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Product: STIHL 034,036,036 QS Chain Saws Service Repair Workshop Manual

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034, 036, 036 QS

# 1 Introduction

Product: STIHL 034,036,036 QS Chain Saws Service Repair Workshop Manual

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

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

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

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

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

↗ = Situation applies from serial number

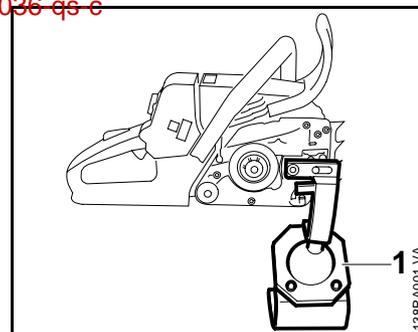
➔ = Situation applies up to serial number

In the illustrations:

➔ Pointer

➔ Direction of movement

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



Servicing and repairs are made considerably easier if the powerhead is mounted on assembly stand (1) 5910 890 3100. Remove the chain sprocket cover, bar and chain first.

The powerhead can then be swivelled to the best position for the ongoing repair. This leaves both hands free.

**Always use original STIHL replacement parts.**

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

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## 2 Safety Precautions

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

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

Improper handling may result in burns or other serious injuries.

### **Warning!**

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

### 3 Specifications

#### 3.1 Engine

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

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

#### 3.2 Fuel System

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

### 3.3 Ignition System

034, 036, 036 QS

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

---

### 3.4 Cutting Attachment

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

---

### 3.5 Tightening Torques

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

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

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

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

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

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

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

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

**Note:**

Power screwdriver settings for polymer:

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

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**3.6 Special Accessories**

**034, 036, 036 QS**

**3.6.1 For User**

Intake air preheating kit	1125 007 1035 (036)
Intake air preheating kit	1125 007 1004 (034/034S)
.325", 8-tooth rim sprocket kit	1125 007 1000
.325", 7-tooth rim sprocket kit	1125 007 1001
3/8", 7-tooth rim sprocket kit	1125 007 1002
3/8", 7-tooth spur sprocket	1125 640 2000
.325", 7-tooth spur sprocket	1125 640 2005

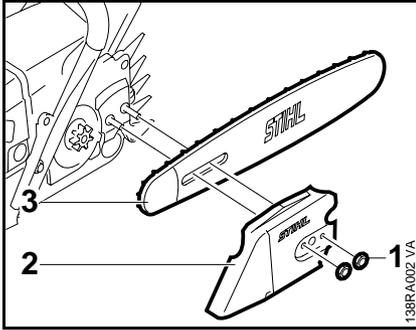
**3.6.2 For Service**

Gasket set	1125 007 1050
Carburetor parts kit	1128 007 1065
Gasket panel	0457 281 0604

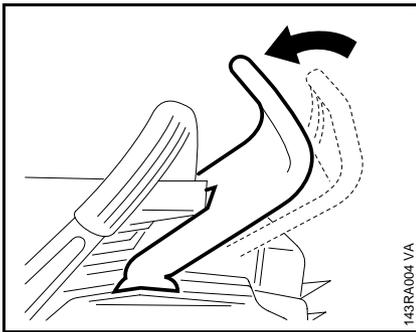
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## 4 Clutch, Chain Drive, Chain Brake and Chain Tensioner

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

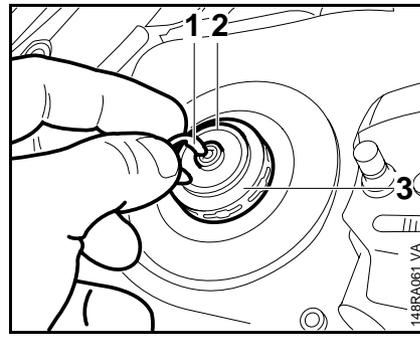


- Unscrew nuts (1) from chain sprocket cover (2). Remove the sprocket cover, bar and chain (3).

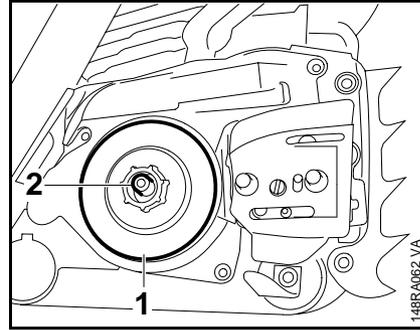


- Disengage the chain brake by pulling the hand guard toward the front handle.

## 4.1 Clutch Drum and Chain Sprocket

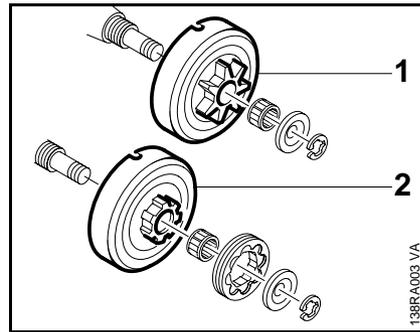


- Remove the E-clip (1) and washer (2). If a rim sprocket (3) is fitted, pull it off.



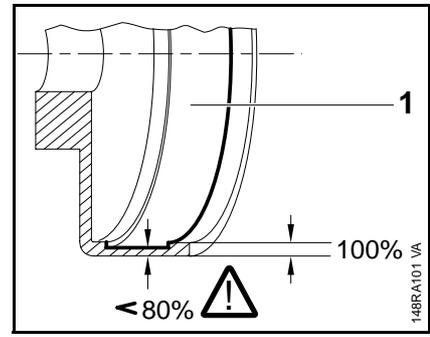
### 036 QS

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



### 034, 036

- Pull off the chain sprocket (1) or clutch drum (2).
- Take out the needle cage.



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

### Important:

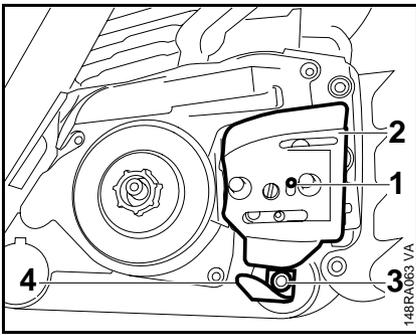
If there are signs of serious wear on the inside diameter of the clutch drum (1), check the remaining wall thickness. If it is less than about 80% of the original thickness, fit a new clutch drum.

### Note:

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

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

## 4.2 Replacing the Chain Catcher



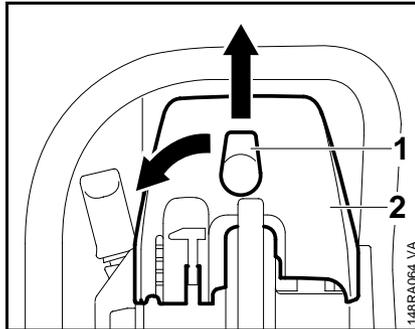
- Remove chain sprocket cover - see 4.1.
- Take out screw (1) and remove the inner side plate (2).
- Take out screw (3) and remove the chain catcher (4).

Reassemble in the reverse sequence.

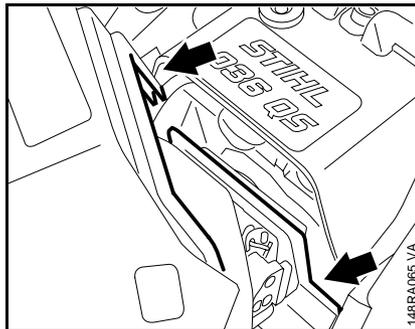
## 4.3 Clutch

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

- Remove clutch drum/chain sprocket - see 4.1.

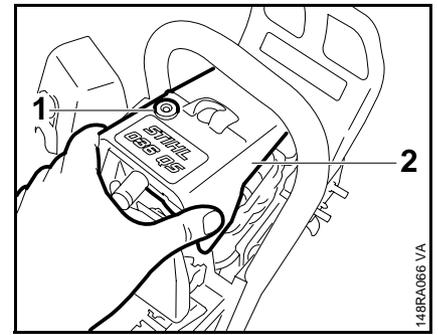


- Release twist lock (1) on carburetor box cover (2) and lift cover off vertically.

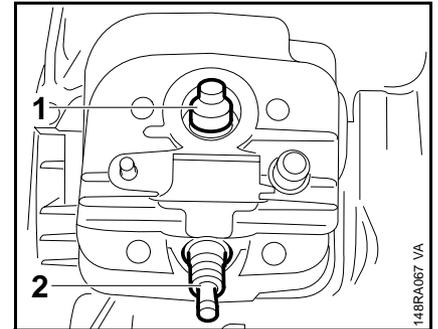


### Note:

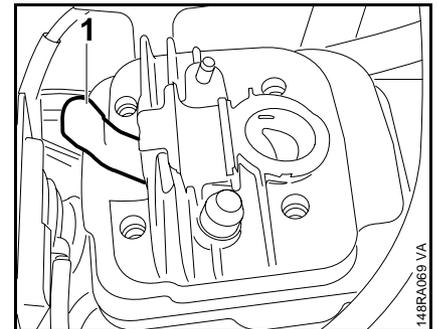
- When reassembling, check correct position of groove and guide.



- Unscrew the slotted nut (1).
- Pull boot off the spark plug.
- Remove the shroud (2).



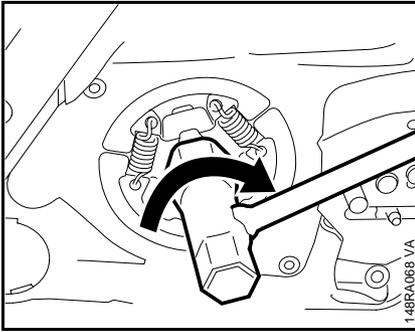
- On powerheads with a decompression valve (1), remove the cover and unscrew the decompression valve.
- Unscrew the spark plug (2).



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

## 4.4 Chain Brake (034, 036)

### 4.4.1 Removing



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

#### On 036, 036 QS:

Remove cover washer from the crankshaft stub.

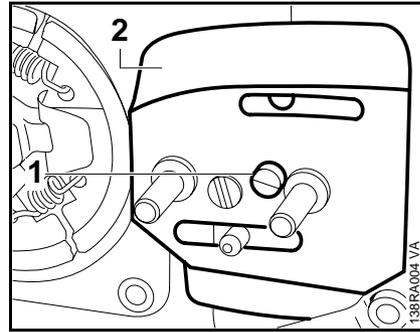
- Disassemble and reassemble the clutch - see "Standard Repairs, Troubleshooting" handbook.
- Reassemble in the reverse sequence.

#### Note:

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

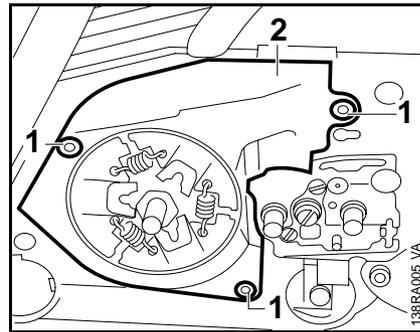
Troubleshooting chart - see "Standard Repairs, Troubleshooting" handbook.

- Remove the chain sprocket cover and cutting attachment - see 4.1.
- Remove the clutch drum/chain sprocket - see 4.1

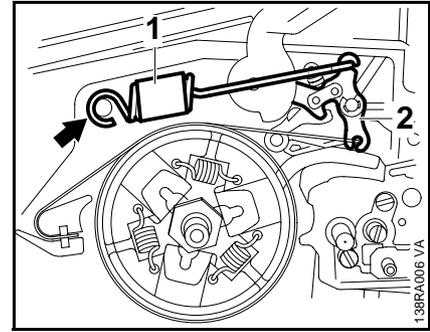


- Remove mounting screw (1) from inner side plate (2) and lift side plate away.

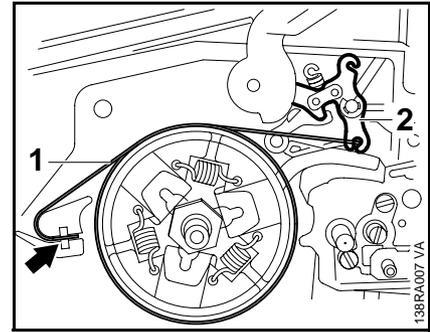
- Engage the chain brake by pushing the hand guard away from the front handle.



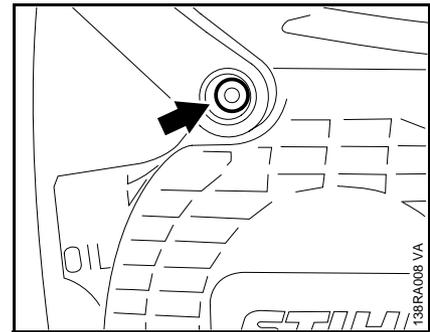
- Remove mounting screws (1) from cover (2) and lift the cover away.



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



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

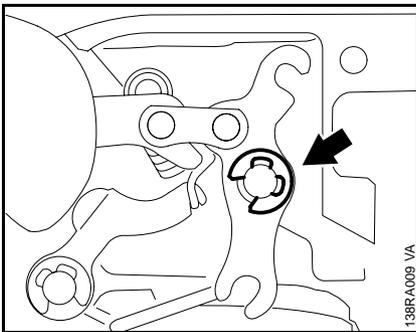


- Remove screw with captive washer from the hand guard.

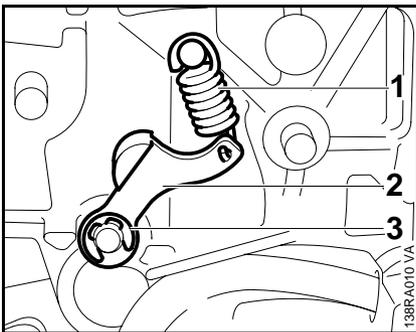
#### Note:

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

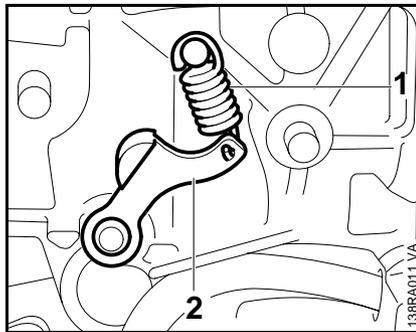
#### 4.4.2 Installing



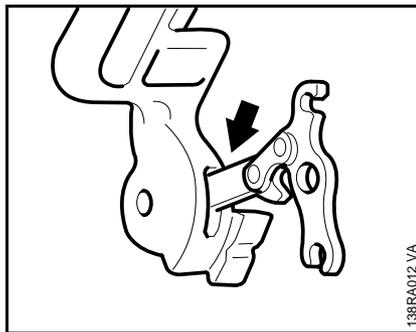
- Remove the E-clip from the pivot pin.
- Pull the hand guard and lever from the pivot pins.



- Pull the lever out of the hand guard.
- Remove the E-clip (3) from pivot pin of lever (2) and detach the spring (1).
- Remove the cam lever and spring.
- Clean all disassembled parts in white spirit. Replace any worn or damaged parts.

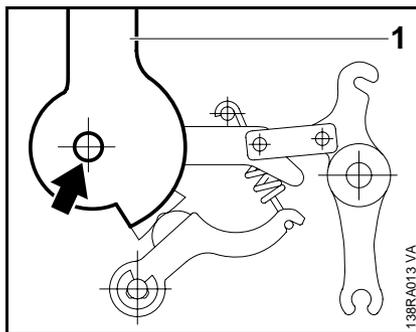


- Fit the cam lever (2) and spring (1).
- Fit the E-clip.

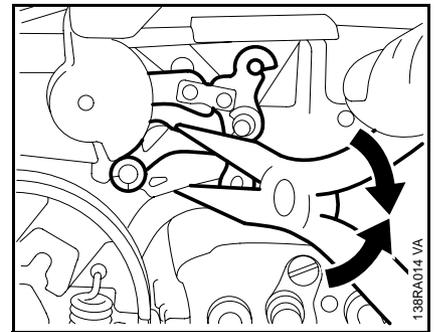


- Insert lever in the side of the hand guard so that short arm of lever points up.

**Note:**  
Check correct installed position of lever.

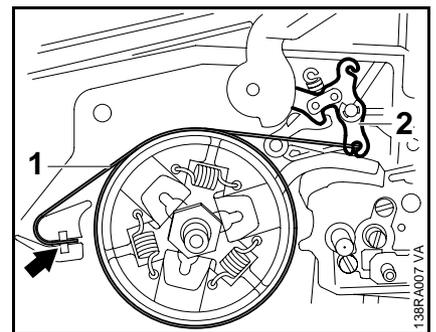


- Position the hand guard (1) against the pivot pin and fit the other side of the hand guard over the fan housing.



- Press the cam lever slightly downward and push the hand guard and lever onto the pivot pins.
- Secure lever with E-clip.
- Insert hand guard mounting screw with captive washer at fan side and tighten down firmly (see "Tightening Torques")

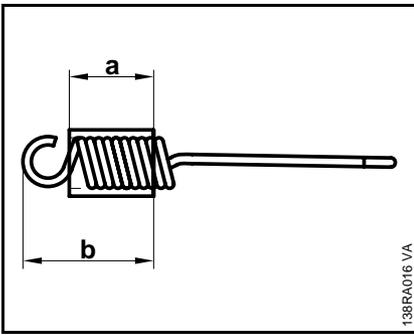
**Important:**  
Coat all sliding and bearing points with STIHL multipurpose grease, [see 13.2](#), or (better) with molybdenum grease (e.g. Molykote), [see 13.2](#).  
Do not lubricate the brake band.



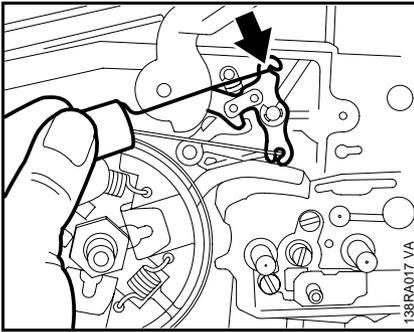
- First attach the brake band (1) to the lever (2) and then push it into the crankcase recess (arrow).

## 4.5 Chain Brake (036 QS)

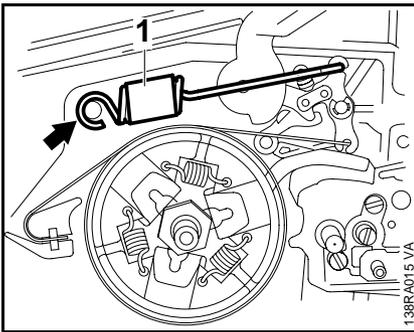
### 4.5.1 Removing



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



- Hook the brake spring to the lever.

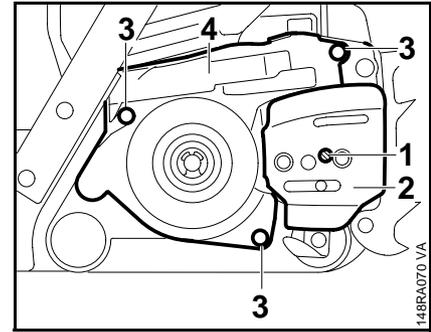


- Use the assembly tool 1117 890 0900 to attach the brake spring (1) to the anchor pin.
- Fit cover over the chain brake.

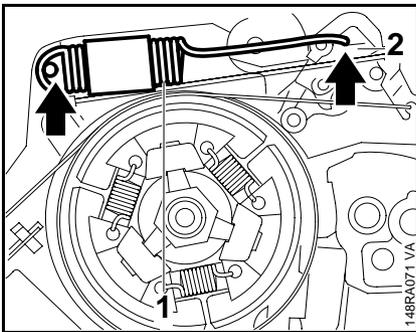
- Fit the inner side plate - see 4.1.
- Install the clutch drum/chain sprocket - see 4.1.
- Fit the cutting attachment and chain sprocket cover - see 4.1.

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

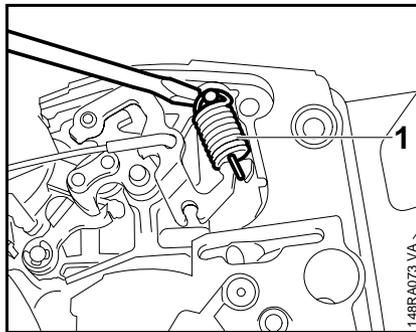
- Remove the chain sprocket cover and cutting attachment - see 4.1.
- Remove clutch drum/chain sprocket - see 4.1.



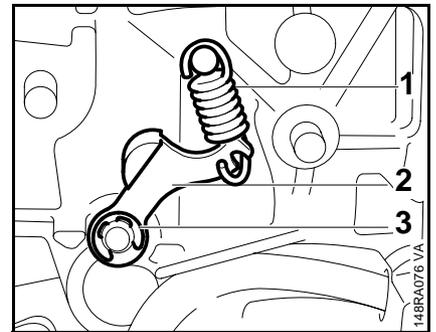
- Remove mounting screw (1) from inner side plate (2) and lift side plate away.
- Remove mounting screws (3) from cover (4) and lift the cover away.
- Engage the chain brake by pushing the hand guard away from the front handle.



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

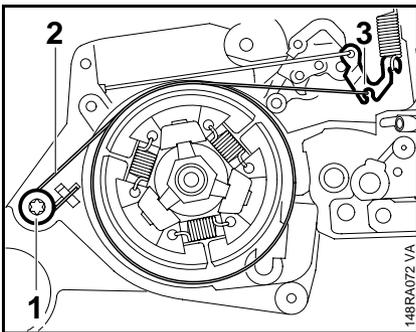


- Carefully pry spring (1) off the pivot pin.

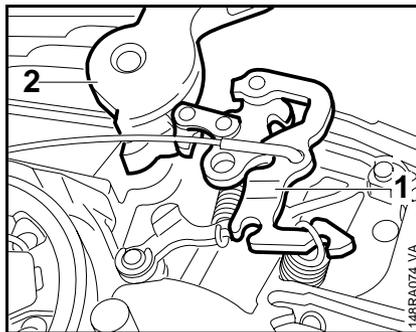


- Disconnect spring (1) from lever (2).
- Pry the E-clip (3) off the pivot pin and remove the lever with spring.

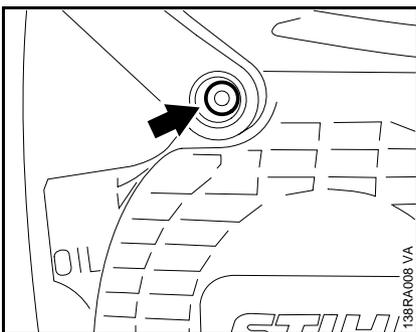
Clean all disassembled parts in white spirit. Replace any worn or damaged parts.



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



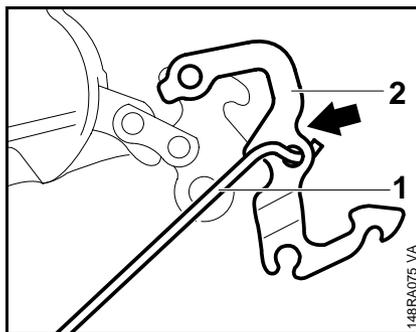
- Pull the hand guard (2) and brake lever (1) off the pivot pins.



- Remove screw with captive washer from the hand guard.

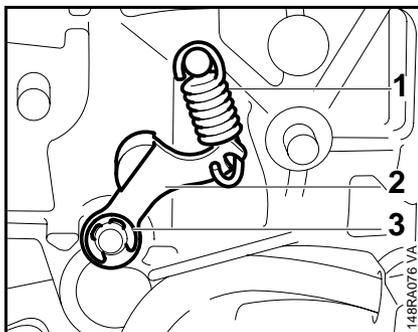
**Note:**

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

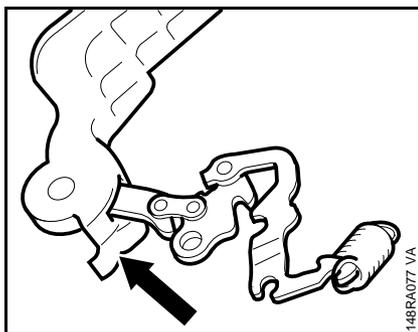


- Disconnect brake cable (1) from the brake lever (2).
- Take the brake lever out of the hand guard.

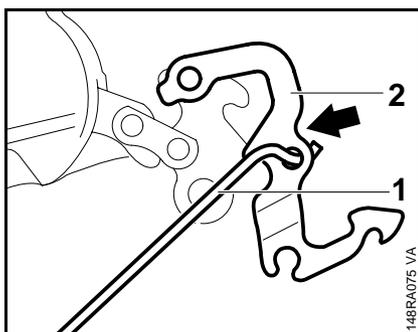
## 4.5.2 Installing



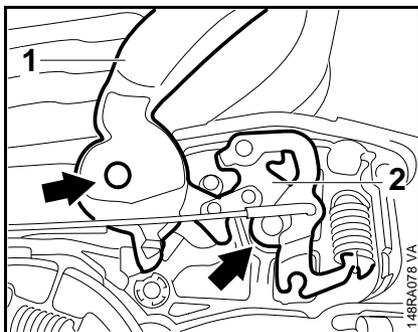
- Fit the lever (2) and spring (1).
- Fit the E-clip (3).



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



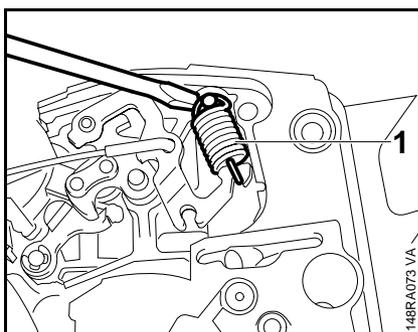
- Attach brake cable (1) to hole (arrow) in brake lever (2).



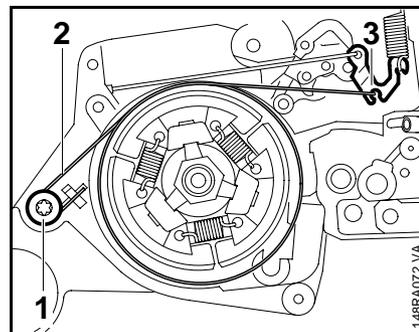
- Position the hand guard (1) against the pivot pin and fit the other side of the hand guard over the fan housing.
- Press the lever (1) slightly downward and push the hand guard and brake lever (2) onto the pivot pins.
- Insert screw with captive washer for hand guard and tighten down firmly (see "Tightening Torques").

### Important:

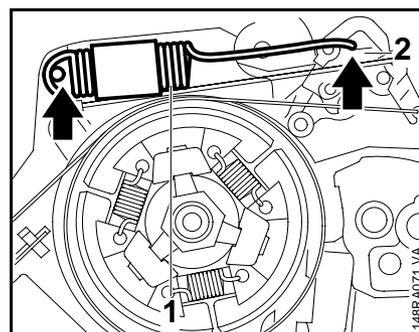
Coat all sliding and bearing points with STIHL multipurpose grease, see 13.2, or (better) with molybdenum grease (e.g. Molykote), see 13.2. Do not lubricate the brake band.



- Attach spring (1) to the pivot pin.

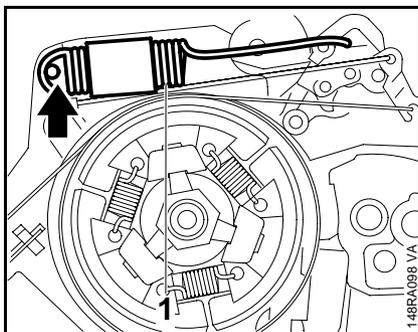


- First attach the brake band (2) to the brake lever (3) and then push it into the slot in the crankcase.
- Install screw (1) with LOCTITE 243 and tighten down firmly (see "Tightening Torques")



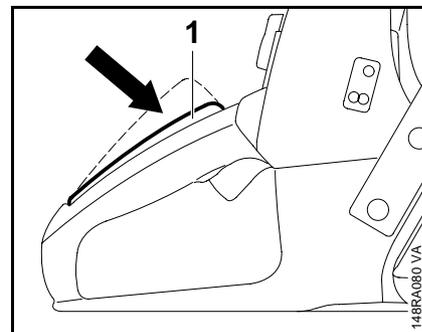
- Hook the brake spring (1) to the brake lever (2).

### 4.5.3 Checking Play

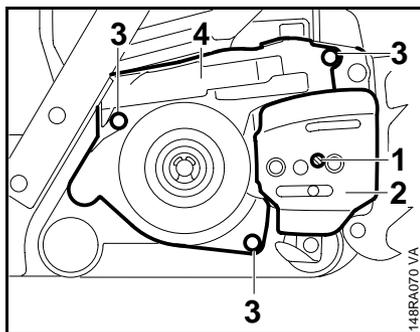


- Use the assembly tool 1117 890 0900 to attach the brake spring (1) to the anchor pin.
- Fit cover over the chain brake - see 4.5.1.
- Fit inner side plate - see 4.5.1.
- Install the clutch drum/chain sprocket - see 4.1.
- Fit the cutting attachment and chain sprocket cover - see 4.1.

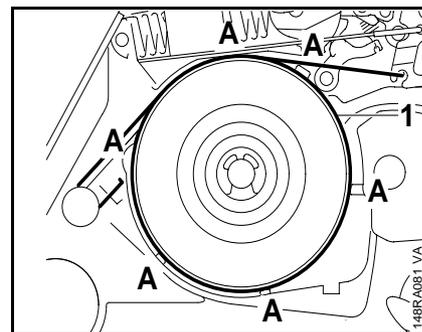
- Pull hand guard toward front handle.
- Unscrew nut from chain sprocket cover and remove the cover - see 4.1.
- Remove the cutting attachment - see 4.1.



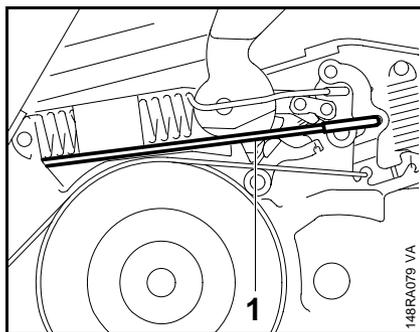
- Press down interlock lever (1) all the way and hold it in that position.



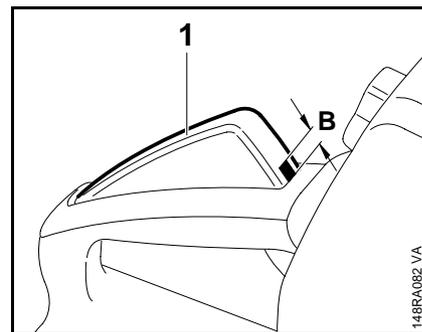
- Take out screw (1) and remove the side plate (2).
- Take out screws (3) and remove the cover (4).



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



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

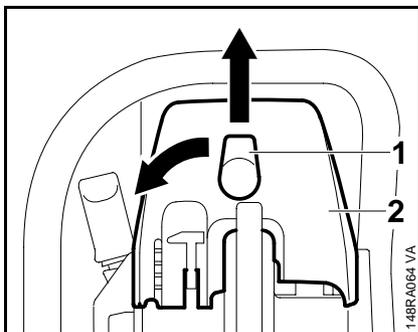


- Let go of the interlock lever (1).
- Check free travel by slowly squeezing the interlock lever (1). Play must be within the mark (B) at the front end of the interlock lever.

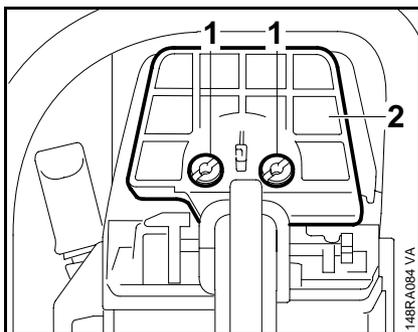
#### 4.5.4 Adjusting Play

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

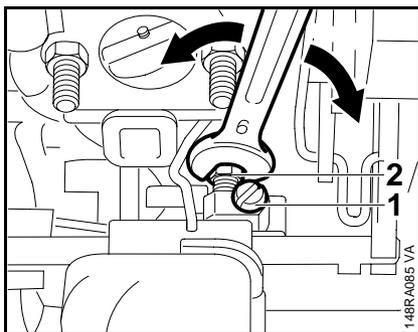
Reassemble in the reverse sequence.



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



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



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

Turn wrench to right to reduce play.

Turn wrench to left to increase play.

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

Reassemble in the reverse sequence.

#### 4.5.5 Checking Operation of Chain Brake

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

**Note:**

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

- With the engine running, open the throttle wide.
- Release the rear handle.

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

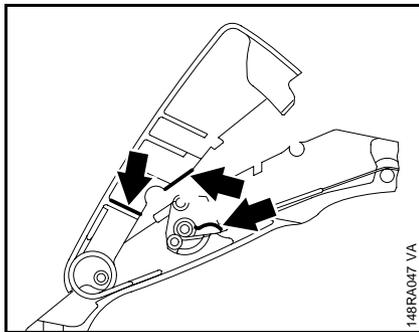
If the brake does not operate properly, service the sliding and bearing points shown in the illustrations as follows:

**If lightly contaminated:**

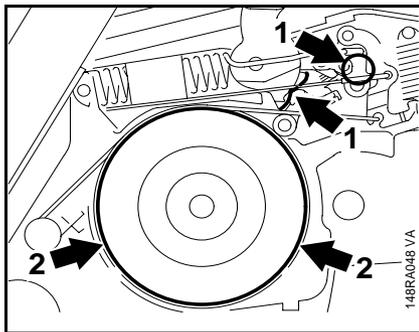
- Clean all parts with a brush and white spirit.

**If heavily contaminated or clogged with resin:**

- Remove the parts concerned and clean in white spirit or a resin solvent.
- Replace worn or damaged parts.
- Before re-installing parts, the machine recesses and seats.



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

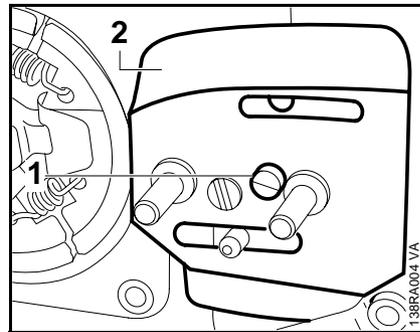


- Lubricate these points (1) with Mobilplex grease (see 13.2).
- Coat outside diameter of clutch drum (2) with chain oil.

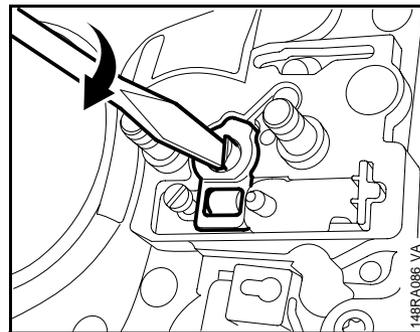
**Note:**

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

#### 4.6 Chain Tensioner



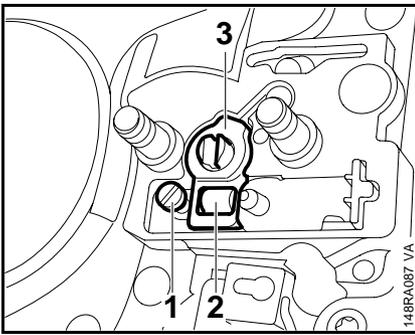
- Remove chain sprocket cover and cutting attachment - see 4.1.
- Remove mounting screw (1) from inner side plate (2) and lift side plate away.



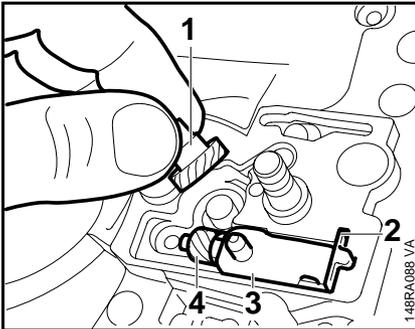
- Use a screwdriver to turn the spur gear clockwise until tensioner slide butts against the thrust pad.

**Note:**

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

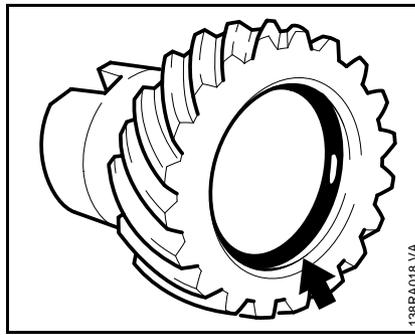


- Take out the cover plate mounting screw (1).
- Remove the cover plate (2) with retainer (3) from the spur gear.



- Pull out the spur gear (1).
- Take out the tensioner slide (3) with adjusting screw (4) and thrust pad (2).
- Inspect the teeth on the spur gear and adjusting screw, remove thrust pad if necessary.
- Take the adjusting screw out of the tensioner slide and replace the parts.

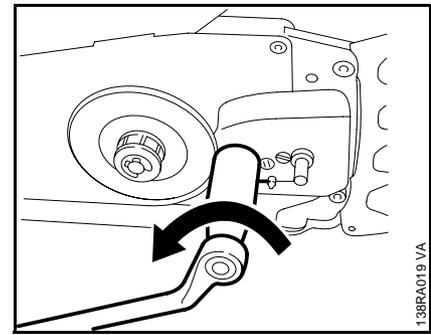
Install in the reverse sequence.



- Check that O-ring is fitted in spur gear.
- Lubricate O-ring with a little oil before fitting the spur gear.

**Note:**  
Coat teeth of adjusting screw and spur gear with grease, [see 13.2](#), before refitting.

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



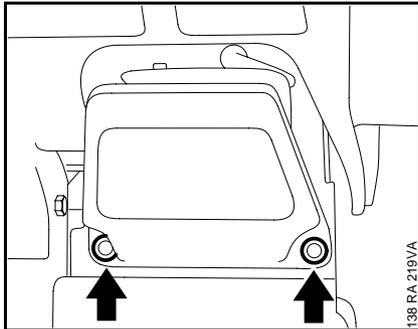
- Remove chain sprocket cover and cutting attachment - [see 4.1](#).
- Push stud puller 5910 893 0501 over the collar stud as far as it will go. Use a 15 mm wrench to unscrew the collar stud counter-clockwise.
- Before installing, coat thread of collar stud with LOCTITE - [see 13.2](#).
- Install and tighten down the collar studs (see "Tightening Torques").

## 5 Engine

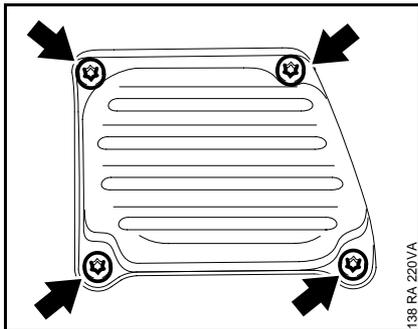
### 5.1 Removing and Installing Muffler

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

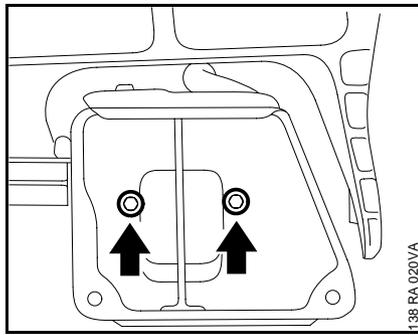
Troubleshooting chart - see "Standard Repairs, Troubleshooting" handbook.



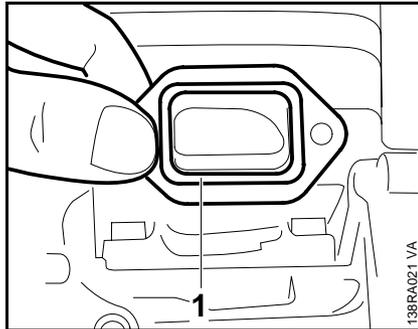
- (034)**
- Take out the screws and remove the upper casing.



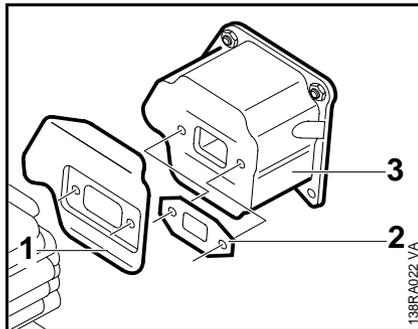
- (036, 036 QS)**
- Take out screws and remove the upper casing.



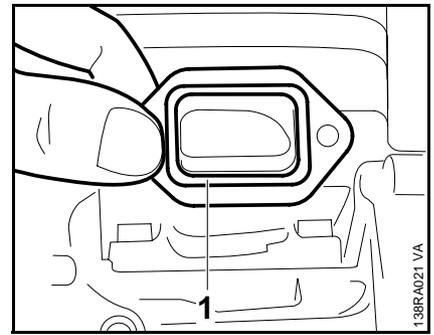
- Take out the screws and remove the lower casing.



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



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



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

**Note:**

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

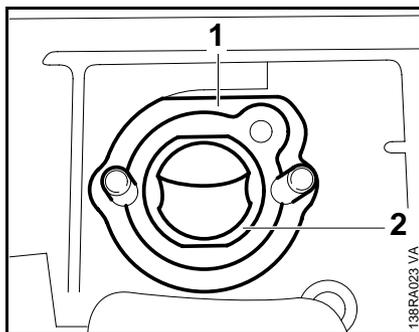
- Coat threads of mounting screws with LOCTITE - see 13.2.
- Insert and tighten down the mounting screws firmly (see "Tightening Torques").

## 5.2 Exposing the Cylinder

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

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

- Drain the fuel and oil tanks.
- Remove the air filter - [see 12.1](#)
- Remove the carburetor - [see 12.3](#)

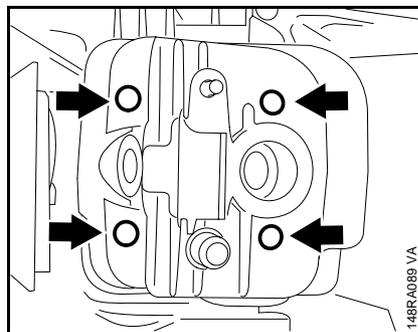


- Pull the washer (1) off the studs and remove the sleeve (2) from the manifold.
- Remove the shroud, spark plug and, if fitted, the decompression valve - [see 4.3](#).
- Remove the muffler - [see 5.1](#)

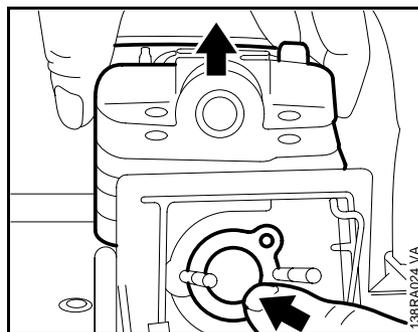
Reassemble in the reverse sequence.

## 5.3 Cylinder and Piston

### 5.3.1 Removing



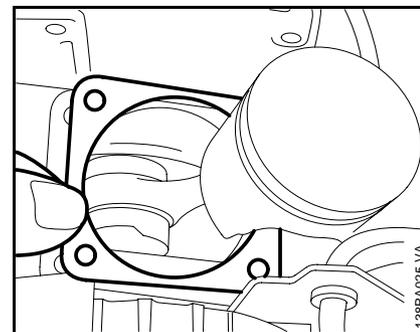
- Preparations - [see 5.2](#)
- Take out the four cylinder base screws.



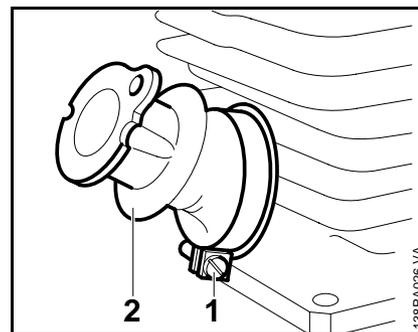
- Pull the cylinder off the piston and, at the same time, push the manifold through the tank housing opening.

#### Caution:

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



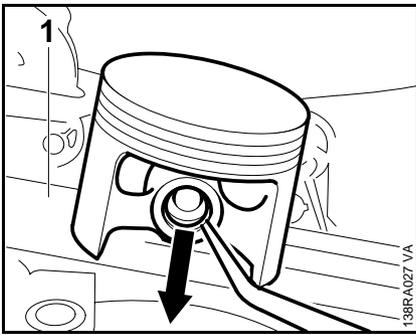
- Remove the cylinder gasket.



- Release the hose clamp (1) on the manifold (2). Pull the manifold off the intake port.
- Inspect the cylinder and replace it if necessary.

#### Note:

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

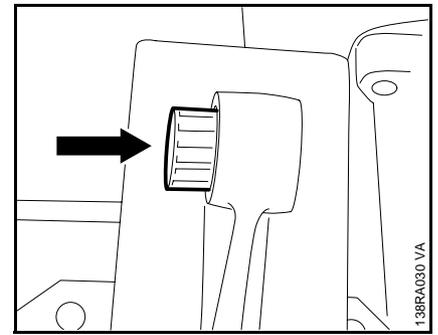


**Important:**

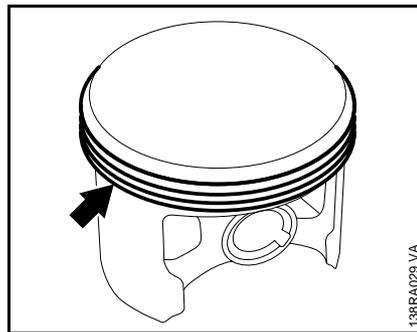
Before removing the piston, decide whether or not the crankshaft has to be removed as well.

- To remove the flywheel and clutch, block the crankshaft by sliding the wooden assembly block (1) 1108 893 4800 between the piston and crankcase.
- Use a scribe or similar tool to ease the hookless snap rings out of the grooves in the piston.

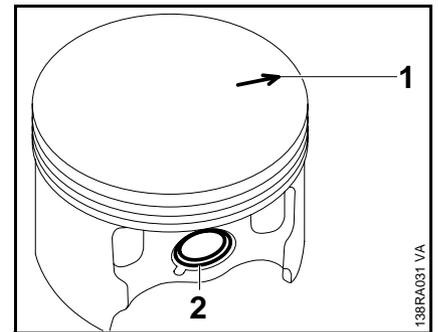
- Important:** Hold the piston steady during this process to ensure that no jolts are transmitted to the connecting rod.
- Remove piston and take the needle cage out of the connecting rod.



- Thoroughly clean the gasket seating surface on the cylinder.
- Lubricate the needle cage with oil and fit it in the small end.



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

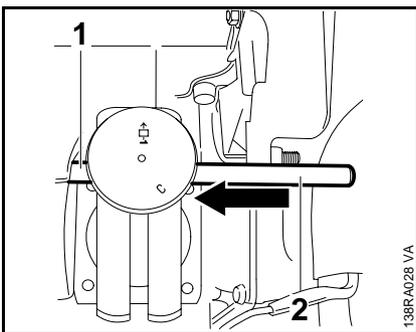


- Install a snap ring in the front piston boss (2), i.e. the piston boss facing you when the arrow (1) on the piston head is pointing to the right.

**Note:**

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

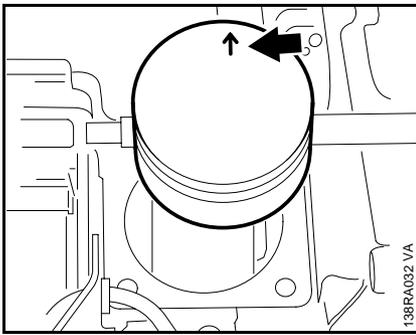
- Heat the piston on an electric heating plate to about 60°C.



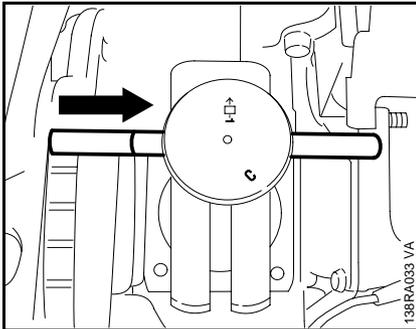
- Use the assembly drift (2) 1110 893 4700 to push the piston pin (1) out of the piston.

**Note:**

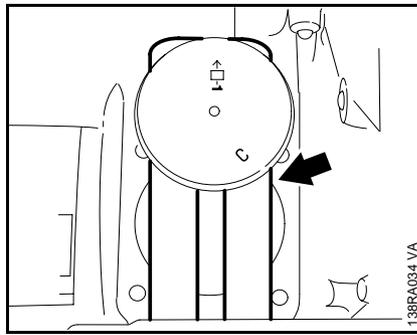
- If the piston pin is stuck, tap the end of the drift **lightly** with a hammer if necessary.



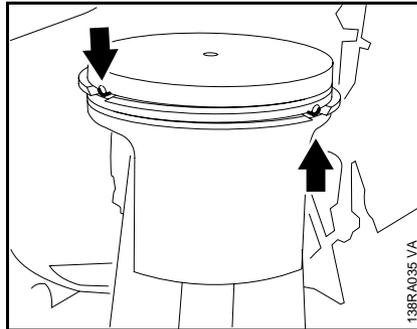
- Slip the piston over the connecting rod so that arrow on piston crown points to exhaust port.



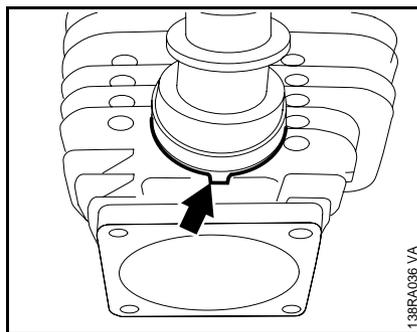
- Push the assembly drift 1110 893 4700, small diameter first from the clutch side, through the piston and small end (needle cage) and line up the piston.
- Fit piston pin on the end of the assembly drift and push it into the piston.
- Use installing tool 5910 890 2210 to fit the snap ring - see "Standard Repairs, Troubleshooting" handbook.
- Fit new cylinder gasket on the crankcase.
- Lubricate piston and piston rings with oil.



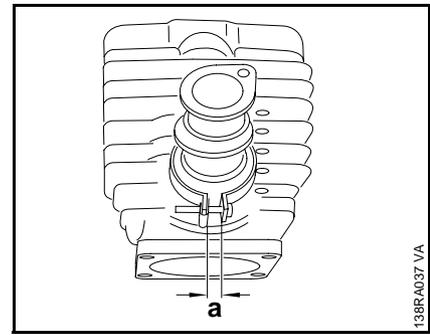
- Slide the wooden assembly block between the piston and crankcase.
- Rest the piston on the wooden assembly block.



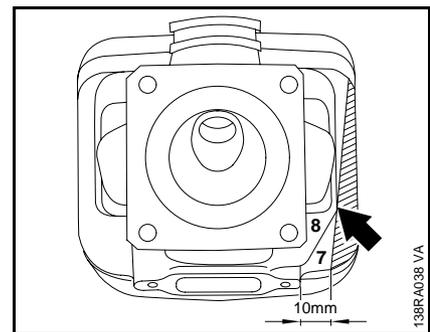
- Position the piston rings so that the radii at the ring gap meet at the fixing pin in the piston groove when the rings are compressed.



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

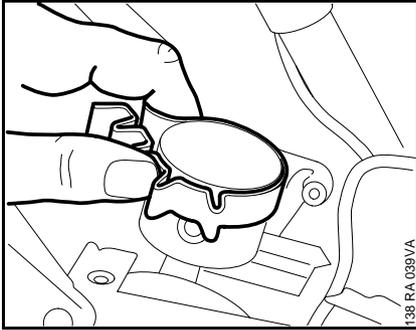


- Slide the hose clamp on to the manifold. The screw head must point to the right.
- The screw on the hose clamp must be below the manifold and at a right angle to the cylinder axis.
- Tighten the screw until the gap "a" between the two ends of the hose clamp is 3.5 to 4.5 mm.



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

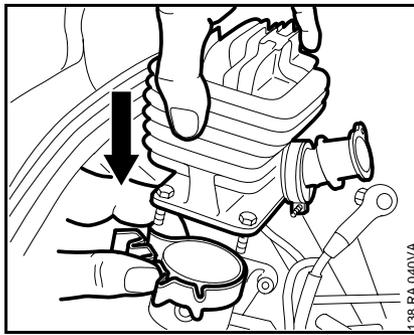
- Coat thread of setscrew in cylinder with LOCTITE - see 13.2.
- Insert setscrew and tighten down firmly (see "Tightening Torques").



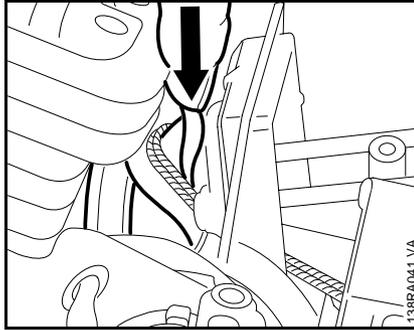
- Lubricate the inside of the cylinder with oil and line it up so that it is positioned as it will be in the installed condition.
- Use the clamping strap 0000 893 2600 to compress the rings around the piston. Check correct installed position of rings once again.

**Note:**

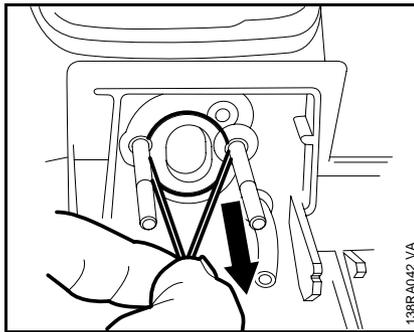
To make cylinder installation easier, apply clamping strap so that it is just below the piston crown.



- Slide the cylinder over the piston.
- Remove the wooden assembly block and clamping strap.



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



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

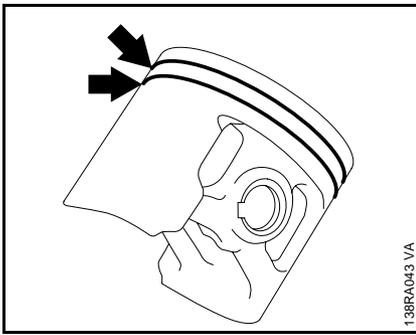
- Carefully line up the cylinder and gasket.
- Fit cylinder base screws and torque down firmly in a diagonal pattern (see "Tightening Torques").

**Important:**

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

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

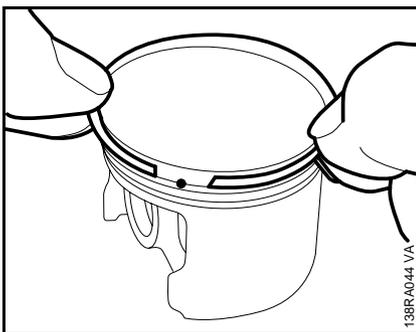
## 5.4 Piston Rings



- Remove the piston - [see 5.3.1](#).
- Remove rings from piston.
- Use a piece of old piston ring to scrape the grooves clean.

### Warning:

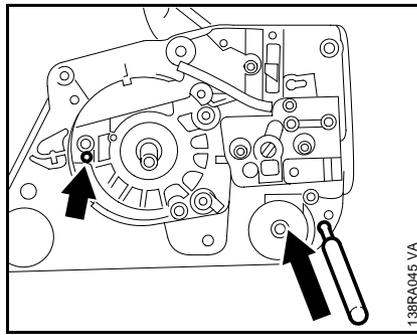
Do not install 1.2 mm rings in pistons with 1.5 mm grooves.



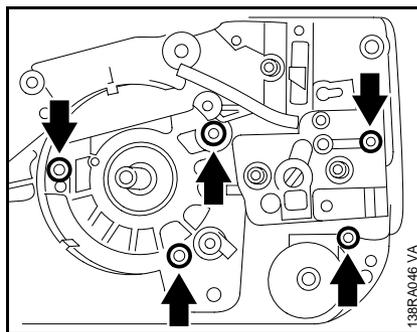
- Install the new piston rings in the grooves so that the radii at the ends of the rings face upward.
- Install the piston - [see 5.3.2](#).

## 5.5 Crankcase

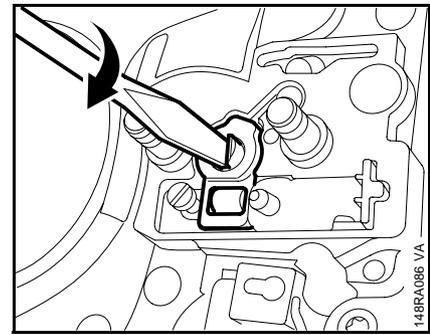
### 5.5.1 Removing the Crankshaft



- Remove the chain brake - [see 4.4](#) and [4.5](#).
- Remove the oil pump - [see 11.4](#)
- Remove the flywheel - [see 6.4.1](#)
- Remove the ignition module - [see 6.5.1](#)
- On machines with handle and/or carburetor heating, remove the generator - [see 10.5.1](#).
- Remove the cylinder and piston - [see 5.3.1](#).
- Remove the tank housing - [see 12.8.1](#).
- Remove the spiked bumper.
- Use a 5 mm drift or other suitable tool to drive out the two dowel pins from the clutch side.



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

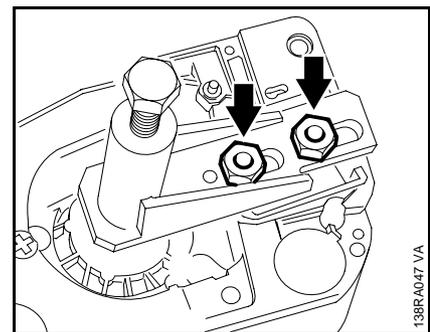


- Use a screwdriver to rotate the spur gear clockwise until the tensioner slide butts against the thrust pad.

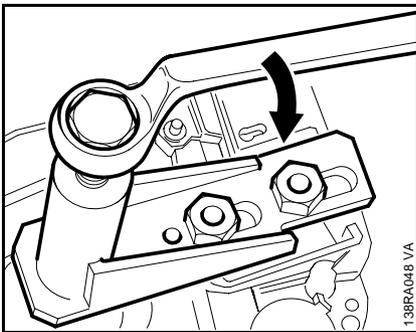
### Note:

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

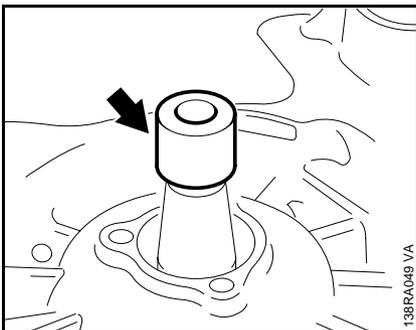
- Back off spindle on service tool AS all the way.



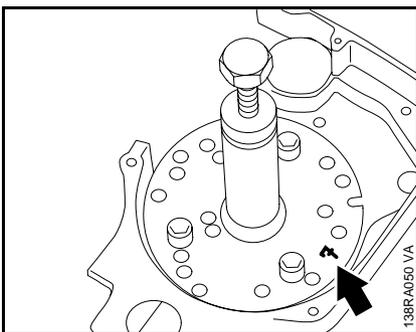
- Slip service tool AS 5910 007 2205 over the two collar studs, fit the hexagon nuts (for sprocket cover) and tighten them down by hand.



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



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

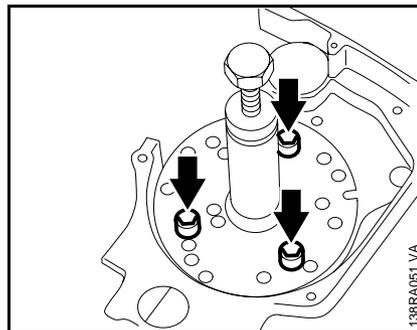


- Fit service tool ZS 5910 007 2200 against the outside of the crankcase.

**Note:**

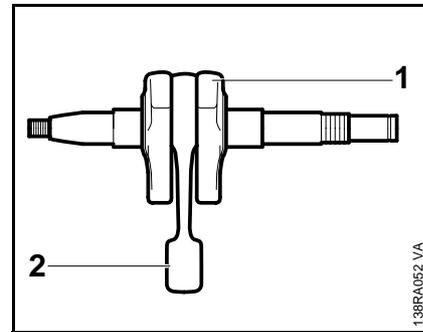
The tool's drilled plate must locate flat against the crankcase.

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



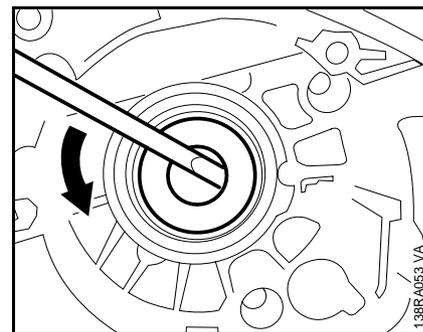
- Secure the service tool to the crankcase with M5x72 mounting screws 9022 341 1190. Insert the screws in the holes marked "7" and tighten them down against the drilled plate.

- Turn spindle counterclockwise (left-hand thread) until it locates against the crankshaft.
- Use a 19 mm wrench to continue turning the spindle and push the crankshaft out of its bearing seat.

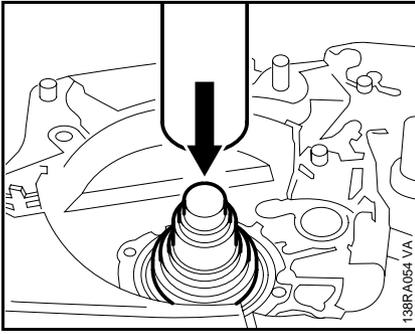


- The crankshaft (1), connecting rod (2) and needle bearing form an inseparable unit. This means that the crankshaft must always be replaced as a complete unit in the event of damage to any one of these parts.

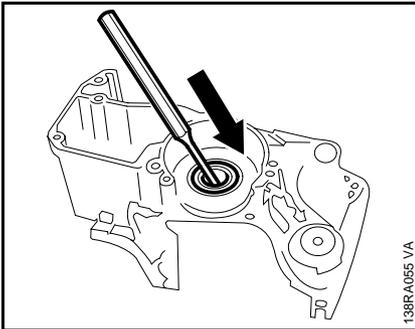
- When fitting a replacement crankshaft, always install new oil seals and ball bearings.
- Remove the gasket from the crankcase sealing face.



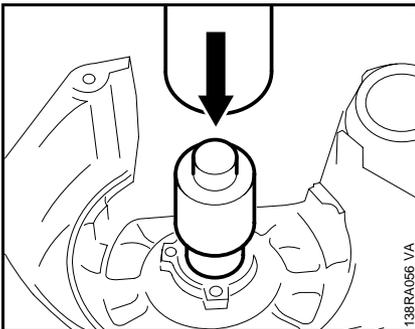
- Use a screwdriver to pry the oil seal out of the ball bearing at the clutch side.



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



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



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

- Pull the oil suction hose out of crankcase.
- Inspect both halves of the crankcase for cracks and replace if necessary.

**Note:**

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

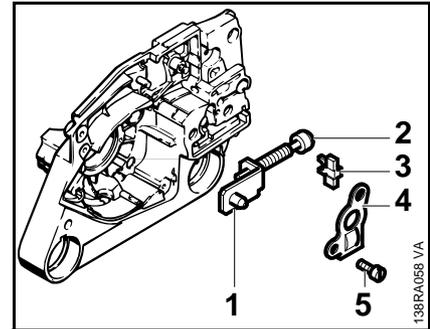
All other parts which are still serviceable can be transferred to the new crankcase after the new bearings have been fitted (crankcase has to be heated).

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

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

**Note:**

Clean the mating surfaces thoroughly to ensure a perfect seal.



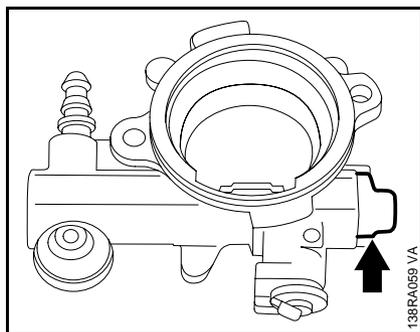
**Note:**

A new front chain tensioner is supplied with replacement crankcases.

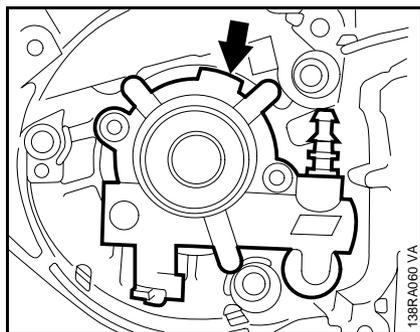
- 1 Tensioner slide
- 2 Adjusting screw
- 3 Thrust pad
- 4 Cover plate
- 5 Pan head screw

- Stamp the machine's serial number on the crankcase with 2.5 mm figure stamps.
- Check that dowel pin is in position. If necessary, drive dowel pin into new crankcase.

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



- Pull the plastic plug out of the oil pump.

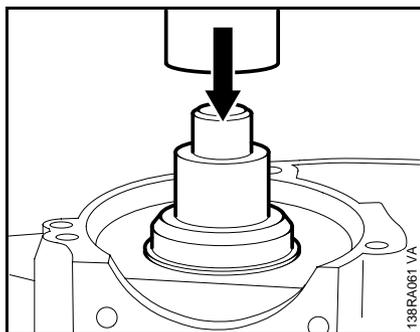


- Position the oil pump against the crankcase. Insert and tighten down the mounting screws.

– Before heating the crankcase, remove all rubber and polymer

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

- Inspect condition of all parts and replace as necessary.
- Heat area of bearing seat on clutch side of crankcase to approx. 120°C.

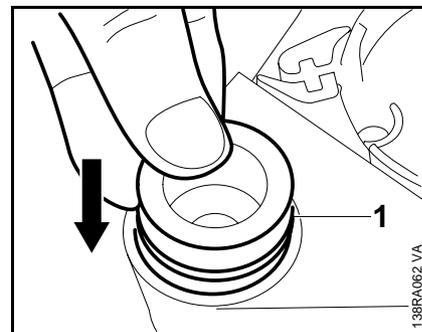


- Place ball bearing in position and press it in until it locates against the oil pump.

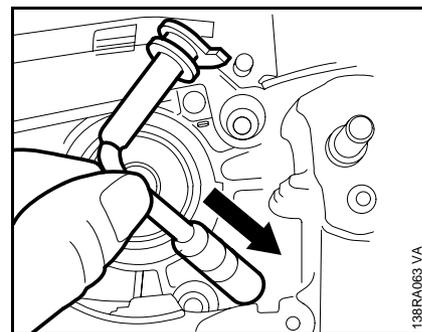
**Note:**

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

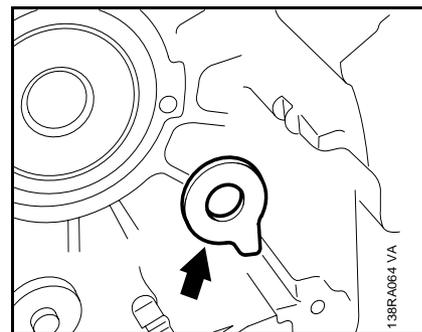
- Remove the oil pump and refit the plastic plug.



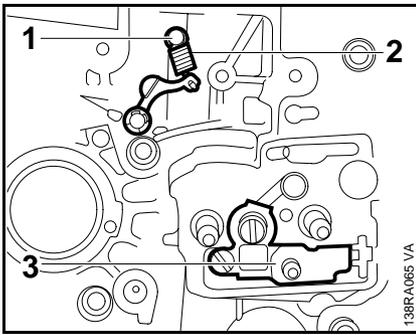
- Push the two annular buffers, tapered end first, into position so that the groove (1) engages over the housing rib.



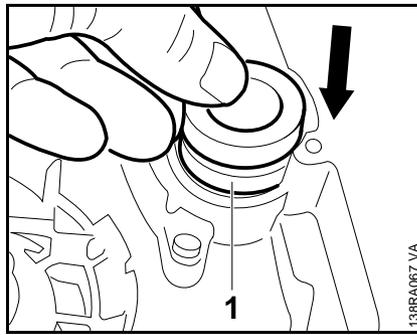
- Push the oil suction hose into the crankcase bore.



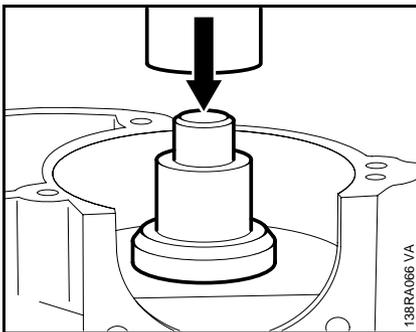
- Use a blunt tool to push the oil suction hose into the bore so that its tab locates in the bottom right recess.



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



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



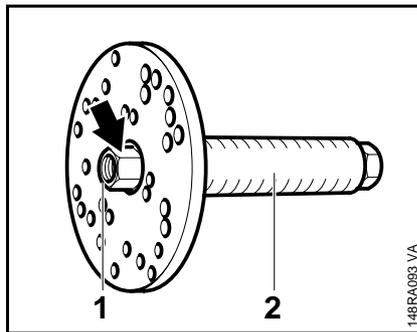
- Heat area of bearing seat on ignition side of crankcase to approx. 120°C.
- Use press arbor 1118 893 7200 to install the ball bearing (open side up).

**Important:**

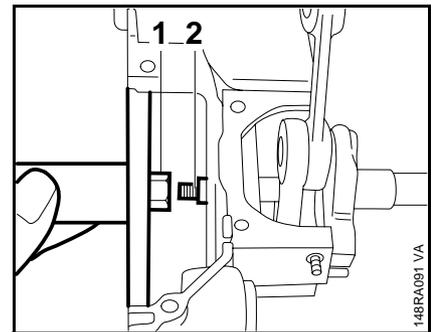
the ball bearing is closed at one side. The open side must be on the inside of the crankcase to guarantee proper lubrication.

**Note:**

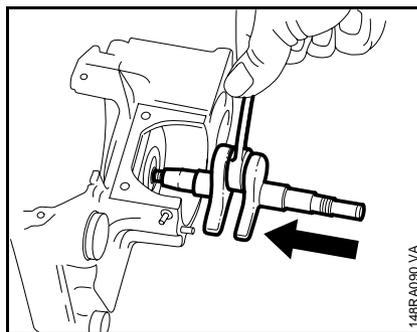
The ball bearing can be fitted by hand if the crankcase is heated as specified. This operation must be carried out very quickly because the bearing absorbs heat immediately and begins to expand.



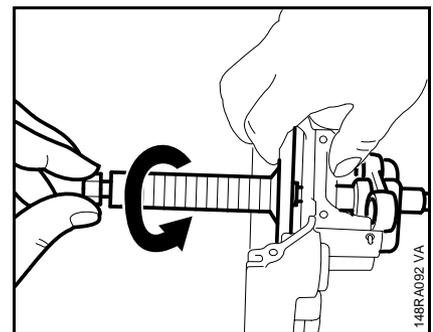
- Extend the spindle of service tool ZS (2) 5910 007 2200 fully and then screw the threaded sleeve (1) 5910 893 2420 onto the spindle as far as it will go.



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



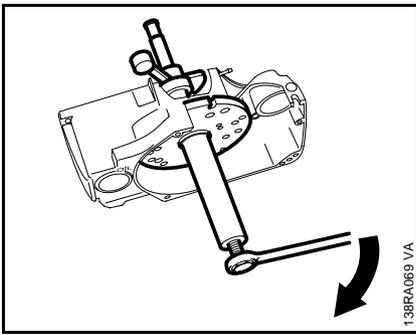
- Lubricate short crankshaft stub with oil and position it in the bearing from inside the ignition side of the crankcase.



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

**Important:**

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

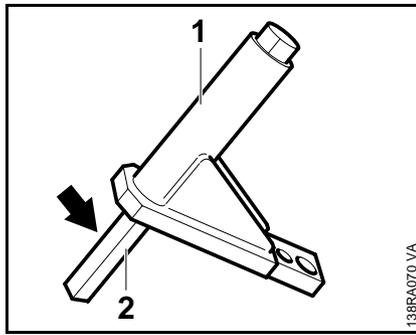


- Turn the spindle clockwise to pull in the crankshaft until it locates against the ball bearing.

**Important:**

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

- Remove service tool ZS: First release the spindle counterclockwise and then unscrew the service tool ZS, also counterclockwise.
- Screw the spindle fully into service tool AS 5910 007 2205 in the clockwise direction.

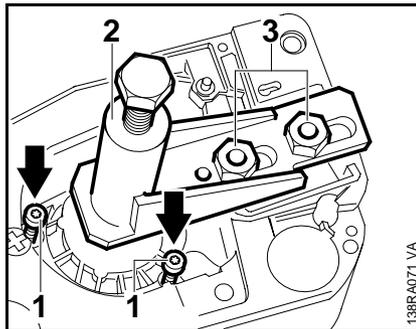


- Screw threaded sleeve (2) 5910 893 2409 onto the spindle of service tool AS (1) as far as it will go (left-hand thread)

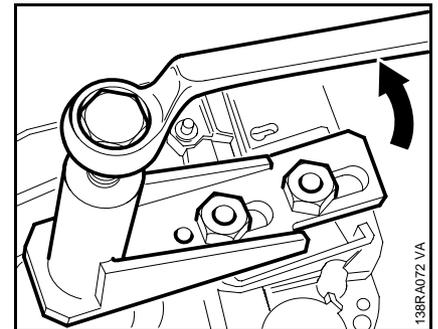
- Lubricate crankshaft stub at clutch side with oil.
- Fit crankcase gasket.
- Push the clutch side of the crankcase over the crankshaft stub as far as it will go.

- Push threaded sleeve over the crankshaft stub.
- Hold the crankshaft steady and rotate the spindle counterclockwise to screw the threaded sleeve onto the crankshaft.

- Release the crankshaft. Hold the service tool (2) steady and continue turning the spindle until the tool locates against the guide bar mounting face.
- Fit the two hexagon nuts (3) on the bar mounting studs and screw them down finger-tight.

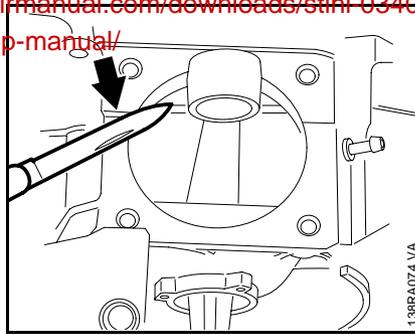


- To prevent the crankcase and gasket twisting, fit M5x72 screws (1) (from service tool ZS 5910 007 2200) in two crankcase holes).

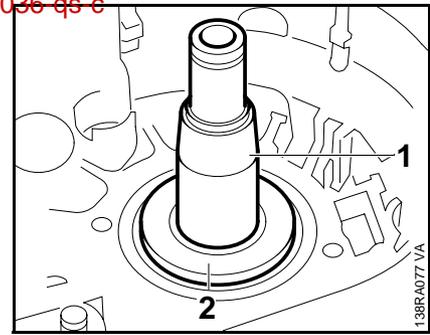


- Turn the spindle counterclockwise until the crankshaft locates against the ball bearing.

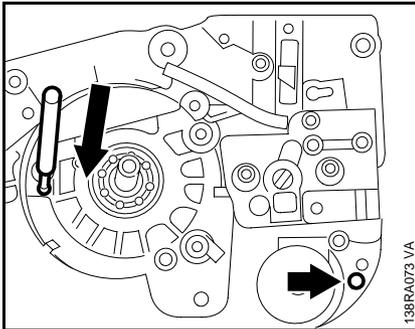
- Unscrew the hexagon nuts. Unscrew the spindle clockwise and take away the service tool.
- Take out the two M5x72 screws.



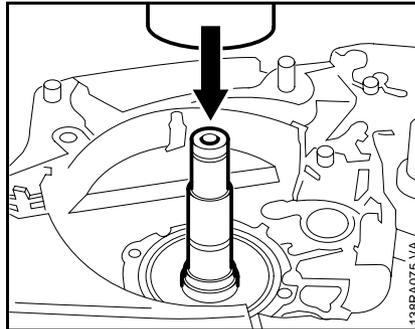
- Trim away any excess gasket material in the area of the cylinder mounting face.



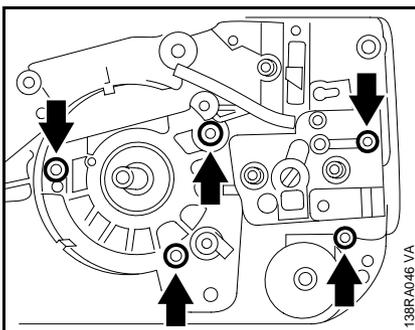
- Fit the installing sleeve (1) 1118 893 4602 over the clutch end of the crankshaft.
- Slip the oil seal (2), open side facing the crankcase, over the installing sleeve.



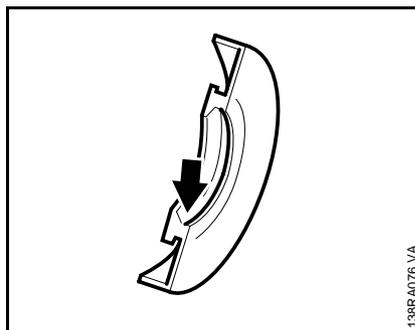
- Drive home the two dowel pins.



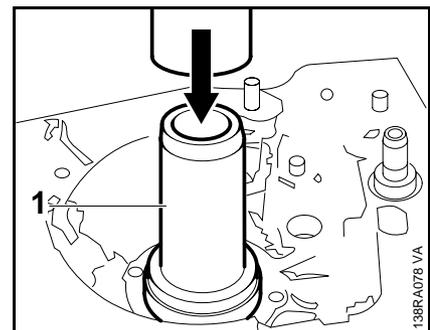
- If the crankshaft does not turn freely, it is sufficient to **tap** the end of the stub with a plastic mallet to relieve axial stresses.



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



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



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