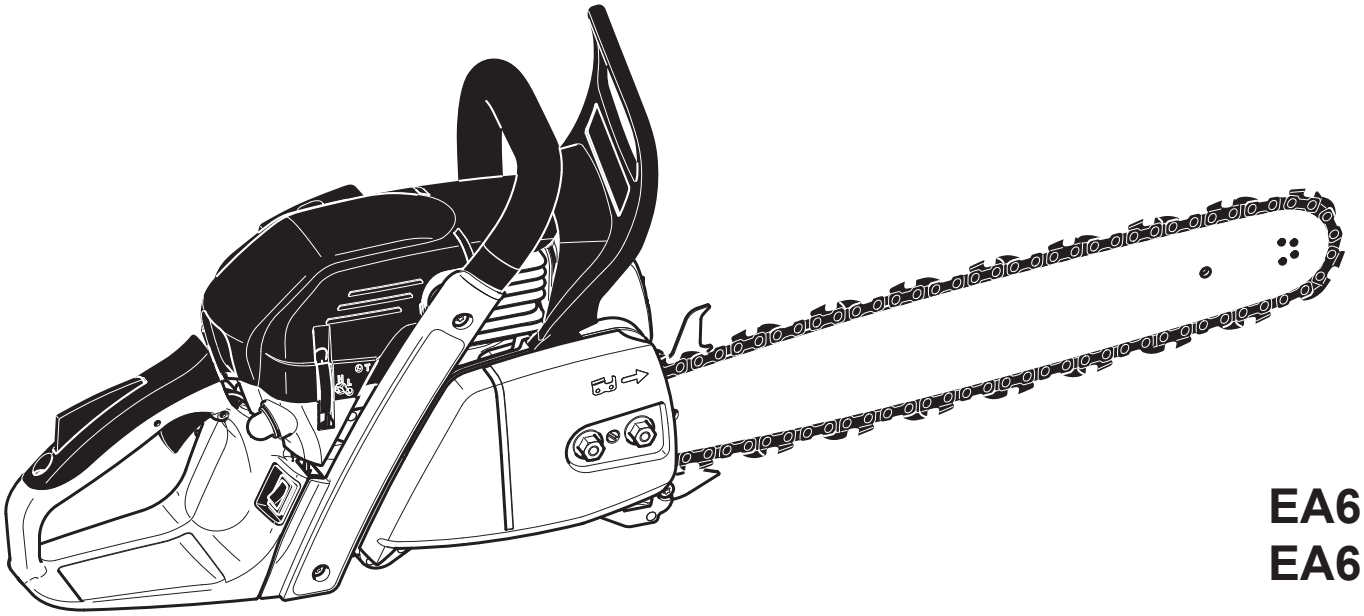
Repair Manual



EA6100P
EA6101P

Caution:

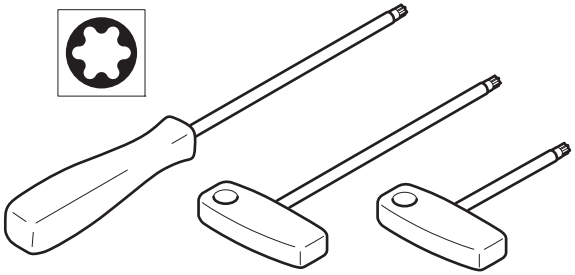
Before doing any maintenance or service work, the combination switch must be in STOP position (ignition current interrupted), in order to prevent unintended starting by the easy start system!

makita®

INHALT

		EA6100P	EA6101P
Stroke volume	cm^3	61	
Bore	mm	47	
Stroke	mm	35	
Max. power at rated speed	kW / 1/min	3.4 / 10,000	
Max. torque at speed	Nm / 1/min	3.7 / 7,000	
Idling speed / max. engine speed with bar and chain	1/min	2,700 / 13,800	
Clutch engagement speed	1/min	5,100	
Sound pressure level at the workplace $L_{pA, eq}$ per ISO 22868 [1) 3)]	dB(A)	105 / K_{pA} = 2.5	
Sound power level $L_{WA, FI + Ra}$ per ISO 22868 [2) 3)]	dB(A)	117 / K_{WA} = 2.5	
Vibration acceleration $a_{hv, eq}$ per ISO 22867 [1) 3)]			
- Tubular handle	m/s^2	5.0 / K = 2	
- Rear handle	m/s^2	4.0 / K = 2	
Carburetor	Type	Diaphragm carburetor	
Ignition system	Type	electronic	
Spark plug	Type	NGK BPMR 7A	
or spark plug	Type	-	
Electrode gap	mm	0.5	
Fuel consumption at max. load per ISO 7293	kg/h	1.5	
Specific consumption at max. load per ISO 7293	g/kWh	430	
Fuel tank capacity	l	0.8	
Chain oil tank capacity	l	0.48	
Mixture ratio (fuel/two-stroke oil)			
- when using MAKITA oil		50 : 1 / 100: 1 (EXTRA)	
- when using Aspen Alkylat (two-stroke fuel)		50 : 1 (2%)	
- when using other oils		50 : 1 (quality grade: JASO FC or ISO EGD)	
Chain brake		engages manually or in case of kickback	
Chain speed (at max. engine speed)	m/s	.325=25.6 3/8=29.6	
Sprocket pitch	inch	.325 oder 3/8	
Number of teeth	Z	7	
Chain type		see the Extract from the spare-parts list	
Pitch / gauge	inch / (mm)	.325 / 0.058 (1.5 mm) oder 3/8 / 0.058 (1.5 mm)	
Guide bar, length of a cut	cm	38 / 45 / 53	
Guide-bar type		see the Extract from the spare-parts list	
Weight (fuel tank empty, without chain, guide bar and accessories)	kg	6.0	6.1

[1)] Figures derived in equal part from idling, full-load and racing speed.
[2)] Figures derived in equal part from full-load and racing speed.
[3)] Uncertainty (K=).



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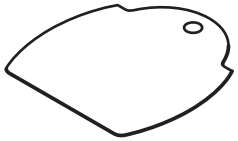

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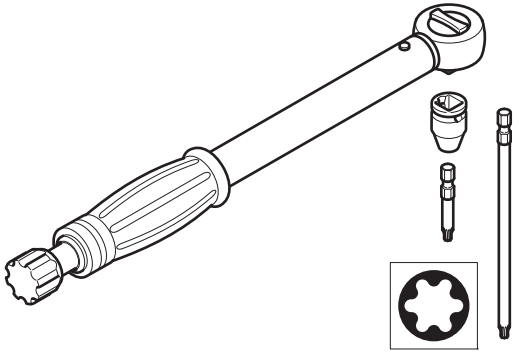

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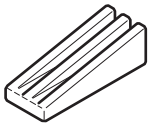

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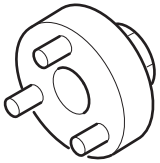

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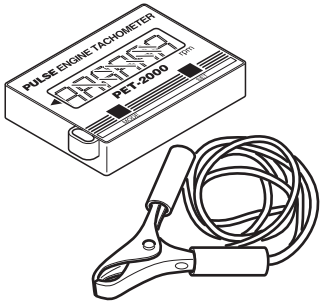


7

1 Torx screwdriver

Grip	944.500.860
T-grip 200 mm	944.500.862
T-grip 100 mm	944.500.861

2 Mandrel

Disassembly mandrel for tapping out the flywheel without damage to the crankshaft thread 944.500.880

3 Setting gauge

Gauge for measuring the gap between flywheel and armature 944.500.891

4 Torque wrench

3/8” Drive socket	944.500.864
Bit 152 mm	944.500.865
Bit 49 mm	944.500.866
Torque wrench 3/8” Drive	950.230.000

5 Piston stop wedge

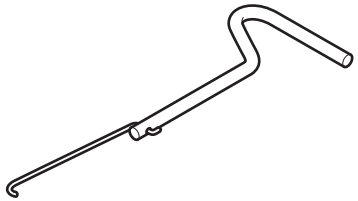
Wedge for blocking the engine through the exhaust port 944.602.000

6 Assembly and disassembly wrench

Wrench for disassembling and assembling the centrifugal clutch 944.500.590

7 Tachometer

Electronic tachometer for measuring the engine speed of 2- and 4-stroke engines 950.233.220



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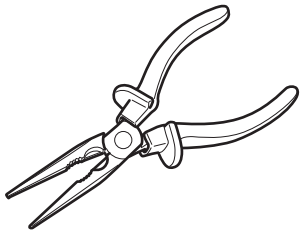

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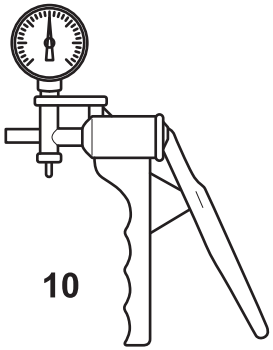

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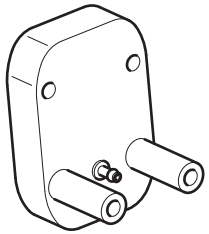

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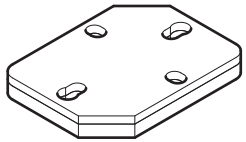

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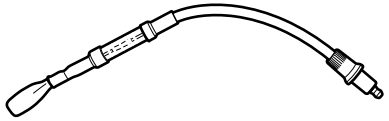

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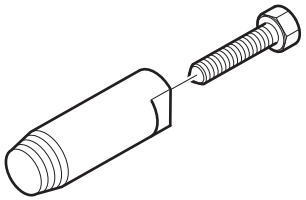


14

8 Disassembly hook

Removal/installation Brake band spring 950.237.000

9 Needle-nose pliers

Various assembly/ disassembly tasks 944.603.400

10 Over/underpressure pump

For checking sealing of radial rings/carburetor 957.004.001

11 Sealing plate

For sealing intake side 944.603.200

12 Sealing plate

For sealing exhaust side 944.603.180

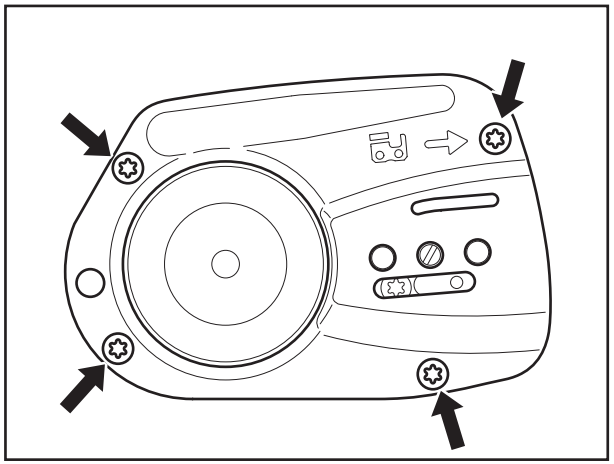
13 Ignition tester

Checking the ignition 950.233.230

14 Radial ring puller

15 mm radial ring puller 944.500.895

Spindle 950.203.020



Remove the sprocket guard, bar, and chain.

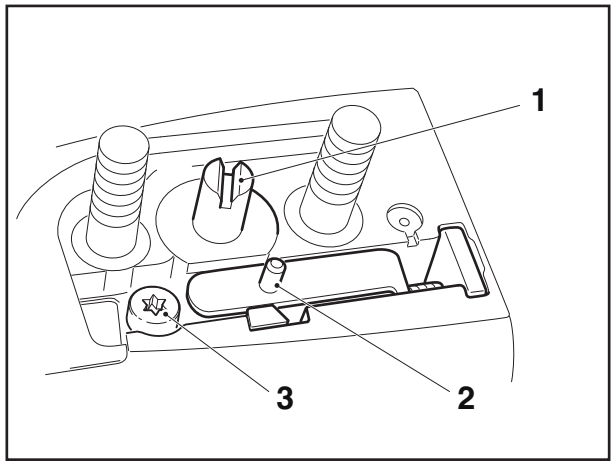
CAUTION: Do not work on the chain brake unless the spring is detensioned!

Chain tensioner

Unscrew 4 screws, and remove the cover.

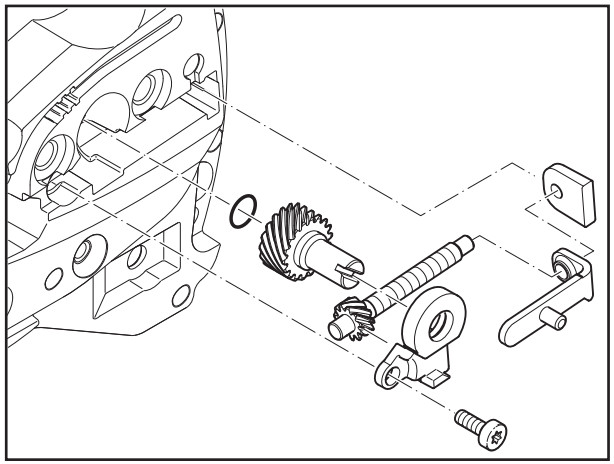
Chain tensioner function

An angled worm drive converts the turns of the adjustment screw **1** to forward or backward motion of the tensioning pin **2**.



If necessary, turn adjusting screw **1** clockwise, until the fastening screw **3** is accessible.

Unscrew the fastening screw and pull the chain tensioner up and out.

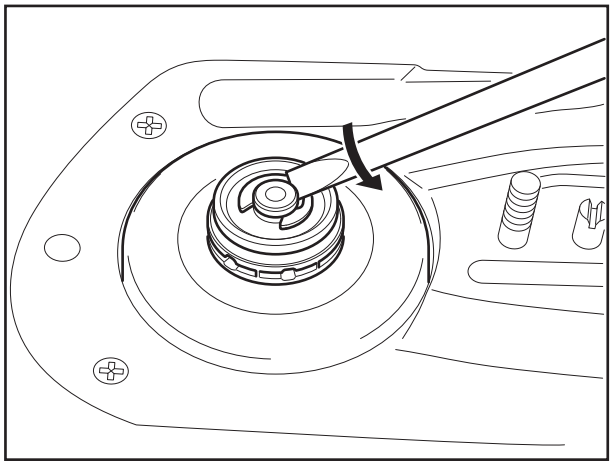


Assembly

NOTE: The worm gear is available only as a set.

Grease spindle and worm gear with multi-purpose grease (944.360.000).

Lock the cover bolts with Loctite 601.

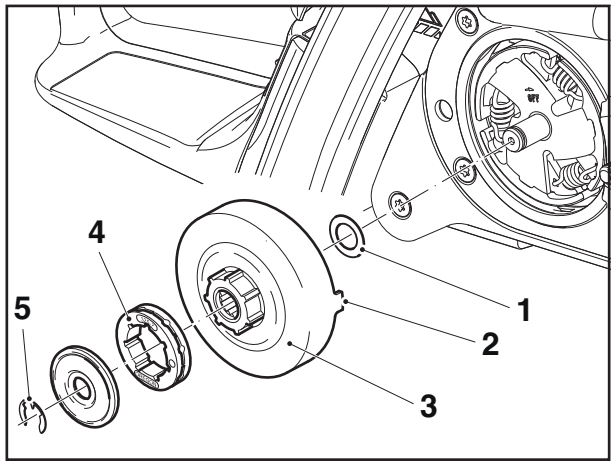


Remove the sprocket guard, bar, and chain.

Release the chain brake.

Remove the circlip **5** with the universal wrench.

Remove cup washer.



Sprocket and clutch drum with needle bearing

Check the chain sprocket **4** for damage and wear.

Important customer information:

Before installing a new saw chain, always check the condition of the chain sprocket. A worn chain sprocket will damage a new saw chain, and must be replaced.

Check the clutch drum needle bearing for wear and damage.

Assembly the bearing with multi-purpose high-performance grease (944.360.000).

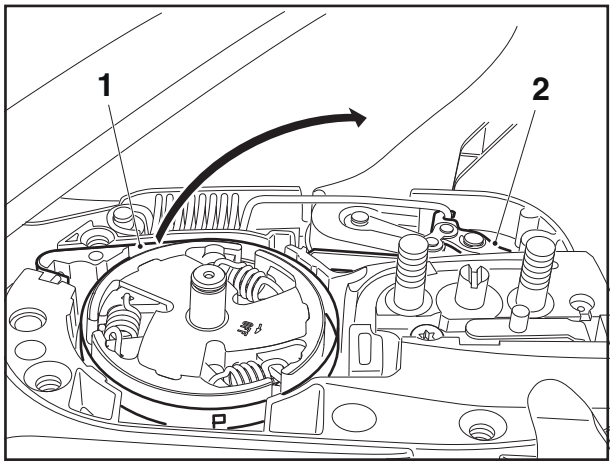
Check the inside and outside of the clutch drum **3** for damage and wear.

Replace the clutch drum if annealing.

Note: Make sure to assemble with thrust washer 1!

Note: Always use a new circlip 5 (927.408.000)!

When assembling the clutch drum, make sure that the lug of the oil pump drive 2 is not positioned on the oil pump drive. When inserting, turn the clutch drum slightly.



Removing the brake band

CAUTION: To prevent cuts, wear protective gloves and disassembly the spike bar (2 screws)**!**

Remove the sprocket guard, bar, and chain.

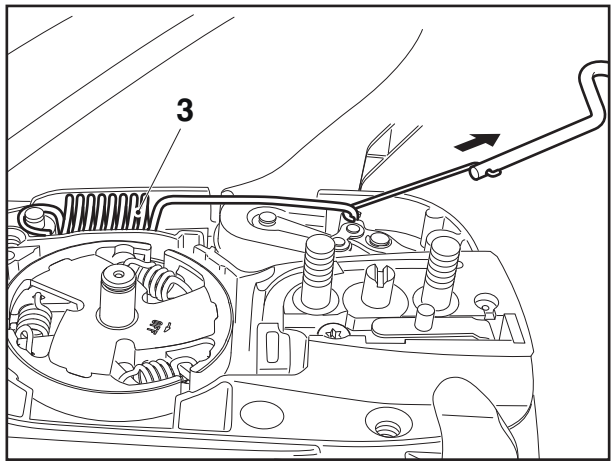
Pull the handguard towards the tubular handle to release the chain brake.

Remove the clutch drum, see chapter 02.

Push the hand guard forward to engage the chain brake. This releases the brake band spring.

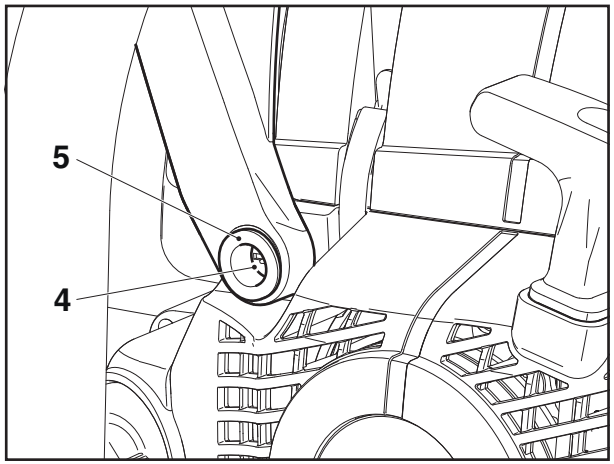
Remove the cover plate, see chapter 01.

Fold the brake band **1** upward and turn it out of the disengagement mechanism **2**.



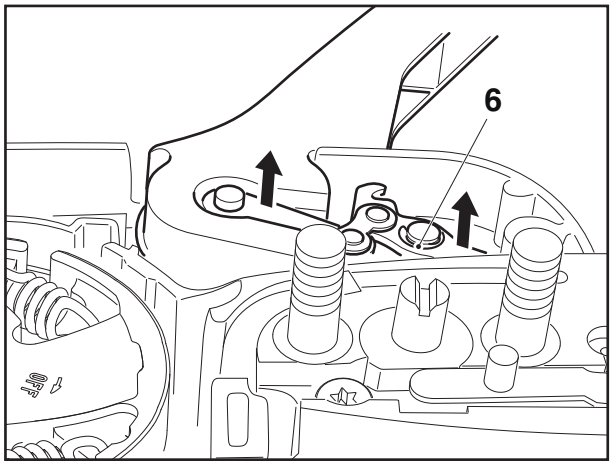
Secure the chain saw from slipping (vise).

Using the disassembly hook (chap. 00, Pos. 8), disengage the brake band spring **3**.



Remove the handguard and disengagement mechanism

Unscrew bolt **4** and pull out the sleeve **5**.

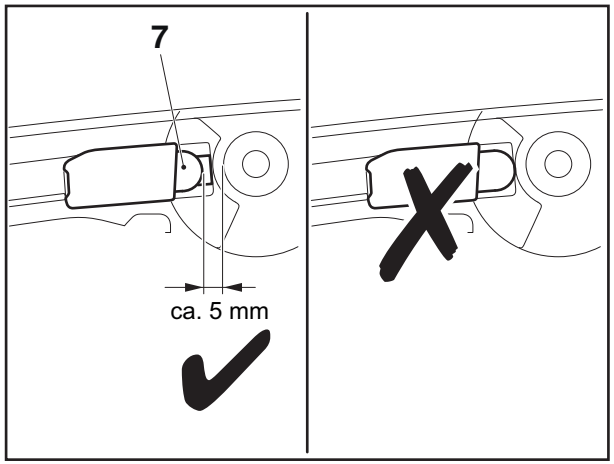


Remove the circlip **6**.

Pull the disengagement mechanism up in parallel with the axes.

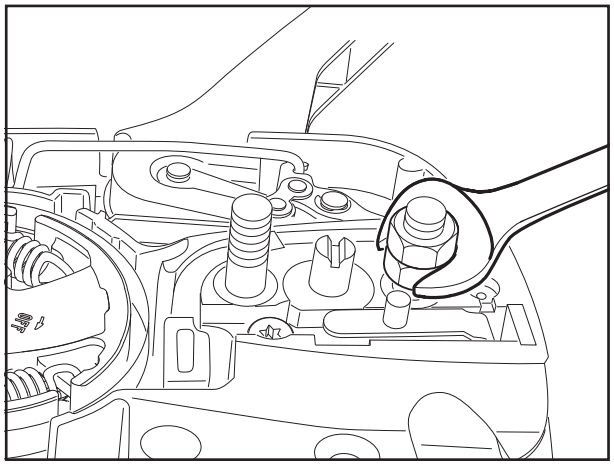
Pull off the handguard with gentle back-and-forth motion.

Note: When reassembling always use a new circlip **6** (927.304.000)!



Note: Make sure that the handguard guide **7** is not unhooked. If necessary, push it back into position with a screwdriver (about 5 mm from the axle support). The handguard can only be assembled when the rest piece is in this position.

Assemble the handguard and disengagement mechanism, brake band and brake band spring in reverse order.

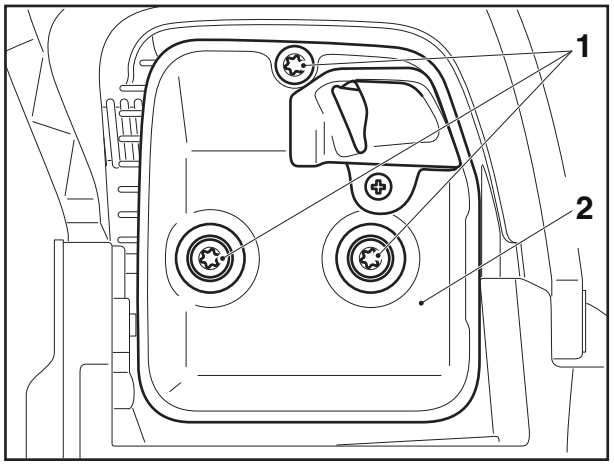


Replacing the guide bar bolt

Screw two nuts onto the bar bolt and counterlock them.

Unscrew the bar bolt.

Assembly: Apply Loctite 243 (980.009.000) to the guide bar bolts and turn them all the way in.



Disassembly

CAUTION: To prevent cuts, wear protective gloves and disassembly the spike bar (2 screws)**!**

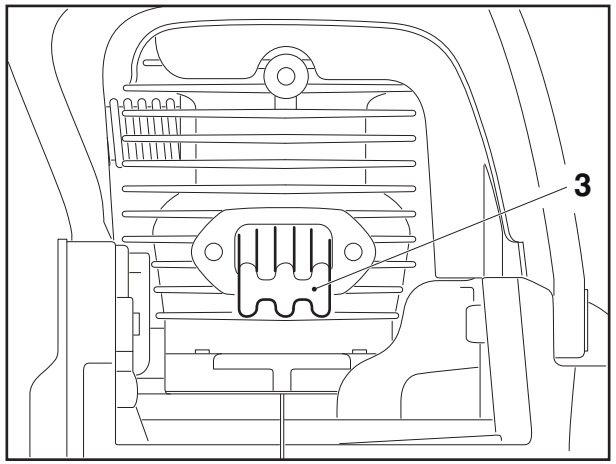
Remove the sprocket guard, bar and chain.

Pull the handguard towards the front handle to release the chain brake if necessary.

Remove the clutch drum, see chapter 02.

Remove the muffler. To do this, unscrew the 3 screws **1** and remove the muffler **2**.

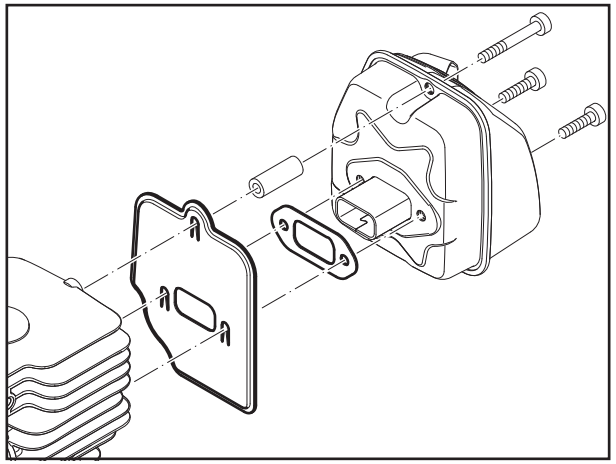
Caution: If a catalytic converter is being used, the muffler will be very hot after operation!

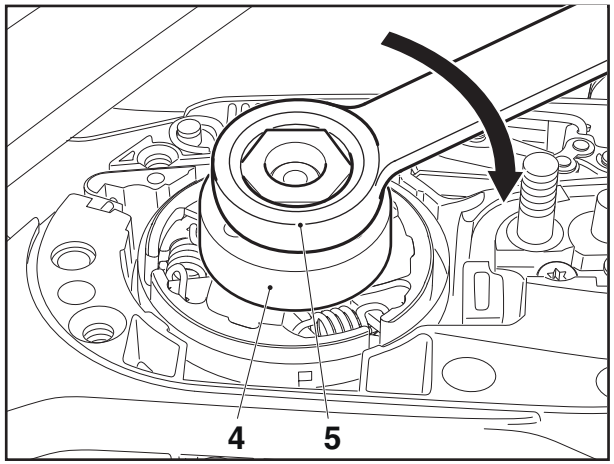


Move piston to bottom dead centre (visible through the exhaust opening).

Press the piston stop wedge **3** (cap. 00, pos. 5) into the exhaust opening.

Position of gasket and cooling plate for muffler assembly:

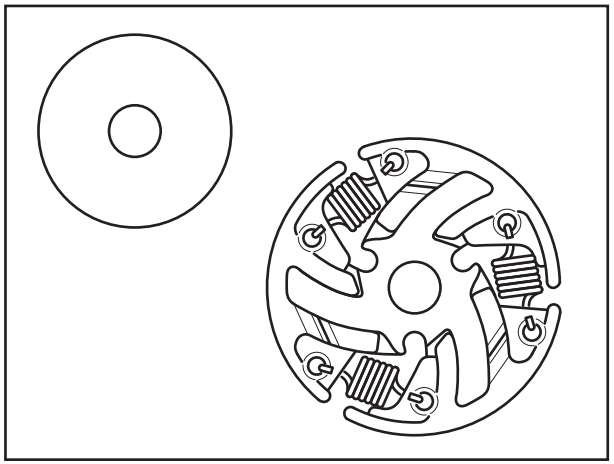




Insert wrench **4** (chap. 00, Pos. 6) into the clutch and use a socket wrench **5** to turn in the direction of the arrow (left-hand thread) to loosen and remove the clutch.

Remove the guide washer (inside of the clutch).

The flyweights can now be pushed off the guide axially in one direction.



Inserting the flyweights

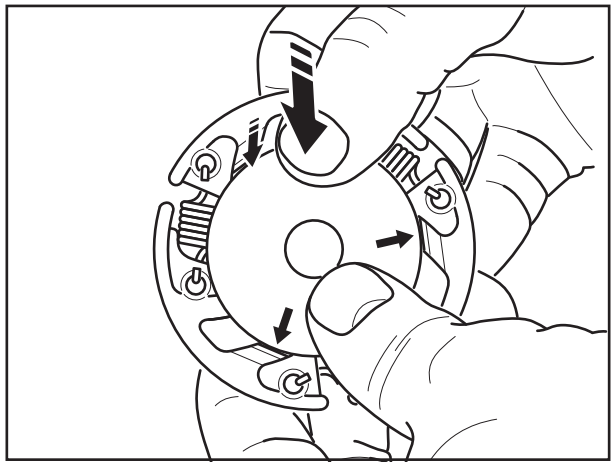
Hook the springs as shown in the illustration.

Then press the flyweights onto the guide. To do this, first push on two flyweights half-way, then put on the third flyweight by setting it on its edge.

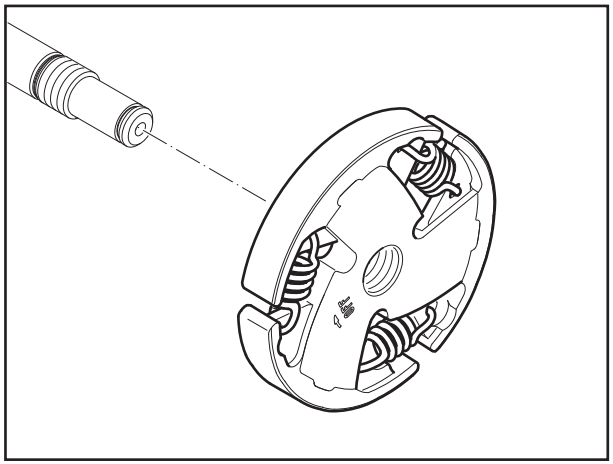
Press the flyweights all the way onto the guide.

CAUTION: Note the position of the springs. Do not replace springs individually! If a spring breaks or is fatigued, all three springs must be replaced. The springs must not touch the cover.

The illustration shows the inside of the clutch.



Press the disc onto the clutch. It must be flat and be engaged.

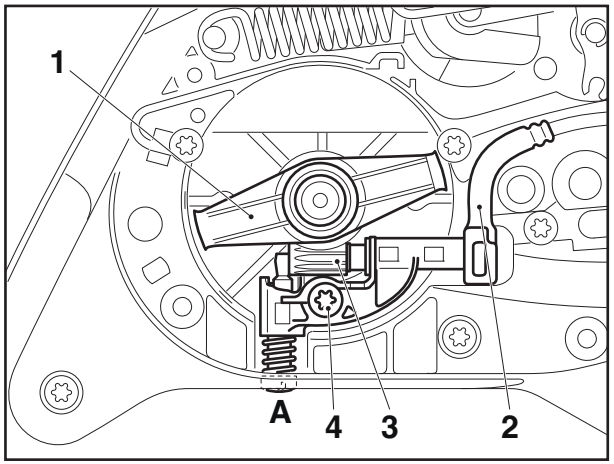


Installing the clutch

Install the clutch with the arrow marking point up.

Mounting torque: 35 $^{+/-2.5}$ Nm

CAUTION: Before installing the clutch, disassemble the starter (chap. 06) in order to prevent damage to the starting catches.



General

The oil pump is driven by the clutch drum. Lugs on the clutch drum transfer the power to the drive arms of the oil pump drive **1**.

The drive worm of the oil pump drive engages in the teeth of the oil pump **3**.

This means that oil is pumped only when the chain is running.

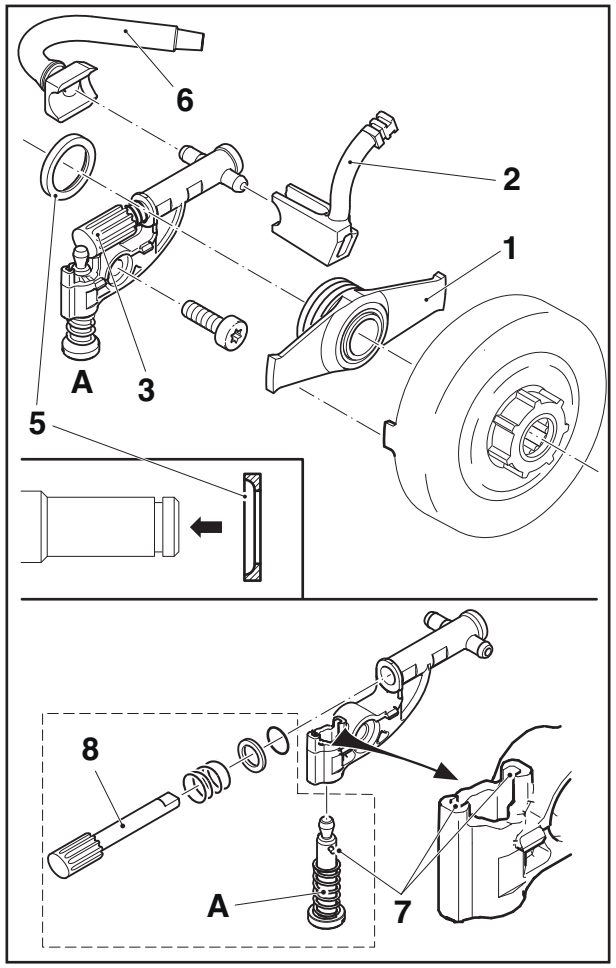
The oil flow rate can be adjusted with adjusting screw **A**:

- Turn right for more oil
- Turn left for less oil

Disassembly

Remove the clutch drum and clutch, see chapter 04. Remove brake band, see chapter 03.

Turn the oil pump drive **1** counter-clockwise and pull it off the shaft.

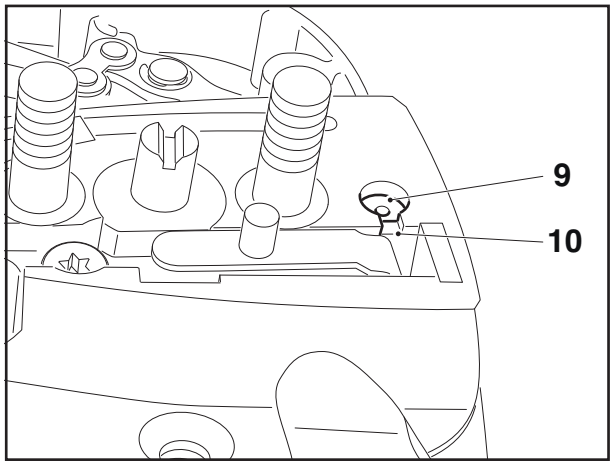


Pull the oil pressure line 2 from the oil pump.

Unsrew screw **4** and remove the oil pump.

Remove spacer ring **5** from the crankshaft.

Note: Make sure to install in the right position. See illustration.



The suction line **6** remains in the crankcase. It extends into the oil tank. To remove it, carefully pull on the connection to the oil pump.

Removing the oil pump

Push the adjusting screw **A** up against the spring pressure and turn it until the pin **7** goes into the assembly slit **7**. If necessary press the supply piston **8** in somewhat.

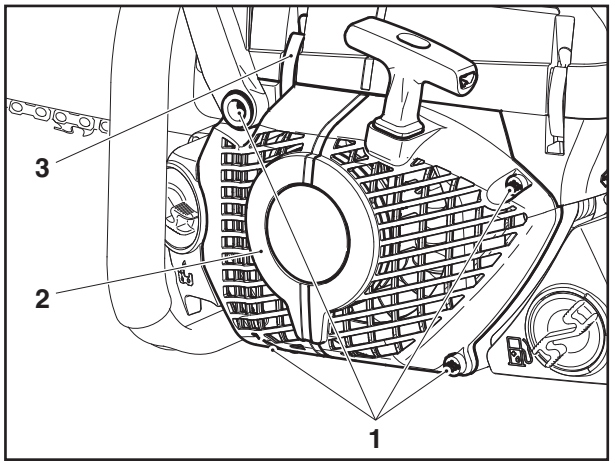
Note: When assembling put the adjusting screw **A** counterclockwise to stop.

Removing the oil tank vent

Note: The ventilation valve **9** must be punched into the tank.

Press in a new valve about 2 mm deep under the housing surface.

Make sure that the ventilation channel **10** is free of deposits. Clean if necessary.



Disassembly

Disengage the hood clip **3** with the combination tool.

Unscrew four screws **1** and remove the fan housing **2**.

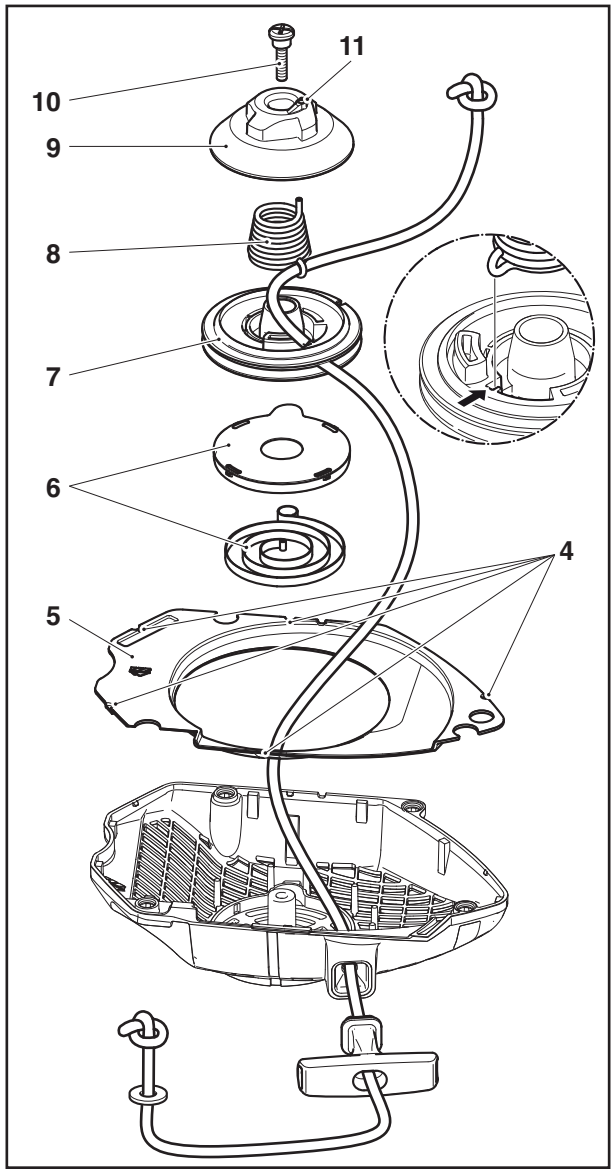
Remove the air guide **5** from the fan housing.

CAREFUL! Injury hazard! Do not unscrew screw 10 if the return spring is under tension.

Unscrew screw **10** and remove the driver **9** with spring **8** and the cable drum **7**.

Separate the driver **9** and cable drum **7**.

Lightly tap the fan housing on a wooden surface with the entire surface of the hollow side, and hold it down. Now lift the fan housing **carefully and in small steps**. This will allow the return spring pack **6**, which should now have fallen out, to relax in a controlled manner if the return spring has popped out of the plastic pack.



CAREFUL! Injury hazard! The return spring can pop out! Always wear eye protection and protective gloves!

If the spring pops out, put it back into the plastic housing as shown in the schematic.

Assembly

Note: If installing a new return spring cassette, grease it on the spring side.

Carefully insert a new return spring cassette **6** and press down until it engages. Lightly grease the surface of the spring and spring cassette with multipurpose grease (944.360.000).

Insert spring **8** in the cable drum **7** and thread in a new cable (dia. 3.8 mm, 1 m long) as shown. Tie knots in both ends and tighten. Press the knot on the cable drum into the space provided.

Guide the hole **11** in the driver over the end of the spring, press down the driver and turn it slightly counter-clockwise until it is flush on the cable drum **7**.

Put the drum **7** on its spindle and turn it slightly until the return spring engages.

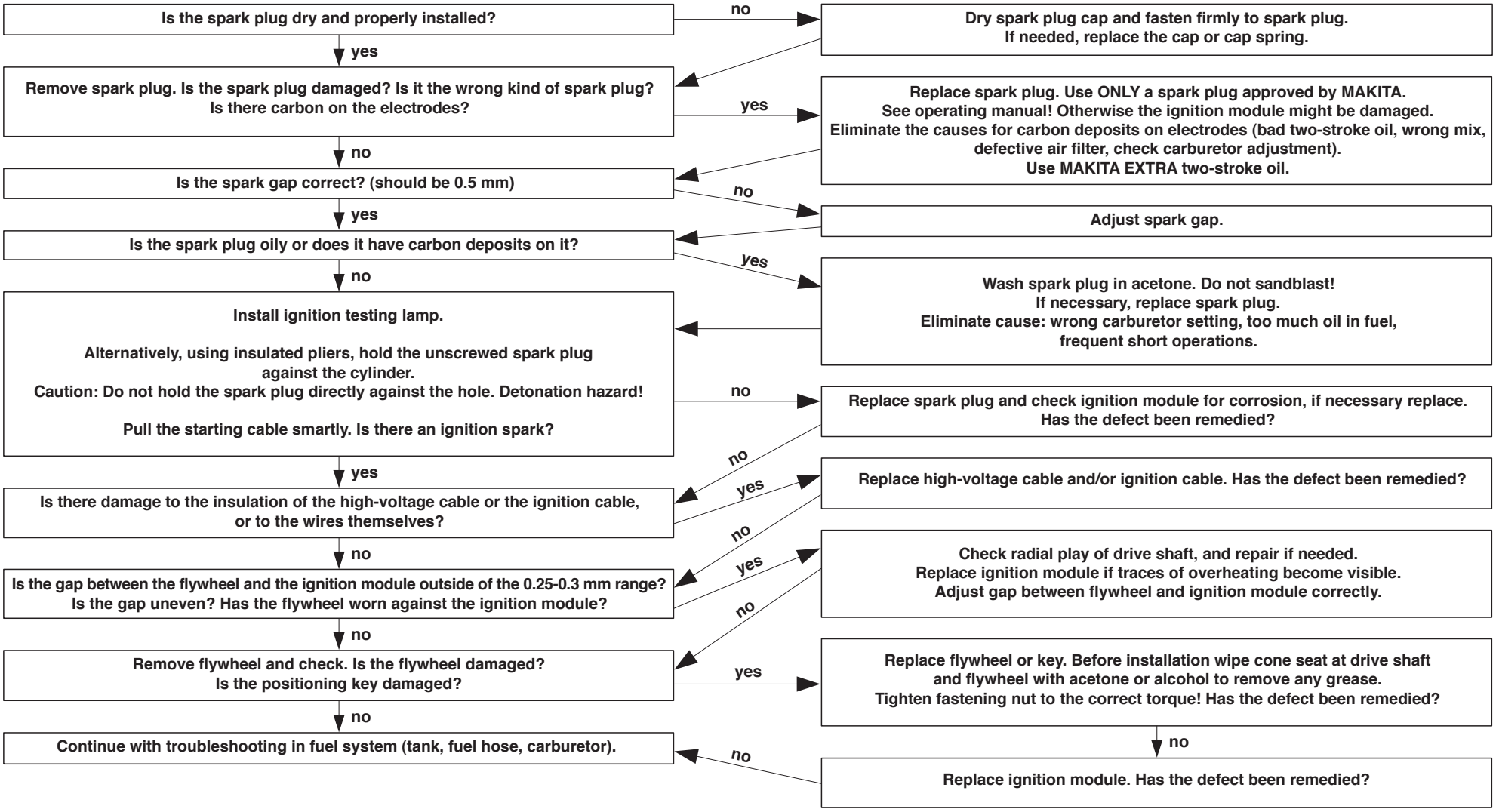
Insert screw **10** and tighten.

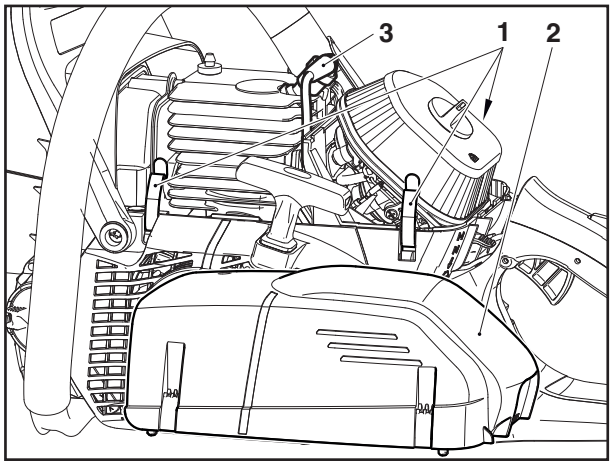
Tension the return spring clockwise. Turn the return spring about 6 turns with the aid of the cable, which should be pressed into the gap in the cable drum.

Place the air guide **5** in the fan housing and make sure the five recesses **4** engage.

Position the fan housing correctly on the saw, press against it slightly, and pull the starter handle until the starter catches.

Tighten screws **1**.


Is the spark plug dry and properly installed?
no
Dry spark plug cap and fasten firmly to spark plug.
If needed, replace the cap or cap spring.
yes
Remove spark plug. Is the spark plug damaged? Is it the wrong kind of spark plug?
Is there carbon on the electrodes?
yes
Replace spark plug. Use ONLY a spark plug approved by MAKITA.
See operating manual! Otherwise the ignition module might be damaged.
Eliminate the causes for carbon deposits on electrodes (bad two-stroke oil, wrong mix,
defective air filter, check carburetor adjustment).
Use MAKITA EXTRA two-stroke oil.
no
Is the spark gap correct? (should be 0.5 mm)
no
Adjust spark gap.
yes
Is the spark plug oily or does it have carbon deposits on it?
yes
Wash spark plug in acetone. Do not sandblast!
If necessary, replace spark plug.
Eliminate cause: wrong carburetor setting, too much oil in fuel,
frequent short operations.
no
Install ignition testing lamp.
Alternatively, using insulated pliers, hold the unscrewed spark plug
against the cylinder.
Caution: Do not hold the spark plug directly against the hole. Detonation hazard!
Pull the starting cable smartly. Is there an ignition spark?
no
Replace spark plug and check ignition module for corrosion, if necessary replace.
Has the defect been remedied?
yes
no
Is there damage to the insulation of the high-voltage cable or the ignition cable,
or to the wires themselves?
yes
Replace high-voltage cable and/or ignition cable. Has the defect been remedied?
no
no
Is the gap between the flywheel and the ignition module outside of the 0.25-0.3 mm range?
Is the gap uneven? Has the flywheel worn against the ignition module?
yes
Check radial play of drive shaft, and repair if needed.
Replace ignition module if traces of overheating become visible.
Adjust gap between flywheel and ignition module correctly.
no
no
Remove flywheel and check. Is the flywheel damaged?
Is the positioning key damaged?
yes
Replace flywheel or key. Before installation wipe cone seat at drive shaft
and flywheel with acetone or alcohol to remove any grease.
Tighten fastening nut to the correct torque! Has the defect been remedied?
no
no
Continue with troubleshooting in fuel system (tank, fuel hose, carburetor).
no
Replace ignition module. Has the defect been remedied?



Spark plug

Disengage the hood clips **1** with the combination tool and remove the hood **2**.

CAUTION:

Do not touch the spark plug or plug cap if the engine is running (high voltage).

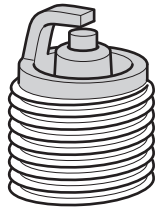
Switch off the engine before starting any maintenance work.

A hot engine can cause burns. Wear protective gloves!

The spark plug (NGK BPMR 7A, parts no. 965 603 021) must be replaced in case of damage to the insulator, electrode erosion (burn) or if the electrodes are very dirty or oily.

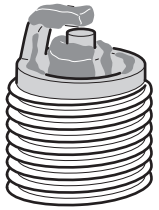
Pull the plug cap **3** off the spark plug. Use only the combination wrench supplied with the saw to remove the spark plug.

The electrode gap must be 0.5 mm.



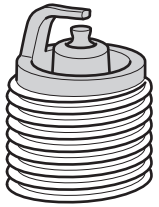
Normal

Proper spark plug,
good combustion



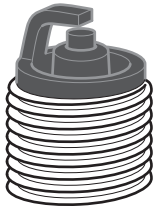
Deposits

Poor-quality oil,
material wear



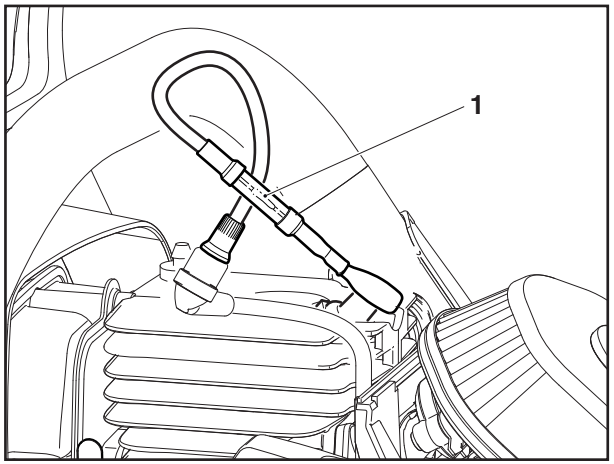
Overheating

Wrong thermal value



Carbon deposits

Wrong spark plug
Wrong thermal value



Checking the ignition spark

See Instruction Manual.

Checking the ignition

NOTE: Test the ignition only in the manner described here. Testing the ignition when uninstalled can destroy the ignition armature.

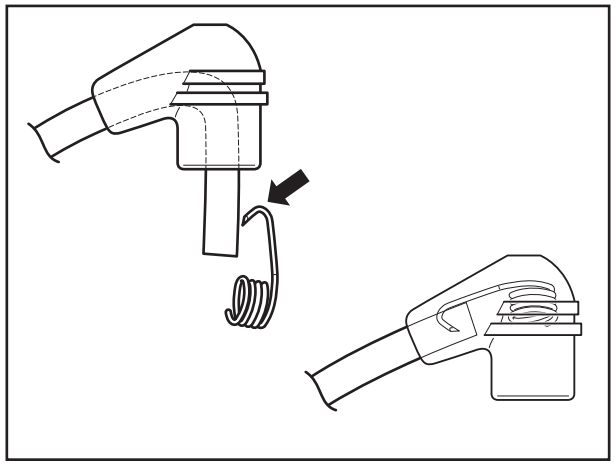
Remove the hood.

Pull off the spark plug cap and connect the ignition tester **1** as shown in the illustration.

Start the engine, let it warm up and then check the ignition over the entire speed range.

NOTE: When it reaches the cut-off speed the ignition will cut off.

For ignition cut-offs, see **IGNITION SYSTEM (TROUBLE-SHOOTING)**.



Replacing the plug connector

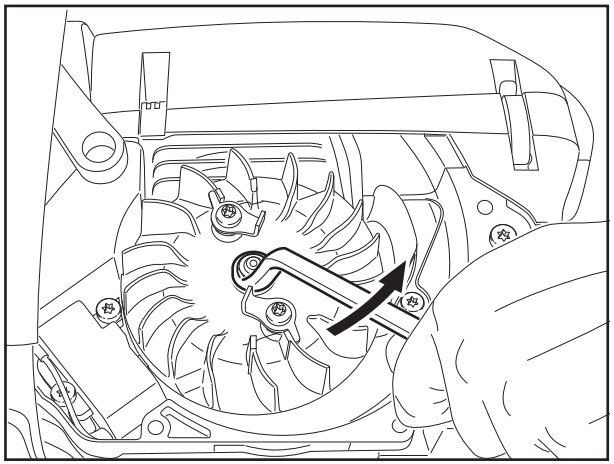
Hold the plug connector spring using pointed pliers and push the rubber cap backwards over the ignition cable.

NOTE: Lightly grease the ignition cable for easier assembly and disassembly of the spark plug cap.

Check the rubber cap and ignition cable for damage, and replace if necessary. The spring must not be bent. During assembly, push the hook of the spring into the middle of the cable from above.

Pull the rubber cap over the spring. Check for proper seating of the spring in the cap.

Incorrect positioning of the spring can cause weak ignition sparking or complete non-functioning.

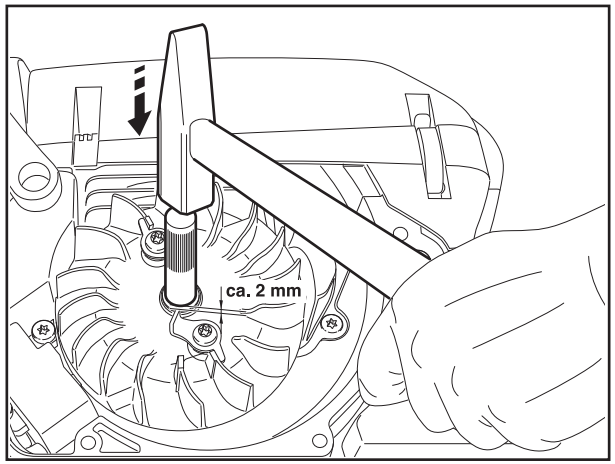


Removing the flywheel

Remove the starting system, see chapter 06.

Block the piston, see chapter 04.

Loosen the nut in the direction of the arrow and remove it along with the washer.



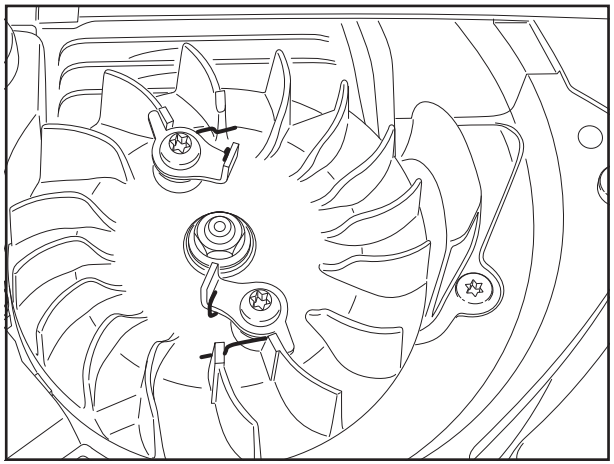
Screw the disassembly mandrel (chap. 00, Pos. 2) onto the threaded end of the shaft.

Do not screw the mandrel all the way down. Leave about 2 mm between the mandrel and the flywheel.

Hold the machine in one hand and knock the flywheel loose with a tap on the mandrel.

CAUTION: The cone of the crankshaft must always be degreased before assembly.

Nut tightening torque: 28 $^{+/-2.0}$ Nm

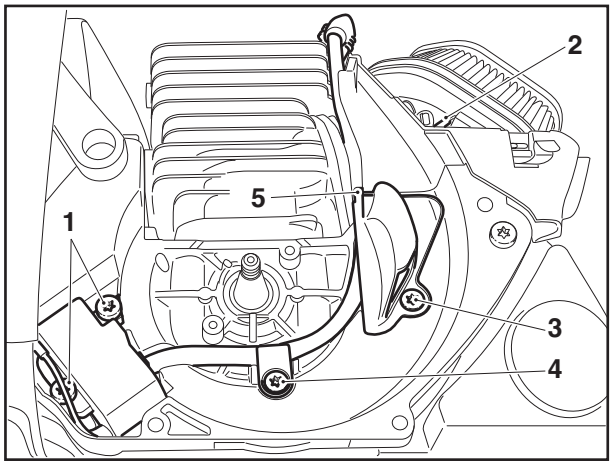


Starting ratchets

Check the starter pawls on the flywheel for easy movement, and clean if necessary.

Install spring as illustrated.

Screw tightening torque: 8 $^{+/-1.0}$ Nm.



Removing the ignition armature

Remove the cover.

Remove the starter. See Chap. 06.

Remove the flywheel. See Chap. 07.

Unscrew 2 bolts on ignition armature 1.

Pull off cable lug 2 .

Unscrew bolt 3 and remove with cooling air guide.

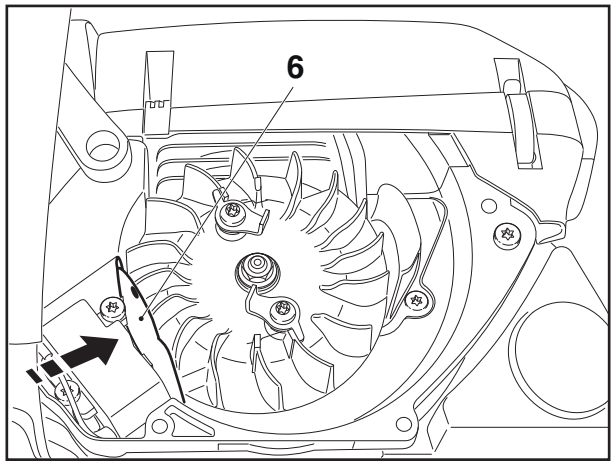
Unscrew bolt 4 and remove with cable clamp.

Remove ignition armature with high-voltage cable, carefully pulling cable lug **2** through the rubber grommet on the carburettor floor.

Installing the ignition armature

NOTE: The high-voltage cable is moulded onto the ignition system and cannot be replaced separately.

Insert the ignition armature and screw in the screws until just before they stop.



Secure the high-voltage cable under the cable clamp with bolt **4**.

Carefully push cable lug **2** through the rubber grommet on the carburettor floor.

Note: Make sure not to press the rubber grommet into the carburettor when doing this. If the grommet gets pushed out, it can be reinserted from the cylinder side.

Route the high-voltage cable as shown, engage the cooling air guide tab **5** and secure it with bolt **3**.

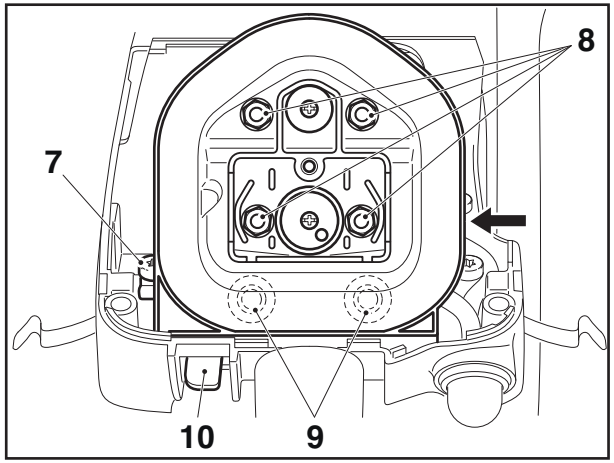
Install the flywheel.

Insert the setting gauge **6** (chap. 00, Pos. 3) between the ignition armature and the fylwheel.

Position the flywheel so that the magnet is against the armature (gap 0.25 – 0.3 mm).

Press the armature against the gauge towards the flywheel and tighten the armature screws (5 $^{+/-0.5}$ Nm). Then check the gap again to make sure it is correct.

Combination switch



Remove the cover and air filter. Pull off cable lug **2**.

Unscrew 4 flanged nuts **8** (A/F 7).

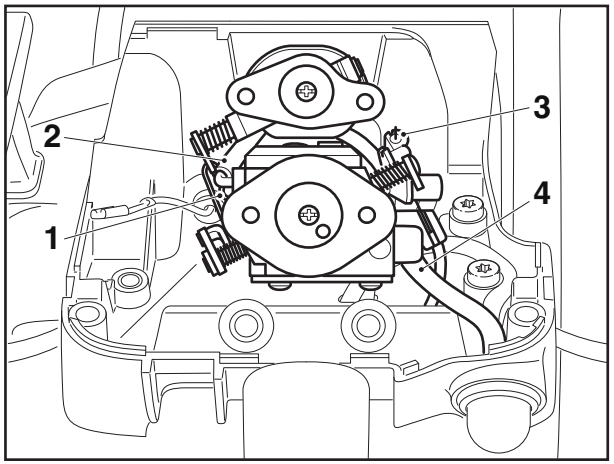
Unscrew bolts **7**.

Carefully remove the air filter base from the rubber buffers **9** and disengage the choke linkage (arrow).

The combination switch **10** with ground wire and contact spring can now be removed from the air filter base.

Note: If the gasket on the carburetor or air flap is damaged, it must be replaced.

Assemble in reverse order.



Removing the carburetor

CAUTION: Completely empty the fuel tank before disassembling the carburetor!

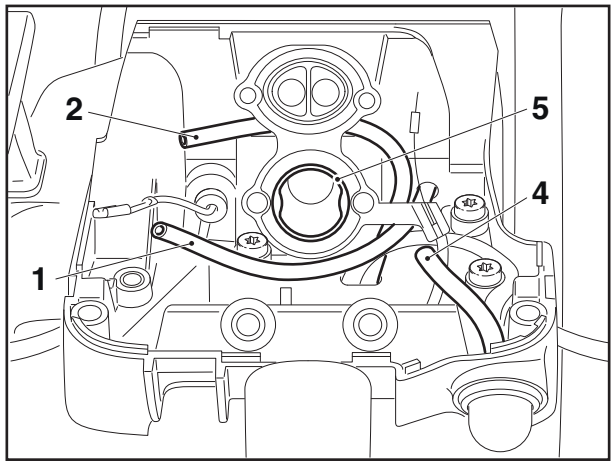
Remove the cover and air filter. Remove the air filter base, see Chap. 07 under **Combination switch**.

Remove the pulse line **1**, fuel line (red) **2** and primer suction line **4** from the carburetor.

CAUTION: There is fuel in the line. Catch escaping fuel with a cloth.

Disengage the throttle cable **3**.

Pull the carburetor and air flap off the stationary bolts and then disengage the air flap linkage **6** from the carburetor.



Assembly

Place the insert **5** in the intake manifold if necessary.

Engage the air flap linkage **6**, see illustration.

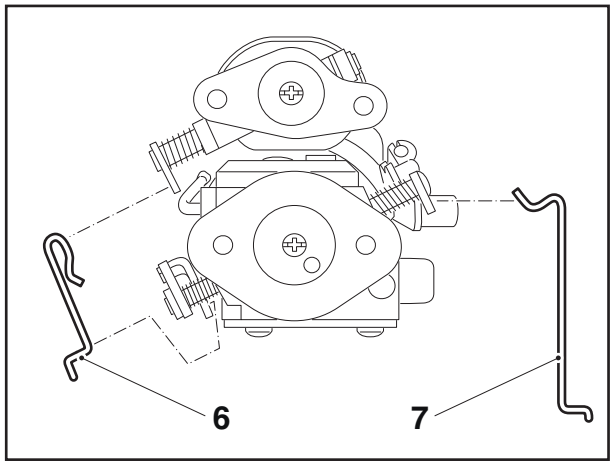
Note: Engage the air flap linkage **6** on the carburetor in the throttle flap actuator on the carburetor side.

Push the carburetor and air flap onto the stationary bolts.

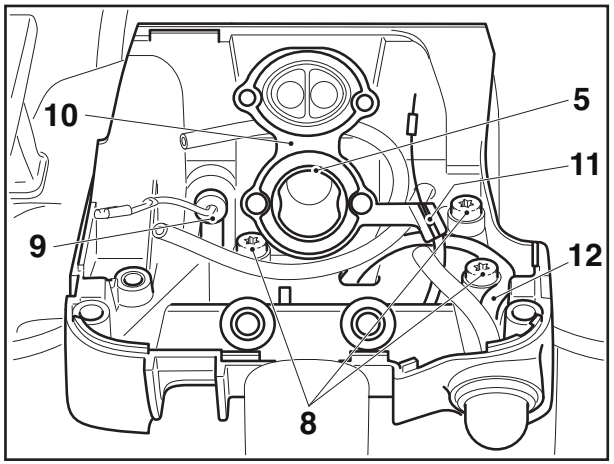
Connect the primer suction line **4** to the carburetor.

Connect the pulse line**1** and fuel line (red) **2**, and then connect the throttle cable **3**.

Position the carburetor and air flap with the red side on the outside.



Before installing the air filter base, see Chap. 07 under **Combination switch**, and engage the choke linkage **7** in the choke valve actuator on the carburetor.



Removing the carburetor base

Remove the insert **5** from the intake manifold if necessary.

Detach the Bowden cable **11**.

Remove the carburetor flange **10** from the intake manifolds.

Remove the primer return line **12** from the primer.

Unscrew 3 bolts **8**.

Lift the carburetor base slightly and pull the rubber grommet **9** with the short-circuit cable down and off.

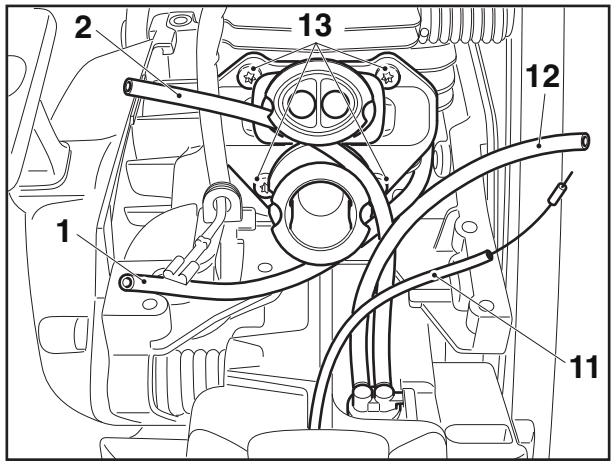
Carefully remove the carburetor base while letting the Bowden cable **11** and lines slide out of the base.

Assembly

Assemble in reverse order.

Route the lines as shown.

Tighten bolts **8** to 5 $^{+/-0.5}$ Nm.



Removing the manifold flange

Unscrew 4 bolts **13** and remove the manifold flange.

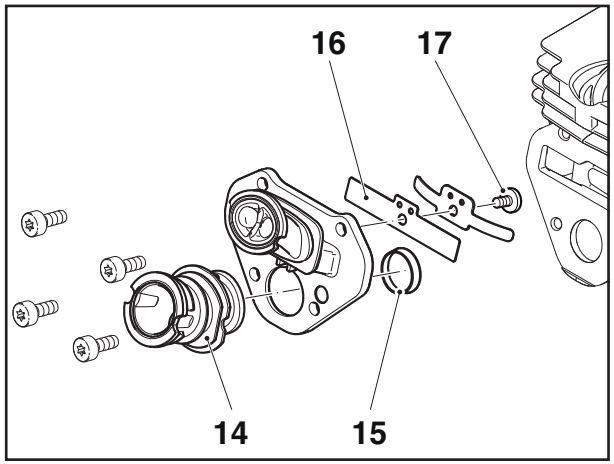
1 Pulse line

2 Fuel line (red)

4 Primer suction line (top primer connection)

12 Primer return line (bottom primer connection)

Note: Check all lines for cracks and damage. Any damaged lines must be replaced.



Intake diaphragm (reed valve)

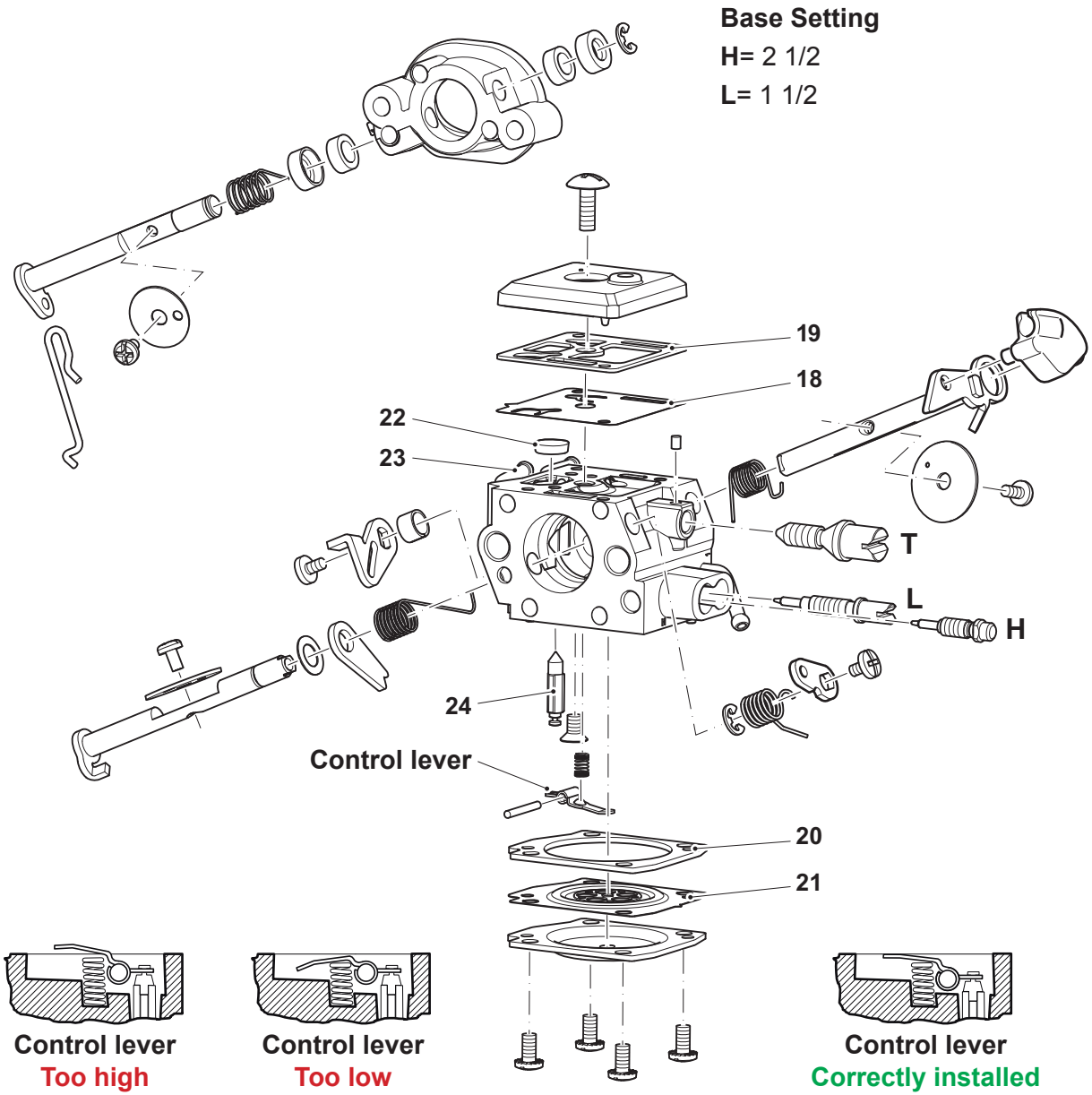
If the intake diaphragm **16** is damaged or protruding away from the air hose flange, it must be replaced.

Note: Turn the side with **TOP** on it to the outside when assembling.

Tighten screw **17** to 3 $^{+/-0.5}$ Nm.

Note: After pushing the carburetor manifold **14** through the flange, put in the insert **15**.

Tighten bolts **13** to 5 $^{+/- 0.5}$ Nm.



Base Setting

H= 2 1/2

L= 1 1/2

Control lever
Too high

Control lever
Too low

Control lever
Correctly installed

Pressure test

Connect the pressure gauge (956.004.001) to the carburetor fuel connection **23**.

Set up a pressure of max. 0.5 bar.

If the pressure drops off, check the inlet needle **24** for damage or foreign objects. If necessary, replace control parts.

If the inlet needle is OK, replace the gasket **20** and diaphragm **21**.

If the pump diaphragm **18** is obviously dented, it needs to be replaced along with the gasket **19**.

Check:

- Screen **22** for contamination
- Pulse hole for contamination

Check control parts
(control lever/inlet needle):

Check the tip of the inlet needle for wear.

Check control lever for correct installation, see illustration to the bottom.

If the control lever is too low:

- Insufficient fuel
- Poor acceleration
- No max. speed

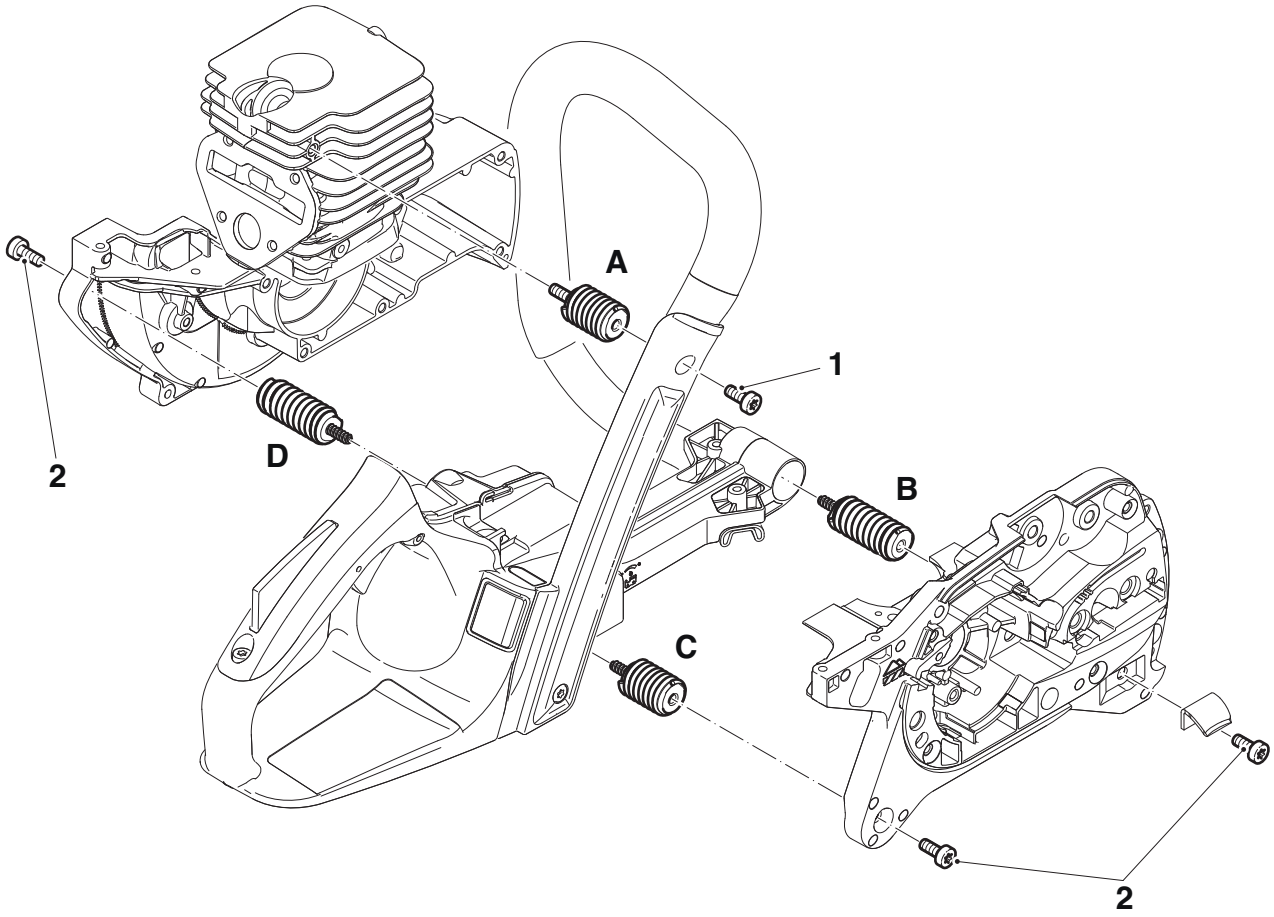
If the control lever is too high:

- Carburetor flooding
- Warm starting problems
- Poor idling

Disassembly

CAUTION: To prevent cuts, wear protective gloves and disassembly the spike bar (2 screws)**!**

Note: For removal and installation, guide the Torx screwdriver through damper springs.



Damper spring A

Remove the cover for easier disassembly.

Unscrew bolt **1** from damper spring **A**.

Damper spring B and C

Remove the sprocket guard, bar, and chain.

Remove starter housing (see chap. 06).

Unscrew bolts **2** from damper springs **A, B and C**.

NOTE: The engine unit is connected to the tank unit by fuel lines and the throttle cable. The two units cannot be separated!

Carefully lift the engine unit on the clutch side over damper springs **B** and **C** (spread the engine unit slightly apart from the tank).

Unscrew the damper springs.

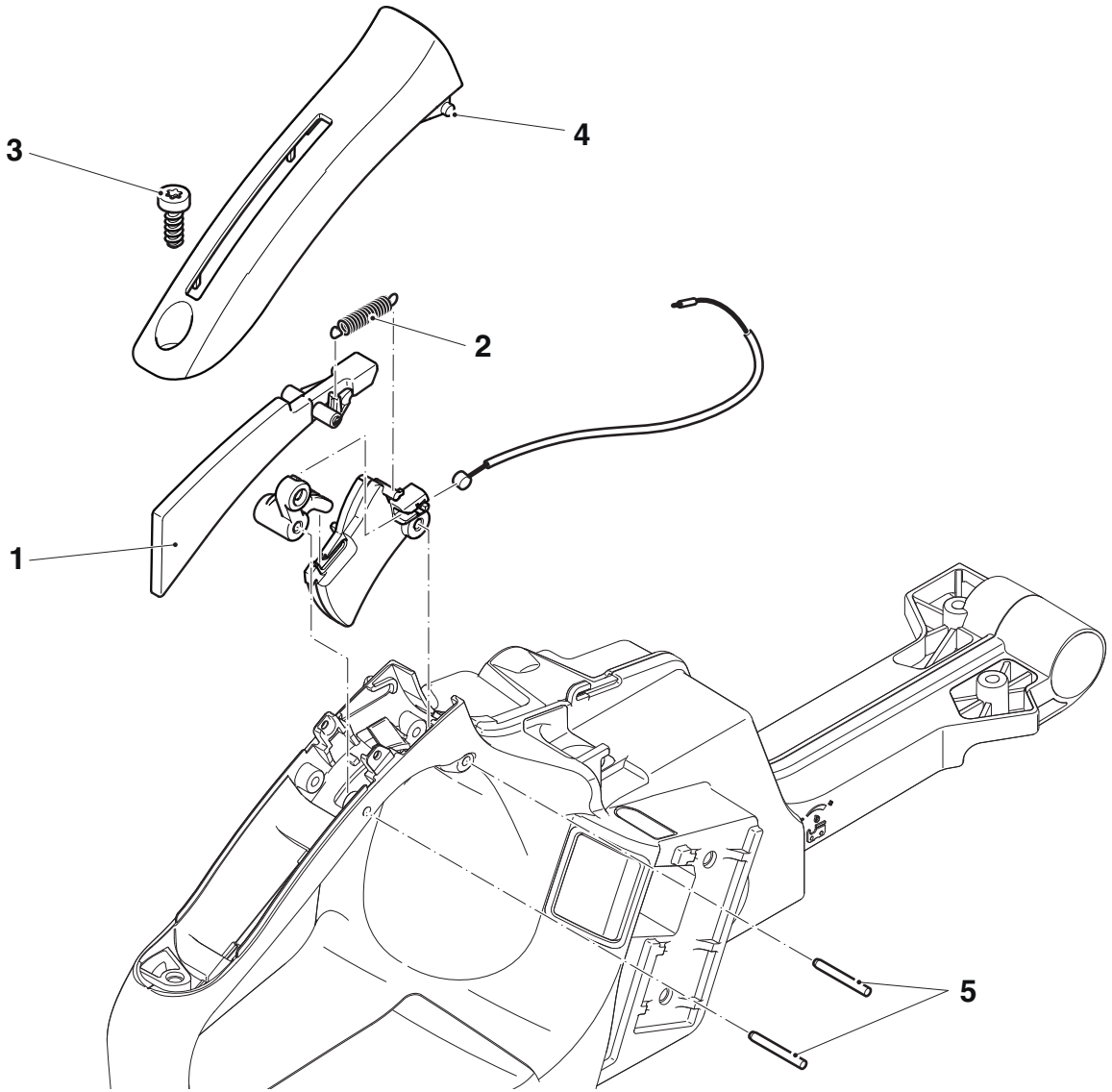
Damper spring D

Note: Damper spring **D** cannot be removed until damper springs A, B and C have been removed.

Carefully lift the engine unit on the fan side over damper spring **D** and spread the engine unit slightly apart from the tank. Unscrew the damper springs.

Assemble in reverse order.

Make sure the fuel lines remain connected to the tank.



Grip mechanism

The throttle trigger is linked to the carburetor by a Bowden cable.

NOTE: Do not lubricate the Bowden cable!

The grip shell is attached to the tank with a Torx screw **3**.

Disengage the throttle lock **1** and spring **2**.

Check for ease of motion and functioning of the safety throttle lock spring **2**.

To replace the throttle trigger and throttle lockon lever drive out the cylinder pins **5** (3.3 x 28.4 mm) with a mandrel (ø 2 mm).

Removing the tank

NOTE: Make sure the fuel tank is empty before removing it.

Remove the flywheel. See Chap. 09.

Detach the throttle cable from the carburetor, see Chap. 08.

Detach the Bowden cable from the carburetor flange, see Chap. 08.

Spread the engine unit and the tank unit apart a little and use needle-nose pliers to carefully pull the fuel lines off the fuel nipple.

Separate the tank and the engine unit.

Note: When attaching the lines, connect the fuel line (red) to the fuel nipple **7.**

Pressure test

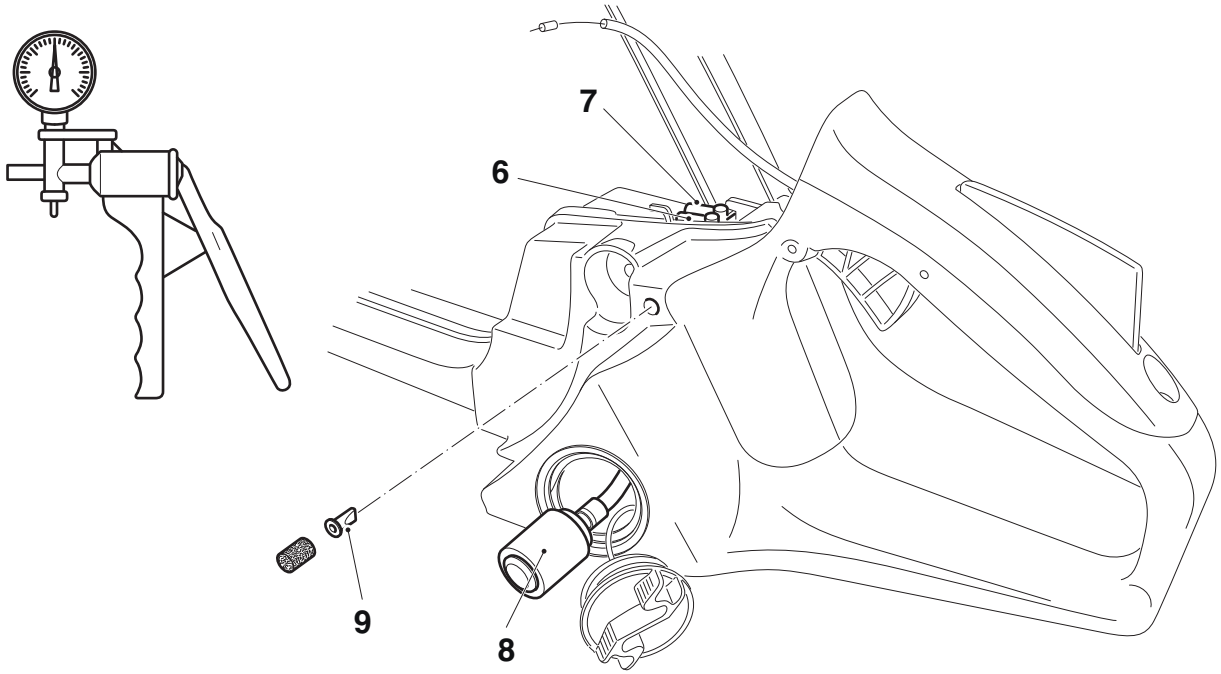
Attach the over/underpressure pump (chap. 00 pos. 11) to one of the two fuel connection. (**6** or **7**). Seal off the second connection.

Set up a pressure of max. 0.3 bar.

If the pressure drops off, check the following:

- Air valve
- Fuel line
- Tank cap O-ring
- Check tank for holes

Note: Detergent can be used to localise leaks.



Vacuum testing ventilation valve 9

Attach the over/underpressure pump as described.

When the pump is operated the underpressure must quickly dissipate.

If underpressure builds, replace the ventilation valve.

Pull out the ventilation valve **9** with a small screwdriver or wire. Before inserting a new valve, wet it with fuel.

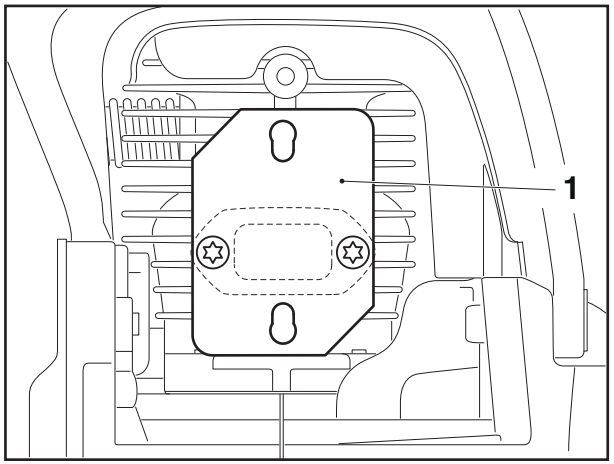
Parts

To remove the suction head **8** pull it through the tank opening with a hooked wire.

Note: Do not use pliers, as this may damage the line. Do not pull on the suction head or fuel line, because they can otherwise be drawn into the inside of the tank.

Turn the fuel nipple slightly counter-clockwise out of the retainer and then carefully lift it out with a sharp flat point screwdriver.

Note: Do not lever against the line connections, as this can break them off.



Drive, pressure test

If it is not possible to adjust the carburetor properly, it will be necessary to check the sealing of the Drive.

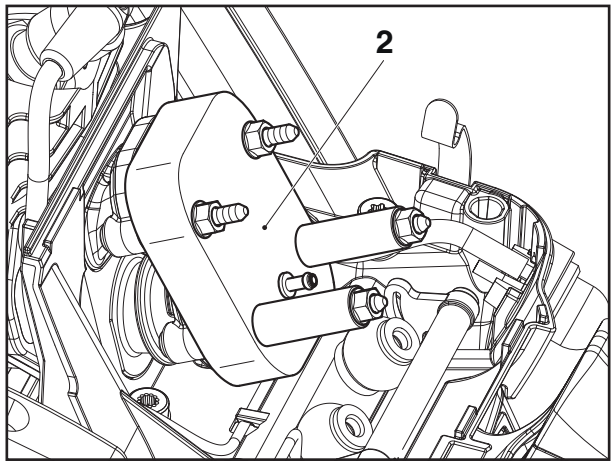
To seal the exhaust side, install sealing plate **1** (944.603.180) in the place of the muffler (rubber coating towards the cylinder).

To do this it will be necessary to remove the muffler, see chap. 04.

To seal the intake side, install sealing plate **2** (944.603.200) in the place of the carburetor unit.

To do this it will be necessary to remove the carburetor unit, see chap. 07 and 08.

Connect the over/underpressure pump to the connection on the sealing plate **2** (944.603.200)



Move the piston to top dead centre.

Pull the pulse line from the cylinder connection and seal the connection.

Set up a pressure of max. 0.5 bar.

If the pressure drops within 20 seconds, it can have one of these causes:

- Radial ring leaking
- Cylinder base gasket leaking
- Crankcase gasket leaking
- Crack in crankcase
- Crack in cylinder
- Spark plug leaking

NOTE: Detergent can be used to localise leaks. If there is a leak into the oil tank, it will not be possible to fully identify the leak. If pressure remains steady in the crankcase after shutting off the oil line hole, for example with a rubber stopper (see chap. 05), it is an indication that there is a defect in the crankcase gasket to the oil tank.

Drive, vacuum test

Since the radial gasket ring can also fail at negative pressure, a vacuum must be established in the crankcase to test the radial ring.

Seal off the intake and exhaust sides as described above.

Connect the over/underpressure pump to the connection on the sealing plate **2**.

Move the piston to top dead centre.

Pull the pulse line from the cylinder connection and seal the connection.

Set up a negative pressure of max. 0.5 bar.

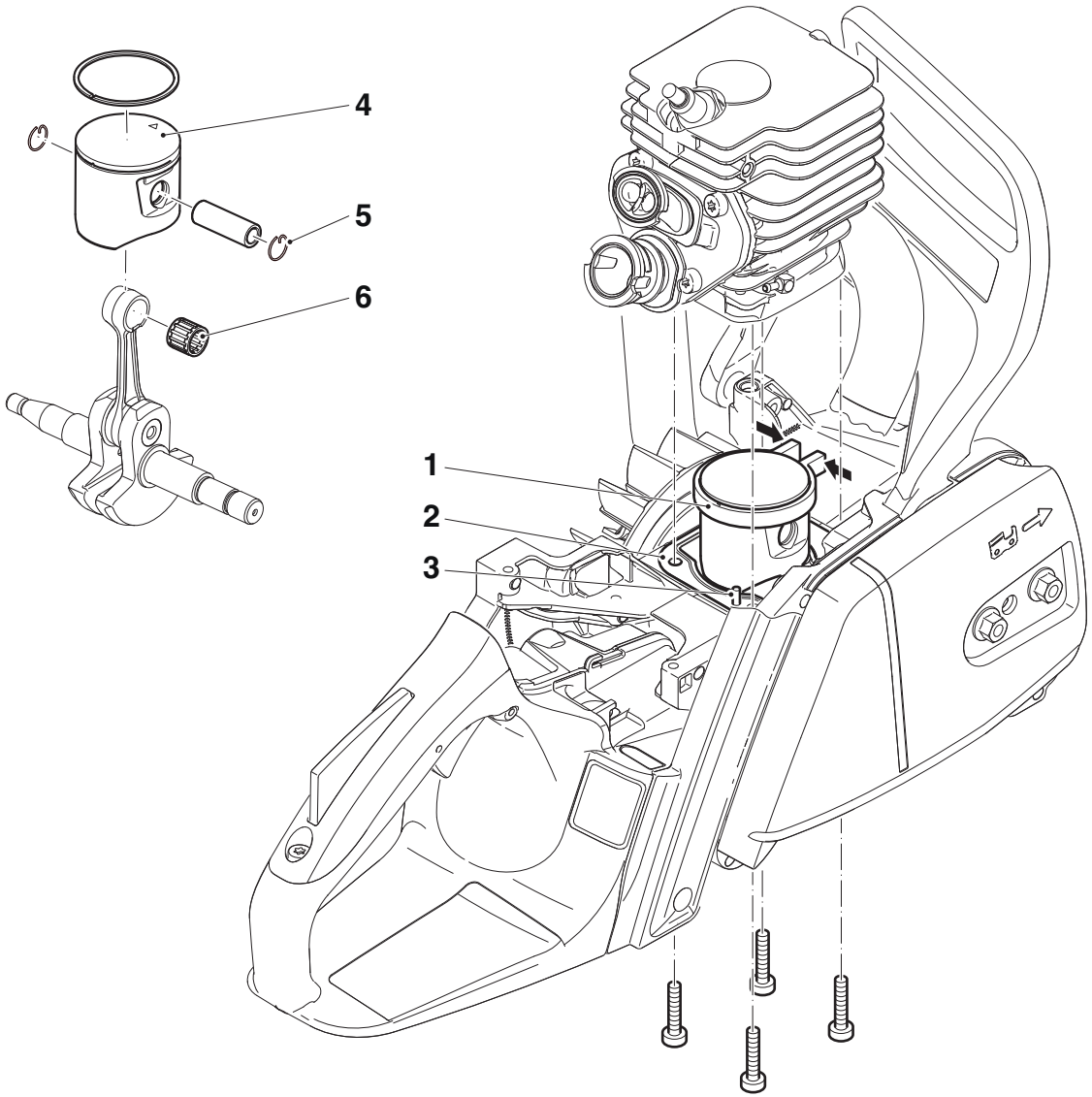
If the pressure does not rise to more than 0.3 bar within 20 seconds, the radial gasket is OK. Otherwise the radial gaskets must be replaced.

Remove the flywheel and clutch, see **IGNITION SYSTEM** and **CLUTCH / CLUTCH DRUM**.

On the clutch side, pull the circlip from the shaft.

Guide the 15 mm radial gasket puller (944.500.895) over the shaft and turn it firmly into the radial gasket. When the spindle is screwed in, it will press against the shaft and pull the radial gasket out.

Caution: Under no circumstances hammer in the puller.



Cylinder and piston disassembly

Remove the muffler, see chap. 04.

Remove the starting system, see chap. 06.

Remove the carburetor unit, see chapter 08.

Unscrew the cylinder bolts and pull the cylinder up and off.

Remove and reinstall the circlip **5** with needle-nose pliers.

Assembling the cylinder and piston

Carefully remove any gasket residues!

Use a new cylinder base gasket 2!

Before assembly, lightly oil the cylinder race, piston and needle bearing 6!

Install the piston with the arrow marking **4** on the outlet side of the camshaft (piston ring lock on the inlet side).

Move piston to bottom dead centre.

Position the opening on the piston ring towards the piston ring lock.

Use the piston ring tensioner **1** to press the piston ring together.

Push the cylinder onto the piston. Let the piston ring tensioner slide down with it.

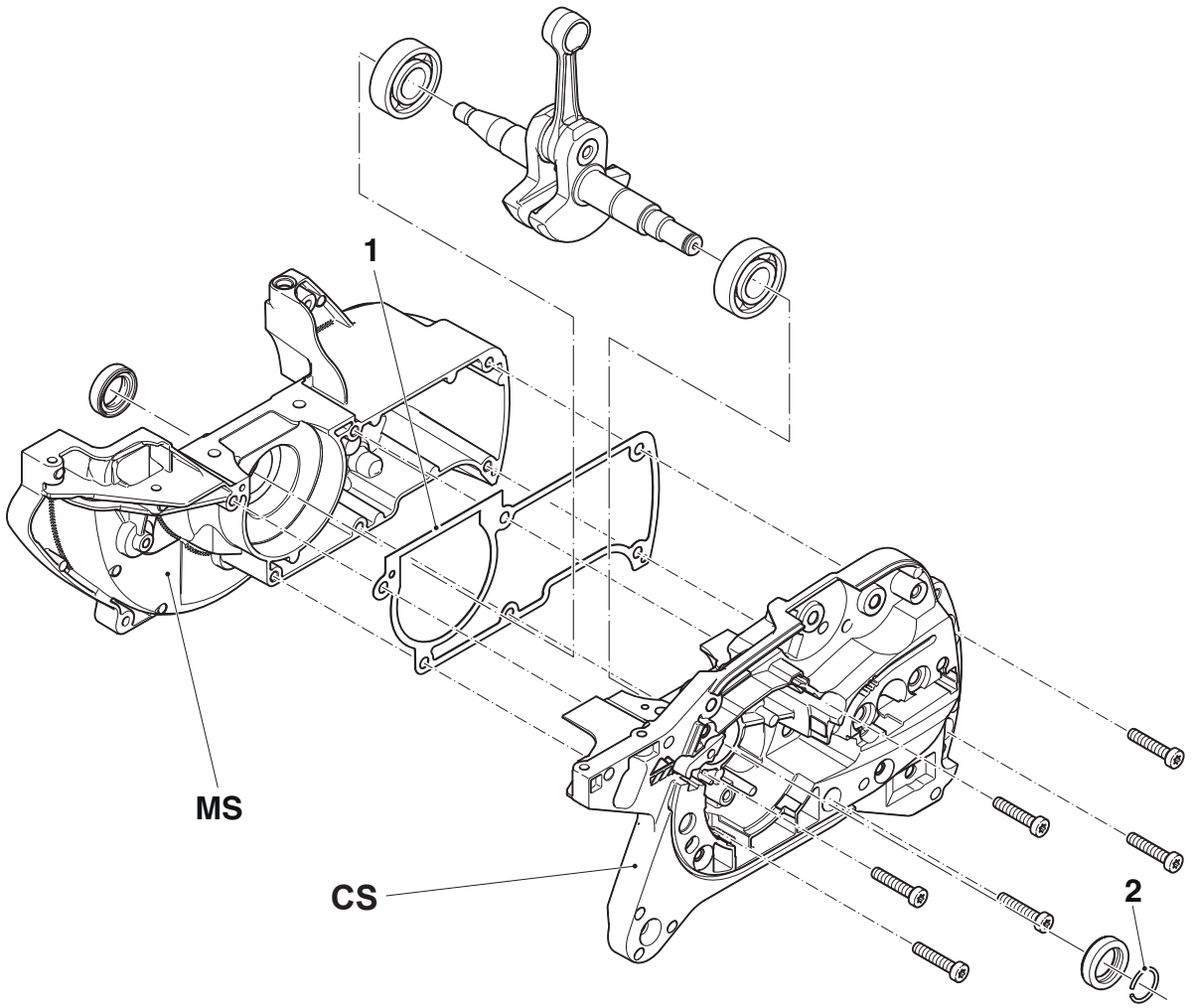
Remove the piston ring tensioner and press the cylinder all the way down on the pins **3**.

Hand-tighten the screws lightly crosswise, and then tighten to the correct torque (12 $^{+1.0}$ Nm), again crosswise.

The complete crankcase is divided into:

- **CS** crankcase clutch side
- **MS** crankcase magneto side

Two pins ensure fitting.



Disassembly

To disassemble, unscrew the 6 bolts. Using a rubber hammer, carefully drive the crankshaft out of the crankcase **MS**.

Remove spacer ring **2** from the crankshaft. Using a rubber hammer, carefully drive the crankshaft out of the crankcase **CS**.

To remove and install the bearings, heat the crankcase **CS** and **MS** to 160-180°C.

Assembling

NOTE: Before installation, apply “Loctite 620” to the outer ring of the bearing.

Place the bearings in the hot crankcase.

When driving the crankshaft into the crankcase **MS** or **CS**, support the crankshaft side between the webs.

When installing the second crankcase half, the crankshaft webs must be supported against each other.

NOTE: Make sure to remove the support after assembly.

Before assembly, carefully clean all sealing surfaces and remove any remnants of the old gasket. When assembling, install a new gasket.

Hand-tighten the screws lightly crosswise, and then tighten to the correct torque (12 $^{+1.0}$ Nm), again crosswise.

After bolting the crankcase sides together, cut off the flash **1**.

13 TORQUES

Screw	Part No.	Size	Qty.	Torque [Nm]
crank case MS with CS	908.405.255	Torx	6	10 +/-1
cylinder on crank case	908.005.255	Torx	4	12 +/-1
reed valve to air hose	908.004.085	Torx	1	3 +/-0,5
air hose to cylinder	908.405.145	Torx	4	5 +/-0,5
carburetor base on crank case	908.005.165	Torx	4	5 +/-0,5
muffler to cylinder	908.005.205	Torx	2	8 +/-1
muffler to cylinder, upper screw	908.305.405	Torx	1	8 +/-1
contact spring to intake manifold	915.135.100	cross recess	1	1,5 +/-0,2
air filter base to intake manifold	175.131.300	A/F 7	4	3 +/-0,5
oil pump to crank case	908.005.165	Torx	1	5 +/-0,5
clutch on crankshaft	---	M12 x 1 L	1	35 +/-2,5
chain tensioner gear cover to crankcase	908.705.125	Torx	1	5 +/-0,5
bar bolt to bar flange	195.232.010	M8 SK6/M8 (Lock with Loctite 243)	2	15 +/-1
assembly of sprocket guard	923.208.004	A/F 13	2	1 +/-0,5
brake cover	908.105.124	Torx	4	5 +/-0,5
ignition coil cpl. crank case	908.805.205	Torx	2	5 +/-0,5
flywheel fastening by nut	920.308.024	A/F 13	1	28 +/-2,0
starter cpl. to crank case	908.005.205	Torx	3	5 +/-0,5
handguard mounting to starter housing	908.005.205	Torx	1	5 +/-0,5
grip half / rear handguard to tank	913.455.164	Torx	1	5 +/-0,5
fastening of tubular handle at side of tank	913.455.204	Torx	1	5 +/-0,5
fastening of tubular handle on bottom of tank	913.455.204	Torx	2	5 +/-0,5
side support cover to tank	913.455.204	Torx	1	5 +/-0,5
side support cover to damping spring	908.006.145	Torx	1	5 +/-0,5
damping spring - tank magnet side back	181.114.300	Torx	1	5 +/-0,5
damping spring - tank clutch side front	181.114.300	Torx	1	5 +/-0,5
damping spring - tank clutch side back	130.114.400	Torx	1	5 +/-0,5
damping spring - cylinder	181.114.400	Torx	1	5 +/-0,5
crank case MS/damping	908.006.145	Torx	1	5 +/-0,5
crank case CS/damping	908.006.145	Torx	2	5 +/-0,5
spike bar to crank case	908.005.165	Torx	2	5+/-0,5
spark plug	965.603.021	A/F 19	1	15 +/-5
starting ratchets to flywheel	170.166.041	Torx	2	8 +/-1
ignition cable holder	908.005.095	Torx	1	5 +/-0,5
evacuation tube	908.005.095	Torx	1	5 +/-0,5
air filter	---	M4	1	3+/-0,5