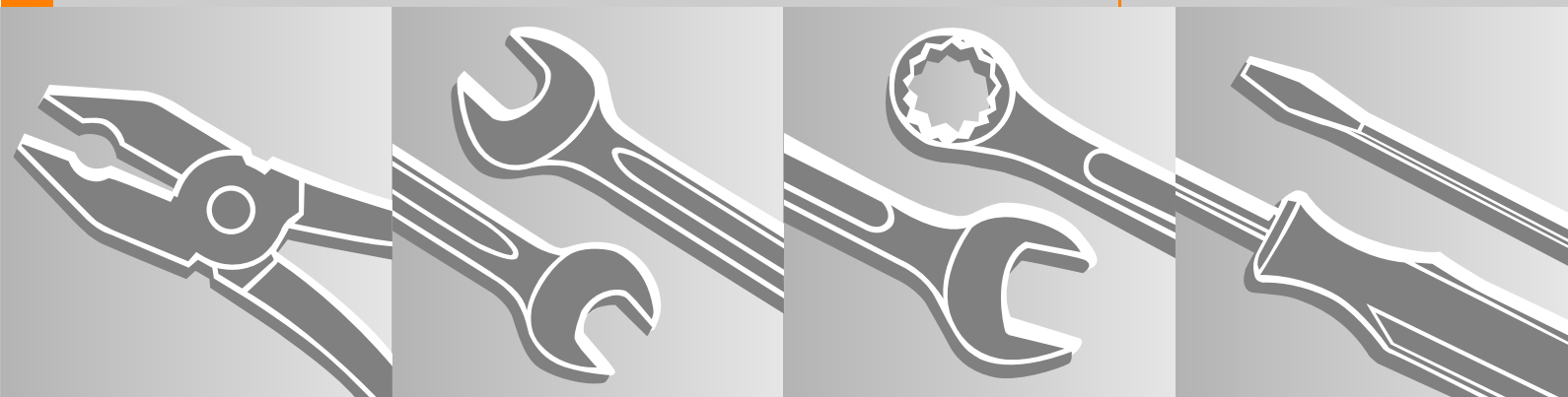


STIHL MS 271, 291

2010-06



Contents

1.	Introduction and Safety Precautions	3	6.	Engine	33	9.	Servicing the AV System	65
1.1	Introduction	3	6.1	Muffler	33	9.1	Annular Buffer and AV Spring on Oil Tank	65
1.2	Safety Precautions	4	6.2	Leakage Test	34	9.2	AV Spring on Fuel Tank	65
			6.2.1	Preparations	34	9.3	AV Spring on Handlebar	66
			6.2.2	Vacuum Test	35	9.4	Stop Buffer at Clutch Side	67
2.	Specifications	5	6.2.3	Pressure Test	35	9.4.1	Stop Buffer at Ignition Side	67
2.1	Engine	5	6.3	Oil Seals	36	9.4.2	Buffers on Filter Base	68
2.2	Fuel System	5	6.4	Shroud	37	9.5	Install new handlebar	68
2.3	Ignition System	5	6.5	Cylinder / Crankshaft	38			
2.4	Chain Lubrication	5	6.6	Crankshaft / Bearings	41			
2.5	Tightening Torques	6	6.7	Piston	42			
			6.8	Piston Rings	44			
3.	Troubleshooting	8	7.	Ignition System	45	10.	Control Levers	70
3.1	Clutch	8	7.1	Ignition Timing	45	10.1	Master Control Lever	70
3.2	Chain Drive, Chain Brake, Chain Tensioner	9	7.2	Preseparator	45	10.1.1	Removing and Installing	70
3.3	Chain Lubrication	11	7.3	Install new ignition module	45	10.2	Throttle Trigger/ Lockout Lever	70
3.4	Rewind Starter	12	7.4	Testing the Ignition Module	47	10.3	Throttle Trigger/ Lockout Lever – QuickStop Super	72
3.5	Ignition System	14	7.5	Spark Plug Boot / Ignition Lead	48	10.3.1	Switch Lever – QuickStop Super	73
3.6	Carburetor	15	7.6	Flywheel	48	10.3.2	Lockout Lever – QuickStop Super	74
3.7	Engine	18	7.7	Short Circuit Wire	49	10.3.3	Choke Rod	75
			7.7.1	Testing	49	10.3.4	Throttle Rod	75
4.	Clutch	19	7.7.2	Removing and Installing	50			
4.1	Clutch Drum	19	7.7.3	Ground Wire	52			
4.2	Clutch	19	7.7.4	Contact Spring	52			
			7.8	Ignition System Troubleshooting	54			
5.	Chain Brake	20	8.	Rewind Starter	57	11.	Chain Lubrication	77
5.1	Checking Operation	20	8.1	General	57	11.1	Pickup Body	77
5.2	Brake Band	20	8.2	Fan housing	57	11.2	Oil Suction Hose	77
5.3	Brake Lever	22	8.3	Pawls	58	11.3	Oil Pump	77
5.4	Brake lever on machines with QuickStop Super	24	8.4	ErgoStart	59	11.4	Valve	79
5.4.1	Adjusting the brake cable	26	8.5	Rope Rotor	60			
5.4.2	Brake cable Removing and Installing	27	8.6	Starter Rope / Grip	60			
5.5	Cam Lever	29	8.7	Tensioning the Rewind Spring	62			
5.6	Pins	30	8.8	Replacing the Rewind Spring	62			
5.7	Chain Tensioner	31						
5.7.1	Quick chain tensioner	31						
5.8	Bar Mounting Studs	32						

STIHL®

© ANDREAS STIHL AG & Co. KG, 2010

Contents

12.	Fuel System	80
12.1	Air Filter	80
12.2	Baffle	80
12.3	Filter Base	80
12.4	Air Guide Shroud	82
12.4.1	Air Guide Shroud – Models with Manual Fuel Pump	82
12.5	Carburetor	84
12.5.1	Leakage Test	85
12.6	Servicing the Carburetor	86
12.6.1	Metering Diaphragm	86
12.6.2	Inlet Needle	86
12.6.3	Pump Diaphragm	87
12.6.4	Levers on Throttle Shaft	88
12.6.5	Adjusting Screws	89
12.7	Adjusting the Carburetor	90
12.7.1	Basic Setting	90
12.7.2	Standard setting	92
12.8	Carburetor Carrier	92
12.9	Intake Manifold	94
12.10	Tank Vent	95
12.10.1	Testing	95
12.10.2	Removing and Installing	95
12.11	Fuel Intake	96
12.11.1	Pickup Body	96
12.11.2	Fuel Hose	96
12.11.3	Fuel Hose – Models with Manual Fuel Pump	99
12.11.4	Manual Fuel Pump	102
12.11.5	Tank Housing	103
13.	Special Servicing Tools	106
14.	Servicing Aids	108

1. Introduction and Safety Precautions

1.1 Introduction

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

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

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

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

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

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

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

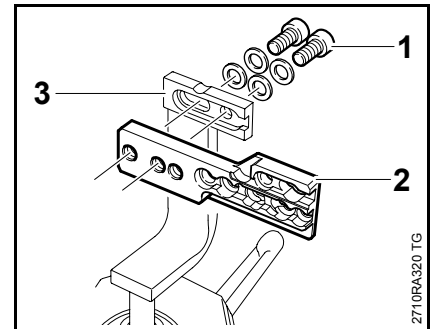
In the descriptions:

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

In the illustrations:

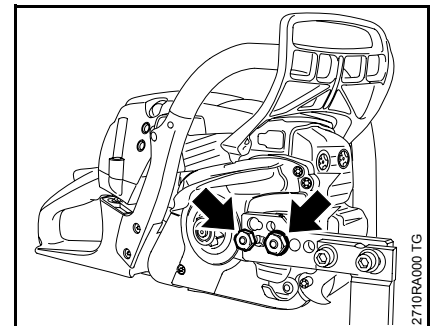
- ➔ Pointer
- ➡ Direction of movement
- 📖 4.2 =Reference to another chapter, i.e. chapter 4.2 in this example.

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



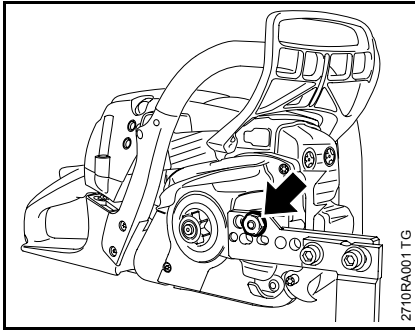
Servicing and repairs are made considerably easier if the machine is mounted to assembly stand (3) 5910 890 3101. To do this, secure the mounting plate (2) 5910 850 1650 to the assembly stand with two screws (1) and washers.

The screws must not project since they, depending on the machine, may damage housings when the machine is clamped in position.



Engage the bar mounting studs in the outer bores in the mounting plate and secure the machine in position with the M 8 nuts (arrows).

Machines with Quick Chain Tensioner




Engage the bar mounting stud in the upper bore in the mounting plate and secure the machine in position with the M 8 nut (arrow).

The machine is held in position on the mounting plate by the screw heads on the engine housing.

Preparations for servicing

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

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

Storing and disposing of oils and fuels

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

1.2 Safety Precautions

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

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

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

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

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

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

Improper handling may result in burns or other serious injuries.

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

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


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

Fuel system – hose barb connectors


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

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

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

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

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

Coat the ends of the hoses and the connectors with STIHL press fluid and then push the new hoses on to the hose barbs,  14.

2. Specifications

2.1 Engine

	MS 271	MS 291
Displacement:	50.2 cm ³	55.5 cm ³
Bore:	44.7 mm	47.0 mm
Stroke:	32.0 mm	32.0 mm
Engine power to ISO 7293:	2.6 kW (3.5 bhp) at 9,500 rpm	2.8 kW (3.8 bhp) at 9,500 rpm
Maximum permissible engine speed with bar and chain:	13,000 rpm	13,000 rpm
Idle speed:	2,800 rpm	2,800 rpm
Clutch:	Centrifugal clutch without linings	Centrifugal clutch without linings
Clutch engages at:	3,600 rpm	3,600 rpm
Crankcase leakage test at gauge pressure:	0.5 bar	
under vacuum:	0.5 bar	

2.2 Fuel System

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

2.3 Ignition System

Air gap between ignition module and fanwheel:	0.20 (+ 0.1/- 0.05) mm
Spark plug (resistor type):	NGK BPMR 7 A
Electrode gap:	0.5 mm

2.4 Chain Lubrication

Speed-controlled oil pump with reciprocating piston	
Oil delivery rate:	8.0 (+/-2.0) cm ³ /min at 10,000 rpm

2.5 Tightening Torques

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

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

Fastener	Thread size	For component	Torque Nm	Remarks
Screw	P 4x12	Cover plate/chain sprocket cover	2.5	B
Screw	P 4x12	Chain tensioner cover/engine housing	1.5	
Screw	P 4x14	Antivibration spring/engine housing	2.0	
Screw	P 5x16	Antivibration spring/tank housing	3.0	
Screw	P 4x12	Brake band/engine housing	2.0	
Screw	P 4x10	Brake cable retainer/ tank housing	2.0	Q
Collar screw	M 8	Collar screw/collar bushing	30.0	1)
Collar screw	M 8/M 10	Collar stud for bar / engine housing	16.0	3)
Collar screw	M 8/ D 8	Collar screw/engine housing	16.0	B
Collar screw	M 8/ D 9	Collar stud for bar / engine housing (repair solution)	16.0	
Screw	P 4x12	Cover, chain brake / engine housing	1.5	
Screw	M 4x9.6	Spark arresting screen/muffler	1.0	
Screw	P 6x32.5	Handlebar/tank housing	7.0	
Screw	P 5x20	Hand guard/fan housing/engine housing	4.0	
Screw	M 5x20	Hand guard/fan housing/engine housing	8.0	
Screw	M 5x14	Shroud / engine housing	5.0	
Screw	P 6x28	Chain catcher/engine housing/bearing plug	6.0	
Screw	P 5x20	Spiked bumper / engine housing, top	4.0	
Screw	P 5x20	Spiked bumper / engine housing, bottom	4.0	
Screw	M 4x12	Manifold/cylinder	3.0	2)
Screw	D 5x18	Bearing plug/cylinder	9.0	2)
Screw	P 5x20	Fan housing / engine housing	4.0	
Screw	P 4x12	Air baffle / engine housing	2.0	
Carrier	M 12x1 L	Carrier / crankshaft	50.0	
Screw	D 4x18	Oil pump/engine pan	4.0	2)
Screw	D 5x18	Muffler / cylinder	9.0	2)
Nut	M 8x1	Flywheel/crankshaft	28.0	4)
Screw	P 4x12	Side plate/engine housing	2.0	
Collar nut	M 5	Carburetor / collar screw, 1st stage, fan side	2.0	
Collar nut	M 5	Carburetor / collar screw, 2nd stage, sprocket side	3.5	
Collar nut	M 5	Carburetor / collar screw, 3rd stage, fan side	3.5	

Fastener	Thread size	For component	Torque Nm	Remarks
Screw	P 5x16	Pre-separator / engine housing	3.0	
	M 14x1.25	Spark plug/cylinder	25.0	
Screw	D 4x18	Ignition module/engine pan	4.0	2)
Screw	D 6x50	Cylinder/engine pan	11.0	
Screw	D 6x35	Cylinder/engine pan	11.0	

Remarks:

- 1) Loctite 270, high strength
- 2) Screws with binding head
- 3) Micro-encapsulated screws
- 4) Degrease crankshaft/flywheel and mount oil-free
- Q) QuickStop Super
- B) Quick chain adjuster

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.

3. Troubleshooting

3.1 Clutch

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

3.2 Chain Drive, Chain Brake, Chain Tensioner

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

Condition	Cause	Remedy
QuickStop Super Coasting brake does not disengage even though lockout lever is depressed	Brake cable stretched	Readjust brake cable
	Brake cable disconnected or broken	Reconnect or replace brake cable
QuickStop Super Coasting brake does not disengage properly even though lockout lever is depressed	Too much free travel on lockout lever	Adjust brake cable
QuickStop Super Braking action of coasting brake inadequate – lockout lever not depressed	Brake cable overtensioned	Adjust brake cable

3.3 Chain Lubrication

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

Condition	Cause	Remedy
Chain receives no oil	Oil inlet hole in guide bar is blocked	Clean oil inlet hole
	Intake hose or pickup body clogged or intake hose ruptured	Fit new intake hose and pickup body
	Valve in oil tank blocked	Clean or replace valve
	Teeth on worm worn	Install new worm
	Oil pump damaged or worn	Install new oil pump
Machine losing chain oil	Oil pump damaged or worn	Install new oil pump
	Oil suction hose connection damaged	Install new oil intake hose
	Engine housing cracked	Install new engine housing
Oil pump delivers insufficient oil	Oil pump damaged or worn	Install new oil pump
	Worm driver is loose	Install new worm

3.4 Rewind Starter

Condition	Cause	Remedy
Starter rope broken	Rope pulled out too vigorously as far as stop or over edge, i.e. not vertically	Fit new starter rope
	Normal wear	Fit new starter rope
Starter rope does not rewind	Rewind spring very dirty or corroded	Clean or replace rewind spring
	Insufficient spring tension	Check rewind spring and increase tension
	Rewind spring broken	Fit new rewind spring
Starter rope cannot be pulled out far enough	Spring overtensioned	Check rewind spring and reduce tension
Starter rope can be pulled out almost without resistance (crankshaft does not turn)	Guide peg on pawl or pawl itself is worn	Fit new pawl
	Spring clip on pawl fatigued	Fit new spring clip
	Spring clip installed wrong	Install spring clip correctly
...Models with ErgoStart	Guide pegs on pawls or pawls themselves are worn	Fit new pawls
	Torsion springs on flywheel fatigued, pawls worn or sticking	Clean seats on pawls or replace pawls and torsion springs if necessary
	Lugs on carrier worn	Install new carrier
	Spring loop in spring housing not attached to carrier	Attach spring loop to carrier
Starter rope is difficult to pull – models with ErgoStart	Spring in spring housing fatigued	Install new spring housing

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

3.5 Ignition System

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 in flywheel has sheared off	Install new flywheel
	Weak magnetization in flywheel	Install new flywheel
	Irregular spark	Check operation of switch shaft/contact spring and ignition module. Damaged insulation or break in ignition lead or short circuit Check ignition lead/module, replace ignition module if necessary Check operation of the spark plug, clean or replace spark plug if necessary.

3.6 Carburetor

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

Condition	Cause	Remedy
Engine will not idle, idle speed too high	Throttle shutter opened too wide by idle speed screw (LA)	Reset idle speed screw (LA) correctly
	Oil seals/engine pan leaking	Seal or replace oil seals/engine pan
	Throttle shutter does not close	Install new carburetor
Engine stops while idling	Idle jet bores or ports blocked	Clean the carburetor
	Low speed screw too rich or too lean	Reset low speed screw (L) correctly
	Setting of idle speed screw LA incorrect – throttle shutter completely closed	Reset idle speed screw (LA) correctly
	Tank vent faulty	Replace tank vent
	Leak on fuel hose from tank to carburetor	Seal connections or install new fuel hose
Saw chain rotates at idle speed	Engine idle speed too high	Readjust with idle speed screw LA (counterclockwise)
	Clutch springs stretched or fatigued	Replace the clutch springs or install new clutch
	Clutch spring hooks broken	Replace the clutch springs

Condition	Cause	Remedy
Engine speed drops quickly under load – low power	Air filter dirty	Clean air filter or replace if necessary
	Throttle shutter not opened fully	Check throttle cable and rod
	Tank vent faulty	Replace tank vent
	Fuel pickup body dirty	Install new pickup body
	Fuel strainer dirty	Clean fuel strainer in carburetor, replace if necessary
	Leak on fuel hose from tank to carburetor	Seal connections or install new fuel hose
	Setting of high speed screw H too rich	Check basic carburetor setting, correct if necessary
	Main jet bores or ports blocked	Clean the carburetor
	Pump diaphragm damaged or fatigued	Fit new pump diaphragm
Engine running extremely rich, has no power and a very low maximum speed	Ignition timing wrong, flywheel out of adjustment – key in flywheel has sheared off	Install new flywheel
	Choke shutter does not open	Check carburetor and choke shaft, service or replace if necessary

3.7 Engine



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

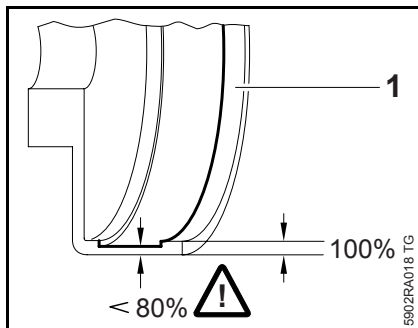
- Air filter
- Fuel system
- Carburetor
- Ignition system

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

4. Clutch

4.1 Clutch Drum

- Remove and install the clutch drum, see instruction manual.
- Remove the needle cage.
- Clean the needle cage and crankshaft stub,  14
- Lubricate the needle cage and crankshaft stub,  14






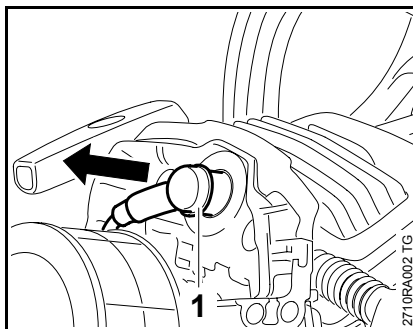
- Inspect the clutch drum (1) for signs of wear.

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

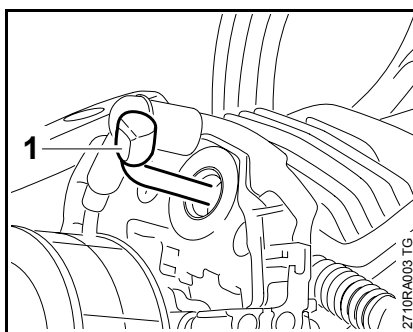
- Install the clutch drum.

4.2 Clutch

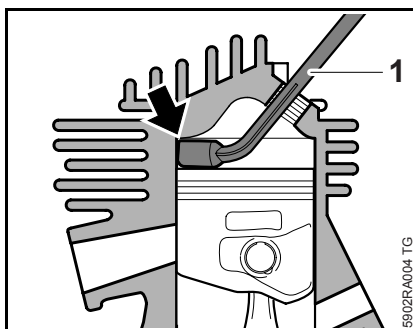
- Troubleshooting,  3
- Remove the clutch drum,  4.1
- Remove the shroud,  6.4.



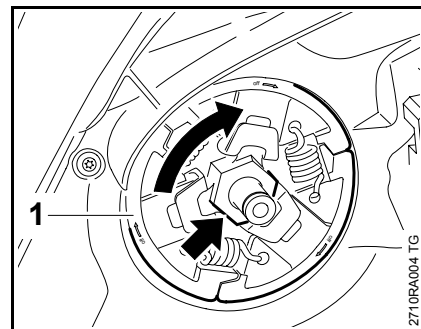
- Pull boot (1) off the spark plug.
- Unscrew the spark plug.



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

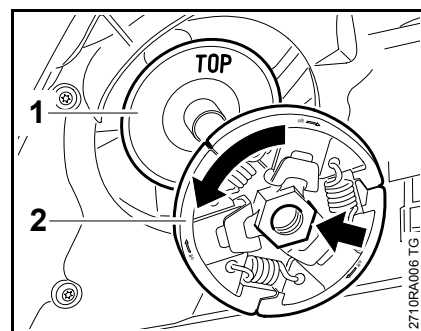


- The locking strip (1) 0000 893 5903 must butt against the cylinder wall (arrow) as shown.



- Apply wrench to hexagon (arrow) and unscrew the clutch (1) – left-hand thread.

Installing



Fit the cover washer (1) so that the word "TOP" faces outwards.

- Position the clutch (2) on the crankshaft stub so that the raised hexagon (arrow) faces outwards.
- Fit the clutch (2) and tighten it down firmly – left-hand thread.
- Remove the locking strip from the cylinder.
- Reassemble all other parts in the reverse sequence.

5. Chain Brake

5.1 Checking Operation

The chain brake is one of the most important safety devices on the chain saw. Its efficiency is measured in terms of the chain braking time, i.e. the time that elapses between activating the brake and the saw chain coming to a complete standstill.

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

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


Machines with QuickStop Super

The clutch drum must rotate freely when the lockout lever is depressed.



With the coasting brake disengaged, open the throttle wide and let go of the lockout lever on the rear handle – the chain must come to an abrupt stop.

All models

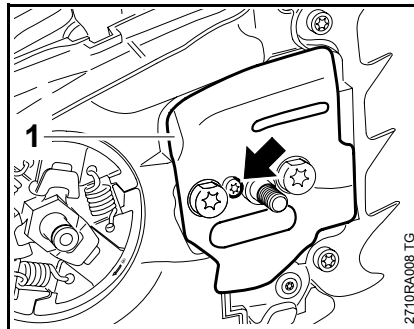
The braking time is in order if deceleration of the saw chain (less than a second) is imperceptible to the eye.

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

5.2 Brake Band

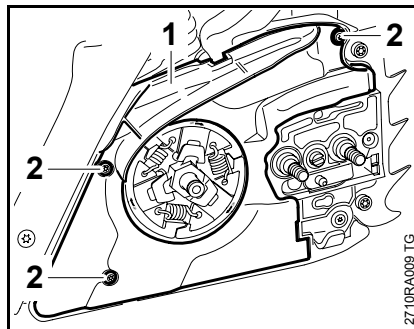
- Remove the clutch drum,  4.1
- Troubleshooting,  3.2

Machines with Quick Chain Tensioner



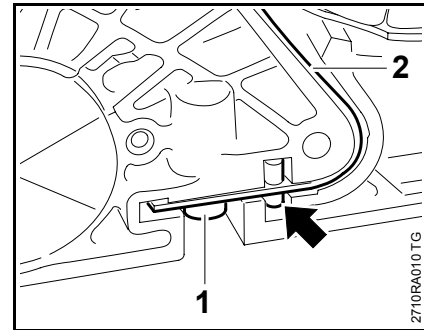
- Take out the screw (arrow) and remove the side plate (1).

All models

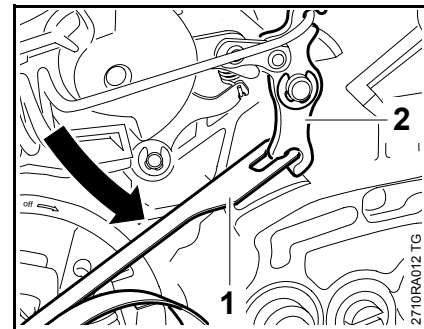


- Take out the screws (2).
- Remove the cover (1).

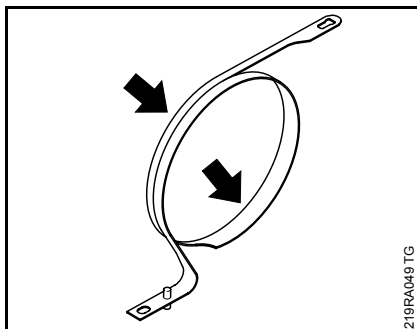
- Engage the chain brake.



- Remove the screw (1) from the underside of the machine.
- Pry the brake band (2) out of its seat (arrow).
- Remove the brake band without overstretching it.
- Disengage the chain brake

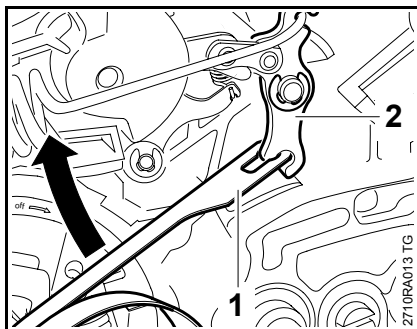


- Turn the brake band (1) to one side and disconnect it from the brake lever (2).



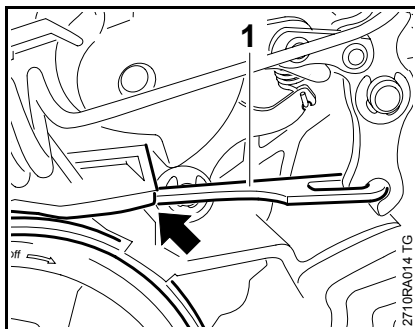
Install a new brake band if there are noticeable signs of wear (large areas on inside diameter and/or parts of outside diameter – arrows) and its remaining thickness is less than 0.6 mm.

Installing



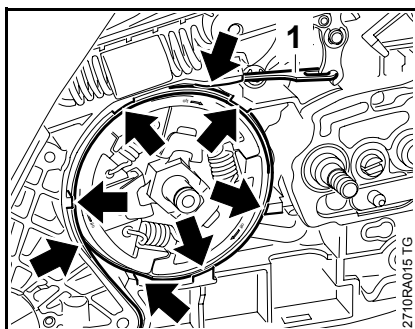
– Disengage the chain brake

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

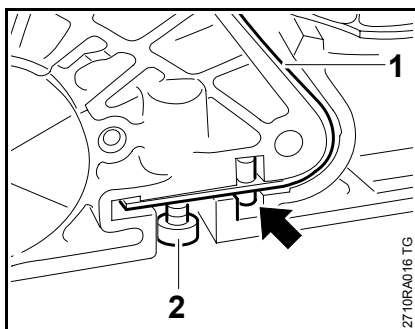


- Position the brake band (1) in the guide (arrow).

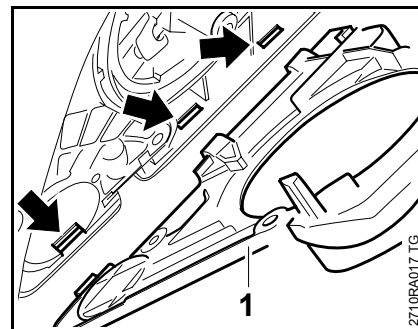
– Engage the chain brake.



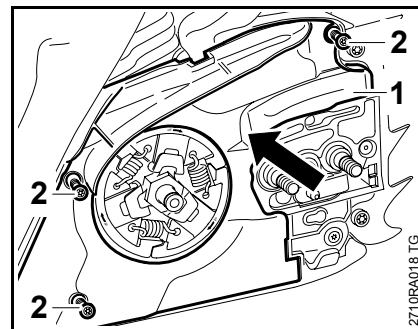
- Push the brake band (1) over the guide lugs (arrows) and into its seat.



- Push the brake band (1) into its seat (arrow) as far as stop.
- Fit the screw (2) on the underside of the machine and tighten it down firmly.



- Engage the cover (1) in the slots (arrows) first.



- Place the cover (1) in position.

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



– Install the clutch drum, [4.1](#)

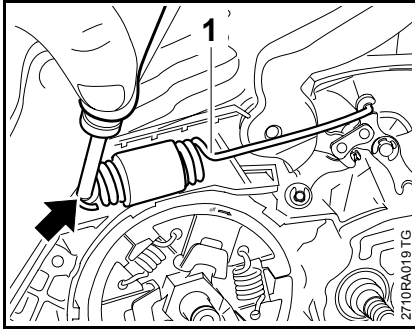
The clutch drum must rotate freely when the chain brake is disengaged.

– Carry out the other checks, [5.1](#)

– Reassemble all other parts in the reverse sequence.



5.3 Brake Lever

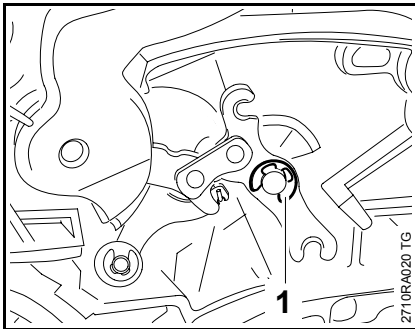
- Troubleshooting,  3.2
- Remove the brake band,  5.2



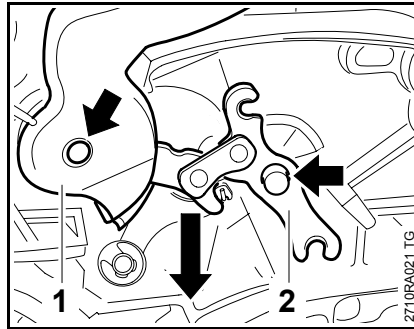
- Engage the chain brake.

The brake spring is now relaxed.

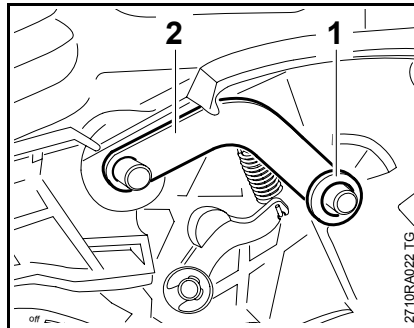
- Use the assembly tool 1117 890 0900 to disconnect the brake spring (1) from the anchor pin (arrow).
- Remove the brake spring from the brake lever.
- Remove the shroud,  6.4
- Remove the fan housing,  8.2



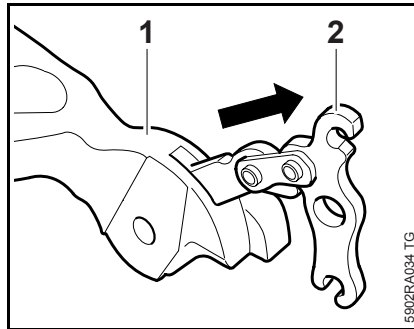
- Remove the retaining ring (1).





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





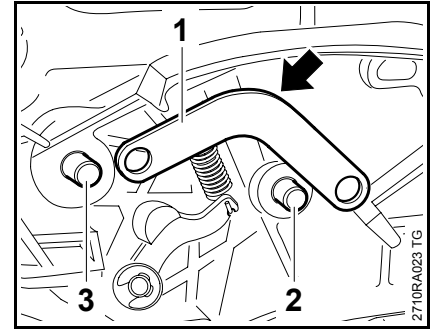
- Remove the spacer washer (1) and strap (2).



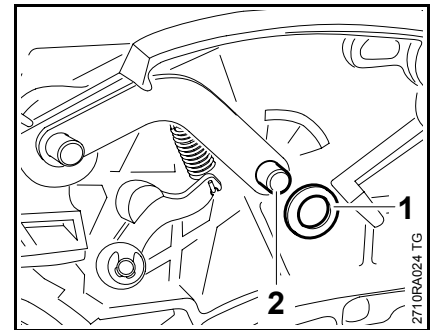
- Take the brake lever (2) out of the hand guard (1).
- Inspect the pivot pins and replace if necessary,  5.6
- Inspect the cam lever and replace if necessary,  5.5

Installing

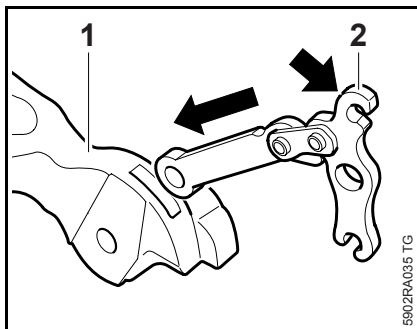
- Clean the pivot pins and disassembled parts,  14
- Lubricate the pivot pins,  14



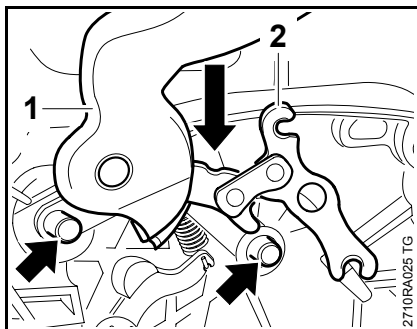
- Push the strap (1), outside radius (arrow) facing up, onto the pins (2) and (3).



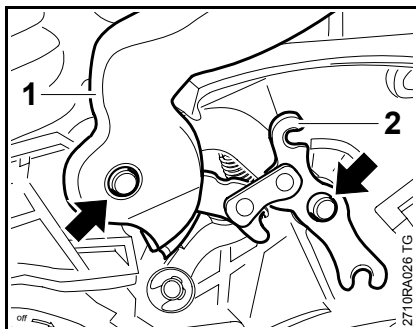
- Slip the spacer washer (1) onto the pin (2).



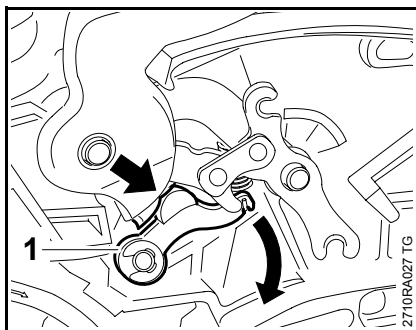
- Hold the brake lever (2) so that the brake spring attachment point (arrow) is at the top.
- Push the brake lever (2) into the recess in the hand guard (1) and line up the holes.



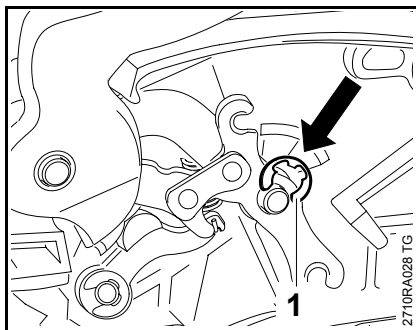
- Push the hand guard (1) with brake lever (2) over the machine until they are positioned against the pivot pins (arrows).



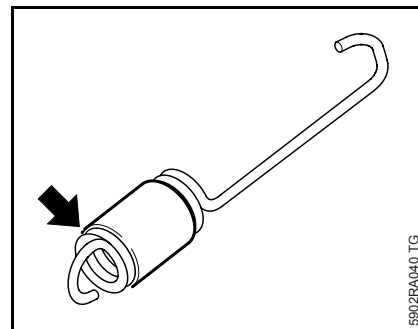
- Lift the bearing boss of the hand guard (1) and the brake lever (2) a little and position them over the pivot pins (arrows).



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

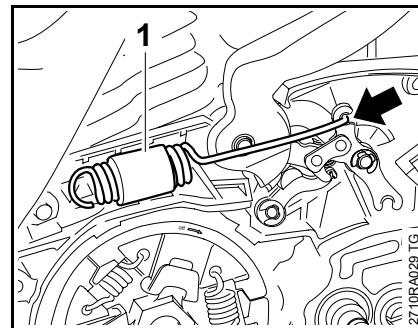


- Fit the retaining ring (1).

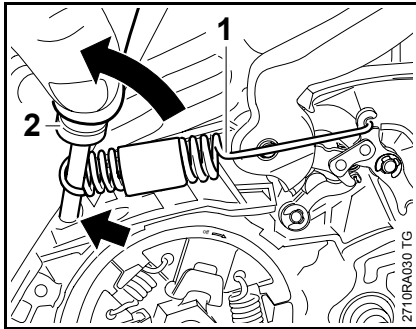


The turns of brake spring must be tightly against one another in the relaxed condition. If this is not the case, replace the brake spring.

- Position the protective tube so that it leaves the first turn (arrow) free.
- If the groove in the spring's anchor pin is worn, install a new pin, [5.6](#)



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

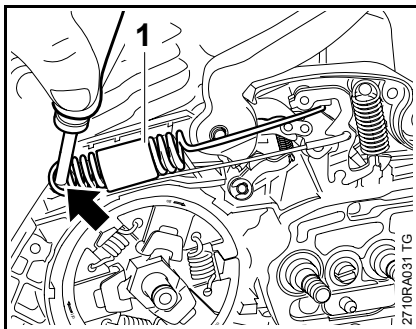


- Use the assembly tool (2) 1117 890 0900 to attach the brake spring (1) to the anchor pin (arrow).

- Lubricate the brake lever, cam lever and slot in hand guard, 14
- Reassemble all other parts in the reverse sequence.

5.4 Brake lever on machines with QuickStop Super

- Troubleshooting, 3.2
- Remove the brake band, 5.2

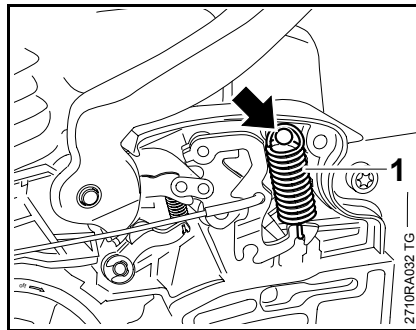


- Engage the chain brake.

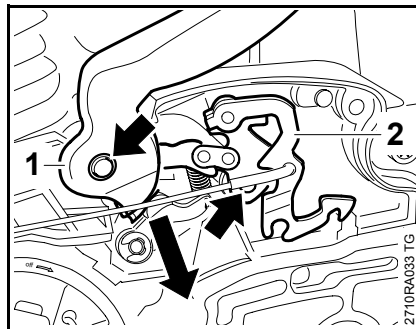
The brake spring is now relaxed.

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

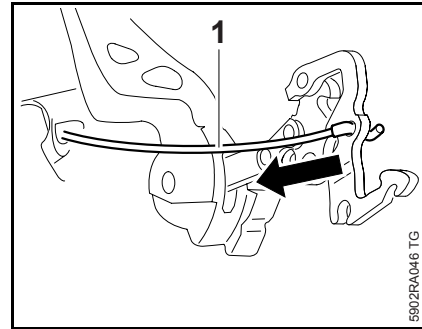
- Remove the brake spring from the brake lever.
- Remove the shroud, 6.4
- Remove the fan housing, 8.2



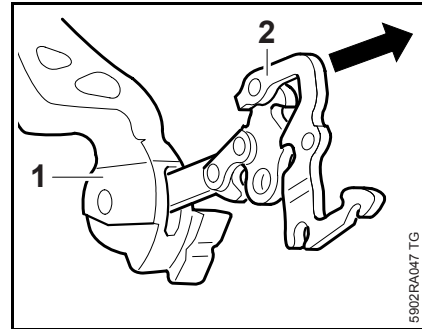
- Disconnect the spring (1) from the anchor pin (arrow).
- Remove the brake spring (1) from the brake lever.



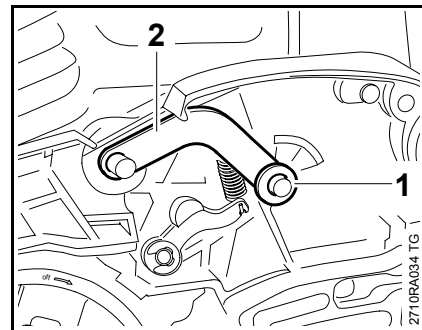
- Pull the hand guard (1) and brake lever (2) off the pivot pins (arrows) together.
- Remove the hand guard and brake lever.



- Disconnect the brake cable (1).





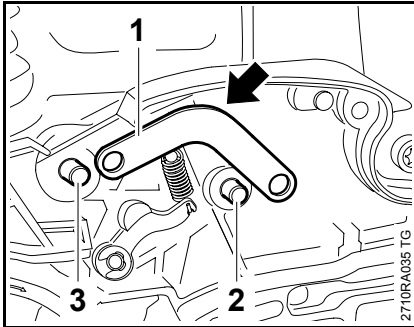
- Take the brake lever (2) out of the hand guard (1).



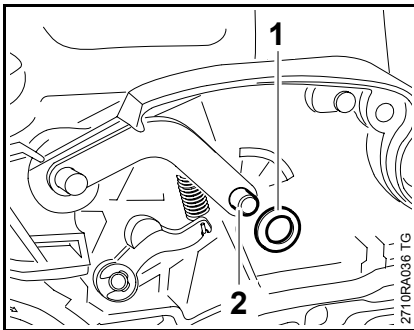
- Remove the spacer washer (1) and strap (2).
- Inspect all pivot pins and replace if necessary, 5.6
- Inspect the cam lever and replace if necessary, 5.5

Installing

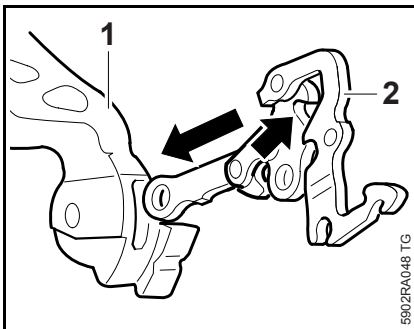
- Clean the pivot pins and disassembled parts,  14
- Lubricate the pivot pins,  14



- Push the strap (1), outside radius (arrow) facing up, onto the pins (2) and (3).

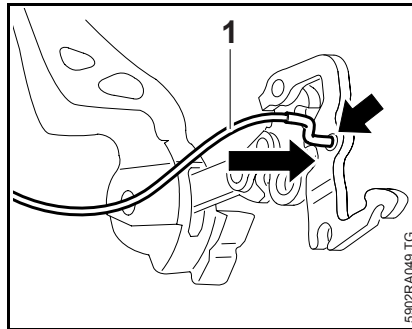


- Slip the spacer washer (1) onto the pin (2).

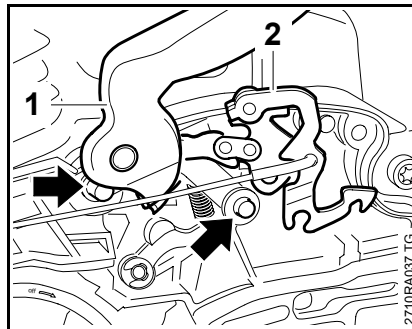


- Hold the brake lever (2) so that the brake spring attachment point (arrow) is at the top.

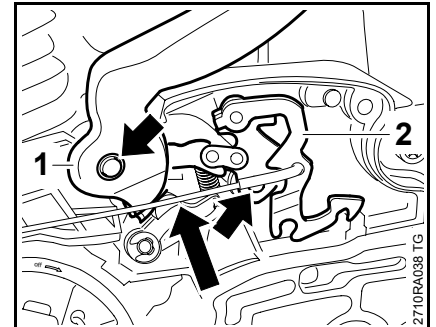
- Push the brake lever (2) into the recess in the hand guard (1) and line up the holes.



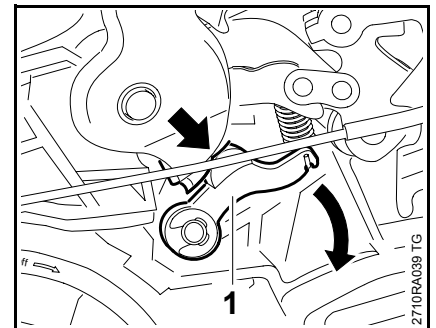
- Fit the brake cable (1) in the hole (arrow).



- Push the hand guard (1) with brake lever (2) over the machine until they are positioned against the pivot pins (arrows).

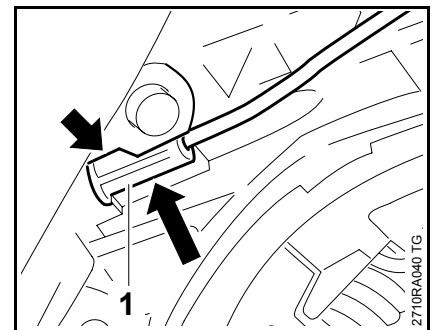


- Lift the bearing boss of the hand guard (1) and the brake lever (2) a little and position them over the pivot pins (arrows).

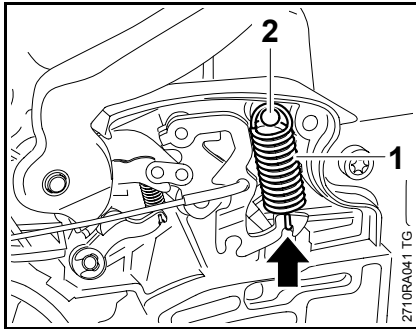


- Turn the cam lever (1) to one side until the cam of the hand guard (arrow) slips passed it.

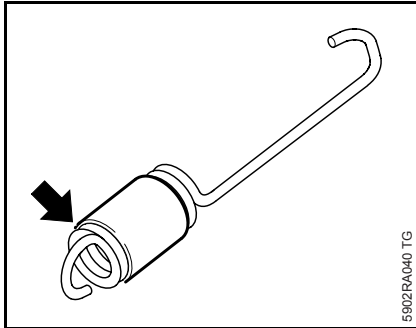
- Push the hand guard bearing boss and the brake lever on to the pivot pins.



- Push the brake cable nipple (1) into its seat (arrow).

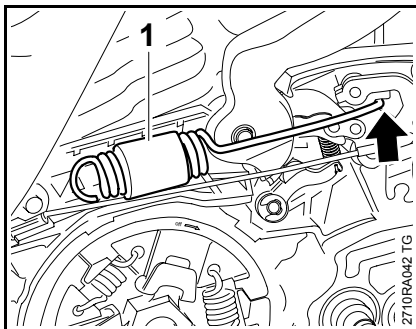


- Attach the spring (1) to the brake lever (arrow) so that the open side of the spring hook (arrow) is visible.
- Attach the spring (1) to the anchor pin (2).

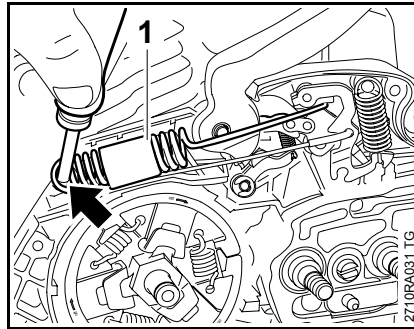


The turns of brake spring must be tightly against one another in the relaxed condition. If this is not the case, replace the brake spring.

- Position the protective tube so that it leaves the first turn (arrow) free.



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



- Use the assembly tool 1117 890 0900 to disconnect the brake spring (1) from the anchor pin (arrow).
- Lubricate the brake lever, cam lever and slot in hand guard, 14
- Adjust the brake cable, 5.4.1
- Reassemble all other parts in the reverse sequence.

5.4.1 Adjusting the brake cable

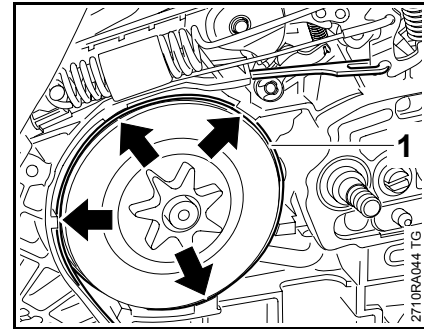
If problems occur on the coasting brake even though the brake band is in order, the reason may be the adjustment of the brake cable.

- Troubleshooting, 3.2

Checking condition and free travel

- Remove the chain brake cover, 5.2

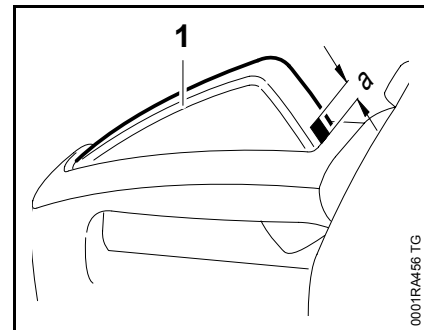
The brake cable must be relaxed when the lockout lever is released.



- Press down the lockout lever (1) and hold it in that position.

The brake band (1) must locate snugly against engine housing (arrows) and the clutch drum must rotate freely.

- Release the lockout lever.



- Carefully press the lockout lever (1) to check free travel.



- Free travel must be within the mark (a).

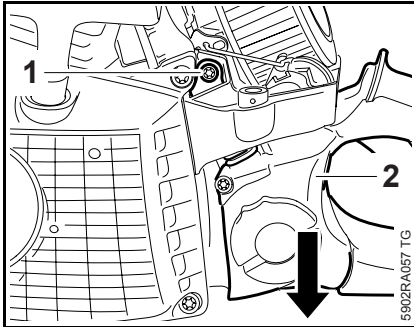
Free travel is the distance the lockout lever (1) can be depressed without the brake lever moving.

A certain free travel is necessary to guarantee correct operation of the coasting brake.

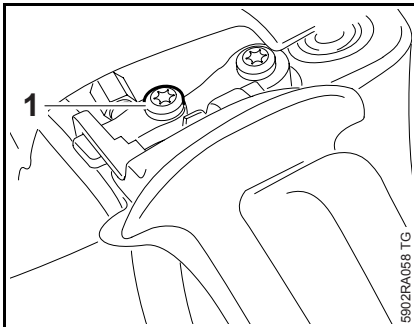
- Troubleshooting, 3.2

Adjust brake cable

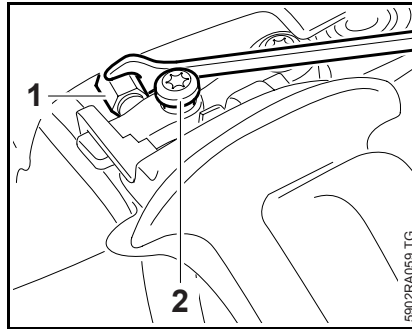
- Remove the throttle rod,  10.3.4
- Fit the handle molding,  10.3



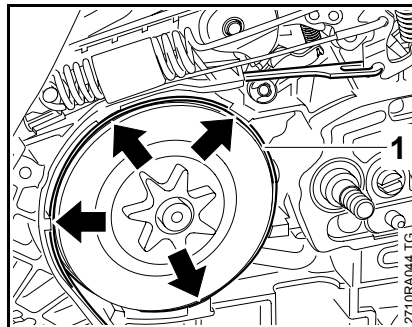
- Take out the screw (1).
- Lower the tank housing (2).



- Loosen the clamp screw (1) on the brake cable retainer.





- Use 6mm open end wrench the set free travel on the adjusting screw (1).
- Turn adjusting screw clockwise to increase free travel.
- Turn adjusting screw counterclockwise to reduce free travel.
- When the setting is correct, tighten down the clamp screw (2) firmly.







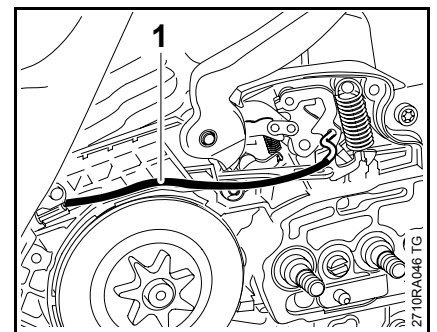
- Press down the lockout lever (1) and hold it in that position.


The brake band (1) must locate snugly against engine housing (arrows) and the clutch drum must rotate freely.

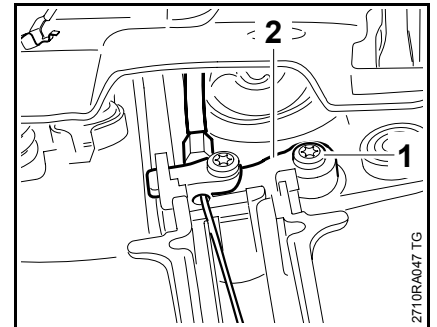
- Install the throttle rod,  10.3.4
- Fit the handle molding,  10.3
- Reassemble all other parts in the reverse sequence.

5.4.2 Brake cable Removing and Installing

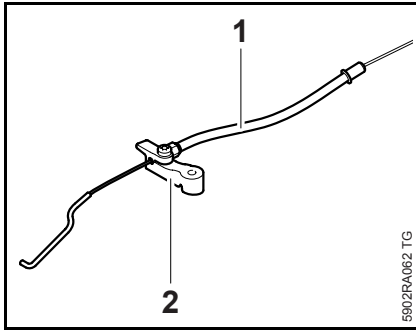
- Disconnect the brake spring,  5.4
- Remove the carburetor,  12.5
- Remove the throttle trigger,  10.3
- Remove the switch lever,  10.3.1



- Pull out the brake cable (1) a little and disconnect it.
- Loosen and lower the tank housing,  12.11.2
- Take care not to stretch the hose.

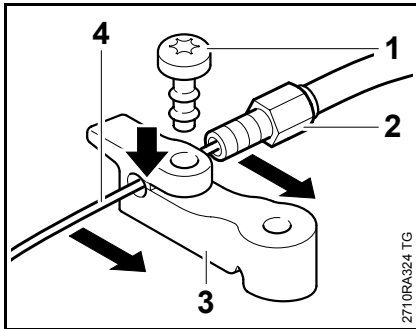


- Take out the screw (1).
- Remove the brake cable retainer (2) with brake cable.



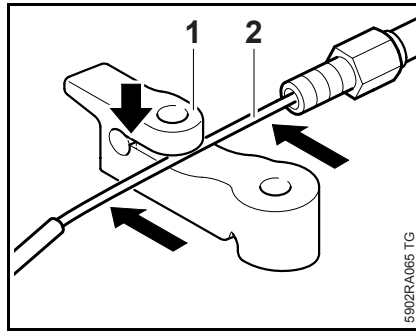
- Check the brake cable (1) and retainer (2), replace if necessary

Disassembling the brake cable and retainer

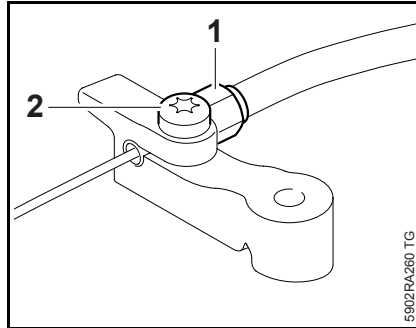


- Loosen the clamp screw (1) and take out the adjusting screw (2).
- Saw through the web (arrow) on the brake cable retainer (3).
- Pull out the brake cable (4).

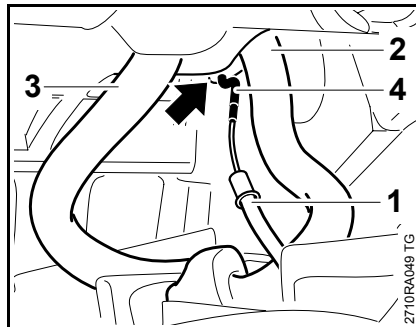
Installing



- Saw through the web (arrow) on the new brake cable retainer (1).
- Position brake cable (2) in bore of the brake cable retainer (1).

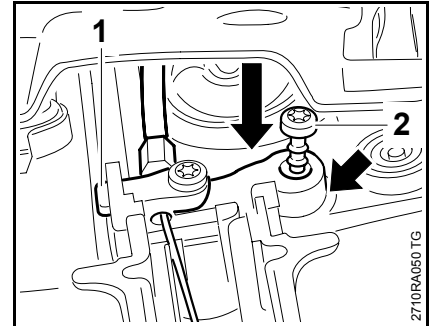


- Screw home the adjusting screw (1) as far as stop.
- Fit the clamp screw (2) and tighten it down firmly.

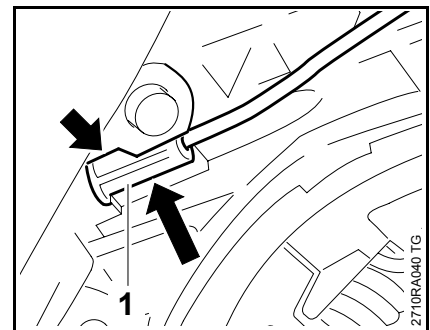


- Thread the brake cable (1) between the fuel hose (2) and fuel return hose (3).

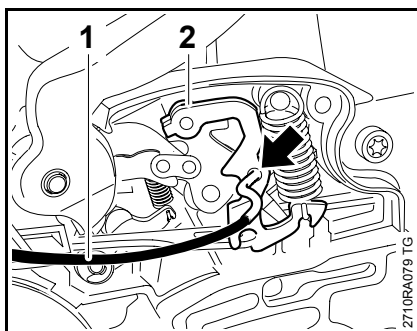
- Push the brake cable (1), short hook (4) first, through the bore (arrow) in the engine housing.



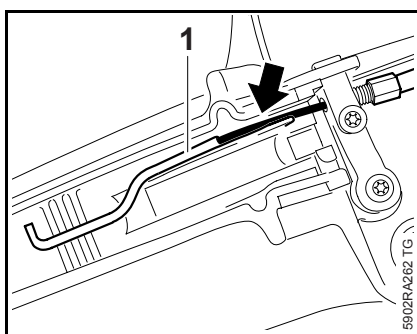
- Slide the brake cable retainer with lug (1) through the opening and press it into its seat (arrow).
- Insert and tighten down the screw (2) firmly.
- Lift the tank housing and secure it in position, 12.11.2
- Check position of fuel hose and correct if necessary, 12.11.2
- Check position of fuel return hose and correct if necessary, 12.11.3



- Push the brake cable nipple (1) into its seat (arrow).



- Attach the brake cable (1) to the bore (arrow) in the brake lever (2).

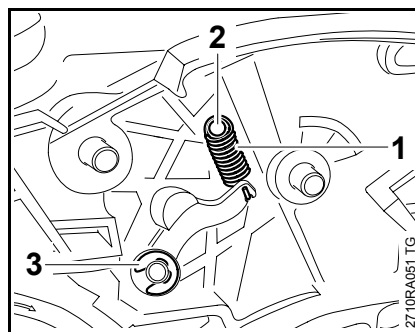


- Position the brake cable (1) in the guide (arrow).
- Install the switch lever, 10.3.1
- Install the throttle trigger, 10.3
- Reassemble all other parts in the reverse sequence.
- Check operation and adjust the brake cable, 5.4.1

5.5 Cam Lever

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

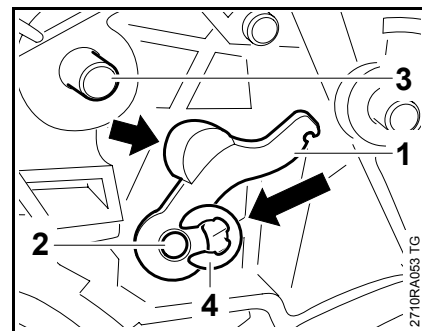
- Remove the brake lever, 5.3, QuickStop Super, 5.4



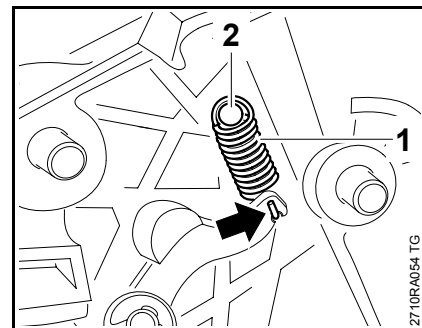
- Disconnect the spring (1) from the anchor pin (2).
- Disconnect the spring (1) from the cam lever and remove it.
- Remove the retaining ring (3).
- Pull off the cam lever.
- Check the cam lever, spring and condition of cam guide in the hand guard and replace if necessary.
- Inspect all pivot pins and replace if necessary, 5.6

Installing

- Lubricate the pivot pins, 14



- Position the cam lever (1) so that its cam (arrow) faces the pin (3).
- Push the cam lever (1) on to the pivot pin (2).
- Fit the retaining ring (4).



- Attach the spring (1) to the cam lever so that the open side of the spring hook (arrow) is visible.
- Attach the spring (1) to the anchor pin (2).

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

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

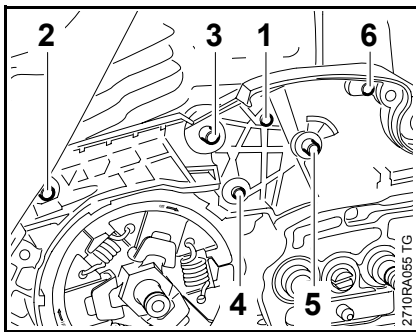
5.6 Pins

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

– The springs may otherwise become detached and pop out.

The pins must be driven home squarely.

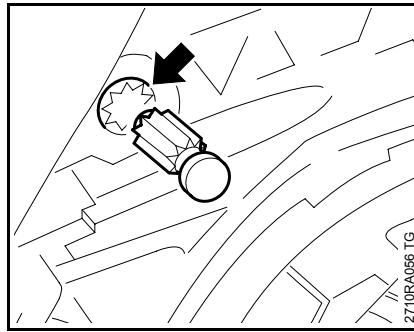
For greater clarity, all parts have been removed from the pins in the following illustrations.



- Remove the pins (1) to (6).

Pin 6 is fitted only on machines with QuickStop Super.

Installing

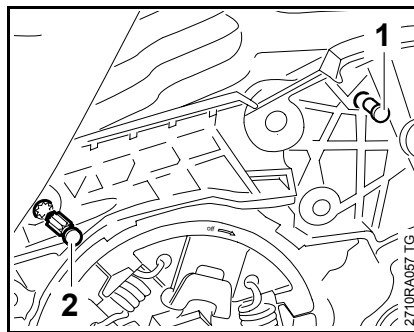


- Before installing the new pin, coat its knurled shank with threadlocking adhesive, 14

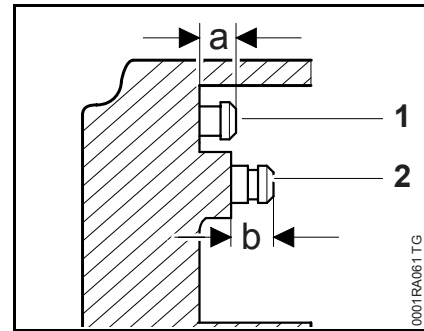
- Position the new pin in the bore (arrow) so that the knurling on the pin meshes with the existing knurling in the bore.

Turn pin back and forth as necessary.

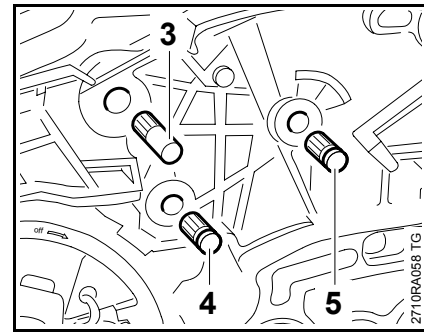
The pins must be driven home squarely.



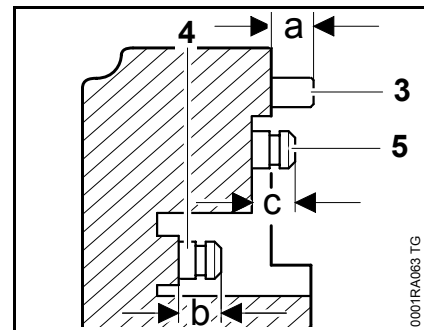
- Drive home the pins (1 and 2) as specified below.



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

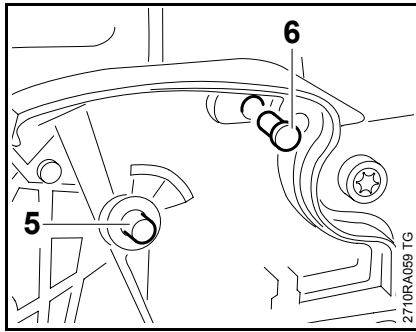


- Drive home the pins (3, 4 and 5) as specified below.

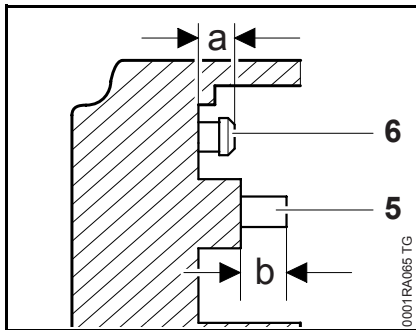


- Pin (3) a = about 11.0 - 11.4 mm
Pin (4) b = about 4.6 - 4.8 mm
Pin (5) c = about 5.1 - 5.3 mm

Machines with QuickStop Super



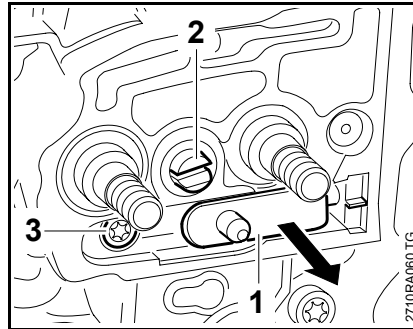
- Drive home the pins (5 and 6) as specified below.



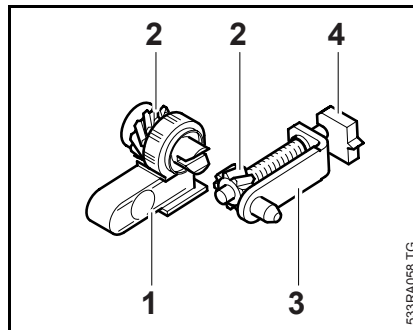
- Pin (5) b = about 10.4 - 10.8 mm
Pin (6) a = about 2.9 - 3.3 mm
- Reassemble all other parts in the reverse sequence.
- Lubricate the brake and cam levers, 14

5.7 Chain Tensioner

- Troubleshooting, 3.2
- Remove the side plate, 5.2



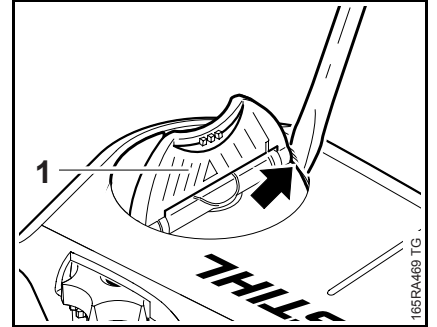
- Turn the spur gear (2) clockwise until the tensioner slide (1) butts against the right-hand end and the screw (3) is visible.
- Take out the screw (3).
- Pull out the spur gear (2) and tensioner slide (1).



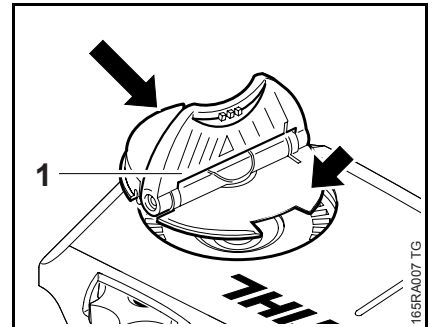
- Inspect the thrust pad (3), support (4), tensioner slide (1), spur gear set (2) and replace as necessary.
- Clean all disassembled parts, 14
- Lubricate thread with STIHL multipurpose grease, 14
- Reassemble in the reverse sequence.

5.7.1 Quick chain tensioner

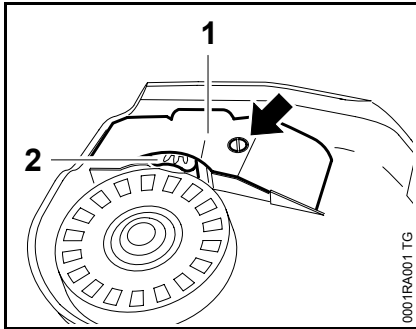
The quick chain tensioner is installed in the sprocket cover.



- Carefully pry the side (arrow) of the wing nut (1) out of the sprocket cover.
- Check the wing nut (1) and replace if necessary



- Swing the wing nut (1) upright.
- Push the wing nut (1), thin side first (see arrow), into the opening and press it down until it snaps into position.

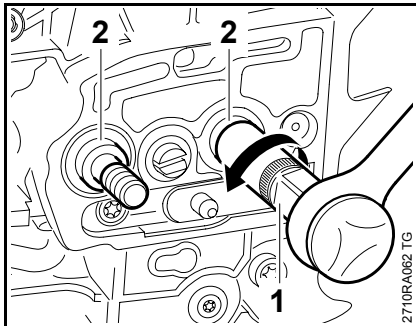


- Take out the screw (arrow).
- Remove the cover plate (1) and adjusting wheel (2).

When installing the adjusting wheel, make sure its teeth face the cover plate.

- Reassemble in the reverse sequence.

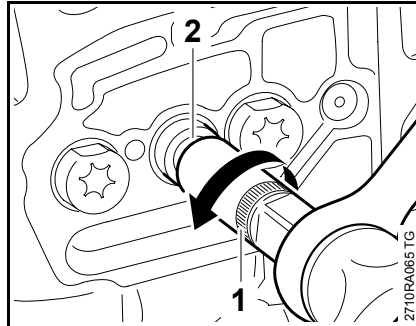
5.8 Bar Mounting Studs



- Push stud puller 5910 893 0501 (1) over the collar studs (2) as far as it will go and unscrew the studs counterclockwise.
- Coat the collar studs with threadlocking adhesive, fit and tighten down firmly, 14

Machines with quick chain tensioner

- Remove the side plate, 5.2

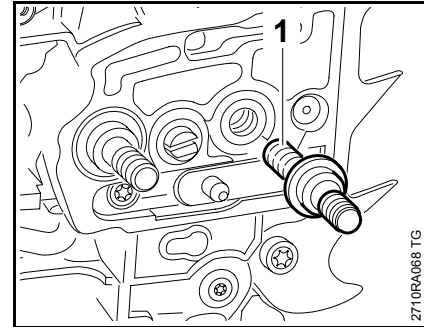


- Push stud puller (1) 5910 893 0501 over the collar stud as far as it will go and unscrew the stud (2) counterclockwise.
- Coat the collar stud with threadlocking adhesive, fit and tighten down firmly, 14
- Reassemble all other parts in the reverse sequence.

Repair solution

If the thread in the engine housing is badly damaged or stripped it will not be possible to tighten the standard collar stud to the specified torque – the security of the collar stud is no longer guaranteed.

Collar stud 0000 664 2411 may be used to rectify such a problem.





- Remove the standard collar stud – do not re-drill the hole.
- Coat the thread (1) of the collar stud 0000 664 2411 with threadlocking adhesive, 14
- Fit the collar stud 0000 664 2411 by hand so that it engages the existing thread.
- Fit collar stud and tighten it down firmly.
- Reassemble all other parts in the reverse sequence.

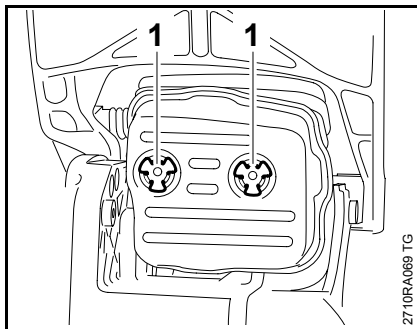
6. Engine

6.1 Muffler

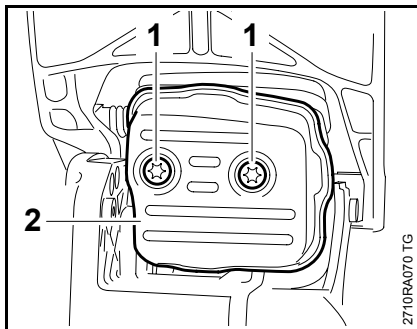
Always check and, if necessary, repair the fuel system, carburetor, air filter and ignition system before looking for faults on the engine.

- Troubleshooting,  3
- Remove the shroud,  6.4

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



- Pry out the plugs (1)
 - do not re-use plugs that have been removed.

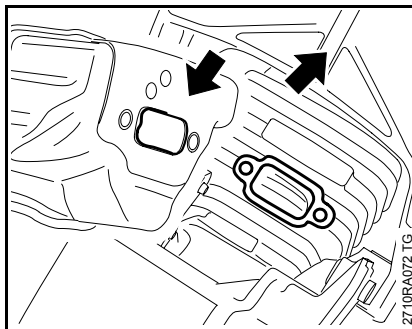


- Take out the screws (1).
- Remove the muffler (2), check and replace if necessary.
- Remove the exhaust gasket.

- Remove and install the spark arresting screen – see instruction manual.

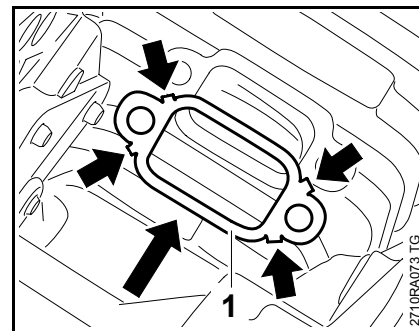
Installing

- Position the machine upright.
- Cover the exhaust port. Remove any dirt from around the cylinder and exhaust port.

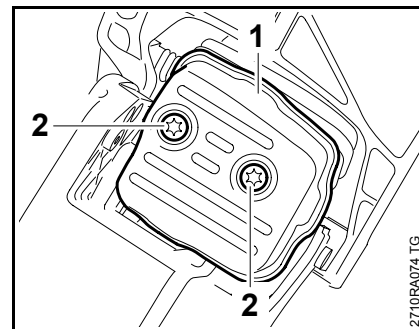


- Check and clean the sealing faces (arrows), remove any gasket residue – make sure there is no gasket residue or dirt in the exhaust port.

Always replace components with damaged sealing faces.



- Position the exhaust gasket (1) so that the tabs (arrows) point towards the cylinder.
- Fit the exhaust gasket (1) and use the tabs (arrows) to line it up on the cylinder.



- Carefully place the muffler (1) in position.
- Check the position of the gasket and fit the screws (2).
- Insert and tighten down the screws (2) firmly.
- Use a blunt tool to push home the new plugs
 - take care not to damage the plugs.

6.2 Leakage Test

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

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

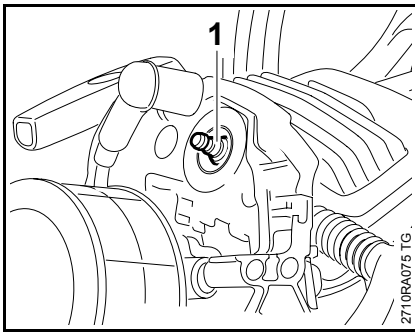
Moreover, the transition from idle speed to part or full throttle is not smooth.

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

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

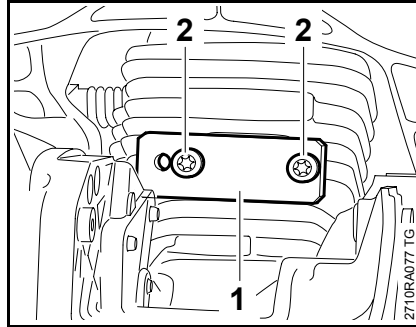
6.2.1 Preparations

- Remove the shroud, 6.4

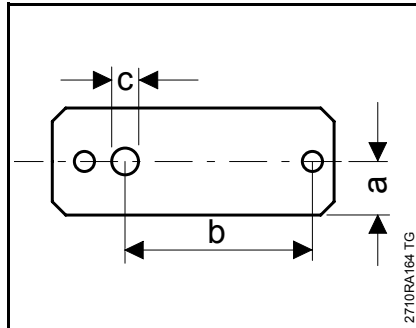


- Pull off the boot and unscrew the spark plug.
- Set the piston to top dead center. This can be checked through the spark plug hole.

- Fit the spark plug (1) and tighten it down firmly.
- Remove the muffler and gasket, 6.1

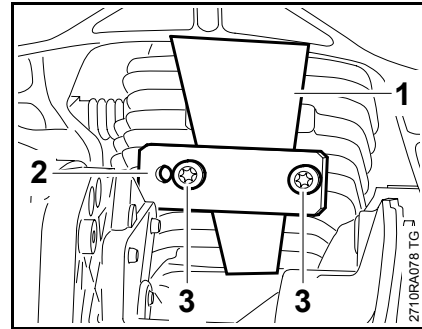


- Fit the test flange (1) 5910 855 4201 on cylinder exhaust port.
- Fit the screws (2)
 - do not tighten down yet.



The flange (1) 4224 893 2501 can be modified as shown.

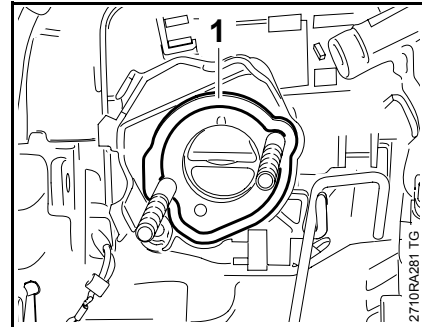
a = 13 mm
b = 39.25 mm
c = 6 mm



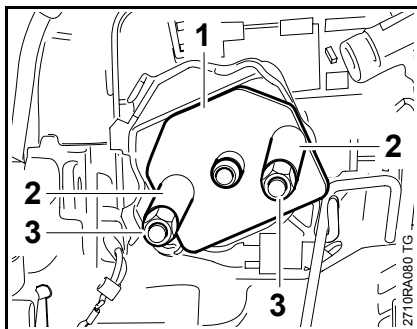
- Fit the sealing plate (1) 0000 855 8106 between the cylinder exhaust port and flange (2).
- Tighten the screws (3) moderately.

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

- Remove the carburetor, 12.5



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



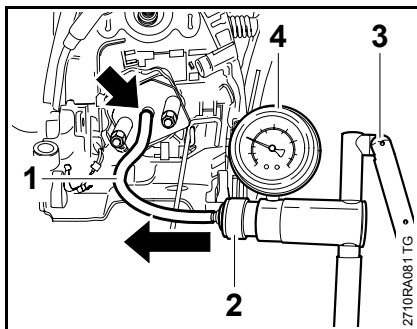
– Line up the flange and fit it over the studs.

- Fit the test flange (1)
1119 850 4201.
- Fit the sleeves (2)
5910 893 1701.
- Fit the nuts (3) and tighten them down firmly.

6.2.2 Vacuum Test

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

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



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

- Push ring (2) to the left
– vacuum test.
- Operate the lever (3) until the pressure gauge (4) indicates a vacuum of 0.5 bar.

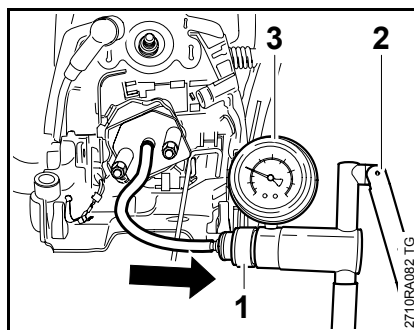
If the vacuum reading remains constant, or rises to no more than 0.3 bar within 20 seconds, it can be assumed that the oil seals are in good condition.

If the pressure continues to rise (reduced vacuum in the engine), the oil seals must be replaced, [6.3](#).

- After finishing the test, push the ring to the right to vent the pump.
- Continue with pressure test, [6.2.3](#)

6.2.3 Pressure Test

Carry out the same preparations as for the vacuum test, [6.2.2](#)

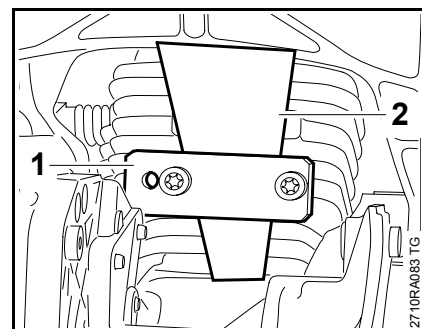


- Push ring (1) to the right
– pressure test.
- Operate the lever (2) until the pressure gauge (3) indicates a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the engine is airtight.

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

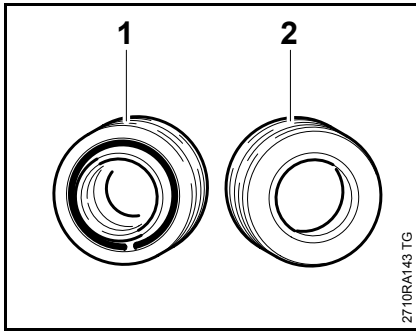
To find the leak, coat the suspect area with soapy water and pressurize the engine again. Bubbles will appear if a leak exists.

- After finishing the test, push the ring to the left to vent the pump – disconnect the hose.
- Remove the flange 1119 850 4201 from the intake manifold.
- Install the carburetor, [12.5](#)



- Remove the flange (1)
5910 855 4201 and sealing plate (2) 0000 855 8106.
- Install the muffler, [6.1](#)
- Use a blunt tool to push home the new plugs
– take care not to damage the plugs.
- Reassemble all other parts in the reverse sequence.

6.3 Oil Seals



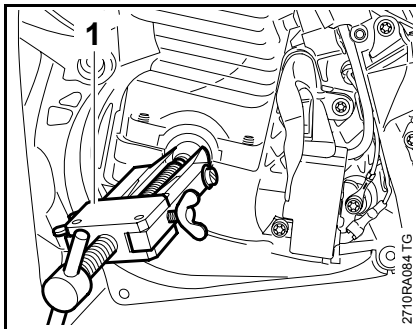
When replacing oil seals, note that a soft oil seal (1) must be installed at the ignition side and a hard oil seal (2) on the clutch side.

Install the soft oil seal with the support ring facing outwards and the hard oil seal with its sealing lip facing the crankshaft.

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

Ignition side

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



Take care not to damage the crankshaft stub.

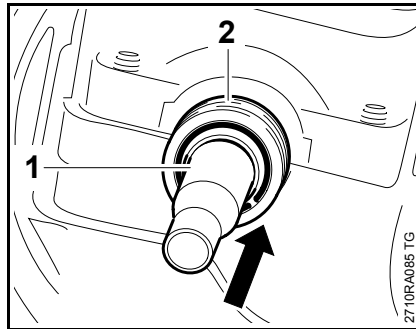
- Free off the oil seal in its seat by tapping it with a suitable tube or a punch.

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

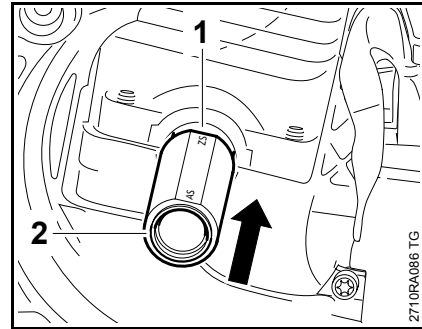
- Clamp the puller arms.
- Pull out the oil seal.

Installing

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



- Fit the installing sleeve (1) 1141 893 4600.
- Slip the oil seal (2), support ring facing outwards, over the installing sleeve.
- Remove the installing sleeve (1).





- Fit press sleeve (2) 1141 893 2401 with the mark "ZS" facing the engine housing.

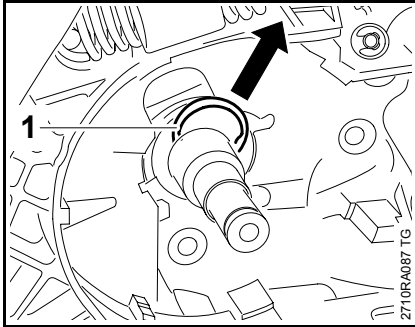
- Use press sleeve (2) 1141 893 2401 to install the oil seal (1).

The seating face must be flat and free from burrs.

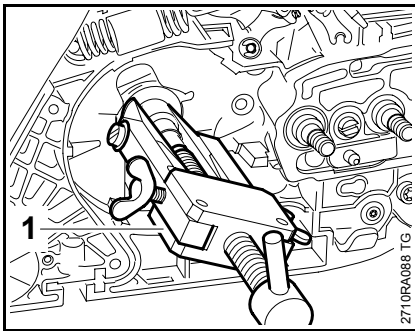
- Degrease the crankshaft taper, 14
- Reassemble all other parts in the reverse sequence.

Clutch side

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




- Remove the retaining ring (1).

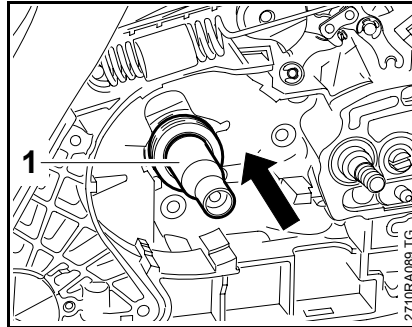


Take care not to damage the crankshaft stub.

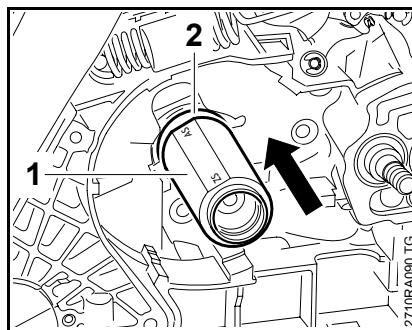
- Free off the oil seal in its seat by tapping it with a suitable tube or a punch.
- Apply puller (1) 5910 890 4400 with No. 3.1 jaws 0000 893 3706.
- Clamp the puller arms.
- Pull out the oil seal.

Installing

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

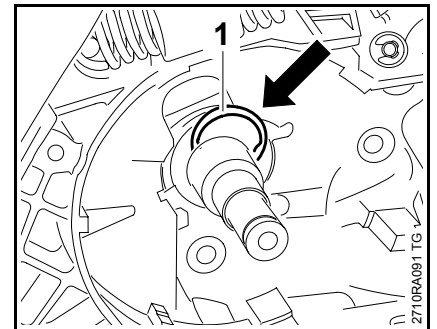


- Fit the installing sleeve (1) 1141 893 4600.
- Slip the oil seal, sealing lip facing the engine housing, over the installing sleeve.
- Remove the installing sleeve (1).



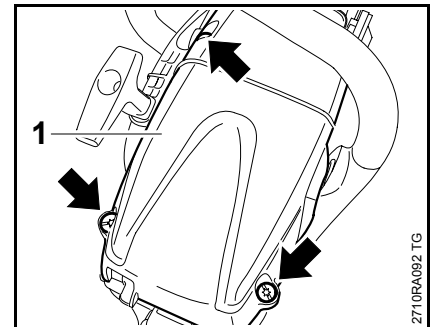
- Fit press sleeve (1) 1141 893 2401 with the mark "AS" facing the engine housing.
- Use press sleeve (1) 1141 893 2401 to install the oil seal (2).

The seating face must be flat and free from burrs.

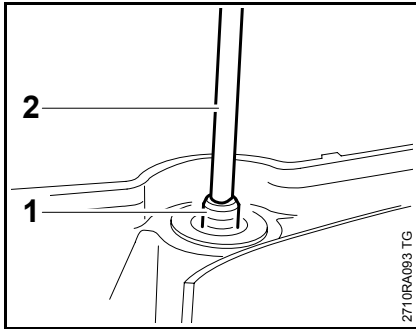


- Fit the retaining ring (1).
- Reassemble all other parts in the reverse sequence.

6.4 Shroud

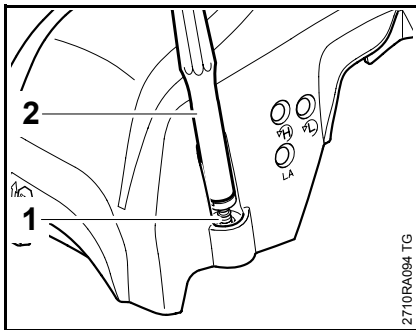


- Take out the screws (arrows).
- Remove the shroud (1).



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

Installing



- Use a drift (2) to drive home the screw (1).
- Reassemble all other parts in the reverse sequence.

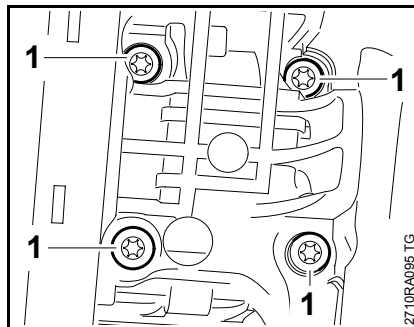
6.5 Cylinder / Crankshaft

The engine pan is screwed to the engine housing.

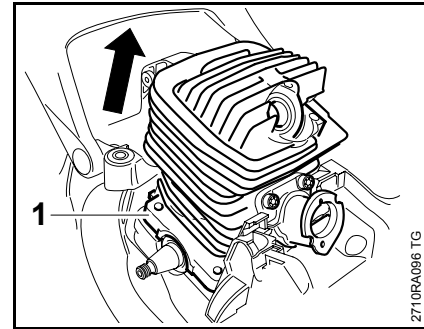
All sealing faces must be in perfect condition. If the sealing faces are damaged, replace the part concerned, 3.7.

- Remove the shroud, 6.4
- Pull off the boot and unscrew the spark plug, 4

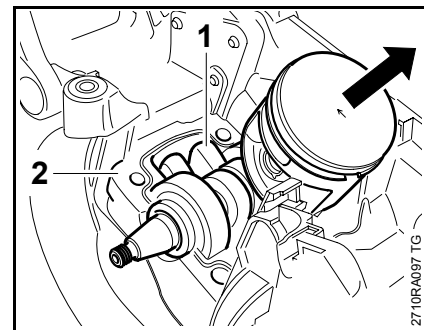
- Remove the fan housing, 8.2
- Remove the flywheel, 7.6
- Remove the clutch, 4
- Remove the oil pump, 11.3
- Remove the filter base, 12.3
- Remove the carburetor, 12.5
- Remove the carburetor carrier, 12.8
- Remove the air guide shroud, 12.4
- Remove the muffler, 6.1
- Remove the handlebar, 9.3
- Remove the tank housing, 12.11.5



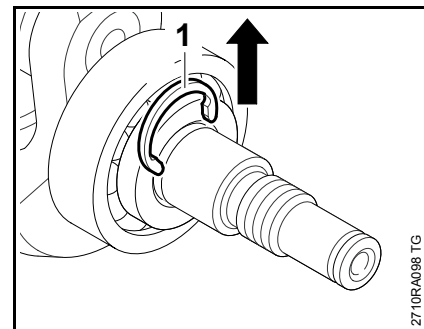
- Remove the screws (1) from the underside of the machine.



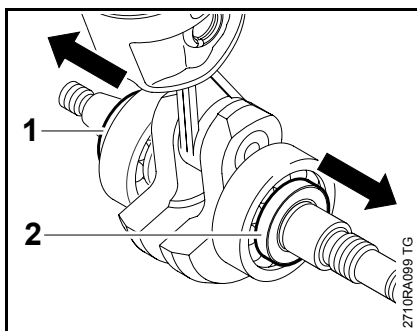
- Carefully release the cylinder (1) from the engine pan and lift it away.



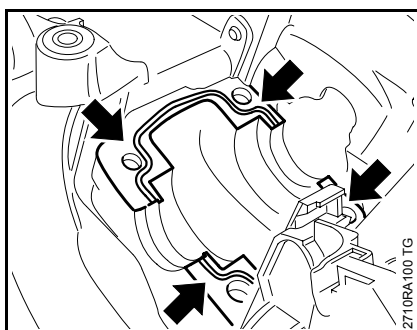
- Loosen the crankshaft (1) at the bearing seats in the engine pan (2) and take it out of the engine housing.



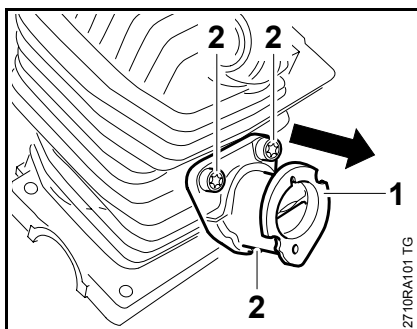
- Remove the retaining ring (1).



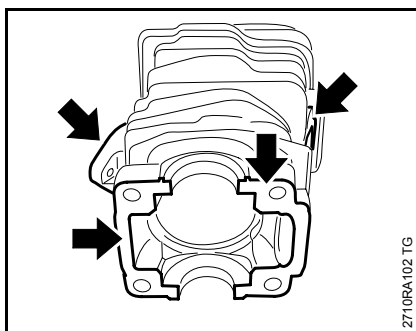
- Remove oil seals (1) and (2) – always install new oil seals.



- Remove sealant from the sealing face (arrows).
- Inspect and clean the sealing face (arrows), [14](#)



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



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

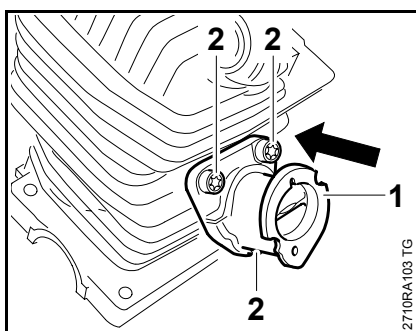
– Clean the sealing face on the intake manifold, [14](#)

When reinstalling the cylinder, always seal it with fresh sealant on the engine pan.

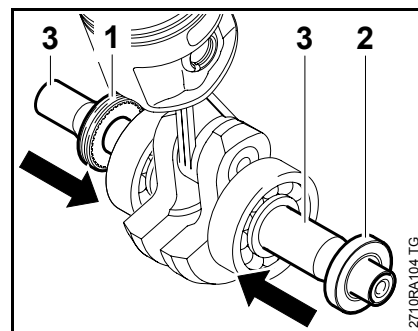
- Check the crankshaft and ball bearings and replace if necessary, [6.6](#)
- Inspect the piston and piston rings and replace if necessary, [6.7](#), [6.8](#)

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

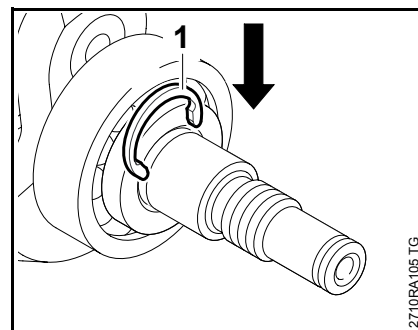
Installing



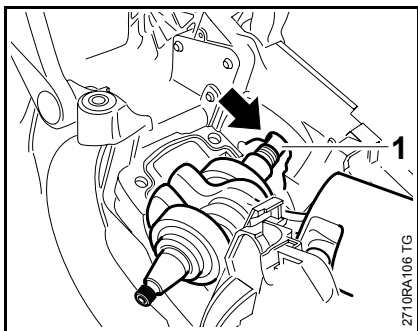
- Fit the manifold (1) in position.
- Insert and tighten down the screws (2) firmly.



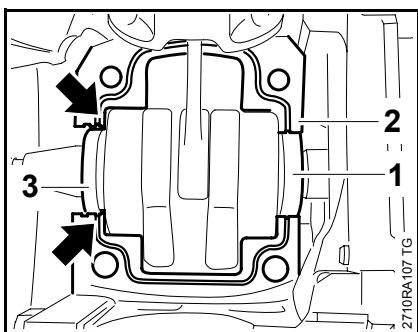
- Fit the installing sleeve (3) 1141 893 4600.
– Use the installing sleeve at both sides.
- Fit the new oil seal (1) with the support ring facing outwards.
- Fit the new oil seal (2) with the sealing lip facing the crankshaft.



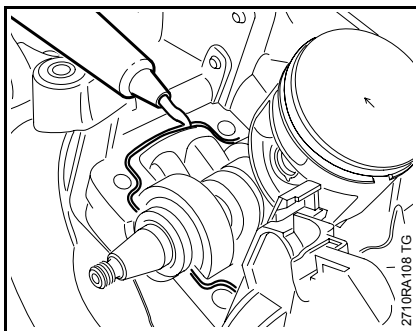
- Fit the retaining ring (1).



- Locate the straight crankshaft stub (1) in the opening (arrow) and position the bearings in their seats in the engine pan.

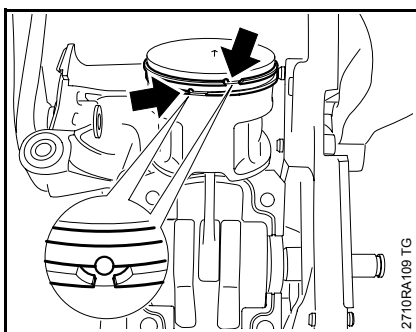


- Push the crankshaft into the bearing seats as far as stop.
- Line up the oil seal (1) at the clutch side so that it is flush with the engine pan (2).
- Line up the oil seal (3) at the ignition side so that it butts against the shoulder (arrows) on the engine pan (2).

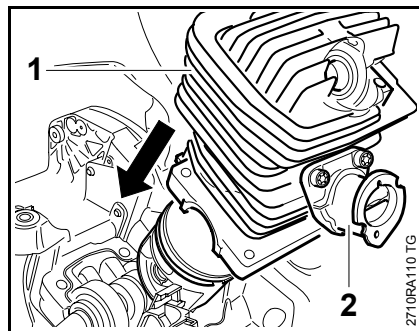


- Apply sealant to the groove in the sealing face, 14

Do not coat oil seals with sealant.



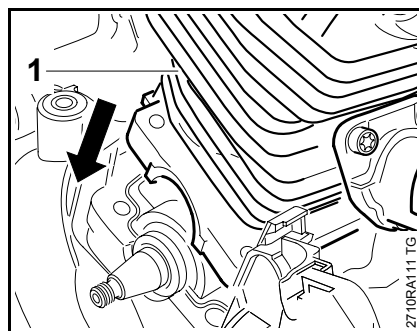
- Lubricate the piston, piston rings and cylinder wall with oil, 14
- Install the piston rings so that the radii at the ring gaps meet at the fixing pins in the piston grooves (arrows).



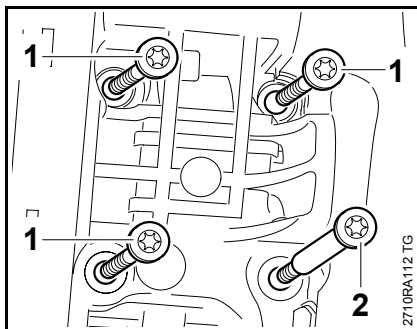
- Position the cylinder (1) so that the manifold (2) points towards the tank housing.

When pushing the cylinder onto the piston, check that the gaps in the piston rings meet at the fixing pins – they might otherwise break.

- Place the cylinder on the piston and carefully slide it onto the piston – do not turn rotate.



- Push home the cylinder (1) as far as stop and hold it there.



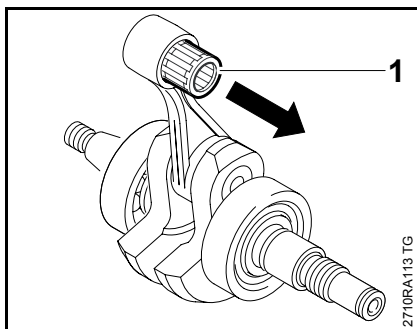
- Hold the cylinder steady and insert screws (1) and screw with collar (2) in the underside of the engine housing.
- Tighten down the screws firmly in a crosswise pattern.
- Reassemble all other parts in the reverse sequence.

6.6 Crankshaft / Bearings

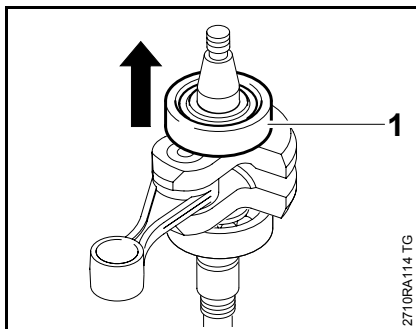
- Remove the cylinder, 6.5
- Remove the crankshaft and pull off the oil seals, 6.5

Always install new oil seals after removing the crankshaft, 6.5

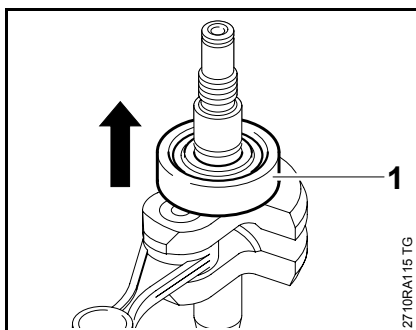
- Remove the piston, 6.7



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



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



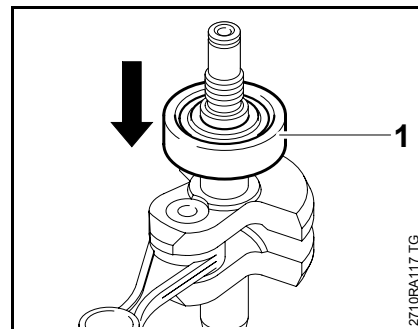
- Pull the ball bearing (1) off the straight crankshaft stub (clutch side).

The crankshaft, connecting rod and needle bearing form an inseparable unit.

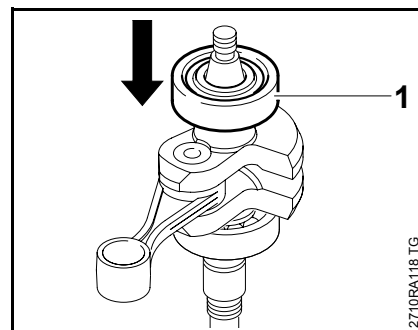
When fitting a replacement crankshaft, always install new ball bearings and oil seals.

Before installing, clean the crankshaft, 14

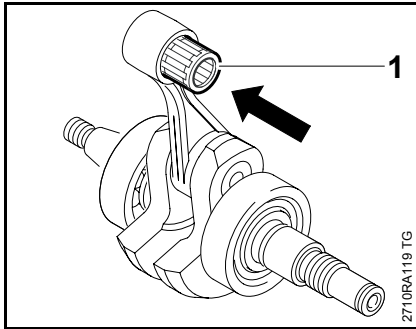
Heated ball bearings must be installed quickly because the crankshaft stubs absorb heat and expand.




- Position the ball bearing (1) with its open side facing the crankshaft.
- Heat the inner bearing race to about 150°C (300°F).
- Push the ball bearing onto the tapered crankshaft stub (clutch side) as far as stop.





- Position the ball bearing (1) with its open side facing the crankshaft.
- Heat the inner bearing race to about 150°C (300°F).
- Push the ball bearing onto the straight crankshaft stub (ignition side) as far as stop.



- Lubricate the needle cage (1) with oil and push it into the connecting rod.


– Install the piston,  6.7


– Install the crankshaft and new oil seals,  6.5

– Install the cylinder,  6.5

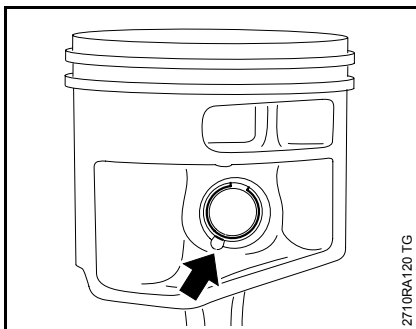
– Reassemble all other parts in the reverse sequence.

6.7 Piston

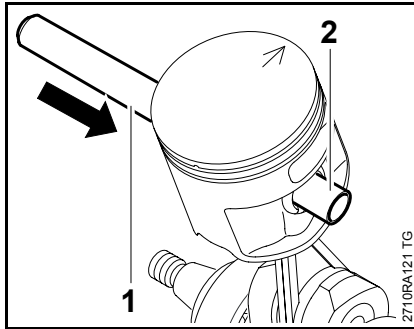
– Remove the cylinder,  6.5

– Remove the crankshaft,  6.6

The assembly drift passes through the installed snap ring. Therefore, only one snap ring needs to be removed.



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




- Slide the assembly drift (1) 1110 893 4700 through the installed snap ring and push the piston pin (2) out of the piston.

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

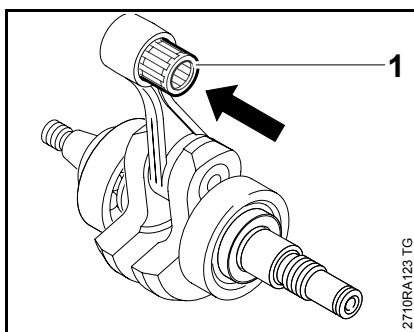
Hold the piston steady during this process to ensure that no jolts are transmitted to the connecting rod.

– Remove the piston.

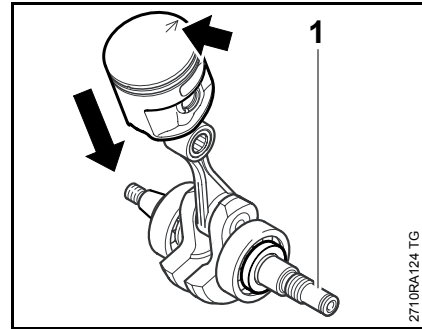
– Inspect the piston rings and replace if necessary,  6.8

Installing

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

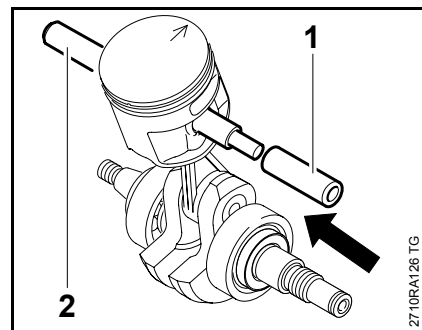


- Lubricate the needle cage (1) with oil and push it into the connecting rod.



- Position the piston as shown so that the arrow (arrow) points to the rear and the straight crankshaft stub (1) is on the right – the arrow must point in the direction of the exhaust port.

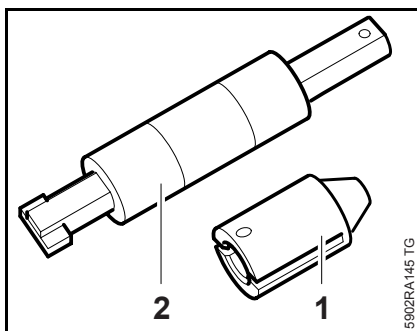
– Place the piston on the connecting rod.



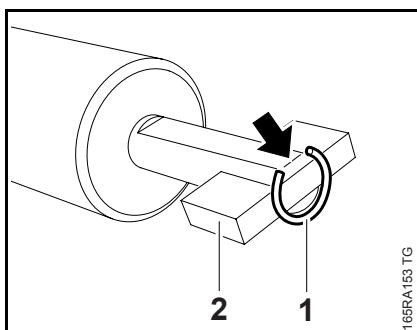
- Push the assembly drift (2) 1110 893 4700 into the piston, at side with snap ring, and through the small end (needle cage) – the piston is aligned.

– Lubricate the piston pin (1) with oil.

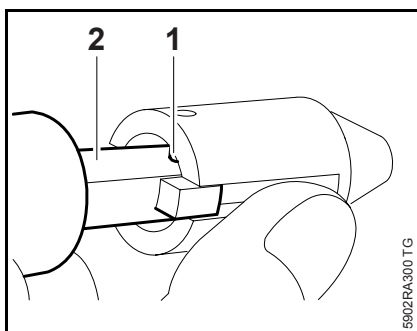
- Fit the piston pin (1) on the assembly drift (2) and slide it into the piston.



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

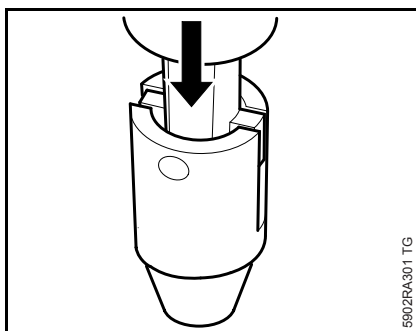


- Attach the snap ring (1) to the magnet (2) so that the snap ring gap is on the flat side of the tool's shank (arrow).



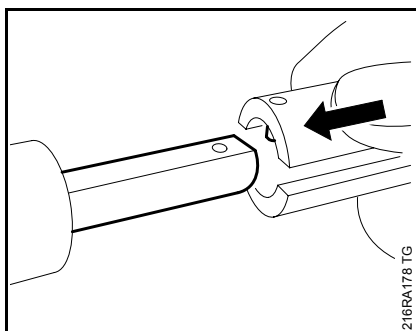
- Push the large slotted diameter of the sleeve over the magnet and snap ring.

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

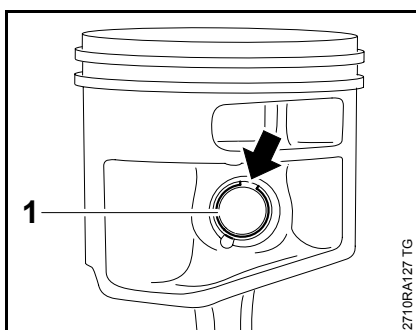


- Press the installing tool downwards into the sleeve until the magnet butts against the end of the guide slot.

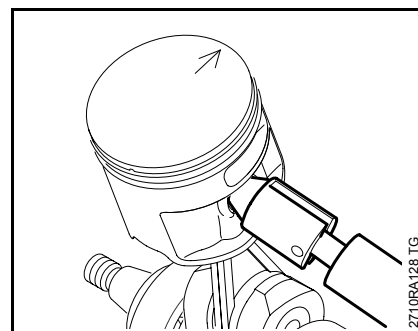
Use a suitable base.



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

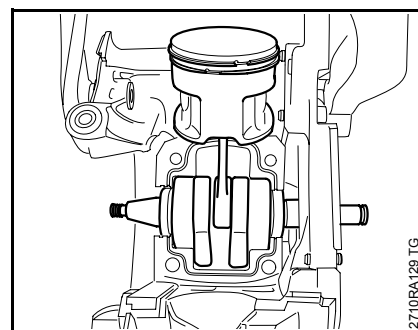


Fit the snap ring (1) so that its gap (arrow) is on the piston's vertical axis (it must point up).




- Apply the installing tool 5910 890 2210 with the sleeve's taper against the piston boss, hold the piston steady, center the tool shank exactly and press home until the snap ring slips into the groove.

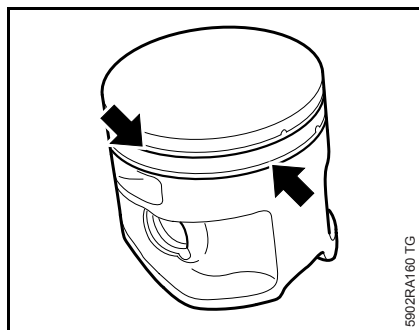
Make sure the tool shank is held square on the piston pin axis.



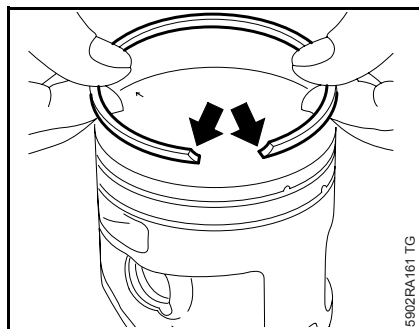
- Inspect the piston rings and replace if necessary, 6.8
- Install the crankshaft and new oil seals, 6.5
- Install the cylinder, 6.5
- Reassemble all other parts in the reverse sequence.

6.8 Piston Rings

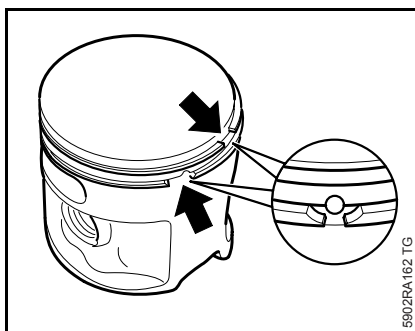
- Remove the piston,  6.7
- Remove the piston rings from the piston.




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




- Position the new piston rings so that the radii face upward (arrows).



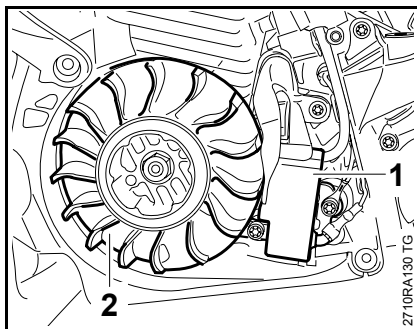
- Carefully fit the piston rings over the piston
– they might otherwise break.
- Install the piston rings so that the radii at the ring gap meet at the fixing pins in the piston grooves (arrows).
- Check correct installed position of the piston rings (arrows).
- Install the piston,  6.7
- Reassemble all other parts in the reverse sequence.

7. Ignition System

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

Troubleshooting on the ignition system should always begin at the spark plug,  3.5

- Remove the fan housing,  8.2



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

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

1. High voltage output with fixed ignition lead.
2. Connector tag for the short circuit wire.

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

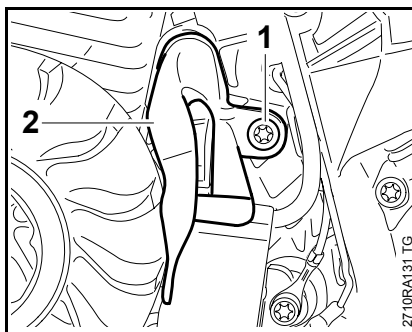
7.1 Ignition Timing

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

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



7.2 Preseparator

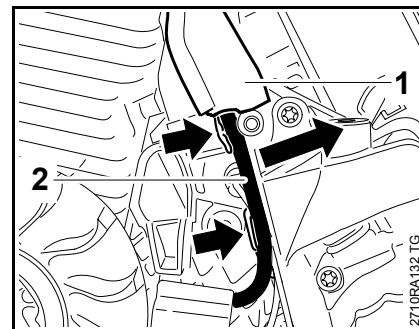
- Remove the fan housing,  8.2



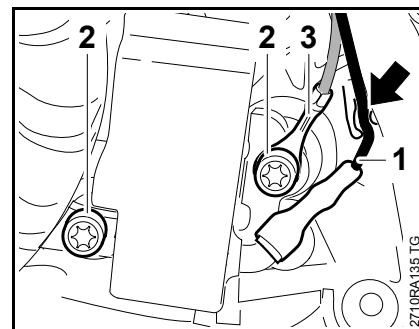
- Take out the screw (1).
- Check the preseparator (2) and replace if necessary
- Reassemble in the reverse sequence.



7.3 Install new ignition module

- Remove the fan housing,  8.2
- Pull the boot off the spark plug.
- Remove the preseparator,  7.2

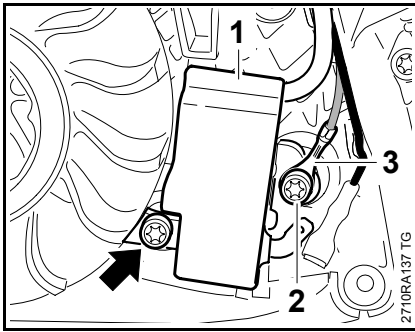


- Lift the air guide shroud (1) a little and pull the ignition lead (2) out of the guides (arrows)
 - take care not to distort the air guide shroud.



- Pull the short circuit wire (1) out of the guide (arrow) and take it away.
- Take out the screws (2).
- Remove the ground wire (3).
- Remove the ignition module.
- Check ignition lead, replace ignition module if necessary
- Check the spark plug boot and replace if necessary,  7.5
- Troubleshooting,  3.5

Installing

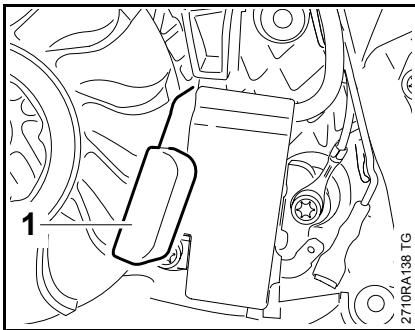


- Fit the ignition module (1) and insert the screw (arrow) – do not tighten down yet.

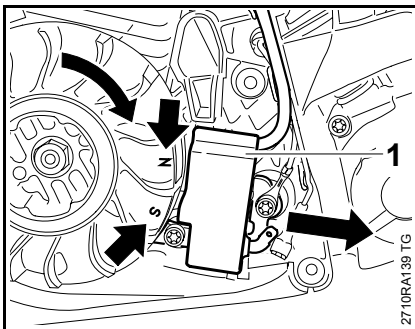
The ground wire must be positioned in the guide under the short circuit wire.

The crimped side of the ground wire terminal must face the screw head.

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

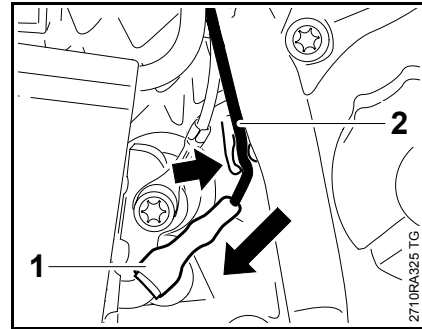


- Push the ignition module back and slide the setting gauge (1) 1111 890 6400 between the arms of the ignition module and the flywheel magnet.



The setting gauge is not shown in the illustration.

- Push the ignition module (1) back and hold it there.
- The flywheel must move freely.
- Rotate the flywheel until the magnet poles (arrows) are next to the ignition module (1).
- Press the ignition module (1) against the setting gauge.
- Position the ground wire terminal so that it points towards the cable guide – hold it steady when tightening and make sure it does not twist.
- Tighten down the screws firmly.
- Remove the setting gauge.
- Check operation.
 - Rotate the flywheel and make sure it does not touch the ignition module.



Crimped side of terminal (1) must face the engine housing.

- Connect the short circuit wire terminal (1) – the terminal must be pushed fully home.
- Press the short circuit wire (2) fully into the guide (arrow).



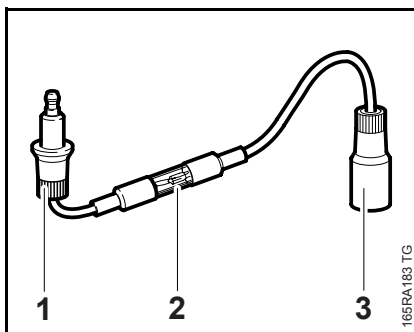
- Lift the air guide shroud (1) a little and push the ignition lead (2) into position – take care not to distort the air guide shroud.
- Starting at the ignition module, press the ignition lead (2) into the guides (arrows).
- Reassemble all other parts in the reverse sequence.

7.4 Testing the Ignition Module

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

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

Using ZAT 4 ignition system 5910 850 4503



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

High voltage – risk of electric shock.

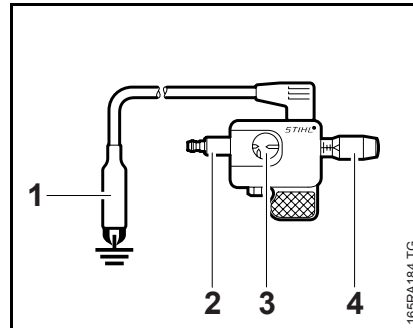
- Crank the engine quickly with the rewind starter and check spark in the tester's window (2).

The engine may start and accelerate during the test.

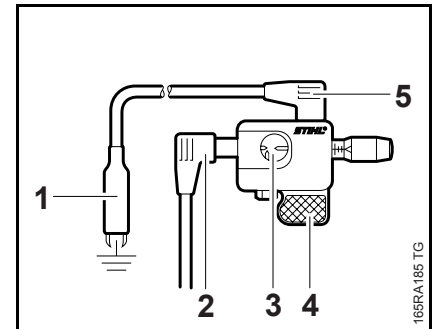
If a spark is visible, the ignition system is in order.

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

Using the ZAT 3 ignition tester 5910 850 4520



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



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

High voltage – risk of electric shock.

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

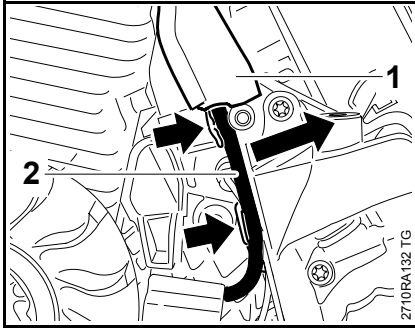
The engine may start and accelerate during the test.

If a spark is visible in the window (3), the ignition system is in order.

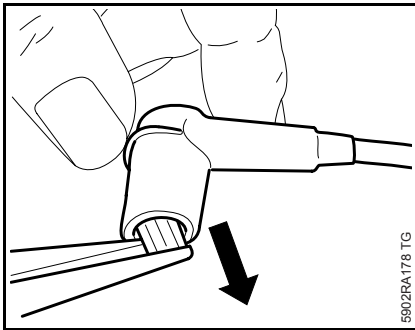
- If no spark is visible in the window (3), check the ignition system with the aid of the troubleshooting chart, 7.8

7.5 Spark Plug Boot / Ignition Lead

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

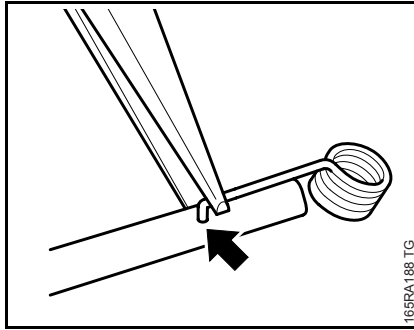


- Lift the air guide shroud (1) a little and pull the ignition lead (2) out of the guides (arrows)
 - take care not to distort the air guide shroud.

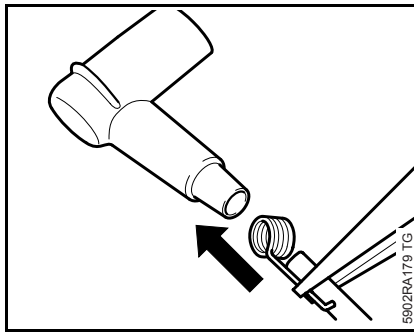


- Use suitable pliers to pull the leg spring out of the spark plug boot.
 - Unhook the leg spring from the ignition lead.
 - Pull the boot off the ignition lead.

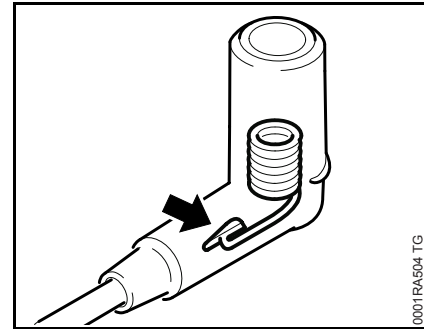
Installing



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



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

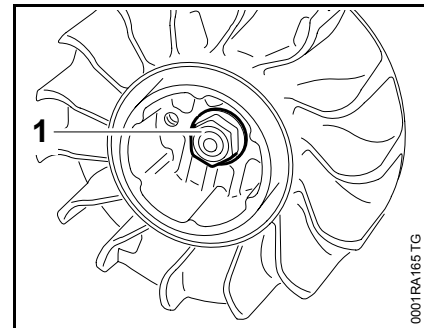


- Make sure the leg spring (arrow) locates properly inside the spark plug boot.
- Reassemble all other parts in the reverse sequence.

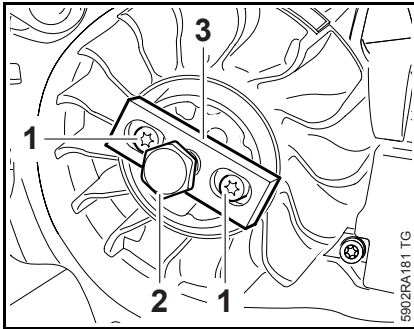
7.6 Flywheel

The new puller 5910 890 4504 (with a longer base block) must be used on models with ErgoStart. The new puller replaces the previous puller 1135 890 4500, which can still be used on standard models.

- Remove the shroud, 6.4
- Remove the fan housing, 8.2
- Use locking strip to block the piston, 4



- Unscrew the flywheel nut (1).



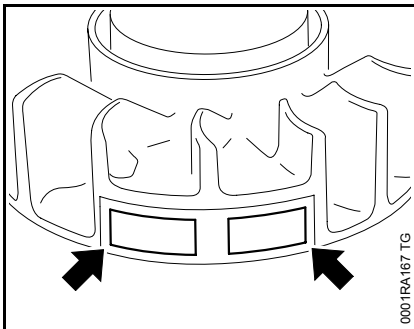
- Fit the puller (3) 5910 890 4504 on the flywheel and tighten the screws (1) as far as stop.
 - Tighten the screws uniformly.

Models with ErgoStart

Take care not to damage the pawls.

All models

- Screw home the thrust bolt (2) clockwise until the flywheel is released from the crankshaft.
- Remove the puller (3) 5910 890 4504 from the flywheel.



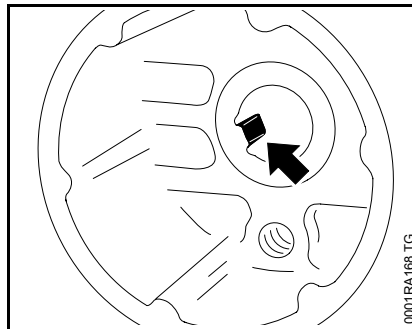
The flywheel and magnet poles (arrows) must not be damaged or have turned blue. Replace flywheel if necessary.

Models with ErgoStart

- Check the pawls for freedom of movement and signs of damage, 8.4.

All models

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



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

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

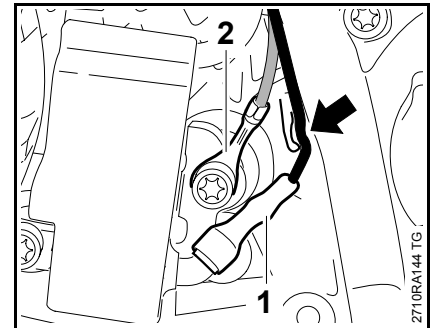
7.7 Short Circuit Wire

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

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

7.7.1 Testing

- Remove the fan housing, 8.2



- Pull the short circuit wire (1) out of the guide (arrow) and take it away.
- Connect the ohmmeter to ground (2) and the short circuit wire (1).
- Set the Master Control lever to "0".

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

- Set the Master Control lever to "I".




The resistance measured must be infinitely high. If not, replace the wiring harness, 7.7.

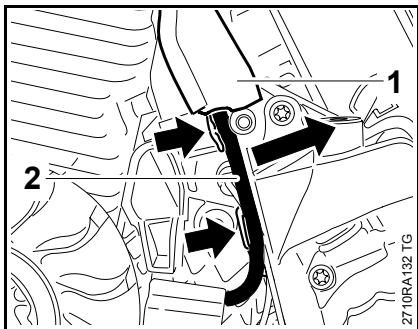
Perform the contact and continuity test on the ground wire too.

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

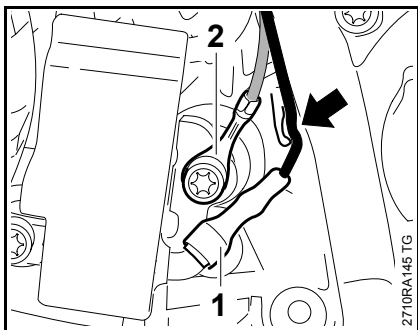
- If no fault can be found, check the ignition system with the aid of the troubleshooting chart, 7.8
- Reassemble in the reverse sequence.

7.7.2 Removing and Installing

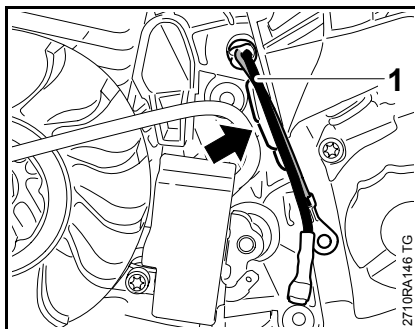
- Remove the shroud,  6.4
- Pull the boot off the spark plug.
- Remove the fan housing,  8.2
- Remove the choke rod,  10.3.3




- Lift the air guide shroud (1) a little and pull the ignition lead (2) out of the guides (arrows) – take care not to distort the air guide shroud.

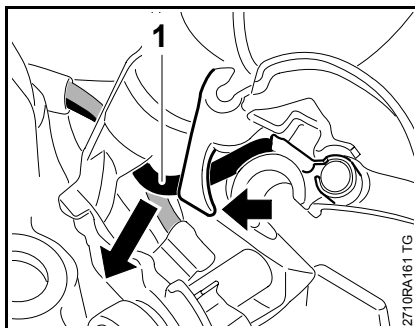


- Pull the short circuit wire (1) out of the guide (arrow) and take it away.
- Take out the screw and remove the ground wire (2).

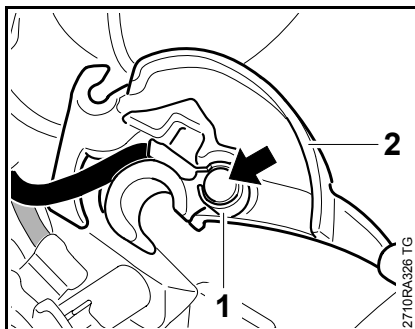



- Pull the wiring harness (1) out of the guide (arrow).



- Remove the switch shaft,  10.1

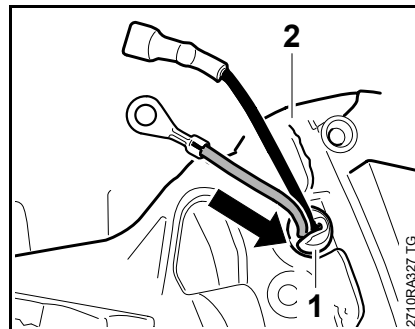


- Pull the short circuit wire (1) out from behind the tab (arrow).



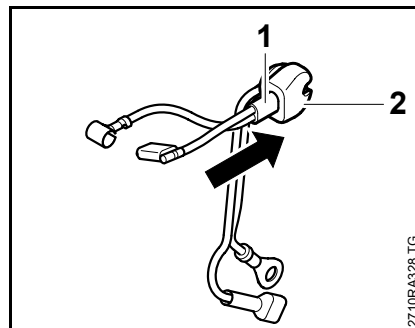
- Pull the ring terminal (1) off the peg (arrow).
- Remove the switch shaft (2).
- Remove the filter base,  12.3

- Remove the carburetor,  12.5
- Remove the carburetor carrier,  12.8



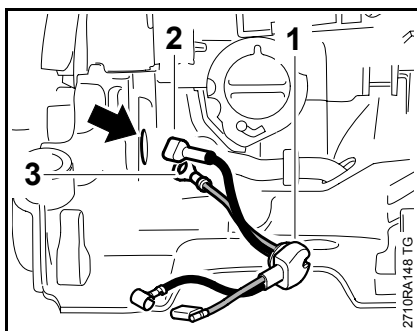
- Push the rubber grommet (1) out of the engine housing (2).
- Pull out the wiring harness.

Installing

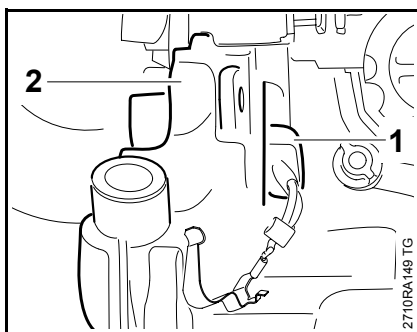


The protective tube (1) must butt against the rubber grommet.

- If necessary, push the wiring harness in the direction of the grommet until the protective tube (1) butts against the grommet (2).

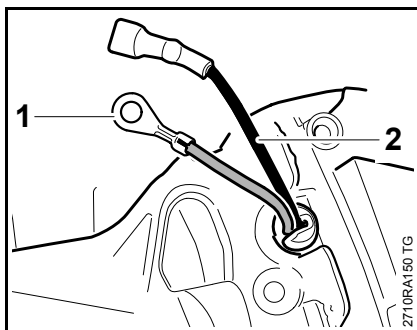


- Push the wiring harness (1), terminal socket (2) and cable lug (3) first, through the hole (arrow).

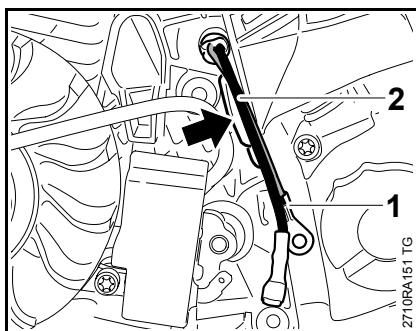


- Use STIHL press fluid to simplify assembly, [14](#)

- Push the rubber grommet (1) into the bore in the engine housing (2) until it is properly seated.

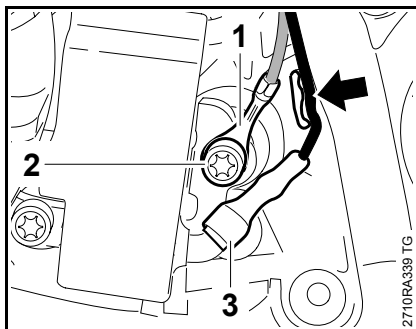


The ground wire (1) must point towards the muffler and the short circuit wire (2) towards the rear handle.



The ground wire (1) must be positioned in the guide under the short circuit wire (2).

- Fit the ground wire (1) and short circuit wire (2) in the guide (arrow).

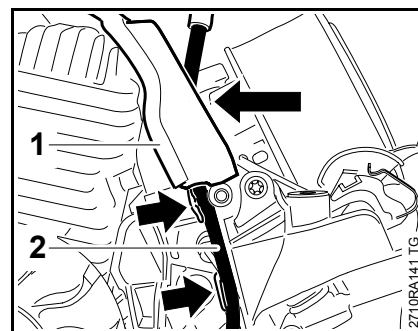


Ground wire: Crimped side of terminal (1) must face the screw head (2).

- Place the cable lug (1) in position and fit the screw (2).
- Position the cable lug (1) so that it points towards the cable guide – hold it steady when tightening and make sure it does not twist.

Short circuit wire: Crimped side of terminal (3) must face the engine housing.

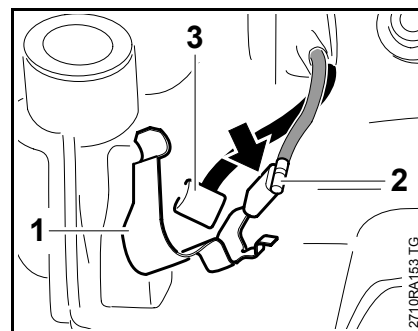
- Connect the short circuit wire terminal (3) – the terminal must be pushed fully home.
- Press the short circuit wire fully into the guide (arrow).



- Lift the air guide shroud (1) a little and push the ignition lead (2) into position – take care not to distort the air guide shroud.

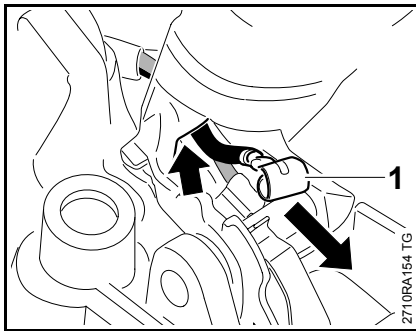
- Starting at the ignition module, press the ignition lead (2) into the guides (arrows).

- Install the carburetor carrier, [12.8](#)
- Install the carburetor, [12.5](#)



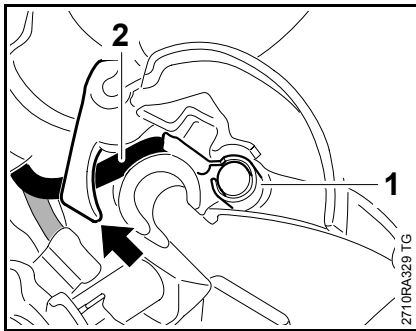
- Push the contact spring (1) onto the ground wire (2).
- Position the short circuit wire (3) so that it is above the ground wire's flag terminal (arrow).

- Fit the contact spring, [7.7.4](#)
- Install the filter base, [12.3](#)

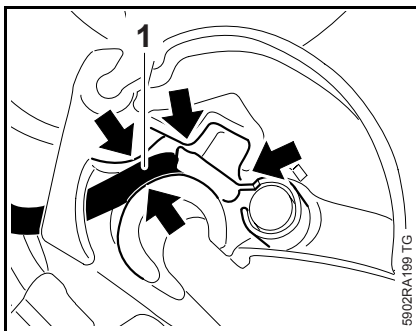


- Pass the ring terminal (1) through the opening (arrow) in the filter base.

- Place the switch shaft in position.



- Position the short circuit wire (1) behind the tab (arrow).
- Position the ring terminal (2) so that the gap in the ring faces down.
- Push the ring terminal (2) onto the peg as far as stop.



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

- Install the switch shaft and check operation, 10.1

- Reassemble all other parts in the reverse sequence.

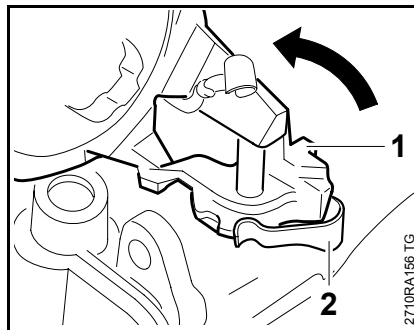
7.7.3 Ground Wire

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

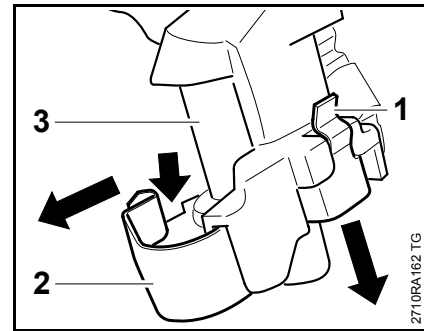
- Check for contact and continuity and replace the wiring harness if necessary, 7.7

7.7.4 Contact Spring

- Remove the shroud, 6.4
- Remove the choke rod, 10.3.3
- Remove the switch shaft, 10.1
- Remove the filter base, 12.3

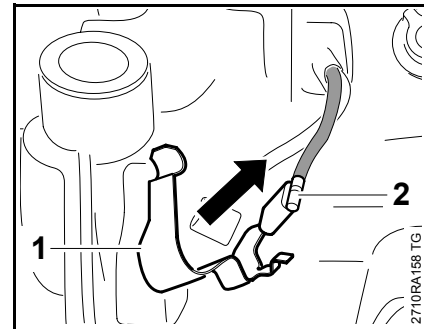


- Carefully turn the filter base (1) until the seat of the contact spring (2) is visible.

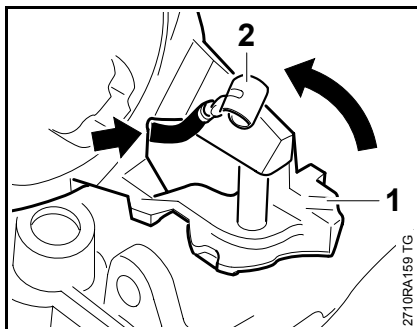


- Lift the contact spring (2) a little and ease it over the bead (arrow).
- Lift the tab (1) a little and slide the contact spring (2) out of the filter base (3).
- Pull the contact spring off the ground wire, check and replace if necessary.

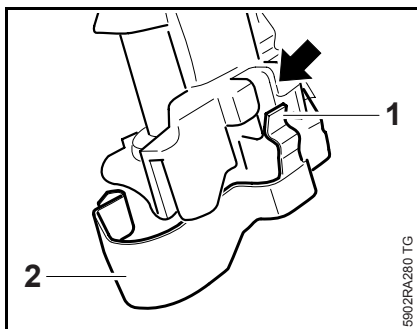
Installing



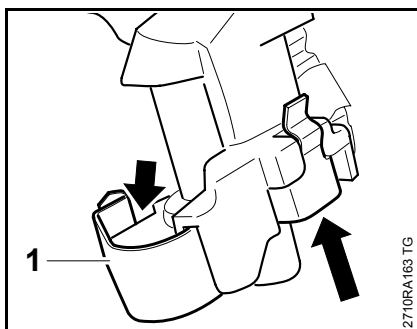
- Push the contact spring (1) fully onto the ground wire's flag terminal (2).



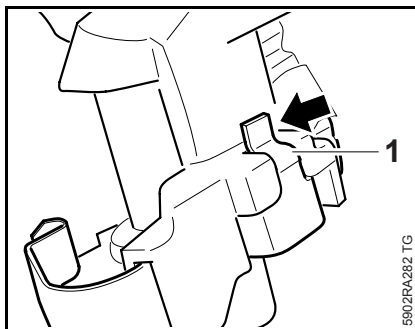
- Place the filter base (1) in position and pass the ring terminal (2) through the opening (arrow) at the same time.
- Turn the filter base (1) about 90° in direction of ignition side.



- Position the contact spring (2) in its seat so that the tab (1) is in line with the guide (arrow).

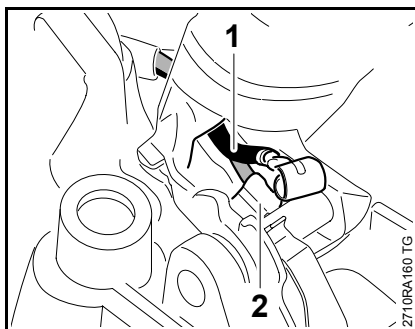


- Lift the contact spring (1) a little and ease it over the bead (arrow).
- Push the contact spring (1) into its seat as far as stop.



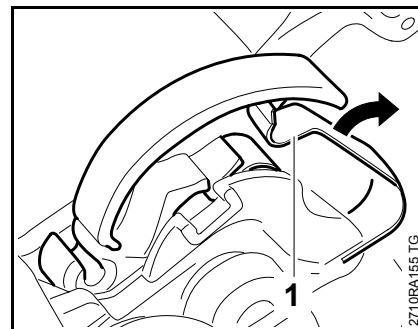
The tab (arrow) on the contact spring (1) must locate securely on the edge of the filter base.

- Install the filter base, [12.3](#)

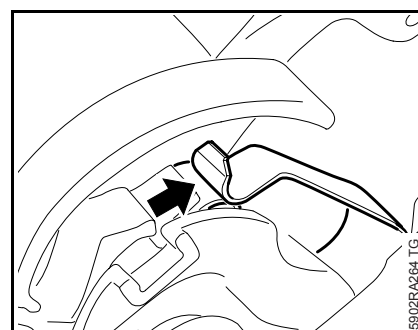


The short circuit wire (1) must be above the ground wire's insulated flag terminal (2).

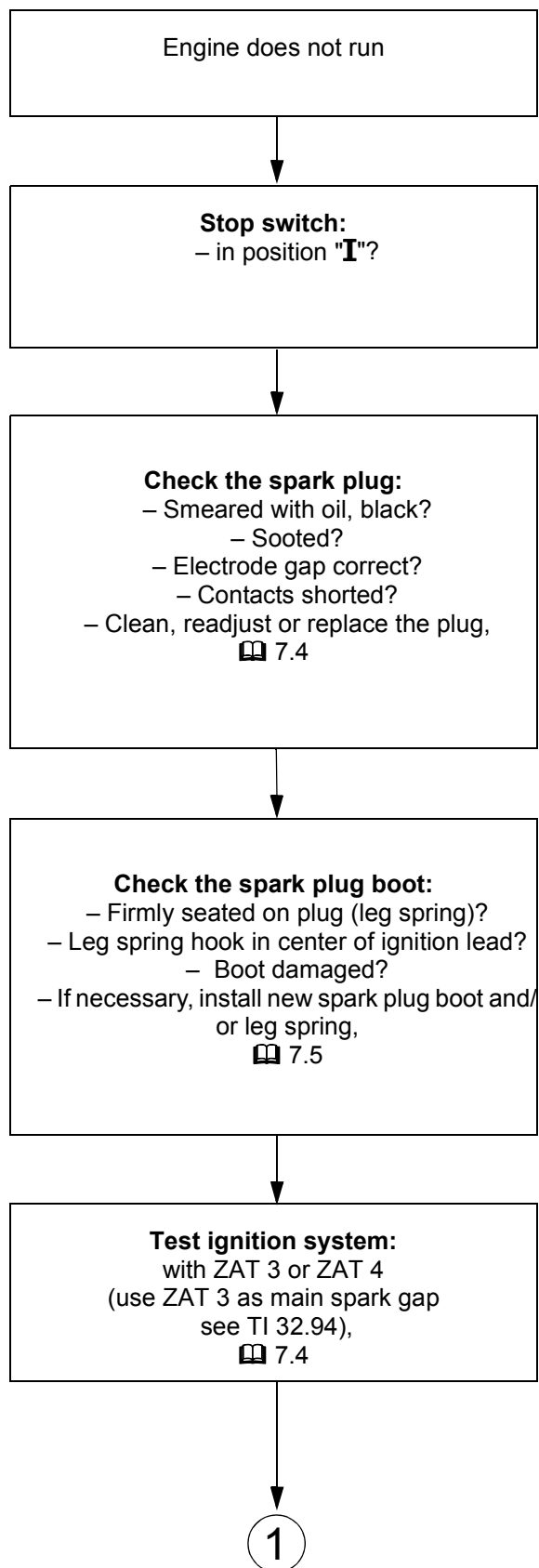
- Fit the short circuit wire in the switch shaft, [7.7.2](#)
- Install the switch shaft and check operation, [10.1](#)

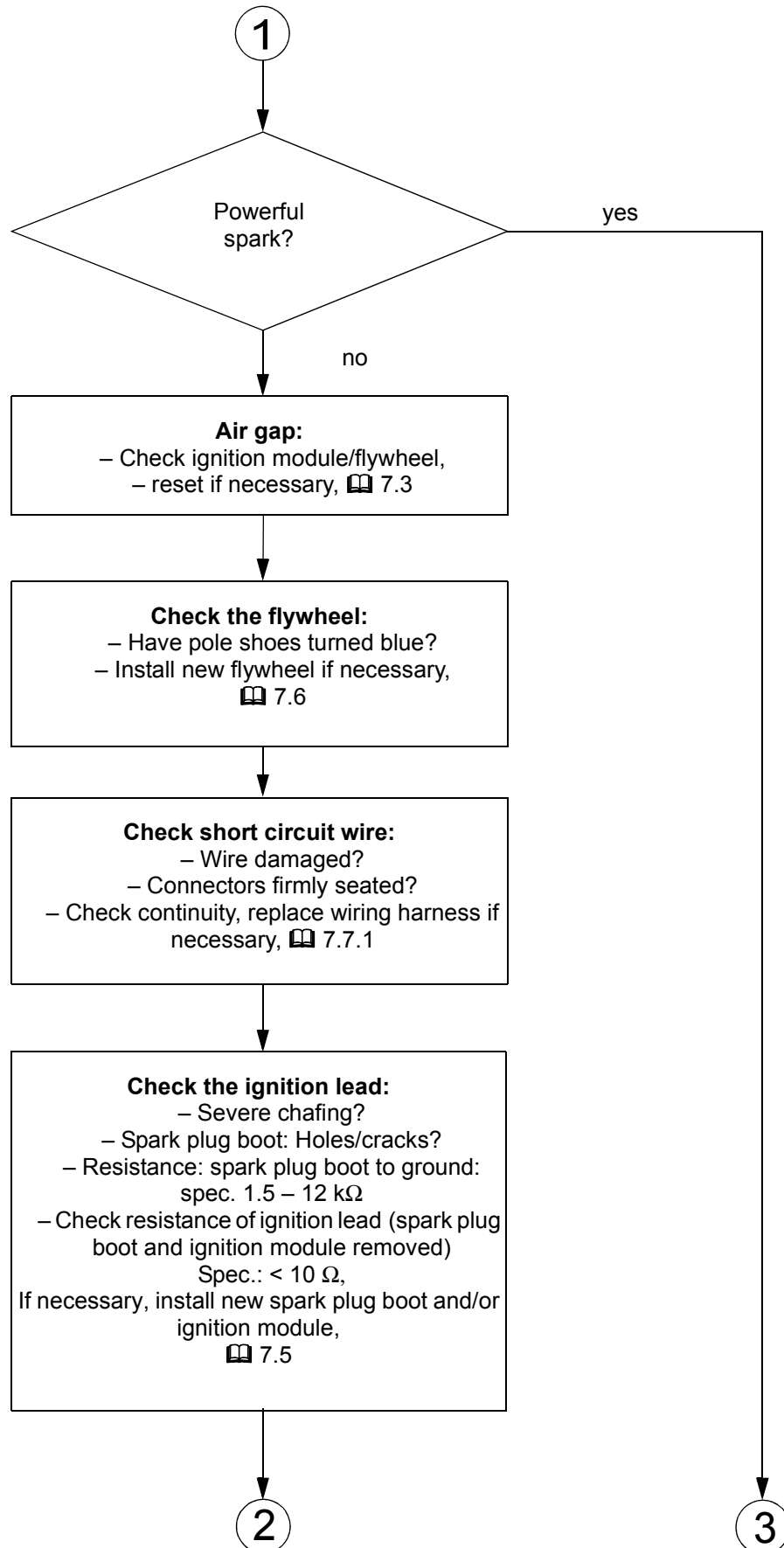


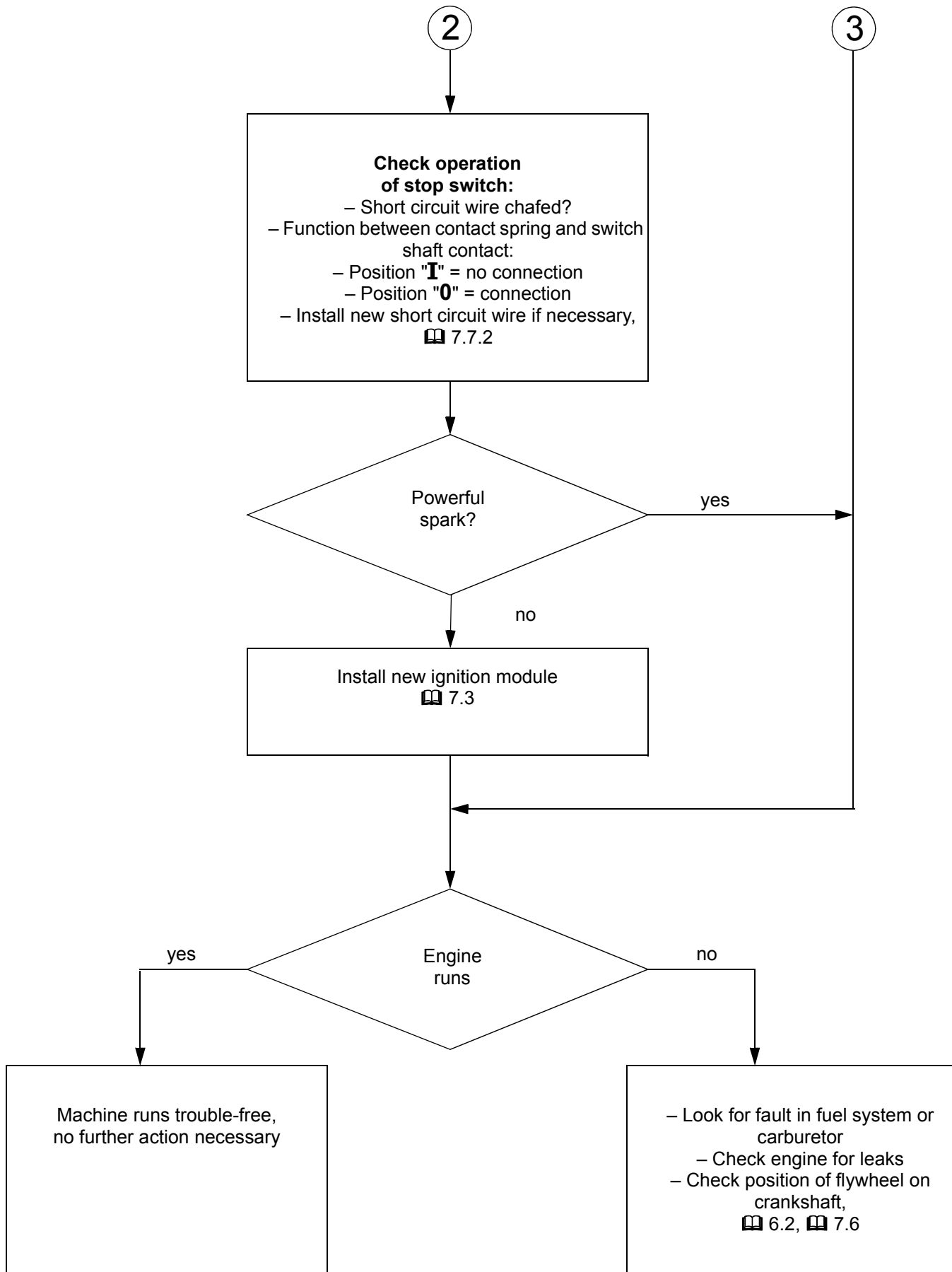
- When installing the switch lever, lift the contact spring (1) a little – no more than 2 mm.



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








8. Rewind Starter

8.1 General

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

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


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

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


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

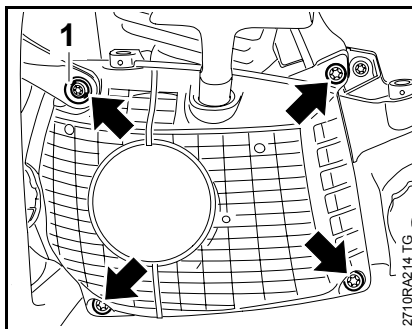
- Clean all components.

Models with ErgoStart

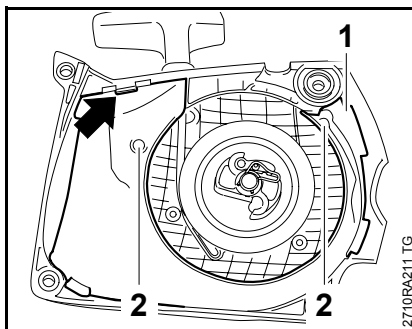
- Relieve tension of rewind spring,  8.4

8.2 Fan housing

- Remove the shroud,  6.4

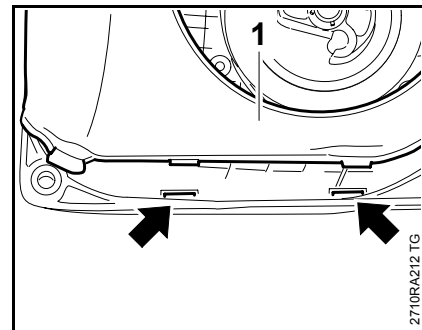


- Take out the screws (arrows).
- Remove the sleeve (1).
- Lift the hand guard a little and remove the fan housing.

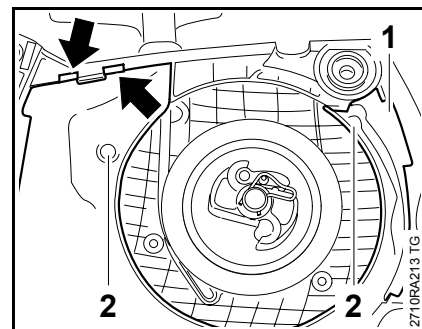


- Pry the segment (1) away at the recess (arrow) and pull it off the pegs (2).
- Examine the fan housing and segment and replace if necessary.

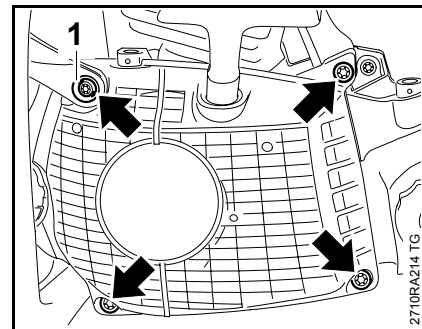
Installing



- Engage the segment (1) in the slots (arrows) in the fan housing first and swing it into position.





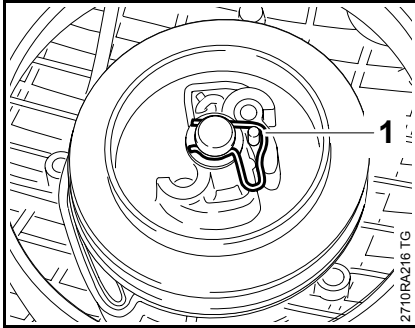
- Push the segment (1) onto the pegs (2) until it engages the tabs (arrows).



- Lift the hand guard a little and fit the fan housing in position.
- Fit the sleeve (1), insert and tighten down the screws (arrows) firmly.
- Reassemble all other parts in the reverse sequence.

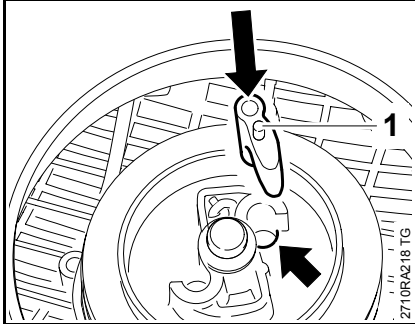
8.3 Pawls


- Remove the fan housing,  8.2
- Relieve tension of rewind spring,  8.5

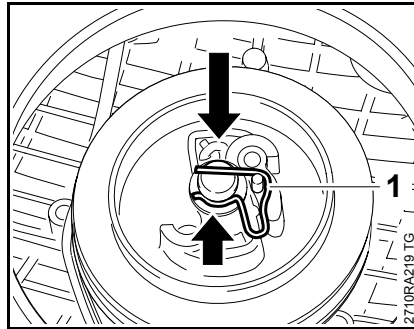


- Carefully ease the spring clip (1) off the starter post.
- Pull the pawl out of the rotor.

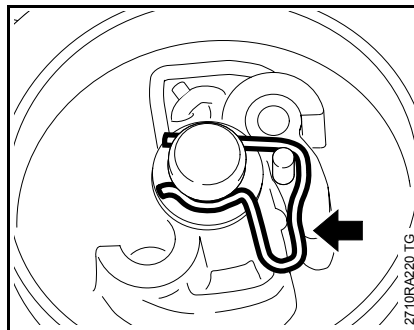
Installing



- Fit the new pawl in the bore (arrow) and lubricate the peg (1),  14



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




The spring clip's guide loop must be in line with the pawl (arrow).



Check operation.

- Pull the starter rope, the rotor turns and the peg on the pawl moves in the direction of the spring loop – the pawl moves outwards.
- Reassemble all other parts in the reverse sequence.

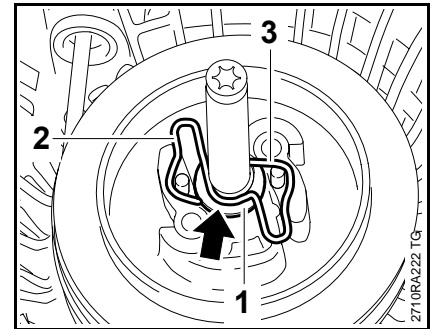
Models with ErgoStart

- Remove the ErgoStart,  8.4

Two pawls are installed in models with ErgoStart. The removal procedure is the same as for the standard version.

- Lubricate the seats of the new pawls,  14
- Fit the new pawls and lubricate their pegs with resin-free oil,  14

Installing




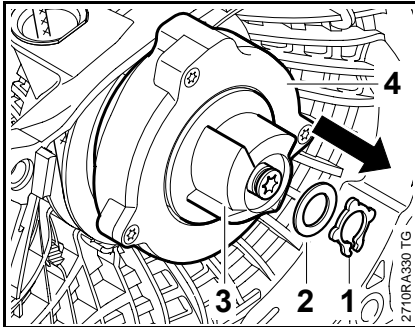
Make sure the washer (1) is in place.

- Position the spring clip (2) so that its loops engage the pegs on the pawls. The rounded part of the spring clip (arrow) must engage the starter post's groove.
- Push the straight part (3) of the spring clip over the starter post until it snaps into the groove.
- Reassemble all other parts in the reverse sequence.

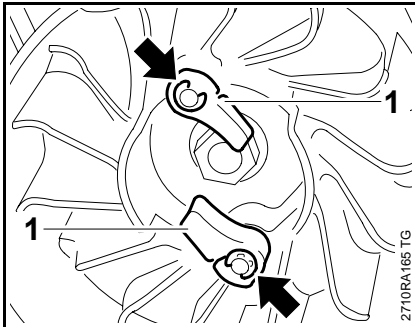
8.4 ErgoStart


The spring may still be under tension and must always be relieved before assembling.

- Pull out the starter rope until the engine turns – this relieves spring tension.
- Remove the fan housing and, if necessary, the segment,  8.2

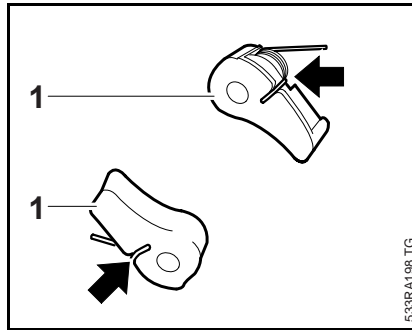


- Remove the circlip (1).
- Remove the washer (2) and carrier (3).
- Pull off the spring housing (4).

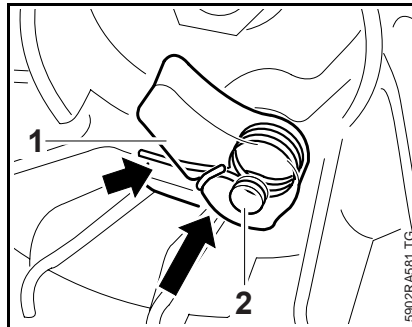


- Remove the E-clips (arrows).
- Pull off the pawls (1) and remove the torsion springs.
- Clean the seats of the pawls (1),  14

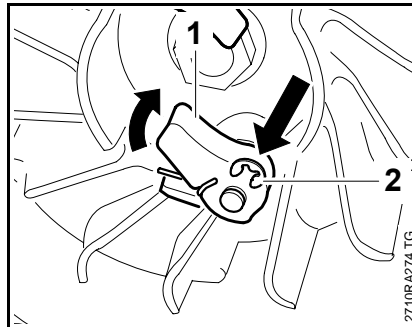
Installing



- Fit the torsion springs on the pawls (1) – note installed position (arrows).



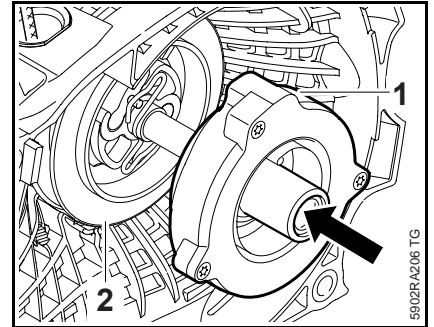
- Fit the pawls (1) on the pins (2) on the flywheel, preload the torsion springs at the same time and locate them against the ribs (arrow).



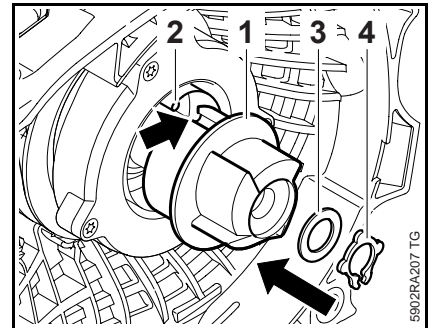
- Fit the pawls (1) so that they can move towards the center of the flywheel as far as stop (arrow).
- Fit the E-clips (2).

Check operation.

Pawls must move freely and be held against the stop by the torsion springs.



- Push the spring housing (1) over the starter post and into the pawls (2) – the pawls must engage the spring housing.



- Push the carrier (1) into the spring housing so that its lug (arrow) engages the loop (2) of the rewind spring.
- Fit the washer (3).
- Fit the E-clip (4).
– Do not overstretch the retaining ring.
- Reassemble all other parts in the reverse sequence.

8.5 Rope Rotor

Relieving tension of rewind spring

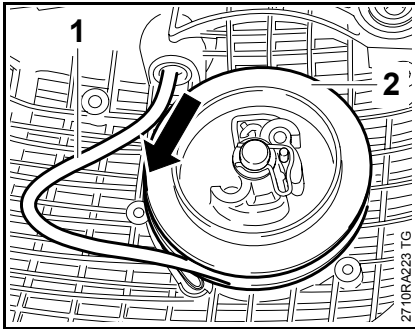
The system will not be under tension if either the starter rope or rewind spring is broken.

- Remove the fan housing and the segment, [8.2](#)

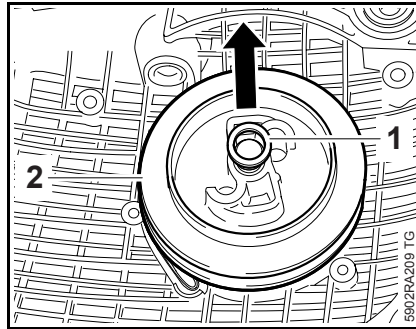
Models with ErgoStart

- Remove the ErgoStart, [8.4](#)

All models



- Pull out the starter rope (1) about 5 cm and hold the rope rotor (2) steady.
- take three full turns of the rope off the rope rotor.
- Pull out the rope with the starter grip and slowly release the rope rotor.
- Remove the starter rope or remaining rope from the rotor, [8.6](#)
- Remove the spring clip and pawl(s), [8.3](#)

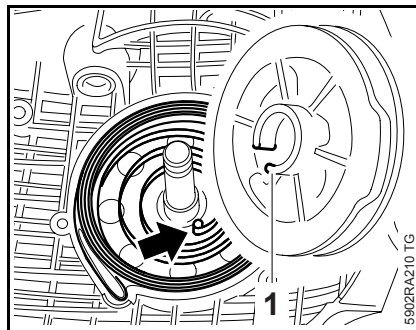


- Remove the shim (1).

Rewind spring must be relaxed.

- Carefully remove the rope rotor (2).
 - The rewind spring may pop out and unwind.
- Check the rope rotor and replace if necessary.
- Coat bore in rope rotor with STIHL special lubricant, [14](#)

Installing



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

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

- Fit the cover washer.

- Install the pawl(s) and spring clip, [8.3](#)
- Install the starter rope, [8.6](#)
- Tension the rewind spring, [8.7](#)
- Lubricate peg(s) on the pawl(s) with grease, [14](#)
- Reassemble all other parts in the reverse sequence.

8.6 Starter Rope / Grip

- Remove the fan housing and the segment, [8.2](#)

Models with ErgoStart

- Remove the ErgoStart, [8.4](#)

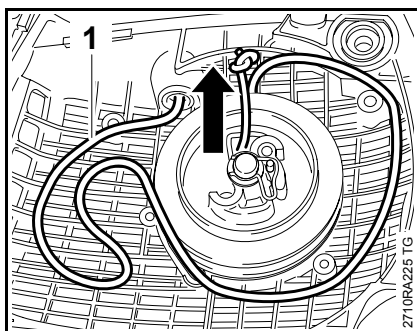
All models

- Relieve tension of rewind spring, [8.5](#)

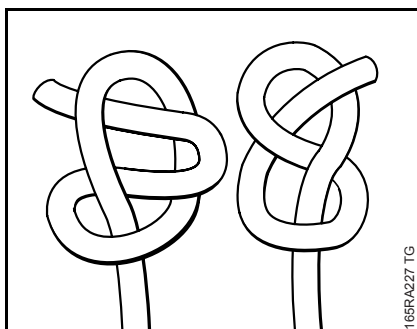
The system will not be under tension if the starter rope is broken.

- Remove any remaining rope from the rope rotor.

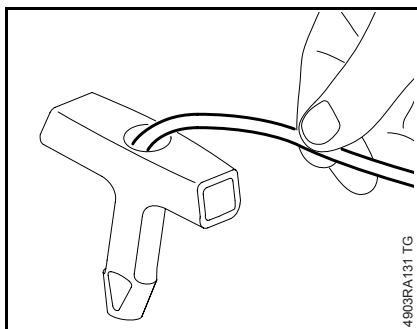
Do not shorten the starter rope.



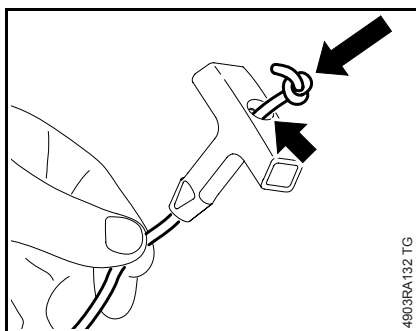
- Push the end of the starter rope (1) out a little and undo the knot.
- Pull the starter rope out of the rope rotor and fan housing.



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

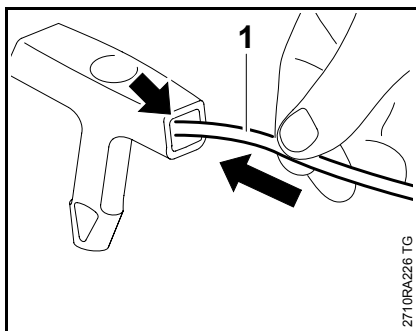


- Thread the rope through the top of the starter grip.

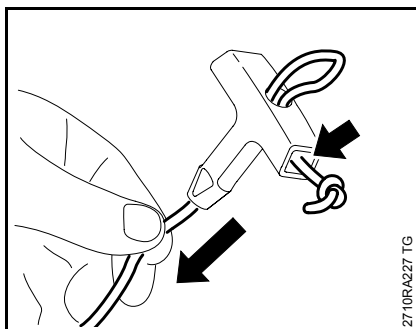


Pull the rope into the starter grip until the knot is properly seated in the grip (small arrow).

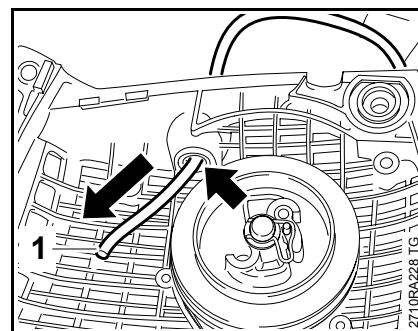
Models with ErgoStart



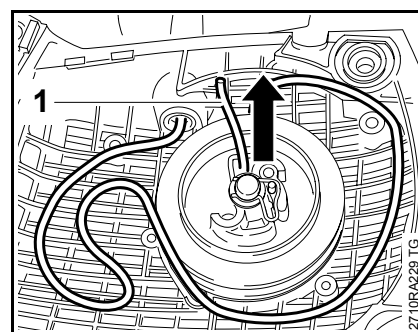
- Thread the new rope through the side (arrow) of the starter grip.



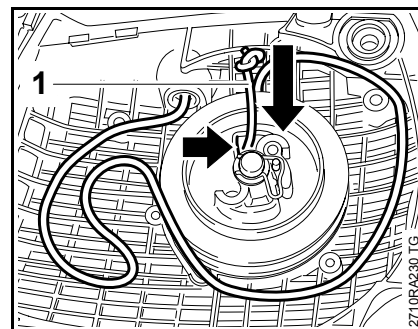
- Pull the rope into the starter grip until the knot is properly seated in the grip (small arrow).



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



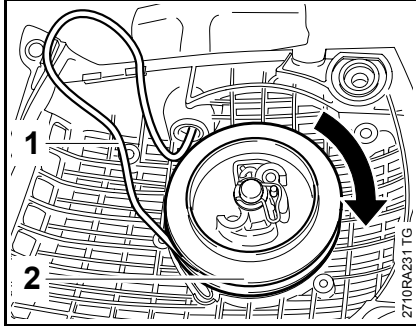
- Thread the starter rope (1) through the side of the rope rotor.
- Secure the rope (1) with a simple overhand knot.



- Pull the rope (1) back into the rotor until the knot locates in the recess (arrow).
- Tension the rewind spring, 8.7
- Reassemble all other parts in the reverse sequence.

8.7 Tensioning the Rewind Spring

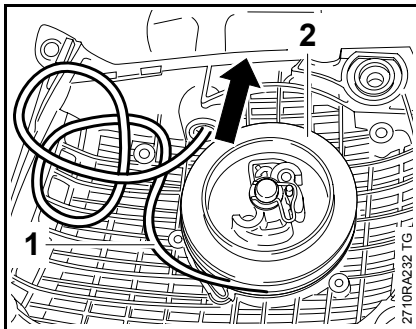
- Remove the fan housing and the segment, 8.2



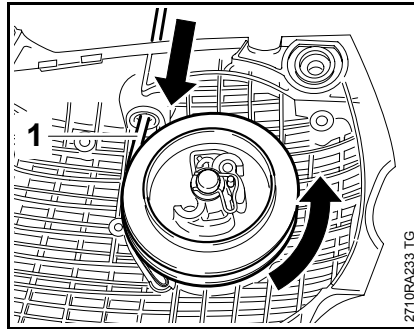
- Pull out a short length of starter rope (1).
- Use the starter rope (1) to rotate the rope rotor (2) six turns clockwise.

The rewind spring is now tensioned.

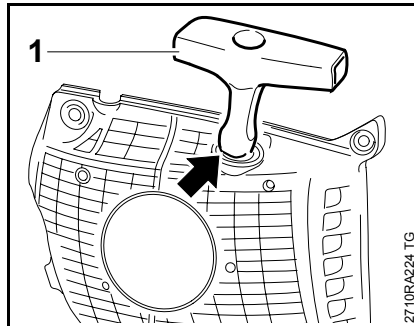
Hold the rope rotor steady since it will otherwise spin back and may damage the rewind spring.



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



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



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

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

To reduce spring tension:

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

- Reassemble all other parts in the reverse sequence.

8.8 Replacing the Rewind Spring

- Troubleshooting, 3.4

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

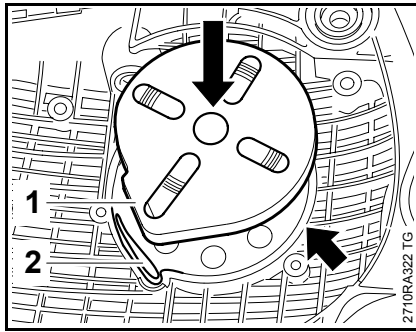
- Wear a face shield and work gloves to protect your eyes and hands from injury.
- Remove the fan housing and the segment, 8.2
- Relieve tension of rewind spring if necessary and remove the rope rotor, 8.5
- Remove any remaining pieces of the old rewind spring.


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

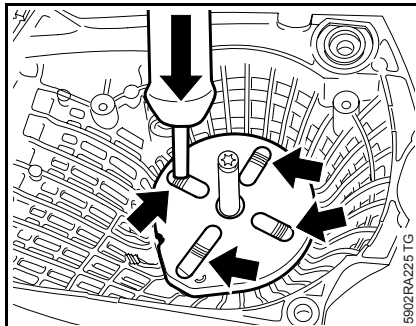
Even a worn rewind spring is still pre-loaded in the installed condition.

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

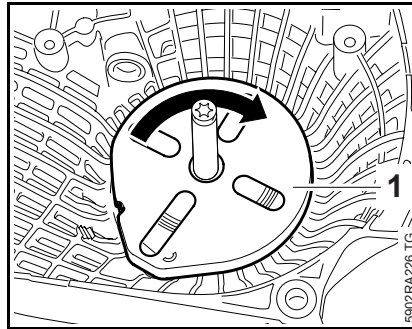
Installing new rewind spring



- Lubricate the replacement spring with frame with a few drops of STIHL special lubricant before installing,  14
- Position the replacement spring with frame in the fan housing so that the anchor loop (1) is above the lug (2) and engages the seat (arrow).



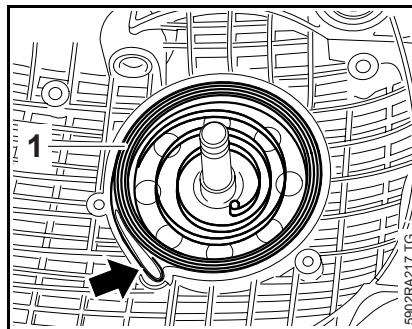
- Starting at the anchor loop, apply suitable tool to the recesses (arrows) and push the rewind spring into its seat in the fan housing – the frame slips off during this process.




- Press the frame (1) against the rewind spring and rotate it slightly clockwise until the spring is properly seated.

The rewind spring may pop out and unwind.

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

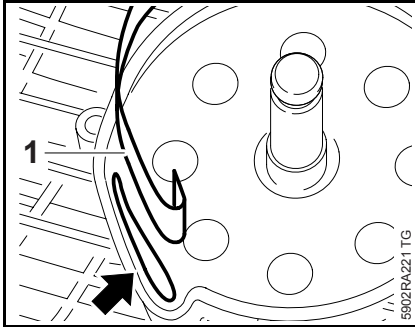


Make sure that the new rewind spring (1) is properly seated and the outer anchor loop is engaged on the lug (arrow). If necessary, use suitable tools to push the rewind spring fully into its seat in the fan housing.

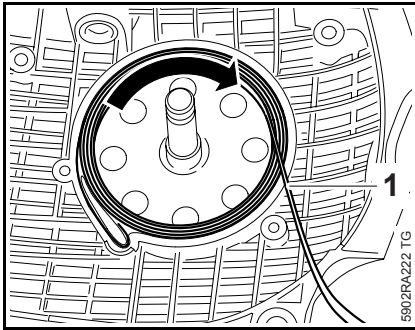
- Secure the spring so that it cannot pop out.
- Install the rope rotor,  8.5
- Reassemble all other parts in the reverse sequence.

Installing unwound rewind spring

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



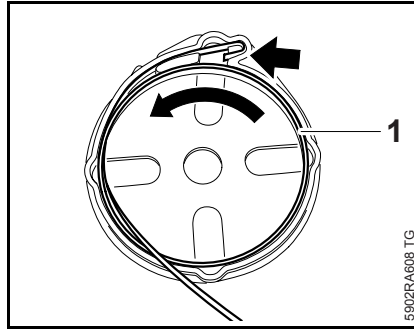
- Arrange the rewind spring (1) in its original position.
- Fit the anchor loop in its seat (arrow) in the fan housing.



- Fit the rewind spring (1) clockwise in the housing, holding the windings steady in the process.

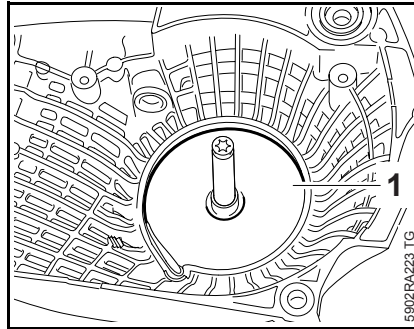
The procedure is otherwise the same as that for installing a new rewind spring.

Models with ErgoStart



As the spring seat is deeper on this model, the rewind spring cannot be fitted directly in the fan housing.

- Fit the anchor loop in its seat (arrow) in the frame.
- Fit the rewind spring (1) counterclockwise in the frame, holding the windings steady in the process.



- Check the washer (1) and replace it if necessary.

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

- Secure the spring so that it cannot pop out.
- Install the rope rotor, 8.5
- Reassemble all other parts in the reverse sequence.

9. Servicing the AV System

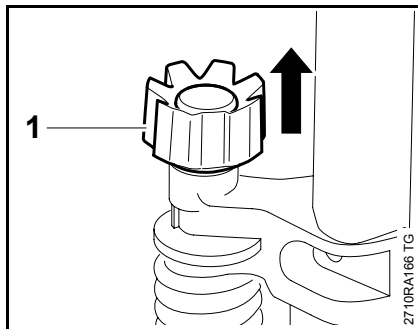
Vibration-damping springs, annular buffers and stop buffers are used for the connection between the handlebar, tank housing and engine housing.

Damaged springs and buffers must always be replaced.

9.1 Annular Buffer and AV Spring on Oil Tank

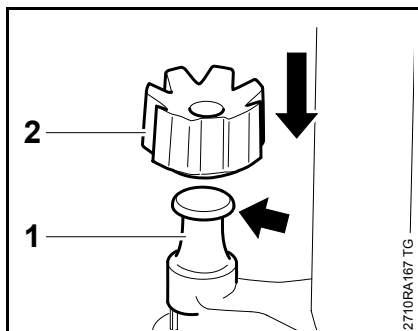
The antivibration elements are located in the area of the oil tank and are secured to the underside of the machine.

- Remove the handlebar, 9.5



- Pull off and replace the buffer (1).

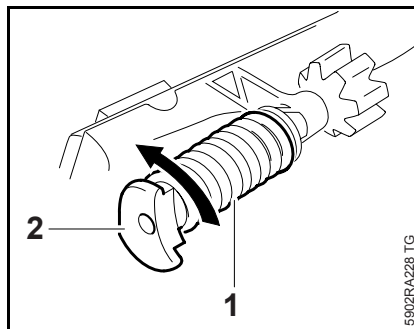
Installing



- Use STIHL press fluid to simplify assembly, 14

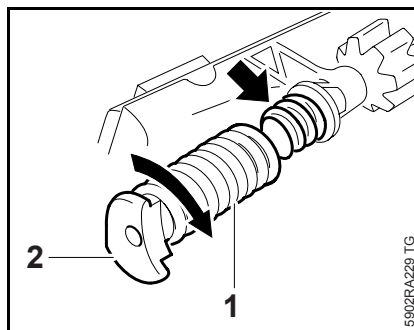
- Push the buffer (2) onto the peg (1) on the handlebar as far as stop.

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



- Unscrew the AV spring (1).
- Unscrew the bearing plug (2).
- Check the AV spring and plug, replace if necessary.

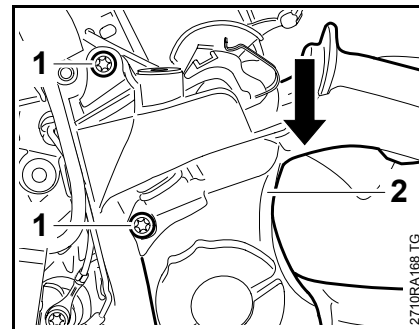
Installing



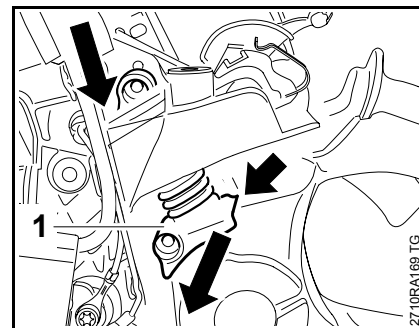
- Screw home the bearing plug (2).
- Screw the AV spring (1) into the handlebar (arrow) as far as stop.
- Reassemble all other parts in the reverse sequence.

9.2 AV Spring on Fuel Tank

- Remove AV spring from handlebar, 9.3
- Remove the stop buffer, 9.4

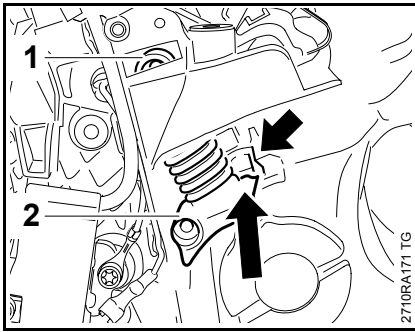


- Take out the screws (1).
- Press the tank housing (2) down a little and hold it there.

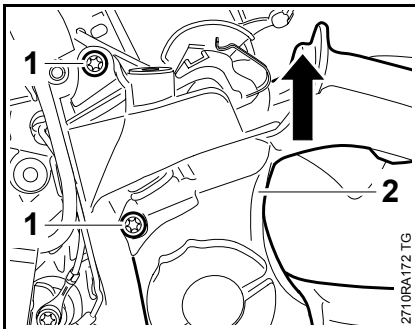


- Pull the AV spring (1) out of the guide (arrow) and remove it from between the engine housing and tank housing.
- Check the AV spring and plug, replace if necessary.

Installing



- Press the tank housing down a little and hold it there.
- Push the AV spring, bearing plug (1) first, between the engine housing and tank housing.
- Push the bearing plug (1) through the opening.
- Push the bearing plug (2) into its seat (arrow).

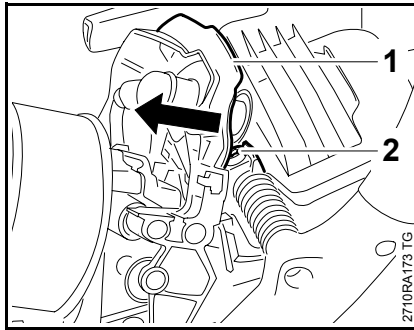


- Push the tank housing (2) upwards and hold it there.
- Insert and tighten down the screws (1) firmly.
- Reassemble all other parts in the reverse sequence.

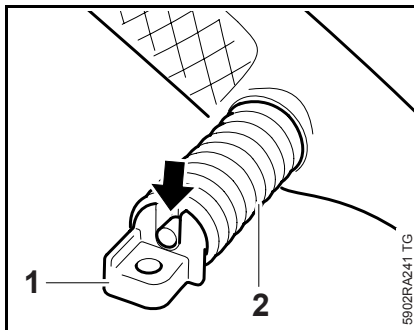
9.3 AV Spring on Handlebar

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

- Remove the shroud, [6.4](#)
- Remove the air filter, [12.1](#)

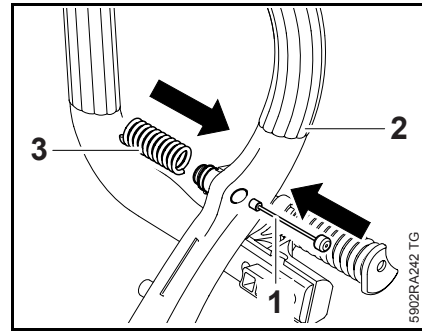


- Push the air guide shroud (1) in direction of rear handle.
- Take out the screw (2).
- Remove the handlebar, [9.5](#)

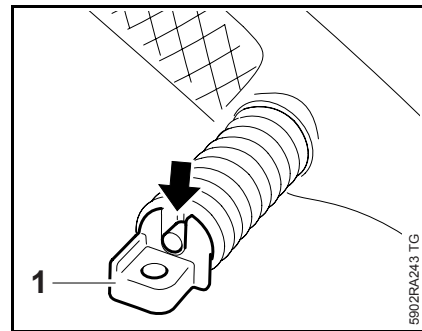


- Unscrew the bearing plug (1) and disconnect the retainer (arrow).
- Unscrew the spring (2) and pull the retainer (arrow) out of the handlebar.

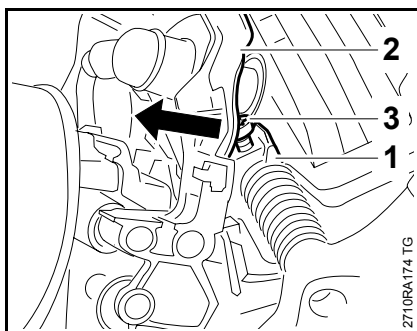
Installing



- Push the retainer (1), small nipple first, through the hole in the handlebar (2).
- Screw the spring (3) onto the peg as far as stop.



- Attach the retainer (arrow) to the bearing plug (1).
- Screw the bearing plug (1) into the spring as far as stop.
- Install the handlebar, [9.5](#)



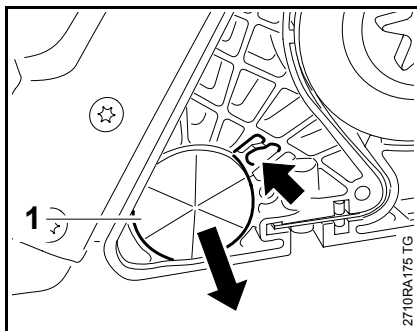
- Position the bearing plug (1) on the cylinder.
- Push the air guide shroud (2) in direction of rear handle.
- Insert and tighten down the screw (3) firmly.
- Reassemble all other parts in the reverse sequence.

9.4 Stop Buffer at Clutch Side

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

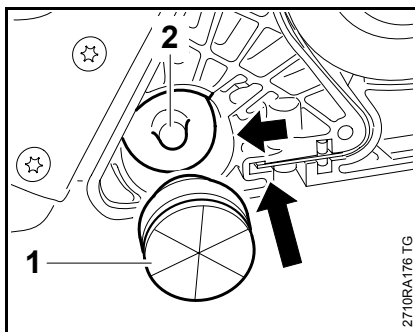
- Remove the cover, 5.2

Stop Buffer at Clutch Side



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

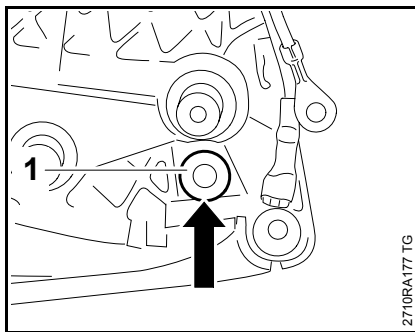
Installing



- Position the stop buffer (1) with its tapered end facing the engine housing.
- Use STIHL press fluid to simplify assembly, 14
- Push the stop buffer (1) into the bore (arrow) as far as stop.
 - the peg (2) must engage the stop buffer (1).

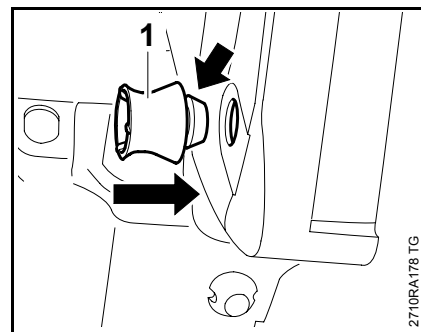
9.4.1 Stop Buffer at Ignition Side

- Remove the ignition module, 7.3
- Remove the tank housing, 12.11.5

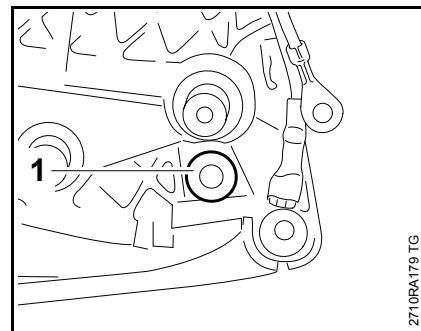


- Push the stop buffer (1) inwards and out of the bore.
- Check the stop buffer (1) and replace if necessary

Installing



- Position the stop buffer (1) with its tapered end (arrow) facing the engine housing.
- Use STIHL press fluid to simplify assembly, 14
- Push the stop buffer (1), tapered end on the inside of the engine housing, fully into the bore – a turning motion simplifies assembly.

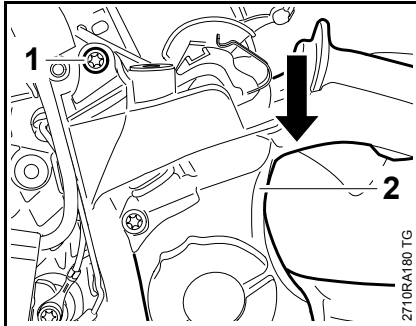


The tapered end (1) must be properly seated in the bore at the ignition side.

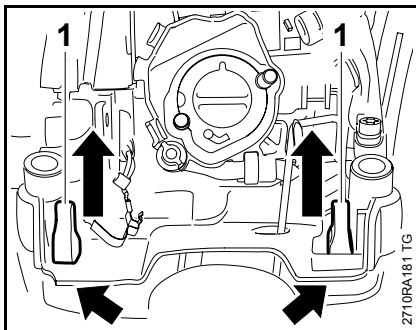
- Reassemble all other parts in the reverse sequence.

9.4.2 Buffers on Filter Base

- Remove the filter base, 12.3

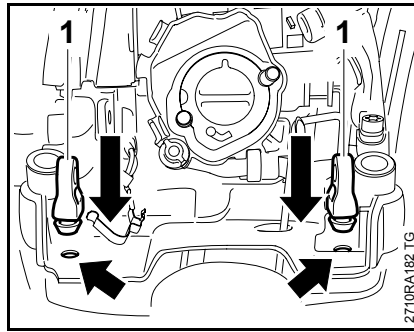


- Take out the screw (1).
- Press the tank housing (2) down a little and hold it there.

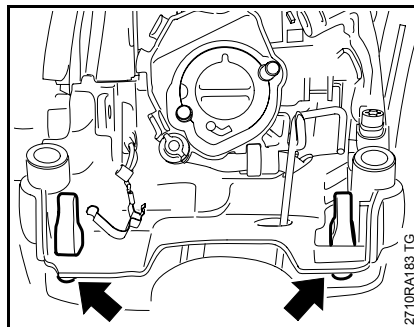


- Push out the buffers (1) from the underside (arrows).
- Check the buffers (1) and replace if necessary

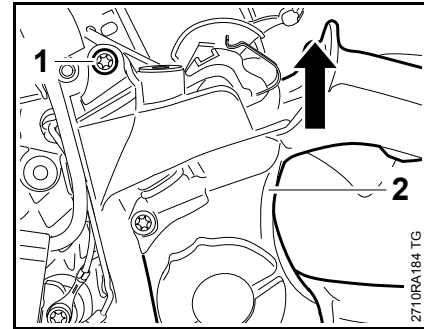
Installing



- Position the buffers (1) with their tapered ends facing the bores.
- Use STIHL press fluid to simplify assembly, 14
- Push the tapered ends of the buffers (1) fully into the bores (arrows).



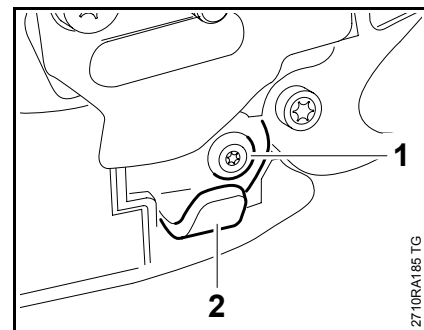
The tapered ends (arrows) must be properly seated on the other sides of the bores.



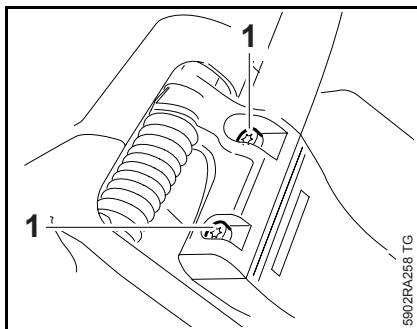
- Push the tank housing (2) upwards and hold it there.
- Insert and tighten down the screw (1) firmly.
- Reassemble all other parts in the reverse sequence.

9.5 Install new handlebar

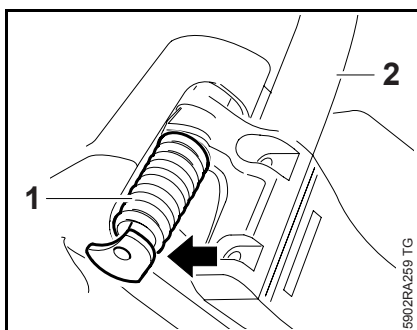
- Remove the shroud, 6.4
- Remove AV spring from handlebar, 9.3



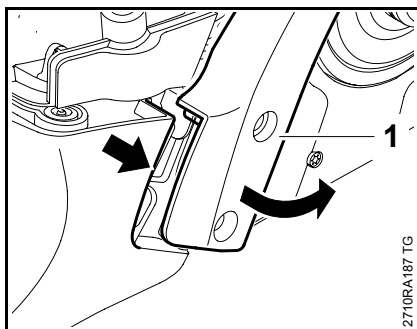
- Take out the screw (1) and remove the chain catcher (2).



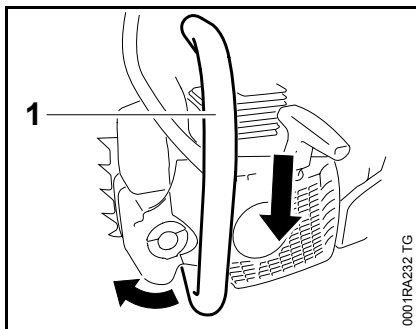
- Remove the screws (1) from the underside of the machine.



- Push the handlebar (2) sideways and pry the AV spring (1) out of its bearing seat (arrow).

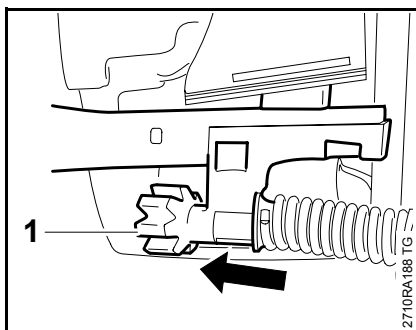


- Take out the screws.
- Ease the handlebar (1) sideways and take it out of the guide (arrow).

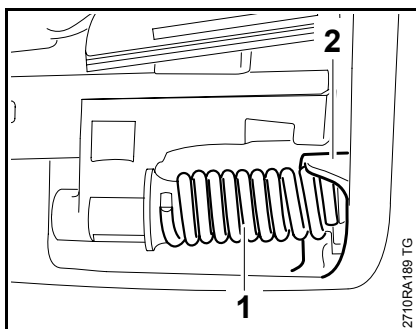


- Push the handlebar (1) out of the lower guide.
- Remove the handlebar (1), check it and replace if necessary.
- Check the annular buffer and replace it if necessary, 9.1

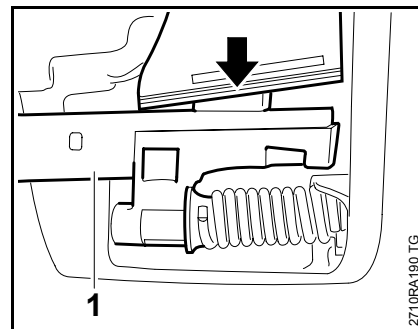
Installing



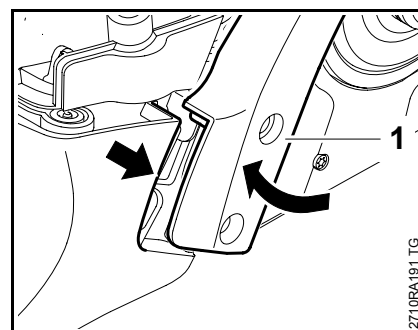
- Push the handlebar, buffer (1) first, into the engine housing.



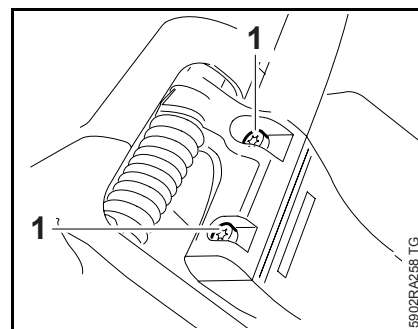
- Push the AV spring (1) into its seat (2).



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



- Ease the handlebar (1) sideways and place it in the guide (arrow).
- Insert the screws and tighten them down firmly.



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

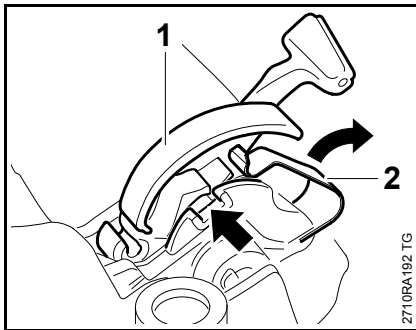
10. Control Levers

10.1 Master Control Lever

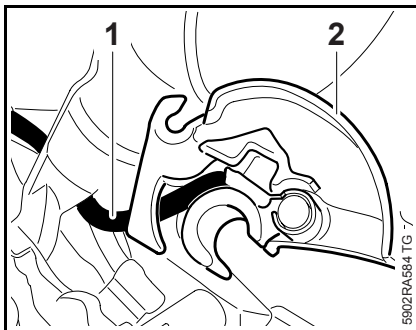
The positions of the Master Control lever are described in the instruction manual.

10.1.1 Removing and Installing

- Remove the air filter, 12.1
- Remove the choke rod, 10.3.3

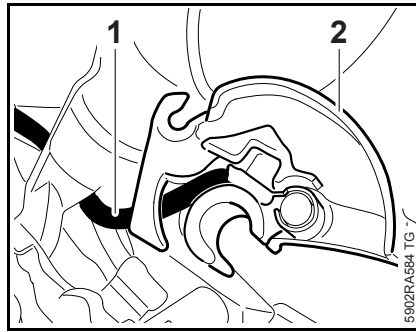


- Set the switch lever (1) to "0".
- Pry out the switch lever (1) at the opening (arrow) and remove it, lifting the contact spring (2) slightly at the same time
 - no more than 2 mm.

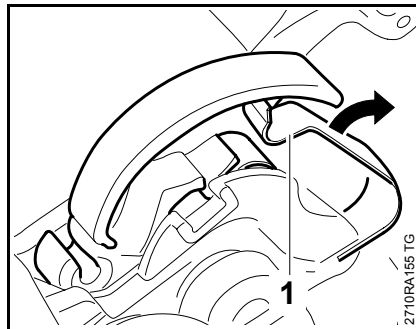


- Remove the short circuit wire (1) from the switch lever, 7.7.2
- Remove the switch lever (2), check it and replace if necessary.

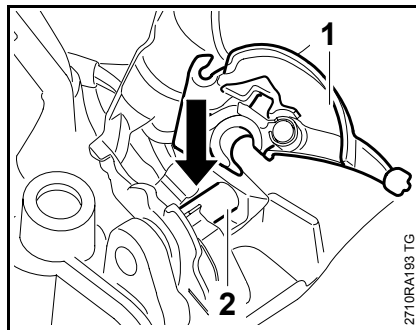
Installing



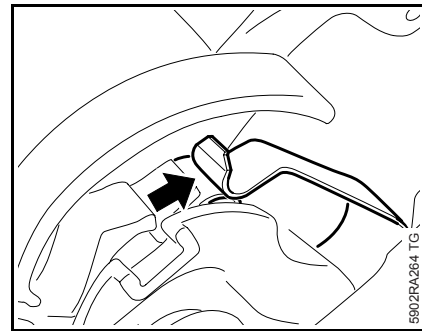
- Place the switch lever (2) in position.
- Fit the short circuit wire (1) on the switch lever, 7.7.2



- When installing the switch lever, lift the contact spring (1) a little
 - no more than 2 mm.

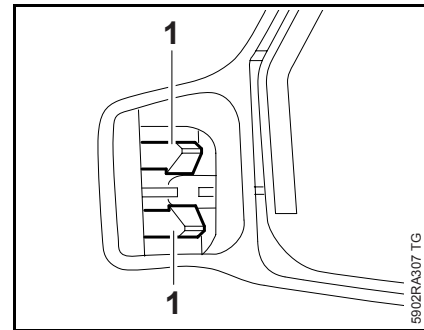


- Push the switch lever (1) onto the filter base's pivot pin (2) until it snaps into position.

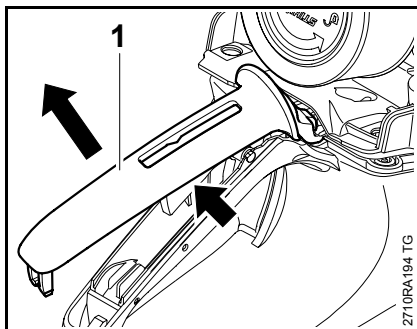


- Check operation.
 - Short circuit wire's ring terminal must touch the contact spring (arrow) in position "0".
- Reassemble all other parts in the reverse sequence.

10.2 Throttle Trigger/Lockout Lever

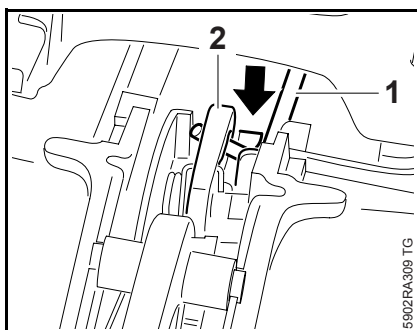


- To remove the handle molding, press the tabs (1) on the underside apart and push them through the rear handle.

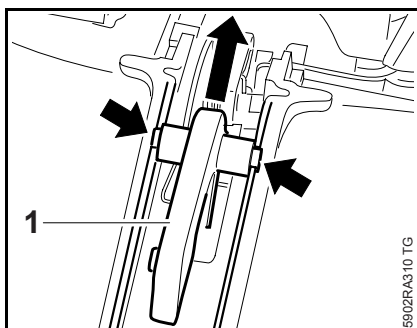


- Remove the handle molding (1).

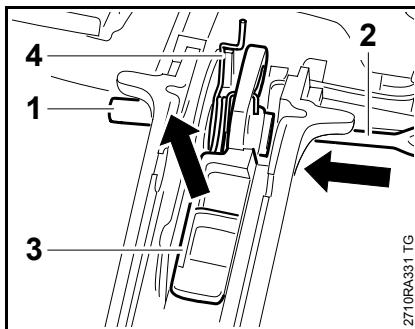
The lockout lever (arrow) may pop out.



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



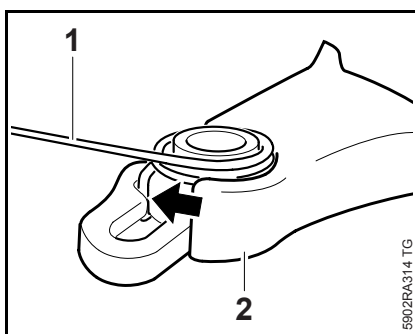
- Rotate the lockout lever (1) in direction of carburetor until it is vertical and then take it out of its mounts (arrows).



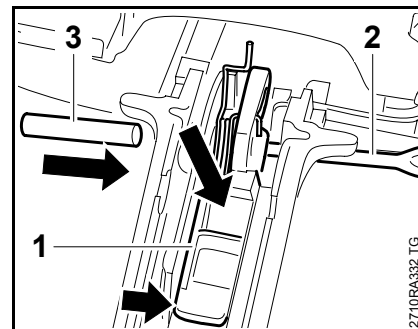
- Use a drift (2) to drive out the pin (1).
- Remove the throttle trigger (3) with torsion spring (4).

– Inspect the lockout lever, throttle trigger and torsion spring, replace as necessary.

Installing



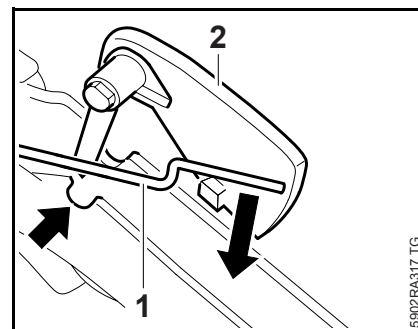
- Attach the torsion spring (1) to the trigger (2)
– note the installed position (arrow).



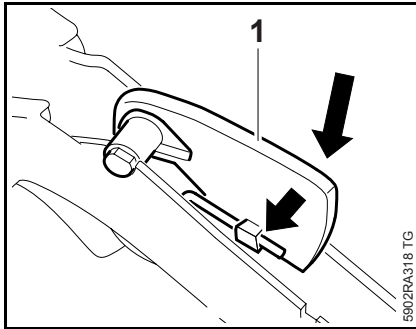
- Place the throttle trigger (1) in the rear handle so that the tongue (arrow) is within the handle and the holes in the throttle trigger and handle are in alignment.

- Use a drift (2) to center the throttle trigger (1).

- Drive home the pin (3) until it is recessed by same amount at both sides.

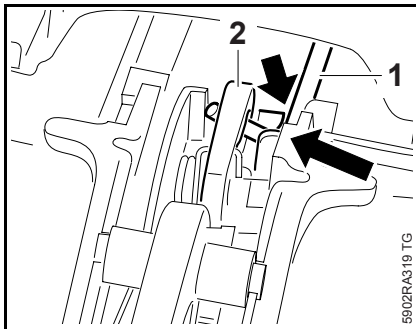


- Push leg (1) of torsion spring in direction of rear handle.
- Push the lockout lever (2) into its mounts (arrow).

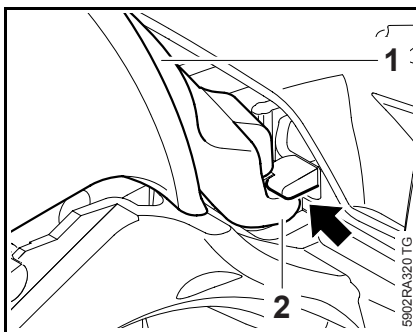


- Rotate the lockout lever (1) in direction of rear handle and engage the torsion spring (arrow).

The lockout lever (1) may pop out.



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

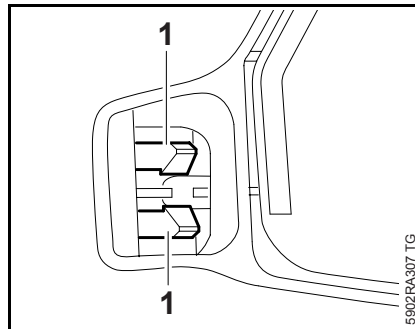


- Engage tabs (2) of handle molding (1) in the openings (arrow).
- Push down the handle molding (1) until it snaps into position.

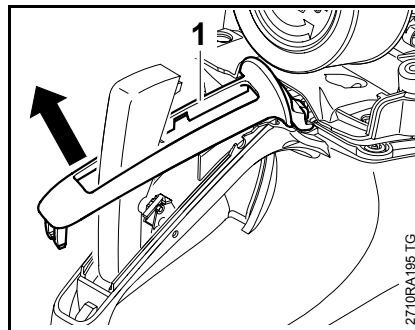
- Check operation.
- Reassemble all other parts in the reverse sequence.

10.3 Throttle Trigger/Lockout Lever – QuickStop Super

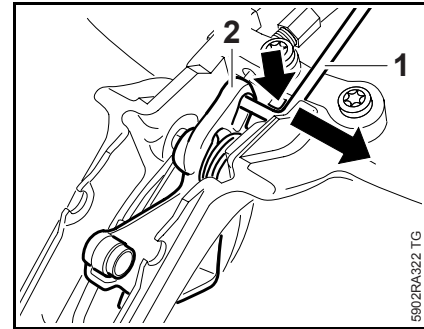
Lubricate sliding and bearing points with grease after disassembly.



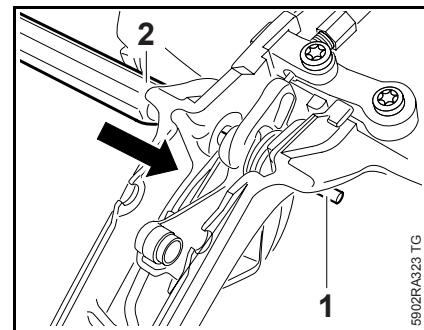
- To remove the handle molding, press the tabs (1) on the underside apart and push them through the rear handle.



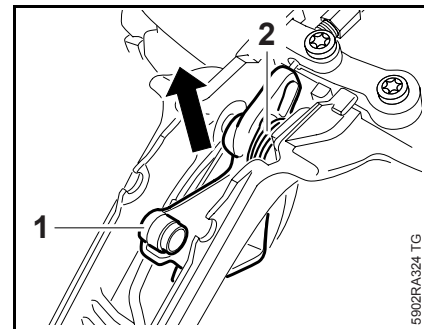
- Remove the handle molding (1).



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

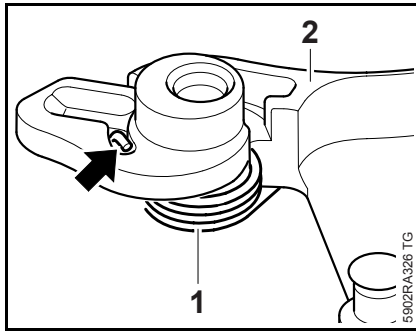


- Use a drift (2) to drive out the pin (1).

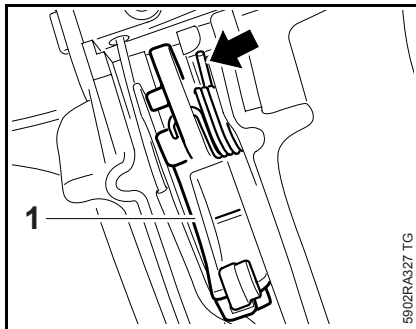


- Remove the throttle trigger (1) with torsion spring (2).
- Inspect the throttle trigger and torsion spring, replace as necessary.

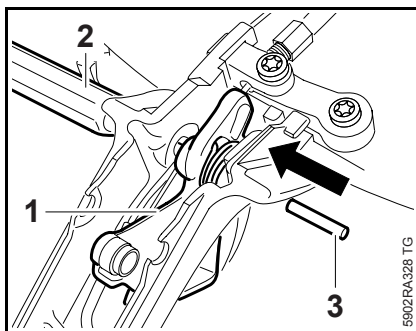
Installing



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



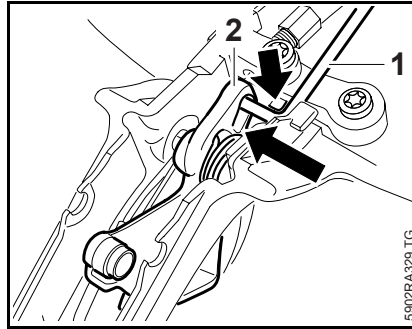
- Place the throttle trigger (1) in the rear handle so that the leg of the torsion spring locates against the handle (arrow) and the holes in the throttle trigger and handle are in alignment.



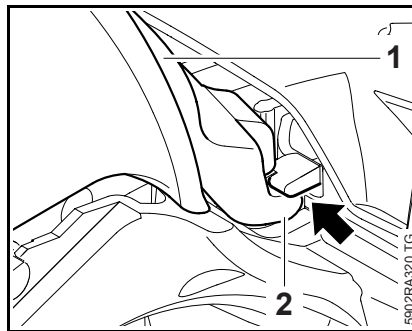
Brake cable must be in the handle housing guide below the drift
– take care not to damage the brake cable.

- Use a drift (2) to center the throttle trigger (1).

- Drive home the pin (3) until it is recessed by same amount at both sides.



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

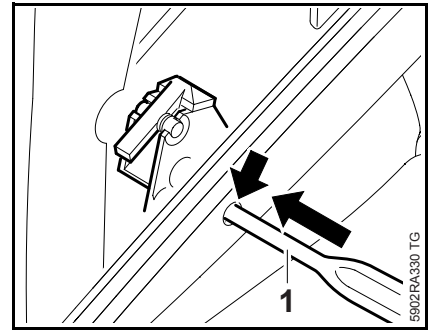


- Engage tabs (2) of handle molding (1) in the openings (arrow).
- Press the lockout lever down.
- Push down the handle molding (1) until it snaps into position.
- Check operation.
- Reassemble all other parts in the reverse sequence.

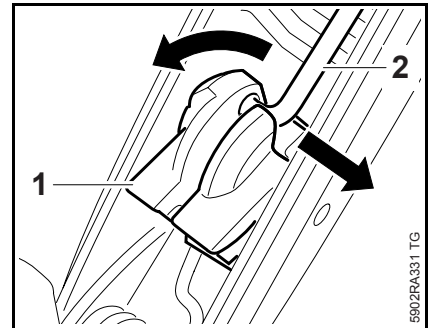
10.3.1 Switch Lever – QuickStop Super

Lubricate sliding and bearing points with grease after disassembly.

- Remove the handle molding, 10.3

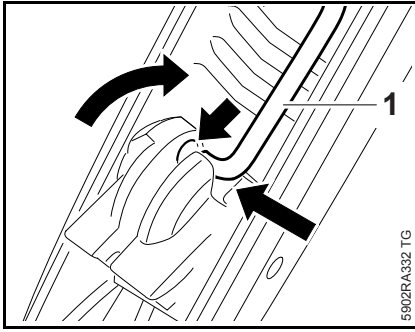


- Use a drift (1) to drive out the pin (arrow).

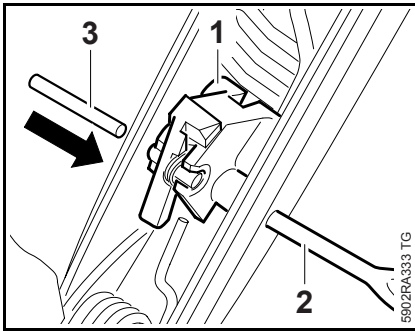


- Lift the switch lever (1) slightly.
- Turn the switch lever (1) about 90° and pull it off the brake cable (2).
- Check the switch lever (1) and replace it if necessary.

Installing




- Connect the brake cable (1) to the bore (arrow) in the switch lever.
- Turn the switch lever so that it faces up.

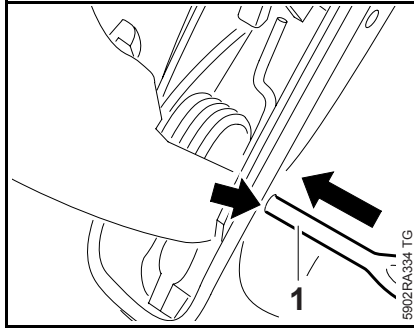


- Use a drift (2) to center the switch lever (1).
- Drive home the pin (3) until it is recessed by same amount at both sides.
- Reassemble in the reverse sequence.
- Check operation of switch lever by operating the lockout lever.

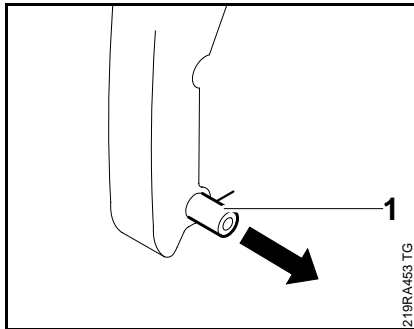
10.3.2 Lockout Lever – QuickStop Super

Lubricate sliding and bearing points with grease after disassembly.

- Remove the handle molding,  10.3

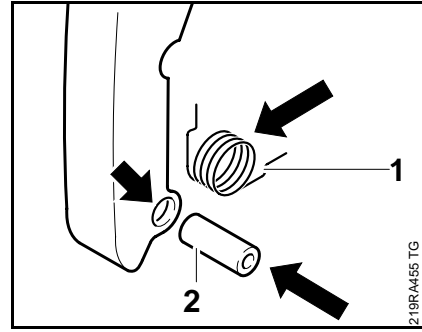


- Use a drift (1) to drive out the pin (arrow).
- Take out the lockout lever.

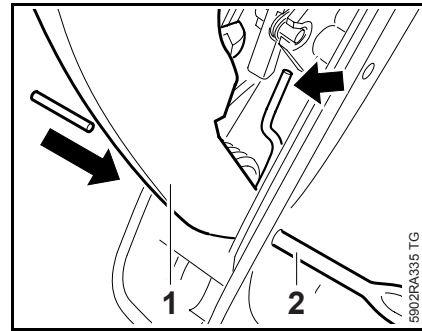


- Push out the bushing (1).
- Remove the torsion spring.
- Inspect the lockout lever, throttle trigger and bushing, replace as necessary.

Installing



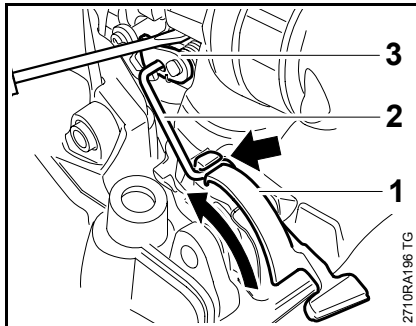
- Position the torsion spring (1) and fit it in the lockout lever.
- Push the bushing (2) into the bore (arrow) – the torsion spring is held in position.



- The torsion spring (arrow) must locate against the tank housing.
- Use a drift (2) to center the lockout lever (1).
- Drive home the pin until it is recessed by same amount at both sides.
- Reassemble all other parts in the reverse sequence.
- Check operation.

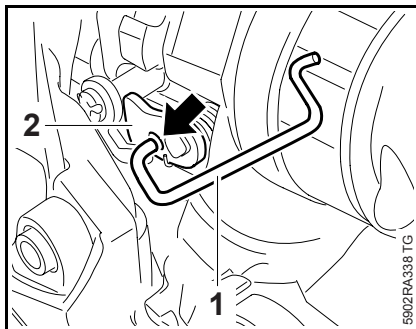
10.3.3 Choke Rod

- Remove the air filter, 12.1

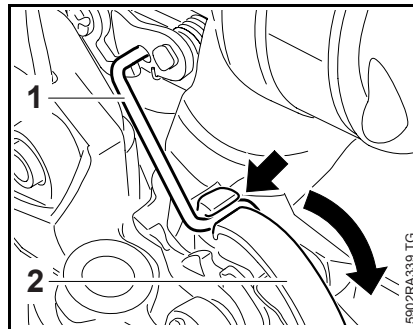


- Set switch lever (1) to cold start and block lever (3) on choke shaft.
- Push the switch lever (1) in the direction of "0"
– the choke rod (2) comes out of its seat (arrow).
- Disconnect the choke rod (2) from the lever (3).
- Check the choke rod and replace it if necessary

Installing



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



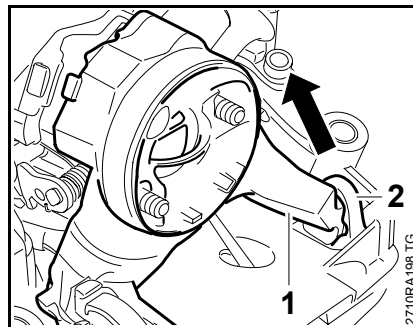
- Position the choke rod (1) in the guide (arrow).
- Move the switch lever (2) in direction of cold start until the choke rod (1) snaps into position.
- Check operation.

Check that the choke rod is properly seated.

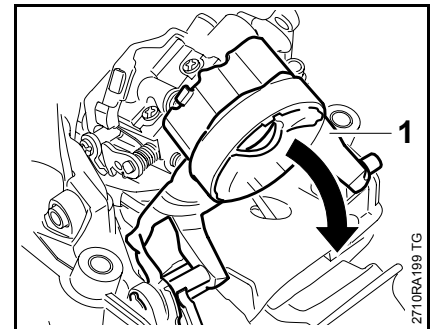
- Reassemble all other parts in the reverse sequence.

10.3.4 Throttle Rod

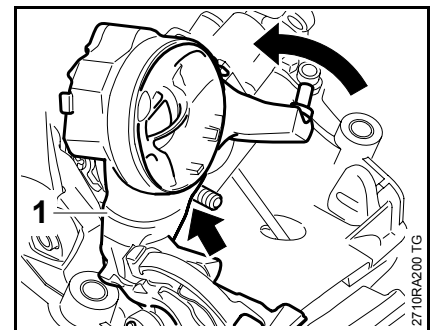
- Remove the throttle trigger, 10.2, QuickStop Super, 10.3
- Remove the baffle, 12.2



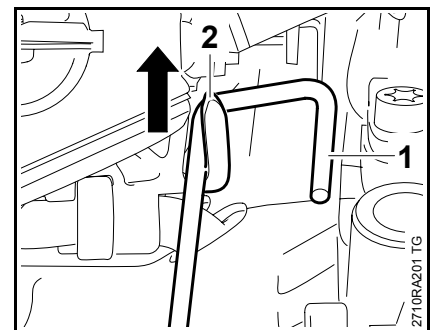
- Pry the filter base (1) out of the buffer (2).



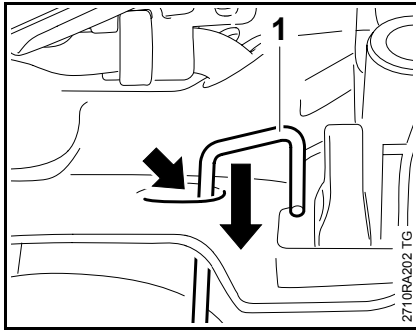
- Swing the filter base (1) in direction of throttle trigger until it is clear of the studs.



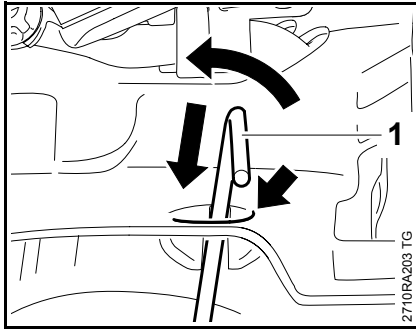
- Swing the filter base (1) in direction of throttle trigger until it is clear of the studs.
- Swing the filter base (1) in direction of ignition side and rest it against the stud (arrow).



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

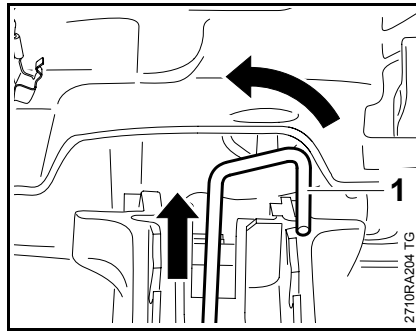


- Pull the throttle rod in the direction of the rear handle until its bent end (1) is at the opening (arrow).

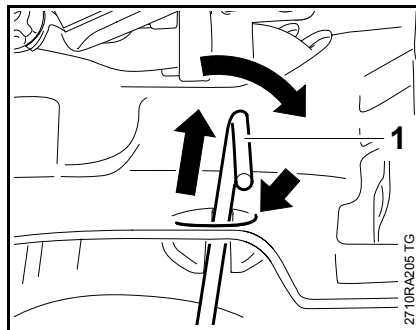


- Rotate the throttle rod (1) about 90° counterclockwise. Pass the throttle rod (1) through the opening (arrow) in the direction of the tank housing and remove it.
- Check the throttle rod and replace if necessary

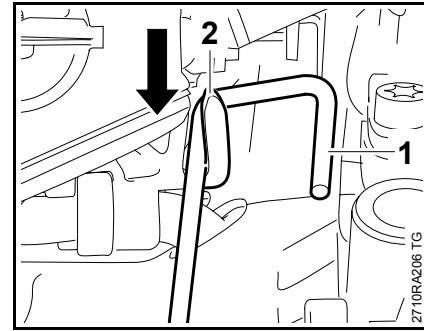
Installing



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



- Pass the throttle rod (1) through the opening (arrow).
- Turn the bent end (1) clockwise and push it under the throttle trigger in the direction of the engine.






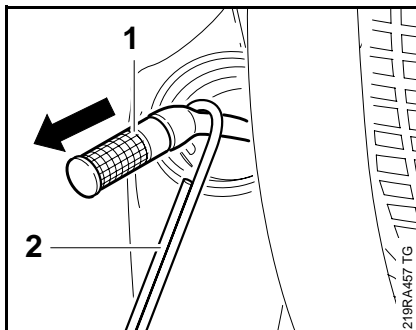
- Push the throttle rod (1) into the guide (2) in the carburetor carrier until it snaps into position.
- Install the throttle trigger, [10.2](#)
- Install the filter base, [12.3](#)
- Check operation.
 - the throttle lever on the carburetor must move upwards when the throttle trigger is pulled.
- Reassemble all other parts in the reverse sequence.

11. Chain Lubrication

11.1 Pickup Body

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

- Troubleshooting,  3.3
- Open the oil tank cap and drain the oil tank.
- Collect the oil in a clean container,  1
- Clean the oil tank if necessary,  1







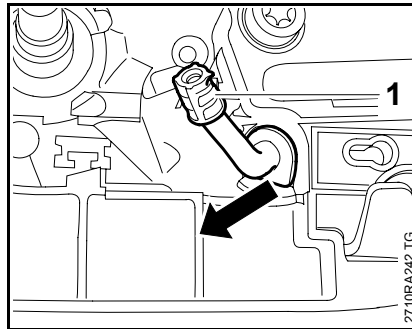
- Use hook (2) 5910 893 8800 to remove the pickup body (1) from the oil tank.


Do not overstretch the suction hose.

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

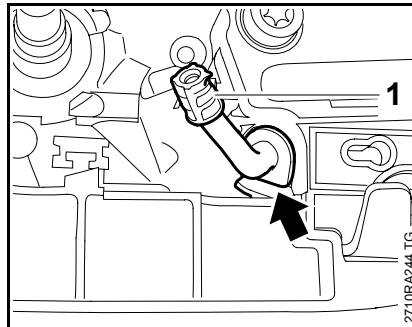
11.2 Oil Suction Hose

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




- Remove the oil suction hose (1) together with the pickup body.
- Check the oil suction hose and pickup body and replace if necessary.
- Fit the pickup body,  11.1




Installing

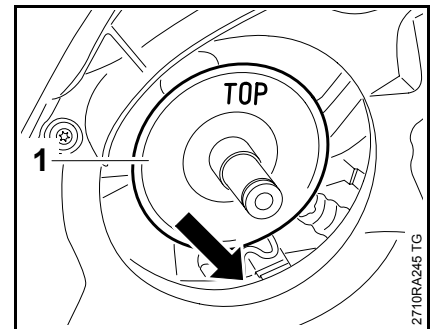


- Push the oil suction hose (1), pickup body first, through the housing bore (arrow).

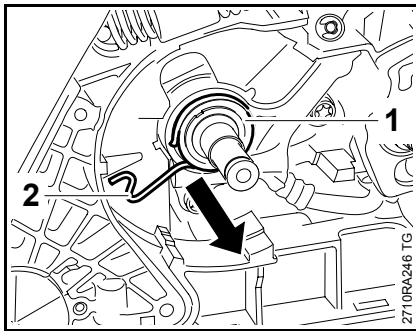
- Line up the oil suction hose (1)
 - the tab (arrow) must match the contour on the housing.
- Push home the oil suction hose (1) until its groove is properly seated in the engine housing.
- Check position of the pickup body and, if necessary, use the hook 5910 893 8800 to re-position it.
- Install the oil pump,  11.3
- Reassemble all other parts in the reverse sequence.

11.3 Oil Pump

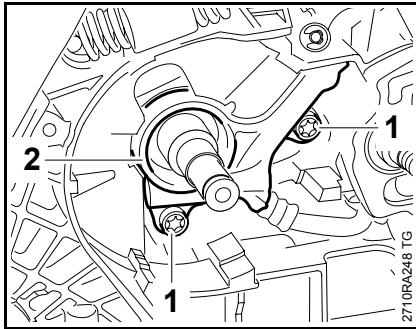
- Troubleshooting,  3.3
- Remove the clutch,  4
- Remove the brake band,  5.2



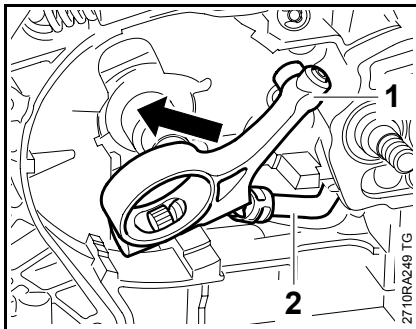
- Remove the shim (1).



- Pull the worm (1) with drive spring (2) out of the oil pump.
- Check the spring and worm and replace if necessary.

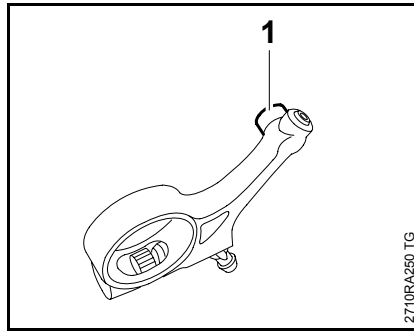


- Take out the screws (1) and lift the oil pump (2).

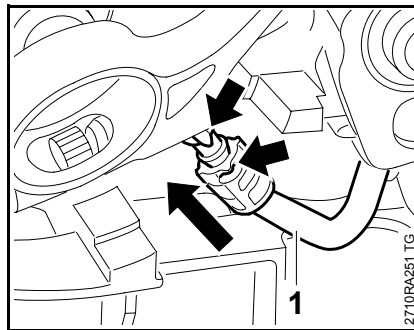


- Pull the oil pump (1) off the oil suction hose (2).
- Check the oil pump (1) and replace it if necessary

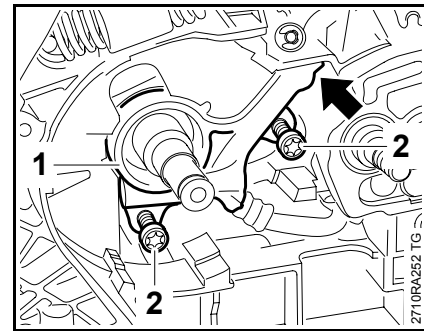
Installing



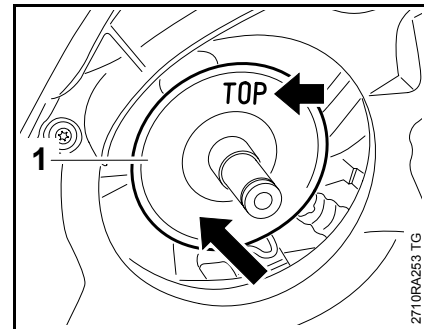
- Replace the sealing ring (1) – always use a new sealing ring.



- Position the oil suction hose (1) so that the lugs (arrows) are in alignment.
- Push the oil suction hose (1) onto the nipple.



- Position the oil pump (1) so that its rear connector (arrow) engages the bore.
- Insert and tighten down the screws (2) firmly.
- Push the worm fully home.




- Push the washer (1) into position.

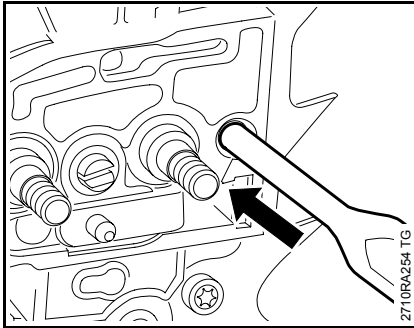
Installed position is correct when "TOP" (arrow) faces outwards.

- Reassemble all other parts in the reverse sequence.

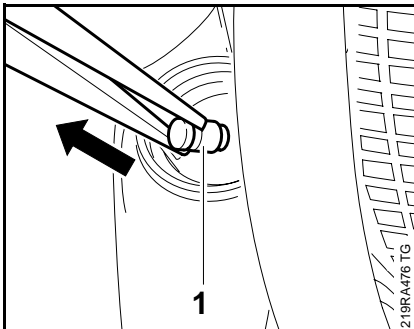
11.4 Valve

A valve is installed in the tank wall to keep internal tank pressure equal to atmospheric pressure. The valve must be replaced if it is faulty.

- Open the oil tank cap and drain the oil tank  1.

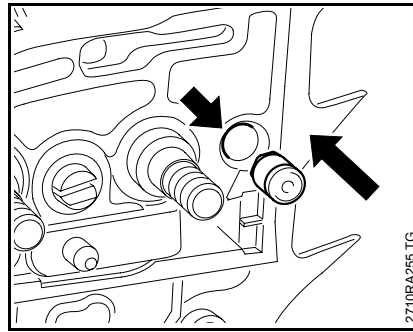


- Use a 6 mm drift to carefully drive the valve out of its seat in the housing and into the oil tank.



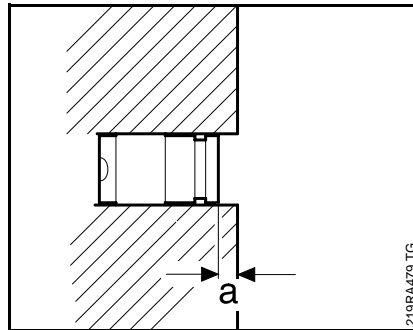
- Remove the old valve (1) from the oil tank.

Installing



Check correct installed position.

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



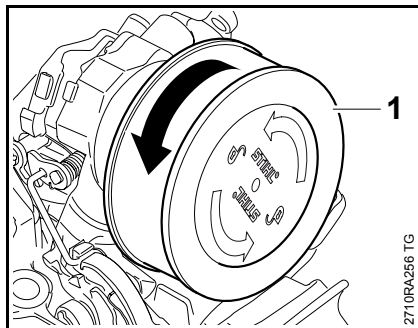
- Installed depth of new valve:
 $a = 1 \text{ mm } \pm 0.1$.
- Reassemble all other parts in the reverse sequence.

12. Fuel System

12.1 Air Filter

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

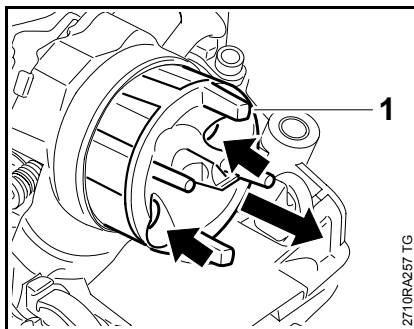
- See also Troubleshooting, 3.6, 3.7
- Remove the shroud, 6.4



- Rotate the air filter (1) counterclockwise and lift it away.
- Check the air filter and clean or replace if necessary
 - see instruction manual.
- Reassemble in the reverse sequence.

12.2 Baffle

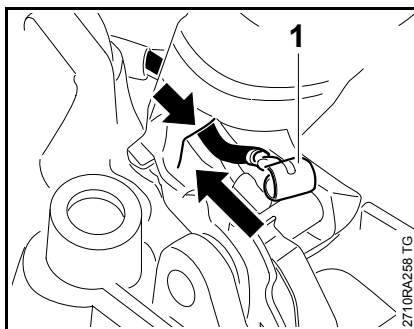
- Remove the air filter, 12.1



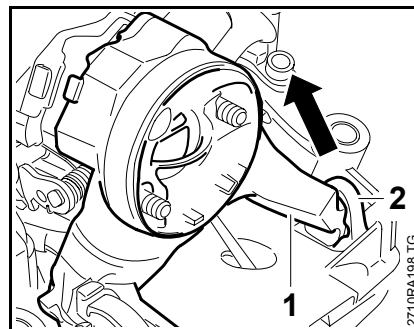
- Unscrew the nuts (arrows).
- Remove the baffle (1).
- Check the baffle and replace it if necessary
- Reassemble in the reverse sequence.

12.3 Filter Base

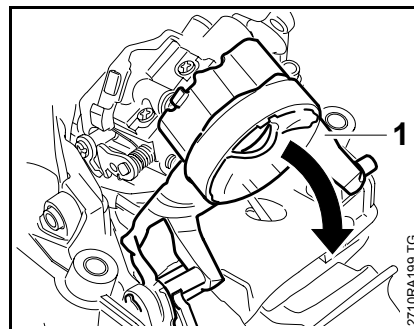
- Remove the air filter, 12.1
- Remove the baffle, 12.2
- Remove the choke rod, 10.3.3
- Remove the switch shaft, 10.1



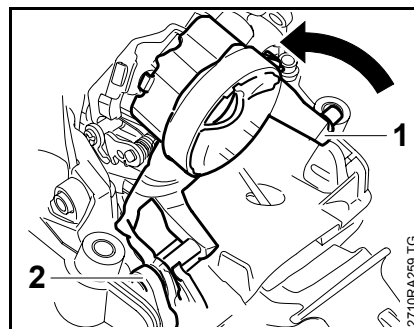
- Push the short circuit wire (1) out through the opening (arrow).



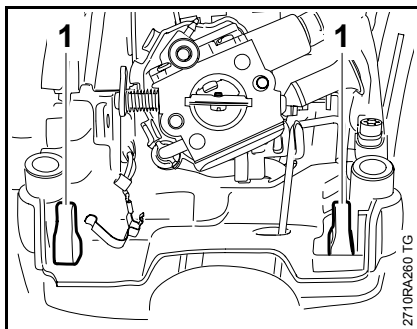
- Pry the filter base (1) out of the buffer (2).



- Swing the filter base (1) in direction of throttle trigger until it is clear of the studs.



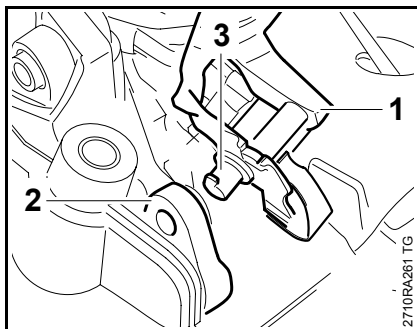
- Turn the filter base (1) in direction of ignition side.
- Disengage the filter base (1) from the buffer (2).
- Remove the contact spring, 7.7.4



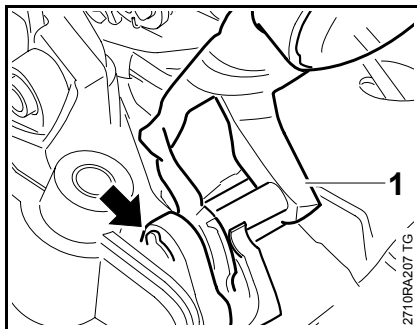
- Check the buffers (1) and replace if necessary, [9.4.2](#)

Installing

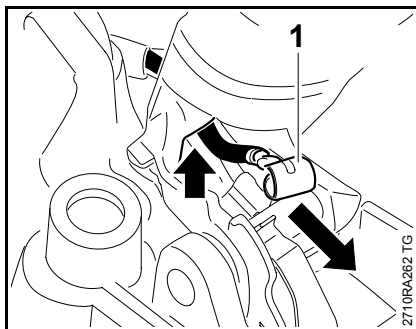
- Fit the contact spring, [7.7.4](#)



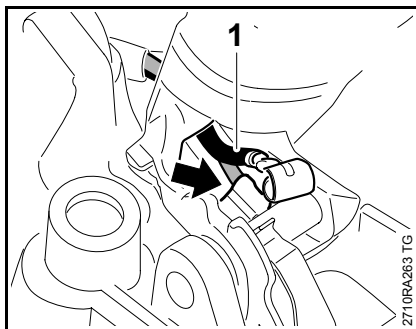
- Use STIHL press fluid to simplify assembly, [14](#)
- Engage the filter base (1) in the buffer (2) – make sure the peg (3) is properly seated in the buffer.



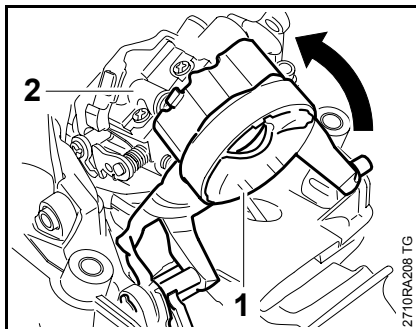
Engage peg of filter base (1) in buffer (arrow) at ignition side.



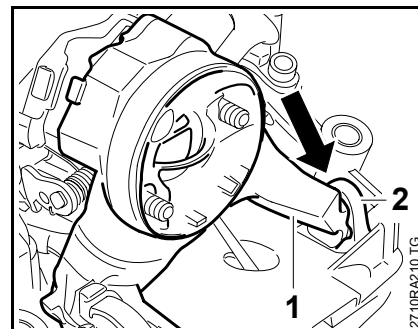
- Push the short short circuit (1) through the opening (arrow).



- Position the short circuit wire (1) so that it is above the ground wire's flag terminal (arrow).









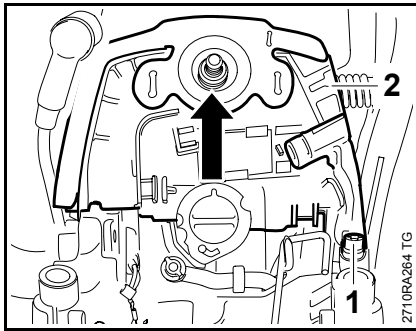
- Push the filter (1) onto the studs and the carburetor (2).



- Use STIHL press fluid to simplify assembly, [14](#)
- Engage the filter base (1) in the buffer (2).
- Reassemble all other parts in the reverse sequence.

12.4 Air Guide Shroud

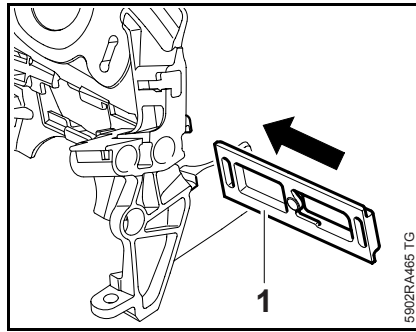
- Remove the fan housing,  8.2
- Remove the filter base,  12.3
- Remove the throttle rod,  10.3.4
- Remove the carburetor,  12.5
- Remove the carburetor carrier,  12.8
- Pull the boot off the spark plug.
- Pull the ignition lead out of the guides,  7.3



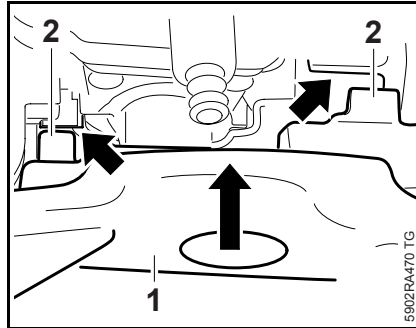
- Take out the screw (1).
- Lift the air guide shroud (2) a little and pull it out of its seats.

If the rubber lip is damaged, install a new air guide shroud.

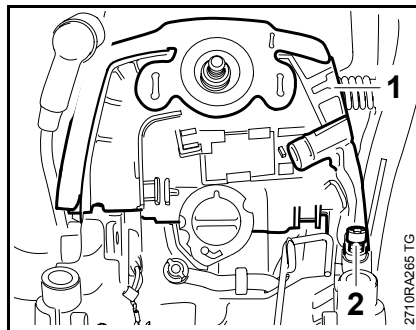
Installing




- Pull out the shutter, check it and replace if necessary.
- Push the shutter (1) into the guide until it snaps into place.









- Push the lugs (2) of the air guide shroud (1) into their seats (arrows).

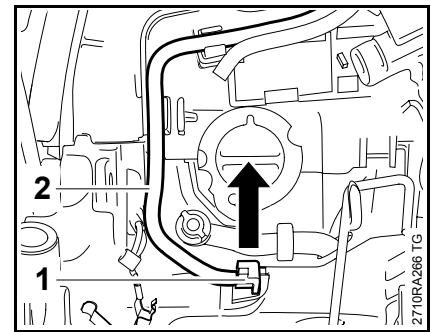


- Place the air guide shroud (1) in position.
- Insert and tighten down the screw (2) firmly.

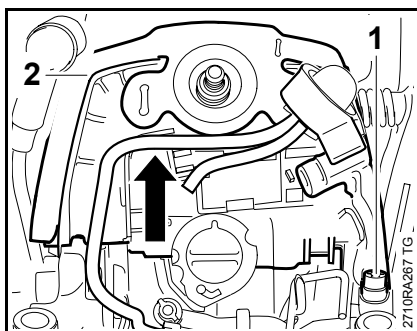
- Install the ignition lead,  7.3
- Reassemble all other parts in the reverse sequence.

12.4.1 Air Guide Shroud – Models with Manual Fuel Pump

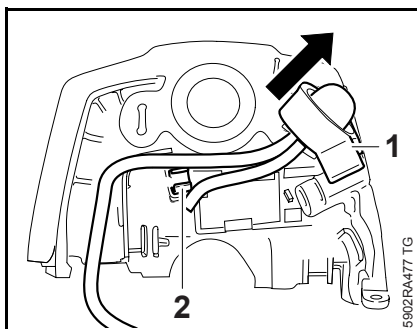
- Remove the fan housing,  8.2
- Remove the filter base,  12.3
- Remove the throttle rod,  10.3.4
- Remove the carburetor,  12.5
- Remove the carburetor carrier,  12.8
- Pull the boot off the spark plug.
- Pull the ignition lead out of the guides,  7.3



- Pull out the connector (1) with fuel return hose (2).
- Pull the fuel return hose (2) out of the guides (arrows).



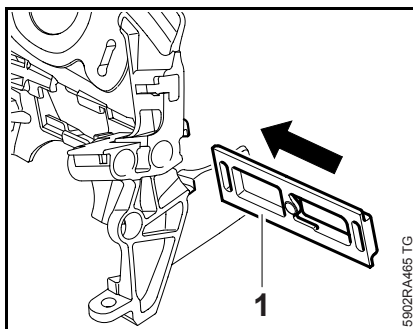
- Take out the screw (1).
- Lift the air guide shroud (2) a little and pull it out of its seats.



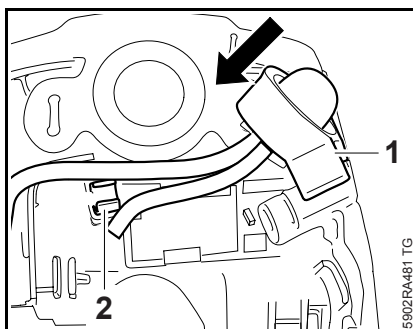
- Push the retainer (1) with fuel pump out of the guide.
- Remove the hose clip (2).
- Check the oil fuel pump and replace if necessary, [12.11.4](#)

If the rubber lip is damaged, install a new air guide shroud.

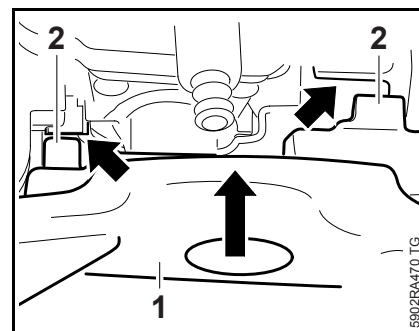
Installing



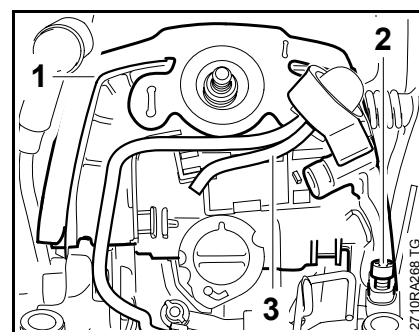
- Pull out the shutter, check it and replace if necessary.
- Push the shutter (1) into the guide until it snaps into place.



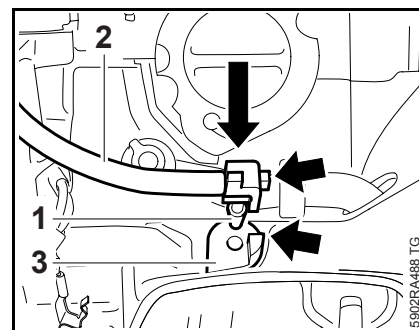
- Push the retainer (1) with fuel pump into the guide as far as stop.
- Position the hose clip (2) so that its locking tabs face the air guide shroud and press it into its seat.



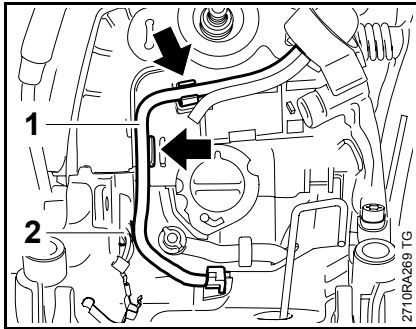
- Push the lugs (2) of the air guide shroud (1) into their seats (arrows).



- Place the air guide shroud (1) in position.
- Insert and tighten down the screw (2) firmly.
- Fit a new fuel suction hose (3), [12.11.3](#)



- Push the connector (1) with fuel return hose (2) into the fuel return hose (3) so that the contours (arrows) are in alignment.



- Push the fuel return hose (1) into the guides (arrows).
- Position the fuel return hose (1) so that it is beside the short circuit wire's grommet (2).

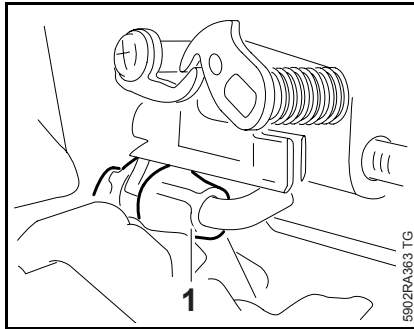
Do not kink or pinch the fuel return hose.

- Install the ignition lead, 7.3
- Reassemble all other parts in the reverse sequence.

12.5 Carburetor

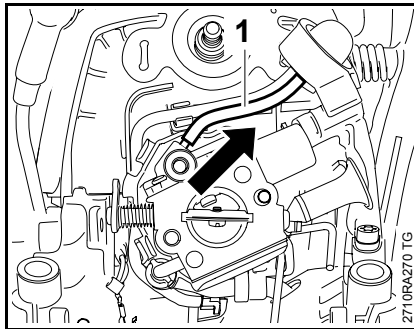
- Remove the filter base, 12.3
- Open the fuel tank cap and drain the fuel tank.
- Collect the fuel in a clean container, 1

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



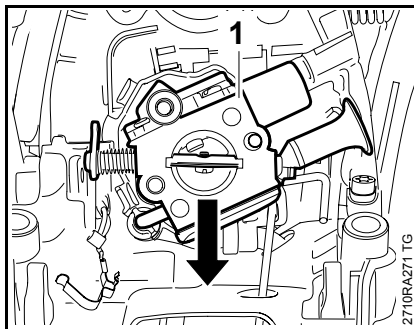
- Push the fuel hose (1) back a little
– the fuel hose is disconnected.

Models with manual fuel pump



- Remove the fuel hose (1).

All models

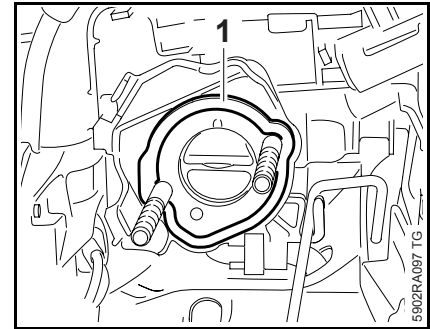


- Remove the carburetor (1).
- Check the carburetor and service or replace if necessary.

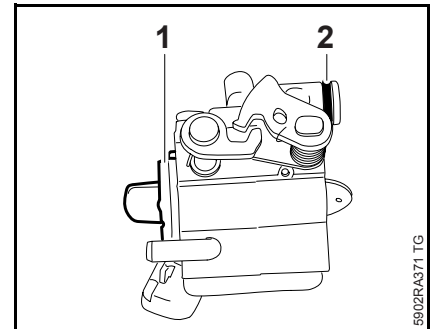
Models with manual fuel pump

- Install a new fuel hose, 12.11.3

Installing



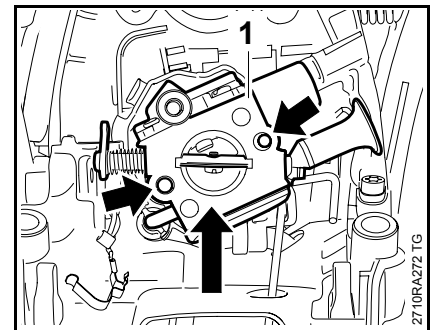
Make sure the washer (1) is in place.



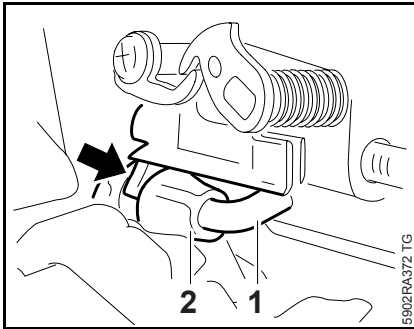
Make sure the ring (1) is in place.

Make sure sealing ring (2) is in place.

- Check the components and replace as necessary.

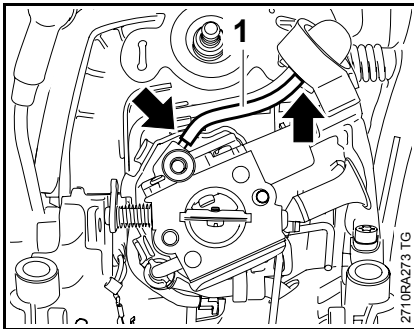


- Push the carburetor (1) onto the studs (arrows).



- The fuel hose must be located in its seat (arrow).
- When positioning the carburetor, make sure the stub (1) is pushed into the fuel hose (2).

Models with manual fuel pump



- Push the new fuel hose (1) onto the nipples (arrows).

All models

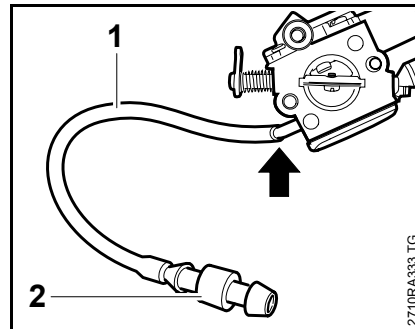
- Install the filter base, 12.3
- Install the air filter, 12.1
- Check operation.
- Reassemble all other parts in the reverse sequence.

12.5.1 Leakage Test

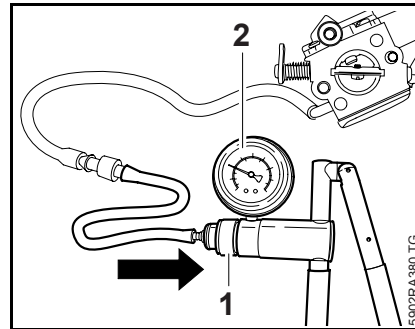
In the case of problems with the carburetor or fuel supply system, also check and clean or replace the tank vent, 12.10

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

- Remove the carburetor, 12.5



- Push the fuel hose (1) 1110 141 8600 onto the nipple (2) 0000 855 9200.
- Push the fuel hose with nipple onto the carburetor's fuel stub (arrow).



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

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

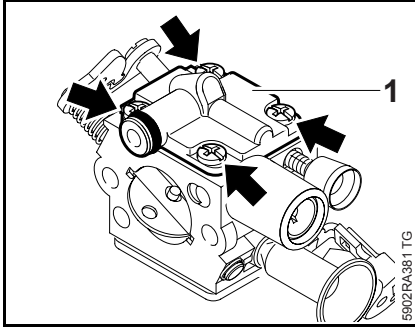
If this pressure remains constant, the carburetor is airtight. However, if it drops, there are three possible causes:

1. Metering diaphragm or gasket damaged, replace if necessary, 12.6.1
 2. The inlet needle is not sealing (foreign matter in valve seat, sealing cone of inlet needle is damaged or inlet control lever is sticking), remove to clean, 12.6.2
 3. Pump diaphragm or gasket damaged, replace if necessary, 12.6.3
- Test the tank vent if necessary, 12.10.1
 - After completing the test, push the ring (1) to the left to vent the system and then pull the fuel hose off the carburetor.
 - Install the filter base, 12.3
 - Reassemble all other parts in the reverse sequence.

12.6 Servicing the Carburetor

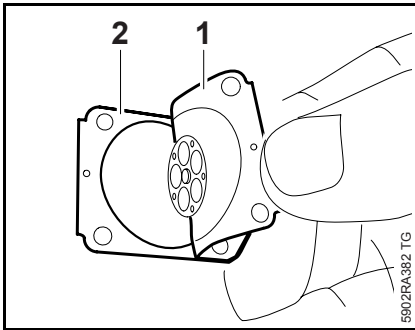
12.6.1 Metering Diaphragm

- Troubleshooting, 3.6
- Remove the carburetor, 12.5



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

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

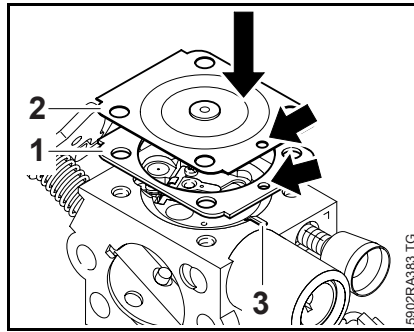


- Carefully separate the metering diaphragm (1) and gasket (2).

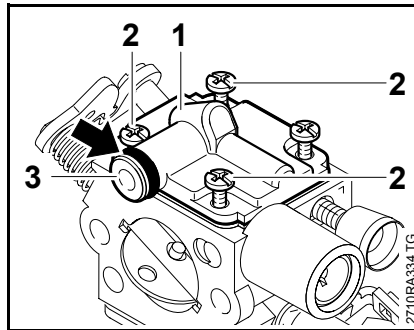
The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue. i.e. the diaphragm distorts and swells and has to be replaced.

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

Installing



- Note installed positions of metering diaphragm (2) and gasket (1).
- Position the gasket (1) and metering diaphragm (2) so that the holes (arrows) are in line with the recess (3).

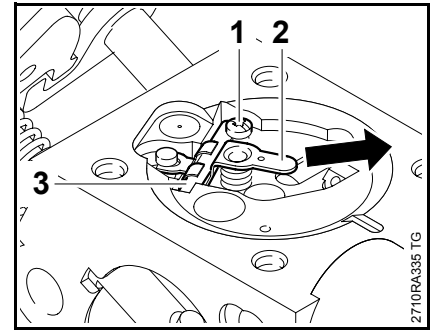


- Position the end cover (1) so that the stub (3) points in the direction of the choke shutter.
- Fit the end cover (1) and line up the holes.
- Fit the screws (2).
- Check position of metering diaphragm and gasket, then tighten down the screws firmly in a crosswise pattern.
- Check the sealing ring (arrow) and replace it if necessary

- Reassemble all other parts in the reverse sequence.

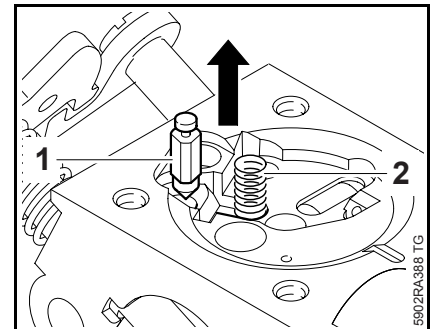
12.6.2 Inlet Needle

- Remove the metering diaphragm, 12.6.1

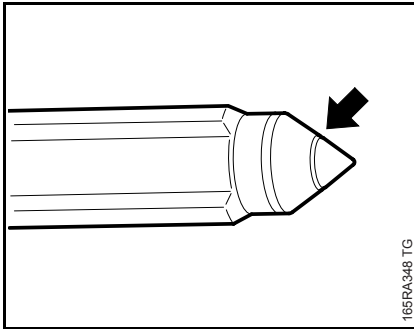


- Take out the screw (1).
- Remove the inlet control lever (2) with spindle (3) out of the inlet needle's groove.

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

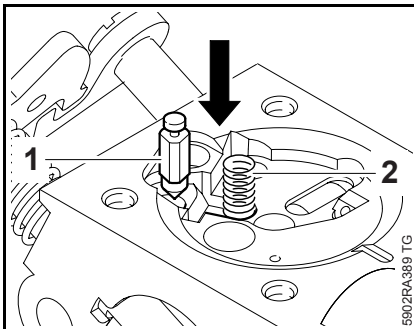


- Remove the inlet needle (1).
- Remove the spring (2). Inspect and replace if necessary.

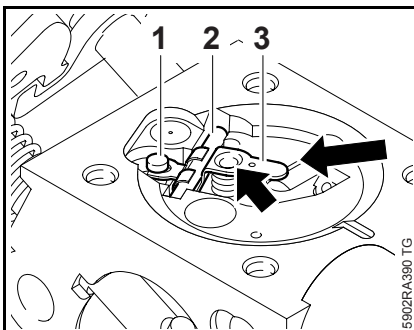


- If there is an annular indentation (arrow) on the sealing cone of the inlet needle, fit a new inlet needle.

Installing



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



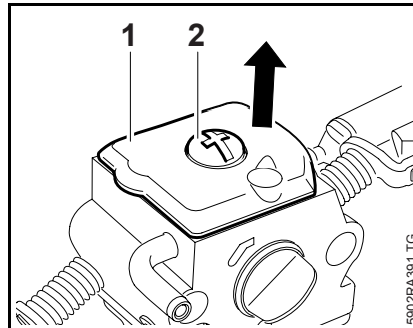
- Position the inlet control lever (3) with spindle (2) on the spring (arrow) first, then slide the inlet control lever's clevis into the groove in the inlet needle (1).

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

- Press the inlet control lever down and secure it with the screw.
- Check that the inlet control lever moves freely.
- Install the metering diaphragm, 12.6.1

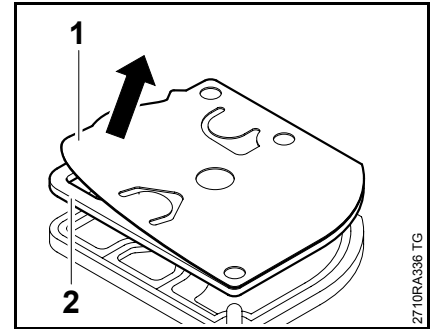
12.6.3 Pump Diaphragm

- Troubleshooting, 3.6
- Remove the carburetor, 12.5



- Take out the screw (2).
- Remove the end cover (1).

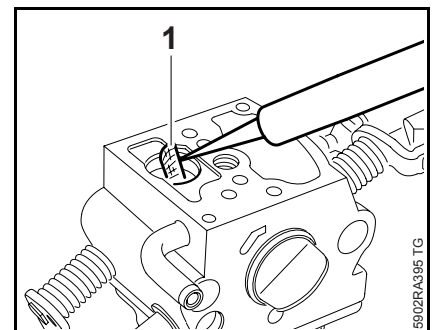
If the gasket and pump diaphragm are stuck to the carburetor, remove them very carefully.



- Carefully remove the pump diaphragm with gasket from the end cover.
- Carefully separate the pump diaphragm (1) and gasket (2) – always install a new gasket.

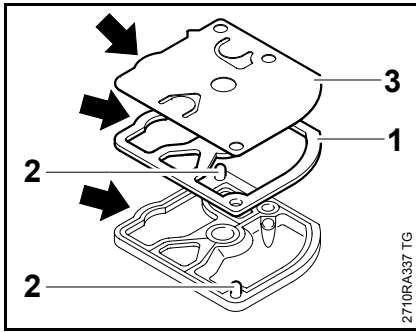
The diaphragm material is subjected to continuous alternating stresses and eventually shows signs of fatigue. i.e. the diaphragm distorts and swells and has to be replaced.

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

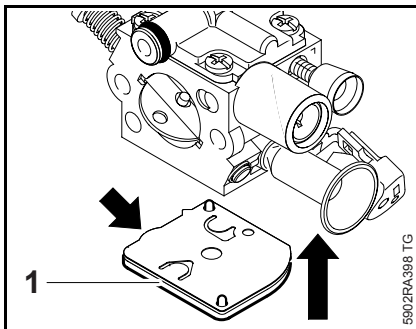


- Use a needle to remove the fuel strainer (1) from the carburetor body. Clean or replace the fuel strainer.
- Reassemble in the reverse sequence.

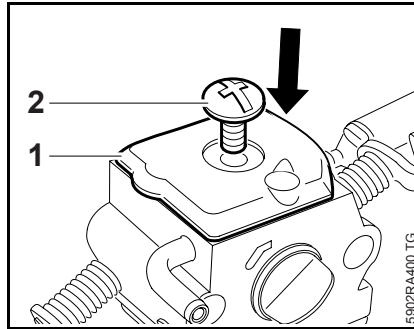
Installing



- Place the gasket (1) and pump diaphragm (2) on the end cover (3) so that the contours (arrows) are in alignment and make sure they are held in position by the pegs (4).



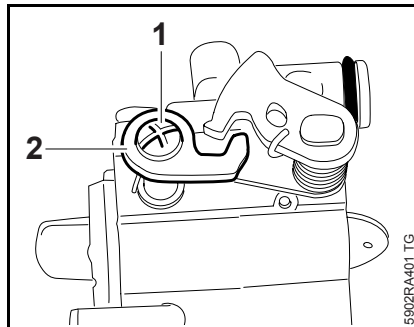
- Fit the end cover (1) from below so that the pump diaphragm and gasket are still held in position.
- Position the end cover (1) so that the contour (arrow) points in the direction of the throttle and choke shaft levers.



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

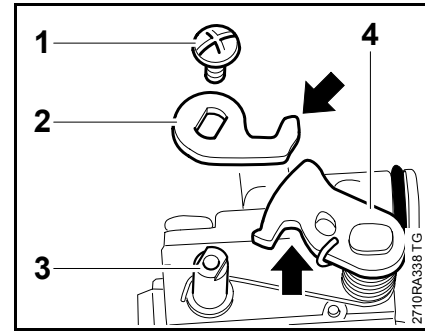
12.6.4 Levers on Throttle Shaft

- Remove the carburetor, 12.5
- Carburetor troubleshooting, 3.6



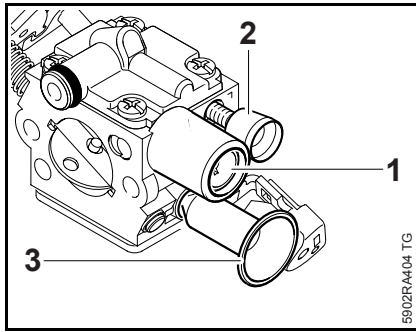
- Take out the screw (1).
- Pull off the lever (2).

Installing



- Position the lever (2) so that its hook engages the lever on the choke shaft (arrows).
- Push the lever (2) onto the throttle shaft so that it engages the flats on the end of the shaft (3).
- Insert and tighten down the screw (1) firmly.
- Check operation
 - lever (2) must engage lever (4) (arrows).
- Reassemble all other parts in the reverse sequence.

12.6.5 Adjusting Screws



Grommet has been removed for the sake of clarity.

There are three adjusting screws on the carburetor:

H = high speed screw (1)

L = low speed screw (2)

LA = idle speed screw (3)

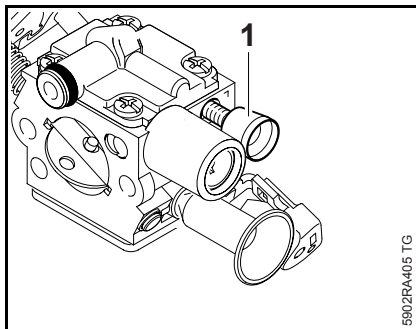
If the carburetor cannot be adjusted properly, the problem may be the adjusting screws.

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

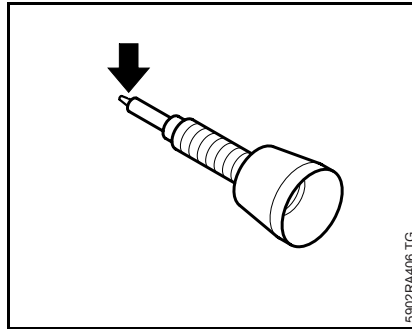
Always install a new limiter cap.

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

Low speed screw



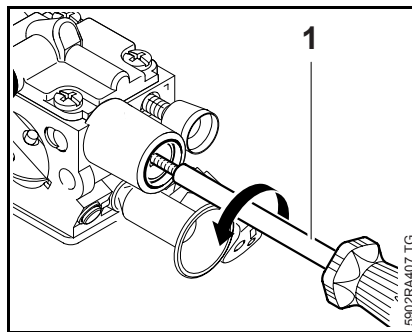
- Take out the low speed screw **L** (1).



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

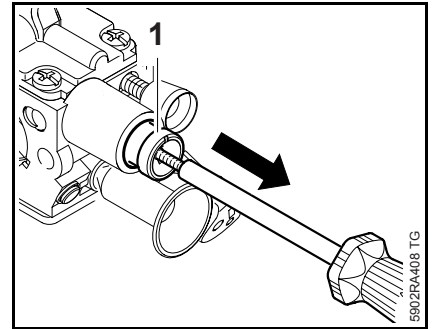
High speed screw

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



- Screw the puller (1) 5910 890 4502 about 5 turns counterclockwise into the limiter cap – left-hand thread.

Do not turn the puller any further – the high speed screw (**H**) may otherwise be damaged.

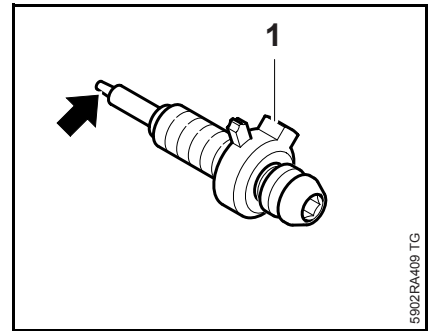


- Pull out the limiter cap (1).

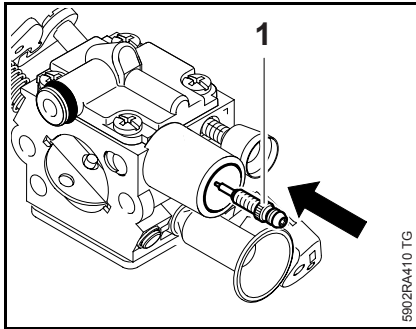
The polymer segment is left on the high speed screw (**H**) after the limiter cap has been pulled off. It is necessary to unscrew the high speed screw (**H**) to remove the old polymer segment.

- Take out the high speed screw (**H**).

Always install a new limiter cap.

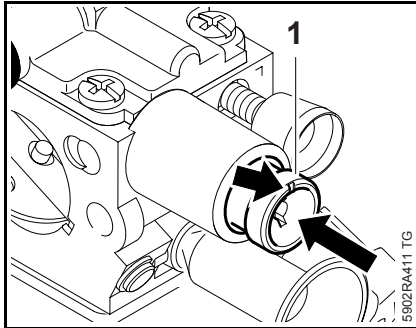


- Inspect the tip (arrow) for damage or wear and replace the screw (**H**) if necessary.
- If the high speed screw (**H**) is in order, remove the old polymer segment (1) – take care not to damage the high speed screw (**H**).



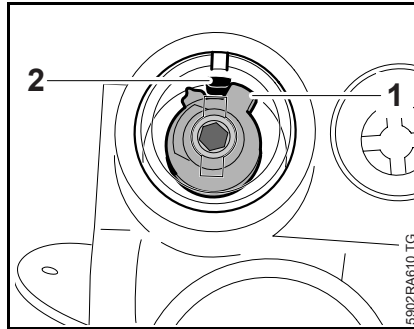
- Screw down the high speed screw **H** (1) as far as stop.
- Continue with "Pre-installing limiter cap".

Pre-installing limiter cap



Make sure the stop on the limiter cap is clear of the stop on the carburetor body.

- Line up the new limiter cap (1) so that the notch (arrow) points vertically upwards.
- Push the new limiter cap (1) onto the high speed screw (**H**) as far as the first detent (arrow) – do not push fully home.



When pushing the limiter cap into position, check that the stop (1) on the limiter cap butts against the right-hand side of the carburetor's stop (2).

The basic setting with the pre-installed limiter cap is carried out with screwdriver 5910 890 2306.

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

12.7 Adjusting the Carburetor

12.7.1 Basic Setting

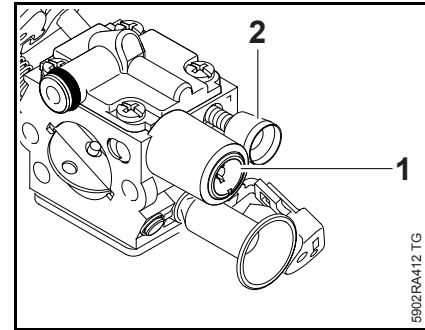
The basic setting is necessary only if the high speed screw (**H**) or low speed screw (**L**) has to be replaced or after cleaning and adjusting the carburetor from scratch.

It is necessary to carry out the basic setting after removing the limiter cap.

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

- Check chain tension and adjust if necessary.

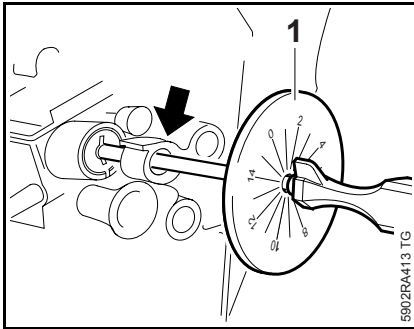
- Inspect the spark arresting screen (if fitted) and clean or replace if necessary, 3.7 or 6.1
- Check the air filter and clean or replace if necessary, 12.1



For the sake of clarity the adjusting screws are shown on the exposed carburetor.

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

The setting disc 5910 893 6600 may be fitted on the screwdriver 5910 890 2306 to aid adjustment.



- Insert screwdriver (1) 5910 890 2306 through the opening (arrow) and into the low speed screw **L** and high speed screw **H** – push the screwdriver through the pre-installed limiter cap on the high speed screw **H**.

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

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

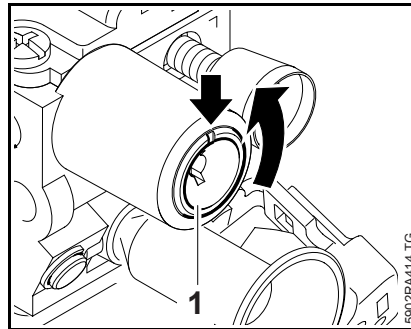
If this speed is higher than 3,700 rpm, abort the procedure and start again with step 1.

3. Use the idle speed screw (**LA**) to set the engine speed again to 3,300 rpm.
4. Use the low speed screw (**L**) to set engine speed to 2,800 rpm.

5. Use the high speed screw (**H**) to set the engine's maximum speed to 13,000 rpm. (starting with $H = 1 \frac{1}{2}$ turns open).

Do not attempt to make the mixture any leaner after obtaining an engine speed of 13,000 rpm – the ignition module limits maximum engine speed to 13,000 rpm. This speed cannot be increased by making the setting leaner. Making the mixture over-lean increases the risk of engine damage.

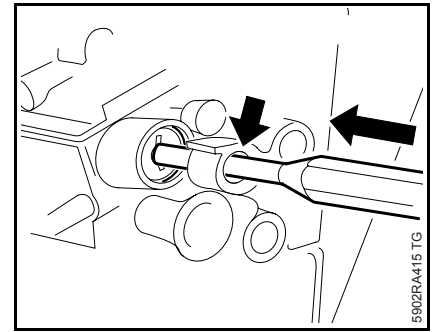
Checking position of limiter cap



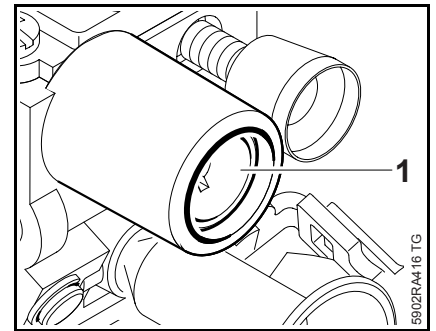
Notch (arrow) in limiter cap (1) must point vertically upwards.

- If necessary, use a screwdriver to rotate the limiter cap (1) counterclockwise as far as stop – the notch (arrow) is at the top.

Securing the limiter cap



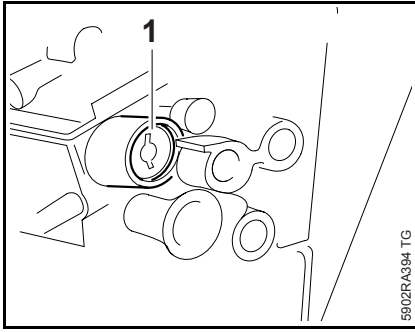
- Insert a drift through the opening (arrow) and then push home the limiter cap until it engages.



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

The setting of the high speed screw **H** is fixed when the limiter cap (1) is recessed 2 mm in the carburetor body.

12.7.2 Standard setting



The limiter cap (1) must not be removed for the standard setting.

Always perform the following steps before carrying out any adjustments:

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

Standard setting

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

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

Adjusting engine idle speed

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

Engine stops while idling

- Turn the idle speed screw (LA) clockwise until the chain starts running, then turn it back 1 full turn.

Saw chain runs while engine is idling

- Turn the idle speed screw (LA) counterclockwise until the chain stops running, then turn it back one full turn.

Erratic idling behavior, poor acceleration

(although standard setting is correct)

Idle setting too lean.

- Warm up the engine.
- Turn the low speed screw (L) counterclockwise until the engine runs and accelerates smoothly.

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

Adjustment for operation at high altitude

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

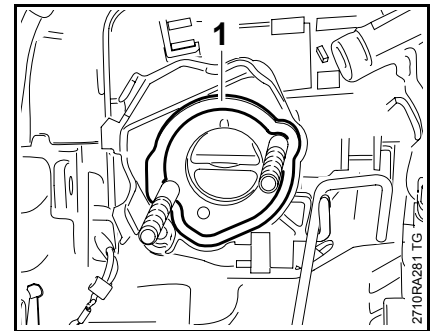
- Check standard setting.
- Warm up the engine.
- Turn the high speed screw (H) clockwise (leaner) – no further than stop.

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

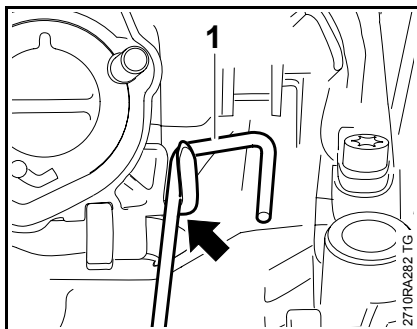
If the setting is made too lean there is a risk of engine damage as a result of lack of lubrication and overheating.

12.8 Carburetor Carrier

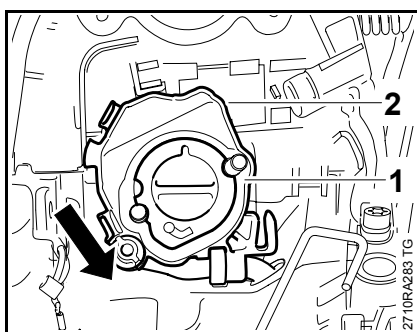
- Remove the carburetor, 12.5



- Remove the shim (1).

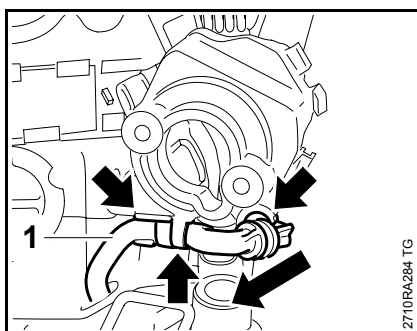


- Pull the throttle rod (1) out of the guide (arrow) and put it to one side.



Take care not to damage the fuel hose when removing the carburetor carrier.

- Push the manifold flange (1) out of the carburetor carrier (2) in the direction of the cylinder, pulling the carburetor carrier away at the same time.



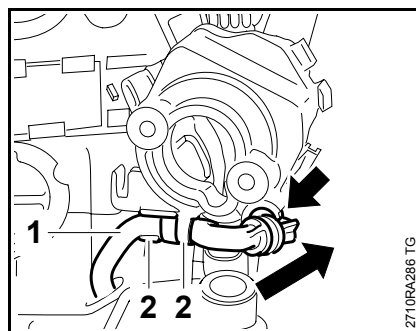
- Remove the fuel hose (1) from the guides (arrows) – take care not to stretch the hose.

- Remove the carburetor carrier, check it and replace if necessary.
- Check the intake manifold and replace if necessary, 12.9

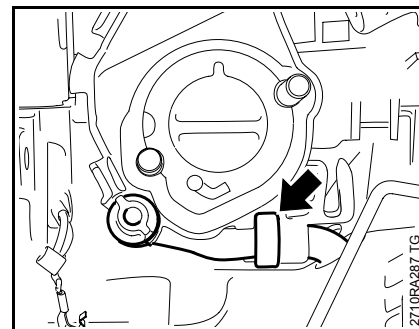
Installing



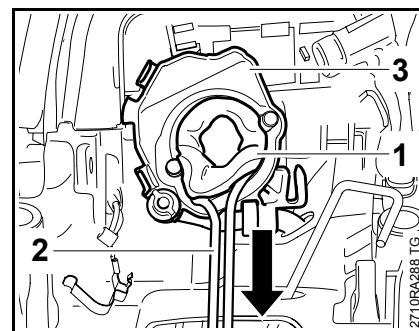
- To fit the manifold (2) through the carburetor carrier's opening, wind a piece of string (1) (about 15 cm long) around the back of manifold flange.



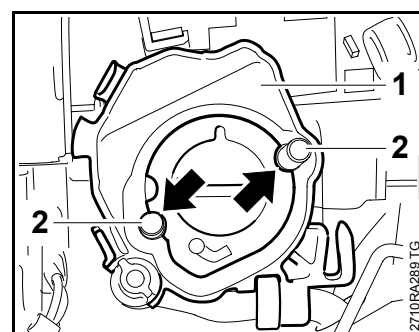
- Place the carburetor carrier in position.
- Fit the fuel hose (1) in the guides (2) – take care not to stretch the hose.
- Press the groove on the fuel hose (1) fully into its seat (arrow).



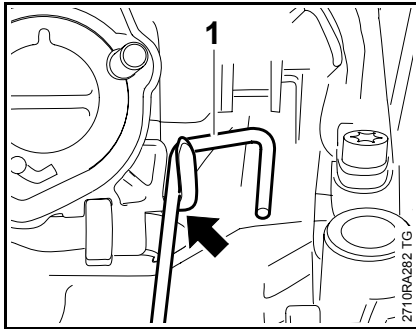
The lug must engage the seat (arrow).



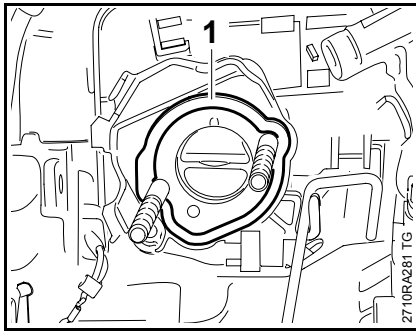
- Use the ends of the string (2) to pull the manifold flange (1) through the intake opening while pushing the carburetor carrier (3) against the manifold flange.
- Remove the string.



- Position the carburetor carrier (1) so that the semi-circles (arrows) locate against the studs (2).



- Push the throttle rod (1) into the guide (arrow) until it snaps into position.



- Push the washer (1) into position.

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

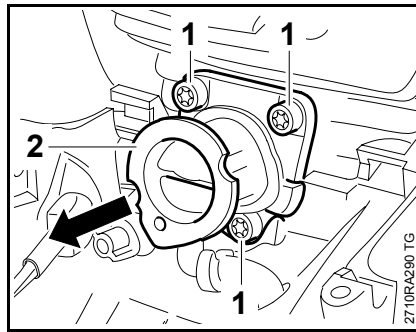
When the filter base is installed, the fuel hose must be centered in the opening in the lower air guide shroud. If it touches one side of the opening, install it properly, [12.11.2](#), [12.8](#).

- Reassemble all other parts in the reverse sequence.

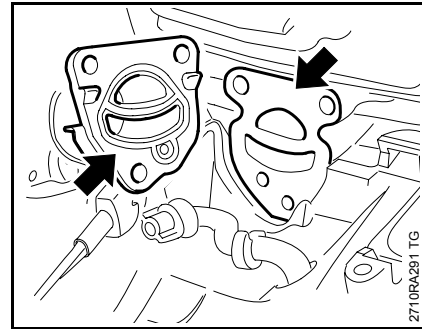
12.9 Intake Manifold

A damaged intake manifold can result in engine running problems.

- Troubleshooting, [3.6](#) or [3.7](#)
- Remove the shroud, [6.4](#)
- Remove the carburetor, [12.5](#)
- Remove the carburetor carrier, [12.8](#)
- Remove the air guide shroud, [12.4](#)
Models with manual fuel pump, [12.4.1](#)



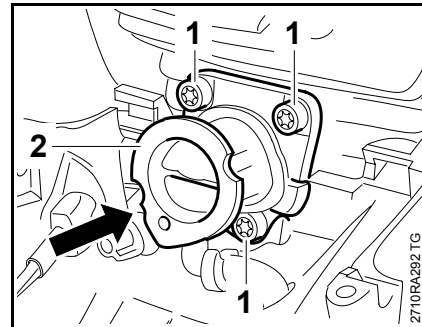
- Take out the screws (1).
- Remove the intake manifold (2).
- Inspect the intake manifold (2) and replace it if necessary – even very minor damage can result in engine running problems, [3.7](#)



- Inspect and clean the sealing faces (arrows), [14](#)

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

Installing





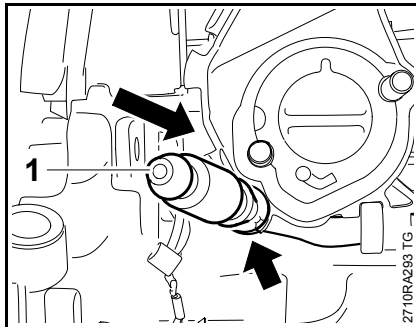
- Position the manifold (2) on the cylinder.
- Insert and tighten down the screws (1) firmly.
- Install the air guide shrouds, [12.4](#)
Models with manual fuel pump, [12.4.1](#)
- Install the carburetor carrier, [12.8](#)
- Reassemble all other parts in the reverse sequence.

12.10 Tank Vent

12.10.1 Testing

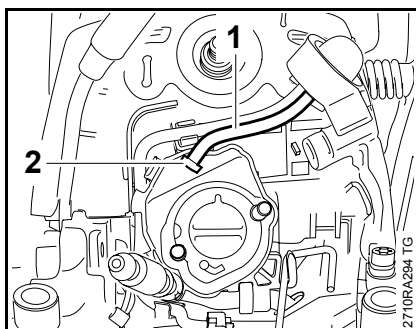
If problems occur on the carburetor or the fuel supply system, also check and clean the tank vent and replace it if necessary. Check function by performing pressure and vacuum tests on the tank via the fuel hose.

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



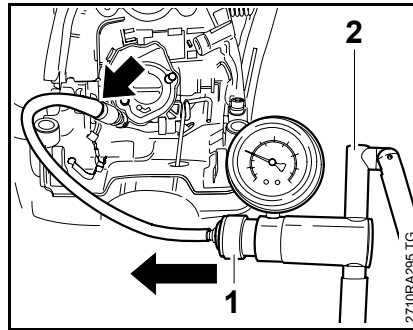
- Push the nipple (1) 0000 855 9200 into the fuel hose (arrow).

Models with manual fuel pump





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

Vacuum test

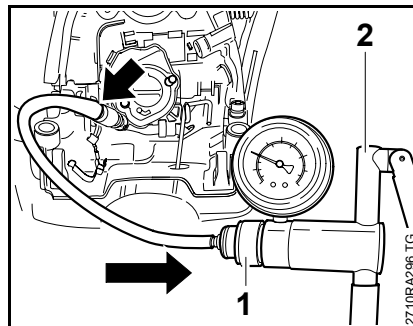


- Push the ring (1) to the left and connect the pump (2) 0000 850 1300 to the nipple (arrow)
 - create a vacuum in the fuel tank.

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

- Clean the area around the tank vent.
- If necessary, install a new tank vent or tank,  12.10 or  12.11.5.


Pressure test

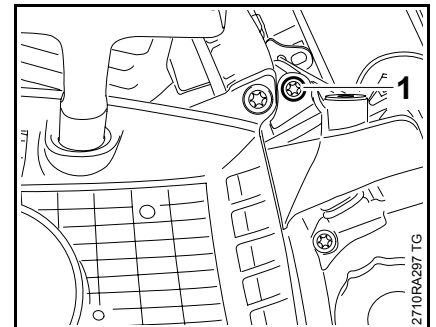


- Push the ring (1) to the right and connect the pump (2) 0000 850 1300 to the nipple (arrow)
 - pressurize the fuel tank.

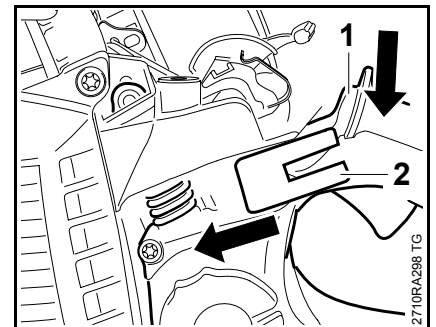
- Operate the pump until the pressure gauge indicates a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the tank, including the tank vent, is airtight. If the pressure drops, the leak must be located and the faulty part replaced.
- Reassemble in the reverse sequence.

12.10.2 Removing and Installing

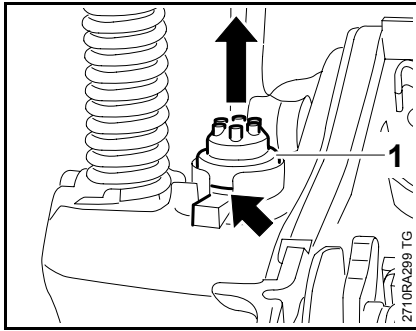
- Remove the shroud,  6.4



- Take out the screw (1).



- Press the tank housing (1) downwards and use wooden block (2) 1108 893 4800 to maintain the gap.



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

Always install a new tank vent.

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

12.11 Fuel Intake

12.11.1 Pickup Body

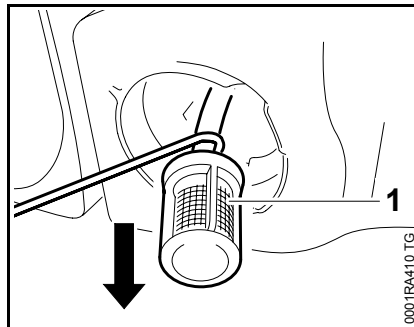
Any impurities mixed with the fuel are retained by the pickup body (filter). The fine pores of the filter eventually become clogged with minute particles of dirt. This restricts the passage of fuel and results in fuel starvation.

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

- Troubleshooting, 3.6 or 3.7

Clean the fuel tank if necessary.

- Open the tank cap and drain the 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.



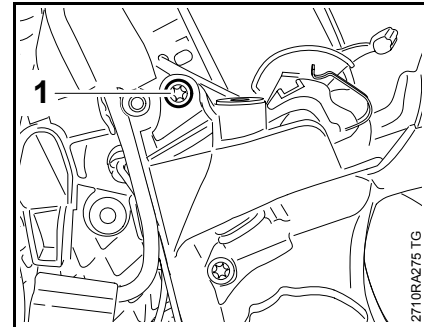
- Use hook 5910 893 8800 to remove the pickup body (1) from the fuel tank.

Do not overstretch the fuel hose.

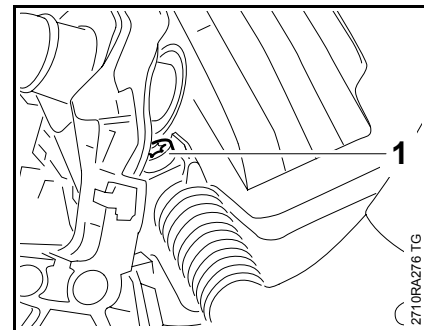
- Pull off the pickup body (1), check it and replace if necessary.
- Reassemble in the reverse sequence.

12.11.2 Fuel Hose

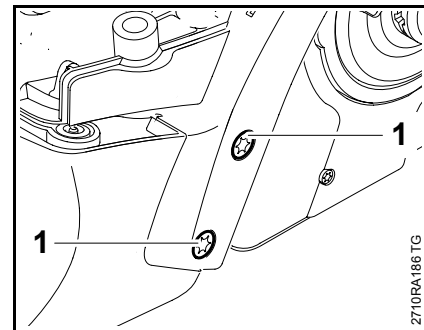
- Open the tank cap.
- Remove the carburetor carrier, 12.8



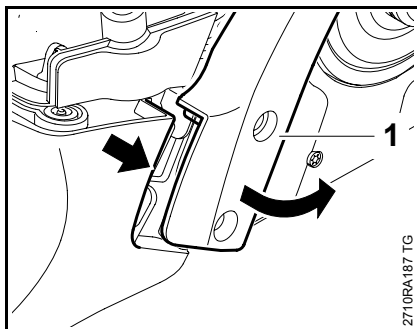
- Take out the screw (1).



- Take out the screw (1).

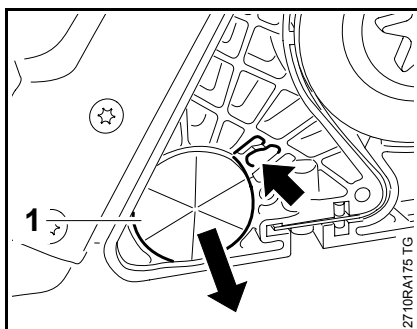


- Take out the screws (1).



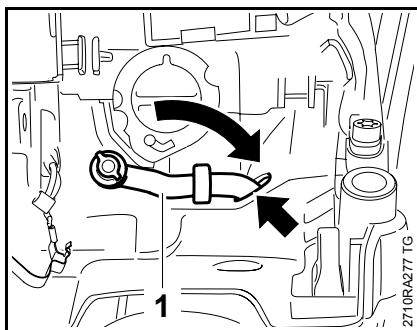
- Ease the handlebar (1) sideways and take it out of the guide (arrow).

– Remove the chain brake cover, 5.2

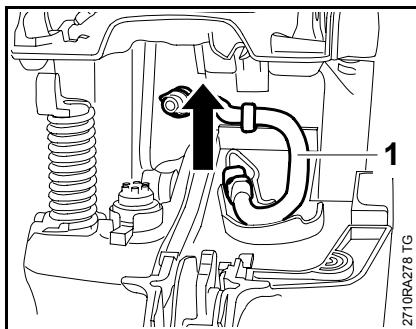


- Pry out the stop buffer (1) at the recess (arrow).

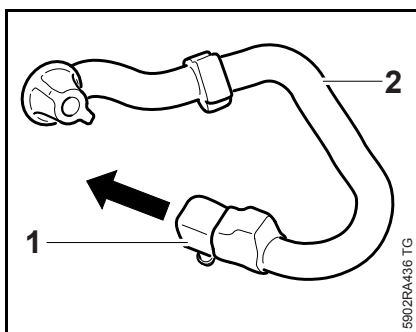
– Lower the tank housing.



- Pull the fuel hose (1) downwards and out through the opening (arrow).

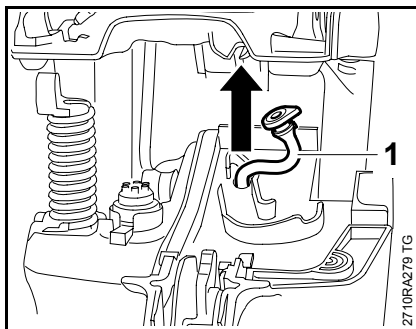


- Pull out the fuel hose (1) with connector.



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

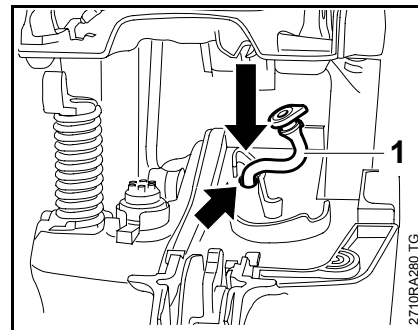
– Remove the pickup body, 12.11.1



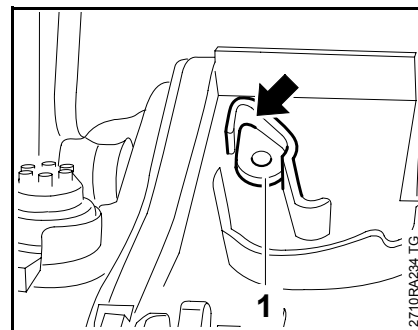
- Pull the fuel suction hose (1) out of the fuel tank.

– Replace the fuel hose and fuel return hose. Check the connector and replace if necessary.

Installing

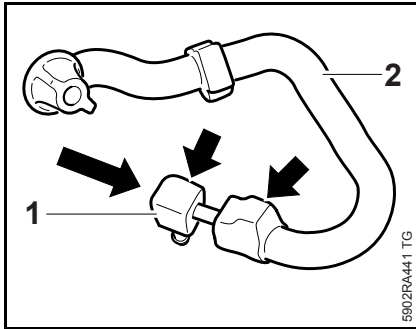


- Push the fuel hose (1) through the bore (arrow) in the fuel tank.

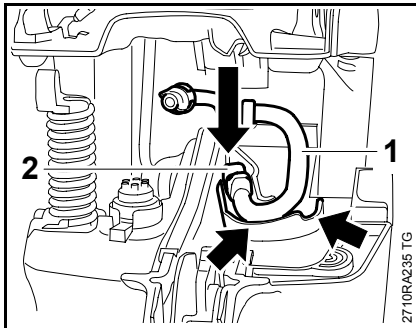


– Use STIHL press fluid to simplify assembly, 14

- Line up the fuel suction hose (1) and push it into the housing bore as far as stop – the flange must engage the guide (arrow).

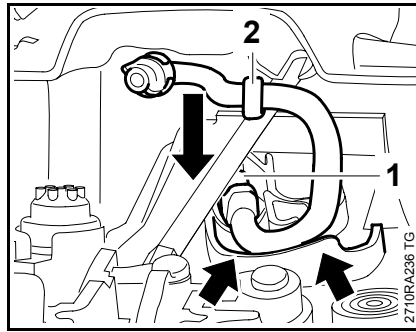


- Line up straight face of connector (1) with hump on fuel hose (2) (see arrows).
- Push the connector (1) into the fuel hose (2) as far as stop.

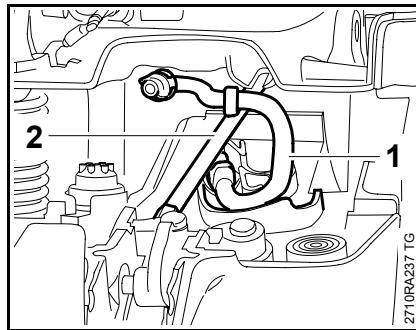


- Push the connector (2) into the fuel suction hose.
- Line up the fuel hose (1) and connector with the channel (arrows).

Machines with QuickStop Super

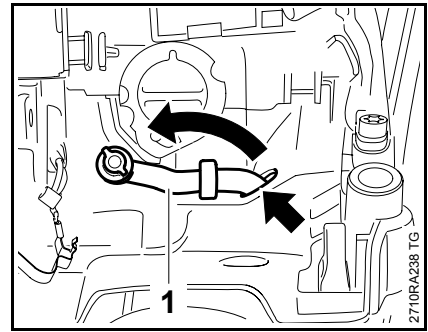


- Pass the fuel hose (2), connector first, under the brake cable.
- Push the connector (1) into the fuel suction hose.
- Line up the fuel hose (2) and connector with the channel (arrows).

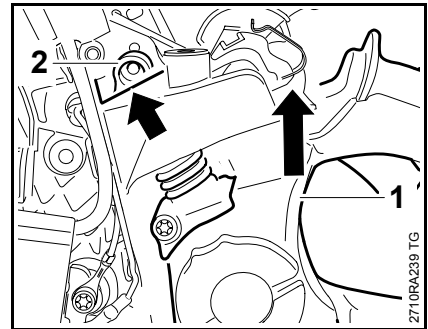


- Position the fuel hose (1) so that it is on the right of the brake cable (2) – as shown in the illustration.

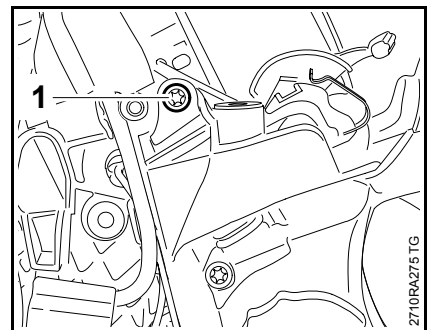
All models



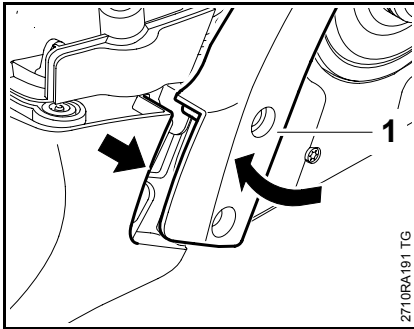
- Push the fuel hose (1) through the opening (arrow) in the engine housing.



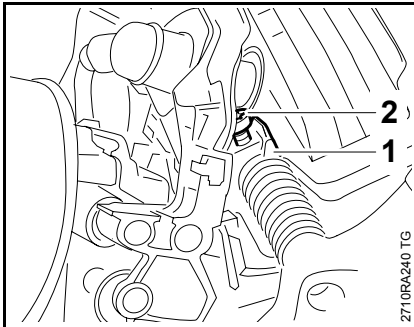
- Pass the AV spring (2) through the opening (arrow).
- Lift the tank housing (1).



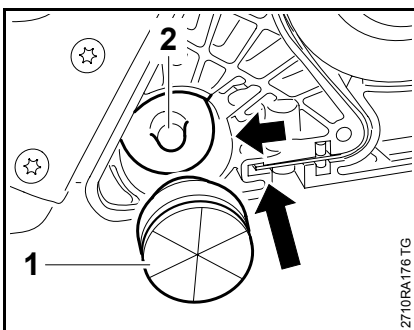
- Insert and tighten down the screw (1) firmly.



- Ease the handlebar (1) sideways and place it in the guide (arrow).
- Insert the screws and tighten them down firmly.

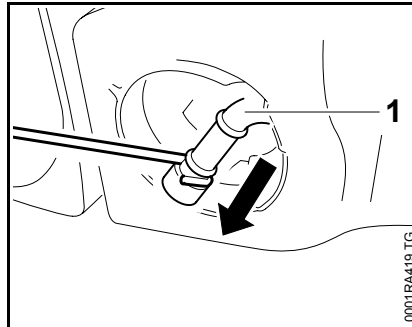


- Fit the AV spring (1) in position.
- Insert and tighten down the screw (2) firmly.



- Position the stop buffer (1) with its tapered end facing the engine housing.

- Push the stop buffer (1) into the bore as far as stop – the peg (2) must engage the stop buffer (1).
- Check position of fuel hose and correct if necessary, [12.11.2](#)



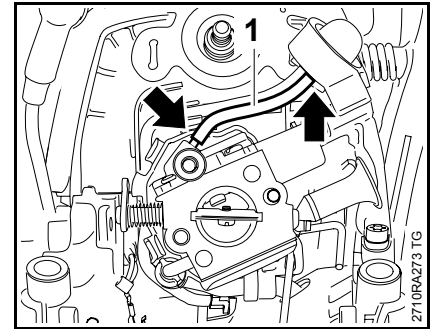
- Use hook 5910 893 8800 to remove the fuel suction hose (1) from the fuel tank.

Do not overstretch the fuel suction hose.

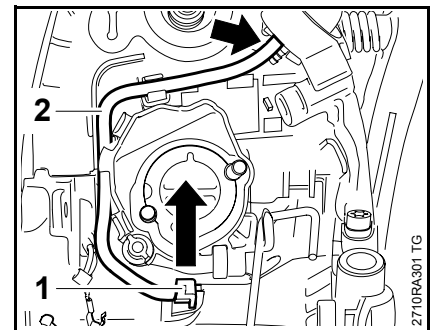
- Fit the pickup body, [12.11.1](#)
- Close the tank cap.
- Reassemble all other parts in the reverse sequence.

12.11.3 Fuel Hose – Models with Manual Fuel Pump

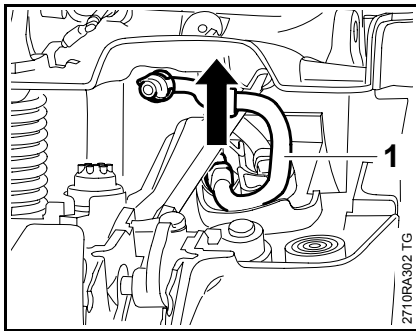
- Remove the filter base, [12.3](#)
- Open the tank cap.



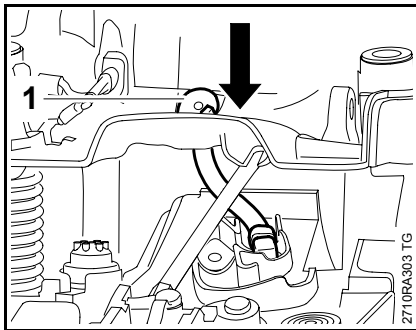
- Pull the fuel suction hose (1) off the nipples (arrows).
- Remove the carburetor, [12.5](#)



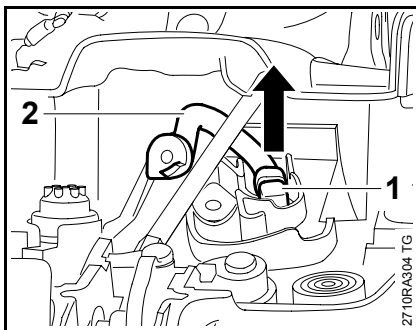
- Pull out the connector (1) with fuel return hose (2).
- Pull the fuel return hose (2) off the nipple on the fuel pump (arrow).
- Pull the connector (1) off the fuel return hose (2).
- Replace the fuel return hose and fuel suction hose. Check the connector and replace if necessary.
- Remove the carburetor carrier, [12.8](#)
- Lower the tank housing, [5.4.2](#)



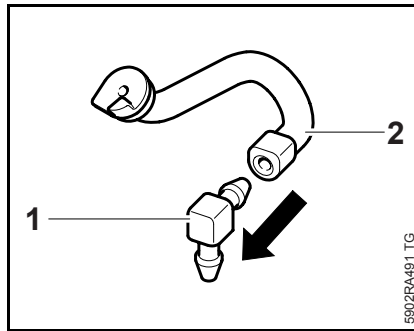
- Remove the fuel hose (1),
📖 12.11.2.



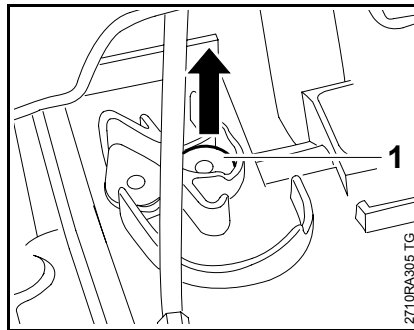
- Press out the fuel return hose (1)
in direction of tank housing.



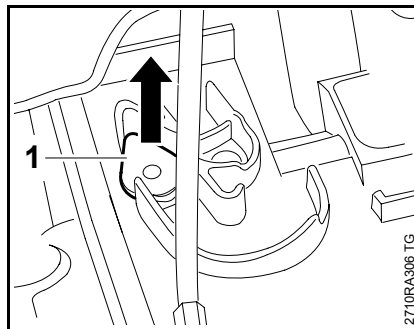
- Pull out the connector (1) with
fuel return hose (2).



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

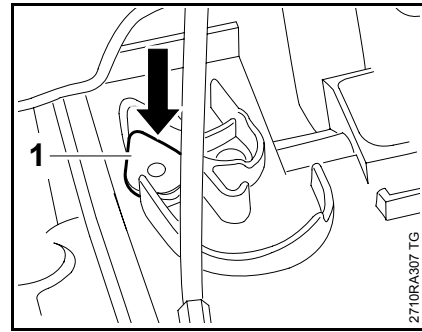


- Pry out the grommet (1).
– Replace the fuel return hose.
Check the connector and
grommet and replace if
necessary.

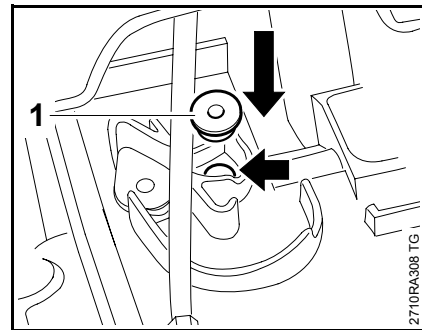


- Remove the fuel suction
hose (1), 📖 12.11.2

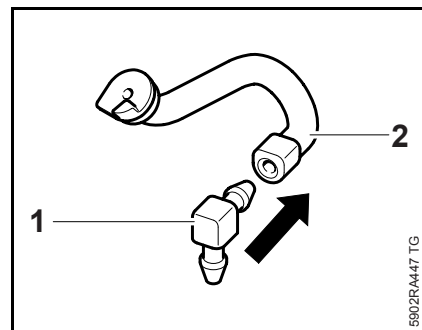
Installing



- Install the fuel suction hose (1),
📖 12.11.2

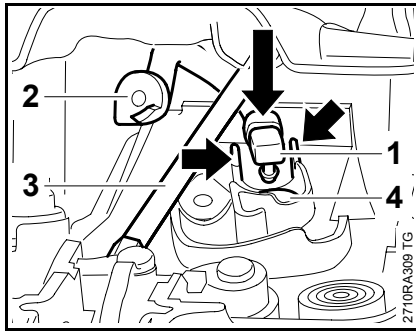


- Use STIHL press fluid to simplify
assembly, 📖 14
- Fit the grommet (1) in the
hole (arrow) in the fuel tank and
make sure it is properly seated.

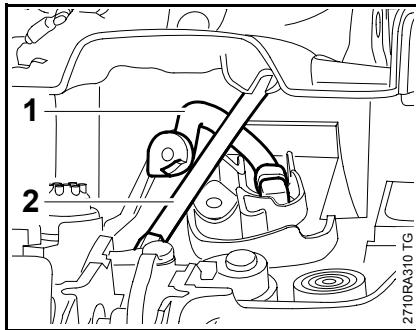


- Push the connector (1) into the
fuel return hose (2) as far as stop.

Machines with QuickStop Super

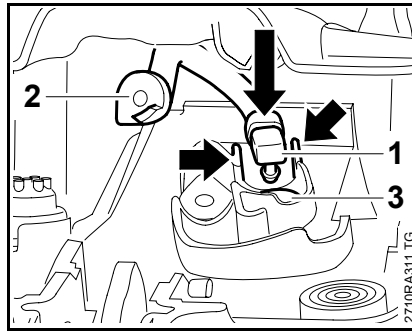


- Pass the fuel return hose (2), connector first, under the brake cable (3).
- Fit the connector (1) with fuel return hose (2) between the positioning ribs (arrows) and push it into the grommet (4).

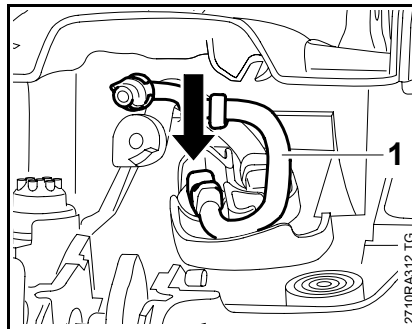


The fuel return hose (1) must be under the brake cable (2) and run to the left as shown in the illustration.

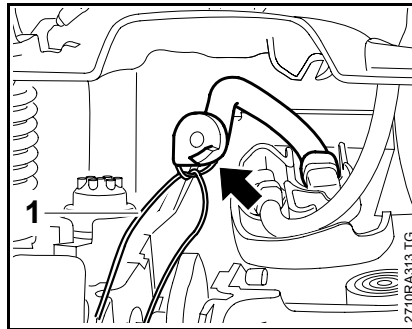
Models with manual fuel pump



- Fit the connector (1) with fuel return hose (2) between the positioning ribs (arrows) and push it into the grommet (3).

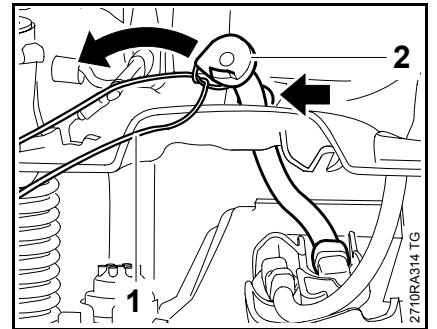


- Install the fuel hose (1),
 12.11.2

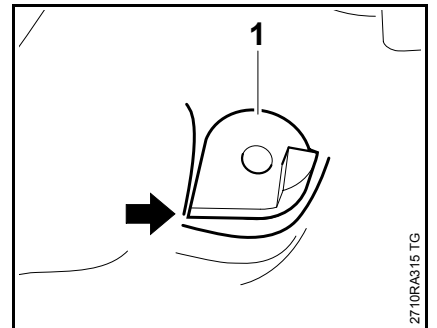


- Tie a thin piece of string (1), about 25 cm long, around the flange (arrow) of the fuel return hose.

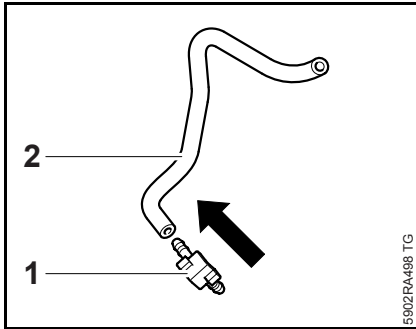
- Coat the flange of the fuel return hose with STIHL press fluid,
 14



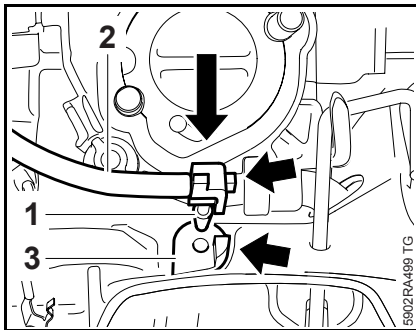
- Thread the ends of the string (1) through the bore (arrow).
- Pull the fuel return hose (2) into the engine housing.
- Remove the string.



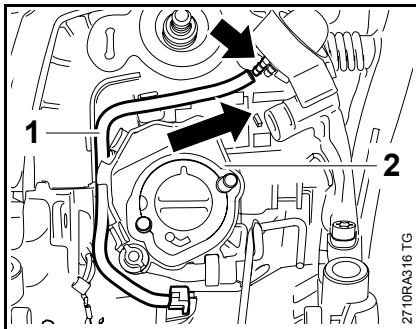
- Position the fuel return hose (1) so that the flange is seated in the guide (arrow).
- Press home the fuel return hose (1) until it fully engages the bore.
- Install the tank housing,
 12.11.5
- Install the carburetor carrier,
 12.8



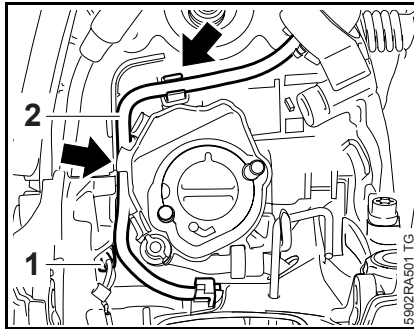
- Push the connector (1) into the fuel return hose (2) as far as stop.



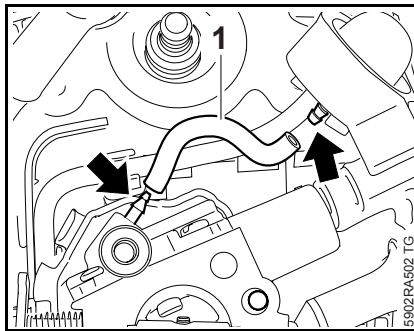
- Push the connector (1) with fuel return hose (2) into the fuel return hose (3) so that the contours (arrows) are in alignment.



- Fit the fuel return hose (1) behind the carburetor carrier (2) and push it onto the fuel pump's nipple (arrow) as far as stop.



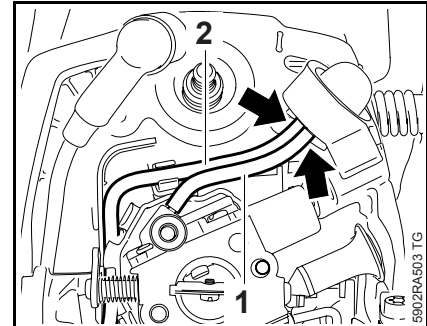
- Position the fuel return hose (2) so that it is next to the short circuit wire's grommet (1).
 - Push the fuel return hose (2) into the guides (arrows).
- Install the carburetor, 12.5



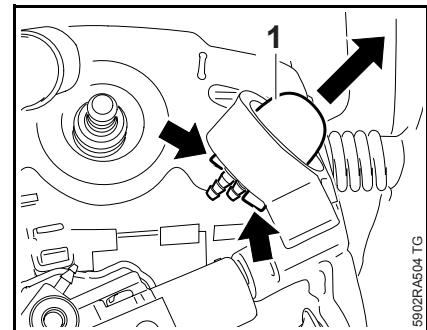
- Push the fuel suction hose (1) onto the nipples (arrows) as far as stop.
- Check operation with manual fuel pump, 12.11.4
- Reassemble all other parts in the reverse sequence.

12.11.4 Manual Fuel Pump

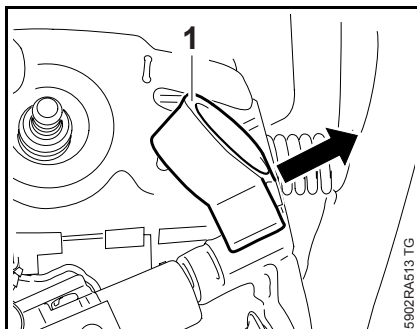
- Remove the filter base, 12.3



- Disconnect the fuel suction hose (1) and fuel return hose (2) from the nipples (arrows).

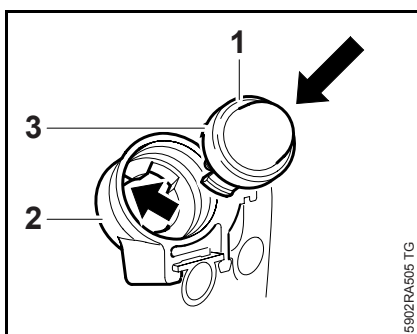


- Squeeze the tabs (arrows) together and pull out the manual fuel pump (1).
- Check the fuel pump (1) and replace it if necessary

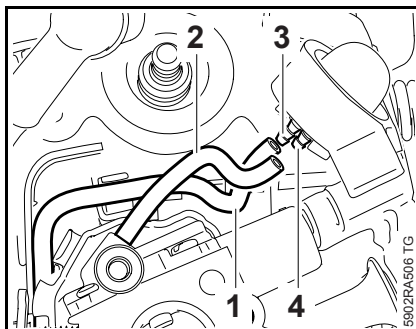


- Check the retainer (1), push it out of its seat and replace if necessary.
- Reassemble in the reverse sequence.
- Install new fuel suction hose and new fuel return hose, [12.11.3](#)

Installing



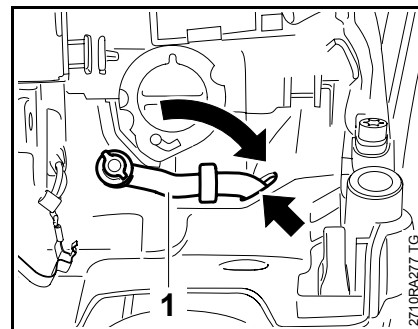
- Position the fuel pump (1) so that the lug (3) points towards the recess (2) (arrow).
- Push the fuel pump (1) into the retainer (2) until the tabs engage.



- Push the fuel return hose (1) onto the long nipple (3) and the fuel suction hose (2) onto the short nipple (4) on the fuel pump.
- Check operation
 - fuel must flow when the fuel pump is operated.
- Reassemble all other parts in the reverse sequence.

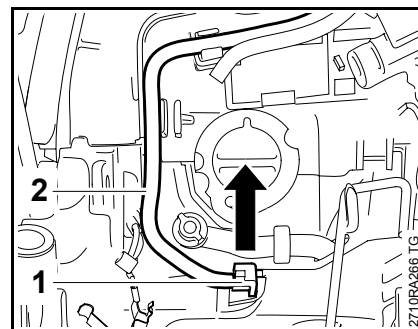
12.11.5 Tank Housing

- Drain the fuel tank, [1](#)
- Remove the handlebar, [9.5](#)
- Remove the carburetor, [12.5](#)
- Remove the carburetor carrier, [12.8](#)
- On models with QuickStop Super, disconnect the brake cable from the brake lever [5.4.2](#)
- Remove the stop buffer, [9.4](#)
- Remove the control levers, [10](#)
- Lower the tank housing a little, [12.11.2](#)

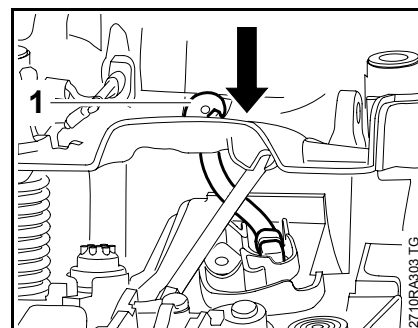


- Pull the fuel hose (1) downwards and out through the opening (arrow).

Models with manual fuel pump

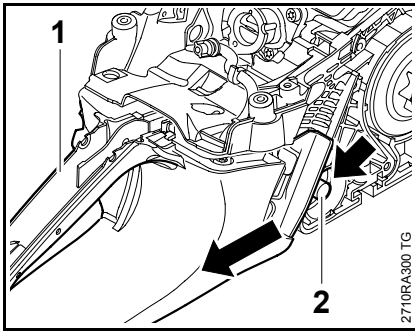


- Pull out the connector (1) with fuel return hose (2).



- Press out the fuel return hose (1) in direction of tank housing.

All models



- Push the tank housing (1) towards the ignition side and turn it towards the clutch side until the peg (2) is clear of the bore (arrow).

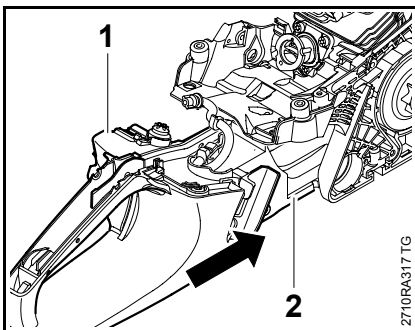
– Pull out the tank housing, check it and replace if necessary.

Machines with QuickStop Super

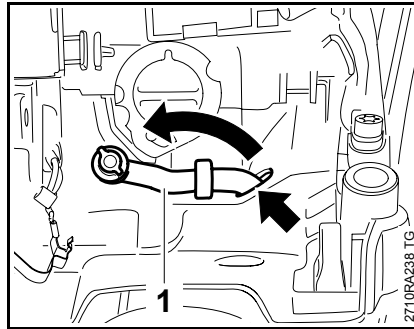
– Pull out the tank housing and pull the brake cable out of the engine housing at the same time.

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

Installing

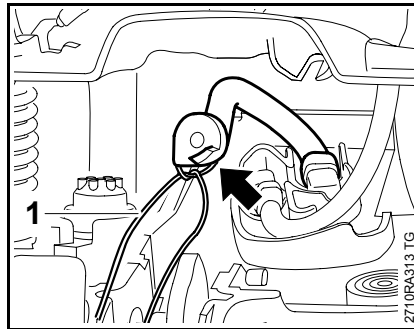


- Slide the tank housing (1), narrow part (2) first, into the engine housing.



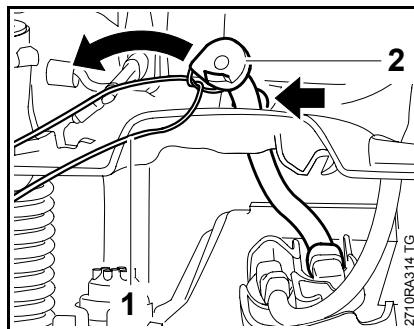
- Pull the fuel hose (1) upwards through the opening (arrow) into the engine housing.

Models with manual fuel pump



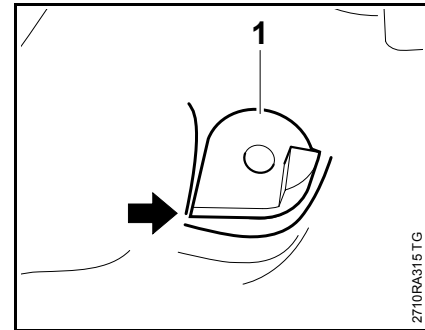
- Tie a thin piece of string (1), about 25 cm long, around the flange (arrow) of the fuel return hose.

– Coat the flange of the fuel return hose with STIHL press fluid, 14



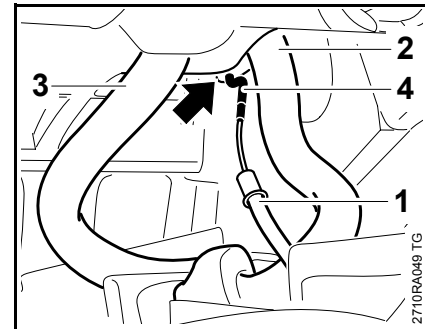
- Thread the ends of the string (1) through the bore (arrow).
- Pull the fuel return hose (2) into the engine housing.

– Remove the string.

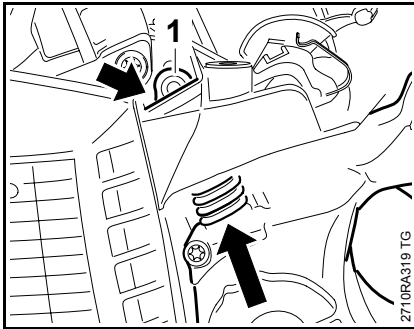


- Position the fuel return hose (1) so that the flange is seated in the guide (arrow).
- Press home the fuel return hose (1) until it fully engages the bore.

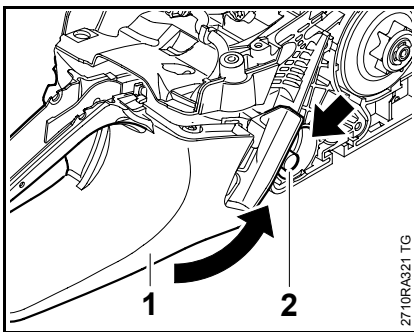
Models with manual fuel pump and QuickStop Super



- Thread the brake cable (1) between the fuel hose (2) and fuel return hose (3).
- Push the brake cable (1), short hook (4) first, through the bore (arrow) in the engine housing.

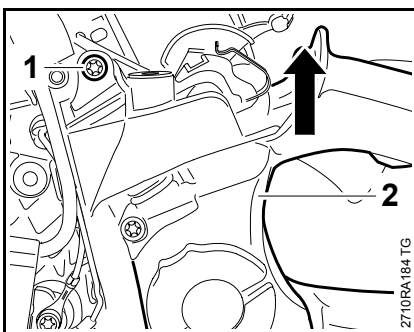


- Fit the antivibration spring (1) in the recess (arrow) in the engine housing.

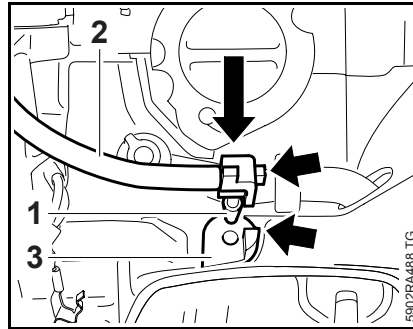


- Push the tank housing (1) towards the ignition side and turn it until the peg (2) is inside the bore (arrow).

– Install the handlebar, 9.5



- Lift the tank housing (2).
- Insert and tighten down the screw (1) firmly.



- Push the connector (1) with fuel return hose (2) into the fuel return hose (3) so that the contours (arrows) are in alignment.

– Install the stop buffer, 9.4

– Reassemble all other parts in the reverse sequence.

13. Special Servicing Tools

New Special Tools

No.	Description	Part No.	Application	Rem.
1	Press sleeve	1141 893 2401	Installing oil seal (clutch and ignition sides)	
2	Flange	5910 855 4201	Sealing exhaust port for leakage test	

Existing Special Tools

No.	Description	Part No.	Application	Rem.
1	Carburetor and engine tester	0000 850 1300	Testing engine and carburetor for leaks	
	- Nipple	0000 855 9200	Testing carburetor for leaks	
	- Hose for leakage test	1110 141 8600	Testing carburetor for leaks	
2	Sealing plate	0000 855 8106	Testing engine for leaks	
3	Installing tool	0000 890 2201	Installing rope guide bushing	
4	Locking strip	0000 893 5903	Blocking the crankshaft	
5	Screwdriver bit, T 27 x 125	0812 542 2104	Removing and installing spline socket screws with electric or pneumatic screwdrivers; tightening down screws with torque wrench	
6	Assembly drift	1110 893 4700	Removing and installing piston pin	
7	Setting gauge	1111 890 6400	Adjusting air gap between the ignition module and flywheel	
8	Installing tool	1116 893 4800	Installing rewind spring	
9	Assembly tube	1117 890 0900	Attaching springs	
10	Test flange	1119 850 4201	Leakage Test	
	- Sleeve	5910 893 1701	Spacer sleeves for test flange	
11	Combination wrench	1129 890 3401	Spark plug	1)
12	Installing sleeve	1141 893 4600	Protecting the oil seal (clutch and ignition sides)	
13	Clamping strap for assembly stand	5910 850 1650	Clamping machine to assembly stand	
14	Ignition system tester, ZAT 4	5910 850 4503	Testing ignition system	
15	Ignition system tester, ZAT 3	5910 850 4520	Testing ignition system	
16	Torque wrench	5910 890 0302	0.5 to 18 Nm	
17	Torque wrench	5910 890 0312	6 to 80 Nm	

No.	Description	Part No.	Application	Rem.
18	Installing tool 10	5910 890 2210	Installing hookless snap rings in piston	
19	Screwdriver	5910 890 2306	Adjusting the carburetor	
20	Screwdriver bit, T 27 x 150	5910 890 2400	IS-P screws	
21	Hook	5910 890 2800	Detaching springs on clutch shoes	
22	Assembly stand	5910 890 3101	Holding saw for repairs	
23	Puller	5910 890 4400	Removing oil seals	
24	Puller	5910 890 4502	Pull off the limiter cap.	
25	Puller	5910 890 4504	Removing flywheel	
	- Jaws (No. 3.1)	0000 893 3706	Removing oil seal(s)	
26	Stud puller M8	5910 893 0501	Removing bar mounting studs	
27	Setting disk	5910 893 6600	Add-on for screwdriver (adjusting carburetor)	
28	Hook	5910 893 8800	Removing pickup body	

Remarks:

1) Use for releasing only.

14. Servicing Aids

No.	Description	Part No.	Application
1	STIHL multipurpose grease	0781 120 1109	
2	Lubricating grease (225 g tube)	0781 120 1111	Oil seals, sliding and bearing points
3	STIHL special lubricant	0781 417 1315	Bearing bore in rope rotor, rewind spring in fan housing
4	STIHL press fluid OH 723	0781 957 9000	Rubber components, AV buffers
5	Dirko HT red sealant	0783 830 2000	Sealing engine pan / cylinder
6	Medium-strength threadlocking adhesive (Loctite 242)	0786 111 2101	
7	High-strength threadlocking adhesive (Loctite 270)	0786 111 2109	
8	Standard commercial solvent-based degreasant containing no chlorinated or halogenated hydrocarbons		Cleaning sealing faces and carburetor, crankshaft stubs and flywheel taper

