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STIHL®

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This service manual contains detailed descriptions of all the repair and servicing procedures specific to this series of chain saws.

There are separate handbooks for servicing procedures on standardized parts and assemblies that are installed in several STIHL power tool models. Reference is made to these handbooks in the appropriate chapters of this manual

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

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

A fault on the machine may have several causes. To help locate the fault, consult the troubleshooting charts for all assemblies in the "Standard Repairs, Trouble-shooting" 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 until a revised edition is issued.

The 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)

→| = Situation applies from serial number

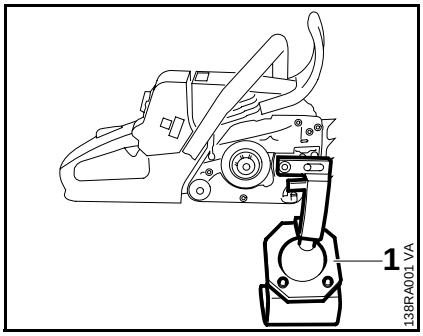
|→ = Situation applies up to serial number

In the illustrations:

➔ Pointer

⟶ Direction of movement

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



Servicing and repairs are made considerably easier if the powerhead is mounted on assembly stand (**1**) 5910 890 3100. Remove the chain sprocket cover, bar and chain first.
The powerhead can then be swivelled to the best position for the ongoing repair. This leaves 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 ®.
This symbol may appear alone on small parts.

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

Gasoline is an extremely flammable 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, flame or other source of heat near the fuel. All work with fuel must be performed outdoors only. Spilled fuel must be wiped away immediately.

3 Specifications

3.1 Engine

STIHL single cylinder two-stroke engine with special impregnated cylinder bore

	034	036, 036 QS
Displacement:	56.5 cm^3	61.5 cm^3
Bore:	46 mm	48 mm
Stroke:	34 mm	34 mm
Compression ratio:	9.5:1	9.5:1
Engine power to ISO 8893:	3.0 kW (4.1 bhp) at 9,500 rpm	3.4 kW (4.6 bhp) at 9,500 rpm
Max. torque:	3.5 Nm at 6,500 rpm	3.7 Nm at 6,500 rpm
Max. permissible engine speed with bar and chain:	13,000 rpm	13,000 rpm
Mean idle speed:	2,700 rpm	2,700 rpm
Crankshaft:	Two-part, drop forged	Two-part, drop forged
Main bearings:	Two deep-groove ball bearings	Two deep-groove ball bearings
Crankshaft journal diameter:	14.4 mm	14.4 mm
Big end bearing:	Needle cage	Needle cage
Piston pin diameter:	10 mm	10 mm
Small end bearing:	Needle cage	Needle cage
Connecting rod length:	58 mm	58 mm
Rewind starter:	Pawl engagement with automatic starter rope rewind mechanism	Pawl engagement with automatic starter rope rewind mechanism
Starter rope:	3.5 mm dia., 960 mm	3.5 mm dia., 960 mm
Clutch:	Centrifugal clutch without linings	Centrifugal clutch without linings
Diameter:	76 mm	76 mm
Clutch engages at:	approx. 3,500 rpm	approx. 3,500 rpm
Crankcase leakage test		
at gauge pressure:	0.5 bar	0.5 bar
under vacuum:	0.5 bar	0.5 bar

3.2 Fuel System

	034, 036, 036 QS
Carburetor:	All positon diaphragm carburetor with integral fuel pump
Standard setting	
High speed screw H:	approx. 1 turn open
Low speed screw L:	approx. 1 turn open
Idle setting:	(starting with screws firmly against their seats)
Carburetor leakage test	
at gauge pressure:	0.4 bar
Fuel tank capacity:	625 cm^3
Fuel mixture:	Regular brand-name gasoline and brand-name two-stroke engine oil
Mix ratio:	50:1 with STIHL two-stroke engine oil 25:1 with other brand-name two-stroke, air-cooled engine oils
Air filter:	Large area, bisectional box filter with wire mesh

3.3 Ignition System

034, 036, 036 QS

Type:	Transistorized magneto ignition (breakerless)
Air gap:	0.2 - 0.3 mm
Spark plug (suppressed):	Bosch WSR 6 F
Electrode gap:	0.5 mm
Spark plug thread:	M14x1.25
Thread length:	9.5 mm
Heat range:	200

3.4 Cutting Attachment

Guide bars:	STIHL Rollomatic S bars with nose sprocket. STIHL Duromatic bars with stellite-tipped nose. Both types with corrosion-resistant finish and induction hardened rails.
Cutting lengths:	Rollomatic 37, 40, 45 and 50 cm Duromatic 37, 40, 45 and 50 cm
Oilomatic chain:	9.32 mm (3/8") Rapid-Micro, Rapid-Super (Options: 8.25 mm (0.325") Rapid-Micro, Rapid-Super, Topic-Micro and Topic-Super)
Chain sprockets:	7-tooth, 3/8" rim sprocket
Chain speed:	20.7 m/s at 9,500 rpm (with 7-tooth, 3/8" sprocket)
Chain lubrication:	Fully automatic, speed-controlled reciprocating oil pump; no oil feed at idle speed. Additional manual oil flow control
Oil delivery rate:	Adjustable 5.5 - 15.5 cm^3/min at 10,000 rpm
Oil tank capacity:	320 cm^3

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, providing the specified tightening torque is observed.
For this reason it is **essential to use a torque wrench.**

Fastener	Thread size	For component	Torque Nm	Remarks
Pan head screw	M4x8	Chain tensioner cover plate	3.0	
	M7x12.5	Starter post to fan housing	12.0	1)
Screw	M8x22	Brake band/crankcase (036 QS II)	10.0	2)
Self-tapping screw	B3.9x13	Brake cable retainer/tank housing (036 QS II)	1.5	
Collar screw	M8x21.5	Guide bar	23.0	2)
Spline screw	IS-M4x12	Cover, chain brake/crankcase	3.0	
	M10x1	Decompression valve (036, 036 QS)	14.0	
Spline screw	M3.5x12	Generator (W version)	2.0	3)
Spline screw	IS-P6x21.5	Front handle/tank housing, top right (W version)	7.0	3)
Spline screw	IS-P6x19	Front handle/tank housing, bottom (W version)	7.0	3)
Spline screw	IS-P6x32,5	Front handle/tank housing, top right, polymer	5.0	3)
Spline screw	IS-P6x21,5	Front handle/tank housing, bottom, polymer	5.0	3)
Spline screw	IS-P4x19	Handle molding	1.6	
Screw assembly	M5x30	Hand guard, left	7.0	2)
Spline screw	IS-P6x19	Chain catcher	2.8	
Spline screw	IS-M5x12	Spiked bumber	7.5	
Spline screw	IS-M5x20	Crankcase	9.0	
Spline screw	IS-M5x20	Fan housing/crankcase	7.0	
	M12x1 L	Carrier	50.0	
Screw	HL6x18.5	Annular buffer to rear left/right of tank housing	5.0	
Spline screw	IS-P6x19	Annular buffer to front right of tank housing	5.0	
Spline screw	IS-M5x6	Muffler, upper/lower casing	6.5	2)
Spline screw	IS-M5x25	Muffler/crankcase	10.0	2)
Spline screw	IS-M5x16	Muffler/cylinder (036, 036 QS)	10.0	2)
Spline screw	IS-M5x25	Muffler/crankcase (034)	10.0	4)
Spline screw	IS-M5x20	Muffler/cylinder (034)	10.0	4)
Spline screw	IS-M5x22	Muffler/cylinder (034/Z version)	10.0	4)
Slotted nut	M5	Shroud	3.3	
Slotted nut	M5	Air filter	2.0	
	M8x1	Flywheel	33.0	6)
Setscrew	M5x8.5	Setscrew, l/h side of cylinder	1.4	5)
Setscrew	M5x8.5	Setscrew, r/h side of cylinder	1.4	

Fastener	Thread size	For component	Torque Nm	Remarks
Hexagon nut	M5	Carburetor (initial)	2.0	
Hexagon nut	M5	Carburetor (final)	3.5	
Spline screw	IS-M5x20	Cylinder/crankcase (036, 036 QS)	11.5	
Spline screw	IS-M5x20	Cylinder/crankcase (034)	10.5	
	M14x1.25	Spark plug	25.0	
Spline screw	IS-M5x20	Ignition module (with washer)	8.0	2)
Spline screw	IS-M4x12	Oil pump/crankcase	3.5	

1) Micro-encapsulated
2) Threadlocking method: medium strength adhesive (e.g. LOCTITE 243)
3) Threadlocking method: high strength adhesive (e.g. LOCTITE 649)
4) Threadlocking method: high strength adhesive up to 250°C (e.g. LOCTITE 272)
5) Threadlocking method: high strength adhesive (e.g. LOCTITE 270)
6) Degrease taper with cleaning agent (e.g. Somentor 33)

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

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

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

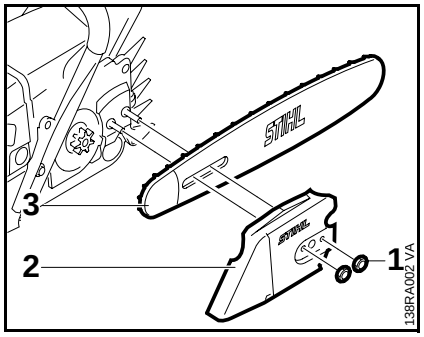
Note:
Power screwdriver settings for polymer:

– Plastoform screws max. 600 rpm
– DG screws max. 500 rpm

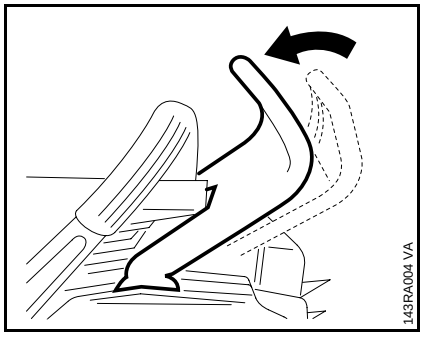
3.6 Special Accessories — 034, 036, 036 QS

3.6.1	**For User**	Intake air preheating kit	1125 007 1035 (036)
		Intake air preheating kit	1125 007 1004 (034/034S)
		.325", 8-tooth rim sprocket kit	1125 007 1000
		.325", 7-tooth rim sprocket kit	1125 007 1001
		3/8", 7-tooth rim sprocket kit	1125 007 1002
		3/8", 7-tooth spur sprocket	1125 640 2000
		.325", 7-tooth spur sprocket	1125 640 2005
3.6.2	**For Service**	Gasket set	1125 007 1050
		Carburetor parts kit	1128 007 1065
		Gasket panel	0457 281 0604

Troubleshooting chart - see "Standard Repairs, Trouble-shooting" handbook.

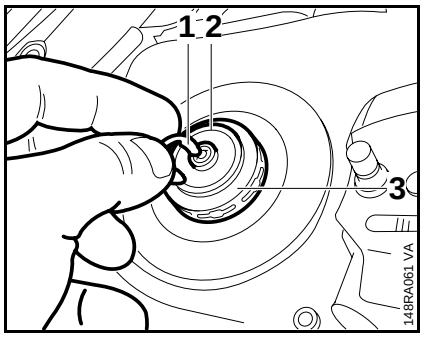


- Unscrew nuts (1) from chain sprocket cover (2). Remove the sprocket cover, bar and chain (3).

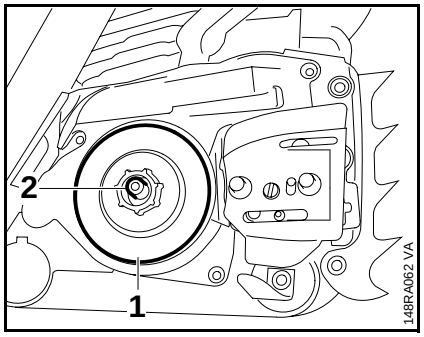


- Disengage the chain brake by pulling the hand guard toward the front handle.

4.1 Clutch Drum and Chain Sprocket

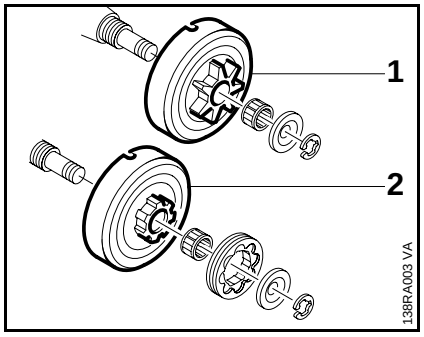


- Remove the E-clip (1) and washer (2). If a rim sprocket (3) is fitted, pull it off.



036 QS

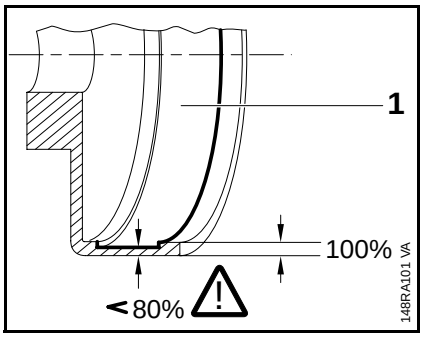
- Disengage the additional brake by pressing down the throttle trigger and interlock lever. Remove the clutch drum (1) and needle cage (2).



034, 036

- Pull off the chain sprocket (1) or clutch drum (2).

– Take out the needle cage.



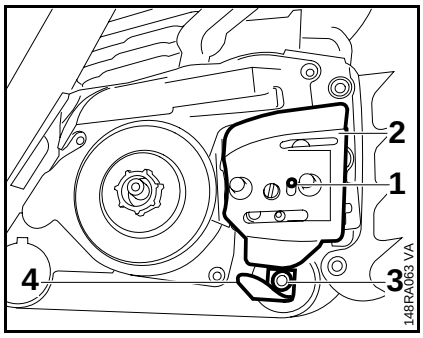
- Inspect the clutch drum (1). There should be no scores or signs of excessive wear.

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

Note:
Clean stub of crankshaft. Wash needle cage, examine it for damage and replace if necessary. Lubricate needle cage with STIHL multi-purpose grease - see 13.2.

Reassemble in the reverse sequence - start by fitting the needle cage on the crankshaft stub.

4.2 Replacing the Chain Catcher



– Remove chain sprocket cover - see 4.1.

● Take out screw (1) and remove the inner side plate (2).

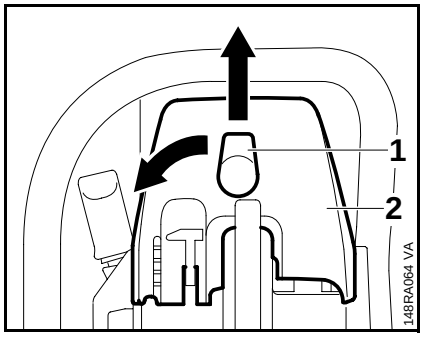
● Take out screw (3) and remove the chain catcher (4).

Reassemble in the reverse sequence.

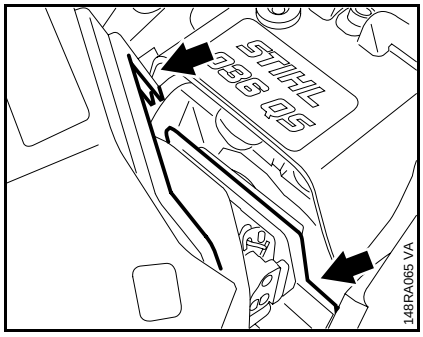
4.3 Clutch

Troubleshooting chart - see "Standard Repairs, Trouble-shooting" handbook.

– Remove clutch drum/chain sprocket - see 4.1.

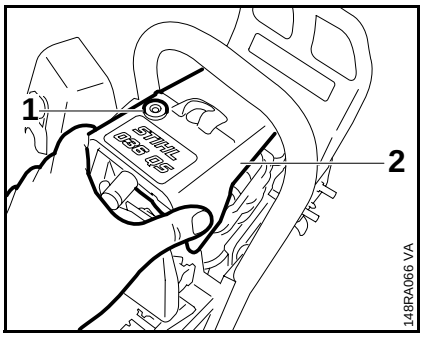


● Release twist lock (1) on carburetor box cover (2) and lift cover off vertically.



Note:

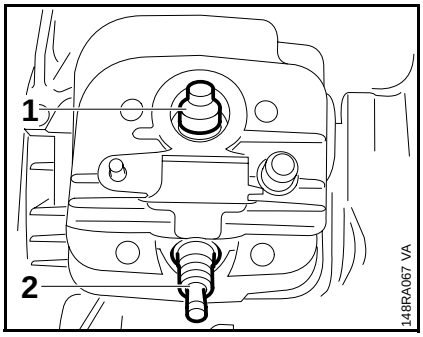
● When reassembling, check correct position of groove and guide.



● Unscrew the slotted nut (1).

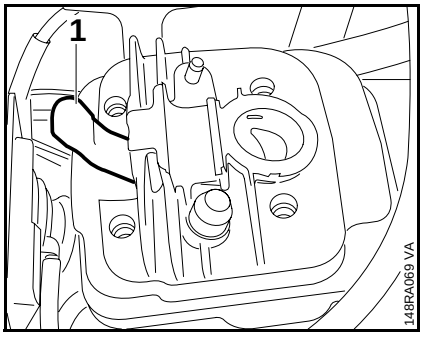
– Pull boot off the spark plug.

● Remove the shroud (2).



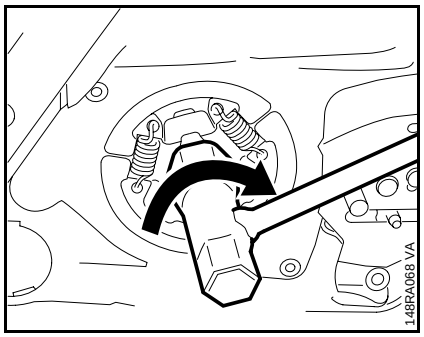
● On powerheads with a decompression valve (1), remove the cover and unscrew the decompression valve.

● Unscrew the spark plug (2).



● Push the locking strip (1) 0000 893 5903 into the cylinder so that the words "OBEN - TOP" face upward.

4.4 Chain Brake (034, 036)
4.4.1 Removing



- Unscrew the clutch clockwise from the crankshaft (left-hand thread).

On 036, 036 QS:
Remove cover washer from the crankshaft stub.

– Disassemble and reassemble the clutch - see "Standard Repairs, Troubleshooting" handbook.

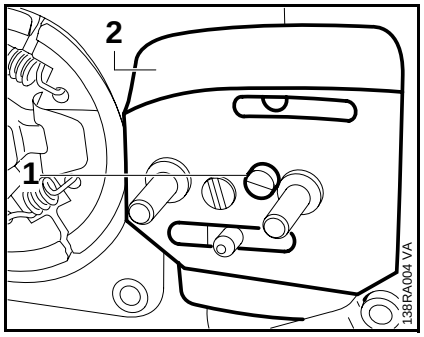
– Reassemble in the reverse sequence.

Note:
Observe tightening torque for clutch (see "Tightening Torques").

Troubleshooting chart - see "Standard Repairs, Trouble-shooting" handbook.

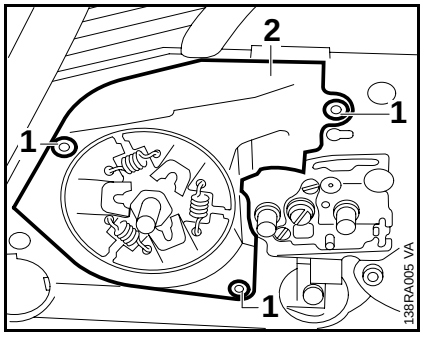
– Remove the chain sprocket cover and cutting attachment - see 4.1.

– Remove the clutch drum/chain sprocket - see 4.1

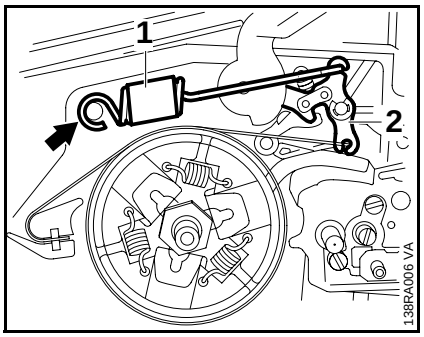


- Remove mounting screw (1) from inner side plate (2) and lift side plate away.

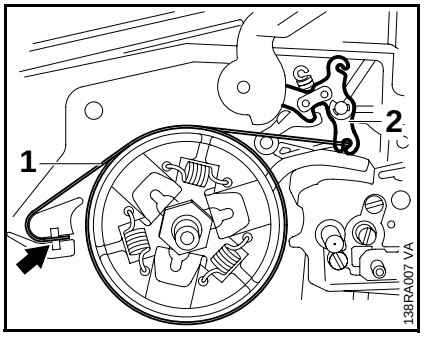
– Engage the chain brake by pushing the hand guard away from the front handle.



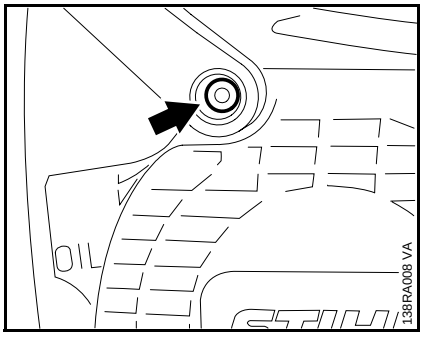
- Remove mounting screws (1) from cover (2) and lift the cover away.



- Carefully pry the brake spring (1) off the anchor pin and disconnect it from the lever (2).

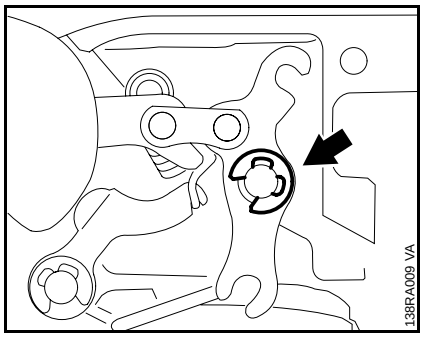


- Ease the brake band (1) out of its seat in the crankcase and disconnect it from the lever (2).



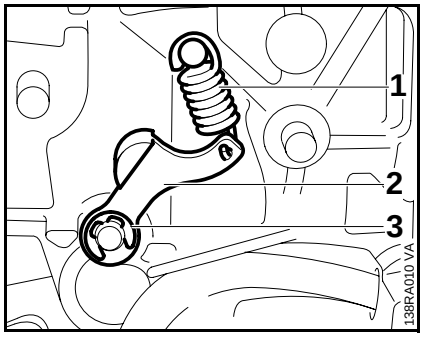
- Remove screw with captive washer from the hand guard.

Note:
When installing, tighten down the screw with captive washer firmly (see "Tightening Torques").



- Remove the E-clip from the pivot pin.

– Pull the hand guard and lever from the pivot pins.

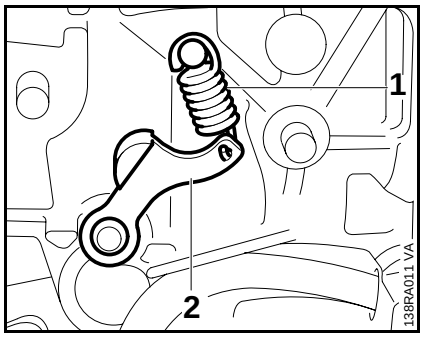


– Pull the lever out of the hand guard.

- Remove the E-clip (3) from pivot pin of lever (2) and detach the spring (1).

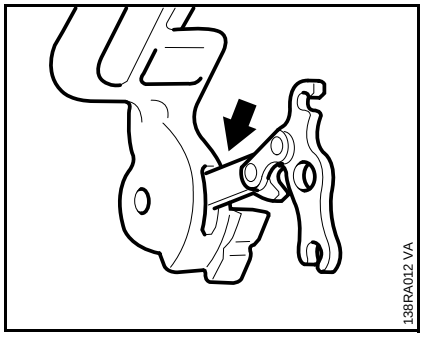
- Remove the cam lever and spring.

– Clean all disassembled parts in white spirit. Replace any worn or damaged parts.



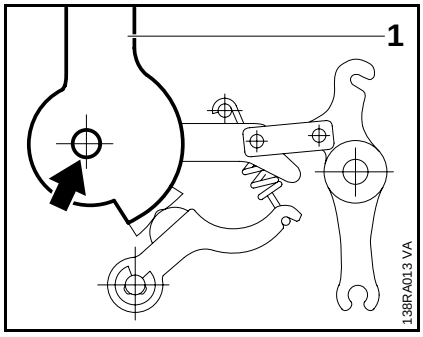
- Fit the cam lever (2) and spring (1).

– Fit the E-clip.

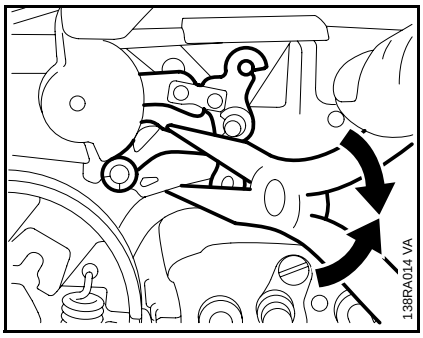


- Insert lever in the side of the hand guard so that short arm of lever points up.

Note:
Check correct installed position of lever.



- Position the hand guard (1) against the pivot pin and fit the other side of the hand guard over the fan housing.

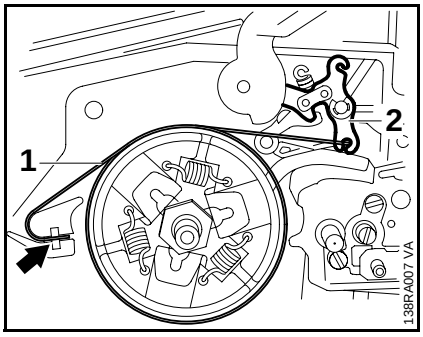


- Press the cam lever slightly downward and push the hand guard and lever onto the pivot pins.

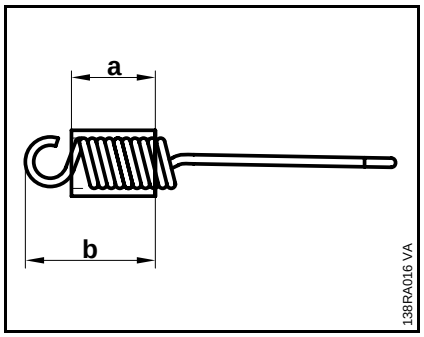
– Secure lever with E-clip.

– Insert hand guard mounting screw with captive washer at fan side and tighten down firmly (see "Tightening Torques")

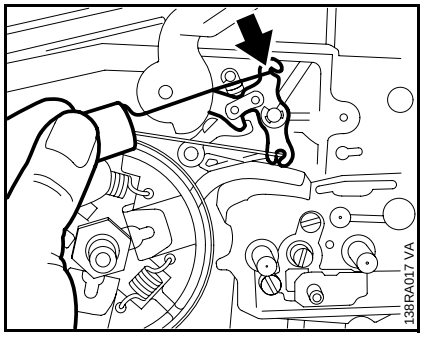
Important:
Coat all sliding and bearing points with STIHL multipurpose grease, see 13.2, or (better) with molybdenum grease (e.g. Molykote), see 13.2.
Do not lubricate the brake band.



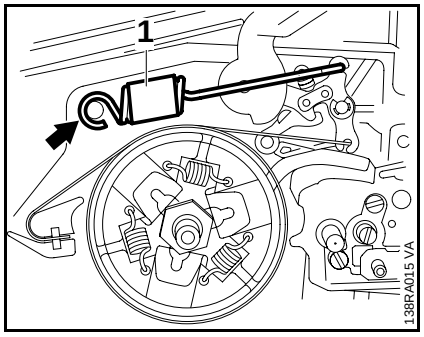
- First attach the brake band (1) to the lever (2) and then push it into the crankcase recess (arrow).



- Check that protective tube is correctly positioned:
  a = 20 mm
  b = 33 mm



- Hook the brake spring to the lever.



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

– Fit cover over the chain brake.

– Fit the inner side plate - see 4.1.

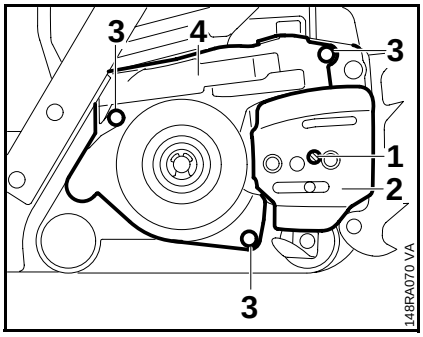
– Install the clutch drum/chain sprocket - see 4.1.

– Fit the cutting attachment and chain sprocket cover - see 4.1.

Troubleshooting chart - see "Standard Repairs, Trouble-shooting" handbook.

– Remove the chain sprocket cover and cutting attachment - see 4.1.

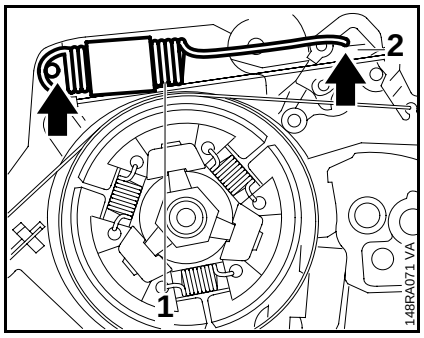
– Remove clutch drum/chain sprocket - see 4.1.



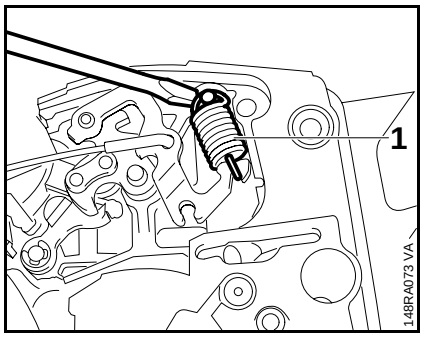
- Remove mounting screw (1) from inner side plate (2) and lift side plate away.

- Remove mounting screws (3) from cover (4) and lift the cover away.

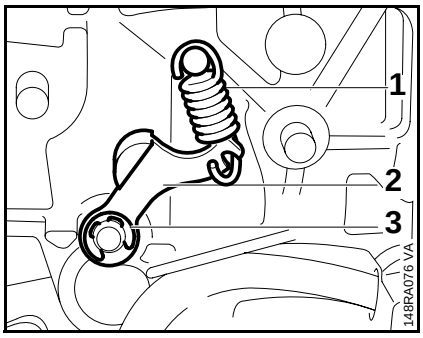
– Engage the chain brake by pushing the hand guard away from the front handle.



- Carefully pry the brake spring (1) off the anchor pin and disconnect it from the lever (2).

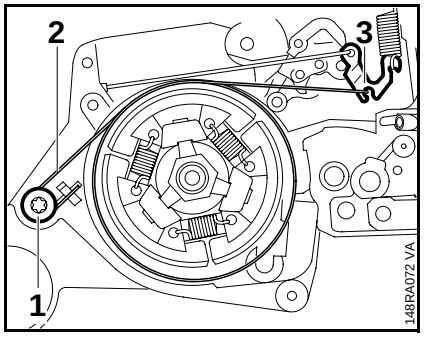


- Carefully pry spring (1) off the pivot pin.

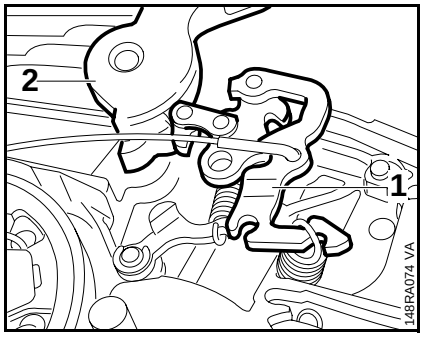


- Disconnect spring (1) from lever (2).
- Pry the E-clip (3) off the pivot pin and remove the lever with spring.

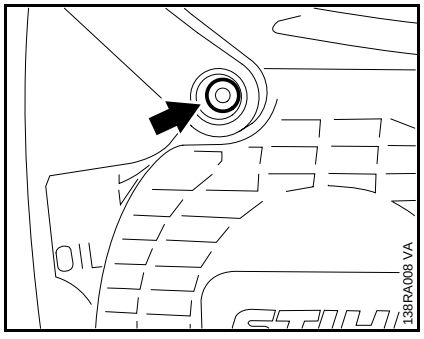
Clean all disassembled parts in white spirit. Replace any worn or damaged parts.



- Remove the screw (1).
- Ease the brake band (2) out of its seat in the crankcase and disconnect it from the lever (3).

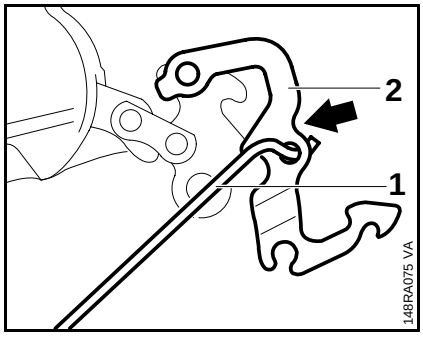


- Pull the hand guard (2) and brake lever (1) off the pivot pins.



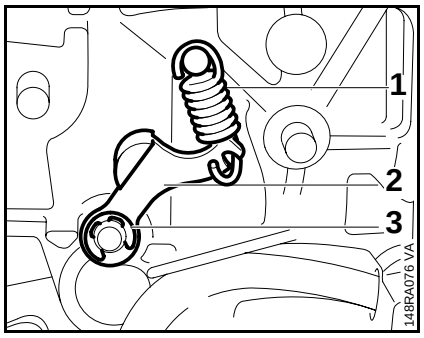
- Remove screw with captive washer from the hand guard.

Note:
When installing, tighten down the screw with captive washer firmly (see "Tightening Torques").

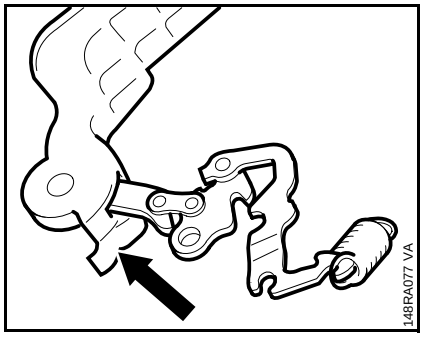


- Disconnect brake cable (1) from the brake lever (2).

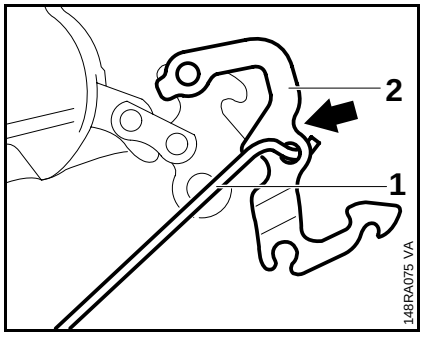
– Take the brake lever out of the hand guard.



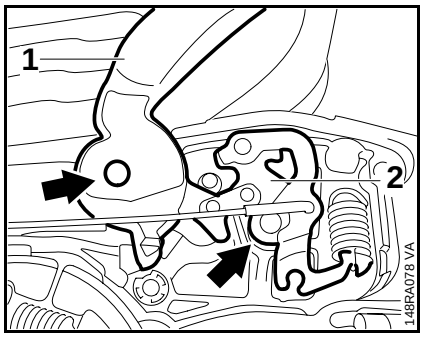
- Fit the lever (2) and spring (1).
- Fit the E-clip (3).



- Insert lever in the side of the hand guard as shown.



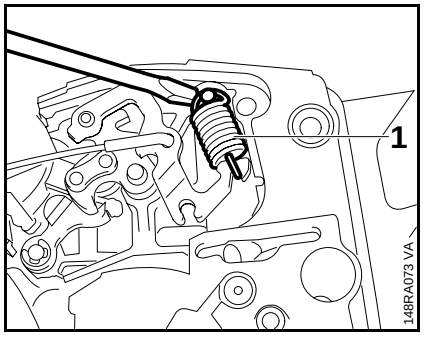
- Attach brake cable (1) to hole (arrow) in brake lever (2).



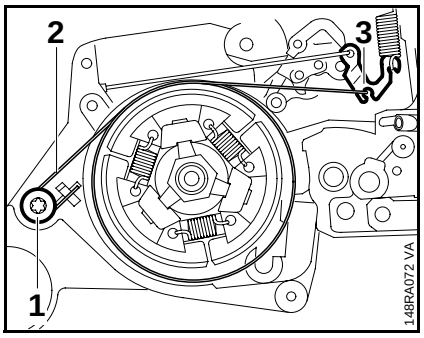
- Position the hand guard (1) against the pivot pin and fit the other side of the hand guard over the fan housing.
- Press the lever (1) slightly downward and push the hand guard and brake lever (2) onto the pivot pins.

– Insert screw with captive washer for hand guard and tighten down firmly (see "Tightening Torques").

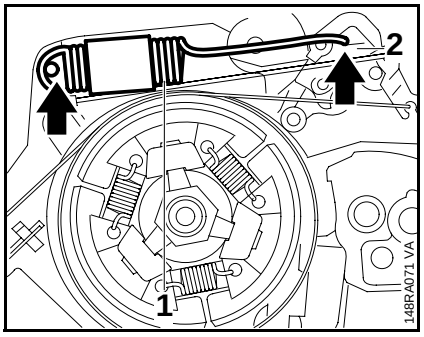
Important:
Coat all sliding and bearing points with STIHL multipurpose grease, see 13.2, or (better) with molybdenum grease (e.g. Molykote), see 13.2.
Do not lubricate the brake band.



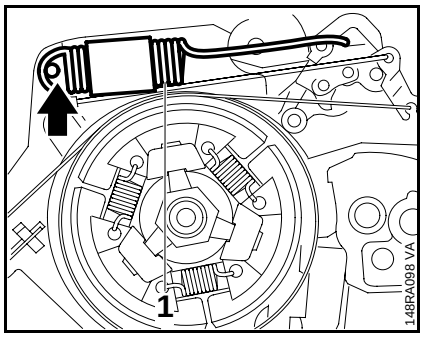
- Attach spring (1) to the pivot pin.



- First attach the brake band (2) to the brake lever (3) and then push it into the slot in the crankcase.
- Install screw (1) with LOCTITE 243 and tighten down firmly (see "Tightening Torques")



- Hook the brake spring (1) to the brake lever (2).



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

– Fit cover over the chain brake - see 4.5.1.

– Fit inner side plate - see 4.5.1.

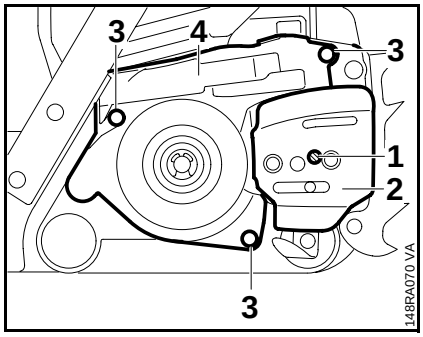
– Install the clutch drum/chain sprocket - see 4.1.

– Fit the cutting attachment and chain sprocket cover - see 4.1.

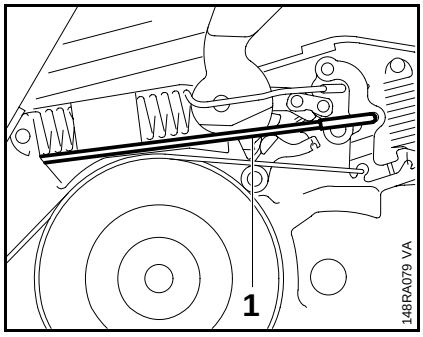
– Pull hand guard toward front handle.

– Unscrew nut from chain sprocket cover and remove the cover - see 4.1.

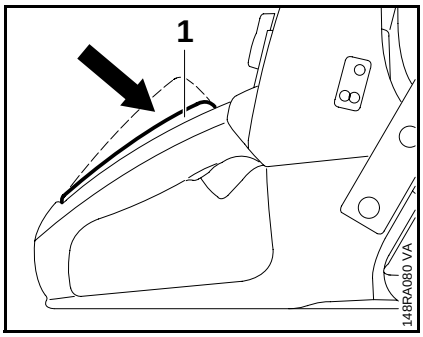
– Remove the cutting attachment - see 4.1.



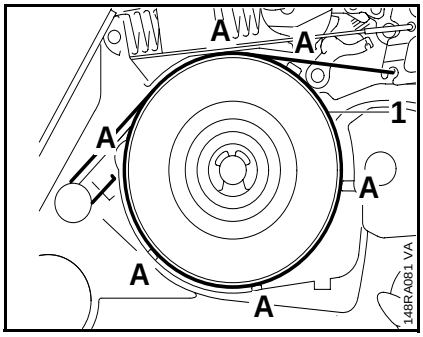
- Take out screw (1) and remove the side plate (2).
- Take out screws (3) and remove the cover (4).



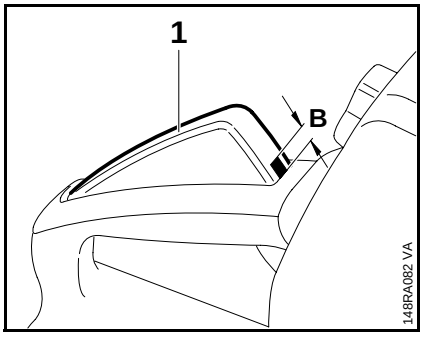
- The brake cable (1) must hang loosely in the crankcase when the brake is disengaged.



- Press down interlock lever (1) all the way and hold it in that position.



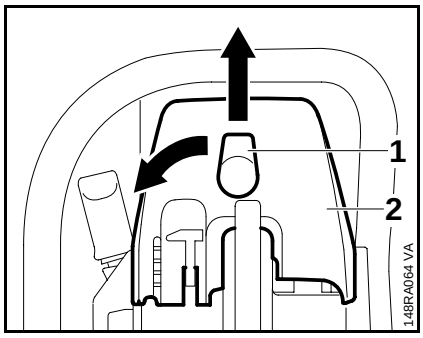
- The brake band (1) must locate without any play against the points (A) in the crankcase.



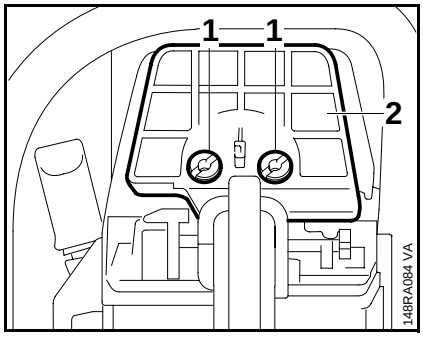
- Let go of the interlock lever (1).
- Check free travel by slowly squeezing the interlock lever (1). Play must be within the mark (B) at the front end of the interlock lever.

The brake lever must not move. If it does, adjust play - see 4.5.4

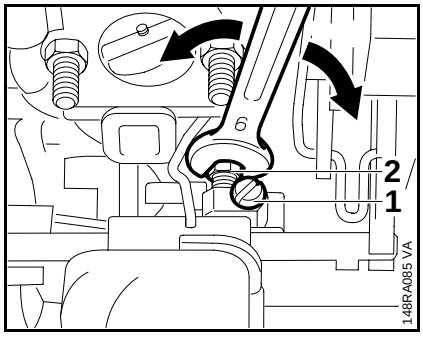
Reassemble in the reverse sequence.



- Open twist lock (1) and lift away the carburetor box cover (2) vertically.



- Release and unscrew slotted nuts (1).
- Remove the air filter (2).



- Loosen the self-tapping screw (1).
- Use a 6mm open-end wrench to adjust play with nut (2).

Turn wrench to right to reduce play.

Turn wrench to left to increase play.

- Lock the setting with self-tapping screw (1).

Reassemble in the reverse sequence.

Check operation of the chain brake with the bar and chain mounted.

Note:
When starting the machine observe local safety regulations and the safety precautions in the owner's manual.

– With the engine running, open the throttle wide.

– Release the rear handle.

The chain must come to a standstill in less than one second.

If the brake does not operate properly, service the sliding and bearing points shown in the illustrations as follows:

If lightly contaminated:

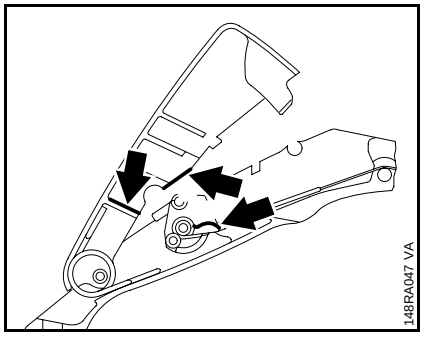
– Clean all parts with a brush and white spirit.

If heavily contaminated or clogged with resin:

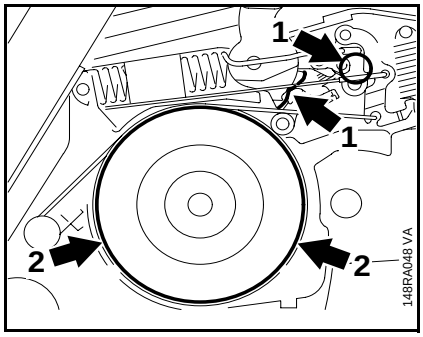
– Remove the parts concerned and clean in white spirit or a resin solvent.

– Replace worn or damaged parts.

– Before re-installing parts, the machine recesses and seats.



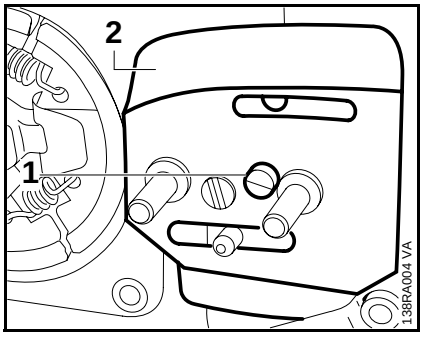
● Lubricate bearing points with Mobilplex grease (see 13.2).



● Lubricate these points (1) with Mobilplex grease (see 13.2).

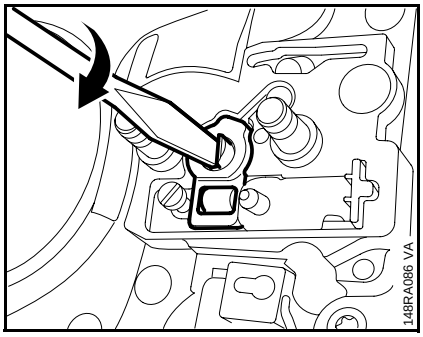
● Coat outside diameter of clutch drum (2) with chain oil.

Note:
If a biological chain oil is preferred, STIHL recommends the use of rapidly biodegradable STIHL Bioplus.
To guarantee troublefree operation, use only original STIHL replacement parts as per the latest parts list.



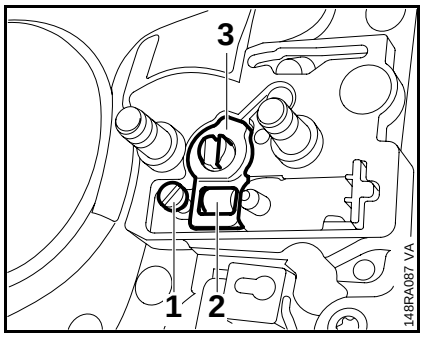
– Remove chain sprocket cover and cutting attachment - see 4.1.

● Remove mounting screw (1) from inner side plate (2) and lift side plate away.

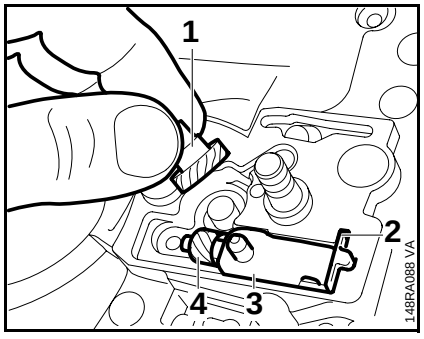


● Use a screwdriver to turn the spur gear clockwise until tensioner slide butts against the thrust pad.

Note:
Older machines are equipped with a front chain tensioner - see 5.5.2.



- Take out the cover plate mounting screw (1).
- Remove the cover plate (2) with retainer (3) from the spur gear.

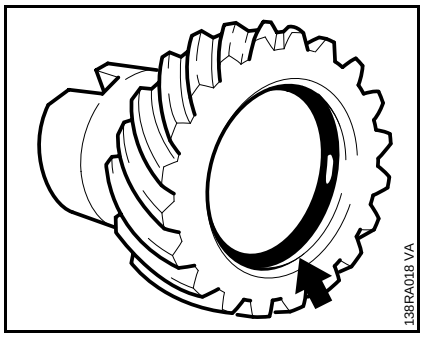


- Pull out the spur gear (1).
- Take out the tensioner slide (3) with adjusting screw (4) and thrust pad (2).

– Inspect the teeth on the spur gear and adjusting screw, remove thrust pad if necessary.

– Take the adjusting screw out of the tensioner slide and replace the parts.

Install in the reverse sequence.

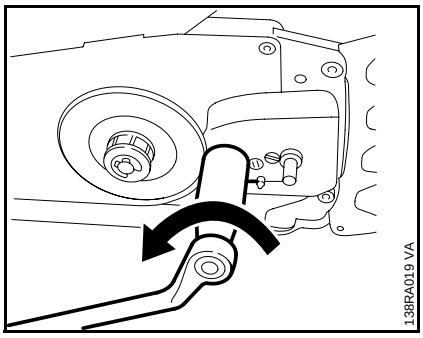


- Check that O-ring is fitted in spur gear.

– Lubricate O-ring with a little oil before fitting the spur gear.

Note:
Coat teeth of adjusting screw and spur gear with grease, see 13.2, before refitting.

The adjusting screw and spur gear must be replaced as a matching pair.



– Remove chain sprocket cover and cutting attachment - see 4.1.

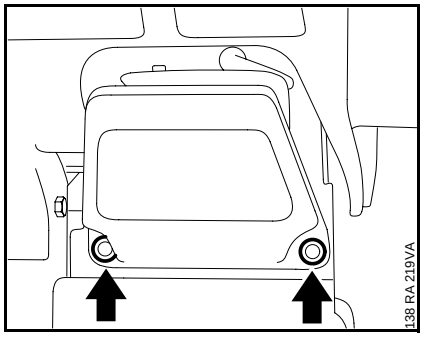
- Push stud puller 5910 893 0501 over the collar stud as far as it will go. Use a 15 mm wrench to unscrew the collar stud counter-clockwise.

– Before installing, coat thread of collar stud with LOCTITE - see 13.2.

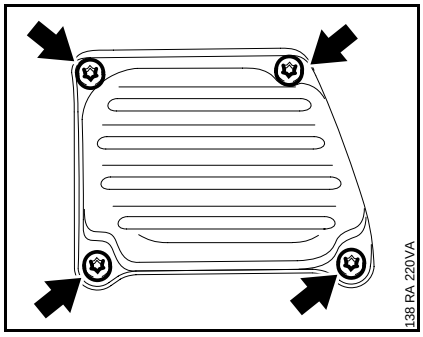
– Install and tighten down the collar studs (see "Tightening Torques").

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

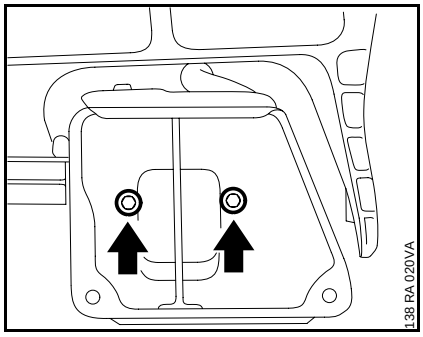
Troubleshooting chart - see "Standard Repairs, Trouble-shooting" handbook.



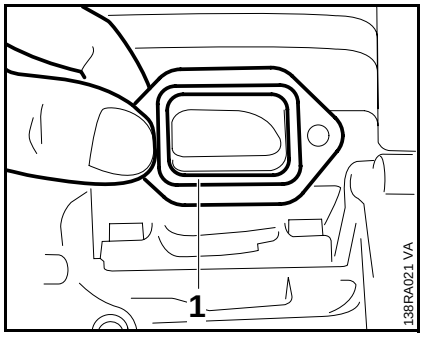
(034)
- Take out the screws and remove the upper casing.



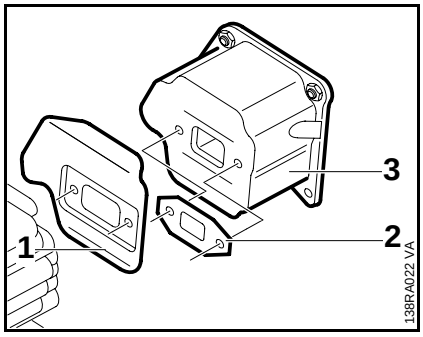
(036, 036 QS)
- Take out screws and remove the upper casing.



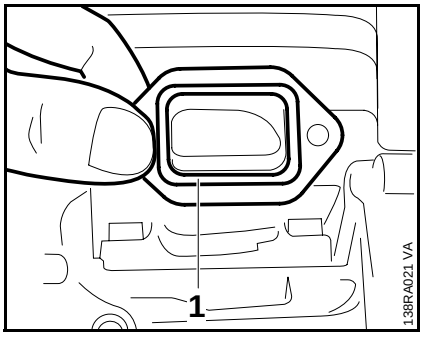
- Take out the screws and remove the lower casing.



(034)
- Remove exhaust gasket (1) and flange.



(036, 036 QS)
- Remove heat shield (1) and gasket (2) from the upper casing (3).



- Install new gasket (1) so that its bead points toward the muffler.

Note:
If the bores of the lower casing are not reinforced, fit washers under the heads of the mounting screws.

– Coat threads of mounting screws with LOCTITE - see 13.2.

– Insert and tighten down the mounting screws firmly (see "Tightening Torques").

5.2 Exposing the Cylinder

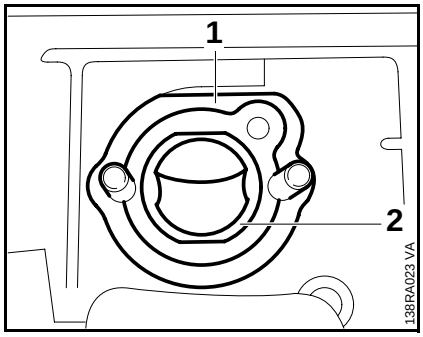
Always check and, if necessary, repair the fuel system, carburetor, air filter and ignition system before looking for faults on the engine.

Troubleshooting chart - see "Standard Repairs, Trouble-shooting" handbook.

– Drain the fuel and oil tanks.

– Remove the air filter - see 12.1

– Remove the carburetor - see 12.3



● Pull the washer (1) off the studs and remove the sleeve (2) from the manifold.

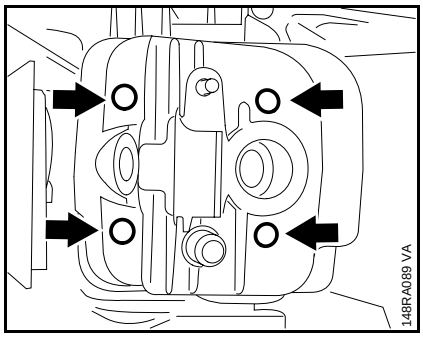
– Remove the shroud, spark plug and, if fitted, the decompression valve - see 4.3.

– Remove the muffler - see 5.1

Reassemble in the reverse sequence.

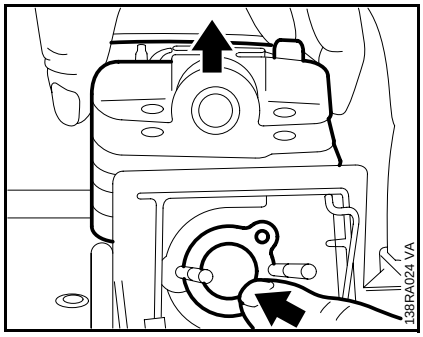
5.3 Cylinder and Piston

5.3.1 Removing



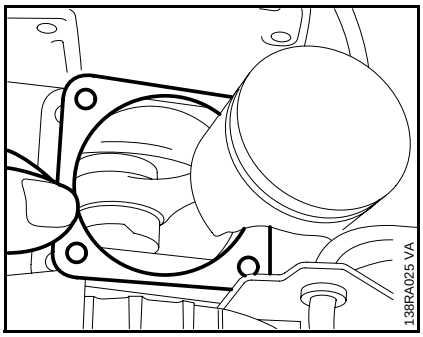
– Preparations - see 5.2

● Take out the four cylinder base screws.

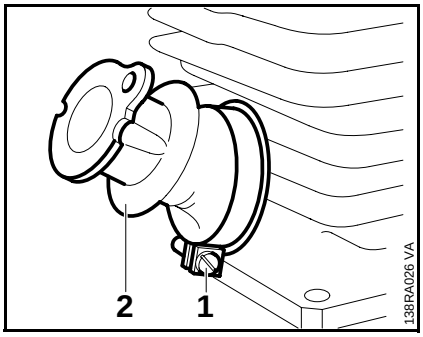


● Pull the cylinder off the piston and, at the same time, push the manifold through the tank housing opening.

Caution:
Do not use pointed or sharp-edged tools for this job.



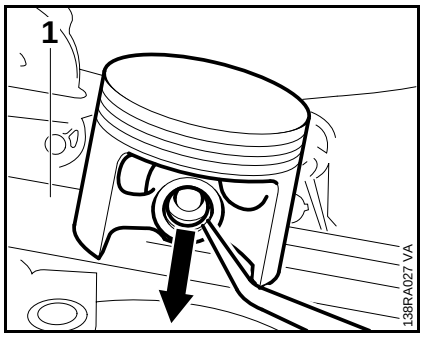
● Remove the cylinder gasket.



● Release the hose clamp (1) on the manifold (2). Pull the manifold off the intake port.

– Inspect the cylinder and replace it if necessary.

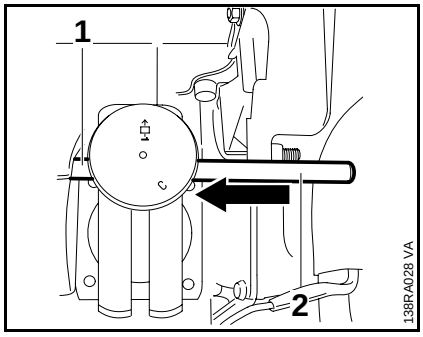
Note:
If a new cylinder has to be installed, always fit the matching piston. New cylinders are only supplied complete with piston for this reason.



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

- To remove the flywheel and clutch, block the crankshaft by sliding the wooden assembly block (1) 1108 893 4800 between the piston and crankcase.

- Use a scriber or similar tool to ease the hookless snap rings out of the grooves in the piston.

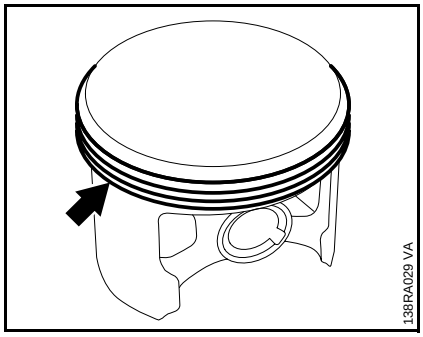


- Use the assembly drift (2) 1110 893 4700 to push the piston pin (1) out of the piston.

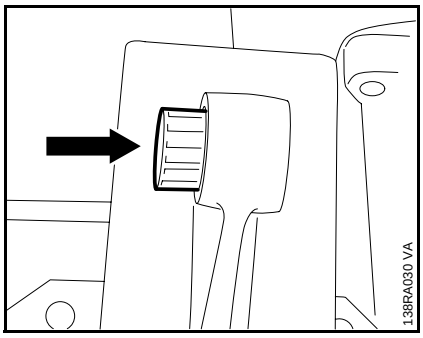
Note:
– If the piston pin is stuck, tap the end of the drift **lightly** with a hammer if necessary.

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

– Remove piston and take the needle cage out of the connecting rod.

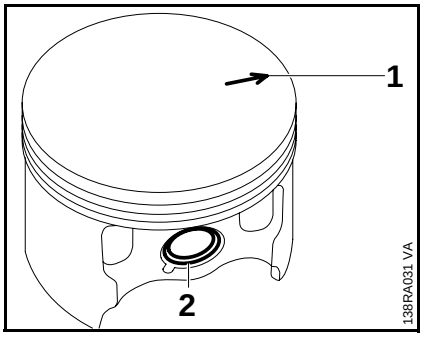


- Inspect piston rings and replace if necessary - see 5.4.



– Thoroughly clean the gasket seating surface on the cylinder.

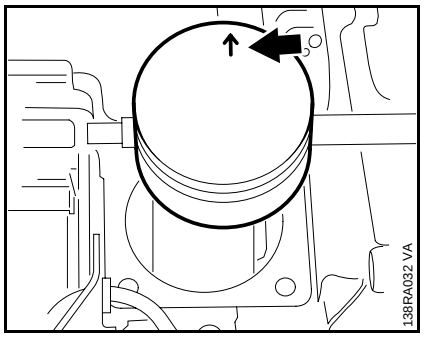
- Lubricate the needle cage with oil and fit it in the small end.



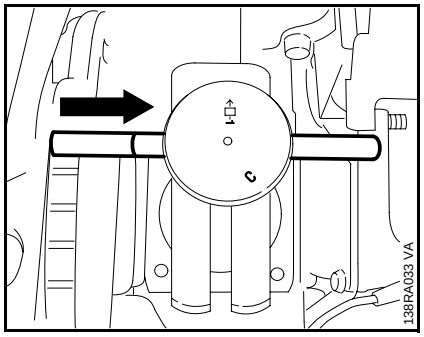
- Install a snap ring in the front piston boss (2), i.e. the piston boss facing you when the arrow (1) on the piston head is pointing to the right.

Note:
Use installing tool 5510 890 2210 to fit the snap ring - see "Standard Repairs, Troubleshooting" handbook.

– Heat the piston on an electric heating plate to about 60°C.



- Slip the piston over the connecting rod so that arrow on piston crown points to exhaust port.



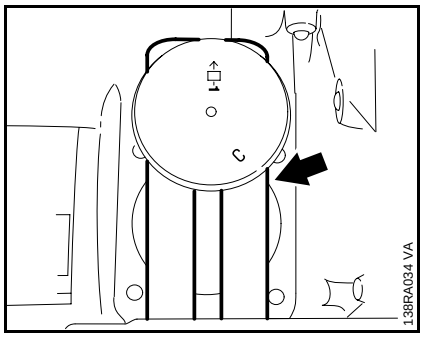
– Push the assembly drift 1110 893 4700, small diameter first from the clutch side, through the piston and small end (needle cage) and line up the piston.

- Fit piston pin on the end of the assembly drift and push it into the piston.

– Use installing tool 5910 890 2210 to fit the snap ring - see "Standard Repairs, Troubleshooting" handbook.

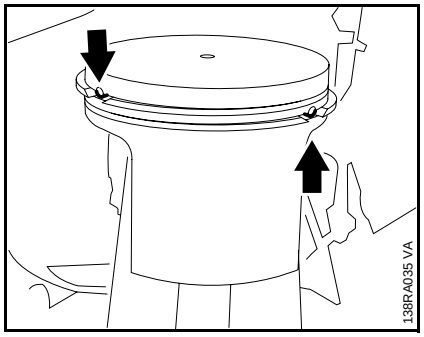
– Fit new cylinder gasket on the crankcase.

– Lubricate piston and piston rings with oil.

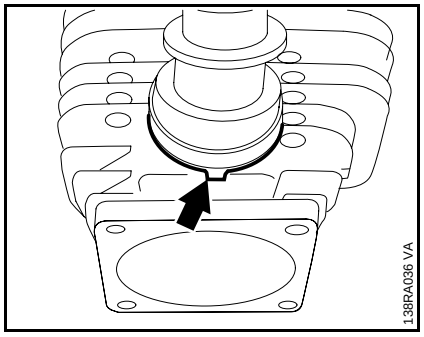


- Slide the wooden assembly block between the piston and crankcase.

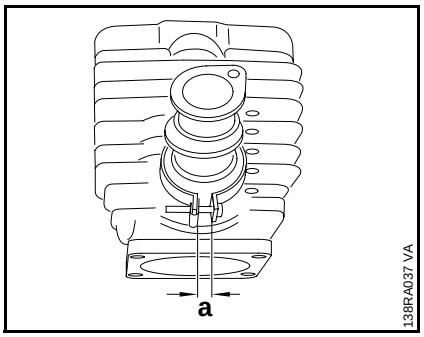
- Rest the piston on the wooden assembly block.



- Position the piston rings so that the radii at the ring gap meet at the fixing pin in the piston groove when the rings are compressed.



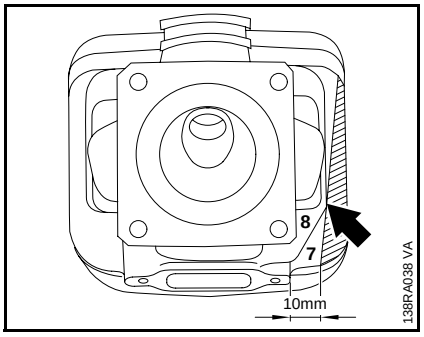
- Push the manifold on to the intake port so that its tab lines up with the rib on the cylinder.



- Slide the hose clamp on to the manifold. The screw head must point to the right.

- The screw on the hose clamp must be below the manifold and at a right angle to the cylinder axis.

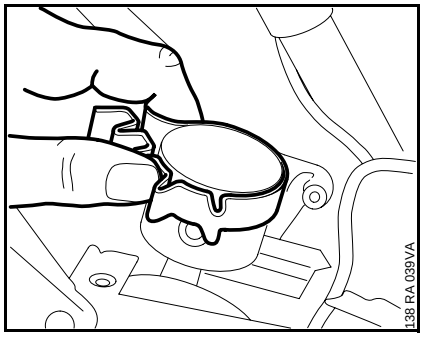
- Tighten the screw until the gap "a" between the two ends of the hose clamp is 3.5 to 4.5 mm.



Note:
If a new cylinder is installed in an older machine, it is necessary to shorten the seventh cylinder fin. Use the edge of the eighth fin as a guide for the modification (see arrow in illustration).

– Coat thread of setscrew in cylinder with LOCTITE - see 13.2.

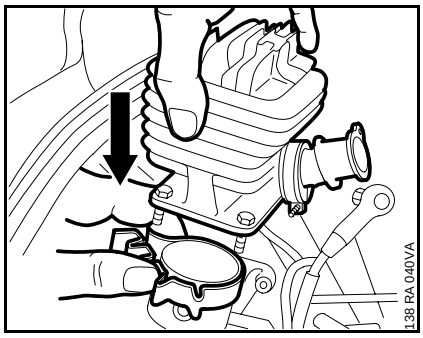
– Insert setscrew and tighten down firmly (see "Tightening Torques").



– Lubricate the inside of the cylinder with oil and line it up so that it is positioned as it will be in the installed condition.

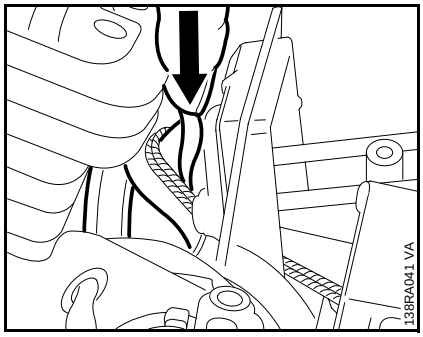
● Use the clamping strap 0000 893 2600 to compress the rings around the piston. Check correct installed position of rings once again.

Note:
To make cylinder installation easier, apply clamping strap so that it is just below the piston crown.

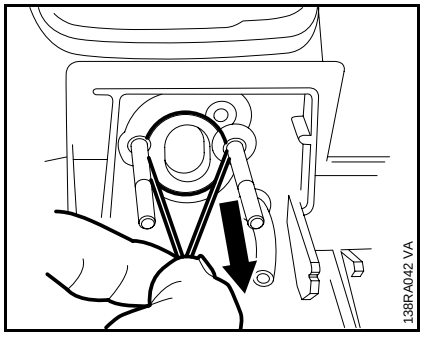


● Slide the cylinder over the piston.

– Remove the wooden assembly block and clamping strap.



● Wind a piece of string (about 15 cm long) around the back of the manifold flange, press the manifold down and pass the ends of the string through the intake opening.



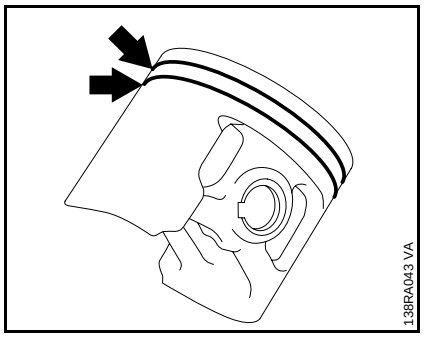
● Pull the ends of the string outward. The manifold flange is pulled through the tank housing intake opening without damaging the manifold.

– Carefully line up the cylinder and gasket.

– Fit cylinder base screws and torque down firmly in a diagonal pattern (see "Tightening Torques").

Important:
It is essential to observe the specified tightening torque as the screws might otherwise work loose.

Assemble all other parts in the reverse sequence. Always install new gaskets.

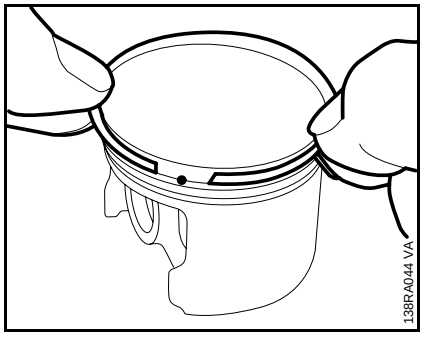


– Remove the piston - see 5.3.1.

– Remove rings from piston.

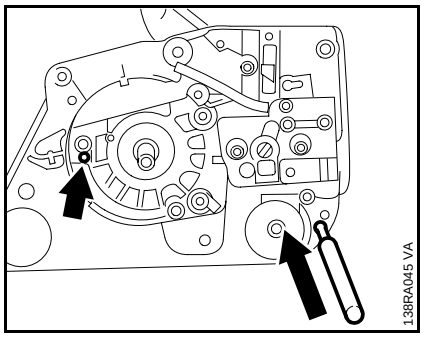
● Use a piece of old piston ring to scrape the grooves clean.

Warning:
Do not install 1.2 mm rings in pistons with 1.5 mm grooves.



● Install the new piston rings in the grooves so that the radii at the ends of the rings face upward.

– Install the piston - see 5.3.2.



– Remove the chain brake - see 4.4 and 4.5.

– Remove the oil pump - see 11.4

– Remove the flywheel - see 6.4.1

– Remove the ignition module - see 6.5.1

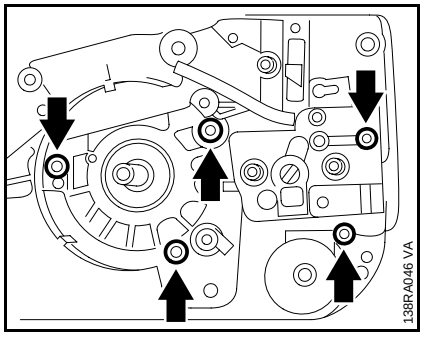
– On machines with handle and/or carburetor heating, remove the generator - see 10.5.1.

– Remove the cylinder and piston - see 5.3.1.

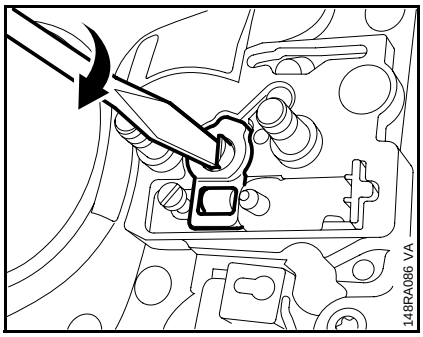
– Remove the tank housing - see 12.8.1.

– Remove the spiked bumper.

● Use a 5 mm drift or other suitable tool to drive out the two dowel pins from the clutch side.



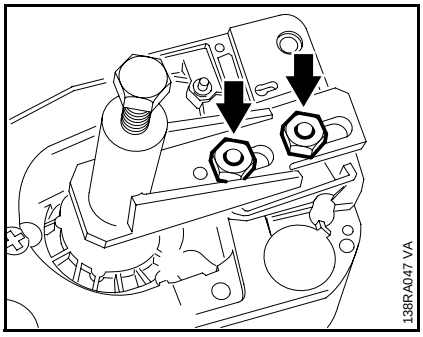
● Unscrew the five mounting screws which join the two halves of the crankcase.



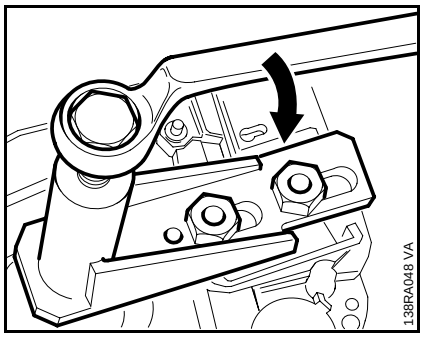
● Use a screwdriver to rotate the spur gear clockwise until the tensioner slide butts against the thrust pad.

Note:
Use service tools
AS 5910 007 2205 and
ZS 5910 007 2200 to remove and install the crankshaft. Follow the instructions supplied with the tools.

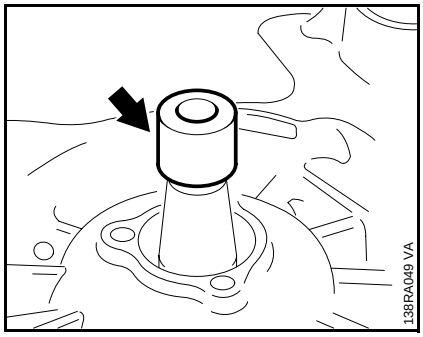
– Back off spindle on service tool AS all the way.



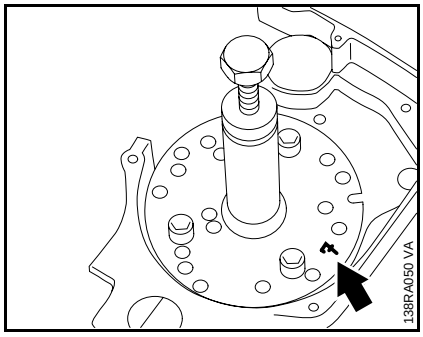
● Slip service tool
AS 5910 007 2205 over the two collar studs, fit the hexagon nuts (for sprocket cover) and tighten them down by hand.



- Turn the spindle of the service tool clockwise until the crankshaft is pressed out of the ball bearing. The two halves of the crankcase separate during this process.



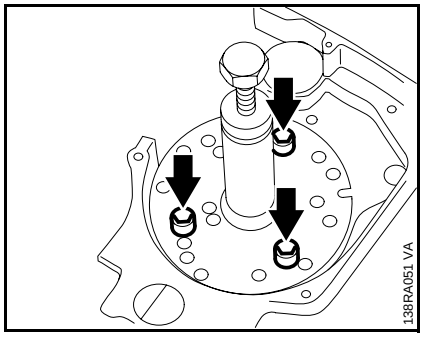
- Fit thrust sleeve 1107 894 1000 from clutch puller 1107 890 4500 to protect the crankshaft thread during the following operation.



- Fit service tool ZS 5910 007 2200 against the outside of the crankcase.

Note:
The tool's drilled plate must locate flat against the crankcase.

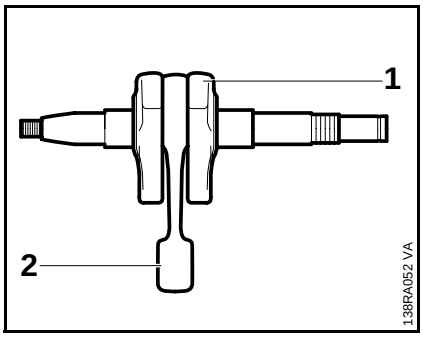
- With the crankcase horizontal (cylinder flange upright), rotate service tool until the number 7 on the plate is at the bottom.



- Secure the service tool to the crankcase with M5x72 mounting screws 9022 341 1190. Insert the screws in the holes marked "7" and tighten them down against the drilled plate.

– Turn spindle counterclockwise (left-hand thread) until it locates against the crankshaft.

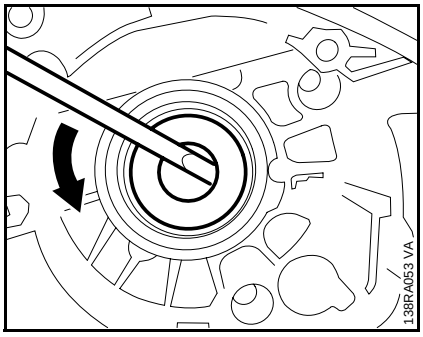
– Use a 19 mm wrench to continue turning the spindle and push the crankshaft out of its bearing seat.



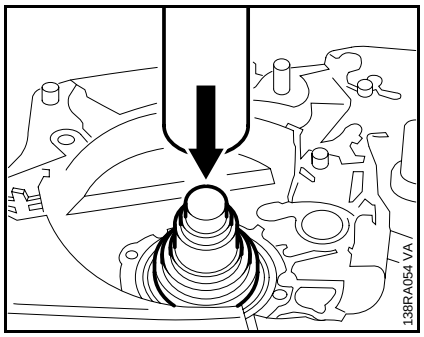
- The crankshaft (1), connecting rod (2) and needle bearing form an inseparable unit. This means that the crankshaft must always be replaced as a complete unit in the event of damage to any one of these parts.

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

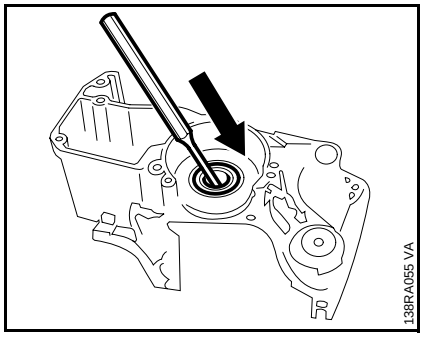
– Remove the gasket from the crankcase sealing face.



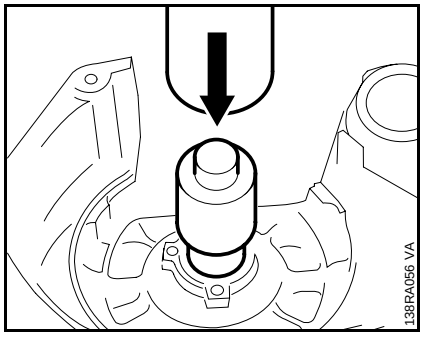
- Use a screwdriver to pry the oil seal out of the ball bearing at the clutch side.



- Use press arbor 1118 893 7200 to press the ball bearing out of its seat.



- Use a screwdriver or similar tool to knock the oil seal out of its seat at the ignition side.



- From outside the crankcase, use arbor 1120 893 7200 to press the ball bearing inwards and out of its seat.

– Pull the oil suction hose out of crankcase.

– Inspect both halves of the crankcase for cracks and replace if necessary.

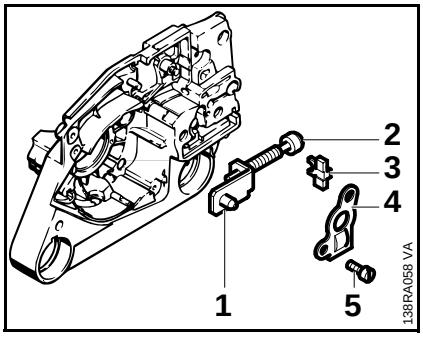
Note:
Always install new gaskets and ball bearings when replacing the crankcase. The crankcase must be replaced as a complete unit even if only one half is damaged.

All other parts which are still serviceable can be transferred to the new crankcase after the new bearings have been fitted (crankcase has to be heated).

Use the stud puller 5910 893 0501 to remove and install the bar mounting studs - see 4.7.

– If the original crankcase is used again, remove all the gasket residue and clean the mating surfaces.

Note:
Clean the mating surfaces thoroughly to ensure a perfect seal.



Note:
A new front chain tensioner is supplied with replacement crankcases.

1 Tensioner slide
2 Adjusting screw
3 Thrust pad
4 Cover plate
5 Pan head screw

– Stamp the machine's serial number on the crankcase with 2.5 mm figure stamps.

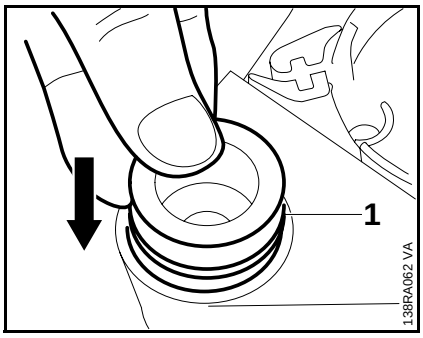
– Check that dowel pin is in position. If necessary, drive dowel pin into new crankcase.

See illustrated parts list for correct installed sequence and positions of crankcase components.

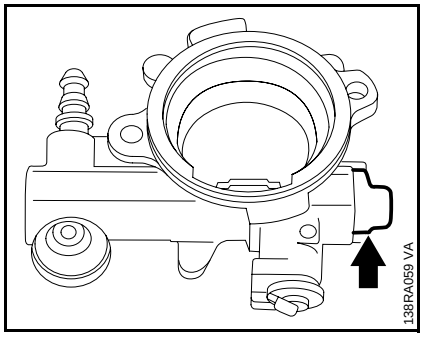
components, such as oil suction and delivery hoses, grommets, annular buffers and levers - see 8.1 and 11.4.

– Inspect condition of all parts and replace as necessary.

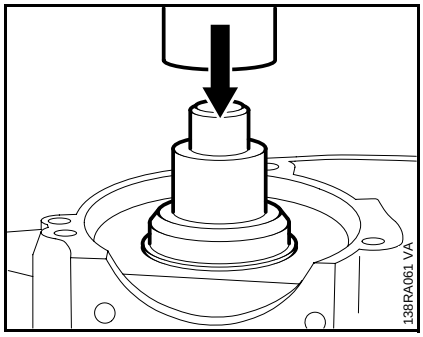
– Heat area of bearing seat on clutch side of crankcase to approx. 120°C.



● Push the two annular buffers, tapered end first, into position so that the groove (1) engages over the housing rib.



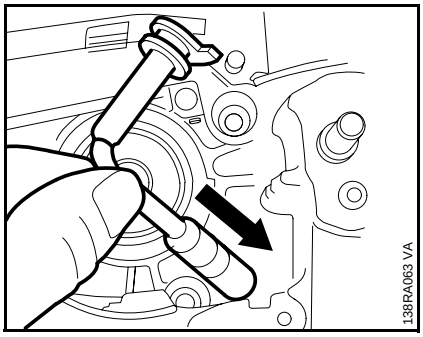
● Pull the plastic plug out of the oil pump.



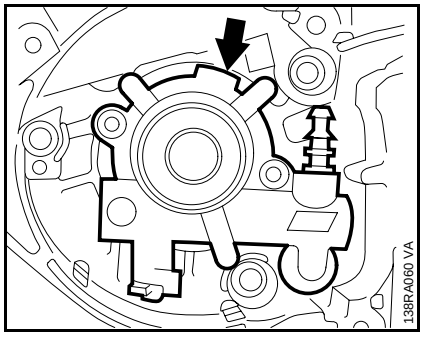
● Place ball bearing in position and press it in until it locates against the oil pump.

Note:
The ball bearing can be fitted by hand if the crankcase is heated as specified. This operation must be carried out very quickly because the bearing absorbs heat immediately and begins to expand.

– Remove the oil pump and refit the plastic plug.

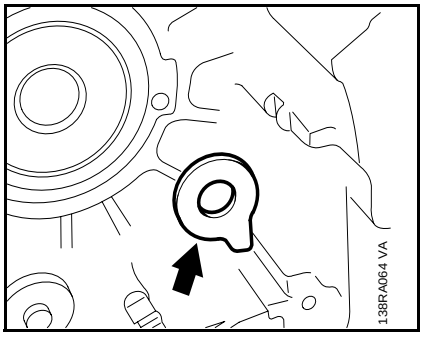


● Push the oil suction hose into the crankcase bore.

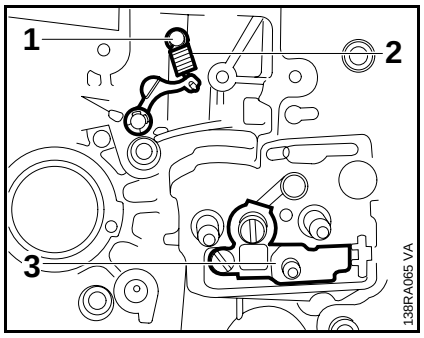


● Position the oil pump against the crankcase. Insert and tighten down the mounting screws.

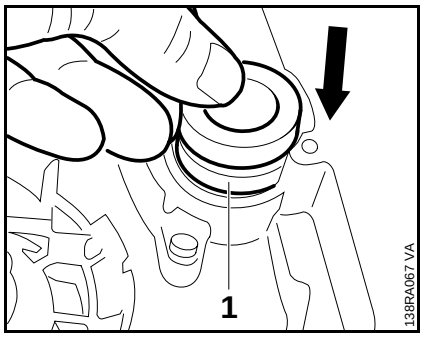
– Before heating the crankcase, remove all rubber and polymer



● Use a blunt tool to push the oil suction hose into the bore so that its tab locates in the bottom right recess.

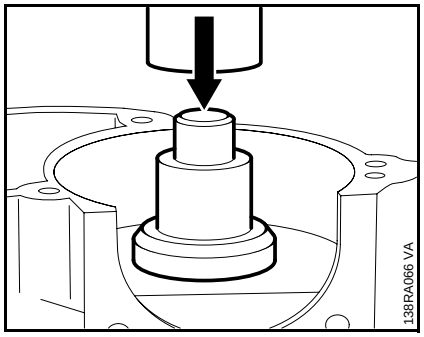


- Fit the lever (1) over the pivot pin, secure it with the E-clip and attach the spring (2).
- Install the chain tensioner (3) - see 4.6



- Push annular buffer into crankcase bore, from outside, until its groove (1) engages the inner rib.

Important:
The original crankshaft must not be installed in model 034S.

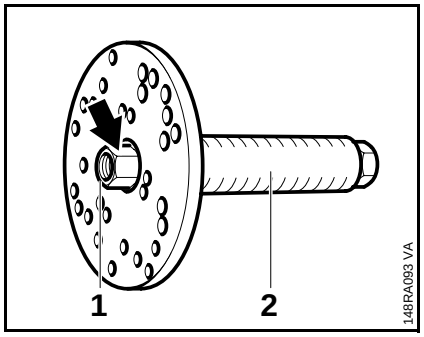


– Heat area of bearing seat on ignition side of crankcase to approx. 120°C.

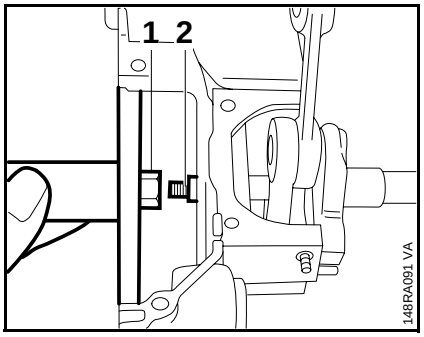
- Use press arbor 1118 893 7200 to install the ball bearing (open side up).

Important:
the ball bearing is closed at one side. The open side must be on the inside of the crankcase to guarantee proper lubrication.

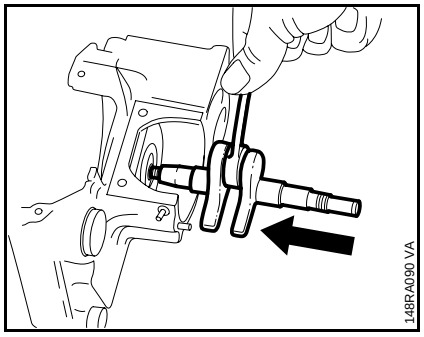
Note:
The ball bearing can be fitted by hand if the crankcase is heated as specified. This operation must be carried out very quickly because the bearing absorbs heat immediately and begins to expand.



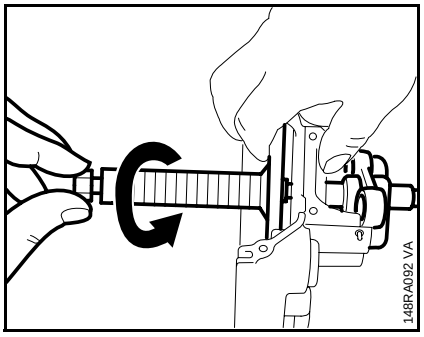
- Extend the spindle of service tool ZS (2) 5910 007 2200 fully and then screw the threaded sleeve (1) 5910 893 2420 onto the spindle as far as it will go.



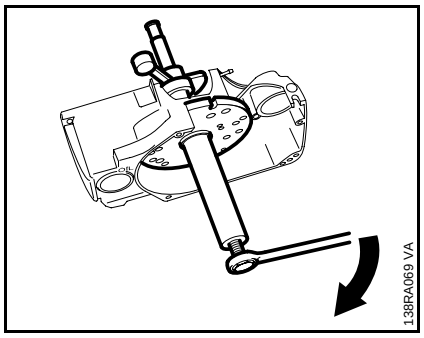
- Apply threaded sleeve (1) to thread (2) on crankshaft stub.



- Lubricate short crankshaft stub with oil and position it in the bearing from inside the ignition side of the crankcase.



- Hold the service tool and crankshaft steady and continue turning the spindle clockwise until the service tool butts against the crankcase.

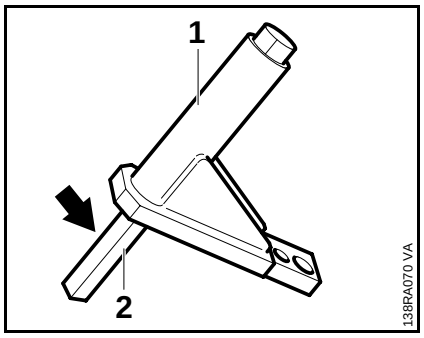


- Turn the spindle clockwise to pull in the crankshaft until it locates against the ball bearing.

Important:
The connecting rod must point toward the cylinder flange while the crankshaft is being installed.

– Remove service tool ZS: First release the spindle counter-clockwise and then unscrew the service tool ZS, also counter-clockwise.

– Screw the spindle fully into service tool AS 5910 007 2205 in the clockwise direction.

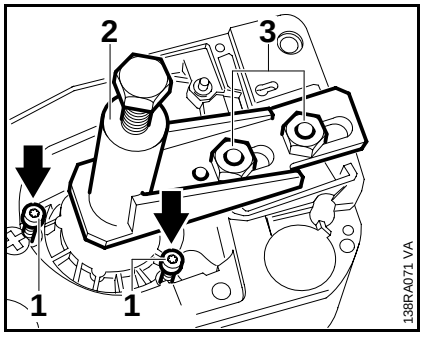


- Screw threaded sleeve (2) 5910 893 2409 onto the spindle of service tool AS (1) as far as it will go (left-hand thread)

– Lubricate crankshaft stub at clutch side with oil.

– Fit crankcase gasket.

– Push the clutch side of the crankcase over the crankshaft stub as far as it will go.



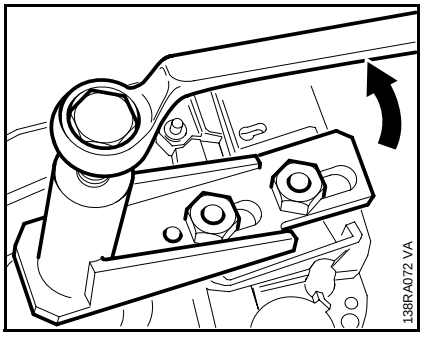
- To prevent the crankcase and gasket twisting, fit M5x72 screws (1) (from service tool ZS 5910 007 2200) in two crankcase holes).

– Push threaded sleeve over the crankshaft stub.

– Hold the crankshaft steady and rotate the spindle counter-clockwise to screw the threaded sleeve onto the crankshaft.

- Release the crankshaft. Hold the service tool (2) steady and continue turning the spindle until the tool locates against the guide bar mounting face.

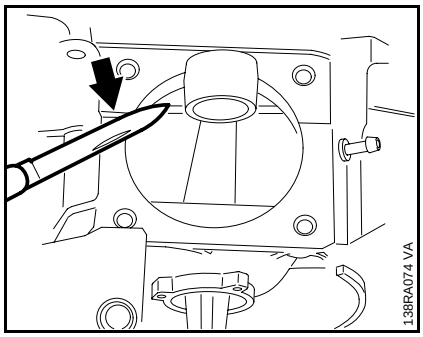
- Fit the two hexagon nuts (3) on the bar mounting studs and screw them down finger-tight.



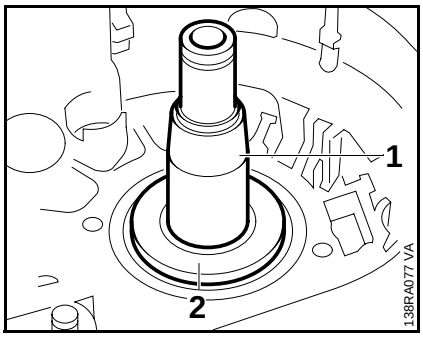
- Turn the spindle counterclock-wise until the crankshaft locates against the ball bearing.

– Unscrew the hexagon nuts. Unscrew the spindle clockwise and take away the service tool.

– Take out the two M5x72 screws.

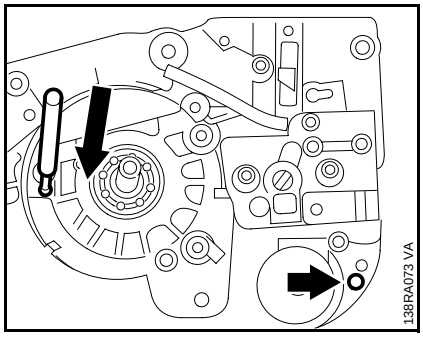


● Trim away any excess gasket material in the area of the cylinder mounting face.

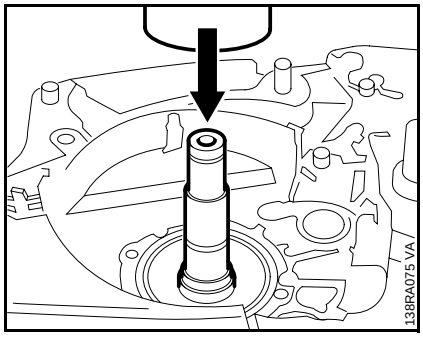


● Fit the installing sleeve (1) 1118 893 4602 over the clutch end of the crankshaft.

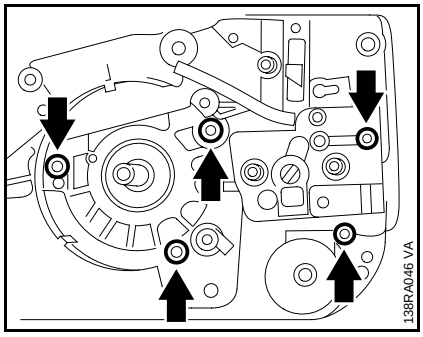
● Slip the oil seal (2), open side facing the crankcase, over the installing sleeve.



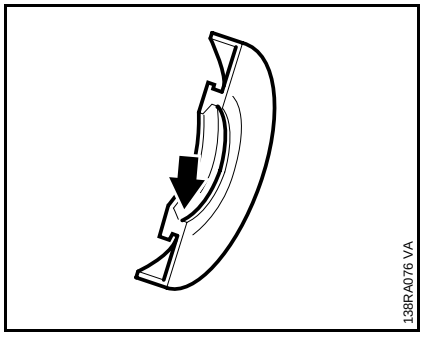
● Drive home the two dowel pins.



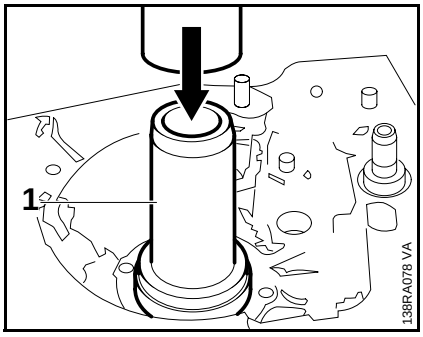
● If the crankshaft does not turn freely, it is sufficient to **tap** the end of the stub with a plastic mallet to relieve axial stresses.



● Fit the five crankcase mounting screws and tighten them down alternately in a diagonal pattern (see "Tightening Torques").

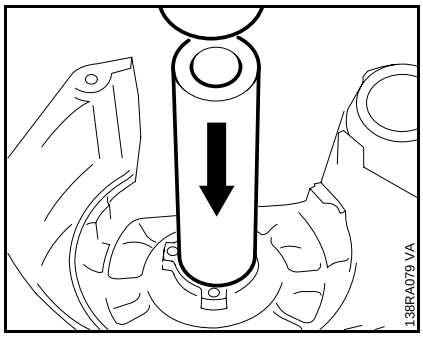


● Before installing oil seal, coat cavity between dust and sealing lips with grease - see 13.2.



● Press home the oil seal with press sleeve (1) 1118 893 2401.

– Remove the installing sleeve.



– Slide the oil seal, open side facing the crankcase, over the ignition end of the crankshaft.

● Use press sleeve 1121 893 2400 to press home oil seal until sleeve butts against the crankcase.

Important:
It is essential to observe the correct installed depth of the oil seal to achieve a proper seal. Always use the press sleeve for this operation.

– Reassemble all other parts in the reverse sequence.

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

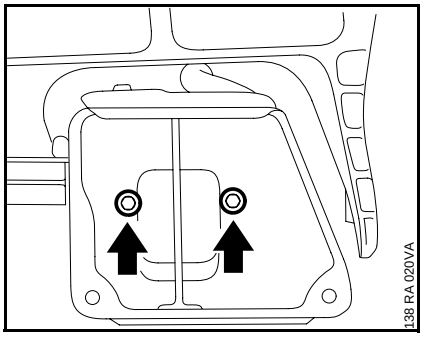
This makes adjustment of the prescribed idle speed difficult, if not impossible.

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

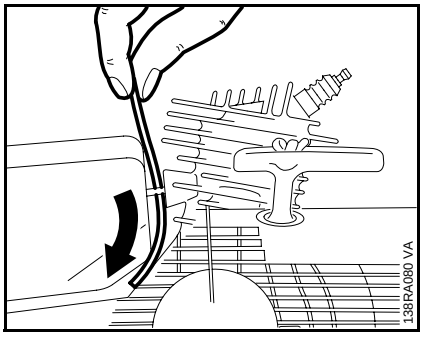
The crankcase can be checked thoroughly for leaks with the carburetor and crankcase tester 1106 850 2905 and the vacuum pump 0000 850 3501.

– Remove the shroud from the cylinder - see 4.3.

– Take out the muffler upper casing mounting screws and remove the upper casing - see 5.1.



● Loosen the muffler lower casing mounting screws about half way.



● Fit sealing plate 0000 855 8106, from above and narrow end first, between the muffler lower casing and cylinder exhaust port.

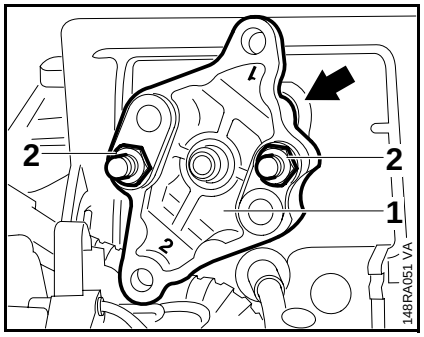
Note:
The sealing plate must completely fill the space between the two

mounting screws. Push the narrow end of the sealing plate home so that it is just below the lower casing.

– Retighten the mounting screws moderately.

– Remove the carburetor - see 12.3

– Set the piston to top dead center (T.D.C.). This can be checked through the inlet port.



– Remove screw 1128 855 9000 from test flange 1128 850 4200.

● Fit the test flange (1), number "1" facing up and flat side first, on the carburetor studs.

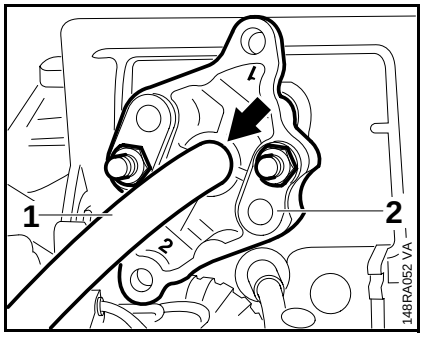
● While fitting the test flange, make sure the impulse opening on the manifold flange is properly sealed (see arrow).

● Fit the two hexagon nuts (2) and tighten them down moderately.

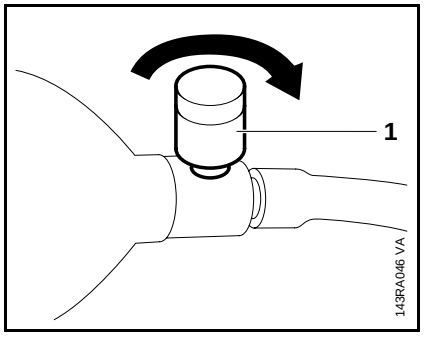
– Preparations - see 5.6.1.

– Check tightness of spark plug before starting leakage test.

– If decompression valve is fitted, make sure it is tight and closed.



● Connect pressure hose (1) of tester 1106 850 2905 to nipple on test flange (2).



● Close the vent screw (1) on the rubber bulb.

– Pump air into the crankcase with rubber bulb until the gauge indicates a pressure of 0.5 bar. If this pressure remains constant for at least 20 seconds, the crankcase is airtight.

– However, if the pressure drops, the leak must be located and the faulty part replaced. Then repeat the pressure test.

Note:
To find the leak, coat the suspect area with oil and pressurize the crankcase. Bubbles will appear if a leak exists.

– Open the vent screw and disconnect the hose.

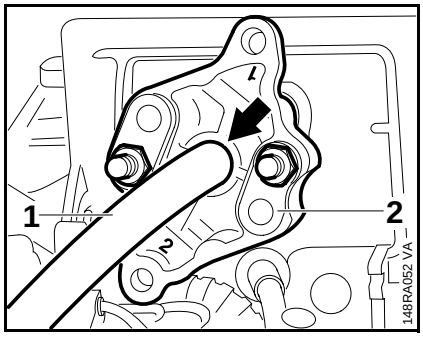
– A pressure must always be followed by a vacuum test - see 5.6.3.

– After finishing the tests, reassemble all parts in the reverse sequence.

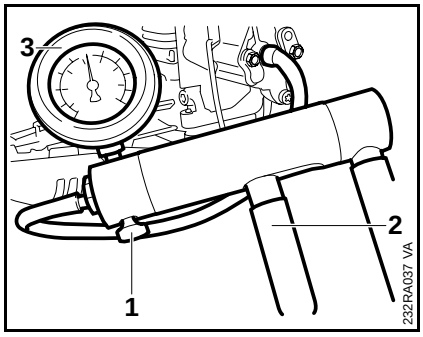
Note:
Coat the mounting screws for the upper and lower muffler casings with LOCTITE. Insert and tighten down the screws (see "Tightening Torques").

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

An additional test can be carried out with vacuum pump 0000 850 3501 to detect this kind of fault.



- Connect suction hose of vacuum pump 0000 850 3501 (1) to nipple of test flange (2).



- Close the vent screw (1) on the pump.
- Operate lever (2) until pressure gauge (3) indicates a vacuum of 0.5 bar.

Note:
If the vacuum reading remains constant, or rises to no more than 0.3 bar within 20 seconds, it can be assumed that the oil seals are in good condition. However, if the pressure continues to rise (reduced vacuum in the crankcase), the oil seals must be replaced, even if no leaks were detected in the pressure test.

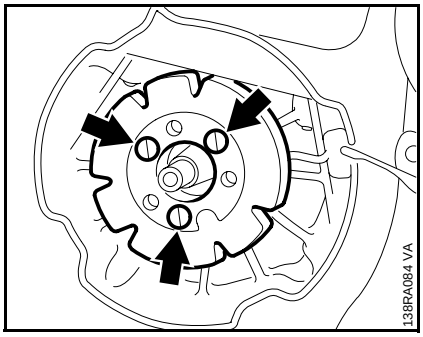
– After finishing the test, reassemble all parts in the reverse sequence.

Note:
Coat the mounting screws for the upper and lower muffler casings with LOCTITE. Insert and tighten down the screws (see "Tightening Torques").

It is not necessary to disassemble the complete crankcase to replace the oil seals.

– Remove the flywheel - see 6.4.1.

– Remove the Woodruff key from the crankshaft stub.



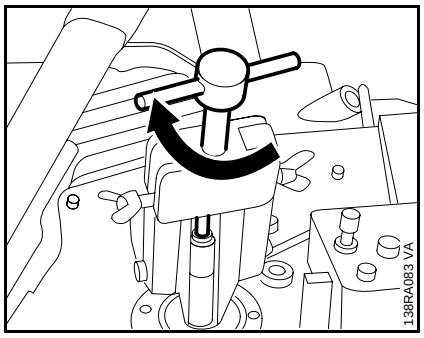
- On machines with handle or carburetor heating system, take out the generator mounting screws, lift the generator away and put it to one side.

– Remove the clutch - see 4.3.

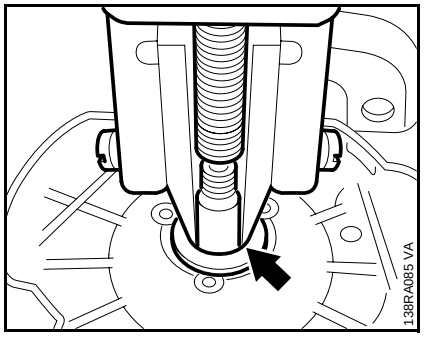
– Remove the brake band - see 4.4.1 and 4.5.1.

– Remove the oil pump - see 11.4.

– Fit No. 3.1 jaws 000 893 3706 in the universal oil seal puller 5910 890 4400.



- Apply the puller at the clutch side and rotate the spindle clockwise to pull the oil seal out of the crankcase.



- Apply the puller at the ignition side and rotate the spindle clockwise to pull the oil seal out of the crankcase.

Important:
When using the puller, make sure it does not damage the crankcase surface or the ball bearing cages.

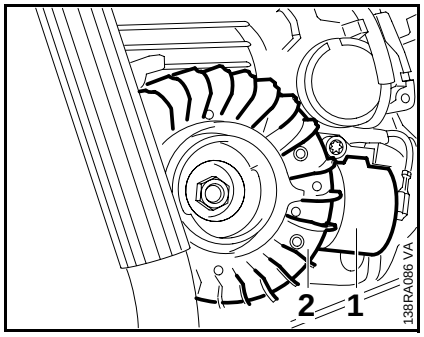
Install the oil seals as described under 5.5.2.

– Install the generator - see 10.5.2.

– Reassemble all other parts in the reverse sequence.

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

Troubleshooting on the ignition system should always begin at the spark plug - see "Standard Repairs, Troubleshooting" handbook.



Note:
The electronic (breakerless) ignition system basically consists of an ignition module (1) and flywheel (2) which requires no outside power source (battery or dynamo). A special flywheel (with ring magnet for the generator) is installed in models with handle or carburetor heating system.

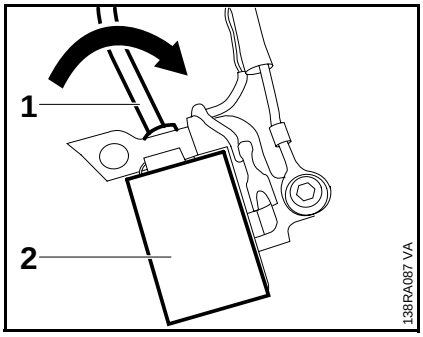
– Remove the air filter - see 12.1

– Pull boot off the spark plug.

– Remove the shroud - see 4.3

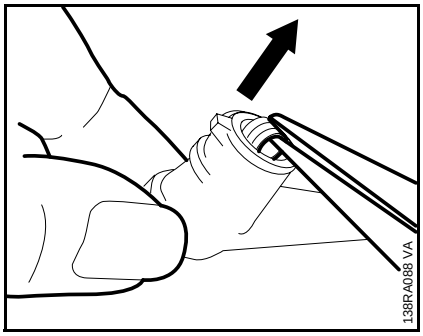
– Remove the ignition module - see 6.5.1

– Pull the ignition lead out of seat in crankcase.



- Unscrew the ignition lead (1) from high voltage output on ignition module (2).

– Pull the insulating tube off the ignition lead.



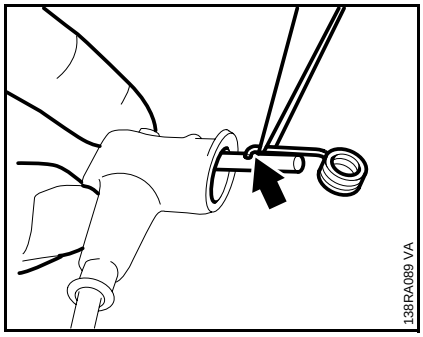
- Use a suitable pair of pliers to grip the leg spring and pull it out of the spark plug boot.

– Unhook the leg spring from the ignition lead and slip the spark plug boot off the lead.

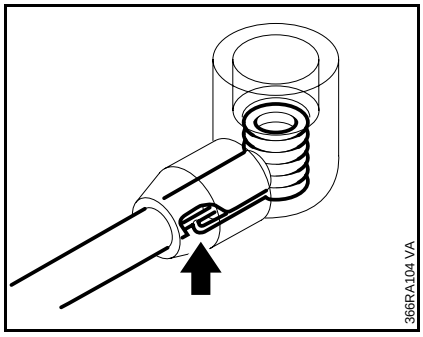
– Coat the end of the ignition lead and insulating tube (about 20 mm) with oil.

– Fit spark plug boot over the lead.

– Use a suitable pair of pliers to grip the end of the ignition lead inside the spark plug boot and pull it out.



● Pinch the hook of the leg spring into the center of the lead, i.e. about 15 mm from the end of the lead.



● Pull the lead back into the boot so that the leg spring locates properly inside it.

– Use a pointed tool to pierce the center of the other end of the ignition lead.

– Slip the insulating tube over the ignition lead.

– Screw the ignition lead into the ignition module.

– Push the insulating tube right up the ignition module's high voltage output.

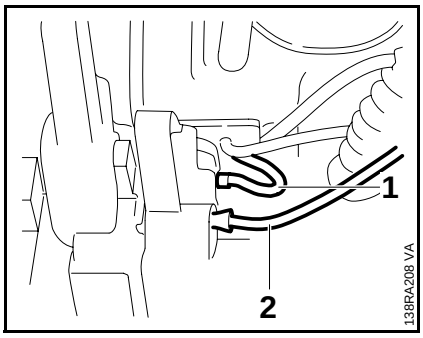
– Install the ignition module - see 6.5.1.

– Push ignition lead into seat in crankcase.

– Fit the shroud - see 4.3.

– Fit boot on the spark plug.

– Fit the air filter - see 12.1.



Note:
If the insulation of the short circuit wire (2) is damaged it can cause a short circuit to ground and upset or completely interrupt ignition.

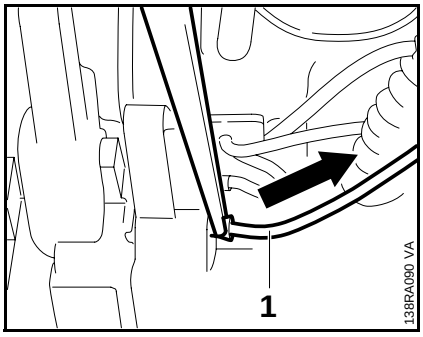
To remove the short circuit wire (2) and ground wire (1), perform the following operations:

– Remove the fan housing - see 6.4.

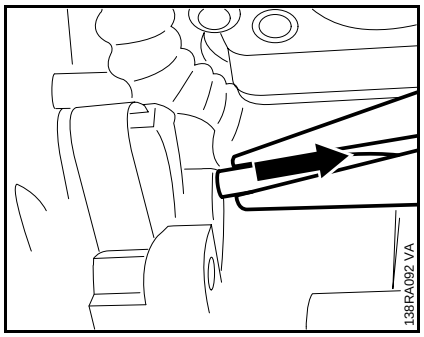
– Remove the shroud - see 4.3.

– Remove the air filter - see 12.1.

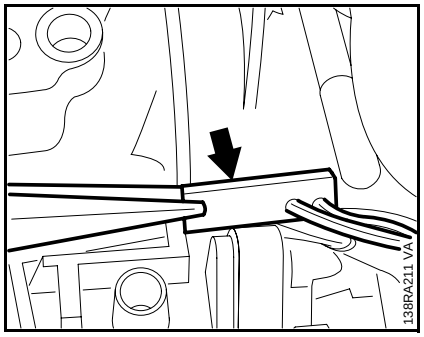
– Remove the tank vent - see 12.6.



● Use a small screwdriver to ease the connector sleeve of the short circuit wire (1) out of its seat in the switch shaft.



● Pull ground wire connector sleeve out of contact spring.



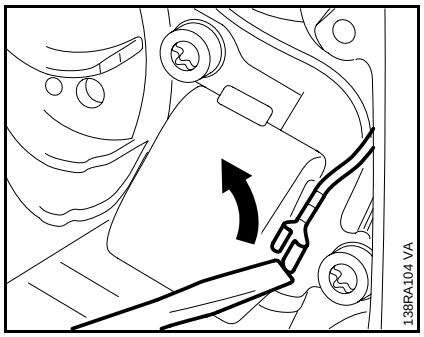
– On machines with handle or carburetor heating, disconnect the pin and socket connectors of the heating systems - see 10.3.

● Pull grommet out of tank housing.

– Slip grommet off the wires.

– Pull the boot off the spark plug and remove the ignition lead from its seat in the crankcase.

– Pull the insulating tube through the cable gland in the crankcase.



Removing the short circuit wire:

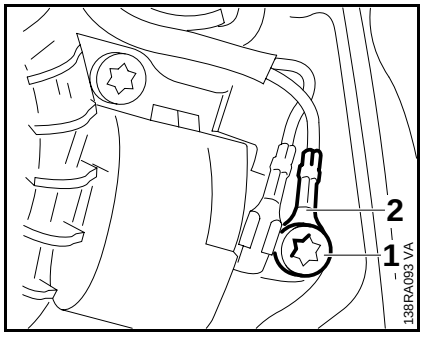
● Disconnect short circuit wire from ignition module.

– Pull short circuit wire out of retainer on ignition module.

– Pull the short circuit wire through the insulating tube.

– Install in the reverse sequence.

Note:
A ground wire is installed because the contact spring in the polymer tank housing is not connected to ground on the ignition module.



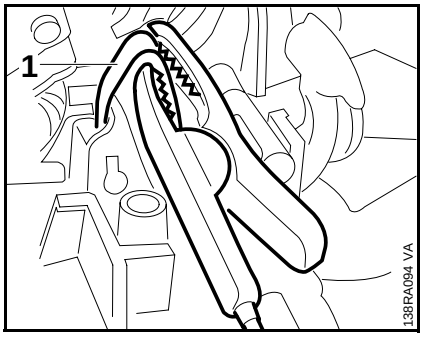
Removing the ground wire:

● Take out the screw (1) and remove the ground wire (2).

– Pull the ground wire out through the insulating tube.

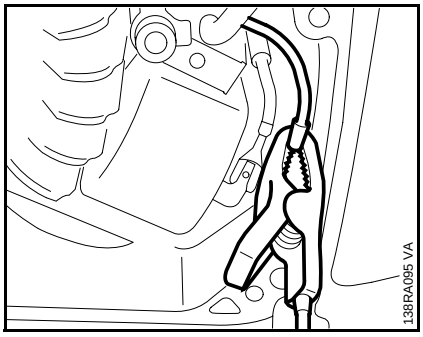
– Install the new ground wire in the reverse sequence. Check that the insulating tube is properly located in the crankcase cable gland.

Important:
Use an ohmmeter to check correct operation of the ground and short circuit wires as well as the STOP contact.



– Set the ohmmeter to measuring range "Ω x 1".

● Clip one of the two test leads to the contact spring (1).



● Clip the other test lead to the ground wire terminal.

– The ohmmeter must now show a reading of 0 Ω. If no reading is obtained, check the connection between the contact spring and connector sleeve.

Checking short circuit wire and STOP contact:

– Leave one test lead clipped to the contact spring.

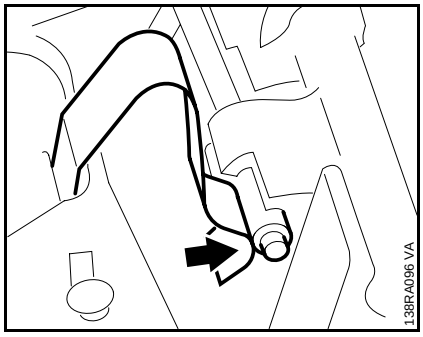
– On machines with carburetor heating, pull the thermostatic switch's flag connector off the contact spring.

– Move the Master Control lever upwards to "STOP".

– Clip other lead to short circuit wire's terminal.

– The ohmmeter must again show a reading of 0 Ω. If no reading is obtained, check the connection between the connector sleeve in the switch shaft's cam and the contact spring.

– On machines with carburetor heating, push the thermostatic switch's flag connector onto the contact spring.



– Remove the air filter - see 12.1

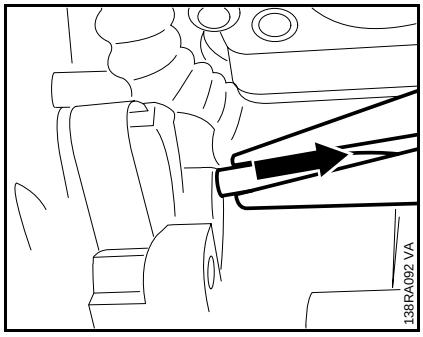
– Remove the tank vent - see 12.6.

● The short circuit system is in order if the short circuit wire makes contact with the connector sleeve when the Master Control lever is in the "STOP" position.

Replacing a bent or broken contact spring:

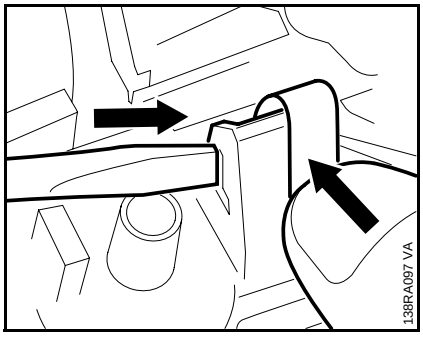
– To avoid damaging the fuel hose, pull it off the carburetor's elbow connector.

– On machines with carburetor heating, pull the thermostatic switch's flag connector off the contact spring.



● Pull the ground wire connector sleeve out of the contact spring.

– Move Master Control lever to "STOP" position.



● Squeeze the contact spring so that is disengages from the Master Control lever and, at the same time, use a screwdriver to pry it out of its seat in the crankcase.

– Install the new contact spring.

– Reconnect the ground wire connector sleeve.

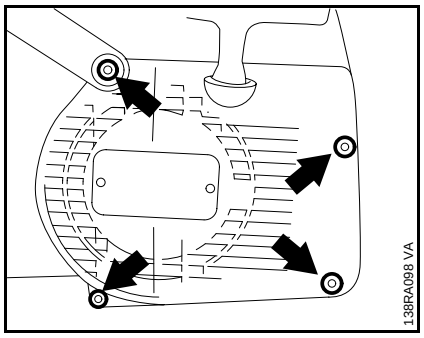
Important:

– Check operation of the short circuit wire - see 6.2.

– On machines with carburetor heating, push the thermostatic switch's flag connector onto the contact spring.

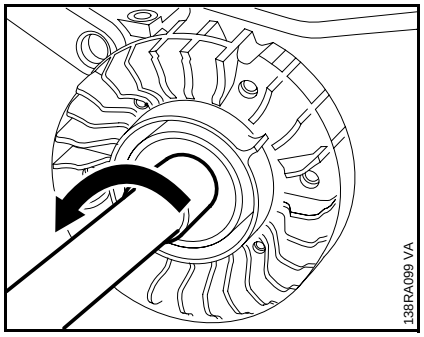
– Fit the tank vent - see 12.6.

– Fit the air filter - see 12.1.



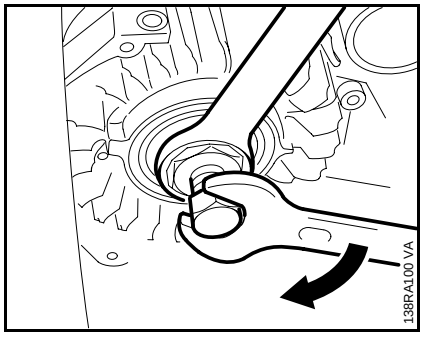
- Take out mounting screws and remove the fan housing.

– Rotate the flywheel so that the magnet poles are opposite the ignition module.



– Use locking strip 0000 893 5903 to block the piston - see 4.3.

- Unscrew the flywheel mounting nut from the crankshaft.



- Screw puller 1110 890 4500 into flywheel hub as far as stop.

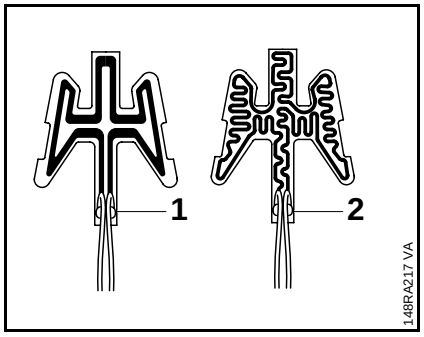
- Hold puller steady with a 24 mm wrench and use a 17 mm wrench to screw home the thrust bolt until the flywheel comes away from its seat on the crankshaft.

– Take off the flywheel.

– Inspect the flywheel. If you find any damage (e.g. cracks, , broken fan blades), fit a new flywheel.

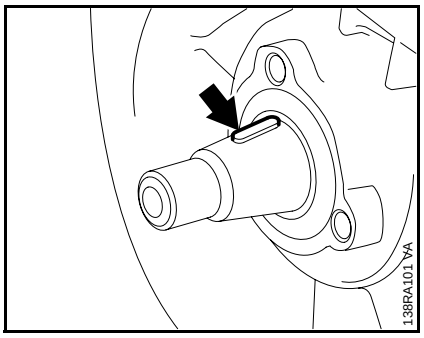
Important:
If a new flywheel 1125 400 1208 is installed in a machine with heated handles ➞I X 31 813 247, the original front handle must always be replaced by front handle 1125 790 1702 to take account of the higher power output.
In addition, the new heating element 1128 434 5000 must be fitted in the rear handle since the heating elements may otherwise burn out.
The old front handle 1125 790 1707 and the old heating elements 1125 434 5000 may only be installed in machines with flywheel 1125 400 1207.

Front handles and heating elements can be identified with the aid of the following resistances:

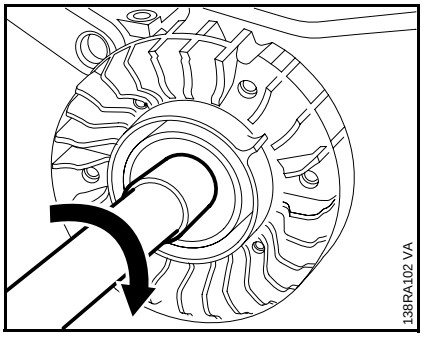


Rear handle heating element:
Old version (1) 0.225...0.275 Ω
New version (2) 0.9 ...1.1 Ω

Front handle heating element:
Old version 1.44 ...1.76 Ω
New version 6.3 ...7.7 Ω



- Check correct position of Woodruff key.

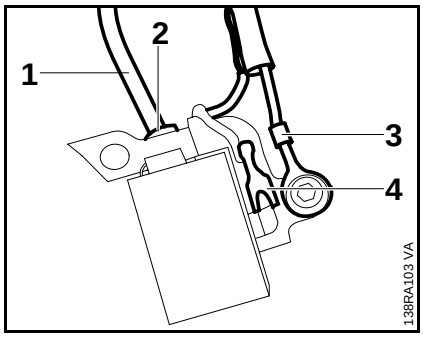


Important:
– Clean the stub of the crankshaft and the flywheel hub bore with a standard commercial, solvent-based degreasant containing no chlorinated or halogenated hydrocarbons - see 13.2.

– Fit the flywheel in position.

- Fit and tighten down the flywheel nut (see "Tightening Torques").

Reassemble all other parts in the reverse sequence.
Observe tightening torques when refitting the fan housing (see "Tightening Torques").



The ignition module accommodates all the components required to control ignition timing.

Ignition module components and connections

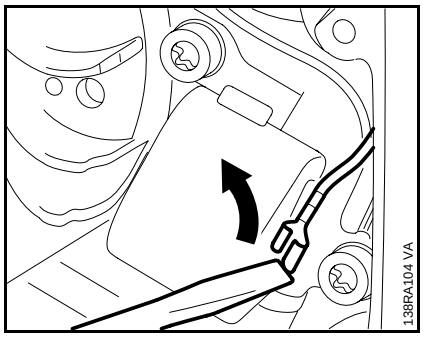
1 Ignition lead with insulating tube

2 High voltage output

3 Ground wire

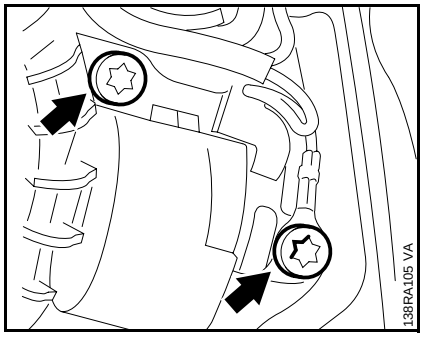
4 Connector tag for short circuit wire

Accurate testing of the ignition module is only possible with special test equipment. For this reason it is only necessary to carry out a spark test in the workshop.
A new ignition module must be installed if no ignition spark is obtained (after checking that wiring and stop switch are in good condition).



– Remove the fan housing - see 6.4.1

● Use a screwdriver to disconnect the short circuit wire from the ignition module.



● Take out the two mounting screws and lift away the ignition module.

Note:
If the ignition module is faulty, unscrew the ignition lead counterclockwise and transfer it along with the spark plug boot and cable retainer to the new ignition module.

– To install the ignition module, connect short circuit wire to tag on ignition module and then push the short circuit wire into the retainer.

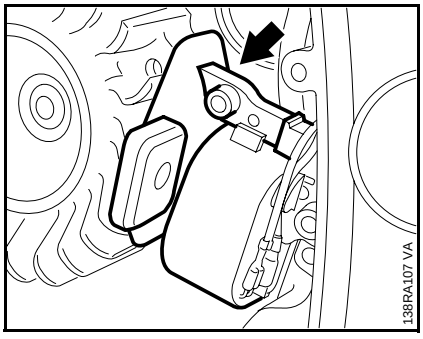
– Place the ignition module in the crankcase.

– Coat threads of ignition module mounting screws with LOCTITE - see 13.2.

– Use lower mounting screw to connect the ground wire to the ignition module.

● Fit the two screws and tighten them down moderately.

– Rotate the flywheel until the magnets are between the two arms of the ignition module.



● Slide the setting gauge 1111 890 6400 or 0.2 mm metal gauge between the arms of the ignition module and the flywheel magnets.

– Press the ignition module against the flywheel and tighten down the mounting screws (see "Tightening Torques").

Important:
Tighten the upper screw first.

– Remove the setting gauge and use a feeler gauge to check the air gap. It should be 0.2 to 0.3 mm.

– Fit the fan housing - observe tightening torques (see "Tightening Torques").

6.5.2 Ignition Timing

Ignition timing on electronic (breakerless) magneto ignition systems is fixed at 2.5 mm B.T.D.C. at 8,000 rpm and is not adjustable.

However, in view of the permissible tolerances in the electronic circuitry, it may vary between 1.8 and 2.6 mm B.T.D.C. at 8,000 rpm.

Since there is no mechanical wear in these systems, ignition timing cannot get out of adjustment. However, an internal fault in the circuit can alter the switching point in such a way that a spark test will still show the system to be in order although timing is outside the permissible tolerance. This will impair engine starting and running behavior.

7 Rewind Starter

7.1 Routine Maintenance

Troubleshooting chart - see "Standard Repairs, Trouble-shooting" handbook.

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

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

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

Wash all parts in paraffin/kerosine or white spirit.

Lubricate the rewind spring and starter post with STIHL special lubricant, see 13.2, before installing.

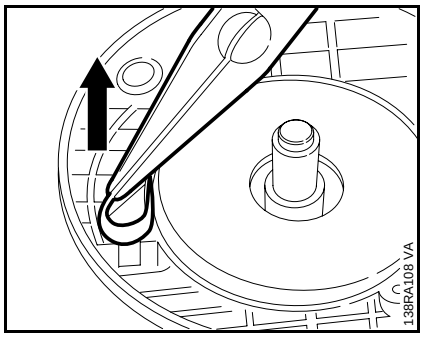
7.2 Rope Rotor, Pawls, Starter Rope, Rope Guide Bush

– Remove the fan housing - see 6.4.1

Note:
For descriptions on removing and installing the rope rotor, replacing the starter rope, pawls or rope guide bush - see "Standard Repairs, Troubleshooting" handbook. Observe tightening torques when refitting the fan housing (see "Tightening Torques").

7.3 Rewind Spring

7.3.1 Replacing the Rewind Spring (034)



– Remove the rope rotor - see 7.2.

● Use suitable pliers to grip the anchor loop of the rewind spring and lift it up.

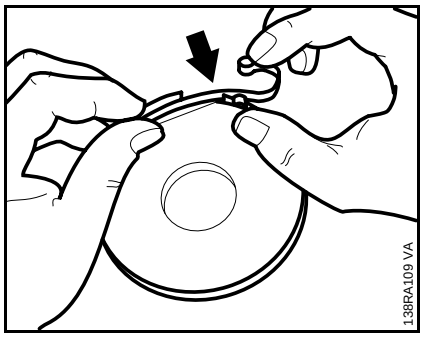
– Take the spring housing and rewind spring out of the fan housing.

– Remove any remaining bits of spring from the fan housing.

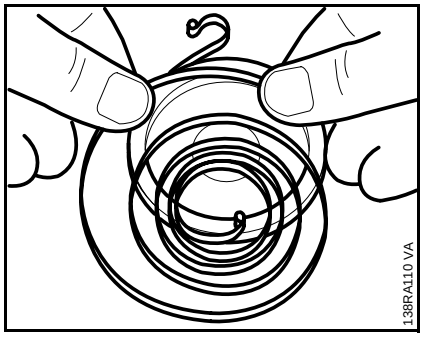
– Lubricate die rewind spring with STIHL special lubricant and fit it with the spring housing (bottom plate facing up) in the fan housing.

– Engage the spring loop over the lug in the fan housing.

Warning:
The rewind spring may pop out and uncoil during installation. If the rewind spring has popped out, refit it in the spring housing as follows:



● Position anchor loop about 25 mm from the edge of the spring housing.



● Refit the rewind spring in the spring housing in the counter-clockwise direction, starting outside and working inwards.

– Fit the spring housing in the fan housing.

– Engage the spring loop over the lug in the fan housing.

– Install the rope rotor - see 7.2.

– Tension the rewind spring - see 7.4.

7.3.2 Replacing the Rewind Spring (036, 036 QS)

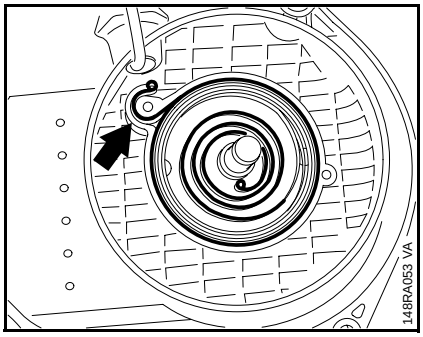
– Remove the rope rotor - see 7.2.

– Use suitable pliers to grip the anchor loop of the rewind spring and pull it out carefully.

Warning:
The rewind spring jumps out of its seat in the fan housing in this process.

– Remove any remaining bits of spring from the fan housing.

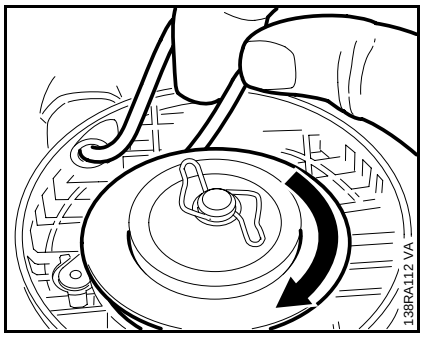
– Lubricate the rewind spring with STIHL special lubricant.



● Engage the anchor loop over the lug in the fan housing and fit the rewind spring in the fan housing in the clockwise direction, starting outside and working inwards.

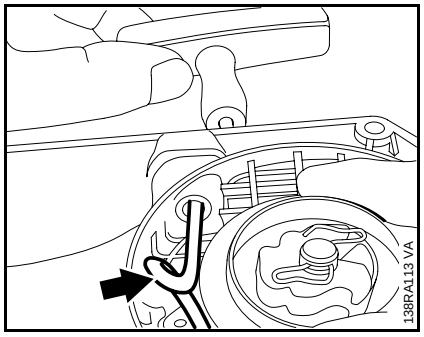
– Install the rope rotor - see 7.2.

– Tension the rewind spring - see 7.4.



- Grip the rope between the guide bush and rotor, pull it out and make a loop.
- Hold the rope close to the rotor and use it to turn the rotor about five full turns clockwise.

– Hold the rope rotor steady.



- Pull out the rope with the starter grip and straighten it out.

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

– Let go of the rope rotor and slowly guide the starter grip back so the starter rope can rewind properly.

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

When the starter rope is fully extended, it must still be possible to rotate the rope rotor at least another 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 as this will cause it to break.

– Fit the fan housing - see 6.4.

The crankcase and tank housing are connected by vibration damping rubber buffers. Damaged rubber buffers (annular buffers) must always be replaced in sets.

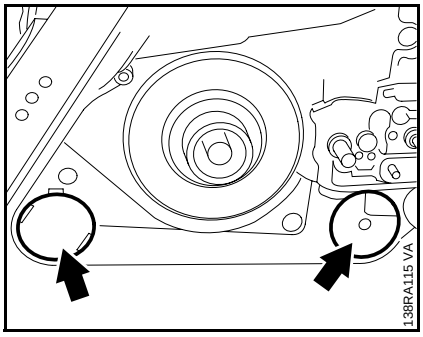
Note:
When replacing annular buffers, make sure you always install the latest type.

Annular buffers must be replaced in sets of the same hardness. Harder buffers are installed for more accurate control but reduced vibration damping, while softer butters provide better vibration damping.

To remove the annular buffers at the clutch side:

– Remove the chain sprocket cover and cutting attachment - see 4.1.

– Remove the chain catcher - see 4.2.



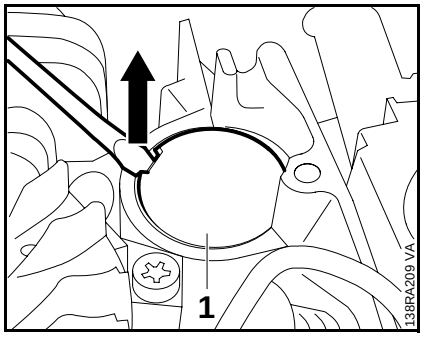
- Use a screwdriver to remove the two plugs from the annular buffers.

– Take out the annular buffer mounting screws.

– Use a screwdriver to pry the annular buffers out of their seats.

To remove the annular buffer at the ignition side:

– Remove the carburetor box cover and shroud - see 4.3.



– Remove the fan housing - see 6.4.

● Use a screwdriver to ease the plug (1) out of the annular buffer.

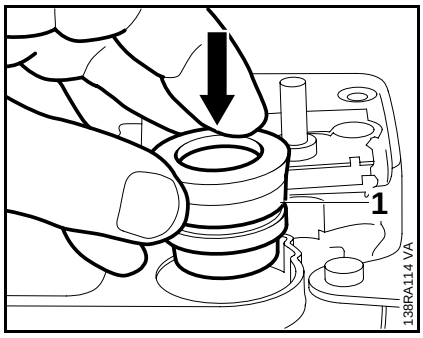
– Take out the annular buffer mounting screw.

– Use a screwdriver to pry the buffer out of its seat.

Note:
The tank housing has to be removed, see 12.8.1, to replace the stop buffer.

– Take out the stop buffer and fit a new one.

– Install the tank housing - see 12.8.1.



Installing new annular buffers:

● Push the annular buffer, washer first, into the crankcase seat until groove (1) engages over the inner housing rib.

– Insert the mounting screw and tighten it down firmly (see "Tightening Torques").

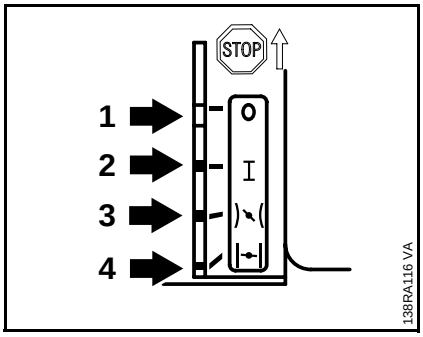
– Lubricate the bead of the plug with oil and then push it into the annular buffer.

Reassemble all other parts in the reverse sequence.

9 Master Control
9.1 Construction and Function

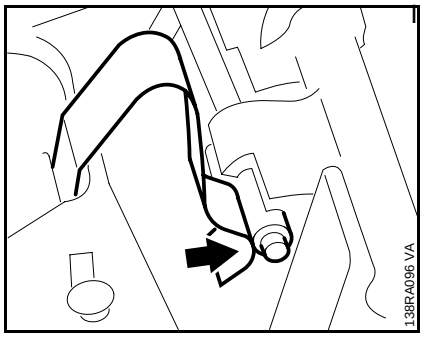
The main part of the Master Control is the switch shaft with an integrally molded multi-function operating lever, a molded cam and a second lever. The switch shaft located forward of the rear handle in the tank housing and is supported at two points.

The Master Control lever moves the switch shaft to select the required function. The following positions can be selected with the Master Control lever:

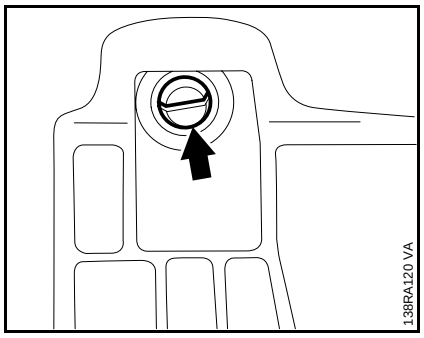


STOP (1)	(closes short circuit contact and interrupts ignition)
RUN (2)	(normal operating position)
START (3)	(warm start - starting throttle/ choke shutter open)
CHOKE (4)	(cold start - starting throttle/ choke shutter closed)

The cam on the left holds the connector sleeve of the short circuit wire and is also the stop for locking the Master Control lever in the "RUN" position.

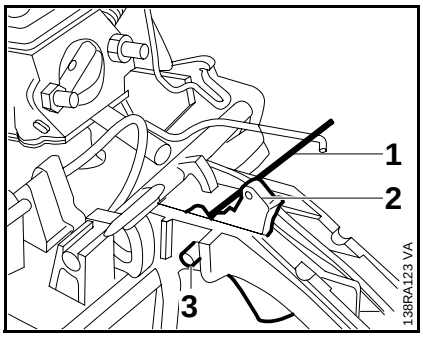


In the "STOP" position the connector sleeve moves against the contact spring (arrow).



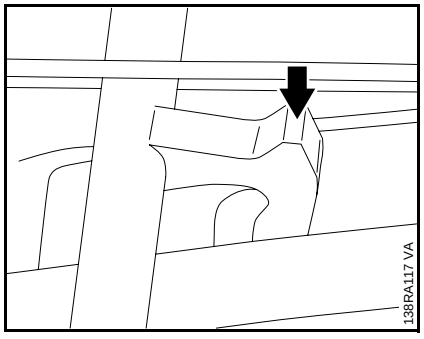
– Remove the air filter - see 12.1

● Take out the handle molding fastening screw. Lift away the handle molding.

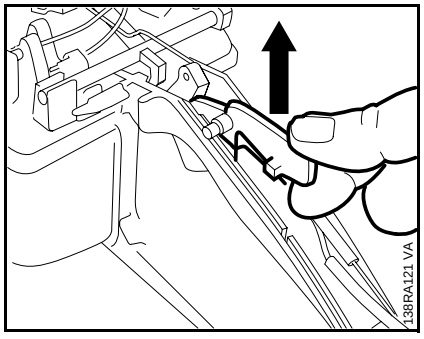


● Use a 5 mm drift to drive out the cylindrical pin (3). Take the throttle trigger (2) and torsion spring (1) out of the handle.

Install in the reverse sequence.

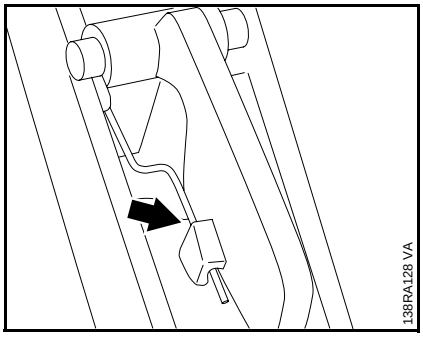


The molded lever on the center of the switch shaft operates the throttle trigger when the "START" and "CHOKE" positions are selected:

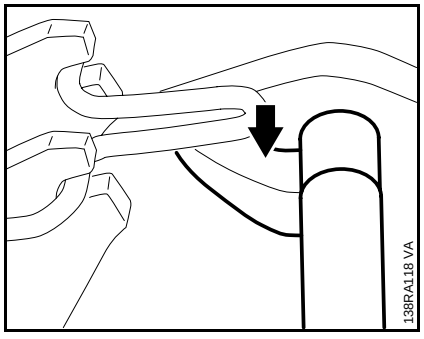


– Move Master Control lever to "RUN" position.

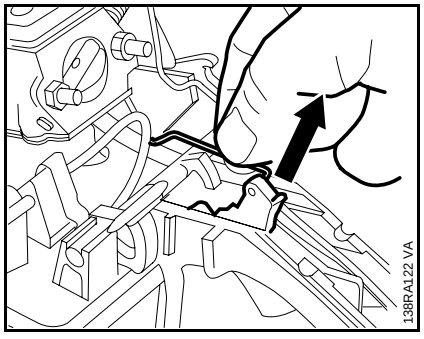
● Pull the throttle interlock lever out of its seat.



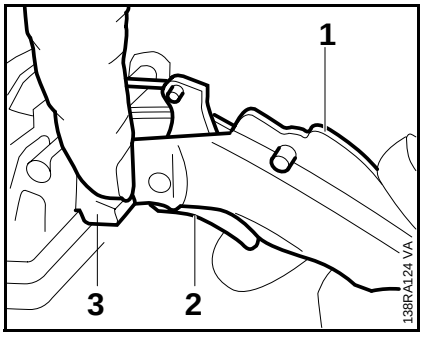
Note:
The torsion spring must be under the interlock lever and locate in the notch (arrow).



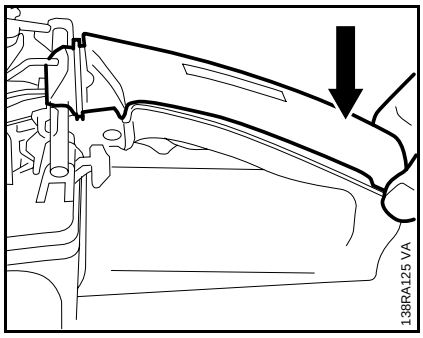
The choke shutter actuating lever is molded to the right-hand end of the switch shaft. It closes the choke shutter when the Master Control lever is set to "CHOKE".



● Detach throttle rod from the trigger.

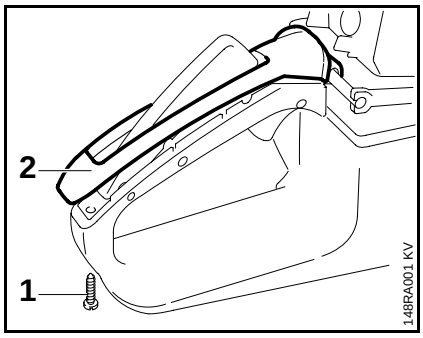


● Press the interlock lever (1) down, pull the throttle trigger (2) up and move the Master Control lever (3) to "CHOKE".



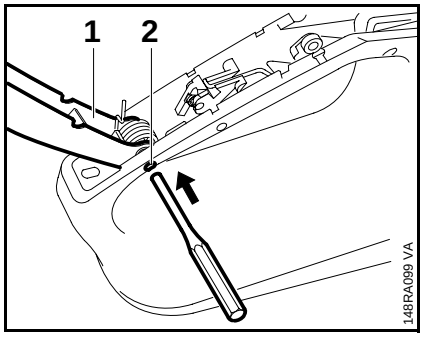
● Fit the handle molding so that the lug at its front end engages properly under the seat on the tank housing.

– Fit handle molding fastening screw (see "Tightening Torques").

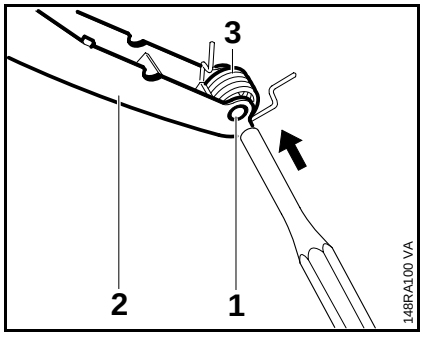


– Remove the air filter - see 12.1.

● Unscrew fastening screw (1) from handle molding (2). Lift away the handle molding.

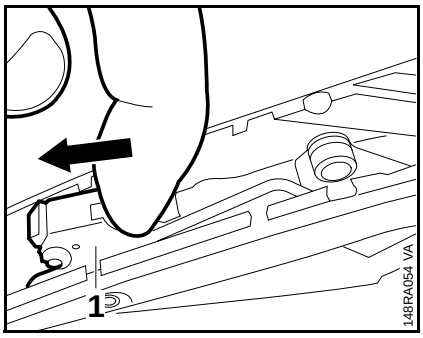


● Use a 3 mm drift to drive the needle roller (2) out of the interlock lever (1). Remove the lever.

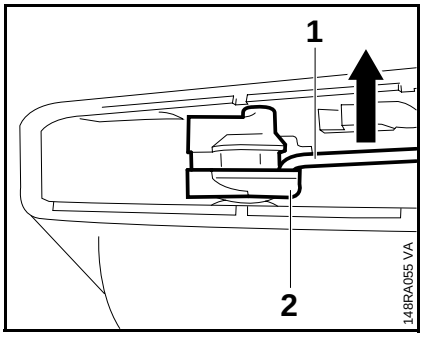


● Use a 4.5 mm drift to drive the bushing (1) out of the interlock lever (2) and then remove the torsion spring (3).

Install in the reverse sequence.



● To remove the switch lever (1), swing it back (arrow).

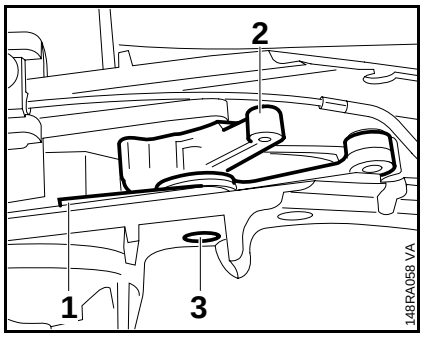


● Disconnect brake cable (1) from switch lever (2).

– Use a 3 mm drift to drive the needle roller out of the switch.

– Take out the switch lever.

Install in the reverse sequence.



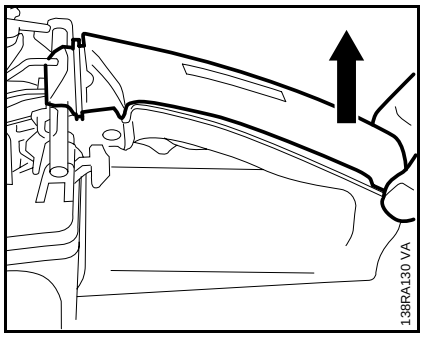
– To remove the throttle trigger, first remove the switch shaft - see 9.4

● Use a 5 mm drift to drive out the cylindrical pin (3) and then remove the throttle trigger (2) with torsion spring (1).

– Take the torsion spring off the throttle trigger.

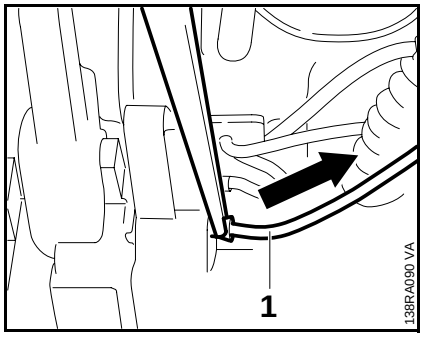
Install in the reverse sequence.

Note:
When installing, make sure that short arm of torsion spring locates in the throttle trigger. The long arm points toward the carburetor.



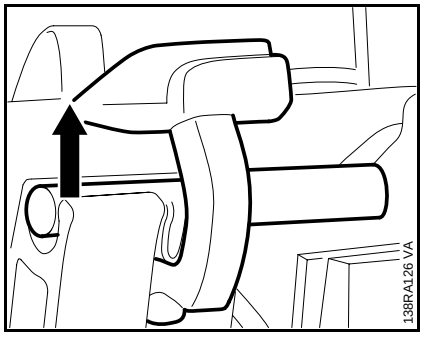
– Remove the air filter - see 6.4.

● Take out the handle molding fastening screw. Lift away the handle molding.



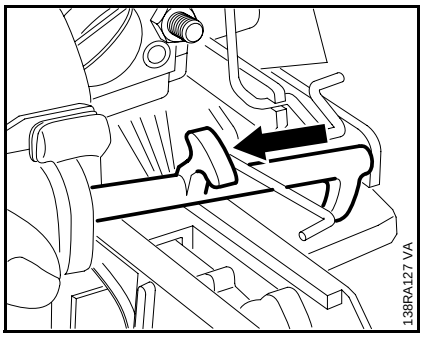
(034, 036)
– Remove the interlock lever - see 9.2

● Take short circuit wire (1) out of cam on switch shaft.



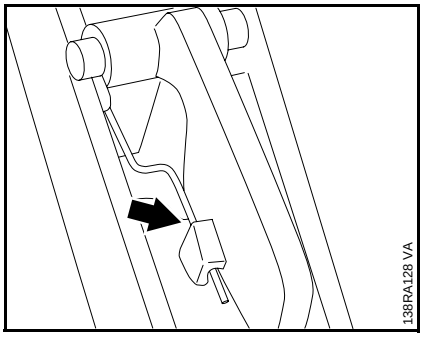
– Move the Master Control lever up to "STOP".

● Pry the switch shaft out of its mounting at the ignition side.



● Take the switch shaft out of its mounting.

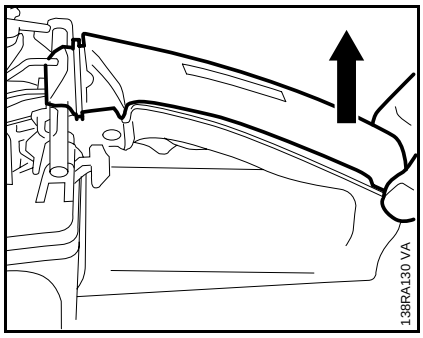
Install in the reverse sequence.



Note:
When installing, make sure that the throttle rod is above the switch shaft and the lug at the front end of the handle molding engages properly under the seat on the tank housing

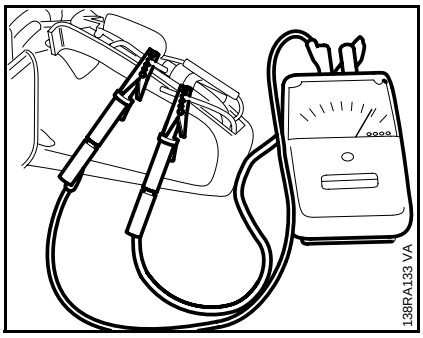
Note: (034, 036)
When fitting the handle molding make sure that the torsion spring, throttle rod and interlock lever are correctly positioned. The torsion spring must pass under the interlock lever's pivot mount and engage the notch in the interlock lever (arrow).

The entire handle heating system is maintenance-free and subject to practically no wear. Faults in the generator, heating elements and wiring are generally caused by mechanical damage.

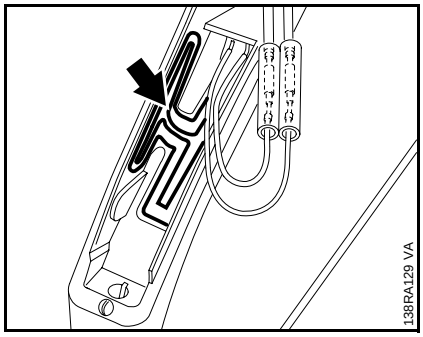


- Take out handle molding fastening screw and lift away handle molding.

– Remove the interlock lever.



- Clip ohmmeter test leads to wires 1 and 3.



Important:
The heating element in the rear handle (arrow) may overheat and fail if it is not bonded firmly in position, i.e. completely flat without creases.

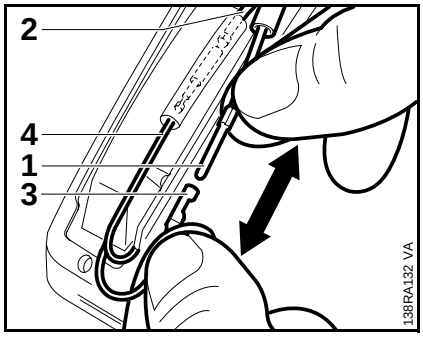
There are two reasons for failures in the heating system:

a) A break in the circuit due to a faulty wire or component.

b) A short circuit resulting from damage to the insulation.

To trace the cause of a fault:

– Remove the air filter - see 12.1.

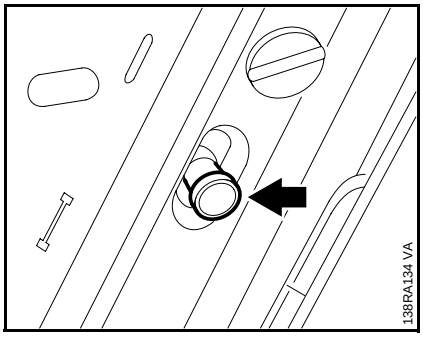


1 = Wire from generator
2 = Wire to front handle heating element
3 & 4 = Wires of rear handle heating element

– On machines with carburetor heating, pull pin of wire from heating element out of round plug.

- Slide back the insulating tube from pin and socket connector of wire (1) between generator and rear handle heating element.

- Separate pin and socket connector of wire (1), from generator, and wire (3) of rear handle heating element.



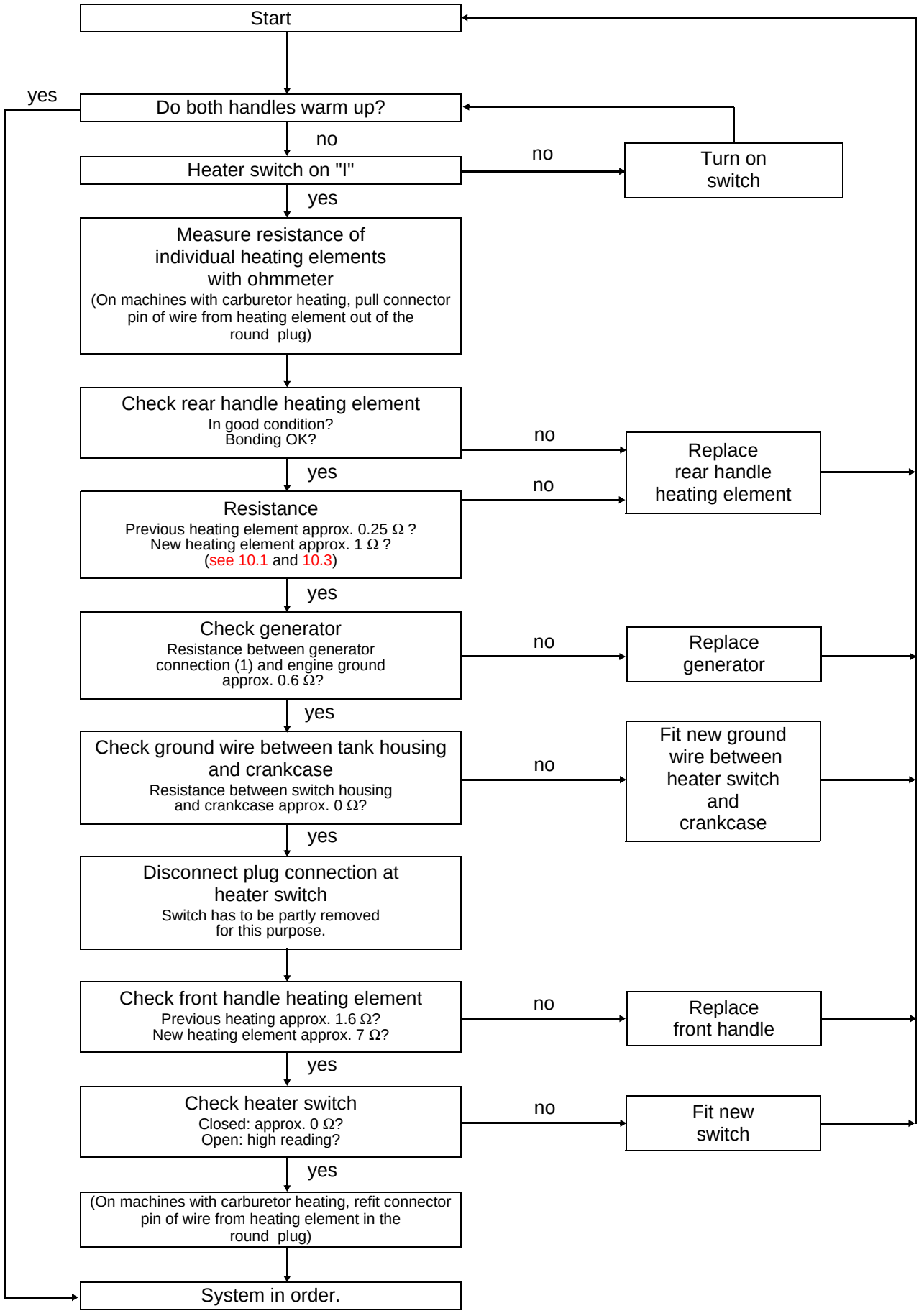
- Set the heater switch to "I".

Note:
All electrical components of the heating system are connected in series with the ohmmeter.

Type of heating element (see 6.4.1)	**Reading in Ω**	**Condition**	**Remedy**
Previous version	approx. 2.5	OK	
	No reading	Break in circuit	Check individual components - see 10.1.2
	less than 2.5	Short circuit in a component	Check individual components - see 10.1.2
New version	7.2 - 9.4	in Ordnung	
	No reading	Break in circuit	Check individual components - see 10.1.2
	less than 7.2	Short circuit in a component	Check individual components - see 10.1.2

If the system is in order, the ohmmeter should indicate, in measuring range "Ω x 1", a value of about 2.5 Ω on previous heating elements or between 7.2 Ω and 9.4 Ω on new heating elements (see also 6.4.). If no reading is obtained, there is a break in the circuit. If the ohmmeter shows a value of less than 2.5 Ω or 7.2 Ω, there is a short circuit in one of the components.
In either case it is necessary to check each component separately. The generator wire remains disconneted from the heating element during this check.

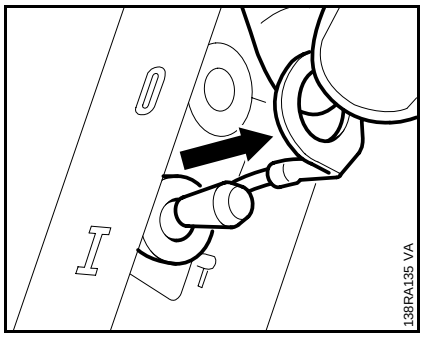
10.1.1 Troubleshooting Chart



– The pin and socket connections of wires 1 to 4 must be disconnected **to test the individual components**. (see 10.1, fig.138 RA 132 VA)

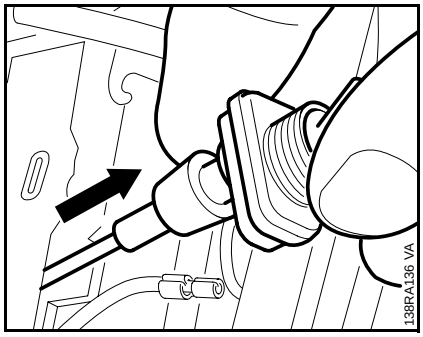
Component	Ohmmeter connection (use either test lead)		Resistance		If faulty	
	Leadl 1	Lead 2	Spec.	Actual	Cause	Remedy
Switch	Switch terminal	Ground	0	-	Switch faulty	Replace switch
Heating element, rear handle (previous)	Connector on wire 3	Connector on wire 4	0.25	approx. 0.25	Heating element OK	
				-	Break in wire, heating element damaged	Replace heating element
				0	Short circuit - damaged insulation	Repair insulation
Heating element, rear handle (new version)	Connector on wire 3	Connector on wire 4	1	approx. 1	Heating element OK	
				-	Break in wire, Heating element damaged	Replace heating element
				0	Short circuit - damaged insulation	Repair insulation
Heating element, front handle (previous)	Connector on wire 2	Ground	1.6	approx. 1.6	Heating element OK	
				-	Break in wire, heating element damaged	Replace front handle
				0	Short circuit durch damaged insulation	Repair insulation
Heating element in front handle (new version)	Stecker an Leitung 2	Ground	7	approx. 7	Heating element OK	
				-	Break in wire, Heating element damaged	Replace front handle
				0	Short circuit - damaged insulation	Repair insulation
Generator	Connector on wire 1	Ground	0.6	approx. 0.6	Generator OK	
				-	Break in wire, generator damaged	Replace generator
				0	Short circuit - damaged insulation	Repair insulation

10.2 Heater Switch

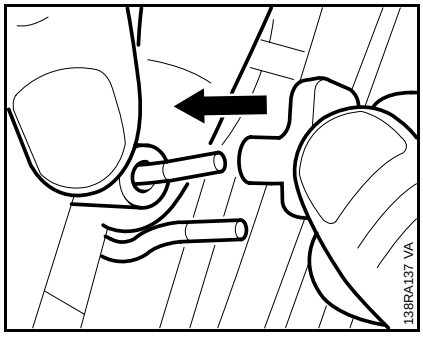


– The front handle has to be removed for access to the heater switch - see 12.8.1.

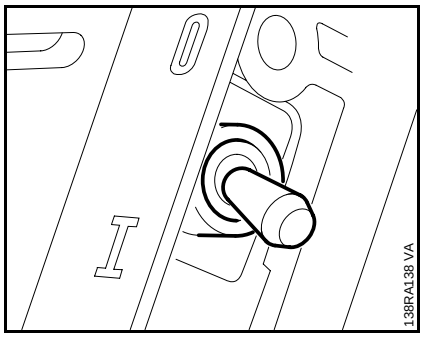
● Take the ground wire ring terminal off the switch.



● Pull the switch out of its seat.



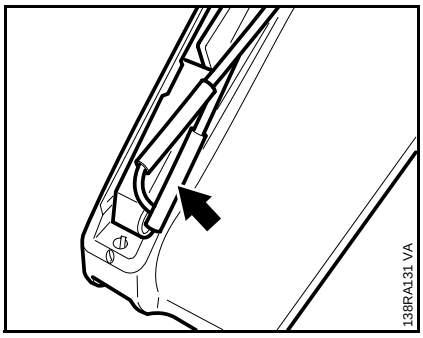
● Push back the rubber grommet a little and pull the connector sleeve out of the switch.



Reassemble in the reverse sequence.

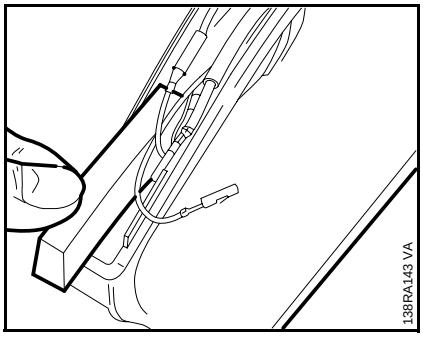
Note:
Check correct installed position of switch in its seat (switch seat in not symmetrical).

10.3 Heating Element in Rear Handle



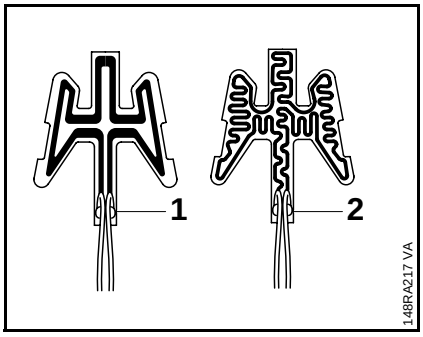
– Remove the handle molding - see 10.1

● Slide the insulating tubes off the two pin and socket connectors. Separate the connectors.



● Take the pressure pad out of the handle recess.

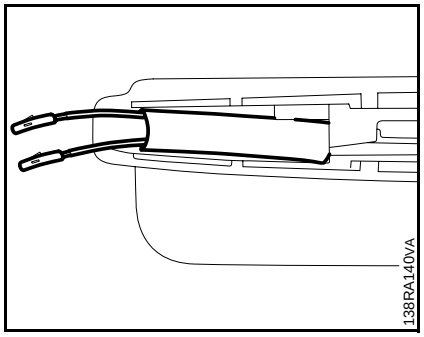
– Release and remove the heating element.



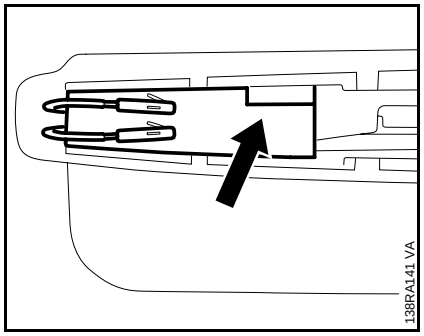
Important:
● Make sure you install the heating element that matches the flywheel - see 6.4
1 = Previous heating element
2 = New heating element

– Before fitting the new heating element, clean the surface inside the handle so that it is free from grease, dirt and moisture.

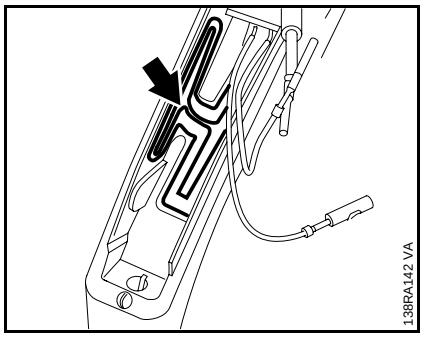
Note:
The previous rear handle heating elements (rectangular) can still be used together with the previous front handles in the modified tank housing if they are bonded in position at an angle.



- Bond the rectangular heating element in the rear handle at an angle.



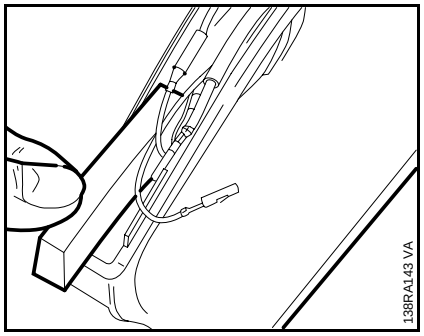
- Cut the previous version of the expanded rubber pressure pad as shown so that the lug (arrow) in the handle does not get in its way.



– Remove the backing paper from the new heating element.

- Press the heating element firmly and uniformly into position, taking special care at the corners and along the edges.

Important:
Avoid creases. If the heating element is not fitted perfectly flat, heat transfer will be interrupted, causing the element to overheat and fail. The ambient temperature during installation should not be less than +15°C.



- Fit a **new** expanded rubber pressure pad on top of the heating element. The heating element must be completely covered.

– Reconnect the wires and slide the insulating tubes back over the pin and socket connectors.

Reassemble all other parts in the reverse sequence.

– Check operation of heating element. Run the saw at maximum revs for no more than 30 seconds with the heating switched on.

Note:
The heat generated during this process also helps the element's adhesive set faster.

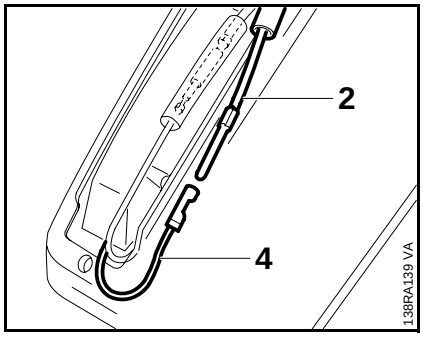
The heating element in the front handle is not replaceable. A new handle must be fitted if the heating element is faulty.

– To disassemble the front handle, remove the carburetor box cover - see 4.3.

– Remove the air filter - see 12.1.

– Remove the handle molding and interlock lever - see 9.2.

– Remove the carburetor - see 12.3.



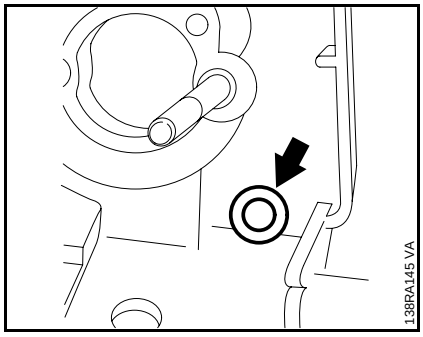
● Separate pin and socket connector of wire (2) of front handle heating element and wire (4) of rear handle heating element.

– Pull of the insulating tube.

– Remove wires from switch - see 10.2.

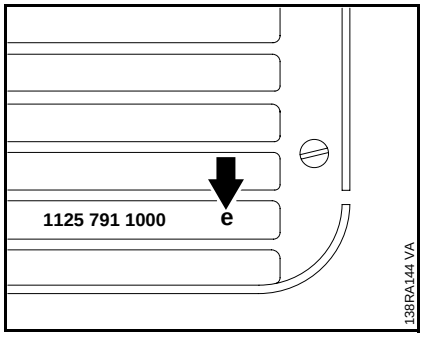
– Take out the mounting screws at the side and bottom of the front handle.

Important:
The special screws used for polymer joints are secured with LOCTITE. Always heat the screwed joint before loosening, e.g. with a hair dryer. Take care not to overheat the polymer.



– Remove the front handle.

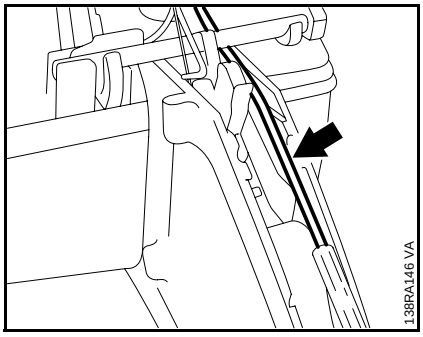
● Pull the connecting wire out of the carburetor box through the grommet (arrow).



Install the new front handle in the reverse sequence.

Note:
Mounting front handle without stiffener to original-type tank housing up to and including index "e": Fit a washer under each screw head.

– Coat front handle mounting screws with LOCTITE, insert and tighten down firmly (see "Tightening Torques")



● Check that the wire of the front handle heating element and the generator wire are properly positioned in the rear handle.

– Remove the air filter - see 12.1.

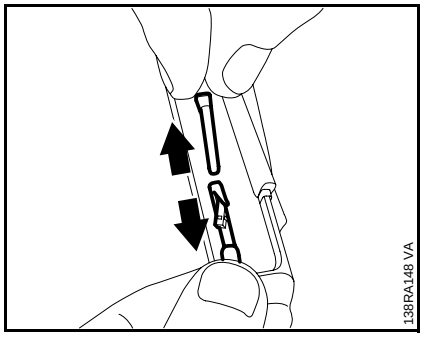
– Remove the tank vent - see 12.6.

– Remove the shroud - see 4.3

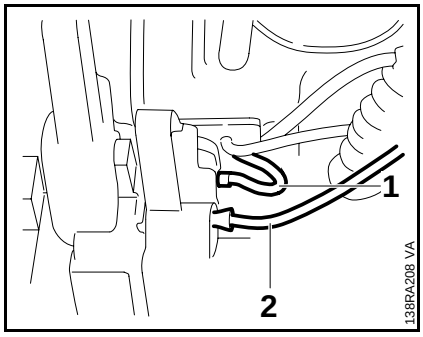
– Remove the handle molding and interlock lever, disconnect the throttle rod - see 9.2.

– Take out ignition module mounting screws, see 6.5.1, and leave ignition module to one side.

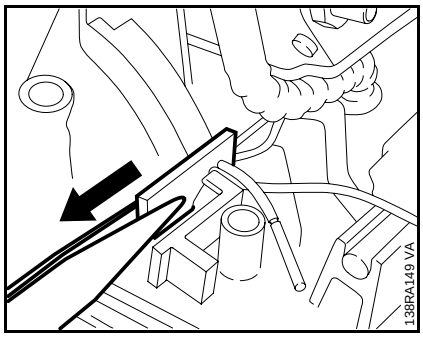
– Remove the flywheel - see 6.4



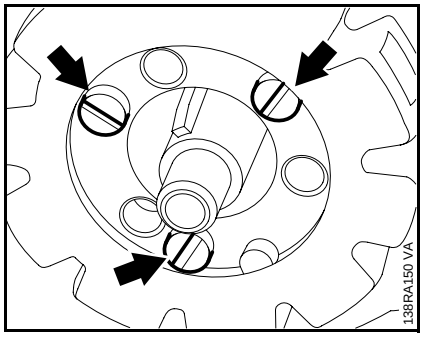
● Disconnect generator wire (see 10.1, fig.138 RA 132 VA, wire 1) in rear handle.



● Pull connector sleeves of short circuit wire (2) and ground wire (1) out of switch shaft and contact spring.

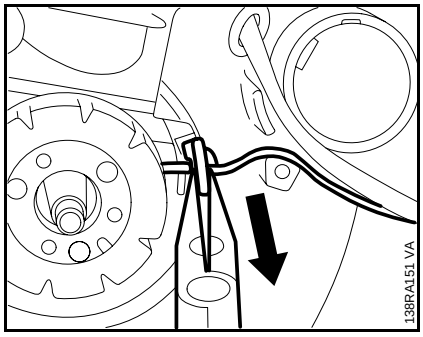


● Use pliers to pull the grommet out of the tank housing.



● Remove the generator mounting screws.

Note:
The screws are secured with LOCTITE and may be difficult to remove.



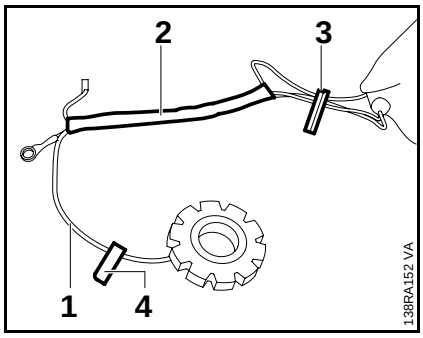
– Remove the generator.

● Use pliers to pull the cable retainer out of the crankcase.

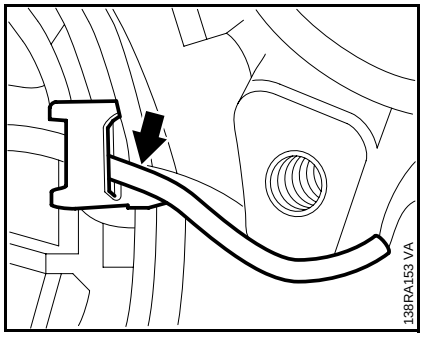
– Pull the generator wire out of the rear grommet, through the insulating tube and the retainer.

Note:
Inspect generator and poles for cracks or other damage. If damage is found, replace the generator.

Inspect magnet ring in flywheel for cracks or other damage. If damage is found, replace the flywheel.

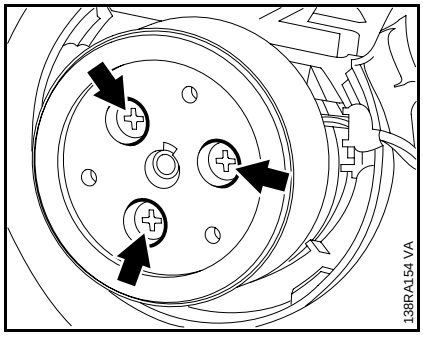


- Thread the generator wire (1) through the retainer (4), the insulating tube (2) and rubber grommet (3).



– Position the generator against the flange face.

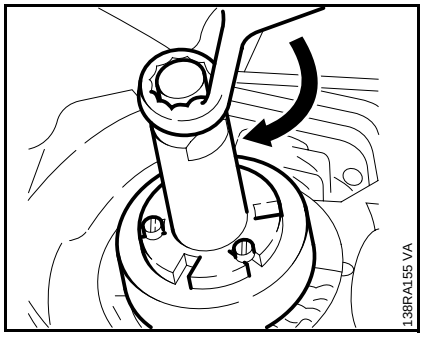
- The generator wire must locate in the crankcase recess (arrow).



– Coat threads of screws with LOCTITE, see 13.2, fit them in the generator and tighten down moderately.

- Fit centering tool 1118 893 3500 on the crankshaft so that its groove engages the Woodruff key.

- Finally tighten the three generator mounting screws (see "Tightening Torques").

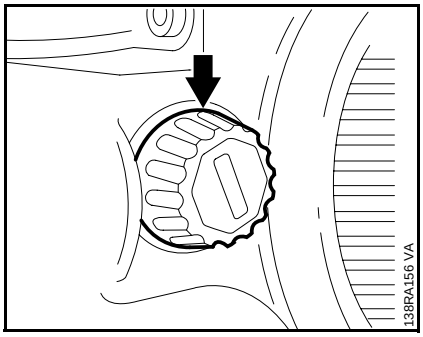


- Remove the centering tool. If necessary, use the puller 1107 890 4500 to remove the centering tool from the crankshaft.

– Install the ignition module - see 6.5.1

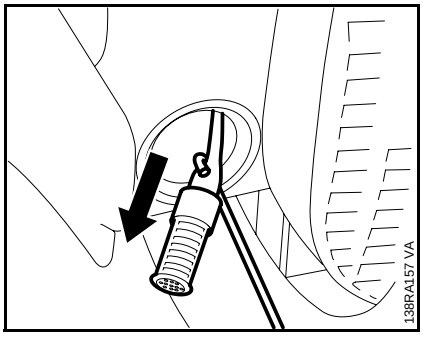
Reassemble all other parts in the reverse sequence.

Impurities gradually clog the fine pores of the filter with tiny particles of dirt. This prevents the oil pump from supplying sufficient oil to the bar and chain. In the event of problems with the oil supply, first check the oil tank and the pickup body. Clean the oil tank if necessary.



- Remove the oil filler cap and the cap retainer.

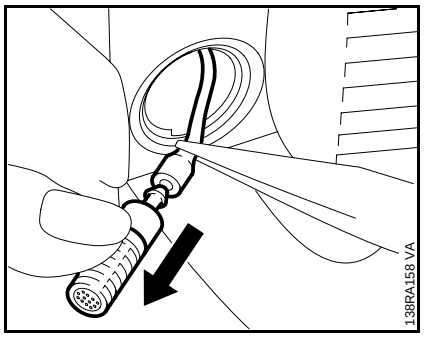
– Drain the oil tank.



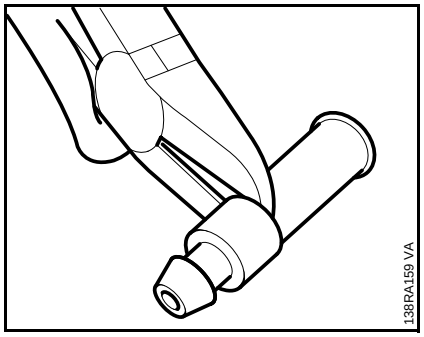
- Use hook 5910 893 8800 to pull the pickup body out of the oil tank.

Note:
Do not stretch the oil hose too much during this operation.

11.2 Suction Hose

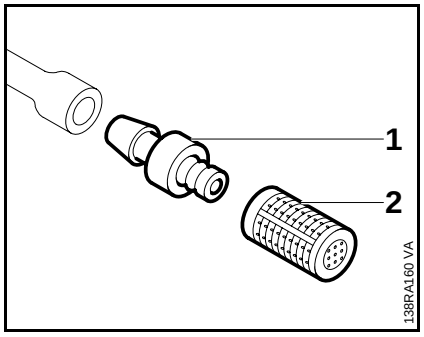


- Hold the oil hose steady and pull out the pickup body.



- Use side cutters or similar tool to remove the strainer from the connector.

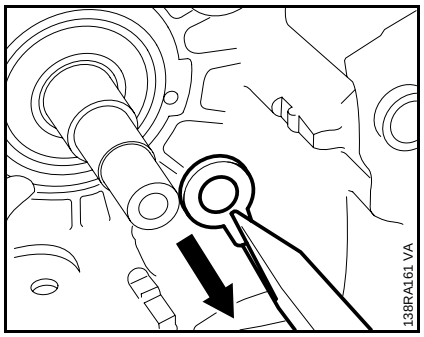
Important:
Always replace any damaged parts.



– Flush out the oil tank.

- Wash the strainer (2) and connector (1) in white spirit and blow out with compressed air.

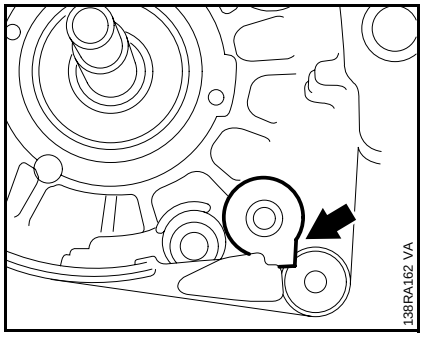
Reassemble in the reverse sequence.



– Remove the pickup body - see 11.1.

– Remove the oil pump - see 11.4.

- Grip the tab of the suction hose and pull it out of the crankcase.

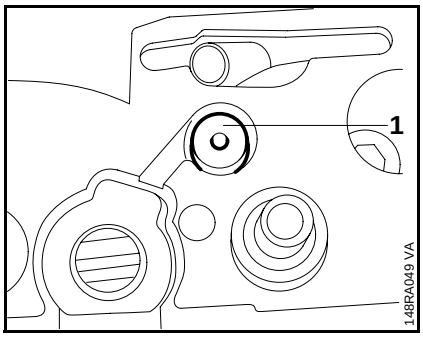


- Use a blunt tool to push the suction hose into the crankcase so that the tab locates it its seat at the bottom right.

– Fit the pickup body - see 11.1.

– Install the oil pump - see 11.4.

11.3 Vent Valve

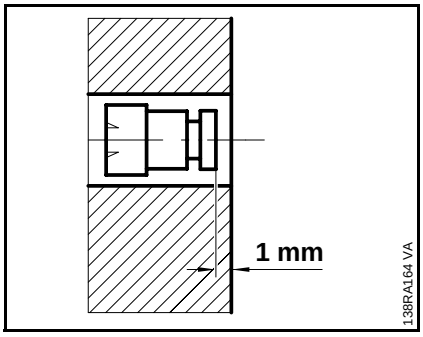


A valve (1) is installed in the tank wall to keep internal tank pressure equal to atmospheric pressure.

– Remove the inner side plate - see 4.2

– Drain the oil tank.

- Use a 7 mm drift to carefully drive the vent valve (1) into the crankcase and take it out of the oil tank.

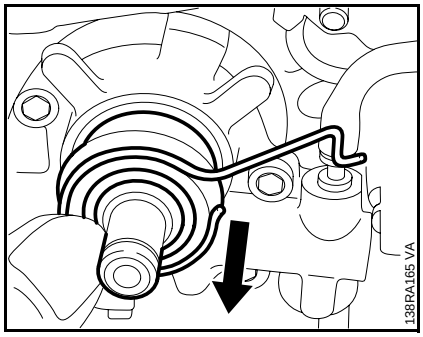


- Carefully press in the new valve until it is about 1 mm below the face of the crankcase.

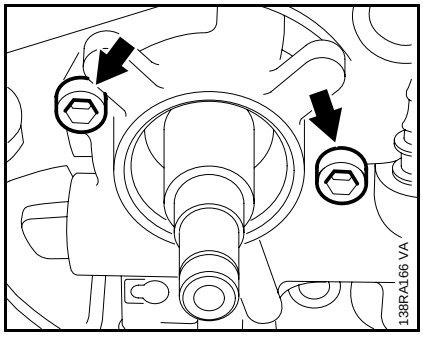
– Fit the inner side plate - see 4.2.

– Remove the brake band - see 4.4.1 and 4.5.1.

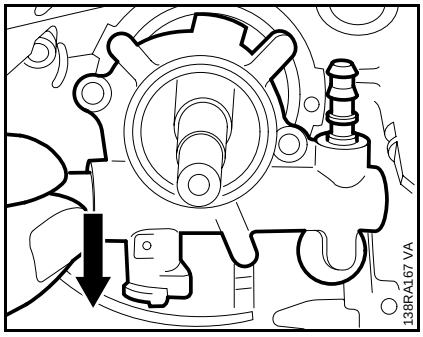
– Remove the clutch - see 4.3.



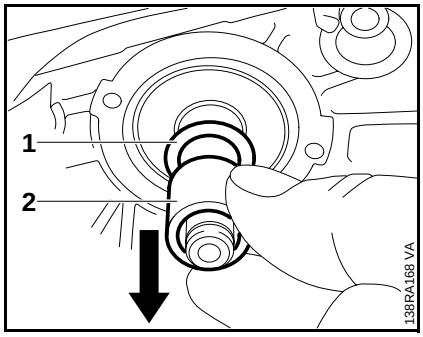
● Rotate the worm and drive spring clockwise and pull them off the crankshaft stub.



● Take out the oil pump mounting screws.

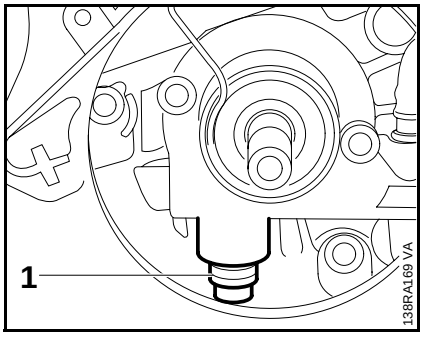


● Carefully pry the oil pump off its seat and lift it away.



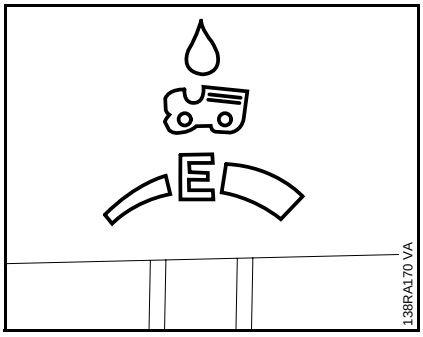
● Pull the ring (1) off the crankshaft stub and remove the washer (2).

Note:
To remove the oil delivery hose it is necessary to pry the sleeve out of the bar mounting flange. The hose is damaged in this process and must be replaced.



A new oil pump version is installed from machine serial number ↦ X 20 239 583. This new oil pump can also be installed in older machines.

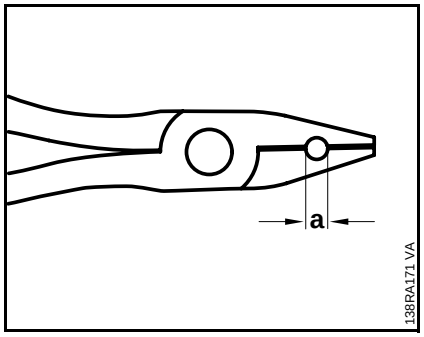
● The adjustment range of the oil quantity control bolt (1) between minimum and maximum oil flow has been reduced from 720 degrees (2 turns) to 90 degrees (1/4 turn).



● Setting the oil pump to the ***E*** matic position "***E*** " is the most economic position under normal operating conditions using a STIHL ***E*** matic guide bar.

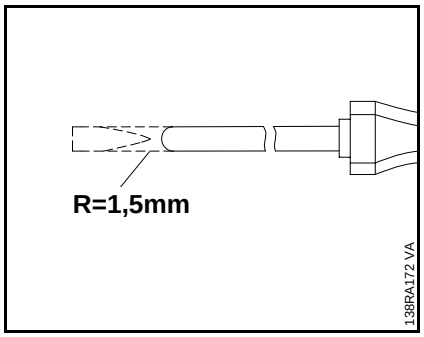
Install in the reverse sequence.

Note:
Pay special attention to the following points:



- Cut new oil delivery hose to a length of 74 mm and coat the ends with oil. Use modified flat nose pliers (a = 5,5 mm) to fit the oil delivery hose on the oil pump nipple.

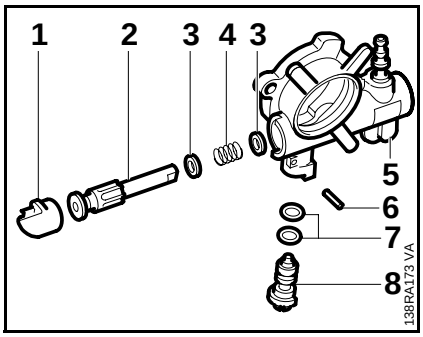
– Push the oil delivery hose through the bore in the bar mounting flange (from the inside outwards) and allow it to project about 10 - 20 mm. If the hose cannot be pushed through on older machines, drill out the bore to a diameter of 6.2 mm and deburr carefully.



- Hold the projecting end with the modified flat nosed pliers. Now push home the sleeve with the modified carburetor screwdriver (R = 1.5 mm).

– Place oil pump in installed position. Use modified carburetor screwdriver to push hose into bar mounting flange so that it is recessed about 1-2 mm.

– Insert oil pump mounting screws and tighten them down firmly (see "Tightening Torques").



Always check the suction hose and pickup body before disassembling the oil pump.

– Remove the oil pump - see 11.4.

- Use a 2 mm drift to drive out the spring pin (6). Pull the control bolt (8) out of the housing (5) and remove the O-rings (7).

Note:
The previous pump has an adjusting screw which must be unscrewed clockwise.

- Pry the plug (1) out of housing (5) and remove the pump piston (2) with spring (4) and washers (3).

- Wash all part in white spirit. Inspect parts for damage and replace as necessary.

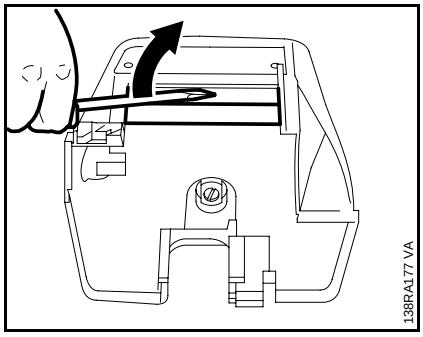
Reassemble in the reverse sequence.

Note:
Always install new O-rings. Coat pump piston and worm with grease, see 13.2, before installing.

The air filter's function is to remove dust and dirt sucked in with the combustion air and thus help reduce wear on engine components to a minimum.

Note:
Older machines have a prefilter in the carburetor box cover which is not fitted in newer machines with compensator (on carburetor). Apart from the carburetor box cover, the air filter was also modified on machines with compensator. The components of the new air filter system (air filter, end cover with compensator stub and carburetor box cover) can only be installed in model 036 from serial number ↦X 32 185 626 and only as a complete assembly.

– Before removing the air filter, close the choke shutter to prevent dirt falling into the carburetor.



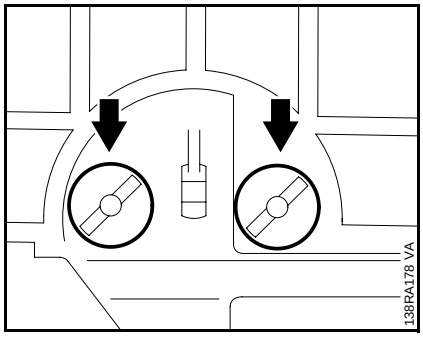
Removing the prefilter (034, 036):

– Remove the carburetor box cover.

– Remove grommet from carburetor box.

● Insert a screwdriver between the prefilter and carburetor box cover and lever the prefilter out of the retainer.

– Pull the prefilter out of the guides in the carburetor box cover.



Removing the main filter:

– Remove the carburetor box cover.

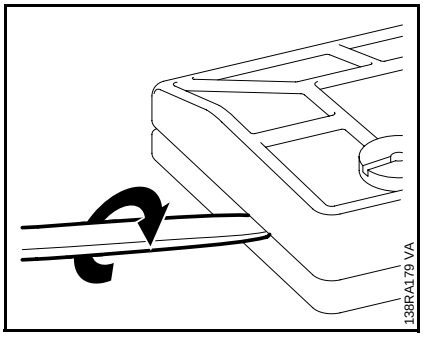
– Clean away any loose dirt from around the filter.

● Unscrew the two slotted nuts so that the filter can be pulled off the collar studs.

Cleaning the prefilter and main filter:

Coarse dirt is retained by the wire mesh prefilter in the carburetor box cover.

Note:
The air filter consists of two parts.



● Insert a screwdriver (combination wrench) in the slot at the side of the filter. Twist the screwdriver to separate the two halves.

– For daily cleaning it is sufficient to clean the two halves of the main filter and the prefilter with a soft brush.

– If heavily plugged with dirt, wash the prefilter and main filter in fresh white spirit and blow out with compressed air - if available.

Note:
Do **not** clean flocked air filters with compressed air, brushes or rags.

If the wire mesh (or flocked coating) is damaged, immediately replace the part of the filter concerned.

Installing the prefilter (034, 036):

– Slide the prefilter in the guides in the carburetor box cover and make sure its snaps into position.

Installing the main filter:

– Assemble the two halves of the main filter.

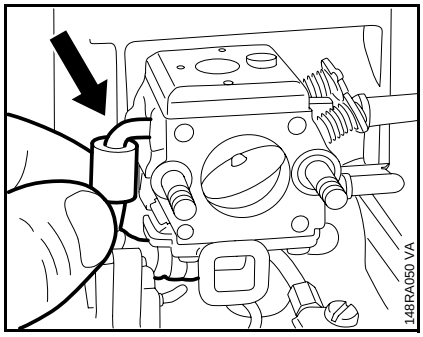
– Fit the filter over the two collar studs and tighten down the slotted nuts firmly (see "Tightening Torques")

– Fit the carburetor box cover, see also 4.3, and secure by turning the twist lock one quarter turn to the right.

Troubleshooting chart - see "Standard Repairs, Trouble-shooting" handbook.

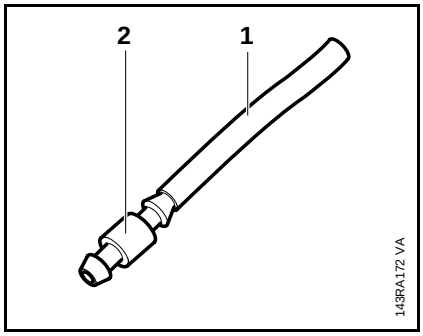
Important:
In the case of problems with the carburetor or fuel supply system, also check and clean the tank vent - see 12.6.

The carburetor can be tested for leaks with the carburetor and crankcase tester 1106 850 2905.

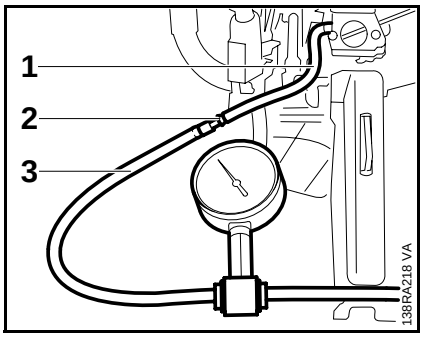


– Remove the air filter - see 12.1.

● Pull fuel hose off the carburetor's elbow connector.



● Push fuel hose 1110 141 8600 (1) onto one end of the nipple 0000 855 9200 (2). Connect nipple to tester's pressure hose.



● Push fuel hose (1) with nipple (2) and tester (3) onto carburetor's elbow connector.

– Close the vent screw on the rubber bulb.

– Squeeze rubber bulb to pump air into the carburetor until the pressure gauge shows a reading of approx. 0.4 bar.

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

1. The inlet needle is not sealing (foreign matter in valve seat or sealing cone of inlet needle is damaged (see 12.4) or inlet control lever sticking).

2. The metering diaphragm is damaged.

In either of these cases the carburetor must be serviced.

– After completing the test, open the vent screw and pull the fuel hose off the carburetor.

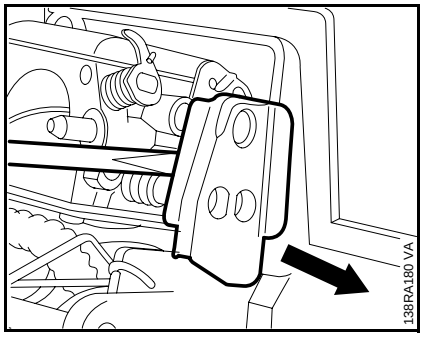
Reassemble in the reverse sequence.

Repeat the leakage test after finishing repairs.

The all-position diaphragm carburetor consists of a fuel pump and the actual carburetor. Although the fuel pump shares a common housing with the carburetor, it operates as a completely separate and independent unit.

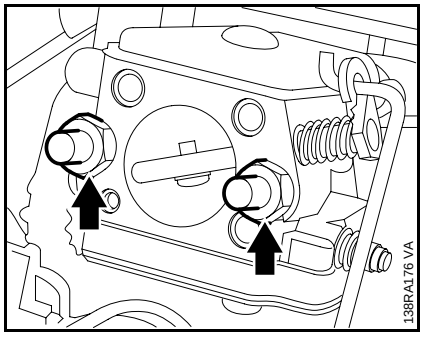
Troubleshooting chart - see "Standard Repairs, Trouble-shooting" handbook.

– Remove the air filter - see 12.1



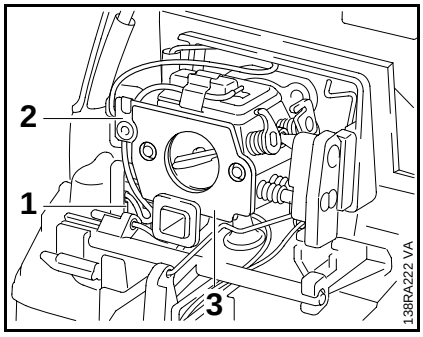
● Lever the grommet off the carburetor adjusting screws.

– Detach the throttle rod and choke lever.



– Pull the fuel hose off the carburetor's elbow connector.

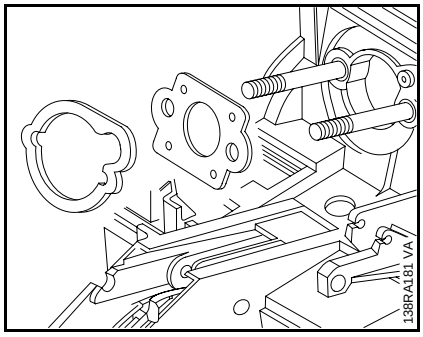
● Unscrew the carburetor mounting nuts.



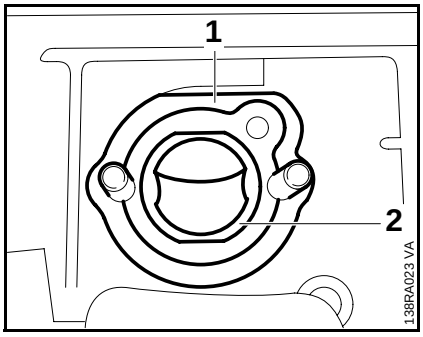
● On machines with a carburetor heating system, first pull the thermostatic switch's flag connector (1) off the contact spring and then remove heater plate (3) and heating element (2) from the collar studs and leave them to one side.

– Pull the carburetor off the collar studs.

Install in the reverse sequence.



Note:
The gasket is not fitted on machines from ↦ X 18 892 140 which are equipped with a Zama carburetor. The gasket must still be installed on Tillotson carburetors.



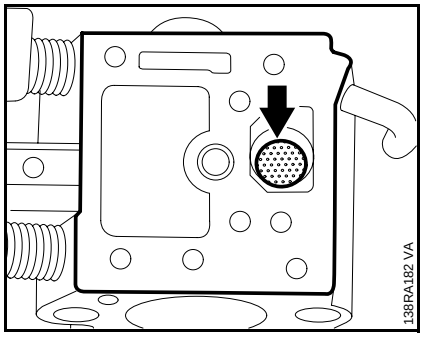
Note:
● Check that sleeve (2) (in manifold) and washer (1) are in place before fitting the carburetor (new version).

– Tighten down the mounting nuts (see "Tightening Torques").

– Remove the carburetor - see 12.3

It is advisable to check the serviceability of the fuel pump whenever the carburetor is removed for repair.

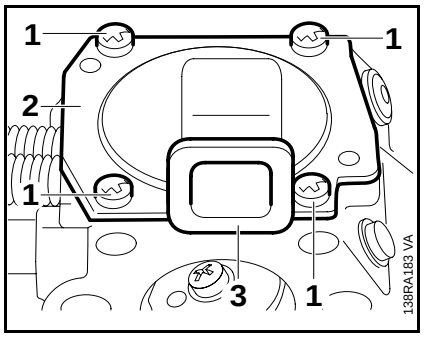
– Inspect pump diaphragm - see "Carburetors" handbook, chapter 7.3, Pump Diaphragm



Note:
If the fuel strainer (arrow) in the pump side of the carburetor body is dirty, use a scriber to pry it out and then clean it.

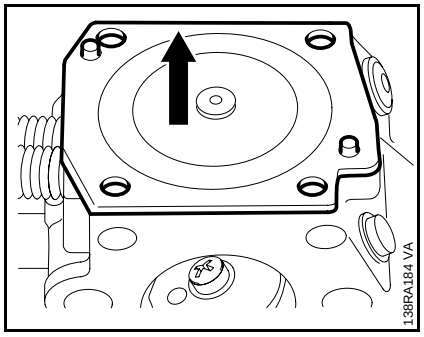
Important:
If the fuel strainer is damaged, fit a new one.

– If the strainer is dirty, also check the fuel pickup body and replace it if necessary - see 12.7.



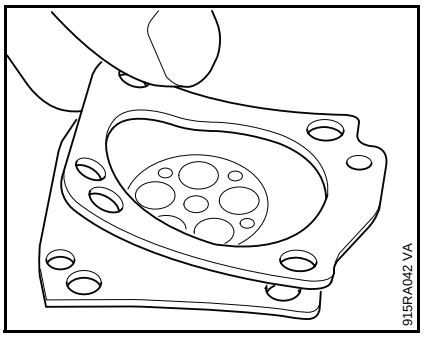
● To disassemble the carburetor, take out the screws (1) of the metering chamber end cover (2) and lift away the cover.

Note:
There is no compensator stub (3) on the end cover (2) of older carburetors installed in model **034** ➞ 1 45 945 205 and model **036** ➞ X 32 622 640.



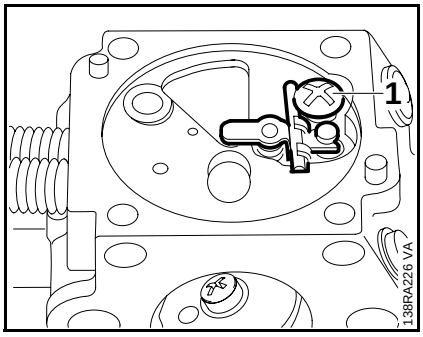
● Remove the metering diaphragm and gasket from the carburetor body or the end cover.

Note:
If the gasket and diaphragm are stuck, remove them very carefully.

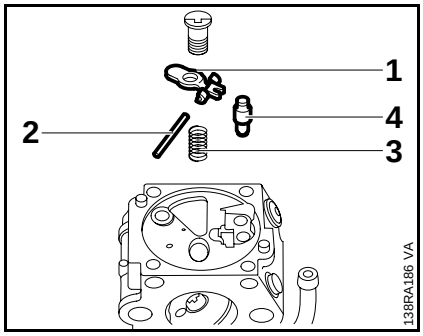


● Carefully separate the diaphragm and gasket.

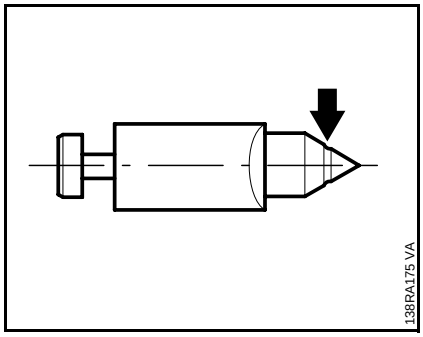
Note:
The diaphragms are the most delicate parts of the carburetor. They are subjected to continuous alternating stresses and the material eventually shows signs of fatigue, i.e. the diaphragms distort and swell. Check and replace if necessary.



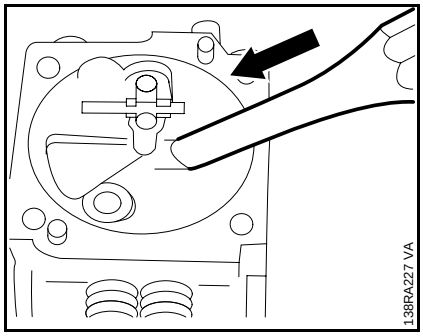
● The inlet needle valve is located in a recess in the metering diaphragm chamber. Remove the round head screw (1).



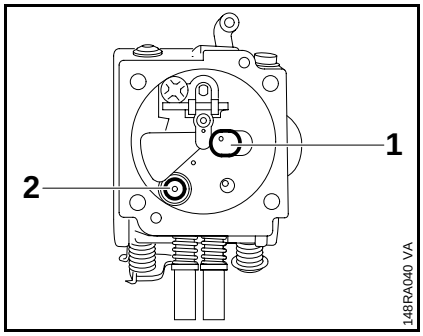
- Remove the inlet control lever (1) with spindle (2), spring (3) and inlet needle (4).



- If there is an annular indentation on the sealing cone of the inlet needle, it will be necessary to replace the inlet needle because it will no longer seal properly.



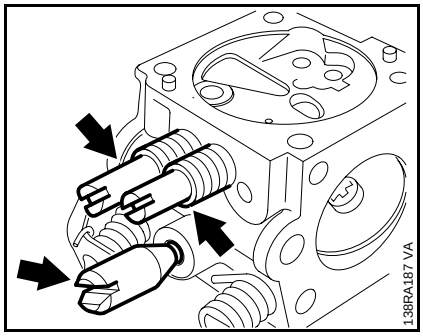
- Use a suitable drift to press the valve jet out of its seat, from outside in the direction of the venturi, and wash it in white spirit.



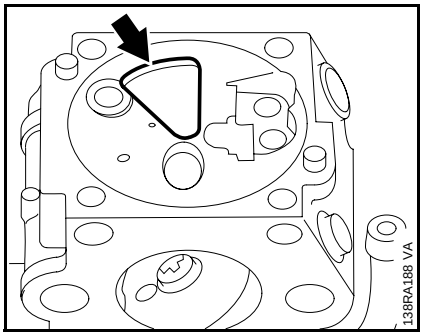
- A part-load fixed jet (2) is installed in addition to the valve jet (1) in machines from ➡X 35 047 484. It helps prevent the mixture becoming over-lean in the part-load range.

- As the part-load fixed jet (2) cannot be removed, blow it out with compressed air.

Note:
Owing to differences in calibration, the old versions of valve jets, high speed and low speed adjusting screws must not be installed in carburetors with a part-load fixed jet (see also parts list).



- Remove the carburetor adjusting screws.



- Use a drift to press the center of the sealing plate down until it buckles and can be removed.

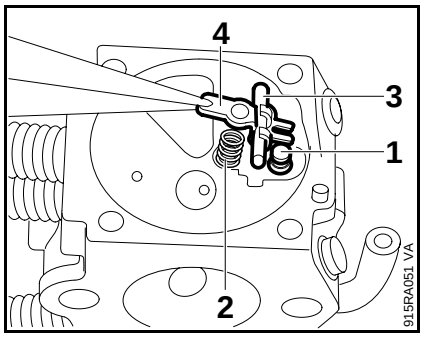
Caution:
The sealing plug is destroyed during removal. Remove it only if a replacement is available.

– Wash the carburetor body and all serviceable parts in fresh white spirit and blow clear with compressed air, paying special attention to the bores and ports.

– Fit the new sealing plate, curvature facing up, in the bore and use a large diameter drift to carefully press it flat.

– When inserting the valve jet, make sure it is exactly vertical in the bore.

– Press the jet home until it is flush with the metering chamber.

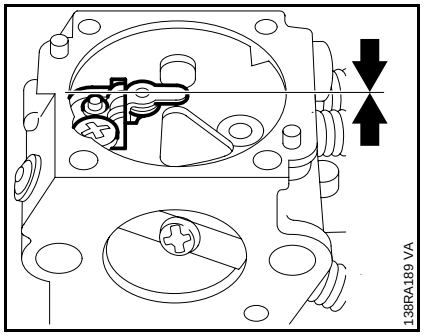


- Fit the inlet needle (1).
- Fit spring (2) in bore.
- Insert spindle (3) in the inlet control lever (4).

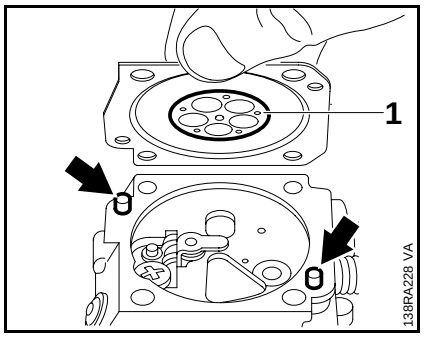
– Engage clevis in annular groove on head of the inlet needle.

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

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



Important:
The upper edge of the inlet control lever must be flush with the top of the carburetor body. If this is not the case, install a new inlet control lever.



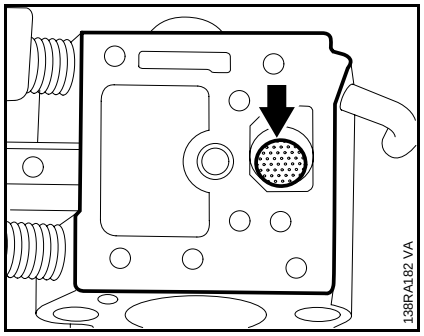
– Place the gasket on the carburetor body.

- Fit the metering gasket with the perforated plate (1) facing the inlet control lever.

– Fit the end cover.

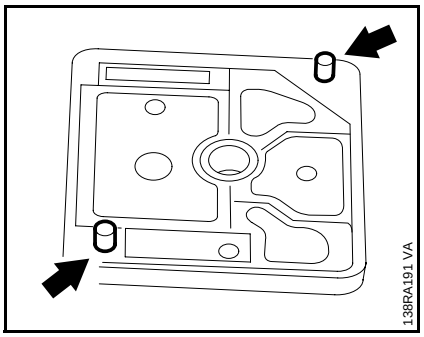
Note:
The gasket, metering diaphragm and end cover are held in position by the pegs (arrow) on the carburetor body.

– Insert the collar screws and tighten them down firmly.

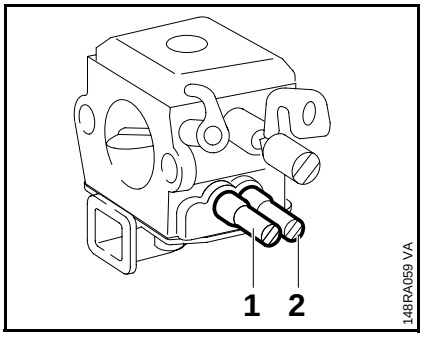


- Insert the fuel strainer at the pump side.

– Fit the pump diaphragm, gasket and end cover and tighten down firmly.



Note:
The pump diaphragm and gasket are held in position by the pegs (arrow) on the cover.

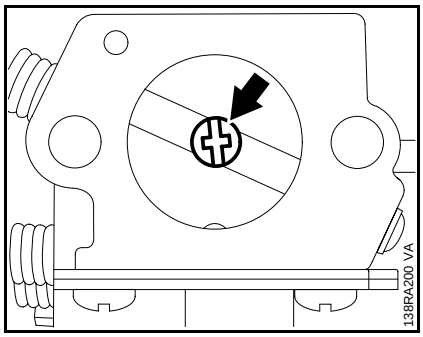


- Thoroughly clean the high speed screw (1) and low speed screw (2). Coat threads of screws (not the first two or three turns) with LOCTITE 221, see 13.2.

Caution:
Do not apply adhesive to the first two or three turns of the screw threads. Adhesive must not enter the carburetor.

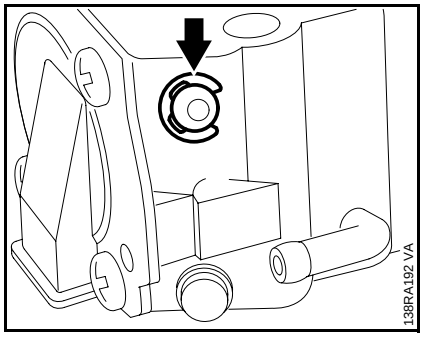
– Fit adjusting screws in the carburetor.

– Carry out leakage test after installing carburetor.

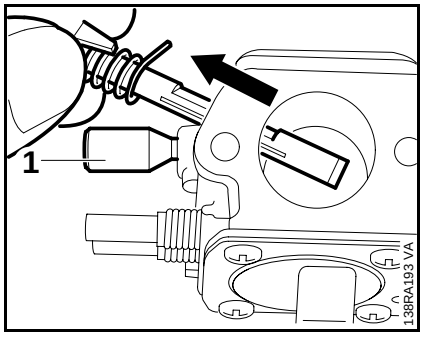


Removing the throttle shaft:

- Unscrew the throttle shutter fastening screw and pull the shutter out of the throttle shaft.



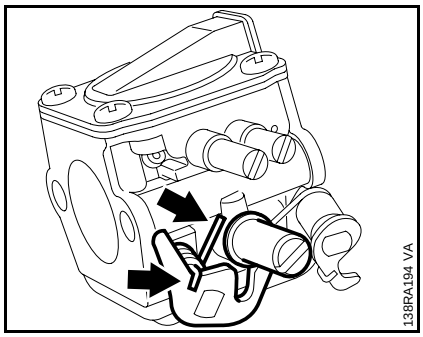
- Ease the E-clip off the throttle shaft.



- Pull the throttle shaft out of the carburetor.

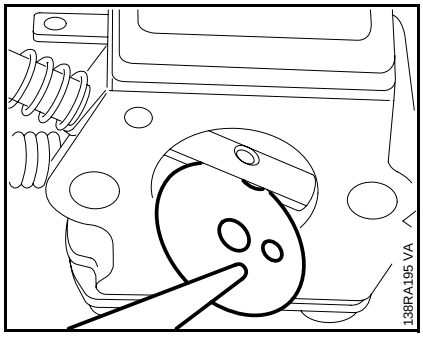
– Remove the torsion spring.

- Take out the idle speed screw (1).



- Fit the throttle shaft with torsion spring and secure with E-clip.

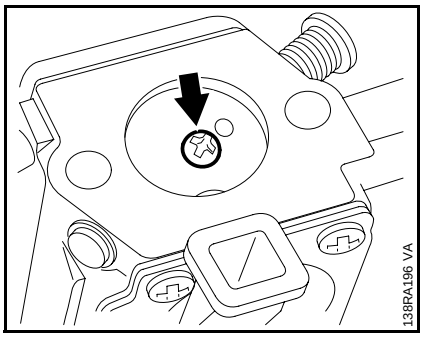
- Fit the idle speed screw and check that torsion spring is correctly positioned.



- Fit the throttle shutter, round notch first, in the throttle shaft.

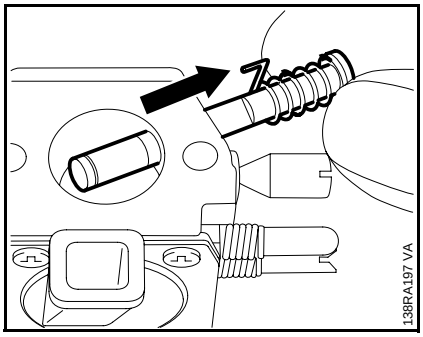
Note:
Whole circumference of throttle shutter must locate against choke tube wall.

– Coat the throttle shutter fastening screw with LOCTITE 270, see 13.2, and tighten down firmly.



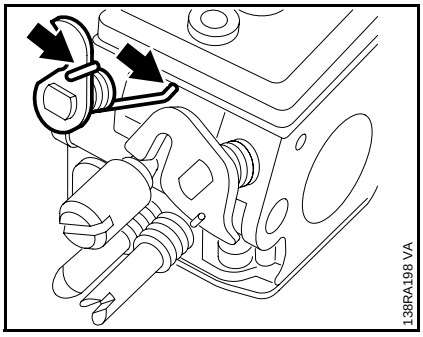
Removing the choke shaft:

- Unscrew the choke shutter fastening screw.



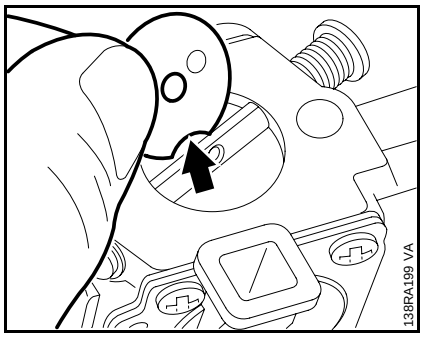
- Ease the E-clip off the choke shaft and pull the shaft out of the carburetor.

– Remove the torsion spring.



- After fitting the choke shaft, check that torsion spring is correctly positioned.

– Fit the E-clip.

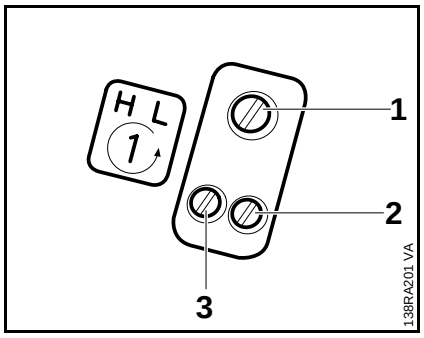


- Fit the choke shutter, round notch first, with the small bore facing the choke lever.

Note:
When choke shutter is closed, its whole circumference must locate against choke tube wall.

– Coat the fastening screw with LOCTITE 270, see 13.2, and tighten down firmly.

– Install the carburetor - see 12.3



1 = Idle speed screw
2 = Low speed screw
3 = High speed screw

Note:
Carry out carburetor adjustments only after warming up the engine and cleaning the air filter.

The carburetor comes from the factors with a **standard setting**.

This is the optimum setting of the high speed screw under the barometric pressure and climatic conditions at the factory (300 m above sea level).
It ensures the machine will deliver maximum power, be fuel efficient and operate reliably.

Standard setting

H = High speed screw opened 1 full turn.
L = Low speed screw opened 1 full turn.

– If the carburetor has to be adjusted from scratch, first carry out the standard setting.

If it is not possible to check the maximum permissible engine speed (13,000 rpm with bar and properly tensioned chain), do not turn the high speed screw beyond the standard setting to make the mixture leaner.

Caution:
The setting of the high speed adjusting screw affects not only the engine's performance but also its maximum off-load speed. If the setting is too lean (adjusting screw turned too far clockwise), the maximum permissible engine speed will be exceeded and increase the risk of engine damage due to a lack of lubricant and overheating.

If the saw is used at high altitudes (mountains) or near sea level it may be necessary to correct the setting. Carry out the correction with the two adjusting screws:

– Turn clockwise (leaner) at high altitudes.

– Turn counterclockwise (richer) at sea level.

Caution:
Even slight changes to the adjusting screws have a noticeable effect on engine running behavior.

Adjusting idle speed

Engine stops while idling:

– Turn idle speed screw clockwise until the chain begins to move.

– Then back off the screw one quarter turn.

Chain runs while engine is idling:

– Turn idle speed screw counter-clockwise until the chain stops running.

– Then turn the screw about another quarter turn in the same direction.

Erratic idling behavior, poor acceleration:

– Idle setting too lean. Turn the low speed screw counterclockwise until the engine runs and accelerates smoothly.

Exhaust smokes at idle speed:

– Idle setting too rich. Turn the low speed screw clockwise until engine speed drops.

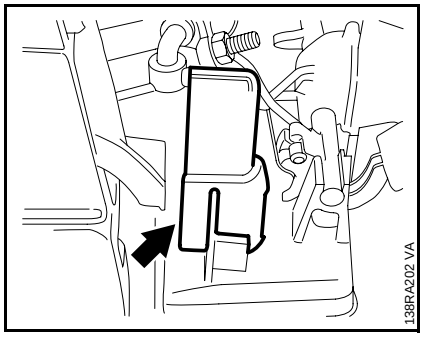
– Then turn it back one quarter turn from that position.

– Check that the engine accelerates smoothly when the throttle is opened.

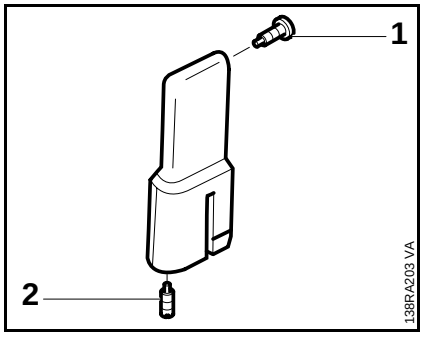
Correct operation of the carburetor is only possible if atmospheric pressure and internal fuel tank pressure are equal at all times. This is ensured by the tank vent.

Important:
In the event of trouble with the carburetor or the fuel supply system, always check and clean the tank vent.

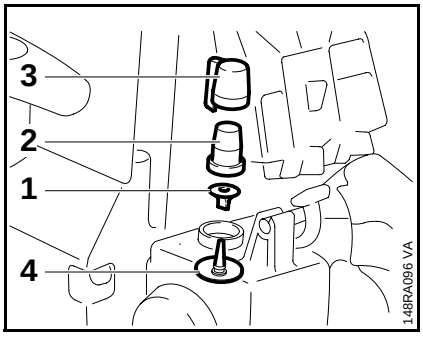
– Remove the air filter - see 12.1



● On older tank housings (up to serial number →I X 32 185 626) remove the original type tank vent (arrow) by pulling it upwards.



● Take out the pan head screw (1) and the grub screw (2).
When assembling the tank vent, make sure the grub screw is fitted squarely.



● On machines from serial number I→X 32 185 626, pull off the cap (3) and filter (2) vertically.

● Inspect previous valve (1), or new valve (4), for damage and, if necessary, replace as follows:

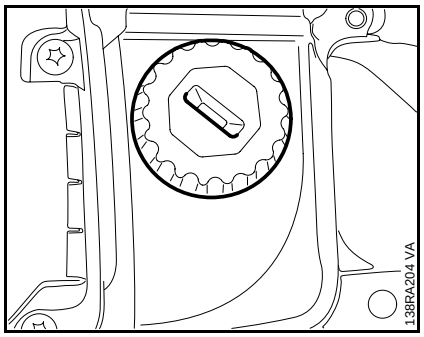
Pull the previous valve (1) out of the tank housing from outside and install it from outside.

In case of new valve (4), first drain the fuel tank. Then pull the valve out of the tank housing from inside. Install new valve from inside the fuel tank, and carefully pull the stem from outside until the valve is properly seated.

– Wash all parts in clean gasoline and blow clear with compressed air.

Reassemble in the reverse sequence.

Note:
Overpressure may occur in the fuel tank (e.g. due to heat build-up or exposure to sunlight). Always open the tank cap carefully so as to allow any pressure build-up to release slowly.



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:
In the event of trouble with the fuel supply system, always check the fuel tank and the pickup body first. Clean the fuel tank if necessary.

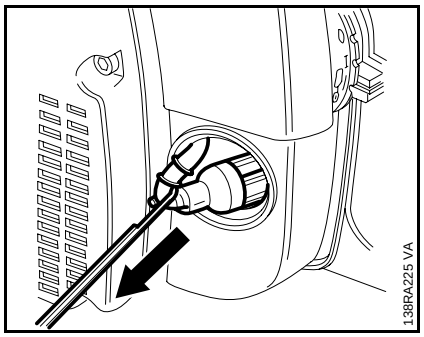
Cleaning the fuel tank:

- Unscrew the filler cap and drain the tank.

– Pour a small amount of clean gasoline into the tank.

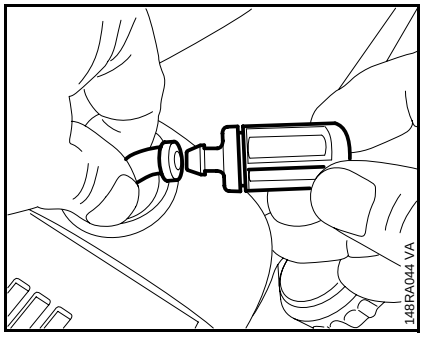
– Close the tank and shake the saw vigorously.

– Open the tank again and drain it.



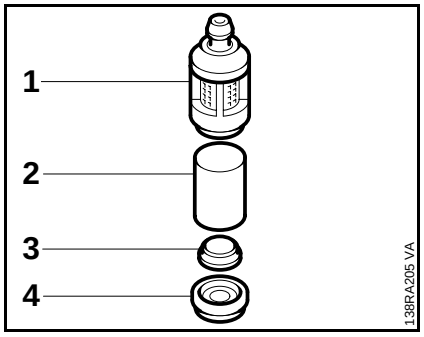
Removing and installing the pickup body:

- Use the hook 5910 893 8800 to pull the pickup body out through the fuel tank filler opening.



- Pull the pickup body off the fuel hose.

- Replace the new type pickup body (once piece).



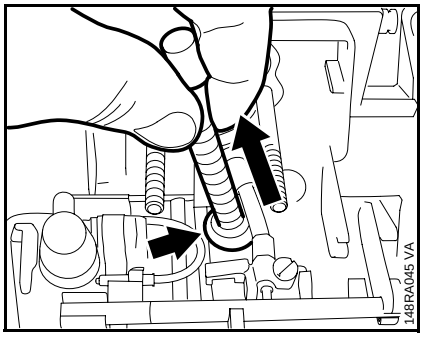
- In case of original type pickup bodies, remove the cap (4) from the pickup body (1) and take out the weight (3).

- Take the filter (2) out of the pickup body.

Caution:
The fine mesh strainer on the pickup body must not be damaged. It can be washed in white spirit.

Note:
It is not advisable to clean the filter (2) - always fit a new one. The foam filter must be fitted without creases or twists.

Install in the reverse sequence.



Removing the suction hose:

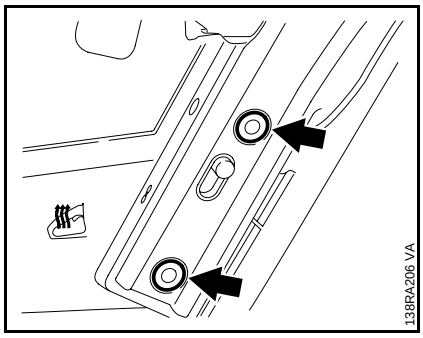
– Remove the carburetor - see 12.3.

– Pull the pickup body off the suction hose.

- Pull the suction hose out of the tank housing.

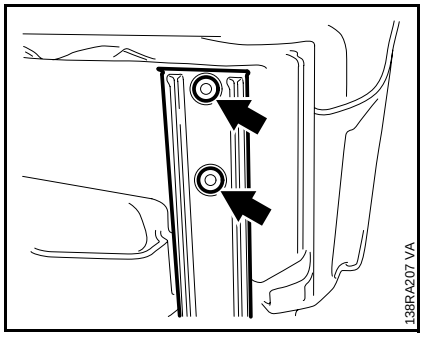
Install in the reverse sequence.

Note:
Coat the hose flange with a little oil to simplify installation. The flat face of the hose flange must be seated on the tank housing.



– Drain the tank housing.

● Remove mounting screws from side of front handle.

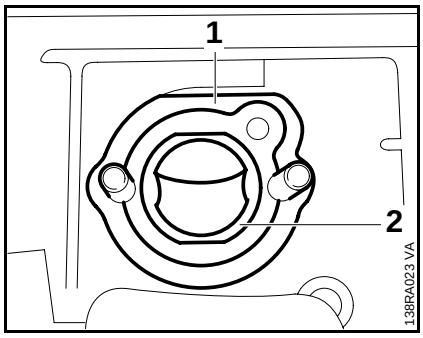


● Remove mounting screws from underside of front handle. Lift away the handle.

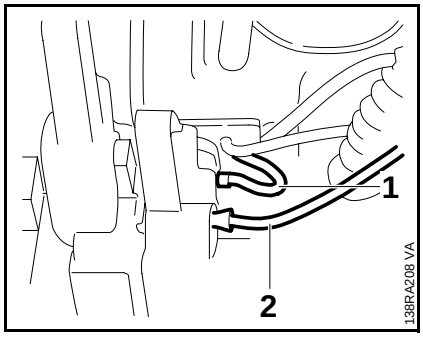
Note:
To remove front handle on machines with handle heating see 10.4.

– Remove the carburetor - see 12.3.

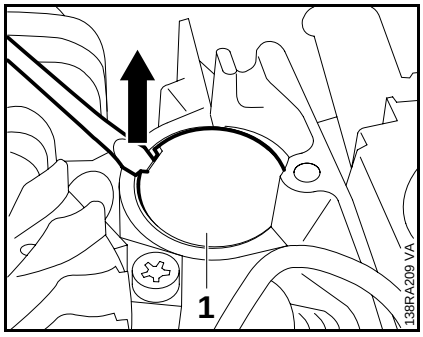
– Remove the shroud - see 4.3.



● Pull the washer (1) off the studs and remove the sleeve (2) from the manifold.

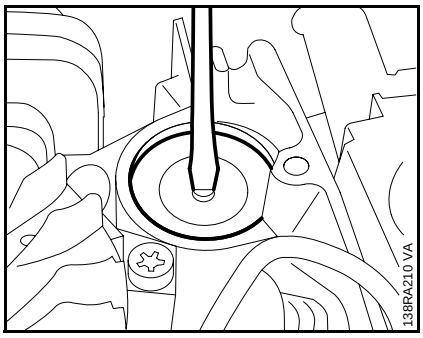


● Pull the connector sleeves of the short circuit wire (2) and ground wire (1) off the contact springs.



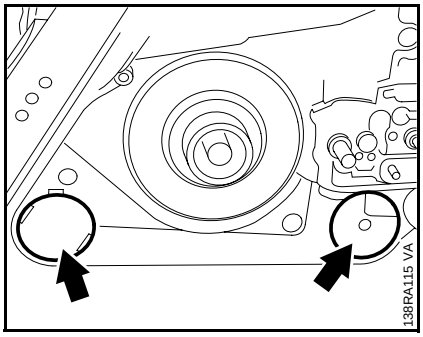
– Remove the fan housing - see 6.4.1.

● Pry the plug (1) out of the annular buffer at the ignition side.



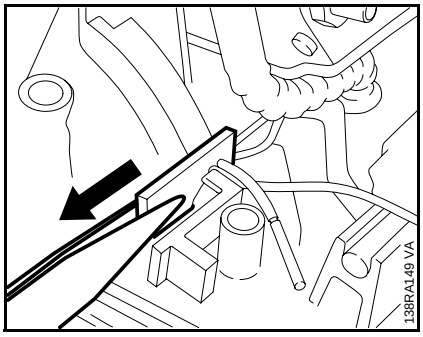
● Remove the annular buffer mounting screw.

– Remove the chain catcher - see 4.2.

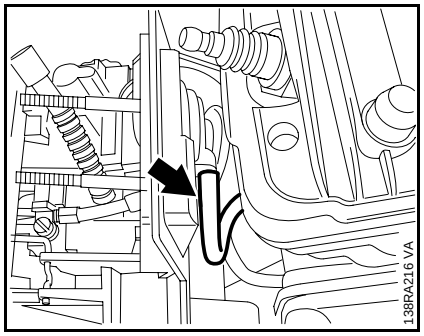


● Pry the plugs out of the annular buffers at the starter side.

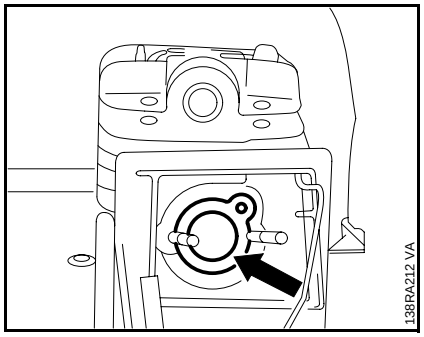
– Remove annular buffer mounting screws.



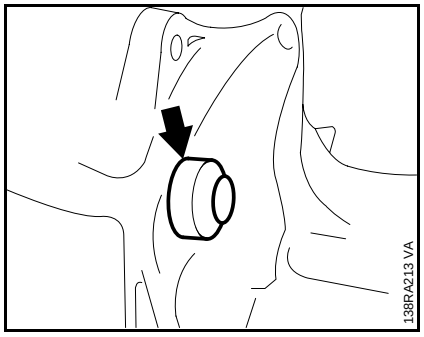
● Pull the grommet with ground and short circuit wires out of the crankcase.



- Pull the impulse hose off the nipple.

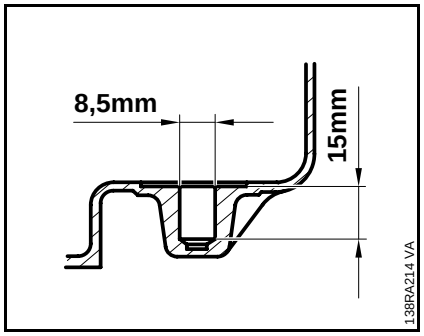


- Pull the tank housing forward and push the manifold flange out of the tank housing intake opening at the same time.



- Pry out the rubber buffer on the inside of the crankcase.

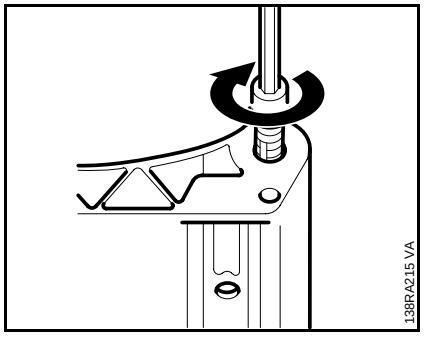
Reassemble in the reverse sequence.



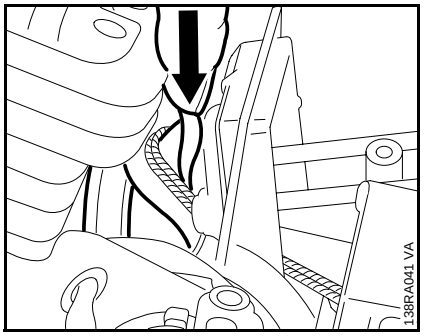
Note:
If a screw thread is stripped in one of the mounting holes for special self-threading screws, the tank housing can be repaired by installing a thread insert. The stripped thread must be drilled out to a diameter of 8.5 mm and a depth of 15 mm.

Important:
Do not exceed the specified hole depth of 15 mm.

– Fit M6x10 screw with washer in the thread insert.

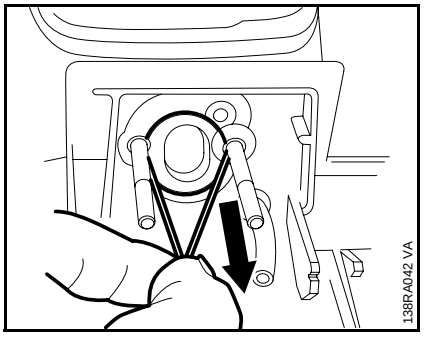


- Screw the thread insert into the tank housing. Use an M6x18 pan head screw in place of the original special self-threading screw.



In order not to damage the manifold when fitting it through the tank housing intake opening, use the following procedure:

- Wind a piece of string (approx. 15 cm long) around the back of the manifold flange, then press the manifold downward and pass the ends of the string through the intake opening.



- Push the tank housing against the manifold and pull the ends of the string outward at the same time.

No.	Part Name	Part No.	Application
1	Locking strip	0000 893 5903	Blocking the crankshaft
2	Press sleeve	1118 893 2401	Installing oil seal (clutch side)
3	Press sleeve	1121 893 2400	Installing oil seal (ignition side)
4	Puller	5910 890 4400	Removing oil seals
5	- Jaws (No. 3.1 + 4)	0000 893 3706	(for clutch side only)
6	Assembly sleeve	1118 893 4602	Oil seal (clutch side)
7	Puller	1110 890 4500	Removing flywheel
8	Crimping tool	5910 890 8210	Attaching connectors to electric wires
9	Assembly drift	1110 893 4700	Fitting the piston pin
10	Clamping strap	0000 893 2600	Compressing piston rings
11	Wooden assembly block	1108 893 4800	Fitting piston
12	Carburetor and crankcase tester	1106 850 2905	Testing crankcase and carburetor for leaks
13	Vacuum pump	0000 850 3501	Testing crankcase for leaks
14	- Nipple	0000 855 9200	
15	- Hose	1110 141 8600	
16	Sealing plate	0000 855 8106	Sealing exhaust port for leakage test
17	Flange for leakage test	1128 850 4200	Leakage test
18	Setting gauge	1111 890 6400	Setting air gap between ignition module and flywheel
19	Socket, 13 mm	5910 893 5608	Crankshaft nut
20	Socket, 19 mm	5910 893 5612	
21	Torque wrench	5910 890 0301	
22	Torque wrench	5910 890 0311	
23	Screwdriver bit T27x125	0812 542 2104	IS (spline socket head) screws
24	Assembly hook	5910 893 8800	Removing pickup bodies
25	Installing tool	5910 890 2210	Fitting hookless snap rings in piston
26	Press arbor	1120 893 7200	Removing crankshaft bearing at ignition side
27	Press arbor	1118 893 7200	Installing crankshaft bearings
28	Assembly hook	5910 890 2800	Detaching springs from clutch shoes
29	Installing tool	0000 890 2201	Flaring rope guide bush
30	Assembly tube	1117 890 0900	Attaching the brake spring
31	Centering tool	1118 893 3500	Centering the heating generator
32	Service tool AS (set)	5610 007 2205	Removing the crankshaft (clutch side)
33	Service tool ZS (set)	5910 007 2200	Removing the crankshaft (ignition side)
34	T-handle screwdriver QI-5x150	5910 890 2400	For all IS screws
35	Stud puller MS	5910 893 0501	Removing bar mounting studs
36	Puller	1107 890 4500	Removing generator centering tool
37	Ohmmeter		
38	Thrust piece (sleeve)	1107 894 1000	Protecting crankshaft thread

No.	Part Name	Part No.	Application
1	Lubricating grease (Mobilplex)	0781 120 1111	Oil seals, oil pump drive, chain sprocket bearing, bearing and sliding points of throttle trigger, switch lever, brake lever and interlock lever
2	Medium-strength threadlocking adhesive (LOCTITE 243)	0786 110 0101	Securing screws, see "Tightening Torques"
3	High-strength threadlocking adhesive (LOCTITE 270)	0786 110 0109	Securing screws, see "Tightening Torques"
4	High-strength threadlocking adhesive up to 250°C (LOCTITE 272)	0786 110 0128	Securing screws, see "Tightening Torques"
5	High-strength threadlocking adhesive (LOCTITE 649)	0786 110 0126	Securing screws, see "Tightening Torques"
6	Standard commercial, solvent based degreasant containing no chlorinated or halogenated hydrocarbons		Cleaning crankshaft stub
7	STIHL special lubricant	0781 417 1315	Bearing bore in rope rotor, rewind spring
8	Electrician’s repair kit	5910 007 1050	Electrical system
9	Sealing paste	0783 810 1101	Manifold, crankcase gasket
10	Sealant (LOCTITE 221)		High speed and low speed adjusting screws
11	Graphite grease		Pawls in rewind starter
12	Molybdenum grease (e.g. Molykote)		Sliding and bearing points of brake levers
13	Ignition lead HTR (10 m)	0000 930 2251	