

Machine components 4140

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1. Introduction

This handbook contains a detailed description of all the repair procedures typically required for the machine components of the basic engine 4140.

All other servicing procedures for the basic engine 4140 are described in the handbook "Basic engine 4140".

There are separate handbooks for servicing procedures for standardized parts and assemblies that are installed in several STIHL power tool models ("Standard Repairs, Troubleshooting", "Carburetors"). Reference is made to these handbooks in the appropriate chapters in this manual.

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

Refer to the latest edition of the relevant parts list to check the part numbers of any replacement parts needed. Parts lists on microfiche and CD-ROM are always more up to date than printed lists.

A fault in the machine may have several causes. To help locate the fault, consult the troubleshooting charts for all assemblies in the "Standard Repairs, Troubleshooting" handbook.

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

Special servicing tools mentioned in the descriptions are listed in the last chapter of 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:

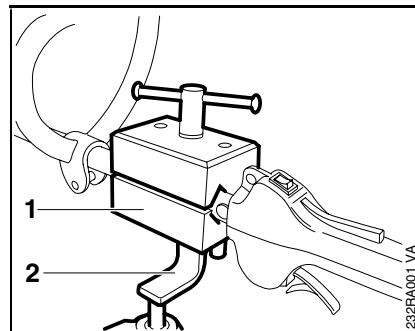
In the descriptions:

- = 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


Service manuals and all technical information bulletins describing engineering changes are intended exclusively for the use of STIHL servicing dealers. They must not be passed on to third parties.



Servicing and repairs of power tools with shaft (FS, FC, HL) are made considerably easier if the machine is mounted on assembly stand (2) 5910 890 3100 with the aid of clamp (1) 5910 890 8800.

Secure the clamp to the assembly stand with two washers and two M8 nuts. The complete unit can then be swivelled to the best position for the ongoing repair, thus leaving both hands free.

Always use original STIHL replacement parts.

They can be identified by the STIHL part number, the **STIHL** logo and the STIHL parts symbol . The symbol may appear alone on small parts.

2. Safety precautions

If the machine is started up in the course of repairs or maintenance work, observe all local and specific national safety regulations, as well as the safety precautions and warnings in the owner's manual.

Petrol is a highly inflammable fuel and can be explosive in certain conditions.

Improper handling may result in burns or other serious injuries.

Warning! Do not smoke or bring any fire or flame near the fuel. All work with fuel must be performed outdoors only. Spilled fuel must be wiped away immediately.

3. Specifications

3.1	Fuel system	Carburetor: Carburetor leakage test at gauge pressure: Operation of tank vent at gauge pressure: under vacuum: Fuel tank capacity:	Diaphragm carburetor $p_{\text{ü}} = 0.8 \text{ bar (8 kPa)}$ $p_{\text{ü}} \leq 0.3 \text{ bar (3 kPa)}$ $p_{\text{u}} \leq 0.05 \text{ bar (0.5 kPa)}$ 0.300 L (300 cm ³) (FS models) 0.400 L (400 cm ³) (BG/SH) 0.225 L (225 cm ³) (HS 45) At least 90 RON
		Octane rating: Fuel mixture: Mixing ratio: Air filter: Additionally for BG/SH and HS:	Brandname regular-grade petrol Brandname two-stroke engine oil 1:50 with STIHL two-stroke engine oil 1:50 1:25 with all other brandname two-stroke engine oils Felt filter element Foam filter element
3.2.1	Gear (FS models)	Type: Gear ratio: Bearing: Lubrication:	Spiral-toothed bevel gear 1:1.235 Deep groove ball bearing STIHL gear lubricant for brushcutters
3.2.2	Gear (HS 45)	Type: Gear ratio: Bearing: Lubrication:	Straight-toothed spur gear 1:5.1 Deep groove ball bearing STIHL gear lubricant for hedge trimmers
3.3	Rewind starter	Type: Pawls: Reserve pull in rope rotor: Starter rope (FS models): Starter rope (BG/SH and HS):	Pawl engagement Single-pawl type At least turn Dia. 3 mm, length 800 mm Dia. 3 mm, length 1060 mm
3.4	Cutting attachment	Blade type: Blade lengths: Blade weight:	Double-sided 450 mm (HS 45/450) 600 mm (HS 45/600) 0.83 kg (HS 45/450) 1.13 kg (HS 45/600)
3.5	Blower attachment	Flow rate: Total weight:	710 m ³ /h (BG 55) 730 m ³ /h (BG 65) 780 m ³ /h (BG 85) 3.9 kg (BG 55) 4.0 kg (BG 65 / 85)
3.6	Vacuum attachment	Flow rate: Total weight:	710 m ³ /h (SH 55) 780 m ³ /h (SH 85) 4.8 kg (SH 55) 5.0 kg (SH 85)

3.7 Tightening torques

DG and P (Plastoform) screws are used in polymer and lightmetal 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, provided the specified tightening torque is observed.

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

Fastener	Thread size	For component	Tightening torque (Nm)	Remarks
Plastoform screw	P6x14	Line limiter blade/deflector	2,5	4) 5) 6)
Nut	M5	Filter housing/carburetor/ adapter flange	3,5	
Spline screw	8-32	Clutch drum/crankshaft	4,0	4) 5) 6)
Spline screw	IS-DG5x24	Locking screw for clutch drum in engine housing	4,5	1) 4) 5) 6)
	3/8"-24	Clutch carrier	17,0	
Spline screw	IS-DG5x24	Engine housing/shroud	4,5	1)
Spline screw	IS-DG5x60	Muffler/cylinder	9,0	2) 3) 4) 5) 6) 7)
Spline screw	IS-DG5x60	Muffler/cylinder	8,0	8)
	M14x1,25x7	Connector/muffler	10,0	3)
Spline screw	M5x8	Clamp/shaft/guide	8,0	6)
Spline screw	M6x30	Deflector shield/clamp	5,0	6)
Spline screw	IS-DG5x12	Shaft centering/engine housing	4,0	1) 4) 5) 6)
Spline screw	IS-DG5x20Z	Starter cover/crankcase	6,0	1)
	M8	Starter cup/crankshaft	17,0	
Spline screw	IS-DG5x24	Adapter flange/cylinder	6,0	2)
	M14x1,25	Spark plug	20,0	
Spline screw	IS-DG4x20	Ignition module/cylinder	4,5	2)
Spline screw	IS-DG5x24	Fuel tank/holder	4,0	1) 4) 5) 6)
Lock nut	M8x1,25L	Cutting tool	25,0	4) 5) 6)
Bearing screw	M10x63	Wheel/deflector	19,0	4)
Self-tapping screw	B3,9x19	Control handle housing halves (separate control handle)	2,5	5) 6)
Spline screw	IS-M6x25	Shackle/sep. control handle/shaft	4,5	5) 6)
Spline screw	IS-M6x35	Clamp moulding, clamp/shaft (bike handle)	4,5	5)
Self-tapping screw	B2,9x25	Control handle housing halves (bike handle)	1,8	5)
Spline screw	M6x14	Carrying ring/shaft (bike handle)	4,5	5)
Spline screw	DG6x28	Gear/shaft clamp	12,0	5)
Spline screw	M6x20	Gear/shaft clamp	9,0	4)
Spline screw	M5x16	Blade guide/gear housing	8,0	7)
Spline screw	P6x26,5	Spring/handlebar with hand guard	4,0	7)
Spline screw	DG5x18	Gear cover/gear housing	6,0	7)
Spline screw	M11x1,5x10	Screw plug/gear housing	8,5	7)

Fastener	Thread size	For component	Tightening torque (Nm)	Remarks
Spline screw	DG5x20Z	Handlebar/gear housing	6,0	7)
Spline screw	P6x25	Fuel tank/handle	5,0	7)
Spline screw	M5x16	Blade/nut	10,0	7)
Spline screw	DG4x15	Handle/handle moulding	2,0	7)
Spline screw	DG5x24	Spiral housing/crankcase	6,0	7) 8)
Nut	M8x1	Flywheel/crankshaft	17,0	7) 8)
Spline screw	DG5x20Z	Gear housing/crankcase	6,0	7)
	M8x1Li	Carrier/clutch	17,0	7)
Spline screw	DG5x20Z	Handle/gear housing	4,0	7)
Spline screw	DG5x20Z	Fan housing/spiral housing (3 units)	6,0	7) 8)
Spline screw	P6x25	Fan housing/handle (2 units)	6,0	7)
Spline screw	P6x19	Fan housing/fan housing	4,0	8)
Spline screw	P6x19	Handle moulding/inner fan housing	6,0	8)
Nut	M8x1LH-06	Fanwheel/crankshaft	17,0	8)
Spline screw	P6x26,5	Inside/outside of fan housing	5,0	8)
Spline screw	DG5x24	Inner fan housing / engine	8,0	8)

- 1) **Without** underhead locking teeth
- 2) **With** underhead locking teeth
- 3) Screw in with sealing compound
- 4) FC 55
- 5) FS 55
- 6) FS 45, 46
- 7) HS 45
- 8) BG 55/SH 55

Proceed as follows to fit a DG or P screw in an existing thread:

- Place the DG or P screw in the hole and turn 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.

Note: Power screwdriver speed settings for polymer materials: Plastoform screws max. 600 rpm
DG screws max. 500 rpm

Important! Do not confuse screws with and without underhead locking teeth.

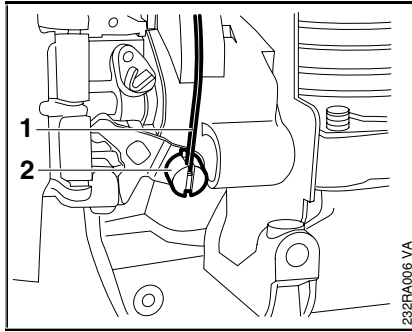
4. Clutch

4.1 Removal and installation (FS models)

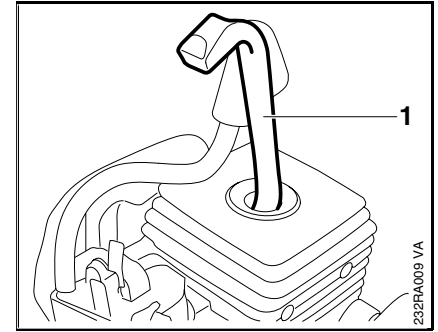
Removal

Troubleshooting chart – see "Standard Repairs, Troubleshooting" handbook.

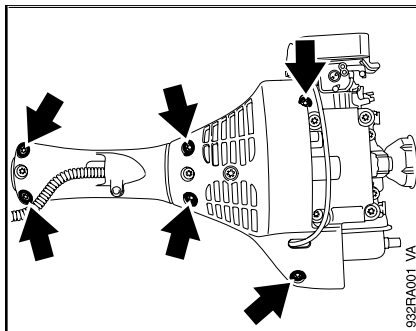
- Remove shaft, [see 9.1.1, 9.2.2 or 9.3.2.](#)
- Remove fuel tank, [see 8.4.](#)



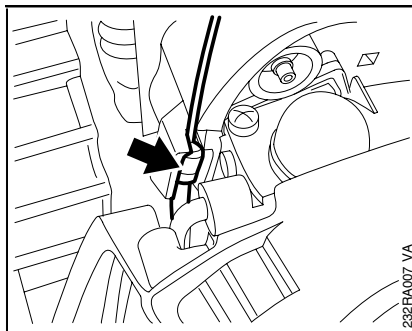
- Unhook nipple of throttle cable (1) from slotted bolt (2) on throttle lever.



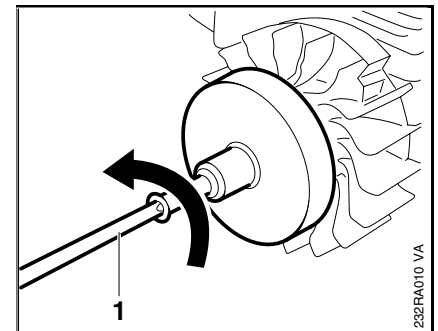
- Unplug spark plug boot.
- Unscrew spark plug.
- Fit locking strip (1) 4221 893 5900.



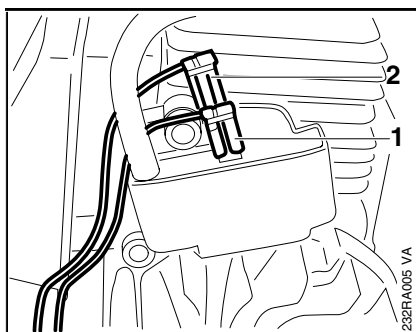
- Undo fastening screws on shroud (diagram shows machine with bike handle).
- Lift off shroud.



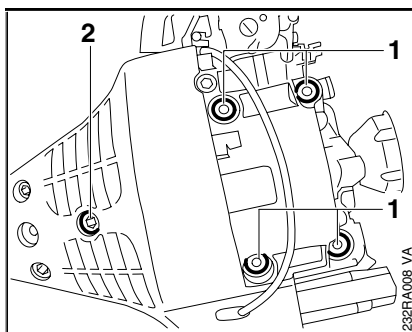
- Press throttle cable out of clamping element at the sleeve.
- Important:** Do not buckle the strand.



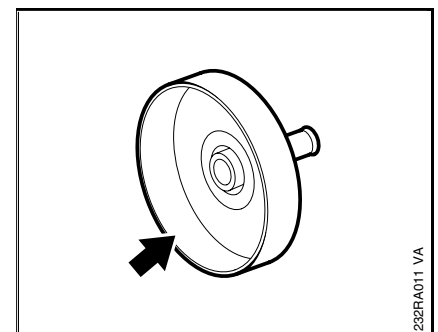
- Remove screw of clutch drum with insert (1) 0812 540 1112.
- Remove clutch drum.



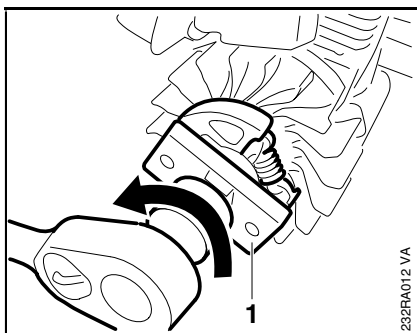
- Unplug short-circuit wire (1) and ground wire (2) from ignition module.



- Undo screws (1).
 - Remove engine housing.
- Note:** Screw (2) should only be removed if damaged. Tighten new screw down with 4.5 Nm.

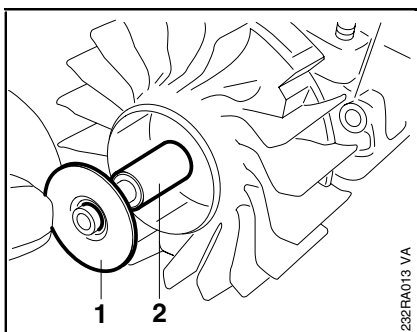


- Examine clutch drum. It must not be scored or badly worn.
- Important:** The clutch drum must be replaced if there are distinct wear marks on the inside perimeter.

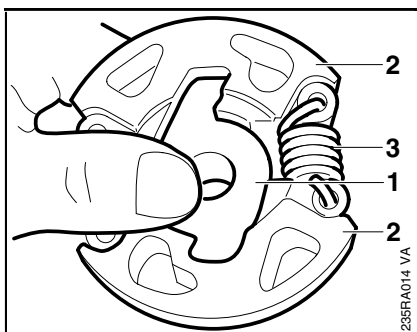


- Insert tip of wrench (1) 4130 890 3600 in semi-circular recesses of clutch.

- Unscrew clutch.



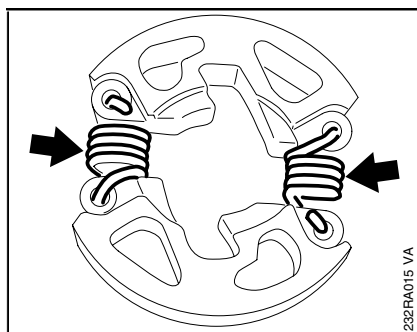
- If necessary, remove washer (1) and spacer sleeve (2) from crankshaft stub.



Note: Clutch shoes, carrier and clutch springs are supplied as a complete part (clutch). Clutch springs can be replaced.

- Press carrier (1) out of clutch shoes (2).
- Unhook clutch springs (3) from clutch shoes with assembly hook 5910 890 2800.

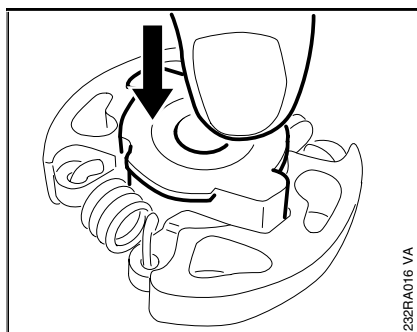
Important: Clutch springs must always be replaced in pairs.



Installation

- Hook clutch springs in so that they are located precisely under the clutch shoes.

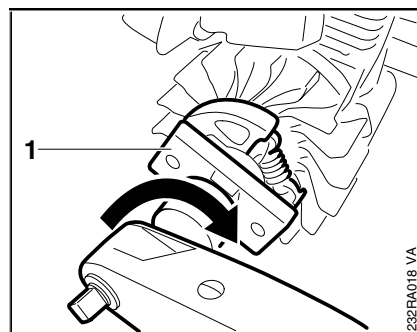
Important: They must not protrude at the sides.



- Position carrier obliquely, pull clutch shoes slightly outwards and press carrier in as far as possible.
- Slide spacer sleeve and washer onto crankshaft stub if they have been removed.

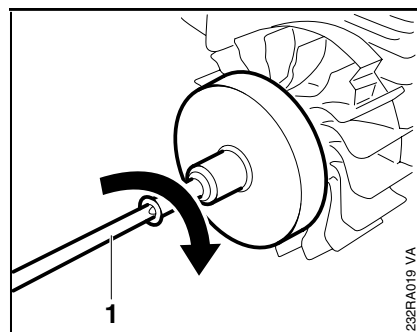


- Screw clutch on so that the "arrow" and the word "OFF" face outwards.



- Fit wrench (1) 4130 890 3600 and tighten clutch down with 17.0 Nm.

The remaining parts are fitted in the reverse order of steps.



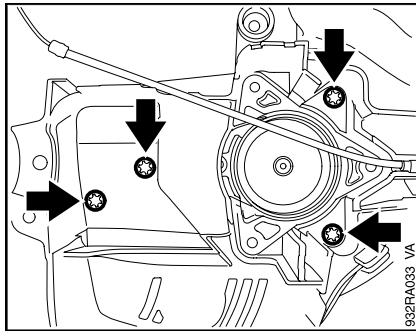
- Tighten inner screw of clutch drum with 4.0 Nm using insert (1) 0812 540 1112.

4.2 Removal and installation (HS 45)

Removal

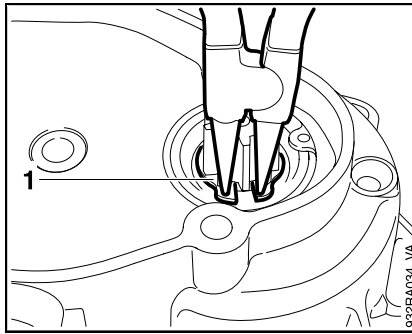
Troubleshooting chart – see "Standard Repairs, Troubleshooting" handbook.

- Remove engine, [see 5.2](#).

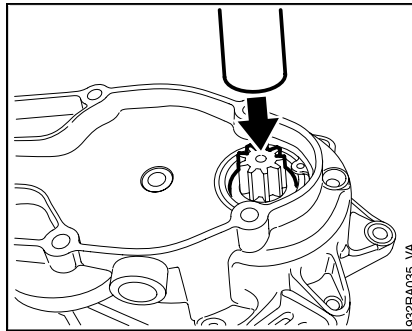


- Undo four screws securing gear housing to handle and remove handle housing.

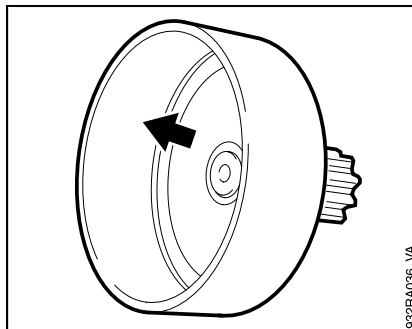
- Remove handlebar with hand guard, [see 9.5](#).
- Remove brake band, [see 4.4](#).
- Remove cutting attachment, [see 11](#).



- Remove circlip (1) from pinion of clutch drum with pliers 0811 611 8200.

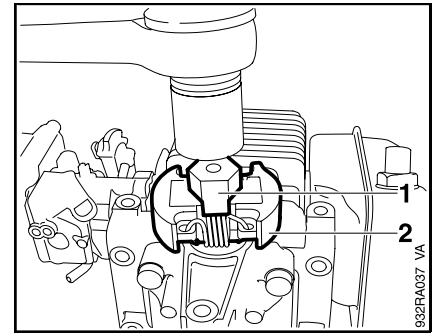


- Press clutch drum (1) out with a standard commercial press.



- Examine clutch drum. It must not be scored or badly worn.

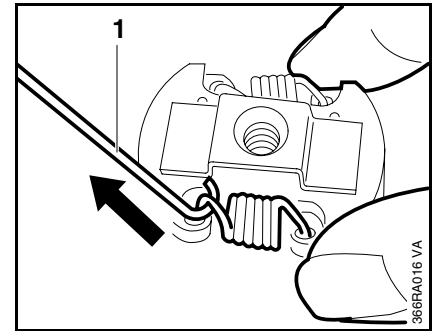
Important: The clutch drum must be replaced if there are distinct wear marks on the inside perimeter.



- Insert wrench (1) 4133 893 1301 in carrier of clutch (2).

- Unscrew clutch.

Note: Left-hand thread



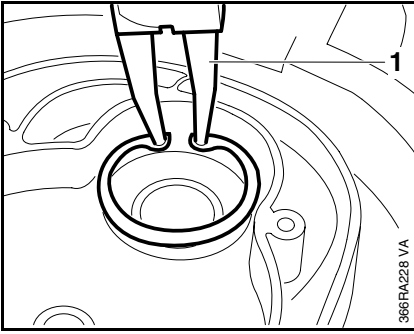
- Unhook both clutch springs with assembly hook (1) 5910 890 2800.

- Remove clutch shoes from carrier.

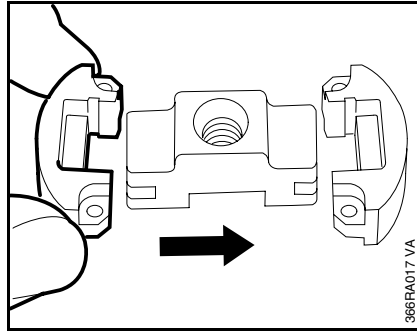
Important: Clutch springs must always be replaced in pairs.

Note: Clutch shoes, carrier and clutch springs are supplied as a complete part (clutch). Clutch springs can be replaced.

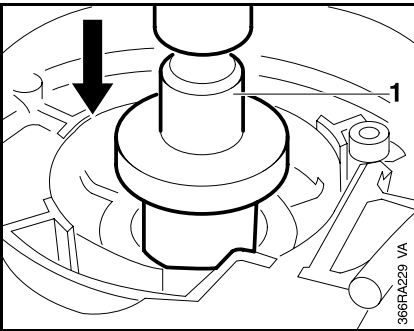
4.3 Check functioning of starting lock (HS 45)



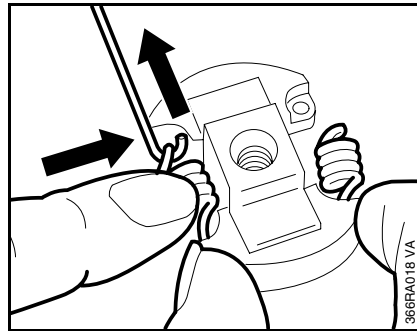
- Remove circlip from ball bearing with pliers (1) 0811 641 8380.



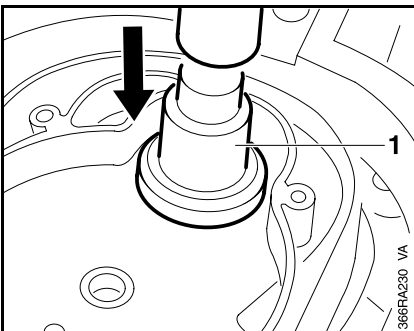
- Slide clutch shoes onto legs of carrier.



- Force ball bearing out with drift pin (1) 1118 893 7200.

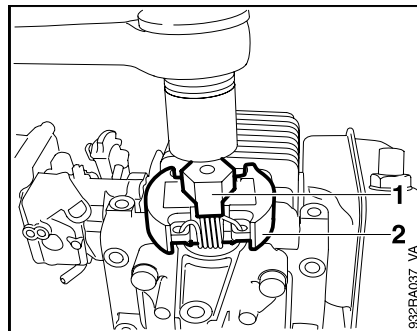


- Hook eyes of clutch springs into clutch shoes.



Installation

- Install ball bearing as far as possible with drift pin (1) 1118 893 7200.
- Fit circlip.



- Screw clutch (2) on with the opening for the special tool facing the operator. Fit carrier (1) and tighten clutch down with 17 Nm.

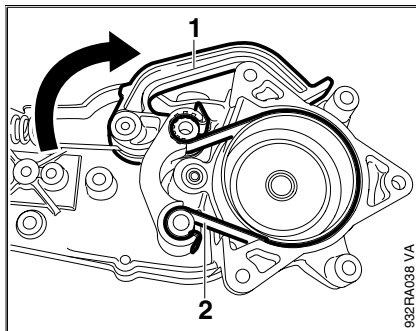
Remaining parts are fitted in the reverse order of steps.

Dirt and increasingly smooth friction surfaces on the brake band and clutch drum cause the friction value to deteriorate, thus reducing the friction force.

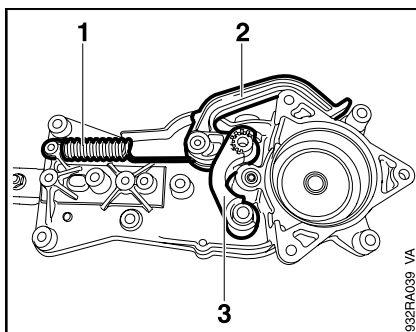
- Move lever of starting lock fully forwards – towards handlebar.
- Start engine.
- The blades must not run when the throttle is in starting position.

4.4 Brake band (HS 45)

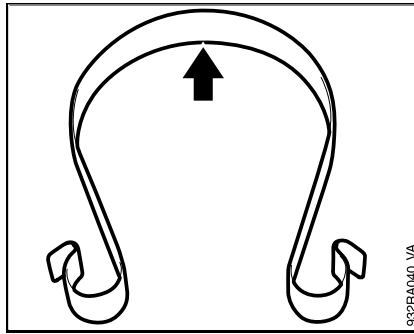
- Remove engine, [see 5.2](#).
- Remove gear housing, [see 10.3](#).
- Remove handlebar with hand guard, [see 9.5](#).



- Swing lever (1) back to relieve the brake band (2).
- Remove brake band with a hook.



- Unhook clutch spring (1).
- Remove lever (2) and lever (3).



- If the brake band can be reused, clean the entire friction surface (inside of brake band) and roughen it with a coated abrasive, grain size approx. 120 μm .

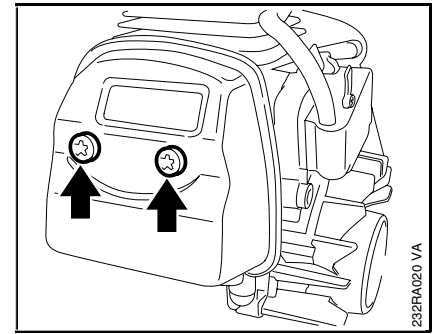
The brake band must be replaced if:

- distinct wear marks can be seen (large areas of the inside perimeter and/or parts of the outside) and
- the remaining wall thickness is < 0.6 mm.

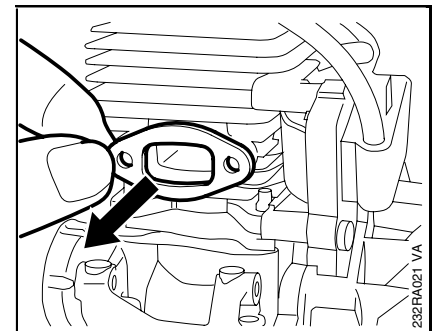
Important: A lower thickness must not be measured at any point!

Refit the brake band in the reverse order of steps.

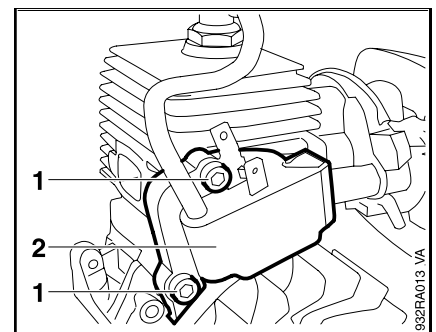
5. Engine 5.1 Removal and installation (FS models)



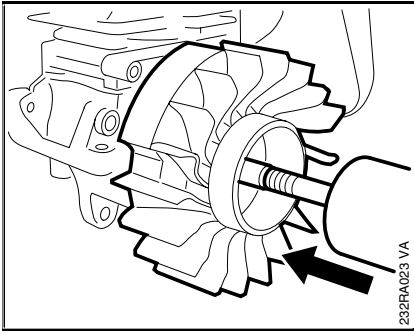
- Remove clutch, [see 4.1](#).
- Undo screws.
- Remove muffler.



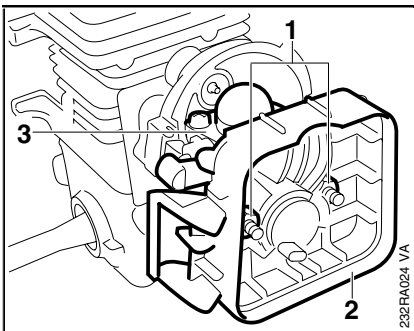
- Remove gasket.



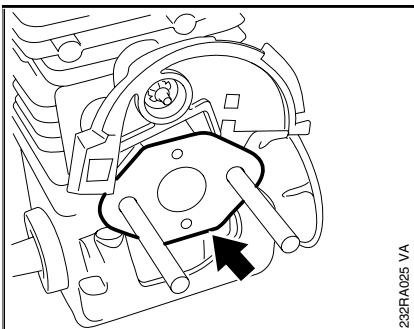
- Undo screws (1).
- Remove ignition module (2).



- **Lightly** tap the front of the crankshaft stub with a plastic hammer to loosen the flywheel.
- Remove flywheel.

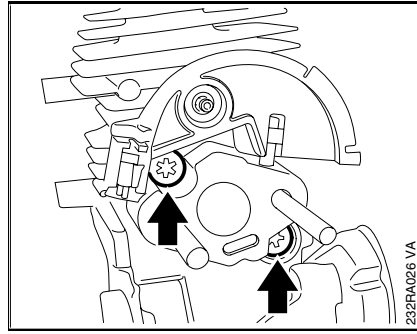


- Remove felt filter element, **see 8.1.**
- Unscrew nuts (1).
- Remove filter housing (2) and carburetor (3).

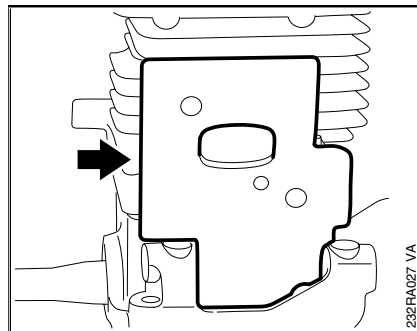


- Remove gasket.

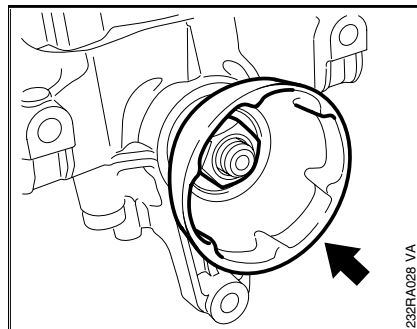
Important: Note installed position for subsequent replacement.



- Undo screws.
- Remove adapter flange with clamping element.

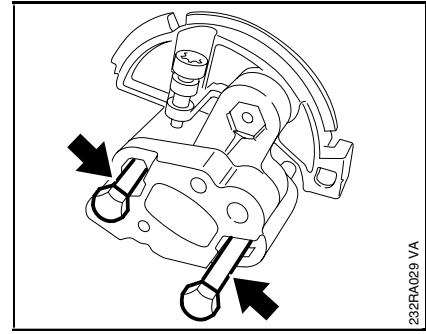


- Remove gasket.
- Fit locking strip 4221 893 5900.



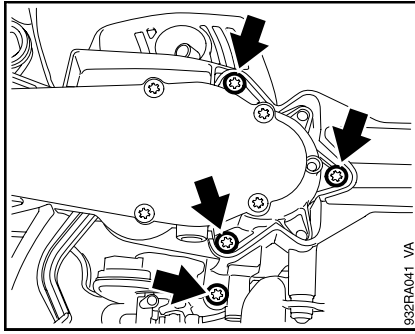
- Unscrew starter cup from crankshaft stub.

Assemble parts in the reverse order of steps.

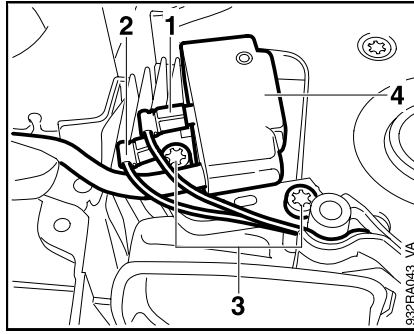


- Use new gaskets. Note installed position.
- Insert screws in adapter flange to secure carburetor.
- Tighten screws down with the specified torque, **see 3.6.**
- Secure connector tab for ground wire to upper screw of ignition module.
- Adjust air gap between ignition module and flywheel with setting gauge, see handbook "Basic engine 4140".

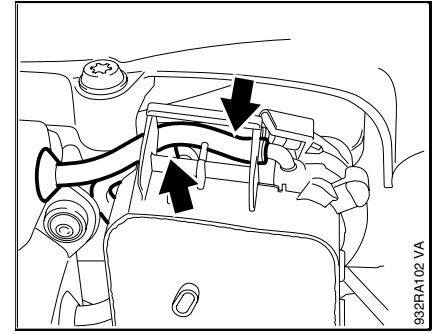
5.2 Removal and installation (HS 45)



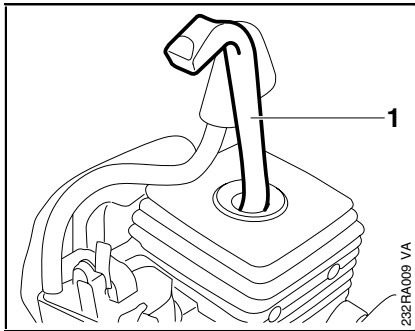
- Remove starter cover, **see 6.1**.
- Undo four screws securing gear housing to handle.



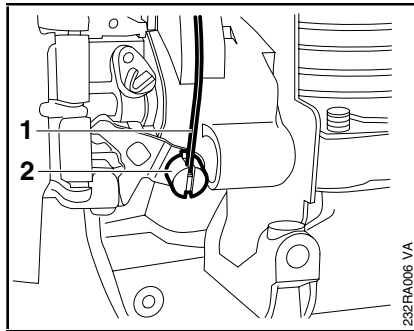
- Unplug short-circuit wire (1) and ground wire (2) from ignition module.
- Undo screws (3) and remove ignition module (4).



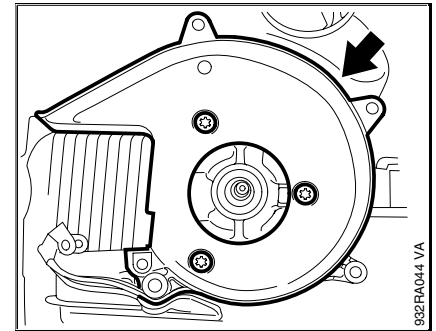
- Disconnect fuel hoses from the angled connector.



- Unplug spark plug boot.
- Unscrew spark plug.
- Fit locking strip (1) 4221 893 5900.

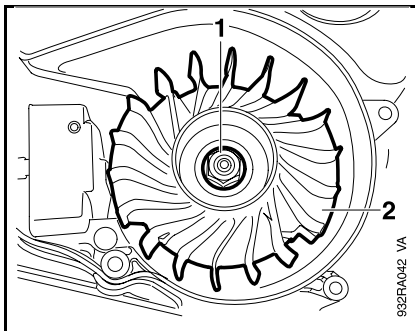


- Unhook nipple of throttle cable (1) from slotted bolt (2) on throttle lever.

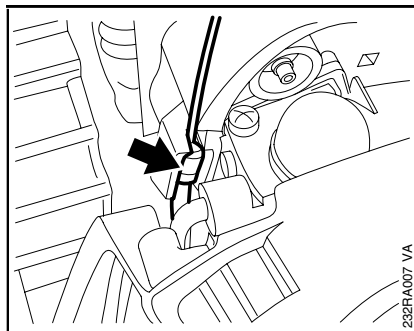


- Undo screws and remove spiral housing (snap-fitted).
- Remove engine from handle housing.

Install parts in the reverse order of steps.



- Unscrew collar nut (1) and remove flywheel (2).
- Tap flywheel lightly with a plastic hammer to loosen it if necessary.

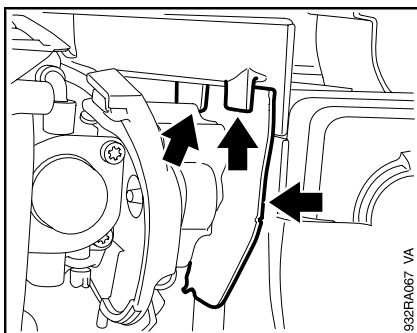


- Press throttle cable out of clamping element at the sleeve.

Important: Do not buckle the strand.

- Remove filter cover, **see 8.1**.

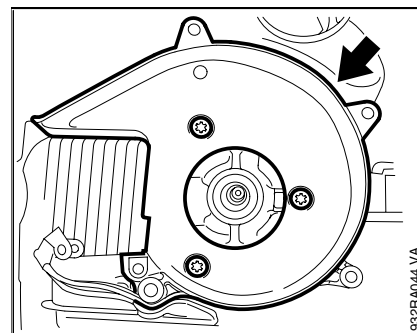
5.3 Removal and installation (BG/SH)



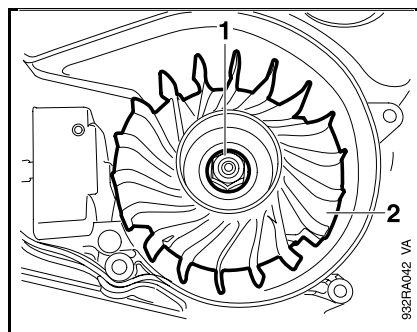
- Ensure that the carburetor gasket is correctly positioned when fitting the engine and spiral housing.

- Adjust air gap between ignition module and flywheel with the setting gauge, see handbook "Basic engine 4140".

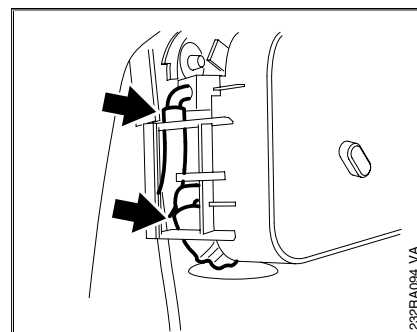
- Remove starter cover, [see 6.1.](#)
- Remove fanwheel, [see 12.2.](#)
- Remove filter cover, [see 8.1.](#)



- Undo screws and remove spiral housing.

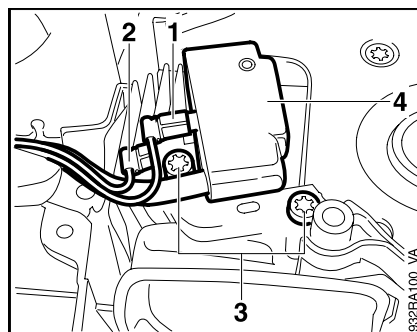


- Unscrew collar nut (1) and remove flywheel (2).
- **Lightly** tap the flywheel with a plastic hammer to loosen it if necessary.

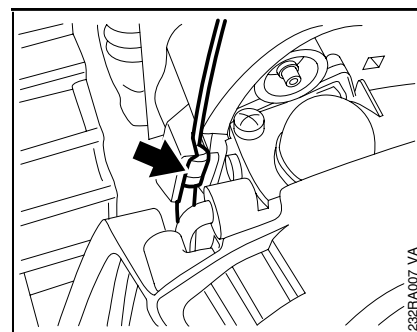


Note: FS model illustrated, BG/SH are similar.

- Disconnect fuel hoses from the angled connector.



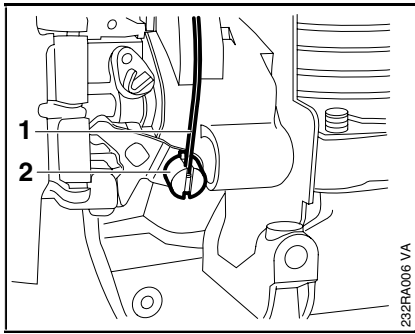
- Unplug short-circuit wire (1) and ground wire (2) from ignition module.
- Undo screws (3) and remove ignition module (4).



- Press throttle cable out of clamping element at the sleeve.

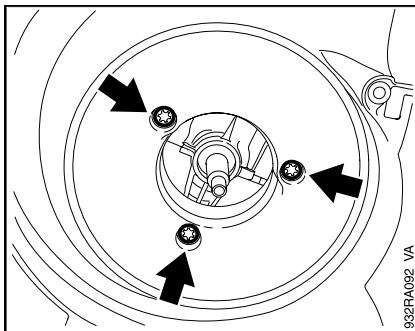
Important: Do not buckle the strand.

5.4 Muffler / spark arresting screen

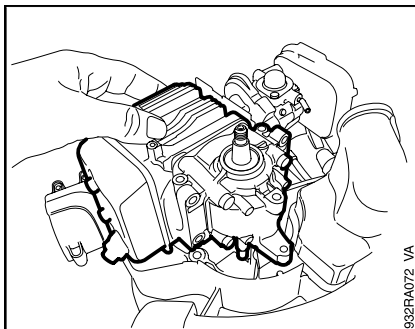


Note: FS model illustrated, BG/SH are similar.

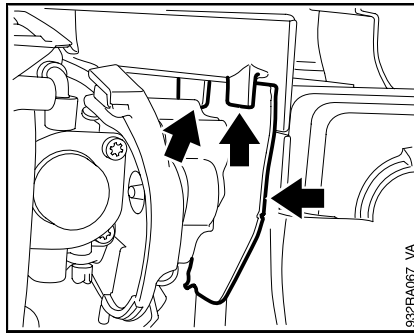
- Unhook nipple of throttle cable (1) from slotted bolt (2) on throttle lever.



- Undo three screws and remove engine from inner fan housing.



- Remove engine.



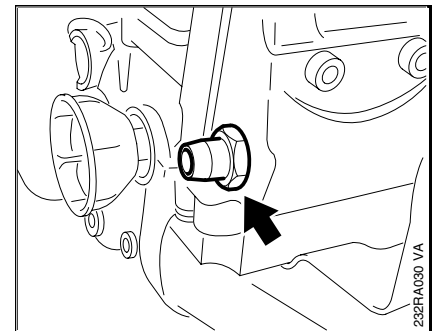
Note: FS model illustrated, BG/SH are similar.

Install parts in the reverse order of steps.

- Ensure that the carburetor gasket is correctly positioned when fitting the engine and spiral housing.
- Adjust air gap between ignition module and flywheel with the setting gauge, see handbook "Basic engine 4140".

Troubleshooting chart – see "Standard Repairs, Troubleshooting" handbook.

- Remove starter cover and fan housing, [see 6.1](#).



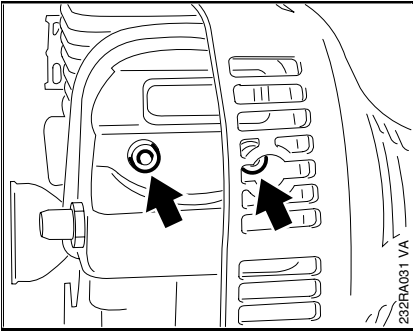
Spark arresting screen

Note: FS model illustrated, BG/SH and HS 45 are similar.

- Unscrew connector with spark arresting screen.
- Clean spark arresting screen and fit a new connector if necessary.
- Clean thread on connector and coat with sealing compound, [see 14](#).
- Important:** Note manufacturer's directions for sealing compound.
- Screw in connector and tighten securely.

6. Rewind starter

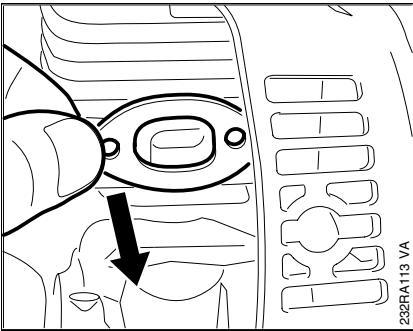
6.1 Replace rewind spring



Muffler

Note: FS model illustrated, BG/SH and HS 45 are similar.

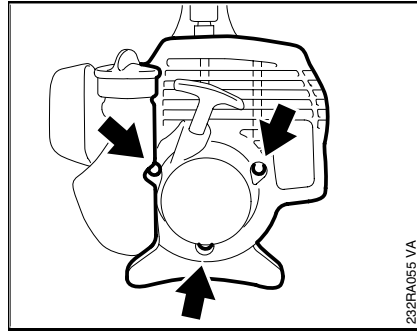
- Undo screws.
- Remove muffler.



- Remove gasket.

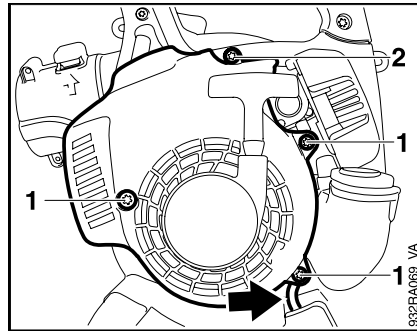
Install parts in the reverse order of steps.

- Use a new gasket.
- Apply sealing compound under the screw head, [see 14](#).
- Tighten screws down with 9.0 Nm.

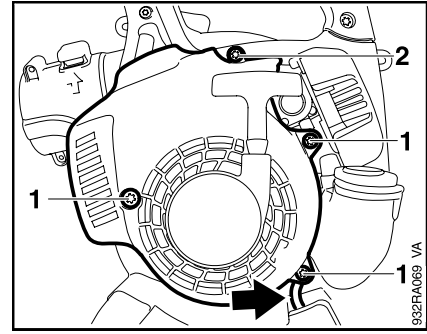


Troubleshooting chart – see "Standard Repairs, Troubleshooting" handbook.

- **FS model:**
Undo three screws and remove starter cover with rewind starter.



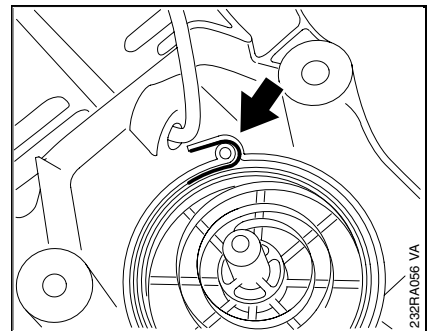
- **HS model:**
Undo three IS DG5x20 screws (1) and two IS P6x25 screws (2). Remove fan housing with rewind starter.



- **BG/SH:**
Undo three IS DG5x20 screws (1) and one IS P6x19 screw (2). Remove fan housing with rewind starter.
- Remove antistatic wire if fitted.
- Remove rope rotor, see "Standard Repairs, Troubleshooting" handbook.
- Remove fragments of rewind spring from rope rotor and starter cover.

Note: The replacement spring is supplied ready for assembly and secured with a washer.

- Apply a few drops of STIHL special lubricant oil before installing the spring, [see 14](#).

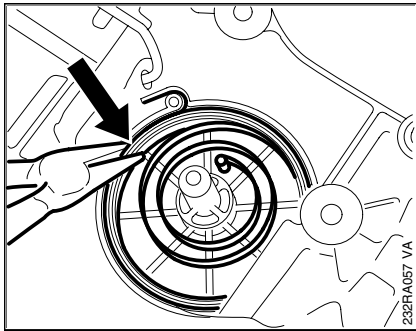


- The rewind spring is forced out of the washer when it is pressed into the starter cover. Press the outer spring loop into the recess in the starter cover.

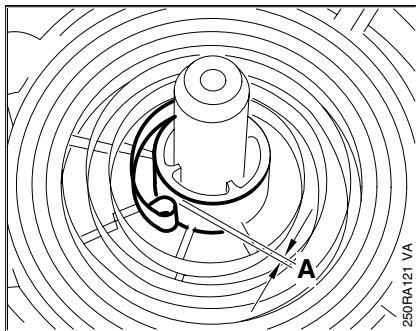
Important! The rewind spring may pop out if it is not fitted with care.

If the rewind spring has popped out, it must be refitted as follows:

- Rewind the spring by hand from the inside outwards and tension it to the diameter of 55 mm required for installation.

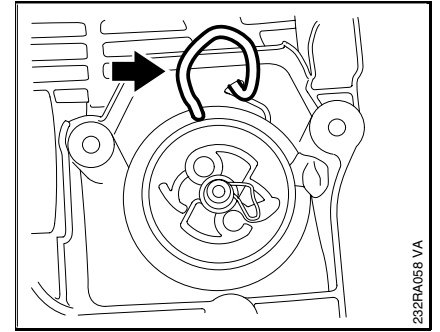


- Then grasp rewind spring with pointed pliers approx. 10 mm from the end of the outer loop and place it in the starter cover.

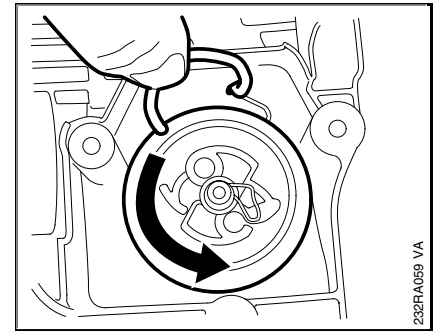


- Check position of inner spring loop in relation to collar
A = 2 mm and correct if necessary.

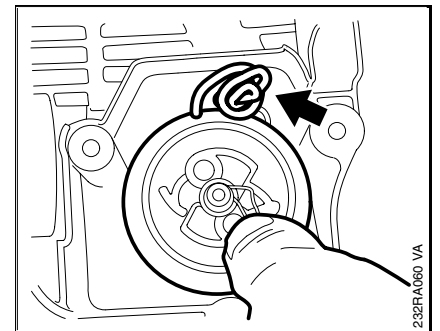
- Fit rope rotor, see "Standard Repairs, Troubleshooting" handbook.
- Tension rewind spring, [see 6.2](#).



- Form a loop with the unwound rope.
- Press starter rope into notch in rope rotor.

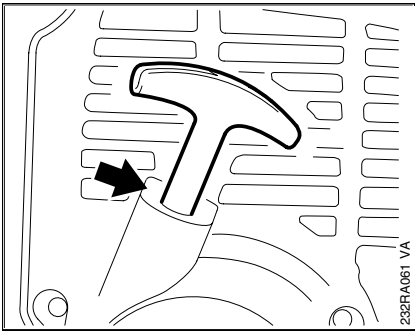


- Hold the rope **close** to the rope rotor and turn the rotor seven times counterclockwise.



- Hold rope rotor steady.
- Pul out rope with starter grip and straighten it out.

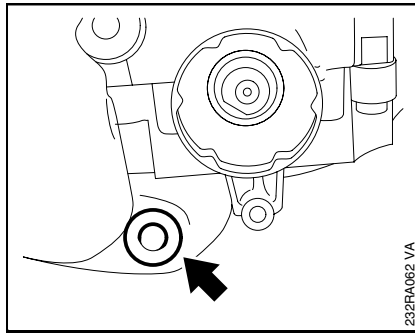
- Hold starter grip firmly to keep rope tensioned.
- Let go of rope rotor and slowly release starter rope so that it rewinds on rope rotor.



Note: The starter grip must sit firmly in the rope guide bush and not droop to one side. If it does droop, the spring must be tensioned by one additional turn.

When the starter rope is fully extended, it must still be possible to rotate the rope rotor at least another half turn before maximum spring tension is reached. If this is not the case, pull the rope out, hold the rope rotor steady and take off one turn of the rope.

Do not overtension the rewind spring otherwise it will break.



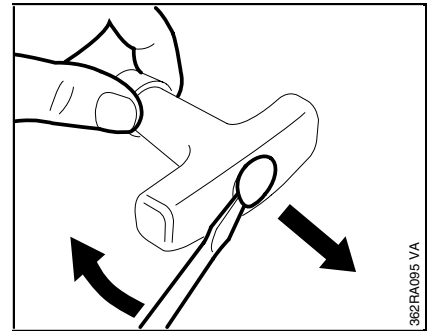
- **FS models only:**
Ensure that the insert in the fuel tank is fitted.
- Fit starter cover, turn in screws and tighten down with 6.0 Nm.

6.3 Starter rope / starter grip (ElastoStart)

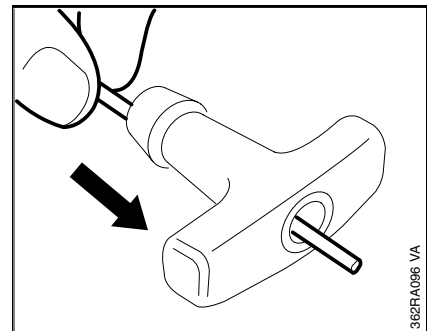
- Remove starter cover with rewind starter, [see 6.1](#).

Starter rope

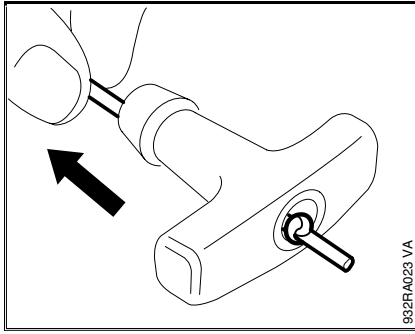
- Remove rope rotor, see "Standard Repairs, Troubleshooting" handbook.
- Remove starter rope from rope rotor.



- Pry cap off starter grip.
- Pull rope out of starter grip.



- Guide end of new starter rope through starter grip from below.
- Secure end of rope with a simple knot.

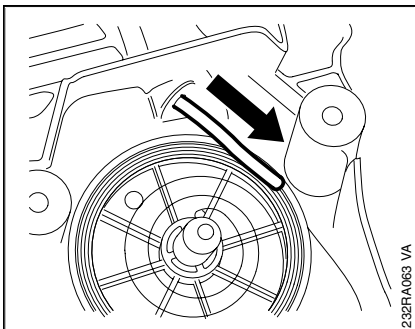


- Pull rope back until knot rests in starter grip.
- Press cap onto starter grip.
- Refit starter rope in rope rotor.
- Install rope rotor.

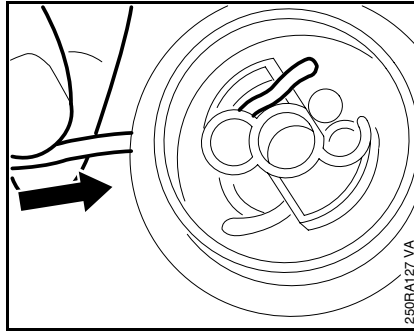
Starter grip

The starter grip is supplied with starter rope.

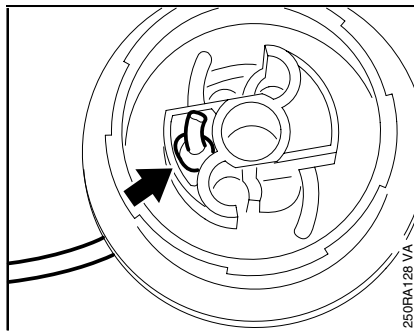
- Remove rope rotor, see "Standard Repairs, Troubleshooting" handbook.
- Pull knot out of chamber in rope rotor.
- Undo knot and pull starter rope out of rope rotor and fan housing.



- Guid starter rope through guide rope bush from the outside.



- Introduce starter rope into hole in side of rope rotor.
- Secure starter rope with a simple knot.



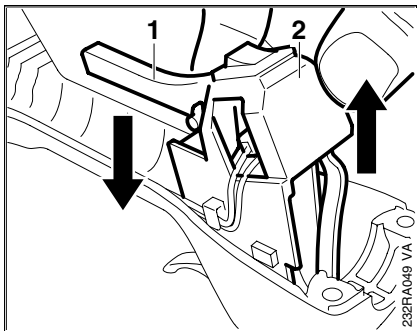
- Pull starter rope back until knot rests in chamber of rope rotor.
- Install rope rotor, see "Standard Repairs, Troubleshooting" handbook.
- Tension rewind spring, [see 6.2](#).
- Install starter cover with rewind starter, [see 6.1](#).

7. Throttle control

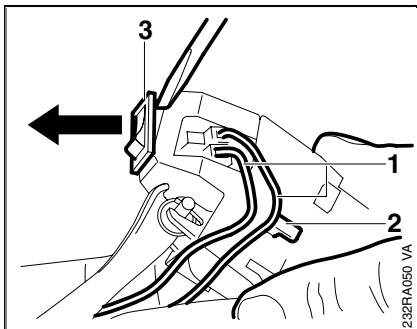
7.1 FS models with integrated control handle

Stop switch

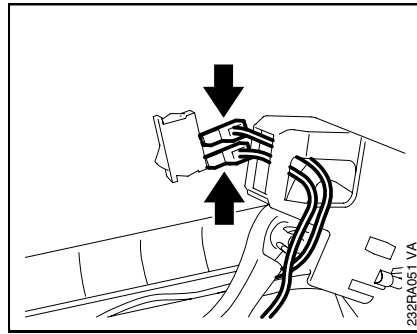
- Remove shroud and housing parts, [see 4.1](#).



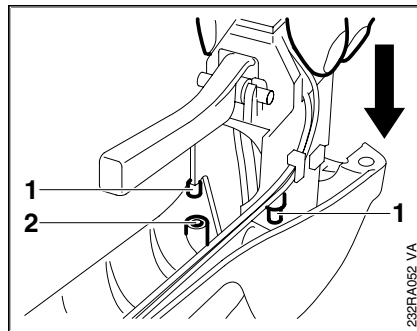
- Press trigger interlock (1) down.
- Pull holder (2) out of engine housing.



- Disconnect leads (1) from bracket (2).
- Prise stop switch (3) out of holder.



- Unplug short-circuit wire and ground wire from stop switch.

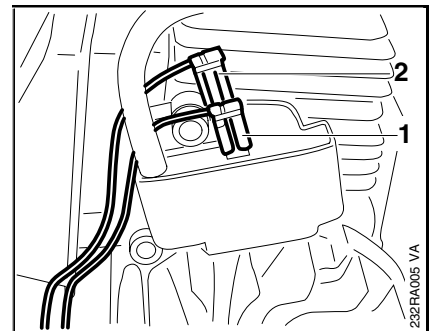


Install parts in the reverse order of steps.

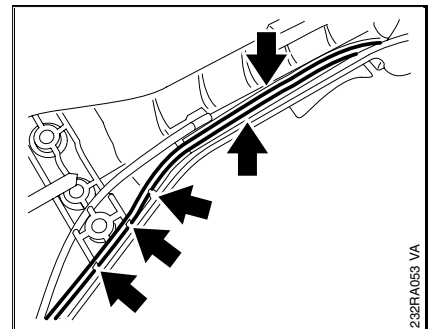
- Press trigger interlock down.
- Insert holder so that pegs (1) engage in holes (2).

Short-circuit wire/ground wire

- Remove stop switch.



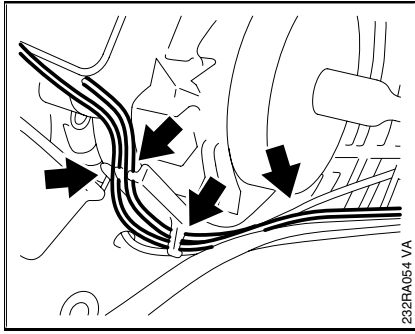
- Unplug short-circuit wire (1) and ground wire (2) from ignition module.
- Remove leads from engine housing.



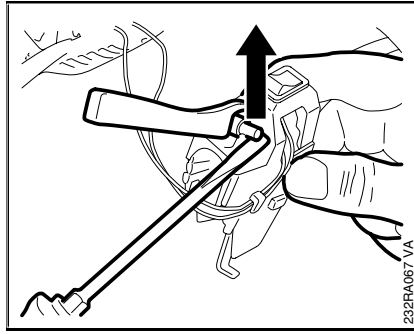
Install parts in the reverse order of steps.

- Ensure that leads are correctly pressed into guides in engine housing.

7.1.1 Trigger interlock/throttle trigger



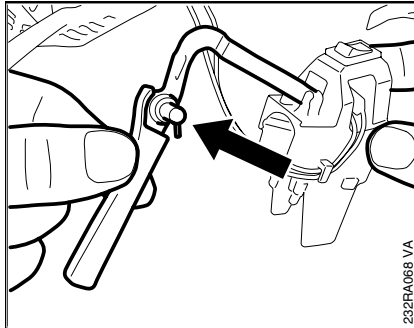
- Fit leads in mounts around flywheel.



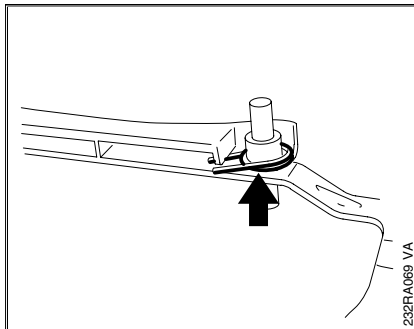
- Remove holder for stop switch and trigger interlock, **see 7.1.**

Trigger interlock

- Prise trigger interlock out of mounts in holder.

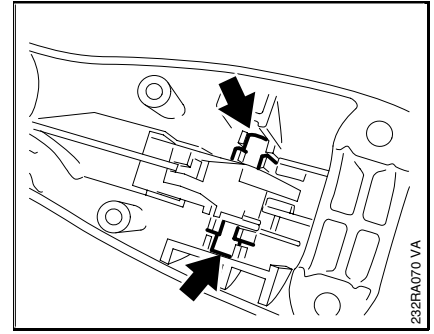


- Remove trigger interlock from holder.



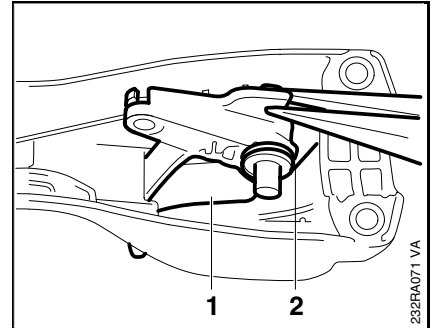
- Examine torsion spring and fit a new spring if necessary.

Install parts in the reverse order of steps.

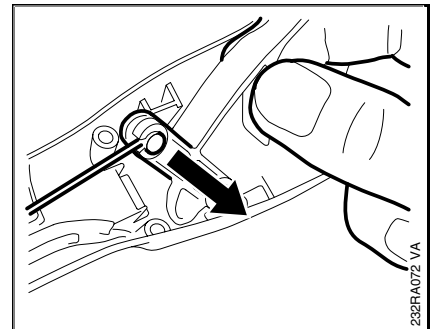


Throttle trigger

- Remove holder for stop switch and trigger interlock, **see 7.1.**
- Pull throttle trigger out of mounts in engine housing.

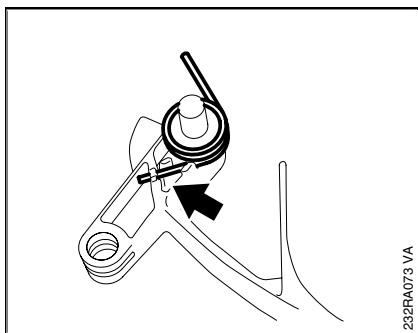


- Lightly press detent lever (1) towards throttle trigger and remove throttle trigger from engine housing.
- Remove torsion spring (2).



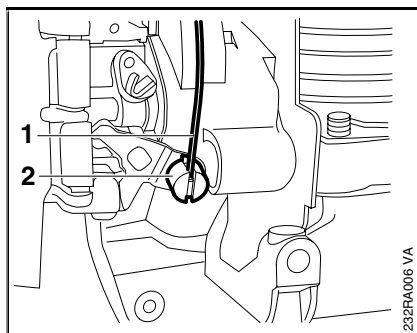
- Unhook throttle cable from throttle trigger.

7.1.2 Replace throttle cable



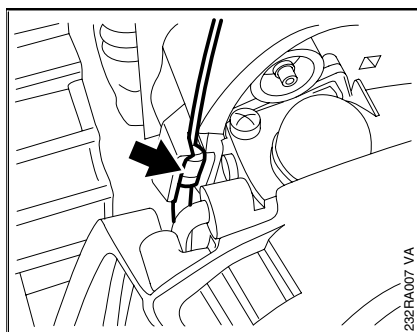
Install parts in the reverse order of steps.

- Fit torsion spring in mounts in throttle trigger.



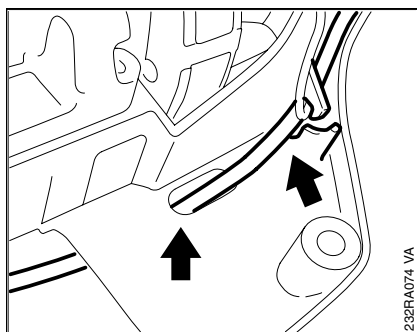
- Remove throttle trigger, see 7.1.1.

- Unhook nipple of throttle cable (1) from slotted bolt (2) on throttle lever.



- Press throttle cable out of clamping element at the sleeve.

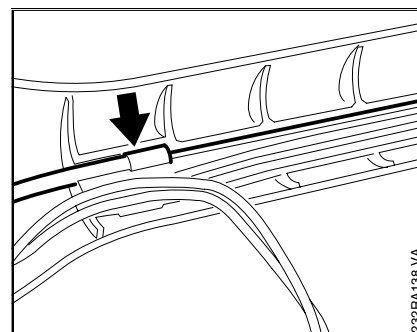
Important: Do not buckle the strand.



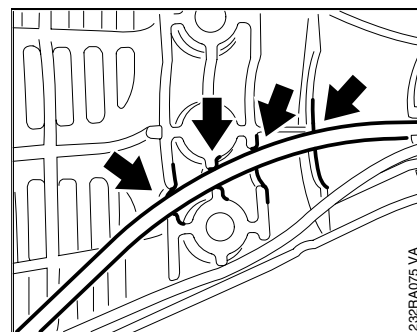
- Remove throttle cable from rear part of engine housing.

- Remove throttle cable from front part of engine housing.

Install parts in the reverse order of steps.



- Press flexible liner of throttle cable fully into front mount of engine housing.

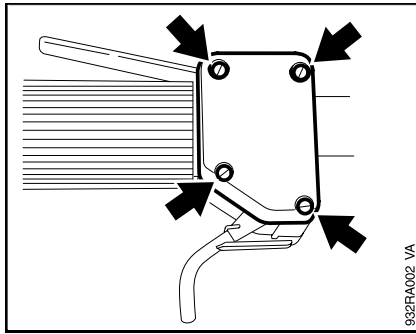


- Insert flexible liner of throttle cable in mounts.

Ensure that the throttle cable is routed correctly.

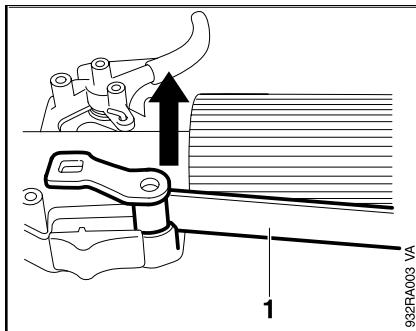
7.2. FS models with separate control handle

7.2.1 Throttle trigger, trigger interlock, stop switch

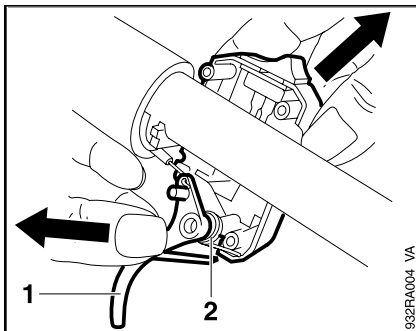


Removal

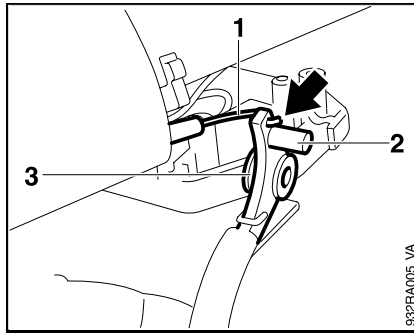
- Undo fastening screws and remove right-hand housing half.
- Remove lever and adjusting spring from right-hand housing half if necessary.



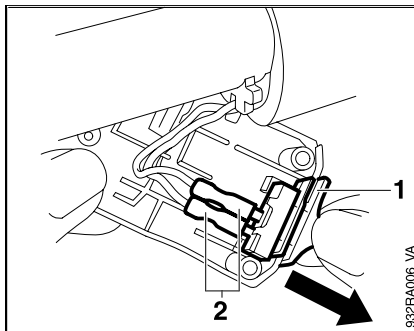
- Remove trigger interlock (1) from peg on left-hand housing half.



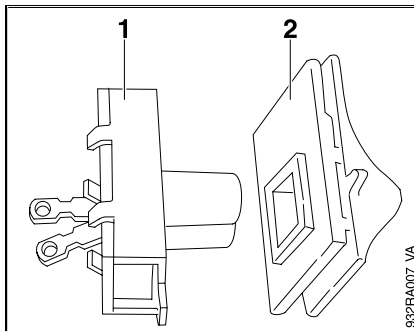
- Remove left-hand housing half, removing throttle trigger (1) and torsion spring (2) from peg at the same time.



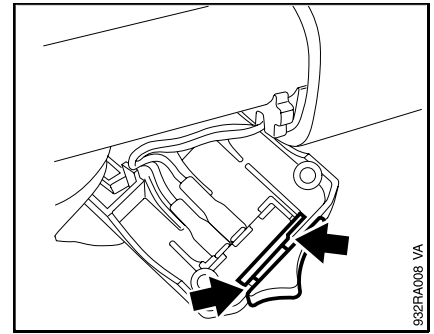
- Unhook throttle cable (1) from throttle trigger (2).
- Remove torsion spring (3) from throttle trigger (2).



- Remove stop switch (1) from left-hand housing half and disconnect short-circuit wires (2).

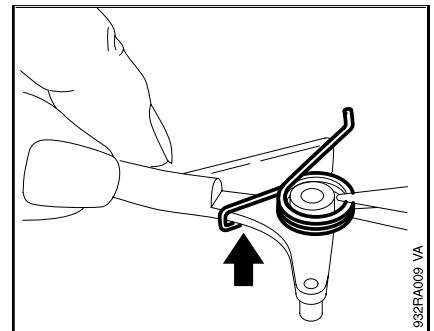


- Remove shutter (2) from stop switch (1).



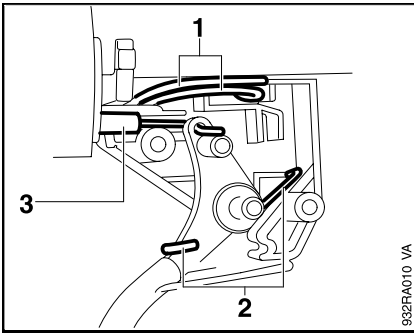
Installation

- Fit shutter on stop switch, connect short-circuit wires and insert stop switch in left-hand housing half so that groove of shutter lies over edge of housing.



- Hook torsion spring into throttle trigger.
- Hook throttle cable into throttle trigger and slide throttle trigger over peg on left-hand housing half.

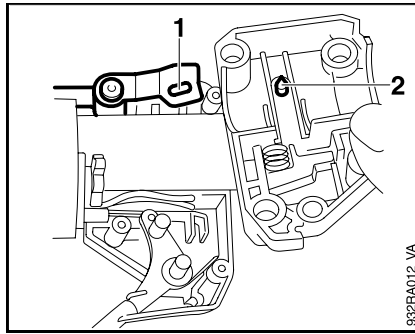
7.2.2 Replace throttle cable



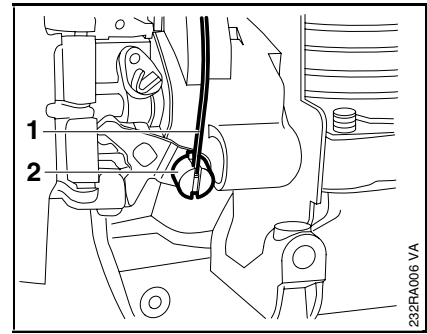
- Position left-hand housing half on shaft.

Note: The housing halves must rest in the groove of the handle support. Ensure that the short-circuit wires (1) and torsion spring (2) are positioned correctly. The throttle cable (3) must rest in the mount of the left-hand housing half.

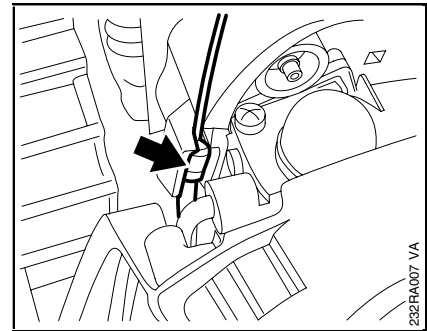
- Slide trigger interlock over peg.



- Position right-hand housing half so that peg (2) on lever engages in hole (1) on trigger interlock.
- Turn in screws and tighten down with 2.5 Nm.

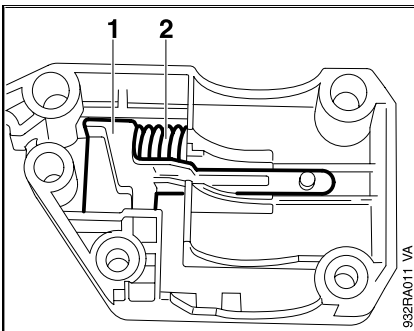


- Remove shaft and shroud, [see 4.1](#).
- Unhook nipple of throttle cable (1) from slotted bolt (2) on throttle lever.

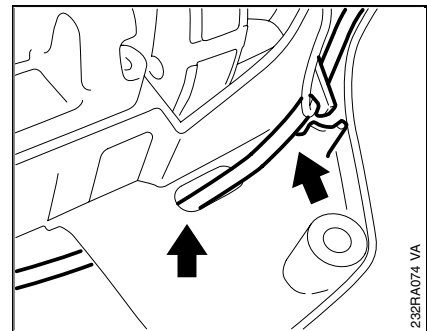


- Press throttle cable out of clamping element at the sleeve.

Important: Do not buckle the strand.



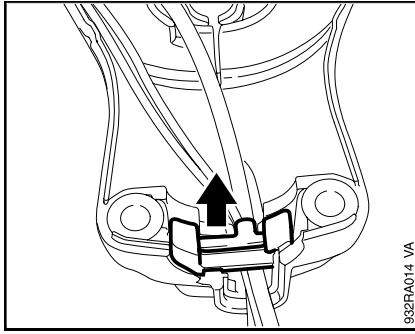
- Insert lever (1) and adjusting spring (2) in right-hand housing half.



- Remove throttle cable from rear part of engine housing.

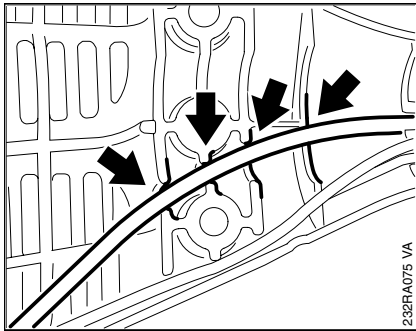
7.3 FS models with bike handle

7.3.1 Trigger interlock / throttle trigger



- Press cable holder out from below and remove throttle cable from front part of engine housing.

Install parts in the reverse order of steps.

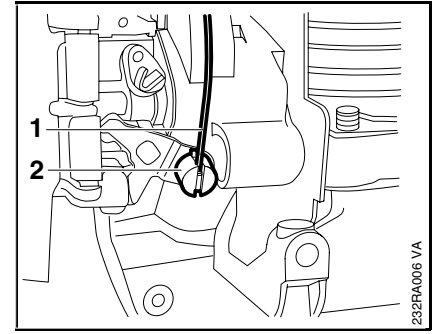


- Fit flexible liner of throttle cable in mounts.

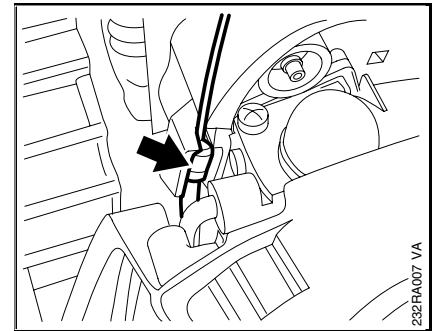
Ensure that remainder of throttle cable is routed correctly.

- See "Standard Repairs, Troubleshooting" handbook for details on replacing the throttle trigger, trigger interlock, contact spring and detent spring.

7.3.2 Replace throttle cable

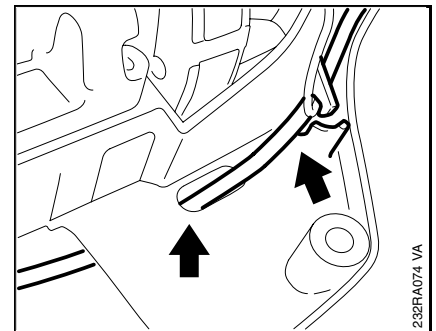


- Remove shaft and shroud, **see 4.1.**
- Unhook nipple of throttle cable (1) from slotted bolt (2) on throttle lever.

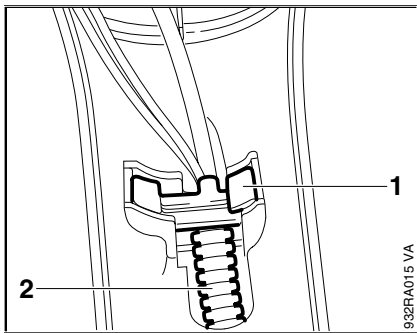


- Press throttle cable out of clamping element at the sleeve.

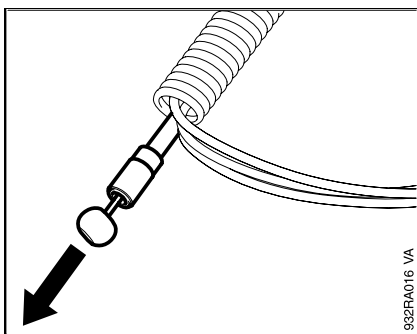
Important: Do not buckle the strand.



- Remove throttle cable from rear part of engine housing.

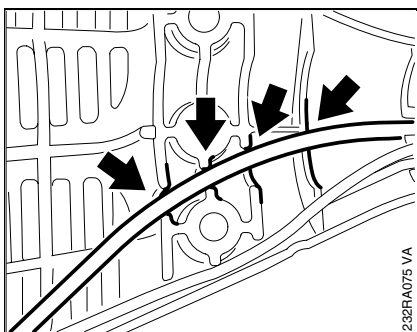


- Pull out cable holder (1) and remove liner with throttle cable (2) from front of engine housing.

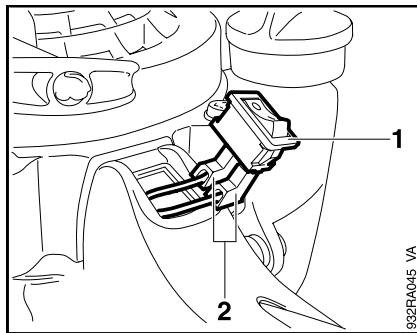


- Pull throttle cable out of liner.

Install parts in the reverse order of steps.

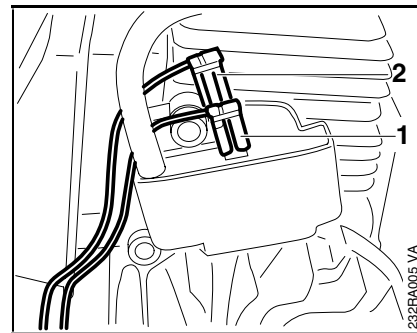


- Fit throttle cable in mounts.

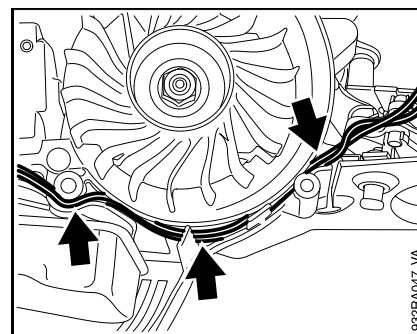


Stop switch

- Prise stop switch (1) out of handle moulding with a flat screwdriver.
- Unplug (2) short-circuit and ground wires from stop switch.



- Unplug short-circuit wire (1) and ground wire (2) from ignition module.
- Remove leads from handle housing and spiral housing.

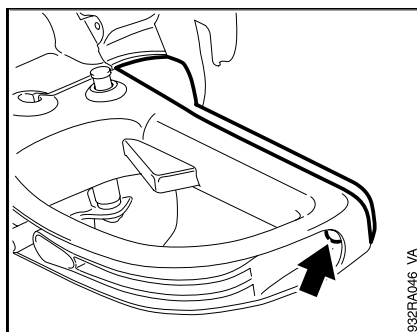


Install parts in the reverse order of steps.

- Ensure that leads are correctly pressed into guides in handle housing and spiral housing.

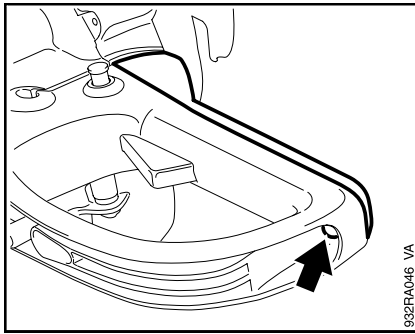
Short-circuit wire/ground wire

- Remove stop switch.



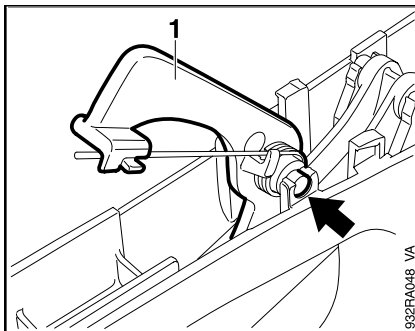
- Undo screw and remove handle moulding.
- Remove fan housing, [see 6.1.](#)

7.4.1 Trigger interlock / throttle trigger

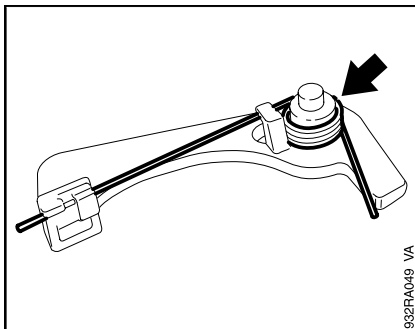


Trigger interlock

- Undo screw and remove handle moulding.

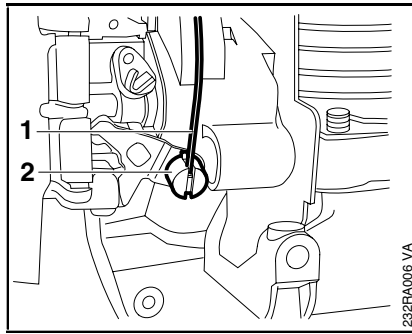


- Prise trigger interlock (1) out of mounts in handle housing.



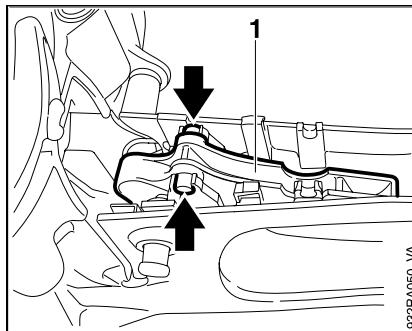
- Remove and examine torsion spring, fit a new spring if necessary.

Install parts in the reverse order of steps.

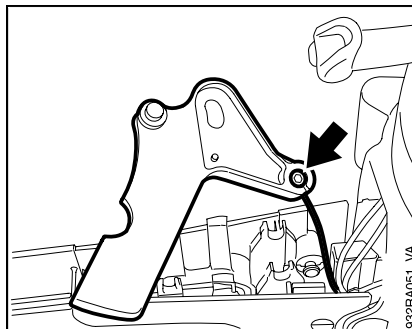


Throttle trigger

- Remove trigger interlock.
- Unhook throttle cable (1) from slotted bolt (2) on throttle lever.



- Disengage throttle trigger (1) from mounts in handle housing.

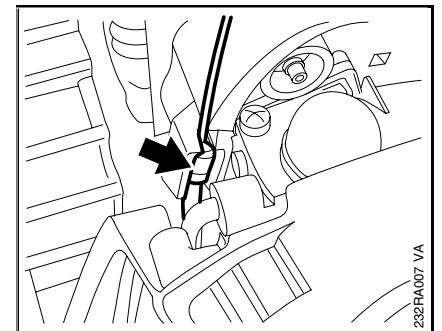


- Unhook throttle cable from throttle trigger.

Install parts in the reverse order of steps.

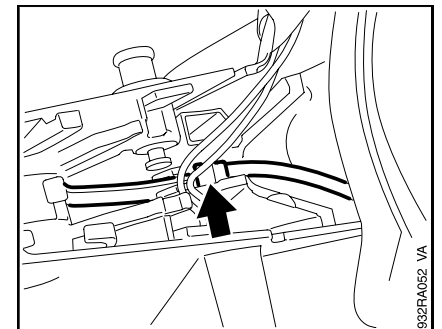
7.4.2 Replace throttle cable

- Remove throttle trigger, [see 7.4.1](#).
- Remove fan housing, [see 6.1](#).
- Remove fuel tank, [see 8.6](#).



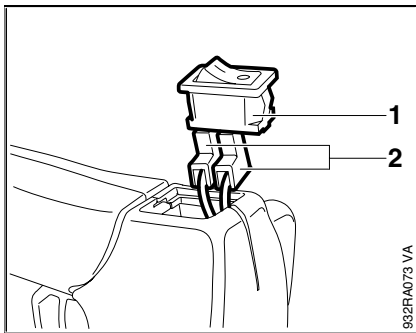
- Press throttle cable out of clamping element at the sleeve.

Important: Do not buckle the strand.



- Press throttle cable out of mount in handle housing and pull out throttle cable.

Install parts in the reverse order of steps.

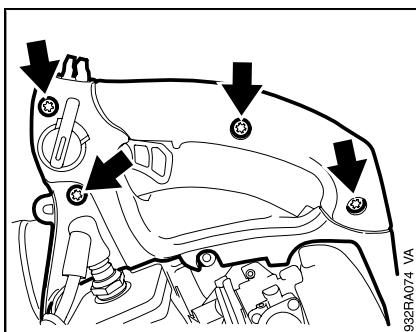


Stop switch

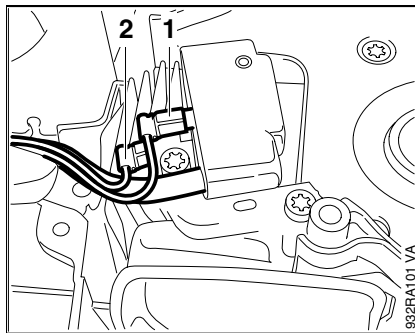
- Prise stop switch (1) out of handle moulding with a flat screwdriver.
- Unplug (2) short-circuit and ground wires from stop switch.

Short-circuit wire/ground wire

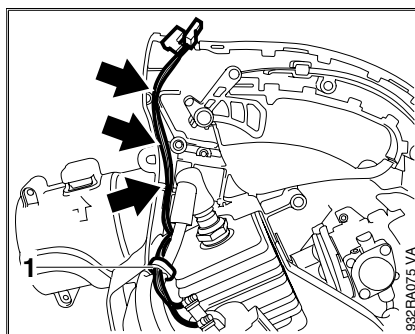
- Remove stop switch.
- Remove fan housing, [see 6.1](#).



- Undo screws and remove handle moulding.



- Unplug short-circuit wire (1) and ground wire (2) from ignition module.

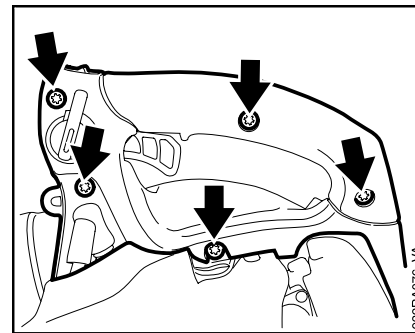


- Remove cable holder (1) from ignition lead and remove leads from inner fan housing.

Install parts in the reverse order of steps.

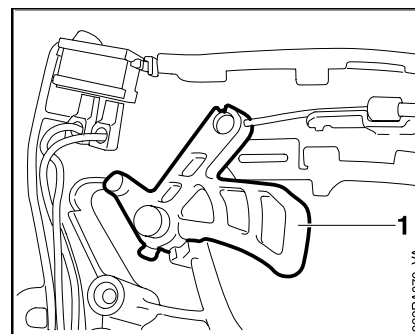
- Ensure that leads are correctly pressed into guides in inner fan housing.

7.5.1 Handle moulding / throttle trigger



Handle moulding

- Undo screws and remove handle moulding.

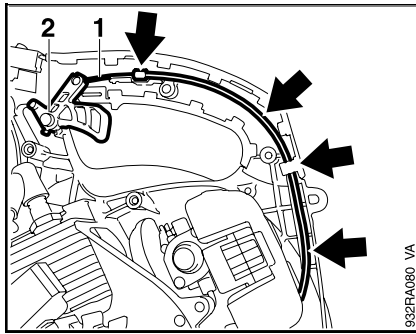


Throttle trigger

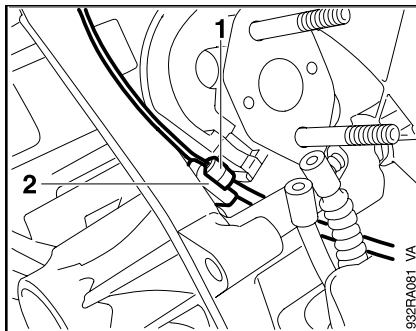
- Remove throttle trigger (1) and unhook throttle cable from throttle trigger.

Install parts in the reverse order of steps.

7.5.2 Replace throttle cable



- Remove fan housing, **see 6.1.**
- Unhook throttle cable (1) from throttle trigger (2).
- Remove throttle cable from mounts in inner fan housing.



- Remove carburetor, **see 8.2.2.**
- Force throttle cable (1) out of clamping element (2) and remove throttle cable.

Install parts in the reverse order of steps.

8. Fuel system

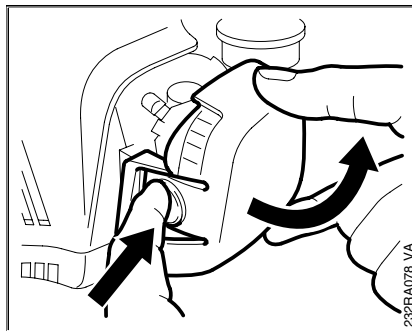
8.1 Air filter

Engine performance is impaired, fuel consumption increases and starting is made more difficult if the filters are fouled.

The air filter must be cleaned if the engine performance deteriorates.

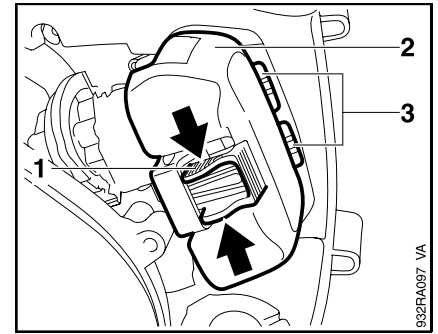
Removal

- Close choke shutter.
- Remove coarse dirt around air filter and filter cover.



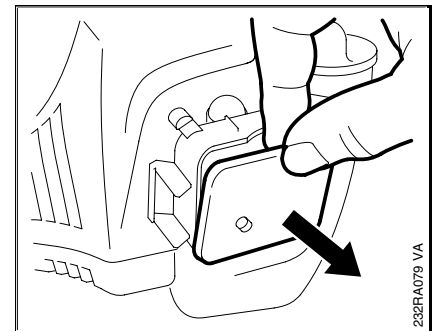
FS models and HS 45

- Press tab on filter cover to side.
- Swing filter cover aside and remove from pegs on housing.



BG/SH

- Press tabs (1) on filter cover (2) together.
- Swing filter cover back slightly and pull off pegs (3).



- Remove prefilter from filter cover, if fitted.
- Remove felt filter element.
- Clean felt filter element by tapping or blowing – **do not wash** – replace if severely fouled.

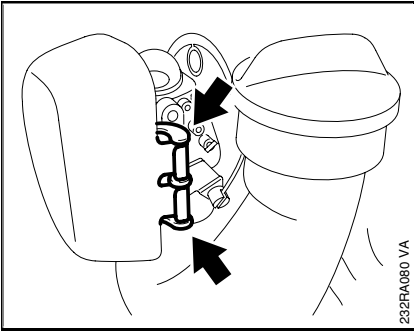
Note: The air filter must be replaced immediately if damaged.

Installation

- Insert prefilter in filter cover, if fitted.
- Insert felt filter element in filter housing.

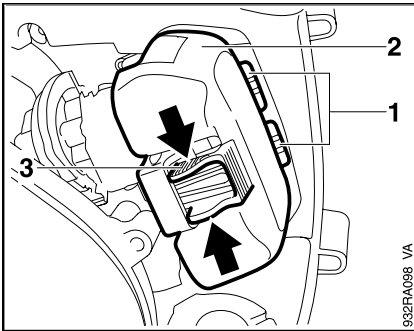
8.2 Carburetor

8.2.1 Leakage test



FS models and HS 45

- Slide mounts on filter cover over ridge on filter housing.
- Fold filter cover over and press onto filter housing until it is heard to engage.



BG/SH

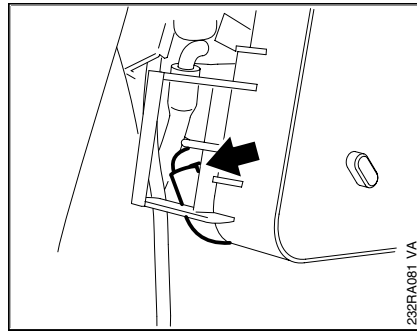
- Fit filter cover (2) in pegs (1).
- Fold filter cover over and press onto filter housing until it is heard to engage.

Troubleshooting chart – see "Standard Repairs, Troubleshooting" handbook.

Important! The tank vent must also be checked and cleaned if necessary, [see 8.3](#), if faults develop in the carburetor or fuel supply.

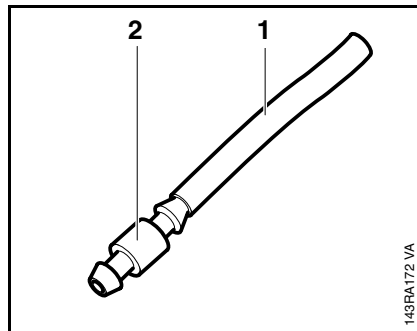
The carburetor can be tested for leaks with the aid of the carburetor/crankcase tester 1106 850 2905.

- Remove filter cover, [see 8.1](#).
- Check that there are no leaks in tester.

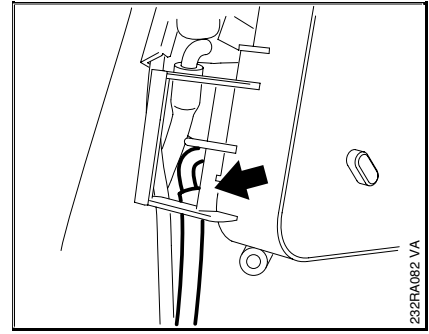


Note: Diagram shows FS model, BG/SH and HS 45 are similar.

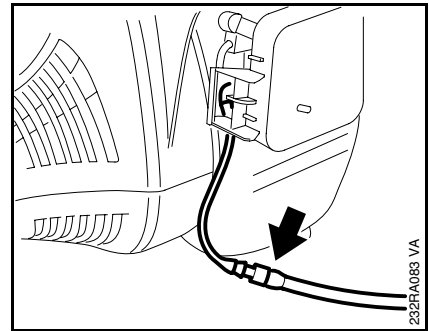
- Disconnect fuel hose from angled connector.



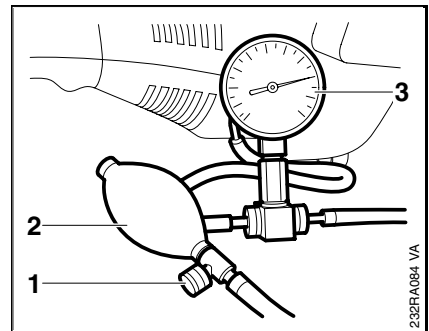
- Slide fuel line (1) 1110 141 8600 onto connector (2) 0000 855 9200.



- Slide fuel line with connector onto angled connector of carburetor.



- Slide pressure hose from tester onto connector.



- Close vent screw (1) on rubber bulb (2) and pump air into carburetor until pressure gauge (3) shows an excess pressure of approx. 8 kPa (0.8 bar).

8.2.2 Removal and installation

There are no leaks in the carburetor if this pressure remains constant. If it drops, however, this is basically due to two causes:

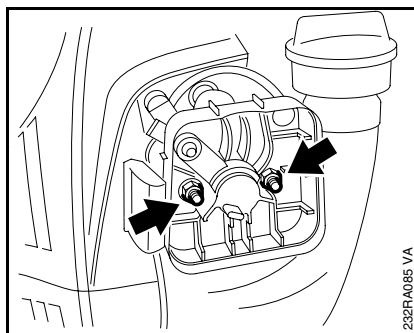
1. Inlet needle valve not sealed (impurities in valve seat, cone of inlet needle damaged or inlet control lever sticking).

2. Metering diaphragm damaged.

- After testing, open vent screw and disconnect fuel line from angled connector.

- Slide fuel hose onto angled connector.

- Fit filter cover.

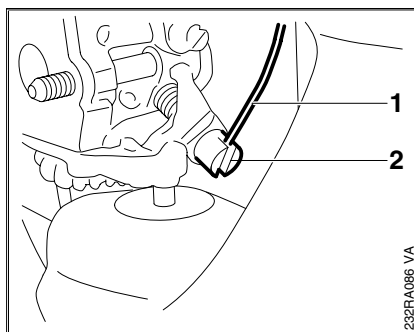


- Remove air filter, [see 8.1](#).

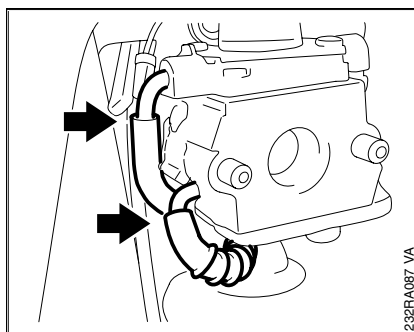
Note: Diagram shows FS model, BG/SH and HS 45 are similar.

• Remove nuts with screwdriver 5910 890 2420.

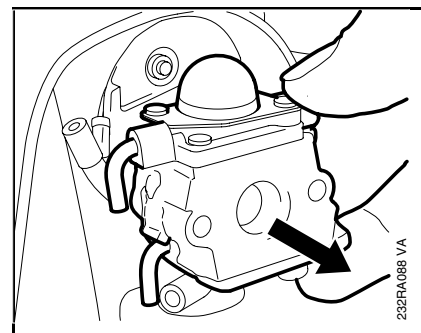
- Remove filter housing.



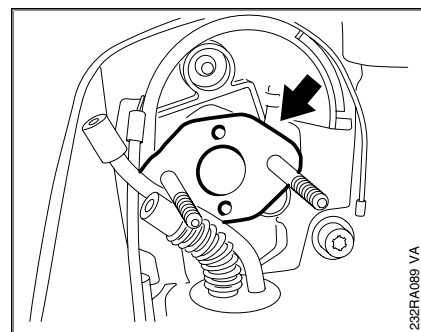
• Unhook nipple of throttle cable (1) from slotted bolt (2) of throttle lever.



• Disconnect fuel hoses from angled connectors.



• Remove carburetor.

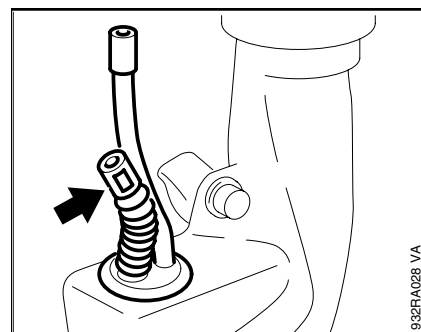


• Remove gasket.

Install parts in the reverse order of steps.

- Use a new gasket.

- Ensure that fuel hoses are routed without buckling.



Note (FS model): Align fuel hose on angled connector so that the positioning strip on the hose points towards the shaft.

Tighten nuts on filter housing down with 3.5 Nm.

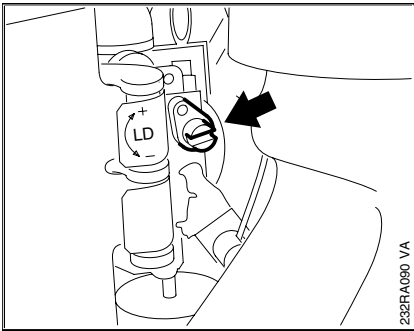
8.2.3 Adjustment

The carburetor does **not** have adjusting screws for high speed (H screw) and low speed (L screw).

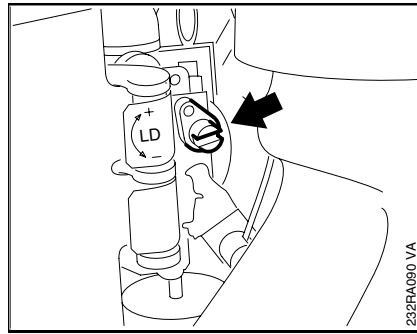
The carburetor is tuned to ensure that the engine receives the optimum mixture of fuel and air in **all** operating states.

Standard setting

The standard setting must be established first when adjusting the carburetor.



- Carefully turn the idle screw (**LD** screw) counterclockwise until it is hard against its seat.
Note: Left-hand thread
- Then turn LD screw **two** turns clockwise.
- **FS models only:** Fit cutting blades.
- Check air filter and replace if necessary.
- Check spark arrester and clean or replace if necessary.



Adjust idle speed

- Make standard setting.
- Start engine and let it warm up.

Engine stops while idling:

- Carefully turn LD screw clockwise until engine runs smoothly.
- The cutting blades on FS models must not rotate.

FS models only: cutting blades run while engine is idling:

- Turn LD screw counterclockwise until cutting blades stop – then give it **one** more turn in the same direction.

Erratic idling behaviour, poor acceleration

- Slowly turn LD screw up to max. one half-turn counterclockwise.

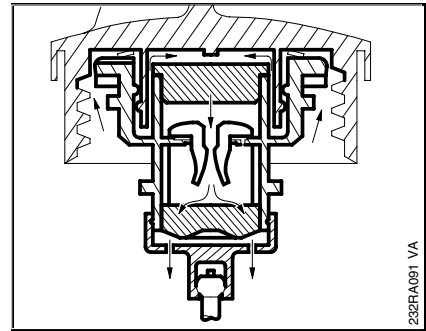
8.3 Tank vent

Correct operation of the carburetor is only possible if atmospheric pressure and internal fuel tank pressure are equal at all times. This is ensured by the tank vent.

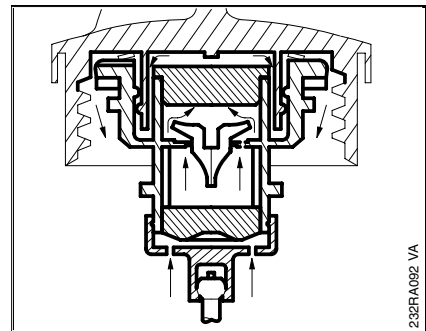
Important! The tank vent must also be checked and cleaned if faults develop in the carburetor or fuel supply.

Check correct functioning by performing pressure and vacuum tests on the tank via the fuel hose.

Pressure equalization

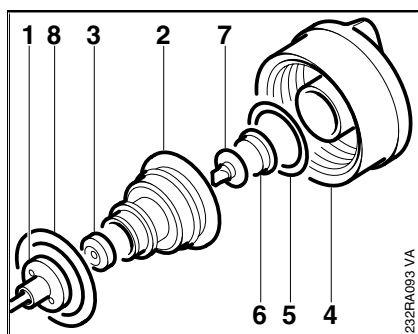


From the outside inwards via the thread of the filler cap, the slits in the valve body, the sintered filter, the valve, the sintered filter and the holes in the cap.



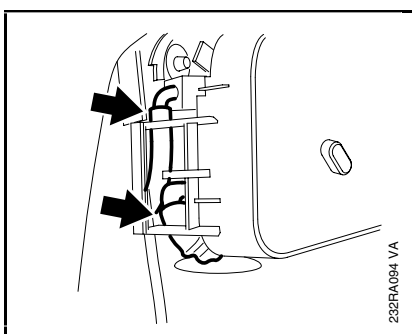
From the inside outwards via the holes in the cap, the sintered filter, the valve, the sintered filter, the slits in the valve body and the thread of the filler cap.

8.4 Fuel tank (FS models)

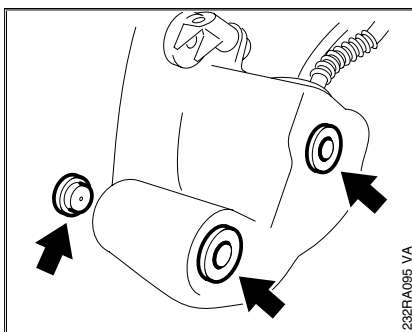


Cleaning

- Unscrew filler cap.
- Prise cap (1) off valve body (2).
- Remove sintered filter (3) from cap.
- Prise valve body out of filler cap (4).
- Remove spring washer (5) from filler cap.
- Prise sintered filter (6) out of filler cap.
- Clean valve body with fresh petrol.
- Remove and replace valve (7).
- Press new sintered filter (6) into filler cap.
- Place sealing ring (8) over valve body.
- Place spring washer (5) in filler cap.
- Insert valve body in filler cap and press home until it is heard to engage.
- Fit a new sintered filter in the cap.
- Fit cap on valve body and press home until it is heard to engage.
- Screw on filler cap.

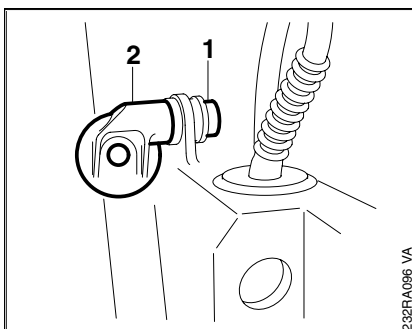


- Remove filter cover, [see 8.1](#).
- Disconnect fuel hoses from angled connector.
- Remove starter cover, [see 6.1](#).



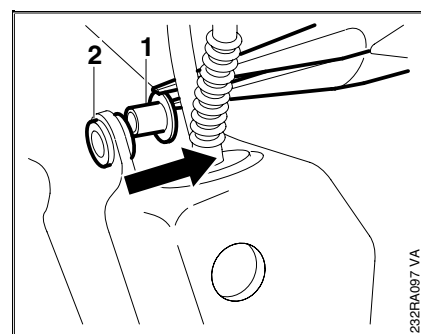
- Remove fuel tank.
- Remove inserts from fuel tank.

Note: Worn inserts must be replaced.

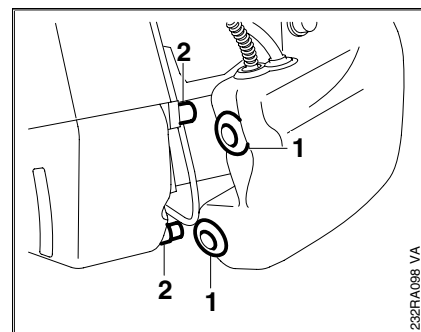


- Undo screw (1).
- Remove holder (2).

Note: Do not tighten screw until starter cover has been fitted.

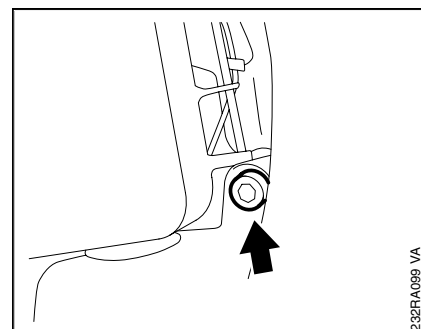


- Pull out bush (1).
- Remove grommet (2) from tank.
- Remove fuel hoses, [see 8.5](#).



Install parts in the reverse order of steps.

- The inserts (1) must engage the pegs (2).
- Ensure that throttle cable is not jammed.



- Tighten screw on holder down with 4.0 Nm.

8.5 Pickup body / fuel hoses (FS models)

The diaphragm pump draws fuel out of the tank and into the carburetor via the fuel hose. 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.

Important: Always check the fuel tank and pickup body first if problems develop in the fuel system. Clean the tank if necessary.

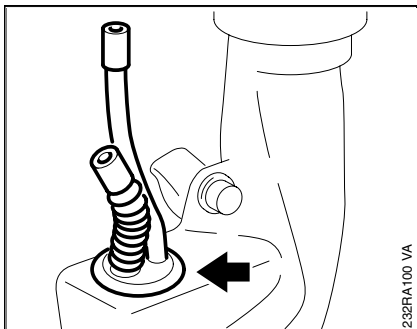
Cleaning the tank

- Unscrew filler cap and drain tank.
- Fill with a little fresh petrol.
- Close filler cap and shake the machine thoroughly.
- Open filler cap and drain tank.

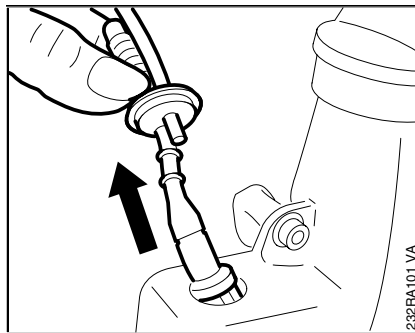
Note: Ensure that fuel is disposed of in accordance with regulations.

Pickup body / fuel hoses

- Remove fuel tank, [see 8.4](#).

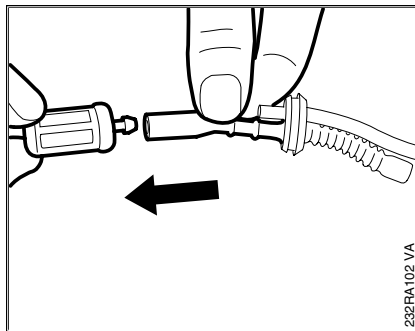


- Prise grommet out of tank.

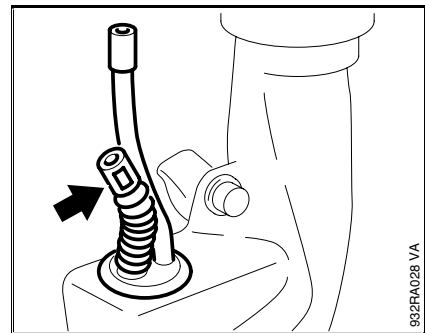


- Pull out fuel hoses with pickup body.

Note: Coat bottom half of grommet with oil so that it can be inserted more easily.

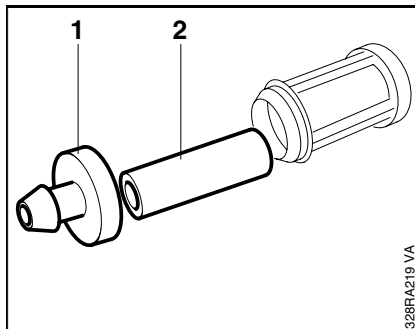


- Pull pickup body off fuel hose.



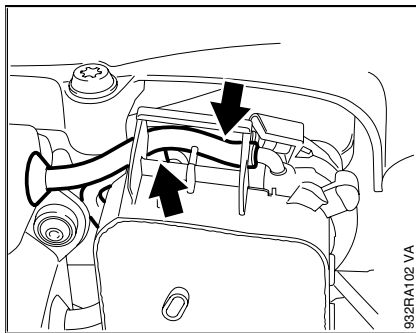
Assemble parts in the reverse order of steps.

Note: Align fuel hose on angled connector so that positioning strip on hose points towards shaft.

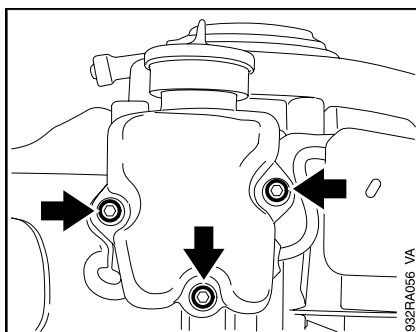


- Remove cap (1).
- Remove and replace filter (2).

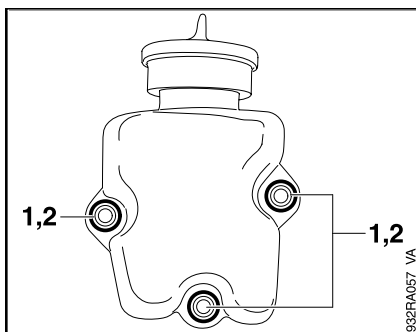
8.6 Fuel tank (HS 45)



- Remove filter cover, **see 8.1.**
- Disconnect fuel hoses from angled connector.



- Undo screws and remove fuel tank.

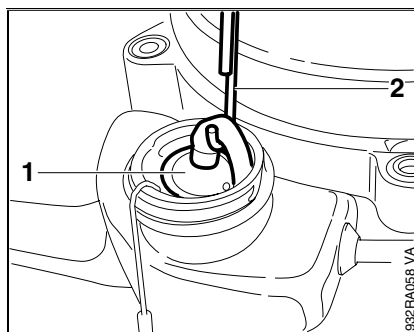


- Pull out sleeves (1) and remove grommets (2) from tank.
 - Remove fuel hoses if necessary, **see 8.7.**
- Install parts in the reverse order of steps.

8.7 Pickup body / fuel hoses (HS 45)

The diaphragm pump draws fuel out of the tank and into the carburetor via the fuel hose. 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.

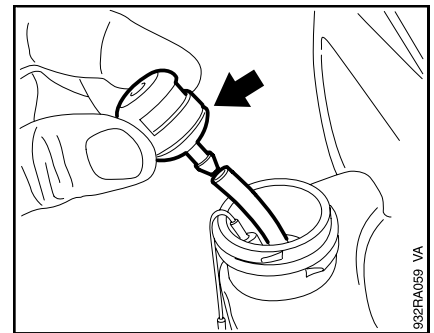
Important: Always check the fuel tank and pickup body first if problems develop in the fuel system. Clean the tank if necessary.



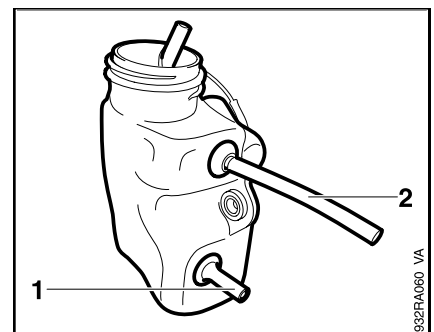
Pickup body

- Unscrew filler cap.
- Pull pickup body (1) out of fuel tank with assembly hook (2) 5910 893 8800.

Note: Ensure that fuel hose is not overextended. If necessary, push bottom end of hose into tank.



- Remove pickup body from fuel hose.
- Check whether pickup body is fouled and replace if necessary.

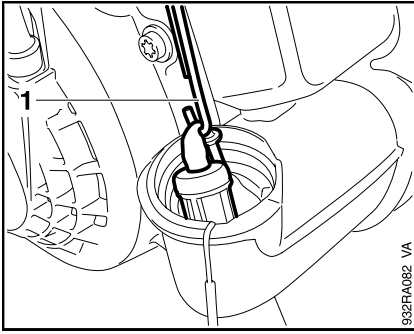


Fuel hoses

- Remove fuel tank, **see 8.6.**
- Pull fuel hose (1) and vent hose (2) out with grommets.

Install parts in the reverse order of steps.

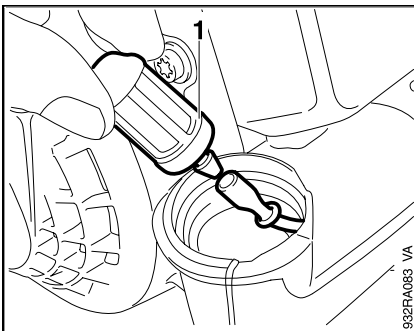
8.8 Pickup body / fuel hoses/ tank vent (BG/SH)



Pickup body

- Unscrew filler cap.
- Pull pickup body out of fuel tank with assembly hook (1) 5910 893 8800.

Note: Ensure that fuel hose is not overextended.

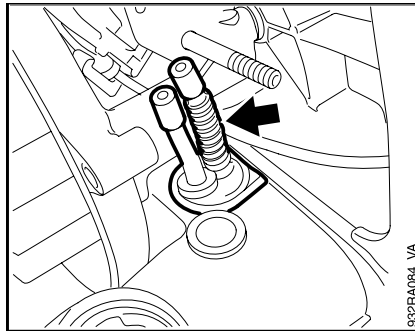


- Remove pickup body (1) from fuel hose, replace pickup body if necessary.

Install parts in the reverse order of steps.

Fuel hoses

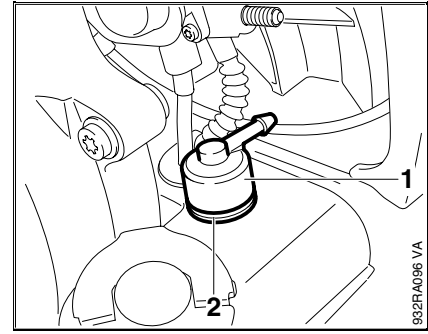
- Remove starter cover, [see 6.1.](#)
- Remove carburetor, [see 8.2.2.](#)
- Remove pickup body.
- Remove tank vent.



- Pull out fuel hoses.

Note: Note installed position.

Install parts in the reverse order of steps.



Tank vent

- Remove filter housing, [see 8.2.2.](#)

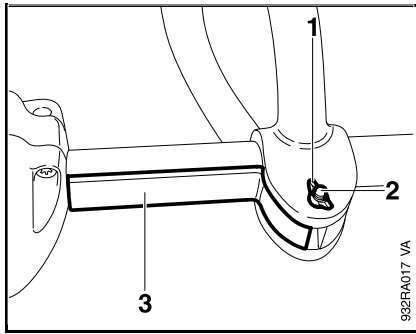
Important: Note installed position of tank vent.

- Pull out tank vent (1).
- Pull out grommet (2).
- Check whether tank vent is fouled and replace if necessary.

Install parts in the reverse order of steps.

9. Shaft

9.1 Models with integrated control handle



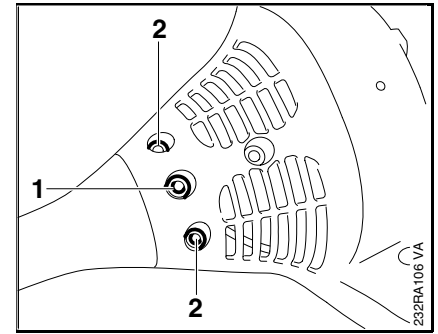
Bar handle

- Unscrew wingnut (1) and remove washer.
- Pull out screw (2).
- Remove spacer (3).
- Remove bar handle from shaft.

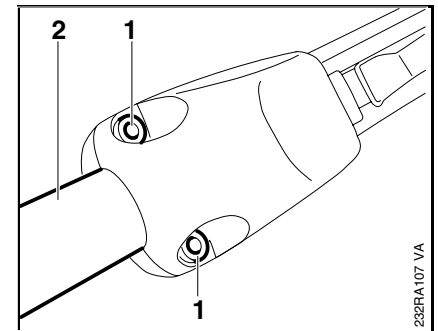
Install parts in the reverse order of steps.

Note: The bar handle must be aligned so that the spacer touches the engine housing.

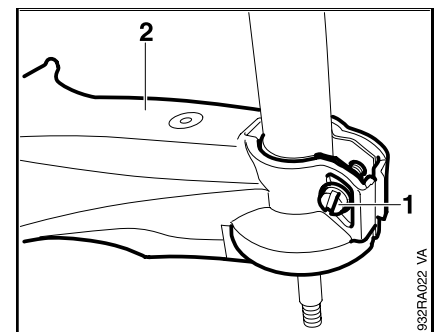
9.1.1 Shaft



- Remove fastening screw (1).
- Undo clamping screws (2).



- Undo clamping screws (1).
- Pull out shaft (2).
- Remove bar handle, [see 9.1](#).
- **FS 55 only:** Remove gear in order to replace shaft, [see 10.1](#).

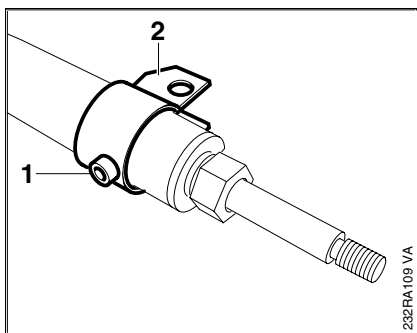


- **FS 45/46 only:** Remove clamping screw (1) to replace shaft.
- Pull deflector (2) off to the front.

9.2 FS models with separate control handle

9.2.1 Loop handle

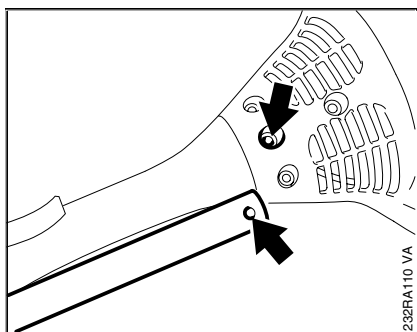
9.2.2 Shaft



FS 45, 46 only:

- Remove screw (1).
- Remove clamp (2).

Install parts in the reverse order of steps.

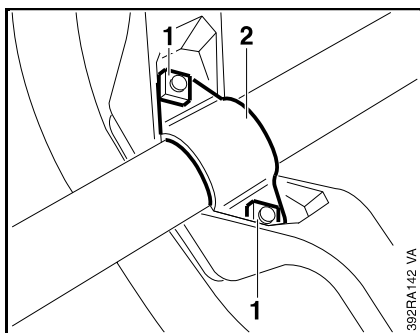


- Grease clamping area.
- Slide shaft in until holes are lined up.

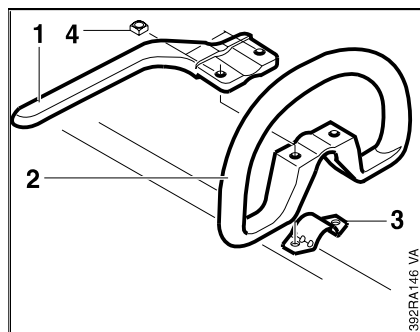
Note: The shaft is illustrated beside the engine housing to show which holes are meant.

- When inserting the shaft, turn the bearing housing back and forth a little at the same time so that the square of the flexible shaft can engage in the square socket of the clutch drum.
- Insert fastening screw in shroud and tighten down with 3.0 Nm.
- **FS 45, 46 only:** Tighten down screw on deflector with 8.0 Nm and clamp on deflector with 5.0 Nm.

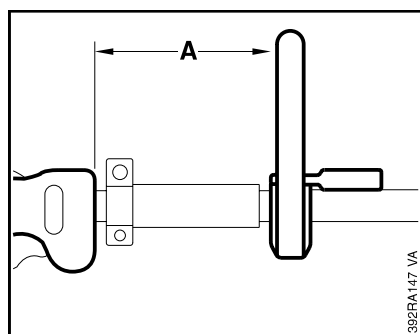
Note: Check that instruction plate on shaft is undamaged and legible. Replace if necessary.



- Remove screws (1).
- Remove bottom bracket (2).



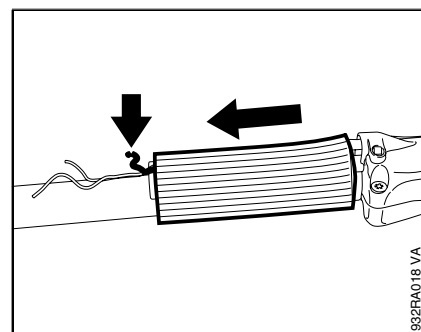
- Remove bar (1, if fitted), loop handle (2) and upper bracket (3).
- Remove square nuts (4) from bar.



- Position and secure loop handle at distance A = 20 cm from control handle.

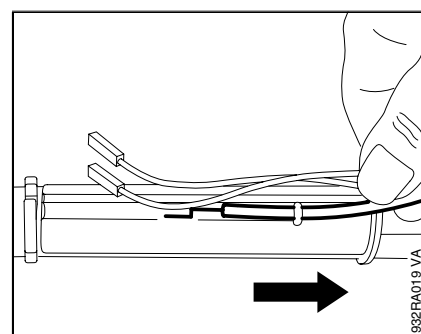
Install parts in the reverse order of steps.

- Remove loop handle, see 9.2.1.
- **FS 55 only:** Remove gear, see 10.1.
- Remove throttle trigger, trigger interlock and stop switch, see 7.2.1.

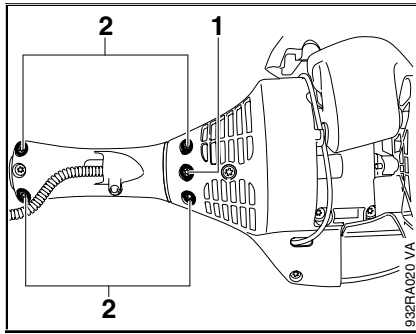


- Pull handle hose off handle support.

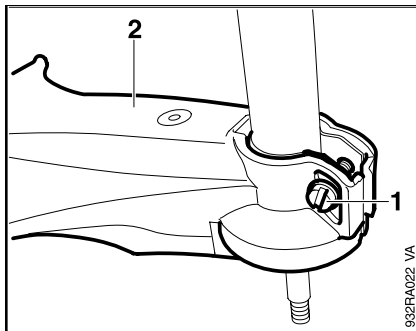
Important: Do not warp angled end of throttle cable when removing hose.



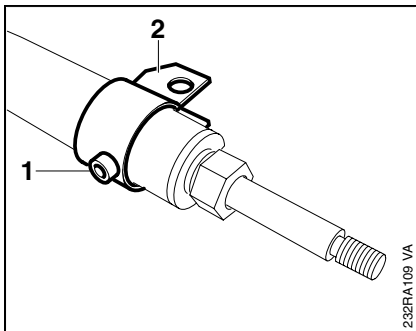
- Pull short-circuit wires out of groove and throttle cable out of mount on handle support.



- Remove fastening screw (1).
- Undo clamping screws (2).
- Pull out shaft.



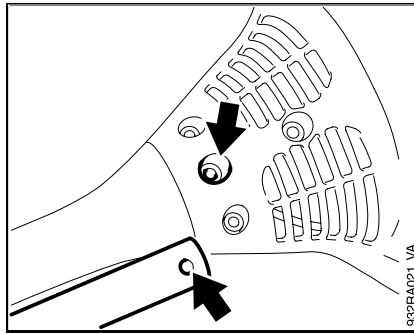
- **FS 45, 46 only:**
Remove clamping screw (1) on deflector in order to replace shaft.
- Pull deflector (2) off to the front.



- **FS 45, 46 only:**
Remove screw (1).
- Remove clamp (2).

Install parts in the reverse order of steps.

Machine components 4140



Grease clamping area.

- Slide shaft in until holes are lined up.

Note: The shaft is illustrated beside the engine housing to show which holes are meant.

- When inserting the shaft, turn the bearing housing back and forth a little at the same time so that the square of the flexible shaft can engage in the square socket of the clutch drum.

- Insert fastening screw in shroud and tighten down with 4.0 Nm.

- FS 45, 46 only:

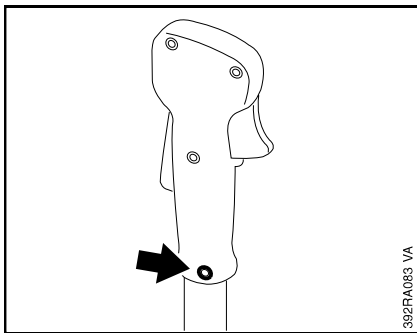
- Tighten down screw on deflector with 8.0 Nm and clamp on deflector with 5.0 Nm.

Note: Ensure that short-circuit wires and throttle cable are correctly seated in handle support.

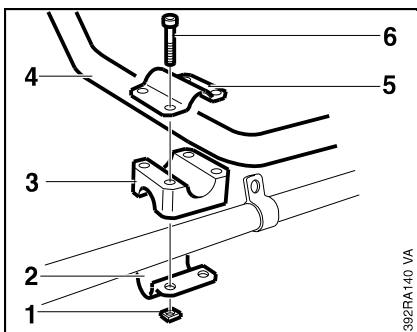
Note: Check that instruction plate on shaft is undamaged and legible. Replace if necessary.

9.3 FS models with bike handle

9.3.1 Bike handle

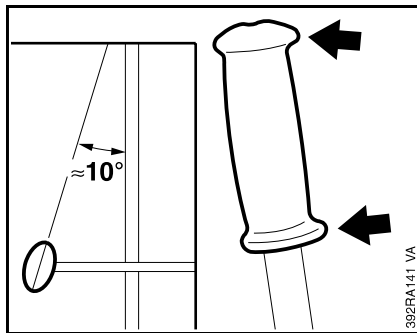


- Remove screw and pull off control handle.



- Unscrew nuts (1).
- Remove bottom half of clamp (2), clamping element (3), bike handle (4) and upper half of clamp (5) with screws (6).
- Carefully slit and remove left-hand handle in order to replace it.
- Mount bike handle in clamp 5910 890 8800.
- Wet inside of handle with a little lubricant (e.g. washing-up liquid) around the opening.

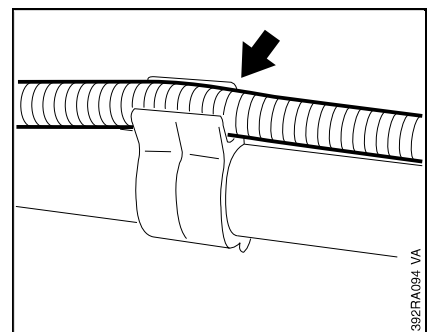
Note: If too much lubricant is applied, the handle will subsequently turn on the handlebar. It must therefore be allowed to dry for some time after assembly.



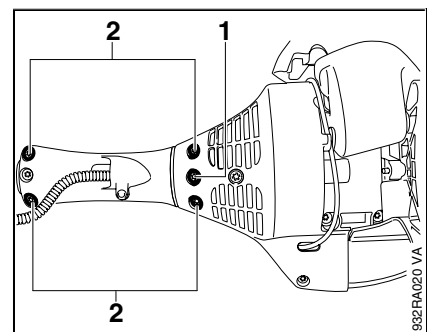
- Slide handle onto handlebar so that the longer ends point towards the gear and are angled at roughly 10 to 15 degrees in relation to the shaft.
- Fit the bike handle and tighten clamping elements down with 4.5 Nm.
- Fit control handle.

9.3.2 Shaft

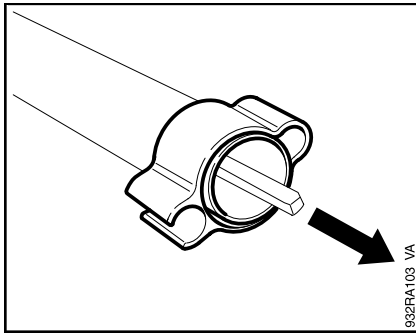
- Remove bike handle, [see 9.3.1](#).
- Remove cutting tool drive, [see 10](#).



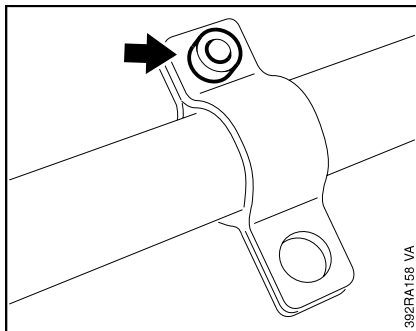
- Remove flexible liner of throttle cable from throttle cable holder.



- Remove fastening screw (1).
- Undo clamping screws (2).
- Pull out shaft.

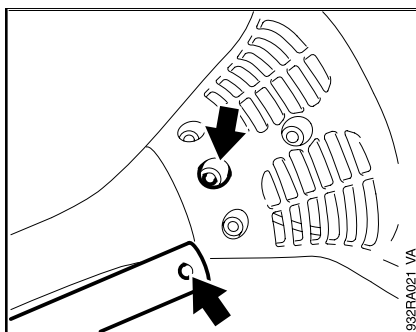


- Remove throttle cable holder.



- Remove screw on carrying ring.
- Pull carrying ring apart and remove it.

Install parts in the reverse order of steps.



- Grease clamping area.
- Slide shaft in until holes are lined up.

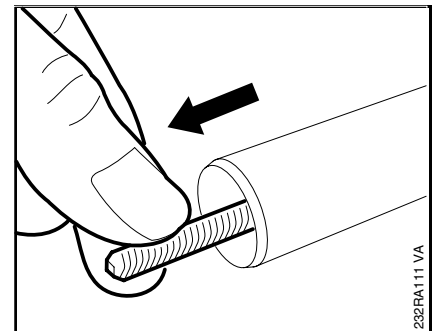
Note: The shaft is illustrated beside the engine housing to show which holes are meant.

- When inserting the shaft, turn the bearing housing back and forth a little at the same time so that the square of the flexible shaft can engage in the square socket of the clutch drum.
- Insert fastening screw in shroud and tighten down with 3.0 Nm.
- Tighten screw on carrying ring down with 4.5 Nm.

Note: Check that instruction plate on shaft is undamaged and legible. Replace if necessary.

The flexible shaft is mounted in the rigid shaft in a flexible liner.

- Remove shaft, [see 9.1.1, 9.2.2 or 9.3.2](#).



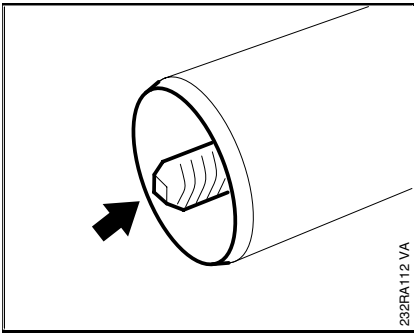
- Pull flexible shaft out of rigid shaft.

Note: The flexible shaft must be replaced if it has turned blue.

- Before inserting the flexible shaft, coat it with STIHL gear lubricant for brushcutters 0781 120 1117, [see 15](#).

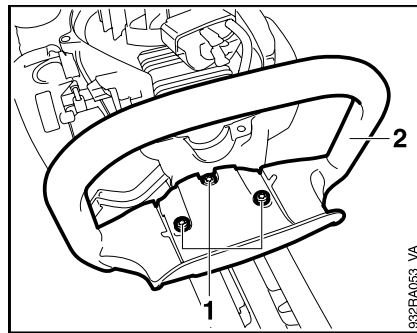
Important! The grease must be uniformly applied to the flexible shaft and not forced directly into the rigid shaft.

9.5 Handlebar with hand guard (HS 45)

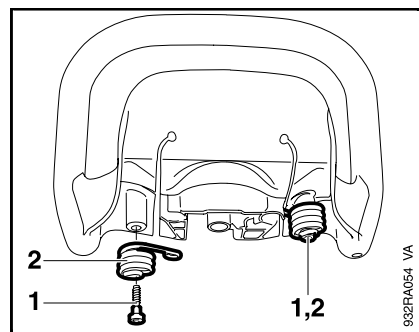


- Slide the flexible shaft as far as possible into the rigid shaft. Check whether the cutting tool runs.
- Fit the rigid shaft, [see 9.1.1](#), [9.2.2](#) or [9.3.2](#).

- Remove starter cover, [see 6.1](#).
- Disconnect spark plug boot and unscrew spark plug.



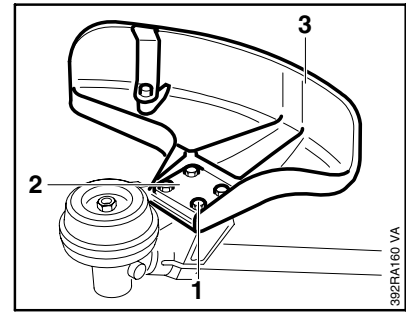
Remove screws (1) and handlebar (2).



Remove screws (1) and springs (2).

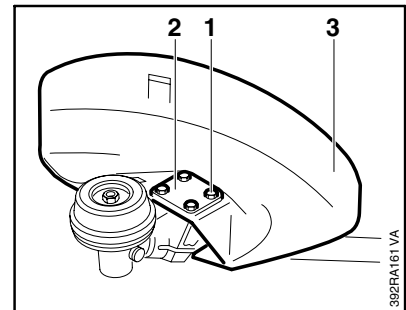
Install parts in the reverse order of steps.

10. Cutting tool drive Gear (FS 55)



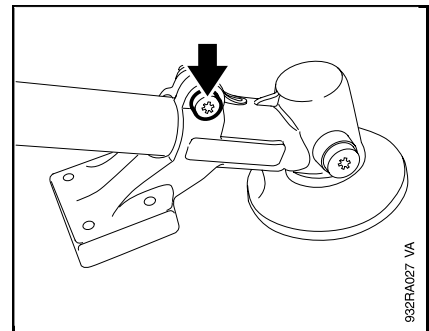
Deflector for mowing heads

- Remove screws (1).
- Remove base (2) and deflector (3).



Deflector for all cutting tools

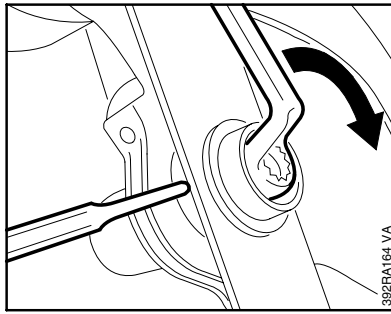
- Remove screws (1).
- Remove base (2) and deflector (3).



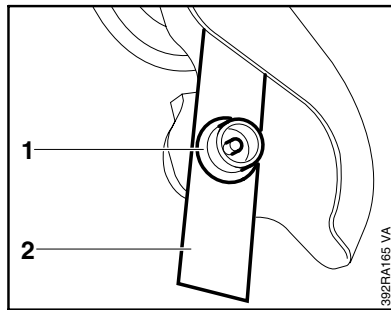
- Undo clamping screw on gear.
- Remove gear from shaft.

10.2 Gear (FC 55)

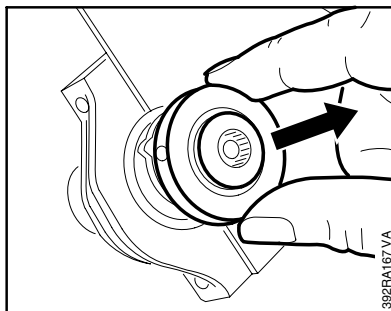
- See "Standard Repairs, Troubleshooting" handbook for further disassembly and assembly procedure.
- Slide gear onto shaft, simultaneously turning output shaft of gear back and forth slightly so that square of drive shaft engages in square socket of drive pinion.
- Slide gear onto shaft as far as possible and align it.
- Tighten clamping screw down with 12.0 Nm.
- Refit deflector.



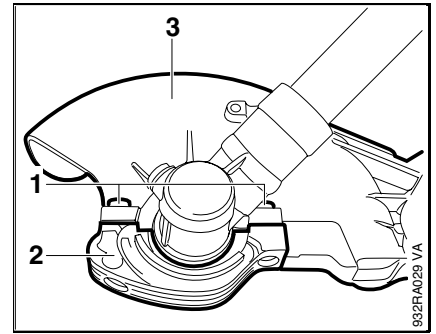
- Block output shaft with an arbor, dia. 5 mm.
- Unscrew collar lock nut in the direction of the arrow (left-hand thread).



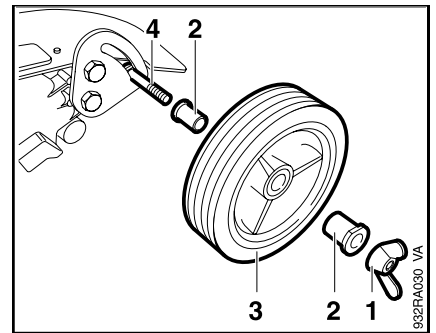
- Remove outer thrust plate (1) and blade (2).



- Remove inner thrust plate.



- Remove clamping screws (1).
- Remove clamping element (2).
- Remove deflector (3) from gear.



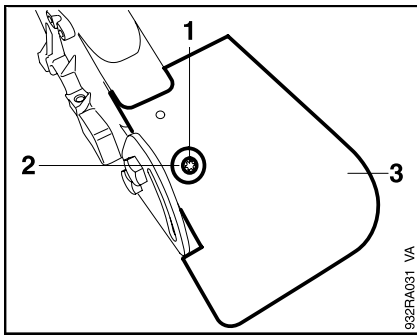
Note: Proceed as follows to replace the deflector:

- Unscrew wingnut (1).

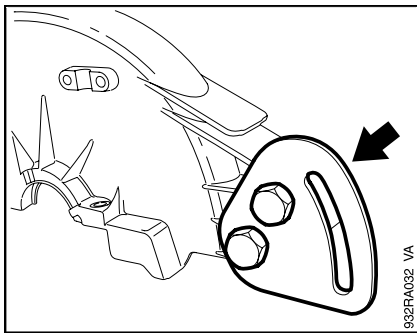
Note: Nut is difficult to remove so that it cannot be lost.

- Remove roller (3) with bushes (2).
- Remove bearing bolt (4).

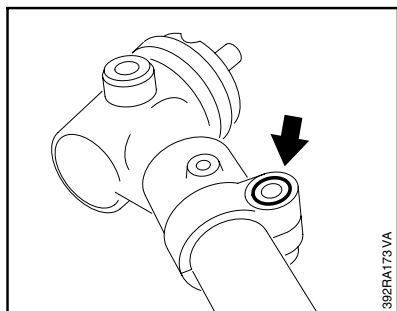
- Discard wingnut and bearing bolt.



- Remove screw (1) and washers (2).
- Remove rubber skirt (3).

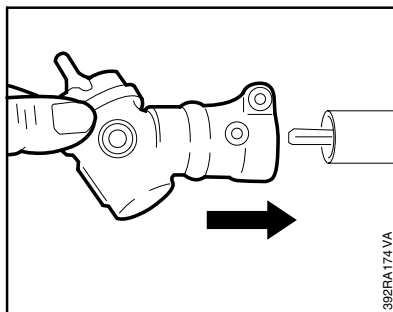


- Unscrew bolts and remove roller holder.

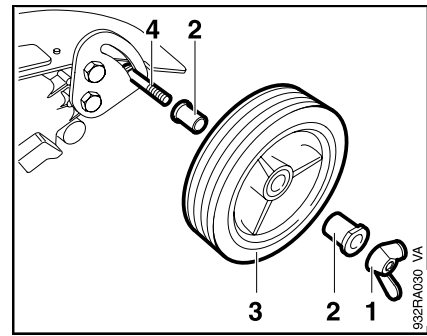


- Undo clamping screw.
- Pull gear off shaft.

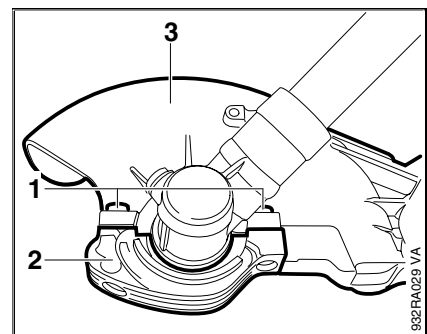
- See "Standard Repairs, Troubleshooting" handbook for further disassembly and assembly procedure.
- Slide gear onto shaft, simultaneously turning output shaft of gear back and forth slightly so that square of drive shaft engages in square socket of drive pinion.



- Slide gear onto shaft as far as possible and align it.
- Tighten clamping screw with 9.0 Nm.
- Mount roller holder and rubber skirt on deflector if removed.



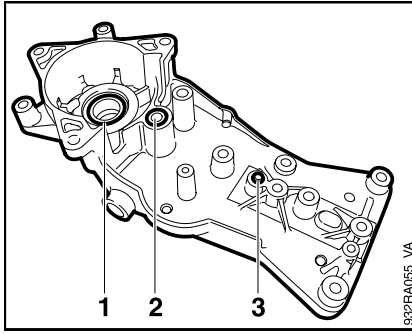
- Insert a new bearing bolt (4) in roller holder.
- Slide bushes (2) and roller (3) onto bolt.
- Secure a new wingnut (1).
- Knock the protruding screw thread of the bearing bolt with a centre punch to damage it so that the wingnut cannot be lost.



- Mount deflector (3) on gear.
- Fit clamping element (2).

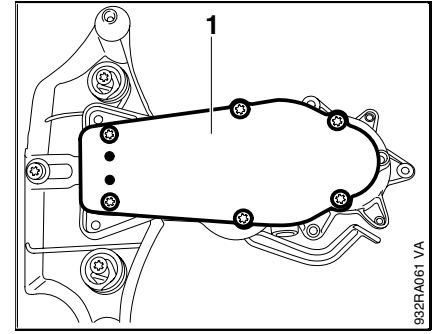
10.3 Gear housing (HS 45)

- Insert new screws (1) and tighten down with 7.5 Nm.
- Refit blade, if removed, in the reverse order of steps for disassembly.
- Tighten collar lock nut down with 25.0 Nm.

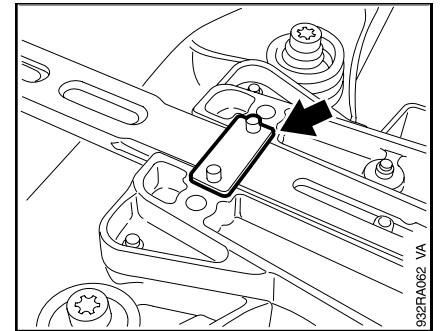


- Remove clutch drum, [see 4.2](#).
- **Note:** The new gear housing is supplied complete with fitted ball bearings (1), bushes (2) and straight pin (3).

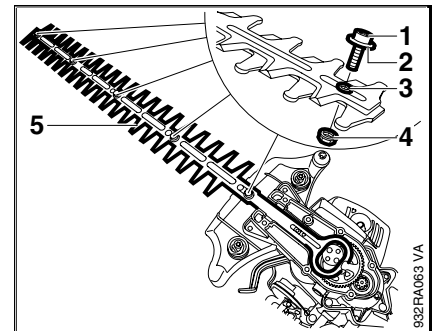
11. Cutting blade (HS 45)



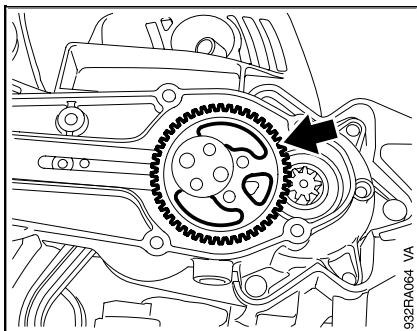
- Undo screws and remove gear cover (1) with gasket.



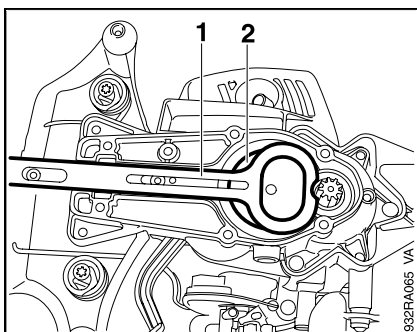
- Remove gasket.
- Remove gear lubricant.



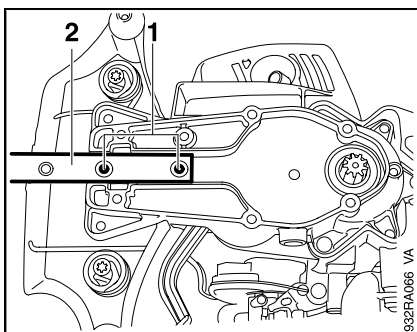
- Undo screws (1).
- Remove washers (2), sleeves (3) and collar nuts (4).
- Remove upper blade (5).



- Remove gear wheel.



- Remove lower blade (1).
- Remove thrust washer (2).



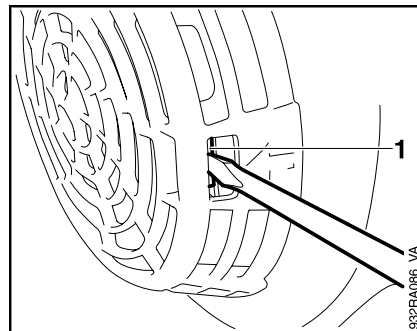
- If necessary, undo screws (1) and remove guide (2).
- 450 mm blade only: remove insert.

Install parts in the reverse order of steps.

- Grease gear wheel shaft, gear wheel, thrust washer, blade and gear housing with gear lubricant for hedge trimmers, [see 15](#).

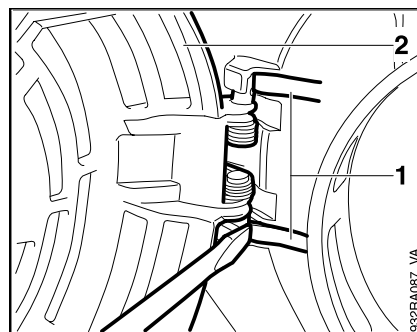
12. Blower and vacuum attachment

12.1 Intake screen

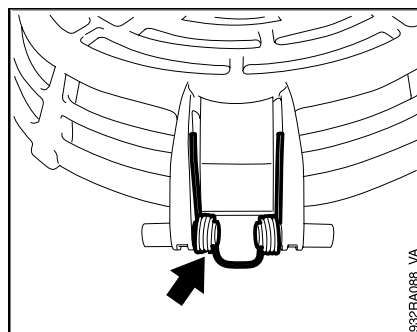


- **SH only:** Remove suction tube, [see 12.4](#).

- Press tab (1) on intake screen down with a screwdriver or similar implement and open the intake screen.



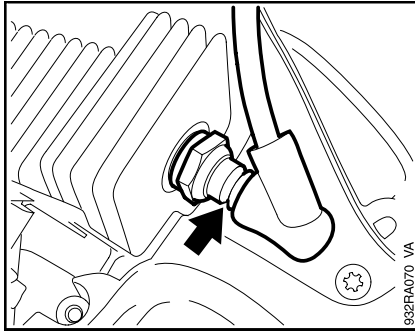
- Press tabs (1) on outer fan housing down with a screwdriver or similar implement and remove intake screen (2).



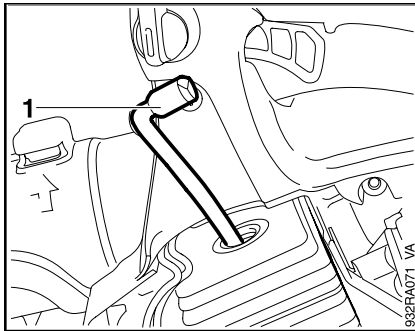
- Remove torsion springs.

Install parts in the reverse order of steps.

12.2 Fanwheel

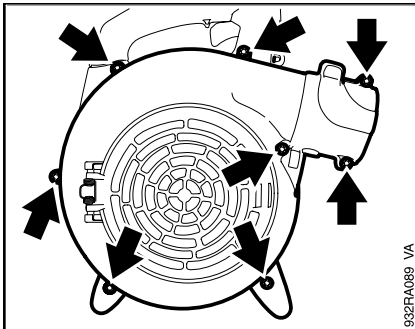


- Disconnect spark plug boot and unscrew spark plug.



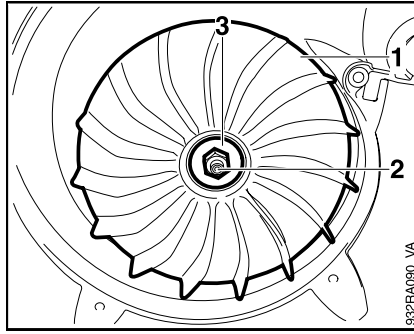
- Insert locking strip (1)
4221 893 5900.

- Remove blower tube and manifold, [see 12.3 and 12.5](#).



- Undo screws and remove outer fan housing.

12.3 Blower tube (BG)

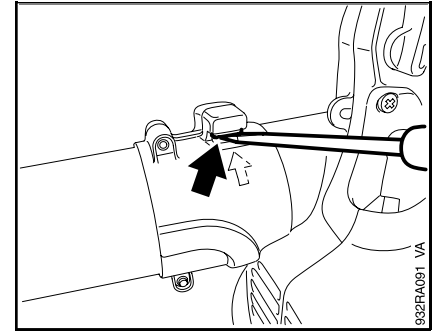


- Unscrew hex nut (2).

Note: Left-hand thread

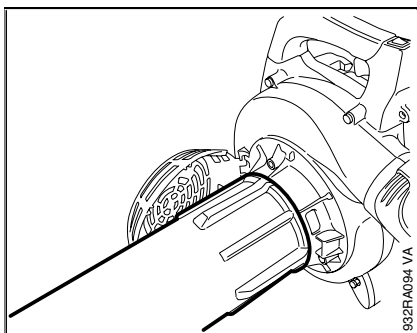
- **SH only:** Remove shredder blade (3).
- Remove washer, fanwheel (1) and the washer underneath it.
- Examine all fan blades and replace fanwheel if necessary.

Install parts in the reverse order of steps.



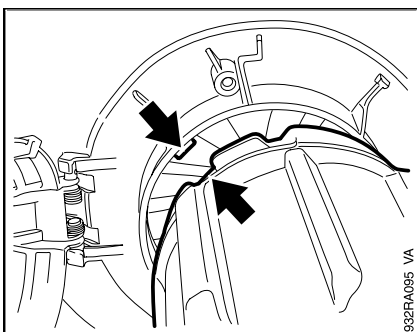
- Insert a screwdriver or similar implement in the recess on the fan connector and press tab upwards.
- At the same time, turn blower tube as far as possible counterclockwise (quarter turn).
- Remove blower tube from connector.
- To refit blower tube, insert it in connector with peg.
- Turn blower tube clockwise until bayonet catch engages.

12.4 Suction tube (SH)



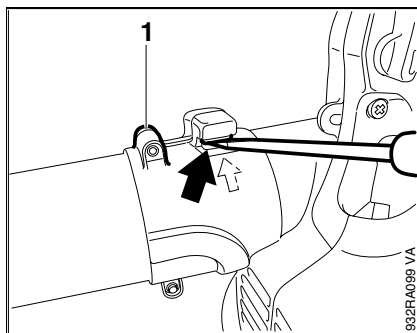
- Turn suction tube as far as possible counterclockwise (quarter turn).
- Remove suction tube from connector.

Open intake screen to fit suction tube.

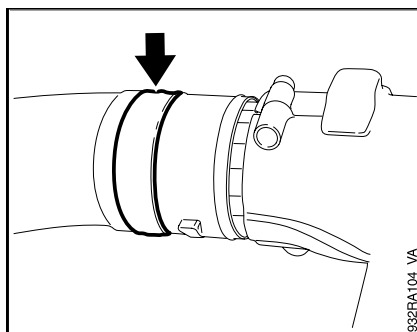


- Fit guide grooves on suction tube over lugs on connector.
- Turn suction tube clockwise until bayonet catch engages.

12.5 Manifold (SH)



- Undo upper screw at front.
- Insert a screwdriver or similar implement in the recess on the suction connector and press tab upwards.
- At the same time, turn manifold as far as possible counterclockwise (quarter turn).
- Remove manifold from connector.
- To refit manifold, insert it in connector with peg.



- Ensure that rubber sealing ring is correctly seated.
- Turn blower tube clockwise until bayonet catch engages.

13. Special tools

No.	Part name	Part No.	Application	Remarks
1	Locking strip for piston	4221 893 5900	Blocking crankshaft	1)
2	Insert	0812 540 1112	Disengaging clutch drum	
3	Wrench	4130 890 3600	Unscrewing and tightening clutch (FS models)	
4	Carburetor and	1106 850 2905	Checking crankcase and carburetor for leaks	
5	- Connector	0000 855 9200		
6	- Fuel line	1110 141 8600		
7	Screwdriver Q-SW8x200	5910 890 2420	Unscrewing nuts for carburetor	
8	Crimping tool	5910 890 8210	Attaching plug connectors to electric leads	
9	Torque wrench	5910 890 0301	Screw connections (0.5 to 18 Nm)	2)
		5910 890 0302		3)
10	Torque wrench	5910 890 0311	Screw connections (6 to 80 Nm)	2)
		5910 890 0312		3)
11	Insert T27x125	0812 542 2104	Tightening socket head screws	
12	Screwdriver Q-T27x150	5910 890 2400	For all socket head screws	4)
13	Assembly stand	5910 890 3100	Mounting FS models	
14	- Clamp	5910 890 8800	Mounting FS models via drive tube for repairs (in combination with assembly stand)	
15	Wrench	4133 893 1301	Disengaging and tightening clutch	5)
16	Assembly hook	5910 890 2800	Unhooking clutch springs from clutch shoes	
17	Pliers	0811 641 8380	Removing inner circlip (ball bearing for clutch drum)	5)
18	Drift pin	1118 893 7200	Fitting and removing deep groove ball bearings	5)
19	Assembly hook	5910 893 8800	Removing pickup body	
20	Assembly tool	5910 890 2204	Fitting rivet (leadthrough for rope)	

Remarks:

- 1) Stop screw 4112 893 1200 can be used instead.
- 2) DG/P screws may only be tightened with a torque wrench.
- 3) This version includes visual / acousting signalling.
- 4) May only be used for unscrewing in the case of DG/P screws.
- 5) Only used for HS 45

14. Service aids

No.	Part name	Part No.	Application
1	Dirko sealant (100 g tube)	0783 830 2120	Deflector on muffler, engine pan
2	Dirko HT red sealant	0783 830 2000	Screws for muffler
3	STIHL special lubricant oil	0781 417 1315	Bearing hole in rope rotor, rewind spring
4	Electrical repair kit	5910 007 1050	Electrical system
5	Set of carburetor parts	4227 007 1060	Zama carburetor
6	Set of carburetor parts (HS 45)	1129 007 1062	Zama carburetor

15. Special accessories for the user

Part name	Part No.
Shoulder strap	
Safety glasses	
STIHL ElastoStart	
- Starter rope (dia. 3 mm, 800 mm) with starter grip (for FS, FC, HL, BG/SH 85)	0000 190 3400
- Starter rope (dia. 3 mm, 1060 mm) with starter grip (for BG/SH 55, BG/SH 65, HS)	0000 190 3404
STIHL gear lubricant for brushcutters	
- 80 g tube	0781 120 1117
- 225 g tube	0781 120 1118
STIHL gear lubricant for hedge trimmers	
- 80 g tube	0781 120 1109
- 225 g tube	0781 120 1110
Bar handle (FS models)	4140 791 2300
Control handle (FS models)	4119 790 1302
Loop handle (FS models)	4130 790 1316
Vaccum attachment (BG models)	4229 007 1000
Roof gutter cleaning attachment (BG models)	4229 007 1001
Round nozzle (BG 65)	4229 708 6300
Flat nozzle (BG 55)	4229 708 6301