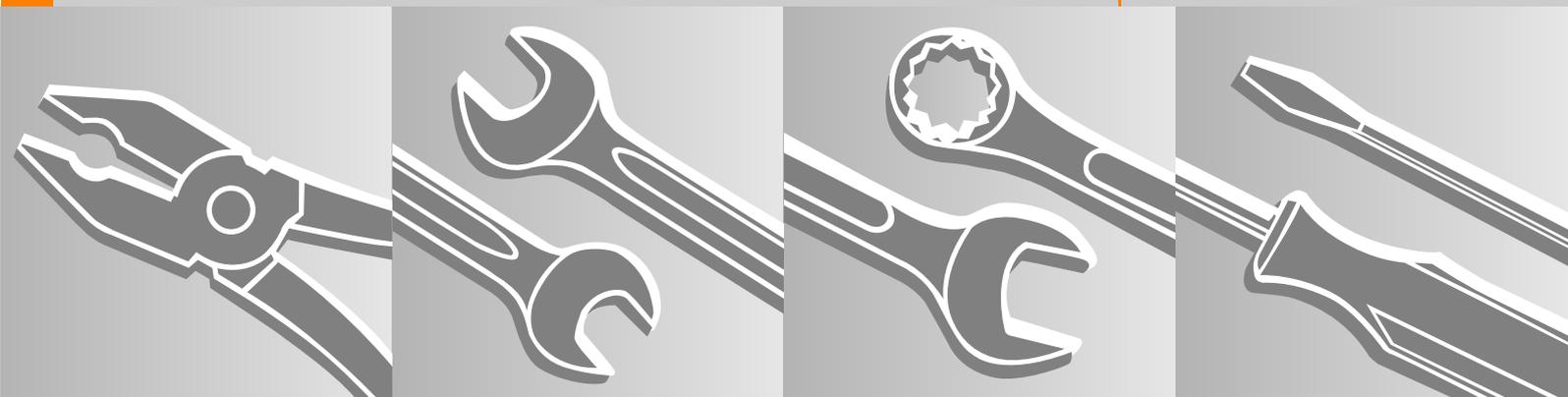


STIHL Series 4144 Components
FC, FS, KM

2008-02



FS 40, FS 50, FS 56

FC 56

KM 56

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1. Introduction

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

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

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

A fault on the machine may have several causes. To help locate the fault, consult the troubleshooting charts for all assemblies and systems in this manual and the "STIHL Service Training System".

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

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

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

In the descriptions:

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

In the illustrations:

- ➔ Pointer
- ➡ Direction of movement
- 📖 4.2 = Reference to another chapter, i.e. chapter 4.2 in this example

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

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

Storing and disposing of oils and fuels

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

2. Safety Precautions

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

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

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

Improper handling may result in burns or other serious injuries.

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

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

3. Specifications

3.1 Engine

	FS 40	FS 50, 56, FC 56, KM 56
Displacement:	27.2 cm ³	27.2 cm ³
Bore:	34 mm	34 mm
Stroke:	30 mm	30 mm
Engine power to ISO 8893:	0.7 kW (1.0 bhp) at 8,500 rpm	0.8 kW (1.1 bhp) at 8,500 rpm
Max. permissible speed (with cutting attachment):	10,000 rpm	10,000 rpm
Idle speed:	2,800 rpm	2,800 rpm
Clutch:	Centrifugal clutch without linings	Centrifugal clutch without linings
Clutch engages at:	4,200 rpm	4,200 rpm
Crankcase leakage test at gauge pressure:	0.5 bar	
under vacuum:	0.5 bar	

3.2 Fuel System

Carburetor leakage test at gauge pressure:	0.3 bar
Operation of tank vent at gauge pressure:	0.5 bar
Fuel:	as specified in instruction manual

3.3 Ignition System

Air gap between ignition module and fanwheel:	0.30 mm
Spark plug (suppressed):	NGK CMR6H NGK 6H Bosch WSR 6 F
Electrode gap:	0.5 mm

3.4 Tightening Torquese

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

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

Fastener	Thread size	For component	Torque Nm	Remarks
Screw	P 6x14	Line limiting blade/deflector	2.5	
Screw	M 5x30	Control handle/handle/nut with washer	2.0	
Screw	P 5x14	Filter cover/filter housing	3.0	
Nut	M 5	Filter housing/carburetor/spacer flange	3.5	
Screw	P 4x12	Throttle cable/engine housing	1.5	
Screw	D 6x28	Gearbox/drive tube clamp (FS 56)	12.0	
Screw	D 5x20	Shroud/cylinder	6.0	
Screw	M 6x35	Clamp/clamp block/clamp	4.5	
Screw	M 6x25	Clamp/loop handle	4.5	
Screw	P 5x20	Engine housing/shroud	4.0	
Screw	M 5x20	Engine housing/crankcase	7.0	
Screw	P 5x20	Engine housing torsion lock/drive tube	4.0	
Screw	M 5x14	Deflector/gearbox (FS 56)	4.5	
Screw	M 6x30	Deflector/drive tube/nut /FS 40,50)	5.0	
Screw	M 6x14	Clamp/drive tube/harness ring	4.5	
Screw	D 5x20	Starter cover/crankcase	6.0	
Screw	D 5x20	Starter cover/engine pan	6.0	
Screw	M 4x9	End cover/carburetor	2.0	

Remarks:

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

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

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

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

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

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

Do not mix up screws with and without binding heads.

4. Troubleshooting

4.1 Clutch

Condition	Cause	Remedy
Cutting attachment stops under load at full throttle	Clutch shoes badly worn	Install new clutch
	Clutch drum badly worn	Install new clutch drum
Cutting attachment runs at idle speed	Engine idle speed too high	Readjust idle speed screw LA
	Clutch springs stretched or fatigued	Replace the clutch springs or install new clutch
	Clutch spring hooks broken	Replace the clutch springs
Loud noises	Clutch springs stretched or fatigued	Replace all clutch springs
	Clutch shoe retainer broken	Install new clutch
	Clutch shoes and carrier worn	Install new clutch
Condition	Cause	Remedy

4.2 Rewind Starter

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

4.3 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 has other damage or pole shoes have turned blue	Install new flywheel
	Ignition timing wrong, flywheel out of adjustment, key on crankshaft has sheared off	Locate flywheel properly or install new flywheel
	Weak magnetization in flywheel	Install new flywheel
	Irregular spark	Check operation of switch shaft/contact springs and ignition module. Faulty insulation or break in ignition lead or short circuit wire. Check ignition lead/ignition module and replace ignition module if necessary. Check operation of spark plug. Clean the spark plug or replace if necessary.
	Crankcase damaged (cracks)	Install new crankcase

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

4.4 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 control lever sticking on spindle	Check inlet control lever, replace if necessary
	Helical spring not located on nipple of inlet control lever	Remove the inlet control lever and refit it correctly
	Perforated disc on diaphragm is deformed and presses constantly against the inlet control lever	Fit a new metering diaphragm
	Metering diaphragm deformed	Fit a new metering diaphragm
Poor acceleration	Setting of low speed screw too lean	Check basic carburetor setting, correct if necessary
	Setting of high speed screw too lean	Check basic carburetor setting, correct if necessary
	Inlet needle sticking to valve seat	Remove inlet needle, clean and refit
	Diaphragm gasket leaking	Fit new diaphragm gasket
	Metering diaphragm damaged or shrunk	Fit a new metering diaphragm
	Tank vent faulty	Replace tank vent
	Leak in fuel hose between tank and fuel pump	Install new hose

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

Condition	Cause	Remedy
Engine speed drops quickly under load – low power	Air filter dirty	Clean air filter or replace if necessary
	Throttle shutter not opened fully	Check throttle cable and cable adjustment and readjust if necessary
	Tank vent faulty	Replace tank vent
	Fuel pickup body dirty	Install new pickup body
	Fuel strainer dirty	Clean fuel strainer in carburetor, replace if necessary
	Leak in fuel hose between tank and fuel pump	Install new hose
	Setting of high speed screw H too rich	Check basic carburetor setting, correct if necessary
	Main jet bores or ports blocked	Clean the carburetor
	Pump diaphragm damaged or fatigued	Fit new pump diaphragm
Ignition timing wrong, flywheel out of adjustment, key on crankshaft has sheared off	Locate flywheel properly or install new flywheel	

4.5 Engine

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

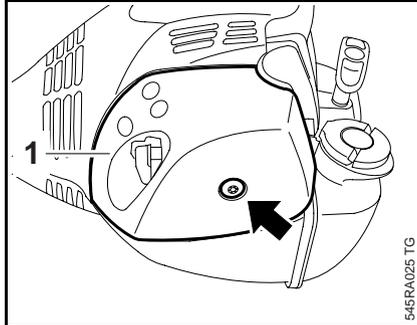
- Air filter
- Fuel system
- Carburetor
- Ignition system

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

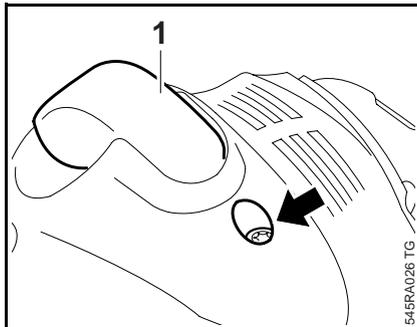
5. Engine

5.1 Removing and Installing

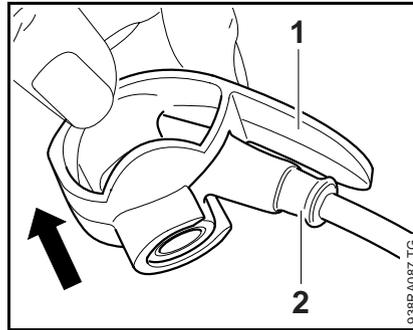
- Remove the drive tube, 9.1
- Remove the rewind starter, 6.2



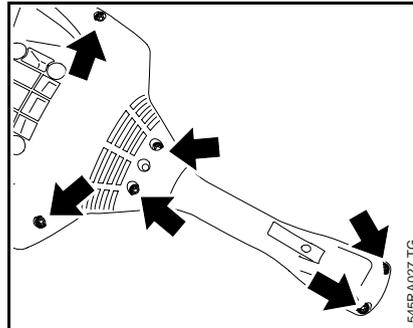
- Take out the screw (arrow).
- Remove the filter cover (1).



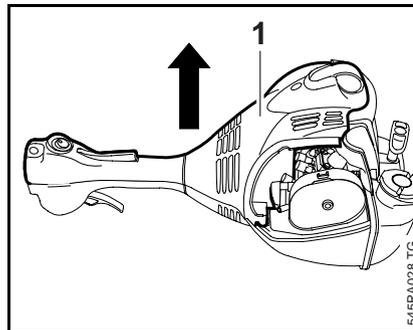
- Take out the screw (arrow).
- Pull boot (1) off the spark plug.



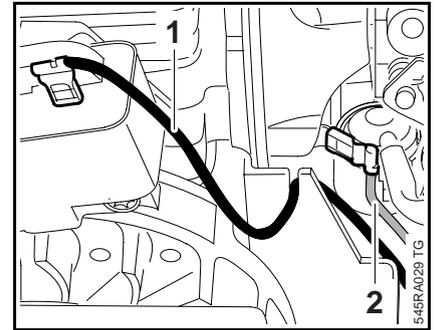
- Pull the protective cap (1) off the spark plug boot (2).
- Push the boot on to the spark plug.



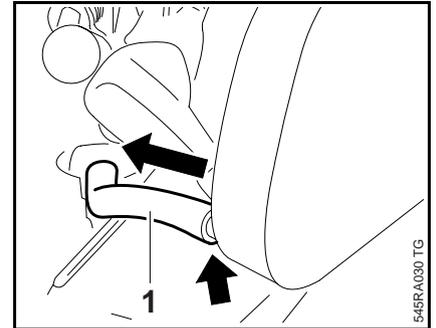
- Turn the machine over.
- Take out the screws (arrows).



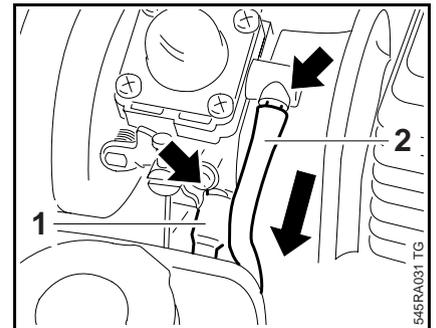
- Turn the machine over
- Remove the shroud (1).



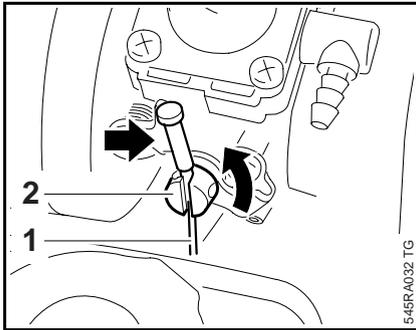
- Disconnect the short circuit wire (1) and ground wire (2).



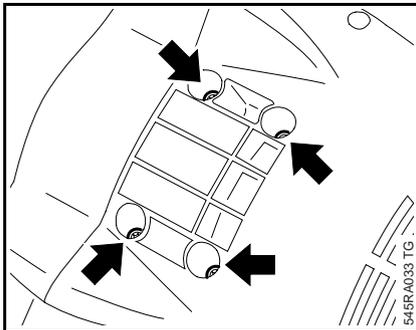
- Disconnect the tank vent hose (1) from the filter housing (arrow).



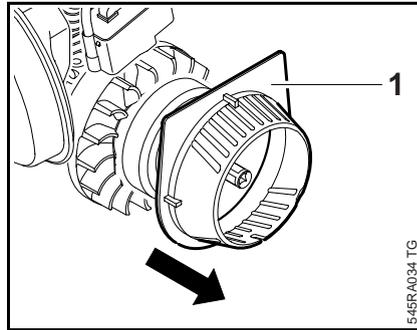
- Disconnect the fuel return hose (2) and fuel suction hose (1) from the stubs (arrows).
- Install new fuel hoses, 8.9.2



- Press down the throttle lever until the nipple (arrow) projects.
- Turn the pin (2) until the slot is in line with the throttle cable (1).
- Remove the throttle cable (1).



- Turn the machine over.
- Take out the screws (arrows).
- Turn the machine over again and lift the engine out.



- Remove the air baffle (1).
- Inspect the muffler and replace if necessary, [5.8](#)
- Check the air filter, carburetor and spacer flange, replace as necessary, [8.1](#), [8.2](#), [8.7](#)
- Troubleshooting, [4.4](#), [4.5](#)

All other operations are described in the service manual for the "Series 4144 Powerhead".

5.2 Leakage test

See service manual for "Series 4144 Powerhead"

5.3 Oil seals

See service manual for "Series 4144 Powerhead"

5.4 Ignition Module / Spark Plug Boot

See service manual for "Series 4144 Powerhead"

5.5 Clutch

See service manual for "Series 4144 Powerhead"

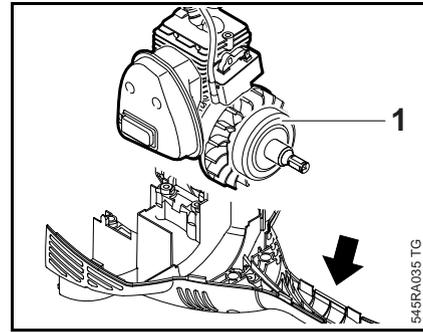
5.6 Flywheel

See service manual for "Series 4144 Powerhead"

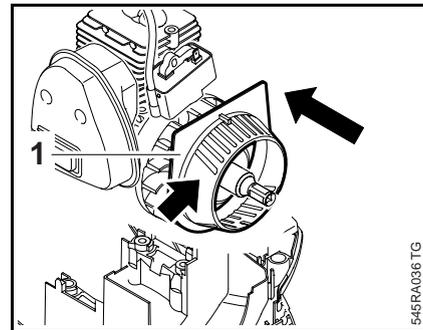
5.7 Motor

See service manual for "Series 4144 Powerhead"

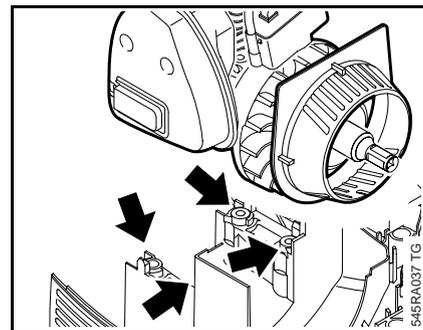
Installing



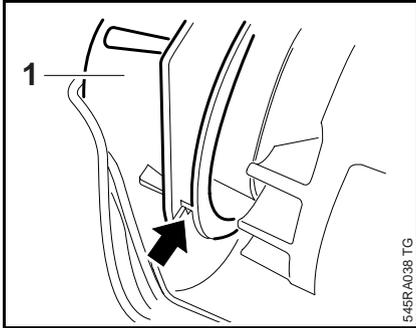
- Position the engine so that the clutch (1) faces the drive tube mounting (arrow) in the engine housing.



- Fit the air baffle (1) over the clutch drum with its straight side facing up and the air slots (arrow) facing the drive tube mounting.

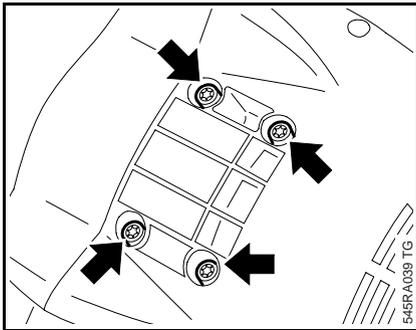


- Position engine with air baffle on the mounts (arrows) on the engine housing.

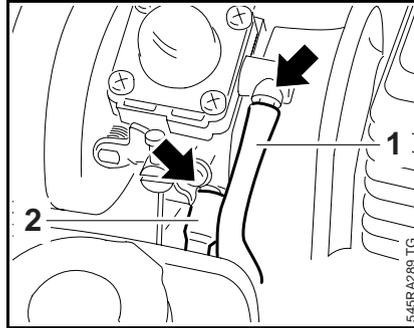


- Line up the air baffle (1).

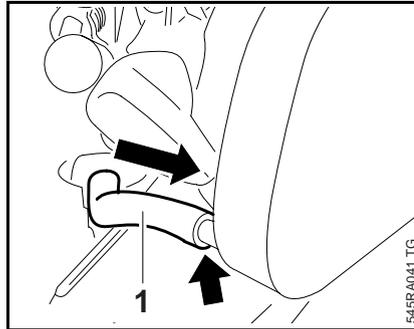
The air baffle's slot must engage the engine housing rib (arrow) at both sides.



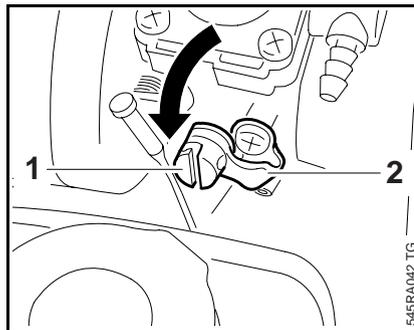
- Turn the machine over.
- Insert screws (arrows) and tighten them down firmly.
- Turn the machine over



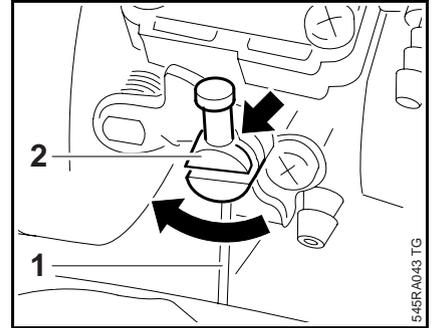
- Coat stubs (arrows) and ends of hoses with STIHL press fluid, 11
- Install new fuel return hose (1) and fuel suction hose (2), 8.9.2



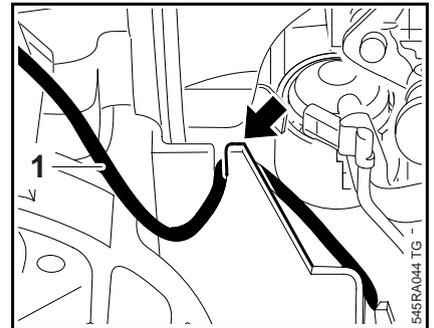
- Connect tank vent hose (1) to filter housing (arrow)
 - push it fully onto the stub.



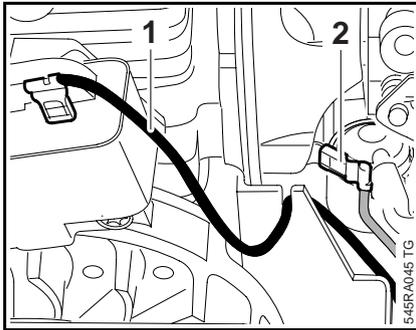
- Turn the pin (1) until the slot is in line with the throttle cable.
- Press down the throttle lever (2).



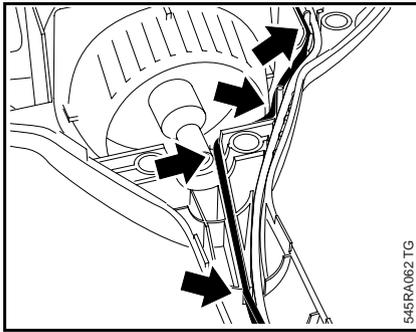
- Fit throttle cable (1) in the pin's (2) slot.
- Turn the pin until the nipple is properly seated (arrow).
- Check operation
 - squeeze throttle trigger on handle as far as stop. The throttle shutter must be fully open, adjust throttle cable if necessary, 8.6.2



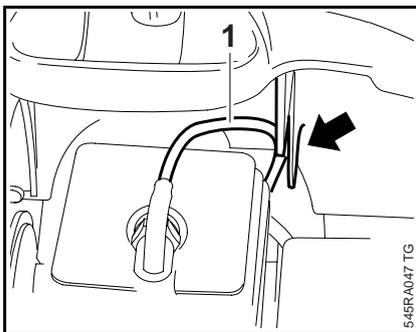
- Fit the short circuit wire (1) in the guide (arrow).



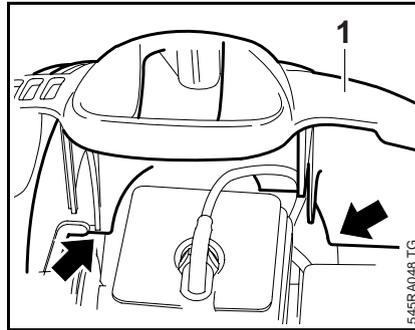
- Push short circuit wire (1) and ground wire (2) firmly onto the connector tags.



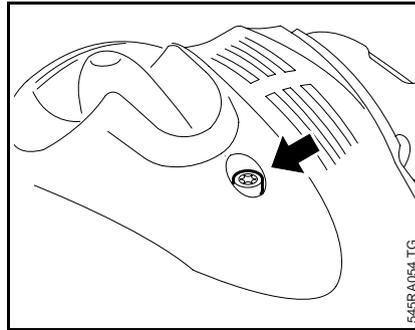
The short circuit and ground wires must be properly seated in the guides (arrows).



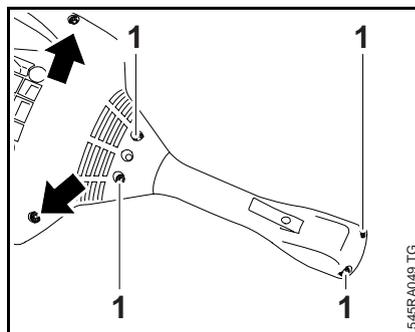
The ignition lead (1) must be inside the web (arrow) when the shroud is fitted.



- Place the shroud (1) in position behind the air baffle (arrows).
- Push the shroud (1) down until it engages the locking tabs.

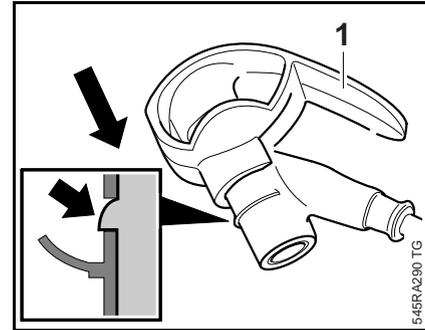


- Fit the screw (arrow).



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

- Insert the screws (1)
 - do not tighten them down yet.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, 3.4

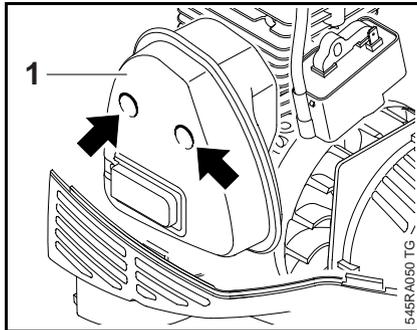


- Push on the protective cap (1) as far as stop.
- Make sure the lug on the spark plug boot (arrow) engages.

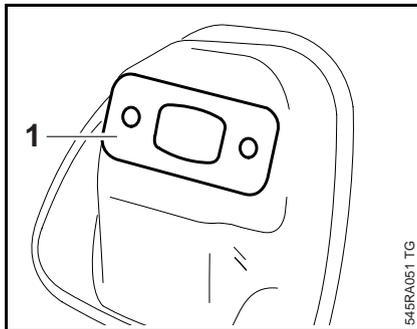
5.8 Muffler / Spark Arresting Screen

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

- Troubleshooting, 4.5
- Remove the drive tube, 9.1
- Remove the rewind starter, 6.2
- Remove the shroud, 5.1

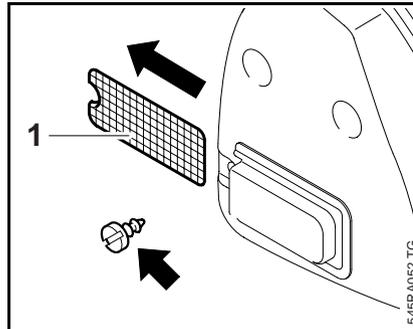


- Take out the screws (arrows).
- Remove the muffler (1), check and replace if necessary.

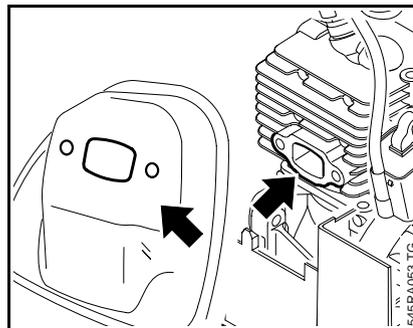


- Remove the gasket (1).

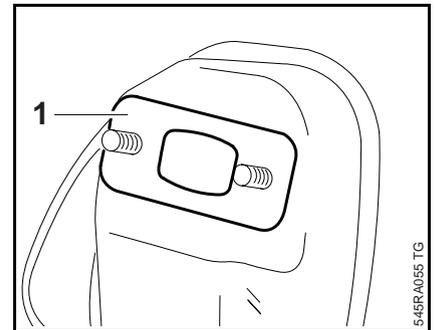
Spark arresting screen (if fitted)



- Take out the screw (arrow) and remove the spark arresting screen (1).
- Clean the spark arresting screen or replace if necessary.
- Reassemble in the reverse sequence.

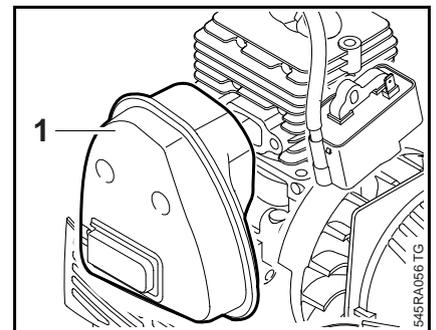


- Inspect and clean the sealing faces (arrows) and remove any gasket residue, 11



Use a new exhaust gasket.

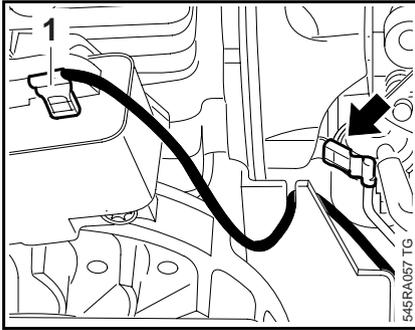
- Insert the screws.
- Push the exhaust gasket (1) over the screws.



- Carefully place the muffler (1) in position.
- Fit the screws with washers and check correct position of exhaust gasket again.
- Insert screws and tighten them down firmly.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, 3.4

5.9 Short Circuit Wire

5.9.1 Testing



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

- Remove the shroud,  5.1
- Disconnect the short circuit wire (1).
- Connect the ohmmeter to ground (arrow) and the short circuit wire (1).
- Set the stop switch to "0" and hold it in that position.

The resistance measured must be about 0 Ω. If it is much higher, the reason may be the stop switch or the wire. Damaged parts must be replaced,  5.9.2,  5.9.3.

- Release the stop switch.

The resistance measured must be infinitely high. If not, fit a new short circuit wire or stop switch,  5.9.2,  5.9.3.

To locate the fault, test the wires for continuity and check insulation for damage. If the wires are in order, check operation of stop switch,  5.10

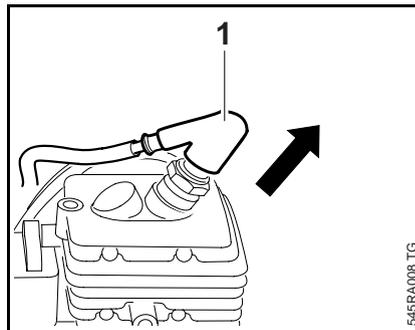
If no fault can be found, check the ignition system with the aid of the troubleshooting chart,  5.10.

- Check ground wire for continuity.
- Reassemble in the reverse sequence.

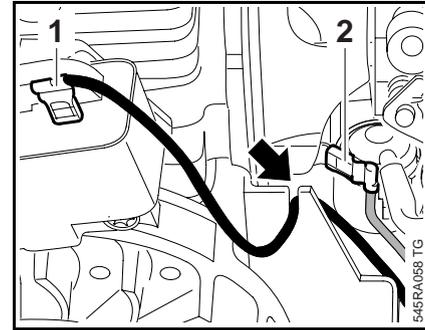
5.9.2 Removing and Installing (Loop Handle Version)

Separate short circuit (black) and ground (blue) wires are installed in these machines and may be replaced individually in case of damage.

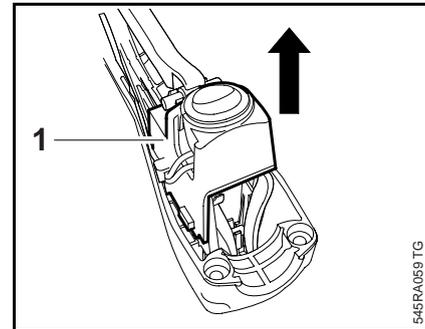
- Remove the drive tube,  9.1
- Remove the shroud,  5.1



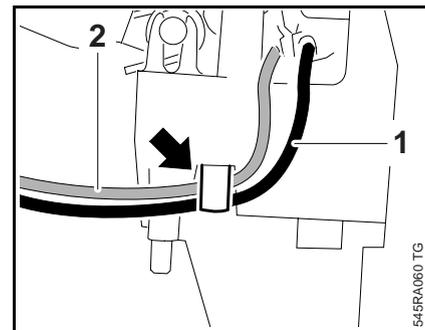
- Pull boot (1) off the spark plug.



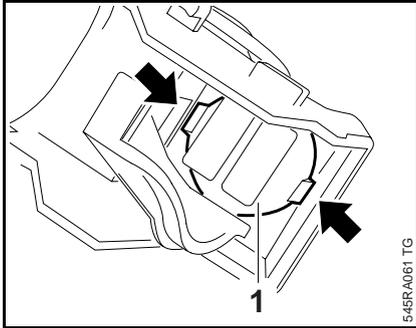
- Disconnect the short circuit wire (1) and ground wire (2).
- Pull the short circuit wire out of the guide (arrow).



- Press down the interlock lever to disengage it from the throttle trigger.
- Pull out the support (1).

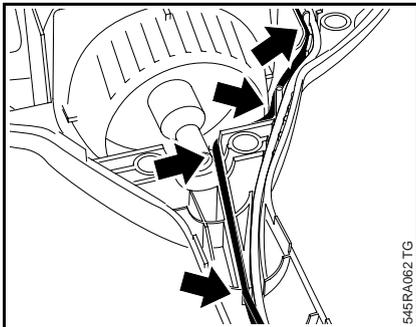


- Take the short circuit wire (1) and ground wire (2) out of the guide (arrow).

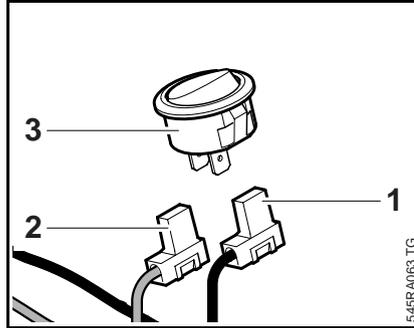


- Squeeze the retaining tabs (arrows) together and push the stop switch (1) out of the support.

– Take the wires and stop switch out of the support.



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



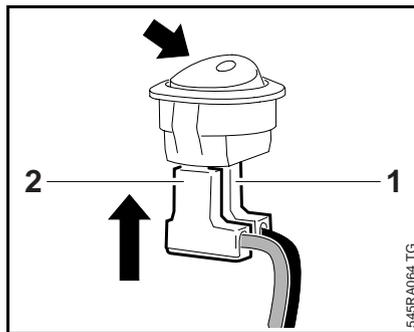
- Disconnect the short circuit wire (1) and ground wire (2) from the stop switch (3).

– Check the individual parts and replace if necessary.

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

– Check operation of the stop switch and replace it if necessary.

Installing



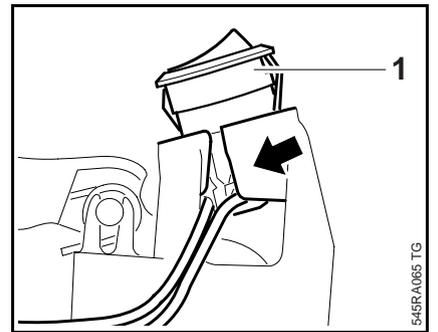
Ground and short circuit wires have different lengths – position the short circuit wire in the guides first.

– Lay the ground and short circuit wires next to one another – do not cross over.

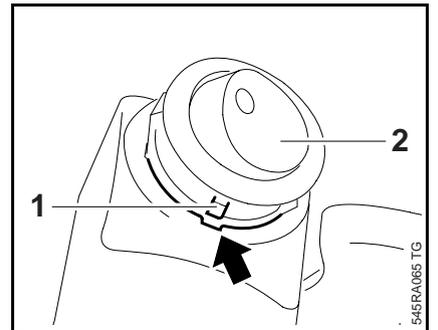
– Push the flag terminals firmly on to the connector tags of the stop switch.

- Push the flag terminal of the short circuit wire (1) onto the rear connector tag (see illustration).
- Push the ground wire (2) onto the connector tag.

The flag terminals must point to the right with the switch in the position shown (small arrow).

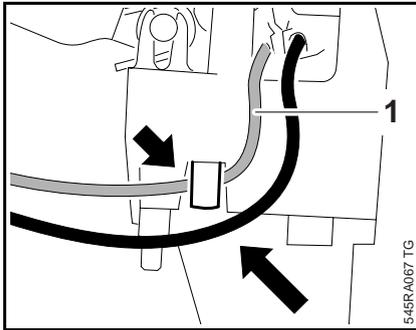


- Pass the wires with stop switch (1) through the opening (arrow).

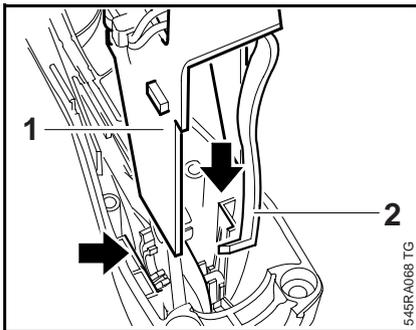


- Position the stop switch (2) so that the lug (1) engages the slot (arrow) in the support.

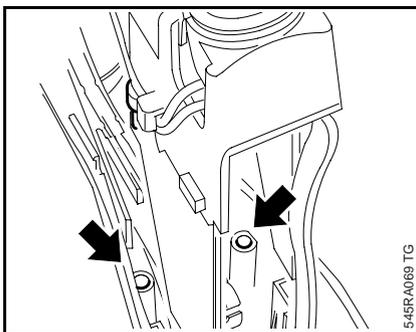
– Push the stop switch (2) into the support until it snaps into position.



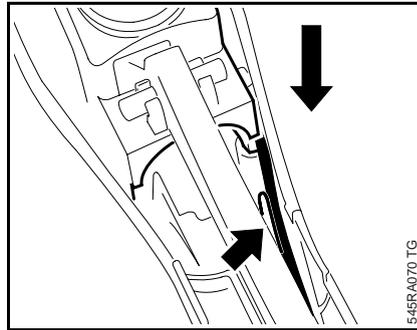
- Fit the wires, ground wire (1) first, in the guide – position the wires next to one another without loops.



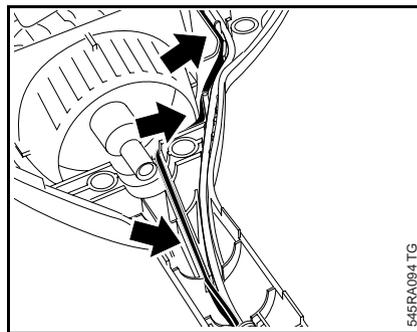
- Push the support (1) into position so that the tabs engage the guides (arrows) and the interlock lever (2) engages the underside of the throttle trigger.



- When pushing the into position, check that its pegs engages the holes (arrows).

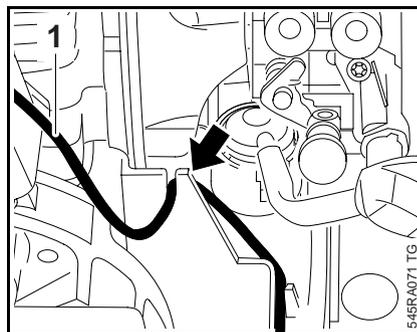


- Push the support fully home and position the wires, short circuit wire first, in the guide (arrow).

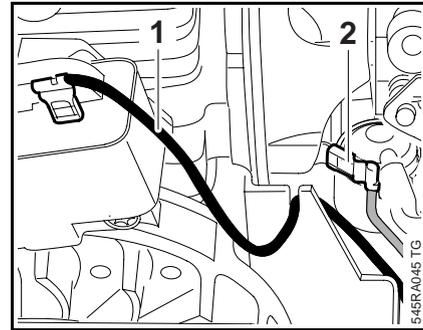


- Push the short circuit into the guides (arrows) first, then the ground wire.

Lay the wires next to one another without crossing over.



- Fit the short circuit wire (1) in the guide (arrow).



- Push short circuit wire (1) and ground wire (2) firmly onto the connector tags.

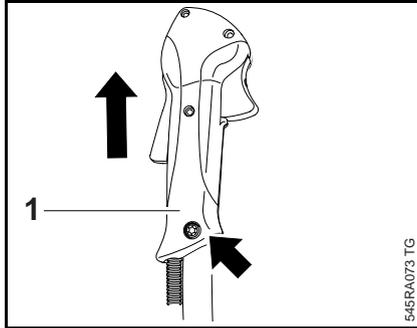
– Reassemble all other parts in the reverse sequence.

– Tightening torques, 3.4

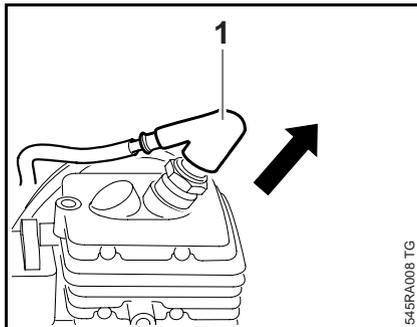
– Check operation.

5.9.3 Removing and Installing (Bike Handle Version)

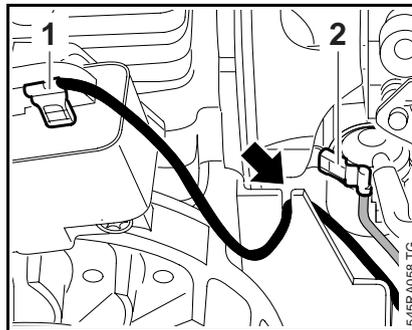
The short circuit wire (black), ground wire (blue) and throttle cable are in a protective tube.



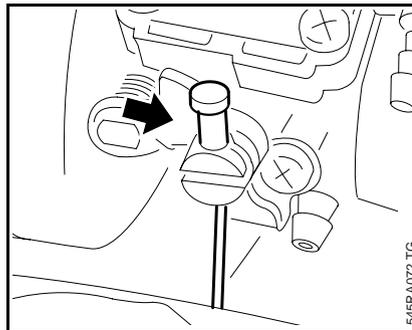
- Take out the screw (arrow) and remove the lock nut.
- Pull the control handle (1) off the handlebar.
- Remove the drive tube, [9.1](#)
- Remove the shroud, [5.1](#)



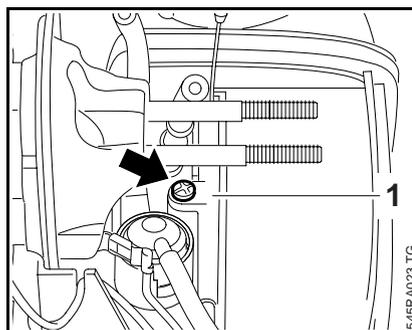
- Pull boot (1) off the spark plug.



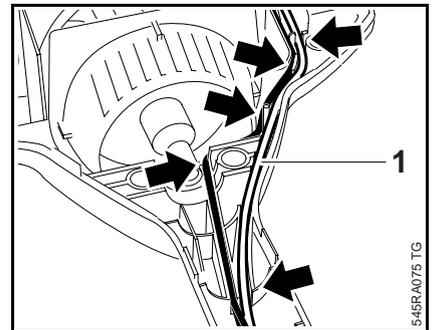
- Disconnect the short circuit wire (1) and ground wire (2).
- Pull the short circuit wire out of the guide (arrow).



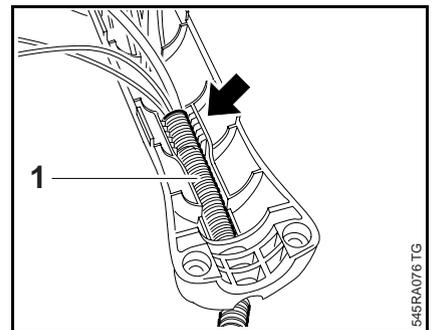
- Disconnect the throttle cable (arrow).
- Remove the carburetor, [8.2](#)



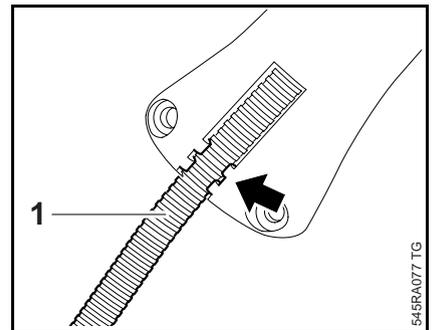
- Take out the screw (arrow).
- Pull the retainer (1) with throttle cable out of its seat.



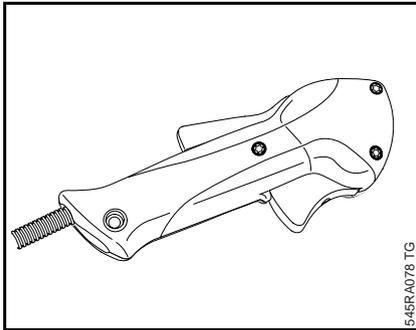
- Pull the ground and short circuit wires with throttle cable out of the guides (arrows).



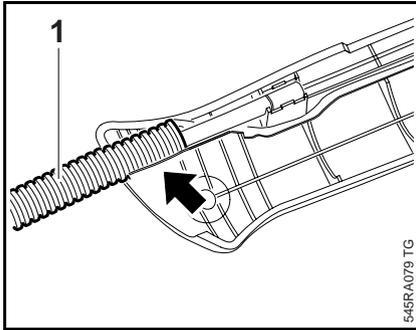
- Pull the protective tube (1) out of its inner seat (arrow).



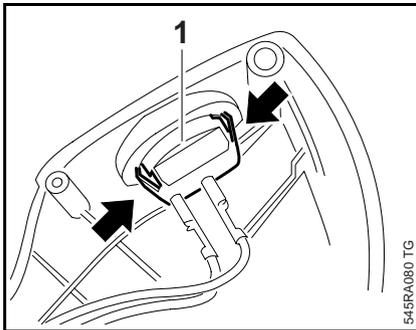
- Pull the protective tube (1) out of its outer seat (arrow).
- Pull the protective tube (1) with wires and throttle cable out of the engine housing.



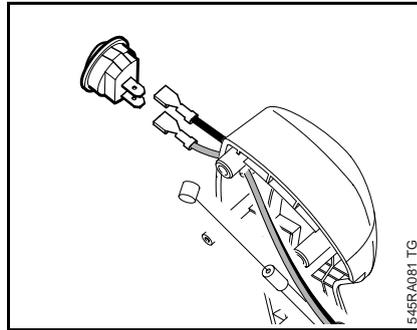
- Remove the handle molding and levers, [7.4](#)



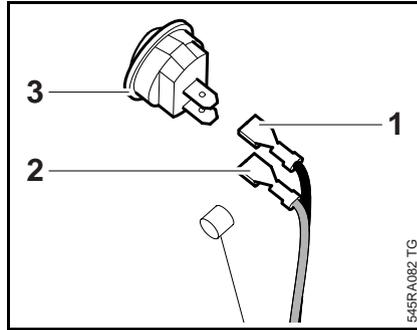
- Pull the protective tube (1) out of its seat (arrow) in the handle molding.
- Pull the wires and throttle cable out of the guides.



- Squeeze the retaining tabs (arrows) together and push the stop switch (1) out of the handle molding.
- Pull the stop switch (1) with wires out of the handle molding.



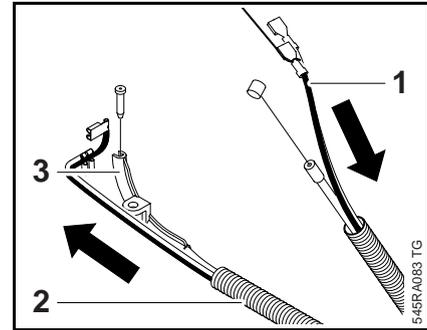
- Disconnect the wires from the stop switch.



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

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

- Check operation of the stop switch and replace it if necessary.

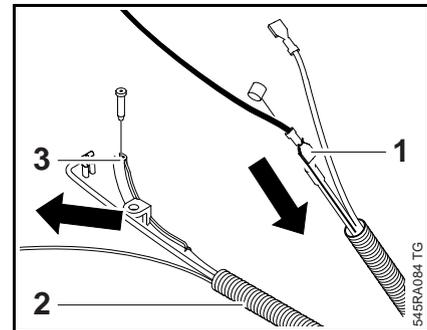


- Tie a thin piece of string to the straight terminal on the short circuit wire (1).

- Pull short circuit wire (1) out of the protective tube (2) in direction of throttle cable retainer (3) and undo the string.

- Check the short circuit wire and replace if necessary.

- Check the throttle cable and replace if necessary, [8.6.1](#)

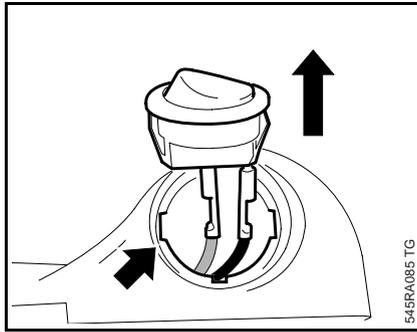


- Tie the thin piece of string to the straight terminal of the new short circuit wire (1).

- Starting at the throttle cable retainer (3), pull the short circuit wire (1) through the protective tube (2) and undo the string.

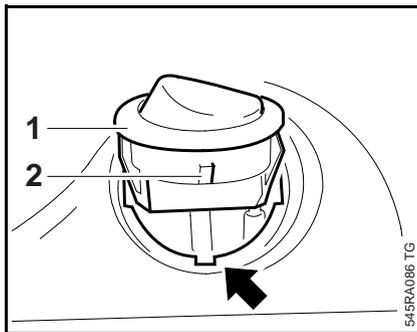
The same method can be used to remove and install the ground wire and throttle cable in the protective tube.

Installing

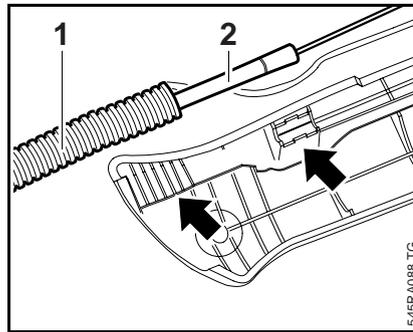


– Thread the short circuit and ground wires through the hole (arrow) in the handle molding.

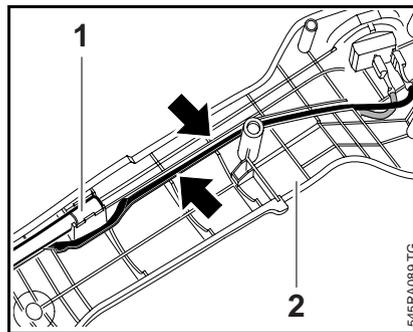
- Push the straight terminals of the ground and short circuit wires firmly onto the stop switch connector tags.



- Position the stop switch (1) so that the lug (2) engages the slot (arrow) in the opening.



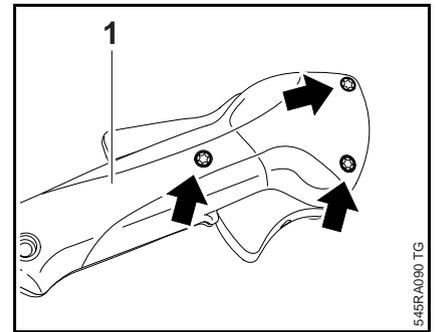
- Push the protective tube (1) and throttle cable (2) into their seats (arrows) in the handle molding.



- Fit the wires, ground wire first, in the guide (arrows) – position the wires next to one another without loops.

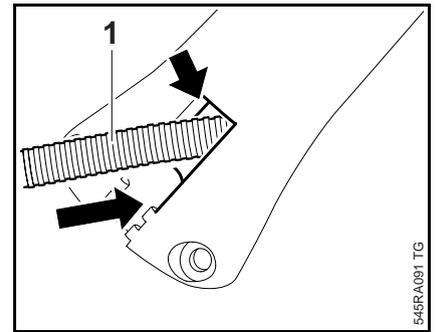
The throttle cable sleeve (1) must locate in its seat in the handle molding (2).

- Install the control levers, [7.4](#)
- Install the throttle cable in the control handle, [8.6.1](#)

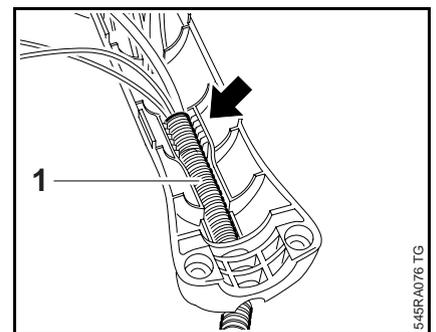


– Fit the handle molding (1) in position.

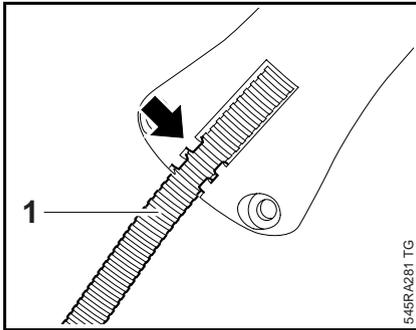
- Insert screws (arrows) and tighten them down firmly.



- Push the protective tube (1) with wires and throttle cable into the engine housing through the opening (arrow).

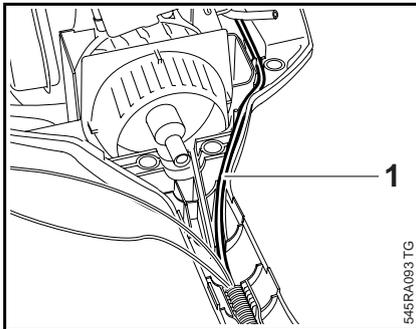


- Press the protective tube (1) into its seat (arrow).



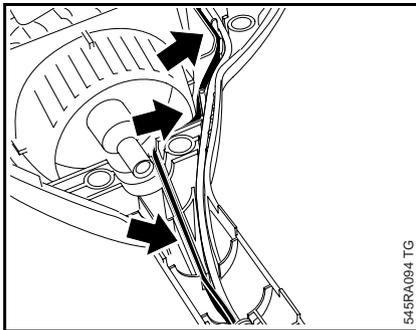
545RA281 TG

- Position the protective tube (1) against the engine housing.
- Press the protective tube (1) into its seat (arrow) as far as stop – it is now secure.



545RA093 TG

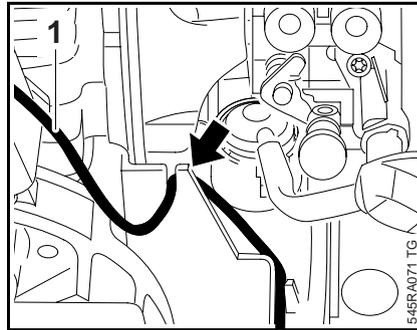
- Install the throttle cable (1), readjust if necessary, [📖 8.6.1](#)



545RA094 TG

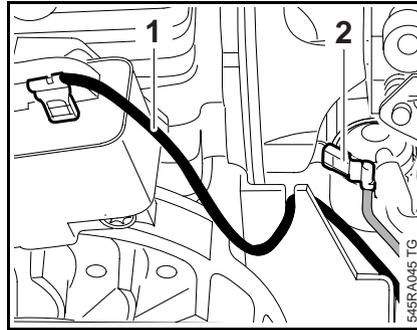
- Push the short circuit into the guides (arrows) first, then the ground wire.

Lay the wires next to one another without crossing over.



545RA071 TG

- Fit the short circuit wire (1) in the guide (arrow).



545RA045 TG

- Push short circuit wire (1) and ground wire (2) firmly onto the connector tags.
- Mount the control handle on the handlebar, [📖 7.5](#)
- Reassemble all other parts in the reverse sequence.
- Tightening torques, [📖 3.4](#)
- Check operation.

5.9.4 Ground Wire

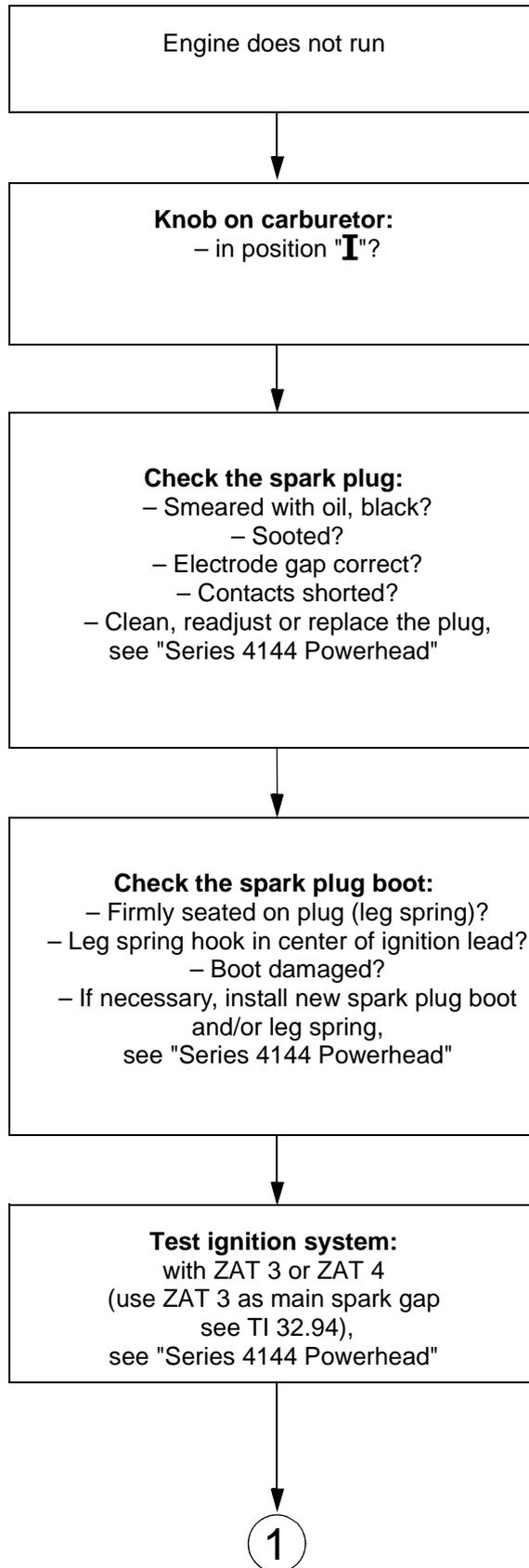
A faulty ground wire may impair or prevent operation of the short circuit wire.

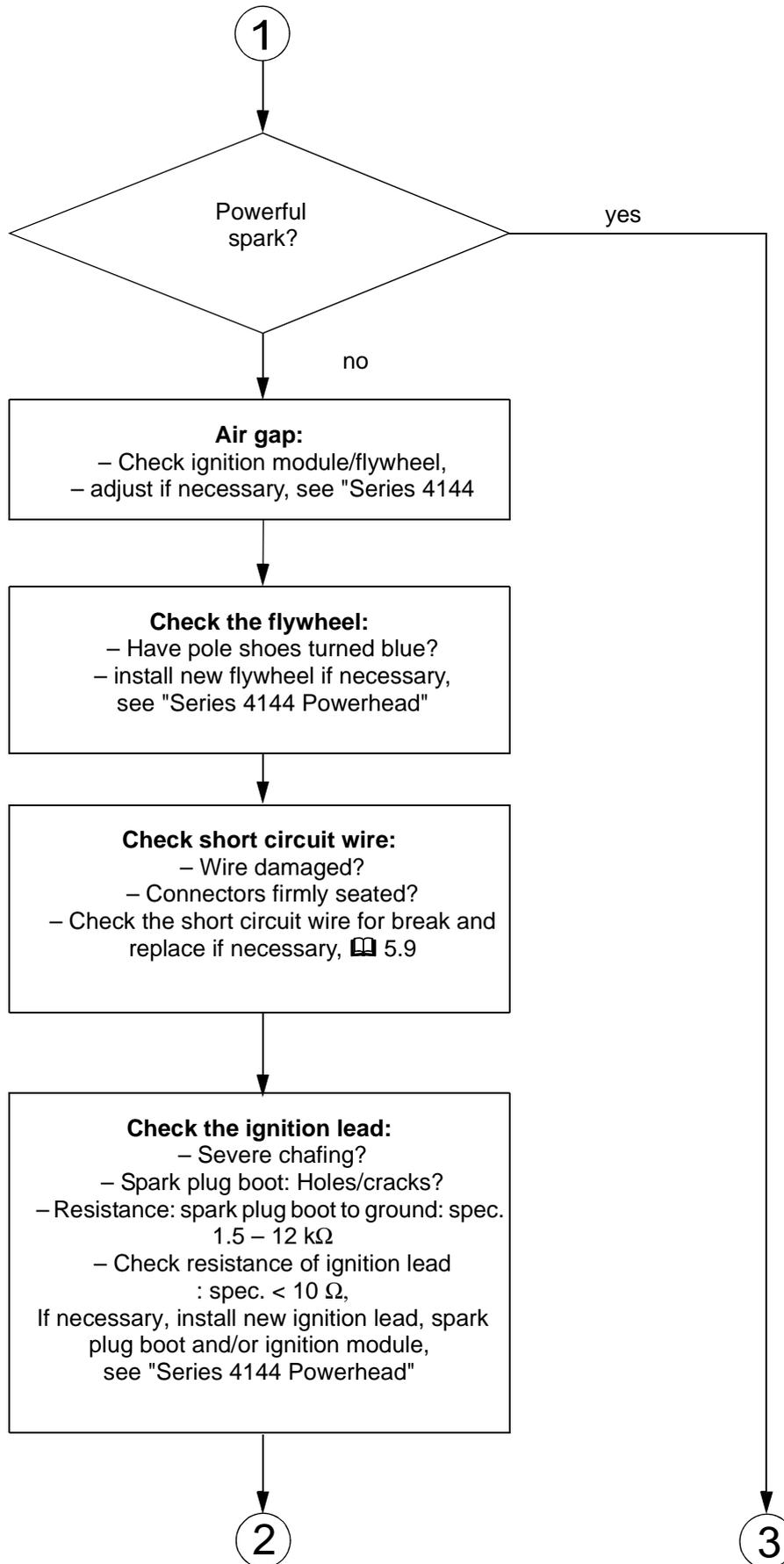
The ground wire is fitted together with the short circuit in the protective tube and must be replaced if damaged.

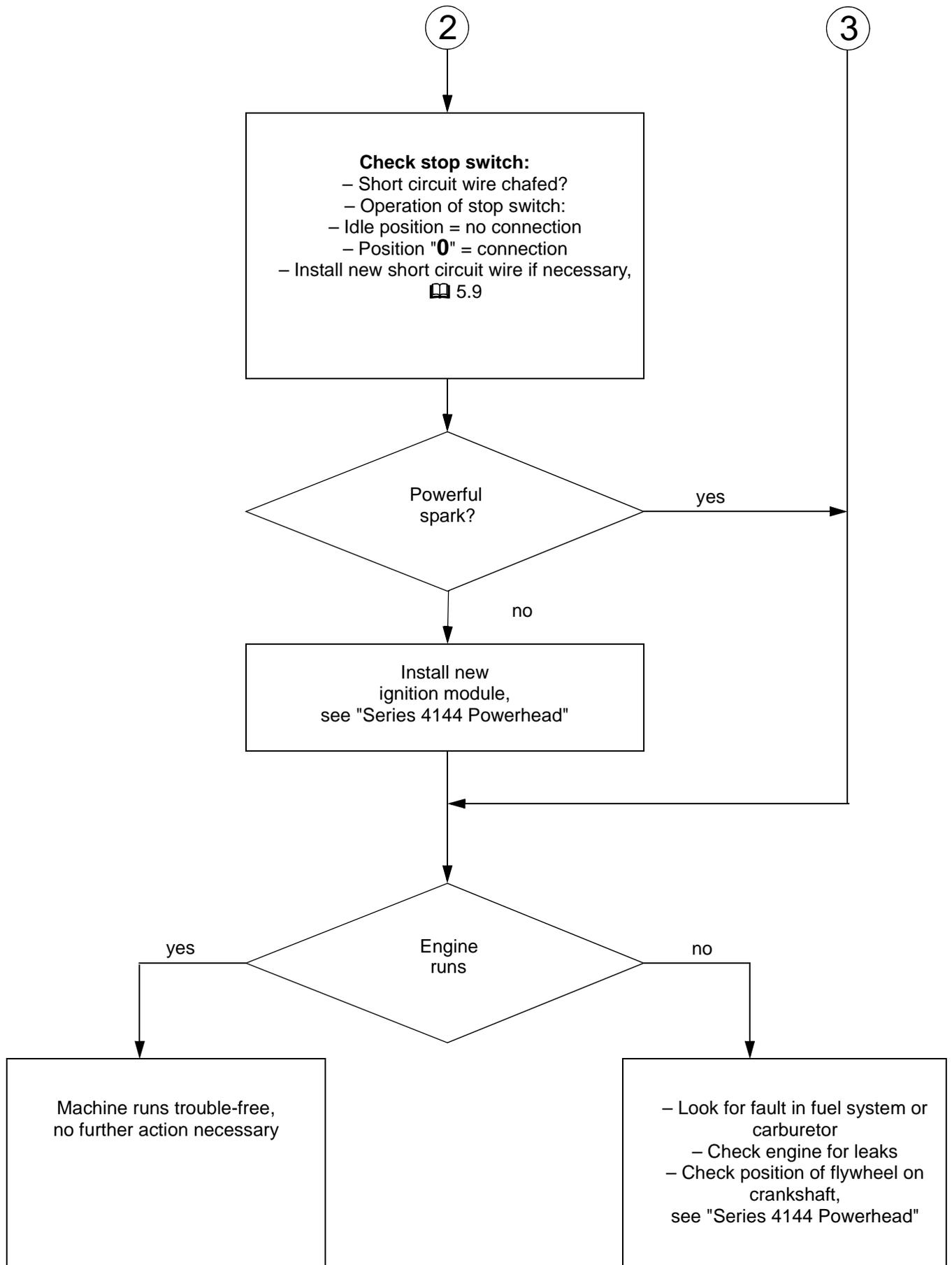
- Check for contact and continuity and replace ground wire if necessary, [📖 5.9.1](#)

5.10 Ignition System Troubleshooting

Troubleshooting can be performed with the engine installed. Refer to service manuals of "Series 4144 Powerhead" or "Series 4144 Components – FS, FC, KM" for descriptions of procedures.







6. Rewind Starter

6.1 General

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

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

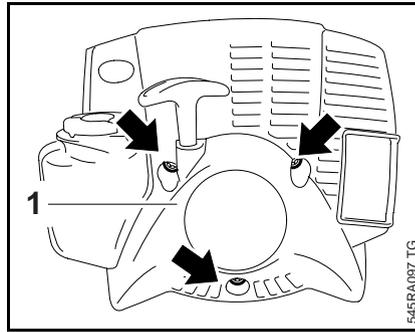
Carefully pull out the starter rope several times and allow it to rewind until its normal smooth action is restored.

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

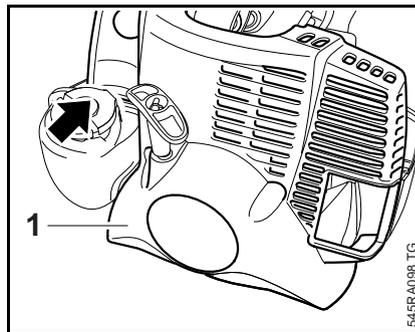
If clogged with dirt or pitch, the entire starter mechanism, including the rewind spring, must be removed and disassembled. Take particular care when removing the spring.

- Clean all components.

6.2 Removing and Installing

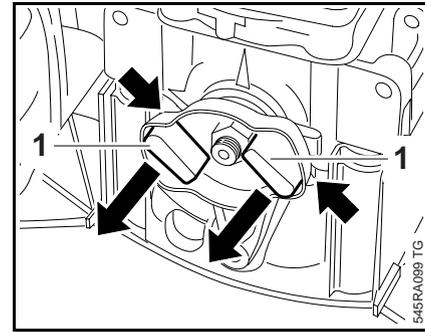


- Take out the screws (arrows).
- Remove the rewind starter (1).

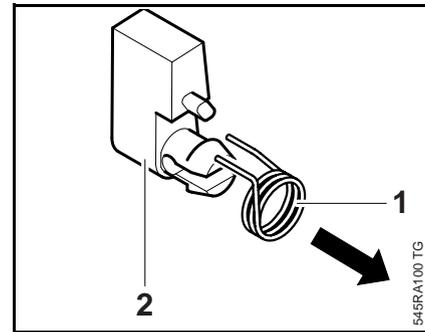


- Position the rewind starter (1) so that the cover (arrow) fits behind the tank filler.
- Push home the rewind starter (1) and, at the same time, pull the starter grip a little until the rope rotor slips between the pawls.
- Insert screws and tighten them down firmly.
- Tightening torques, 3.4

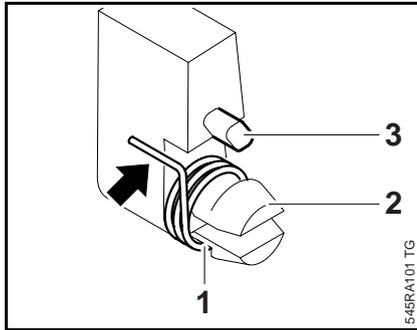
6.3 Pawls



- Remove the rewind starter, 6.2
- Push the locking pegs (arrows) from behind the carrier to remove the pawls (1)



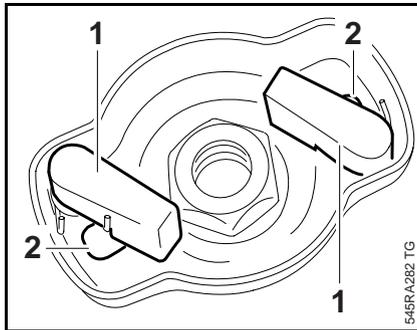
- Remove the torsion spring (1) from the pawl (2).
- Check the individual parts and replace if necessary.



- Fit the torsion spring (1) so that its leg (arrow) is against the pawl.

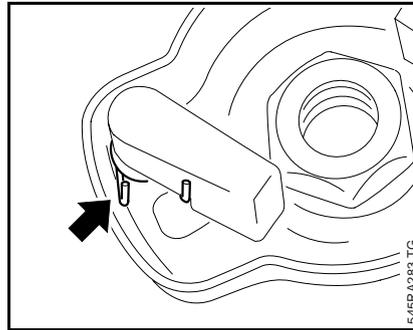
The torsion spring must be pushed fully onto the locking peg (2).

Pawls have locking pegs and guide pegs (3).



- Rotate leg of torsion spring a 1/4 turn counterclockwise and hold it there.

- Push locking pegs of pawls (1) into the holes in the carrier until they snap into position.
- The pawl guide pegs must engage the recesses (2).



- Leg (arrow) of torsion spring must be preloaded and locate against the carrier.

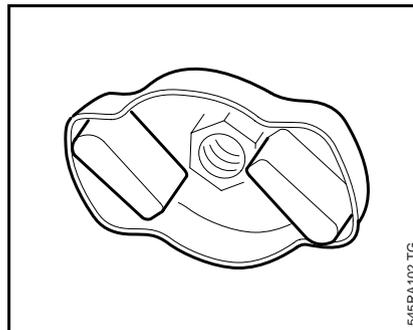
- Check operation.

Spring force must move the pawls in the direction of the carrier's hexagon – as far as stop.

- Reassemble all other parts in the reverse sequence.

- Tightening torques, 3.4

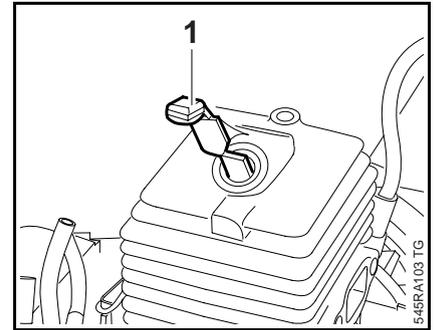
6.3.1 Carrier



- Remove the rewind starter, 6.2

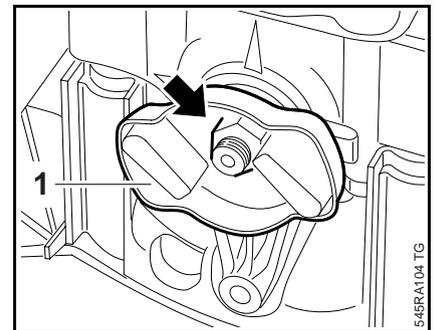
- Check the carrier and replace if necessary.

A new carrier comes with the pawls and torsion springs preassembled.



- Pull the boot off the spark plug.
- Unscrew the spark plug.

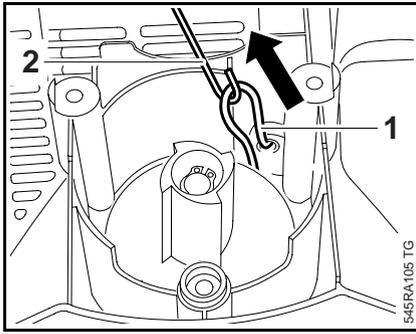
- Block the piston with the locking strip (1) 0000 893 5904.



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

- Install the new carrier in the reverse sequence.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, 3.4

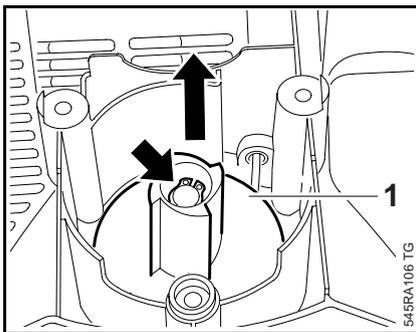
6.4 Rope Rotor



Relieving tension of rewind spring

- Remove the rewind starter, 6.2
- Use the hook (2) 5910 890 2800 to pull out the starter rope (1) from between the rope rotor and housing.
- Take three full turns of the rope off the rope rotor.
- Pull out the rope with the starter grip and slowly release the rope rotor.

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



- Remove the E-clip (arrow).

Rewind spring must be relaxed.

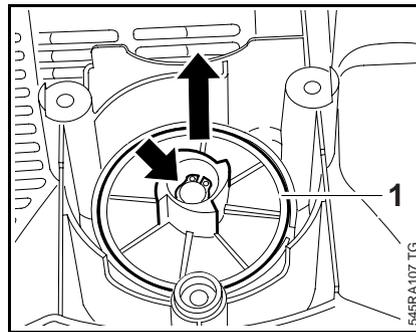
- Carefully remove the rope rotor (1) – the rewind spring may pop out and uncoil.

- Remove the starter rope or remaining rope from the rotor, 6.5
- Check the rope rotor and replace if necessary.

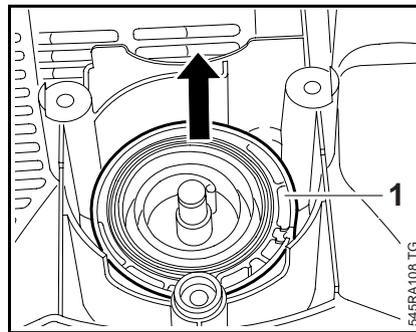
A new rope rotor comes with the rewind spring preassembled.

Models with ErgoStart

The rope rotor accommodates the ErgoStart spring and rewind spring.



- Remove the E-clip (arrow).
- Remove the carrier (1).



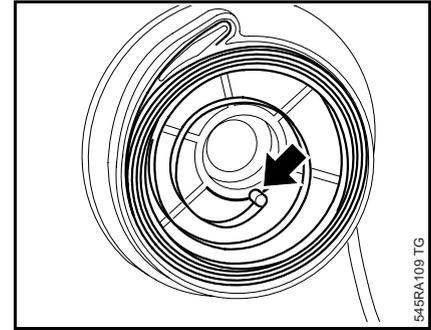
Rewind spring must be relaxed.

- Carefully remove the rope rotor (1) – the rewind spring may pop out and uncoil.
- Remove the starter rope or remaining rope from the rotor, 6.5
- Check the rope rotor and replace if necessary.

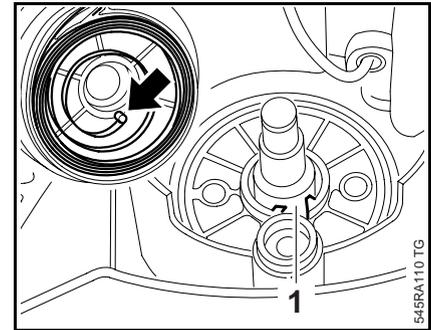
A new rope rotor comes with the rewind spring and ErgoStart spring preassembled.

All models

- Coat bore in rope rotor with STIHL special lubricant, 11



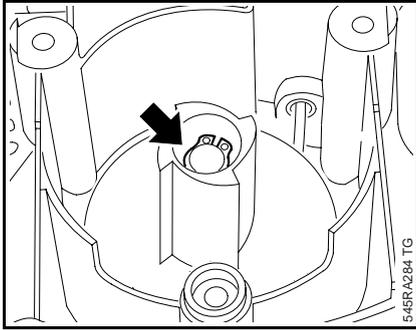
- If necessary, line up the inner spring loop (arrow) so that it is against the edge of the rope rotor.
- Install the starter rope, 6.5



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

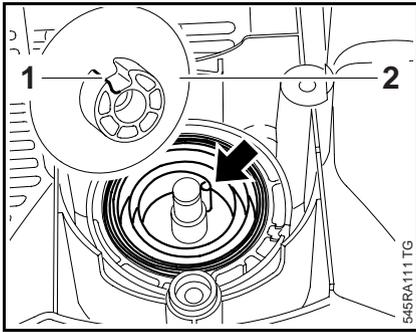
The recess in the hub of the rope rotor is the anchor point for the spring.

- Push the rope rotor into position.

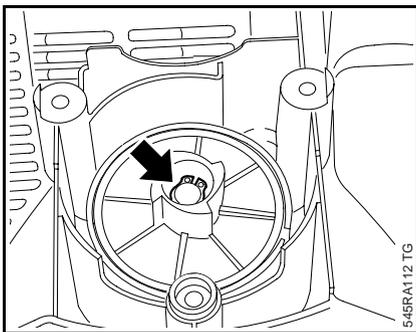


- Fit the E-clip (arrow).

Models with ErgoStart



- Fit the carrier (2) on the starter post so that the ErgoStart's inner spring loop (arrow) engages the recess (1).
- Push the carrier (2) into position.



- Fit the E-clip (arrow).
- Tension the rewind spring, 6.6
- Reassemble all other parts in the reverse sequence.

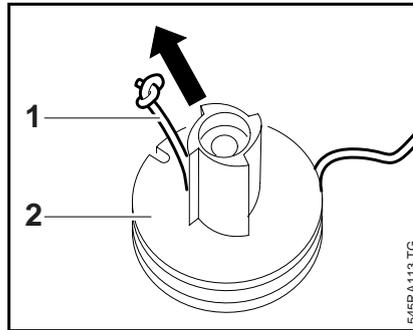
6.5 Starter Rope / Grip

- Remove the rewind starter, 6.2
- Relieve tension of rewind spring, 6.6

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

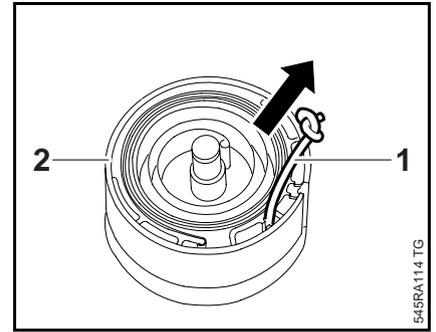
- Remove the rope rotor, 6.4
- Remove remaining rope from the rope rotor and starter grip.

Do not shorten the starter rope.



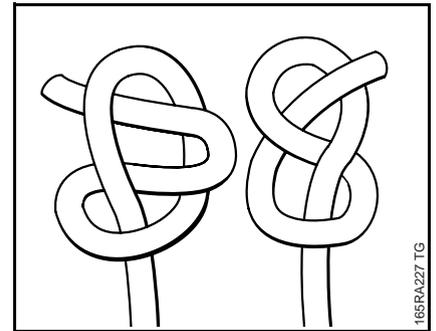
- Push the end of the starter rope (1) out a little and undo the knot.
- Pull the starter rope (1) out of the rotor (2).

Models with ErgoStart

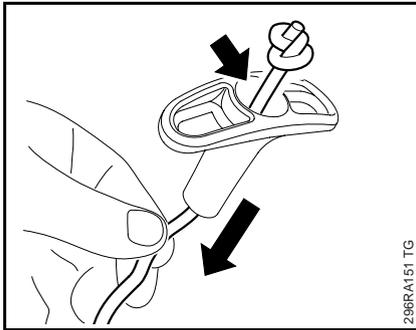


- Push the end of the starter rope (1) out a little and undo the knot.
- Pull the starter rope (1) out of the rotor (2).

Machines with standard starter grip



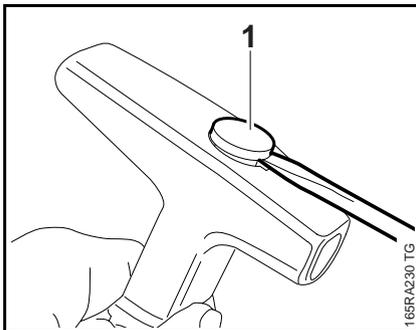
- Pull the rope out of the starter grip.
- Tie one of the special knots shown in the end of the rope.



298RA151 TG

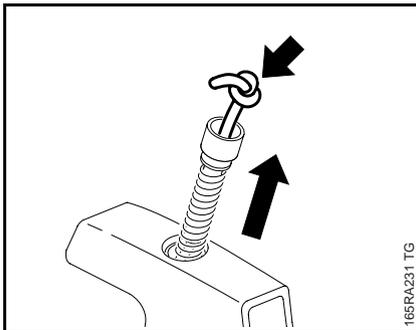
- Thread the rope through the top of the starter grip.
- Pull the rope with knot into the starter grip until it is properly seated in the grip (small arrow).

Elastostart Starter Grip
(special accessory)



165RA230 TG

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

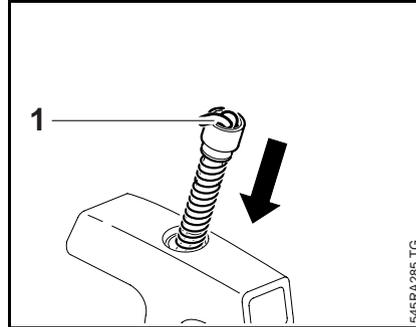


165RA231 TG

- Pull the sleeve, washers, spring and remaining rope (arrow) out of the grip.

- Pull any remaining rope out of the sleeve. Inspect the individual parts and replace if necessary.

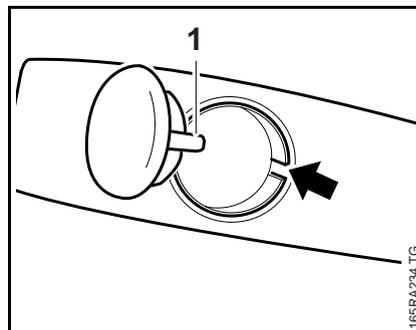
Do not shorten the starter rope.



545RA285 TG

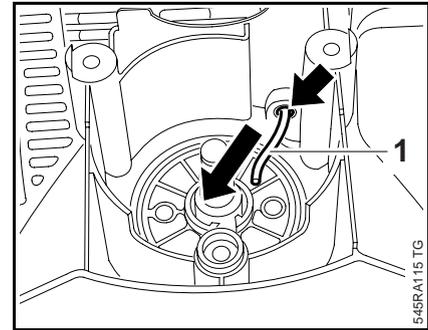
- Tie a simple overhand knot in the end of the new rope and thread the rope through the sleeve.
- Fit the washers and spring.
- Pull the starter rope with sleeve, spring and washers into the starter grip (1).

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



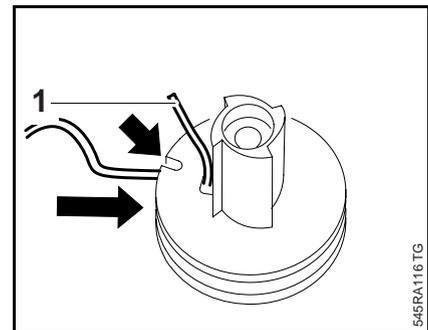
165RA234 TG

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



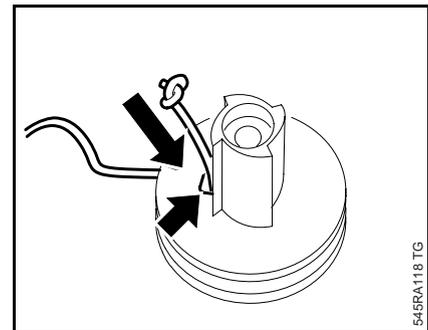
545RA115 TG

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



545RA116 TG

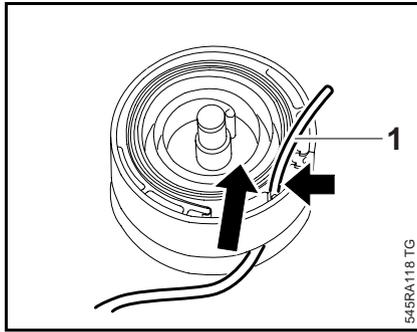
- Thread the rope (1) through the hole in the rotor (arrow).



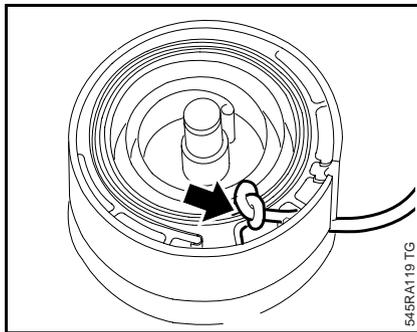
545RA118 TG

- Tie a simple overhand knot in the end of the new rope.
- Pull rope back until knot locates in recess (arrow) in rope rotor.

Models with ErgoStart

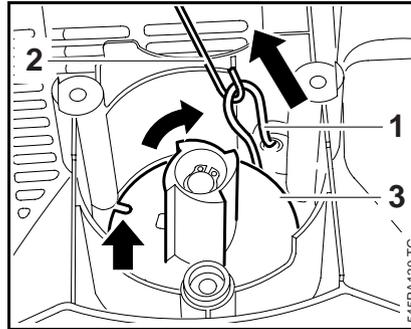


- Thread the rope (1) through the hole in the rotor (arrow).
- Tie a simple overhand knot in the end of the new rope.



- Pull the rope back until the knot locates in the recess (arrow) in the rope rotor.
- Install the rope rotor and tension the rewind spring, [6.4](#), [6.6](#)
- Install the rewind starter, [6.2](#)
- Tightening torques, [3.4](#)

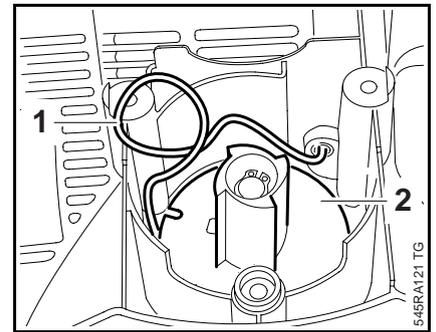
6.6 Tensioning the Rewind Spring



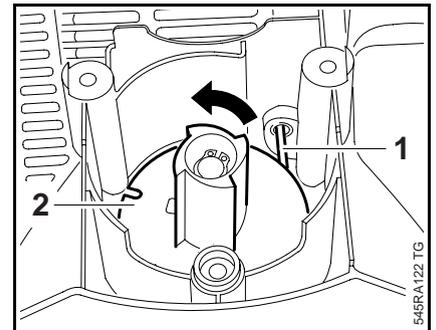
- Remove the rewind starter, [6.2](#)
- Use the hook (2) 5910 890 2800 to pull out the starter rope (1) from between the rope rotor and housing and engage it in the rotor's notch (arrow).
- Use the starter rope (1) to rotate the rope rotor (3) six turns clockwise,

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

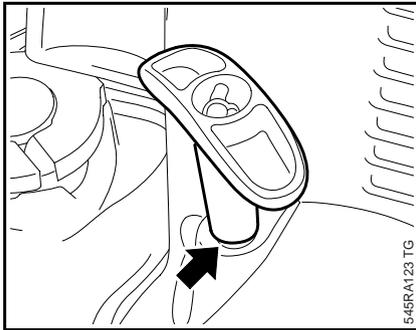
Hold the rope rotor steady since it will otherwise spin back and may damage the rewind spring.



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



- Hold the starter grip (1) firmly to keep the rope tensioned.
- Let go of the rope rotor (2) and slowly release the starter rope so that it can rewind properly.



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

When the starter rope is fully extended, it must still be possible to rotate the rope rotor as follows before maximum spring tension is reached.

Standard version
= 1 full turn

ErgoStart version
= 1 – 2 full turns

If this is not the case, reduce spring tension since there is otherwise a risk of breakage.

To reduce spring tension:

Pull the rope out, hold the rope rotor steady and take off one turn of the rope.

- Install the rewind starter, 6.2
- Tightening torques, 3.4

6.7 Replacing the Rewind Spring

- Troubleshooting, 4.2

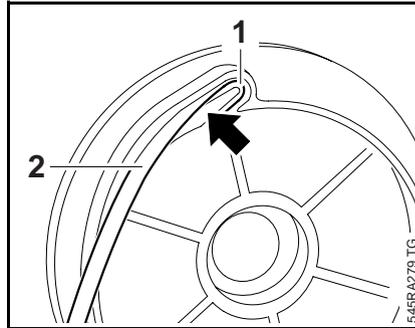
The rewind spring is installed in the rope rotor.

A replacement spring is supplied ready to install with a new rope rotor.

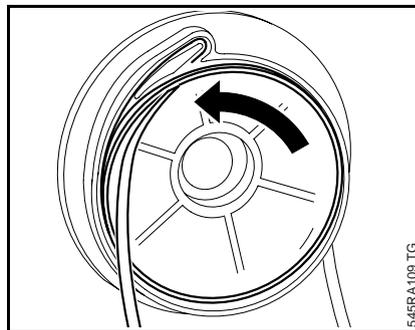
If the rewind spring has popped out, refit it in the rope rotor as follows:

Wear a face shield and work gloves.

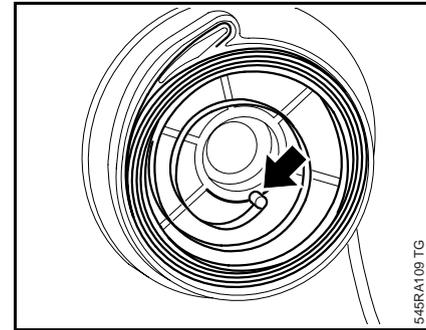
- Remove the rope rotor, 6.4



- Engage anchor loop (1) in its seat (arrow) in the rope rotor (2).

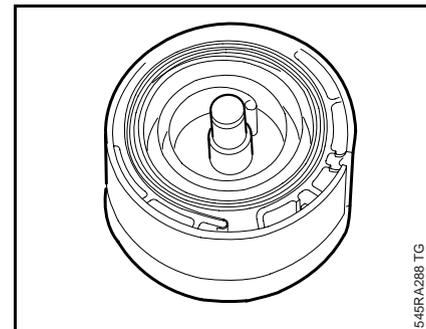


- Fit the rewind in the counterclockwise direction, holding the windings steady to prevent them popping out.



- Secure the spring so that it cannot pop out.
- If necessary, line up the inner spring loop (arrow) so that it is against the edge of the rope rotor.
- Remove the rope rotor, 6.4
- Tension the rewind spring, 6.6
- Reassemble all other parts in the reverse sequence.
- Tightening torques, 3.4

6.8 ErgoStart



The Ergostart is installed in the rope rotor, 6.4

If the ErgoStart spring has popped out, install a new rope rotor.

A new rope rotor comes with the rewind spring and ErgoStart spring preassembled.

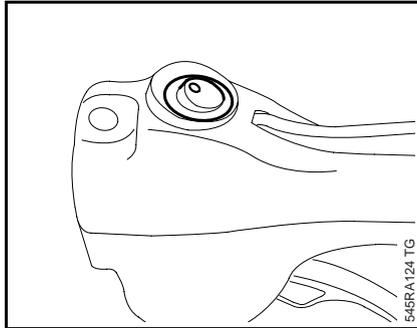
7. Control Levers

7.1 Switch Shaft / Control Lever

7.2 Switch Positions

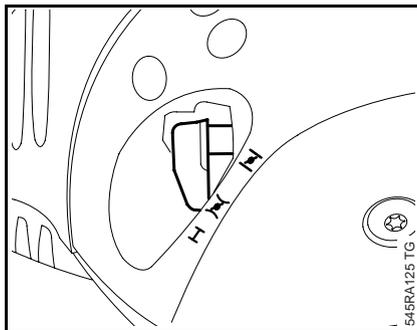
On these machines the operating modes are set on the handle and the carburetor:

On the handle



- Position **0** = engine off
 - ignition is switched off (not locked, button automatically returns to run position)

On the carburetor



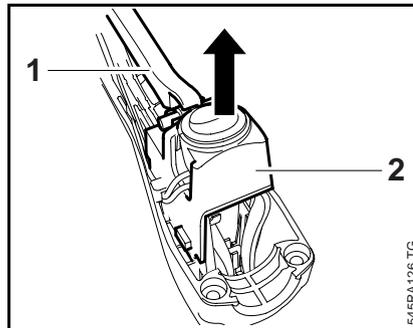
The rotary knob returns to the run position when the throttle trigger is operated.

- Position **I** = normal run position
- Press in the rotary knob – warm and cold start positions can only be selected when the knob is pressed in.

- Position **W** = warm start
 - warm engine is started in this position.

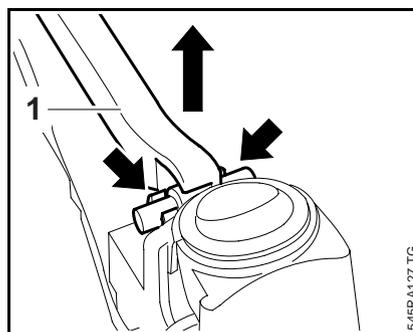
- Position **C** = cold start
 - cold engine is started in this position

7.3 Interlock Lever (Loop Handle)

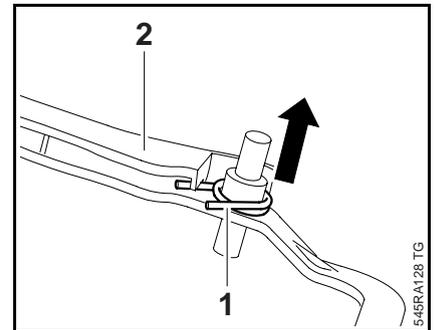


- Remove the shroud, [5.1](#)
- Pull the boot off the spark plug.
- Press down the interlock lever (1) to disengage it from the throttle trigger.

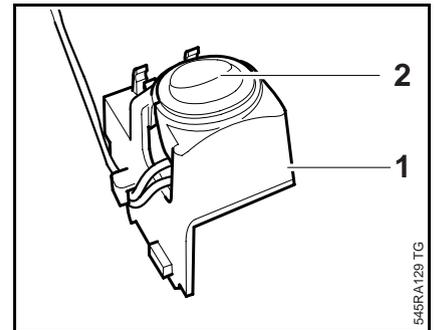
- Pull out the support (2).



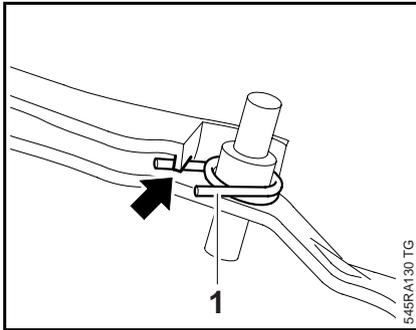
- Ease the interlock lever (1) out of its mounts (arrows).
- Turn the interlock lever (1) slightly and pull it out of the support.



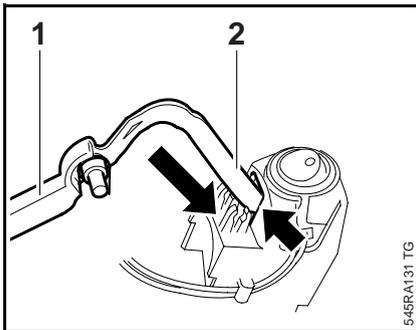
- Remove the torsion spring (1).
- Check the interlock lever (2) and torsion spring (1) and replace if necessary



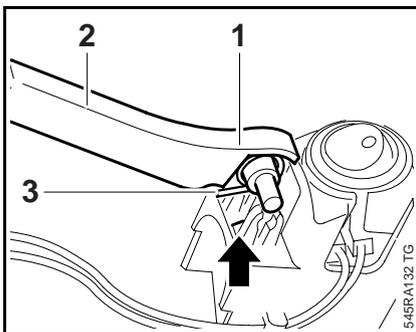
- Check the support (1) and replace if necessary
- If the support (1) has to be replaced, first remove the stop switch (2) with short circuit and ground wires, [5.9.2](#)
- Check the throttle trigger and replace or readjust as necessary, [7.3.1](#)



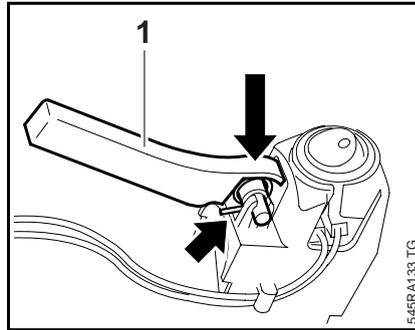
- Fit the torsion spring (1) in the interlock lever so that its leg (arrow) engages the recess as shown (arrow).



- Push the interlock lever (1), arm (2) first, into the opening (arrow) and turn it slightly back and forth to maneuver it past the stop switch.



- Position the interlock lever (1) on the mounts so that it faces up as shown (2).
- Line up the torsion spring (3) so that its leg locates against the lug (arrow).



- Press the interlock lever (1) into the mounts until it snaps into place.
 - The leg of the torsion spring must locate against the edge (arrow) of the support and project slightly.

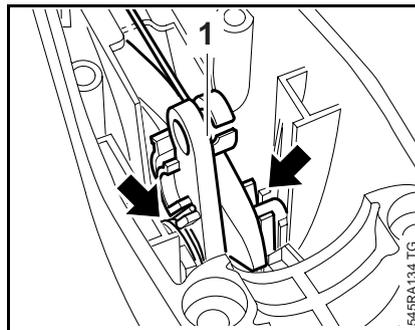
- Install the support and fit the short circuit wire in the guide, [5.9.2](#)

- Check operation
 - the throttle trigger is locked when the interlock lever is not depressed.

- Reassemble all other parts in the reverse sequence.

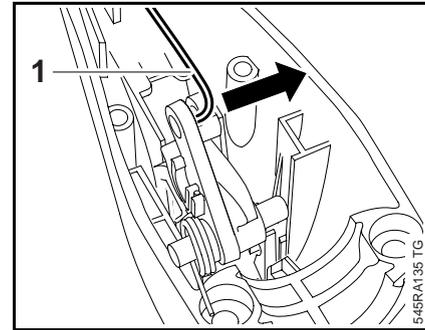
- Tightening torques, [3.4](#)

7.3.1 Throttle Trigger

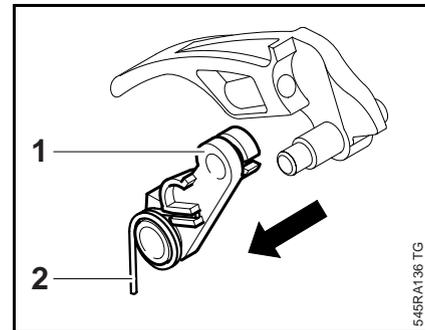


- Remove the support with interlock lever, [7.3](#)

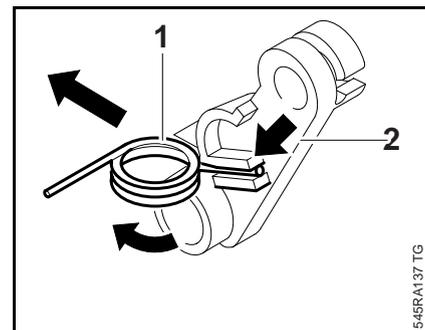
- Ease the throttle trigger (1) out of its mounts (arrows).



- Disconnect the throttle cable (1).

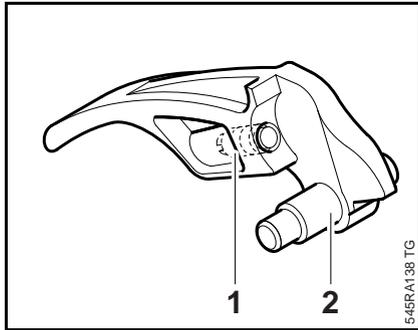


- Pull off the lever (1) with torsion spring (2).



- Turn the torsion spring (1) and pull it out of the guide (arrow).

- Check the lever (2) and torsion spring (1) and replace if necessary

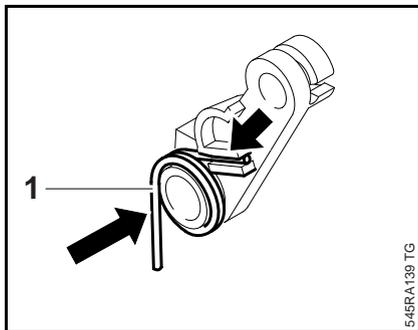


- Check the grub screw (1) and throttle trigger (2) and replace if necessary

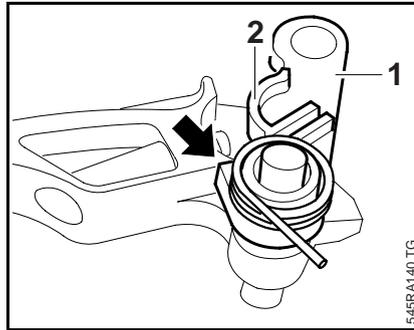
Make sure the grub screw (1) is in place.

A new throttle trigger comes with the grub screw fitted.

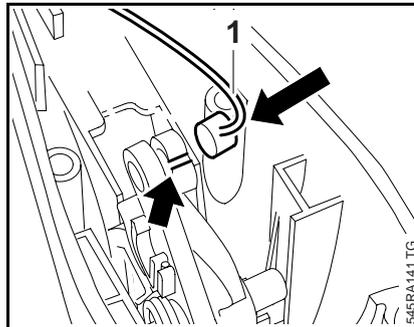
The throttle cable must be readjusted if a new throttle trigger is installed or the position of the grub screw is changed,  8.6.2



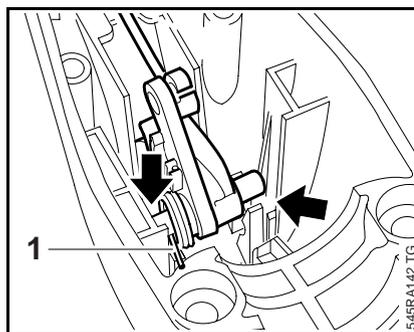
- Push the torsion spring (1) into the guide (arrow) so that it is held in position.



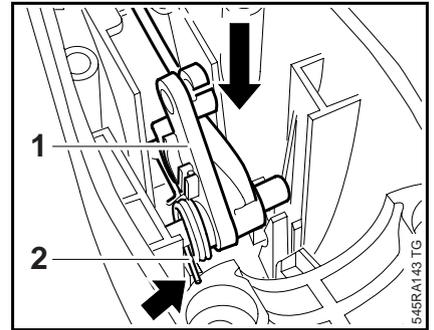
- Fit the lever (1) on the same side as the grub screw.
- Push the lever (1) onto the pivot pin so that the lug is below the shoulder (arrow).



- Push the throttle cable nipple (1) into the lever and engage it in the slot (arrow).

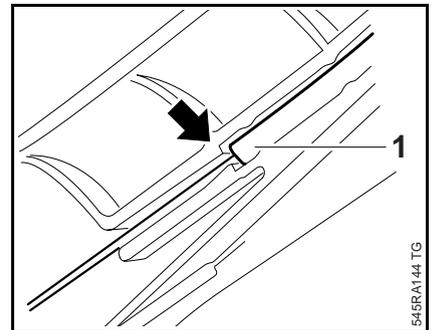


- Position the throttle trigger with lever on the mounts (arrows) so the leg (1) locates against the edge of the engine housing.



- Press the throttle trigger (1) into the mounts until it snaps into place.

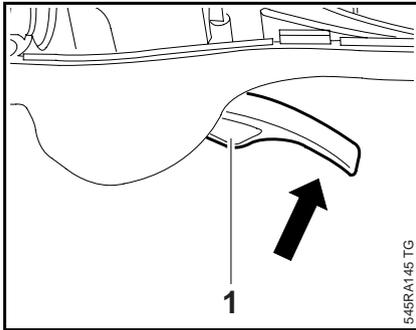
The leg (2) of the torsion spring must locate against the edge (arrow) and project slightly.



- Push the throttle cable sleeve (1) into the guide as far as stop.

The throttle cable sleeve must butt against the stop (arrow).

- Install the support and fit the short circuit wire in the guide.

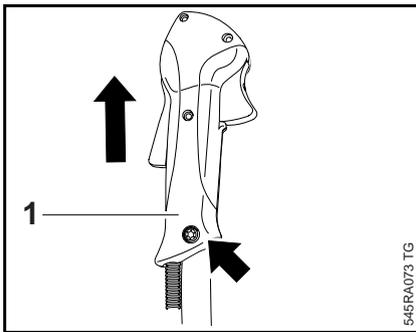


– Check operation.

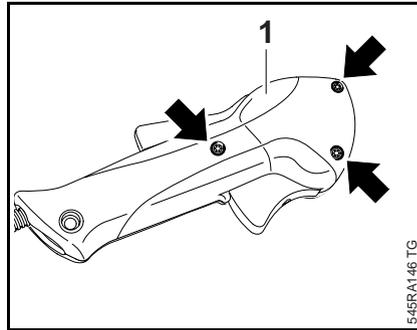
The throttle trigger must be locked in position when the interlock lever is not depressed.

- Release the throttle trigger – it must return to the stop
- Reassemble all other parts in the reverse sequence.
- Tightening torques, 3.4

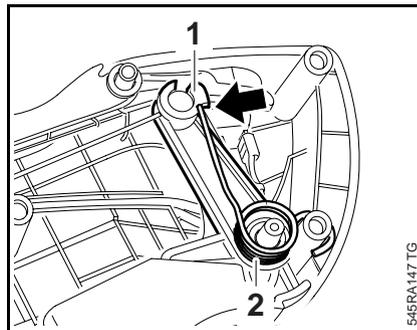
7.4 Throttle Trigger/Interlock Lever (Bike Handle)



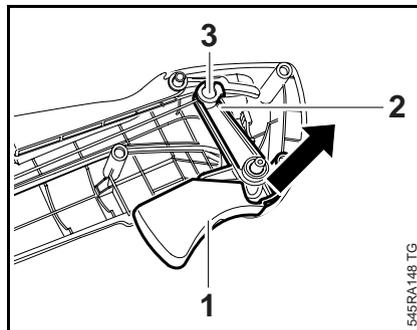
- Take out the screw (arrow).
- Pull off the control handle (1).



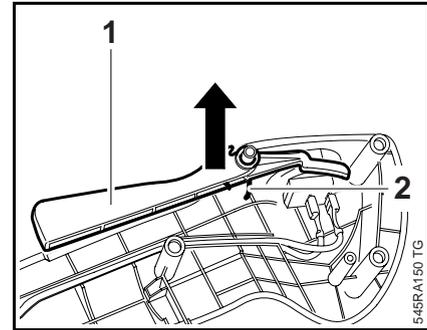
- Take out the screws (arrows).
- Remove the handle molding (1).



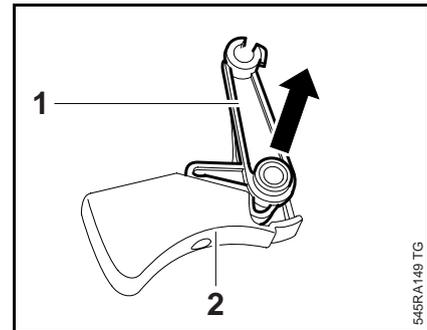
- Disconnect the leg (arrow) from the lever (1).
- Remove the torsion spring (2).



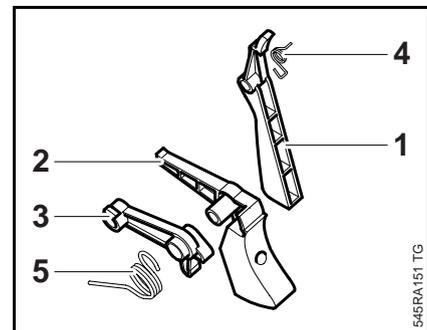
- Remove the throttle trigger (1) and lever (2).
- Disconnect the throttle cable (3).



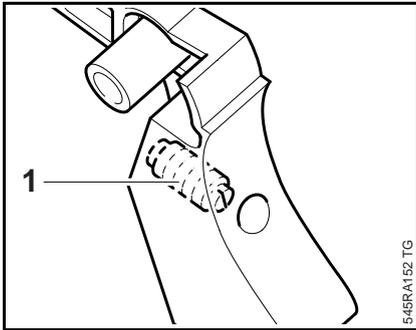
- Carefully remove the interlock lever (1) – tension of torsion spring (2) is suddenly relieved.
- Remove the torsion spring (2).



- Pull the lever (1) off the throttle trigger (2).



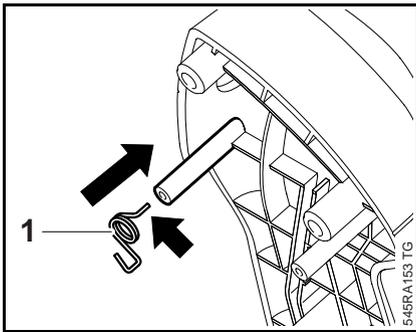
- Check the interlock lever (1), throttle trigger (2), lever (3) and torsion springs (4+5) and replace if necessary,



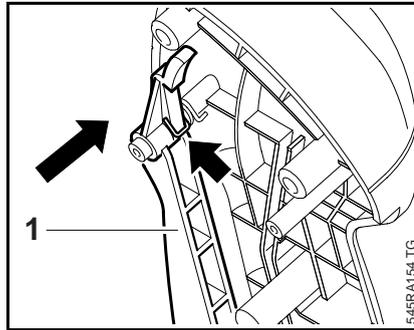
- Check that the stub (1) is in place, fit a new grub screw if necessary.

A new throttle trigger comes with the grub screw fitted.

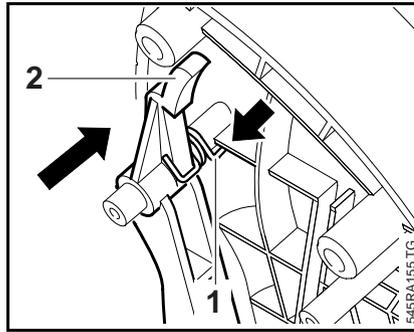
- The throttle cable must be readjusted if a new throttle trigger is installed or the position of the grub screw is changed, [8.6.2](#)



- Slip the torsion spring (1) over the pivot pin so that its straight leg (small arrow) points towards the handle molding.

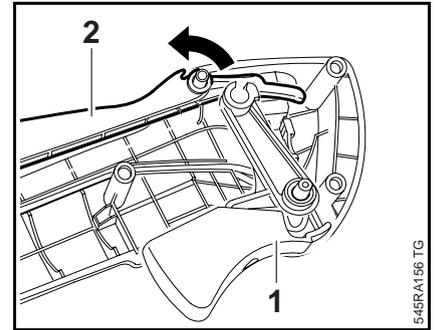


- Push the interlock lever (1) into position and engage the torsion spring (arrow).

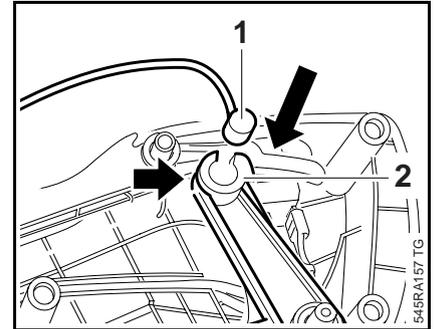


- Rotate the straight leg (1) clockwise until it engages behind the stiffener (arrow).
- Push the interlock lever (2) fully home and check that the straight leg (1) butts against the stiffener (arrow).

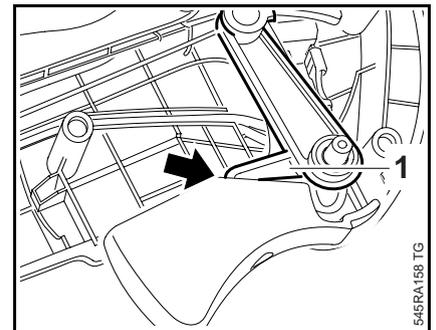
Make sure during the next operations that the interlock lever butts against the handle molding – the torsion spring may otherwise pop out.



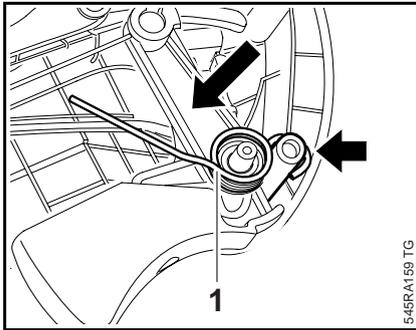
- Push the throttle trigger (1) onto the pivot pin.
- Turn the interlock lever (2) slightly and continue pushing the throttle trigger into position until it engages the interlock lever.



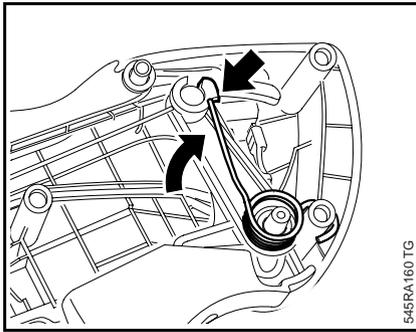
- Push the throttle cable nipple (1) into the lever (2) and engage it in the slot (arrow).



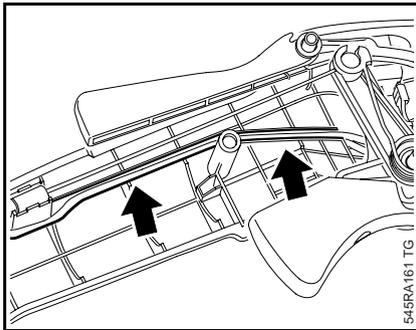
- Push the lever (1) into the throttle trigger so that it butts against the grub screw (arrow).



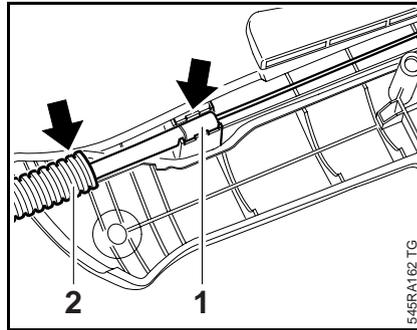
- Fit the torsion spring (1) on the throttle trigger and attach its loop to the boss (arrow).



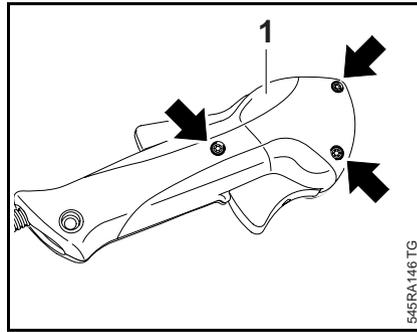
- Rotate the leg clockwise and engage it on the lever (arrow).



The ground and short circuit wires must be properly seated in the guides (arrows).

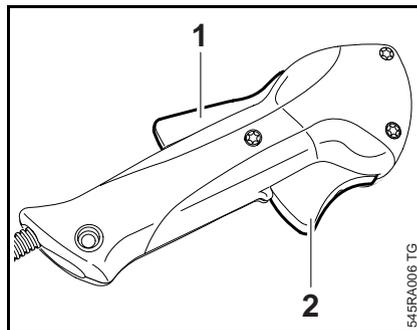


- Push the throttle cable (1) and protective tube (2) into the seats (arrows) and hold in that position.



- Carefully fit the handle molding (1) so that it snaps into position – the levers may pop out.

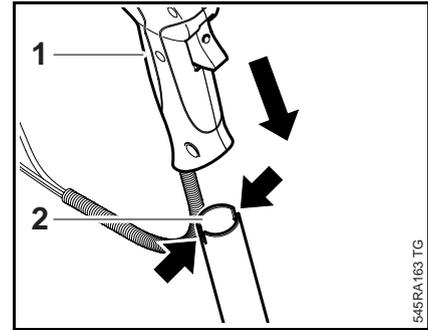
- Insert screws (arrows) and tighten them down firmly.



- Check operation.

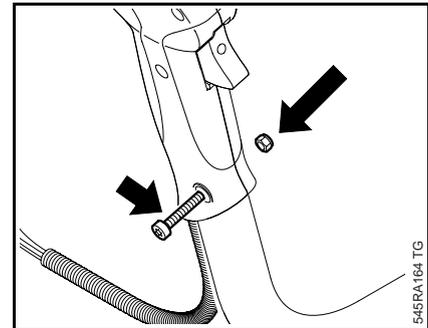
The throttle trigger (2) must be locked in position when the interlock lever (1) is not depressed.

- Release the throttle trigger (2) – it must return to the stop



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

- Push the control handle (1) onto the handlebar (2), turning it back and forth until it engages the slots (arrows).



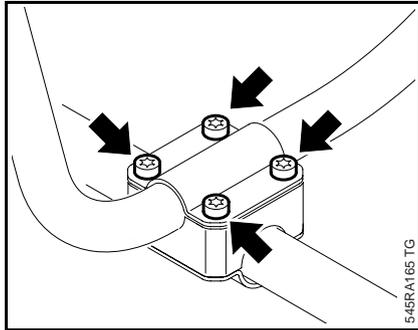
- Fit the screw (arrow) through the control handle and handlebar.

- Fit a new hex nut in the seat on the other side and then tighten down the screw firmly.

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

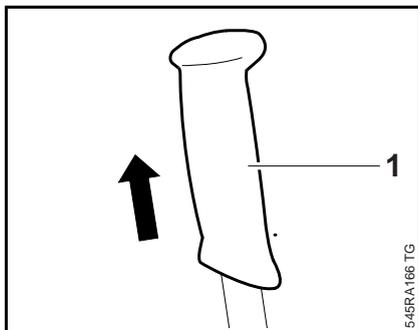
7.5 Handlebar (Bike Handle)

- Remove the control handle,  5.9.3

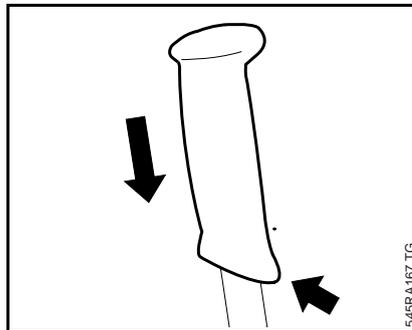


- Take out the screws (arrows).

Handlebar and lower clamp drop down after the screws have been removed.



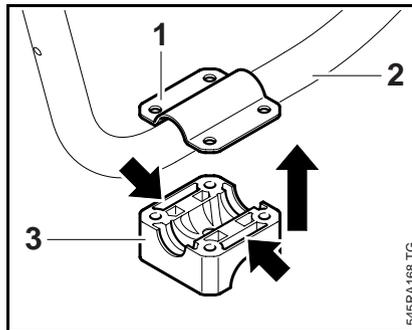
- Check the handle (1) and replace if necessary
- Pull off the handle (1).
- If the handle is stuck, carefully cut it open longitudinally at the thinnest point.



- Line up the handle so that its long side (arrow) faces the cutting tool.

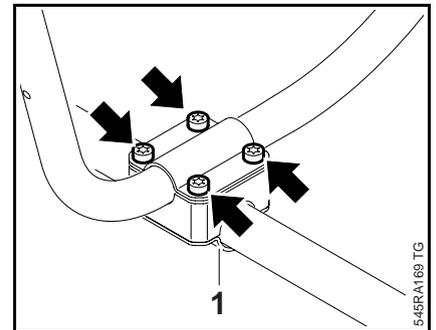
The handle must be fitted in the dry condition.

- Push the handle on to the handlebar as far as stop.

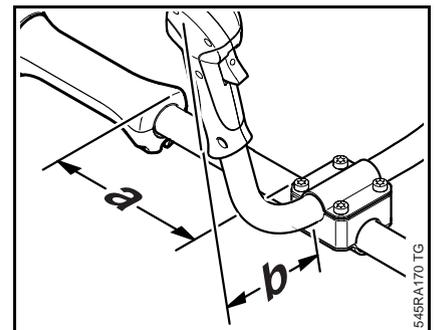


The diameters of the handlebar and drive tube are different.

- Position the clamp (1) with plain holes against the handlebar (2).
- Position the clamp block (3), slots (arrows) facing up, against the underside of the handlebar.
- Insert the screws through the clamp and clamp block.



- Position the preassembled handlebar on the drive tube.
- Fit the clamp (1), with tapped holes, against the underside of the drive tube.
- Fit the screws (arrows) – tighten them down only moderately at this point to allow for alignment.



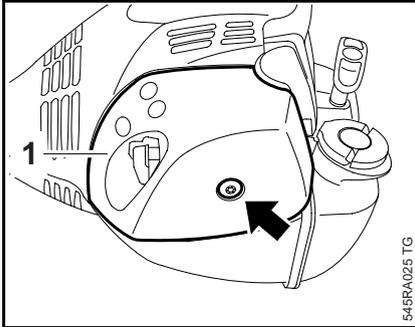
- Swing handlebar upright, i.e. at an angle of 90° to the drive tube.
- Line up the handlebar so that the control handle is closer to the drive tube.
- Adjust distance from engine housing
a = about 20 cm
b = about 15 cm
- Tighten down the screws firmly.

8. Fuel System

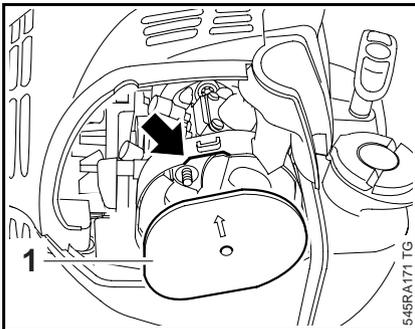
8.1 Air Filter

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

- See also troubleshooting,  4.4,  4.5



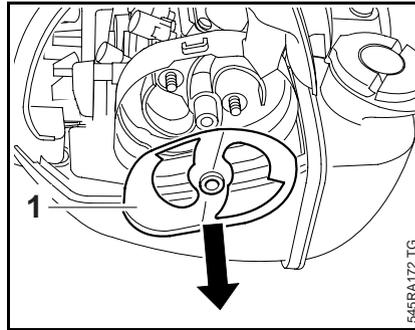
- Take out the screw (arrow).
- Remove the filter cover (1).



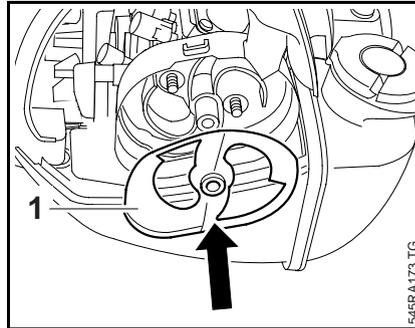
- Remove the air filter (1).
- Clean the air filter (1) – see instruction manual.
- Line up the air filter (1) – the arrow must face the opening (arrow).
- Reassemble in the reverse sequence.

8.1.1 Baffle

Remove the air filter,  8.1



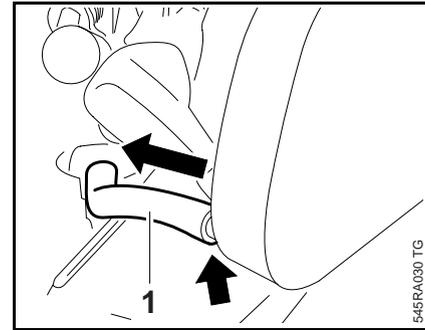
- Pull out the baffle (1), check it and replace if necessary.



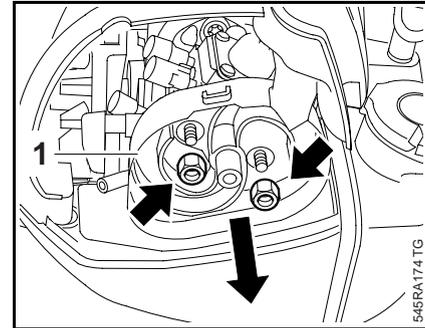
- Line up the baffle (1) so that it matches the contour of the filter housing.
- Push the baffle (1) into the filter housing until it snaps into position.
- Reassemble all other parts in the reverse sequence.

8.1.2 Filter housing

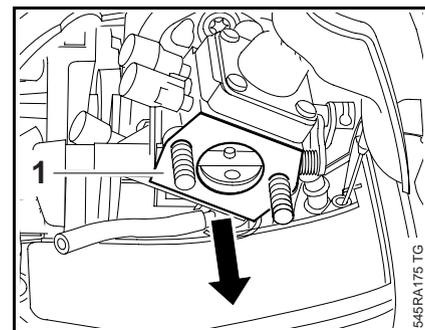
Remove the air filter,  8.1



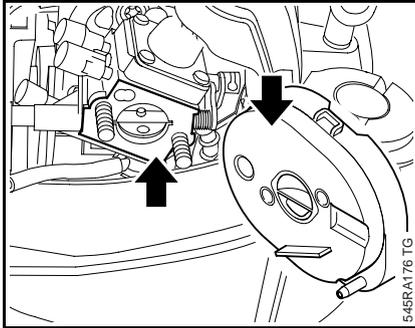
- Disconnect the tank vent hose (1) from the filter housing (arrow).



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

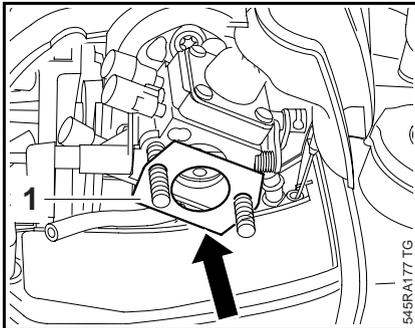


- Remove the gasket (1).

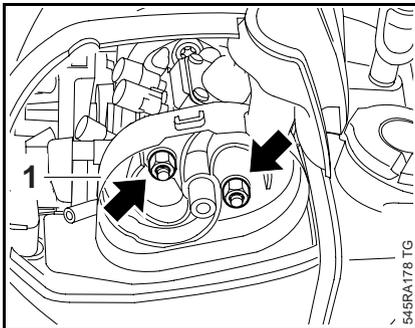


- Inspect the sealing faces (arrows), and clean if necessary  11

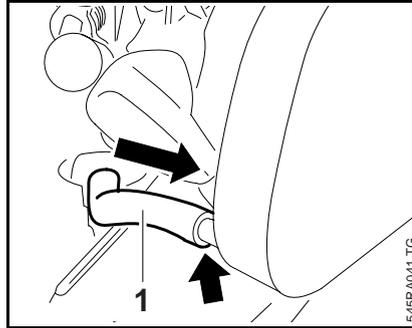
Always replace components with damaged sealing faces; fit new gasket if necessary.



- Fit the gasket (1).



- Push the filter housing (1) into position.
- Fit the nuts (arrows) and tighten them down firmly.

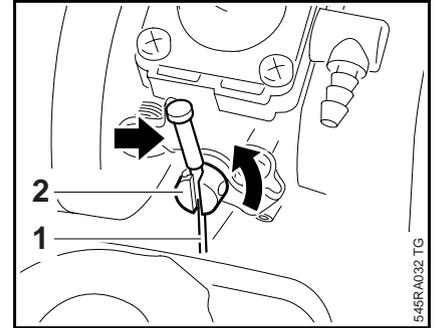


- Connect tank vent hose (1) to filter housing (arrow)
 - push it fully onto the stub.
- Reassemble all other parts in the reverse sequence.
- Tightening torques,  3.4

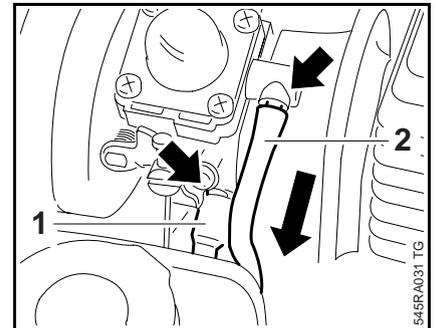
8.2 Removing and Installing the Carburetor

- Remove the rewind starter,  6.2
- Remove the shroud,  5.1
- Remove the filter housing,  8.1.2
- Open the fuel tank cap and drain the fuel tank.
- Collect the fuel in a clean container,  1

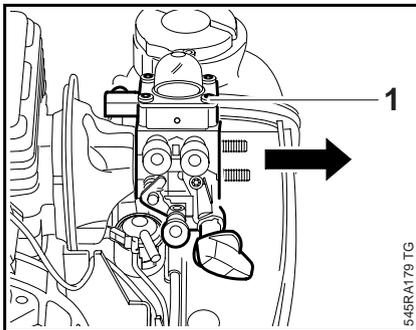
Disconnect the fuel hoses only when the tank cap is open.



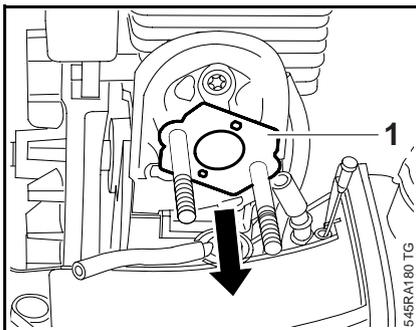
- Press down the throttle lever until the nipple (arrow) projects.
- Turn the pin (2) until the slot is in line with the throttle cable (1).
- Remove the throttle cable (1).



- Disconnect the fuel return hose (2) and fuel suction hose (1) from the stubs (arrows).
- Install new fuel hoses,  8.9.2

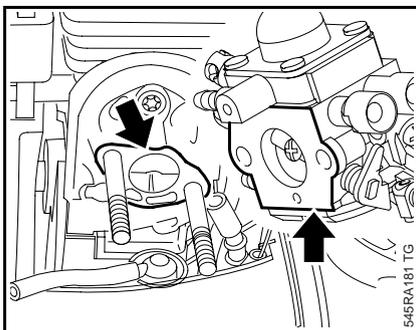


- Pull out the carburetor (1).
- Check the carburetor and service or replace if necessary.



- Remove the gasket (1).

Always install a new gasket.

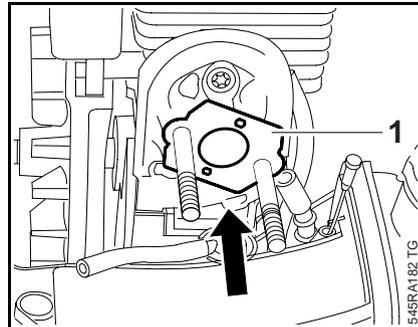


- Inspect the sealing faces (arrows), and clean if necessary [11](#)
- Inspect the spacer flange and replace it if necessary – even very minor cracks can result in engine running problems, [4.4](#), [4.5](#)

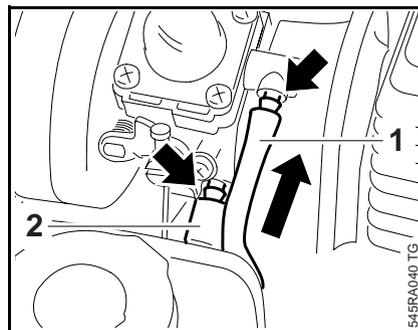
Always replace components with damaged sealing faces.

Installing

Install new fuel hoses, [8.9.2](#)

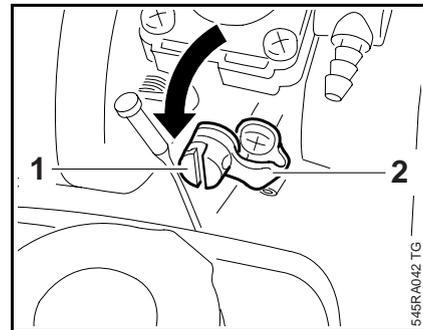


- Fit the new gasket (1).

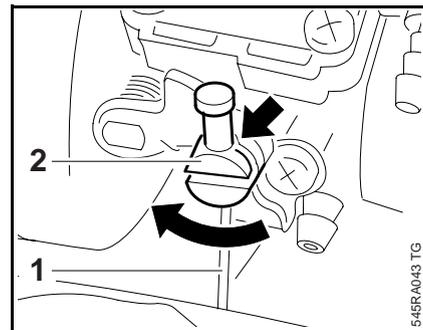


- Push the carburetor into position.
- To simplify assembly, coat the stubs and ends of the new fuel hoses with a little STIHL press fluid, [11](#)
- Push the new fuel return hose (1) and fuel suction hose (2) on to the stubs (arrows) without using pointed or sharp-edged tools

Fuel hoses must be pushed on firmly as far as stop.



- Turn the pin (1) until the slot is in line with the throttle cable.
- Press down the throttle lever (2).



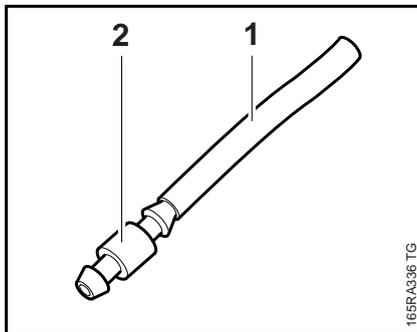
- Fit throttle cable (1) in the pin's (2) slot.
- Turn the pin (2) until the nipple is properly seated (arrow).
- Check operation of throttle cable and readjust if necessary, [8.6.2](#)
- Reassemble all other parts in the reverse sequence.
- Tightening torques, [3.4](#)

8.3 Leakage Test

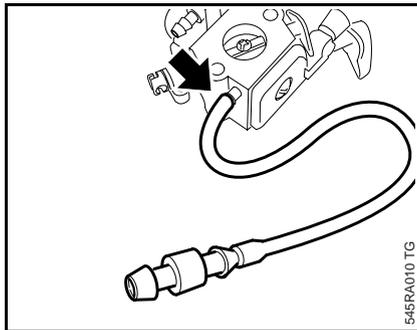
In the case of problems with the carburetor or fuel supply system, also check and clean or replace the tank vent, 8.8

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

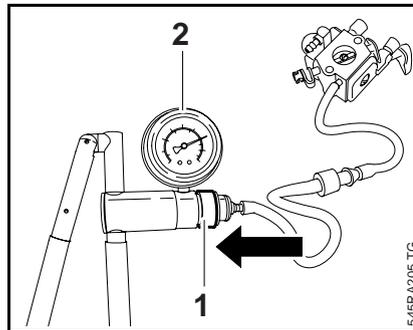
- Remove the carburetor, 8.2



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



- Push the pressure hose with nipple on to the carburetor's fuel stub (arrow).



- Push the pressure hose of pump 0000 850 1300 on to the nipple.

- Push the ring (1) to the left and pump air into the carburetor until the pressure gauge (2) indicates a pressure of about 0.8 bar (80 kPa).

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

1. The inlet needle is not sealing (foreign matter in valve seat, sealing cone of inlet needle is damaged or inlet control lever is sticking). Remove to clean, 8.4.2
2. Metering diaphragm or gasket damaged, replace if necessary, 8.4.1
3. Pump diaphragm or gasket damaged, replace if necessary, 8.4.3

- After completing the test, push the ring (1) to the right to vent the system and then pull the fuel hose off the carburetor.

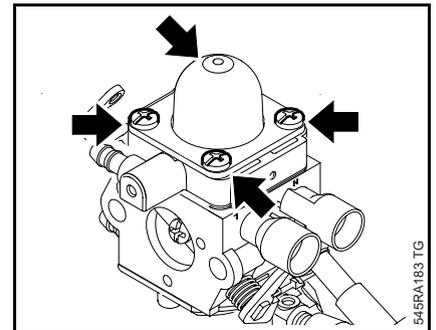
- Use new fuel hoses and install the carburetor, 8.2

- Tightening torques, 3.4

- Reassemble all other parts in the reverse sequence.

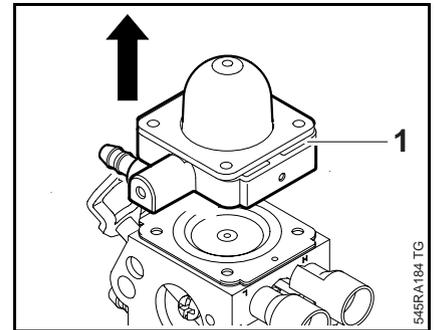
8.4 Servicing the Carburetor

8.4.1 Metering Diaphragm / Manual Fuel Pump

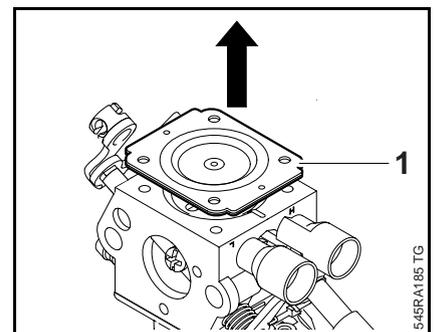


- Remove the carburetor, 8.2

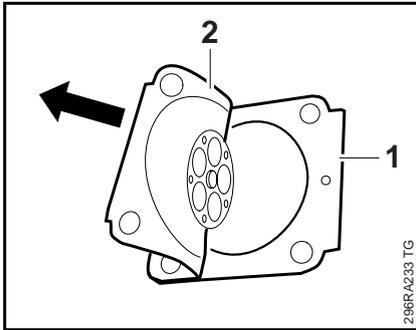
- Take out the screws (arrows).



- Remove the complete flange (1).



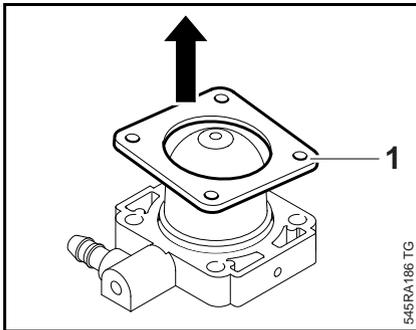
- Remove the metering diaphragm and gasket (1).



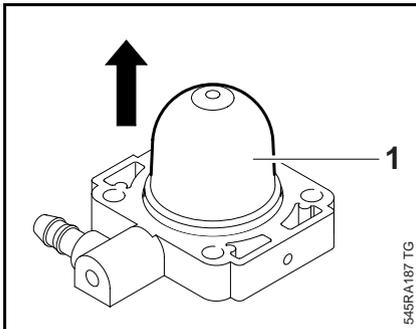
- Carefully separate the metering diaphragm (2) and gasket (1).

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

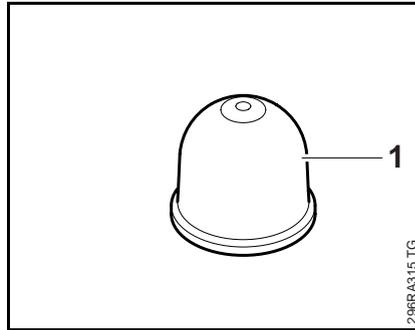
- Check the metering diaphragm for signs of damage and wear and replace if necessary.
- Install a new gasket.



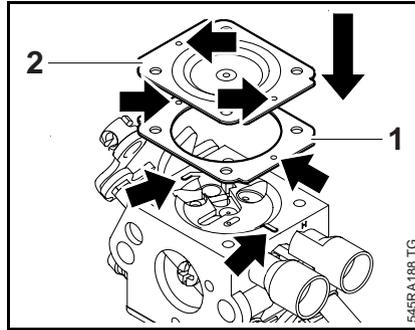
- Remove the flange (1).



- Remove the cap (1).

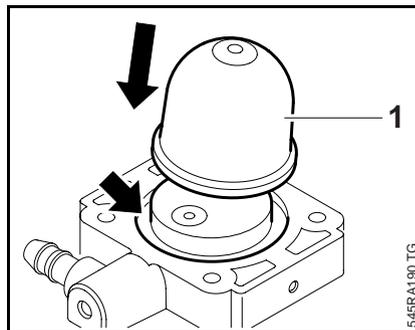


- Check the cap (1) and replace if necessary



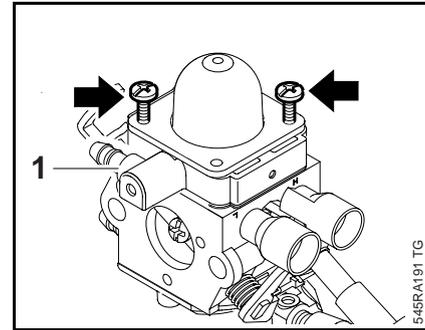
- Line up the gasket (1) and metering diaphragm (2) with the holes (arrows).

- Place the gasket (1) and metering diaphragm (2) in position.



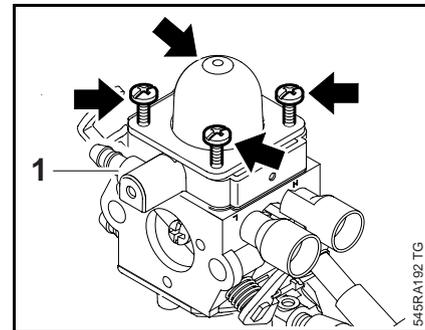
- Position the cap (1) in the annular groove (arrow).

- Fit the end cover.



- Place the flange in position
 - stub (1) must be on same side as throttle shutter.

- Insert two screws (arrows) to hold the flange, gasket and diaphragm in position.



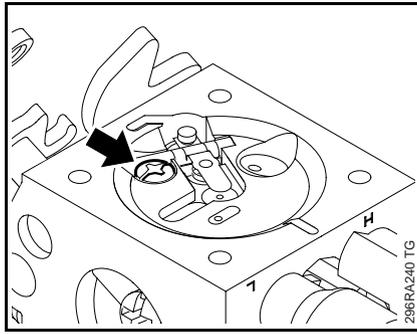
- Insert the other screws.

- Insert the screws (arrows) and tighten them down firmly in an alternate pattern.

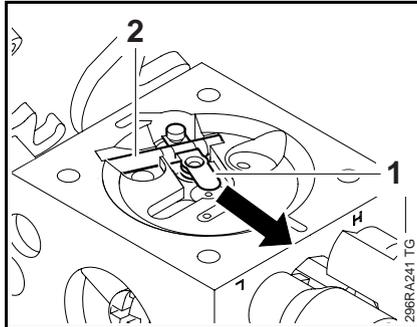
- Reassemble all other parts in the reverse sequence.

- Check operation.

8.4.2 Inlet Needle

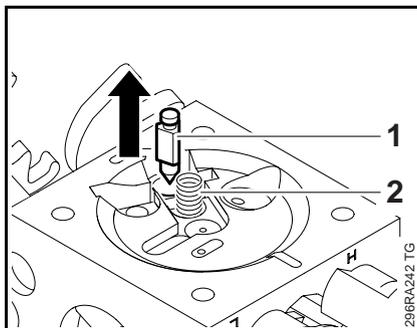


- Remove the metering diaphragm, 8.4.1
- Take out the screw (arrow).



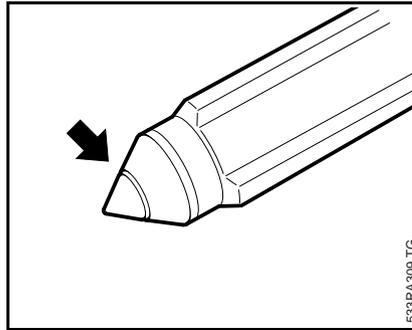
- Pull the inlet control lever (1) with spindle (2) out of the inlet needle's groove.

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

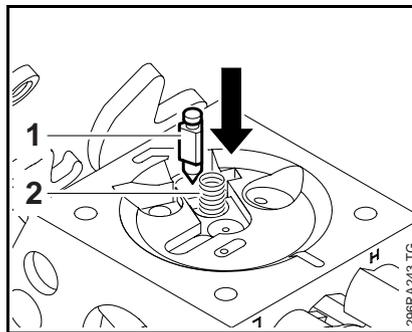


- Remove the inlet needle (1).

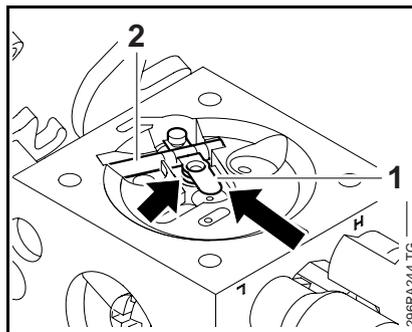
- Remove the spring (2). Inspect and replace if necessary.



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



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

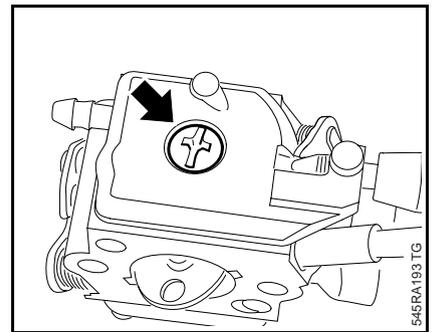


- Position the inlet control lever (1) with spindle (2) on the spring's seat (arrow) first, then slide the inlet control lever's clevis into the groove in the inlet needle.

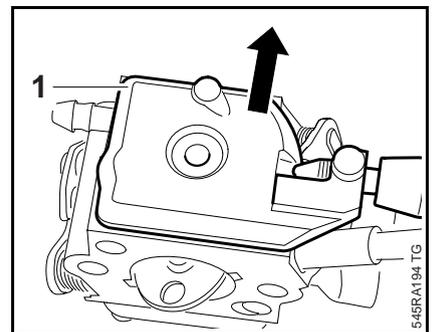
Make sure the spring locates on the control lever's nipple.

- Press the inlet control lever down and secure it with the screw.
- Check that inlet control lever moves freely.
- Install the metering diaphragm, 8.4.1
- Reassemble all other parts in the reverse sequence.

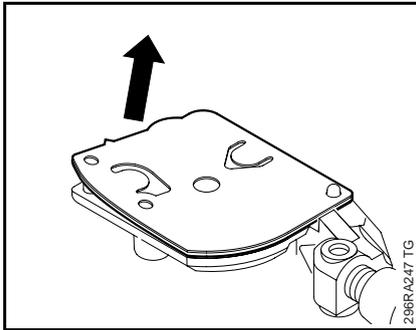
8.4.3 Pump Diaphragm



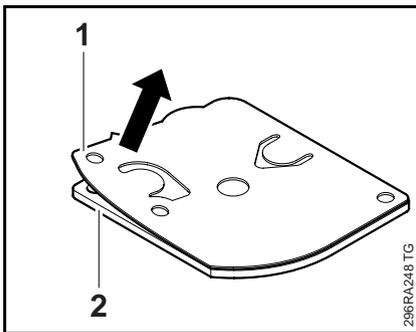
- Remove the carburetor, 8.2
- Take out the screw (arrow).



- Carefully remove the end cover (1).



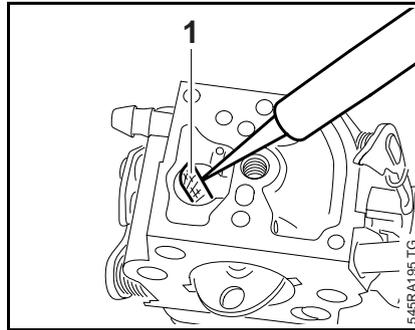
- Carefully remove the gasket with pump diaphragm from the end cover.



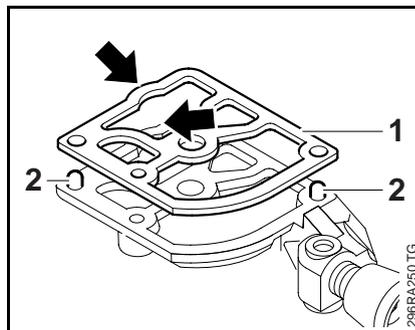
- Carefully separate the pump diaphragm (1) and gasket (2).

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

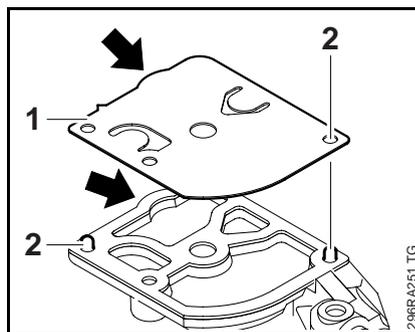
- Check the pump diaphragm for signs of damage and wear. Install a new gasket.
- Check fuel strainer for contamination and damage. Clean or replace if necessary.



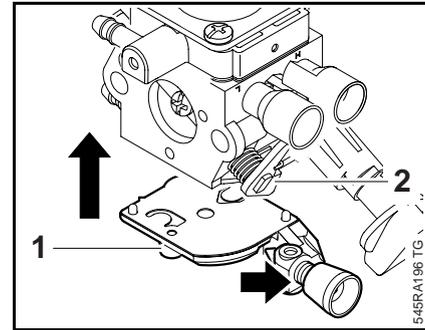
- Use a needle to remove the fuel strainer (1) from the carburetor body.
- Reassemble in the reverse sequence.



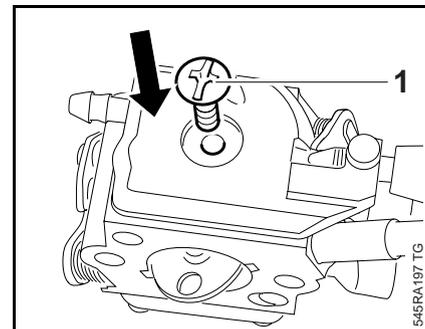
- Fit the gasket (1) so that the contours (arrows) match and it is held in position by the pegs (2).



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



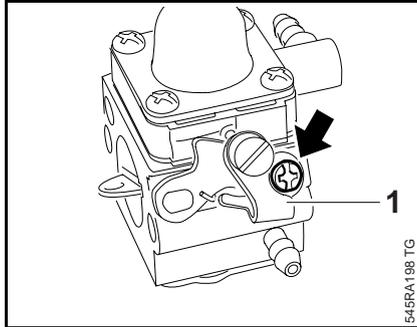
- Position the end cover (1) so that the idle speed screw (arrow) is at the same side as the adjusting screws.
- Turn lever (2) on throttle shaft a little and place the end cover (1) against the carburetor body from below so that the gasket and pump diaphragm remain in position on the end cover.
- Align the end cover (1) so that its pegs engage the holes in the carburetor body.



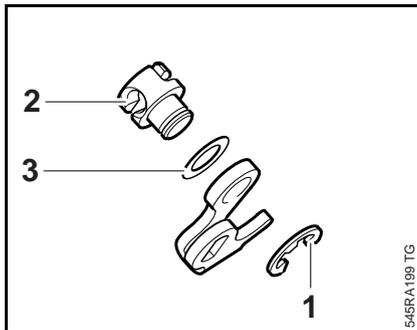
- Check that diaphragm and gasket are properly seated.
- Tighten down the screw (1) firmly.
- Tightening torques, 3.4
- Reassemble all other parts in the reverse sequence.

8.4.4 Throttle Lever / Rotary Knob

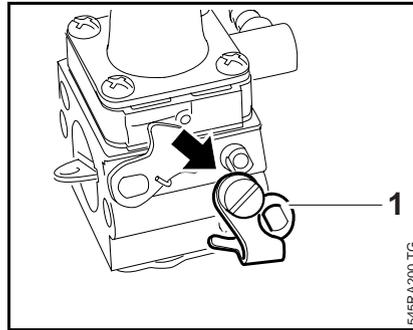
– Remove the carburetor,  8.2



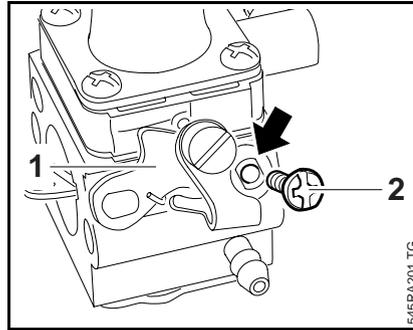
- Take out the screw (arrow).
- Pull off the throttle lever (1).



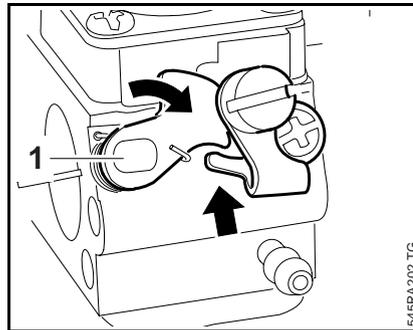
- Remove the E-clip (1).
- Remove the pin (2) and washer (3).
- Check the individual parts and replace if necessary.
- Reassemble in the reverse sequence.



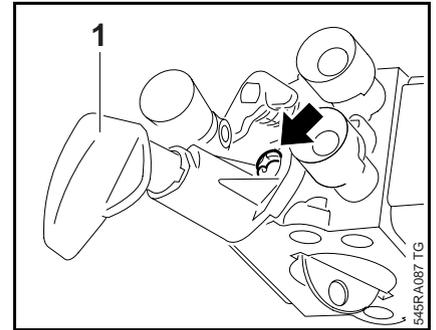
- Position the throttle lever (1) so that the pin (arrow) faces up.



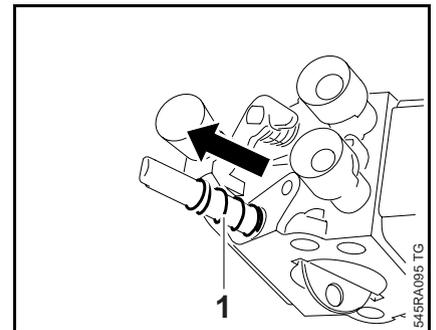
- Push the throttle lever (1) on to the end of the throttle shaft (arrow).
- Tighten down the screw (2) firmly.



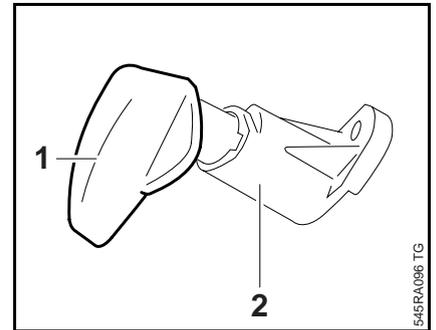
- Check operation.
- Rotate the choke shaft. The choke lever (1) must engage the throttle lever (arrow).



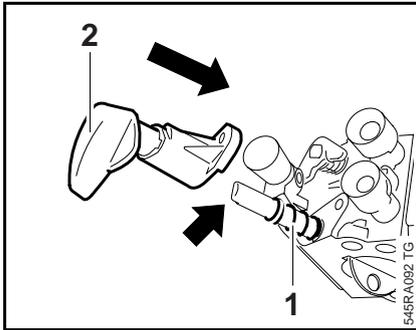
- Take out the screw (arrow).
- Pull off the rotary knob (1).



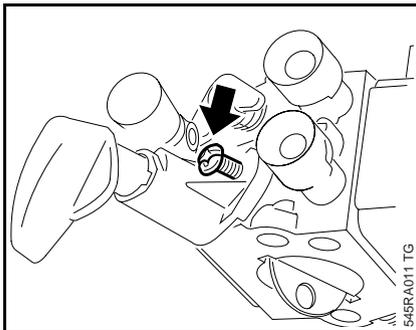
- Remove the spring (1).
- Check the individual parts and replace if necessary.



- Turn the rotary knob (1) until it is locked in the guide sleeve (2).



- Fit the spring (1) on the choke shaft.
- Position the rotary knob (2) so that the flat in the knob's bore lines up with the flat side (arrow) of the choke shaft.
- Push the rotary knob (2) on to the choke shaft until it engages, and hold it in that position.

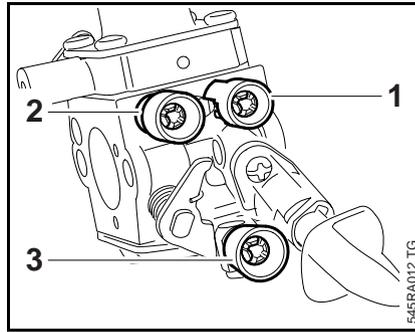


- Insert screw (arrow) and tighten it down firmly.

Check operation:

- Press down the rotary knob = it can be rotated counterclockwise.
- Turn the rotary knob back to the stop = it springs back to its original position
 - knob is locked.
- Reassemble all other parts in the reverse sequence.

8.4.5 Adjusting Screws



There are three adjusting screws on the carburetor:
H = high speed screw (1)
L = low speed screw (2)
LA = idle speed screw (3)

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

The high speed screw **H** and low speed screw **L** each have a limiter cap, which has to be removed before the screw is removed.

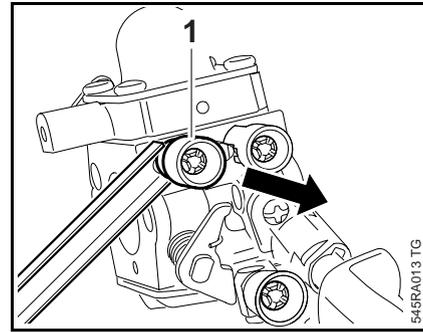
Always install new limiter caps.

- Remove the filter cover, 5.1

It is not necessary to remove the carburetor to remove and install the adjusting screws. For the sake of clarity, however, the illustrations show the carburetor removed from the machine.

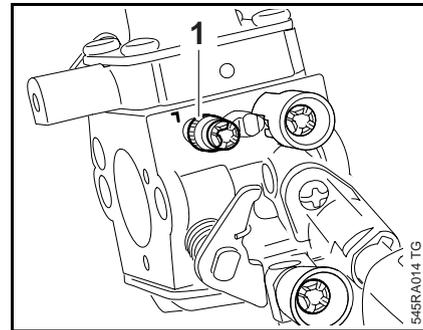
- See also carburetor troubleshooting, 4.4

Low speed screw

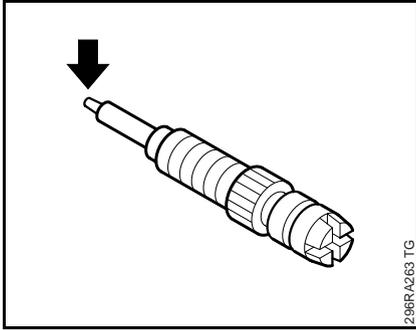


- Use special tool 5910 890 4501 to pry the limiter cap (1) off the low speed screw.

Do not re-install used cap – always fit a new cap.



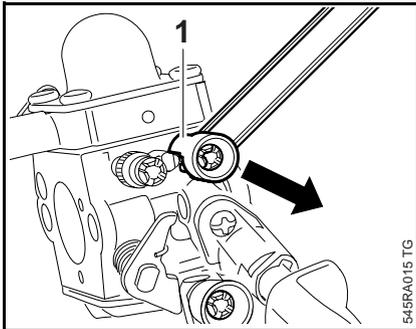
- Take out the low speed screw (1).



296RA263 TG

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

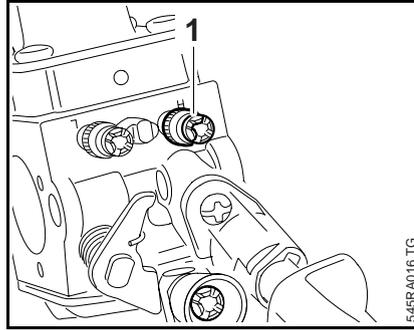
High speed screw



546RA015 TG

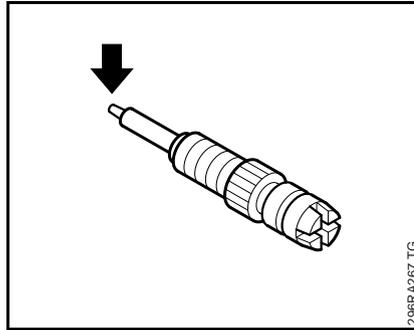
- Use special tool 5910 890 4501 to pry the limiter cap (1) off the high speed screw.

Do not re-install used cap – always fit a new cap.



546RA016 TG

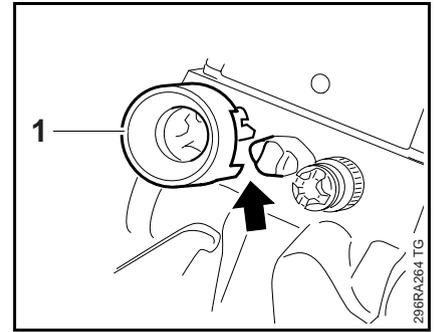
- Take out the high speed screw (1).



296RA267 TG

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

Pre-installing limiter caps

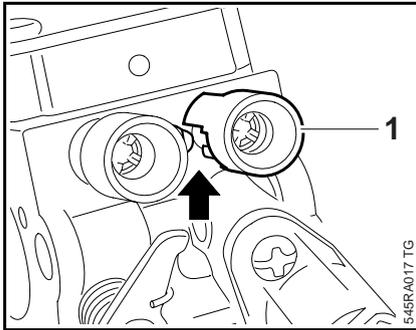


296RA264 TG

Low speed screw (L)

Always use a new limiter cap and position it so that the long part of the cap butts against the underside of the stop (arrow).

- Push the limiter cap (1) on to the low speed screw as far as the first detent – the limiter cap is thus prepared for final installation.



High speed screw (H)

Always use a new limiter cap and position it so that the long part of the cap butts against the top of the stop (arrow).

- Push the limiter cap (1) on to the low speed screw as far as the first detent – the limiter cap is thus prepared for final installation.

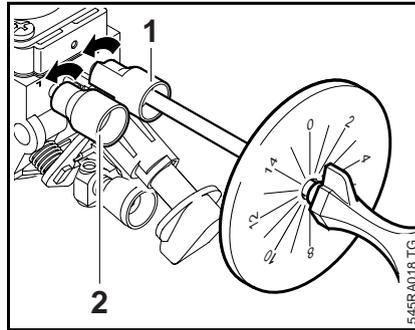
– Carry out basic setting, 8.5.1

8.5 Adjusting the Carburetor

8.5.1 Basic Setting

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

- Pre-install the new limiter caps on the high speed and low speed screws, 8.4.5



High speed and low speed screws can now be adjusted through the pre-installed limiter caps.

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

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

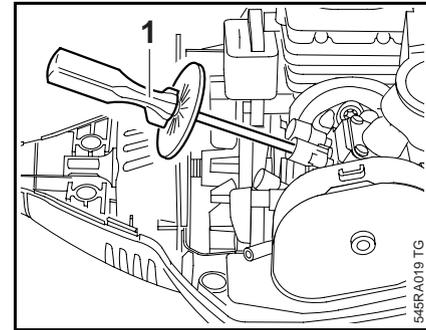
This completes the basic setting of the high speed screw (**H**) and the low speed screw (**L**).

- Mount the deflector and cutting tool (mowing head), see instruction manual
 - the cutting tool must turn freely, clean it if necessary.
- Inspect the spark arresting screen (if fitted) and clean or replace if necessary. 5.8

The carburetor must be installed.

- Check the air filter and clean or replace if necessary, 8.1
- Allow engine to warm up.

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



- Push screwdriver (1) 5910 890 2305 into the adjusting screws (arrow).

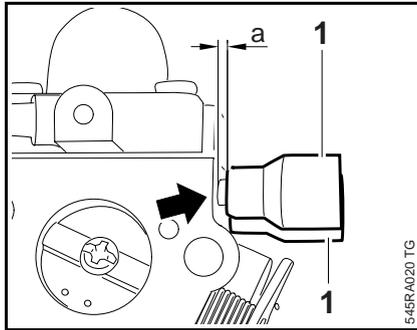
Adjust idle speed with a tachometer. Adjust specified engine speeds within tolerance of ± 200 rpm.

1. Adjust engine speed with idle speed screw (**LA**) to 3,000 rpm.

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

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

3. Use the idle speed screw (**LA**) to set the engine speed again to 3,000 rpm.
4. Set the engine speed to 2,800 rpm with the low speed screw (**L**)



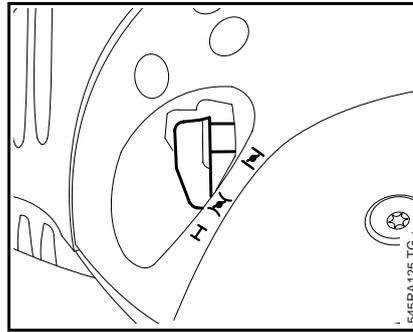
The limiter caps must be in their pre-installed positions above and below the stop, 8.4.5.

- After completing the basic setting, push the limiter caps fully on to the adjusting screws.
- Do not push the limiter caps up against the carburetor body since they will otherwise be damaged. Clearance 'a' (arrow) must be at least 1 mm.

The range of adjustment of the high speed screw **(H)** and low speed screw **(L)** is now limited.

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

8.5.2 Standard Setting



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

Always perform the following steps before carrying out any adjustments:

- Troubleshooting, 4.4
- Mount the deflector and cutting tool (mowing head), see instruction manual
 - the cutting tool must turn freely, clean it if necessary.
- Inspect the spark arresting screen (if fitted) and clean or replace if necessary. 5.8
- Check the air filter and clean or replace if necessary, 8.1

Standard Setting

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

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

Adjusting engine idle speed

- Allow engine to warm up.

Engine stalls at idle speed

- Turn the idle speed screw **(LA)** clockwise until the engine runs smoothly
 - the cutting tool must not rotate.

Cutting tool rotates when engine is idling

- Turn the idle speed screw **(LA)** counterclockwise until the cutting tool stops rotating – then turn the screw another **full turn** in the same direction.

Erratic idling behavior, engine stops even though setting of LA screw has been corrected, poor acceleration

Idle setting is **too lean**.

- Turn the low speed screw **(L)** counterclockwise, no further than stop, until the engine runs and accelerates smoothly.

Erratic idling behavior, engine speed drops when swinging the machine

Idle setting is **too rich**

- Turn the low speed screw **(L)** clockwise (1/8 of a turn or 45° at a time) until the engine runs smoothly and accelerates well.

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

Adjustment for operation at high altitude

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

- Check standard setting.
- Warm up the engine with the cutting tool mounted.

The drive shaft and cutting must rotate freely.

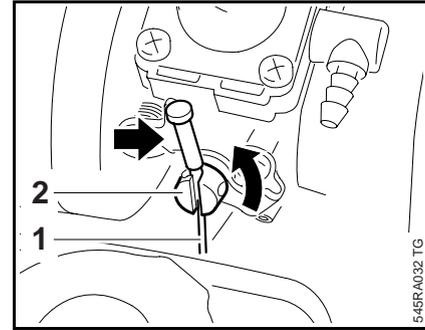
- Turn the high speed screw **(H)** clockwise (leaner) – no further than stop.

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

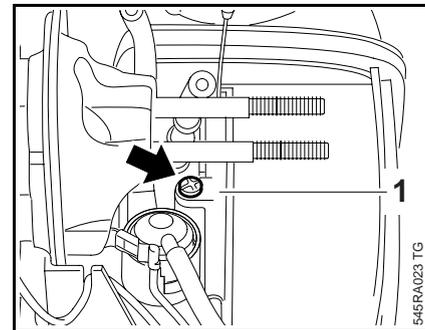
If the setting is made too lean there is a risk of engine damage as a result of lack of lubrication and overheating.

If the adjustments produce no improvement, see the troubleshooting charts for the ignition system,  4.3, carburetor and engine,  4.4,  4.5.

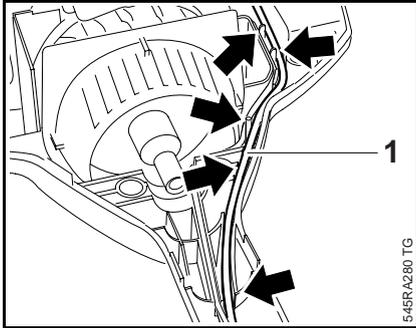
8.6 Removing and Installing Throttle Cable (Loop Handle)



- Press down the throttle lever until the nipple (arrow) projects.
- Turn the pin (2) until the slot is in line with the throttle cable (1).
- Remove the throttle cable (1).
- Remove the carburetor,  8.2

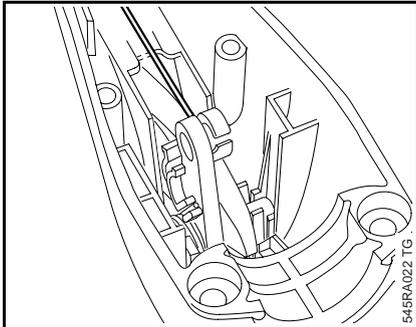


- Take out the screw (arrow).
- Pull the retainer (1) with throttle cable out of its seat.



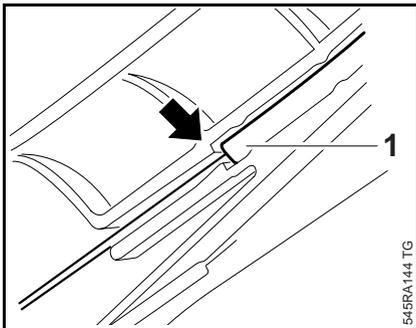
546RA280 TG

- Pull the throttle cable (1) out of the guides (arrows).
- Remove the throttle trigger and disconnect the throttle cable, 7.3.1



546RA022 TG

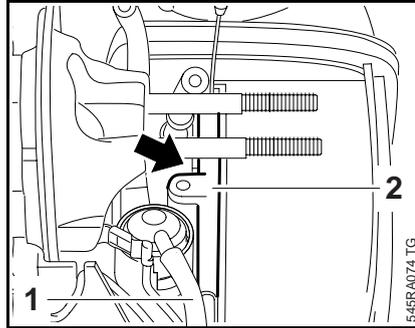
- Check the throttle cable and replace if necessary.
- Fit throttle cable on throttle trigger, 8.6



546RA144 TG

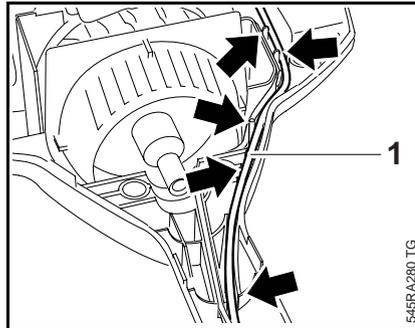
- Push the throttle cable sleeve (1) into the guide as far as stop.

The throttle cable sleeve must butt against the stop (arrow).



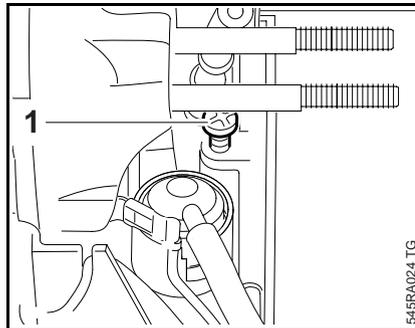
546RA074 TG

- Position the throttle cable under the tank vent hose (1).
- Fit the throttle cable retainer (2) in its seat (arrow).



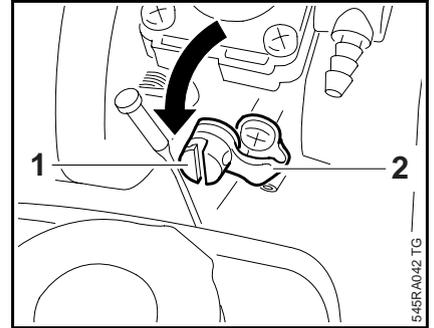
546RA280 TG

- Push the throttle cable (1) into the guides in the engine housing (arrows) as far as stop.



546RA024 TG

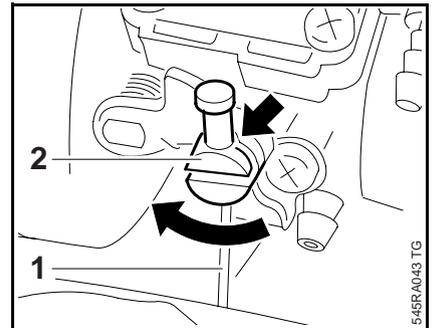
- Tighten down the screw (1) firmly.
- Install the carburetor, 8.2



546RA042 TG

- Turn the pin (1) until the slot is in line with the throttle cable.

- Press down the throttle lever (2).



546RA043 TG

- Fit throttle cable (1) in the pin's (2) slot.

- Turn the pin until the nipple is properly seated (arrow).

- Check operation of throttle cable and readjust if necessary, 8.6.2

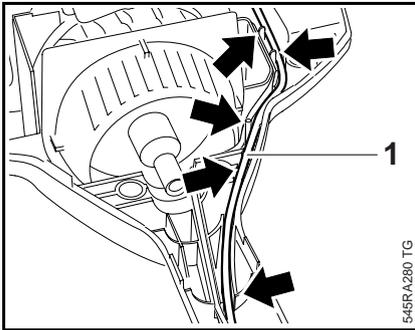
- Reassemble all other parts in the reverse sequence.

- Tightening torques, 3.4

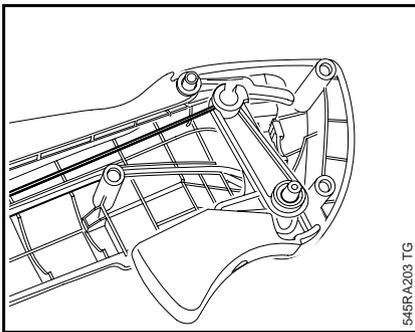
8.6.1 Removing and Installing Throttle Cable (Bike Handle)

The throttle cable is installed in a protective tube together with the short circuit and ground wires and must therefore be removed as an assembly.

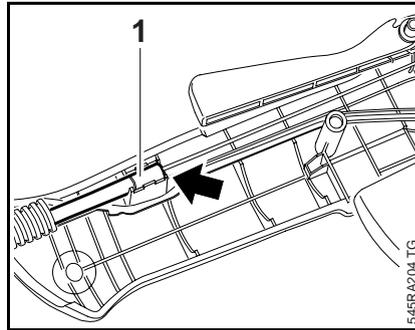
- Remove the throttle cable at the carburetor end,  5.9.3



- Pull the throttle cable (1) out of the guides (arrows).
- Remove the protective tube,  5.9.3
- Disconnect the throttle cable from the throttle trigger,  7.4



- Check the throttle cable and replace if necessary.
- Fit throttle cable on throttle trigger,  7.4
- Fit the protective tube in the engine housing,  5.9.3



- Push the throttle cable sleeve (1) into the guide as far as stop.

The throttle cable sleeve (1) must butt against the stop (arrow).

- Fit the throttle cable at the carburetor end,  5.9.3
- Reassemble all other parts in the reverse sequence.
- Tightening torques,  3.4

8.6.2 Adjusting the Throttle Cable

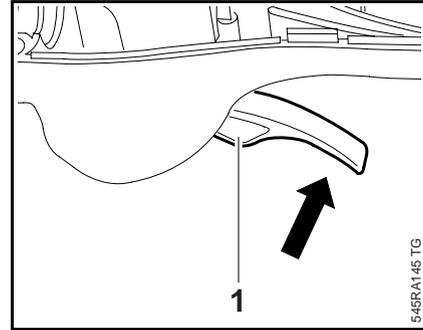
- Remove the shroud,  5.1

The throttle cable must be adjusted to ensure the throttle shutter opens and closes properly.

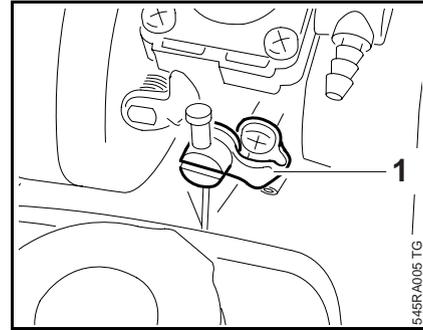
The adjustment procedure is the same for loop-handled and bike-handled machines.

Make sure on both versions that the throttle cable sleeves are properly seated in their guides and butt against their stops – this is important for the adjustment.

Checking adjustment of throttle cable



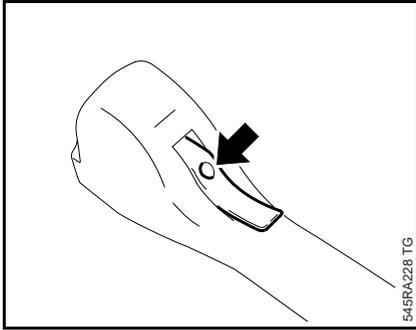
- Squeeze the throttle trigger (1) as far as stop and hold it there.



- Press down the throttle lever (1).

If the throttle lever (1) can be turned further, the throttle shutter is not wide open in the full throttle position.

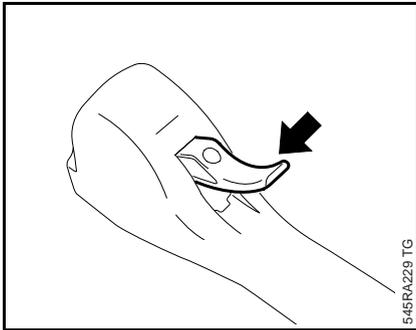
Adjusting the throttle cable



- Squeeze the throttle trigger and turn the grub screw (arrow) until the throttle shutter is wide open.

– Turn the grub screw clockwise = more throttle cable tension (opens throttle shutter wider)

– Turn the grub screw counterclockwise = less throttle cable tension (closes throttle shutter)



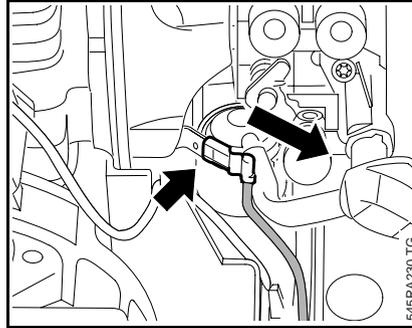
- Release the throttle trigger (arrow) – it must return to the stop

The throttle cable must not be under tension when the throttle trigger is released since the throttle shutter may not close properly – the engine idle speed will then be too high.

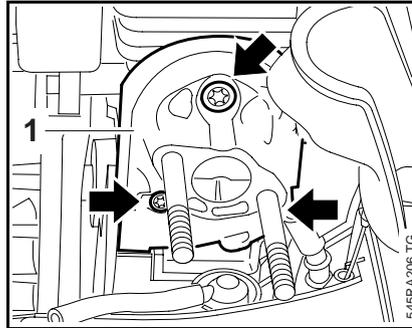
– Reassemble in the reverse sequence.

8.7 Removing and Installing the Spacer Flange

Remove the carburetor, 8.2

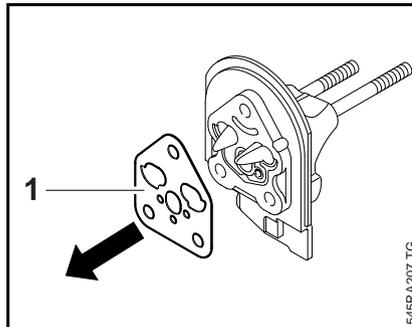


- Disconnect the ground wire (arrow).



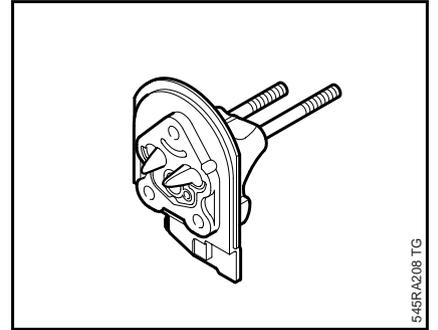
- Take out the screws (arrow) together with the connector tag.

– Remove the spacer flange (1).

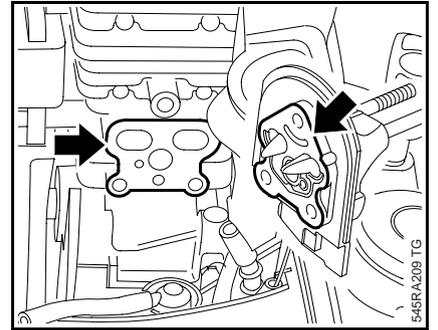


- Remove the gasket (1).

Always install a new gasket.

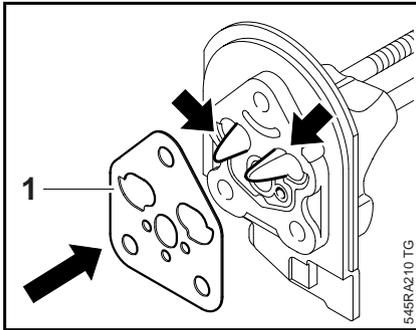


– Inspect the spacer flange and replace it if necessary – even very minor cracks can result in engine running problems, 4.4, 4.5

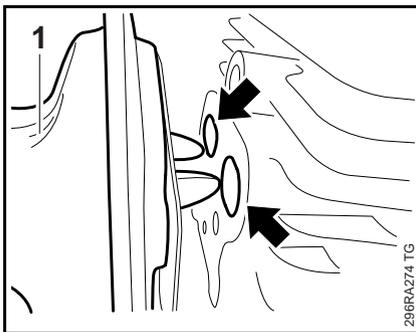


- Inspect and clean the sealing faces (arrows) and remove any gasket residue, 4.5

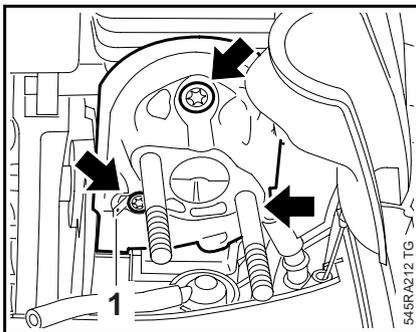
The sealing faces must be in perfect condition. If the sealing faces are damaged, install a new cylinder or spacer flange.



- Fit the new gasket (1) over the guides (arrows) on the spacer flange.



- Push the spacer flange (1) against the cylinder, engage the guides in the inlet bores (arrows).



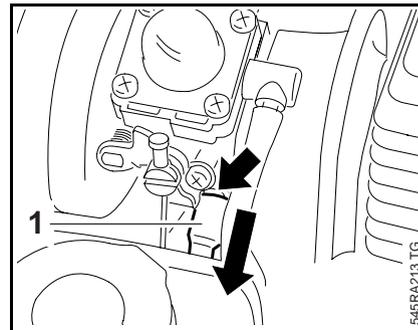
- Fit the connector tag (1).
- Insert screws (arrows) and tighten them down firmly.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, 3.4

8.8 Tank Vent

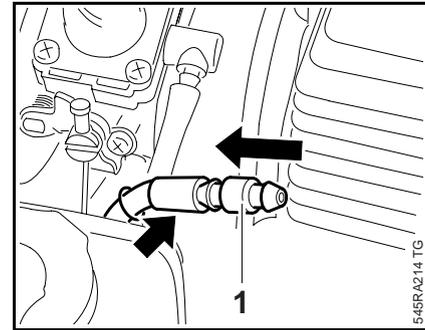
8.8.1 Testing

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

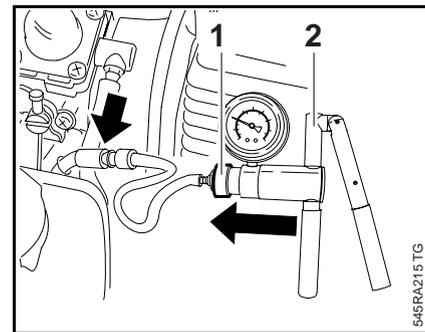
- Open the fuel tank cap and drain the fuel tank.
- Collect the fuel in a clean container, 1
- Close the tank cap.
- Remove the rewind starter, 6.2
- Remove the shroud, 5.1



- Pull the fuel suction hose (1) off the stub (arrow).
- Close the tank cap.



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

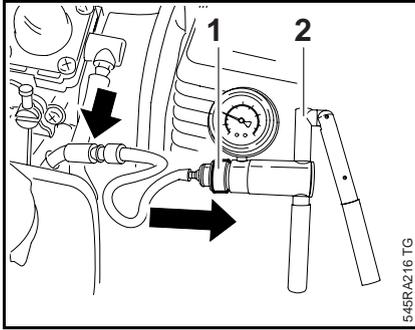


Vacuum test

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

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

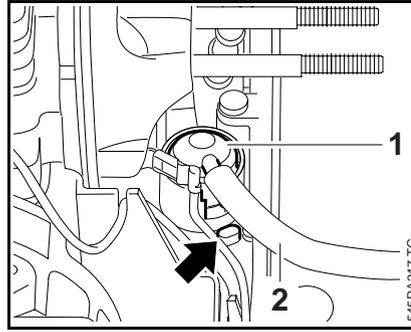
- Clean the area around the tank vent.
- Install new tank vent if necessary, 8.8



Pressure test

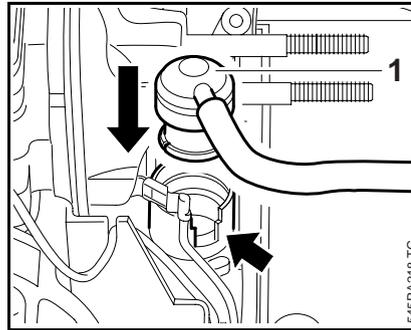
- Push the ring (1) to the right and connect the pump (2) 0000 850 1300 to the nipple (arrow)
 - pressurize the fuel tank.
- Operate the pump until the pressure gauge indicates a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the tank, including the tank vent, is airtight.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

8.8.2 Removing and Installing



- Remove the carburetor, [8.2](#)
- Pry the tank vent (1) out of its seat using the rib (arrow) for leverage.
- Pull the tank vent (1) off the hose (1), check and replace if necessary.

Always install a new tank vent.



- Connect the new tank vent to the hose.
- Line up the tank vent so that its stub fits in the recess (arrow).
- Push the tank vent with hose into its seat until it snaps into place.

Make sure the hose is pushed fully on to the filter housing stub.

- Reassemble all other parts in the reverse sequence.

8.9 Fuel Intake

8.9.1 Pickup Body

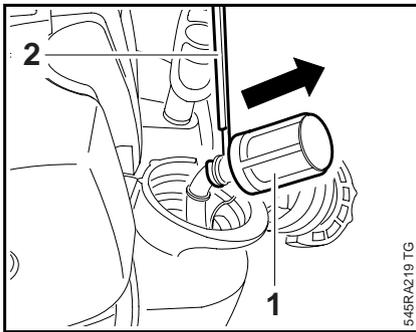
Any impurities mixed with the fuel are retained by the pickup body (filter). The fine pores of the filter eventually become clogged with minute particles of dirt. This restricts the passage of fuel and results in fuel starvation.

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

- Troubleshooting, [4.4](#) or [4.5](#)

Clean the fuel tank if necessary:

- Open the tank cap and drain the tank.
- Pour a small amount of clean gasoline into the tank. Close the tank and shake the saw vigorously.
- Open the tank again and drain it.
- Dispose of fuel properly in accordance with environmental requirements, [1](#)



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

Do not overstretch the fuel hose.

- Check the pickup body (1) and replace if necessary
- Reassemble in the reverse sequence.

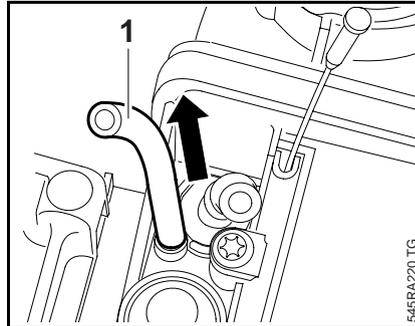
8.9.2 Fuel Hoses

In order to guarantee tightness of the fuel system, the fuel hoses must be pushed firmly and fully on to the stubs – always install new fuel hoses after every repair.

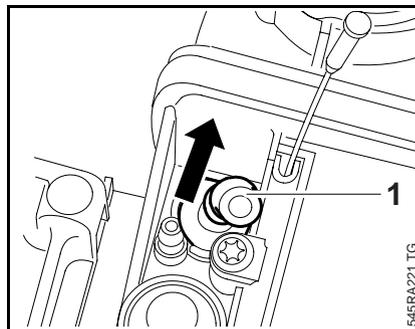
To avoid damage to the fuel hoses and stubs, fit the hoses by hand.

Do not use pointed or sharp-edged tools and do not cut open the fuel hoses at the stubs because they could be damaged in this way.

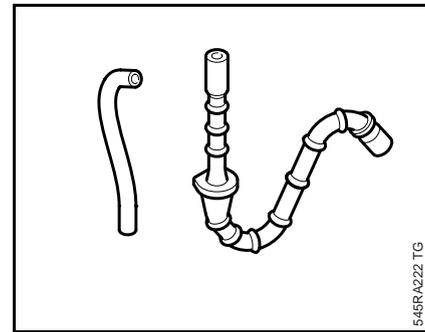
To aid assembly, use STIHL press fluid at the points recommended. Do not use any other oil, fuel, grease or press fluids since they may damage the fuel hoses.



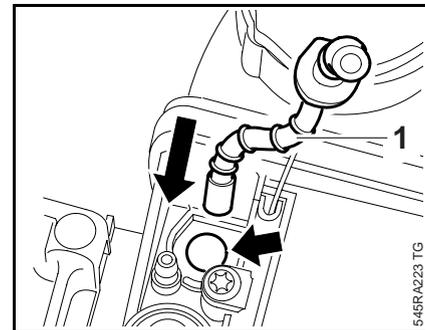
- Remove the pickup body, 8.9.1
- Remove the spacer flange, 8.7
- Pull the fuel return hose (1) off the stub.



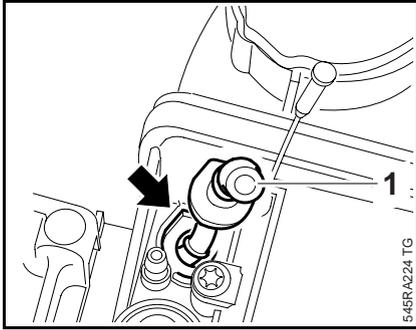
- Pull the fuel suction hose (1) out of its seat.



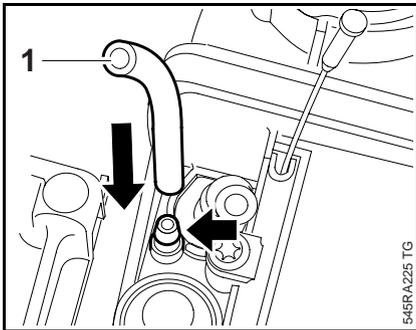
- Always install new fuel hoses.



- Push the new fuel suction hose (1) through the hole (arrow) in the fuel tank.
- Coat the grommet on the new fuel suction hose with STIHL press fluid, 11



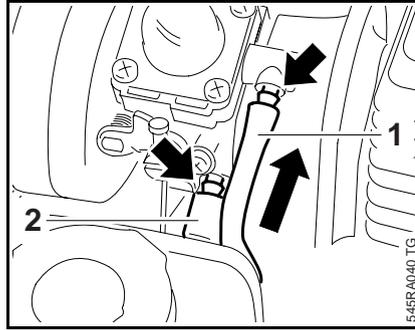
- Line up the fuel suction hose (1)
 - the flange must match the contour of the hole (arrow).
- Push the fuel suction hose home until the rubber lip is properly seated in the hole and the flange lies flat against the tank housing.



- Coat stub and end of hose with STIHL press fluid, 11
- Push the new fuel return hose (1) on to the stub (arrow).

Fuel return hose must be pushed on firmly as far as stop.

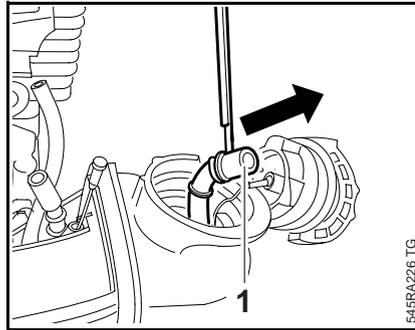
- Install the spacer flange, 8.7



- Push the carburetor into position.
- To simplify assembly, coat the stubs (arrows) and ends of the new fuel hoses with a little STIHL press fluid, 11

- Push the new fuel return hose (1) and fuel suction hose (2) on to the stubs (arrows)

Fuel hoses must be pushed on firmly as far as stop.



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

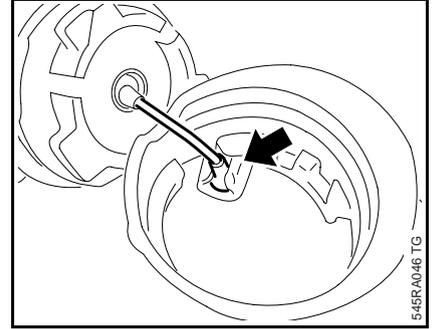
Do not overstretch the fuel hose.

- Fit the pickup body, 8.9.1
- Close the tank cap.
- Reassemble all other parts in the reverse sequence.

8.9.3 Fuel Tank Cap

See instruction manual.

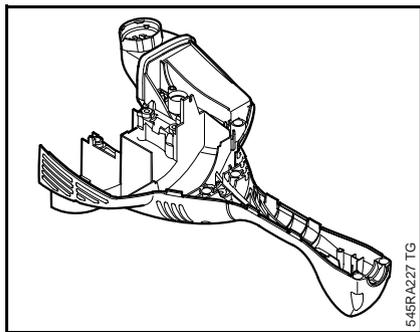
- Open the tank cap.



- Disconnect the tank cap cord from the slot (arrow).
- Inspect the tank cap. Install new sealing ring or tank cap if necessary.
- Reassemble in the reverse sequence.
- Check for leaks.

8.10 Removing and Installing the Engine Housing

- Drain the fuel tank,  1
- Remove the drive tube,  9.1
- Remove the engine,  5.1



- Check the engine housing and replace if necessary.

If a new engine housing is used, the short circuit wire, ground wire and throttle cable must be transferred from the old housing.

Machines with loop handle

- Transfer the short circuit and ground wires,  5.9.2
- Transfer the throttle cable,  8.6

Machines with bike handle

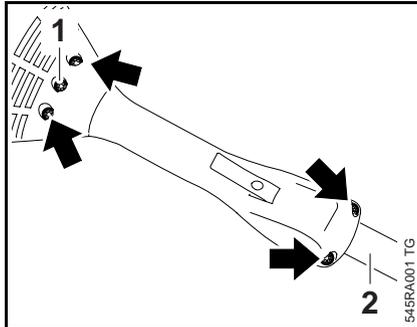
- Transfer the short circuit and ground wires,  5.9.3
- Transfer the throttle cable,  8.6.1
- Check parts before transferring, use new parts where necessary.
- Reassemble in the reverse sequence.
- Tightening torques,  3.4

9. Drive Tube

9.1 Removing and Installing

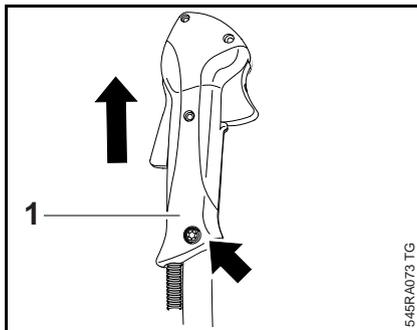
The drive tube can be removed from the machine without dismantling other parts.

Machines with loop handle

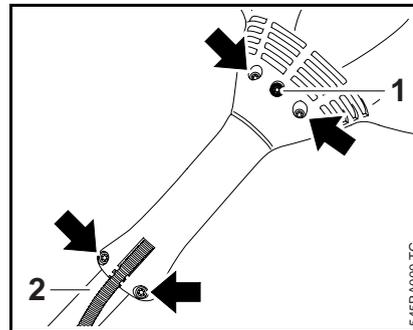


- Take out the screw (1) and loosen the screws (arrows).
- Pull out the drive tube (2).
- Check the drive tube and repair or replace if necessary, 9.1

Machines with bike handle



- Loosen the screw (arrow).
- Pull off the control handle (1).



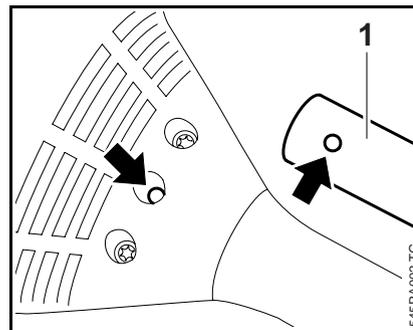
- Take out the screw (1) and loosen the screws (arrows).
- Pull the drive tube (2) out of the engine housing.
- Check the drive tube and repair or replace if necessary, 9.1

If a new drive tube is installed, the other parts and components must be transferred from the old drive tube.

Installing

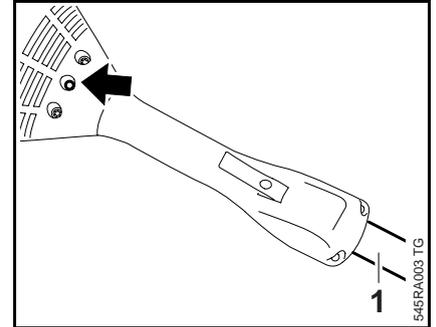
- Degrease the clamp area with a little standard solvent-based degreasant containing no chlorinated or halogenated hydrocarbons, 11

Machines with loop handle

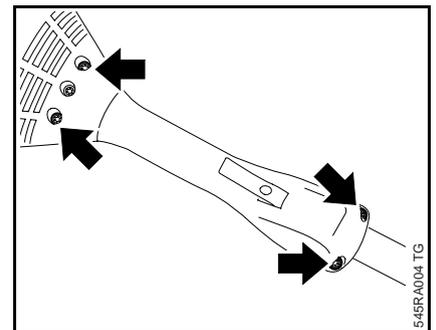


- Position the drive tube (1) so that the holes are in alignment.

- Push home the drive tube (1) as far as stop, turn the drive shaft to and fro until the square end of the drive shaft engages the square recess in the clutch drum.

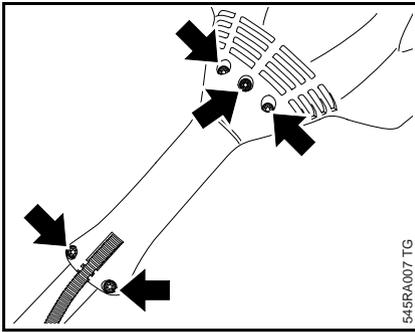


- Turn the drive tube (1) until the holes (arrow) in the drive tube and engine housing line up.
- Insert and tighten down the screw – turn the drive tube to and fro until the screw slips through the hole – the drive tube is only located and not clamped in position at this stage.



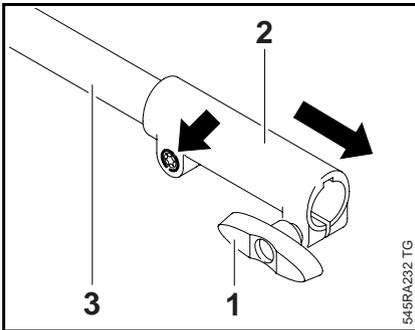
- Tighten down the screws (arrows) firmly.

Machines with bike handle

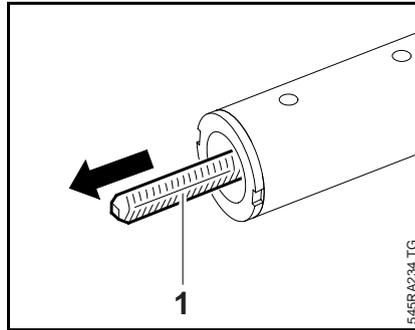


- Tighten down the screws (arrows) firmly.
- Install the control handle, 7.4
- Check instruction label on drive tube for damage and legibility, replace if necessary.
- Tightening torques, 3.4

9.1.1 Disassembling (KM 56)

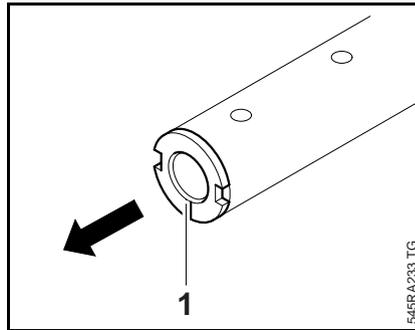


- Remove the drive tube, 9.1
- Remove the loop handle if necessary, 9.1.7
- Remove the carrying ring if necessary.
- Loosen the wing screw (1) and pull out the attachment.
- Loosen the screw (arrow).
- Pull the coupling sleeve (2) off the drive tube (3).

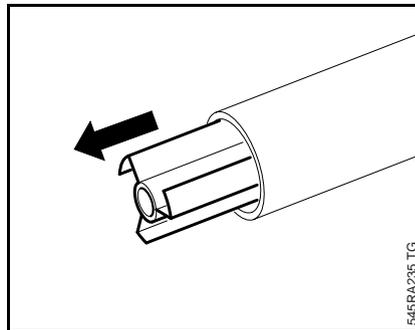


- Pull the drive shaft (1) out of the drive tube.

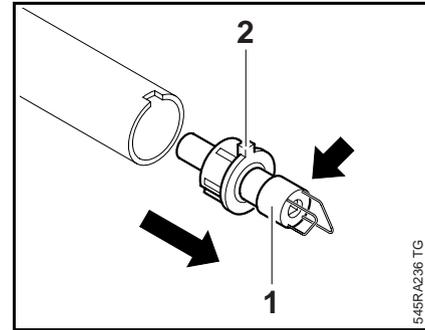
If the drive shaft has turned blue, install a new one.



- Pry the plug (1) out of the drive tube.

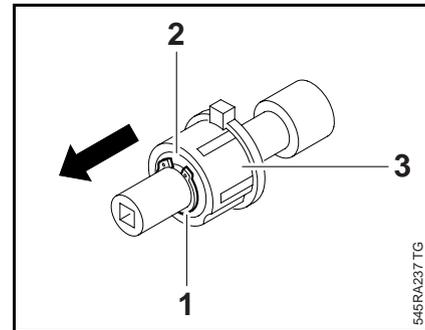


- Pull the flexible liner out of the drive tube.

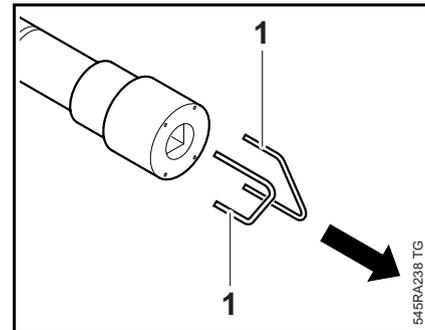


- Grip the collar (arrow) and pull the complete driver (1) out of the drive tube.

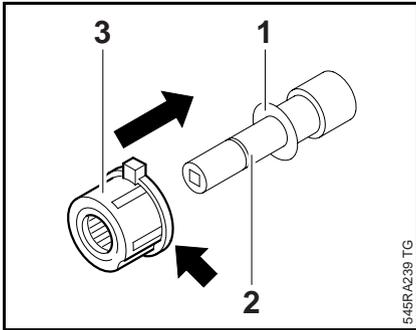
Do not apply tool to plastic lug (2) since it might break.



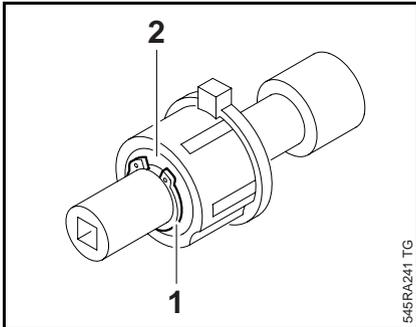
- Remove the E-clip (1).
- Remove the washer (2) and bushing ((3) and the second washer.



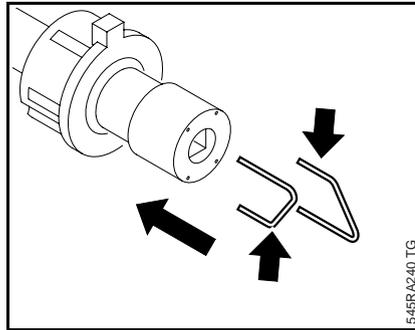
- Pull out the wire clips (1).
- Check the individual parts and replace if necessary.



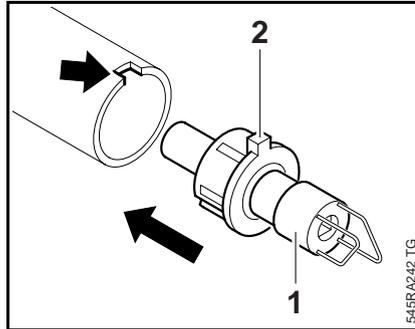
- Slip the washer (1) on to the driver (2).
- Line up the bushing (3) with its collar (arrow) facing the driver.
- Coat needle bearing in bushing and shank of driver with STIHL lubricating grease, 11
- Push the bushing (3) into position.



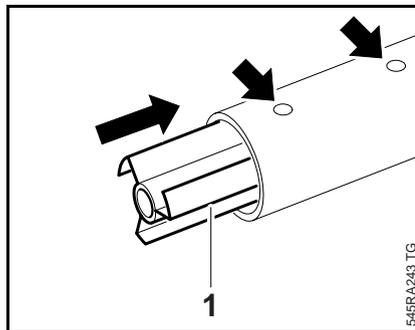
- Fit the washer (2).
- Fit the E-clip (1).



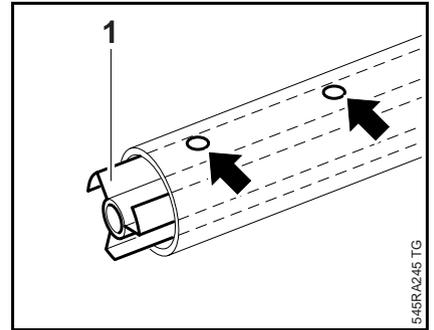
- Push the wire clips into the driver so that their long sides (arrows) are offset.
- Push the wire clips home as far as stop – they must be firmly seated.



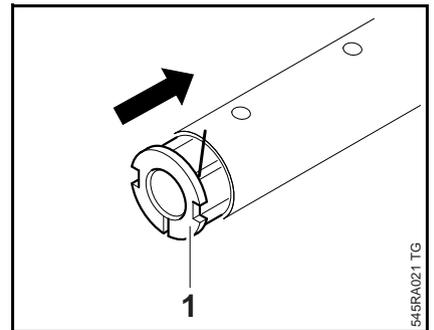
- Push the complete driver (1) into the drive tube so that the lug (2) engages the notch (arrow).
- Push the driver home as far as stop.



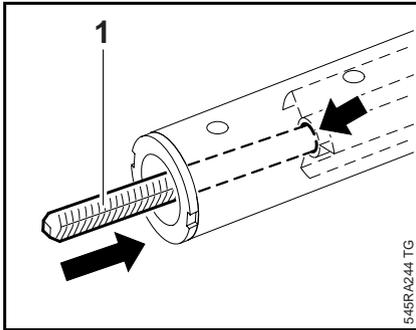
- Push the flexible liner (1) into the end of the drive tube with the cross holes (arrows).



- Line up the flexible liner (1) so that the cross holes (arrows) in the drive tube are between the spokes.



- Push the plug (1) into the drive tube as far as stop.



The drive shaft is supported in the flexible liner inside the drive tube.

If the drive shaft has turned blue, install a new one.

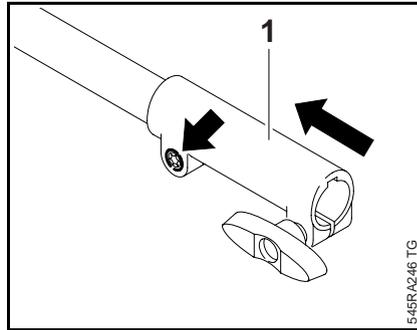
- Before installing the drive shaft, coat it with STIHL gear lubricant for hedge trimmers, 11

- Apply the grease evenly to the drive shaft. Do not pump grease directly into the drive tube or flexible liner.

- Push the drive shaft (1) into the flexible liner (arrow) until it engages the driver.

- Check operation.

- Rotate the drive shaft – the driver at the other end must rotate too.



- Line up the coupling sleeve (1) so that the gap in the clamp points down.

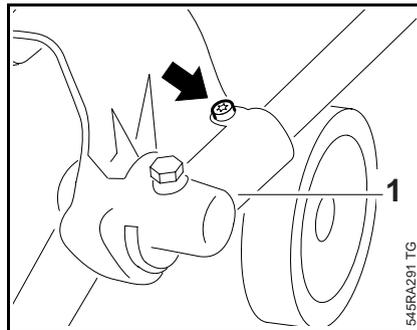
- Push the coupling sleeve (1) onto the driver end of the drive tube as far as stop.

- Tighten down the screw (arrow) firmly.

- Reassemble in the reverse sequence.

- Tightening torques, 3.4

9.1.2 Disassembling (FC 56)



- Remove the drive tube, 9.1

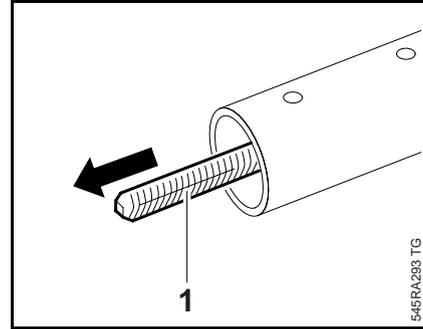
- Remove the loop handle if necessary, 9.1.6, 9.1.7

- Remove the carrying ring if necessary, 9.2.3

- Loosen the screw (arrow).

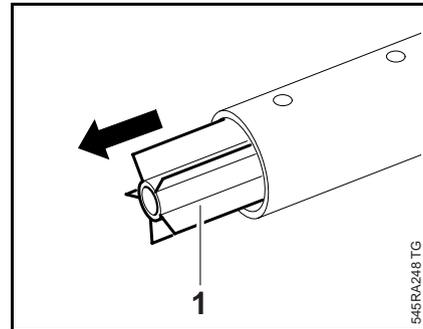
- Pull off the gearbox (1), check it and repair or replace as necessary
 - see "KombiTools" service

manual.

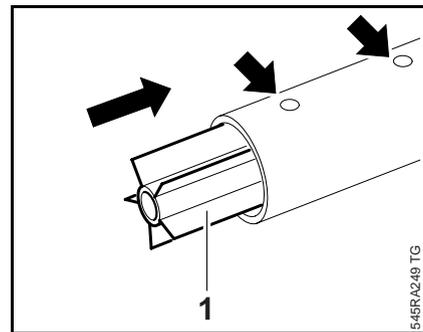


- Pull the drive shaft (1) out of the drive tube.

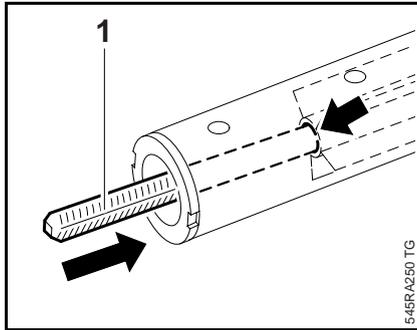
If the drive shaft has turned blue, install a new one.



- Pull out the flexible liner (1) out of the drive tube, check it and replace if necessary.



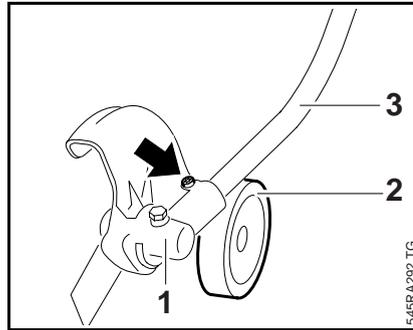
- Push the flexible liner (1) into the end of the drive tube with the cross holes (arrows).



The drive shaft is supported in the flexible liner inside the drive tube.

If the drive shaft has turned blue, install a new one.

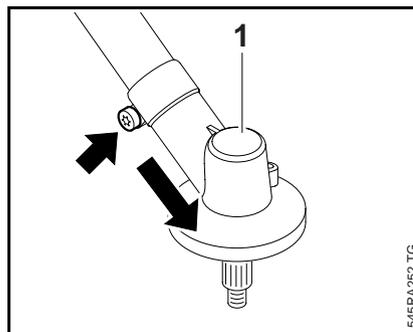
- Before installing the drive shaft, coat it with STIHL gear lubricant for hedge trimmers, 11
- Apply the grease evenly to the drive shaft. Do not pump grease directly into the drive tube or flexible liner.
- Push the drive shaft (1) into the flexible liner (arrow) until it engages the square recess in the gearbox.
- Check operation.
- Rotate the drive shaft – the gearbox output shaft must rotate too.



- Line up the gearbox (1) so that the depth wheel (2) is under the drive tube (3).

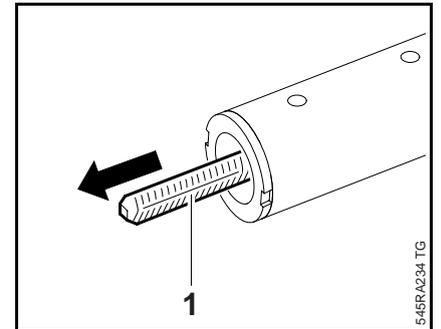
- Push the gearbox (1) on to the drive tube (3) as far as stop.
- Tighten down the screw (arrow) firmly.
- Reassemble in the reverse sequence.
- Tightening torques, 3.4

9.1.3 Disassembling (FS 56)



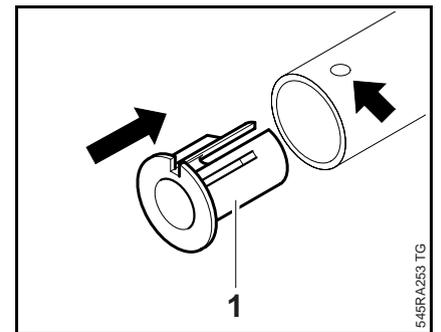
- Remove the drive tube, 9.1
- Remove the loop handle if necessary, 9.1.6, 9.1.7
- Remove the carrying ring if necessary, 9.2.3
- Remove the deflector, 9.2.2
- Loosen the screw (arrow).

- Pull off the gearbox (1), check it and repair or replace as necessary – see "KombiTools" service manual.

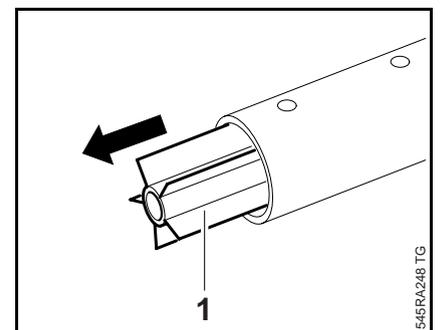


- Pull the drive shaft (1) out of the drive tube.

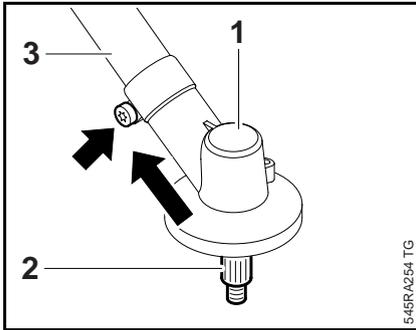
If the drive shaft has turned blue, install a new one.



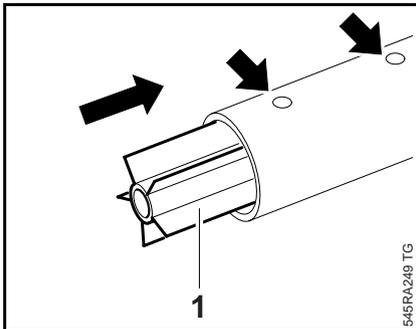
- Pry the plug (1) out of the drive tube.



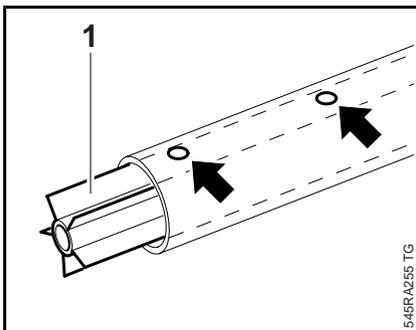
- Pull the flexible liner (1) out of the drive tube.
- Check the individual parts and replace if necessary.



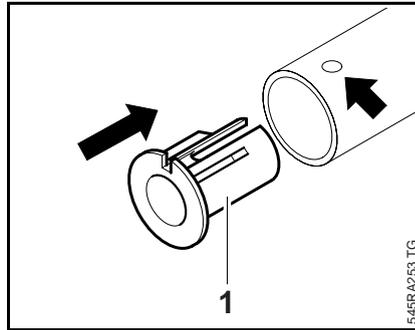
- Line up the gearbox (1) so that the output shaft (2) points away from the loop handle.
- Push the gearbox (1) on to the drive tube (3) as far as stop.
- Tighten down the screw (arrow) firmly.



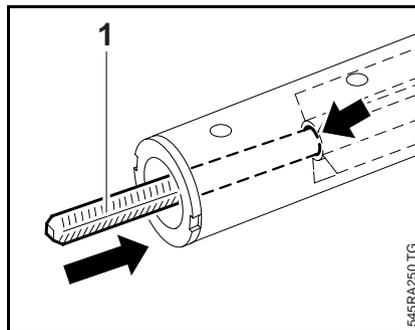
- Push the flexible liner (1) into the end of the drive tube with the cross holes (arrows).



- Line up the flexible liner (1) so that the cross holes (arrows) in the drive tube are between the spokes.



- Push the plug (1) into the end of the drive tube with the cross holes (arrows).



The drive shaft is supported in the flexible liner inside the drive tube.

If the drive shaft has turned blue, install a new one.

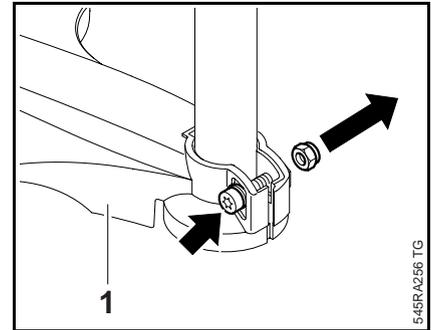
- Before installing the drive shaft, coat it with STIHL gear lubricant for hedge trimmers, 11
- Apply the grease evenly to the drive shaft. Do not pump grease directly into the drive tube or flexible liner.
- Push the drive shaft (1) into the flexible liner (arrow) until it engages the square recess in the gearbox.
- Check operation.

– Rotate the drive shaft – the gearbox output shaft must rotate too.

– Reassemble in the reverse sequence.

Tightening torques, 3.4

9.1.4 Disassembling (FS 40, 50)



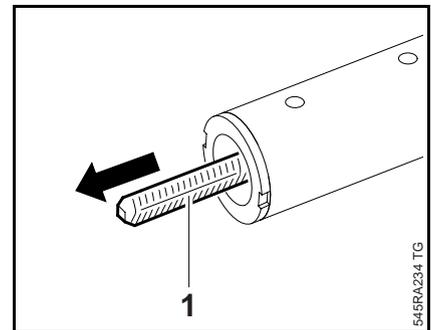
– Remove the drive tube, 9.1

– Remove the loop handle if necessary, 9.1.6, 9.1.7

– Remove the carrying ring if necessary, 9.2.3

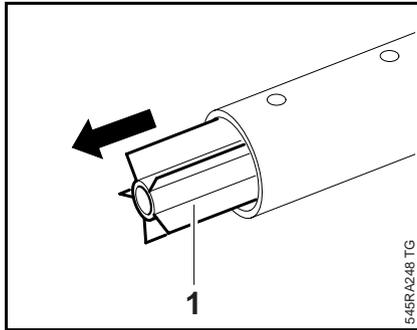
● Take out the screw (arrow) and remove the hex nut at the other side.

– Pull off the deflector (1).

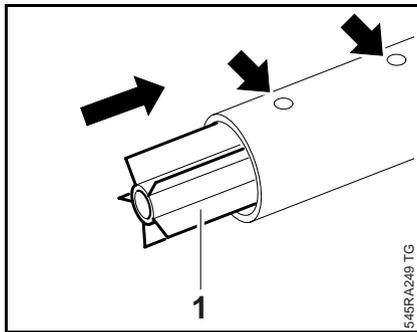


● Pull the drive shaft (1) out of the drive tube.

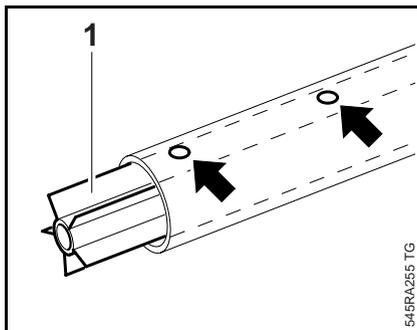
If the drive shaft has turned blue, install a new one.



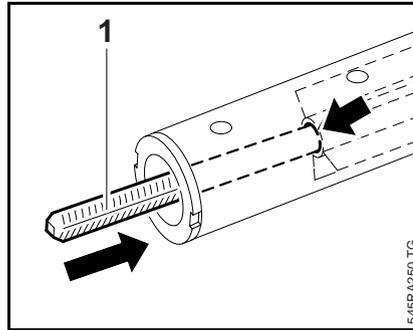
- Pull the flexible liner (1) out of the drive tube.
- Check the individual parts and replace if necessary.
- Inspect the bearing housing and replace if necessary, 9.1.5



- Push the flexible liner (1) into the end of the drive tube with the cross holes (arrows).



- Line up the flexible liner (1) so that the cross holes (arrows) in the drive tube are between the spokes.

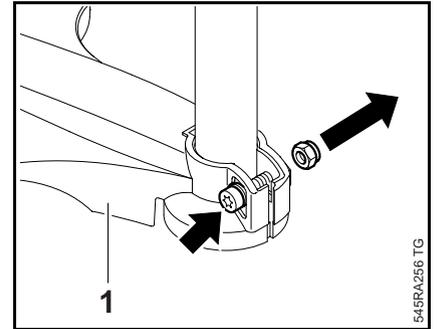


The drive shaft is supported in the flexible liner inside the drive tube.

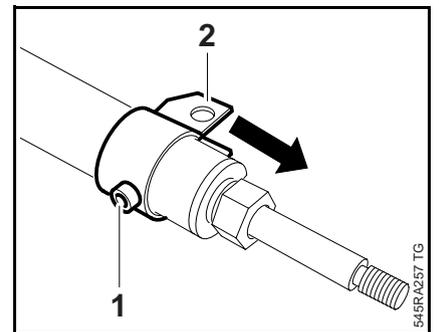
If the drive shaft has turned blue, install a new one.

- Before installing the drive shaft, coat it with STIHL gear lubricant for brushcutters, 11
- Apply the grease evenly to the drive shaft. Do not pump grease directly into the drive tube or flexible liner.
- Push the drive shaft (1) into the flexible liner (arrow) until it engages the square recess in the bearing housing.
- Check operation.
- Rotate the drive shaft – the bearing housing output shaft must rotate too.
- Reassemble in the reverse sequence.
- Tightening torques, 3.4

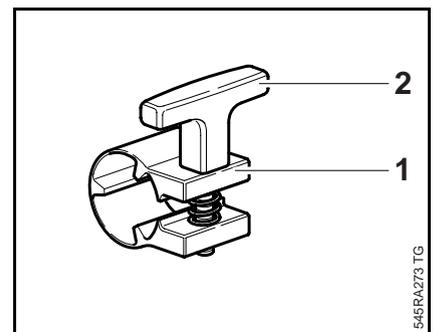
9.1.5 Removing and Installing the Bearing Housing



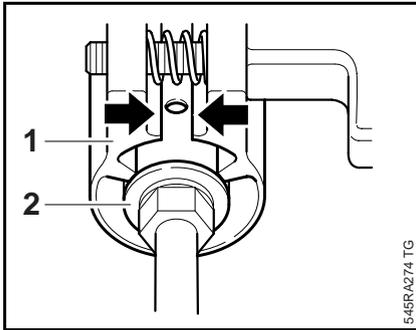
- Take out the screw (arrow) and remove the hex nut at the other side.
- Pull off the deflector (1).



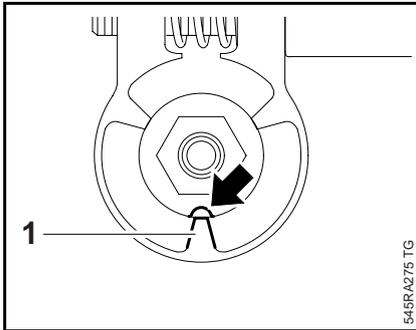
- Take out the screw (1).
- Pull off the clamp (2).



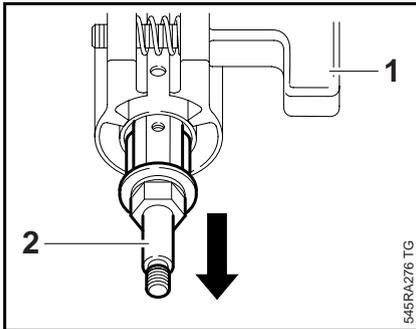
- Loosen wing screw (2) on the clamp (1) 5910 890 1100 until it can be slipped on to the drive tube.



- Push the clamp (1) 5910 890 1100 on to the drive tube so that the bearing housing collar (2) remains free and the fixing hole in the drive tube lines up with the gap (arrows) in the clamp.



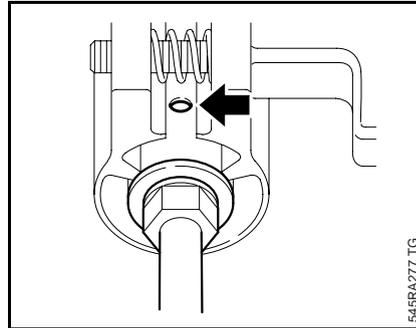
- The clamp's thrust piece (1) must line up with the notch (arrow) in the bearing housing.



- Carefully close the wing screw (1) until the bearing housing (2) can be pulled out.

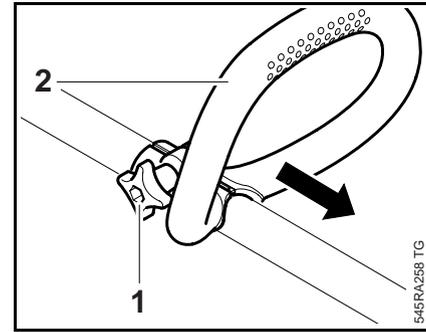
Do not apply too much pressure to the drive tube with the clamp since the tube will otherwise be permanently deformed and the bearing housing will no longer fit properly.

- Pull out the bearing housing (2).
- Leave the clamp in position, and do not change its setting, to install a new bearing housing.

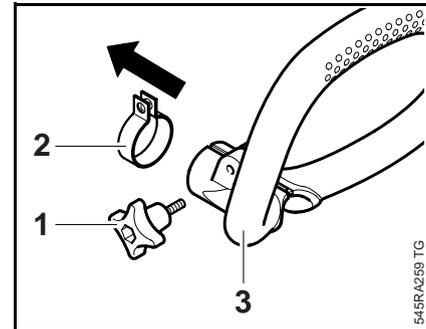


- Push the new bearing housing into the drive tube so that their holes (arrow) are in alignment.
- Push the bearing housing fully home.
- Check position of hole, turn bearing housing slightly if necessary until holes are exactly in alignment.
- Loosen and remove the clamp.
- Reassemble in the reverse sequence.

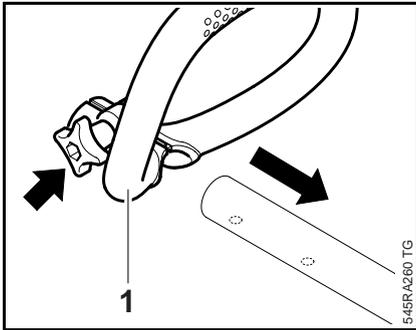
9.1.6 Loop Handle



- Remove the drive tube,  9.1
- Loosen the star knob screw (1).
- Slip the loop handle (2) off the drive tube.

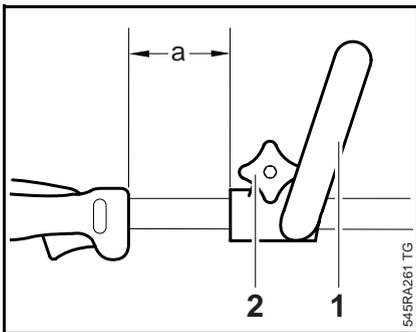


- Take out the star knob screw (1).
- Pull the clamp (2) out of the loop handle (3).
- Check the individual parts and replace if necessary.
- Reassemble in the reverse sequence.
- Do not finally tighten the star knob screw.



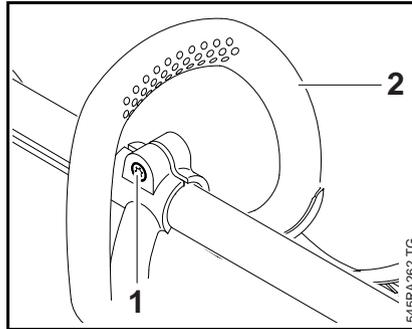
The engine end of the drive tube has cross holes, this end is installed in the machine.

- Line up the loop handle (1) so that the star knob screw (arrow) points towards the engine.
- Slide the loop handle (1) onto the engine end of the drive tube.

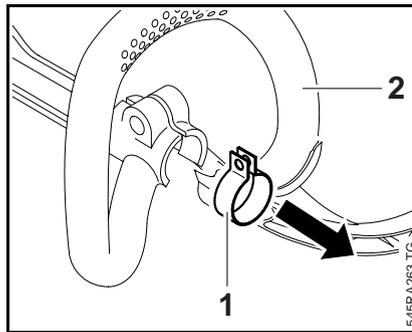


- Install the drive tube, 9.1
- Position the loop handle (1) at a distance of about 7 cm (a) in front of the engine housing.
- Line up the loop handle (1) so that it points away from the throttle trigger.
- Tighten down the star knob screw (2) firmly.

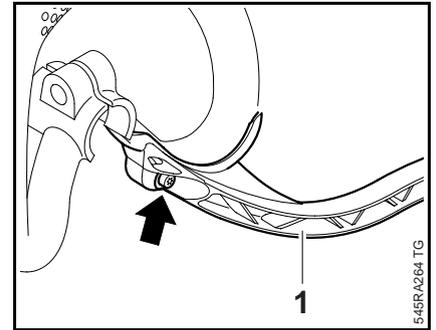
9.1.7 Loop Handle with Barrier Bar



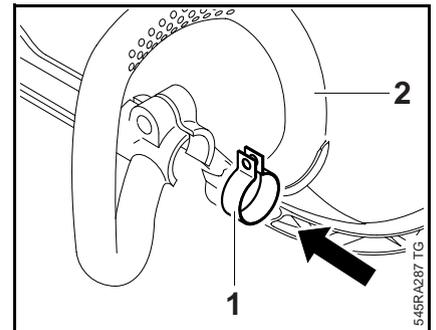
- Remove the drive tube, 9.1
- Loosen the screw (1).
- Slip the loop handle (2) off the drive tube.



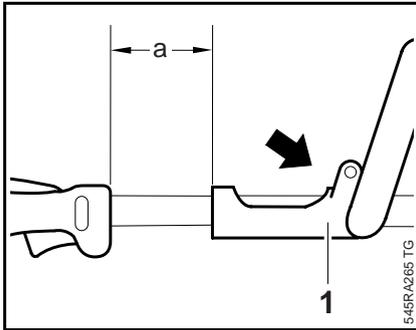
- Take out the screw.
- Pull the clamp (1) out of the loop handle (2).



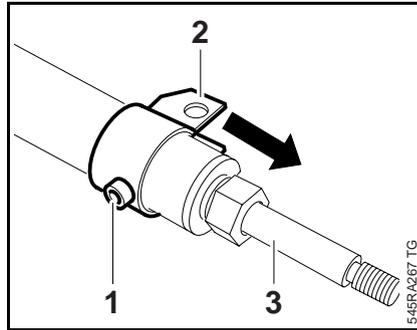
- Take out the screw (arrow) and washer.
- Remove the barrier bar (1).
- Check the individual parts and replace if necessary.
- Reassemble in the reverse sequence.



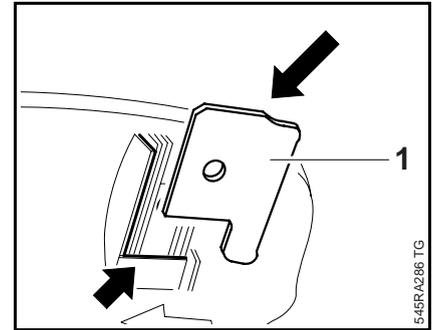
- Push the clamp (1) into the loop handle (2).
- Insert the screw (1)
 - do not tighten it down yet.



- Install the drive tube, 9.1
- Position the loop handle (1) at a distance of about 5 cm (a) in front of the engine housing.
- Line up the loop handle (1) so that the barrier bar is opposite the throttle trigger and tighten down the screw (arrow) firmly.



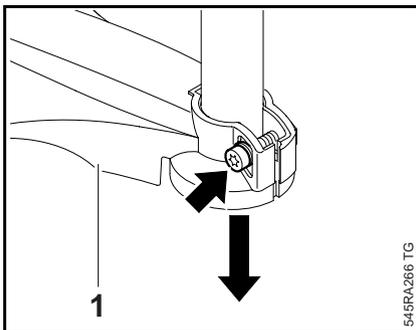
- Take out the screw (1).
- Pull off the clamp (2).
- Reassemble in the reverse sequence.
- Inspect the bearing housing (3) and replace if necessary, 9.1.5



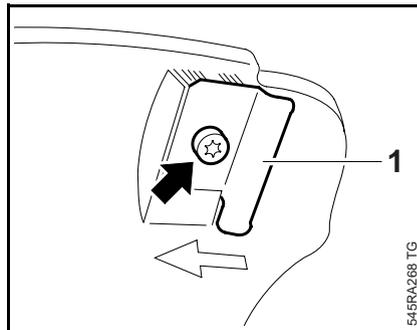
- Push the line limiting blade (1) into its seat (arrow).
 - Insert screw and tighten it down firmly.
- To avoid stripping the thread in the plastic housing, carefully locate screw in existing thread and tighten in down.
- Reassemble all other parts in the reverse sequence.

9.2 Add-On Components

9.2.1 Deflector for Machines without Gearbox

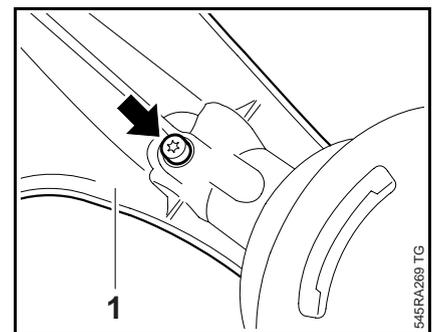


- Take out the clamp screw (arrow) and remove the hex nut.
- Pull off the deflector (1).

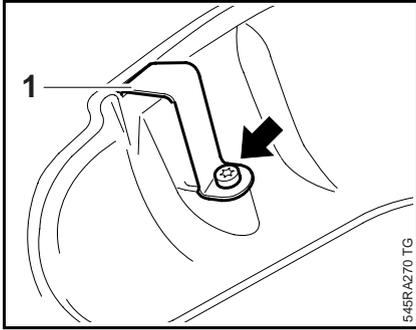


- Take out the screw (arrow).
- Remove the line limiting blade (1), check and sharpen or replace as necessary.

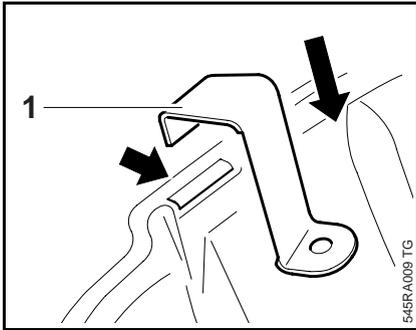
9.2.2 Deflector for Machines with Gearbox



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



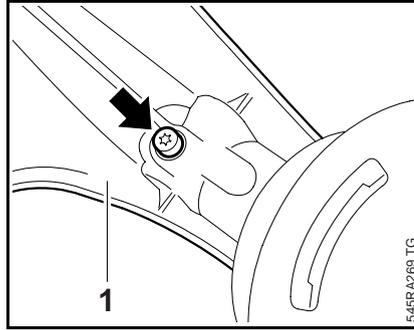
- Take out the screw (arrow).
- Remove the line limiting blade (1), check and sharpen or replace as necessary.



- Push the line limiting blade (1) into its seat (arrow).
- Insert screw and tighten it down firmly.

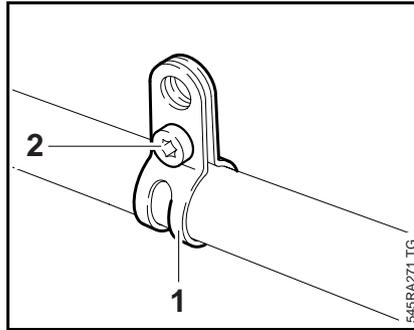
To avoid stripping the thread in the plastic housing, carefully locate screw in existing thread and tighten in down.

- Check the gearbox, repair or replace as necessary – see "KombiTools" service manual.



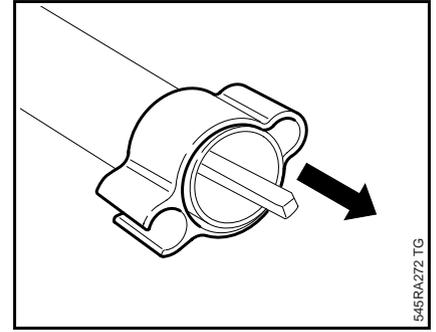
- Locate deflector (1) against the gearbox.
- Insert screw (arrow) and tighten it down firmly.
- Reassemble all other parts in the reverse sequence.

9.2.3 One-part Carrying Ring



- Take out the screw (2), bend open the clamp (1) and remove it.
- Reassemble in the reverse sequence.

9.2.4 Retainer



- Remove the drive tube,  9.1
- Pull off the throttle cable retainer.
- Reassemble in the reverse sequence.

9.3 Gearbox

Refer to "KombiTools" service manual for descriptions of servicing procedures on the gearbox.

10. Special Servicing Tools

New Special Servicing Tools

No.	Part Name	Part No.	Application	Rem.
1	Clamp	5910 890 1100	Removing and installing bearing housing	

No.	Part Name	Part No.	Application	Rem.
1	Locking strip	0000 893 5904	Blocking the crankshaft	
2	Pump	0000 850 1300	Testing engine and carburetor for leaks	
3	Nipple	0000 855 9200	Testing engine and carburetor for leaks	
4	Hose for leakage test	1110 141 8600	Testing carburetor for leaks	
5	Screwdriver Q-SW 8x200	5910 890 2420	Carburetor nuts	
6	Crimping tool	5910 890 8210	Attaching connectors to electrical wires	
7	Torque wrench	5910 890 0301	0.5 to 18 Nm	
8	Torque wrench	5910 890 0311	6 to 80 Nm	
9	Screwdriver Q-T 27x150	5910 890 2400	All IS screws	
10	Hook	5910 893 8800	Removing pickup body	
11	Installing tool	5910 890 2204	Installing and flaring rope guide bushing	
12	Puller	5910 890 4501	Removing limiter cap	
13	Screwdriver	5910 890 2305	Low speed, high speed and idle speed screws	
14	Setting disk	5910 893 6600	Adjusting the Carburetor	
15	Ignition system tester, ZAT 4	5910 850 4503	Testing ignition system	
16	Ignition system tester, ZAT 3	5910 850 4520	Testing ignition system	

11. Servicing Aids

No.	Part Name	Part No.	Application
1	Lubricating grease (225 g tube)	0781 120 1111	Oil seals, sliding and bearing points
2	STIHL gear lubricant for hedge trimmers (225 g tube)	0781 120 1110	Lubricating drive shafts in straight drive tubes
3	STIHL gear lubricant for brushcutters (225 g tube)	0781 120 1118	Lubricating drive shafts in curved drive tubes
4	STIHL special lubricant	0781 417 1315	Bearing bore in rope rotor, rewind spring in starter
5	Press fluid OH 723	0781 957 9000	Rubber elements of AV system, hoses
6	STIHL multipurpose grease	0781 120 1109	High voltage output on ignition module
7	Dirko HT red sealant	0783 830 2000	Crankcase, oil seals (outside)
8	Medium-strength threadlocking adhesive (Loctite 242)	0786 111 2101	
9	High-strength threadlocking adhesive (Loctite 270)	0786 111 2109	
10	High-strength threadlocking adhesive (Loctite 648)	0786 111 2117	
11	Standard commercial solvent-based degreasant containing no chlorinated or halogenated hydrocarbons		Cleaning sealing faces and carburetor, crankshaft stubs and flywheel taper

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