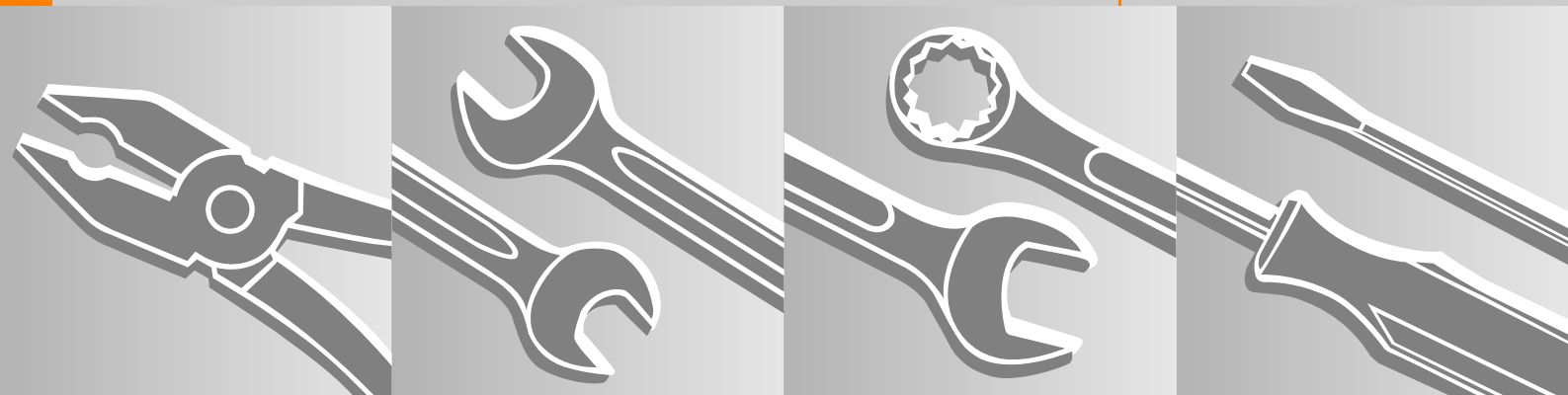


STIHL MS 440

2006-05



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1. Introduction

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

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

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

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

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 an updated edition is issued.

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

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

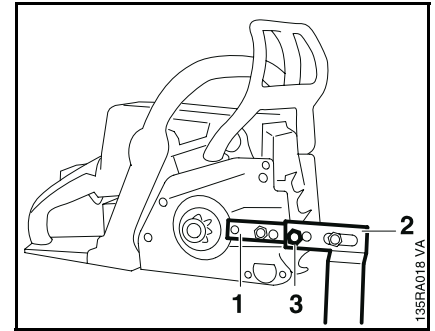
In the descriptions:

- = 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 as from serial No.
- ➡ = Situation applies up to serial No.

In the illustrations:

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

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




Servicing and repairs are made considerably easier if the clamp (1) 5910 890 2000 is used to mount the machine on assembly stand (2) 5910 890 3100 so that one clamp screw engages the outer 10 mm (0.39 in) hole (3) in the assembly stand.

To service the underside of the machine (e.g. remove the front handle), turn it upside down and mount it so that one clamp screw engages the inner 10 mm (0.39 in) hole in the assembly stand.

Pull the hand guard back against the front handle for this purpose.

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.

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 instruction 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 bring any fire, flame, spark 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

Displacement:	70.7 cm ³ (4.31 cu.in)
Bore:	50 mm (1.97 in)
Stroke:	36 mm (1.42 in)
Engine power to ISO 7293: at 9,500 rpm	4 kW (5.4 bhp)
Max. permissible engine speed with bar and chain:	13,500 ± 150 rpm
Idle speed:	2,500 1 rpm
Clutch:	Centrifugal clutch with three unlined clutch shoes
Clutch engages at:	3,500 rpm
Crankcase leakage test at gauge pressure:	$p_{\bar{u}} = 0.5 \text{ bar (7.25 psi)}$
under vacuum:	$p_{\bar{u}} = 0.5 \text{ bar (7.25 psi)}$

3.2 Fuel System

Carburetor leakage test at gauge pressure:	$p_{\bar{u}} = 0.8 \text{ bar (11.6 psi)}$
Operation of tank vent at gauge pressure:	$p_{\bar{u}} = 0.3 \text{ bar (4.35 psi)}$
Fuel:	as specified in instruction manual

3.3 Ignition System

Air gap between ignition module and fanwheel:	0.15...0.3 mm (0.006...0.12in)
Spark plug (suppressed):	Bosch WSR 6F NGK BPMR 7A
Electrode gap:	0.5 mm (0.02 in)

3.4 Chain Lubrication

Fully automatic, speed-controlled oil pump with rotary piston	
Oil delivery rate:	8...18 cm ³ /min (0.49...1.1 cu.in/min) at 10,000 rpm

3.5 Tightening Torques

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

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

Fastener	Thread size	For component	Torque		Remarks
			Nm	(lbf ft)	
Screw	IS-M5x20	Crankcase	11.5	(8.48)	
Screw	IS-M5x20	Cylinder	11.5	(8.48)	
Screw	IS-M5x16	Muffler, lower casing to cylinder	11.0	(8.11)	1)
Screw	IS-M5x6	Muffler, upper casing top	6.5	(4.79)	1)
Screw	IS-M5x16	Muffler top	11.0	(8.11)	1)
Screw	IS-M5x18	Muffler bottom	15.0	(11.06)	1)
Screw	IS-M5x20	Ignition module	7.0	(5.16)	2)3)
Screw	IS-M4x16	Shroud	4.0	(2.95)	
	M12x1 L	Carrier (clutch)	50.0	(36.88)	
	M14x1,25	Spark plug	25.0	(18.44)	
Nut	M5	Carburetor	3.5	(2.58)	
Screw	IS-M4x16	Annular buffer plate	5.0	(3.69)	
Screw	IS-M5x12	Spiked bumper top (with nut)	7.5	(5.53)	
Screw	IS-M5x16	Spiked bumper bottom (chain catcher)	7.5	(5.53)	
Screw	IS-M3,5x12	Generator	2.0	(1.48)	1)
Screw	M4x8	Cover, chain tensioner	3.0	(2.21)	
Screw	IS-M4x12	Oil pump	3.5	(2.58)	
Screw	IS-M4x12	Cover, chain brake	3.0	(2.21)	
Screw	IS-M4x12	Brake band	3.0	(2.21)	1)
Screw	IS-M4x16	Fan housing	4.0	(2.95)	2)
Screw	M4x8	Side plate, inner	3.0	(2.21)	
Nut	M8x1	Crankshaft (flywheel)	33.0	(24.34)	
	M10x1	Decompression valve	14.0	(10.33)	
Collar stud	M8x21,5	Bar mounting	23.0	(16.96)	1)
Polymer screw	IS-P6x26,5	Annular buffer, top	5.5	(4.06)	
Polymer screw	IS-P6x19	Annular buffer, bottom	5.5	(4.06)	
Polymer screw	IS-P6x19	Front handle, top	8.0	(5.90)	4)
Polymer screw	IS-P6x19	Front handle, bottom	8.0	(5.90)	4)
Screw assy.	IS-M4x16	Hand guard left, fan housing	4.0	(2.95)	

Remarks:

- 1) Secure screw with Loctite 270
- 2) Secure screw with Loctite 242
- 3) A washer must be fitted under the screw head

4. Troubleshooting Chart
4.1 Clutch, Chain Drive, Chain Brake, Chain Tensioner

Condition	Cause	Remedy
Saw chain stops under load at full throttle	Clutch shoes badly worn	Replace clutch shoes
	Clutch drum badly worn	Install new clutch drum
	Brake band stuck	Check freedom of movement and function of brake band.
Saw chain rotates at idle speed	Engine idle speed too high	Adjust idle speed screw (counterclockwise)
	Clutch springs stretched or fatigued	Replace clutch springs
	Clutch spring hooks broken	Replace clutch springs
Loud noises	Clutch springs stretched or fatigued	Replace all clutch springs
	Needle cage damaged	Fit new needle cage
	Clutch shoe retainer broken	Fit new retainer
	Clutch shoes and carrier worn	Install new clutch
Chain sprocket wears rapidly	Chain not properly tensioned	Tension chain as specified
	Wrong chain pitch	Fit chain of correct pitch
	Insufficient chain lubrication	Check chain lubrication
	Chain sprocket worn	Fit new chain sprocket
Saw chain does not stop immediately when brake is activated	Brake spring stretched or broken	Fit new brake spring
	Brake band stretched, worn or broken	Fit new brake band

4.2 Rewind Starter

Condition	Cause	Remedy
Starter rope broken	Rope pulled out too vigorously as far as stop or over edge, i.e. not vertically	Fit new starter rope
	Normal wear	Fit new starter rope
Starter rope does not rewind	Rewind spring broken	Fit new rewind spring
	Spring overtensioned – no reserve when rope is fully extended	Fit new rewind spring
	Very dirty or corroded	Clean or replace rewind spring
Starter rope can be pulled out almost without resistance (crankshaft does not turn)	Guide peg on pawls or pawls themselves are worn	Fit new pawls
	Spring clip fatigued	Fit new spring clip
Starter rope is difficult to pull and rewinds very slowly	Starter mechanism is very dirty	Thoroughly clean complete starter mechanism
	Lubricating oil on rewind spring becomes viscous at very low outside temperatures (spring windings stick together)	Coat rewind spring with a little standard solvent-based degreasant (containing no chlorinated or halogenated hydrocarbons), then pull rope carefully several times until normal action is restored

4.4 Ignition System

Warning!

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

Condition	Cause	Remedy
Engine runs roughly, misfires, temporary loss of power	Spark plug boot is loose	Press boot firmly onto spark plug and fit new spring if necessary
	Spark plug sooted, smeared with oil	Clean the spark plug or replace if necessary
	Incorrect air gap between ignition module and flywheel	Set air gap correctly
	Flywheel cracked or has other damage or pole shoes have turned blue	Install new flywheel
	Ignition timing wrong, flywheel out of adjustment, key in flywheel has sheared off	Install new flywheel
	Weak magnetization in flywheel – pole shoes have turned blue	Install new flywheel
No spark		Check operation of Master Control lever and ignition module
No spark		Faulty insulation on ignition lead or short circuit wire. Use ohmmeter to check ignition lead for break. If break is detected or high resistance measured, fit a new ignition lead
	Leak in crankcase	Replace oil seals or crankcase

4.5 Carburetor

Condition	Cause	Remedy
Carburetor floods; engine stalls	Inlet needle not sealing. Foreign matter in valve seat or cone damaged	Remove and clean or replace the inlet needle, clean the fuel tank, pickup body and fuel line if necessary
	Inlet control lever sticking on spindle	Free off inlet control lever
	Helical spring not located on nipple of inlet control lever	Remove the inlet control lever and refit it correctly
	Perforated disc on diaphragm is deformed and presses constantly against the inlet control lever	Fit a new metering diaphragm
	Inlet control lever too high (relative to correct installed position)	Set inlet control lever flush with top edge of housing
Poor acceleration	Idle jet too lean	Rotate low speed screw (L) counterclockwise (richer), no further than stop
	Main jet too lean	Rotate high speed screw (H) counterclockwise (richer), no further than stop
	Inlet control lever too low (relative to correct installed position)	Set inlet control lever flush with top edge of housing
	Inlet needle sticking to valve seat	Remove inlet needle, clean and refit
	Diaphragm gasket leaking	Fit new diaphragm gasket
	Metering diaphragm damaged or shrunk	Fit new metering diaphragm
	Impulse hose damaged or kinked	Fit new impulse hose

Condition	Cause	Remedy
Engine will not idle, idle speed too high	Throttle shutter opened too wide by idle speed screw (LA)	Reset idle speed screw (LA) correctly
	Oil seals/crankcase leaking	Seal or replace oil seals/crankcase
Engine stalls at idle speed	Idle jet bores or ports blocked	Clean jet bores and ports, and blow through with compressed air
	Idle jet too rich or too lean	Set low speed screw (L) correctly
	Setting of idle speed (LA) incorrect – throttle shutter completely closed	Set idle speed screw (LA) correctly
	Small plastic plate in valve jet does not close	Clean or renew valve jet
Engine speed drops quickly under load – low power	Air filter dirty	Clean the air filter
	Throttle shutter not opened fully	Check actuation
	Tank vent faulty	Clean tank vent or replace if necessary
	Fuel pickup body dirty	Clean the pickup body, fit a new filter
	Fuel strainers dirty	Replace the fuel strainers
	Leak in fuel line between tank and fuel pump	Seal connections or install a new fuel line
	Pump diaphragm damaged or fatigued	Fit new pump diaphragm
	Main jet bores or ports blocked	Clean bores and ports
	Setting of high speed screw (H) too rich	Rotate high speed screw (H) clockwise (leaner), no further than stop
Impulse hose damaged or kinked	Fit new impulse hose	

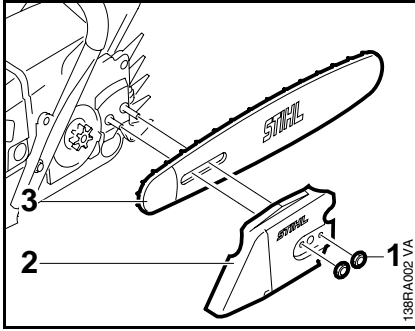
4.6 Engine

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

Air filter
Fuel system
Carburetor
Ignition system

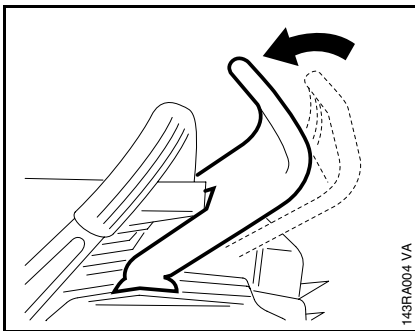
Condition	Cause	Remedy
Engine does not start easily, stalls at idle speed, but operates normally at full throttle.	Oil seals in crankcase damaged	Replace the oil seals
	Crankcase leaking or damaged (cracks)	Seat or replace the crankcase
	Leak in muffler	Seal / replace muffler
Engine does not deliver full power or runs erratically	Piston rings worn or broken	Replace piston rings
	Muffler / spark arresting screen carbonized	Clean muffler (inlet and exhaust opening), replace spark arresting screen
	Air filter insert soiled	Replace air filter insert
	Fuel / impulse hose severely kinked or damaged	Fit new hoses or position them free from kinks
	Decompression valve sticking	Replace the decompression valve
Engine overheating	Insufficient cylinder cooling. Air inlets in fan housing blocked or cooling fins on cylinder very dirty	Thoroughly clean all cooling air openings and the cylinder fins.

5. Clutch, Chain Drive, Chain Brake and Chain Tensioner



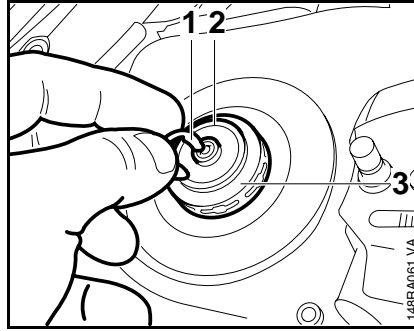
Wear work gloves to protect your hands from injury.

- Unscrew the hex nuts (1) on the chain sprocket cover (2) and remove chain sprocket cover and guide bar (3).

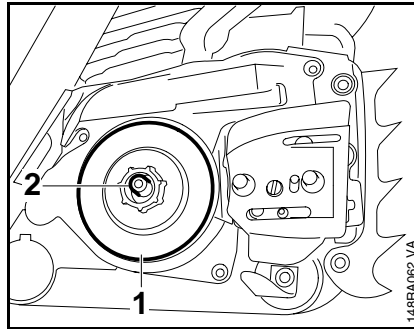


- Disengage the chain brake by pulling the hand guard towards the front handle.

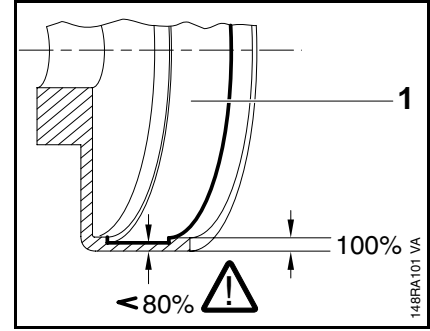
5.1 Clutch Drum / Chain Sprocket



- Remove the E-clip (1), washer (2) and rim sprocket (3) if fitted.




- Remove the clutch drum (1) with needle cage (2).
- Examine the needle cage for signs of damage.

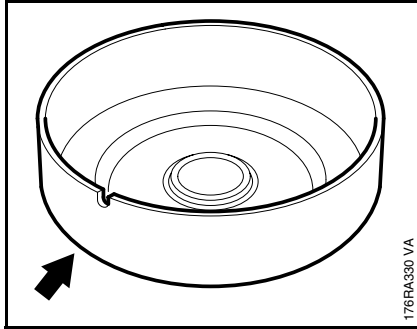


- Inspect the clutch drum (1).

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.

If the clutch drum has to be replaced, also check the brake band –  5.4.2

5.2 Replacing the Chain Catcher

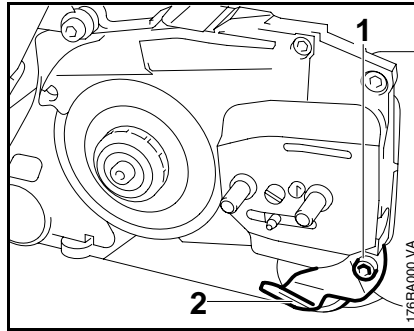


If the clutch drum can be reused, clean and roughen the friction surface.

Reassemble in the reverse sequence.

Clean stub of crankshaft. Wash needle cage, examine it for damage and replace if necessary. Lubricate needle cage with STIHL multi-purpose grease – 16.

- Rotate clutch drum / chain sprocket and apply slight pressure at the same time until the oil pump drive spring engages in the slot on the circumference.



- Remove the chain sprocket cover – 5.1

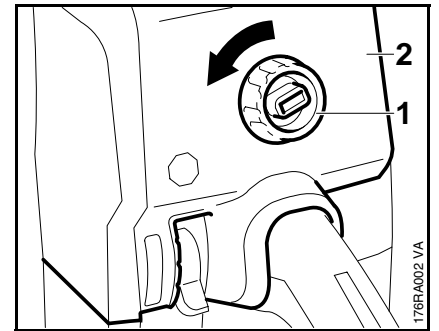
- Take out the screw (1) and remove the chain catcher (2).

Reassemble in the reverse sequence.

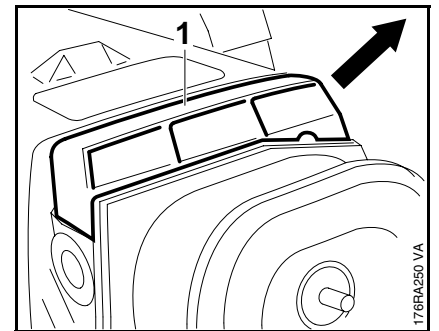
5.3 Clutch

Troubleshooting chart – 4.1

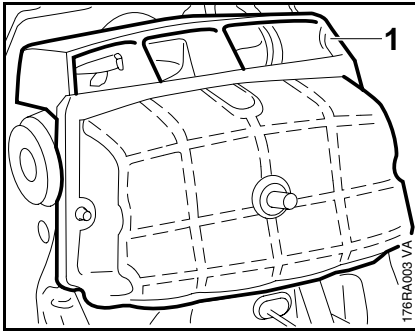
- Remove the clutch drum/chain sprocket – 5.1



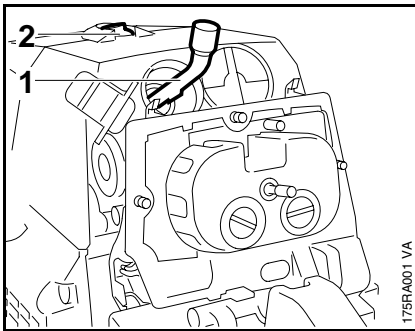
- Release twist lock (1) on carburetor box cover (2) and lift it off.



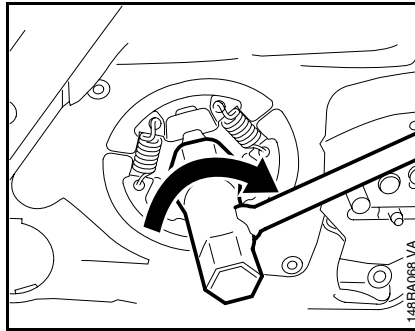
- On machines with HD air filter, draw air guide (1) off to the rear.



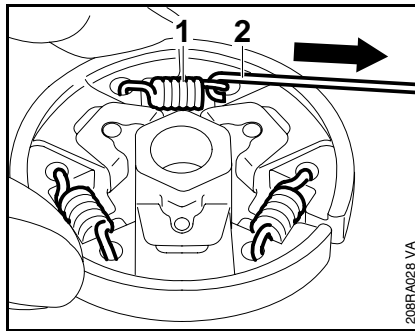
- On machines with box filter, remove air filter (1).
- Pull the boot off the spark plug and unscrew the spark plug.



- Close the decompression valve if fitted, carefully prising the button (2) upwards for this purpose.
- Push the locking strip (1) 0000 893 5903 into the spark plug hole so that "OBEN-TOP" faces up.

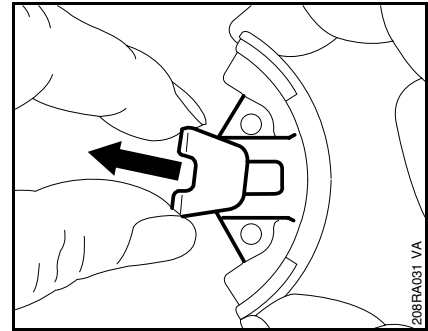


- Unscrew the clutch (1) from the crankshaft clockwise (left-hand thread).

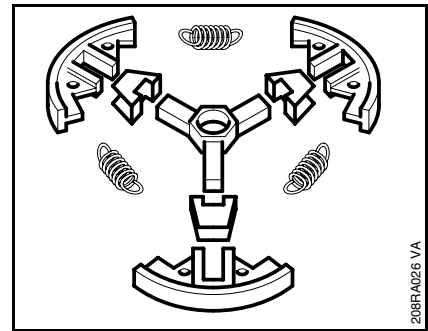


Disassembling the clutch

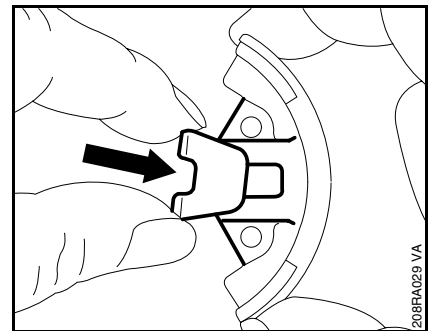
- Use hook (2) 5910 890 2800 to remove the clutch springs (1).
- Pull the clutch shoes off the carrier.



- Pull the retainers off the clutch shoes.

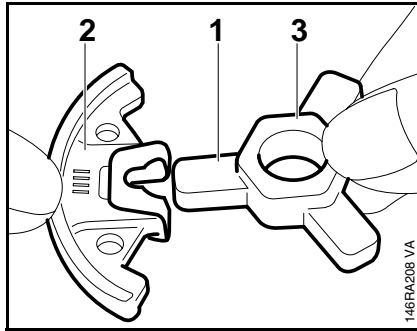


- Clean all parts.
- Replace any damaged parts.

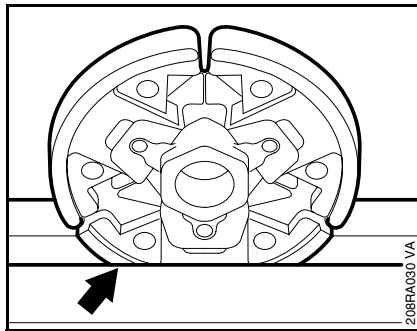


Assembly

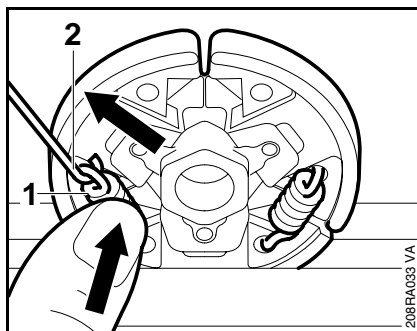
- Slip the retainers onto the clutch shoes.



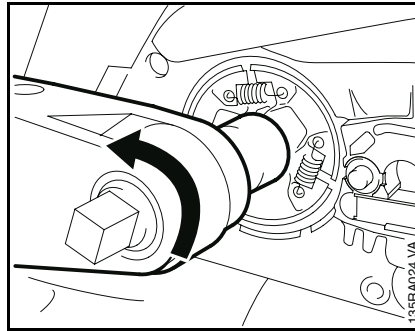
- Fit the clutch shoes over the arms (1) of the clutch carrier so that the series number (2) is on the same side as the longer hexagon (3).



- Clamp the clutch in a vise.



- Attach one end of each spring (1) to the clutch shoes.
- Use the hook (2) 5910 890 2800 to attach other end of the spring and press it firmly into the clutch shoe.



- Screw home the clutch, turning counterclockwise, and tighten it down firmly – 3.5
- Remove locking strip from the cylinder.
- Turn in the spark plug and tighten it down firmly – 3.5
- Plug the boot onto the spark plug.
- Refit the shroud.
- Fit the clutch drum / chain sprocket – 5.1

Ensure that the grooves in the shroud are correctly positioned when assembling the parts.

5.4 Chain brake

5.4.1 Checking correct operation

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



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.

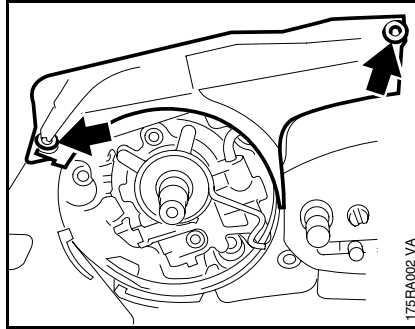
- Start the engine.
- With the chain brake activated (locked), open the throttle wide for a brief period (max. 3 seconds) – the chain must not rotate.
- With the chain brake released, open the throttle wide and activate the brake manually – the chain must come to an abrupt stop.

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

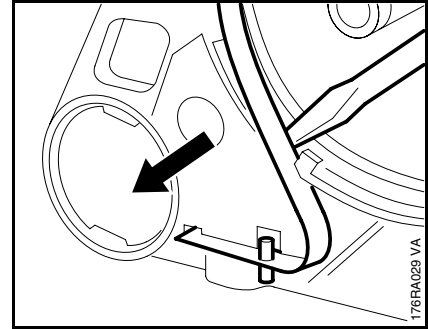
If the chain brake does not operate properly, see troubleshooting chart – 4.1.

5.4.2 Removing

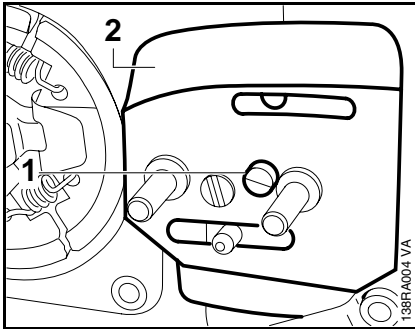
- Remove the chain sprocket cover and guide bar –  5.1
- Remove the clutch –  5.3



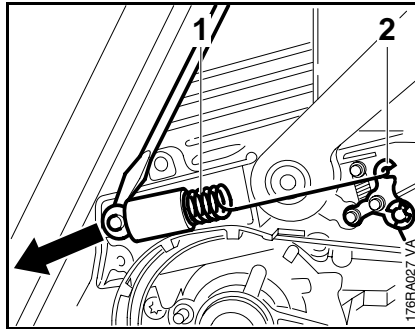
- Take out the screws (arrows).
- Remove the cover.
- Release the brake spring by pushing the hand guard forwards.



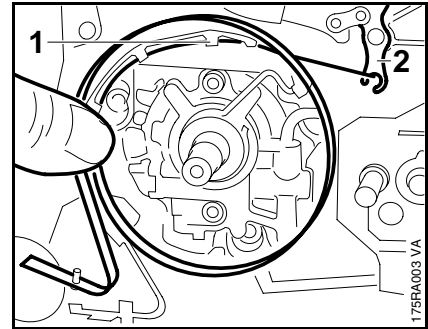
- Ease the brake band out of the engine housing.



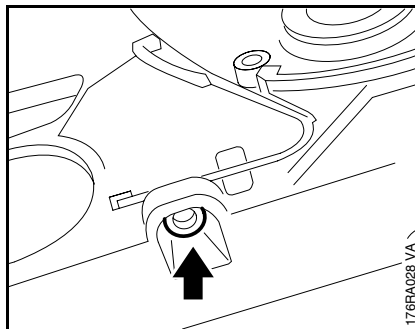
- Take out the screw (1) of the inner side plate (2) and remove the side plate.
- Engage the chain brake by pushing the hand guard away from the front handle.



- Carefully ease the brake spring (1) off the anchor pin and remove it from the bell crank (2).



- Remove the brake band from the stubs (1) on the crankcase.
- Unhook the brake band from the bell crank (2).



- Take out the screw (arrow) on the brake band.



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