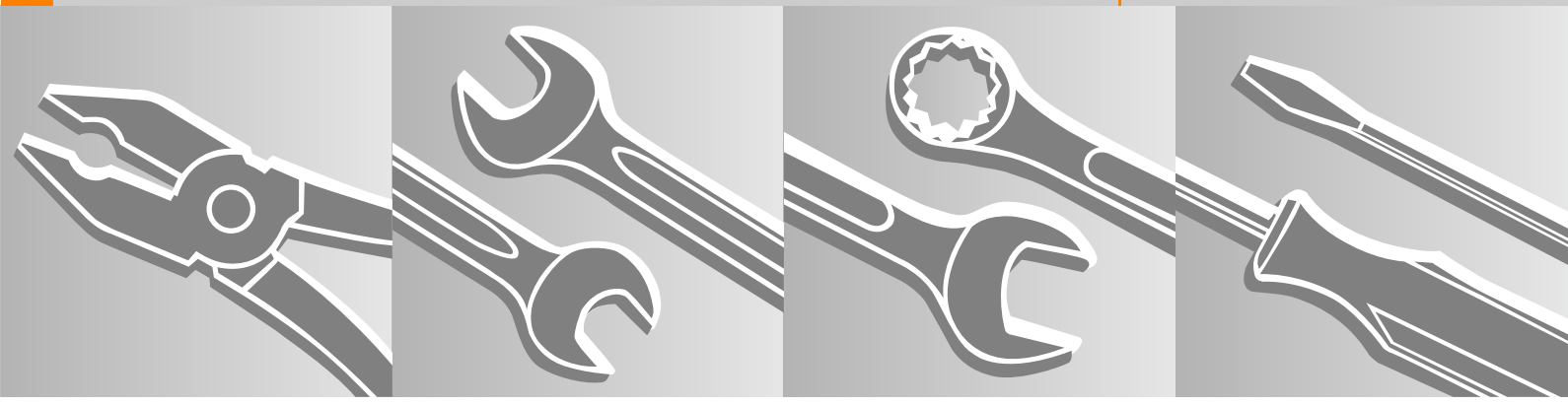
STIHL Series 4149 Powerhead

2014-10



FS 94

KM 94

SP 92, SP 92 T

Contents

RA_593_00_01_03

STIHL®

1.1 Introduction

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

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

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

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

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

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

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

In the descriptions:

- Action to be taken as shown in the illustration above the text

– Action to be taken that is not shown in the illustration above the text

In the illustrations:

➧ Pointer

➞ Direction of movement

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

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

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

Storing and disposing of oils and fuels

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

1.2 Safety Precautions

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

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

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

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

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.

Always wear suitable protective gloves for operations in which components are heated for assembly or disassembly. Hot grease can cause burn injuries. The lubricants in the components can become very hot.

Improper handling may result in burns or other serious injuries.

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

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

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

Fuel system – hose barb connectors

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

Avoid damaging the hose barb – do not use sharp-edged pliers, screwdrivers, etc.
Do not cut open fuel hoses with a knife or similar tool.

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

Install new fuel hoses either dry or with the aid of STIHL press fluid, 🕮 12.

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

Coat the ends of the hoses and the connectors with STIHL press fluid and then push the new hoses on to the hose barbs, 🕮 12.

2. Specifications

2.1 Engine

	SP 92, SP 92 T	FS 94, KM 94
Displacement:	21.4 cm^3	24.1 cm^3
Bore:	33.0 mm	35.0 mm
Stroke:	25.0 mm	25.0 mm
Engine power to ISO 8893:	0.75 kW (1.0 bhp) at 8,500 rpm	0.9 kW (1.2 bhp) at 8,500 rpm
Max. torque at engine speed (rated):	1 Nm / 5,000 rpm	1.3 Nm / 5,000 rpm
Cut-off speed (rated):	9,800 rpm [1)]	9,800 rpm [1)]
Idle speed (rated):	2,800 rpm	2,800 rpm
Clutch:	Centrifugal clutch without linings	Centrifugal clutch without linings
Clutch engages at (rated):	3,850 rpm	3,850 rpm
Crankcase leakage test		
at gauge pressure:	0.5 bar	0.5 bar
under vacuum:	0.5 bar	0.5 bar

2.2 Fuel System

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

2.3 Ignition System

Air gap between ignition module and fanwheel:	0.30 (+ 0.15/- 0.20) mm	0.30 (+ 0.15/- 0.20) mm
Spark plug (resistor type):	NGK CMR 6 H BOSCH USR 4 AC	NGK CMR 6 H BOSCH USR 4 AC
Electrode gap:	0.5 mm	0.5 mm

1) The engine reaches its maximum RPM and maximum power after the break-in period (5 to 10 tank fillings) – do not make any changes to the high speed screw (**H**) during the break-in period.

2.4 Tightening Torques

DG and P (Plastoform) screws are used in polymer and light metal components. These screws form a permanent thread when they are installed for the first time. They can be removed and installed as often as necessary without impairing the strength of the screwed assembly, providing the specified tightening torque is observed.
For this reason it is **essential to use a torque wrench.**

Use the following procedure when refitting a DG or P screw in an existing thread:
Insert the screw in the hole and rotate it counterclockwise until it drops down slightly and engages in the existing thread. Tighten the screw clockwise to the specified torque.

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

Micro-encapsulated screws and screws coated with threadlocking adhesive:
Before re-installing, clean both threads (screw tap into female thread by hand and then blow out with compressed air; clean male thread with brush), coat micro-encapsulated screws with medium-strength Loctite 242 or 243, and screws previously coated with threadlocking adhesive with Loctite (see list of screws below).

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

Do not mix up screws with and without binding heads.

Fastener	Thread size	For component	Torque Nm	Remarks
Screw	M 5x12	Cover / shroud	5.0	1), 2)
Screw	D 5x24	Rewind starter / shroud / cylinder	6.0	1), 2)
Screw	D 5x24	Rewind starter / tank housing / crankcase	6.0	1), 2)
Screw	P 4x16	Control handle molding, outer / inner	1.3	1), 2)
Screw	M 5x12	Control handle clamp/shaft	5.0	1), 2)
Screw	P 4x10	Control handle, throttle set wheel / lever / inner handle molding	1.3	
Screw	M 5x12	Filter cover / filter housing	5.0	
Nut	M 5	Filter housing / carburetor	3.5	
Screw	D 5x12	Sleeve, anti-vibration / drive tube		5)
Screw	M 5x20	Sleeve, anti-vibration clamp screw	5.5	1), 2)
Screw	M 6x25	Clutch / flywheel	12.0	
Screw	D 5x24	Crankcase / cylinder	8.0	1), 2)
Screw	D 5x24	Crankcase, flywheel side / crankcase, starter side	8.0	1), 2)
Screw	D 5x24	Fan housing / shroud / crankcase	6.0	1), 2)
Screw	D 5x24	Fan housing / crankcase	6.0	1). 2)
Carrier	M 8x1	Carrier / crankshaft	17,0	
Screw	D 5x20	Muffler / cylinder	8,0	1). 2)
Nut	M 6	Flywheel / crankshaft	12.0	4)
Nut	M 8	Flywheel / crankshaft	16.0	4)

Fastener	Thread size	For component	Torque Nm	Remarks
Screw	D 5x12	Carburetor / throttle cable	3.0	
	M 10x1	Spark plug / cylinder	12.0	
Screw	D 4x20	Ignition module / cylinder	4.0	1), 2)
Screw	D 5x28	Spacer flange / cylinder	7.0	1), 2)

Remarks:

1) Screws with binding head
2) Waxed screws
3) Micro-encapsulated screws
4) Degrease crankshaft / flywheel and mount oil-free
5) Tighten down until head is seated

3. Troubleshooting

3.1 Clutch

Condition	Cause	Remedy
Working tool stops under full load	Clutch shoes badly worn	Install new clutch
	Clutch drum badly worn	Install new clutch drum
Working tool runs when engine is idling	Engine idle speed too high	Readjust with idle speed screw **LA**
	Clutch spring stretched	Replace the clutch spring or install new clutch
	Clutch spring broken	Replace the clutch spring
Loud noises	Clutch spring stretched	Replace clutch spring
	Clutch drum bearing damaged	Replace fan housing
	Clutch screws loose	Tighten down screws, replace clutch if necessary and check tapped holes in flywheel, replace flywheel if necessary
	Clutch shoes worn	Install new clutch

Condition	Cause	Remedy
Starter rope broken	Rope pulled out too vigorously as far as stop or constantly over the edge	Install new starter rope
	Normal wear	Install new starter rope
Starter rope does not rewind	Rewind spring very dirty or corroded	Clean or replace rewind spring
	Insufficient spring tension	Check rewind spring and increase tension
	Rewind spring broken	Install new rewind spring
Starter rope cannot be pulled out far enough	Spring overtensioned	Check rewind spring and reduce tension
Starter rope can be pulled out almost without resistance (crankshaft does not turn)	Pegs on pawls broken or pawls worn	Replace pawls
	Pawl springs fatigued	Fit new springs and check pawls, replace if necessary
	Springs not installed correctly	Install springs correctly
	Lugs on carrier worn	Fit new carrier, check pawls and replace if necessary
	Spring loop in ErgoStart spring housing not attached to carrier	Attach ErgoStart spring loop to carrier

Condition	Cause	Remedy
Starter rope is difficult to pull or rewinds very slowly	Starter mechanism is very dirty	Thoroughly clean complete starter mechanism
	ErgoStart spring in rope rotor fatigued	Replace ErgoStart spring, check carrier and rope rotor, replace if necessary
	At very low outside temperatures: Lubricating oil on rewind spring becomes viscous (spring windings stick together) or moisture has got onto the rewind spring (spring windings frozen together)	Coat rewind spring with a small amount of standard solvent-based degreasant (containing no chlorinated or halogenated hydrocarbons), then pull rope carefully several times until normal action is restored

3.3 Ignition System

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

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

3.4 Carburetor

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

3.5

Condition	Cause	Remedy
Engine loses power during acceleration	Jet on the low speed screw **L** dirty – insufficient volume of fuel, engine running too lean	Clean the carburetor
	Fuel strainer dirty	Clean fuel strainer and carburetor
Engine will not idle, idle speed too high	Control valve opened too wide by idle speed screw (**LA**)	Reset idle speed screw (**LA**) correctly
	Oil seals / crankcase leaking	Seal oil seals / crankcase, replace if necessary
	Cylinder gasket leaking	Perform leakage test, inspect sealing faces and replace cylinder gasket if necessary
	Gaskets on spacer flange and carburetor leaking, or crack in spacer flange	Perform leakage test, replace gaskets and spacer flange if necessary
	Spring in control valve broken or fatigued – throttle lever is not returned to original position	Install new control valve, check and replace carburetor if necessary
Engine stops while idling	Setting of low speed screw (**L**) too rich or too lean	Reset low speed screw (**L**) correctly
	Setting of idle speed screw **LA** incorrect – control valve completely closed	Reset idle speed screw (**LA**) correctly
	Control valve lever does not locate against idle speed screw **LA** – control valve completely closed	Open the throttle wide, the control valve lever returns to its original position and locates against the idle speed screw (**LA**), replace control valve if necessary
	Tank vent faulty	Fit new tank vent
	Leak in fuel hose from tank to carburetor	Install a new fuel suction hose.

Condition	Cause	Remedy
Working tool runs when engine is idling	Engine idle speed too high	Readjust idle speed screw **LA** (counterclockwise)
	Clutch spring stretched or fatigued	Replace the clutch spring or install new clutch
	Clutch spring hooks broken	Replace the clutch spring
Engine speed drops quickly under load – low power	Air filter dirty	Clean or replace fleece filter; replace paper filter
	Control valve not opened fully	Check the throttle cable and re-adjust if necessary.
	Leak in fuel hose from tank to carburetor	Seal connections or install new fuel hose
	Setting of high speed screw (**H**) too rich	Check basic carburetor setting, correct if necessary
	Tank vent faulty	Fit new tank vent
	Fuel pickup body dirty	Fit new pickup body
	Fuel strainer dirty	Clean fuel strainer in carburetor, replace if necessary
	Main jet bores or ports blocked	Clean the carburetor
	Pump diaphragm damaged or fatigued	Fit new pump diaphragm
	Ignition timing wrong, flywheel out of adjustment – key in flywheel has sheared off	Install new flywheel

Condition	Cause	Remedy
Engine running extremely rich, has no power and a very low maximum speed	Cold start device of control valve sticking or does not return to original position	Check and clean the control valve or replace if necessary
Engine does not start	No spark	Replace spark plug, check ignition module/control unit, replace if necessary
	Starter rope not pulled vigorously enough – fuel mixture too rich (flooded)	Remove and dry off the spark plug, pull starter rope several times to clear combustion chamber, refit and tighten down the spark plug, repeat starting procedure
	Jet on the low speed screw **L** blocked – no fuel feed	Clean the carburetor or replace if necessary
	Jet on the low speed screw **L** broken – engine stalls	Install new carburetor

3.6 Engine

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

- Air filter
- Fuel system
- Carburetor
- Ignition system

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

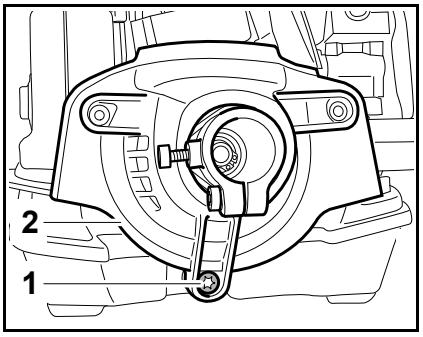
4.1 Clutch Drum

– Troubleshooting, 🕮 3.1

– Remove the rewind starter, 🕮 7.2

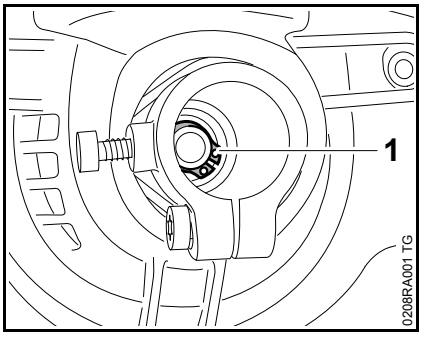
– Remove the shroud, 🕮 5.4

– Remove the drive tube, 🕮 9.1

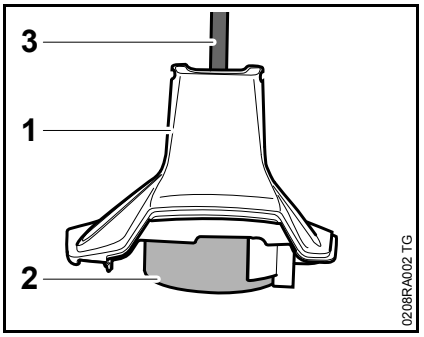


- Take out the screw (1) and remove the fan housing (2) – the two upper screws have already been removed.

– Remove the sleeve and rubber element, 🕮 8.1



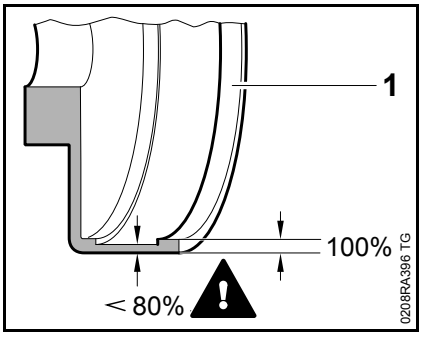
- Remove the retaining ring (1).



- Place the fan housing (1) on ring (2) 5910 893 7008 – this ensures the fan housing (1) is upright and securely supported.

- Position the ring (2) so that it engages the projecting clutch drum.

- Use suitable press arbor (3) to remove the clutch drum.



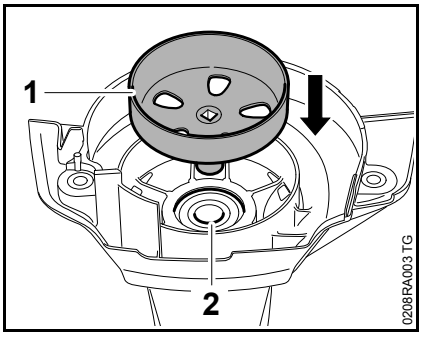
– Inspect the clutch drum (1) for signs of wear.

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

If square socket is worn or the stub damage, install a new clutch drum.

– Inspect the ball bearing and replace if necessary.

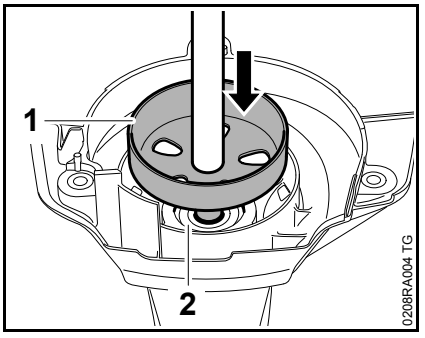
Installing



– Heat inner race of ball bearing to about 120°C (250°F).

- Position clutch drum (1) on ball bearing (2) and push it home as far as stop.

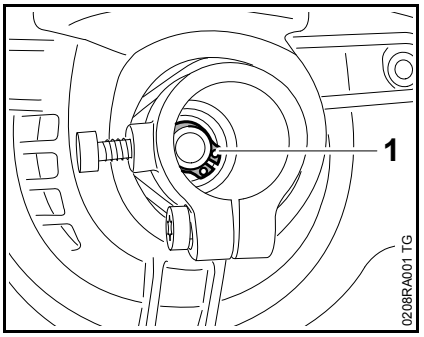
This operation must be carried out quickly because the clutch drum absorbs heat and begins to expand.



If it is not possible the heat the inner bearing race, use a bench press to install the cold clutch drum.

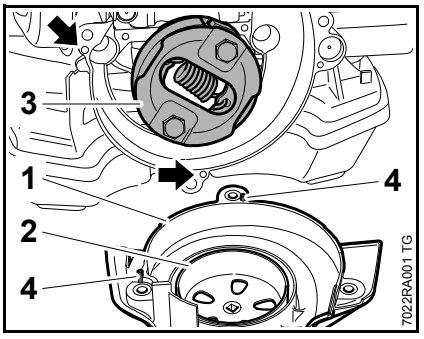
– Support the other side of the fan housing with a suitable tube on the inner race of the ball bearing.

- Position clutch drum (1) on ball bearing (2) and press it home as far as stop.

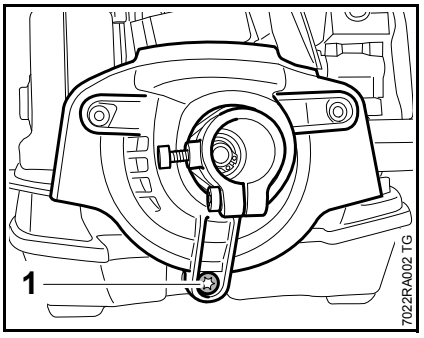


● Install circlip (1) at the other side.

– Remove the sleeve and rubber element, 🕮 8.1



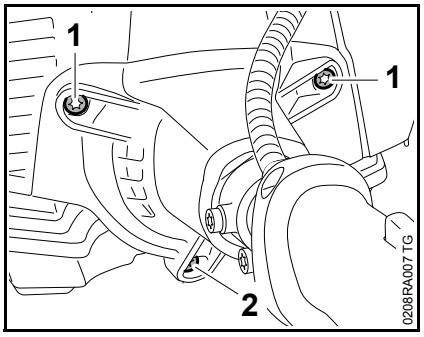
● Fit the fan housing (1) with clutch drum (2) over the clutch (3) and line it up so that the pins (4) engage the holes (arrows) in the crankcase.



● Tighten the screw (1) until the fan housing is seated
– the upper screws are not fitted and secured until the shroud is installed – do not finally tighten screw (1) yet.

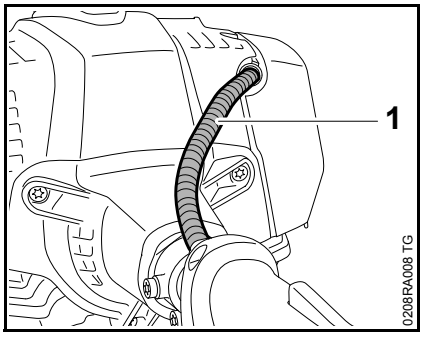
– Install the drive tube, 🕮 9.1

– Fit the shroud, 🕮 5.4



● Fit screws (1), then tighten down screw (2) and screws (1) firmly.

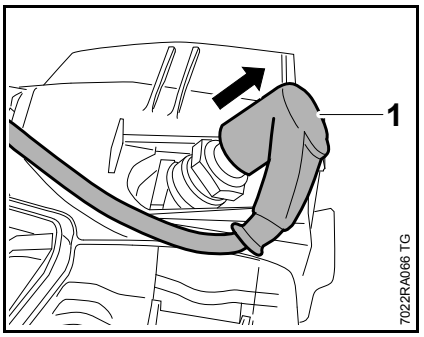
– Install the rewind starter, 🕮 7.2



● The throttle cable (1) must not be under tension.

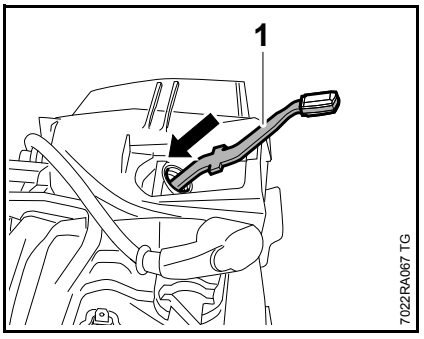
4.2 Clutch

– Remove the fan housing, 🕮 4.1

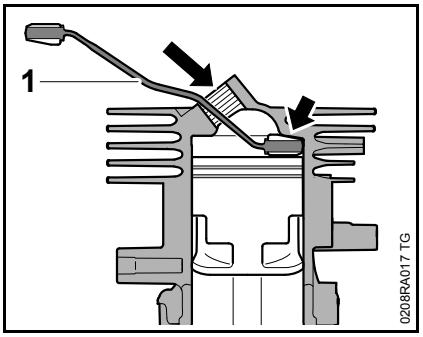


● Pull boot (1) off the spark plug.

– Unscrew the spark plug.

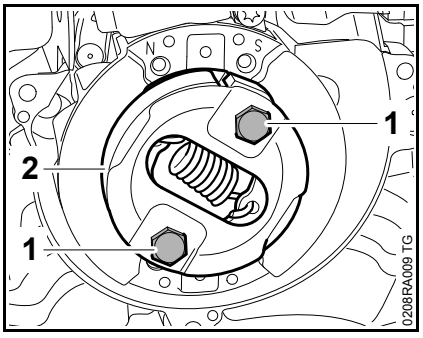


● Insert locking strip (1) 0000 893 5904 in the cylinder.

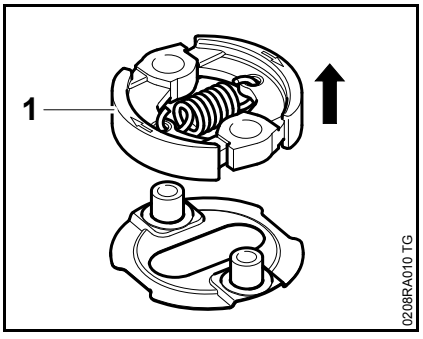


- The locking strip (1) 0000 893 5904 must butt against the cylinder wall (arrow) – as shown in the illustration.

Disassembling



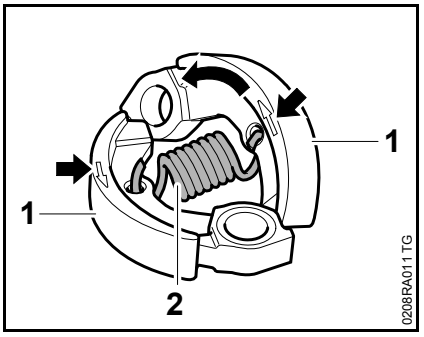
- Take out the screws (1).
- Remove the clutch (2) with cover washers.



– Remove the upper cover washer.

- Pull the clutch (1) off the lower cover washer.

Assembling

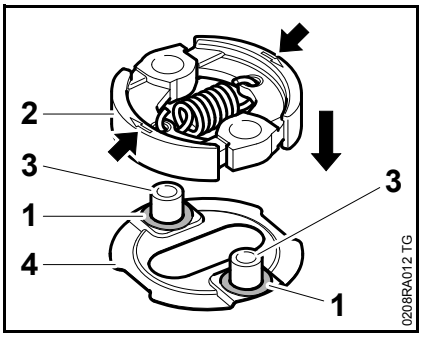


- Fold the clutch shoes (1) and unhook the spring (2).

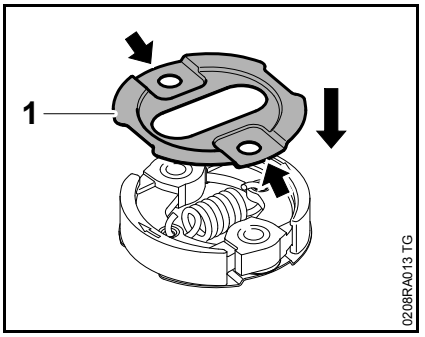
Position the clutch shoes (1) so that the markings (arrows) are visible.

The spring (2) must be hooked into the back of the clutch shoes (1).

– Reassemble the clutch shoes in the reverse sequence.

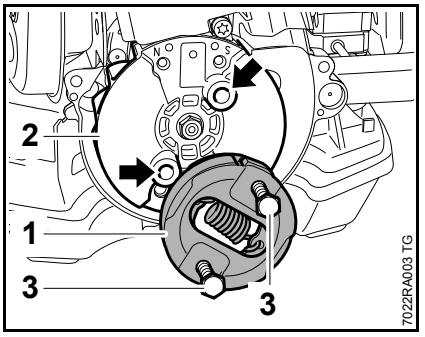


- Fit the washers (1) over the sleeves.
- Position the clutch (2) so that the marks (arrows) face up.
- Push clutch (2) onto sleeves (3) of lower cover washer (4).



- Fit upper cover washer (1) so that the recesses (arrows) face up and the holes are in alignment.

Installing



- Position clutch (1) with cover washers on tapped holes (arrows) in flywheel (2).
- Insert and tighten down the screws (3) firmly.

– Remove the locking strip from the cylinder.

– Install the fan housing, 🕮 4.1

– Reassemble all other parts in the reverse sequence.

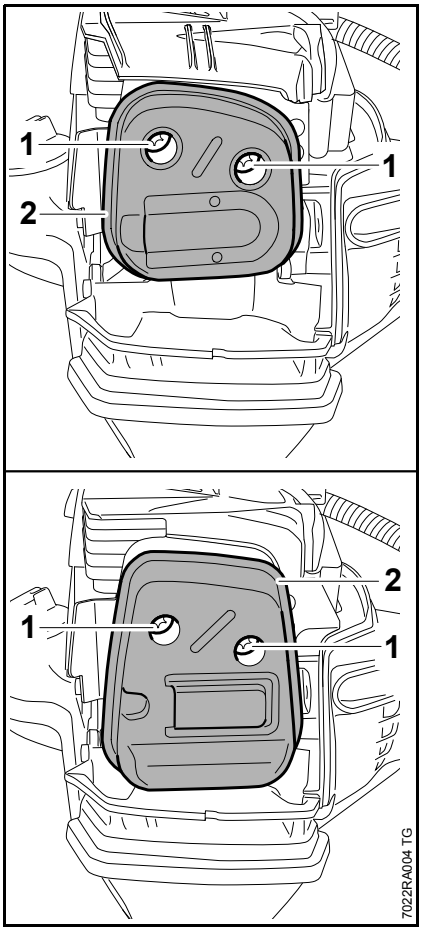
5.1 Muffler / Spark Arresting Screen

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

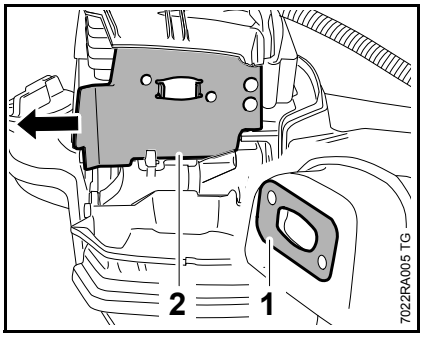
– Troubleshooting, 🕮 3

– Remove the shroud, 🕮 5.4

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

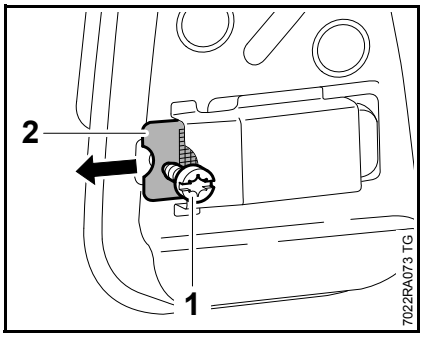


- Take out the screws (1).
- Remove the muffler (2), check it and replace if necessary.



- Remove the muffler gasket (1) and pull out the heat shield (2) sideways – always install a new muffler gasket.

Spark arresting screen
(if fitted)

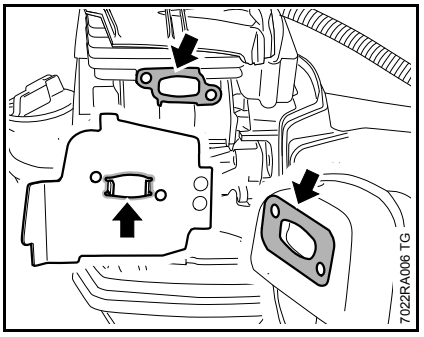


- Take out the screw (1) and pull out the spark arresting screen (2).

– Clean the spark arresting screen or replace if necessary.

– Reassemble in the reverse sequence.

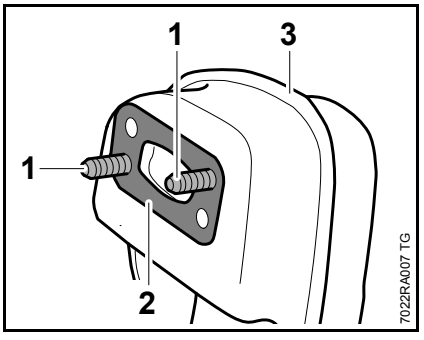
Installing



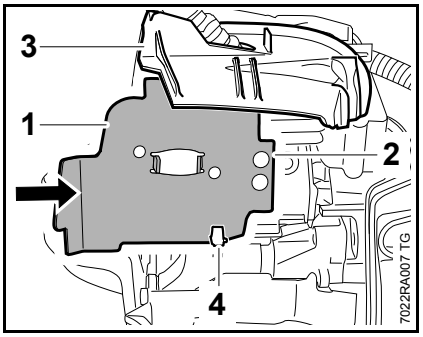
– Cover the exhaust port. Remove any dirt from around the cylinder and exhaust port.

- Check and clean the sealing faces (arrows) on the exhaust port, heat shield and muffler, remove any gasket residue – make sure there is no gasket residue or dirt in the exhaust port.

Always replace components with damaged sealing faces.

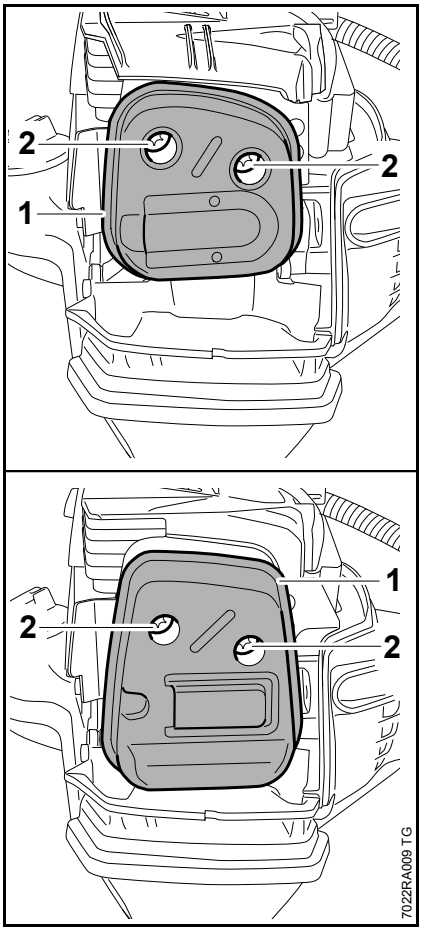


- Insert the screws (1).
- Fit new muffler gasket (2) over the screws (1) and against the muffler (3).



- Push the upper edge of the heat shield (1), tab (2) first, between the wall of the air guide shroud (3) and cylinder and its lower edge between the hook (4) and the cylinder.

- Push the heat shield (1) home until its holes line up with the holes in the cylinder.



- Carefully fit the muffler (1) in position and insert the screws (2) – do not tighten down yet.

- Check that gasket and heat shield are properly positioned.

- Insert and tighten down the screws (2) firmly.

– Reassemble all other parts in the reverse sequence.

5.2 Leakage Test

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

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

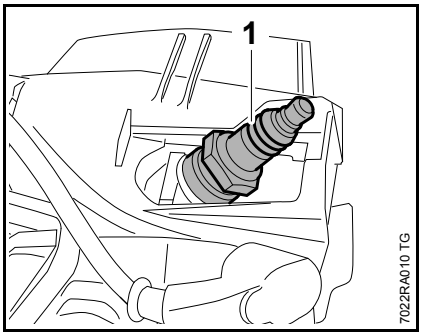
Moreover, the transition from idle speed to part or full throttle is not smooth.

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

The engine can be checked thoroughly for leaks under vacuum and pressure with the pump 0000 850 1300.

5.2.1 Preparations

– Remove the shroud, 🕮 5.4

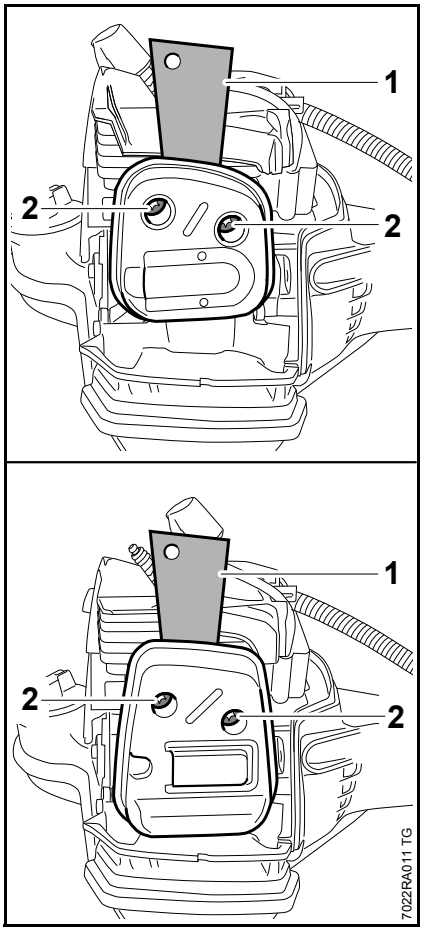


– Pull off the boot and unscrew the spark plug.

– Set the piston to top dead center. This can be checked through the spark plug hole.

● Fit the spark plug (1) and tighten it down firmly.

– Remove the heat shield and gasket, fit muffler in position and insert screws, 🕮 5.1

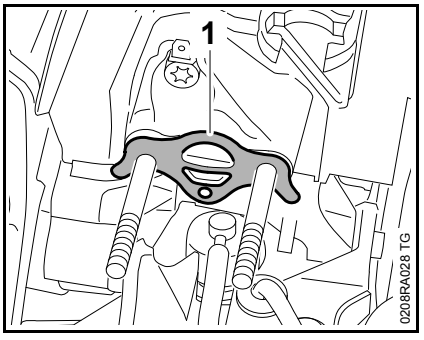


● Fit the sealing plate (1) 0000 855 8106 between the cylinder exhaust port and muffler.

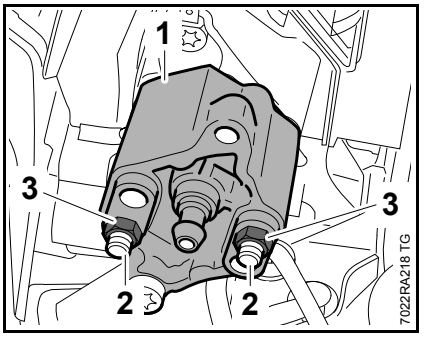
● Tighten the screws (2) moderately.

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

– Remove carburetor with fuel hoses still attached and put it to one side, 🕮 10.3



Make sure the gasket (1) is in place.



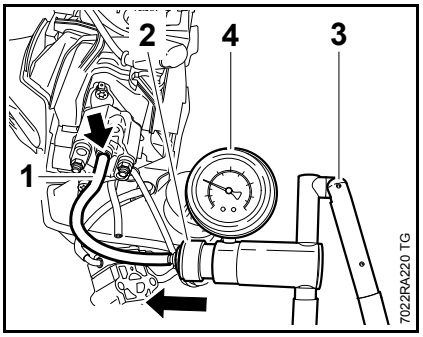
● Line up the flange (1) 5910 850 4200 and fit it over the studs (2).

● Fit the nuts (3) and tighten them down firmly.

5.2.2 Vacuum Test

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

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



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

- Push ring (2) to the left – vacuum test.

- Operate the lever (3) until the pressure gauge (4) indicates a vacuum of 0.5 bar.

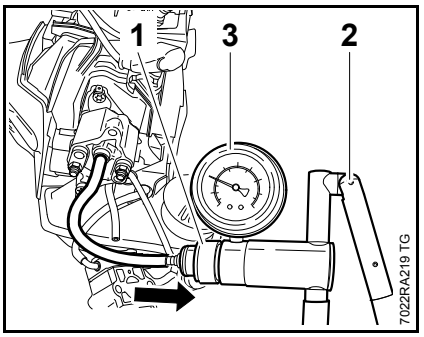
If the vacuum reading remains constant, or rises to no more than 0.3 bar within 20 seconds, it can be assumed that the oil seals are in good condition.
If the pressure continues to rise (reduced vacuum in engine), the oil seals must be replaced, 🕮 5.3.

– After finishing the test, push the ring to the right to vent the pump.

– Continue with pressure test, 🕮 5.2.3

5.2.3 Pressure Test

Carry out the same preparations as for the vacuum test, 🕮 5.2.2



- Push ring (1) to the right – pressure test.

- Operate the lever (2) until the pressure gauge (3) indicates a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the engine is airtight.

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

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

– After finishing the test, push the ring to the left to vent the pump – disconnect the hose.

– Remove the flange 5910 850 4200 from the intake manifold.

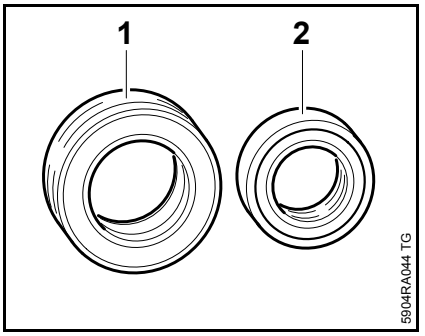
– Install the carburetor, 🕮 10.3

– Remove the muffler and the sealing plate 0000 855 8106.

– Install the gasket, heat shield and muffler, 🕮 5.1

– Reassemble all other parts in the reverse sequence.

5.3 Oil Seals



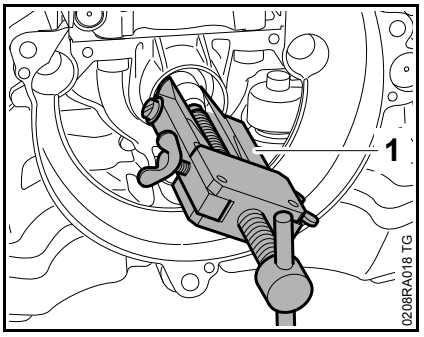
When replacing oil seals, note that the 12x22x5 oil seal (1) must be installed at the ignition side and the 10x20x4 oil seal (2) at the starter side.

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

Ignition Side

– Remove the clutch, 🕮 4.2

– Remove the flywheel, 🕮 6.5



Take care not to damage the crankshaft stub.

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

● Apply puller (1) 5910 890 4400 with No. 6 jaws 0000 893 3711.

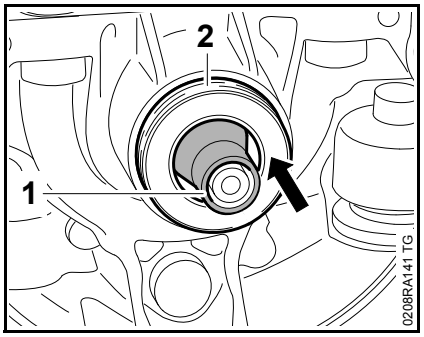
– Clamp the puller arms.

– Pull out the oil seal.

Installing

– Clean the sealing face, 🕮 12

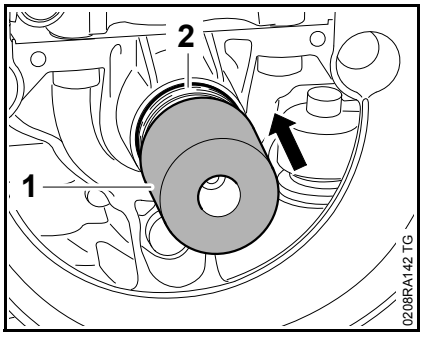
– Lubricate sealing lips of new oil seal with grease, 🕮 12



● Fit the installing sleeve (1) 4149 893 4600.

● Slip the oil seal (2), sealing lip facing the crankcase, over the installing sleeve.

– Remove the installing sleeve.



To avoid the risk of engine damage, only use press sleeve (1) 4149 893 2400 to install the oil seal.

● Fit the press sleeve (1) 4149 893 2400 with the smaller diameter (22 mm) facing the crankcase and press home the oil seal (2).

The seating face must be flat and free from burrs.

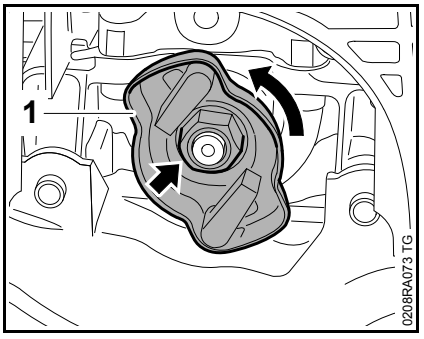
– Degrease the crankshaft taper, 🕮 12

– Reassemble all other parts in the reverse sequence.

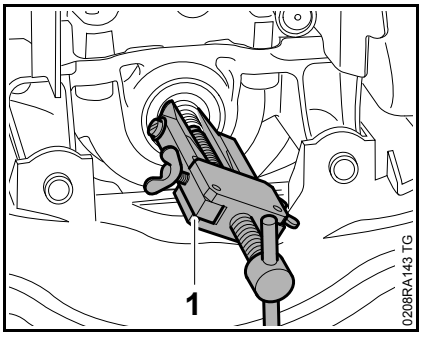
Starter Side

– Remove the rewind starter, 🕮 7.2

– Block the piston, 🕮 4.2



● Use hexagon (arrow) to loosen and unscrew carrier (1) counterclockwise.



Take care not to damage the crankshaft stub.

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

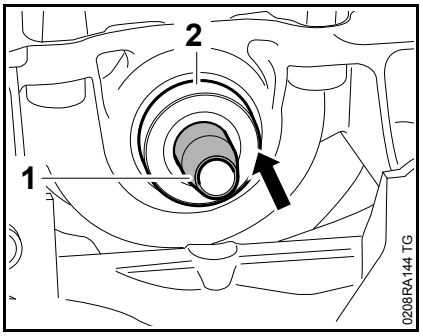
● Apply puller (1) 5910 890 4400 with No. 3.1 jaws 0000 893 3706.

– Clamp the puller arms and pull out the oil seal.

Installing

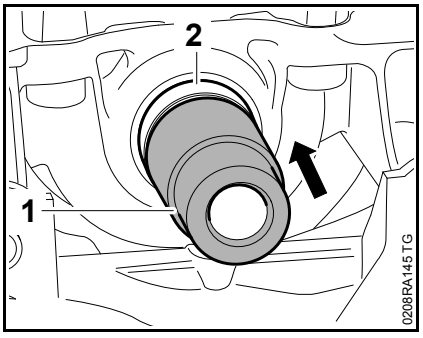
– Clean the sealing face.

– Lubricate sealing lips of new oil seal with grease, 🕮 12



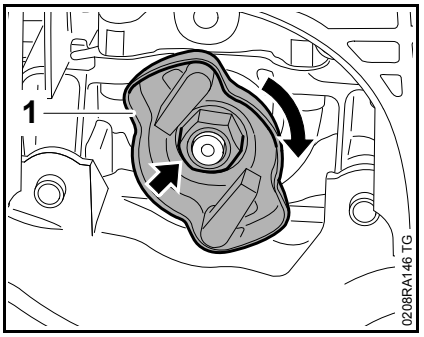
- Fit the installing sleeve (1) 1146 893 4600.
- Slip the oil seal (2), sealing lip facing the crankcase, over the installing sleeve.

– Remove the installing sleeve.



- Fit the press sleeve (1) 4149 893 2400 with the larger diameter (25 mm) facing the crankcase and press home the oil seal (2).

The seating face must be flat and free from burrs.

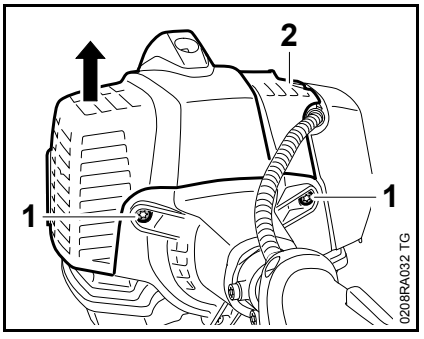


- Use hexagon (arrow) to screw carrier (1) into place clockwise, then tighten it down firmly.

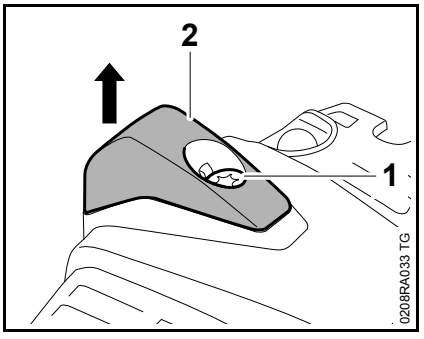
– Reassemble all other parts in the reverse sequence.

5.4 Shroud

– Remove the rewind starter, 🕮 7.2

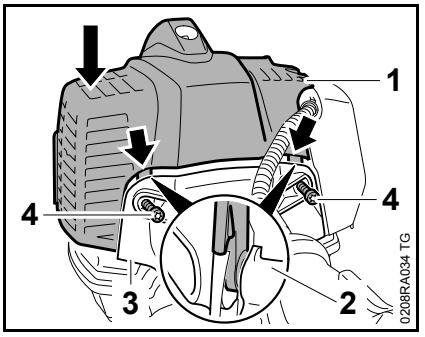


- Take out the screws (1) and remove the shroud (2).



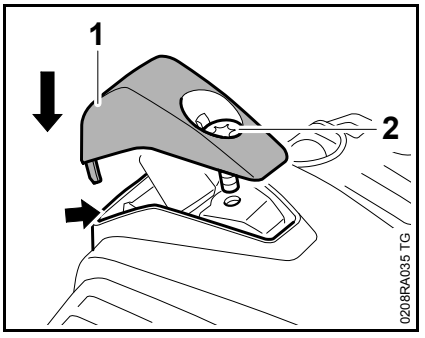
- Take out the screw (1) and remove the cover (2).

Installing



- Fit the shroud (1) so that the tabs (arrows) engage between the crankcase (2) and fan housing (3).
- Insert and tighten down the screws (4) firmly.

– Install the rewind starter, 🕮 7.2



- Push tab of cover (1) into opening in shroud and fit cover in position.
- Insert and tighten down the screw (2) firmly.

5.4.1 Air guide shroud

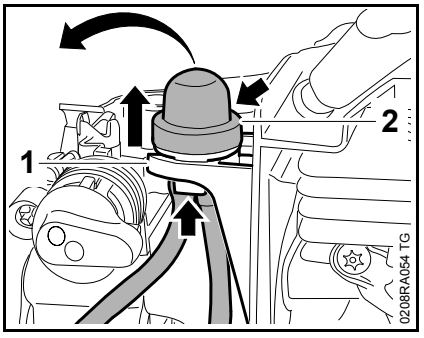
– Remove the drive tube, 🕮 9.1

– Remove the shroud, 🕮 5.4

– Remove the fan housing, 🕮 4.1

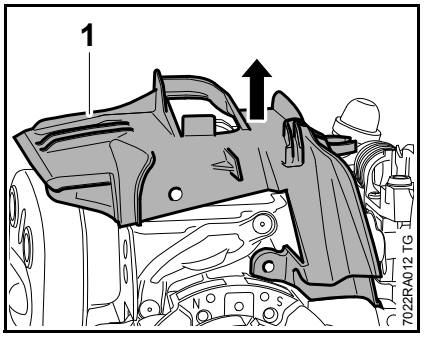
– Remove the ignition module, 🕮 6.2

– Pull short circuit wire out of guide in air guide shroud.



● Squeeze locking tabs (arrows) under the retainer (1) together and push out the manual fuel pump (2).

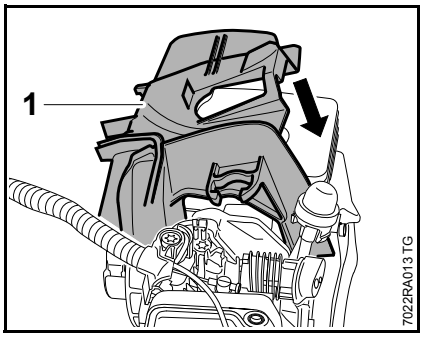
● Remove the manual fuel pump (2) with fuel hoses still attached and put it to one side.



– Unscrew the spark plug.

● Lift the air guide shroud (1) at the starter side and remove it over the cylinder.

Installing

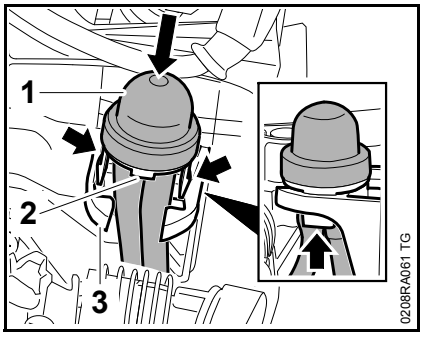


● Position the air guide shroud (1) at a slight angle and lower it in the direction of the starter side.

● Line up the air guide shroud (1) so that it locates on the cylinder and spacer flange and lines up with the holes in the cylinder.

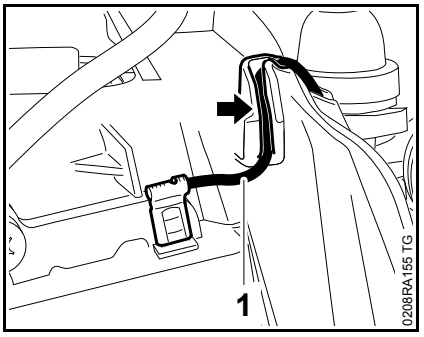
– Fit the spark plug and tighten it down firmly.

– Install the ignition module, 🕮 6.2



● Line up the manual fuel pump (1) so that the lug (2) points towards the carburetor.

● Push the manual fuel pump (1) into the retainer (3) on the air guide shroud until the locking tabs (arrows) snap into place below the retainer (3).



● Starting at the flag terminal, push the short circuit wire (1) into the guide (arrow) so that it fits snugly – if necessary, also push the wires on the throttle cable retainer fully into the guide.

– Reassemble all other parts in the reverse sequence.

5.5 Cylinder

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

Cylinder installed
To remove the clutch, flywheel or carrier, block the.crankshaft by inserting the locking strip in the spark plug hole.

Cylinder removed
To remove the clutch, flywheel or carrier, block the crankshaft by resting the piston on the wooden assembly block.

All sealing faces must be in perfect condition. If the sealing faces are damaged, replace the part concerned, 🕮 3.6.

– Remove the rewind starter, 🕮 7.2

– Remove the shroud, 🕮 5.4

– Remove the filter cover, 🕮 10.2

– Remove the throttle cable / short circuit wire, 🕮 6.6.2

– Remove the drive tube, 🕮 9.1

– Remove the fan housing, 🕮 4.1

– Pull off the boot and unscrew the spark plug, 🕮 4.2

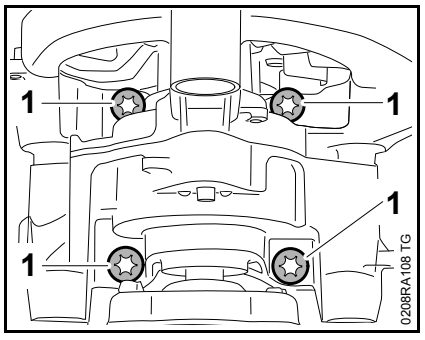
– Pull off the carburetor and put it to one side – there is no need to remover the fuel hoses, 🕮 10.3

– Remove the spacer flange, 🕮 10.6

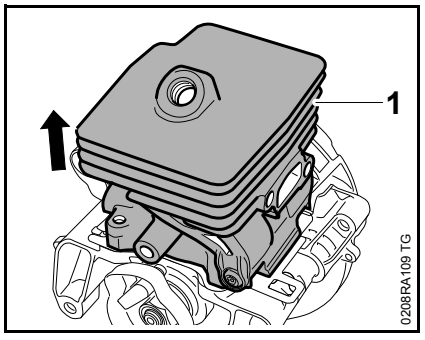
– Remove the ignition module and air guide shroud, 🕮 6.2

– Remove the muffler, 🕮 5.1

– Remove the fuel tank, 🕮 10.9

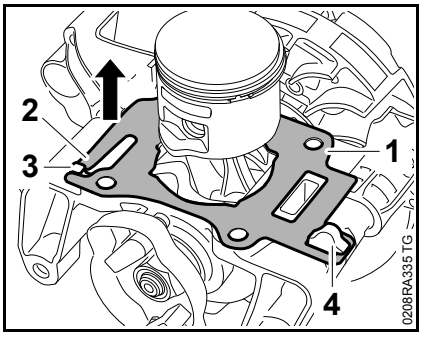


- Remove the screws (1) from the underside of the crankcase.

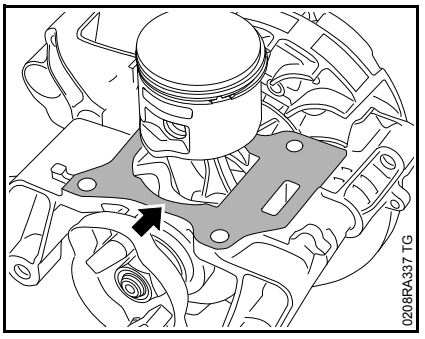


- Carefully lift the cylinder (1) away.

Versions with 0.75 kW engine



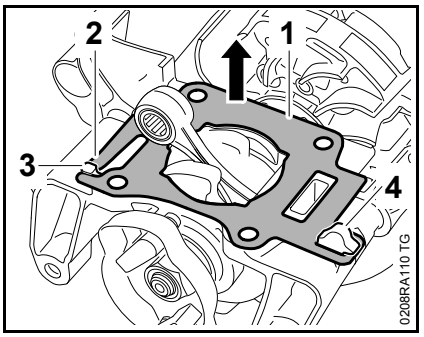
- Lift cylinder gasket (1) with tab (2) over the lug (3), detach it from the hook (4) and lift it over the piston – always install a new cylinder gasket.



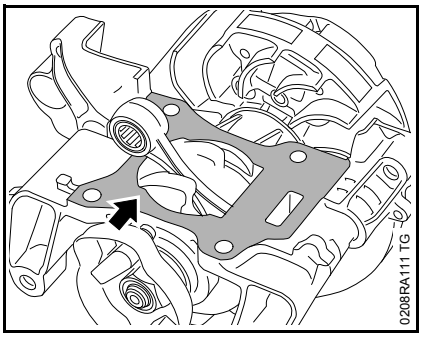
- Inspect and clean the sealing face (arrow) – components with damaged sealing faces must be replaced, 🕮 12

Versions with 0.9 kW engine

– Remove the piston, 🕮 5.7



● Lift cylinder gasket (1) with tab (2) over the lug (3), detach it from the hook (4) and lift it over the connecting rod – always install a new cylinder gasket.



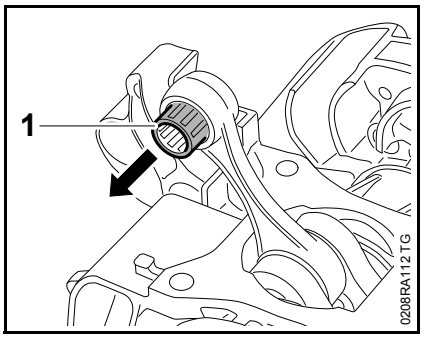
● Inspect and clean the sealing face (arrow) – components with damaged sealing faces must be replaced, 🕮 12

Versions with fixed needle cage

The needle cage is permanently connected to the small end and cannot be replaced separately.

– Inspect and clean the needle cage, replace crankshaft if necessary, 🕮 5.6

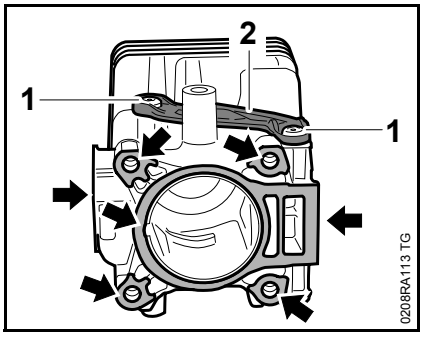
Versions with replaceable needle cage



● Pull out the needle cage (1), inspect and clean it, replace if necessary.

– Reassemble in the reverse sequence.

All models



The screws (1) and cover (2) must not be removed at either side.

● Inspect and clean the sealing faces (arrows) and remove any gasket residue, 🕮 12

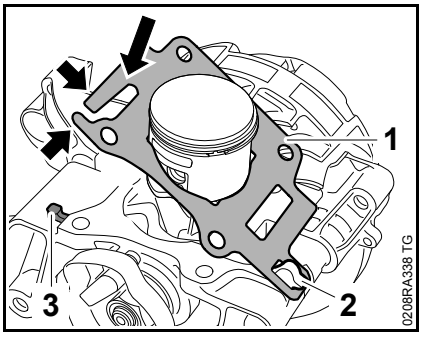
Always use a new cylinder gasket when re-installing the cylinder.

– Inspect the piston and piston rings and replace if necessary, 🕮 5.7, 🕮 5.8

If the piston or the oil seals are damaged, also inspect the inside of the cylinder for signs of damage and install a new cylinder if necessary.

Installing

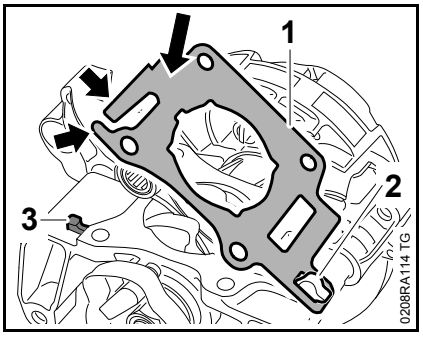
Versions with 0.75 kW engine



● Fit the new cylinder gasket (1) over the piston, attach it to the hook (2) and place it in position.

● Press down tabs (arrows) of new cylinder gasket (1) until they locate behind the lug (3).
– the cylinder gasket is now held in position.

Versions with 0.9 kW engine

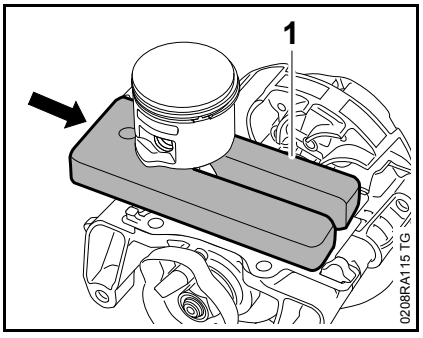


- Fit the new cylinder gasket (1) over the piston, attach it to the hook (2) and place it in position.

- Press down tabs (arrows) of new cylinder gasket (1) until they locate behind the lug (3).
  – the cylinder gasket is now held in position.

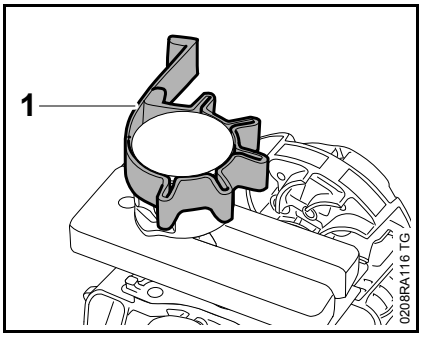
– Install the piston, 🕮 5.7

All models



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

Take care not to damage the cylinder gasket.

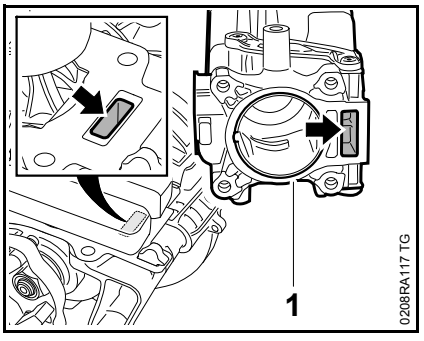


– Lubricate the piston, piston rings and cylinder wall with oil, 🕮 12

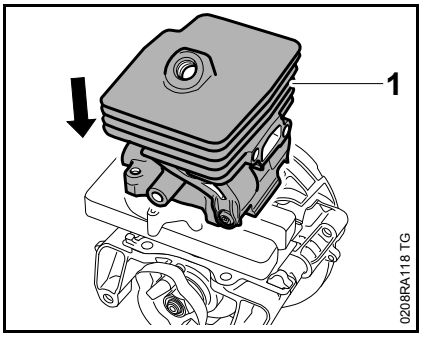
– Check correct installed position of rings, 🕮 5.8

- Use the clamping strap (1) 0000 893 2600 to compress the rings around the piston.

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



- Position the cylinder (1) so that the rectangular ports (arrows) are in alignment.

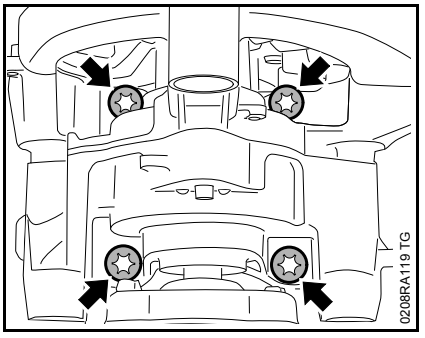


While sliding the cylinder over the piston, hold the clamping strap tightly around the piston so that the rings do not project
– they might otherwise break.

- Slide the cylinder (1) over the piston, the clamping strap moves downwards at the same time.

– Remove the clamping strap and wooden assembly block.

Make sure the cylinder gasket is properly seated.



– Push cylinder on as far as stop and hold it steady, then turn cylinder and crankcase over.

- Fit screws (arrows) in underside of crankcase and tighten them down firmly in crosswise pattern.

– Reassemble all other parts in the reverse sequence.

5.6 Crankshaft

– Remove the flywheel, 🕮 6.5

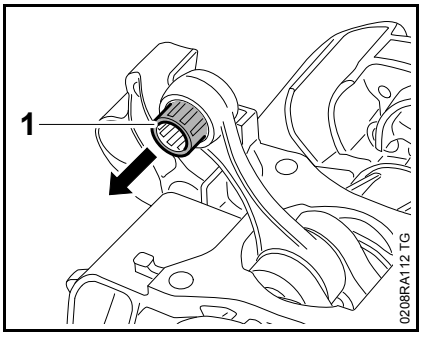
– Remove the carrier, 🕮 7.3

– Remove the cylinder, 🕮 5.5

– Remove the piston, 🕮 5.7

– Always install new bearings and oil seals after removing the crankshaft, 🕮 5.6.1 and 🕮 5.3.

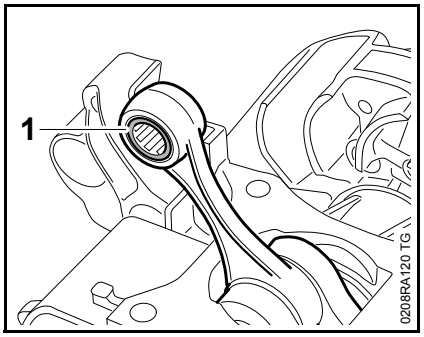
Versions with replaceable needle cage



- Pull out the needle cage (1), inspect and clean it, replace if necessary.

Versions with fixed needle cage

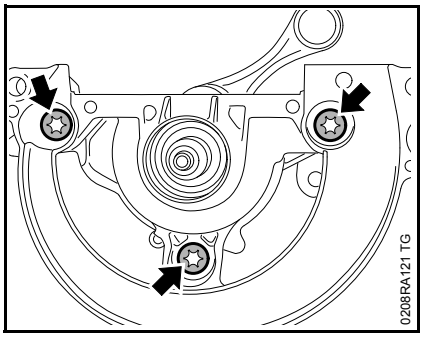
The needle cage is permanently connected to the small end and cannot be replaced separately.



- Inspect and clean the needle cage (1), replace crankshaft if necessary.

All models

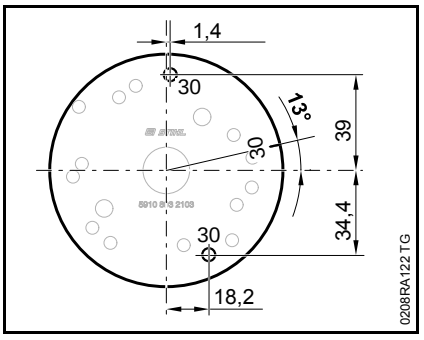
Starter side of crankcase



- Remove screws (arrows) from the ignition side.

Use the tools in the service tool set 5910 007 2201 to remove and install the starter side of the crankcase
– use drilled plate 5910 893 2103 and thrust piece 4116 894 1000.

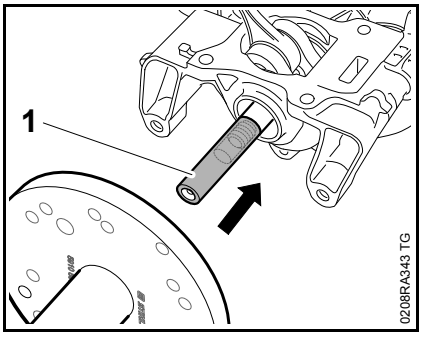
Modifying an existing drilled plate



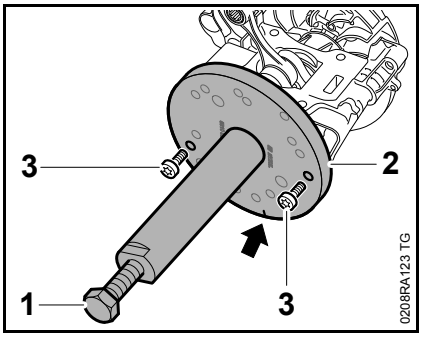
Drilled plate 5910 893 2103 without holes marked "30" can be updated with 5.5 mm holes as shown in the illustration.

Dimensions are in millimeters.

The illustration shows the front of the drilled plate.



- Fit the deep bore of thrust piece (1) 4116 894 1000 over the crankshaft stub at the starter side to ensure that the length of the screw sleeve in the service tool set is sufficient to remove the crankshaft.



- Unscrew the spindle (1) clockwise until the drilled plate (2) butts against the starter side of the crankcase – left-hand thread.

- Position the service tool with drilled plate (2) 5910 893 2103 so that the number "30" (arrow) is at the bottom.

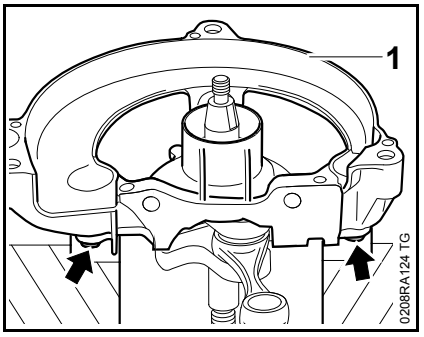
The spindle (1) must engage the center hole of the thrust piece 4116 894 1000.

- Insert two D 5 x 25 screws (3) – or two screws from the rewind starter – through the holes marked "30", into the crankcase at the starter side and tighten them down as far as stop.

- Turn the spindle (1) counterclockwise until the crankshaft is pushed out of the starter side of the crankcase.

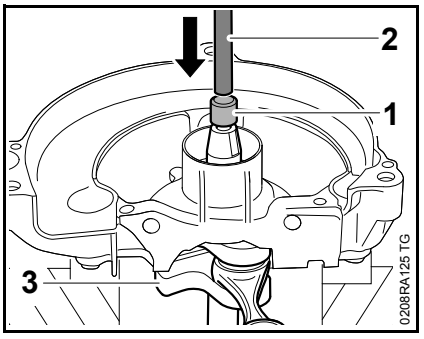
– Take out the screws and remove the puller.

Ignition side of crankcase



- Rest the crankcase (1) on a suitable base so that it is secure and the inbuilt guide sleeves (arrows) are not damaged.

There must be sufficient space below to allow the crankshaft to be removed.



- Fit the thrust piece (1) 1107 894 1000 on the crankshaft stub to protect it from damage.

- Apply a suitable press arbor (2) to the crankshaft stub (ignition side) and press out the crankshaft (3).

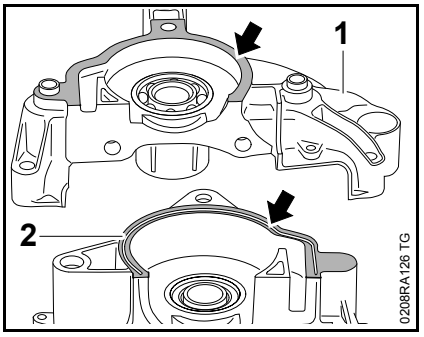
Versions with replaceable needle cage

The crankshaft, connecting rod and needle bearing form an inseparable unit. Always replace as a complete unit.

Versions with fixed needle cage

The crankshaft, connecting rod with needle cage and needle bearing form an inseparable unit. Always replace as a complete unit.

All models



- Remove any gasket residue and clean the sealing faces (arrows) thoroughly (including the peripheral groove in the starter side of the crankcase)
  – sealing faces must be in good condition and clean.

- Check ignition side (1) and starter side (2) of crankcase for cracks and all sealing faces (arrows) for damage.

– Replace damaged crankcase halves, 🕮 5.6.1.

If the original crankcase is used again, replace the oil seals and ball bearings.

– If the original halves of the crankcase are used again, replace the ball bearings and oil seals, 🕮 5.6.1 and 🕮 5.3

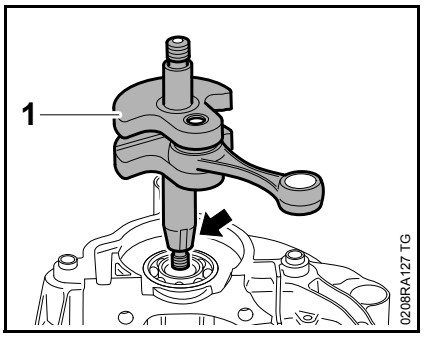
– Before installing, clean the crankshaft, 🕮 12

Installing

Ignition side of crankcase

Take care not to damage the crankshaft stub.

– Lubricate the crankshaft stub with oil.



- Position the tapered stub (arrow) of the crankshaft (1) above the ball bearing at the ignition side.

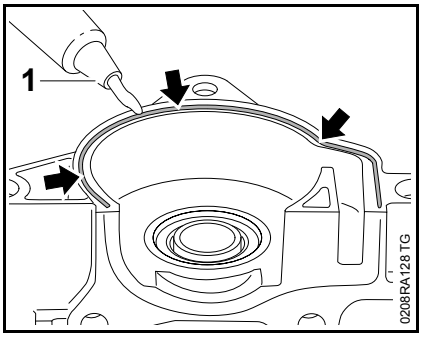
– Heat inner race of ball bearing to about 160°C (320°F).

- Push the crankshaft home as far as stop.

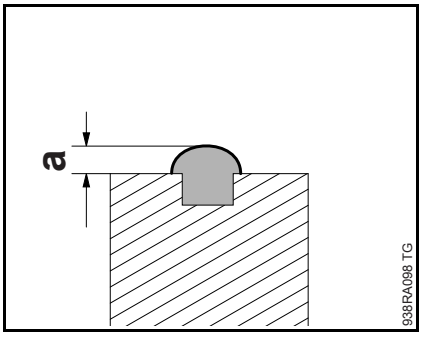
This operation must be carried out very quickly because heat is absorbed by the crankshaft, and the inner bearing race shrinks.

Starter side of crankcase

Take care not to damage the crankshaft stub.



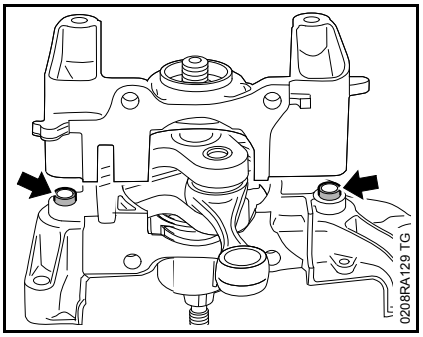
- Apply sealant (1) to peripheral groove (arrows), 🕮 12



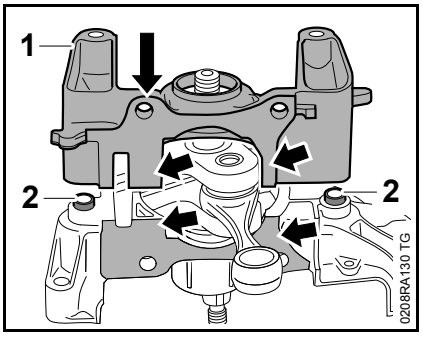
- The bead of sealant should be about 1 mm high (a).

Make sure the sealant does not project into the crankcase.

– Lubricate the crankshaft stub with oil.



● Check that the guide sleeves (arrows) line up with the holes.

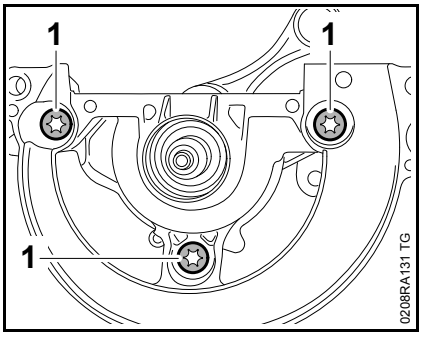


● Position starter side of crankcase on straight crankshaft stub so that the cylinder sealing faces (arrows) are in alignment.

– Heat inner race of ball bearing to about 160°C (320°F).

● Push the crankcase (1) into the guide sleeves (2) as far as stop.

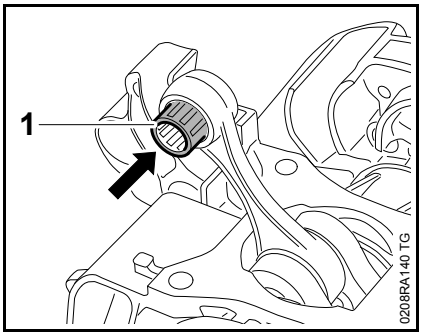
This operation must be carried out very quickly because heat is absorbed by the crankshaft, and the inner bearing race shrinks.



● Fit the screws (1) and tighten them uniformly in a crosswise pattern until the two halves of the crankcase are together.

● Tighten down the screws (1) firmly.

Versions with replaceable needle cage



● Lubricate the cleaned or replacement needle cage (1) with oil and push it into the connecting rod, 🕮 12

Versions with fixed needle cage

The needle cage is permanently connected to the small end and cannot be replaced separately.

– Lubricate the cleaned needle cage with oil, 🕮 12

All models

– Check and install the piston, 🕮 5.7

– Check and install the cylinder, 🕮 5.5

– Reassemble all other parts in the reverse sequence.

5.6.1 Bearings / Crankcase

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

– See also Troubleshooting, 🕮 3.6

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

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

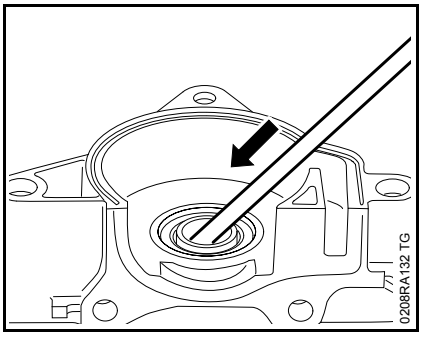
Parts not supplied with the new crankcase must be transferred from the original crankcase – check the parts and replace if necessary.

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

If the original crankcase is used again, replace the oil seals and ball bearings, remove any gasket residue and clean the sealing surfaces thoroughly (including the peripheral groove in the starter side of the crankcase). The sealing faces must be in good condition and clean to guarantee a perfect seal.

– Remove the crankshaft, 🕮 5.6

Ignition side of crankcase



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

– Check and clean the crankcase or replace if necessary.

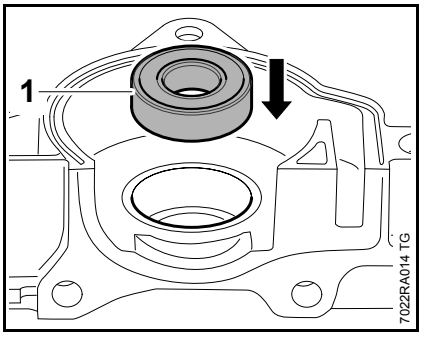
– If this half of the crankcase is in order, install a new ball bearing.

– Heat area of bearing seat to about 160°C (320°F).

The bearing drops out as soon as this temperature is reached.

Installing

The ball bearing must not be press-fitted in the cold condition.



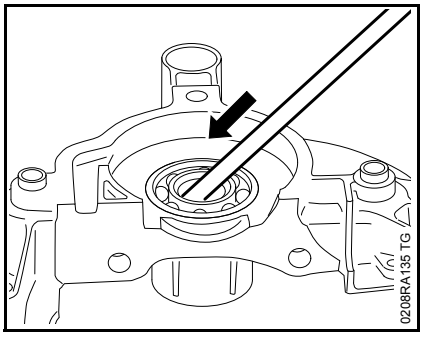
– Heat area of bearing seat to about 160°C (320°F).

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

- Push the ball bearing (1) home as far as stop.

– Check that the bearing is properly seated. If necessary, use press arbor 4224 893 7200 to press the bearing fully home.

Starter side of crankcase



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

– Check and clean the crankcase or replace if necessary.

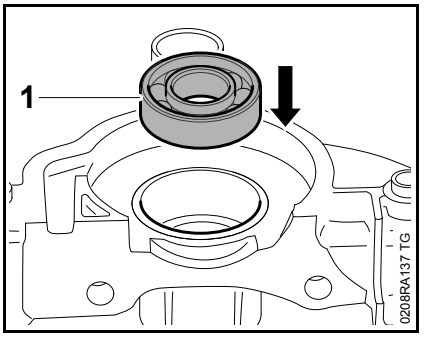
– If this half of the crankcase is in order, install a new ball bearing.

– Heat area of bearing seat to about 160°C (320°F).

The bearing drops out as soon as this temperature is reached.

Installing

The ball bearing must not be press-fitted in the cold condition.



– Heat area of bearing seat to about 160°C (320°F).

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

- Push the ball bearing (1) home as far as stop.

– Check that the bearing is properly seated. If necessary, use press arbor 4116 893 7205 to press the bearing fully home.

– Install the crankshaft, 🕮 5.6

– Install the oil seals, 🕮 5.3

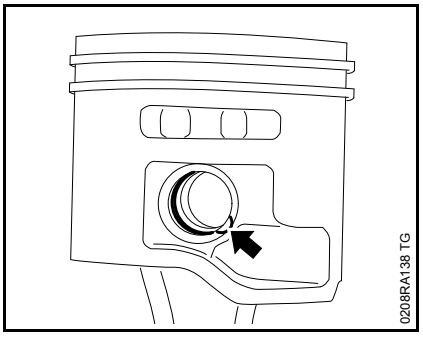
The tapered crankshaft stub must be free from grease.

– Reassemble all other parts in the reverse sequence.

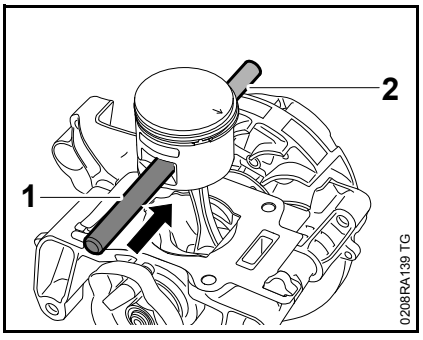
5.7 Piston

– Remove the cylinder, 🕮 5.5

The piston has only one snap ring. It is fitted at the ignition side.



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



● Slide the assembly drift (1) 1130 893 4700, small diameter first, through the side of the piston opposite the snap ring groove and push the piston pin 2) out of the piston.

If the piston pin is stuck, release it by tapping the end of the drift lightly with a hammer.
Hold the piston steady during this process to ensure that no jolts are transmitted to the connecting rod.

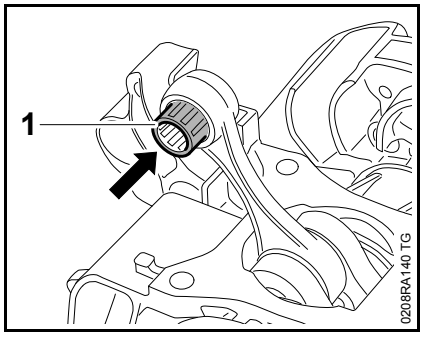
– Remove the piston.

– Inspect the piston rings and replace if necessary, 🕮 5.8

– Replace the cylinder gasket, inspect and clean the sealing faces, 🕮 5.5

Installing

Versions with replaceable needle cage

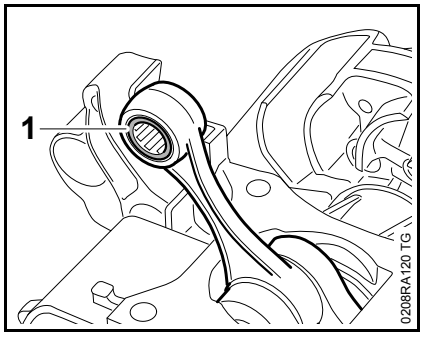


– Pull the needle cage out of the small end, check it and replace if necessary.

● Lubricate the cleaned or replacement needle cage (1) with oil and push it into the connecting rod, 🕮 12

Versions with fixed needle cage

The needle cage is permanently connected to the small end and cannot be replaced separately.



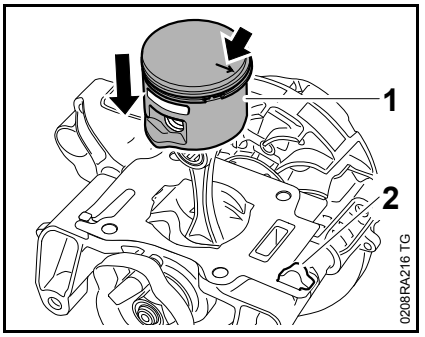
● Inspect and clean the needle cage (1), replace crankshaft if necessary.

– Lubricate the cleaned needle cage with oil, 🕮 12

All models

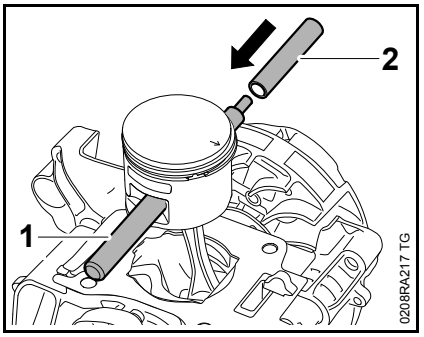
– Inspect the piston rings and replace if necessary, 🕮 5.8

– Fit new cylinder gasket, 🕮 5.5



● Position the piston (1) as shown so that the arrow (arrow) points in the direction of the hook (2), or the side with the snap ring groove is on the ignition side.

● Place the piston (1) on the connecting rod.

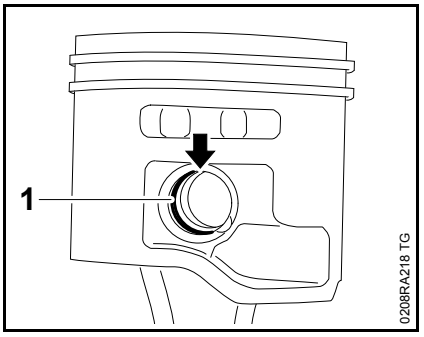


- Slide the assembly drift (1) 1130 893 4700, small diameter first, through the side of the piston opposite the snap ring groove and the small end (needle cage) and line up the piston.

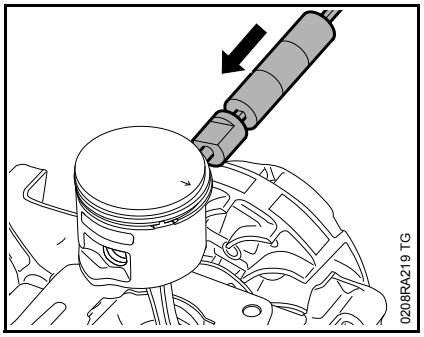
– Lubricate the piston pin with oil.

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

– Prepare snap ring for installation with installing tool 5910 890 2208.



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



- Installing tool 5910 890 2208 with the sleeve's taper against the piston boss, hold the piston steady, center the tool shank exactly and press home until the snap ring slips into the groove.

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

– Install the cylinder, 🕮 5.5

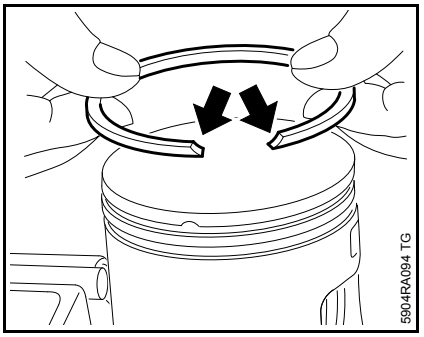
– Reassemble all other parts in the reverse sequence.

5.8 Piston Rings

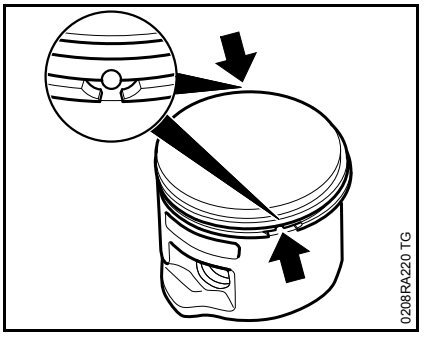
– Remove the piston, 🕮 5.7

– Remove the piston rings from the piston.

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



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



– Carefully fit the piston rings over the piston – they might otherwise break.

- Install the piston rings so that the radii at the ring gap meet at the fixing pins in the piston grooves (arrows).

- Check correct installed position of the piston rings (arrows).

– Install the piston, 🕮 5.7

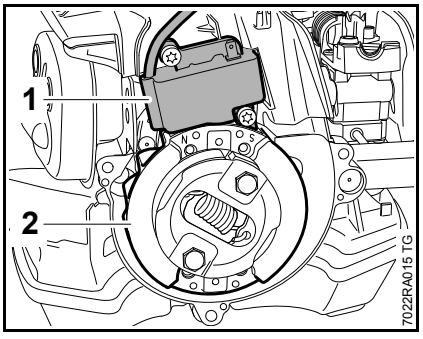
– Reassemble all other parts in the reverse sequence.

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

Troubleshooting on the ignition system should always begin at the spark plug, 🕮 3.3

– Remove the drive tube, 🕮 9.1

– Remove the fan housing, 🕮 4.1



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

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

1. High voltage output with fixed ignition lead.
2. Fixed wire with cable lug for the short circuit wire.

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

6.1 Ignition Timing

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

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

6.2 Install new ignition module

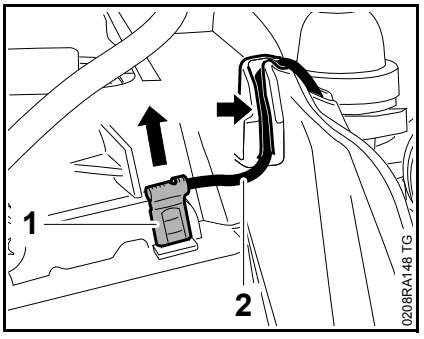
– Troubleshooting, 🕮 3.3

– Remove the shroud, 🕮 5.4

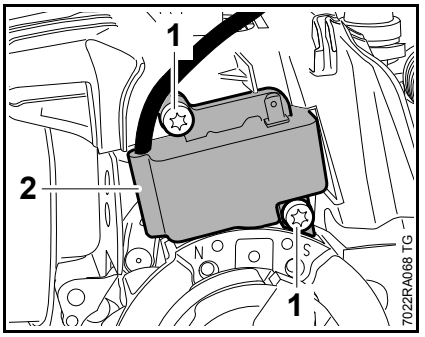
– Remove the fan housing, 🕮 4.1

– Pull boot off the spark plug.

– Remove the drive tube, 🕮 9.1



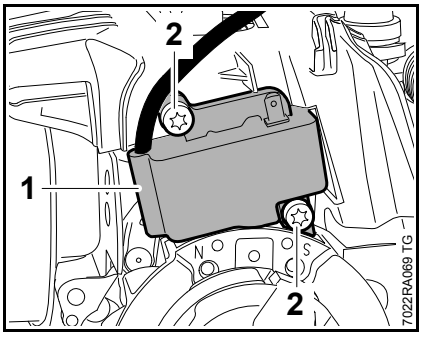
● Disconnect the flag terminal (1) and pull the short circuit wire (2) out of the guide (arrow).



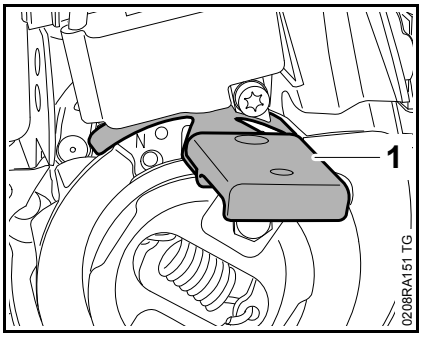
● Take out the screws (1) with washers and remove the ignition module (2).

– Check ignition module and lead, replace ignition module if necessary

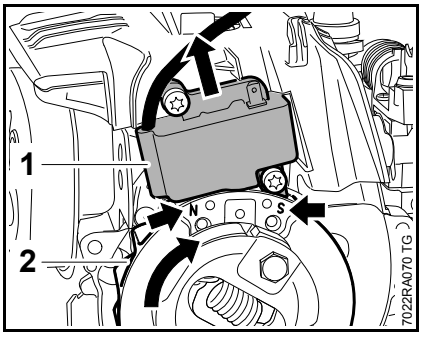
Installing



● Fit the ignition module (1) and insert the screws (2) with washers – do not tighten down yet.



- Push the ignition module back and slide the setting gauge (1) 0000 890 6400 between the arms of the ignition module and the flywheel magnet poles.

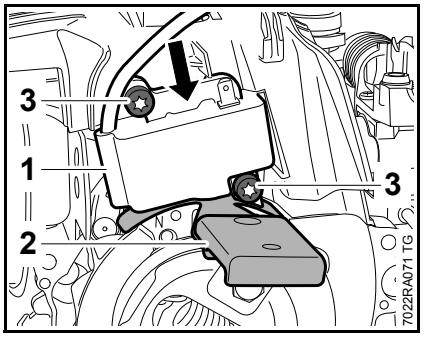


The setting gauge is not shown in the illustration.

- Push the ignition module (1) back and hold it there.

The flywheel (2) must rotate freely.

- Rotate the flywheel (2) until the "N / S" magnets (arrows) are in line with the ignition module (1).

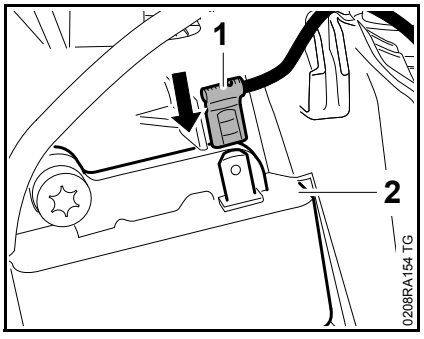


- Press the ignition module (1) against the setting gauge (2) and tighten down the screws (3) firmly.

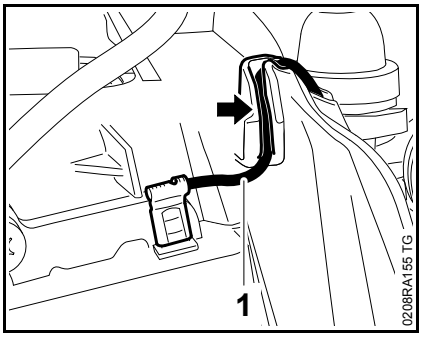
- Remove the setting gauge (2).

Check operation

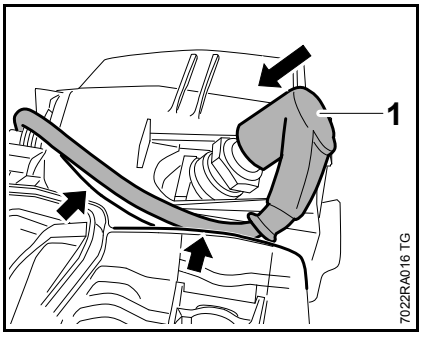
– Rotate the flywheel and make sure it does not touch the ignition module.



- Connect short circuit wire's flag terminal (1) to the ignition module (2) so that its crimped side faces the cylinder.



- Starting at the flag terminal, push the short circuit wire (1) snugly into the guide (arrow).



- Fit the boot (1) on the spark plug and arrange it so that the ignition lead is positioned in the recess (arrows) in the air guide shroud

– Install the fan housing, 🕮 4.1

– Reassemble all other parts in the reverse sequence.

6.3 Testing the Ignition Module

Install a new spark plug before starting the test.

The engine may start and accelerate during the test.

– 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.

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

– If no spark is visible in the window, check the ignition system with the aid of the troubleshooting chart, 🕮 6.7

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

6.3.1 Testing Ignition Module with STIHL MDG 1

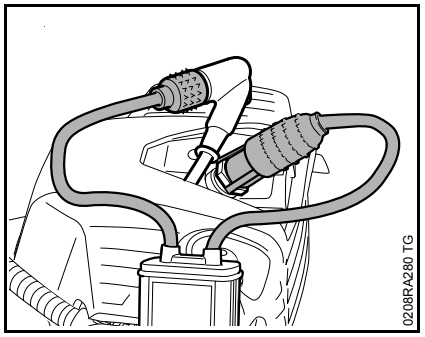
The ignition module can be tested simply, reliably and quickly with the STIHL MDG 1.

The following points are checked during the test:

– Ignition voltage
– Ignition spark?

– Remove the cover and pull off the spark plug boot, 🕮 5.4

– Before starting the test, check the spark plug and replace it if necessary – use only spark plugs recommended by STIHL.



- Connect the MDG 1 between the spark plug and spark plug boot – ground clamps must engage hexagon on spark plug.

– To run diagnosis, select "Other STIHL Products". Then start the diagnostic function and follow the steps in the diagnostic software.

To obtain an accurate result, pull the starter rope briskly.

The engine may start and accelerate during the test.

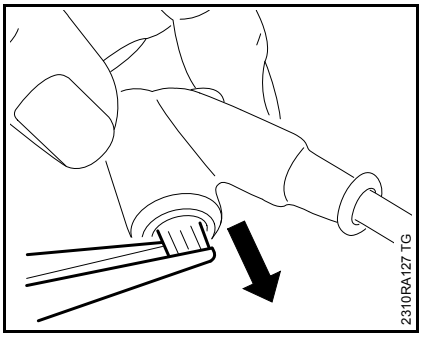
– In the event of a malfunction, check ignition system with the aid of the troubleshooting chart, 🕮 6.7

6.4 Spark Plug Boot / Ignition Lead

The ignition module (1) and ignition lead (2) form a unit. If the ignition lead is damaged, it may be shortened no more than 5 mm in order to reposition the leg spring. Do not shortened it any further – install a new ignition module.

– Remove the shroud, 🕮 5.4

– Pull boot off the spark plug.

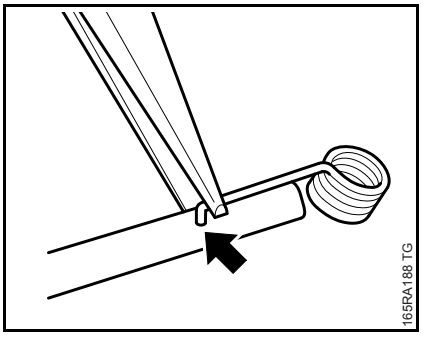


- Use suitable pliers to pull the leg spring out of the spark plug boot.

– Unhook the leg spring from the ignition lead.

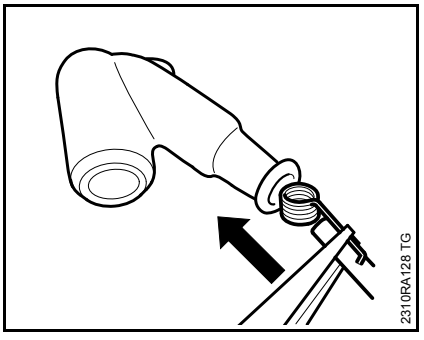
– Pull the boot off the ignition lead.

Installing



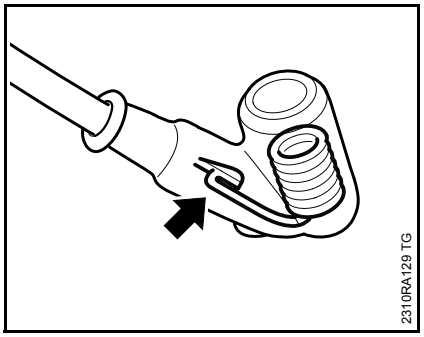
– If the ignition module is new, use a pointed tool to pierce the center of the ignition lead's insulation, about 15 mm from the end of the lead.

● Pinch the hook of the leg spring into the pierced hole in the center of the lead (arrow).

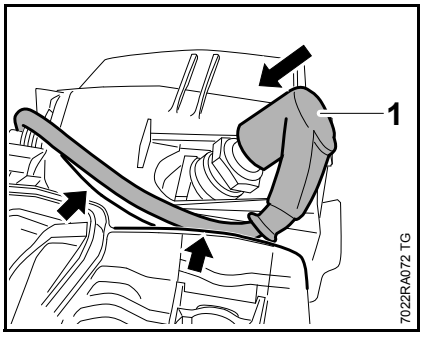


– Coat the inside of the spark plug boot with
STIHL press fluid, 🕮 12

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



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



● Fit the boot (1) on the spark plug and arrange it so that the ignition lead is positioned in the recess (arrows) in the air guide shroud

– Reassemble all other parts in the reverse sequence.

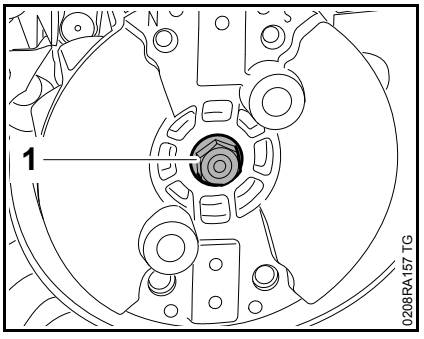
6.5 Flywheel

– Remove the shroud, 🕮 5.4

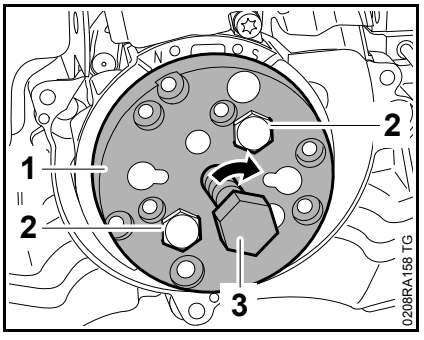
– Remove the fan housing, 🕮 4.1

– Use locking strip to block the piston, 🕮 4.2

– Remove the clutch, 🕮 4.2



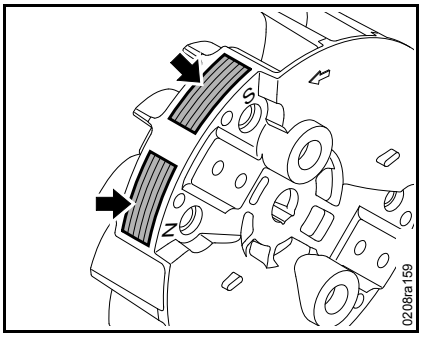
● Unscrew the flywheel nut (1).



● Apply the puller (1) 4119 890 4501, insert screws (2) from clutch and tighten them down firmly.

● Screw home the thrust bolt (3) clockwise until the flywheel is released. Remove the flywheel.

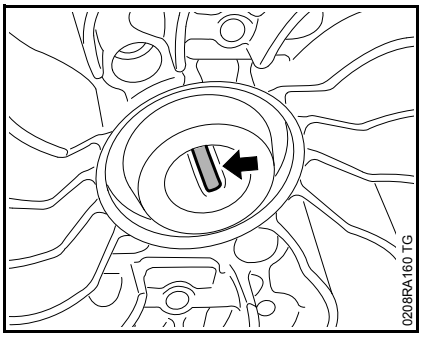
– Remove the puller (3) 4119 890 4501 from the flywheel.



The flywheel and magnet poles (arrows) must not be damaged or have turned blue. Replace flywheel if necessary.
– the magnet poles are marked "N / S".

Installing

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



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

– Push the flywheel into position, fit the nut and tighten it down firmly.

– Set the air gap between the ignition module and flywheel, 🕮 6.2

– Reassemble all other parts in the reverse sequence.

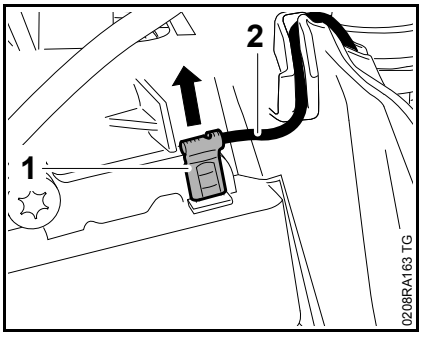
6.6 Short Circuit Wire

The short circuit and ground wires are combined with the throttle cable to form a unit. If either is damaged, a new throttle cable must be installed.

6.6.1 Testing

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

– Remove the shroud, 🕮 5.4



● Disconnect flag terminal (1) of the short circuit wire (2).

– Connect ohmmeter to ground and short circuit wire's flag terminal.

– Depress stop switch on control handle and hold it there.

The resistance measured must be about 0 Ω. If it is much higher, the reason is a break in the wire and the throttle cable has to be replaced, 🕮 6.6

– Release stop switch = start position.

The resistance measured must be infinitely high. If not, install a new throttle cable, 🕮 6.6.

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

If the ground wire is damaged, the throttle cable has to be replaced, 🕮 6.6

– If no fault can be found, check the ignition system with the aid of the troubleshooting chart, 🕮 6.7

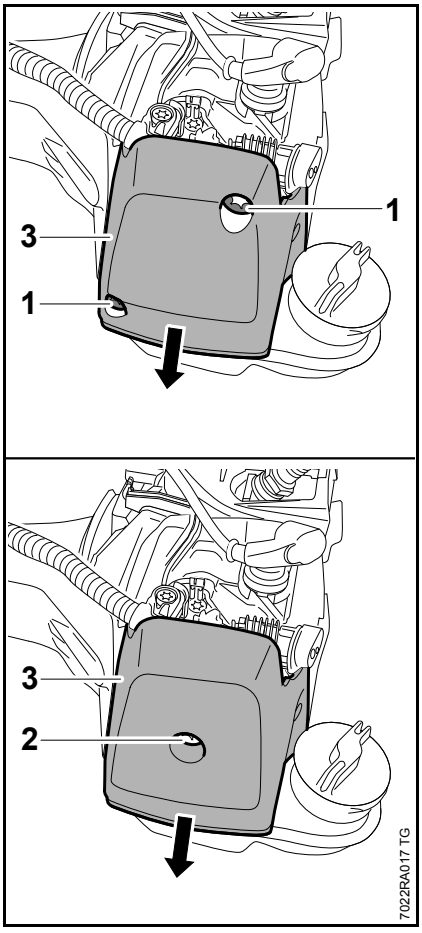
– Reassemble in the reverse sequence.

6.6.2 Short Circuit Wire on Engine – Removing and Installing

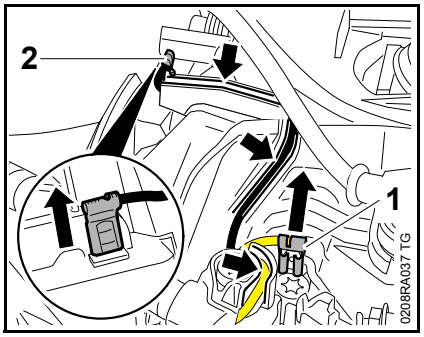
– If necessary, remove the drive tube, 🕮 9.1

– Remove the shroud, 🕮 5.4

– Pull boot off the spark plug.

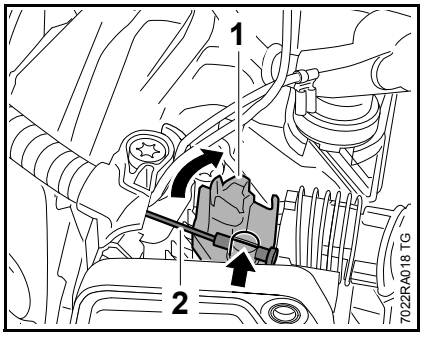


- Take out the screws (1) or screw (2) and remove the filter cover (3).

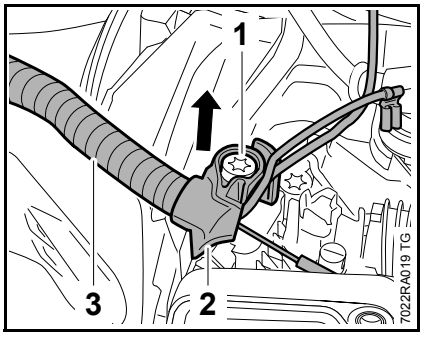


- Disconnect ground wire terminal (1) and short circuit wire terminal (2).

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



- Turn the control valve lever (1) in direction of full throttle, push the throttle cable (2) out of its seat (arrow) and remove it.



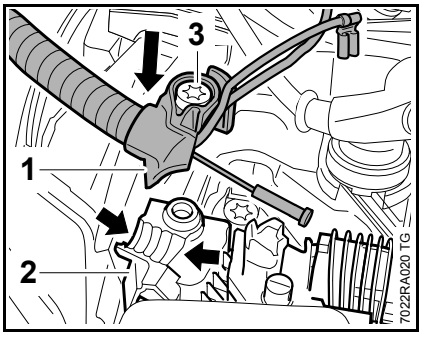
- Take out the screw (1) and remove the cable holder (2) with protective tube (3).

- Check the cable holder (2), replace throttle cable if necessary.

– Remove the short circuit wire from the control handle, 🕮 6.6.3

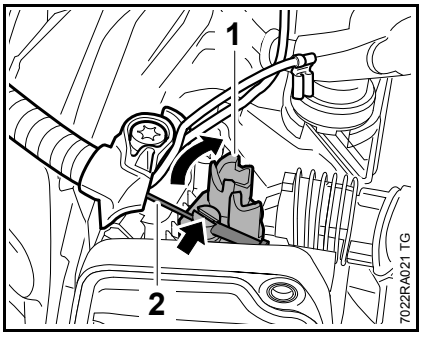
Installing

– Fit the short circuit wire in the control handle, 🕮 6.6.3

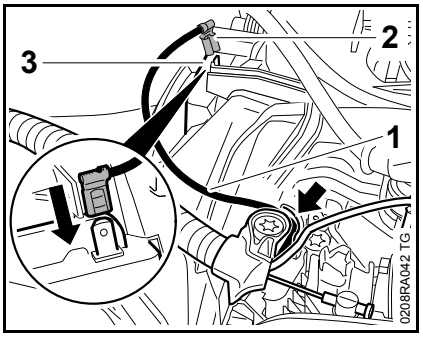


- Fit the cable holder (1) on the control valve (2) so that it and the protective tube fully engage the seat (arrows).

- Insert and tighten down the screw (3) firmly.

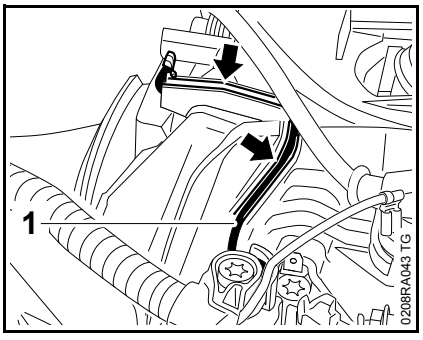


- Turn the control valve lever (1) in direction of full throttle and engage the throttle cable (2) in its seat (arrow).

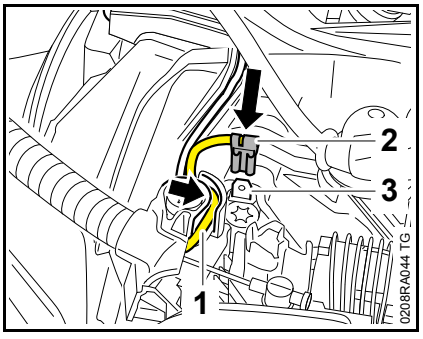


- Press the short circuit wire (1) into the guide (arrow).

- Connect short circuit wire's flag terminal (2) to the ignition module (3) so that its crimped side faces the engine.



- Starting at the flag terminal, push the short circuit wire (1) snugly into the guides (arrows).



- Push the ground wire (1) into the guide (arrow).
  – Ground wire must be under the short circuit wire.

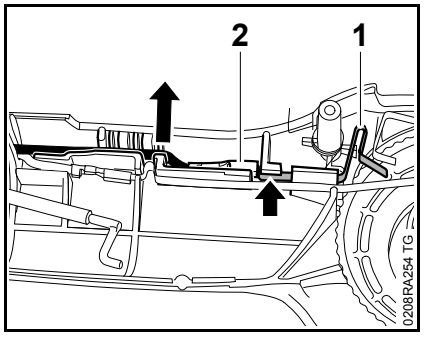
- Connect short circuit wire's flag terminal (2) to the tag (3) so that its crimped side faces the carburetor.

– Reassemble all other parts in the reverse sequence.

6.6.3 Short Circuit Wire and Contact Springs on Control Handle – Removing and Installing

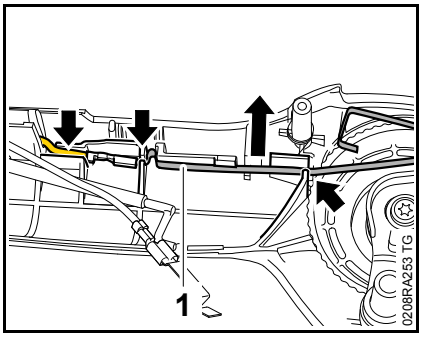
– Remove the throttle trigger and lockout lever, 🕮 9.3

– Remove stop switch lever, 🕮 9.4

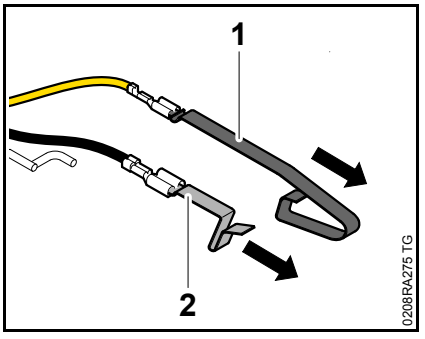


- Push the contact spring (1) inwards in area of terminal (2) and lift it over the lug (arrow).

- Pull the contact spring (1) with short circuit wire out of the guides.



- Pull the contact spring (1) with ground wire out of the guides (arrows).



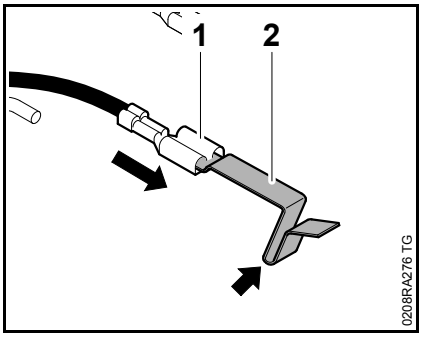
- Disconnect contact springs (1, 2) from the ground and short circuit wires.

– Inspect the contact springs, replace if necessary – contact springs must not be twisted.

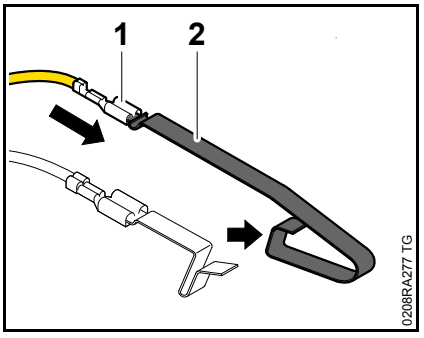
– Remove the throttle cable and short circuit wire from the engine, 🕮 6.6.2

Installing

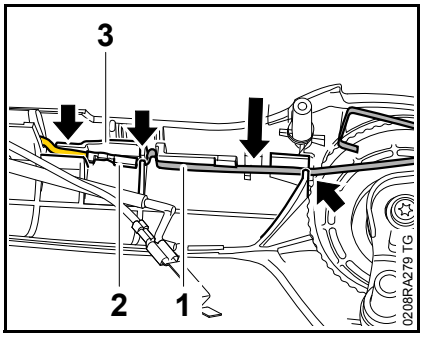
– Install throttle cable and short circuit wire on engine, 🕮 6.6.2



- Push terminal (1) of short circuit wire onto the short contact spring (2) so that its crimped side faces away from the loop (arrow) – the terminal must be pushed fully home.



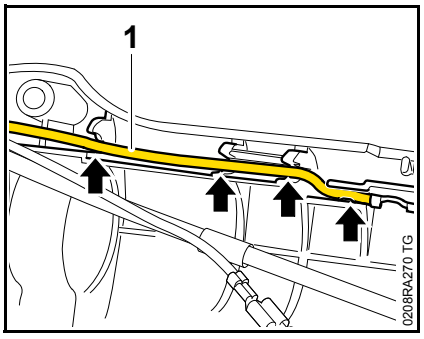
- Push terminal (1) of ground wire onto the long contact spring (2) so that its crimped side faces away from the loop (arrow) – the terminal must be pushed fully home.



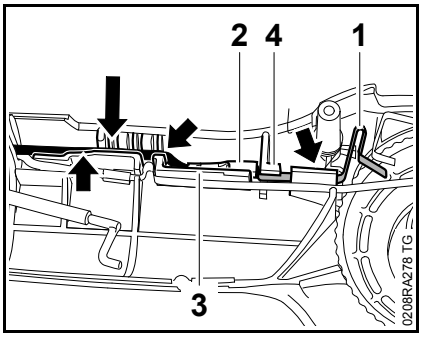
Do not twist the wire.

- Position contact spring (1) with ground wire so that the crimped side of the terminal (2) faces away from the rib (3).

- Push the contact spring (1) with ground wire into the guides (arrows).



- Press the ground wire (1) fully into the guides (arrows).

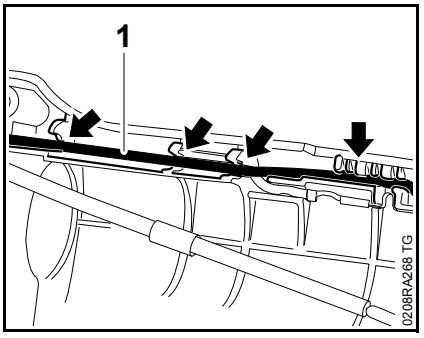


Do not twist the wire.

- Position contact spring (1) with short circuit wire so that the crimped side of the terminal (2) faces away from the rib (3).

- Push the contact spring (1) with short circuit wire into the guides (arrows) until the contact spring (1) is behind the lug (4).

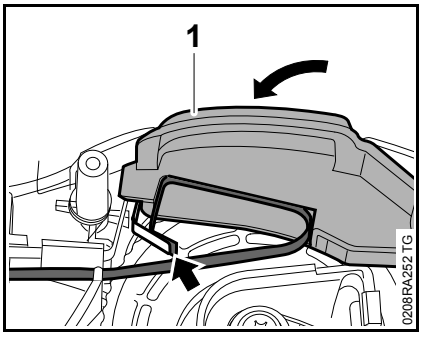
- Apply thin coating of STIHL lubricating grease to radius of contact spring (1) – the contact face must remain free from grease, 🕮 12



- Push short circuit wire (1) fully into the guides (arrows) – the ground wire must be underneath the short circuit wire.

– Install stop switch lever, 🕮 9.4

Check operation



- Depress stop switch lever (1), the contact springs (arrows) must touch each other
  – the contact springs must be free from grease.

– Install the throttle trigger / lockout lever, 🕮 9.3

– The travel of the throttle trigger in the direction of full throttle is limited by rotating the throttle set wheel.

– Check throttle cable adjustment, re-adjust if necessary, 🕮 9.6

– Reassemble all other parts in the reverse sequence.

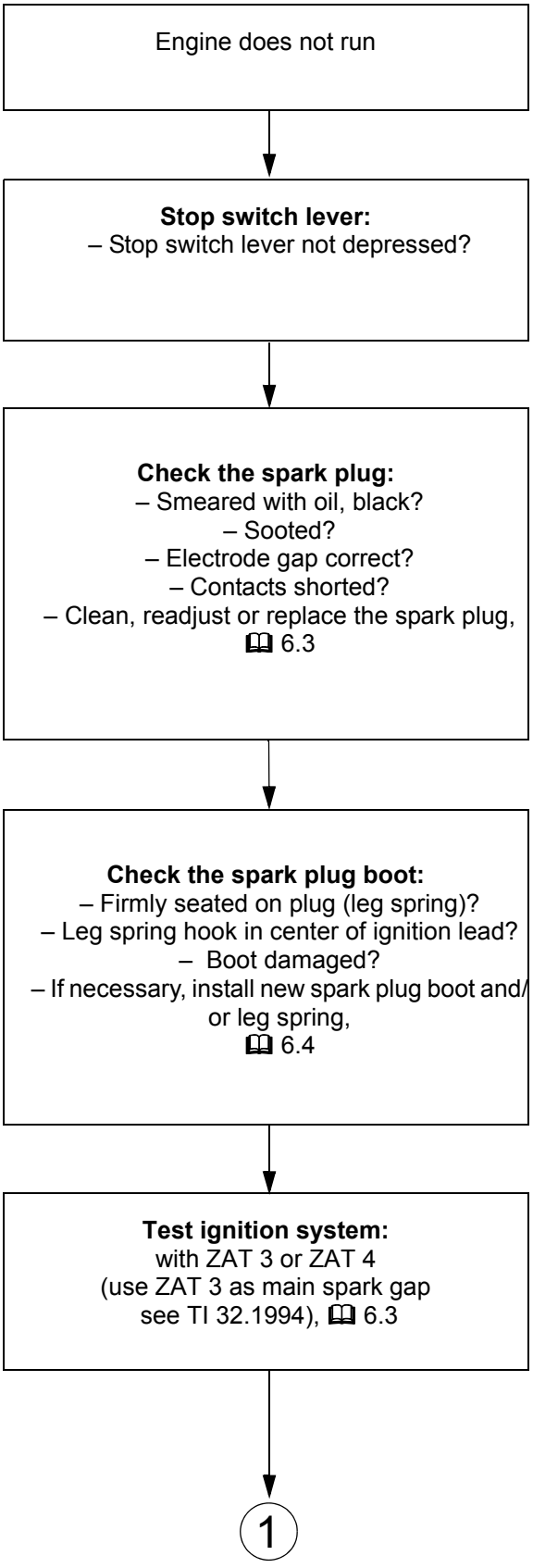
6.6.4 Ground Wire

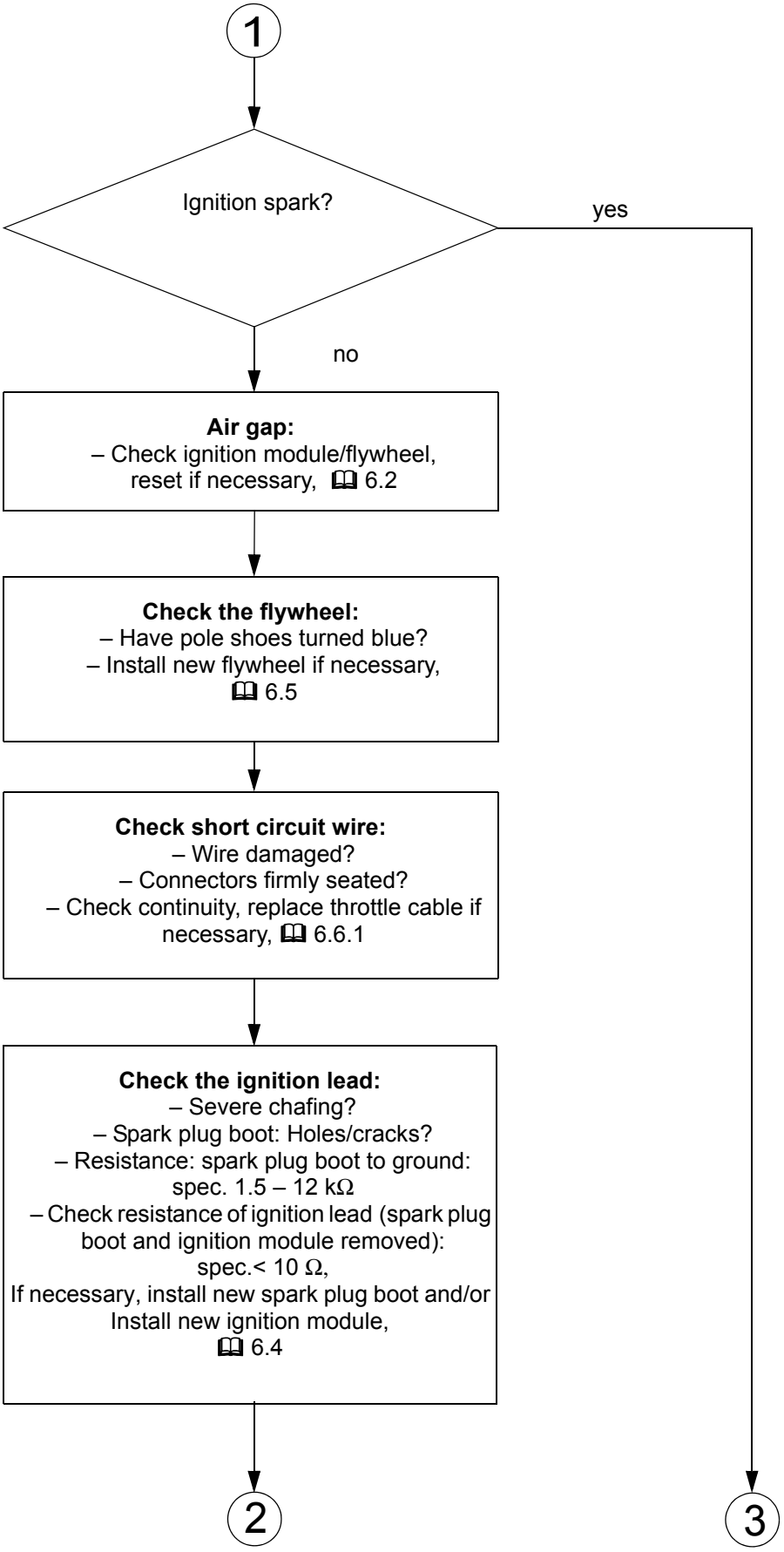
Test and install the ground wire as described for the short circuit wire.

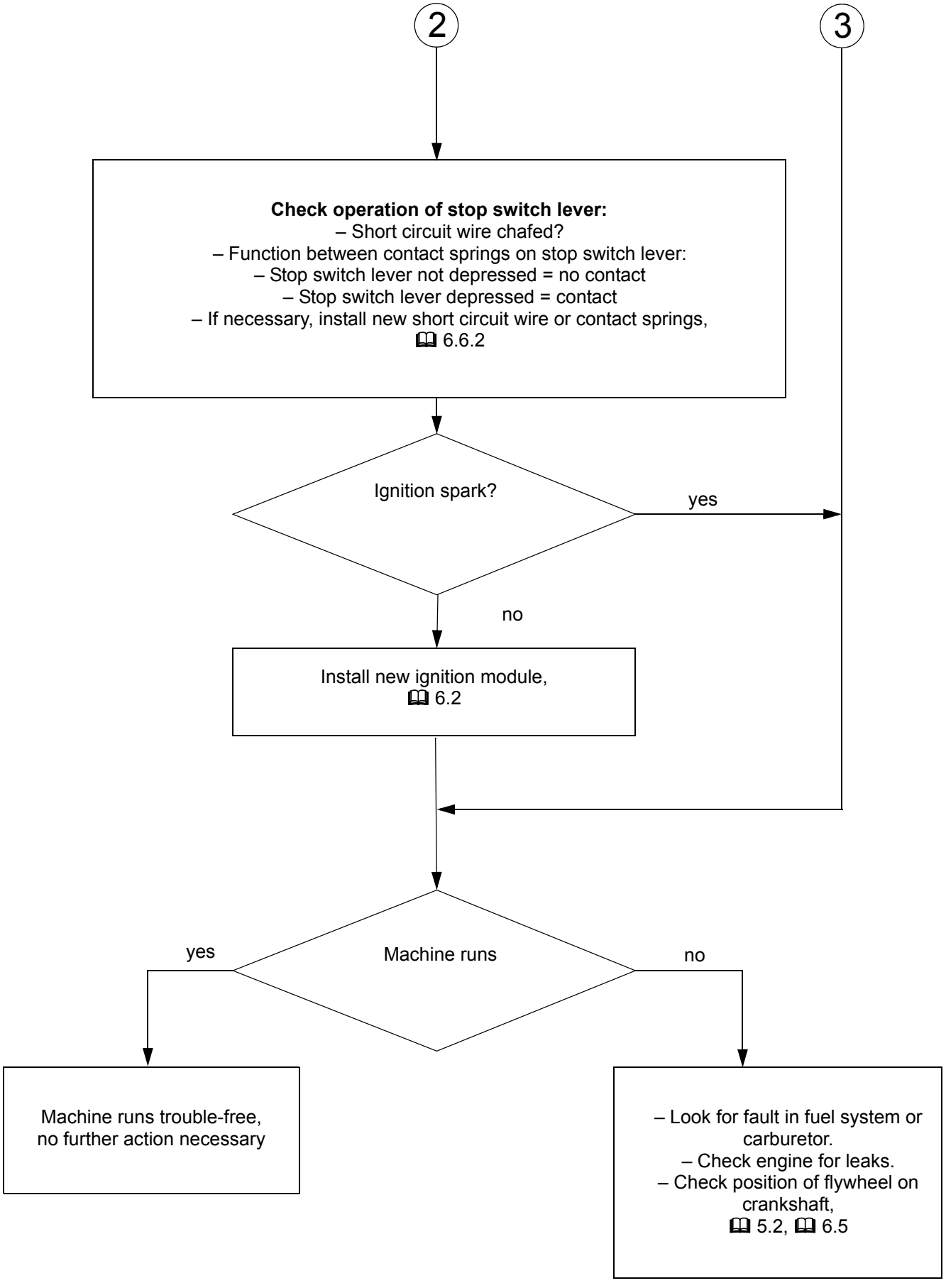
– Perform contact and continuity test and
  replace throttle cable if necessary, 🕮 6.6, 🕮 6.6.2, 🕮 6.6.3

6.6.5 Contact Springs

Test and install contact springs as described in chapter on "Short Circuit Wire on Control Handle – Removing and Installing", 🕮 6.6.3 0


Engine does not run
Stop switch lever:
– Stop switch lever not depressed?
Check the spark plug:
– Smeared with oil, black?
– Sooted?
– Electrode gap correct?
– Contacts shorted?
– Clean, readjust or replace the spark plug,
📖 6.3
Check the spark plug boot:
– Firmly seated on plug (leg spring)?
– Leg spring hook in center of ignition lead?
– Boot damaged?
– If necessary, install new spark plug boot and/
or leg spring,
📖 6.4
Test ignition system:
with ZAT 3 or ZAT 4
(use ZAT 3 as main spark gap
see TI 32.1994), 📖 6.3
1


1
Ignition spark?
yes
no
Air gap:
– Check ignition module/flywheel, reset if necessary, 🕮 6.2
Check the flywheel:
– Have pole shoes turned blue?
– Install new flywheel if necessary, 🕮 6.5
Check short circuit wire:
– Wire damaged?
– Connectors firmly seated?
– Check continuity, replace throttle cable if necessary, 🕮 6.6.1
Check the ignition lead:
– Severe chafing?
– Spark plug boot: Holes/cracks?
– Resistance: spark plug boot to ground: spec. 1.5 – 12 kΩ
– Check resistance of ignition lead (spark plug boot and ignition module removed): spec.< 10 Ω,
If necessary, install new spark plug boot and/or Install new ignition module,
🕮 6.4
2
3


2
3
Check operation of stop switch lever:
– Short circuit wire chafed?
– Function between contact springs on stop switch lever:
– Stop switch lever not depressed = no contact
– Stop switch lever depressed = contact
– If necessary, install new short circuit wire or contact springs,
📖 6.6.2
Ignition spark?
yes
no
Install new ignition module,
📖 6.2
Machine runs
yes
no
Machine runs trouble-free,
no further action necessary
– Look for fault in fuel system or carburetor.
– Check engine for leaks.
– Check position of flywheel on crankshaft,
📖 5.2, 📖 6.5

7.1 General

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

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

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

Before installing, lubricate the rewind spring and starter post with special lubricant, 🕮 12.

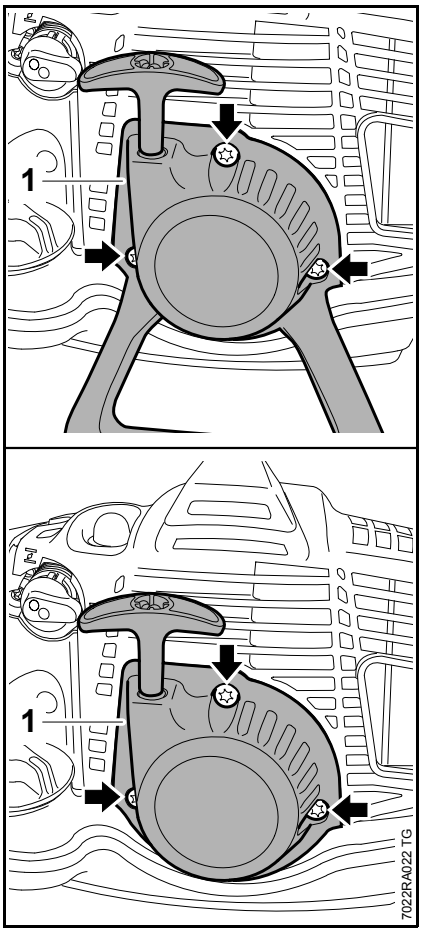
If clogged with dirt or pitch, the entire starter mechanism, including the rewind spring, must be removed and disassembled. Take particular care when removing the rewind spring.

– Clean all components.

ErgoStart

– Relieve tension of rewind spring, 🕮 7.4

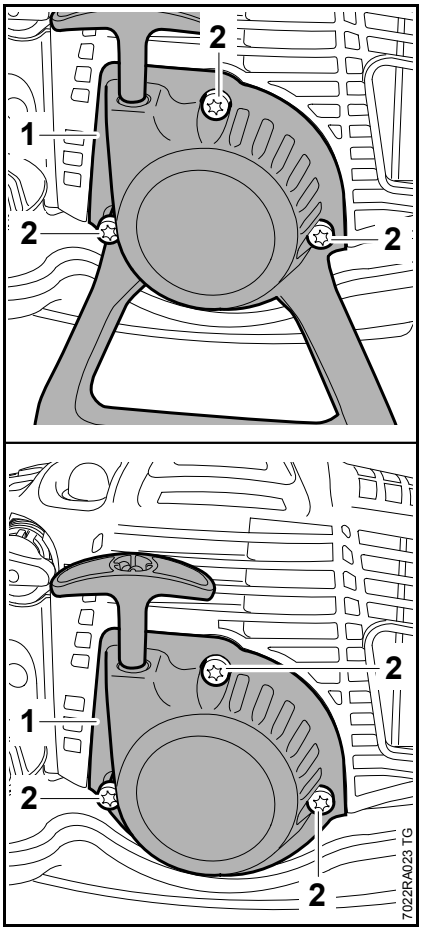
7.2 Rewind Starter



● Take out the screws (arrows) and remove the rewind starter (1).

Installing

– Lubricate pegs on pawls with STIHL multipurpose grease, 🕮 12



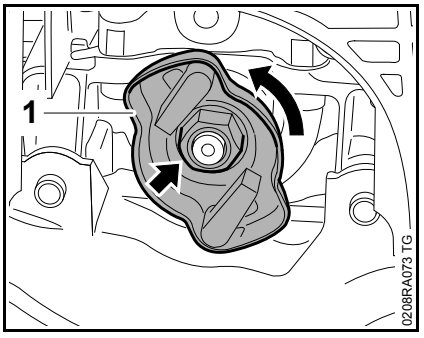
The shroud must be in place.

● Place the rewind starter (1) in position – insert and tighten down the screws (2) firmly.

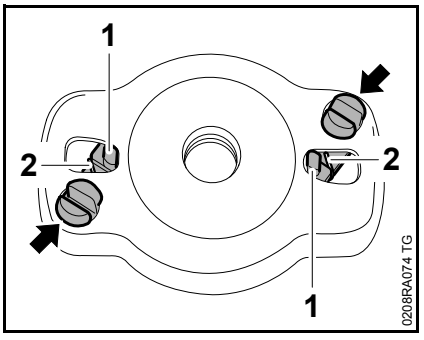
7.3 Pawl / Carrier

– Remove the rewind starter, 🕮 7.2

– Block the piston, 🕮 4.2



● Apply tool to hexagon (arrow), then loosen and unscrew carrier (1) counterclockwise.

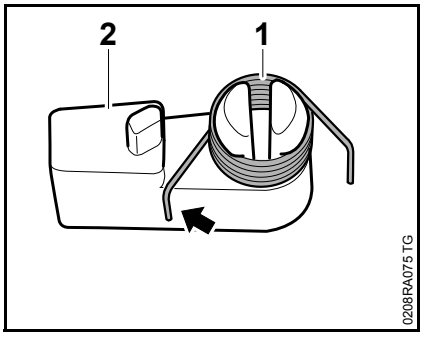


● Squeeze the retaining lugs on the pivot (arrows) together and push out the pawls (1) with torsion springs (2).

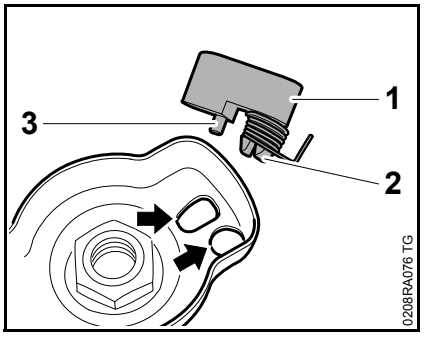
● Remove the torsion springs (2).

– Inspect the torsion springs, pawls and carrier and replace if necessary.

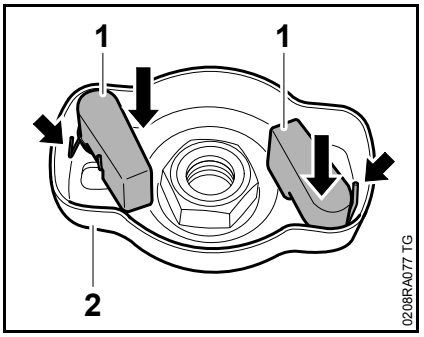
Installing



● Push the torsion springs (1) onto the pawls (2) so that the hooks (arrow) locate against the pawls (2) as shown.



● Position the pawls (1) so that the retaining lugs on the pivots (2) engage the bores and the pegs (3) locate in the openings (arrows)
– the pegs (3) limit the range of movement of the pawls (1).



● Push the pawls (1) into the bores until they snap into place and locate the ends of the springs (arrow) against the side of the carrier (2).

Check operation

– Swing pawls outwards towards edge of carrier and release – the pawls must spring back automatically as far as stop.

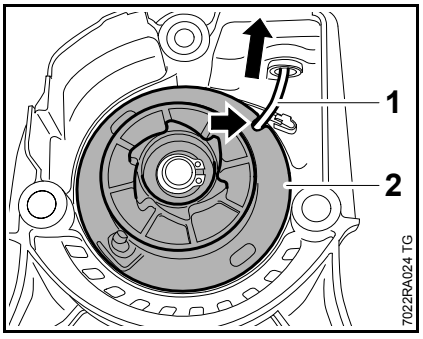
– Reassemble all other parts in the reverse sequence.

7.4 ErgoStart / Rope Rotor

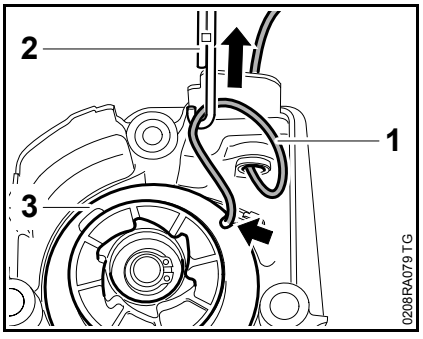
Relieving tension of rewind spring

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

– Remove the rewind starter, 🕮 7.2

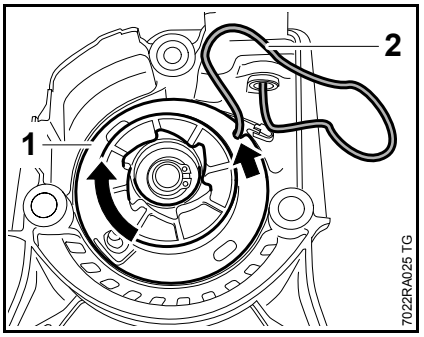


- Pull out starter rope (1) all the way until the notch (arrow) is next to the rope guide bushing, then hold the rope rotor (2) steady.

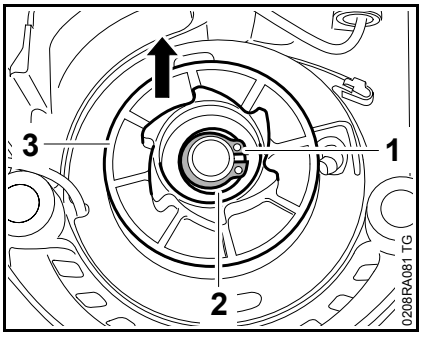


- Use hook (2) 5910 893 8800 to pull out the starter rope (1) between the notch and rope guide bushing.

- Hold the starter rope in the notch (1) and allow the rope rotor (3) to rotate slowly until the rewind spring is no longer under tension.

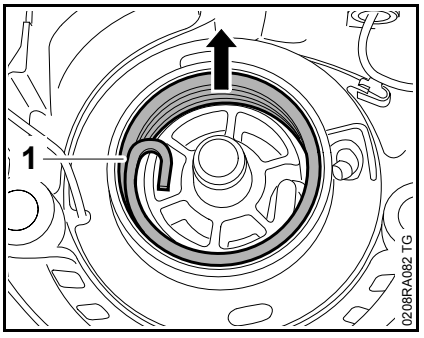


- Carefully release the rope rotor (1), while holding the starter rope (2) in the notch (arrow), until the rewind spring is relieved of tension
  – do not completely let go of the rope rotor (1) because it will otherwise spin back and may damage the rewind spring.

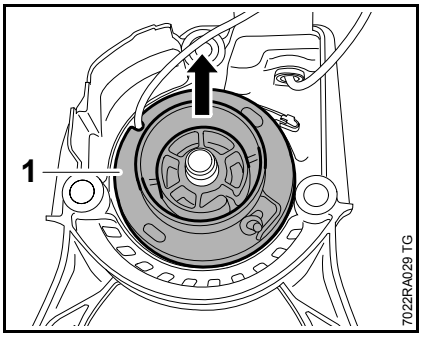


- Take out the retaining ring (1) and remove the washer (2).

- Pull off the carrier (3).



- Pull out the spring (1).



Rewind spring must be relaxed.

- Carefully remove the rope rotor (1).
  – the rewind spring may pop out and uncoil.

– Remove the starter rope from the rotor and check it, replace if necessary, 🕮 7.5

– Check the rope rotor and replace if necessary.

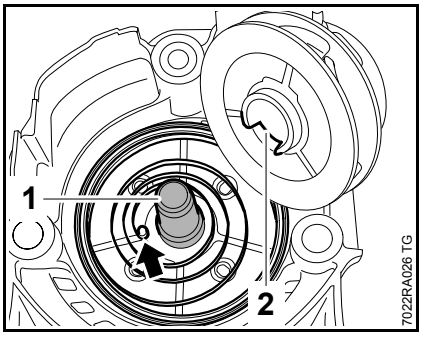
– Inspect bore in rope rotor, and clean or replace if necessary.

– Inspect the rewind spring and replace if necessary, 🕮 7.7

Installing

– Lubricate full length of starter post with STIHL special lubricant, 🕮 12

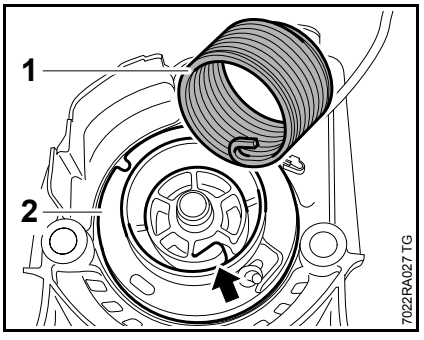
– Fit the starter rope on the rotor, 🕮 7.5



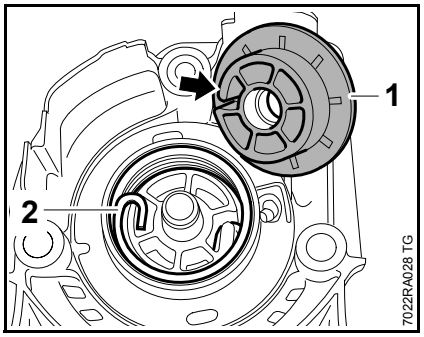
- Line up the inner spring loop (arrow) so that it locates against the starter post (1).

- Fit the rope rotor (2) on the starter post so that the inner spring loop (arrow) engages the recess (1).

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



- Fit the spring (1) in the rope rotor (2) so that its loop engages the lug (arrow).



- Fit the carrier (1) in position so that the recess (arrow) engages the spring's loop (2).

– Fit the washer and retaining ring.

– Tension the rewind spring, 🕮 7.6

– Lubricate pegs on pawls with STIHL multipurpose grease, 🕮 12

– Reassemble all other parts in the reverse sequence.

7.5 Starter Rope / Grip

– Remove the rewind starter, 🕮 7.2

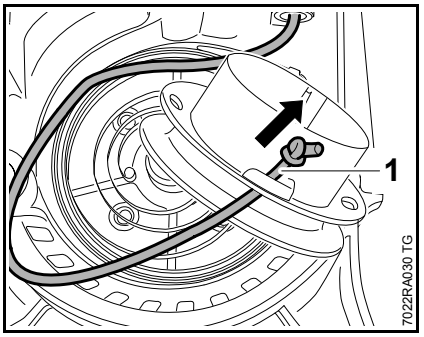
– Relieve tension of rewind spring, 🕮 7.4

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

– Remove the ErgoStart / rope rotor, 🕮 7.4

– Remove any remaining rope from the rope rotor.

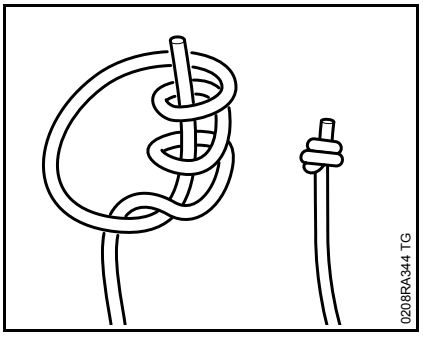
Do not shorten the starter rope.



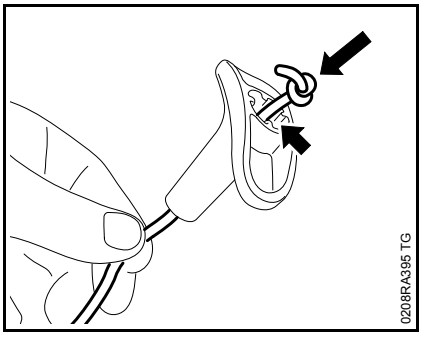
- Push the end of the starter rope (1) out a little and undo the knot.

– Pull the rope out of the rotor, starter cover and grip.

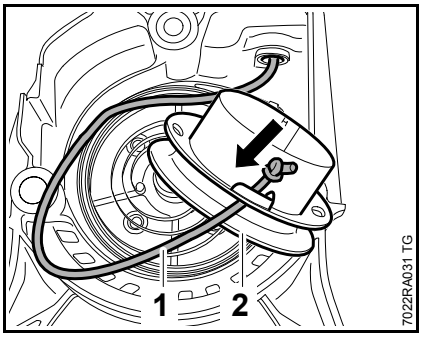
Installing



- Tie special knot shown in end of rope.



- Thread the new starter rope through the top of the starter grip until the knot is seated in the recess (arrow).



- Thread the rope (1) through the guide bushing and the rotor (2).
- Secure end of rope (1) with a simple overhand knot and pull it back until the knot is against the rotor (2).

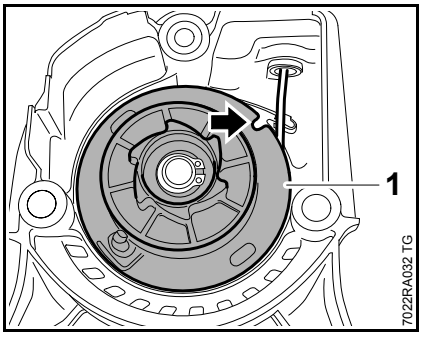
– Install the ErgoStart / rope rotor, 🕮 7.4

– Tension the rewind spring, 🕮 7.6

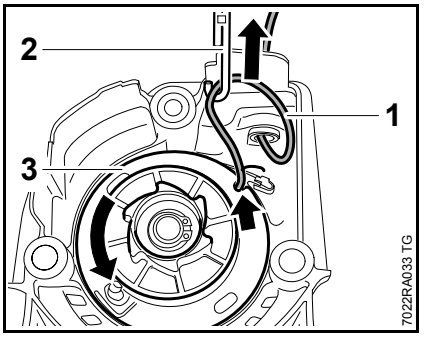
– Reassemble all other parts in the reverse sequence.

7.6 Tensioning the Rewind Spring

– Remove the rewind starter, 🕮 7.2



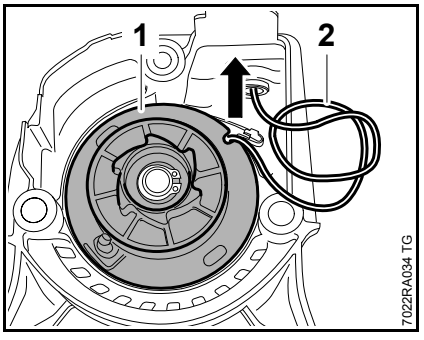
- Position the rope rotor (1) so that the notch (arrow) points towards the rope guide bushing.



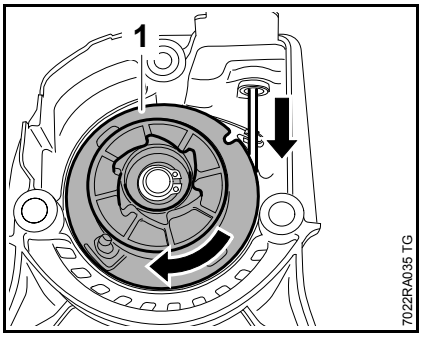
- Use hook (2) 5910 893 8800 to pull out the starter rope (1) between the notch (arrow) and rope guide bushing.
- Engage the starter rope (1) in the notch (arrow) and hold it there. Then turn the rotor (3) six turns counterclockwise.

The rewind spring is now tensioned.

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

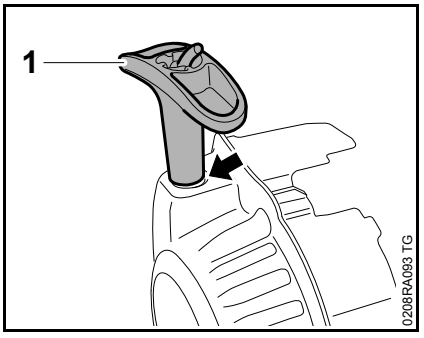


- Hold the rope rotor (1) steady, pull out the rope (2) with the starter grip and straighten it out.



– Hold the starter grip firmly to keep the rope tensioned.

- Let go of the rope rotor (1) and slowly release the starter rope so that it can rewind properly.



The starter grip (1) must sit firmly in the rope guide bushing (arrow) without drooping to one side. If this is not the case, tension the spring by one additional turn.

When the starter rope is fully extended, it must still be possible to rotate the rope rotor at least another 1/2 to 1 1/2 turns before maximum spring tension is reached. If this is not the case, reduce spring tension since there is otherwise a risk of breakage.

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

– Reassemble all other parts in the reverse sequence.

7.7 Replacing the Rewind Spring

– Troubleshooting, 🕮 3.2

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

– Keep the frame in a safe place – the frame can be used as an assembly aid for installing a rewind spring that has popped out and unwound.

– Wear a face shield and work gloves
to protect your eyes and hands from injury.

– Remove the rewind starter, 🕮 7.2

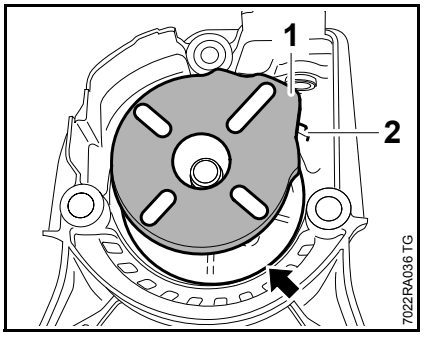
– Relieve tension of rewind spring if necessary and remove the ErgoStart / rope rotor, 🕮 7.4

The spring will not be under tension if it is broken.

If the rewind spring can no longer be properly tensioned, install a new spring.

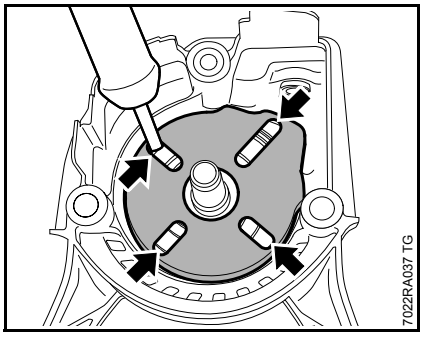
– To reduce the risk of injury, place suitable cover over the work area when removing the rewind spring.

Installing new rewind spring

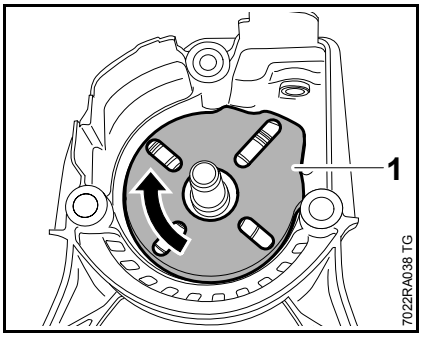


– Lubricate the rewind spring in the frame with a few drops of STIHL special lubricant before installing, 🕮 12

● Position the replacement spring with frame in the starter cover so that the anchor loop (1) is above the lug (2) and slips into its seat (arrow).



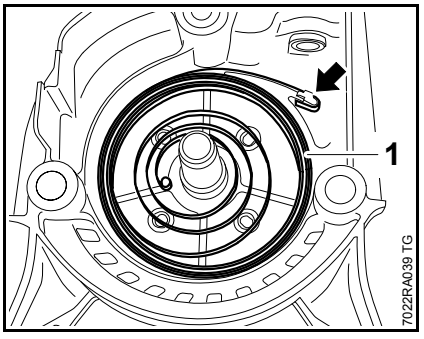
● Starting at the anchor loop, apply suitable tool to the recesses (arrows) and push the rewind spring into its seat in the starter cover – the frame slips off during this process.



● Press the frame (1) against the rewind spring and, if necessary, rotate it slightly until the spring is properly seated.

The rewind spring may pop out and uncoil.

– Carefully remove the frame and keep it in a safe place
– the frame is used as an assembly tool for installing a rewind spring that has popped out and unwound.



Make sure that the
rewind spring (1) is properly seated and the outer anchor loop is engaged on the lug (arrow). If necessary, push the rewind spring fully into its seat in the starter cover.

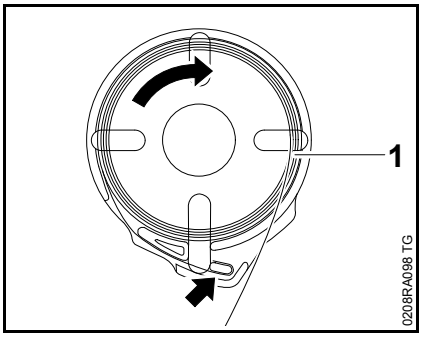
● Secure the spring so that it cannot pop out.

– Install the ErgoStart / rope rotor, 🕮 7.4

– Reassemble all other parts in the reverse sequence.

Installing unwound rewind spring

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



- Fit the anchor loop in its seat (arrow) in the frame.
- Fit the rewind spring (1) in the frame in the clockwise direction.

The procedure is otherwise the same as that for installing a new rewind spring.

– Install the ErgoStart / rope rotor, 🕮 7.4

– Reassemble all other parts in the reverse sequence.

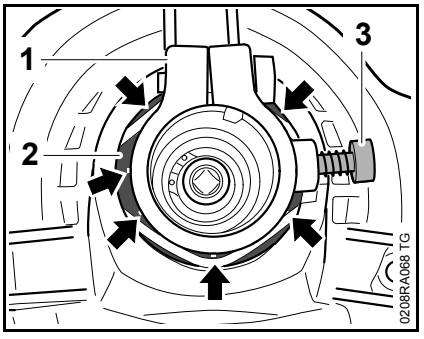
The drive tube and fan housing are connected by a vibration-damping rubber element.

A damaged rubber element must always be replaced.

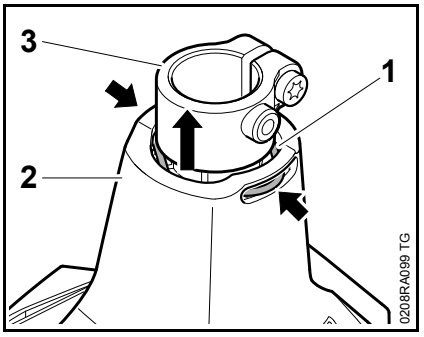
8.1 Rubber Element

– Remove the drive tube, 🕮 9.1

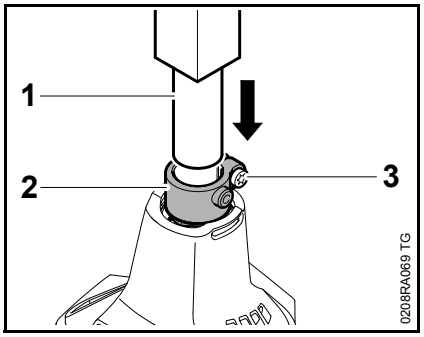
– Remove the fan housing, 🕮 4.1



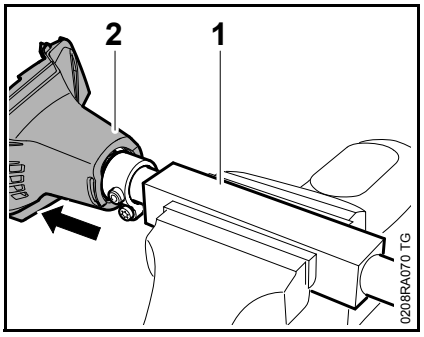
- Stand fan housing (1) upright, then apply STIHL press fluid to profile (arrows) of rubber element (2) and allow it to act briefly, 🕮 12
- Take out the screw (3).



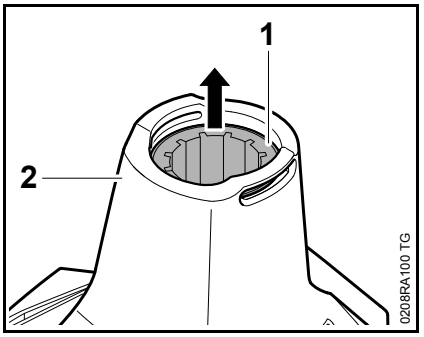
- Press the retaining ring (1) inwards through the slots (arrows) in the fan housing (2) and pry it out.
- Remove the retaining ring (1) over the sleeve (3).



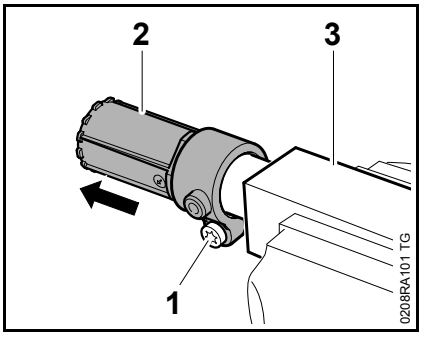
- Push 24 mm or 26 mm shaft of installing tool (1) 4126 893 4900 into the sleeve (2) as far as stop.
- Tighten down the screw (3) firmly



- Clamp square shank of installing tool (1) with fan housing (2) in the vise.
- Turn fan housing (2) back and forth and pull it off at the same time.



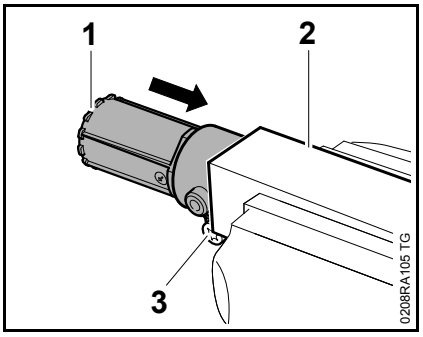
- Pull the rubber element (1) out of the fan housing (2).



- Loosen the screw (1) and pull the sleeve (2) off the installing tool (3).

– Examine the sleeve, rubber element and fan housing, replace if necessary.

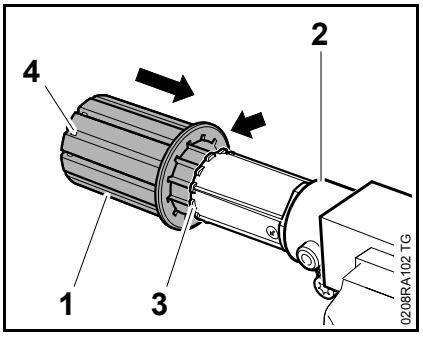
Installing



– Clamp square shank of installing tool in the vise.

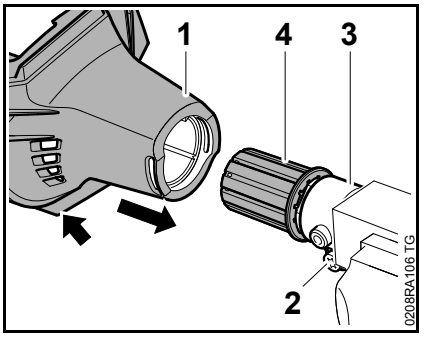
- Push sleeve (1) onto 24 mm or 26 mm shaft of installing tool (2) 4126 893 4900 as far as stop and line it up so that the screw (3) is at the bottom.

- Tighten down the screw (3) firmly



- Position the rubber element (1) so that its collar (arrow) faces the vise and guide ribs on the sleeve (2) are in line with the recesses on the inside of the rubber element (1).

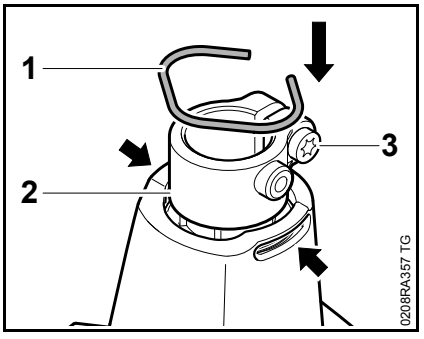
- Push the rubber element (1) onto the sleeve (2) as far as stop – the lugs (3) must engage the openings (4).



- Coat outside of rubber element (4) with STIHL press fluid – do not use oil or any other lubricant, 🕮 12

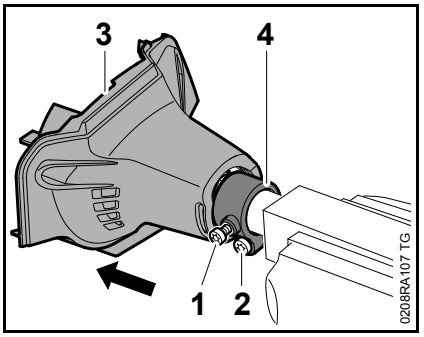
- Position the fan housing (1) so that the lower bore (arrow) is in line with the clamp screw (2) on the sleeve (3)
  – the guide ribs in the fan housing (1) seat must line up with the recesses in the rubber element (4).

- Push the fan housing (1) onto the rubber element (4) until the collar is behind the lateral slots in the fan housing (1).



- Fit the retaining ring (1) over the sleeve (2) so that the gap is on the same side as the clamp screw (3).

- Push the retaining ring (1) into its seat until it snaps into position in the lateral slots (arrows).

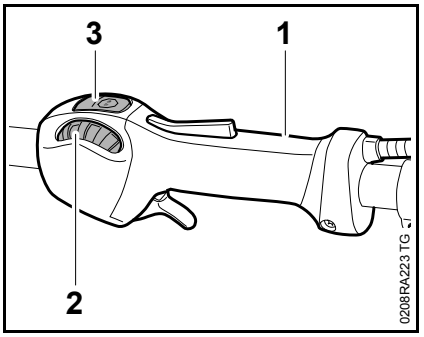


- Insert the screw (1) – do not tighten down yet.

- Loosen the screw (2) and pull off the fan housing (3) complete with rubber element and sleeve (4).

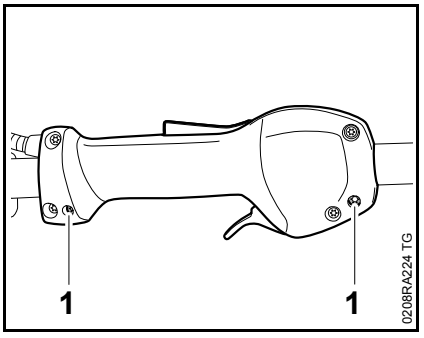
– Reassemble all other parts in the reverse sequence.

9.1 Control Handle on Drive Tube Removing and Installing

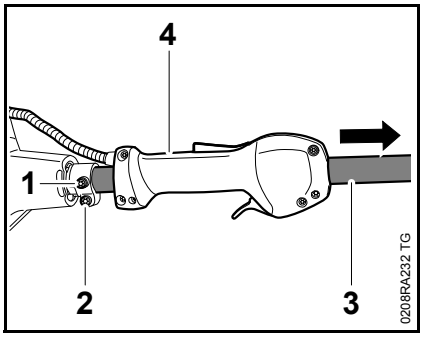


This control handle (1) with adjusting wheel (2) and stop switch (3) is pushed onto the drive tube (24 mm or 25.4 mm diameter) and secured with clamps.

To replace the complete control handle (1), first remove the throttle cable from the engine, 🕮 6.6.2.



- Loosen the screws (1) on the clamps.



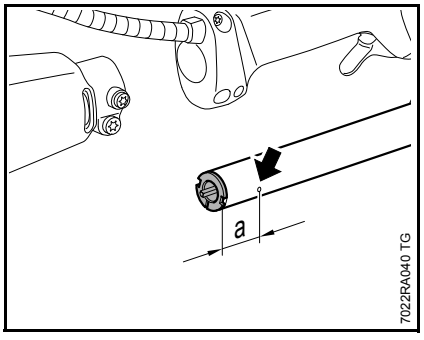
- Take out the screw (1) – serves to fix the drive tube in position.

To avoid strain on the throttle cable, hold the control handle (4) steady while pulling out the drive tube.

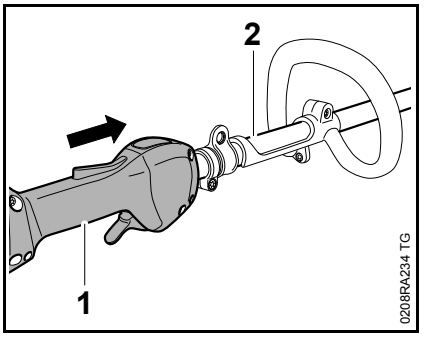
Loosen the screw (2) and pull the drive tube (3) out of the fan housing and control handle (4).

Installing

– Degrease area for clamp, 🕮 12

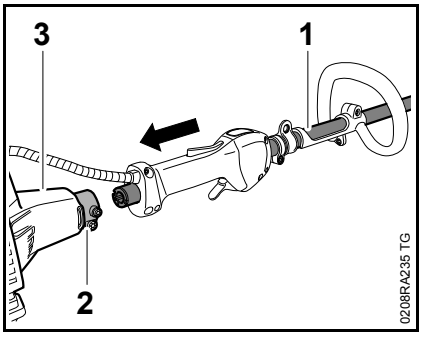


- The end of the drive tube with the cross hole (arrow) must face the engine – distance "a" from end of drive tube to cross hole is 65 mm.



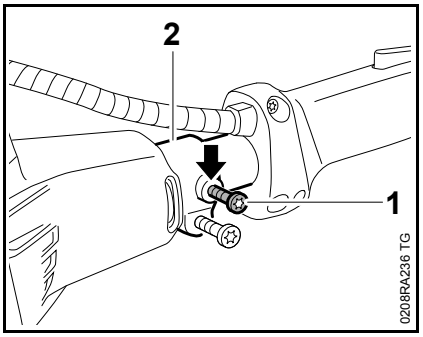
The clamps in the control handle on the drive tube must be loose.

- Push the control handle (1) onto the end of the drive tube (2) with the plug or spring damper.



- Push the drive tube (1) through the sleeve (2) and into the fan housing (3) while turning it back and forth until the square end of the drive shaft engages the clutch drum.

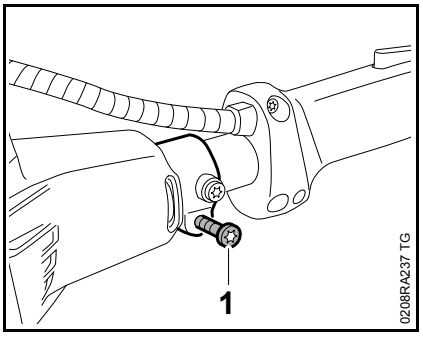
The drive tube must be pushed through the clamp as far as stop.



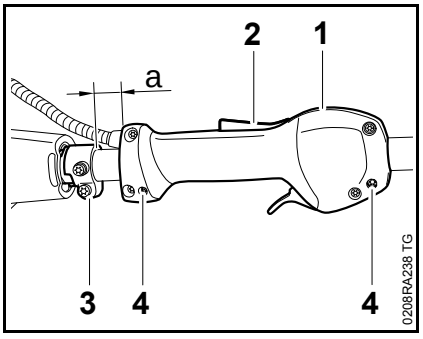
- Position the drive tube so that the holes (arrow) in the drive tube and sleeve (2) are in alignment.

- Fit the screw (1) as far as stop – the drive tube is held in position

Label on drive tube must be visible in working position.



- Insert and tighten down the screw (1) firmly – drive tube is secured.

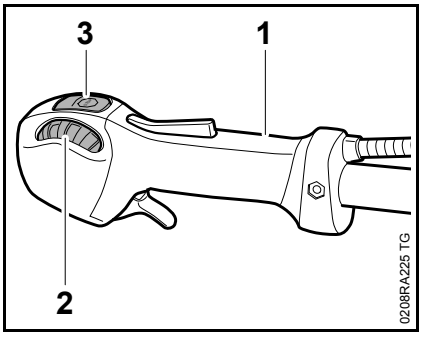


- Position the control handle (1) so that the lockout lever (2) faces up and distance "a" between it and the sleeve (3) is 25 mm.

- Tighten down the screws (4) firmly.
  – The control handle is now clamped securely to the drive tube.

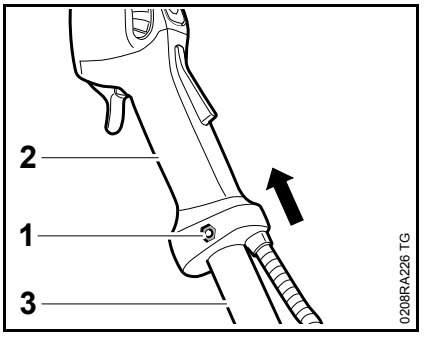
– Check instruction label on drive tube for damage and legibility, replace if necessary.

9.2 Control Handle for Bike Handle Removing and Installing



This control handle (1) with adjusting wheel (2) and stop switch (3) is pushed onto the bike handle and secured with a screw.

To replace the complete control handle (1), first remove the throttle cable from the engine, 🕮 6.6.2.



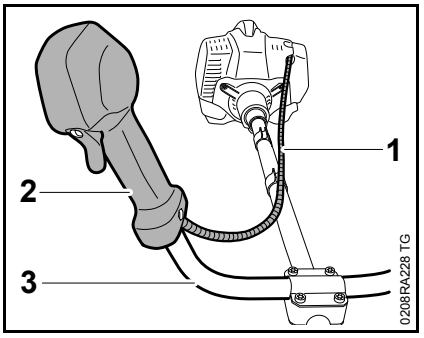
- Take out the screw and remove the locknut (1) from the other side – always install a new locknut.

- Pull the control handle (2) off the bike handlebar (3).

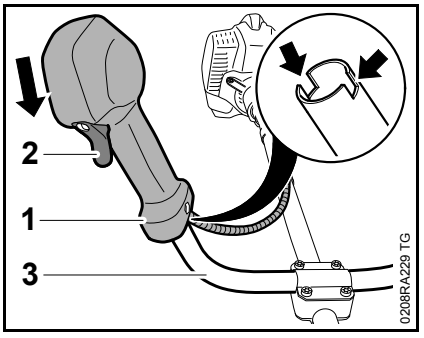
– Check the control levers and replace if necessary,
  Throttle trigger and lockout lever, 🕮 9.3,
  Stop switch lever (momentary contact switch), 🕮 9.4,
  Adjusting wheel, 🕮 9.5

– Check the throttle cable or short circuit wire and replace if necessary, 🕮 6.6.1

Installing

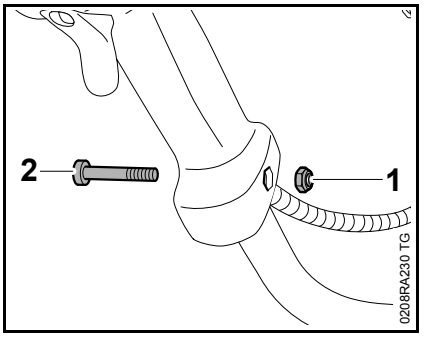


- Position the throttle cable (1) with control handle (2) along the top of the drive tube to the bike handle (3).



- Line up the control handle (1) so that the throttle trigger (2) points towards the gearbox.

- Push the control handle (1) onto the handlebar (3), turning it back and forth until it engages the slots (arrows).



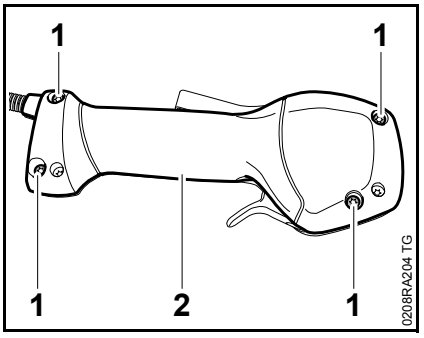
- Fit new locknut (1) in the recess and push the screw (2) through the control handle and handlebar from the other side.
- Hold the locknut steady and tighten down the screw firmly.

The control handle must be firmly seated on the handlebar and not move.

9.3 Throttle Trigger / Lockout Lever

Version with control handle on drive tube

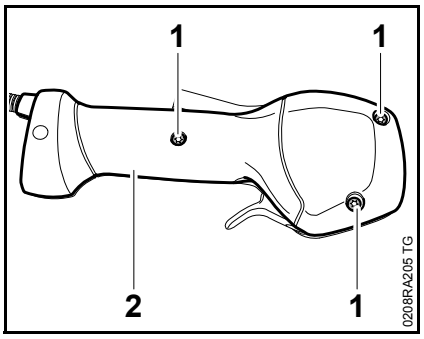
– Remove control handle from drive tube, 🕮 9.1



- Take out the screws (1) and carefully remove the handle molding (2).

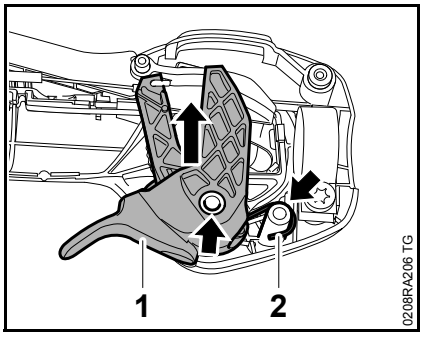
Version for bike handle

– Remove control handle from bike handle, 🕮 9.2

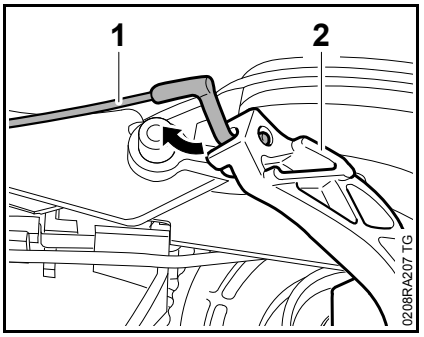


- Take out the screws (1) and carefully remove the handle molding (2).

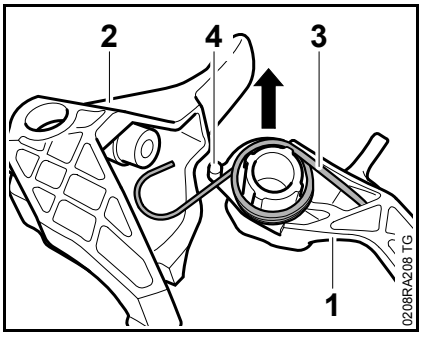
All models



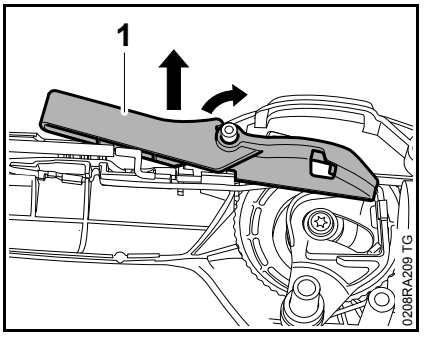
- Take the throttle trigger (1) with torsion spring (2) off the pivots (arrows).



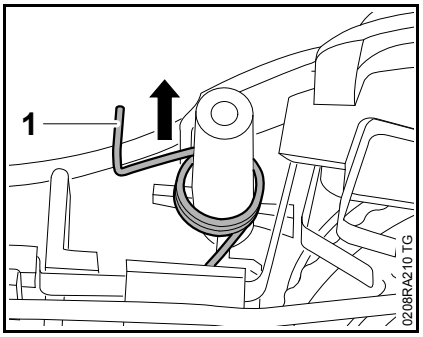
- Disconnect the throttle cable (1) from the trigger (2).



- Take the lever (1) out of the throttle trigger (2).
- Lift the torsion spring (3) clear of the stop (4) and take it away.



- Carefully lift the lockout lever (1) a little and turn it clockwise until the torsion spring is relieved of tension, then pull it off.



- Remove the torsion spring (1).

– Inspect the throttle trigger, lever, lockout lever and torsion springs, replace if necessary.

– Check the adjusting wheel and replace if necessary, 🕮 9.5

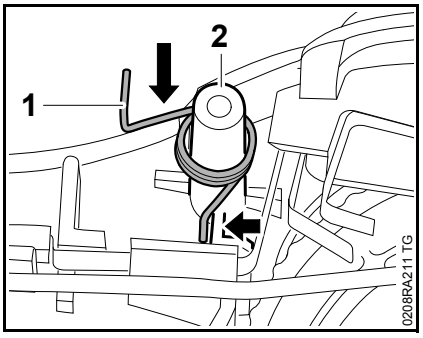
– Inspect the stop switch lever and replace if necessary, 🕮 9.4

– Check the throttle cable and adjust or replace if necessary, 🕮 9.6

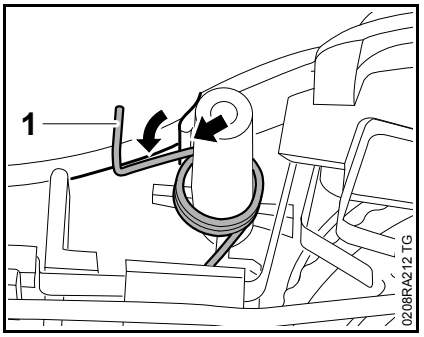
– Inspect the contact springs and replace if necessary, 🕮 6.6.3

– Check the handle moldings and replace if necessary.

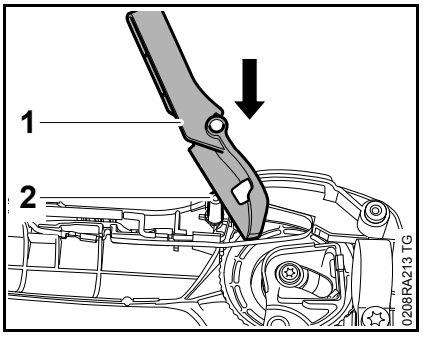
Installing



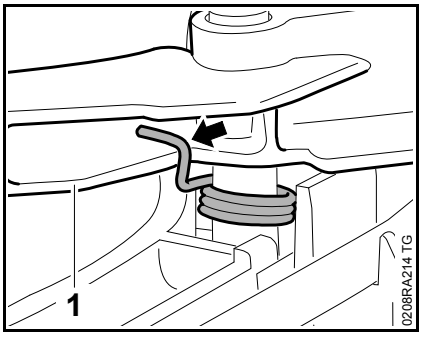
- Fit the torsion spring (1) on the pivot pin (2) so that its lower, bent leg butts against the web (arrow) on the left.



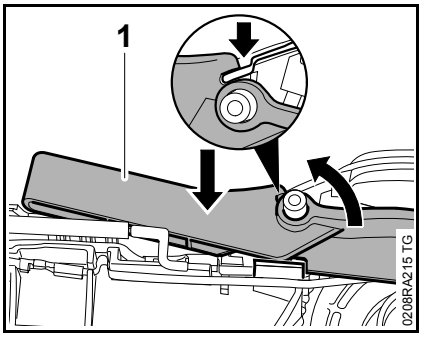
- Turn the upper leg (1) of the torsion spring counterclockwise and push it behind the web (arrow)
  – torsion spring is now pretensioned in its seat.



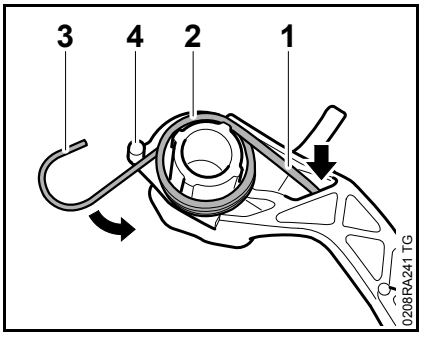
- Push the lockout lever (1) onto the pivot pin (2) so that it fits past the upper leg of the torsion spring.



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

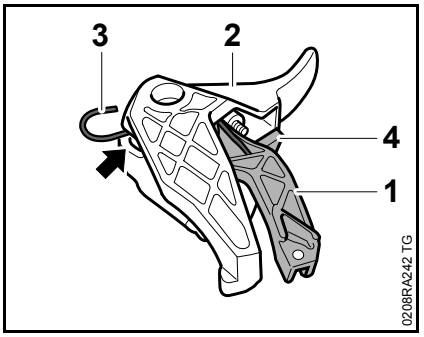


- Push the lockout lever (1) onto the pivot pin and turn it counterclockwise until it engages the rib (arrow)
  – the lockout lever is now pretensioned.

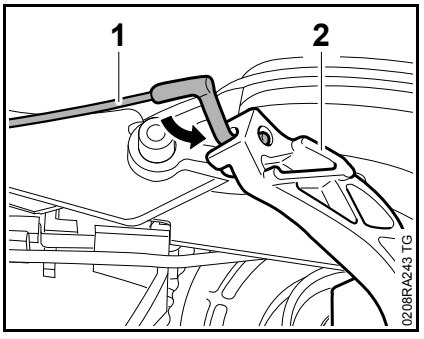


- Push the straight leg (1) into the opening (arrow) and fit the torsion spring (2) in position.

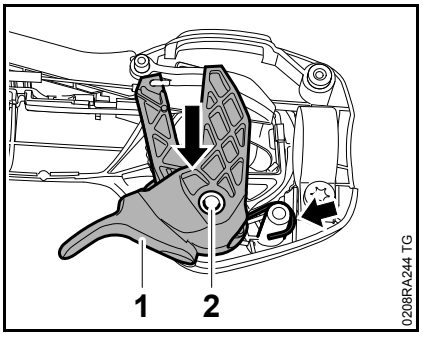
- Tension the hooked leg (3) counterclockwise and fit it behind the stop (4).



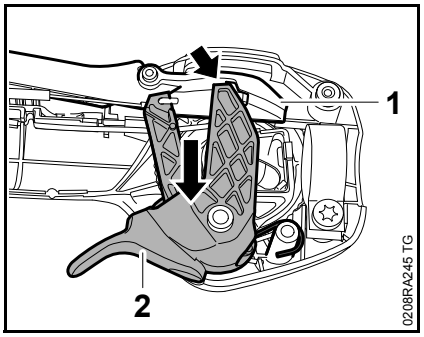
- Fit the lever (1) in the throttle trigger (2) so that the hooked leg (3) projects from the opening (arrow) and the stop (4) is next to the adjusting screw.



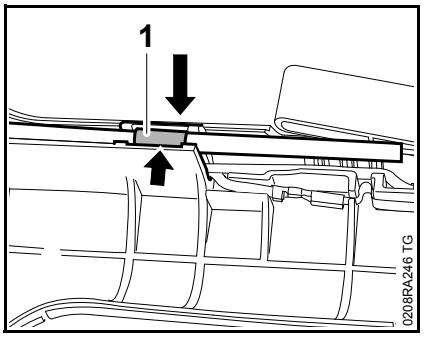
- Attach the throttle cable (1) to the trigger (2).



- Fit the throttle trigger (1) on the pivot pin (2) so that the hooked leg (arrow) engages the pivot.



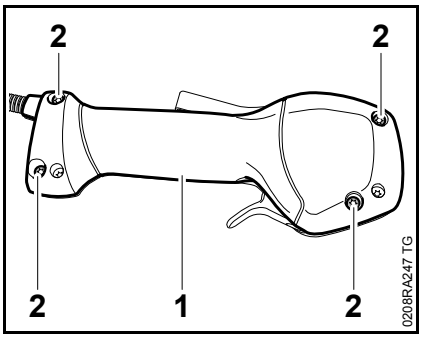
- Lift the lockout lever (1) slightly and push the throttle trigger (2) into position until the lug (arrow) engages the lockout lever (1).



The wires must be properly seated in the right order in the guides.

- Push throttle cable grommet (1) into its seat (arrow).

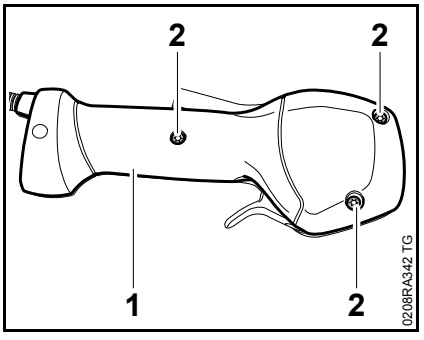
Version with control handle on drive tube



- Fit the handle molding (1), insert and tighten down the screws (arrows) firmly.

– Install control handle on drive tube, 🕮 9.1

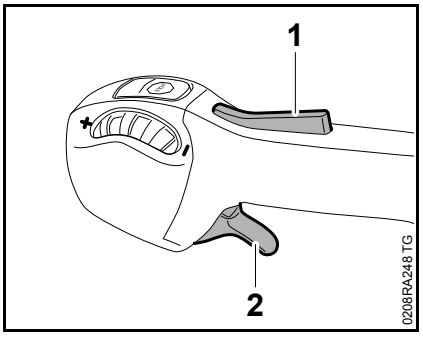
Version for bike handle



- Take out the screws (1) and carefully remove the handle molding (2).

– Install control handle on bike handle, 🕮 9.2

Check operation



The throttle trigger (2) must be locked in position when the lockout lever (1) is not depressed.

– Turn adjusting wheel in direction of "+" up to stop.

● Depress the throttle trigger (2) to full throttle position and let it go – it must return to the stop.

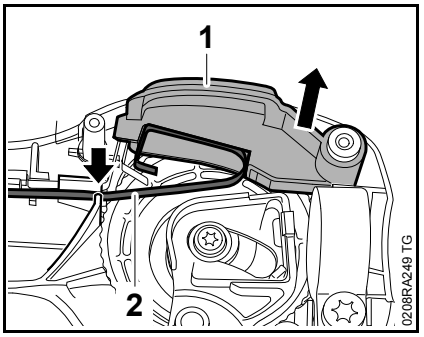
– Check throttle cable adjustment, re-adjust if necessary, 🕮 9.6

– Install control handle on drive tube, 🕮 9.1
Install control handle on bike handle, 🕮 9.2

9.4 Stop switch lever (momentary contact switch):

– Remove control handle from drive tube, 🕮 9.1
Remove control handle from bike handle, 🕮 9.2

– Remove the throttle trigger and lockout lever, 🕮 9.3



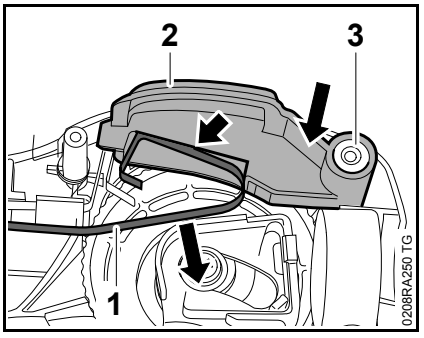
● Lift the stop switch lever (1) slightly, pull the contact spring (2) out of the guide (arrow) and push it to one side.

● Pull off the stop switch lever (1), check it and replace if necessary.

– Inspect the contact springs and replace if necessary, 🕮 6.6.3

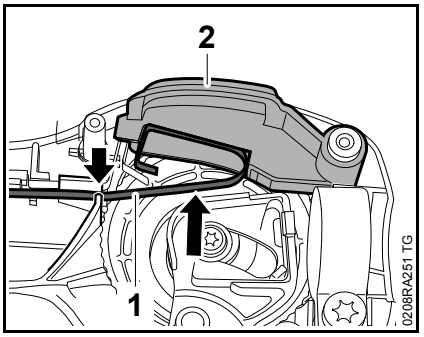
– Check the adjusting wheel and replace if necessary, 🕮 9.5

Installing



● Push the contact spring (1) to one side.

● Push the stop switch lever (2) onto the pivot pin (3) so that the contact spring loop (1) engages in its seat (arrow).

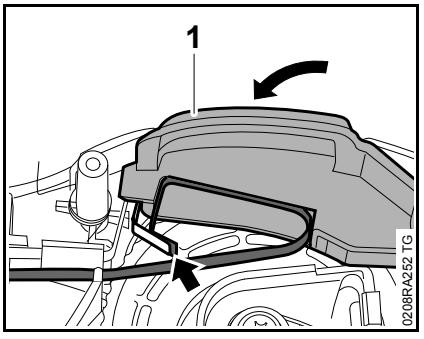


The contact spring (1) must be located properly in the stop switch lever (2).

● Push the contact spring (1) towards stop switch lever (2) and into the guide (arrow).

● Push stop switch lever (2) with contact spring (1) into position – press the wires fully into the guides if necessary.

Check operation



● Depress stop switch lever (1), the contact springs (arrows) must touch each other
– the contact springs must be free from grease.

– Install the throttle trigger / lockout lever, 🕮 9.3

– Check throttle cable adjustment, re-adjust if necessary, 🕮 9.6

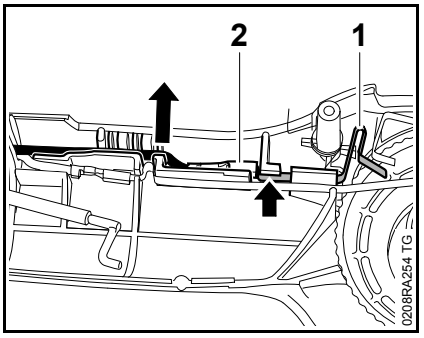
– Reassemble all other parts in the reverse sequence.

9.5 Adjusting Wheel

– Remove control handle from drive tube, 🕮 9.1
Remove control handle from bike handle, 🕮 9.2

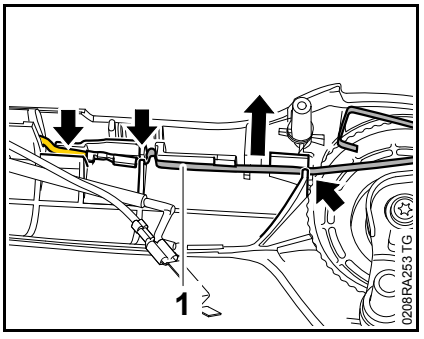
– Remove the throttle trigger and lockout lever, 🕮 9.3

– Remove stop switch lever, 🕮 9.4



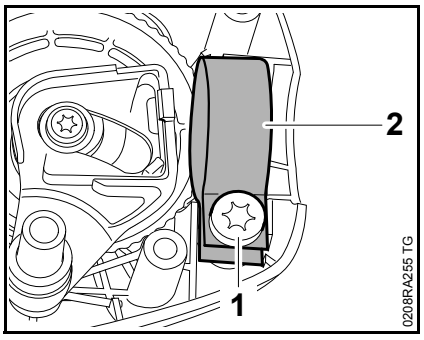
- Push the contact spring (1) inwards in area of terminal (2) and lift it over the lug (arrow).

- Pull the contact spring (1) with short circuit wire out of the guides.



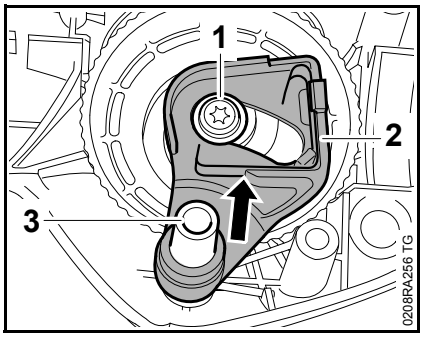
- Pull the contact spring (1) with ground wire out of the guides (arrows).

Version with control handle on drive tube

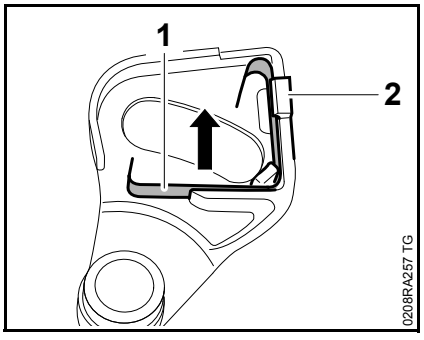


- Take out the screw (1) and remove the clamp (2).

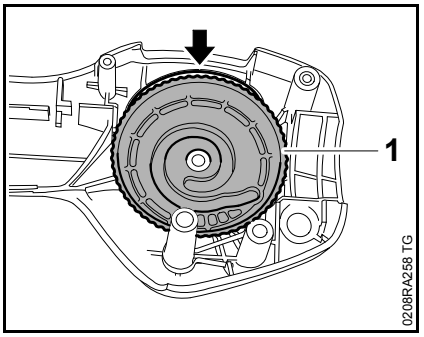
All models



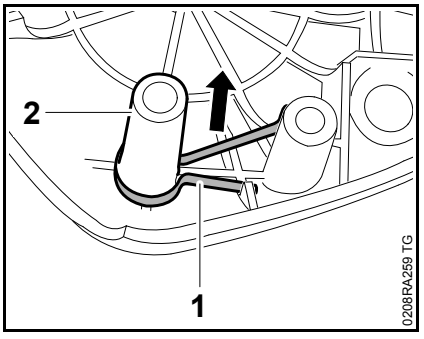
- Take out the screw (1) and pull lever (2) off the pivot pin (3).



- Lift the spring (1) a little until it slips past the lug (2), then pull it out.



- Reach through the opening (arrow) and push the adjusting wheel (1) off the pivot pin.

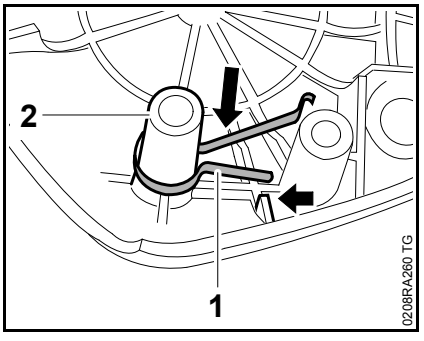


- Remove the spring (1) from the pivot pin (2).

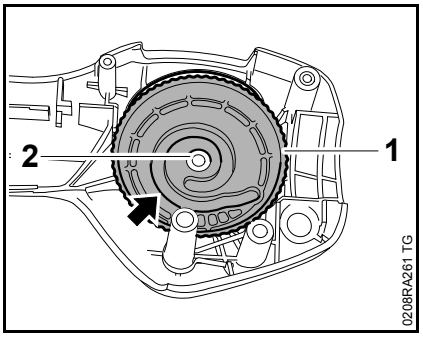
– Check the handle moldings and replace if necessary.

– Inspect the adjusting wheel, lever and springs, replace if necessary.

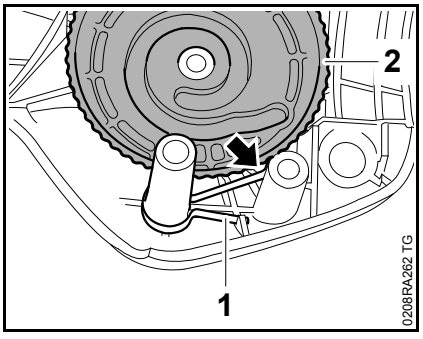
Installing



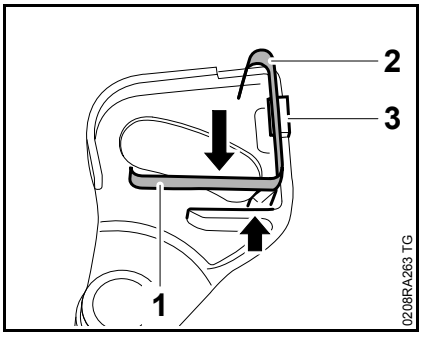
- Fit the spring (1) on the pivot pin (2) so that its short leg locates against the rib (arrow).



- Push the adjusting wheel (1) onto the pivot pin (2) so that the spiral groove (arrow) is visible.

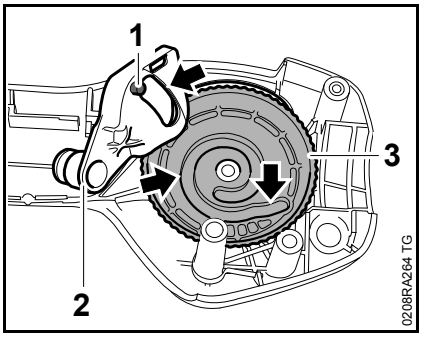


- Leg (arrow) of spring (1) must be under tension and locate against the adjusting wheel (2) – the spring (1) must hold the adjusting wheel (2) in the set position. If necessary, bend torsion spring to increase tension.



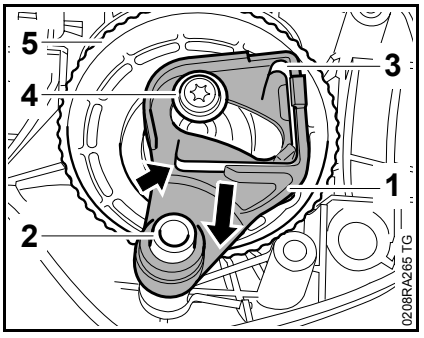
- Line up the spring (1) so that its hooked end (2) is next to the lug (3).

- Push the spring (1) into the guide (arrow) until it is behind the lug (3).



The peg (1) on lever (2) must engage the spiral groove (arrow) in the adjusting wheel (3).

- Lubricate spiral groove (arrows) in adjusting wheel (3) and slot (arrow) in lever (2) with STIHL lubricant, 🕮 12

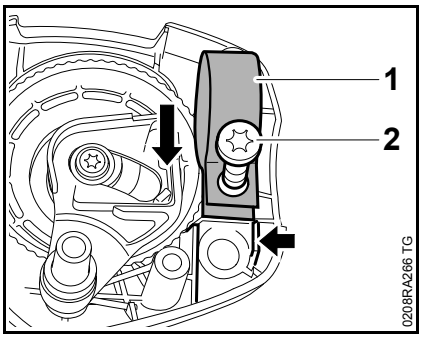


- Push the lever (1) onto the pivot pin (2) so that the spring (3) is visible.

- Insert the screw (4) and tighten it down – lever (1) and adjusting wheel (5) must move freely, loosen the screw (4) a little if necessary.

- Lubricate end of spring (arrow) with STIHL lubricant, 🕮 12

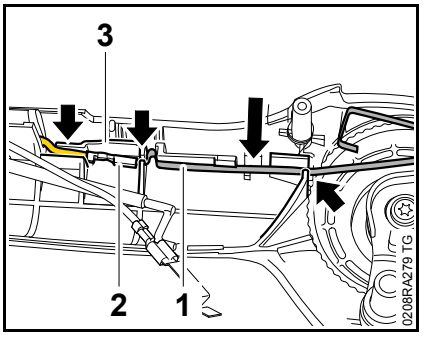
Version with control handle on drive tube



- Fit clamp (1) in the handle molding and position it against the rabbet as shown (arrow).

- Insert the screw (2) – do not tighten down yet.

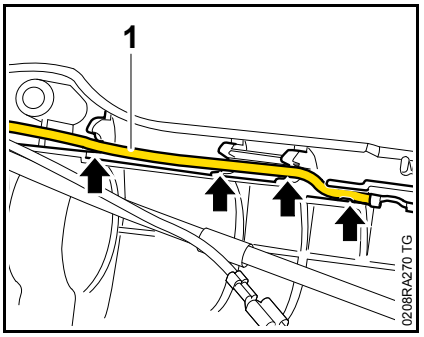
All models



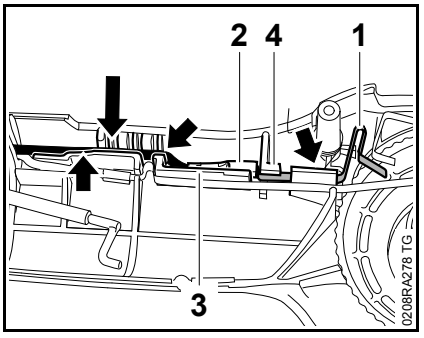
Do not twist the wire.

- Position contact spring (1) with ground wire so that the crimped side of the terminal (2) faces away from the rib (3).

- Push the contact spring (1) with ground wire into the guides (arrows).



- Press the ground wire (1) fully into the guides (arrows).

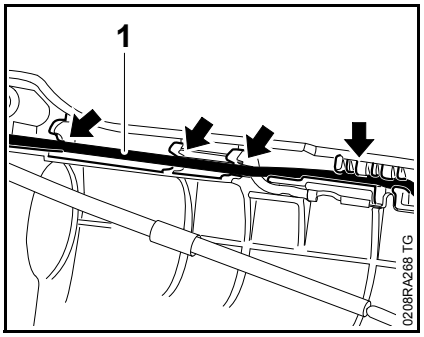


Do not twist the wire.

- Position contact spring (1) with short circuit wire so that the crimped side of the terminal (2) faces away from the rib (3).

- Push the contact spring (1) with short circuit wire into the guides (arrows) until the contact spring (1) is behind the lug (4).

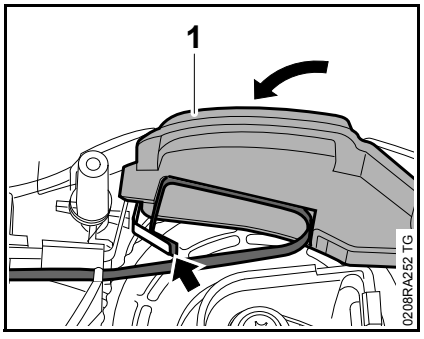
- Apply thin coating of STIHL lubricating grease to radius of contact spring (1)
  – the contact face must remain free from grease, 🕮 12



- Push short circuit wire (1) fully into the guides (arrows) – the ground wire must be underneath the short circuit wire.

– Install stop switch lever, 🕮 9.4

Check operation



- Depress stop switch lever (1), the contact springs (arrows) must touch each other
  – the contact springs must be free from grease.

– Install the throttle trigger / lockout lever, 🕮 9.3

– The travel of the throttle trigger in the direction of full throttle is limited by rotating the throttle set wheel.

– Check throttle cable adjustment, re-adjust if necessary, 🕮 9.6

– Reassemble all other parts in the reverse sequence.

9.6 Adjusting the Throttle Cable

– Remove the shroud, 🕮 5.4

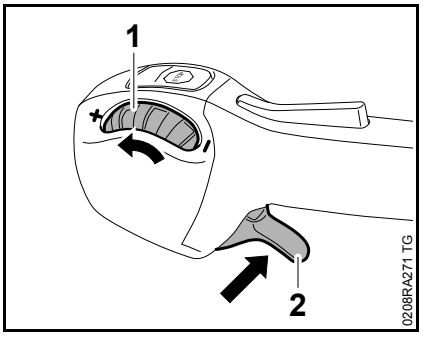
– Remove the filter cover, 🕮 10.1

The throttle cable must be adjusted to ensure the rotary piston of the control valve on the carburetor opens fully when the throttle is opened, and also closes properly.

The adjustments are the same on all versions of the control handle.

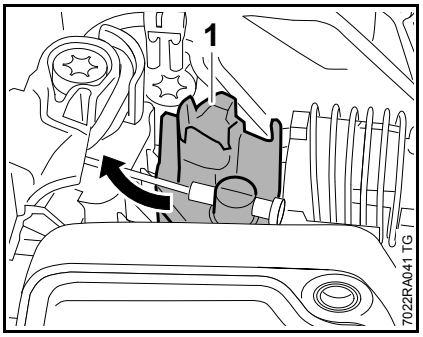
Make sure the throttle cable sleeve is properly seated in the guides and butts against the stops
– the position of the throttle cable sleeve affects the adjustment.

Checking adjustment of throttle cable



- Turn adjusting wheel (1) in direction of "+" up to stop.

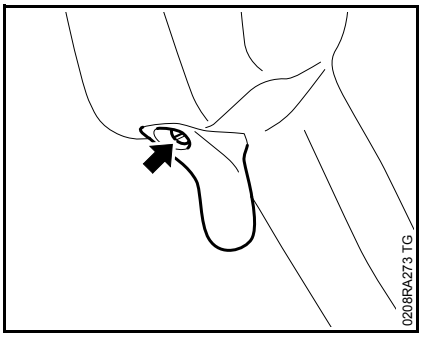
- Squeeze the throttle trigger (2) as far as stop and hold it there.



- Turn the lever (1) on the rotary piston.

If the throttle lever (1) can be turned further in the full throttle direction, the control valve's rotary piston will not be wide open in the full throttle position

Adjusting the throttle cable



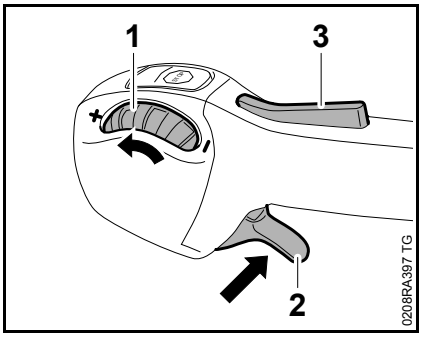
- Squeeze the throttle trigger and turn the grub screw (arrow) until the control valve's rotary piston is wide open.

– Turn the grub screw clockwise = throttle cable is tensioned (rotary piston is opened more)

– Turn the grub screw counterclockwise = throttle cable is relaxed (rotary piston is opened less)

The throttle cable must not be under tension when the throttle trigger is released since the control valve's rotary piston may not close properly – the engine idle speed will then be too high.

Engine speed increases when throttle trigger alone is depressed



- Turn adjusting wheel (1) in direction of "+" up to stop.

– Start the engine.

- Squeeze the throttle trigger (2) – do not depress the throttle trigger lockout (3).

If the engine speed increases or if the working tool runs, the throttle cable must be re-adjusted.

– Shut off the engine.

- Depress the lockout lever (3), then squeeze the throttle trigger (2) as far as stop and hold it there.

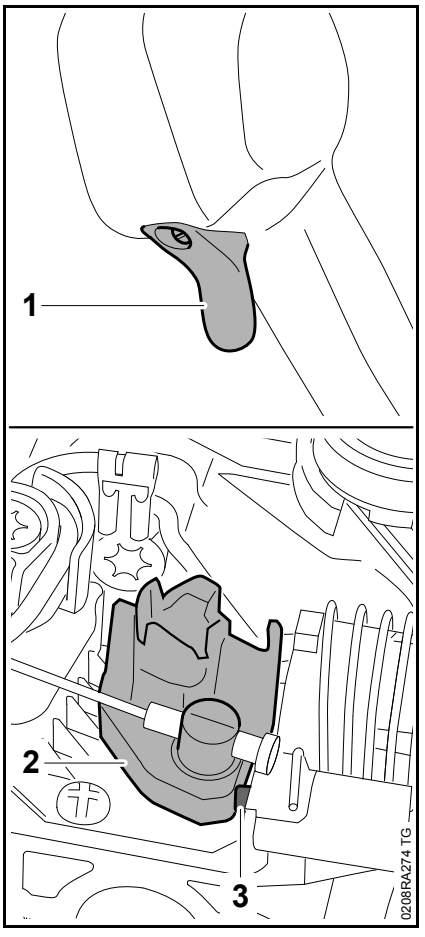
- Turn grub screw (2) on throttle trigger **1/2 turn** counterclockwise.

- Release the throttle trigger (2) and lockout lever (3).

– Start the engine and check the adjustment, repeat procedure if necessary.

Engine does not return to idle speed – working tool runs in this position

– Shut off the engine.



- Squeeze throttle trigger (1) all the way and release it. The throttle trigger (1) and lever (2) on the control valve must automatically return to their original positions.

– Check freedom of movement of throttle cable and re-adjust if necessary, 🕮 6.6.2, 🕮 6.6.3

– Check freedom of movement of lever on control valve, replace control valve if necessary, 🕮 10.4.4

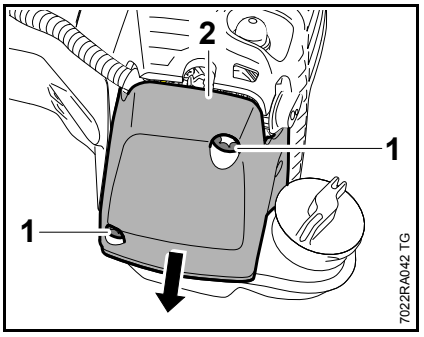
– Fit the filter cover, 🕮 10.1

– Fit the shroud, 🕮 5.4

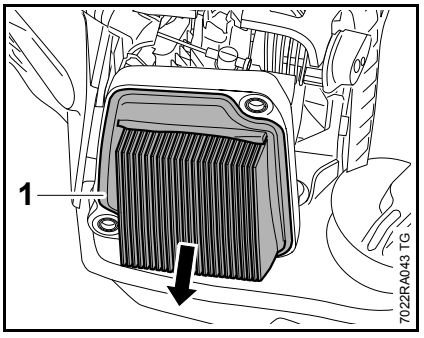
10.1 Air filter

– See also Troubleshooting, 🕮 3.4, 🕮 3.6

Paper filter



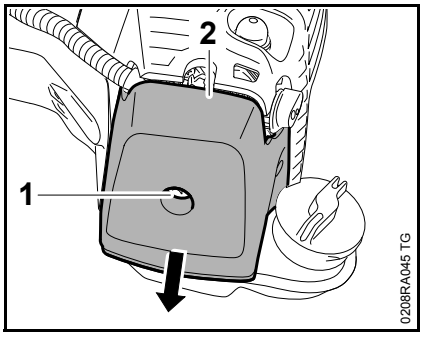
● Take out the screws (1) and remove the filter cover (2).



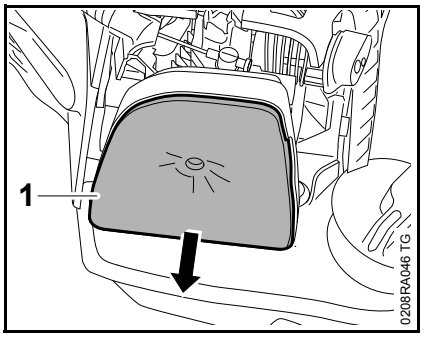
● Take out the air filter (1).

– Check the air filter and replace if necessary.
– see instruction manual.

Fleece filter



● Take out the screw (1) and remove the filter cover (2).



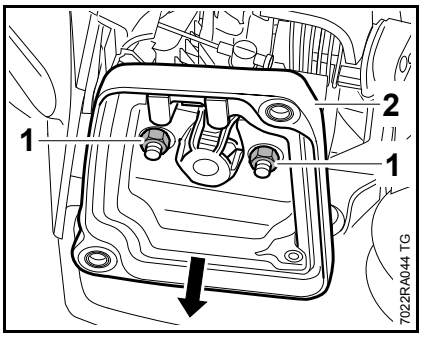
● Take out the air filter (1).

Check the air filter (fleece element) and clean or replace if necessary – see instruction manual.

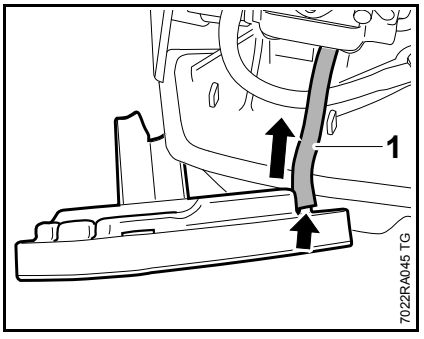
– Reassemble in the reverse sequence.

10.2 Filter Housing

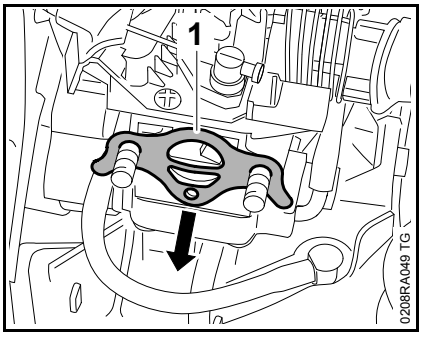
– Remove the air filter, 🕮 10.1



● Unscrew the nuts (1) and remove the filter housing (2).



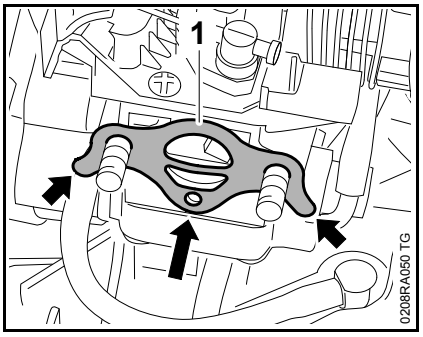
● Pull the tank vent hose (1) off the nipple (arrow) – always install a new tank vent hose.



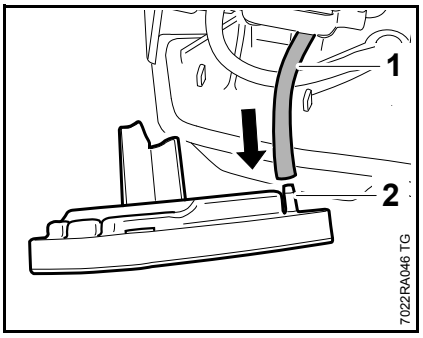
● Remove the gasket (1) – always install a new gasket.

– Examine sealing faces on carburetor and filter housing and clean if necessary, 🕮 12

Installing

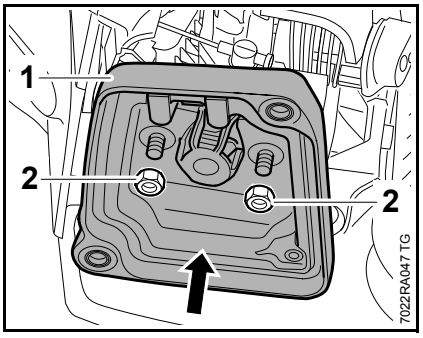


- Fit the new gasket (1) so that the tabs (arrows) point down.



– Use STIHL press fluid to ease installation, 🕮 12

- Push the new tank vent hose (1) fully onto the nipple (2).



- Push the filter housing (1) over the studs.

- Fit the nuts (2) and tighten them down to the specified torque. Over-tightening may impair freedom of movement or function of carburetor.

– Reassemble all other parts in the reverse sequence.

10.3 Carburetor

– Remove the shroud, 🕮 5.4

– Remove the filter housing, 🕮 10.2

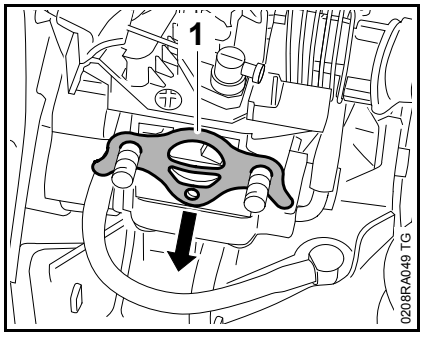
– Remove throttle cable (short circuit wire) from engine, 🕮 6.6.2

– Open the fuel tank cap and drain the fuel tank.

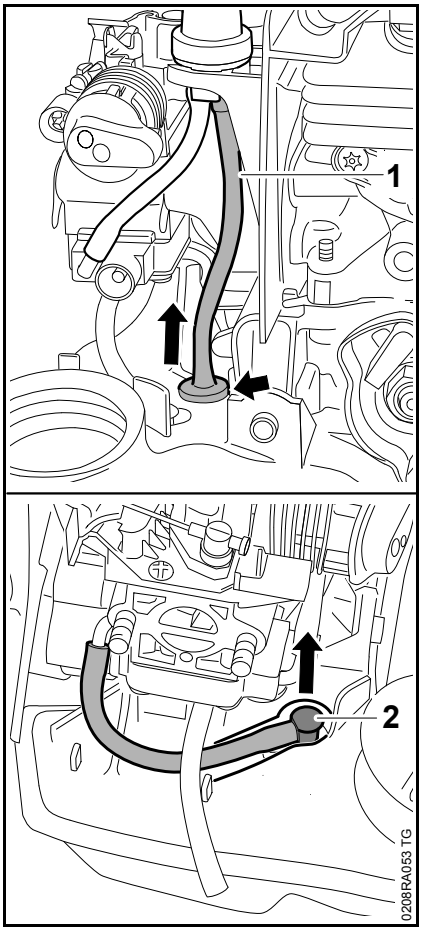
– Collect the fuel in a clean container, 🕮 1

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

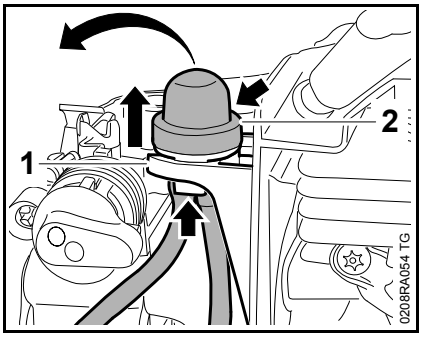
Remove the carburetor with the fuel hoses attached
– if fuel hoses are disconnected, they must be replaced by new ones.



- Remove the gasket (1) – always install a new gasket.

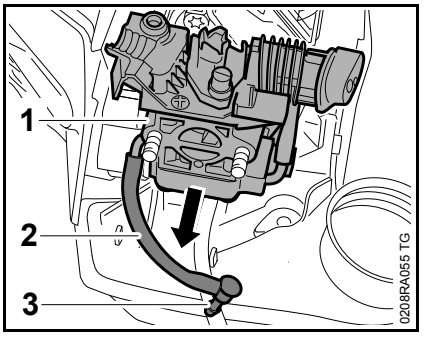


- Pry the fuel return hose (1) out of the bore (arrow) in the tank housing and pull off the elbow connector (2) of the fuel suction hose.



- Squeeze locking tabs (arrows) under the retainer (1) together and push out the manual fuel pump (2).

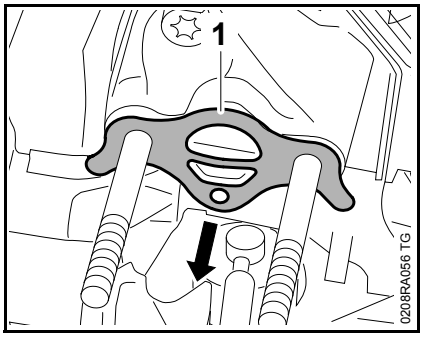
- Remove the manual fuel pump (2) with fuel hoses still attached and put it to one side.



- Remove the carburetor (1).

- Check the fuel suction hose (2) with elbow connector (3), replace if necessary, 🕮 10.8.2

– Inspect the fuel hoses and manual fuel pump, replace if necessary, 🕮 10.8.4

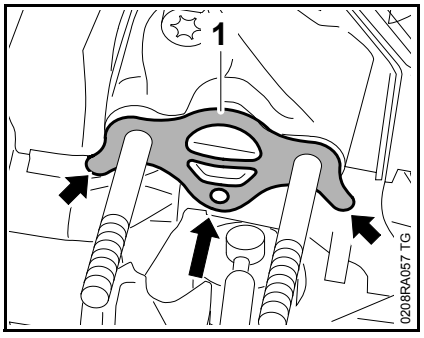


- Remove the gasket (1) – always install a new gasket.

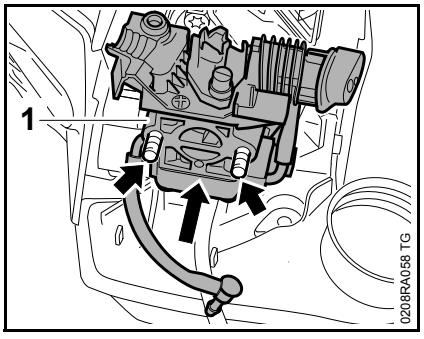
– Inspect and clean the sealing faces on the carburetor and spacer flange, 🕮 12

– Check the carburetor and service or replace if necessary, 🕮 10.4

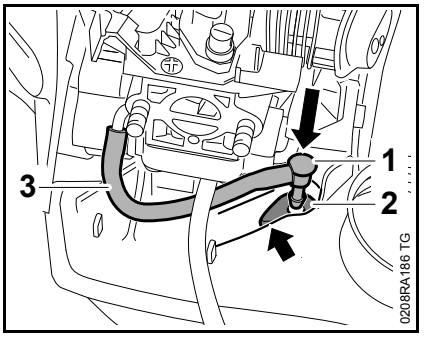
Installing



- Fit the new gasket (1) so that the tabs (arrows) point down.



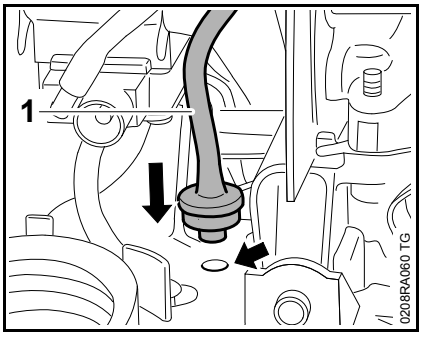
- Push the carburetor (1) onto the studs (arrows).



– Use STIHL press fluid to make installation easier, 🕮 12

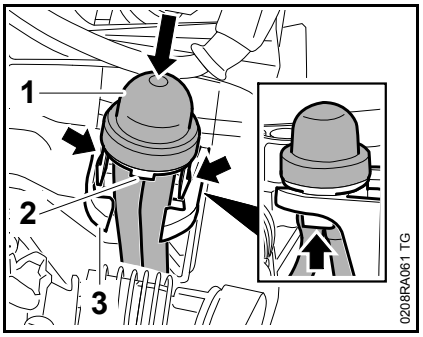
- Fit the elbow connector (1) with fuel suction hose (3) under the tank vent hose.

- Push the elbow connector (1) into the fuel suction hose (2) so that fuel suction hose (3) locates in the recess (arrow)
– the elbow connector (1) must be pushed fully into the fuel suction hose (2).

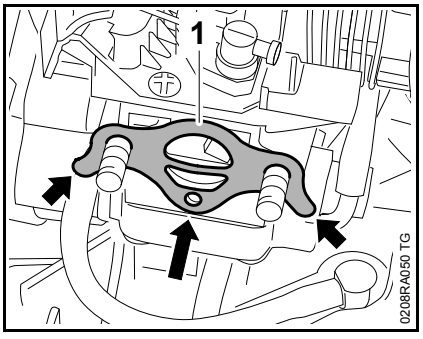


– Use STIHL press fluid to simplify assembly, 🕮 12

- Push the fuel return hose (1) fully into the bore (arrow).



- Line up the manual fuel pump (1) so that the lug (2) points towards the carburetor.
- Push the manual fuel pump (1) into the retainer (3) on the air guide shroud until the locking tabs (arrows) snap into place below the retainer (3).



- Fit the new gasket (1) so that the tabs (arrows) point down.

– Install the filter housing, 🕮 10.2

– Fit throttle cable (short circuit wire) on engine, 🕮 6.6.2

Check operation

– Check throttle cable and trigger adjustments and re-adjust if necessary, 🕮 9.6

– Install the air filter, 🕮 10.1

– Reassemble all other parts in the reverse sequence.

10.3.1 Leakage Test

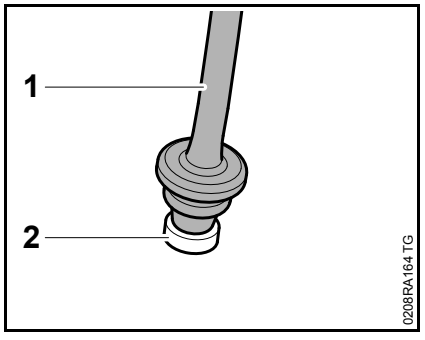
In the case of problems with the carburetor or fuel supply system, also check and clean or replace the tank vent, 🕮 10.7

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

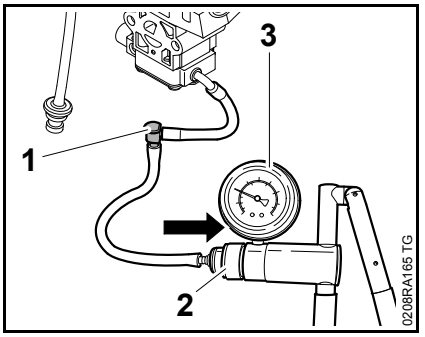
– Remove carburetor with fuel hoses still attached and the manual fuel pump, 🕮 10.3

– Check the fuel hoses on the carburetor for signs of damage.

Leakage test with manual fuel pump



- Use a suitable plug (2) to seal the fuel return hose (1).

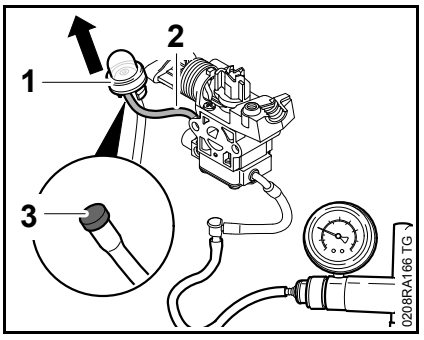


– Push the pressure hose of pump 0000 850 1300 onto the elbow connector (1).

- Push the ring (2) to the right and pump air into the carburetor until the pressure gauge (3) indicates a pressure of about 0.8 bar (80 kPa).

If this pressure remains constant with the manual fuel pump attached, the carburetor and manual fuel pump are airtight. However, if the pressure drops, the manual fuel pump may be damaged.

Leakage test without manual fuel pump



- Pull the manual pump (1) off the fuel hose (2).
- Use a suitable plug (3) to seal the fuel hose (1).

– Repeat the leakage test.

If the pressure remains constant, the carburetor is airtight and the manual fuel pump has to be replaced, 🕮 10.8.4.

However, if it drops, there are three possible causes:

1. Metering diaphragm or gasket damaged, replace as necessary, 🕮 10.4.1
2. The inlet needle is not sealing (foreign matter in valve seat, sealing cone of inlet needle is damaged or inlet control lever is sticking), remove to clean, 🕮 10.4.2
3. Pump diaphragm or gasket damaged, switch, 🕮 10.4.3

– Test the tank vent if necessary, 🕮 10.7.1

– After completing the test, push the ring to the left to vent the system and then pull the pressure hose off the elbow connector.

– Install the carburetor, 🕮 10.3

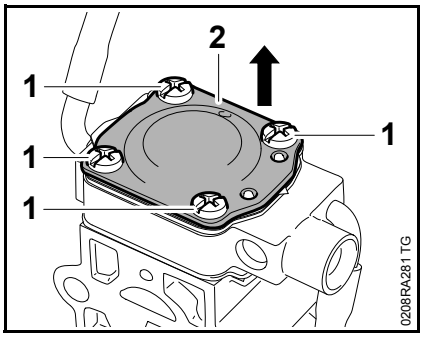
– Reassemble all other parts in the reverse sequence.

10.4 Servicing the Carburetor

10.4.1 Metering Diaphragm

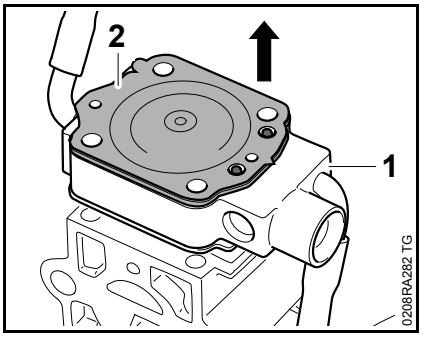
– Troubleshooting, 🕮 3.4

– Remove carburetor with fuel hoses still attached and the manual fuel pump, 🕮 10.3



– Turn the carburetor over.

- Take out the screws (1) and remove the end cover (2).



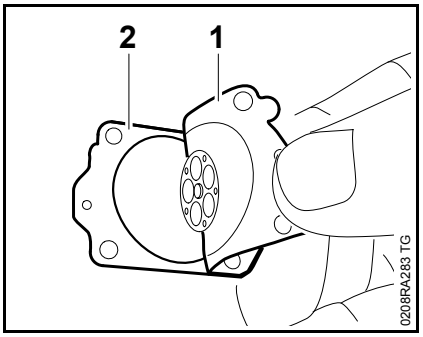
- Remove the complete flange (1) with fuel hoses still attached.

– Inspect the pump diaphragm and gasket, replace if necessary, 🕮 10.4.3

– Inspect the fuel hoses, replace if necessary, 🕮 10.8.2, 🕮 10.8.4

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

- Remove the metering diaphragm (2) with gasket.

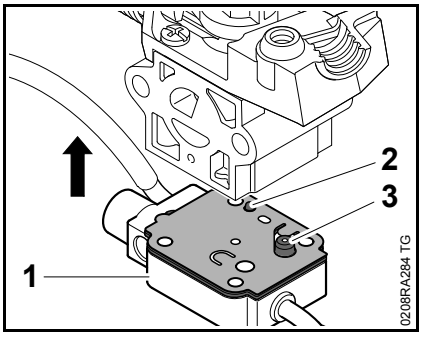


- Carefully separate the metering diaphragm (1) and gasket (2).

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

- Check metering diaphragm (1) and gasket (2) for signs of wear or damage, replace if necessary.

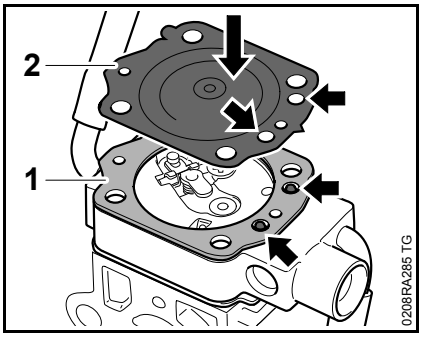
Installing



- Position the complete flange (1) with fuel hoses attached against the underside of the carburetor body so that its peg (2) and the projecting valve jet (3) engage the recesses.

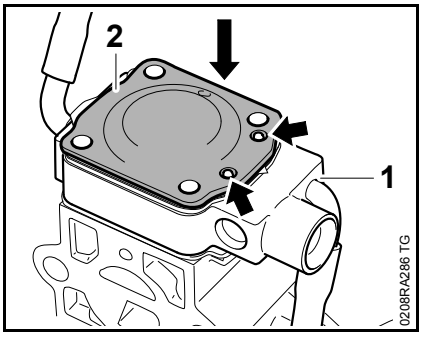
– Check that the pump diaphragm and gasket are properly seated.

– Hold the flange steady and turn it over with the carburetor.

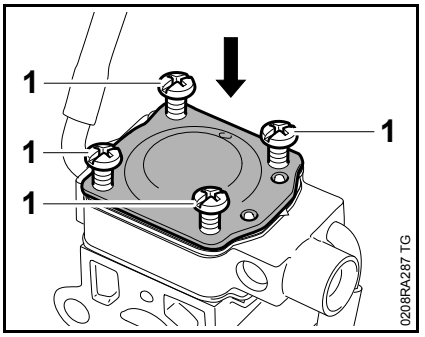


- Note installed positions of gasket (1) and metering diaphragm (2).

- Fit the gasket (1) and metering diaphragm (2) so that the holes line up with the pegs (arrows) and the holes in the carburetor.



- Hold the complete flange (1) and fit the end cover (2) so that it engages the pegs (arrows).



– Check that metering and pump diaphragms with gaskets are properly seated, re-position if necessary.

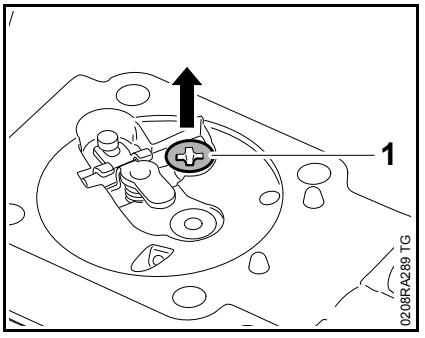
- Fit the screws (1) and tighten them down firmly in a crosswise pattern.

– Reassemble all other parts in the reverse sequence.

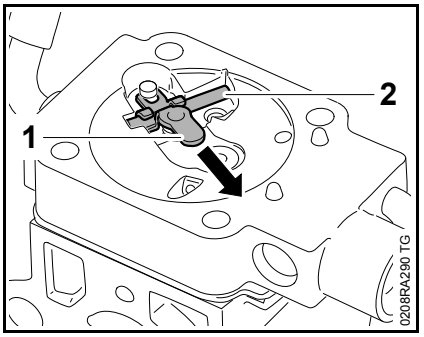
10.4.2 Inlet Needle

– Remove the metering diaphragm, 🕮 10.4.1

– Check gaskets of metering and pump diaphragms and replace if necessary, 🕮 10.4.1, 🕮 10.4.3

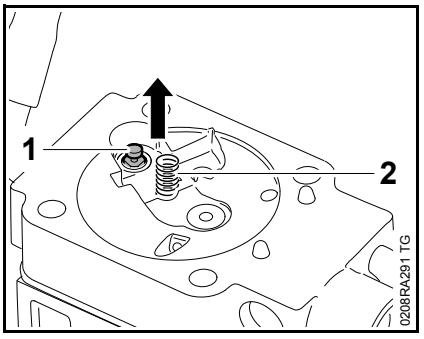


- Take out the screw (1)



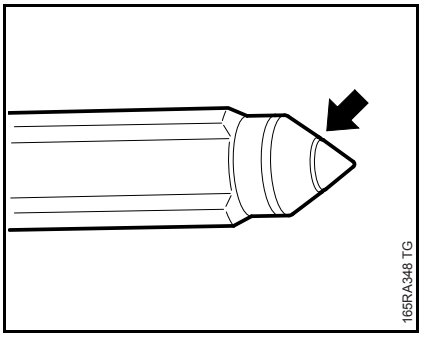
- Take the inlet control lever (1) with
  spindle (2) out of the inlet needle's groove.

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



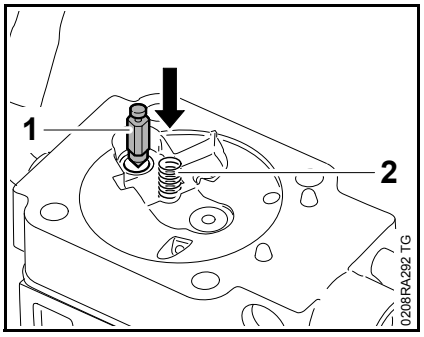
- Pull out the inlet needle (1) and spring (2).

– Check individual parts, replace if necessary.



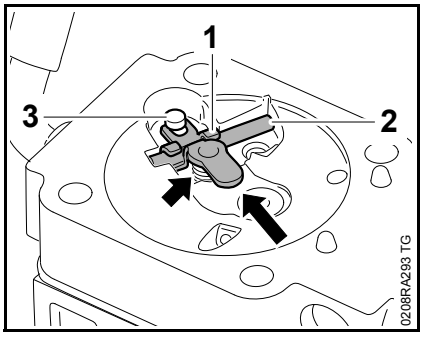
- If there is an annular indentation (arrow) on the sealing cone of the inlet needle, fit a new inlet needle.

Installing



- Fit the inlet needle (1).

- Fit the spring (2) in the bore.



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

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

– Press the inlet control lever down and secure it with the screw.

– Check that the inlet control lever moves freely.

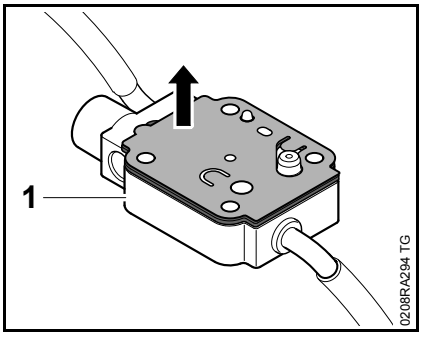
– Install the metering diaphragm, 🕮 10.4.1

10.4.3 Pump Diaphragm

– Troubleshooting, 🕮 3.4

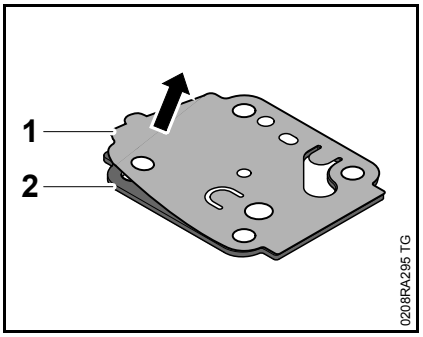
– Remove carburetor with fuel hoses still attached and the manual fuel pump, 🕮 10.3

– Remove the end cover, 🕮 10.4.1



- Remove the complete flange (1) with fuel hoses still attached and turn it over.

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



● Carefully separate the pump diaphragm (1) and gasket (2)

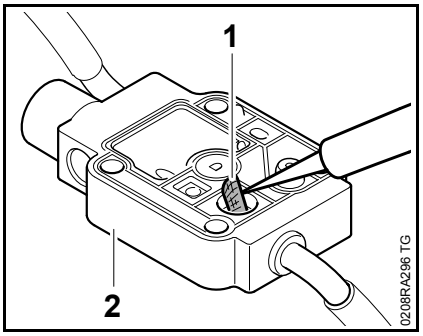
The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue, i.e. the diaphragm distorts and swells and has to be replaced.

● Check pump diaphragm (1) and gasket (2) for signs of wear or damage, replace if necessary.

– Inspect the metering diaphragm and gasket, replace if necessary, 🕮 10.4.1

– Inspect the fuel hoses, replace if necessary, 🕮 10.8.2, 🕮 10.8.4

– Check fuel strainer for contamination and damage. Clean or replace if necessary.

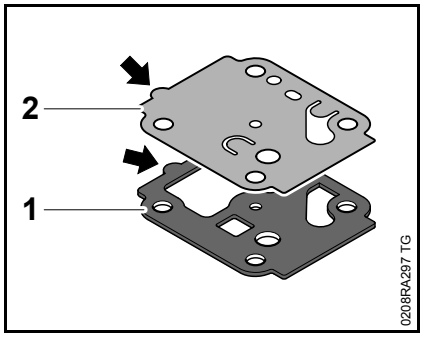


● Use a needle to remove the fuel strainer (1) from the flange (2). Clean or replace the fuel strainer.

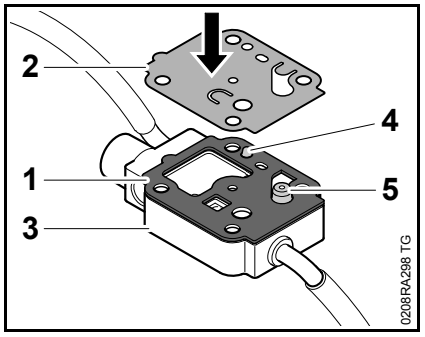
– Inspect the flange and replace if necessary
– if a new flange is installed, the attached fuel hoses must also be replaced.

– Reassemble in the reverse sequence.

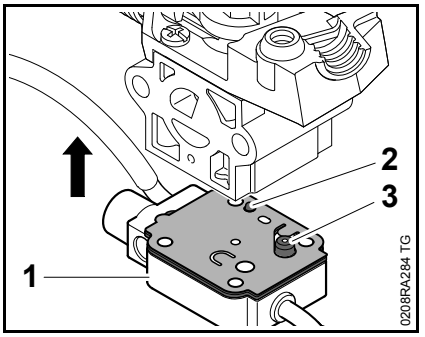
Installing



● Position the new gasket (1) and pump diaphragm (2) so that the tabs (arrows) are on the same side.



● Fit the gasket (1) and pump diaphragm (2) on the flange (3) so that they engage the peg (4) and projecting carburetor jet (5).



● Position the complete flange (1) with fuel hoses attached against the underside of the carburetor body so that its peg (2) and the projecting valve jet (3) engage the recesses.

– Check that the pump diaphragm and gasket are properly seated.

– Hold the flange steady and turn it over with the carburetor.

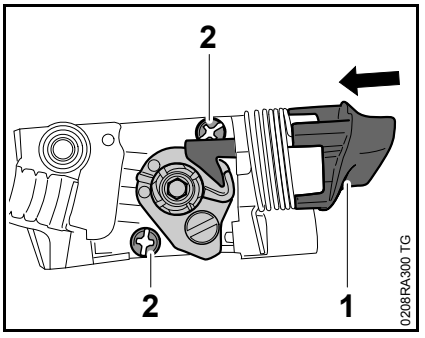
– Install the metering diaphragm and end cover, 🕮 10.4.1

– Reassemble all other parts in the reverse sequence.

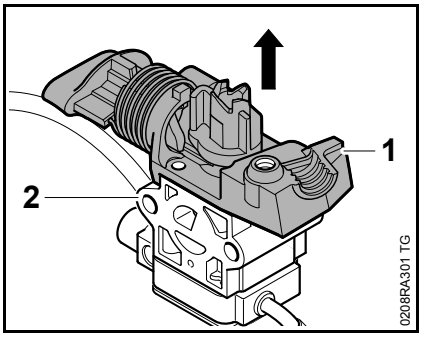
10.4.4 Control Valve

– Remove the carburetor, 🕮 10.3

– Carburetor troubleshooting, 🕮 3.4



● Set the lever (1) to the start position and take out the screws (2).



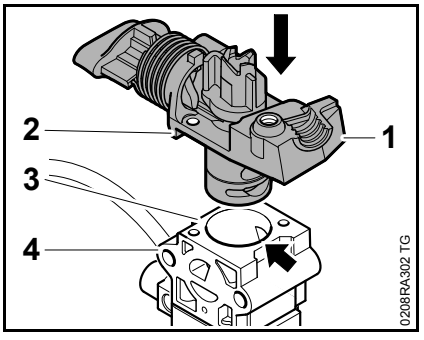
- Carefully pull the control valve (1) out of the carburetor (2).

– Check the control valve and replace if necessary.

The needle of the low speed screw **L** in the control valve engages in the carburetor jet. Remove the low speed screw **L** to reduce the risk of damaging the jet (small plastic tube) when installing the
control valve.

– Check the low speed screw **L**, replace if necessary, 🕮 10.4.5

Installing

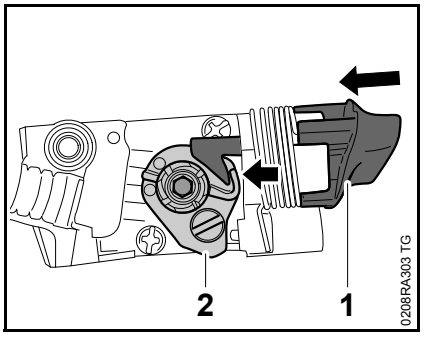


- Line up the control valve (1) so that the rabbet (2) engages over the shoulder (3), then push it carefully into the carburetor's (4) bore (arrow) as far as stop.

– Fit the screws and tighten them down firmly.

– Install the low speed screw **L**, 🕮 10.4.5

Check operation



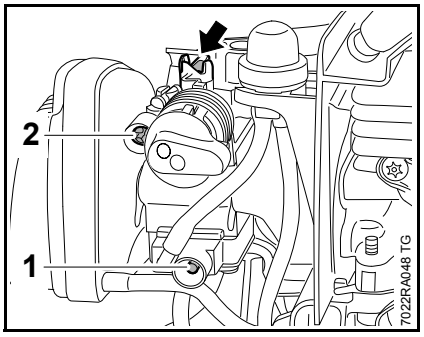
- Turn lever (1) counterclockwise and push it home until it engages on and is held by lever (2) (arrow) = cold start position.

When lever (2) is turned in direction of full throttle, lever (1) is disengaged and automatically jumps back to its original position. When lever (2) is released, it automatically moves back until it locates against idle speed screw **LA**.

– Install the carburetor, 🕮 10.3

– Reassemble all other parts in the reverse sequence.

10.4.5 Adjusting Screws



There are three adjusting screws on the carburetor:
H = high speed screw (1)
L = low speed screw (arrow)
LA = idle speed screw (2)

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

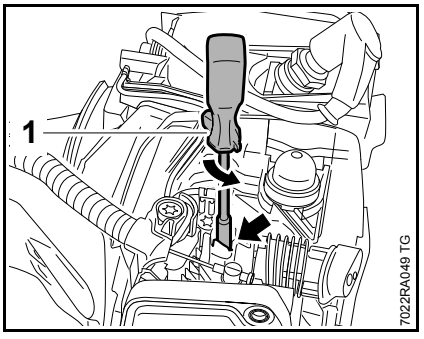
The high speed screw **H** and low speed screw **L** have a special hex head and can only be adjusted with screwdriver 5910 890 2311
– no limiter caps are used.

– See also carburetor troubleshooting, 🕮 3.4

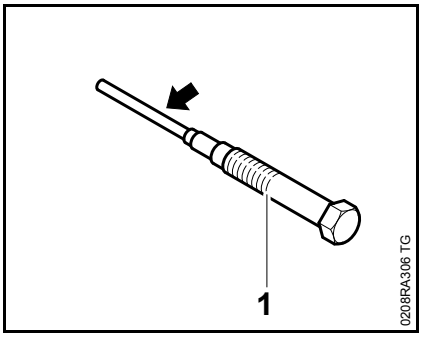
The idle speed screw **L** is located in the control valve lever. Exact adjustments are made difficult because the lever moves. Use sleeve 5910 893 1711 to hold the lever steady while making adjustments.

Adjusting screws can be removed and installed with the carburetor in position.

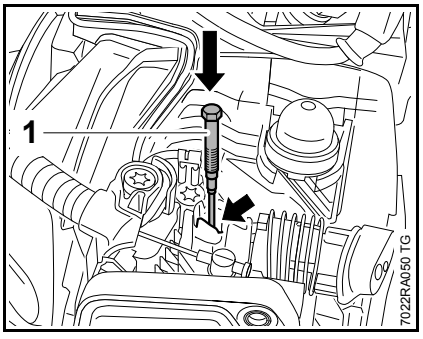
Low speed screw



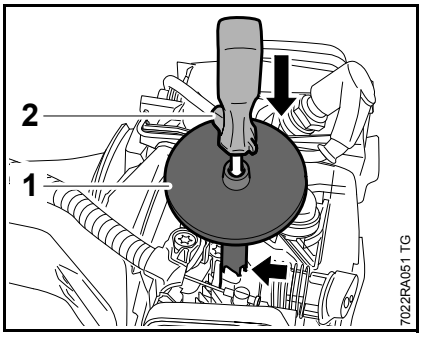
- Use screwdriver (1) 5910 890 2311 to remove the low speed **L** (arrow) from the control valve.



- Check needle (arrow) for damage or wear, replace low speed screw **L** (1) if necessary – the needle must be perfectly straight.



- Carefully push the low speed screw **L** (1) into the bore (arrow) and screw it home – take care not to bend the needle.



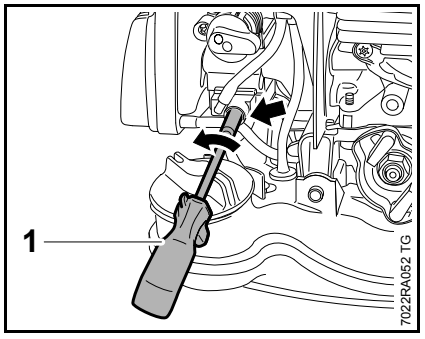
- Position sleeve (1) 5910 893 1711 on the control valve lever so that it engages the teeth (arrow).

- Insert screwdriver (2) 5910 890 2311 through the sleeve (1) and locate it on the hex head of the low speed screw **L**.

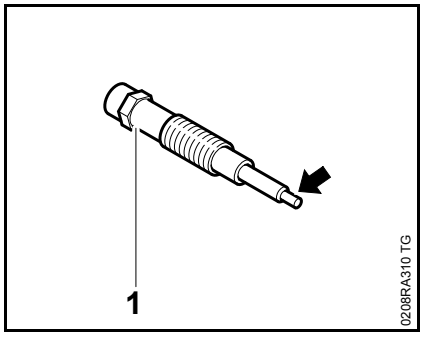
- Hold the sleeve (1) steady and screw home the low speed screw **L** as far as stop.

– Continue with the high speed screw **H**.

High speed screw



- Use screwdriver (1) 5910 890 2311 to remove the high speed **H** (arrow).



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

– Screw down the high speed screw (**H**) as far as stop.

– Carry out the basic setting, 🕮 10.5.1

10.5 Adjusting the Carburetor

The new carburetors are tuned at the factory so that the engine receives an optimum fuel-air mixture in all environments and operating conditions.

The high speed screw **H** and low speed screw **L** can only be adjusted with screwdriver 5910 890 2311.

It is no longer necessary or possible for the user to change the settings of these adjusting screws.

The user may adjust engine idle speed with the idle speed screw **LA**.

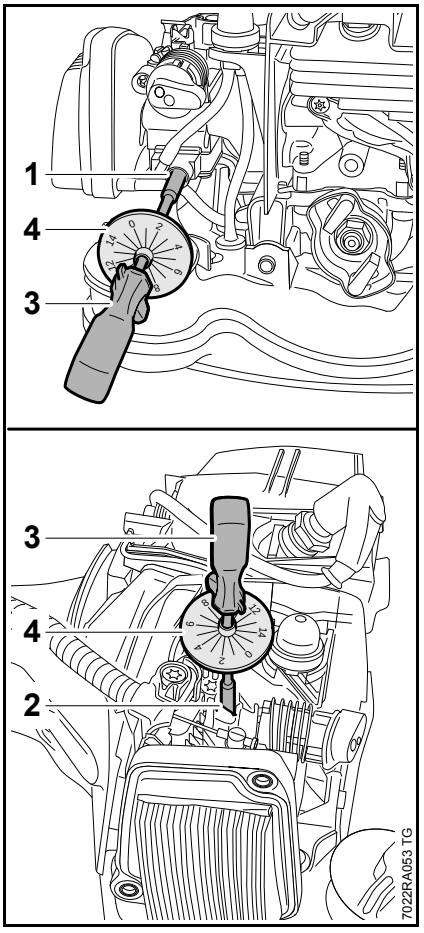
10.5.1 Basic Setting

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

A basic setting and fine tuning are necessary after removing and installing the adjusting screws.

The adjusting screws have to be preset before starting fine tuning. This can be performed while the engine is stationary or on a carburetor removed from the machine.

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



- Adjust the adjusting screws with screwdriver (3) 5910 890 2311 and setting disk (4) 5910 893 6601.

- Open the high speed screw **H** (1) **1 1/4 turns** and low speed screw **L** (2) **1 1/2 turns** from their seats.

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

– Continue with fine tuning.

Fine Tuning

The carburetor and air filter must be installed.

– Mount the deflector and working tool (mowing head) – see instruction manual
– the working tool must run freely, clean if necessary.

– Check the air filter (fleece element) and clean or replace if necessary
– see instruction manual, 🕮 10.1

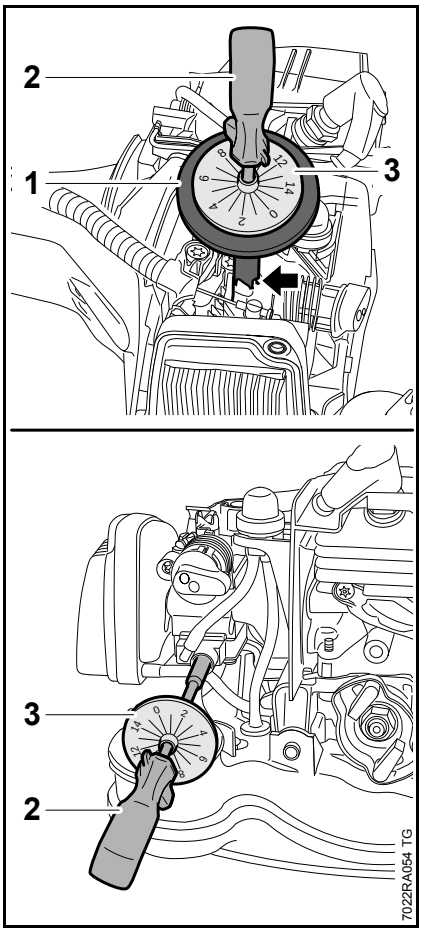
– Use screwdriver 5910 890 2311 to make adjustments.

Basic setting of
high speed screw **H**and low speed screw **L** must be in order.

– Start the engine and warm it up for 1 minute at varying speeds.

– If necessary, turn the idle speed screw **LA** slowly clockwise until the engine runs smoothly – the working tool must not run.

Preparations for adjusting idle speed



- Position sleeve (1) 5910 893 1711 on the control valve lever so that it engages the teeth (arrow).

- Insert screwdriver (2) 5910 890 2311 with setting disk (3) 5910 893 6601 through the sleeve (1) and locate it on the hex head of the low speed screw **L**.

- Hold the sleeve (1) steady and adjust the low speed screw **L** to the highest engine speed by turning it counterclockwise or clockwise.

Adjusting idle speed

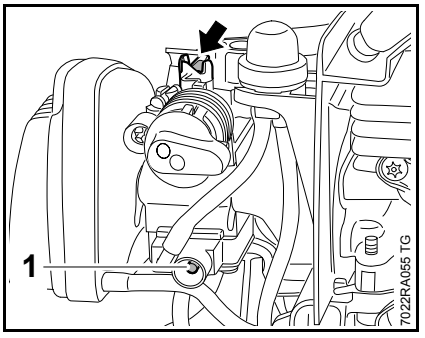
– Adjust engine idle speed with a tachometer or the STIHL MDG 1. Adjust specified engine speeds within a tolerance of ± 100 rpm.

1. Turn the low speed screw **L** counterclockwise or clockwise to obtain the highest engine idle speed.

If the engine speed is not between 3,100 rpm and 3,300 rpm, abort the procedure, set the engine speed to 3,200 rpm with idle speed screw **LA** and start again with step 1.

2. Use the idle speed screw **LA**
) to set the engine speed to 3,200 rpm.

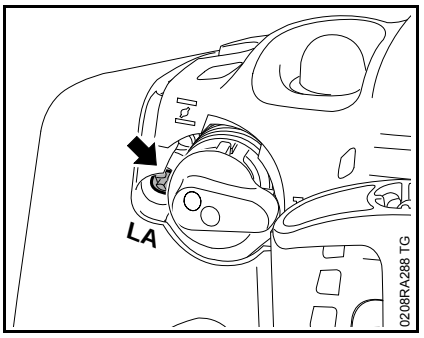
3. Use the low speed screw **L** to set the engine speed to 2,800 rpm.
.



This completes fine tuning of the high speed screw **H** (1) and low speed screw **L** (arrow).

The settings of the high speed screw **H** and low speed screw **L** cannot be changed by the user.

10.5.2 Adjustments by User



The new carburetors ensure the engine receives an optimum fuel-air mixture in all environments and operating conditions. For this reason it is only possible to correct the engine idle speed with the idle speed screw **LA** (arrow).

Always perform the following steps before carrying out any adjustments:

– Troubleshooting, 🕮 3.4

– Check the working tool, adjust if necessary.

– Check the air filter (felt element) and clean or replace if necessary – see instruction manual, 🕮 10.1

Check running behavior:
The engine must accelerate smoothly when the throttle is opened and run uniformly at idle speed.

Adjusting idle speed

Basic setting and fine tuning of adjusting screws has been carried out.

– Warm up the engine.

Engine stops while idling

– Turn the idle speed screw **LA** clockwise until the working tool starts running, then turn it back 1 full turn.

Working tool runs when engine is idling

– Turn the idle speed screw **LA**) counterclockwise until the working tool stops running, then turn it back 1 full turn.

Erratic idling behavior, poor acceleration

– Check basic setting and fine tuning of adjusting screws, re-adjust if necessary or service the carburetor, 🕮 10.5.1, 🕮 10.4

Fine Tuning for Operation at High Altitude

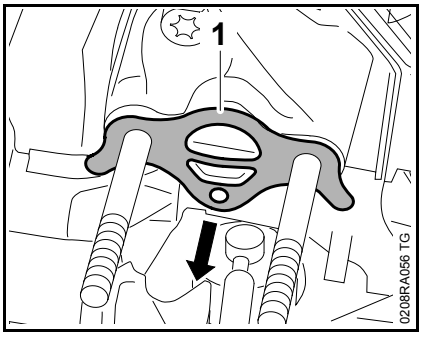
Motor does not run satisfactorily.

– Check basic setting and fine tuning of adjusting screws, re-adjust if necessary or service the carburetor, 🕮 10.5.1, 🕮 10.4

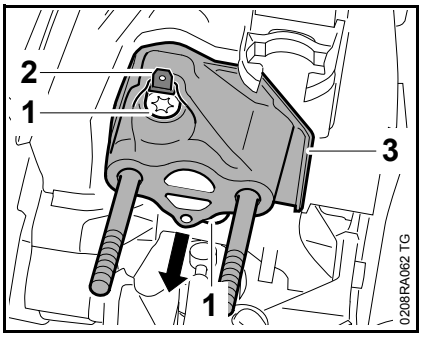
10.6 Spacer Flange

– Troubleshooting, 🕮 3.6

– Remove carburetor with fuel hoses still attached and put it to one side, 🕮 10.3

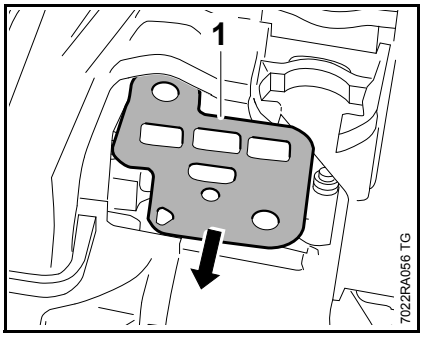


● Remove the gasket (1) – always install a new gasket.



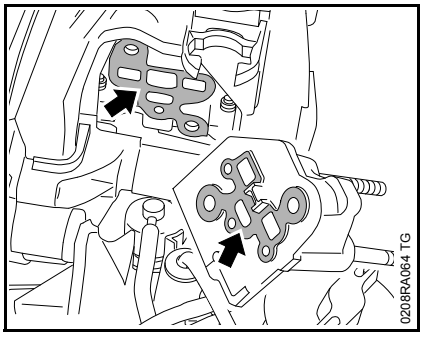
● Take out the screw (1) and remove the connector tag (2).

● Remove the spacer flange (3).



● Remove the gasket (1) – always install a new gasket.

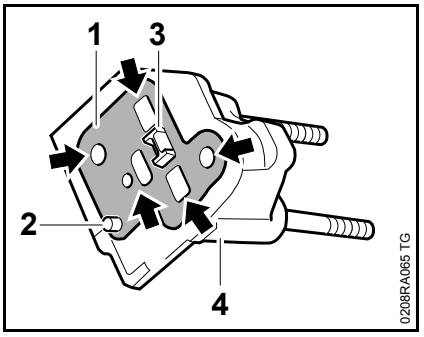
– Inspect the spacer flange and replace it if necessary – even very minor cracks can result in engine running problems, 🕮 3.4, 🕮 3.6



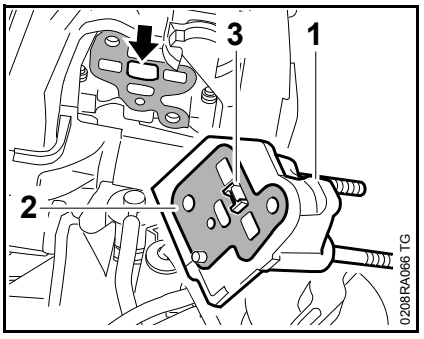
● Inspect and clean the sealing faces (arrows) on the cylinder inlet port and spacer flange and remove any gasket residue, 🕮 12

The sealing faces must be in perfect condition. If the sealing faces are damaged, install a new cylinder and / or spacer flange.

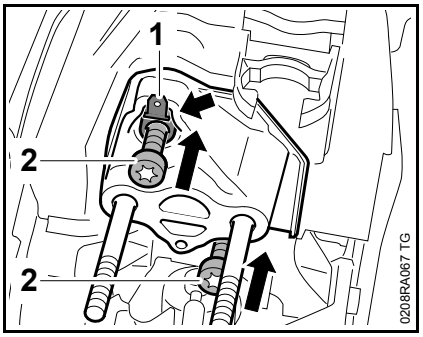
Installing



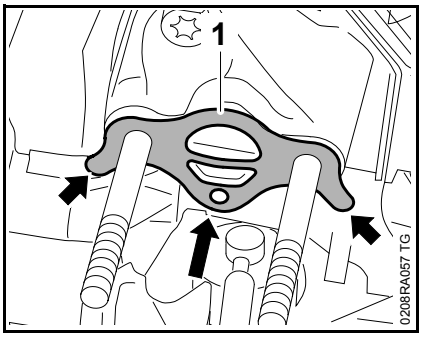
● Fit the new gasket (1) over the peg (2) and lug (3) and against the spacer flange (4)
– the holes (arrows) must be in alignment.



● Position the spacer flange (1) with gasket (2) against the cylinder intake port so the lug (3) engages the opening (arrow) in the intake port.



- Fit the connector tag (1) on the screw (2).
- Insert the screw (2) with connector tag (1) so that the tag (1) locates in the recess (arrow) and points up, then fit the lower screw (2).
- Tighten down the screws (2) firmly – hold the connector tag (1) in the recess (arrow) while tightening the screw.



- Fit the new gasket (1) so that the tabs (arrows) point down.

– Push the carburetor with fuel hoses attached into position, 🕮 10.3

– Reassemble all other parts in the reverse sequence.

10.7 Tank Vent

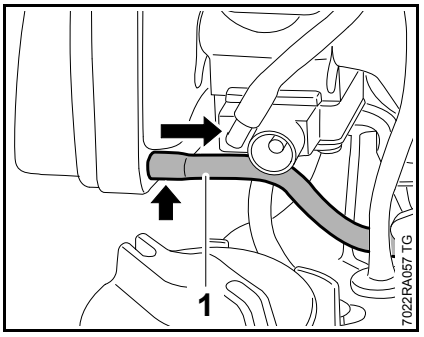
10.7.1 Testing

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

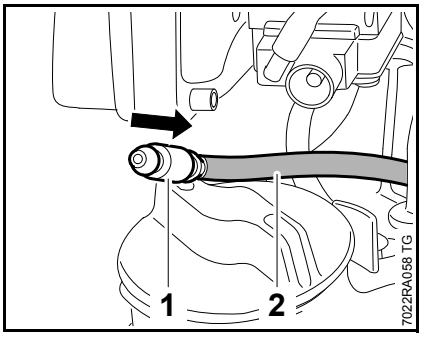
– Open the fuel tank cap and drain the fuel tank, 🕮 1.

– Close the tank cap.

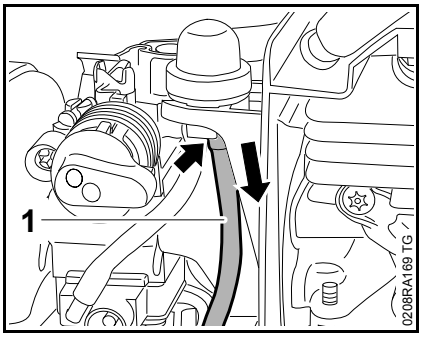
– Remove the filter cover, 🕮 10.1



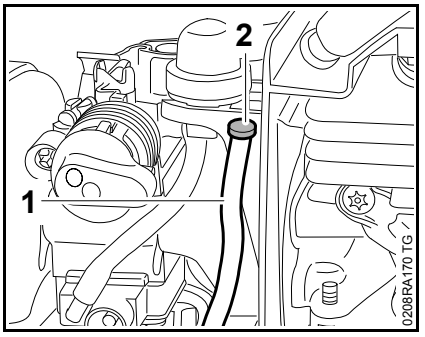
- Pull the tank vent hose (1) off the nipple (arrow) on the filter housing.



- Push the nipple (1) 0000 855 9200 into the fuel hose (2).

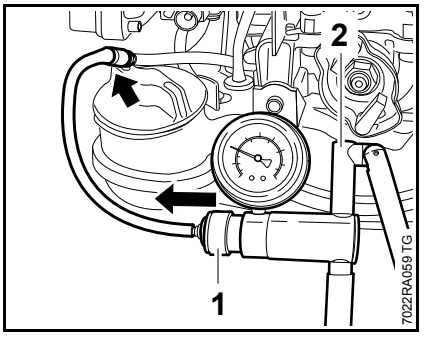


- Pull the fuel return hose (1) off the nipple on the manual fuel pump (arrow).



- Use a suitable plug (2) to seal the fuel return hose (1).

Vacuum test



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

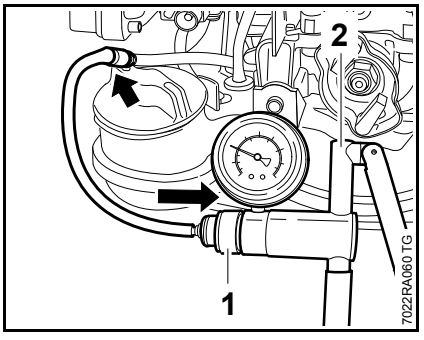
Equalization of pressure takes place via the tank vent. There must be no buildup of vacuum in the tank.

– Clean the area around the tank vent.

– Always install a new fuel hose.

– If necessary, install a new tank vent or tank, 🕮 10.7 or 🕮 10.9

Pressure test

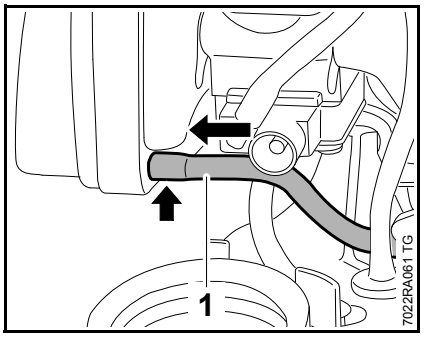


- Push the ring (1) to the right and connect the pump (2) 0000 850 1300 to the nipple (arrow) – pressurize the fuel tank.

– Operate the pump until the pressure gauge indicates a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the tank, including the tank vent, is airtight. If the pressure drops, the leak must be located and the faulty part replaced.

– If necessary, install a new tank vent or tank, 🕮 10.7 or 🕮 10.9

– The fuel return hose and tank vent may be re-used if they are still in order.



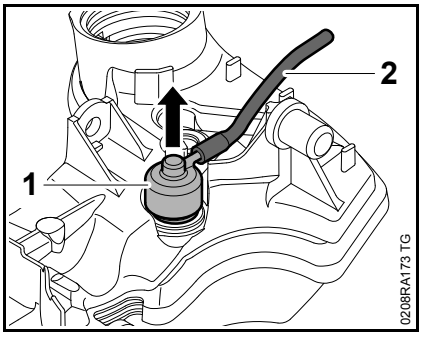
– Use STIHL press fluid to make installation easier, 🕮 12

- Push the tank vent hose (1) onto the nipple (arrow) on the filter housing – the tank vent hose (1) must be positioned above the fuel suction hose.

– Reassemble in the reverse sequence.

10.7.2 Removing and Installing

– Remove the fuel tank, 🕮 10.9



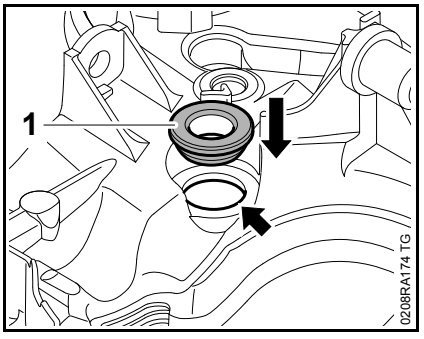
- Pry out the tank vent (1).

- Pull the tank vent (1) off the hose (2), check and replace if necessary.

– Remove the grommet.

Always install a new tank vent.

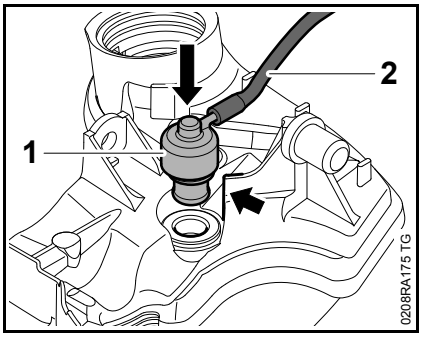
Installing



- Position the grommet (1) so that its taper points in the direction of the fuel tank.

– Use STIHL press fluid to make installation easier, 🕮 12

- Fit the grommet (1) in the hole (arrow) and make sure it is properly seated.



– Use STIHL press fluid to make installation easier, 🕮 12

● Push nipple of new tank vent (1) fully into the tank vent hose (2).

● Position the tank vent (1) so that the nipple with tank vent hose (2) locate in the recess (arrow).

● Push the tank vent (1) with hose (2) fully into the grommet.

The tank vent hose (1) must be positioned above the fuel suction hose and be pushed fully onto the nipple on the filter housing.

– Reassemble all other parts in the reverse sequence.

10.8 Fuel Intake

10.8.1 Pickup Body

The fine pores of the filter become clogged with minute particles of dirt. This restricts the passage of fuel and results in fuel starvation.

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

– Troubleshooting, 🕮 3.4 or 🕮 3.6

Clean the fuel tank if necessary.

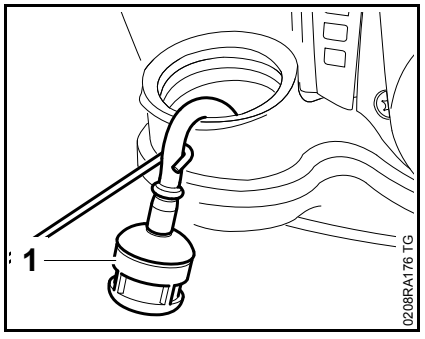
– Open the tank cap and drain the fuel tank.

– Pour a small amount of clean gasoline into the fuel tank. Close the tank and shake the machine vigorously.

– Open the tank again and drain it.

– Dispose of fuel properly in accordance with environmental requirements, 🕮 1.2

– Open the tank cap.



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

Do not overstretch the fuel hose.

● Pull off the pickup body (1), check it and replace if necessary.

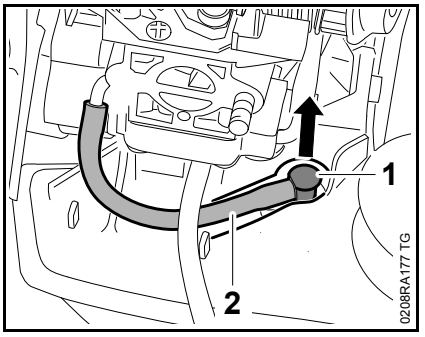
– Reassemble in the reverse sequence.

10.8.2 Fuel Hose on Carburetor

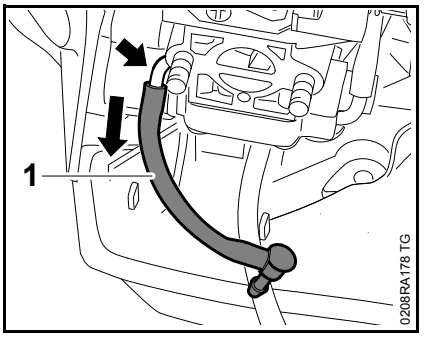
– Open the tank cap.

– Remove the shroud, 🕮 5.4

– Remove the filter cover, 🕮 10.1



● Pry out the elbow connector (1) with fuel suction hose (2).

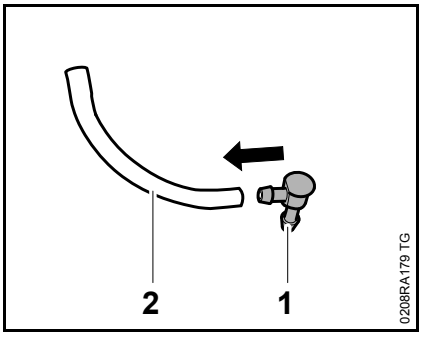


● Pull the fuel suction hose (1) with elbow connector off the carburetor (arrow).

– Pull the elbow connector off the fuel suction hose, check it and replace if necessary.

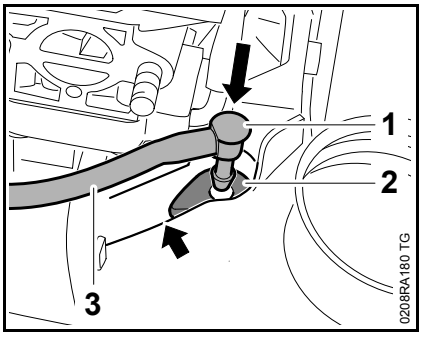
Always use a new fuel suction hose.

Installing



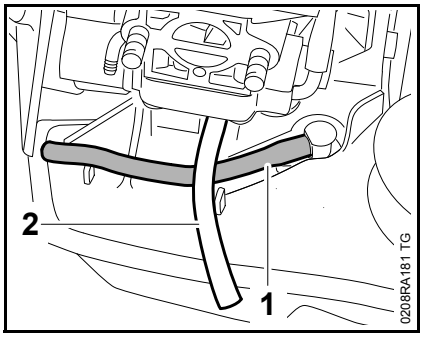
– Use STIHL press fluid to make installation easier, 🕮 12

● Push the elbow connector (1) fully into the new fuel suction hose (2) as far as stop.

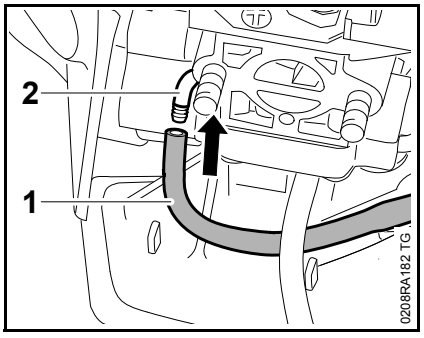


– Use STIHL press fluid to make installation easier, 🕮 12

● Push the elbow connector (1) into the fuel suction hose (2) so that fuel suction hose (3) locates in the recess (arrow)
– the elbow connector (1) must be pushed fully into the fuel suction hose.



● Position the fuel suction hose (1) under the tank vent hose (2).



● Push the fuel hose (1) onto the carburetor's connector (2).

– Reassemble all other parts in the reverse sequence.

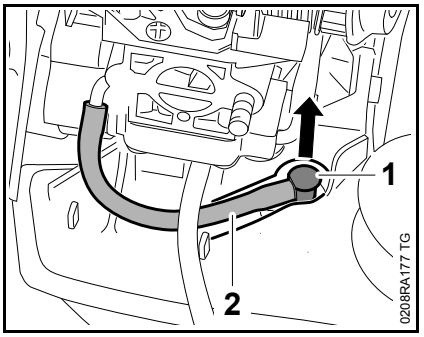
10.8.3 Fuel Suction Hose in Fuel Tank

– Open the tank cap and drain the fuel tank.

– Remove the shroud, 🕮 5.4

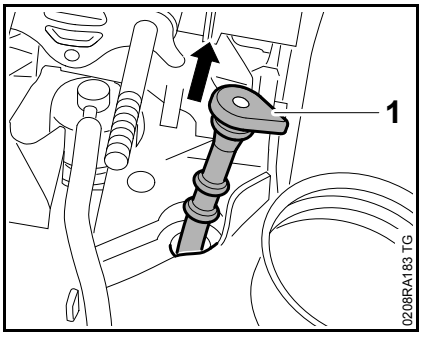
– Remove the filter cover, 🕮 10.1

– Remove the pickup body, 🕮 10.8.1



● Pry out the elbow connector (1) with fuel suction hose (2).

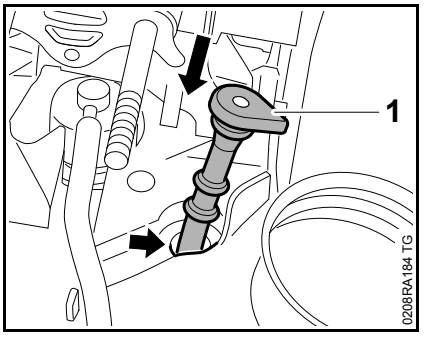
– Remove the tank housing, 🕮 10.9



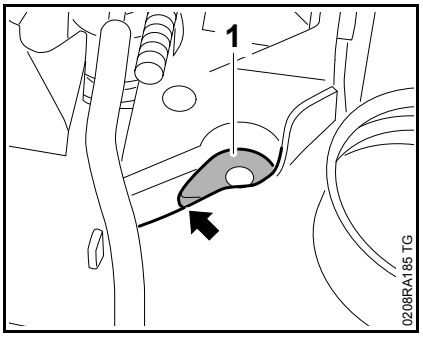
● Pull the fuel suction hose (1) out of the fuel tank.

Always use a new fuel suction hose.

Installing



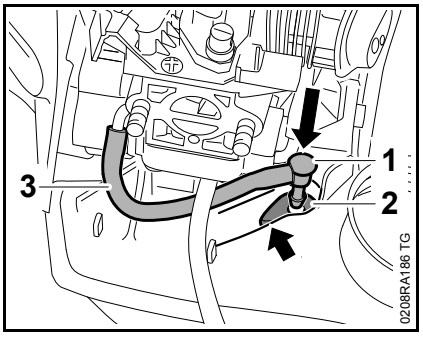
● Push the fuel suction hose (1) through the bore (arrow) in the fuel tank.



– Use STIHL press fluid to make installation easier, 🕮 12

● Push the fuel suction hose (1) into the housing bore as far as stop so that pointed end of the flange faces the recess (arrow).

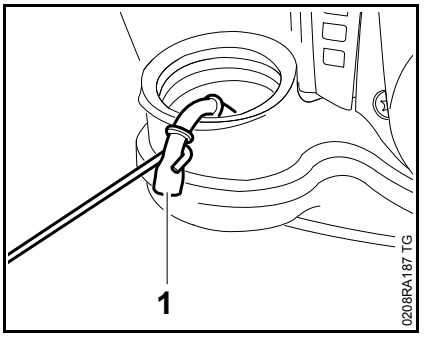
– Install the tank housing, 🕮 10.9



– Use STIHL press fluid to make installation easier, 🕮 12

● Fit the elbow connector (1) with fuel suction hose (3) under the tank vent hose.

● Push the elbow connector (1) into the fuel suction hose (2) so that fuel suction hose (3) locates in the recess (arrow)
– the elbow connector (1) must be pushed fully into the fuel suction hose (2).



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

Do not overstretch the fuel suction hose.

– Fit the pickup body, 🕮 10.8.1

– Close the tank cap.

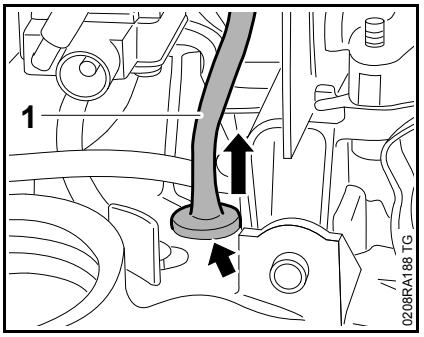
– Reassemble all other parts in the reverse sequence.

10.8.4 Fuel Hose / Fuel Return Hose and Manual Fuel Pump

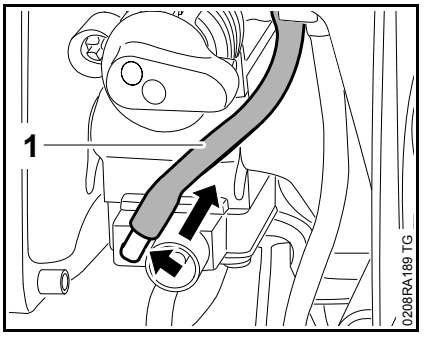
– Open the tank cap.

– Remove the shroud, 🕮 5.4

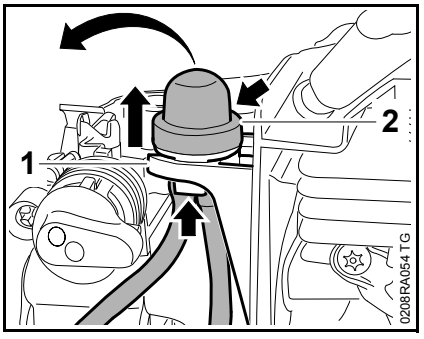
– Remove the filter cover, 🕮 10.1



● Pry the fuel return hose (1) out of the bore (arrow) in the tank housing.

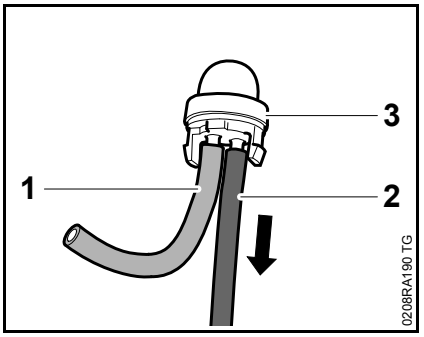


● Pull the fuel hose (1) off the connector (arrow) on the carburetor.



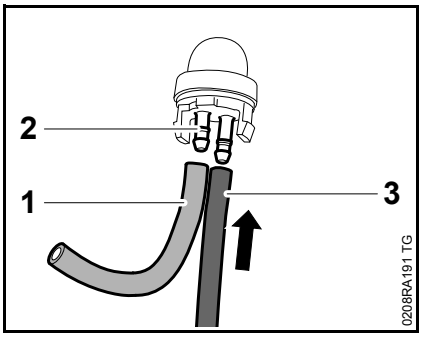
● Squeeze locking tabs (arrows) under the retainer (1) together and push out the manual fuel pump (2).

– Remove manual fuel pump with fuel hoses.

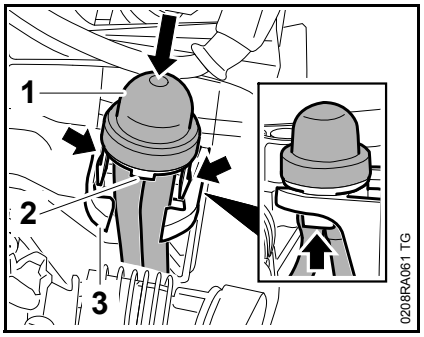


- Pull off the fuel hose (1) and fuel return hose (2).
- Check the manual fuel pump (3) and fuel return hose (2) and replace if necessary.
- Install a new fuel hose (1).

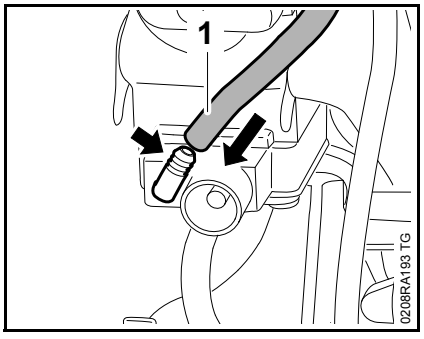
Installing



- Push the new fuel hose (1) onto the short nipple (2).
- Push the fuel return hose (3) onto the long nipple.

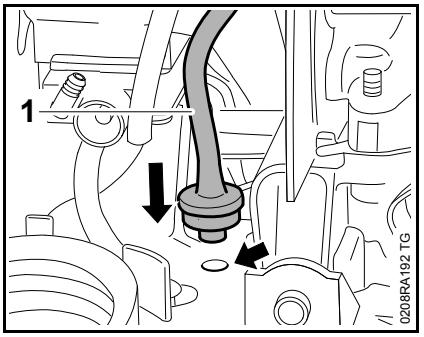


- Line up the manual fuel pump (1) so that the lug (2) points towards the carburetor.
- Push the manual fuel pump (1) into the retainer (3) on the air guide shroud until the locking tabs (arrows) snap into place below the retainer (3).



– Use STIHL press fluid to simplify assembly, 🕮 12

- Push the fuel hose (1) fully onto the carburetor's connector (arrow).



– Use STIHL press fluid to simplify assembly, 🕮 12

- Push the fuel return hose (1) fully into the bore (arrow) in the tank housing.

– Check operation
– fuel must flow when the fuel pump is operated.

– Reassemble all other parts in the reverse sequence.

10.9 Fuel Tank

– Remove the drive tube, 🕮 9.1

– Drain the fuel tank, 🕮 1

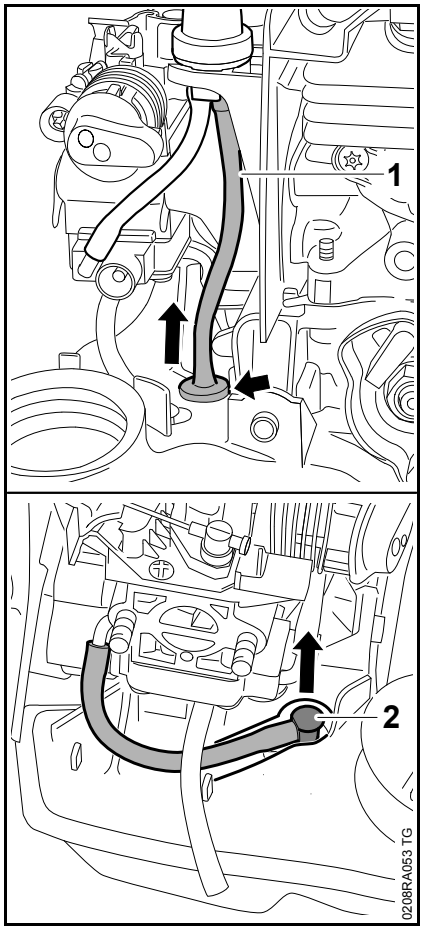
– Remove the rewind starter, 🕮 7.2

– Remove the shroud, 🕮 5.4

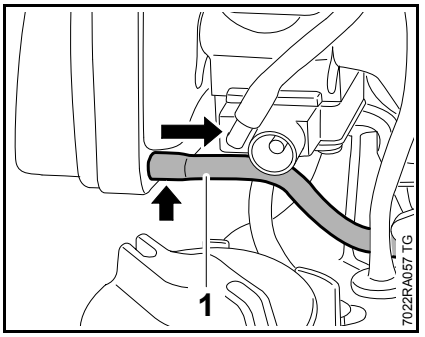
– Remove the filter cover, 🕮 10.1

– Remove the tank guard if necessary,

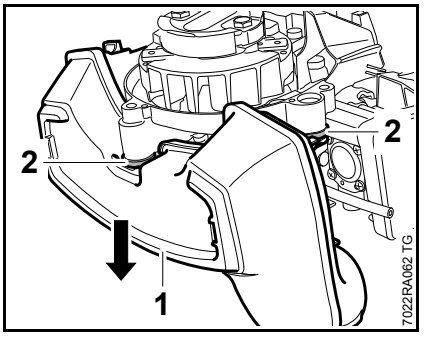
10.9.1 Fuel Tank Removing and Installing



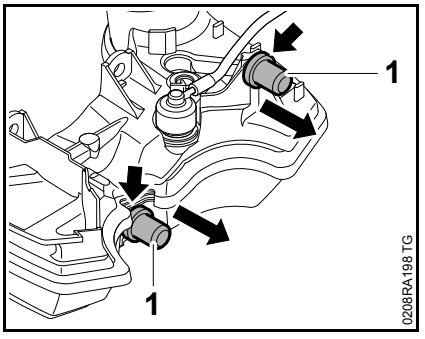
● Pry the fuel return hose (1) out of the bore (arrow) in the tank housing and pull off the elbow connector (2) of the fuel suction hose.



● Pull the tank vent hose (1) off the nipple (arrow) on the filter housing.



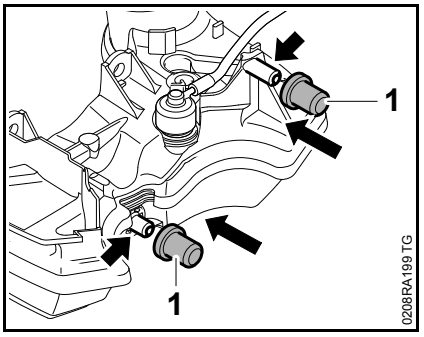
● Pull the fuel tank (1) out of the rubber mounts (2) and lift it away.



● Pull the rubber mounts (1) off the stubs (arrows), check them and replace if necessary.

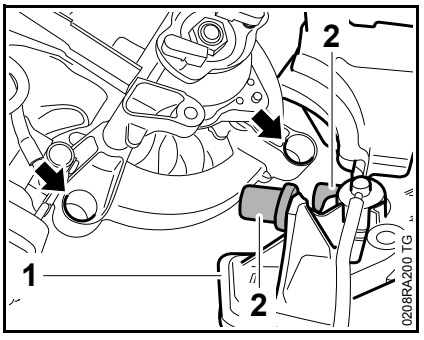
– Test the tank vent, replace if necessary, 🕮 10.7

Installing



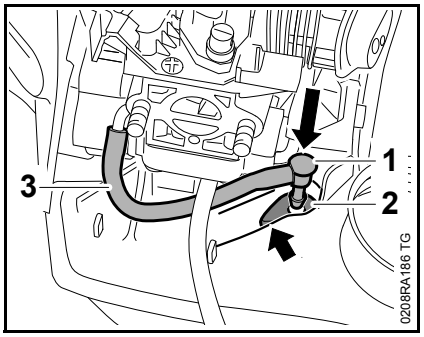
– Use STIHL press fluid to simplify assembly, 🕮 12

● Push the rubber mounts (1) fully onto the stubs (arrows).



– Use STIHL press fluid to simplify assembly, 🕮 12

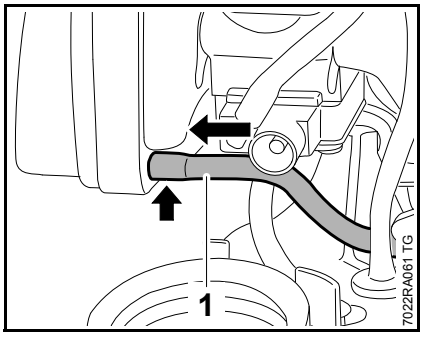
● Push the fuel tank (1) with rubber mounts (2) into the bores (arrows) in the crankcase until seated.



– Use STIHL press fluid to make installation easier, 🕮 12

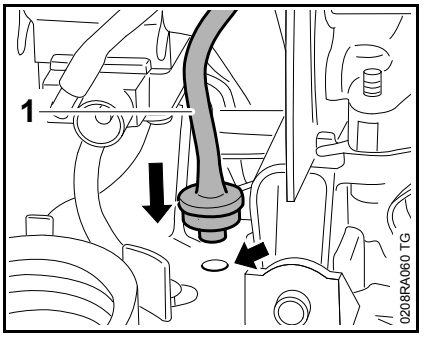
● Fit the elbow connector (1) with fuel suction hose (3) under the tank vent hose.

● Push the elbow connector (1) into the fuel suction hose (2) so that fuel suction hose (3) locates in the recess (arrow)
– the elbow connector (1) must be pushed fully into the fuel suction hose (2).



– Use STIHL press fluid to make installation easier, 🕮 12

● Push the tank vent hose (1) onto the nipple (arrow) on the filter housing – the tank vent hose (1) must be positioned above the fuel suction hose.

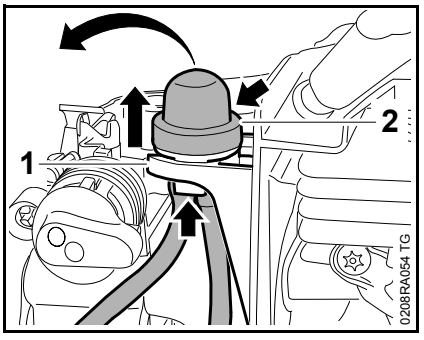


– Use STIHL press fluid to simplify assembly, 🕮 12

● Push the fuel return hose (1) fully into the bore (arrow).

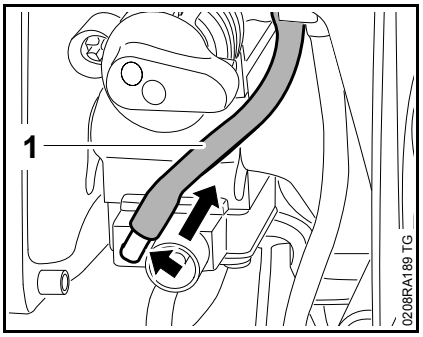
– Reassemble all other parts in the reverse sequence.

10.9.2 Fuel tank Replacing

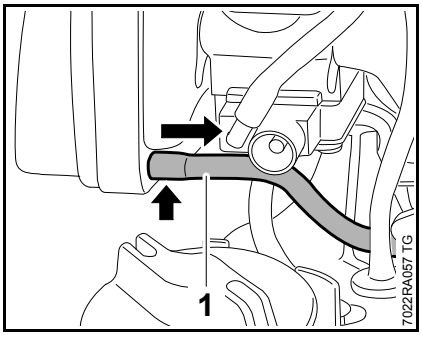


● Squeeze locking tabs (arrows) under the retainer (1) together and push out the manual fuel pump (2).

– Remove manual fuel pump with fuel hoses.

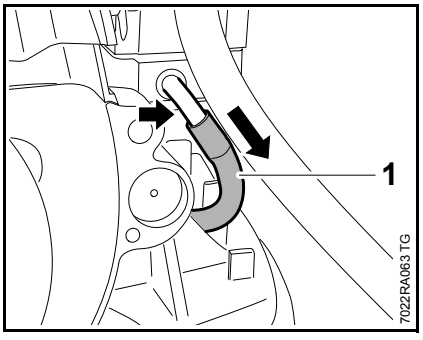


- Pull the fuel hose (1) off the connector (arrow) on the carburetor.

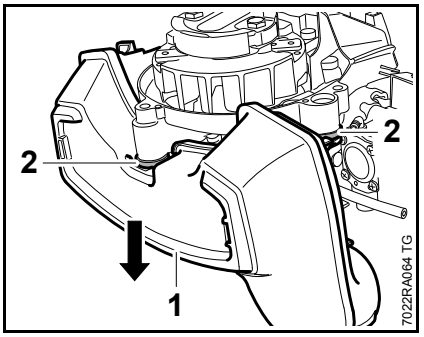


- Pull the tank vent hose (1) off the nipple (arrow) on the filter housing.

– Remove the filter housing, 🕮 10.2



- Pull the fuel suction hose (1) off the connector (arrow) on the carburetor.

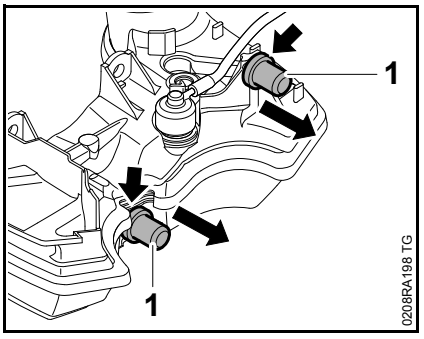


- Pull the fuel tank (1) out of the rubber mounts (2) and lift it away.

FS 94, KM 94

– Remove the tank guard, 🕮 10.9.3

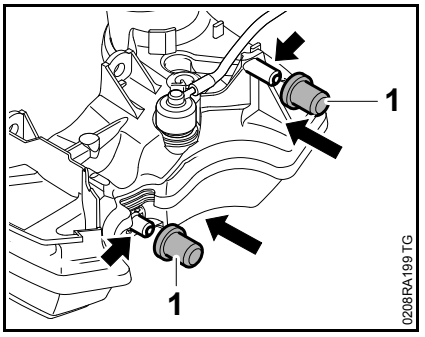
All models



- Pull the rubber mounts (1) off the stubs (arrows), check them and replace if necessary.

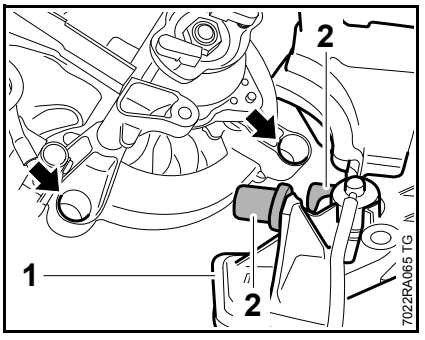
– If the rubber mounts are in order, transfer them to the new fuel tank. All other parts are included with the new fuel tank – see parts list.

Installing



– Use STIHL press fluid to simplify assembly, 🕮 12

- Push the rubber mounts (1) fully onto the stubs (arrows).



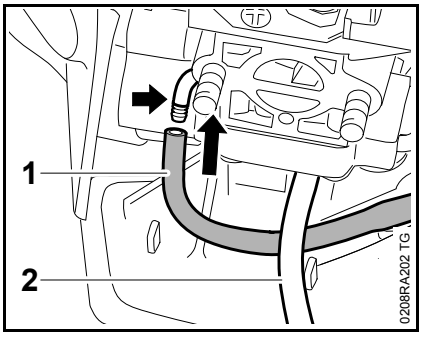
– Use STIHL press fluid to simplify assembly, 🕮 12

- Push the fuel tank (1) with rubber mounts (2) into the bores (arrows) in the crankcase until seated.

FS 94, KM 94

– Install the tank guard, 🕮 10.9.3

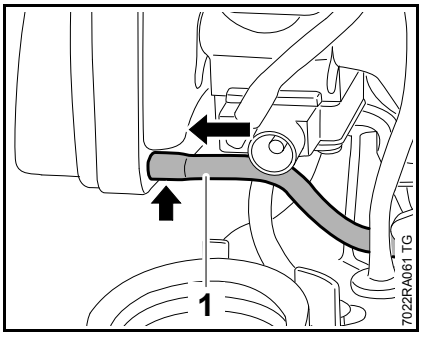
All models



– Use STIHL press fluid to make installation easier, 🕮 12

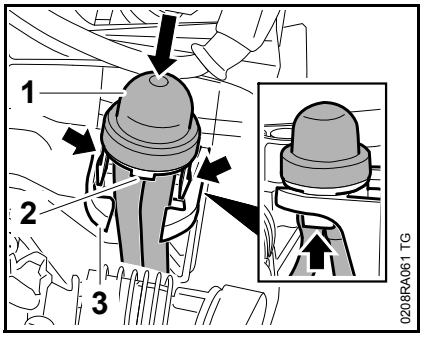
● Position the fuel suction hose (1) under the tank vent hose (2) and push it onto the carburetor's connector (arrow).

– Install the filter housing, 🕮 10.2



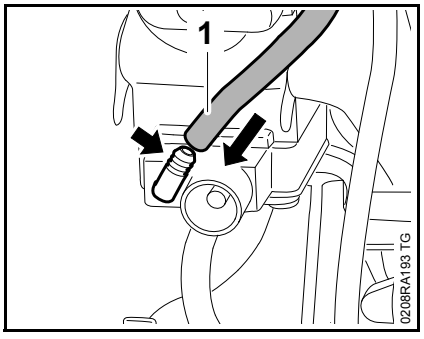
– Use STIHL press fluid to make installation easier, 🕮 12

● Push the tank vent hose (1) onto the nipple (arrow) on the filter housing
– the tank vent hose (1) must be positioned above the fuel suction hose.



● Line up the manual fuel pump (1) so that the lug (2) points towards the carburetor.

● Push the manual fuel pump (1) into the retainer (3) on the air guide shroud until the locking tabs (arrows) snap into place below the retainer (3).



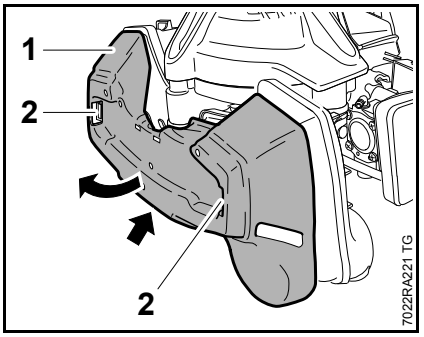
– Use STIHL press fluid to simplify assembly, 🕮 12

● Push the fuel hose (1) fully onto the carburetor's connector (arrow).

– Reassemble all other parts in the reverse sequence.

10.9.3 Tank Guard (FS 94, KM 94)

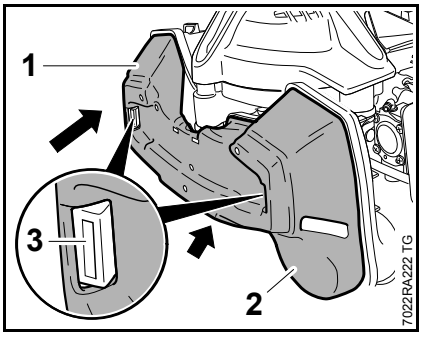
– Remove the rewind starter, 🕮 7.2



● Hold the fuel tank steady, lift the tank guard (1) at the starter side (arrow) and pull it off the lugs (2) at the same time.

– Inspect the tank guard and replace it if necessary.

Installing



● Position the tank guard (1) so that the bulge (2) points in the directon of the filler neck.

● At the starter side (arrow), fit the tank guard (1) over the fuel tank and push it home until the lugs (3) snap into place in the openings.

– Reassemble all other parts in the reverse sequence.

11. Special Servicing Tools

New Special Tools

No.	Part Name	Part No.	Application	Rem.
1	Press sleeve	4149 893 2400	Installing oil seal (ignition side / starter side)	
2	Installing sleeve	4149 893 4600	Protecting oil seal at ignition side	
3	Screwdriver	5910 890 2311	Adjusting the carburetor	
	– Screwdriver	5910 890 2307	Adjusting carburetor (without sleeve and setting disk)	
	– Sleeve	5910 893 1711	Used as holder for adjusting low speed screw **L**	
	– Setting disk	5910 893 6601	Adjusting the carburetor	
4	Ring	5910 893 7008	Supporting fan housing, protecting guide sleeves	

Existing Special Tools

No.	Part Name	Part No.	Application	Rem.
1	Carburetor and engine tester	0000 850 1300	Testing engine and carburetor for leaks	
	- Nipple	0000 855 9200	Testing carburetor for leaks	
	- Hose for leakage test	1110 141 8600	Testing carburetor for leaks	
2	Sealing plate	0000 855 8106	Testing engine for leaks	
3	Installing tool	0000 890 2201	Installing rope guide bushing	
4	Setting gauge	0000 890 6400	Adjusting air gap between the ignition module and flywheel	
5	Clamping strap	0000 893 2600	Clamping rings around piston	
6	Locking strip	0000 893 5904	Blocking the crankshaft	
7	Screwdriver bit, T 27 x 125	0812 542 2104	Removing and installing spline socket screws with electric or pneumatic screwdrivers; tightening down screws with torque wrench	
8	Thrust piece	1107 894 1000	Protecting crankshaft stub at starter side	
9	Wooden assembly block	1108 893 4800	Supporting the piston	
10	Assembly drift	1130 893 4700	Removing and installing piston pin	
11	Installing sleeve	1146 893 4600	Protecting oil seal at starter side	
12	Press arbor	4116 893 7205	Installing ball bearings hot and pressing fully home if necessary (starter side of crankcase)	

No.	Part Name	Part No.	Application	Rem.
13	Thrust piece	4116 894 1000	Extension for spindle of screw sleeve, from service tool set ZS	
14	Puller	4119 890 4501	Removing flywheel	
15	Press arbor	4224 893 7200	Installing ball bearings hot and pressing fully home if necessary (ignition side of crankcase)	
16	Installing tool	4126 893 4900	Rubber element, 1-point AV system	
17	Combination wrench	4149 890 3400	Spark plug	1)
18	Service tool ZS (set)	5910 007 2201	Removing and installing the crankshaft (starter side)	
	- Drilled plate	5910 893 2103	Removing and installing the crankshaft (starter side)	
	- Instruction label	5910 967 3500	Adhesive label with latest hole circles for screw sleeve 5910 893 2420	
19	Flange	5910 850 4200	Crankcase leakage test	
20	Ignition system tester, ZAT 4	5910 850 4503	Testing ignition system	
21	Ignition system tester, ZAT 3	5910 850 4520	Testing ignition system	
22	Torque wrench	5910 890 0302	0.5 to 18 Nm	
23	Torque wrench	5910 890 0312	6 to 80 Nm	
24	Installing tool 8	5910 890 2208	Installing hookless snap rings in piston	
	– Sleeve	5910 893 1708	Sleeve for installing tool 8	
25	Screwdriver bit, T 27 x 150	5910 890 2400	IS-P screws (4 mm)	
26	Hook	5910 890 2800	Removing the clutch spring	
27	Assembly stand	5910 890 3101	Holding power tool for repairs	
28	Puller	5910 890 4400	Removing oil seals	
	- Jaws (No. 3.1)	0000 893 3706	Removing oil seal(s)	
	- Jaws (No. 6)	0000 893 3711	Removing oil seal(s)	
29	Clamp for assembly stand	5910 890 8800	Clamping drive tube of power tool to assembly stand	
30	Hook	5910 893 8800	Removing pickup body	

Remarks:

1) Use for releasing only.

No.	Part Name	Part No.	Application
1	STIHL multipurpose grease - 80 g tube - 225 g tube	 0781 120 1109 0781 120 1110	Control handle, carrier
2	STIHL lubricating grease - 225 g tube	 0781 120 1111	Oil seals, sliding and bearing points
3	STIHL press fluid OH 723	0781 957 9000	Rubber elements, antivibration elements, fuel hoses
4	Dirko HT red sealant	0783 830 2000	Sealing crankcase
5	Standard commercial solvent-based degreasant containing no chlorinated or halogenated hydrocarbons		Cleaning sealing faces and carburetor, crankshaft stubs and flywheel taper
6	Special plastic compatible, low temperature lubricating oil, trade		Bearing bore in rope rotor, rewind spring in starter

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