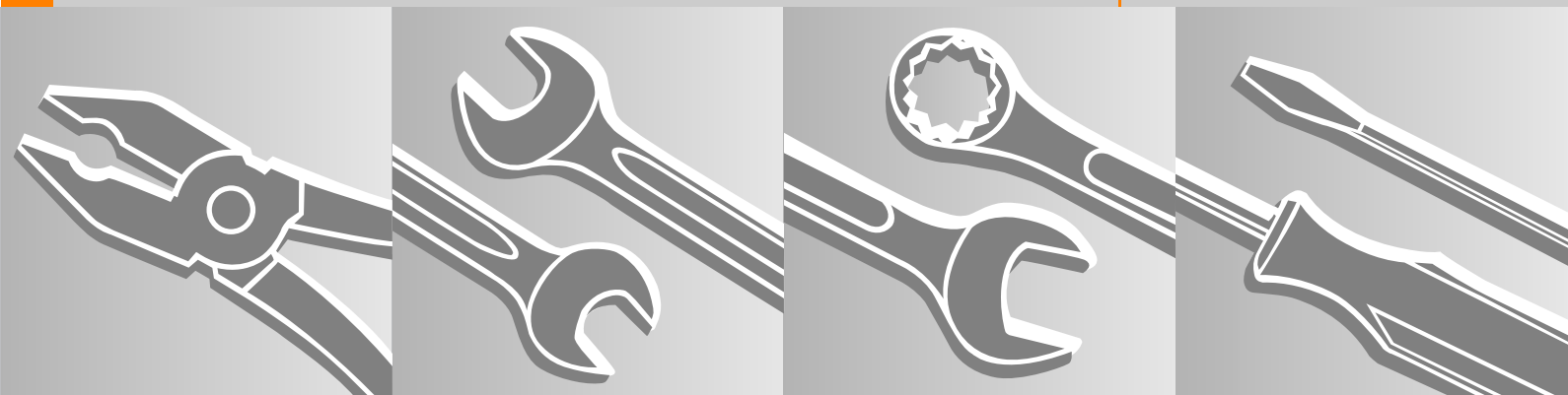


**STIHL MS 171, 181, 211**

2007-05



## Contents

<b>1.</b>	<b>Introduction</b>	<b>3</b>	<b>8.</b>	<b>Engine</b>	<b>28</b>	<b>11.</b>	<b>Servicing the AV System</b>	<b>60</b>
<b>2.</b>	<b>Safety Precautions</b>	<b>4</b>	8.1	Muffler / Spark Arresting Screen	28	11.1	AV Spring on Oil Tank	60
<b>3.</b>	<b>Specifications</b>	<b>5</b>	8.2	Leakage Test	29	11.2	AV Spring on Fuel Tank	60
3.1	Engine	5	8.2.1	Preparations	29	11.3	AV Spring on Cylinder	61
3.2	Fuel System	5	8.2.2	Vacuum Test	30	11.4	Handle Frame	62
3.3	Ignition System	5	8.2.3	Pressure Test	30			
3.4	Chain Lubrication	5	8.3	Oil Seals	31	<b>12.</b>	<b>Master Control Lever</b>	<b>64</b>
3.5	Tightening Torques	6	8.4	Removing and Installing the Shroud	32	12.1	Switch Shaft	64
<b>4.</b>	<b>Troubleshooting</b>	<b>8</b>	8.5	Removing and Installing the Engine	33	12.1.1	Removing and Installing	64
4.1	Clutch	8	8.6	Crankshaft	34	12.2	Throttle Trigger / Interlock Lever	66
4.2	Chain Drive, Chain Brake, Chain Tensioner	9	8.7	Ball Bearings/ Crankshaft	36			
4.3	Chain Lubrication	10	8.8	Piston	37	<b>13.</b>	<b>Chain Lubrication</b>	<b>68</b>
4.4	Rewind Starter	11	8.8.1	Piston Rings	39	13.1	Pickup Body	68
4.5	Ignition System	12	<b>9.</b>	<b>Ignition System</b>	<b>40</b>	13.2	Oil Suction Hose	68
4.6	Carburetor	14	9.1	Ignition Module	40	13.3	Removing and Installing the Oil Pump	69
4.7	Engine	17	9.1.1	Removing and Installing	40	13.4	Valve	70
<b>5.</b>	<b>Cutting Attachment</b>	<b>18</b>	9.2	Ignition Timing	42	13.5	Oil Tank Cap	71
5.1	Chain Catcher	18	9.3	Testing the Ignition Module	42			
<b>6.</b>	<b>Clutch</b>	<b>19</b>	9.4	Spark Plug Boot	43			
6.1	Clutch Drum	21	9.5	Flywheel	44			
<b>7.</b>	<b>Chain Brake</b>	<b>22</b>	9.6	Short Circuit Wire	45			
7.1	Checking Operation	22	9.6.1	Testing	45			
7.2	Removing and Installing the Brake Band	22	9.6.2	Removing and Installing	45			
7.3	Brake Lever	24	9.6.3	Ground Wire	47			
7.4	Flat Spring	26	9.6.4	Contact Spring	47			
7.5	Pins	26	9.7	Ignition System Troubleshooting	49			
7.6	Chain Tensioner	27	<b>10.</b>	<b>Rewind Starter</b>	<b>52</b>			
7.7	Bar Mounting Studs	27	10.1	General	52			
			10.2	Removing and Installing	52			
			10.3	Pawl	53			
			10.4	ErgoStart	53			
			10.5	Rope Rotor	55			
			10.6	Starter Rope / Grip	55			
			10.7	Tensioning the Rewind Spring	57			
			10.8	Replacing the Rewind Spring	58			

## Contents

<b>14.</b>	<b>Fuel System</b>	<b>72</b>
14.1	Air Filter	72
14.2	Baffle / Filter Base	72
14.3	Removing and Installing the Carburetor	73
14.3.1	Leakage Test	74
14.4	Servicing the Carburetor	74
14.4.1	Metering Diaphragm	74
14.4.2	Inlet Needle	76
14.4.3	Fixed Jet	76
14.4.4	Valve Jet	77
14.4.5	Pump Diaphragm	77
14.4.6	Air Valve	79
14.4.7	Choke Shaft / Choke Shutter	80
14.4.8	Throttle Shaft / Throttle Shutter	82
14.4.9	Adjusting Screws	85
14.5	Adjusting the Carburetor	86
14.5.1	Basic Setting	86
14.5.2	Standard Setting	87
14.6	Choke and Throttle Rods	87
14.7	Removing and Installing the Intake Manifold	89
14.7.1	Removing and Installing the Carburetor Carrier	90
14.8	Tank Vent	92
14.8.1	Testing	92
14.8.2	Removing and Installing	93
14.8.3	Manual Fuel Pump	93
14.9	Fuel Intake	94
14.9.1	Pickup Body	94
14.9.2	Fuel Intake Hoses	95
14.9.3	Fuel Hoses, Tank Vent / Manual Fuel Pump	96
14.9.4	Fuel Tank Cap	97
<b>15.</b>	<b>Special Servicing Tools</b>	<b>98</b>
<b>16.</b>	<b>Servicing Aids</b>	<b>100</b>

## 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" for all assemblies.

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:

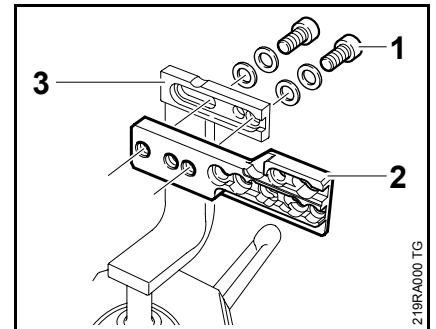
In the descriptions:

- = 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)

In the illustrations:

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

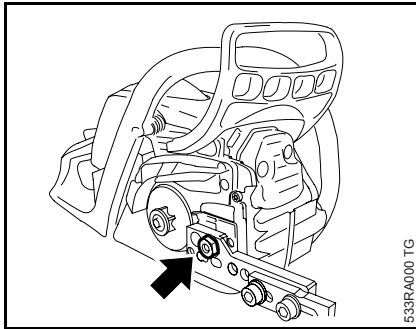
Service manuals and technical information bulletins are intended exclusively for the use of properly equipped repair shops. They must not be passed to third parties.



Servicing and repairs are made considerably easier if the machine is mounted to assembly stand (3) 5910 890 3100. To do this, secure the mounting plate (2) 5910 850 1650 to the assembly stand with two screws (1) and washers.


The screws must not project since they, depending on the machine, may damage housings when the machine is clamped in position.

The above operation is not necessary with the new assembly stand 5910 890 3101 since the mounting plate is already fitted.



After disengaging the chain brake and removing the chain sprocket cover, bar and chain, the powerhead's bar stud is pushed through the outer hole in the mounting plate and secured with the nut (arrow).

The machine is held in position on the mounting plate by the two screw heads on the engine housing.

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.

### Storing and disposing of oils and fuels

Collect fuel or lubricating oil in a clean container and dispose of it properly in accordance with local environmental regulations.

## 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.

Always wear suitable protective gloves for operations in which components are heated for assembly or disassembly.

Improper handling may result in burns or other serious injuries.

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.

Always perform leakage test after working on the fuel system and the engine.

### 3. Specifications

#### 3.1 Engine

	<b>MS 171</b>	<b>MS 181, MS 181 C</b>	<b>MS 211, MS 211 C</b>
Displacement:	30.1 cm <sup>3</sup>	31.8 cm <sup>3</sup>	35.2 cm <sup>3</sup>
Bore:	37 mm	38 mm	40 mm
Stroke:	28 mm	28 mm	28 mm
Engine power to ISO 7293:	1.3 kW (1.8 PS) at 9,500 rpm	1.5 kW (2.0 PS) at 9,500 rpm	1.7 kW (2.3 PS) at 9,500 rpm
Max. permissible engine speed with bar and chain:	13,500 rpm	13,500 rpm	13,500 rpm
Idle speed:	2,800 rpm	2,800 rpm	2,800 rpm
Clutch:	Centrifugal clutch without linings		
Clutch engages at:	5,100 rpm	5,100 rpm	5,100 rpm
Crankcase leakage test at gauge pressure:	0.5 bar		
under vacuum:	0.5 bar		
<hr/>			
<b>3.2 Fuel System</b>	Carburetor leakage test at gauge pressure:		0.8 bar
	Operation of tank vent at gauge pressure:		0.5 bar
	Fuel:	as specified in instruction manual	
<hr/>			
<b>3.3 Ignition System</b>	Air gap between ignition module and fanwheel:		0.15...0.35 mm
	Spark plug (suppressed):		NGK CMR 6H
	Electrode gap:		0.5 mm
<hr/>			
<b>3.4 Chain Lubrication</b>	Fully automatic, speed-controlled oil pump with reciprocating piston		
	Oil delivery rate:		7.0 cm <sup>3</sup> /min at 10,000 rpm

### 3.5 Tightening Torques

DG and P (Plastoform) 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	
Screw	P 4x12	Cover plate, chain sprocket cover	2.5	
Screw	B 3.9x13	Cover plate (special accessory)	1.0	
Screw	D 4x15	Chain tensioner cover/engine housing	2.5	
Collar screw	D 8x18	Collar screw, engine housing/guide bar, rear	16.0	1)
Collar screw	D 8x18	Collar screw engine housing/guide bar, front	16.0	1)
Screw	P 4x16	Cover, chain brake/engine housing (repair solution)	2.0	
Screw	D 5x16	Cover, chain brake/engine housing (repair solution)	2.0	
Countersunk screw	M 6x14	Replacement chain catcher (repair solution)	4.0	
Screw	P 5x20	Filter base/engine housing	4.0	
Screw	P 5x20	Filter base/engine housing/carburetor carrier	4.0	
Screw	D 5x16	Spiked bumper/engine housing	3.5	
Screw	D 4x12	Manifold/cylinder	4.0	
Screw	P 5x20	AV bearing plug, front bottom/engine housing	4.0	
Screw	P 5x20	AV bearing plug, rear bottom/handle frame	4.0	
Screw	P 5x20	AV bearing plug, rear bottom/engine housing	4.0	
Screw	D 5x18	AV bearing plug/cylinder	8.0	
Screw	P 5x25	Fan housing/hand guard/engine housing	4.0	
Screw	P 5x20	Fan housing/engine housing	4.0	
	M 12x1 L	Clutch/crankshaft	50.0	
Screw	D 5.3x41	Crankcase/engine pan/cylinder	11.0	
Collar nut	M 5	Baffle/filter base/collar screw, carburetor	3.5	
Screw	D 5x18	Muffler/cylinder	8.0	
Nut	M 8x1	Flywheel/crankshaft	28.0	2)
	M 10x1	Spark plug	12.0	
Screw	D 4x18	Ignition module/cylinder	4.0	

Remarks:

- 1) Loctite 243 medium strength
  - 2) Degrease crankshaft/flywheel faces and mount oil-free
- 

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.

Power screwdriver setting for polymer: DG and P screws max. 500 rpm  
Do not use a impact wrench for releasing or tightening screws.

Do not mix up screws with and without binding head



## 4. Troubleshooting

### 4.1 Clutch

Condition	Cause	Remedy
Saw chain stops under load at full throttle	Clutch shoes badly worn	Install new clutch
	Clutch drum badly worn	Install new clutch drum
Saw chain rotates at idle speed	Engine idle speed too high	Readjust with idle speed screw ( <b>LA</b> ) (counterclockwise)
	Clutch springs stretched or fatigued	Replace the clutch springs or install new clutch
	Clutch spring hooks broken	Replace the clutch springs
	Clutch shoe bores worn	Replace clutch shoes or install new clutch
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

### 4.3 Chain Lubrication

In the event of trouble with the chain lubrication system, check and rectify other sources of faults before disassembling the oil pump.

Condition	Cause	Remedy
Chain receives no oil	Oil tank empty	Fill up with oil, check oil pump
	Oil inlet hole in guide bar is blocked	Clean oil inlet hole
	Intake hose or pickup body clogged or intake hose ruptured	Fit new intake hose and pickup body
	Valve in oil tank blocked	Clean or replace valve
	Teeth on worm worn	Install new worm
	Oil pump damaged or worn	Install new oil pump
	Oil intake hose not properly fitted or damaged	Fit oil intake hose properly or install new hose
Machine losing chain oil	Oil pump body (engine housing) damaged	Check engine housing and oil pump and replace if necessary
	Oil pump damaged or worn	Install new oil pump
	Oil intake hose connector damaged	Install new oil intake hose
	Oil intake hose not properly fitted or damaged	Fit oil intake hose properly or install new hose
Oil pump delivers insufficient oil	Oil pump worn	Install new oil pump
	Oil intake hose not properly fitted or damaged	Fit oil intake hose properly or install new hose
	Unsuitable chain lubricant has been used	Drain unsuitable chain lubricant from oil tank and fill up with recommended chain lubricant

#### 4.4 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	Very dirty or corroded	Clean or replace rewind spring
	Insufficient spring tension	Check rewind spring and increase tension
	Rewind spring worn	Fit new rewind spring
Starter rope cannot be pulled out far enough	Spring overtensioned	Check rewind spring and reduce tension
Starter rope can be pulled out almost without resistance (crankshaft does not turn)	Guide peg on pawl or pawl itself is worn	Fit new pawl
	Spring clip on pawl fatigued	Fit new spring clip
Versions with ErgoStart	Spring worn or fatigued	Fit new ErgoStart spring housing
	Carriers or pawls on flywheel faulty	Install new ErgoStart carriers or pawls
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

## 4.5 Ignition System

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
	Fuel/oil mixture – too much oil	Use correct mixture of fuel and oil
	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
	Irregular spark	Check operation of switch shaft/contact springs and ignition module. Faulty insulation or break in ignition lead or short circuit wire. Check ignition lead/ignition module and replace ignition module if necessary. Check operation of spark plug, clean spark plug and replace if necessary.

A problem with the carburetor or the engine can also be the reason for erratic running behavior.

---

Condition	Cause	Remedy
No spark	Spark plug faulty	Install new spark plug
	Faulty insulation or short in short circuit wire	Check short circuit wire for short circuit to ground
	Break in ignition lead or insulation damaged	Check ignition lead, replace ignition module if necessary
	Ignition module faulty	Install new ignition module

---

## 4.6 Carburetor

Condition	Cause	Remedy
Carburetor floods; engine stalls	Inlet needle not sealing. Foreign matter between valve seat and cone or cone worn	Remove and clean or replace the inlet needle, clean the carburetor, replace inlet needle if necessary
	Inlet control lever sticking on spindle	Clean inlet control lever, replace if necessary
	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
Poor acceleration	Setting of low speed screw too lean	Check basic carburetor setting, correct if necessary
	High speed screw too rich	Check basic carburetor setting, correct if necessary
	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
	Manifold damaged	Install new manifold

Condition	Cause	Remedy
Engine will not idle, idle speed too high	Throttle shutter opened too wide by idle speed screw <b>(LA)</b>	Reset idle speed screw <b>(LA)</b> correctly
	Oil seals/engine leaking	Seal or replace oil seals/engine
	Air valve contaminated – does not close	Clean air valve, replace if necessary
	Air valve stiff	Check air valve, replace if necessary
	Throttle rod stiff – throttle shutter does not close	Replace throttle rod and lever
Engine stalls at idle speed	Idle jet bores or ports blocked	Clean the carburetor
	Idle jet too rich or too lean	Set low speed screw <b>(L)</b> correctly
	Setting of idle speed <b>(LA)</b> incorrect – throttle shutter completely closed	Set idle speed screw <b>(LA)</b> correctly

Condition	Cause	Remedy
Engine speed drops quickly under load – low power	Air filter dirty	Clean the air filter
	Throttle shutter not opened fully	Check throttle rod
	Tank vent faulty	Replace tank vent
	Fuel pickup body dirty	Install new pickup body
	Fuel strainer dirty	Clean fuel strainer in carburetor, replace if necessary
	Leak in fuel line between tank and fuel pump	Install new fuel line
	Setting of high speed screw ( <b>H</b> ) too rich	Check basic carburetor setting, correct if necessary
	Main jet bores or ports blocked	Clean the carburetor
Pump diaphragm damaged or fatigued	Fit new pump diaphragm	
Engine running extremely rich, no power and very low maximum speed	Air valve does not open	Check lever on air valve and replace if necessary
Engine running too rich, low power and low maximum speed	Air valve does not open fully in full throttle position	Check lever on air valve and replace if necessary
Erratic idle – too lean	Air valve does not close properly	Check lever on air valve and replace if necessary



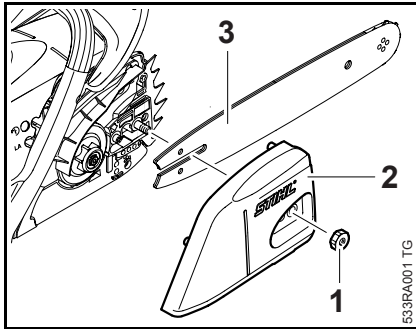
## 4.7 Engine

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 engine damaged	Replace the oil seals
	Engine leaking or damaged (cracks)	Seal or replace the engine
Engine does not deliver full power or runs erratically	Piston rings worn or broken	Fit new piston rings
	Muffler / spark arresting screen carbonized	Clean the muffler (inlet and exhaust), replace spark arresting screen, replace muffler if necessary
	Air filter element dirty	Replace air filter element
	Fuel hose severely kinked or damaged	Fit new hose or position it free from kinks
	Tank vent faulty	Check tank vent and replace if necessary
	Air valve does not open	Check air valve and replace if necessary
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

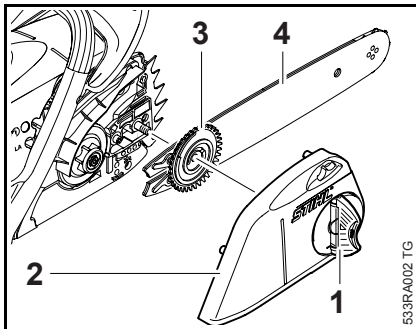
## 5. Cutting Attachment



Wear gloves to protect your hands from injury.

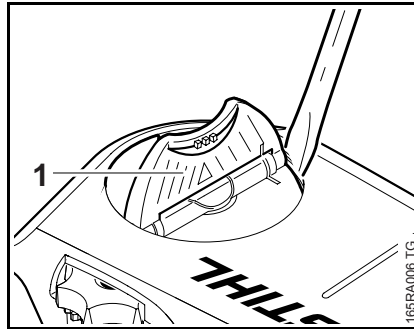
- Unscrew the hex nut (1).
- Remove the chain sprocket cover (2).
- Remove the bar (3) and chain.
- Install in the reverse sequence.

### Machines with quick chain tensioner

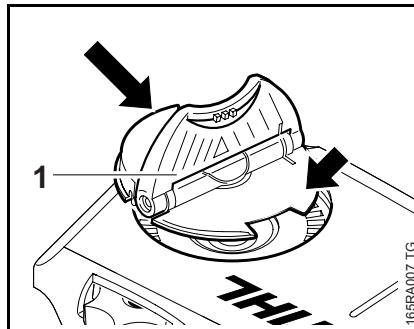


Wear gloves to protect your hands from injury.

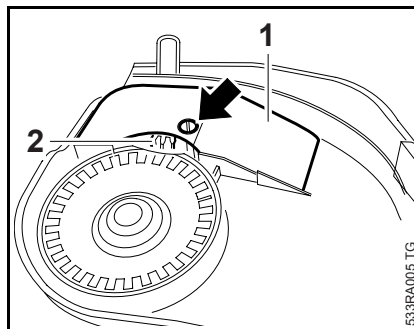
- Open up the wing nut (1) and unscrew it counterclockwise.
- Remove the chain sprocket cover (2) and tensioning gear (3) with guide bar (4).
- Install in the reverse sequence.



- Apply screwdriver to side (1) of wing nut and pry it out of its seat.
- Check the wing nut and replace if necessary.



- Open up the wing nut.
- Push the wing nut (1), thin side first (arrow), into the opening and press it home until it snaps into position.



- Remove the screw (arrow).
- Remove the cover plate (1) and adjusting wheel (2).

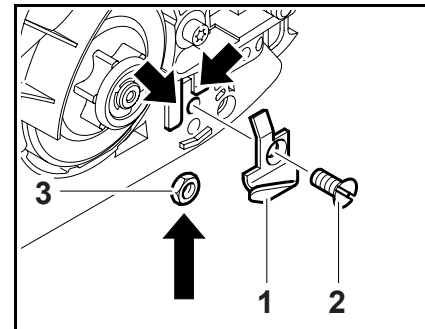
When installing the adjusting wheel, check that its teeth face the cover plate.

- Reassemble in the reverse sequence.

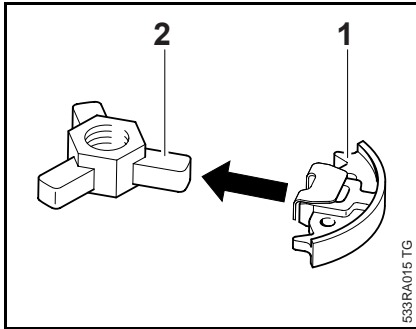
### 5.1 Chain Catcher

A replacement chain catcher can be fitted if the integral chain catcher on the chain sprocket cover is worn.

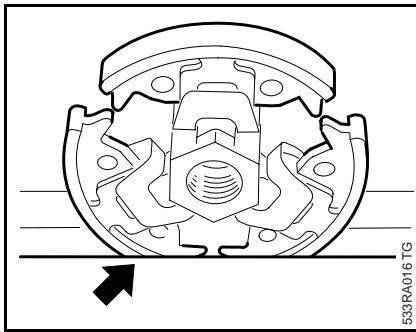
- Remove the chain sprocket cover, bar and chain, [1](#) 5
- File down the damaged chain catcher on the chain sprocket cover.



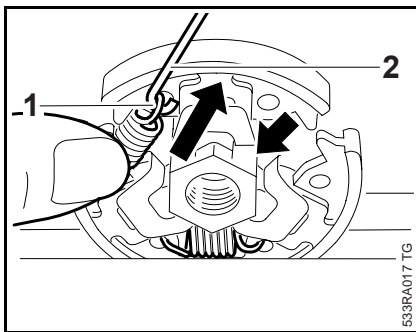
- Position the replacement chain catcher (1) in the guides (arrows).
- Push the countersunk screw (2) through the bore in the engine housing and fit the locknut (3) at the other side.
- Tighten down the countersunk screw firmly – the locknut butts against the engine housing and need not be held.
- Reassemble all other parts in the reverse sequence.
- Tightening torques, [1](#) 3.5



- Fit the clutch shoes (1) over the arms (2).

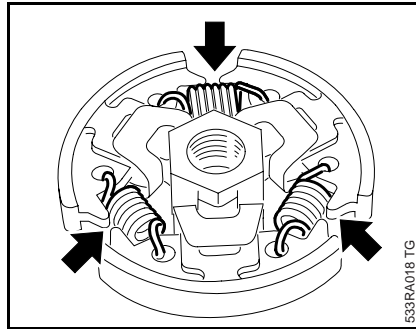


- Clamp the clutch in a vise (arrow).

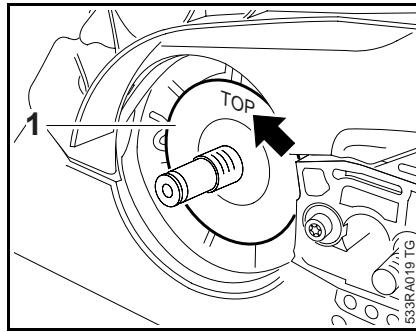


Attach the springs to the side with the raised hexagon (arrow).

- Attach one end of each spring (1) to the clutch shoes.
- Use the hook (2) 5910 890 2800 to attach the other ends of the springs and press them firmly into the clutch shoes – do not overstretch the springs.

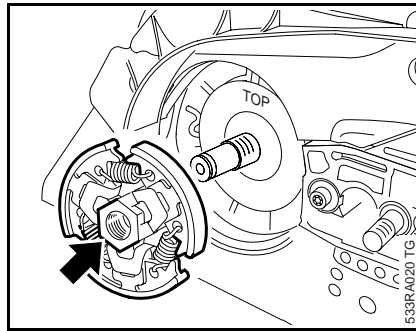


- Check the clutch – all springs (arrows) must be properly attached.

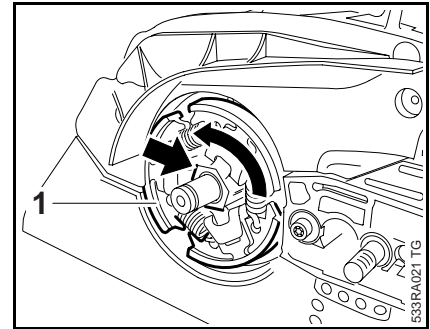


- Cover washer (1) must be in position.

It is correctly fitted when “TOP” (arrow) faces outwards.



- Position the clutch on the crankshaft stub so that the raised hexagon (arrow) faces outwards.



- Use the hexagon (arrow) to screw the clutch (1) onto the crankshaft stub. Check the position of the locking strip and then tighten down the clutch firmly – left-hand thread.

- Tightening torques, 3.5
- Remove the locking strip from the cylinder.
- Reassemble all other parts in the reverse sequence.



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