) on the left, the lettering facing downwards.



- Coat the screw with screw locking paint, **14**.
- Insert a new screw (1) on the flat side and screw it in slightly.
- Close the air valve (2) and center it in the hole in the air valve housing.
- Tighten down the screw.

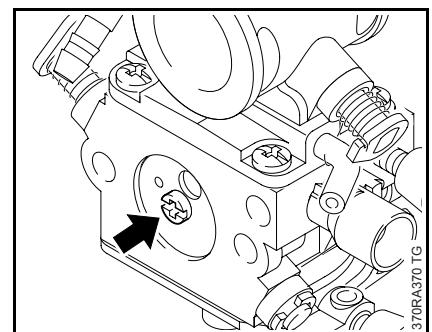


- Undo the screw (3) slightly and lift lever (4) slightly.
- Attach the rod (1).
- Retighten screw (3); lever (4) must be located in the hole.
- Fit the E-clip (2).
- Check correct functioning and easy movement.
- Reassemble remaining parts in reverse order.

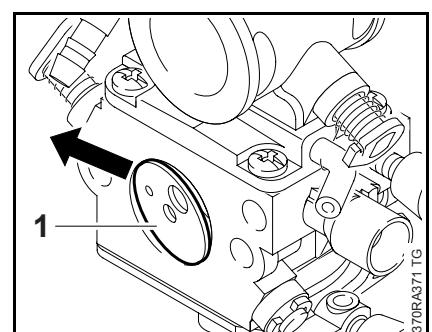
12.3.6 Choke shaft/choke shutter

If actuation of the choke shaft is stiff and/or the choke shutter cannot be opened or closed properly:

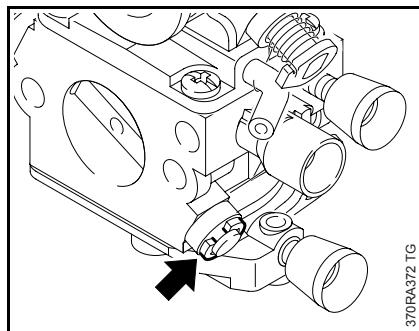
- Remove the carburetor, **12.2**.
- Troubleshooting on the carburetor, **4.5**.



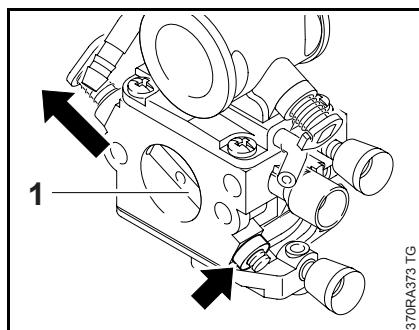
- Turn the choke shaft until the choke shutter is closed.
- Remove the screw (arrow).



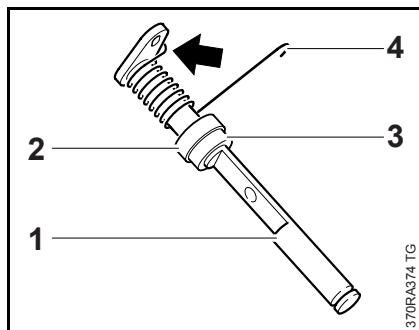
- Turn the choke shaft a little and take out the choke shutter (1).



- Remove the E-clip (arrow).

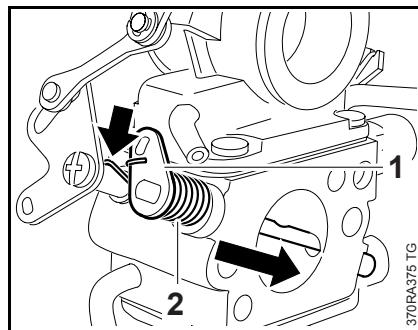


- Pull off the ring (arrow) and the sealing ring underneath.
- Pull the choke shaft out towards the lever, unhooking and relieving the torsion spring at the same time.

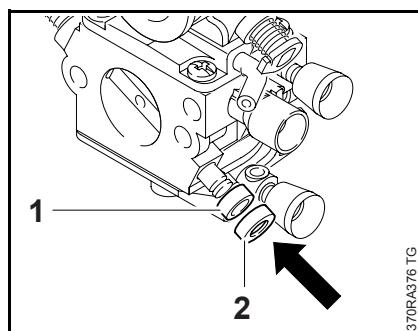


- Examine the choke shaft (1), ring (2), sealing ring (3) and torsion spring (4), replace if necessary.
- Note the installed position (arrow) when installing the torsion spring.

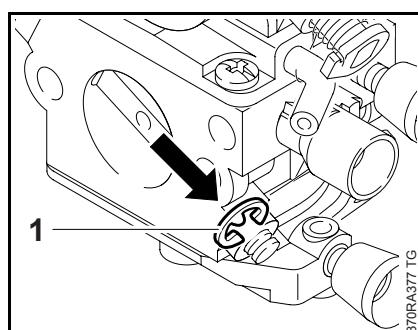
- Clean the choke shaft and guides, **14**.
- Reassemble parts in reverse order.



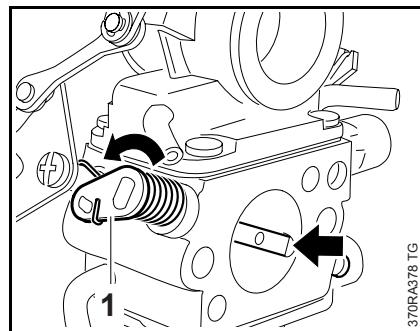
- Push the choke shaft (1) into the carburetor.
- Turn the leg of the torsion spring (2) clockwise and fit it on the throttle shaft (arrow).



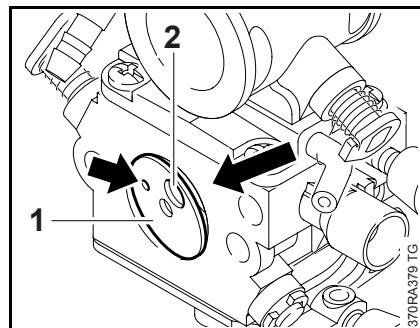
- Fit the sealing ring (1) and ring (2).



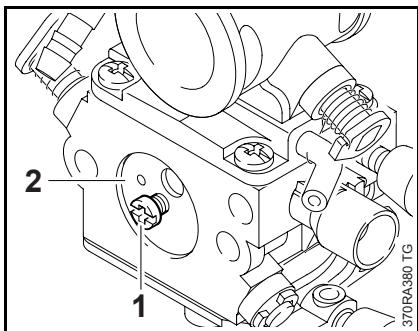
- Install the E-clip (1) and let go of the choke shaft.



- Turn the choke shaft (1) counterclockwise until the flat side (arrow) faces the front. The air valve shaft is now pre-tensioned.



- Hold the choke shaft in this pre-tensioned position.
- Slide the choke shutter (1) into the hole in the carburetor. The small hole (arrow) must be on the left and the large hole (2) above the choke shaft.

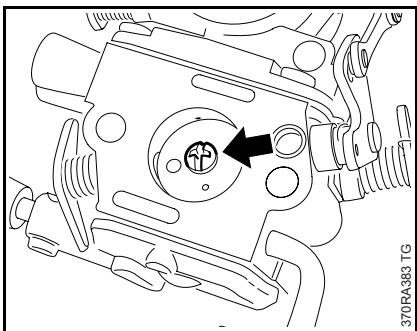


- Coat the screw with screw locking paint, **14**.
- Insert a new screw (1) and screw it in slightly.
- Close the choke shutter (2) and center it in the hole in the carburetor housing.
- Tighten down the screw.
- Check correct functioning and easy movement.
- Reassemble remaining parts in reverse order.

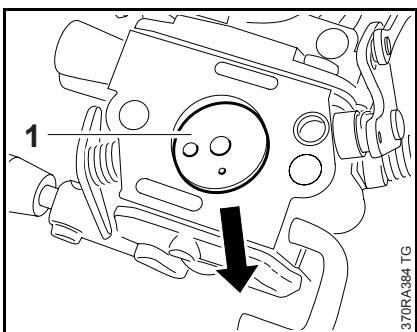
12.3.7 Throttle shaft/throttle shutter

If actuation of the throttle shaft is stiff and/or the throttle shutter cannot be opened or closed properly:

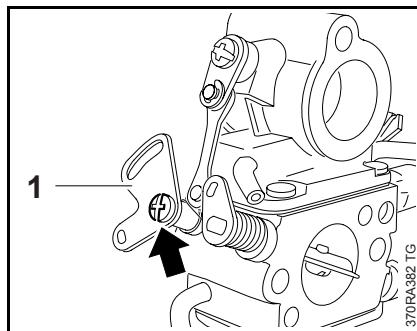
- Remove the carburetor, **12.2**.
- Troubleshooting on the carburetor, **4.5**.
- Remove the pump diaphragm, **12.3.4**.



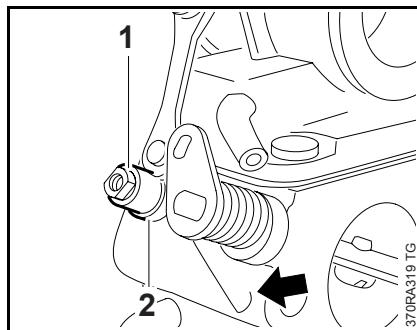
- Remove the screw (arrow).



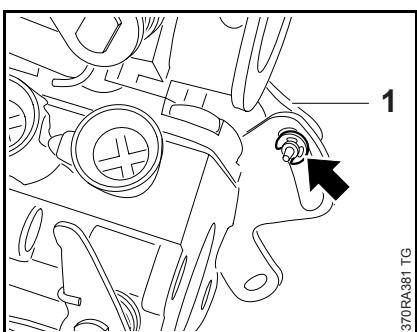
- Turn the throttle shaft a little and pull out the throttle shutter (1).



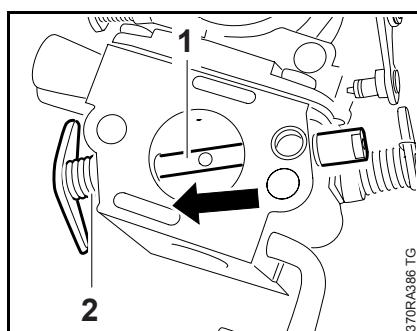
- Remove the screw (arrow).
- Remove the lever (1).



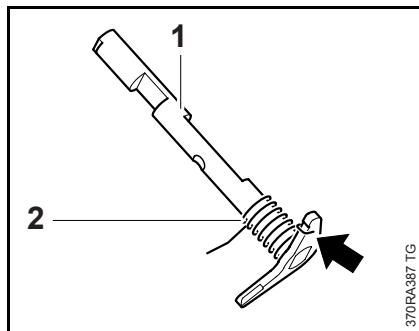
- Remove the leg (arrow) of the torsion spring.
- Pull off the spacer (1) and ring (2) with sealing ring underneath.



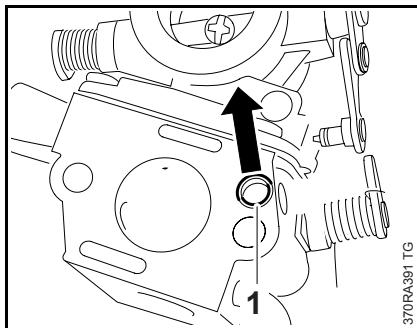
- Remove the E-clip (arrow).
- Unhook and examine the rod (1), replace if necessary, **12.3.5**.



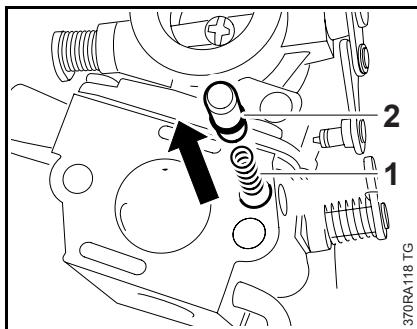
- Pull the throttle shaft (1) out towards the adjusting screws, unhooking and relieving the torsion spring (2) at the same time.
- Clean the throttle shaft and guides, **14**.



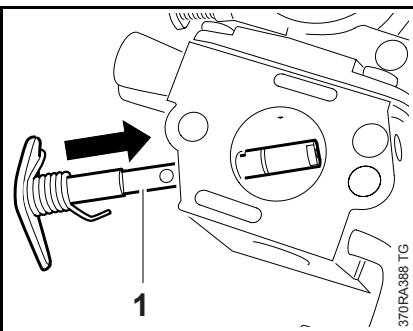
- Examine the throttle shaft (1) and torsion spring (2), replace if necessary.
- Note the installed position (arrow) of the torsion spring.



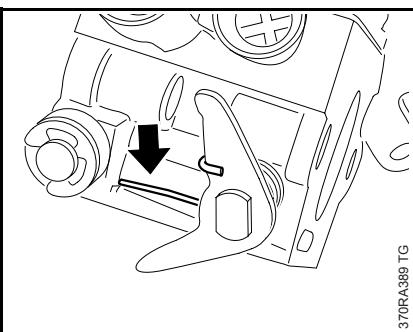
- Remove the cap (1).



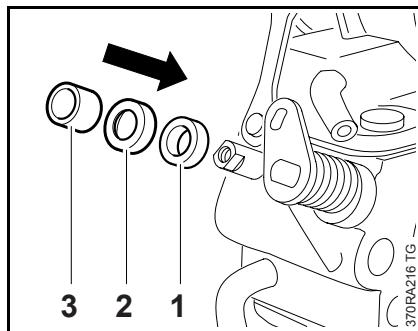
- Remove the pump piston (2) with its sealing ring and spring (1).
- Check the various parts and replace if necessary.
- Reassemble parts in reverse order.



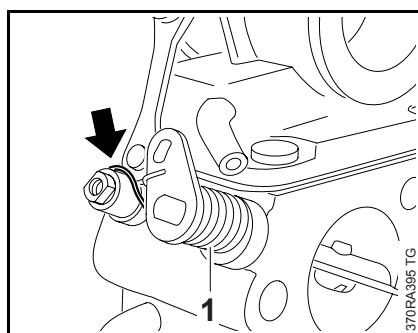
- Slide the throttle shaft (1) into the carburetor housing with the torsion spring from the side with the adjusting screws.



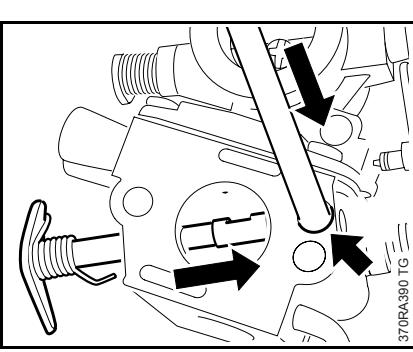
- Lay the torsion spring on the shoulder (arrow) of the carburetor housing.



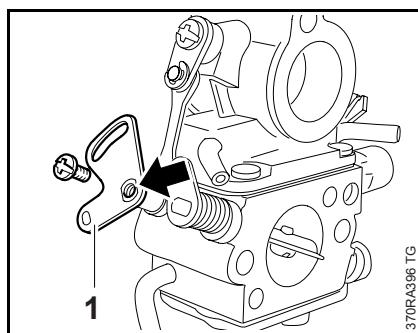
- Fit the sealing ring (1), ring (2) and sleeve (3).



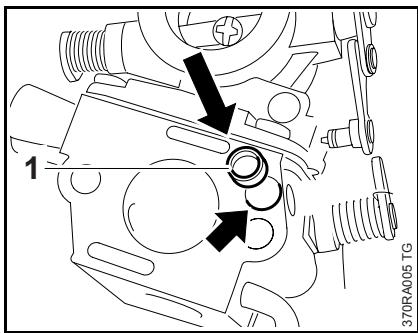
- Lay the pre-tensioned leg of the torsion spring (1) against the sleeve (arrow).



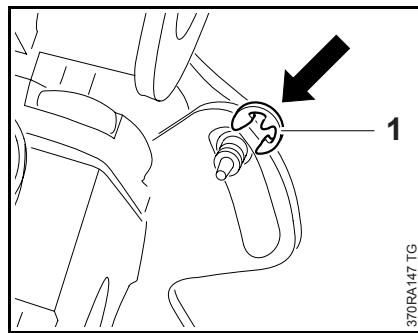
- Press the piston of the accelerator pump into the hole (arrow) with a suitable tool and push the throttle shaft through further.



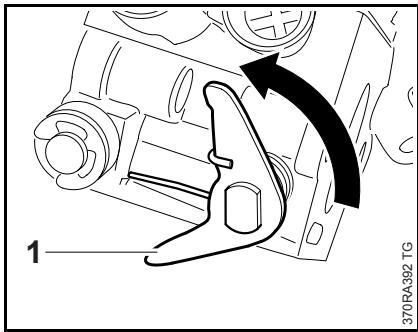
- Slide the lever (1) into the hole (arrow) in the throttle shutter shaft.
- Insert and tighten down the screw.



- Lay the throttle shutter (1) onto the flat side of the throttle shaft so that the hole (2) is on the left and the small hole (3) is below the throttle shaft.



- Install the E-clip (1).
- Reassemble remaining parts in reverse order.



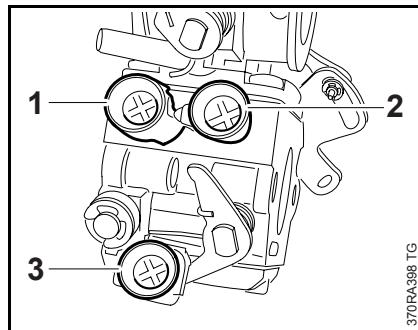
- Turn the throttle shaft (1) approx. $\frac{1}{2}$ turn counterclockwise until the flat side of the throttle shaft comes into view. The throttle shaft is now pre-tensioned.

- Coat the screw with screw locking paint, **14**.

- Insert a new screw (1) and screw it in slightly.
- Close the throttle shutter and center it in the hole in the carburetor housing.

The hole (2) must be on the left and the small hole (arrow) below the screw.

- Tighten down the screw.
- Check correct functioning and easy movement.



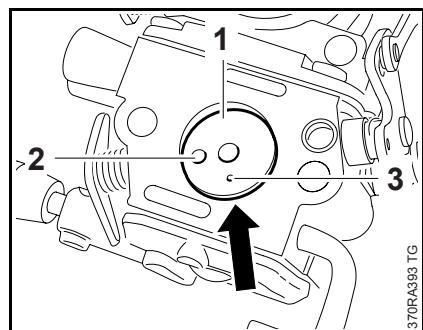
There are three adjusting screws on the carburetor:

- H** = High speed adjusting screw (1)
L = Low speed adjusting screw (2)
LA = Idle speed adjusting screw (3)

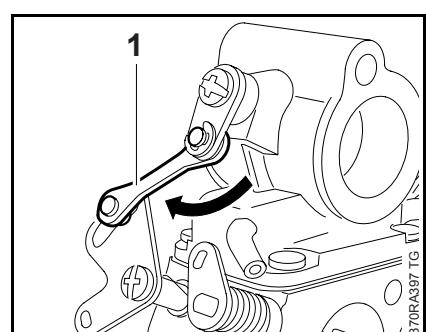
If the carburetor setting can no longer be adjusted, this may also be due to the adjusting screws.

The high speed adjusting screw **H** has a limiter cap which must be removed before removing the screw.

Always fit a new limiter cap.



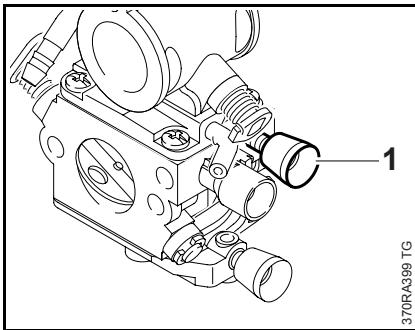
- Hold the throttle shaft in this pre-tensioned position.



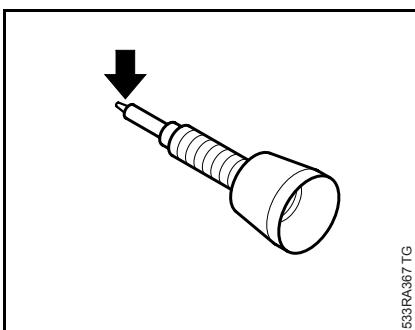
- Attach the rod (1).

- Remove the carburetor, **12.2**.
- See also troubleshooting on the carburetor, **4.5**.

Low speed adjustment screw

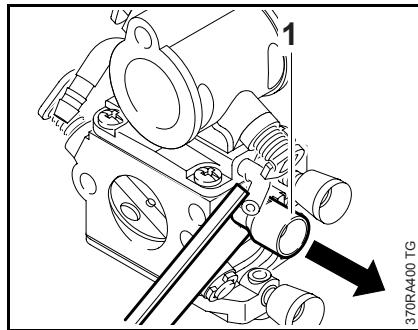


- Take out the low speed screw (1).



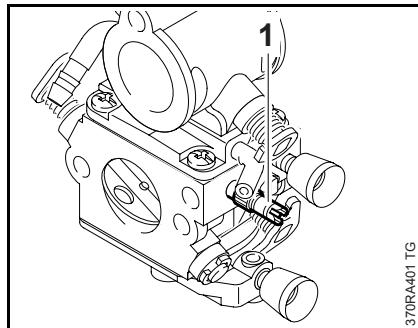
- Examine the tip (arrow) for signs of damage or wear. Fit a new low speed adjusting screw **L** if necessary.
- Turn the low speed adjusting screw **L** in as far as possible.
- Continue with the high speed adjusting screw.

High speed adjustment screw

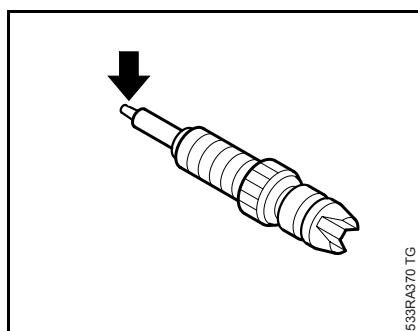


- Prise the limiter cap (1) off the high speed screw with tool 5910 890 4501.

Always fit a new limiter cap.



- Take out the high speed screw (1).



- Examine the setting cone (1) for signs of damage or wear. Fit a new high speed adjusting screw if necessary.

- Turn the high speed adjusting screw **H** in as far as possible.

- Make the basic setting, **12.4.1.**

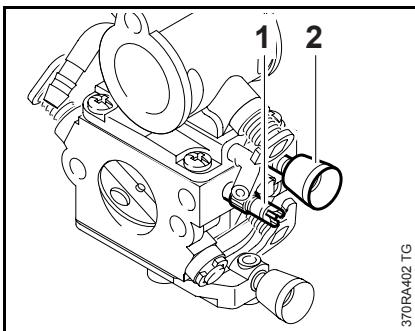
12.4 Carburetor adjustment

12.4.1 Basic setting

Only necessary if the high speed screw **H** or low speed screw **L** has to be replaced or for cleaning and setting the carburetor.

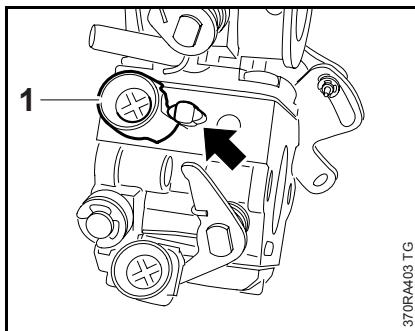
- Remove the limiter cap from the high speed screw, **12.3.8.**

The basic setting must be made after removing the limiter cap.



370RA402 TG

- Turn the high speed screw **H** (1) clockwise until it is firmly in its seat.
- With the high speed screw **H** (1) in its seat, give it **1.5 turns** counterclockwise to obtain the basic setting.
- Turn the low speed screw **L** (2) clockwise until it is firmly in its seat.
- With the low speed screw **L** (2) in its seat, give it **1 turn** counterclockwise to obtain the basic setting.



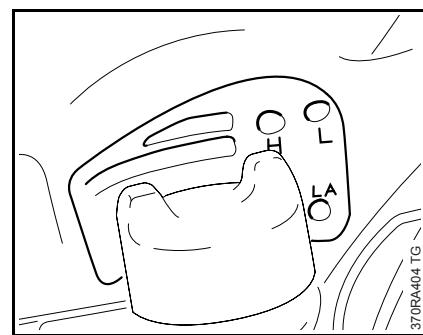
370RA403 TG

Always use a new limiter cap; before fitting it, hold it so that the bump on the limiter cap is below the stop (arrow), then press it home on the high speed screw.

- Press the limiter cap (1) onto the high speed screw **H**.

The high speed screw **H** is now limited. The standard setting has been obtained when the high speed screw **H** is turned counterclockwise until it engages.

12.4.2 Standard setting



370RA404 TG

The limiter cap must not be removed when making the standard setting.

To avoid problems, the following steps must be performed for all settings:

- Troubleshooting, **4.5**.
- Check and adjust axial truth of running of the cutting wheel.
- Examine the spark arresting screen (if installed); clean or replace it if necessary, **7.1**.
- Examine the air filter, replace if necessary, **12.1**.

Standard setting

- Switch off engine.
- Carefully turn the high speed screw **H** counterclockwise as far as possible (max. $\frac{3}{4}$ turn).
- Carefully turn the low speed screw **L** clockwise as far as possible, then back off **1 turn**.

Setting the idle speed

- Make the standard setting.
- Let the engine warm up.
- Turn the idle speed screw **LA** clockwise as far as the stop or until the cutting wheel begins to turn, then back off **1 turn**.

Erratic idling behavior, poor acceleration

(despite the standard setting)

Idle setting is too lean.

- Let the engine warm up.
- Turn the low speed screw **L** counterclockwise until the engine runs smoothly and accelerates properly.

The setting of the idle speed screw **LA** must usually also be adjusted whenever the setting of the low speed screw **L** has been corrected.

Correcting the carburetor setting for use at high altitudes

If the engine does not run satisfactorily, a minor correction may have to be made.

- Check the standard setting.
- Let the engine warm up.
- Turn the high speed screw **H** clockwise (leaner), but no further than the stop.

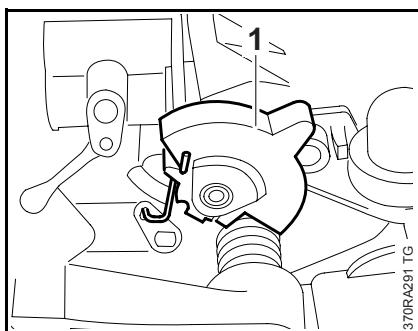
The screws should be adjusted as little as possible. The slightest adjustment produces a tangible difference in engine behavior.

If you make the setting too lean it will increase the risk of engine damage through lack of lubrication and overheating.

If the adjustments do not yield any improvement, refer also to the troubleshooting chart for the ignition system, carburetor and shortblock, **4.4**, **4.5** and **4.6**.

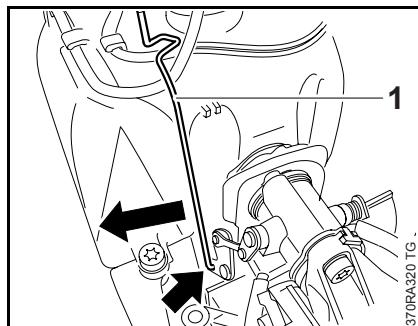
12.5 Choke rod and throttle rod

Choke rod

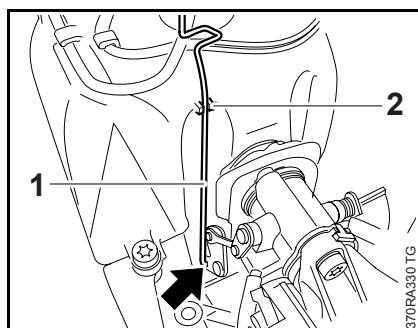


- Remove the shroud, **7.4**.
- Remove the choke rod (1), **11.2.1**.
- Reassemble parts in reverse order.
- Check correct functioning.

Throttle rod



- Remove the shroud, **7.4**.
- Unhook the throttle rod (1) from the throttle shaft lever (arrow).

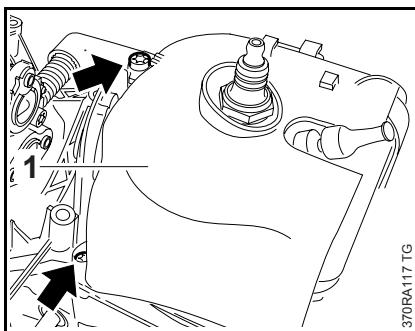


- Attach the throttle rod (1) to the throttle shaft lever (arrow) and place in the guide (2). It is now in position for the subsequent installation work.
- Install the shroud, **7.4**.
- Check correct functioning.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

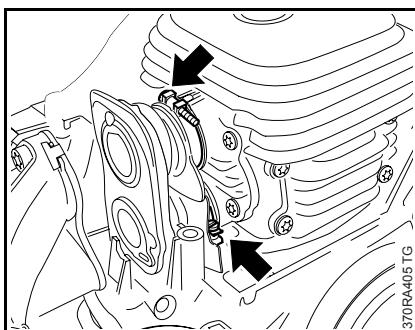
12.6 Intake elbow, removal and installation

A damaged intake elbow may lead to impaired engine performance.

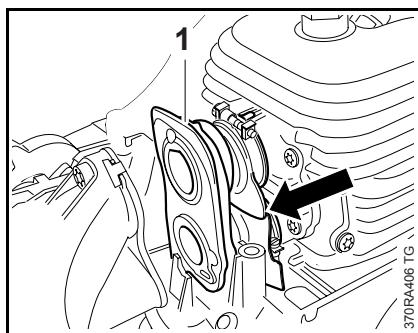
- Troubleshooting, **4.5** or **4.6**.
- Remove the shroud, **7.4**.
- Remove the carburetor **12.2**.
- Disconnect the impulse hose from the connector on the flange, **12.6.1**.



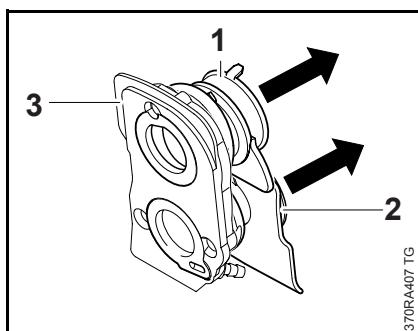
- Remove the ignition lead and wiring harness from the air guide shroud.
- Take out the screws (arrows).
- Remove the air guide shroud (1).



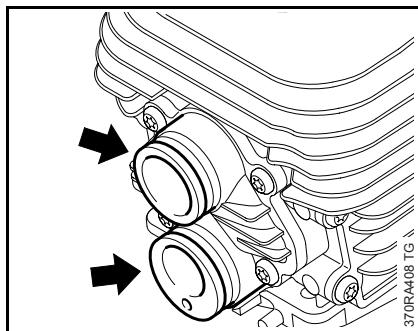
- Take out the screws (arrows) and open the hose clips completely.



- Pull the intake elbow (1) off the intake fitting.
- Remove the hose clips.

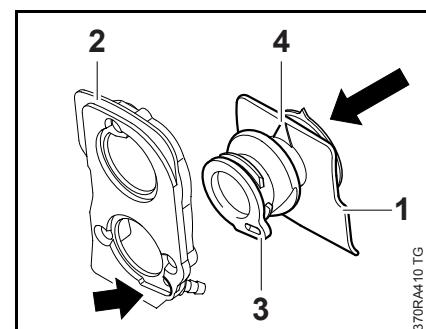


- Pull the intake elbow (1+2) out of the flange (3).
- Examine and replace the flange if necessary.
- Examine and replace the intake elbow (1+2) if necessary. The slightest damage may lead to impaired engine performance.

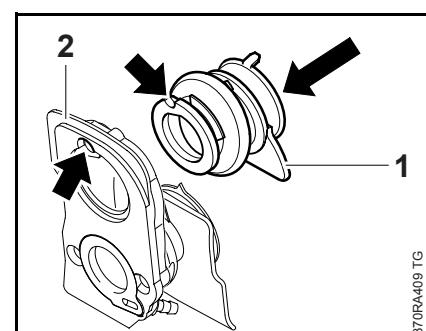


- Check and clean the intake fitting (arrows) on the cylinder, **14**.

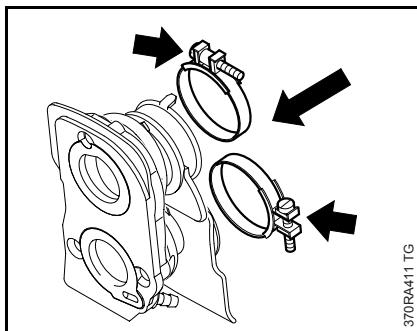
The intake fittings must not display any signs of damage. Damaged parts must be replaced.



- Align the elbow so that the tab (3) engages in the mount (arrow) on the flange (2) and the marking (4) points towards the upper elbow.
- Press the lower elbow (1) into the flange (2) until it encloses the lower hole completely.

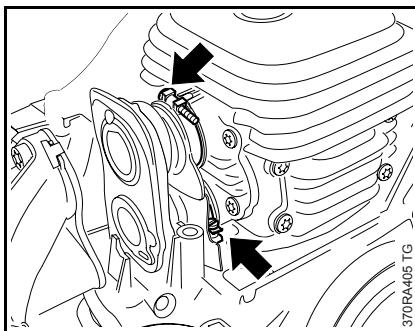


- Align the elbow so that the recess is lined up with the hole (arrows) on the flange (2).
- Press the upper elbow (1) into the flange (2) until it encloses the upper hole completely.



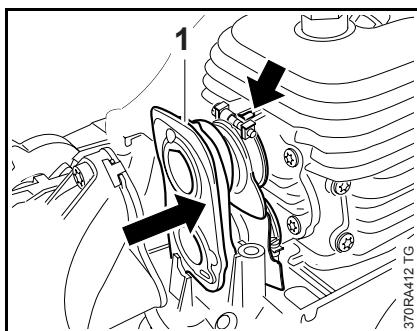
370RA411 TG

- Fit the hose clips (arrows), noting the installed position.



370RA405 TG

- Align the hose clips (arrows) and close them as far as possible.

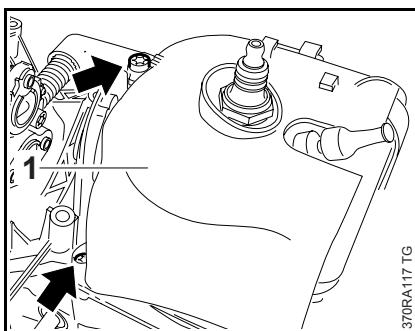


370RA412 TG

- Use STIHL Press Fluid to ease installation, **14**.

- Push the intake elbow (1) as far as possible onto the intake fitting of the cylinder.

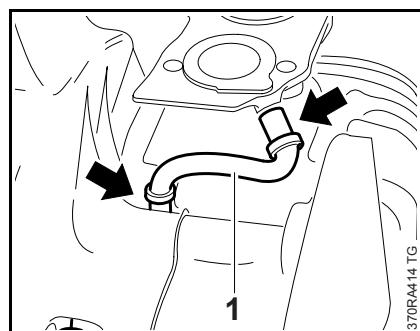
The tab (arrow) must be located in the guide.



370RA117 TG

- Insert and tighten down the screws (arrows).
- Push the impulse hose onto the connector on the flange, **12.6.1**.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

12.6.1 Impulse hose



370RA414 TG

- Remove the carburetor, **12.2**.

- Disconnect the impulse hose (1) from the connectors (arrows).

- Take out and examine the impulse hose (1), replace if necessary.

The impulse hose must not display any signs of damage, otherwise it must be replaced.



370RA415 TG

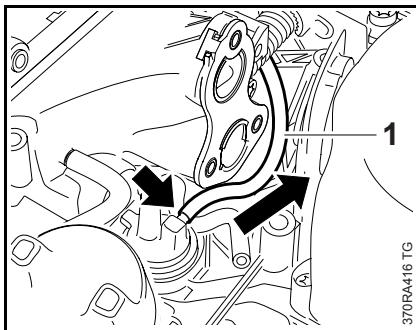
- Push the impulse hose (1) onto the connectors (arrows) as far as possible.
- Reassemble remaining parts in reverse order.

12.7 Tank vent

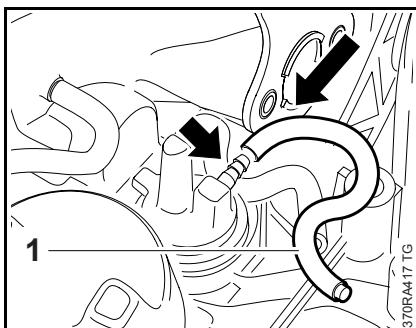
12.7.1 Testing

If problems develop in the carburetor or fuel supply, the tank vent must always also be tested and replaced if necessary. Correct functioning is determined by testing the fuel tank under vacuum or at gauge pressure via the fuel hose.

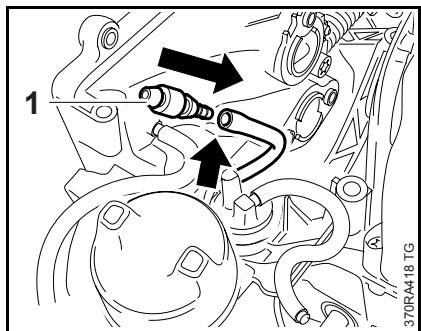
- Open the filler cap and drain the fuel tank in accordance with regulations, **1**.
- Close the filler cap.
- Remove the air filter, **12.1**.
- Remove the carburetor, **12.2**.



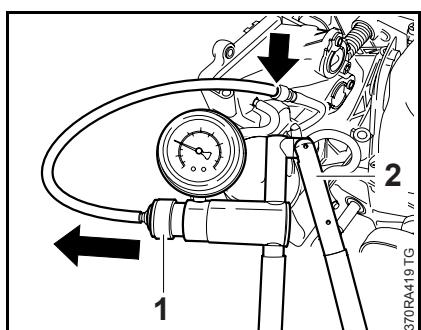
- Disconnect the fuel hose (1) of the manual fuel pump from the connector (arrow).



- Connect a separate fuel hose (1) to the connector (arrow) and seal it.



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

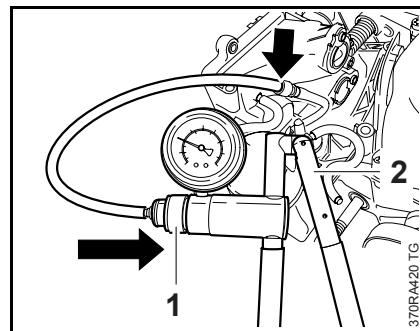


Testing with negative pressure

- Slide ring (1) to the left and connect the pump (2) 0000 850 1300 to the double nipple (arrow). Build up a vacuum in the fuel tank.

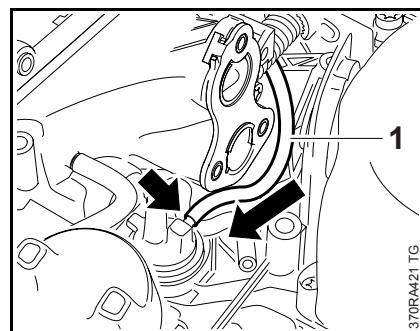
Pressure is equalized via the tank vent. A negative pressure must not build up inside the tank.

- Clean the area around the tank vent.
- Replace the tank or tank vent if necessary, **12.7.2** or **12.9**.



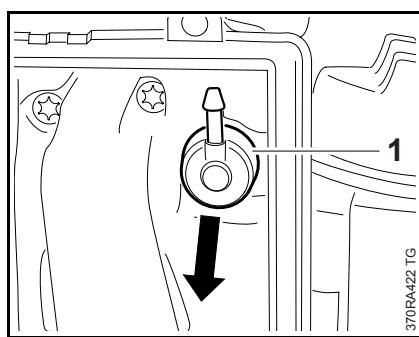
Testing with gauge pressure

- Slide ring (1) to the right and connect the pump (2) 0000 850 1300 to the double nipple (arrow). Build up gauge pressure in the tank.
- Actuate the pump until the pressure gauge shows a pressure of 0.3 bar. If this pressure remains constant for at least 20 seconds, the tank and tank vent are airtight. If the pressure drops, the leak must be located and the defective part replaced.



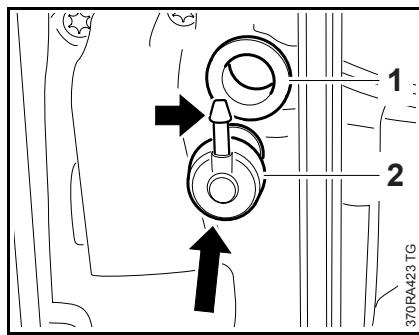
- Disconnect the separate fuel hose.
- Connect the fuel hose (1) of the manual fuel pump to the connector (arrow).
- Reassemble remaining parts in reverse order.

12.7.2 Removal and installation



- Remove the air filter, **12.1.**
- Pry out the tank vent (1).

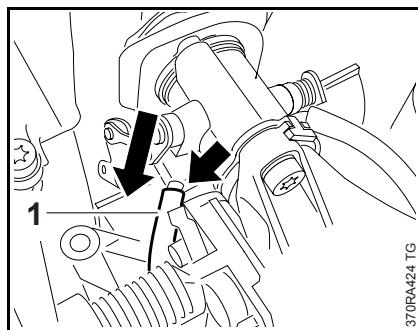
Always fit a new tank vent.



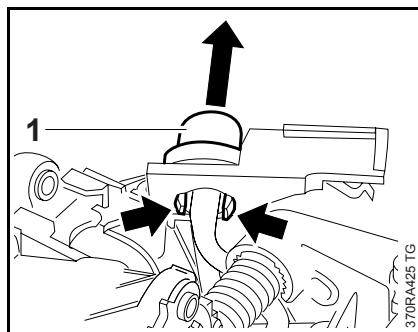
- Examine the grommet (1). Pry it out and fit a new grommet if necessary.
- Install the grommet so that the rubber lip encloses the hole completely.
- Align the new tank vent (2) so that the connector (arrow) points upwards.
- Push the new tank vent (2) as far as possible into the grommet.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5.**

12.7.3 Manual fuel pump

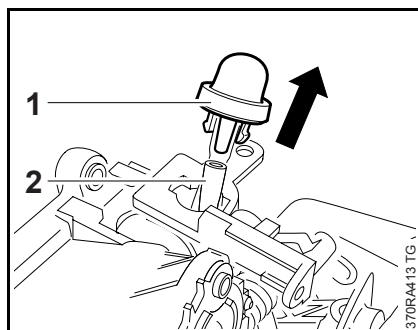
The fuel pump must always be replaced if defective.



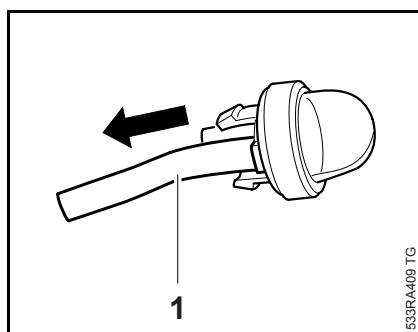
- Remove the shroud, **7.4.**
- Remove the choke lever, **11.2.1.**
- Pry out the holder, **11.2.1.**
- Disconnect the fuel hose (1) from the connector (arrow).



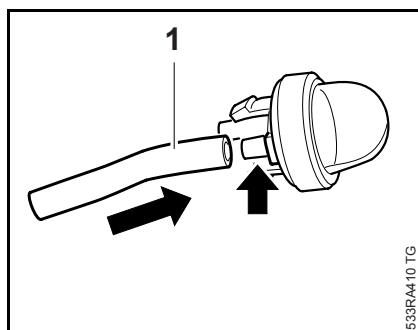
- Press the lugs (arrows) together and pull out the fuel pump (1).



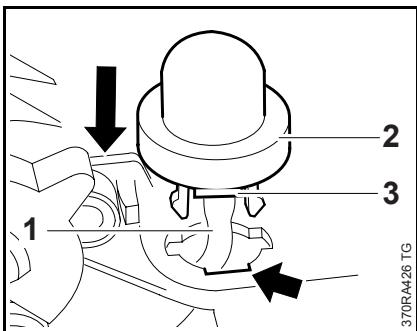
- Pull the fuel pump (1) off the fuel hose (2).
- Examine the fuel hose (2), replace if necessary, **12.8.2.**



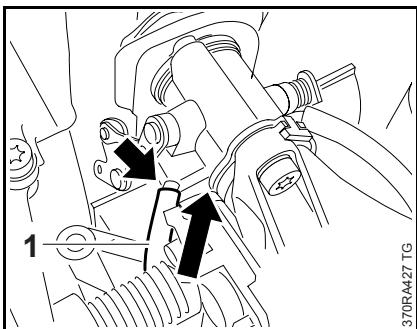
- Disconnect the fuel hose (1).
- Examine the fuel hose, replace if necessary.



- Connect the fuel hose (1) to the short connector (arrow) on the new fuel pump.



- Push the fuel pump (2) into the fuel hose (1).
- Slide the fuel pump (2) into the hole with the shoulder (3) facing the recess (arrow) until the lugs engage.



- Install the holder, **11.2.1**.
- Connect the fuel hose (1) to the connector (arrow).
- Install the choke lever, **11.2.1**.
- Check correct functioning.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

12.8 Fuel Intake

12.8.1 Pickup body

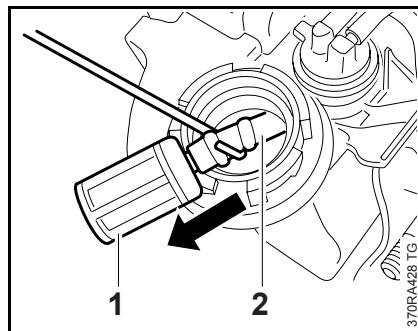
Impurities which are entrained into the fuel tank with the fuel are trapped by the pickup body. With time, the fine pores in the pickup body become clogged with very fine dirt particles. This reduces the intake diameter and fuel can no longer be delivered in sufficient quantities.

Always check the fuel tank and pickup body first if problems develop in the fuel supply.

- Troubleshooting, **4.5** or **4.6**.

Clean the fuel tank if necessary.

- Open the filler cap and drain the tank.
- Fill a little clean gasoline into the tank, close the tank and shake it thoroughly.
- Reopen the tank and empty it.
- Dispose of fuel in accordance with regulations, **1**.

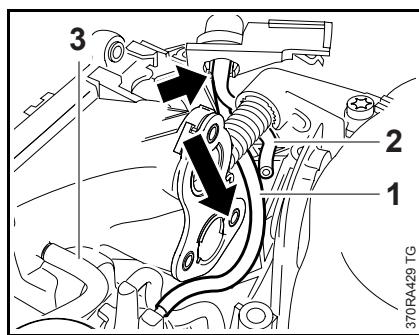


- Open the filler cap.
- Use hook 5910 893 8800 to pull the pickup body (1) out of the fuel tank.

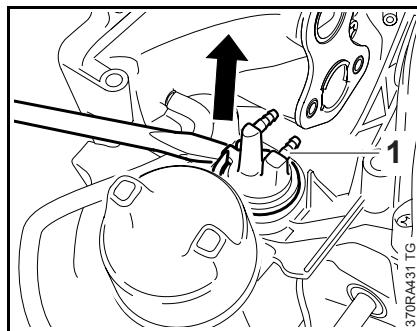
Take care not to overextend the fuel hose.

- Pull the pickup body (1) off the fuel hose (2), examine it and clean or replace it if necessary.
- Reassemble parts in reverse order.

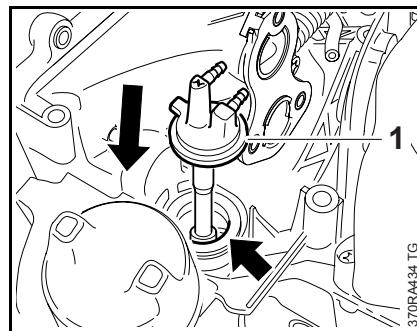
12.8.2 Fuel hoses



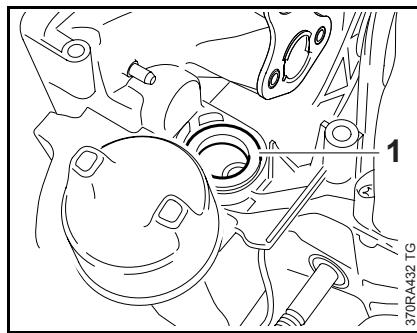
- Remove the compensator hose (3), **12.2.**
- Remove the carburetor, **12.2.**
- Remove the pickup body, **12.8.1.**
- Remove the holder, **11.2.1.**
- Disconnect the fuel hose (1+2) from the connectors (arrow).
- Examine the fuel hose (2), replace if necessary.
- Reassemble parts in reverse order.



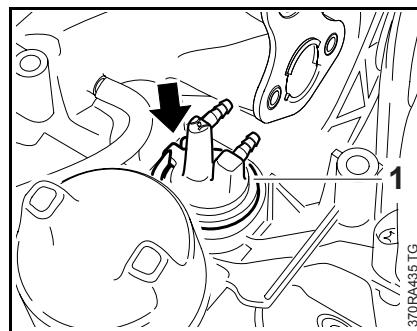
- Pry the connector (1) out at the tab and pull it out of the fuel tank.



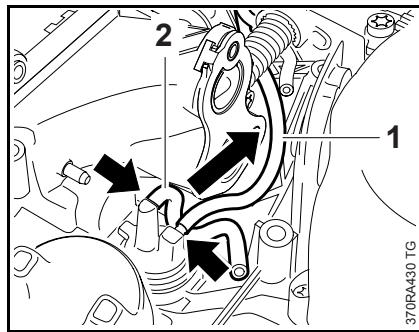
- Slide the connector (1) into the hole (arrow) of the fuel tank with the fuel hose first.



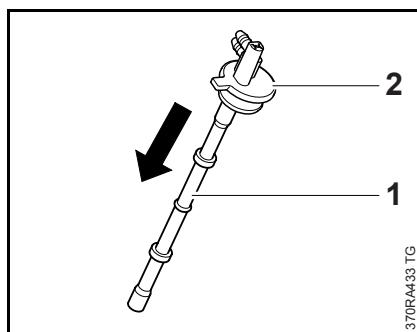
- Examine the grommet (1). Pry it out and fit a new grommet if necessary.
- Fit the grommet so that the rubber lip encloses the hole completely.



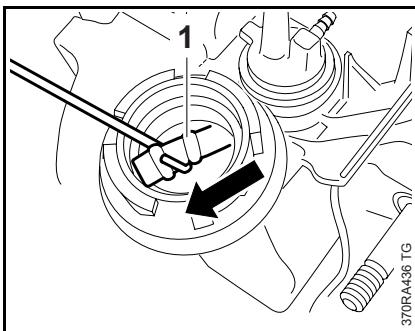
- Align the connector (1) so that the tab (arrow) lies between the ribs.
- Press the connector (1) as far as possible into the hole in the housing.
- Coat with STIHL Press Fluid, **14.**



- Pull the fuel hose (1+2) off the connector (arrows).
- Examine the fuel hoses, replace if necessary.



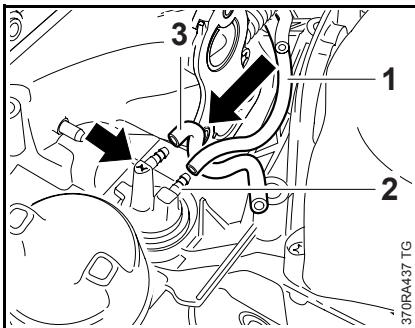
- Pull the fuel hose (1) off the connector (2).
- Check the various parts and replace if necessary.
- Reassemble the parts in reverse order.



- Use hook 5910 893 8800 to pull the fuel suction hose (1) out of the fuel tank.

Take care not to overextend the fuel hose.

- Fit the pickup body, **12.8.1.**
- Close the filler cap.



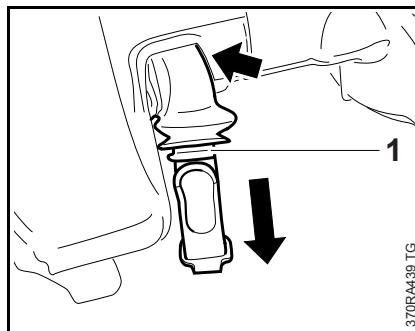
- Connect the fuel hose (1) to the connector of the manual fuel pump, **12.7.3.**
- Connect the fuel hose (1) from the fuel pump to the lower connector (2).
- Connect the fuel hose (3) to the upper connector with symbol (arrow). It is subsequently connected to the lower connector on the carburetor, **12.2.**
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5.**

12.8.3 Fuel tank filler cap

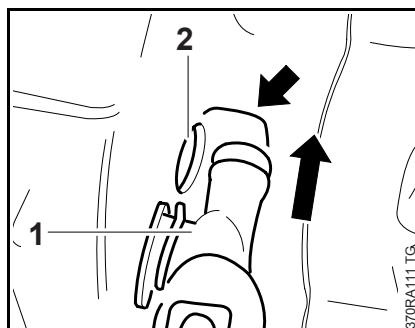
- See user manual.

12.9 Tank housing, removal and installation

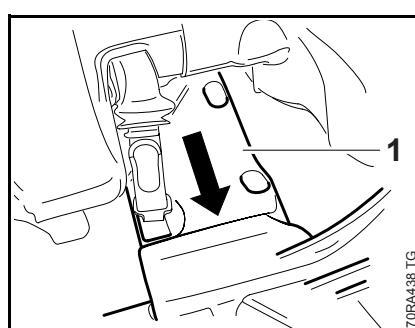
- Empty the fuel tank.
- Dispose of the fuel, **1.**
- Remove the shroud, **7.4.**
- Remove the carburetor, **12.2.**
- Remove the handlebar, **10.5.**
- Remove the support, **10.6.**
- Remove the AV spring on the carburetor, **10.4.**



- Pull the hose (1) out of the crankcase (arrow).
- Examine the hose and replace it if necessary.



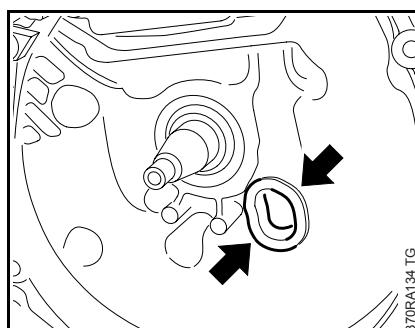
- Remove the flywheel, **8.5.**
- Slide the hose (1) into the recess (arrow) in the crankcase and then push it into the opening (2) in the side of the ignition-side half of the crankcase.



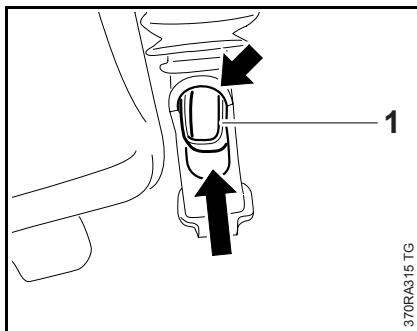
- Pull the tank housing (1) down and out of the hose and remove it from the crankcase.

Examine the tank housing and replace it if necessary.

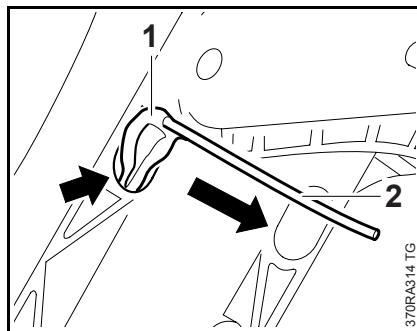
Those parts of the old tank housing which are not supplied with the new tank housing must be reused – see spare parts list.



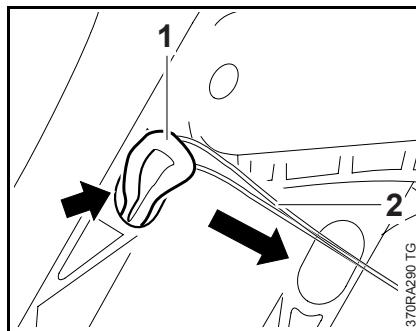
- Check that the hose is correctly seated: the hose (arrows) must enclose the opening completely on the flywheel side.



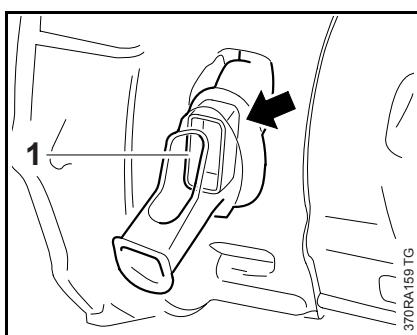
- Slide the sleeve (1) into the opening (arrow) in the hose until it lies flush.



- Pull the hose (1) into the tank housing with the tab (2) until the hose completely encloses the opening (arrow).
- Cut off the tab.

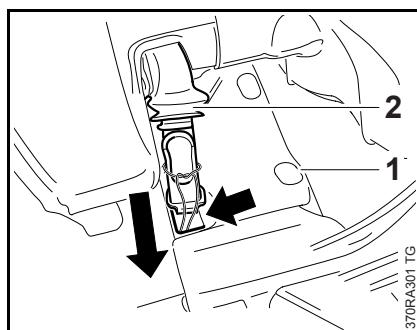


- Pull the hose (1) into the tank housing with the ends of the string (2) until the hose completely encloses the opening (arrow).
- Remove the string.
- Install the handlebar, **10.5**.
- Reassemble remaining parts in reverse order.
- Tightening torques, **3.5**.

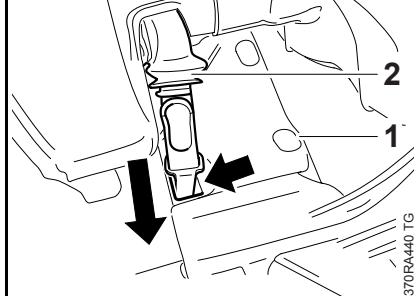


- Note the position (arrow) of the sleeve (1).

Fitting a new hose



- Position the tank housing (1) on the crankcase from below.
 - Lay a piece of string (approx. 30 cm) around the hose (2) (single loop) and guide the ends of the string through the opening (arrow) in the tank housing (1).
- Hold the tank housing (1).



- Position the tank housing (1) on the crankcase from below.
 - Draw the hose (2) through the opening (arrow) in the tank housing with the tab.
- Hold the tank housing (1).

13. Special tools

New special tools

No.	Part name	Part No.	Use	Re-marks
1	Clamping plate for cut-off machine	4238 890 2100	Mount cut-off machine on assembly stand	
2	Flange	4238 890 1200	Leakage testing	
3	Sleeve	5910 893 1707	For installing tool, 10	
4	Tightening ring	4238 893 7000	Piston installation	
5	Press sleeve	4238 893 2400	Press in oil seal	

Existing special tools

No.	Part name	Part No.	Use	Re-marks
1	Assembly stand	5910 890 3101	Mount cut-off machine for repair (support 5910 850 1650 mounted)	
2	Support	5910 850 1650	Mount support on assembly stand (only for the assembly stand version 5910 890 3100)	
3	Pump	0000 850 1300	Test crankcase and carburetor for leaks	
4	Sealing plate – Hose 135 mm / 5 5/16"	0000 855 8106 1110 141 8600	Seal exhaust bore Test carburetor for leaks	
	– Nipple	0000 855 9200	Test carburetor for leaks	
5	Puller	5910 890 4501	Remove limiter caps	
6	Socket, 13 mm, long reach	5910 893 2804	Remove and install decompression valve	
7	Plug	4221 025 2200	Leakage testing (on decompression valve)	
8	Locking strip	0000 893 5903	Block crankshaft	
9	Socket, S19x12.5L	5910 893 5613	Connector	
10	Assembly hook	5910 890 2800	Detach springs from clutch shoes	
11	Socket, 13 mm	5910 893 5608	Unscrew flywheel nut	
12	Puller	1135 890 4500	Release flywheel	
13	Setting gauge	1127 890 6400	Set the air gap between ignition module and flywheel	
14	Ignition system tester, ZAT 4	5910 850 4503	Test ignition system	
15	Ignition system tester, ZAT 3	5910 850 4520	Test ignition system	
16	Puller – Jaw (profile No. 3.1 and 4) – Jaw (profile No. 2)	5910 890 4400 0000 893 3706 0000 893 3700	Remove oil seals Remove oil seal(s) Remove oil seal(s)	
17	Installing sleeve	1118 893 4602	Protect oil seal on clutch side	
18	Assembly drift	1110 893 4700	Remove and install the piston pin	
19	Installing tool, 10	5910 890 2210	Fit hookless snap rings in piston	

No.	Part name	Part No.	Use	Re-marks
20	Wooden assembly block	1108 893 4800	Locate piston	
21	Service tool ZS	5910 007 2200	Remove crankshaft	
22	Press arbor	4119 893 7200	Drive grooved ball bearings out of spindle bearing	
23	Press arbor	4224 893 7200	Drive grooved ball bearing out of poly V-belt pulley	
24	Stud puller, M8	5910 893 0501	Unscrew studs for attaching the cast arm with guard	
25	Assembly hook	5910 893 8800	Remove pickup body	
26	Test disk	5910 851 6100	Test axial truth of running of the cutting wheel mount	
27	Dial gauge holder	5910 850 6000	Test axial truth of running	
28	Dial gauge	0000 890 9100	Test axial truth of running	
29	Torque wrench with optical/ acoustic signal	5910 890 0302	Screw connections (0.5 to 18 Nm) (with visual and acoustic signaling)	
30	Torque wrench with optical/ acoustic signal	5910 890 0312	Screw connections (6 to 80 Nm) (with visual and acoustic signaling)	
31	Socket, T27x125	0812 542 2104	Remove and install spline socket head screws with electric or pneumatic screwdrivers; tighten down screws with torque wrench	1)
32	Screwdriver T27x150	5910 890 2400	IS-P screws (4 mm)	1)
33	Pliers A10	0811 611 8200	Remove and install external retaining rings	
34	Pliers C19	0811 641 8380	Remove and install internal retaining rings	

Remarks:

1) Use only for releasing.

14. Servicing accessories

No.	Part name	Part No.	Use
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 starter cover
3	Press Fluid OH 723	0781 957 9000	Rubber buffers in AV system
4	STIHL multi-purpose grease	0781 120 1109	High-voltage output on ignition module
5	Tube of sealant Dirk HT red	0783 830 2000	Engine pan, oil seals (outside)
5	Medium-strength thread-locking adhesive (Loctite 242)	0786 111 2101	
6	High-strength thread-locking adhesive (Loctite 270)	0786 111 2109	
7	Very high-strength thread-locking adhesive (Loctite 648)	0786 111 2117	
8	Standard solvent-based degreasant not containing any chlorinated or halogenated hydrocarbons		Cleaning sealing faces and the carburetor, cleaning the crankshaft stub and tapers in flywheel

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