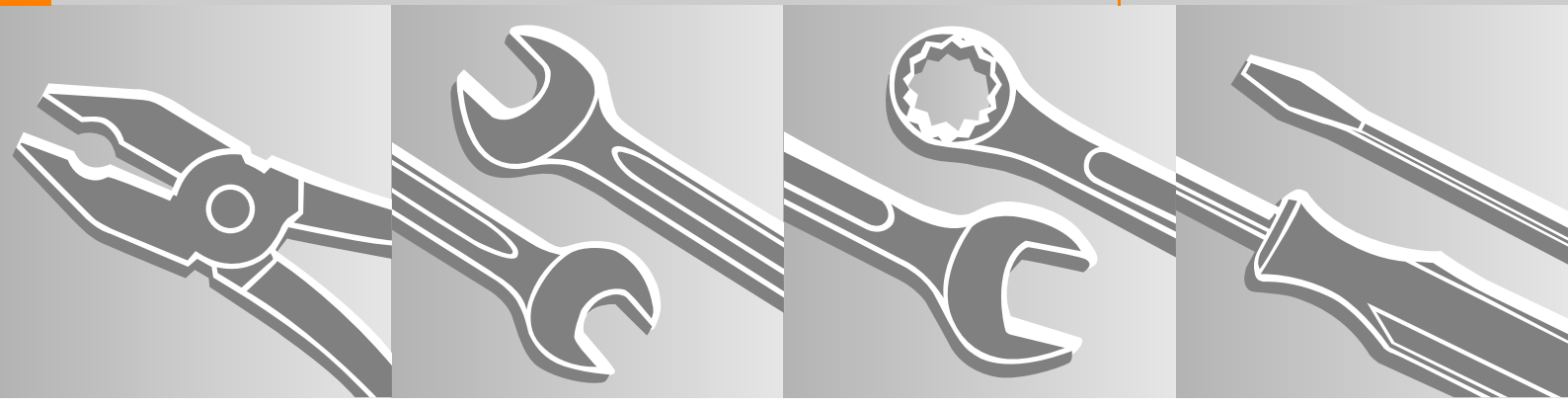
STIHL 024, 026

2004-08



CONTENTS

1. SAFETY PRECAUTIONS

If the engine is started up in the course of repairs or maintenance work, observe all local and country-specific safety regulations as well as the safety precautions and warnings in the 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 or flame near the fuel. All work with fuel must be performed outdoors only. Spilled fuel must be wiped up immediately.

Wash hands thoroughly after every contact with waste oil.

Do not pour waste oil down the drain or allow it to soak into the ground.

Collect waste oil and take it to an official disposal site for environment-friendly disposal.

STIHL®

This service manual contains detailed descriptions of all the repair and servicing procedures specific to this power tool series. There are separate handbooks for servicing procedures for 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.

As the design concept of model 024 and 026 chainsaws is almost identical, the descriptions and servicing procedures generally apply to both. Differences are described in detail.

Servicing procedures on the carburetor are described in the "Carburetors" handbook.

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

Refer to the latest edition of the relevant parts list to check the part numbers of any replacement parts needed.
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, Troubleshooting" handbook.

Refer to the "Technical Information" bulletins for engineering changes which have been introduced since publication of this service manual. Technical information bulletins also supplement the parts list 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)

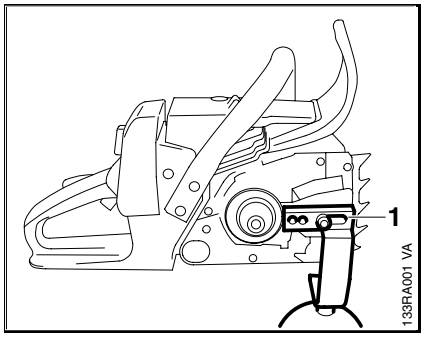
- = Action to be taken that is not shown in the illustration (above the text)

In the illustrations:

➡ = Pointer

➡ = Direction of movement

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



Servicing and repairs are made considerably easier if the machine is mounted on assembly stand (**1**) 5910 890 3100.

Remove the chain sprocket cover and secure the machine to the assembly stand with the sprocket cover nuts. Machines with a quick chain tensioning system and secure with one M8 nut and washer.

The complete unit 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 ®.
The symbol may appear alone on small parts.

3. SPECIFICATIONS

3.1 Engine

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

	024	024 S	026
Displacement:	42 cm^3 (2.56 cu.in)	44.3 cm^3 (2.70 cu.in)	48.7 cm^3 (2.97 cu.in)
Bore:	42 mm (1.65 in)	42 mm (1.65 in)	44 mm (1.73 in)
Stroke:	30 mm (1.18 in)	32 mm (1.26 in)	32 mm (1.26 in)
Engine power to ISO 7293:	2.1 kW (2.85 bhp) at 7,000 rpm	2.3 kW (3.1 bhp) at 7,000 rpm	2.6 kW (3.5 bhp) at 7,000 rpm
Max. permissible engine speed with bar and chain:	13,000 rpm	13,000 rpm	14,000 rpm
Idle speed:	2,500 rpm		
Bearings:	Crankshaft supported in heavy-duty deep-groove ball bearings, needle cages on small and big ends		
Piston pin diameter:	10 mm (0.39 in)		
Rewind starter:	Single pawl system		
Reserve pull on rope rotor:	min. 1/2 turn		
Starter rope:	3.5 mm (0.14 in) dia.		
Clutch:	Centrifugal clutch without linings		
Clutch engages at:	3,600 rpm		
Crankcase leakage test			
at gauge pressure:	0.5 bar (7.25 psi)		
under vacuum:	0.5 bar (7.25 psi)		

3.2 Fuel System

Carburetor:	Diaphragm carburetor
Setting	
High speed screw H:	approx. 1 turn open
Low speed screw L:	approx. 1 turn open (standard setting)
Carburetor leakage test	
at gauge pressure:	0.8 bar (11.6 psi)
Function of tank vent	
at gauge pressure:	≤ 0.3 bar (4.35 psi)
under vacuum: *	≤ 0.05 bar (0.725 psi)
Fuel tank capacity:	0.47 L (16 fl.oz)
Octane number:	min. 90 RON
Fuel mixture:	Regular brand-name gasoline and two-stroke engine oil
Mix ratio:	**50:1** with STIHL 50:1 two-stroke engine oil **25:1** with other brand-name two-stroke, air-cooled engine oils
Air filter:	Large area, bisectional flat filter, additional prefilter in carburetor box cover

* Original tank vent

3.3	**Ignition System**	Type:	Electronic magneto ignition (breakerless) with integral trigger unit
		Air gap:	0.2-0.3 mm (0.008-0.012 in)
		Spark plug (suppressed):	Bosch WSR 6F, NGK BPMR 7 A or Champion RCJ 6Y
		Electrode gap:	0.5 mm (0.020 in)
3.4	**Cutting Attachment**	Guide bars:	STIHL Rollomatic with nose sprocket, corrosion-resistant finish and induction hardened rails
		Bar lengths:	32, 37 and 40 cm (13, 15, 18 in)
		Oilomatic chain:	0.325" (8.25 mm) Rapid chain
		Chain sprocket:	7-tooth 0.325"
		Chain speed:	18.3 m/s (60 ft/s) at 9,500 rpm
		Chain lubrication:	Speed-controlled or adjustable reciprocating pump
		Oil feed rate on non-adjustable pump:	6 cm^3/min (0.2 fl.oz/min) at 6,000 rpm 9.5 cm^3/min (0.3 fl.oz/min) at 10,000 rpm
		on adjustable pump:	4.5-11.5 cm^3/min (0.15-0.4 fl.oz/min) at 10,000 rpm
		Oil tank capacity:	0.32 L (11 fl.oz)

3.5 Special Accessories

3.5.1	**For User**	ElastoStart	0000 190 3401
		Air filter, "fleece" 024	1121 120 1625
		0.325", 8-tooth chain sprocket	1121 640 2001 1) 1121 640 2005 2)
		Intake air preheating kit 024	1121 007 1030
		Intake air preheating kit 026	1121 007 1027 (up to serial number X 30 976 774)
		Intake air preheating kit 026	1121 007 1044 (from serial number X 30 976 775)
		0.325", 7-tooth rim sprocket kit	1121 007 1001 1) 1121 007 1037 2)
		0.325", 8-tooth rim sprocket kit	1121 007 1002 1) 1121 007 1038 2)
		3/8" Picco, 7-tooth rim sprocket kit	1121 007 1004 1) 1121 007 1039 2)
		3/8" Picco, 8-tooth rim sprocket kit	1121 007 1005 1) 1121 007 1040 2)
		3/8", 7-tooth rim sprocket kit	1121 007 1035 1) 1121 007 1041 2)
		Chain scabbard extension (from 45 cm/18 in)	0000 792 9131
		CAT mounting kit	1121 007 1042

1) 024
2) 026

3.5.2 For Service

Carburetor parts kit 024, small	1118 007 1060 (Tillotson)
Carburetor parts kit 024, large	1118 007 1065 (Tillotson)
Carburetor parts kit 024/026, large	1121 007 1062 (Walbro)
Carburetor parts kit 024/026, large	1118 007 1066 (Walbro WT 22)
Gasket set 024/026	1121 007 1050

3.6 Tightening Torques

Plastoform screws are used for polymer 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 detrimentally affecting 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	For component size	Torque Nm	Torque lbf.ft	Remarks	
Pan head screw	M4x8	Cover plate/chain tensioner	3.0	2.2		
Countersunk screw	PT4x12	Cover plate/chain sprocket cover	2.5	1.8	1)	
Collar screw	M8x21.5	Bar mounting	23.0	17.0	2)	
Collar screw	M10/M8	Bar mounting	30.0	22.0	1)	3)
Spline screw	IS-M4x12	Cover to crankcase, sprocket side	3.0	2.2		
	M10x1	Decompression valve	14.0	10.3	4)	
Self-tapping screw	B4.2x9.5	Spark arresting screen	2.0	1.5		
Spline screw	M3.5x12	Generator	2.0	1.5	2)	
Self-tapping screw	IS-P6x19	Front handle top/bottom (W version)	7.0	5.2		
Self-tapping screw	IS-P6x32.5	Front handle, top (polymer)	5.0	3.7		
Self-tapping screw	IS-P6x21.5	Front handle, bottom (polymer)	5.0	3.7		
Self-tapping screw	B3.9x19	Handle molding	1.6	1.2		
Screw assembly	IS-M4x16	Hand guard, left	4.0	3.0		
Slotted nut	M5	Shroud to cylinder	3.5	2.6		
Self-tapping screw	IS-P6x19	Chain catcher/plug	2.8	2.1		
Spline screw	IS-M5x12	Spiked bumper (with self-locking nut)	7.5	5.5		
Spline screw	IS-M5x20	Crankcase	9.0	6.6		
Mutter	M5	Air filter	2.0	1.5		
Spline screw	IS-M4x16	Fan housing	4.0	3.0		
	M12x1L	Clutch carrier	50.0	37.0		
Self-tapping screw	IS-P6x26.5	Annular buffer to tank housing, left	5.0	3.7		
Self-tapping screw	IS-P6x19	Annular buffer to tank housing, right	5.0	3.7		

Fastener	Thread	For component size	Torque Nm	lbf.ft	Remarks	
Spline screw	IS-M5x12	Annular buffer plate	8.0	5.9	2)	
Spline screw	IS-M5x16	Muffler to crankcase (Cat version)	10.0	7.5	2)	
Spline screw	IS-M5x12	Muffler to crankcase (non-Cat version)	10.0	7.5	2)	
Spline screw	IS-M5x12	Muffler to cylinder	10.0	7.5	2)	
Spline screw	IS-M5x12	Upper casing to muffler (non-Cat version)	10.0	7.5		
Spline screw	IS-M5x16	Upper casing to muffler (Cat version)	10.0	7.5		
Nut	M8x1	Flywheel	33.0	24.4		
Spline screw	M4x8	Side plate	3.0	2.2		
Self-tapping screw	BM4x16	Side plate	3.0	2.2	1)	
Stud	M5x8.5	Stud to cylinder, left	1.4	1.1	3)	
Stud	M5x8.5	Stud to cylinder, right	1.4	1.1		
Nut	M5	Carburetor	3.5	2.6		
Spline screw	IS-M5x20	Cylinder	10.5	7.7		
	M14x1.25	Spark plug	25.0	18.5		
Spline screw	IS-M5x20	Ignition module	7.0	5.2	2)	5)
Spline screw	IS-M4x12	Oil pump	3.5	2.6		

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

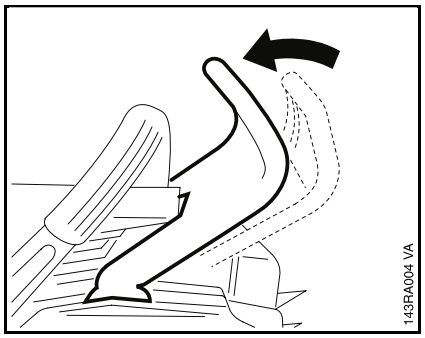
– Place the P screw in the hole and rotate it counterclockwise until it drops down slightly.
– Tighten the screw clockwise to the specified torque.

This procedure ensures that the screw engages properly in the existing thread and does not form a new thread, i.e. the thread is not weakened.

1) On machines with quick chain tensioner
2) Secure screw with Loctite 242.
3) Secure screw with Loctite 270.
4) On 026 only
5) A washer must be fitted under the screw head.

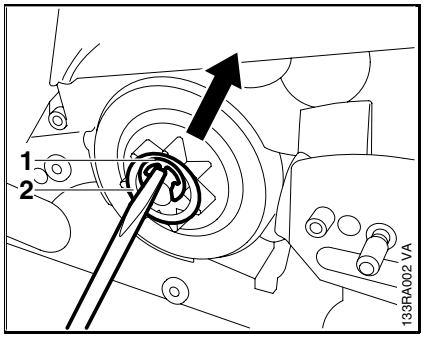
Note: Screws secured with adhesive (Loctite) are easier to release if they are heated with a hot air blower (hair dryer). **Take care on polymer components.**

Power screwdriver setting for use in polymer: max. 600 rpm for Plastoform screws



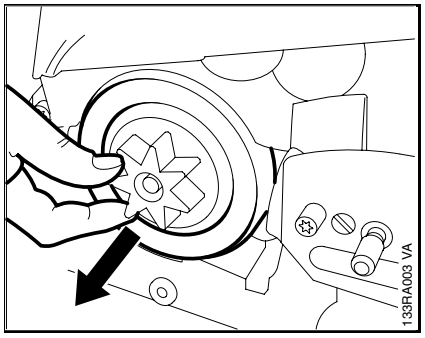
- Remove the chain sprocket cover.

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



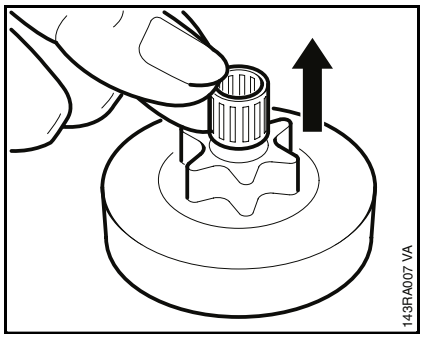
• Remove the E-clip (1).

• Remove the washer (2).



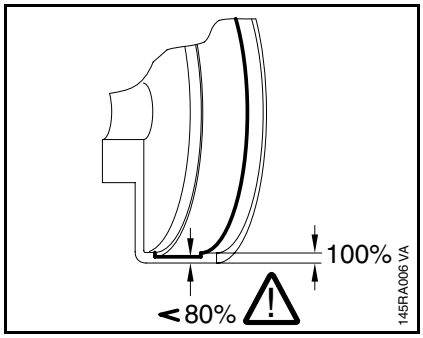
- If a rim sprocket is fitted, pull it off.

• Pull off the clutch drum/chain sprocket.



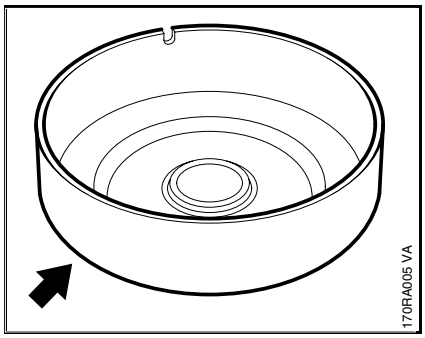
• Remove the needle cage.

- Clean and inspect the clutch drum/chain sprocket.



Important: If there are noticeable wear marks on the inside diameter of the clutch drum, check its wall thickness. If it is less than 80% of the original wall thickness, fit a new clutch drum.

Note: If the clutch drum has to be replaced, also check the brake band - see 4.3.2.



• If the clutch drum is still serviceable, use No. 120 emery paper or emery cloth (grain size approx. 120µm) to clean and roughen its friction surface.

Reassemble in the reverse sequence.

- Clean stub of crankshaft. Wash needle cage in clean white spirit and lubricate with grease - see 13.2.

- Replace damaged needle cage.

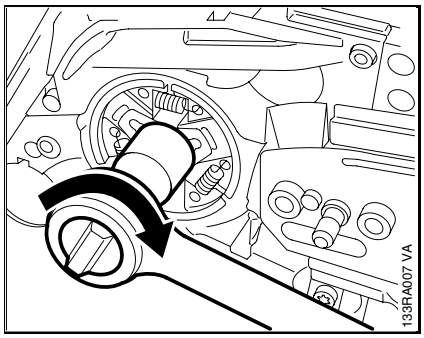
- On 026, rotate clutch drum/chain sprocket and apply slight pressure at the same time until driver on oil pump worm engages the notch on the drum's circumference.

- If machine is equipped with a rim sprocket, refit it so that the cavities face outwards.

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

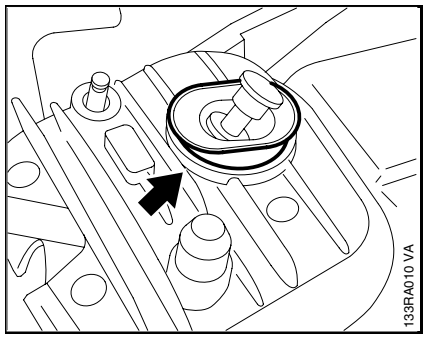
- Remove the clutch drum/chain sprocket - see 4.1.

- Remove the air filter - see 12.1.



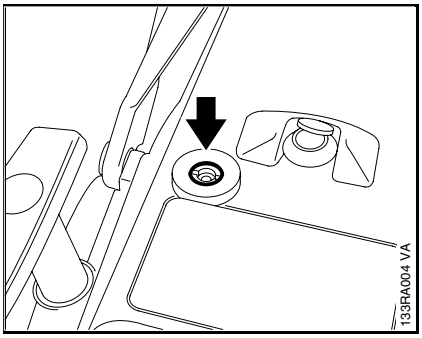
• Unscrew the clutch in the direction of the arrow (left-hand thread).

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



- Install spark plug and torque down to 25 Nm (18.5 lbf.ft).

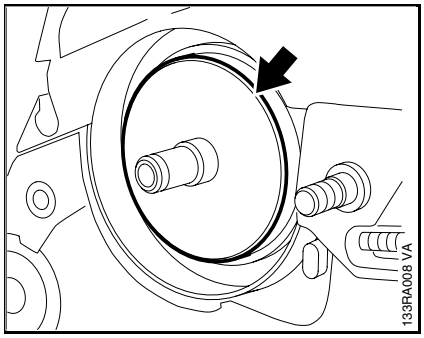
• On machines with a decompression valve, make sure the cover is properly seated.



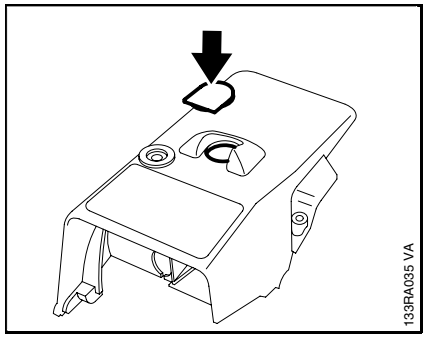
• Unscrew slotted nut from the shroud.

- Remove the shroud.

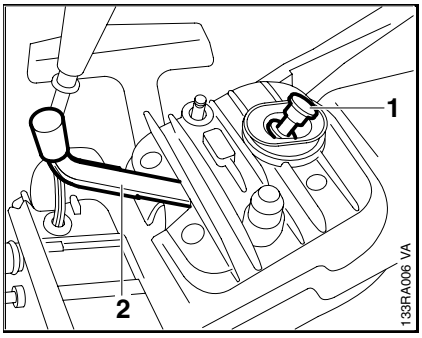
- Pull off the spark plug boot.



• On 024, if a cover washer is fitted behind the original clutch, do not refit it when installing the new clutch.



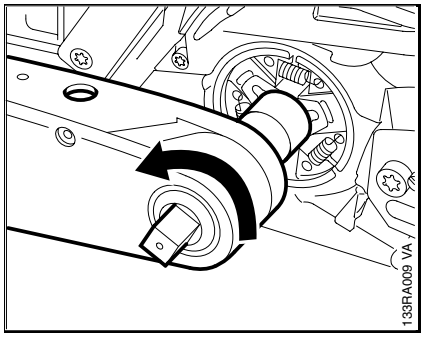
• If the shroud is replaced on a 026 machine without decompression valve, seal the opening in the shroud with the cap.



- Unscrew the spark plug.

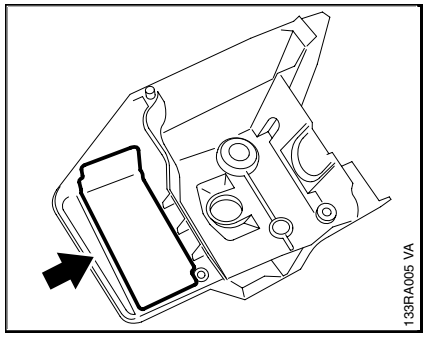
• Close the decompression valve (1), where fitted.

• Push the locking strip (2) 0000 893 5903 into the cylinder.



• Screw clutch onto crankshaft and torque down to 50 Nm (37 lbf.ft).

- Remove locking strip from cylinder.



• Check condition of heat shield (foil) and fit a new one if necessary.

- Fit the shroud.

4.3 Chain Brake

4.3.1 Checking Function

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

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

- Start the engine.

- With the chain brake activated (locked), open throttle wide for brief period (max. 3 seconds) - the chain must not rotate.

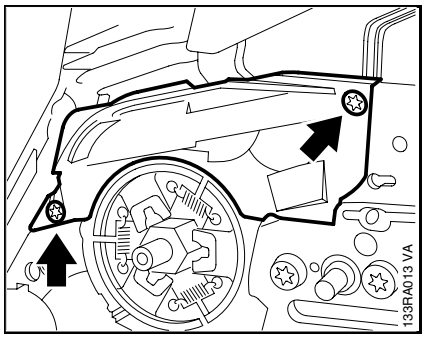
- With the chain brake released, open throttle wide and activate the brake manually - the chain must come to an abrupt stop.

Note: The braking time is in order if deceleration of the saw chain is imperceptible to the eye.

4.3.2 Disassembling

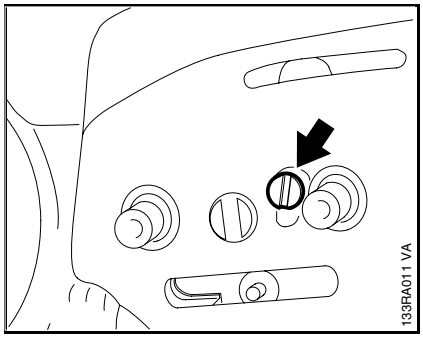
- Remove clutch drum/chain sprocket - see 4.1.

- Relieve tension of brake spring by pushing hand guard forwards.



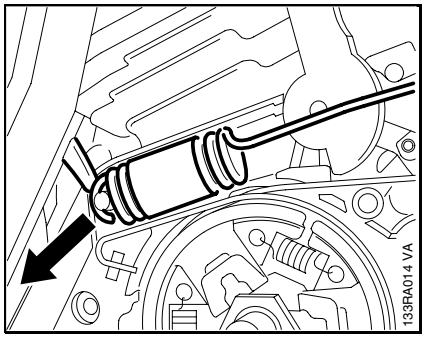
- Take out the screws.

- Remove the cover.

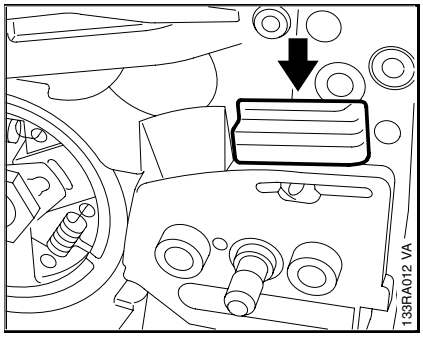


- Take out the screw.

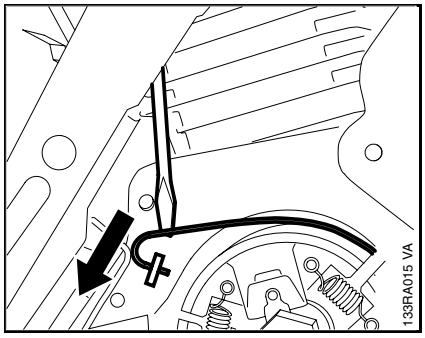
- Remove the side plate.



- Carefully pry the brake spring off the anchor pin and unhook it from the bell crank.

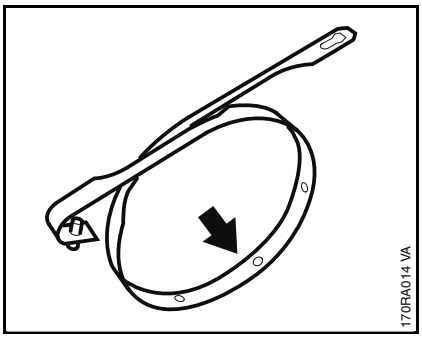


- On 026, remove the upper bumper strip from the chain tensioner.



- Lever the brake band out of the crankcase.

- Unhook the brake band from the bell crank.



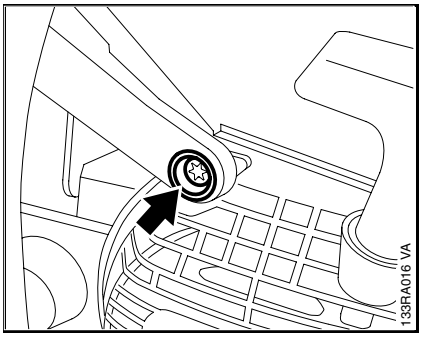
Replace the brake band if:

- there are noticeable signs of wear (large areas on inside diameter and/or parts of outside diameter) and

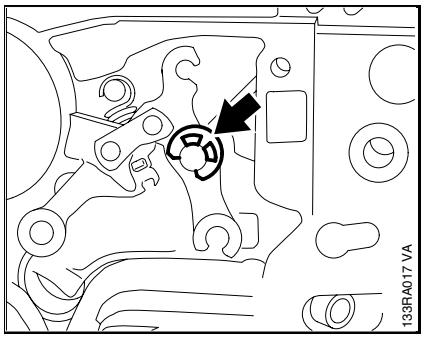
- its remaining thickness is less than 0.6 mm (0.024").

Important! Thickness of brake band must not be less at any point.

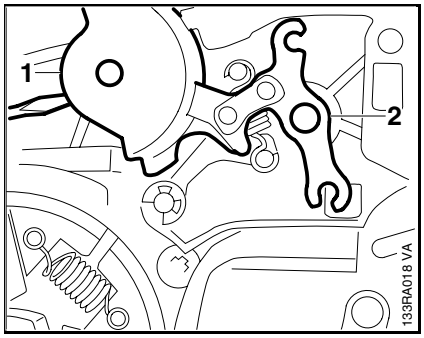
- If the brake band is still serviceable, use No. 120 emery paper or emery cloth (grain size approx. 120µm) to clean and roughen its entire friction surface (inside diameter).



- Take out the screw.

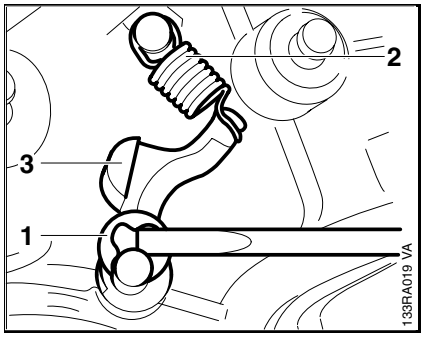


- Ease the E-clip off the bell crank pivot pin.



- Carefully ease the hand guard (1) and bell crank (2) off the pivot pins and lift them away together.

- Pull the bell crank out of the hand guard.



- Remove the E-clip (1).

- Unhook the spring (2) and take it away.

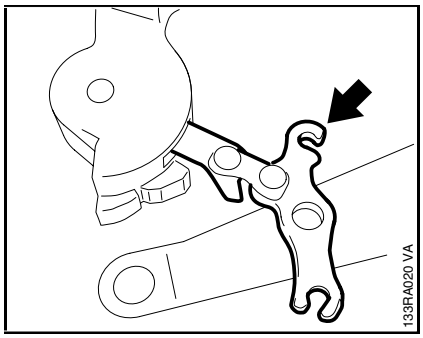
- Pull off the cam lever (3).

- Inspect parts. Replace any worn or damaged parts.

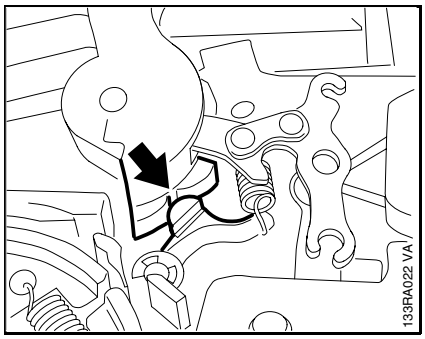
- Clean chain brake seat in crankcase.

- If the brake spring anchor pin or the hand guard pivot pin are worn, install new pins - see 4.3.4 and 4.3.5.

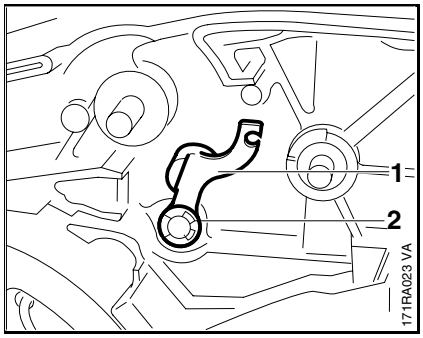
- Lubricate sliding and bearing points of chain brake with STIHL multipurpose grease or, preferably, molybdenum grease (e.g. Molykote) - see 13.2.



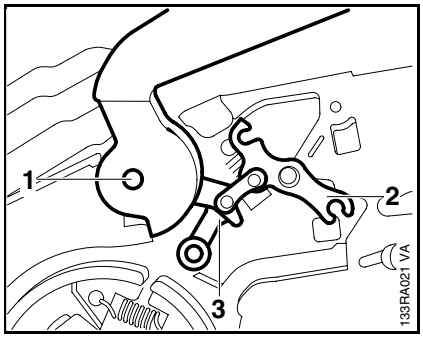
- Insert the bell crank in the side of the hand guard so that the short arm of the bell crank points up.



- Check that cam lever is properly located on face of hand guard bearing boss.

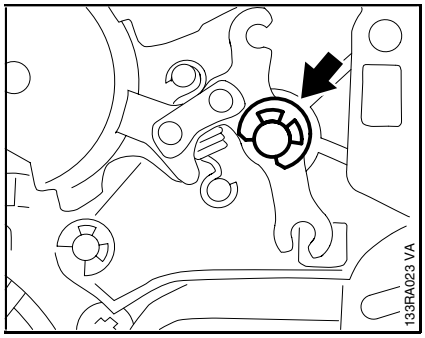


- Push the cam lever (1) onto the pivot pin.
- Install the E-clip (2).



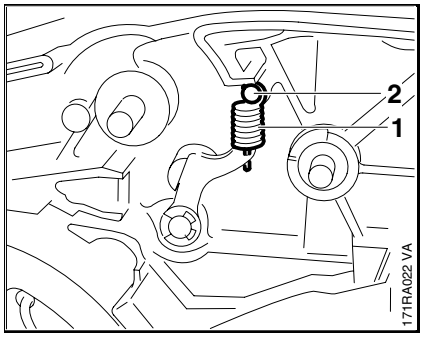
- Position the hand guard (1) against the pivot pin and fit the other side of the hand guard over the fan housing.
- Position the bell crank (2) against the pivot pin.
- Press the cam lever (3) downwards and push the hand guard and bell crank onto their pivot pins.

- Fit hand guard mounting screw and tighten to 4.0 Nm (3.0 lbf.ft).

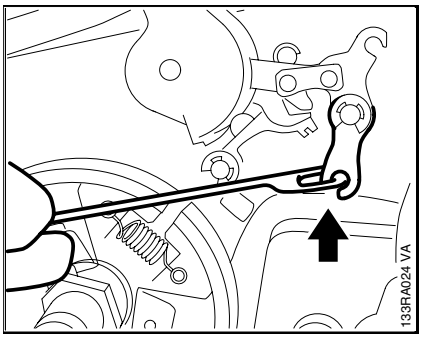


- Secure bell crank with E-clip.

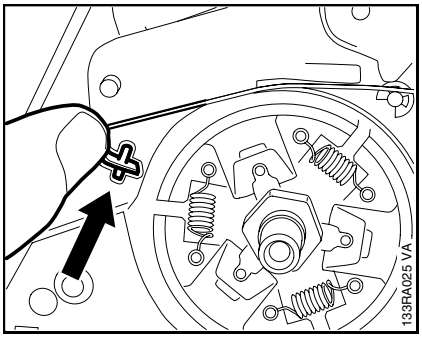
- Coat brake band with chain oil (STIHL Bioplus), see 12.2, to protect it from corrosion and help reduce brake "snatching" during the first few applications.



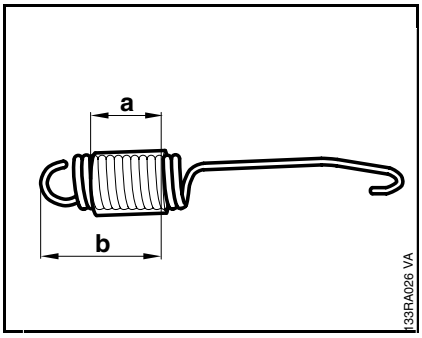
- Attach the spring (1) to the pivot pin (2) and cam lever.



- Hook the brake spring onto the bell crank.

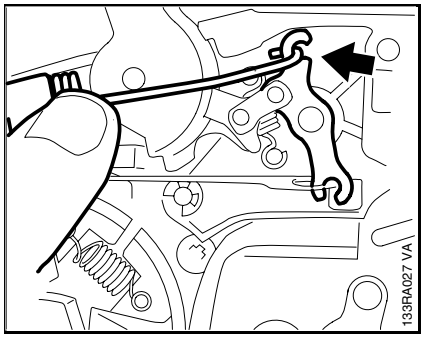


- Press brake band into slot.

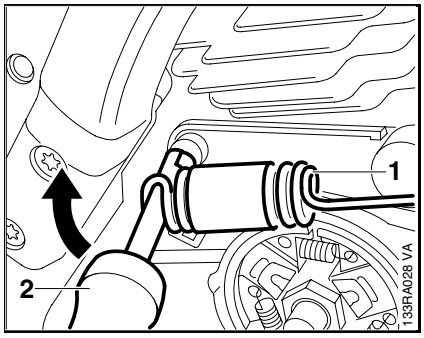


- Coils of brake spring must locate tight against one another in relaxed condition. Install a new brake spring if necessary.

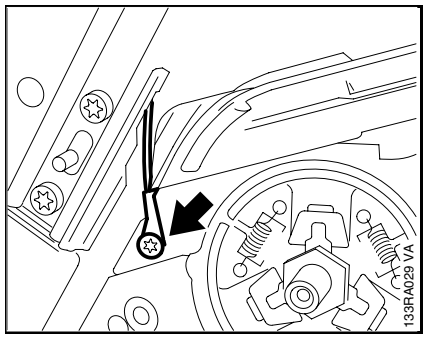
- Check that protective tube is correctly positioned:
  a = 20 mm (0.8")
  b = 33 mm (1.3")



- Attach the brake spring to the bell crank.



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



- Fit cover over the chain brake.

- On machines with handle heating, secure ground wire for heater switch with rear screw.

- Tighten down screws to 3.0 Nm (2.2 lbf.ft).

- On 026, fit the upper bumper strip.

- Install the side plate.

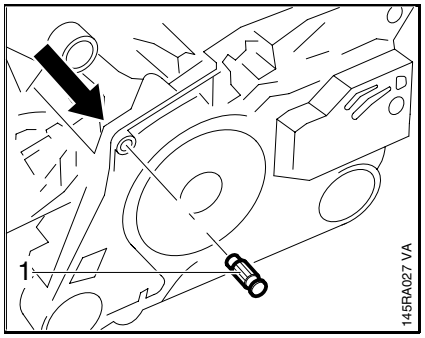
- Install clutch drum/chain sprocket - see 4.1.

- Check operation of chain brake - see 4.3.1.

4.3.4 Anchor Pin for Brake Spring

- Remove the cylinder - see 5.6.1.

- Remove the chain brake - see 4.3.2.

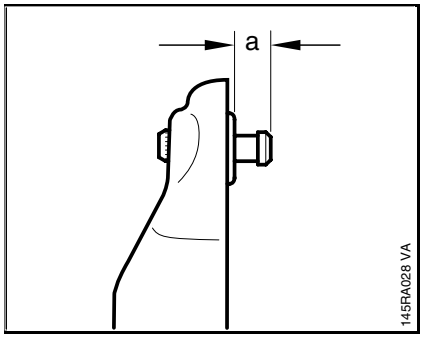


- Use a suitable punch to drive the anchor pin out of the crankcase in the direction of the arrow.

Important! Do not drive out the pin in the other direction as this would damage the annular bead which was formed in the crankcase bore when the pin was originally installed.
In such a case neither the new anchor pin nor the brake spring would locate properly. Furthermore, the crankcase could be damaged in this way and possibly impair correct operation of the chain brake.

- Coat the knurled area of the new pin with Loctite, see 13.2, before installation.

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

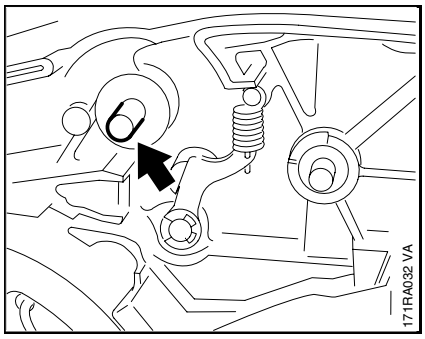


- Carefully tap home the pin squarely to obtain dimension "a", i.e. 4.3 - 4.7 mm (11/64").

- Install the cylinder - see 5.6.2.

- Install the chain brake - see 4.3.3.

4.3.5 Pin for Hand Guard

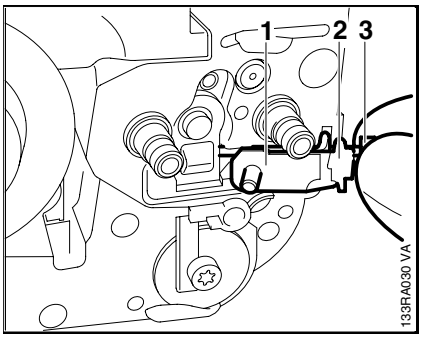


- Use pliers (e.g. pincers) to pull the pin out of the crankcase.

- Coat the knurled area of the new pin with Loctite, see 13.2, before installation.

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

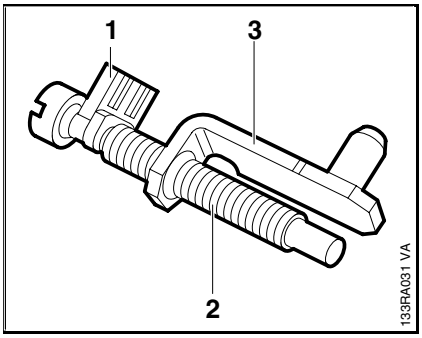
- Carefully tap home the pin squarely.



- Remove the side plate.

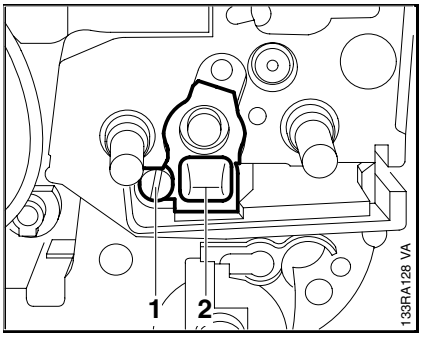
- Wind tensioner slide (1) back till it butts against thrust pad (2).

- Take out the adjusting screw (3) with thrust pad and tensioner slide.



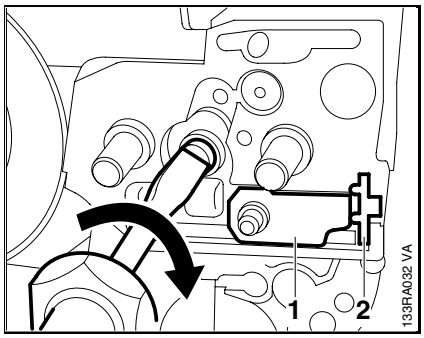
- Pull the thrust pad (1) off the adjusting screw.

- Unscrew the adjusting screw (2) from the tensioner slide (3).



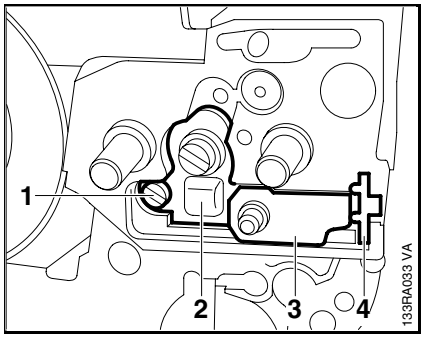
- Take out the screw (1).

- Remove the cover plate (2).



- Remove the side plate.

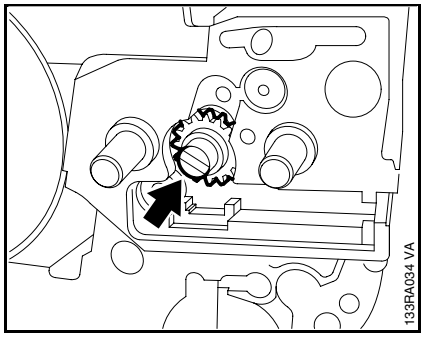
- Rotate the spur gear clockwise until the tensioner slide (1) butts against the thrust pad (2).



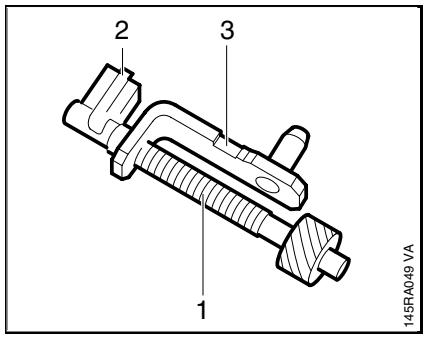
- Take out the screw (1).

- Remove the cover plate (2).

- Take out the tensioner slide (3) with adjusting screw and thrust pad (4).



- Pull out the spur gear.

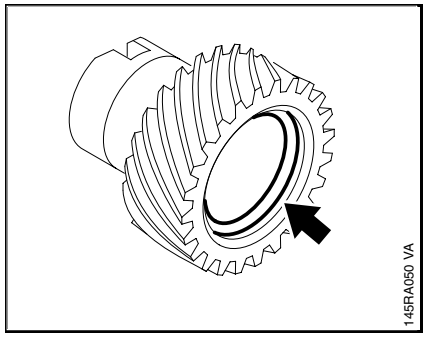


- Inspect the teeth on the spur gear and adjusting screw (1). If the teeth are damaged, pull off the thrust pad (2), take the adjusting screw out of the tensioner slide (3) and replace both parts.

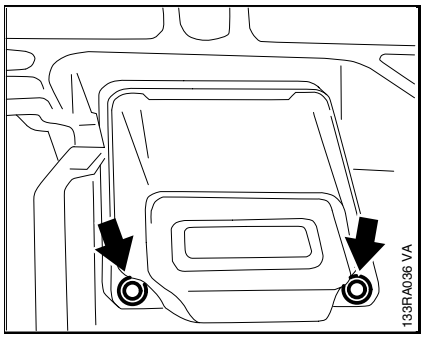
Note: The adjusting screw and spur gear must be replaced together.

Install in the reverse sequence.

- Coat teeth of adjusting screw and spur gear with grease, see 13.2, before installing.



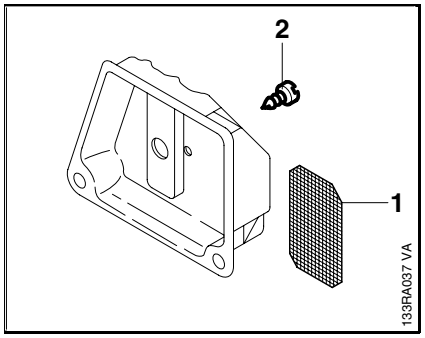
- Check that O-ring is fitted in spur gear and lubricate it with a little oil before installing.



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

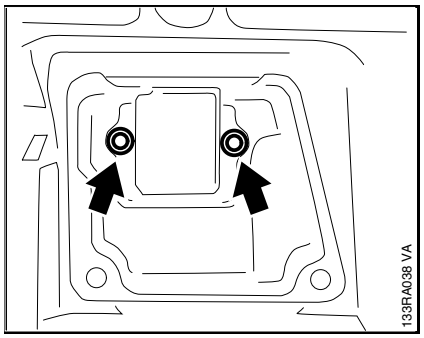
• Take out the screws.

- Remove the exhaust casing.



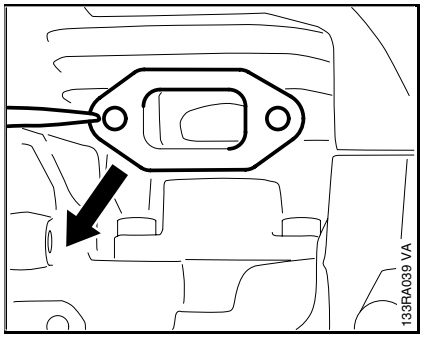
• Inspect the spark arresting screen (1), if fitted. If necessary, take out the screw (2) and remove the spark arresting screen from the exhaust casing.

- Clean the spark arresting screen or fit a new one.

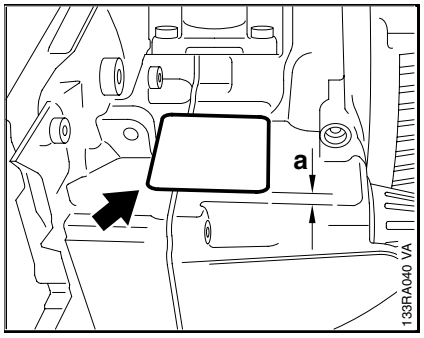


• Take out the screws.

- Remove the muffler.



• Remove the gasket.



• On machines with catalytic converter, check condition of heat reflecting foil and replace if necessary.

a = 8 mm (0.3")

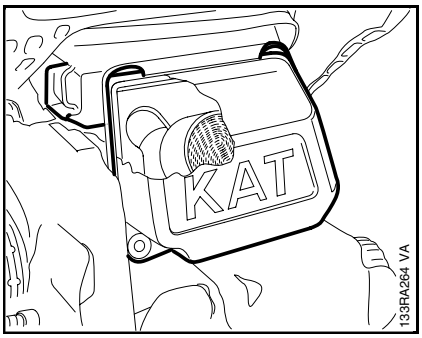
Reassemble in the reverse sequence.

- Install new gasket so that its bead (3) points towards the muffler.

- Coat threads of muffler mounting screws with Loctite - see 13.2.

- Tighten down screws to 10.0 Nm (7.5 lbf.ft).

5.2 Catalytic Converter
5.2.1 Construction and Function



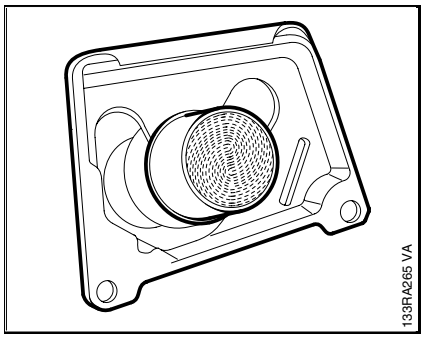
The catalytic converter is integrated in the muffler casing and helps reduce the amount of noxious emissions in the exhaust gas by means of a chemical reaction (’afterburning’).

The main emissions are unburnt hydrocarbons and carbon monoxide. The nitrogen oxide content is negligible in two-stroke engines.

Hydrocarbon emissions are reduced approximately 70% by a process of catalytic combustion of the exhaust gases in the converter.

The metal carrier catalyst in these machines provides less flow resistance than the ceramic carrier catalyst commonly found in motor vehicles.

There is therefore no loss of engine power compared to machines without a catalyst. Furthermore, this catalytic converter reaches operating temperature in a relatively short 20 to 30 seconds and is temperature resistant up to approx. 1300°C (2375°F).
"Afterburning" the exhaust gases in the muffler generates temperatures in the region of 1200°C (2200°F).



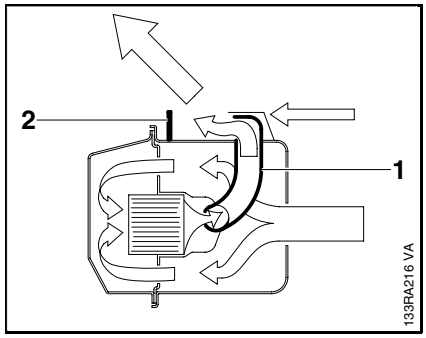
Inside the catalytic converter, very thin, flat and corrugated stainless steel sheets are rolled together in a spiral shape to produce a honeycomb structure which is enclosed in a round steel jacket.

The honeycomb cells are coated with the noble metal platinum which acts as the actual catalyst. A chemical reaction which reduces harmful emissions takes place when hot exhaust gas flows through the catalytic converter. Some 70% of the hydrocarbons (HC) is transformed into water (H_2O) and non-poisonous carbon dioxide (CO_2).

A catalyst is a component which initiates chemical reactions **without** being consumed in the process.

The platinum coating of the honeycomb cells is sensitive to lead, i.e. lead collects on platinum. This inhibits the chemical reaction. If several tankfuls of leaded fuel are used, the catalyst’s function can be reduced by more than 50%. For this reason **only unleaded** gasoline may be used in a chainsaw with a catalytic converter.

In order to avoid damage to the engine, the catalytic converter must be replaced if cracks are found in the honeycomb structure or if the converter’s steel jacket is damaged in any way.



Exhaust gas leaves the internal pipe (1) and is deflected sideways and forwards by the specially shaped baffle plate (2). Additional fresh air is sucked in and used for cooling at this point.

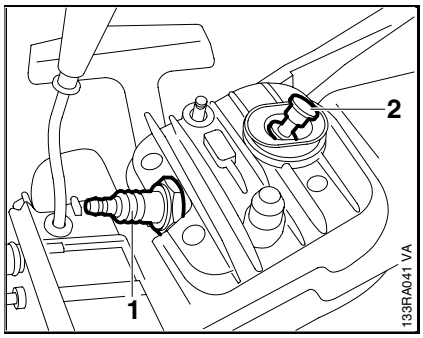
The special construction of the exhaust outlet allows the exhaust gas to expand immediately so that its temperature drops rapidly (in area of spiked bumper) to approx. 300°C (570°F).

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.

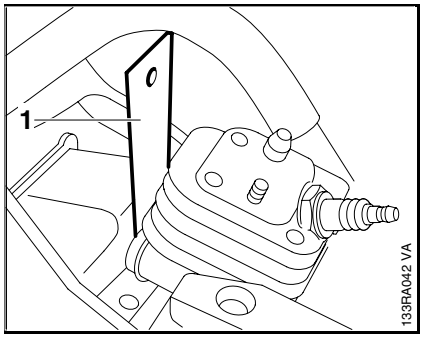
The engine can be checked thoroughly for leaks with the carburetor and crankcase tester and the vacuum pump.



- Remove the shroud - see 4.2.

- Make sure spark plug (1) is properly tightened down.

- Pull out knob (2) of decompression valve - if fitted.



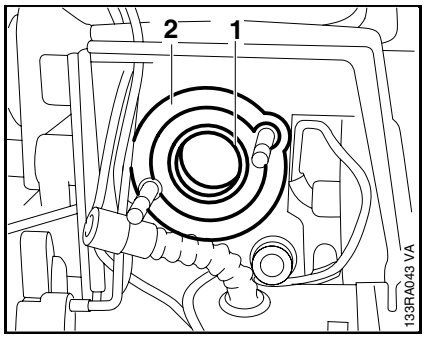
- Remove muffler upper casing and back off the muffler mounting screws half way - see 5.1.

- Fit the sealing plate (1) 0000 855 8106 between the muffler and exhaust port and then retighten the screws moderately.

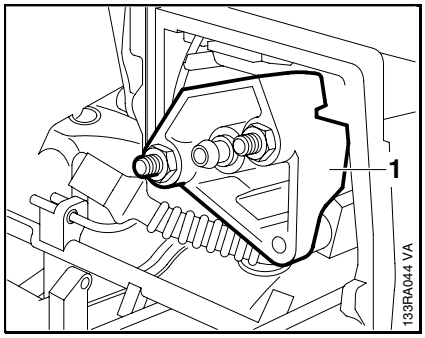
Note: The sealing plate must completely fill the space between the two screws.

- Remove the carburetor - see 12.5.2.

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



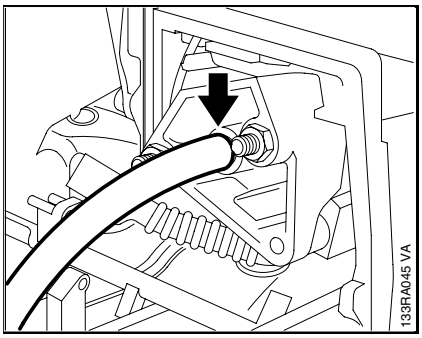
- Check that sleeve (1) and washer (2) are in position.



- Fit the test flange (1) 1118 850 4200 on the carburetor studs.

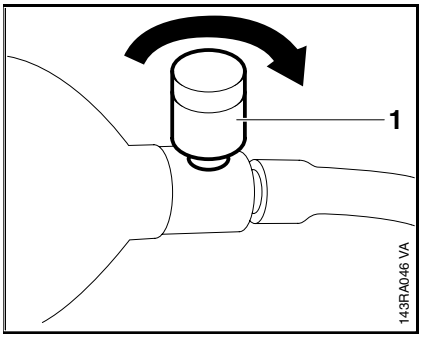
- Check tester 1106 850 2905 and vacuum pump 0000 850 3501 for leaks.

5.3.2 Pressure Test



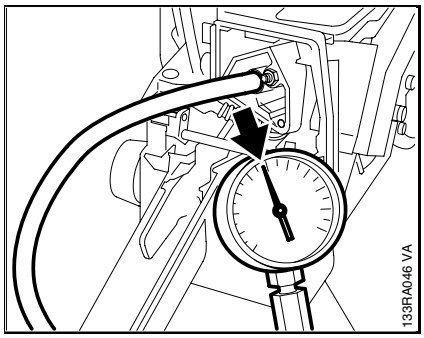
- Carry out preparations - see 5.3.1.

• Connect pressure hose of tester 1106 850 2905 to nipple on test flange.



• 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 (7.25 psi). If this pressure remains constant for at least 20 seconds, the crankcase, or decompression valve, is airtight.



• However, if the indicated pressure drops, the leak must be located and the faulty part replaced.

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

- If the decompression valve is leaking, install a new one - see 5.9.

- Repeat the pressure test.

- Carry out the vacuum test - see 5.3.3.

- After finishing the test, open the vent screw and disconnect the hose.

- Remove the test flange.

- Install the carburetor - see 12.5.2.

- Loosen muffler screws and pull out the sealing plate.

- Take out one screw and coat its thread with Loctite - see 13.2.

- Refit screw and tighten down to 10 Nm (7.5 lbf.ft).

Note: Remove and install the second screw in the same way.

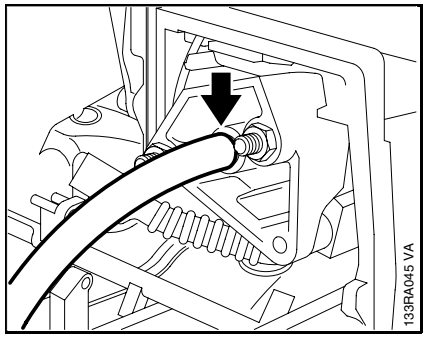
- Fit the upper casing.

5.3.3 Vacuum Test

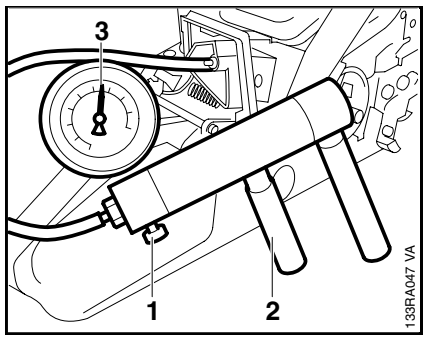
Oil seals tend to fail when subjected to a vacuum, i.e. the sealing lip lifts away from the crankshaft during the piston's induction stroke because there is no internal counterpressure.

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

- Carry out preparations - see 5.3.1.



• Connect suction hose of vacuum pump 0000 850 3501 to test flange nipple.



• Close the vent screw (1) on the pump.

• Operate lever (2) until pressure gauge indicates a vacuum of 0.5 bar (7.25 psi).

Note: If the vacuum reading remains constant, or rises to no more than 0.3 bar (4.25 psi) 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.

- After finishing the test, open the vent screw and disconnect the hose.

- Remove the test flange.

- Install the carburetor - see 12.5.2.

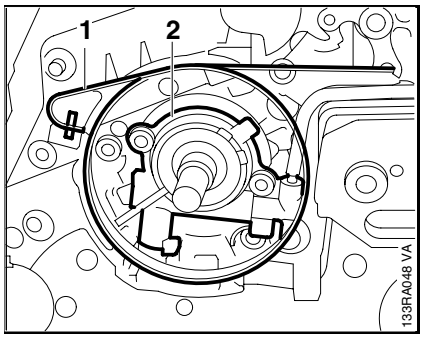
- Loosen the muffler screws and pull out the sealing plate.

- Take out one screw and coat its thread with Loctite - see 13.2.

- Refit screw and tighten down to 10 Nm (7.5 lbf.ft).

Note: Remove and install the second screw in the same way.

- Fit the upper casing.



It is not necessary to disassemble the complete crankcase if only the oil seals have to be replaced.

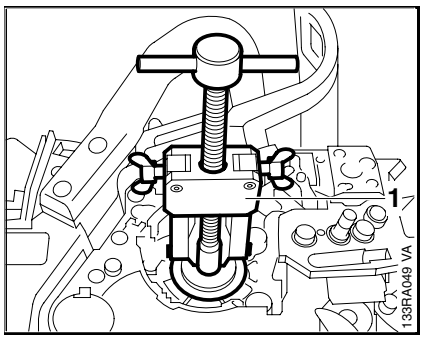
Clutch side

- Remove the clutch - see 4.2.

- Remove the brake band (1) - see 4.3.2.

- Remove the oil pump (2) - see 11.3.

- Use a suitable pipe or punch to carefully tap the oil seal and free it off.



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

- Clamp the arms.

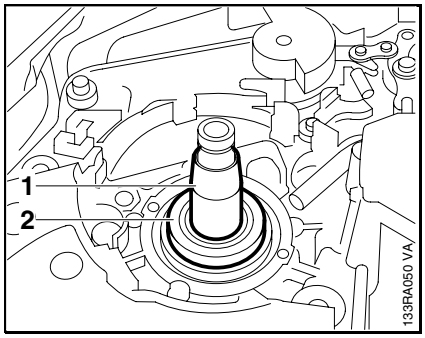
- Pull out the oil seal.

Important: Take special care not to damage crankshaft stub.

- Clean sealing face on crankshaft stub with standard commercial, solvent-based degreasant containing no chlorinated or halogenated hydrocarbons - see 13.2.

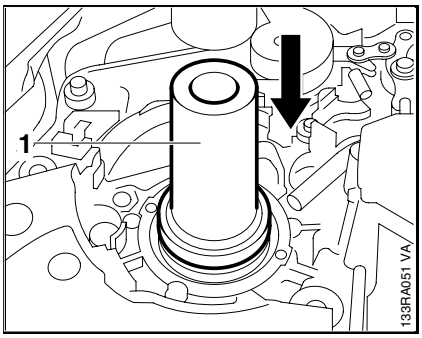
- Lubricate sealing lips of oil seal with grease - see 13.2.

- Thinly coat the outside diameter of the oil seal with sealant - see 13.2.



- Slip assembly sleeve (1) 1118 893 4602 over the crankshaft stub.

- Push the oil seal (2), open side facing the crankcase, over the assembly sleeve.



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

- After about one minute, turn the crankshaft several times.

- Remove the assembly sleeve.

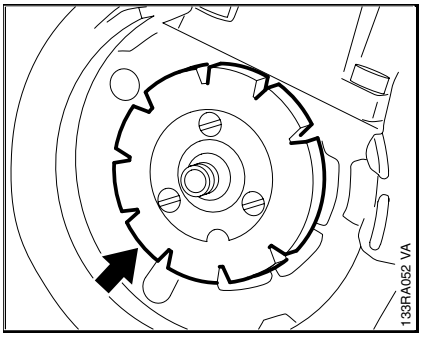
- Install the oil pump - see 11.3.

- Fit the brake band - see 4.3.3.

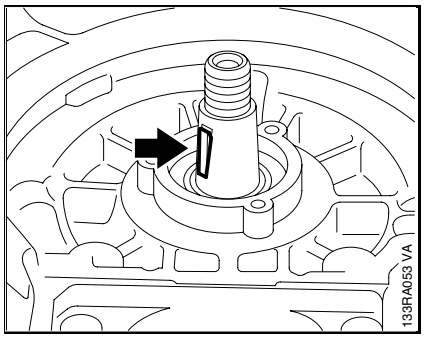
- Install the clutch - see 4.2.

Ignition side

- Remove the flywheel - see 6.6.

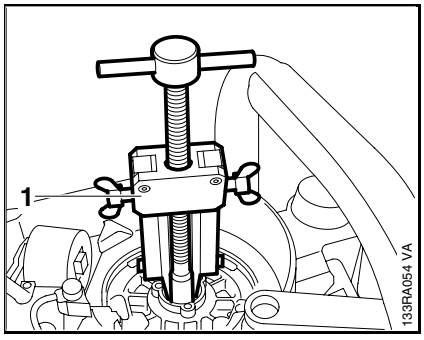


- On machines with heated handles, remove the generator and put it to one side.



- Remove key from crankshaft stub.

- Use a suitable pipe or punch to carefully tap the oil seal and free it off.



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

- Clamp the arms.

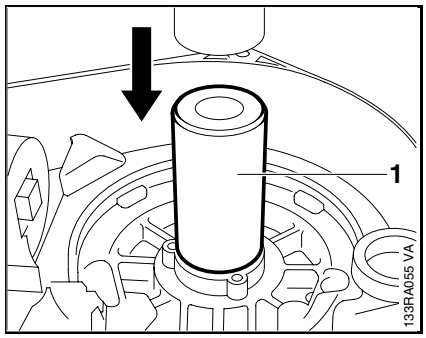
- Pull out the oil seal.

Important: Take special care not to damage crankshaft stub.

- Clean sealing face on crankshaft stub with standard commercial, solvent-based degreasant containing no chlorinated or halogenated hydrocarbons - see 13.2.

- Lubricate sealing lips of oil seal with grease - see 13.2.

- Thinly coat the outside diameter of the oil seal with sealant - see 13.2.



- Push the oil seal over the crankshaft stub - the open side must face the crankcase.

- Use the press sleeve (1) 1121 893 2400 to install the oil seal.

- After about one minute, turn the crankshaft several times.

- Install the generator (if fitted) - see 10.5.

- Install the flywheel - see 6.6.

5.5 Exposing the Cylinder

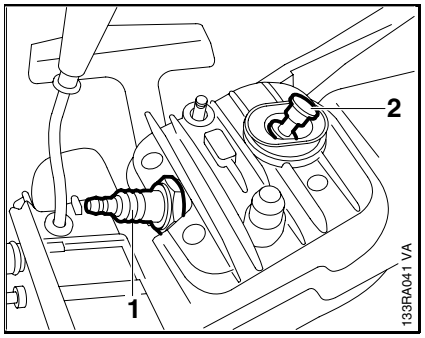
Always check and, if necessary, repair the fuel system, carburetor, air filter and ignition system before looking for faults on the engine.

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

- Remove the muffler - see 5.1.

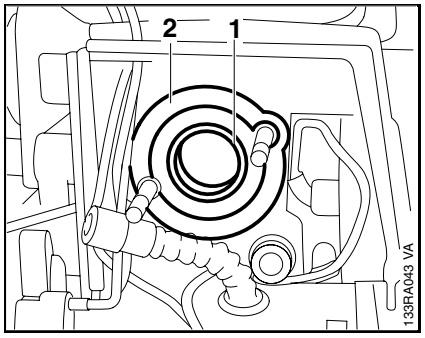
- Remove the carburetor - see 12.5.2.

- Remove the shroud - see 4.2.



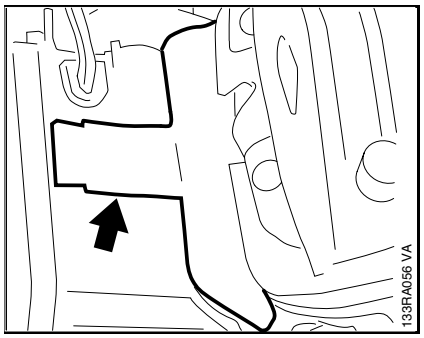
- Unscrew the spark plug (1).

- On 026, remove decompression valve, if fitted - see 5.9.

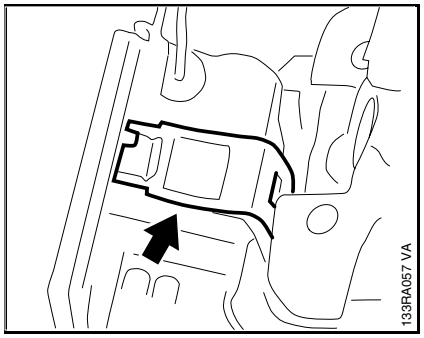


- Take the sleeve (1) out of the manifold.

- Pull the washer (2) off the studs.



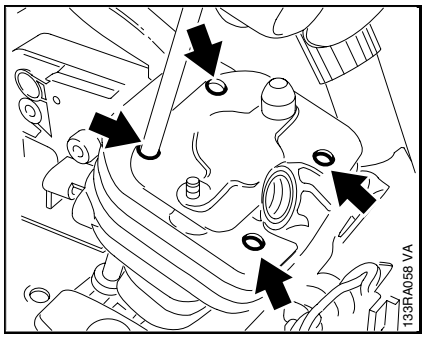
- On 026 up to serial number X 36 348 619, remove cover from tank housing.



- On 024 up to serial number X 36 348 619, it is not necessary to remove the shutter for carburetor preheating (see arrow).

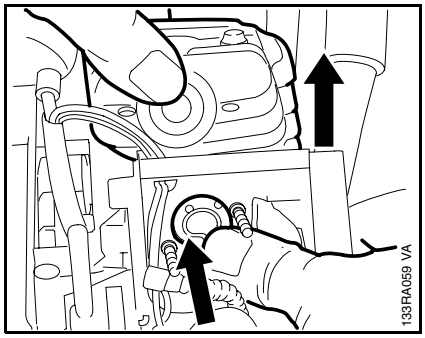
Reassemble in the reverse sequence.

5.6 Cylinder and Piston
5.6.1 Removing



Preparations - see 5.5.

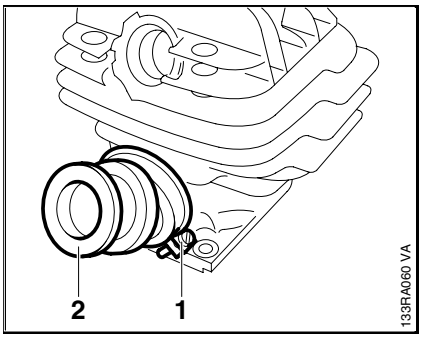
- Unscrew the cylinder base screws through the throughholes in the cylinder.



- Carefully lift the cylinder up and, at the same time, push the manifold through the tank housing opening.

Important: Do not use pointed or sharp-edged tools.

- Pull the cylinder off the piston.



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

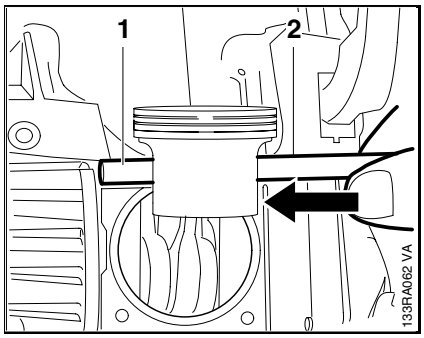
- Inspect the cylinder and replace it if necessary.

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

- Before removing the piston, decide whether or not the crankshaft has to be removed as well. To remove the flywheel, block the crankshaft by sliding the wooden assembly block between the piston and crankcase.

- Remove the cylinder gasket.

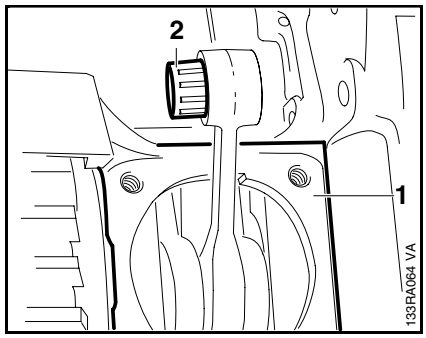
- If the cylinder is changed on the 026, pull the cap off the stud.



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

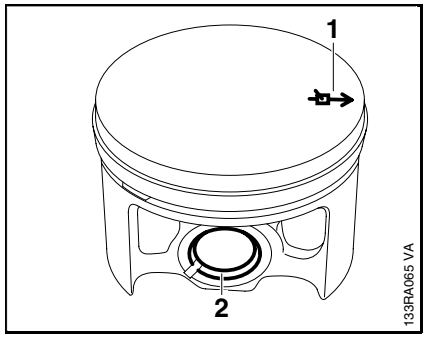
Note: If the piston pin is stuck, tap the end of the drift **lightly** with a hammer if necessary.
Important: Hold the piston steady during this process to ensure that no jolts are transmitted to the connecting rod.

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

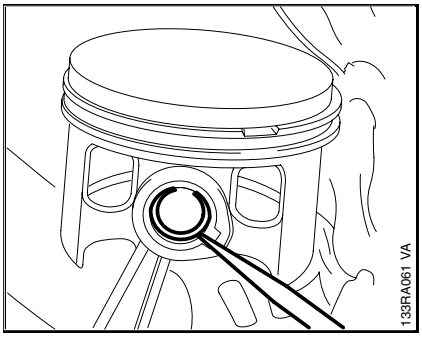


- Thoroughly clean the gasket seating surface (1).

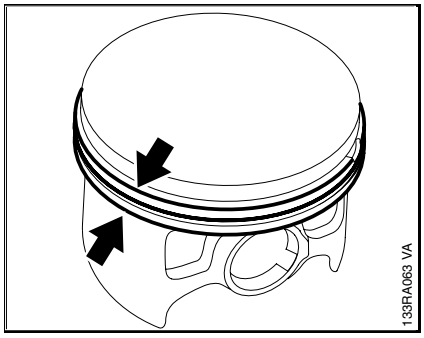
- Lubricate the needle cage (2) with oil and fit it in the small end.



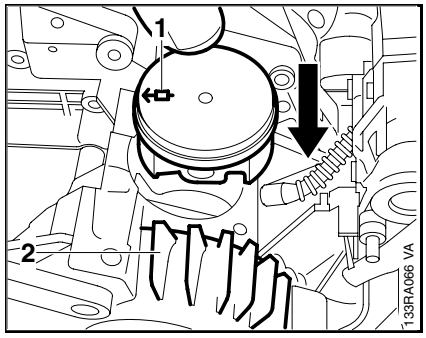
- With arrow (1) pointing to the right, use installing tool 5910 890 2210 to fit hookless snap ring (2) in the front piston boss.



- Ease the hookless snap rings out of the grooves in the piston bosses.

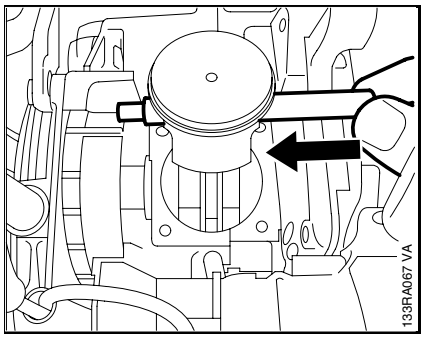


- Inspect piston rings and replace if necessary - see 5.7.

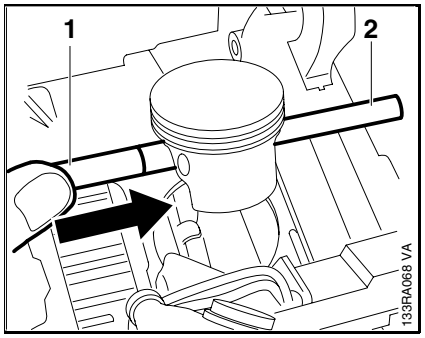


- Heat the piston slightly and slip it over the connecting rod.

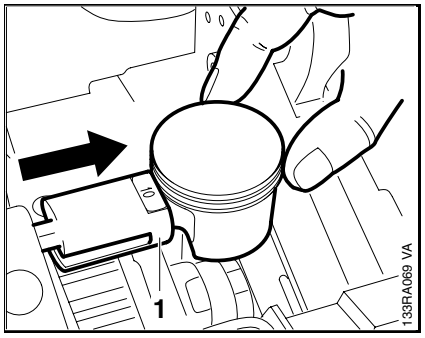
- Check installed position of piston:
  1 = Arrow = exhaust side
  2 = Flywheel



- Push the assembly drift, small diameter first, through the piston and small end (needle cage) and line up the piston.



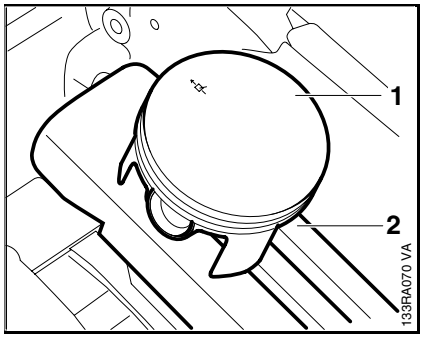
- Fit the piston pin (1) on the assembly drift (2) and slide it into the piston (the pin slides home easily if the piston has been heated).



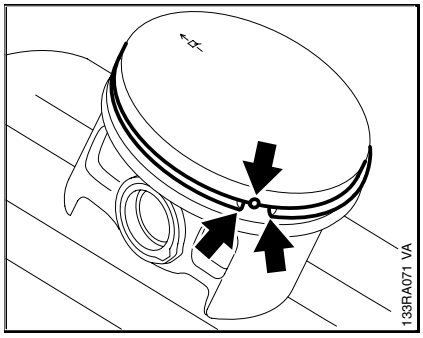
- Apply the installing tool (1) 5910 890 2210 to the piston boss, hold the piston steady, center the tool shank exactly and press home until the snap ring slips into the groove.

Note: For instructions on how to use installing tool, see "Standard Repairs, Troubleshooting" handbook.

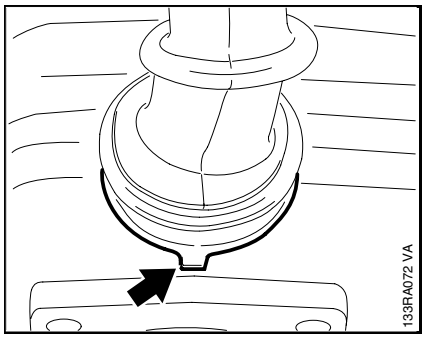
- Fit new cylinder gasket.



- Lubricate the piston and piston rings with oil and place the piston (1) on the wooden assembly block (2) 1108 893 4800.

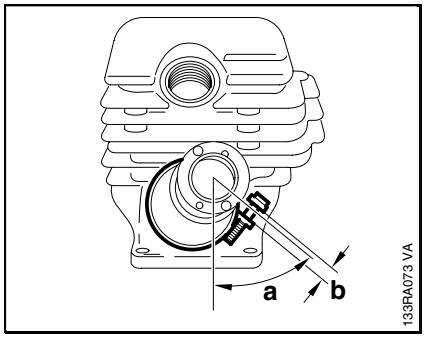


- Position piston rings in the grooves so that the radii at the ring gap meet at the fixing pin.



- Push the manifold onto the intake port.

- Note installed position.

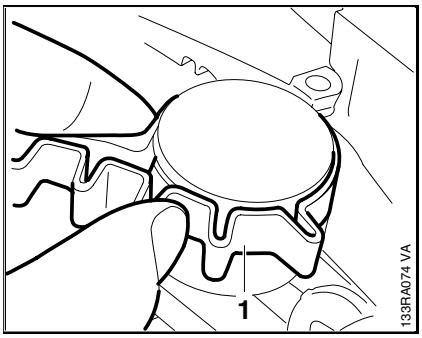


- Push the hose clamp over the manifold. The screw head must point upwards to the right.

- Tighten the hose clamp. Ends of clamp must point down to the right at angle "a" of 45 degrees.

Note: Tighten the screw until the gap "b" between the two ends of the hose clamp is 5 - 6 mm (0.20 - 0.24 in).

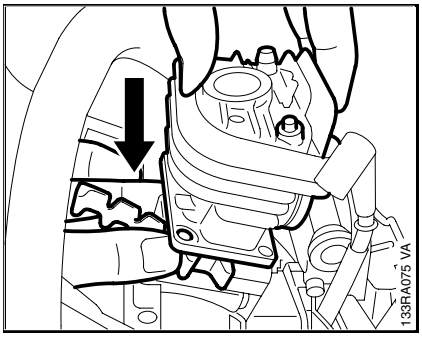
- On 026, push cap onto stud and screw home the decompression valve (if fitted) - see 5.9.



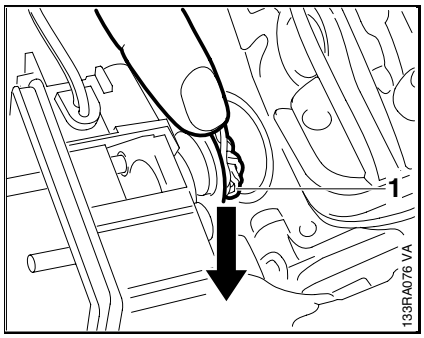
- Use the clamping strap (1) 0000 893 2600 to compress the piston rings around the piston.

- Check that the piston rings are correctly positioned.

- 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. It is important to observe this point as the piston rings might otherwise break.



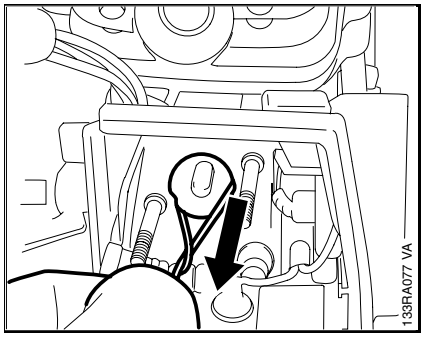
- Slide the cylinder over the piston - the clamping strap is pushed downward as the piston rings slip into the cylinder.



- Remove the clamping strap and wooden assembly block.

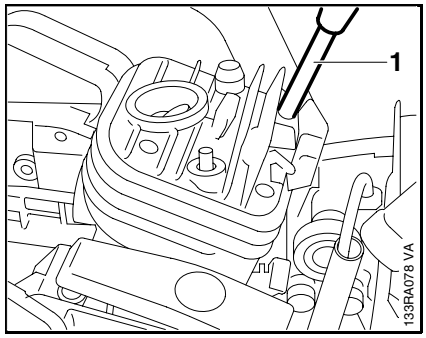
- To fit the manifold in the tank housing intake opening, wind a piece of string (about 15 cm / 6" long) around the back of the manifold flange and pass the ends of the string through the intake opening.

- Push the manifold down.



- Pull the ends of the string outward.

Note: The manifold flange is pulled through the tank housing intake opening in this way without damaging the manifold.



- Carefully line up the cylinder and gasket.

- Use screwdriver bit (1) 0812 542 2104 to torque down cylinder base screws to 10.5 Nm (7.7 lbf.ft) alternately in diagonal pattern.

Assembly is now a reversal of the disassembly sequence.

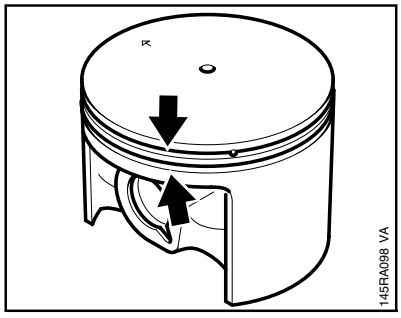
5.7 Piston Rings

- Remove the piston - see 5.6.1.

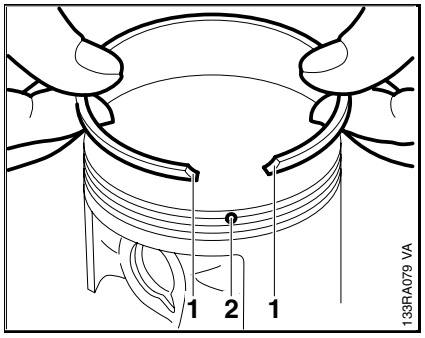
Note: To avoid carbon residue falling into the crankcase, always remove the piston to install the piston rings and clean the ring grooves.

- Remove rings from piston.

- Check thickness of piston rings.



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



- Install the new piston rings in the grooves so that the radii (1) face the fixing pin (2).

- Install the piston - see 5.6.2.

5.8 Crankcase
5.8.1 Removing the Crankshaft

- Remove the clutch - see 4.2.

- Remove the chain brake - see 4.3.2.

- Remove the cylinder - see 5.6.1.

- Remove the flywheel - see 6.6.

- On machines with heated handles, remove the generator - see 10.5.

- Remove the ignition module - see 6.2.2.

- Drain the chain oil tank.

- Drain the fuel tank.

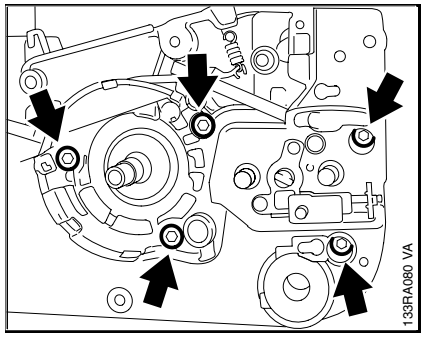
Note: Dispose of fuel at approved disposal site.

- Remove the tank housing - see 12.8.

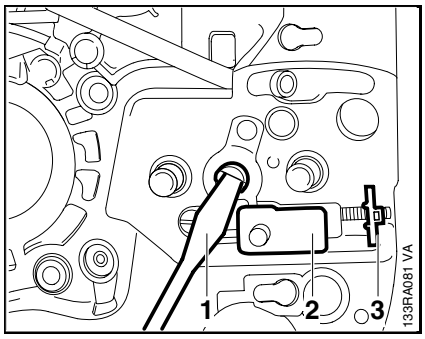
- Remove the oil pump - see 11.3.

- Remove the spiked bumper.

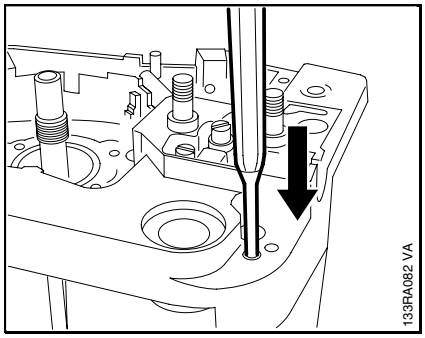
- Remove the piston - see 5.6.1.



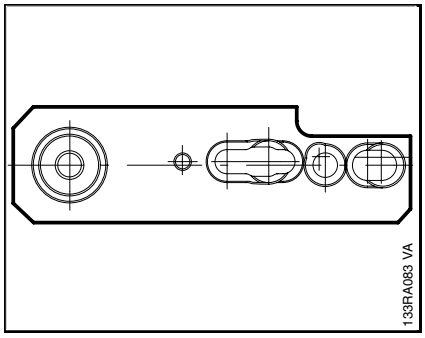
- Take out the screws that join the two halves of the crankcase.



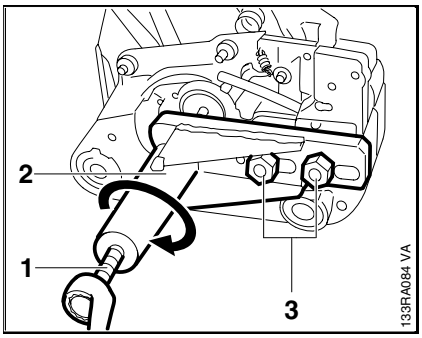
- Use a screwdriver to rotate the spur gear (1) clockwise until the tensioner slide (2) butts against the thrust pad (3).



- At the chain tensioner side of the crankcase, use a 4 mm (0.15") drift to drive the dowel pin out of the two halves of the crankcase.



- Only the new service tool AS for machines with the quick chain tensioning system (illustration shows view from below).



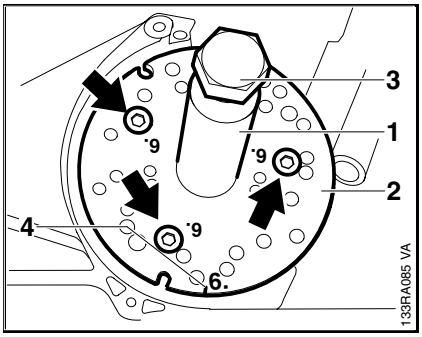
- Back off spindle (1) of service tool AS (5910 890 2205) all the way.

- Slip service tool AS (2) over the collar studs, fit the hexagon nuts (3) (for sprocket cover) and tighten them down by hand.

- Turn the spindle (1) clockwise until the crankshaft is pressed out of the ball bearing. The two halves of the crankcase separate during this process.

- Remove the service tool AS.

- Remove crankcase gasket.



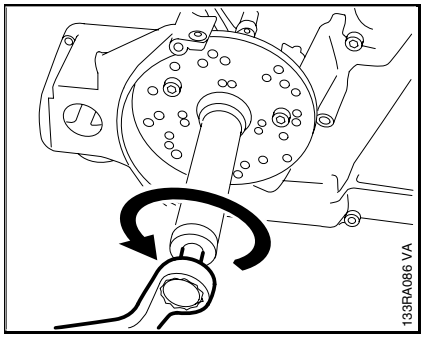
- On new service tool ZS (5910 890 2200), first screw the sleeve (1) 5910 890 1800 into the plate (2) 5910 893 2101.

- Unscrew spindle (3) a little (left-hand thread).

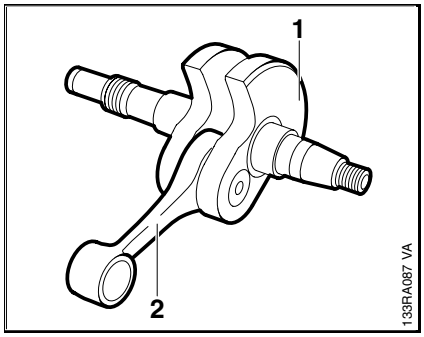
- Fit service tool ZS against ignition side of crankcase so that number "6" (4) is at bottom.

Note: Cylinder flange is at top.

- Insert three M5x72 screws 9022 341 1190 in the holes marked "6" and tighten them down against the drilled plate.

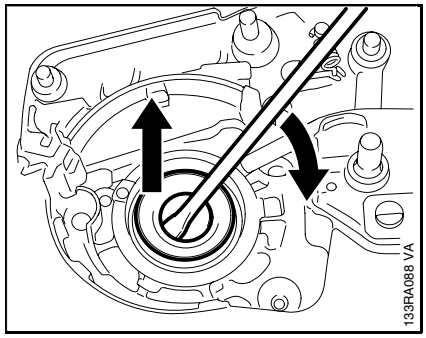


- Turn spindle counterclockwise until the crankshaft is pushed out of the ball bearing.

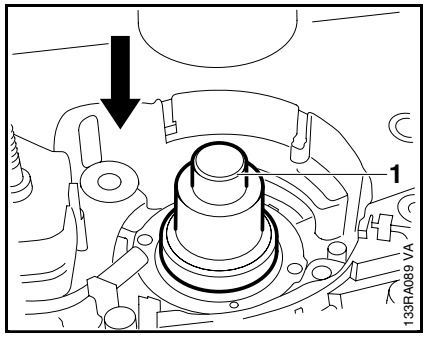


- The crankshaft (1), connecting rod (2) and needle bearing are an inseparable unit. Always replace as a complete unit.

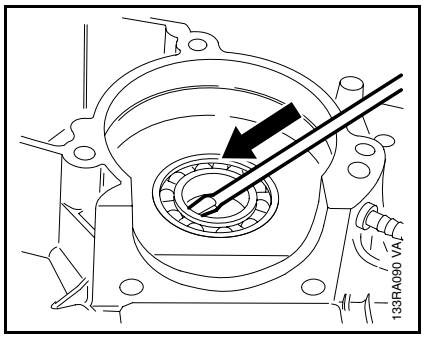
- When fitting a replacement crankshaft, always install new oil seals and ball bearings.



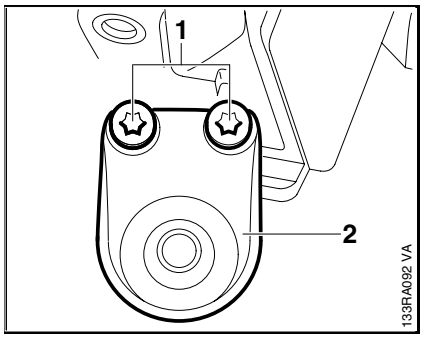
- Ease the oil seal out of the clutch side of the crankcase.



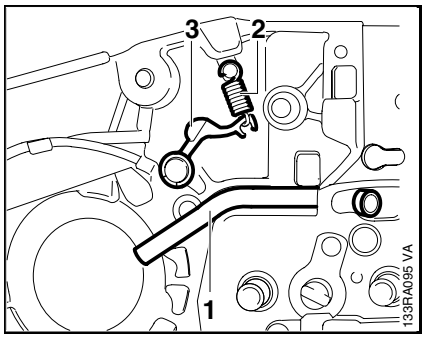
- Use press arbor (1) 1118 893 7200 to remove the ball bearing.



- Carefully knock the oil seal out of the ignition side of the crankcase.



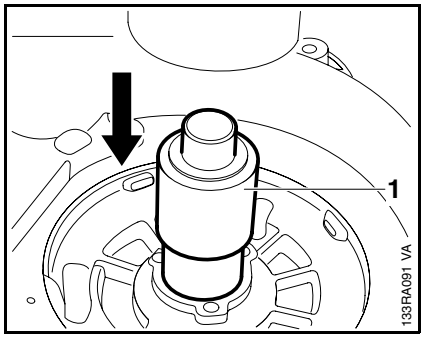
- Take out the screws (1).
- Remove the annular buffer (2).



- Remove the oil delivery hose (1).

To replace the crankcase:

- Unhook the spring (2) and remove the cam lever (3).



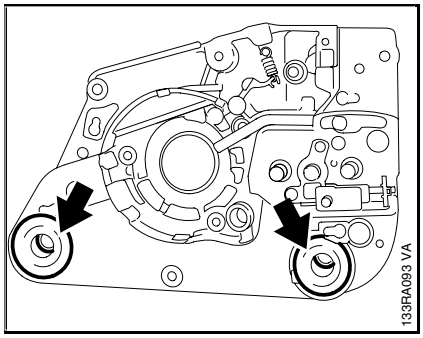
- Use press arbor (1) 1120 893 7200 to remove the ball bearing.

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

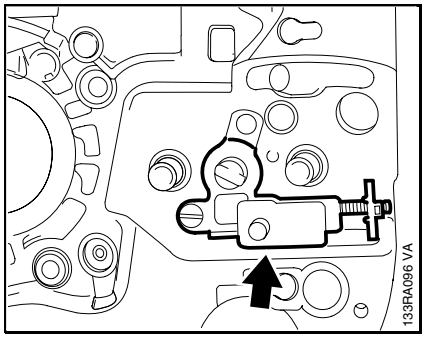
Note: The crankcase must be replaced as a complete unit even if only one half is damaged.

All other parts which are still serviceable can be transferred to the new crankcase.

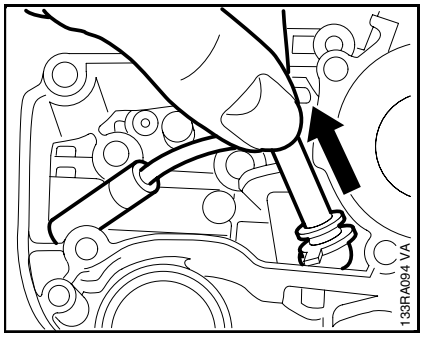
If only the ball bearings have to be replaced, remove all rubber and plastic components first. Carry out the following operations for this purpose.



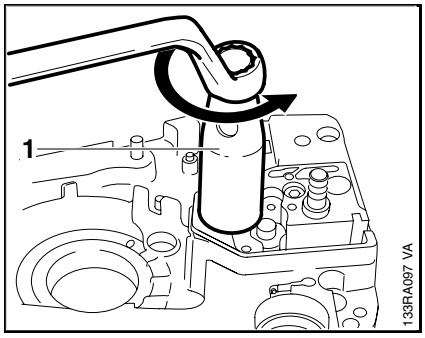
- Push the annular buffers out of the clutch side of the crankcase.



- Remove the complete chain tensioner - see 4.4 or 4.5.



- Pull out the oil suction hose with pickup body.



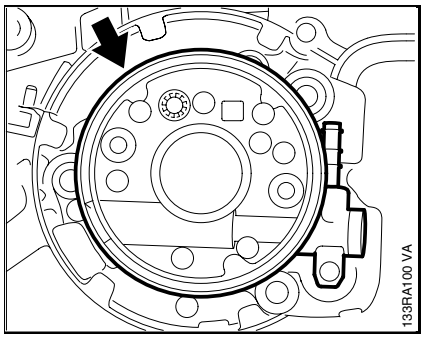
- Use stud puller (1) 5910 893 0501 to unscrew the collar studs (not on machines with quick chain tensioner).

5.8.2 Installing the Crankshaft

New crankcases come with preassembled ball bearings.

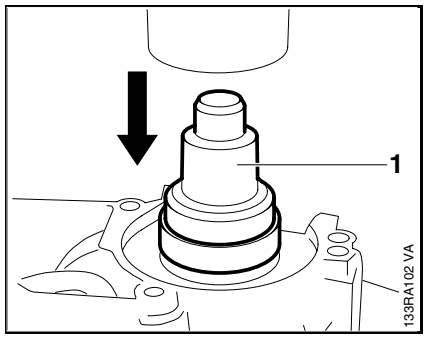
Stamp the serial number on the crankcase with 2.5 mm (0.1") figure stamps.

If the original crankcase is used again, remove the gasket residue and clean the mating surfaces - they must be cleaned very thoroughly to ensure a perfect seal.



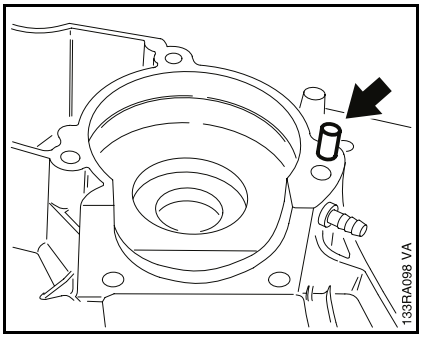
- Place oil pump in position.

- Insert screws and tighten down fingertight.

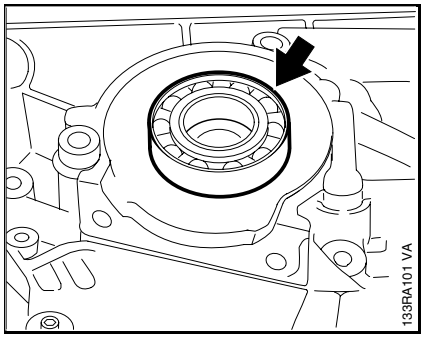


- If it is not possible to heat the crankcase, use the press arbor (1) 1118 893 7200 to press in the ball bearing as far as stop.

- Remove the oil pump and refit the plastic plug.



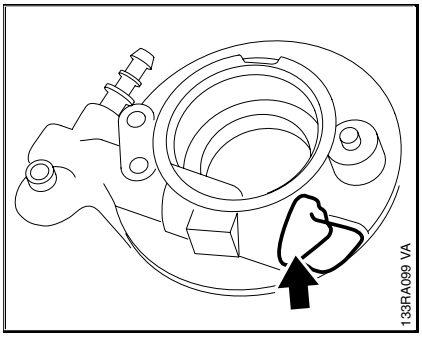
- Check that dowel pin is in position. If necessary, drive dowel pin into crankcase.



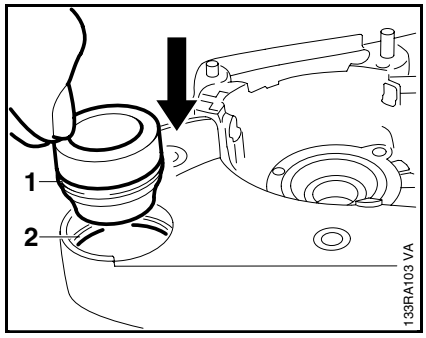
- Heat area of bearing seat on clutch side of crankcase to approx. 150°C (300°F).

- Place ball bearing in position with flush side up and push it home as far as stop.

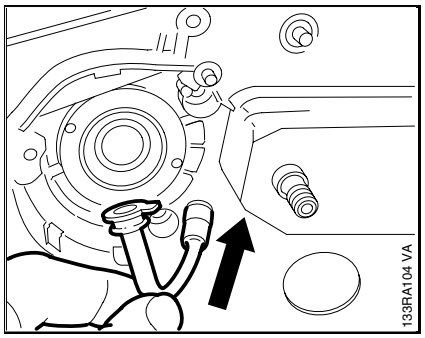
Note: This operation must be carried out very quickly because the bearing absorbs heat immediately and begins to expand.



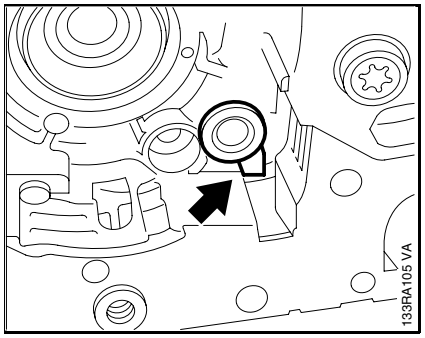
- Pull plastic plug out of oil pump.



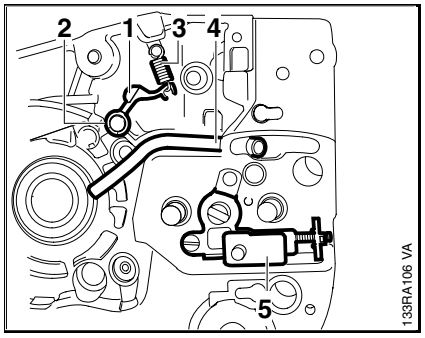
- After the crankcase has cooled down, push the two annular buffers, tapered end first, into position so that the annular groove (1) engages the housing rib (2).



- Push the oil suction hose into the crankcase bore.

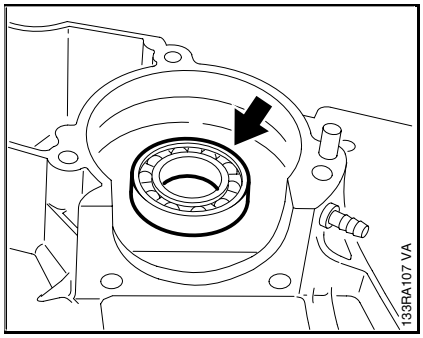


- Use a blunt tool to push the oil suction hose into the bore so that its tab locates in the recesss at the bottom right.



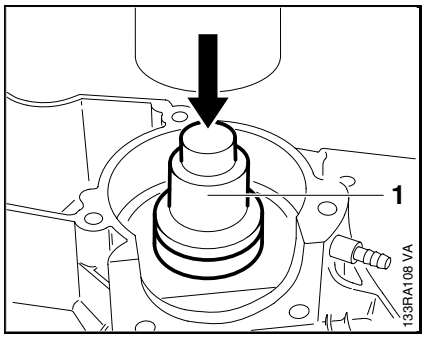
- Install the cam lever (1) and secure it with the E-clip (2).
- Attach the spring (3).

- Install the oil delivery hose (4) - see 11.3.
- Install chain tensioner (5) - see 4.4 or 4.5.

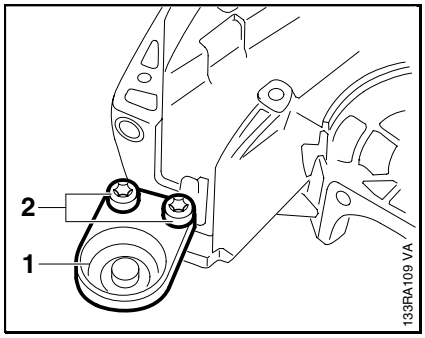


- Heat area of bearing seat on ignition side of crankcase to approx. 150°C (300°F).
- Place ball bearing in position with open side up and push it home by hand as far as stop.

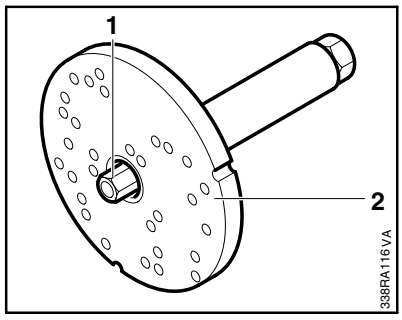
Note: This operation must be carried out very quickly because the bearing absorbs heat immediately and begins to expand.



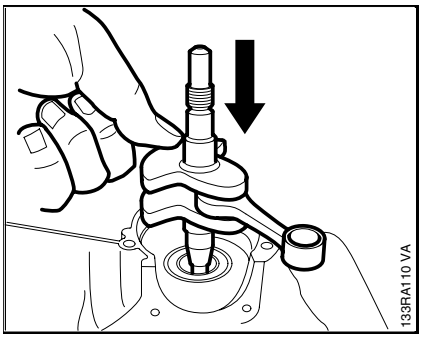
- If it is not possible to heat the crankcase, use the press arbor (1) 1118 893 7200 to press in the ball bearing as far as stop.



- Place annular buffer (1) in position with large opening facing outward.
- Install screws (2) with Loctite 242 and tighten down to 8 Nm (5.9 lbf.ft) - see 13.2.

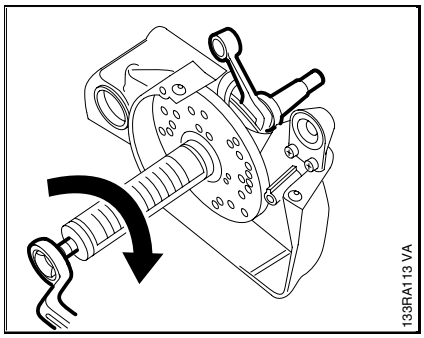


- Screw the spindle fully into service tool ZS (2) and then screw the threaded sleeve (1) 5910 893 2420 onto the spindle as far as it will go.



- Lubricate tapered crankshaft stub with oil.

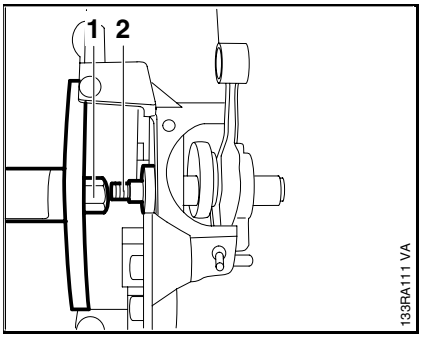
• Place tapered crankshaft stub in ball bearing at ignition side of crankcase.



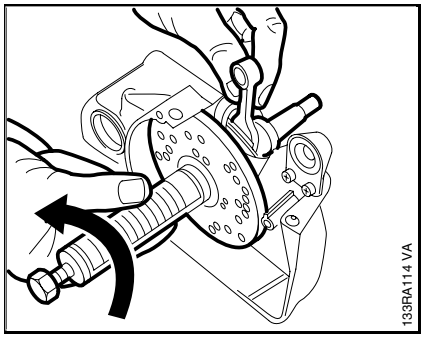
• Turn the spindle clockwise the until the crankshaft locates against the ball bearing.

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

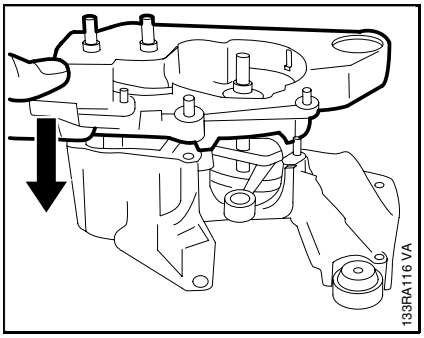
- If crankcase is new, install collar studs for guide bar with Loctite 242 and torque down to 23 Nm (17 lbf.ft).



• Position threaded sleeve (1) on thread (2) of crankshaft stub and screw it on.

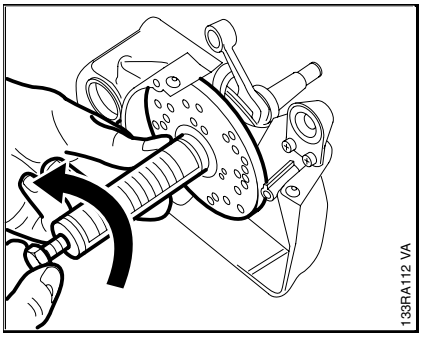


• Release the spindle by turning it counterclockwise, then hold the crankshaft steady and unscrew the service tool counterclockwise.

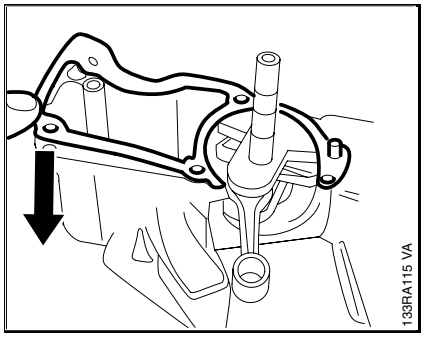


- Lubricate straight crankshaft stub with oil.

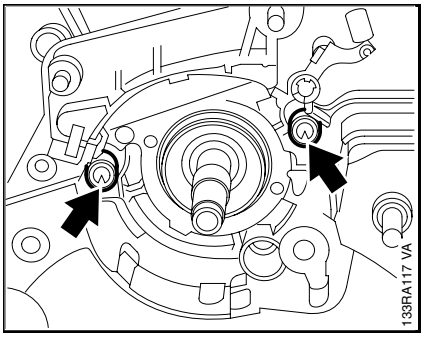
• Slip clutch side of crankcase over the crankshaft stub.



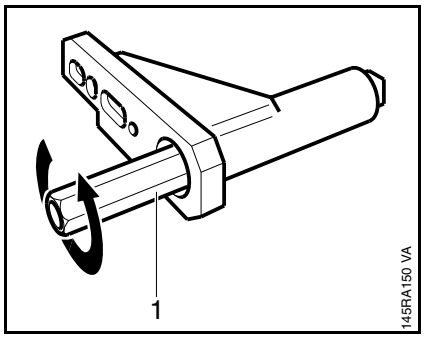
• Hold the spindle steady and turn the service tool counterclockwise until the drilled plate butts against the crankcase.



• Fit a new gasket on the ignition side of the crankcase.

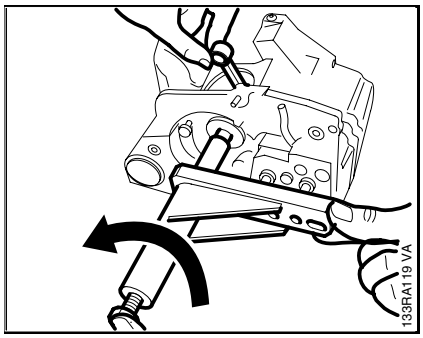


• To prevent the crankcase and gasket twisting, fit M5x72 screws (from service tool ZS) in two crankcase holes as far as stop.



- Screw the spindle fully into service tool AS by turning it clockwise.

• Screw the threaded sleeve (1) 5910 893 2409 onto the spindle as far as it will go (left-hand thread).



- Push the threaded sleeve over the crankshaft stub.

• Hold the crankshaft steady, rotate the spindle counter-clockwise to screw the threaded sleeve onto the crankshaft.

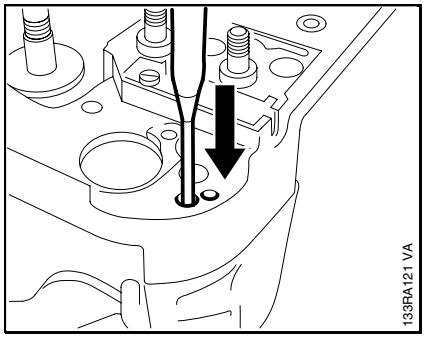
- Release the crankshaft. Hold the service tool steady and continue turning the spindle until the tool locates against the guide bar mounting face.

- Fit two hexagon nuts on the bar mounting studs and screw them down fingertight.

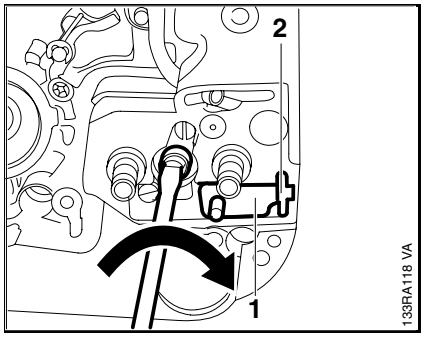
- Unscrew the hexagon nuts.

- Unscrew the spindle clockwise and take away the service tool.

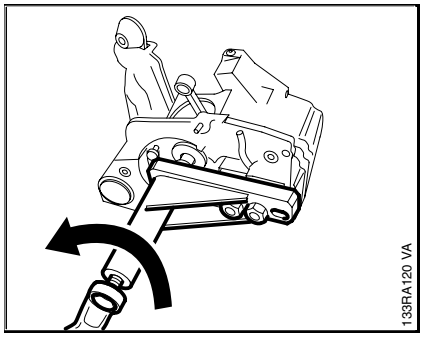
- Take out the two M5x72 screws.



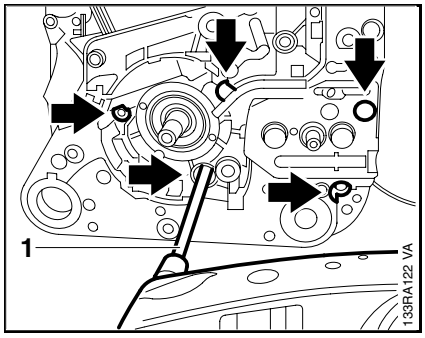
• Use a 4 mm (0.15") drift to drive the dowel pin into the crankcase from the chain tensioner side.



• Check that tensioner slide (1) is butting against thrust pad (2). If necessary, rotate spur gear clockwise until slide is against thrust pad.



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



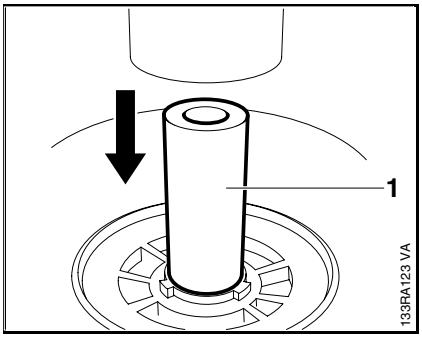
• Use screwdriver bit (1) 0812 542 2104 to tighten screws alternately in a diagonal pattern to 9 Nm (6.6 lbf.ft).

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

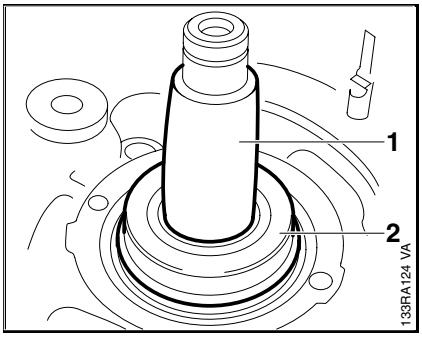
- Coat sealing lips of oil seals with grease - see 13.2.

- Apply thin coating of sealant, see 13.2, to outside diameter of oil seals.

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

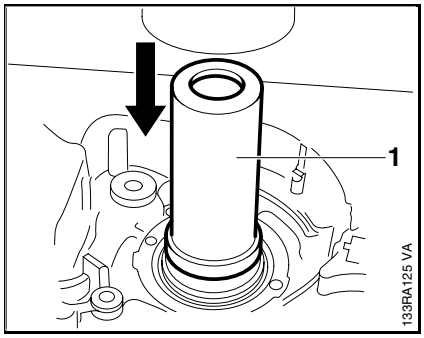


- Press it fully home with press sleeve (1) 1121 893 2400.



- Fit the assembly sleeve (1) 1118 893 4602 over the clutch end of the crankshaft.

- Slide the oil seal (2), open side facing the crankcase, over the assembly sleeve.

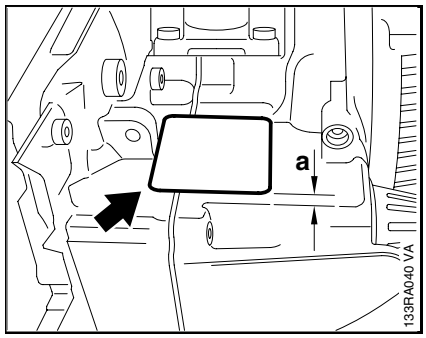


- Press it home with press sleeve (1) 1118 893 2401.

- Remove the assembly sleeve.

- Wait about one minute and then turn the crankshaft several times.

Reassemble remaining parts in the reverse sequence.



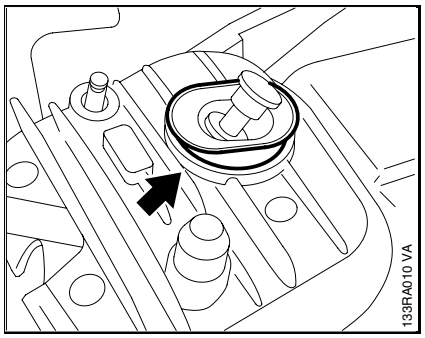
- On machines with a catalytic converter it is necessary to stick a heat reflecting foil on the crankcase. Clean and degrease surface first.

- Remove the backing from the new heat reflecting foil.

- Press heat reflecting foil firmly into position so there are no creases.

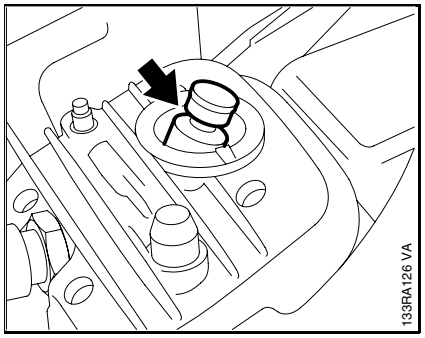
  a = 8 mm (0.3")

5.9 Decompression Valve



- Remove the shroud - see 4.2.

• Remove the grommet.



• Use standard 13 mm socket to unscrew the decompression valve.

- Fit new decompression valve and torque down to 14 Nm (10.3 lbf.ft).

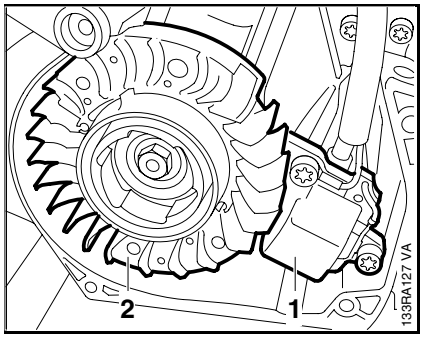
- Fit the grommet.

- Fit the shroud.

6. IGNITION SYSTEM

Warning! 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).

6.1 Spark Plug Boot/ Ignition Lead

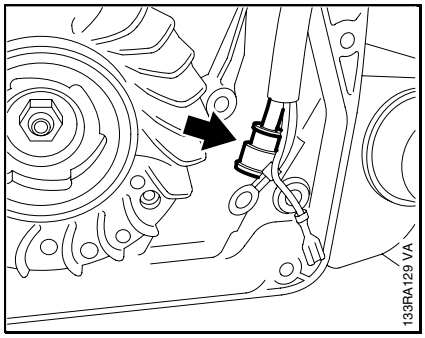
- Remove the shroud - see 4.2.

- Remove the carburetor box cover.

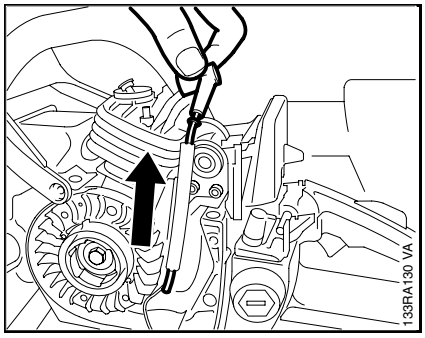
- Remove the ignition module - see 6.2.2.

- Remove boot from the spark plug.

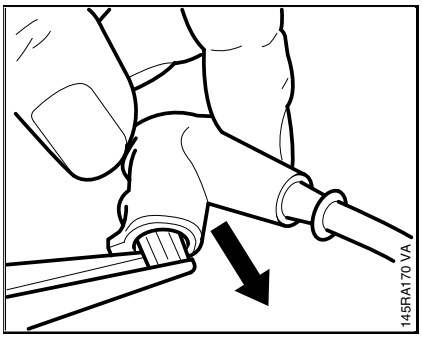
Note: An angled spark plug boot is installed on model 026 from serial number X 19 830 900.



• Pull grommet, if fitted, off the ignition lead.



• Pull the ignition lead out of the insulating tube.



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

- Unhook the leg spring from the ignition lead.

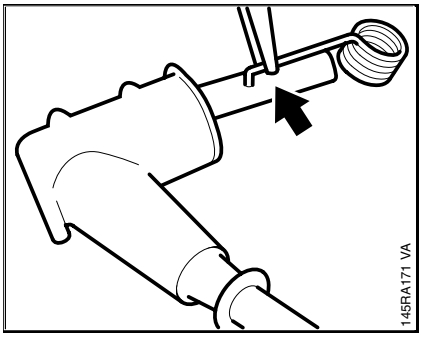
- Slip the spark plug boot off the ignition lead.

- Cut new ignition lead to length (see parts list or cut to same length as old lead).

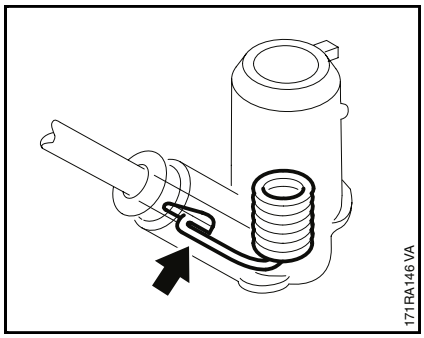
- Coat end of the ignition lead (about 20 mm/3/4") with oil.

- Fit spark plug boot over the ignition lead.

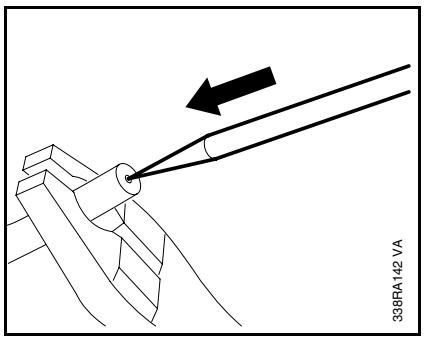
- Use suitable pliers to grip the end of the ignition lead inside the spark plug boot and pull it out.



- Pinch the hook of the spring into the center of the lead, about 15 mm (5/8") from the end of the lead.

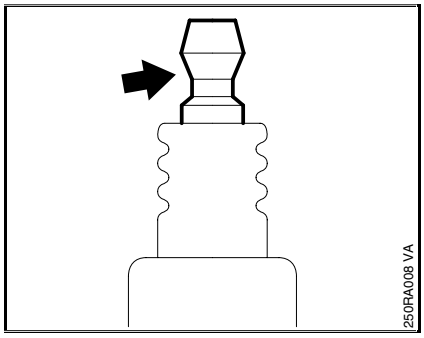


- Pull the lead back into the boot so that the spring locates properly inside it.

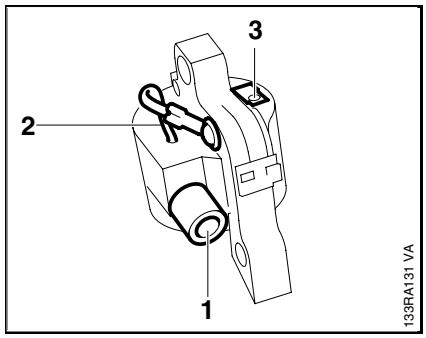


- Use a pointed tool (awl or gimlet) to pierce the center of the other end of the ignition lead which screws into the module.

Reassemble remaining parts in the reverse sequence.



- If spark plug has detachable adapter nut, it must be attached and tightened down securely.



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

1. the high voltage output (1)

2. the ground wire (2)

3. the connector tag (3) for the short circuit wire

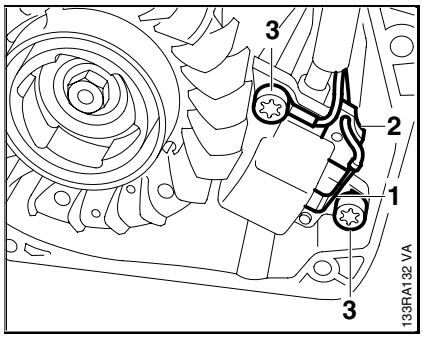
Accurate testing of the ignition module is only possible with special test equipment. For this reason it is only necessary to carry out a spark test in the workshop. A new ignition module must be installed if no ignition spark is obtained (after checking that wiring and stop switch are in good condition).

6.2.1 Ignition Timing

Ignition timing is fixed and is **not** adjustable.

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.

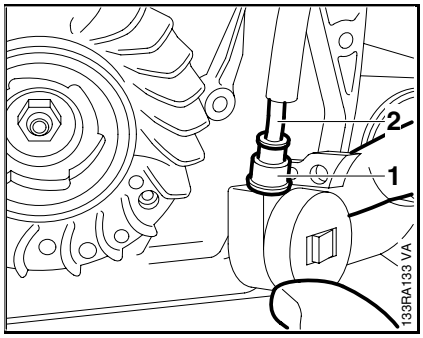
6.2.2 Removing and Installing



- Remove the fan housing.

- Pull the short circuit wire (1) off the connector tag and out of the retainer (2).

- Take out the screws (3).



- Remove the ignition module.

- Pull off the grommet (1).

- Rotate the ignition module to unscrew the ignition lead (2) from the contact pin.

- Pull the ignition lead out of the high voltage output.

- Pack the high voltage output with STIHL multipurpose grease - see 13.2.

Important: Do not use graphite grease (Molykote) or silicone insulating paste.

- Screw home the ignition lead.

- Push the grommet over the high voltage output.

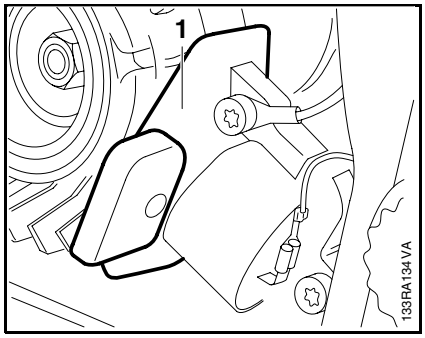
- Coat threads of screws with Loctite 242 - see 13.2.

- Place the ignition module in position, insert screws with washers but do not tighten them down yet.

Important: A washer must be fitted under each screw head.

Note: Secure the ground wire with the upper screw.

On machines with heated handles, position connector of generator wire under the ignition module - see 10.5.



- Slide the setting gauge (1) 1111 890 6400 between the arms of the ignition module and the flywheel magnets.

- Press the ignition module against the setting gauge and tighten down the mounting screws to a torque of 7.0 Nm (5.2 lbf.ft).

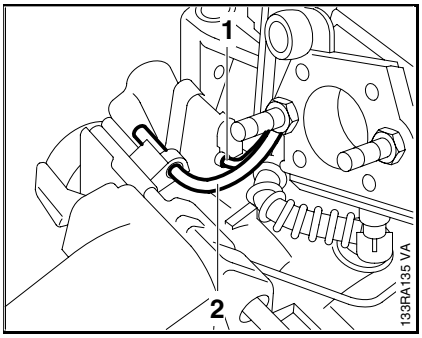
Assemble all other parts in the reverse sequence.

6.3 Short Circuit Wire/ Ground Wire

The complete wiring harness has to be replaced on machines with carburetor heating from serial number X 32 611 639 and machines with heated handles from serial number X 37 055 376 - see 6.4.

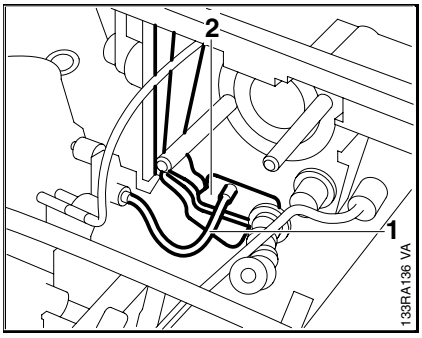
- Remove the shroud - see 4.2.

- Remove the air filter - see 12.1.

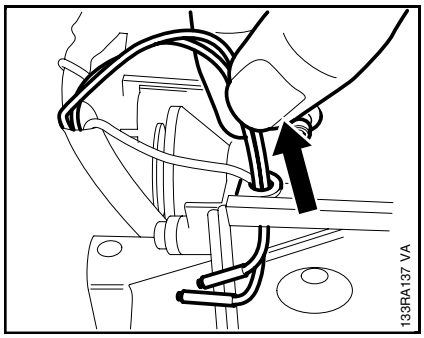


- Pull ground wire (1) out of the contact spring.

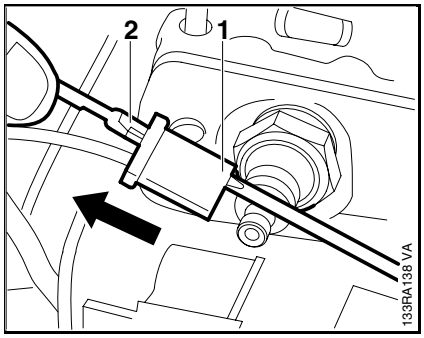
- Pull short circuit wire (2) out of the switch shaft.



Note: The ground wire (1) is soldered to the printed circuit board (2) on machines with carburetor heating up to serial number X 32 611 638.

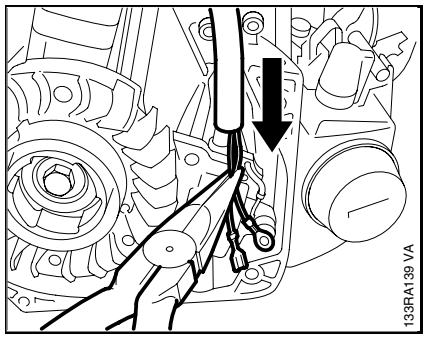


- Pull both wires out of the grommet.



- To change the ground wire on machines with carburetor heating up to serial number X 33 339 217, pull the connector housing (1) off the printed circuit board.

- Use a small screwdriver to carefully press down the retaining lug of the terminal socket (2) in the connector housing. Remove the terminal socket.



- Remove the short circuit wire and ground wire from the ignition module - see 6.2.2.

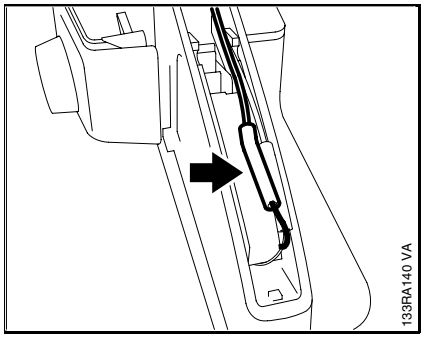
- Pull the short circuit wire and ground wire out the insulating tube.

Install in the reverse sequence.

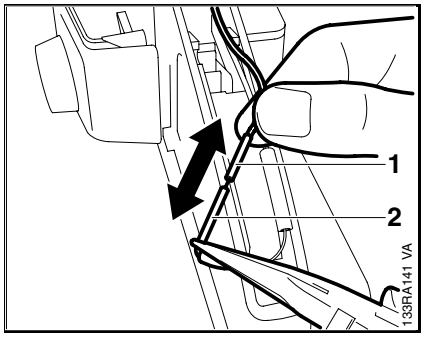
The wiring harness includes the ground wire, short circuit wire and connecting wire to the generator and rear handle heating element.

- Remove the carburetor - see 12.5.2.

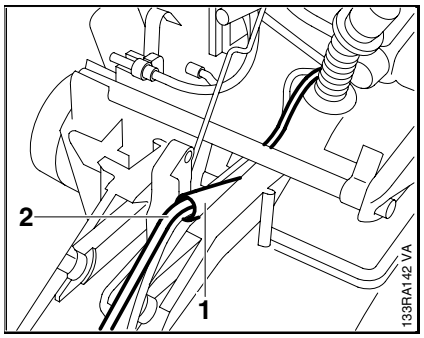
- Remove the interlock lever - see 9.2.



- Pull back the insulating tube on the thinner wire (from generator to rear handle heating element) to expose connector.

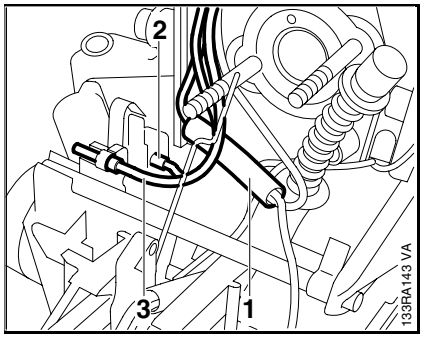


- Disconnect the pin (1) and socket connector (2).



- Pull wire with tube (1) out of channel in tank housing.

- Pull wire (2) out of tube.



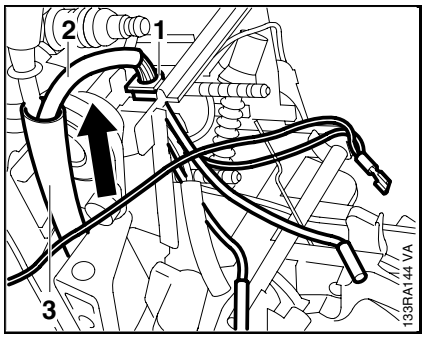
- Pull back insulating tube (1) to expose connector.

- Disconnect the wires.

- Pull the ground wire (2) out of the contact spring.

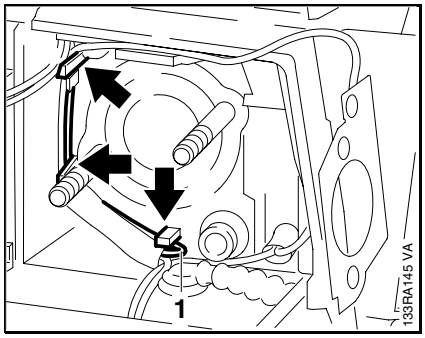
- Pull the short circuit wire (3) out of the switch shaft.

- Disconnect wire from generator - see 10.5.



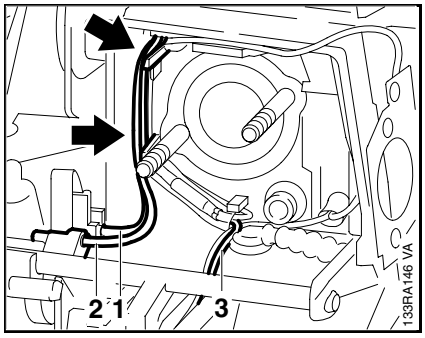
- Ease the grommet (1) out of the tank housing.

- Pull the wiring harness (2) out of the tank housing and the insulating tube (3).



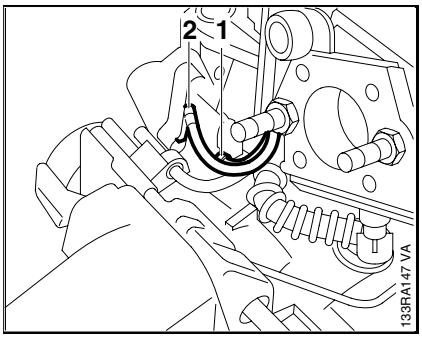
Install in the reverse sequence.

- Make a loop (1) in the wire from the generator to the rear handle heating element and push it behind the retainers.



- Also push the ground wire (1) and short circuit wire (2) behind the retainers.

- Note correct position of wire (3) to rear handle heating element.

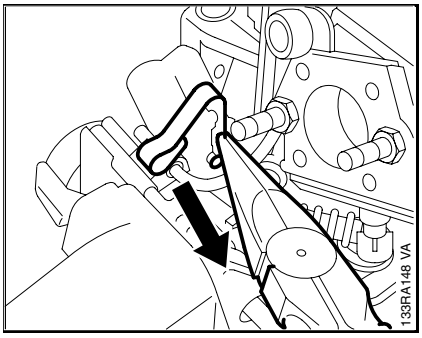


- Remove the air filter - see 12.1.

- Turn switch lever so that it points up.

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

- Machines with carburetor heating from serial number X 33 339 218: Pull flag terminal (2) off the contact spring.



- Pull contact spring out of its seat in the tank housing.

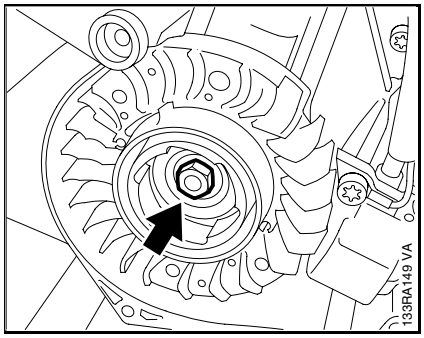
Reassemble in the reverse sequence.

Removing the flywheel

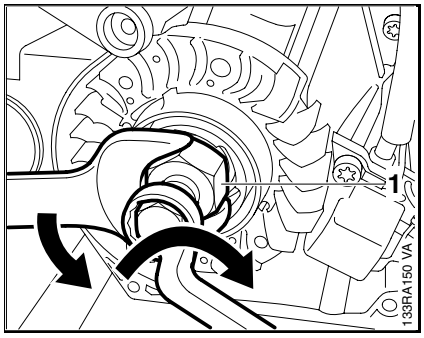
- Use the locking strip to block the piston - see 4.2.

- Remove the fan housing.

- Rotate the flywheel so that the magnet poles line up with the ignition module.

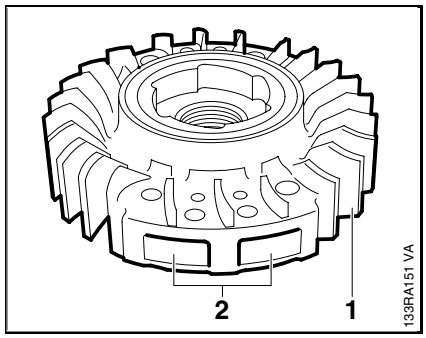


- Unscrew the flywheel mounting nut.



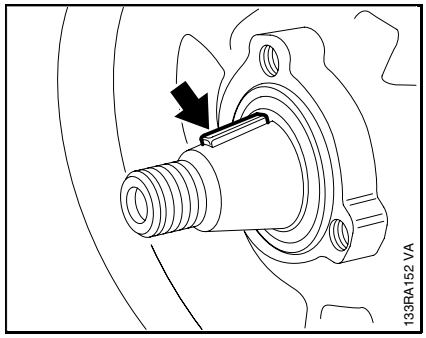
- Use puller (1) 1110 890 4500 to release the flywheel.

- Pull the flywheel off the crankshaft.



- The flywheel (1) and magnet poles (2) must not be cracked or damaged in any way. Install a new flywheel if necessary.

- For machines with heated handles see 10.5.



Installing the flywheel

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.

- Check that the key is correctly positioned in the crankshaft.

- Fit the flywheel in position.

- Fit and tighten down flywheel nut to 33 Nm (24.5 lbf.ft).

Assemble all other parts in the reverse sequence.

7. REWIND STARTER

7.1 General

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

7.2 Rewind Spring

7.2.1 Replacing

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

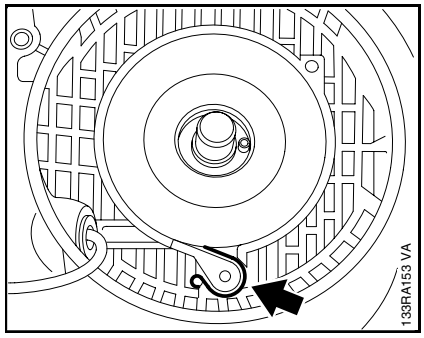
- Remove the fan housing with rewind starter.

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

- After removing the spring housing, take remaining pieces of rewind spring out of fan housing.

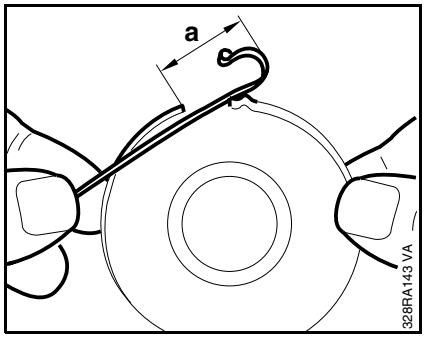
Note: The replacement spring comes ready for installation with a spring housing.

- It should be lubricated with a few drops of STIHL special lubricant before installation - see 13.2.

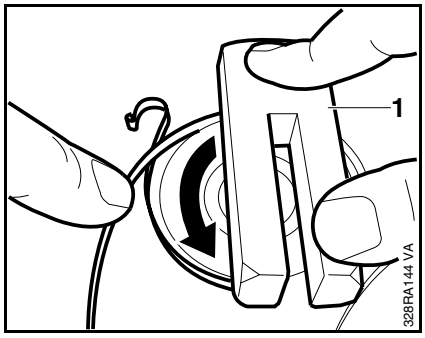


- Position the rewind spring with spring housing (bottom plate must face up) in the fan housing. Engage the anchor loop over the cast lug in the fan housing.

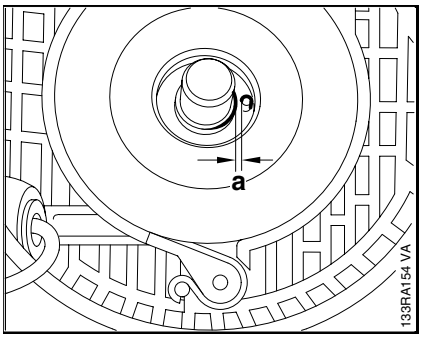
Important: If the rewind spring pops out and uncoils during installation, it must be refitted in the spring housing as follows:



- Position the anchor loop about 20 mm (3/4") from the edge of the spring housing.



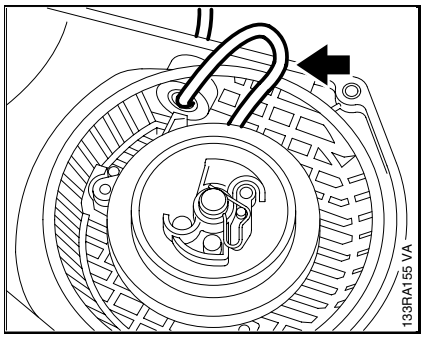
- Fit rewind spring in the counterclockwise direction, starting outside and working inwards. Place wooden block (1) 1108 893 4800 over the spring housing to simplify this operation.



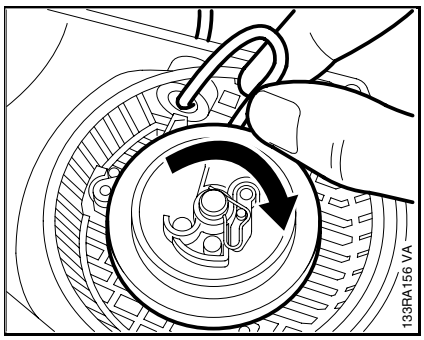
- Check distance of inner spring loop from starter post, a = 2 mm (0.08"), and correct if necessary.

- Install the rope rotor - see "Standard Repairs, Trouble-shooting" handbook.

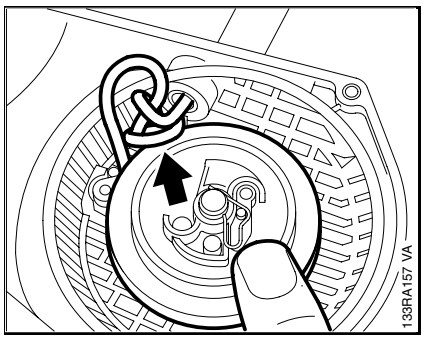
- Tension the rewind spring - see 7.2.2.



- Make a loop in the starter rope.



- Grip the rope **close** to the rotor and use it to turn the rope rotor six full turns clockwise.

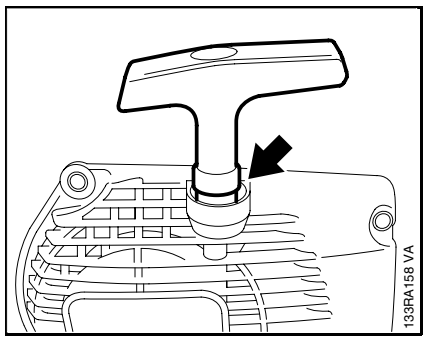


- Hold the rope rotor steady.

- 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 release the starter grip so that the rope winds itself onto the rotor.



Note: The starter grip must sit 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 - it might break.

- Fit the fan housing.

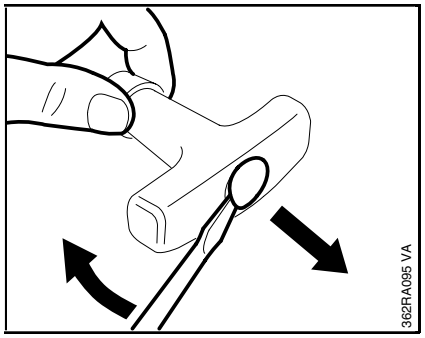
- Remove the fan housing with rewind starter.

For starter rope (ElastoStart) on 026, see "Standard Repairs and Troubleshooting" handbook.

Starter rope

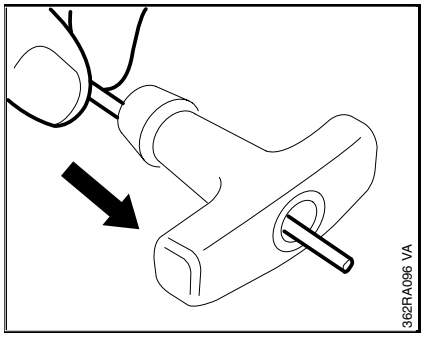
- Remove the rope rotor - see "Standard Repairs and Troubleshooting" handbook.

- Remove starter rope from the rope rotor.



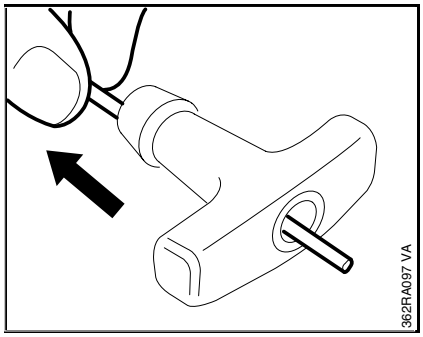
- Remove cap from the starter grip.

- Pull the rope out of the starter grip.



- Thread end of new rope through the underside of the starter grip.

- Secure the end of the rope with a simple overhand knot.



- Pull the rope back until the knot locates in the starter grip.

- Press cap into the starter grip.

- Fit starter rope on rope rotor.

- Install the rope rotor.

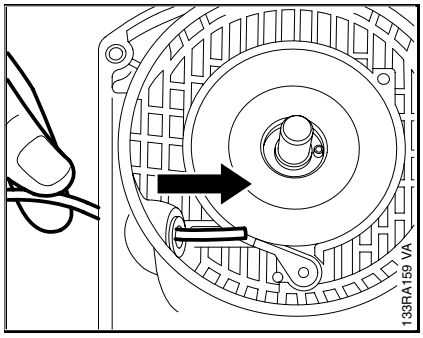
Starter grip

The new starter grip comes with starter rope.

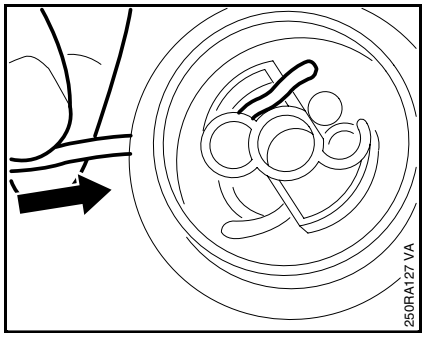
- Remove the rope rotor - see "Standard Repairs and Troubleshooting" handbook.

- Take the knot out of the recess in the rope rotor.

- Open the knot and pull the starter rope out of the rotor and fan housing.

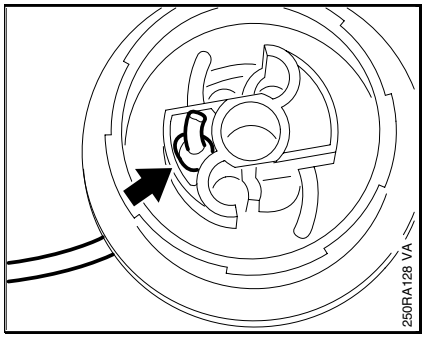


- Thread the starter rope 1113 195 8200 through the guide bush from outside.



- Thread other end of rope through the hole in the side of the rope rotor.

- Secure the rope with a simple overhand knot.



- Pull the rope back into the rotor so that the knot locates in the recess.

- Install rope rotor - see "Standard Repairs, Troubleshooting" handbook.

- Tension the rewind spring - see 7.2.2.

- Fit fan housing with rewind starter.

Rubber anti-vibration buffers are installed between the crankcase and tank housing. Damaged rubber buffers (annular buffers) must always be replaced in sets.

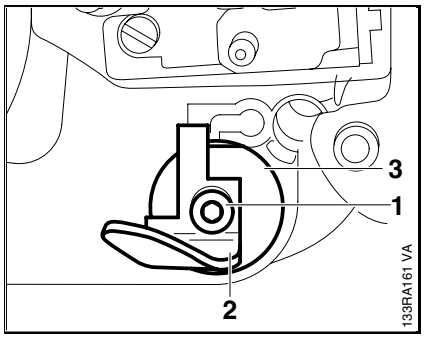
Modified (softer) annular buffers are installed in 026 machines without spark arresting from serial number 1 42 567 877.

All annular buffers are marked with an abbreviated version of the part number for easy identification. The marking is usually molded on the end face of the buffer, e.g. annular buffer 1121 790 9902 is marked 1121/02.

- Remove the shroud - see 4.2.

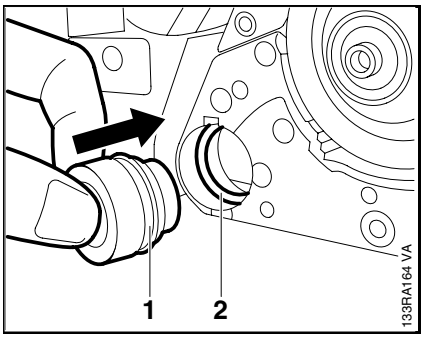
- Remove the side plate - see 4.3.2.

- On quick chain tensioning system, remove the lower bumper strip.

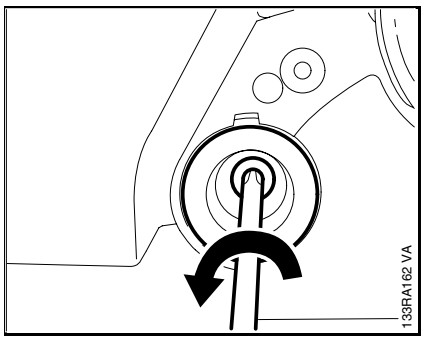


- Remove screw (1) from chain catcher (2).

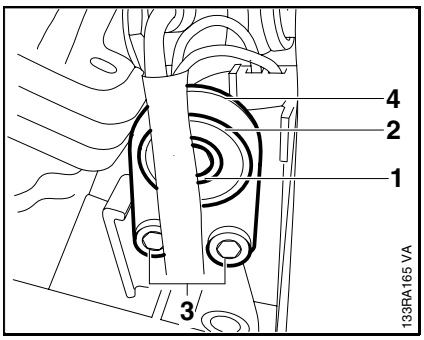
- Ease expanding plug (3) out of front annular buffer.



- Push the new annular buffers into the crankcase so that the groove engages over the inner housing rib (1).

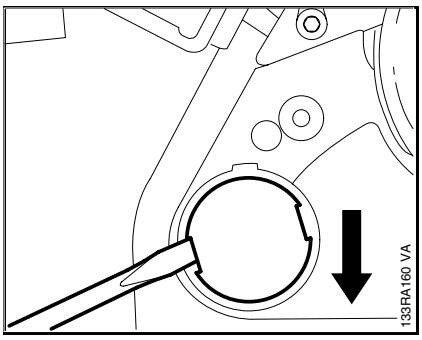


- Unscrew the annular buffer mounting screws.

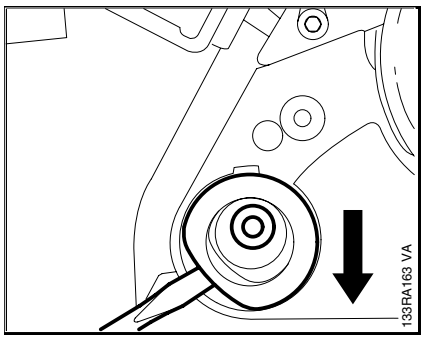


- Take out the screw (1) and remove the sleeve (2).

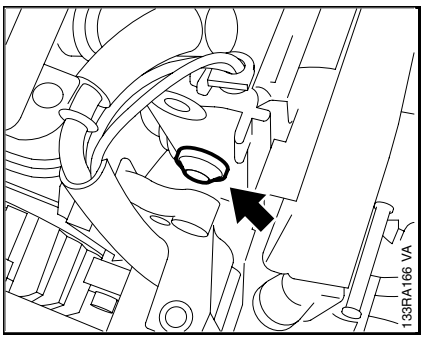
- Take out the screws (3) and remove the annular buffer plate (4).



- Ease the plug out of the rear annular buffer.



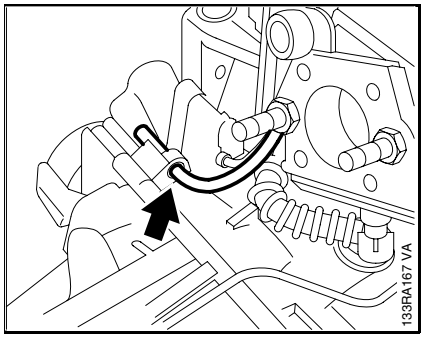
- Pry the annular buffers out of the crankcase.



- Check stop buffer from machine X 36 348 620 and install new one if necessary. To do this, remove tank housing - see 12.8.

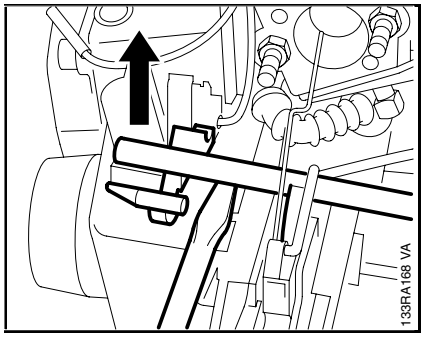
- Tightening torques see 3.6.

The thumb-operated Master Control lever moves the switch shaft to select the required function.

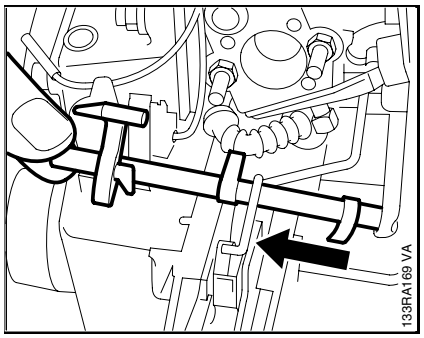


- Remove the interlock lever - see 9.2.

• Pull the short circuit wire out of the switch shaft.

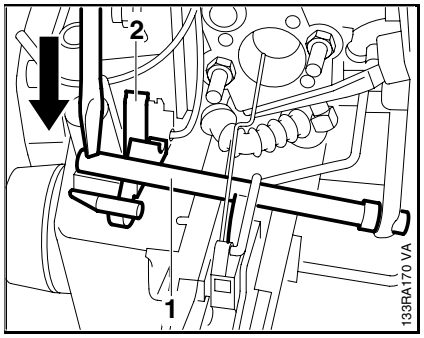


• Pry the switch shaft out of its pivot mount next to the contact spring.



- Turn the switch shaft so the Master Control lever points up.

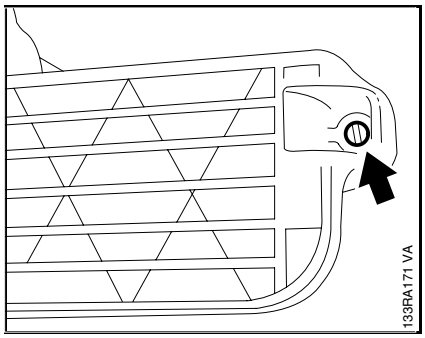
• Pull the switch shaft out of the other pivot mount.



Install in the reverse sequence.

- The throttle rod must be above the switch shaft.

• Use a screwdriver to press the switch shaft (1) into the pivot mount and ease the contact spring (2) forwards a little at the same time.

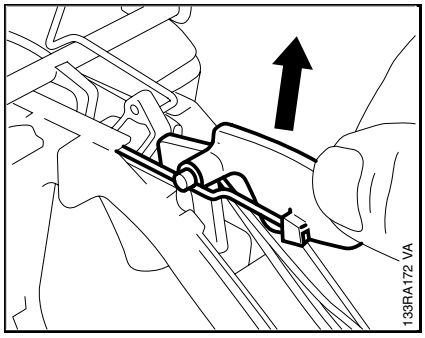


- Remove the air filter - see 12.1.

- Move Master Control lever to "CHOKE" position.

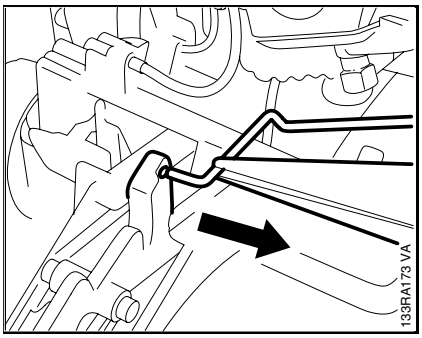
• Take out the screw.

- Remove the handle molding.

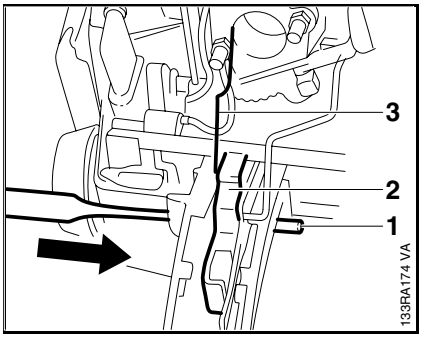


- Move Master Control lever to "RUN" position.

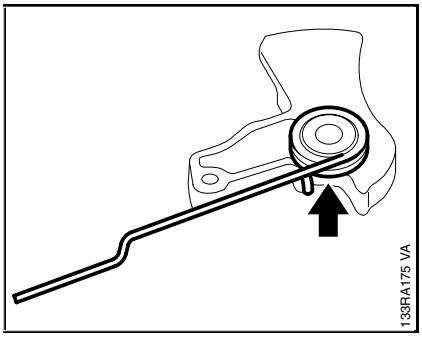
• Pull interlock lever out of its seat.



- Pull the throttle rod out of the throttle trigger.

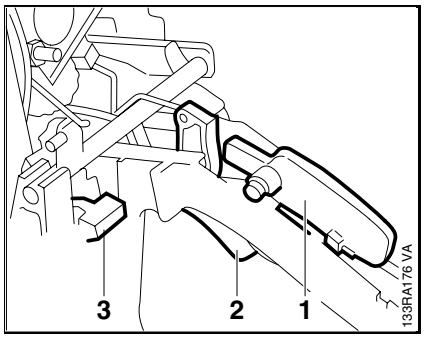


- Use a 5 mm (3/16") drift to drive out the cylindrical pin (1).
- Take the throttle trigger (2) and torsion spring (3) out of the handle.



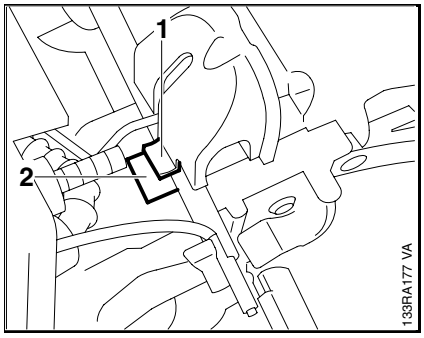
- Remove the torsion spring.

- The torsion spring must be under the interlock lever and engage the notch.



Install in the reverse sequence.

- Press the interlock lever (1) down.
- Push the throttle trigger (2) up and move Master Control lever (3) to "CHOKE" position.



- Fit the handle molding so that tab (1) engages the seat (2) in the tank housing.

10. ELECTRIC HANDLE HEATING SYSTEM
10.1 Troubleshooting

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.

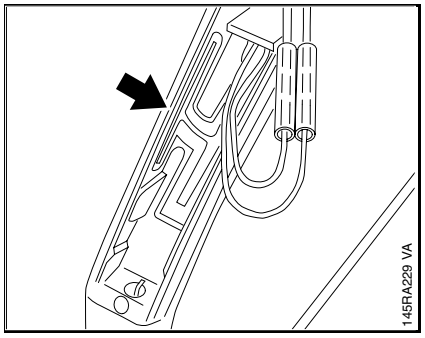
Heating elements with a higher resistance are installed from serial number X 33 339 218 - see 10.3 or 10.4.

There are two reasons for failures in the heating system:

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

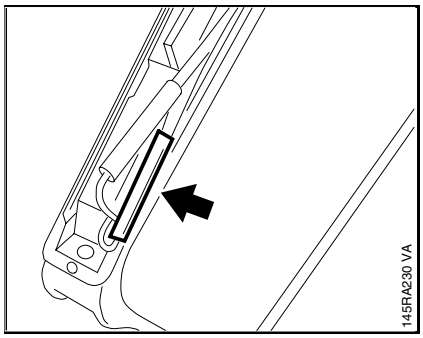
2. A short circuit resulting from damaged insulation.

Important: The heating element in the rear handle may overheat and



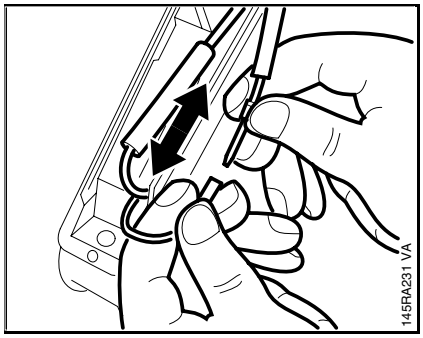
fail if it is not bonded firmly in position, i.e. completely flat (no creases).

To trace the cause of a fault:

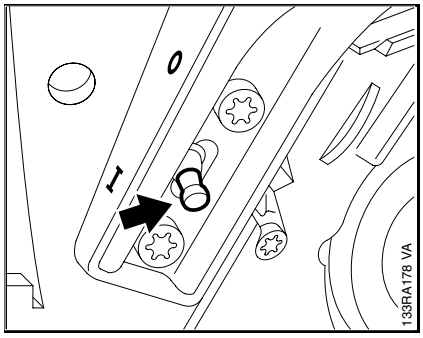


- Remove interlock lever - see 9.2.

- Slide back the insulating tube from connector on the wire between the generator and rear handle heating element.

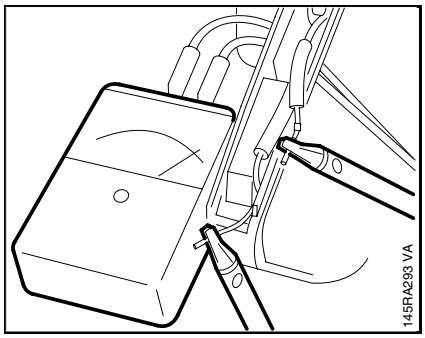


- Separate the pin and socket connector.



- Set the heater switch to "I".

- Set the ohmmeter to "Ωx1".



- Clip one ohmmeter test lead to the generator wire and the other test lead to the heating element wire.

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

If the system is in order, the ohmmeter should indicate a value between 3.5 and 4 Ω or 0.9 and 1.1 Ω.

If no reading is obtained, there is a break in the circuit.

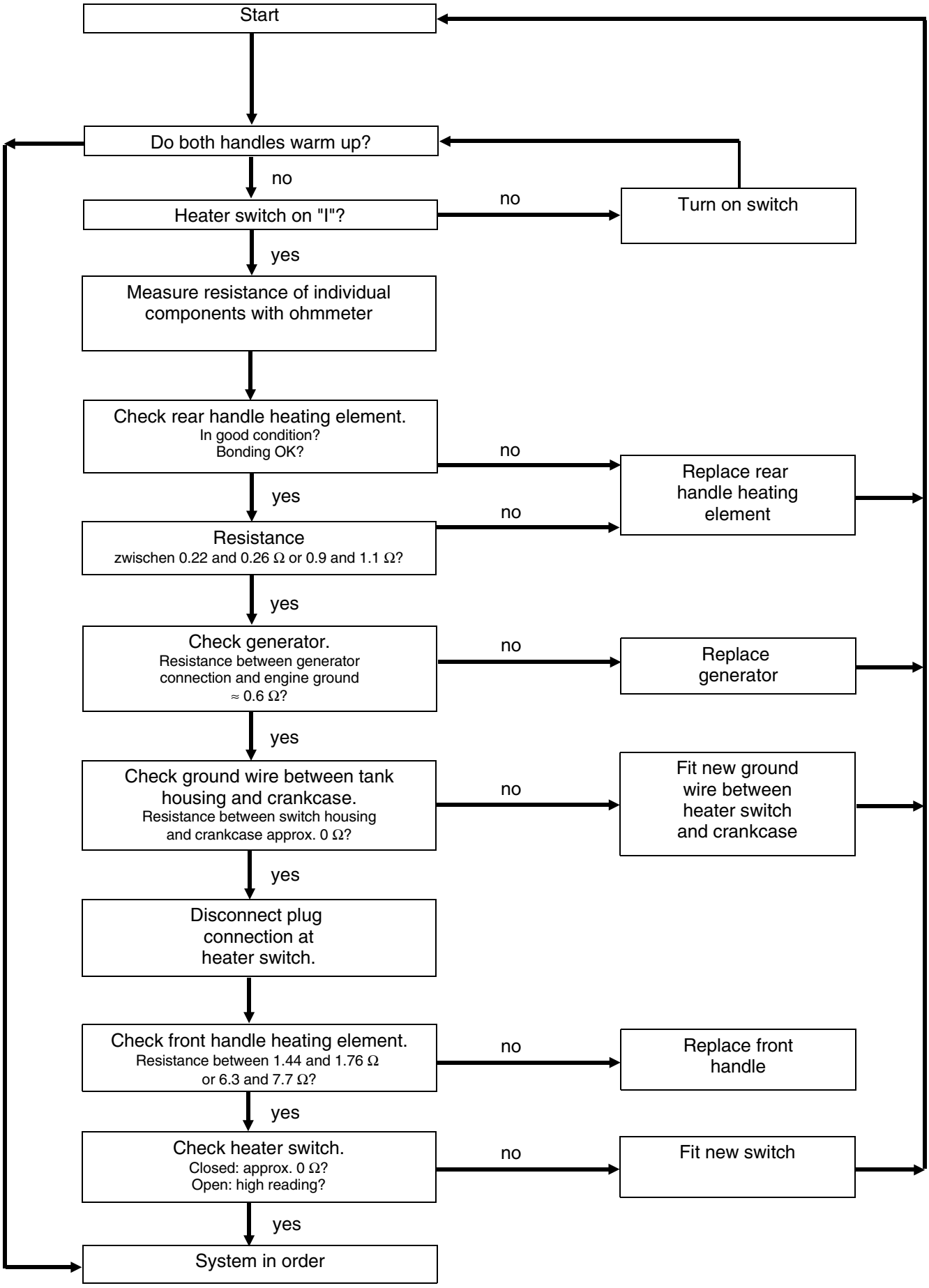
If the ohmmeter shows a value of less than 3.5 Ω or 0.9 Ω, there is a short circuit in one of the components.

In either case it is necessary to check each component separately. The generator wire remains disconnected from the heating element during this check.

- After completing the test, reconnect the wires and slide the insulating tube over the pin and socket connector.

- Fit the interlock lever - see 9.2.

10.1.1 Troubleshooting Chart



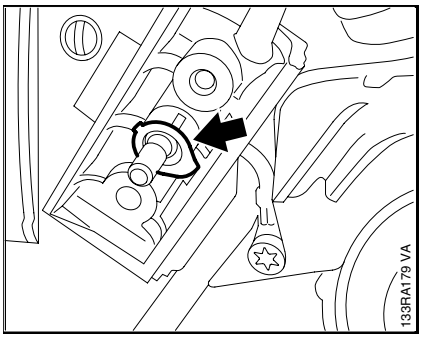
10.1.2 Test Connections and Test Values

The plug and socket connections of the wires in the rear handle must be disconnected to test the individual components.

Component	Ohmmeter connection (use either test lead)		Resistance Ω		If faulty	
	Lead 1	Lead 2	Spec.	Actual (reading)	Cause	Remedy
Switch	Switch terminal[1)]	Ground	0	–	Switch faulty	Replace switch
Heating element in rear handle	Connector on wire from rear handle heating element	Connector on wire from rear handle heating element	0.22... 0.26 (old) 0.9...1.1 (new)	approx. 0.22 approx. (0.9	Heating element okay	
				–	Break in wire, heating element damaged	Replace heating element
				0	Short circuit - damaged insulation	Repair insulation
Heating element in front handle	Connector on wire from front handle heating element	Ground	1.44... 1.76(old) 6.3...7.7 (new)	approx. 6.3 approx. 1.5	Heating element okay	
				–	Break in wire, heating element damaged	Replace front handle
				0	Short circuit - damaged insulation	Repair insulation
Generator	Connector on wire from generator	Ground	0.6 or 1.2	approx. 0.6 or 1.2	Generator okay	
				–	Break in wire, generator damaged	Replace generator
				0	Short circuit - damaged insulation	Repair insulation

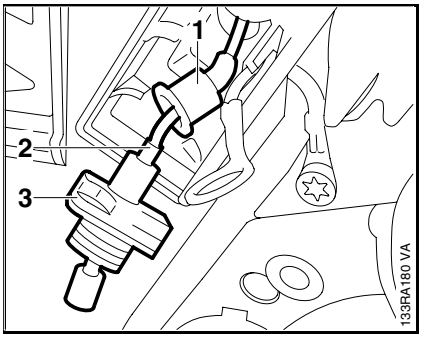
[1)] Pull out wire to make connection

10.2 Heater Switch



- Remove the front handle and put it to one side - see 10.4.

• Take the ground wire ring terminal off the heater switch.



- Pull the switch out of its seat in the tank housing.

• Push back the rubber grommet (1).

• Pull the connector sleeve (2) out of the heater switch (3).

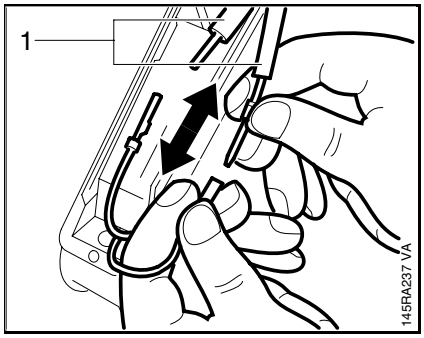
Assemble in the reverse sequence.

10.3 Heating Element in Rear Handle

Heating elements with a higher resistance are installed from serial number X 33 339 218.

Previous version:
0.225...0.275 Ω
New version: 0.9...1.1 Ω

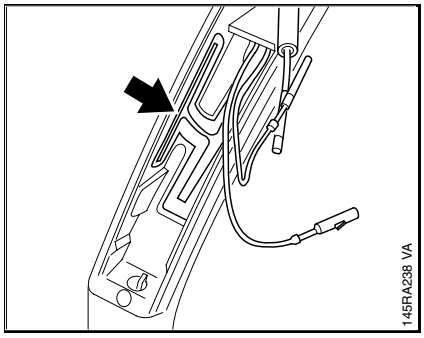
If a heating element with a higher resistance is installed, the flywheel and front handle must be replaced at the same time.



- Remove the interlock lever - see 9.2.

• Slide the two insulating tubes (1) off the pin and socket connectors.

• Separate the connectors of the handle heating system.



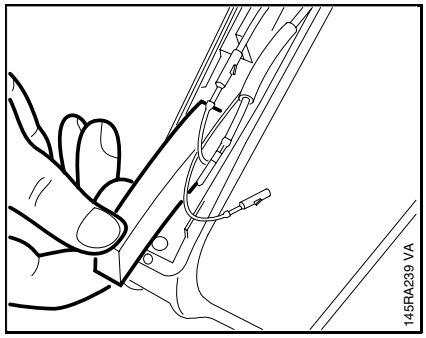
• Remove pressure pad and heating element from handle recess.

Important: Make sure inside of handle is free from grease, dirt and moisture.

- Remove the backing 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 and the element may fail as a result of overheating.
The ambient temperature during installation should not be less than 15°C (60°F).



• Fit a **new** expanded rubber pressure pad on top of the heating element. It must completely cover the heating element.

- Reconnect the two wires.

- Slide the insulating tubes over the pin and socket connectors.

- Fit the interlock lever - see 9.2.

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 (handlebar) is not replaceable. A new handle must be fitted if the heating element is faulty.

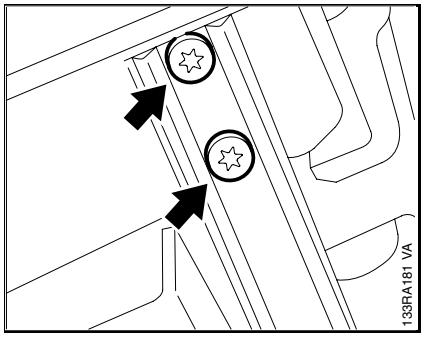
A heating element with a higher resistance is installed in the front handle of machines from serial number X 33 339 218.

Previous version:
1.44...1.76 Ω
New version:
6.3...7.7 Ω

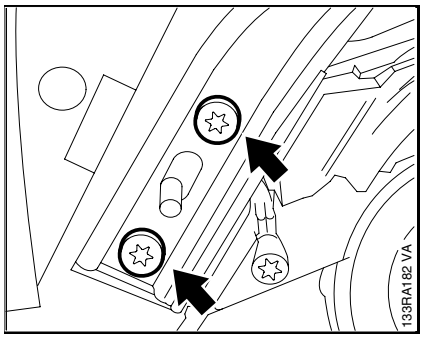
The flywheel and heating element in the rear handle have to be replaced if a new heating element with a higher resistance is installed in the front handle.

- Remove carburetor - see 12.5.2.

- Separate the pin and socket connector (the thicker wire) in the rear handle and pull wire out of channel in the tank housing - see 6.4.

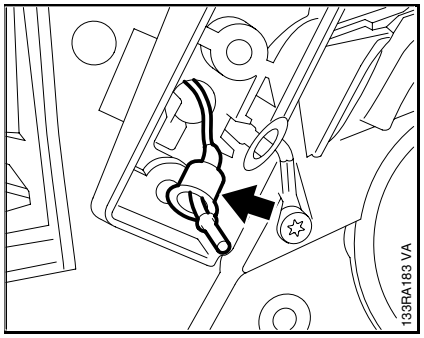


- Remove front handle mounting screws from underside of machine.



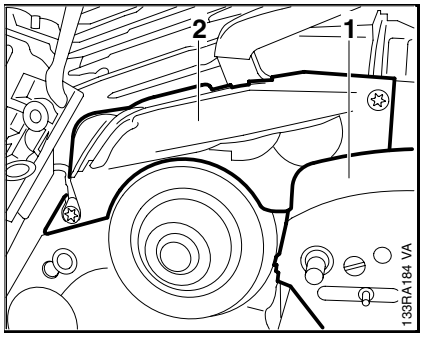
- Remove front handle mounting screws from side of machine.

- Lift away the front handle and put it to one side.



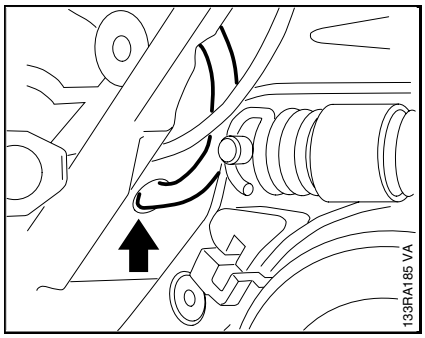
- Pull the grommet off the connecting wire.

- Pull the connecting inwards through the opening.

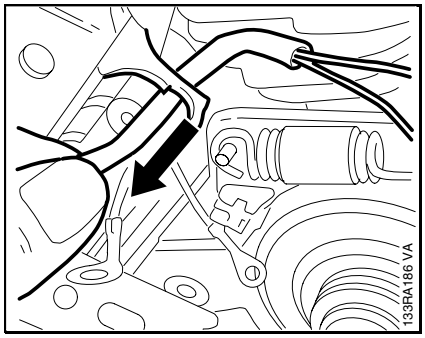


- Remove the side plate (1).

- Remove the cover (2).

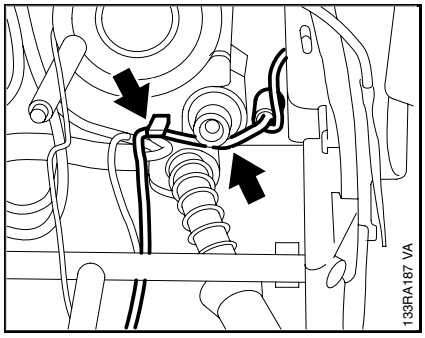


- Pull the insulating tube and wires out of the lower hole in the tank housing.

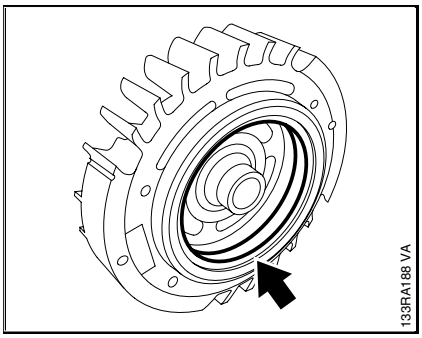


- Pull the insulating tube and wires out of the upper hole in the tank housing.

Install in the reverse sequence.



- Install wire to rear handle heating element in carburetor box as shown.



- Remove the flywheel - see 6.6.

All versions

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

Note: Flywheels with a more powerful magnet are installed from serial number X 33 339 218.

Flywheels can be identified by the width of the magnet.

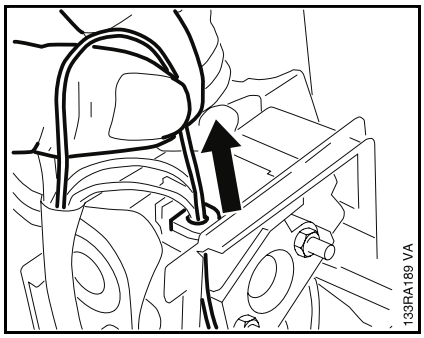
Previous = 11 mm (0.4")
New = 6 mm (0.24")

- If a new flywheel has to be installed in a machine up to serial number X 33 339 217, the front handle and the rear handle heating element must be replaced at the same time.

- Remove the ignition module - see 6.2.2.

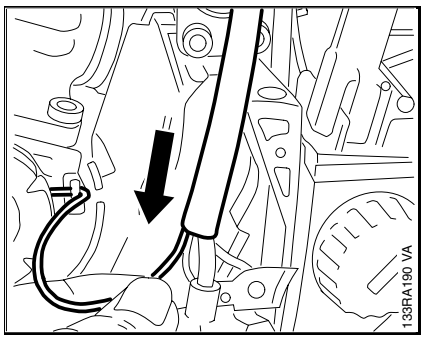
Machines up to serial number X 33 339 217

- Separate the generator connecting wire at the connector in the rear handle and pull it out of the insulating tube - see 6.4.

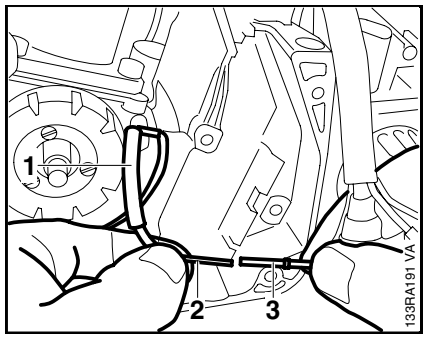


- Pull the connecting wire out of the grommet.

Note: On machines with carburetor heating, pull the terminal socket housing off the printed circuit board and pull the copper-colored wire out of the housing - see 6.3.



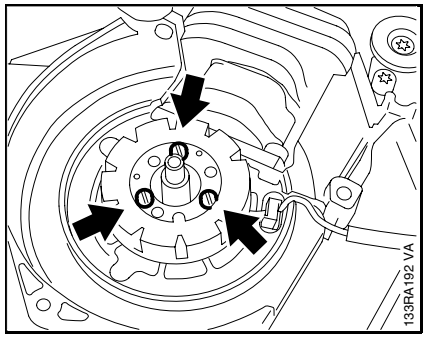
- Pull the connecting wire out of the insulating tube.



Machines from serial number X 33 339 218

- Remove the insulating tube (1).

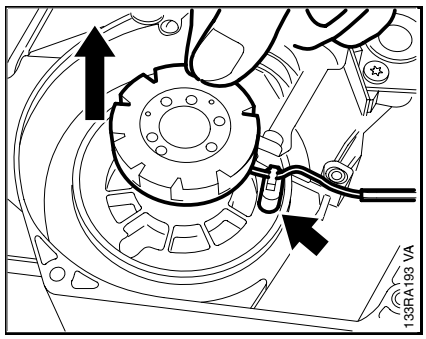
- Pull pin (2) out of socket (3).



All versions

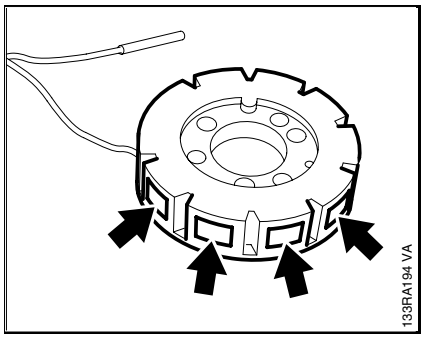
- Take out the screws.

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



- Remove the generator.

- Pull the retainer out of the crankcase.



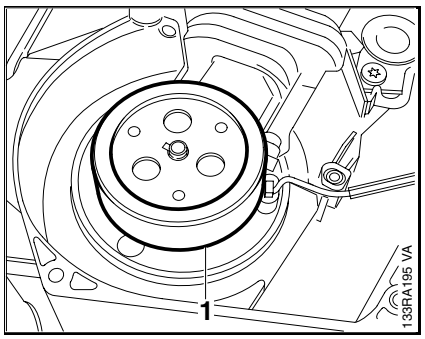
- Inspect generator and poles for cracks or other damage. If damage is found, replace the generator.

- Place the generator in position with the connecting wire facing the crankcase.

- The connecting wire and must be at same side as the crank-case recess.

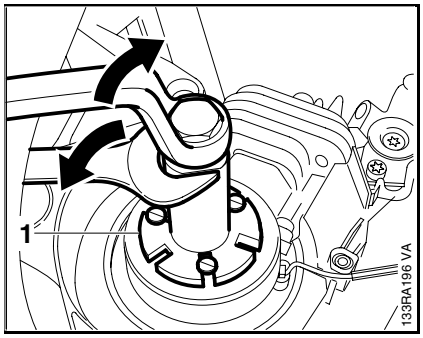
- Push the retainer into the crankcase.

- Install screws with Loctite 242 - see 13.2.



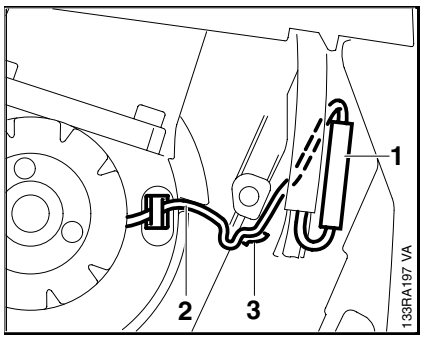
- Fit the centering tool (1) 1118 893 3500 on the crankshaft so that its groove engages the key.

- Tighten the screws to a torque of 2 Nm (1.5 lbf.ft).



- Remove the centering tool.

- If necessary, use puller (1) 1107 893 4500 to remove the centering tool from the crank-shaft.



- Reconnect the pin and socket, machines from serial number X 33 339 218, and slide the insulating tube (1) over the connector.

Important! The insulating tube must completely cover the connector.

- The connecting wire must locate properly in the crankcase notch (2) so that it is clear of the flywheel

- Position the connecting wire behind the retainer (3).

Assemble all other parts in the reverse sequence.

11. CHAIN LUBRICATION
11.1 Pickup Body/Suction Hose

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 system, first check the oil tank and the pickup body. Clean the oil tank if necessary.

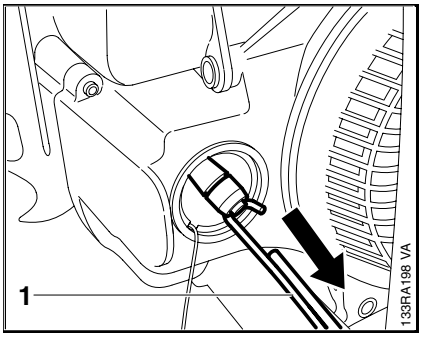
Troubleshooting chart - see "Standard Repairs and Troubleshooting" handbook.

Pickup Body

- Unscrew oil filler cap and drain the oil tank.

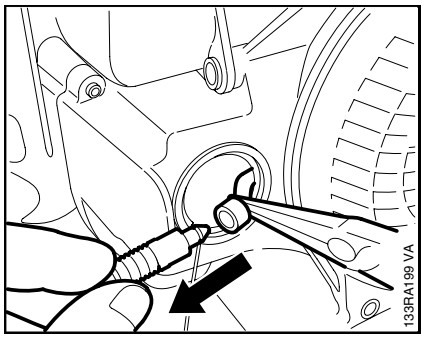
Note: Collect chain oil in a clean container or dispose of properly.

- Observe safety precautions - see 1.



- Use hook (1) 5910 893 8800 to pull the pickup body out of the oil tank.

Note: Avoid stretching the oil hose.



- Pull the pickup body out of the oil suction hose.

- Wash the pickup body in white spirit and, if possible, blow out with compressed air.

- Always replace a damaged pickup body.

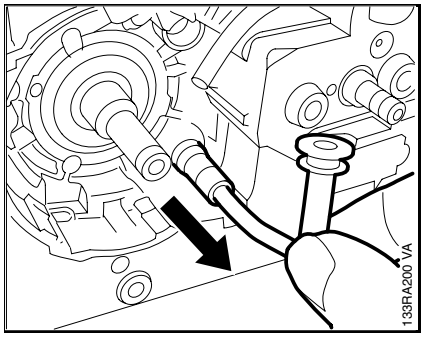
- Flush out the oil tank.

Install in the reverse sequence.

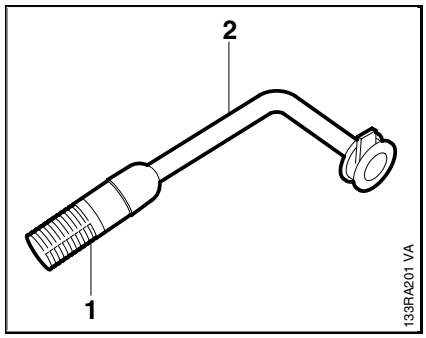
Suction hose

- Remove the oil pump - see 11.3.

- Use pliers to grip the tab of the oil hose and pull it out of the bore.

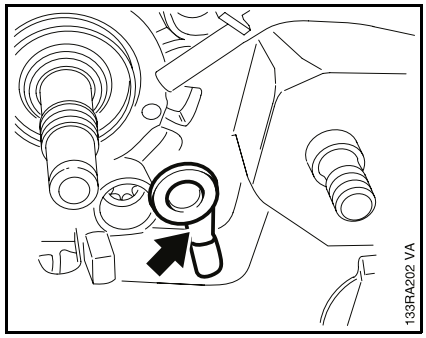


- Pull suction hose and pickup body out of the crankcase.



- Pull the pickup body (1) off the suction hose (2).

Install in the reverse sequence.



- Insert suction hose in bore.

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

- This operation is easier if the bead of the hose is lubricated with a little oil.

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

Cleaning the valve

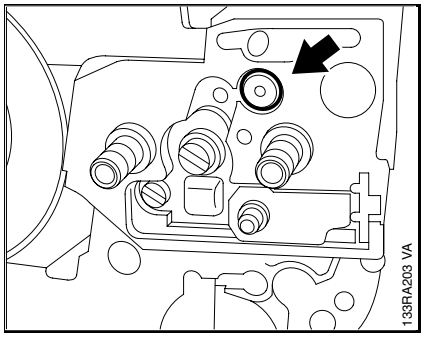
- Unscrew the oil filler cap.
- Drain the oil tank.

Note: Collect chain oil in a clean container or dispose of properly.

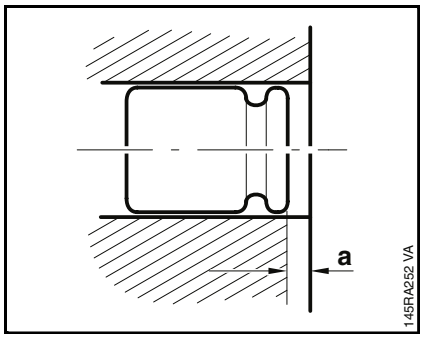
- Observe safety precautions - see 1.
- Remove the side plate.
- Blow valve clear with compressed air - from outside to inside of tank.
- Flush out the oil tank.
- Fit the oil filler cap.
- Fit the side plate.

Replacing the valve

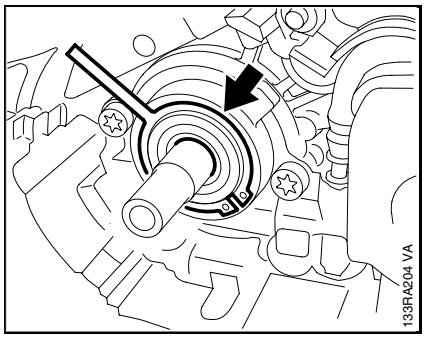
- Unscrew the oil filler cap.
- Remove the side plate.



- Use a 7 mm (9/32") drift to carefully drive the vent valve into the crankcase and take it out of the oil tank.



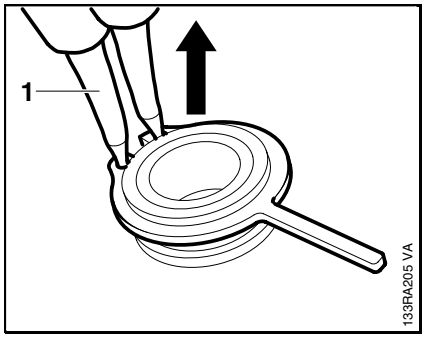
- Use a 7 mm (9/32") drift to carefully press in the new valve until it is about 1 mm (3/64") below the face of the crankcase (dimension 'a').
- Fit the oil filler cap.
- Fit the side plate.



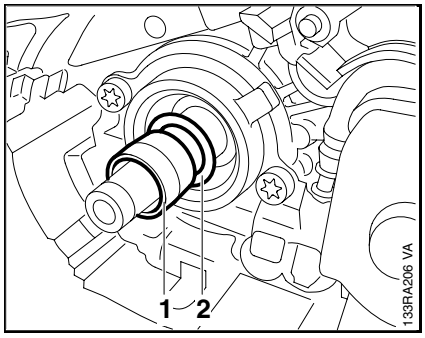
- Remove the clutch and brake band - see 4.2 and 4.3.2.

Adjustable oil pump

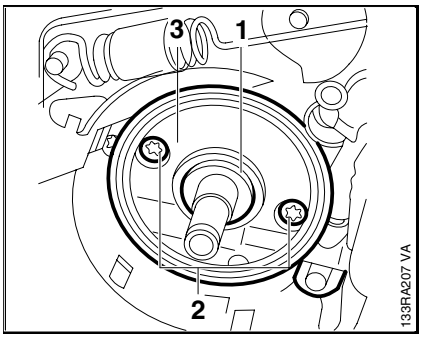
- Pull off the worm and driver.



- If necessary, use pliers (1) 0811 611 8380 to remove the driver from the worm.



- Slip the ring (1) and washer (2) off the end of the crankshaft.

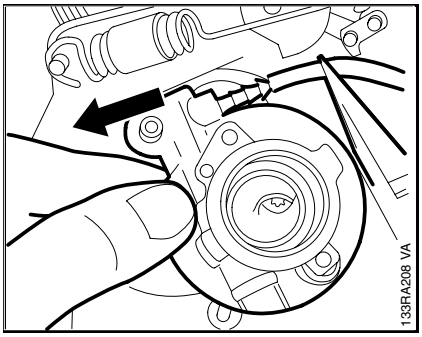


Non-adjustable oil pump

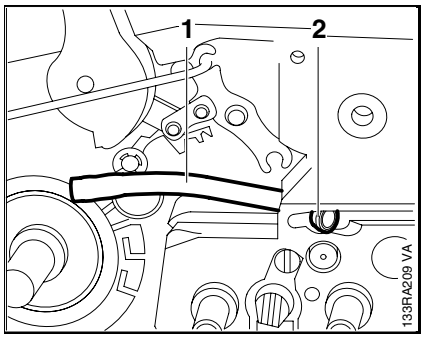
- Remove the worm (1).

All versions

- Take out the screws (2).
- Remove the oil pump (3).



- Pull the oil delivery hose off the oil pump nipple.

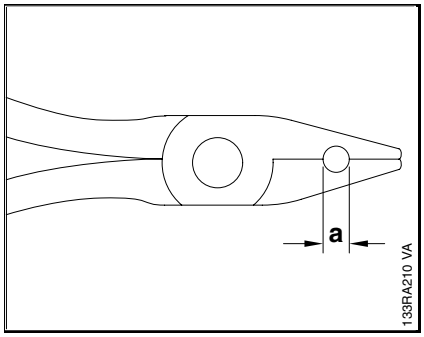


- To remove the oil delivery hose (1), pry the sleeve (2) out of the bore. The hose is damaged in this process and must be replaced.

An oil pump with a stroke of 0.5 mm, instead of 0.65 mm, is installed in 024 machines from serial number 1 42 721 934.

Install in the reverse sequence.

- Before installing a new or overhauled oil pump (on 026), pry the polymer plug out of the pump housing and lubricate the control edge of the pump piston with a thin coating of grease.



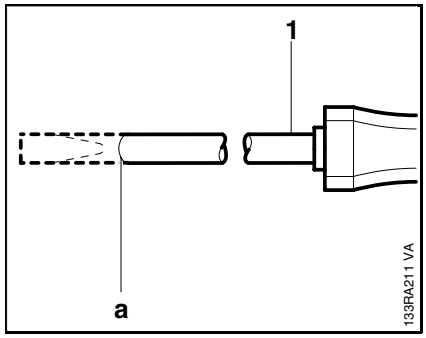
- Fit the plug.
- Lubricate worm on pump piston with grease.

Installing oil delivery hose

- Coat ends of hose with oil.
- Use modified flat nosed pliers (see illustration) to push the oil delivery hose onto the oil pump nipple.

  a = 5.5 mm (7/32")

- Push the oil delivery hose through the bore in the bar mounting flange (from the inside outwards) so that it projects about 10-20 mm (3/4").



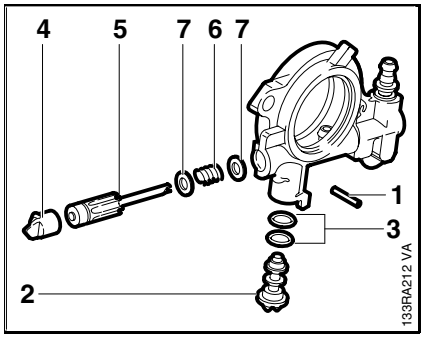
- Hold the projecting end with the modified flat nosed pliers. Now push home the sleeve with the modified carburetor screwdriver (1) 0000 890 2300.

  a = R 1.5 mm (1/16")

- 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 (1/16").
- Tighten mounting screws to 3.5 Nm (2.6 lbf.ft).

On 026, always check the suction hose and pickup body before disassembling the oil pump.

- Remove the oil pump - see 11.3.



- Use a 2 mm (5/64") drift to drive out the roll pin (1).
- Pull out the control bolt (2).
- Remove the 0-rings (3).
- Pry the plug (4) out of the housing.
- Withdraw the pump piston (5) with spring (6) and washers (7).

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

Reassemble in the reverse sequence.

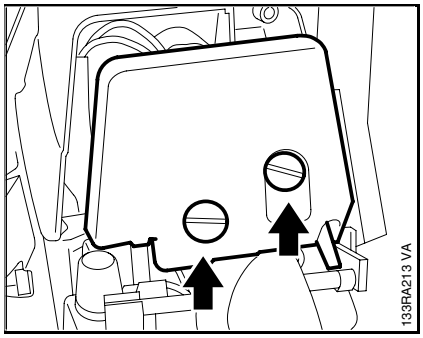
- Always install new O-rings.
- Coat pump piston and worm with grease, see 13.2, before installing.

Dirty and clogged air filters reduce engine power, increase fuel consumption and make starting more difficult.

026 machines from serial number X 32 252 039 are equipped with a newly developed air filter system.

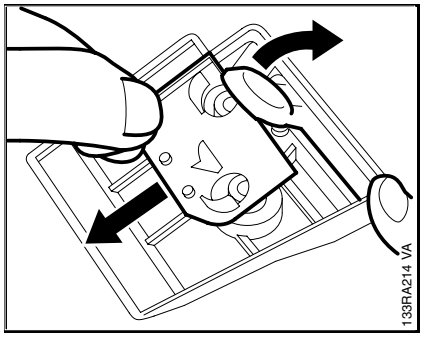
The air filter should always be cleaned when engine power begins to drop off.

- Clean away any loose dirt from around the air filter and filter cover.
- Remove the carburetor box cover.



- Loosen the slotted nuts and remove the air filter.

- Separate the two halves of the filter.



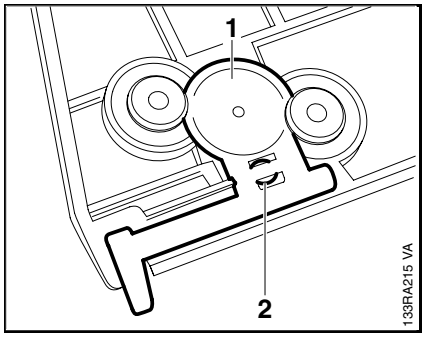
- Lift the choke shutter and remove the baffle.

Note: There is no separate baffle in 026 machines with the new filter system.

- Wash both halves of the filter in a fresh, non-flammable cleaning solution (e.g. warm soapy water). Soften encrusted dirt by soaking the filter for a while in cleaning solution.

Note: If filter mesh is damaged, replace filter immediately.

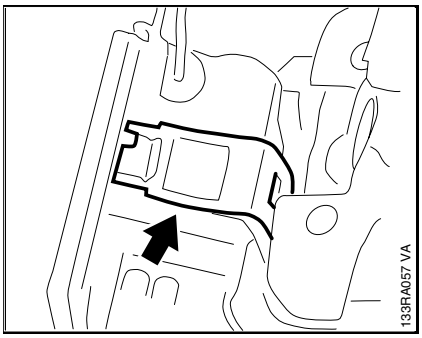
Important: Flocked air filters must **not** be cleaned with compressed air, brushes or rags.



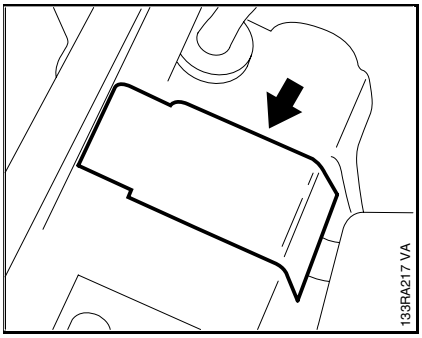
- Disconnect the spring (2) to replace the choke shutter (1).

Install in the reverse sequence.

12.2 Carburetor Preheating



- 024 machines up to serial number X 36 348 619 have a rectangular opening at the top of the carburetor box which is covered by a spring steel shutter.

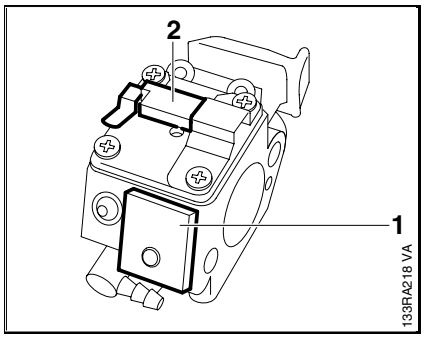


- The retaining lug in the tank housing may be damaged if force is used to pry the shutter out of its seat without pressing down the sprung tab. In such a case the shutter will no longer snap back into position.

- A sealing plug (1121 791 1400) can be fitted in place of the shutter to avoid the need to replace an otherwise intact tank housing.

12.3 Carburetor Heater

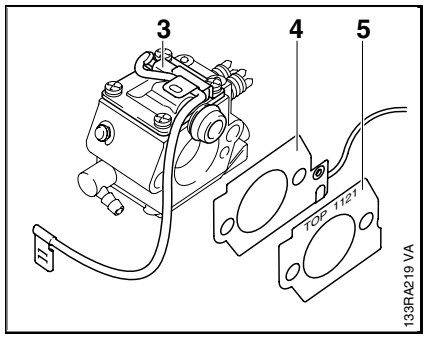
12.3.1 Construction and Function



The carburetor heater in 024 machines up to serial number X 33 339 217 and the 026 both operate in exactly are the same way, but differ slightly in construction.
The heating element (1) is a small ceramic plate bonded to the carburetor. Power is supplied by the generator for the electric handle heating system.
Current is fed via wires to the tank housing and from there via a printed circuit board with sliding contacts to the heating element. Carburetor heating is controlled automatically via the thermostatic switch (2) on the carburetor.

Note: In the 024, the thermostatic switch is installed inside the tank housing. It trips at approx. 18°C (65°F).

The "VH" versions of 026 machines from serial number X 33 339 218 are equipped with a new carburetor heating system.



A new thermostatic switch (3) is mounted on a bracket on the new carburetor's end cover.

The new thermostatic switch turns off the carburetor heating at a lower temperature.
This means that more power is available sooner for the handle heating system. The handles therefore warm up faster.

Cut-out temperature of thermostatic switch.
Previous version:
15-21°C (60-70°F)
New version:
7-13°C (45-55°F)

The heating element (1) bonded to the previous carburetor and the printed circuit board have been deleted. Instead, heating element (4) and hot plate (5) are installed between the carburetor and air filter.

Resistances at temperature of 25°C (77°F).
Previous heating element: 4 Ω
New heating element: 8 Ω

Tests should be carried out as follows on 026 machines up to serial number X 33 339 217.

Complete system

Note: The printed circuit board and heating element are tested as described below. The ambient temperature for the test must be at least 21°C (70°F).

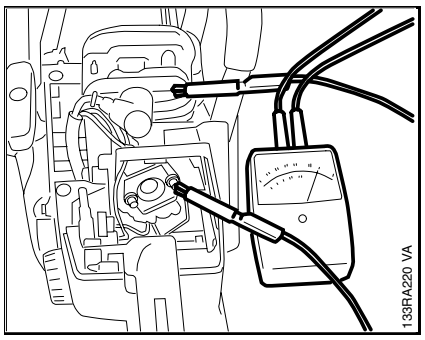
If the temperature is much lower than 21°C (70°F) the thermostatic switch may close and produce false readings.

Test the thermostatic switch separately.

- Remove the air filter - see 12.1.

- Remove the shroud - see 4.2.

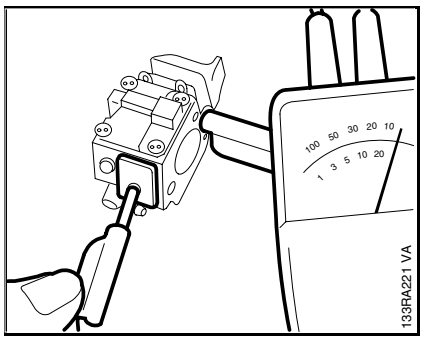
- Set ohmmeter to "Ω x 1".



- Clip one of the two test leads to the carburetor body and the other to a cylinder fin.

- If the system is in good condition the ohmmeter will indicate 3-8 Ω in measuring range "Ω x 1".

Note: If the reading obtained is outside this tolerance, test each component separately.



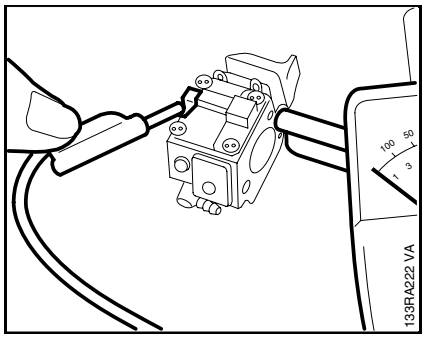
Heating element

- Remove the carburetor - see 12.5.2.

- Hold one of the two test leads against the carburetor body and the other against the heating element's center contact.

- If the heating element is in good condition the ohmmeter will show a reading of 3 - 8 Ω in measuring range "Ω x 1".

Note: If the reading obtained is outside this tolerance, replace the carburetor.



Thermostatic switch

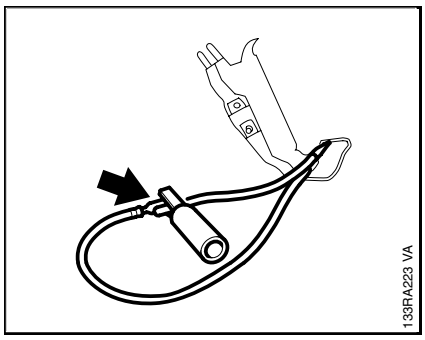
- Clip one of the two test leads to the carburetor body and the other to the tag on the thermostatic switch.

Note: The switch must open at temperatures above 21°C/70°F (e.g. hold it in your closed hand for a few moments). The ohmmeter must indicate an infinite value in measuring range "Ω x 1" (no deflection).
Cool the switch to below 12°C (54°F). The ohmmeter should indicate a value of around 0 Ω in measuring range "Ω x 1".

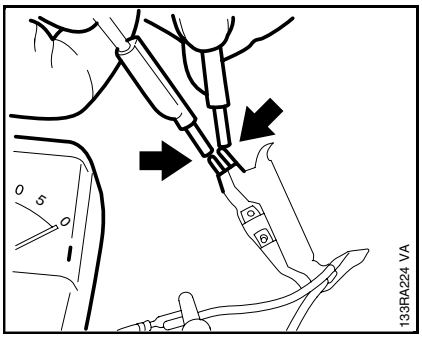
- Replace faulty thermostatic switch.

Printed circuit board

- Remove the printed circuit board - see 12.4.

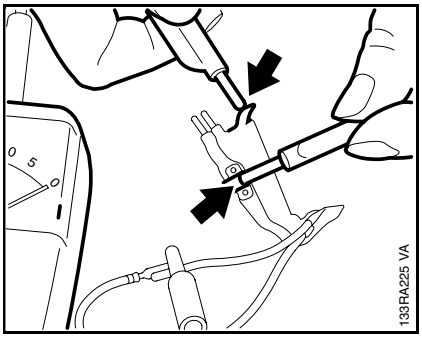


- Connect the ends of the ground wire and handle heating connecting wire (e.g. with a crocodile clip).



- In the first test, hold the test leads against the two upper connector tags.

Note: If the printed circuit board is in good condition the ohmmeter will show a reading of 0 Ω in measuring range "Ω x 1".

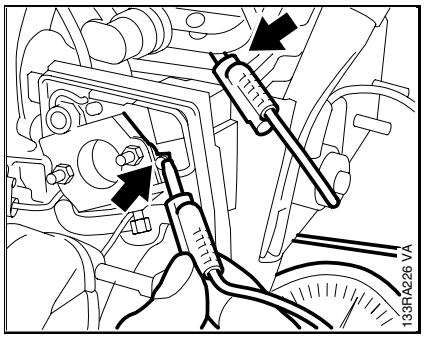


- In the second test, hold the test leads against the riveted contact and the bent contact (see illustration).

Note: If the printed circuit board is in good condition the ohmmeter will show a reading of 0 Ω in measuring range "Ω x 1".

- Replace faulty printed circuit board.

- Install the printed circuit board - see 12.4.



Perform the following tests on 026 machines from serial number X 33 339 218.

Heating element

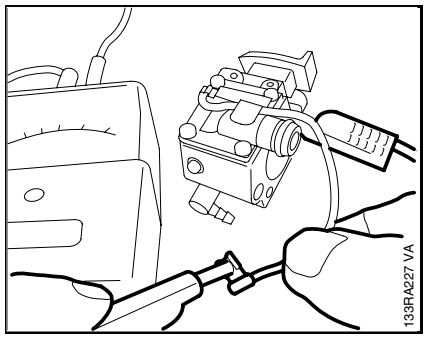
- Remove the shroud - see 4.2.

- Remove the air filter - see 12.1.

- Clip one of the two test leads to a cylinder fin and the other to the heating element contact.

- If the heating element is in good condition the ohmmeter will indicate 8 Ω in measuring range "Ω x 1".

- If the reading is outside this tolerance, replace the heating element - see 12.5.2.



Thermostatic switch

- Remove the carburetor - see 12.5.2.

- Clip one of the two test leads to the carburetor body and the other to the flag terminal on the thermostatic switch wire.

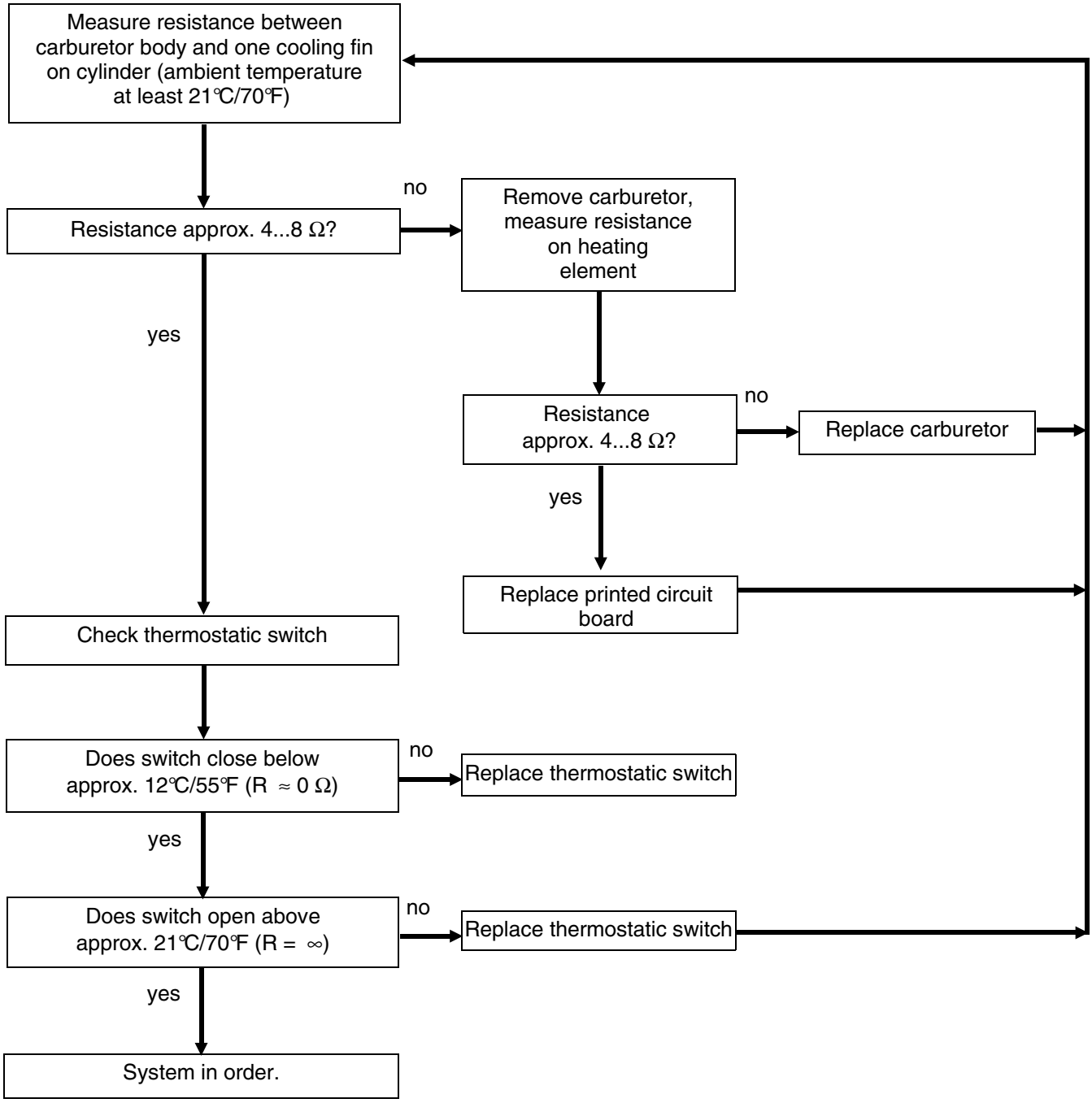
Note: The switch must open at temperatures above 21°C/70°F (e.g. hold it in your closed hand for a few moments). The ohmmeter must indicate an infinite value in measuring range "Ω x 1" (no deflection).

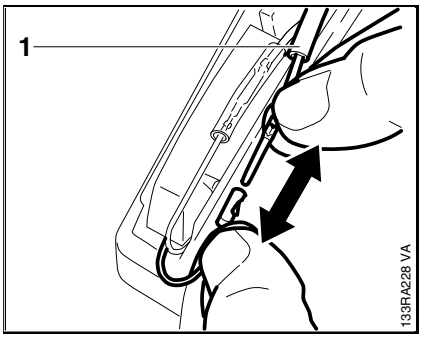
Cool the switch to below 12°C (54°F). The ohmmeter should indicate a value of around 0 Ω in measuring range "Ω x 1".

- Replace faulty thermostatic switch.

- Install the carburetor - see 12.5.2.

12.3.3 Troubleshooting Chart





026 machines up to serial number X 33 339 217

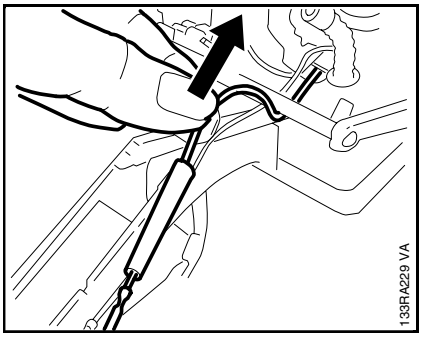
- Remove the shroud - see 4.2.

- Remove the carburetor - see 12.5.2.

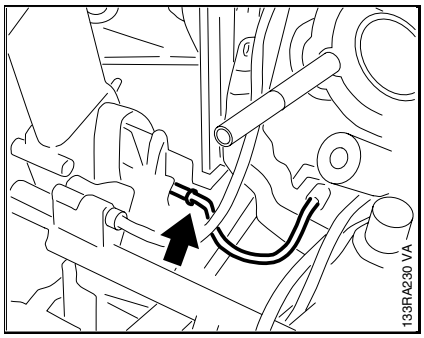
- Take boot off the spark plug.

- Slide the insulating tube (1) off the connector on the wire between the printed circuit board and the rear handle heating element.

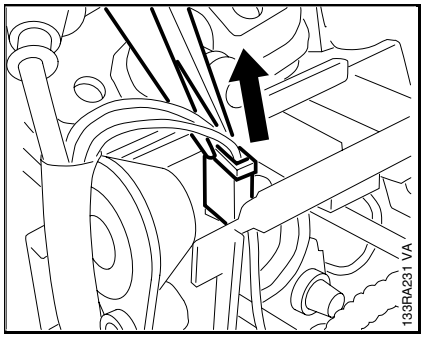
- Separate the pin and socket connector.



- Take the insulating tube out of the rear handle and pull the wire out of the insulating tube.



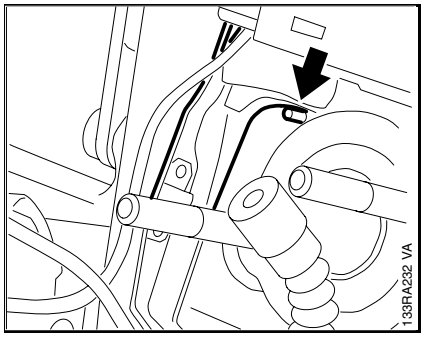
- Pull the ground wire contact sleeve out of its seat in the contact spring.



- Pull the terminal socket housing off the printed circuit board.

- Remove the printed circuit board.

Install in the reverse sequence.



- When refitting, make sure the bent contact locates between the housing and peg.

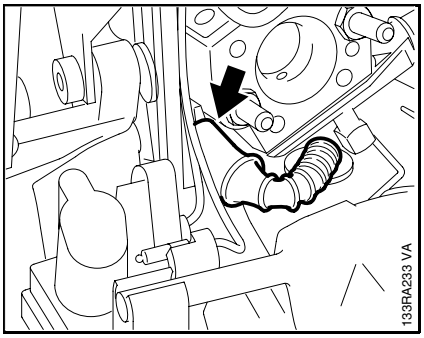
Troubleshooting chart - see "Standard Repairs and Troubleshooting".

Important: If problems occur on the carburetor or the fuel supply system, always check and clean the tank vent - see 12.6.

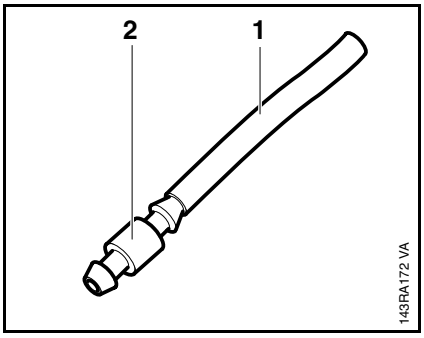
The carburetor can be tested for leaks with the carburetor and crankcase tester 1106 850 2905.

- Remove the air filter - see 12.1.

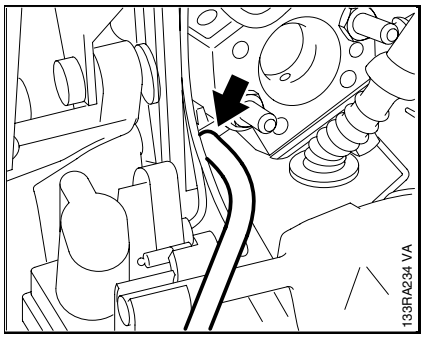
- Check tester for leaks.



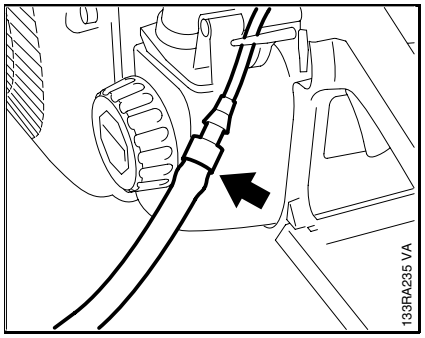
- Pull fuel hose off the carburetor's elbow connector.



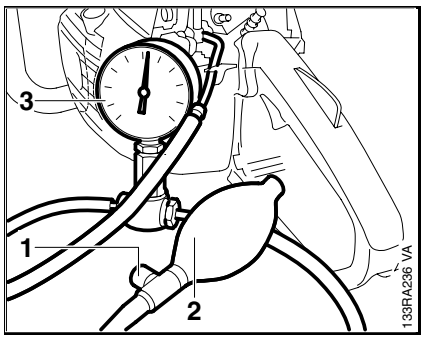
- Push the fuel line (1) 1110 141 8600 onto the nipple (2) 0000 855 9200.



• Push fuel line with nipple onto carburetor elbow connector.



• Connect the tester's pressure hose to the nipple.



• Close the vent screw (1) on the rubber bulb (2) and pump air into the carburetor until the pressure gauge (3) shows a reading of approx. 0.8 bar (11.6 psi).

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

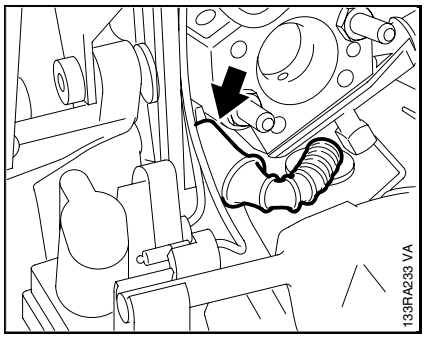
1. The inlet needle is not sealing (foreign matter in valve seat or sealing cone of inlet needle is damaged or inlet control lever sticking).

2. The metering diaphragm is damaged.

- After completing test, open the vent screw and pull the fuel line off the elbow connector.

- Push the fuel hose onto the elbow connector.

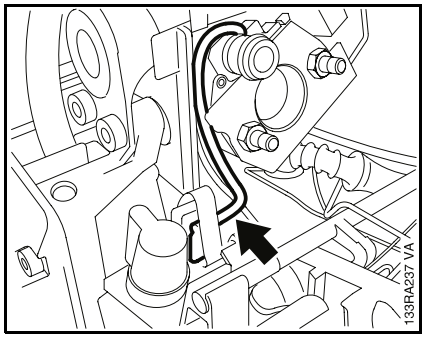
- Install the air filter.



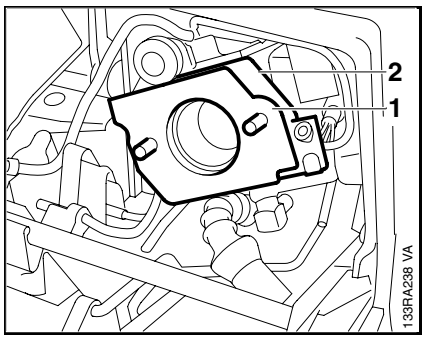
- Remove the air filter - see 12.1.

- Remove the interlock lever - see 9.2.

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

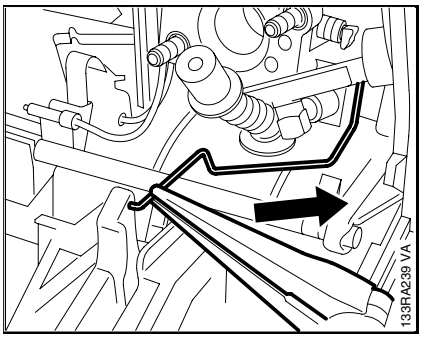


• On machines with new carburetor heating, pull flag terminal off contact spring.

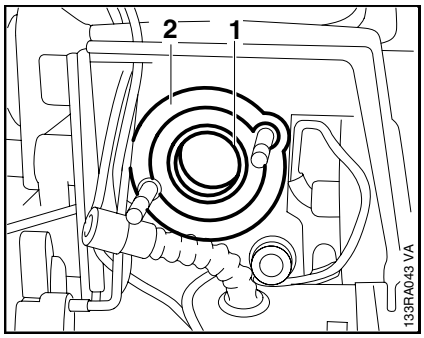


- Unscrew the nuts.

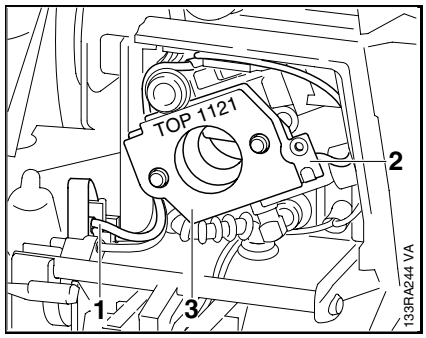
• On machines with new carburetor heating, remove the hot plate (1) and heating element (2).



- Detach throttle rod from the throttle trigger.

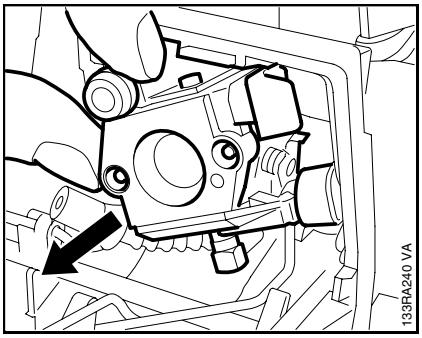


- Check that sleeve (1) and washer (2) are in place.



- On machines with carburetor heating from serial number X 33 339 218, connect thermostatic switch's flag terminal (1) to tag on contact spring.
- Push the heating element (2) into position.
- Fit hot plate (3) with "TOP 1121" facing upwards and outwards.

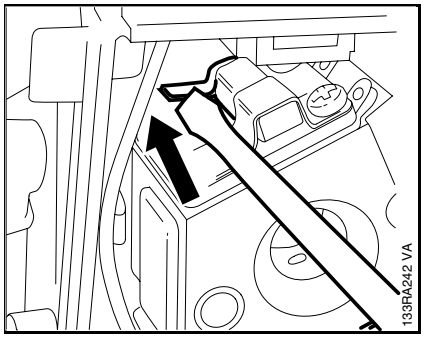
- Tighten down nuts to 3.5 Nm (2.6 lbf.ft).



- Remove the carburetor.

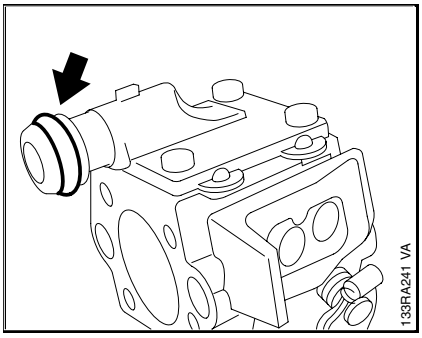
- Take the throttle rod off the throttle shaft.

Install in the reverse sequence.

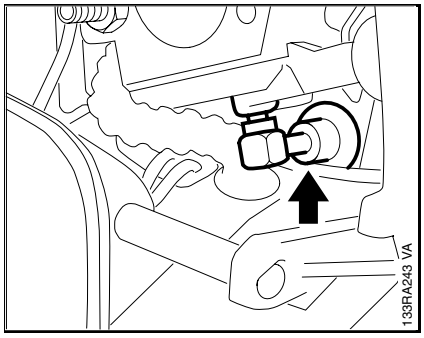


- On machines with carburetor heating up to serial number X 33 339 217, lift thermostatic switch connecting tag while pushing home the carburetor.

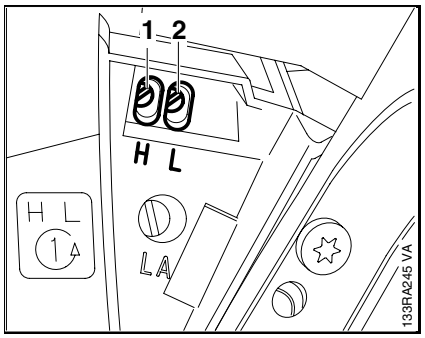
- Machines with carburetor heating up to serial number X 33 339 217: Run machine at full throttle and operate the stop switch. If the machine does not stop, the wires are not properly connected at the top of the carburetor box cover. Connect the green/yellow wire (ground wire) at spark plug boot side and the copper-colored wire (generator wire) at the air filter side.



- On machines with compensator, inspect 0-ring on stub and install a new one if necessary.



- After fitting the carburetor, check that elbow connector is correctly seated in the impulse hose.



Standard setting

To readjust the carburetor, start with the standard setting.

- Carefully screw down both adjusting screws until they are against their seats.

Then make the following adjustments:

H = High speed screw (1), open 1 full turn
L = Low speed screw (2), open 1 full turn

A slight correction to this setting may be necessary at high altitudes (mountains) or near sea level.

For corrections to high speed screw **(H)**:
Use a tachometer - do not exceed max. permissible engine speed.
Engine can be damaged by lack of lubricant and overheating.

Maximum engine speed with bar and properly tensioned chain:
13,000 rpm (024)
14,000 rpm (026)

Note: If no tachometer is available, do not turn the high speed or low speed screws beyond the standard setting to make the mixture leaner.

Furthermore, the engine speed of machines with catalytic converter must **not be less than** 12,000 or 13,000 rpm.

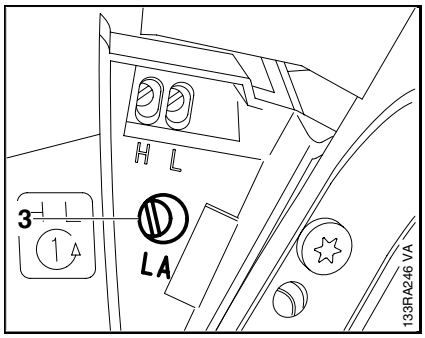
- Check chain tension.
- Check air filter and clean if necessary.
- Inspect the spark arresting screen and clean or replace if necessary.
- Start the engine and warm it up
- Adjust idle speed correctly (chain must not rotate).

Turn high speed screw **(H)** and low speed screw **(L)** clockwise for leaner mixture at high altitudes or counterclockwise for richer mixture at sea level.

Turn screws very slowly and carefully - even slight movements produce a noticeable change in engine running behavior.

Note the following when making corrections to high speed screw:

The setting of the high speed screw **(H)** affects the maximum off-load engine speed.
If the setting is too lean, the maximum permissible engine speed will be exceeded and increase the risk of engine damage.



Adjusting engine idle speed:
A correction at the low speed screw **(L)** usually necessitates a change in the setting of the idle speed screw **(LA)** (3).

Engine stops while idling:
Check standard setting.

Turn idle speed screw **(LA)** clockwise until the chain begins to run - then turn it back one quarter turn.

Chain runs while engine is idling:
Check standard setting.

Turn the idle speed screw **(LA)** counterclockwise until the chain stops running - and then turn it about another quarter turn in the same direction.

Erratic idling behavior, poor acceleration
Idle setting too lean.

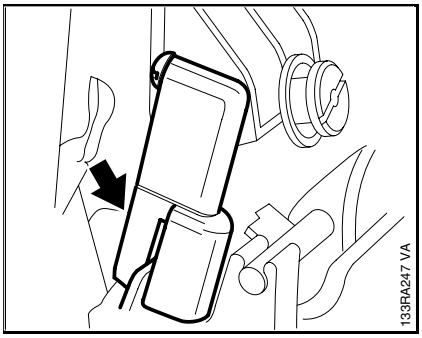
Turn the low speed screw **(L)** counterclockwise until the engine runs and accelerates smoothly.

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: If problems occur on the carburetor or the fuel supply system, always check and clean the tank vent.

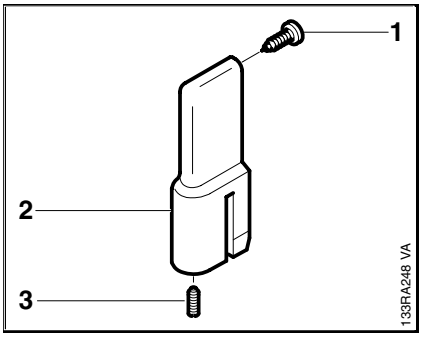
Check function by performing pressure and vacuum tests on the tank via the fuel hose.

Up to serial number X 30 976 774



- Remove the carburetor box cover.

• Pull off the tank vent vertically.

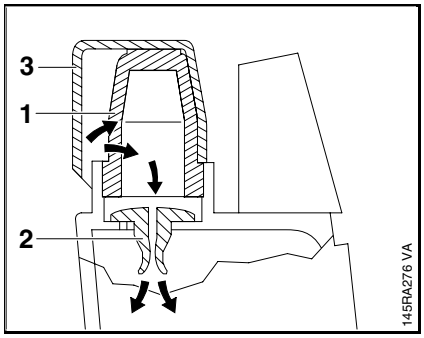


• Unscrew the self-tapping screw (1) and grub screw (2) from the tank vent.

- Wash all parts in fresh white spirit and blow out with compressed air.

Assemble in the reverse sequence.

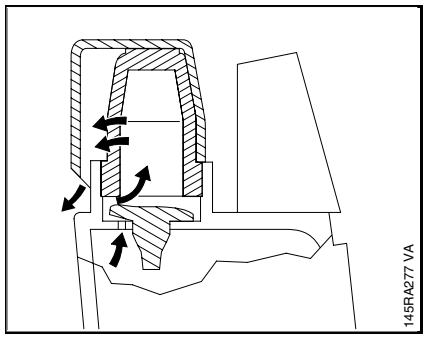
- Make sure the grub screw is fitted squarely.



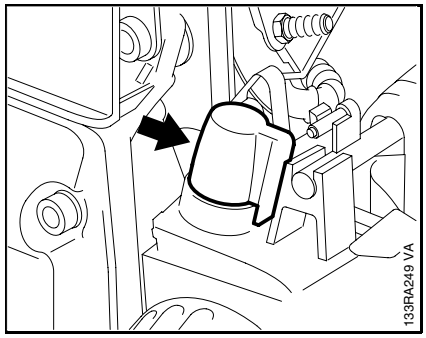
From serial number X 30 976 775

Equalization of pressure from the outside inwards takes place via the sintered filter (1) and the valve (2).

Note: The sintered filter helps prevent dirt entering the valve or the tank.
The cap (3) protects the sintered filter from damage and contamination.

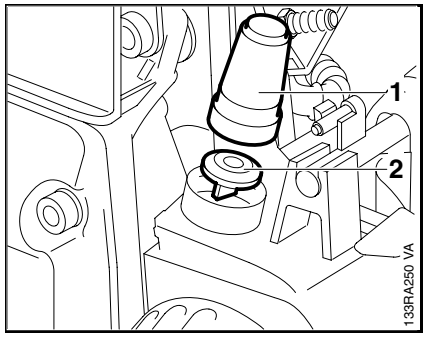


Equalization of pressure from the inside outwards takes place via the bore in the tank, the valve and sintered filter.



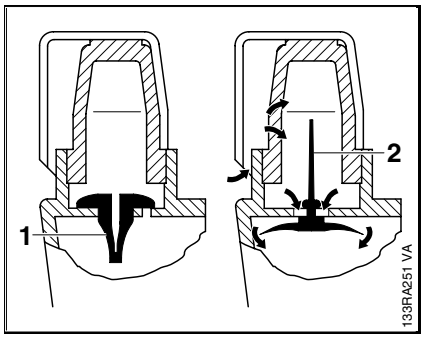
- Remove the air filter - see 12.1.

• Pull off the cap.



• Pull the sintered filter (1) and valve (2) out of the tank.

- Install a new valve.



From serial number X 36 348 620

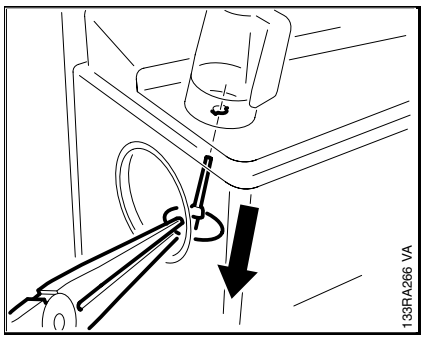
- The previous vent valve (1) has been replaced by valve (2).

The new valve only allows air to enter the fuel tank.

To equalize pressure from the inside outwards, **always open** the tank cap slowly to release pressure and ensure that no fuel is spilled.

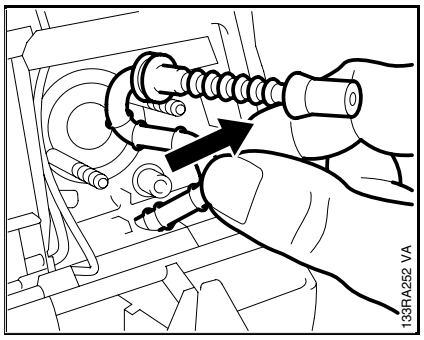
Note: Valve (1) is removed and installed from above while valve (2) is removed and installed from below.

- To replace the valve, unscrew the filler cap.



- Pull the valve out of its seat.

- Push new valve into position.



- Remove the carburetor - see 12.5.2.

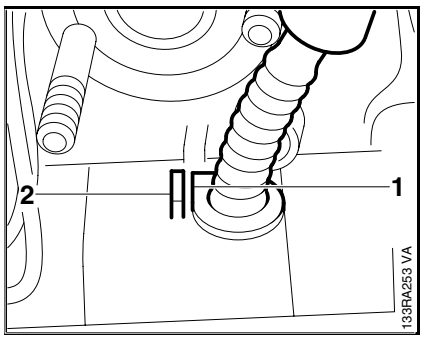
- Take off the pickup body - see 11.1.

- Pry the flange of the fuel hose out of the fuel tank.

- Remove the fuel hose.

Reassemble in the reverse sequence.

- Coat the flange of the fuel hose with a little oil.



- Straight side (1) of flange must be in line with the web (2) and its point must face forwards.

- Drain the tank housing.

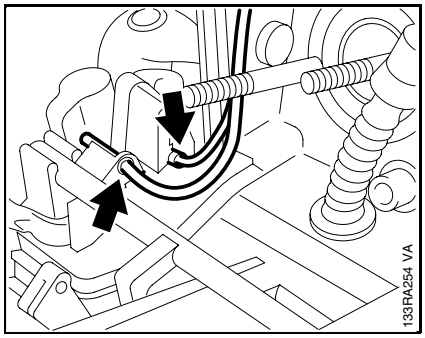
Note: Collect fuel in a clean container or dispose of at approved disposal site.

- Remove the carburetor - see 12.5.2.

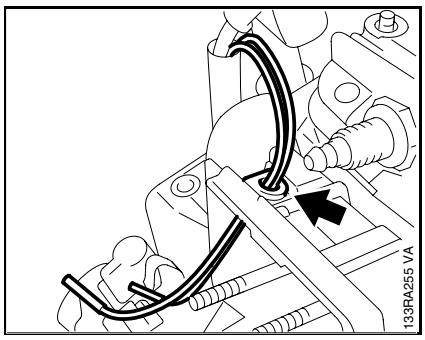
- On machines with carburetor heating up to serial number X 33 339 217, remove the printed circuit board - see 12.4.

- Remove the front handle - see 10.4.

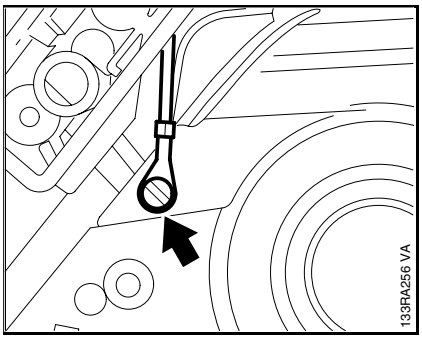
- Remove the shroud - see 4.2.



- Pull short circuit wire and ground wire out of switch shaft and off the contact spring.

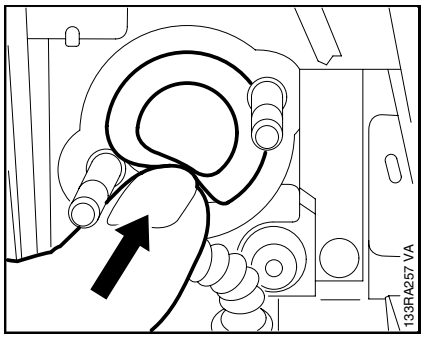


- Pry rubber grommet out of tank housing and pull wires out of the bore.

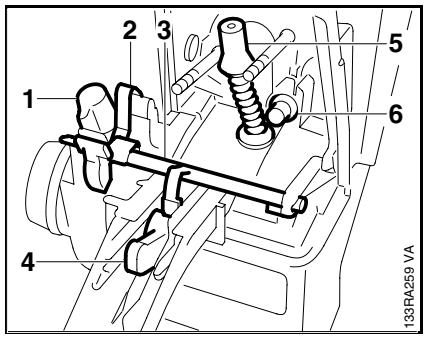


- On machines with heated handles, take out screw of ground wire for heater switch.

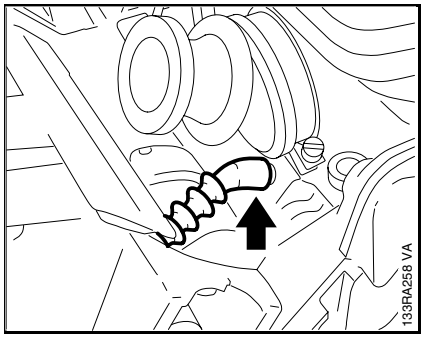
- Remove screws from annular buffers - see 8.



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



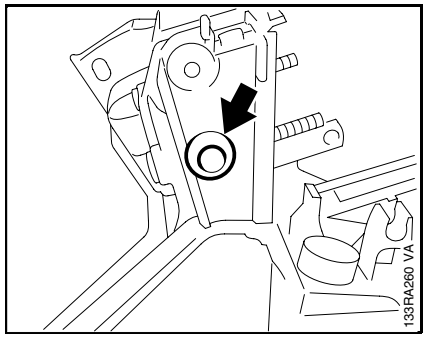
- Remove tank vent (1), contact spring (2), switch shaft (3), throttle trigger (4), fuel hose (5) and impulse hose (6).



- Pull the impulse hose off the nipple.

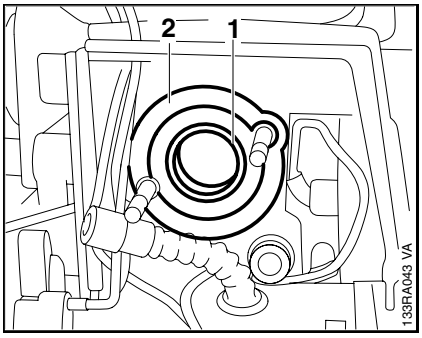
- On machines up to serial number X 36 348 619, remove cover on 026 (shroud/carb box cover) and shutter on 024.

- On machines with heated handles, remove heating element from rear handle - see 10.3, and pull heater switch ground wire out of tank housing.



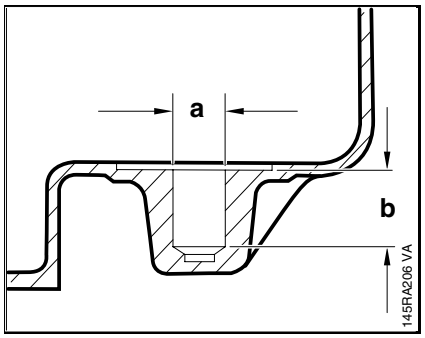
- On machines from serial number X 36 348 620, pry stop buffer out of wall of carburetor box.

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.



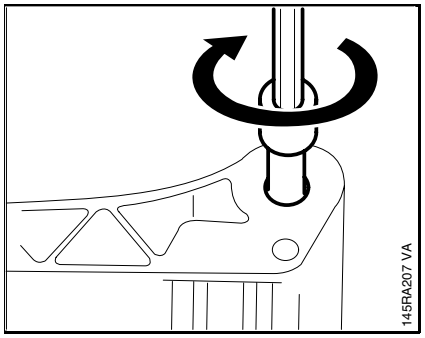
- Take sleeve (1) out of manifold.

- Slip the washer (2) off the studs.



- The stripped thread must be drilled out to a diameter of 'a' = 8.5 mm and a depth of 'b' = 15 mm.

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

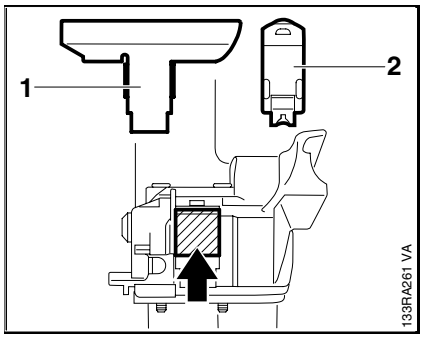


- Fit an M6x10 screw with washer in the thread insert.

- Screw the thread insert into the tank housing.

- An M6x18 pan head screw must then be used in place of the original special self-threading screw.

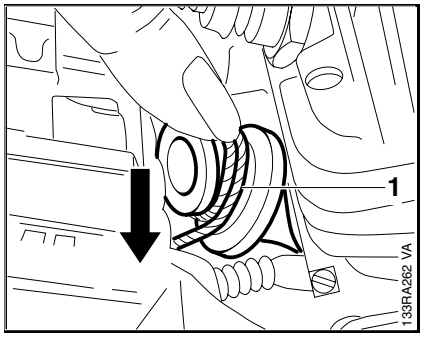
Reassemble in the reverse sequence.



- A different air filter system is installed from serial number X 36 348 620. As a result of the modified air flow, the cut-out (see arrow) in the tank housing is no longer required.

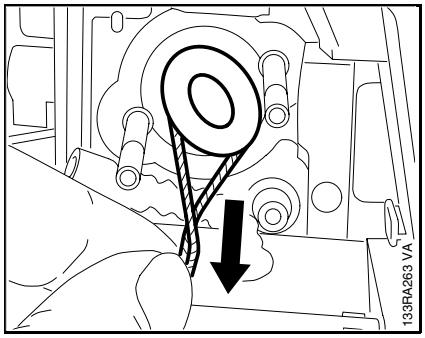
- The cut-out is now closed with a molding skin. It can be re-opened for machines with the original air filter system.

Note: Carry out this work carefully so that the cover (1) or shutter (2) is an exact fit.



- Fit the manifold in the tank housing intake opening as follows: Wind a piece of string (1) (approx. 15 cm / 6" long) around the back of the manifold flange and pass the ends of the string through the intake opening.

- Push the manifold down.



- Pull the ends of the string outward.

Note: The manifold flange is thus pulled through the tank housing intake opening without damaging the manifold.

13. Special Servicing Tools and Aids
13.1 Special Servicing Tools

No.	Part Name	Part No.	Application	Rem.
1	Locking strip	0000 893 5903	Blocking crankshaft	
2	Press sleeve	1118 893 2401	Installing oil seal (clutch side)	
3	Assembly sleeve	1118 893 4602	Protecting oil seal at clutch side	
4	Press sleeve	1121 893 2400	Installing oil seal (ignition side)	
5	Puller	5910 890 4400	Removing oil seals	1)
6	- Jaws (No. 3.1)	0000 893 3706		
7	- Jaws (No. 6)	0000 893 3711		
8	Puller	1110 890 4500	Removing flywheel	
9	Crimping tool	5910 890 8210	Attaching connectors to electrical wires	
10	Assembly drift	1110 893 4700	Removing and installing piston pin	
11	Wooden assembly block	1108 893 4800	Fitting piston	
12	Clamping strap	0000 893 2600	Compressing piston rings	
13	Carburetor and crankcase tester	1106 850 2905	Testing carburetor and crankcase for leaks	
14	- Nipple	0000 855 9200		
15	- Fuel line	1110 141 8600		
16	Vacuum pump	0000 850 3501	Testing carburetor for leaks	
17	Sealing plate	0000 855 8106	Sealing export port for leakage test	
18	Test flange	1118 850 4200	Leakage test	
19	Setting gauge	1111 890 6400	Setting air gap between ignition module and flywheel	
20	Socket, 13 mm	5910 893 5608	Flywheel nut	
21	Socket, 19 mm, long	5910 893 5613	Clutch	
22	Torque wrench	5910 890 0301	0.5 - 18 Nm (0.4 - 13.5 lbf.ft)	2)
		5910 890 0302		3)
23	Torque wrench	5910 890 0311	6 - 80 Nm (4.4 - 60 lbf.ft)	2)
		5910 890 0312		3)
24	Screwdriver bit T27x125	0812 542 2104	IS screws	
25	Hook	5910 893 8800	Removing pickup bodies	
26	Installing tool	5910 890 2210	Fitting hookless snap rings in piston	
27	Assembly tube	1117 890 0900	Attaching the brake spring	

No.	Part Name	Part No.	Application	Rem.
28	T-handle screwdriver QI-T27x150	5910 890 2400	For all IS screws	4)
29	Stud puller M8	5910 893 0501	Removing guide bar mounting studs	
30	Service tool AS	5910 890 2205	Removing crankshaft (clutch side)	
31	- Screw sleeve	5910 893 2409	Assembling crankcase	
32	Service tool ZS	5910 890 2220	Removing crankshaft (ignition side)	
33	- Screw sleeve	5910 893 2421	Installing crankshaft	
34	Press arbor	1118 893 7200	Removing and installing main bearings	
35	Press arbor	1120 893 7200	Removing main bearing (clutch side)	
36	Centering tool	1118 893 3500	Centering the generator	
37	Puller	1107 893 4500	Removing centering tool	
38	Pliers A19	0811 611 8380	Removing driver from worm	
39	Assembly stand	5910 890 3100	Holds chainsaw for repairs	

Remarks:

1) Equivalent to puller 0000 890 4400, but with longer spindle 5910 890 8400
2) DG screws must always be tightened with a torque wrench
3) Wrench has optical/acoustic signal
4) Only use for releasing DG screws

No.	Part Name	Part No.	Application
1	Lubricating grease (370 g/13 oz tube)	0781 120 1111	Oil seals, oil pump drive, chain sprocket bearing, chain tensioner
2	Standard commercial, solvent-based degreasant containing no chlorinated or halogenated hydrocarbons		Cleaning crankshaft stub and flywheel taper
3	STIHL special lubricant (100 ml/3.5 fl.oz bottle)	0781 417 1315	Bearing bore in rope rotor, rewind spring in fan housing
4	Ignition lead HTR, 10 m (33')	0000 930 2251	
5	Graphite grease		Peg on pawl
6	Molykote grease		Sliding and bearing points on brake band
7	STIHL Bioplus (1 liter/34 fl.oz bottle)	0781 516 3331	Protects brake band against corrosion
8	Medium-strength threadlocking (Loctite 242)	0786 111 1101	Securing screws, see 3.6
9	High-strength threadlocking (Loctite 270)	0786 111 1109	Securing screws, see 3.6
10	STIHL gear lubricant - 80 g/2.8 oz tube - 225 g/8 oz tube	 0781 120 1109 0781 120 1110	High voltage output on ignition module

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