

2/93



**DOLMAR 109**  
**DOLMAR 110i**  
**DOLMAR 111**  
**DOLMAR 111i**  
**DOLMAR 115i**

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**DOLMAR**



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## Technical data

| Model   |                    |   | 109   | 110i   | 111/111i  | 115i  |
|---|--------------------|---|---|--|---|---|
| Displacement  | cm <sup>3</sup>    |    | 43  | 43   | 52  | 52  |
| Bore  | mm                 |    | 40  | 40   | 44  | 44  |
| Stroke  | mm                 |    | 34  | 34   | 34  | 34  |
| Rating  | kW                 |    | 2,0   | 2,3  | 2,4   | 2,7   |
| Idling  | 1/min              |    | 2500  | 2500   | 2500  | 2500  |
| Allowed max. engine speed with bar and chain<br>(* with speed limitation) | 1/min              |    | 12500   | 13200  | 12500   | 13000   |
| Gap   | Flywheel / Coil mm |    | 0,2-0,3   | 0,2-0,3  | 0,2-0,3   | 0,2-0,3   |
| High tension wire   | length mm          |    | 180   | 180  | 180   | 180   |
| Spark plug  | NGK                |    | BPMR-7A   | BPMR-7A  | BPMR-7A   | BPMR-7A   |
|   | BOSCH              |    | WSR-6F  | WSR-6F   | WSR-6F  | WSR-6F  |
|   | CHAMPION           |    |   |  |   |   |
| Elektrode gap   | mm                 |  | 0,5   | 0,5  | 0,5   | 0,5   |
| Fuel tank capacity  | Ltr.               |  | 0,56  | 0,56   | 0,56  | 0,56  |
| Oil tank capacity   | Ltr.               |  | 0,28  | 0,28   | 0,28  | 0,28  |
| Carb. adjustment  | L / H              |  | 1/1   | 1/ 1 1/8   | 1/1   | 1/ 1 1/8  |
| Starter rope  | ø / length mm      |  | 3,5 / 980   | 3,5 / 980  | 3,5 / 980   | 3,5 / 980   |
| Saw chain   | Model              |  | 093   | 084  | 093   | 099   |
|   |                    |   | Normal profil   | Low profil   | Normal profil   | Low profil  |
| Cutter type   |                    |  | 7   | 7  | 7   | 7   |
|   |                    |   | Semi chisel   | Chisel   | Semi chisel   | Chisel  |
| Gauge   | inch mm            |  | 3/8<br>(9,52)   | .325<br>(8,2)  | 3/8<br>(9,52)   | 3/8<br>(9,52)   |
| Drive link  | inch mm            |  | 0.58<br>(1,5)   | 0.58<br>(1,5)  | 0.58<br>(1,5)   | 0.58<br>(1,5)   |
| Filling Angle   |                    |  | 35°   | 30°  | 35°   | 25°   |
| Side Angle  |                    |  | 85°   | 75°  | 85°   | 60°   |
| Cutting Angle   |                    |  | 60°   | 60°  | 60°   | 60°   |
| File Guide Angle  |                    |  | 90°   | 10°  | 90°   | 90°   |
| Depth Gage Setting  | mm                 |  | 0,65  | 0,65   | 0,65  | 0,65  |
| File ø  | mm                 |  | 5,5   | 4,5  | 5,5   | 5,5   |
|   | From 1/2 Cutter mm |   | 4,8   | 4,0  | 4,8   | 4,8   |
| Kick back reduction   |                    |  |  |  |  |  |
|   |                    |   | Bumper Drive Link   | Depth Gauge  | Bumper Drive Link   | Bumper Drive Link   |
| Type  |                    |   | Spur (fixed)  | Rim (loose)  | Spur (fixed)  | Rim (loose)   |
| Cutting length  | cm                 |  | 38  | 33/38  | 38  | 45  |
| Drive Link  | count              |  | 56  | 56/64  | 56  | 64  |
| Sprocket  | Z                  |  | 7   | 8  | 7   | 7   |

## Special tools



Mounting tool for  
clutch hub  
944 500 680



Mounting tool for  
clutch hub  
944 500 690



Puller for tension spring  
of chain brake  
950 237 000



Sealing plate for  
leakage test of crankcase  
944 603 020 / 944 603 030



Drift for piston pin  
944 603 260



Special socket wrench  
for rubber buffer  
944 500 621



Mounting for roller bearing  
crankcase  
950 500 050



Puller for drive worm  
of oil pump  
957 433 000



Snap ring pincer for external snap  
rings of starting system  
946 101 010



Radial ring extractor  
944 500 900

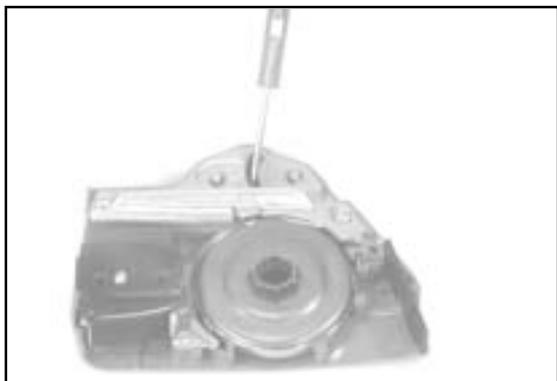


Mounting sleeve  
for radial rings  
944 500 550



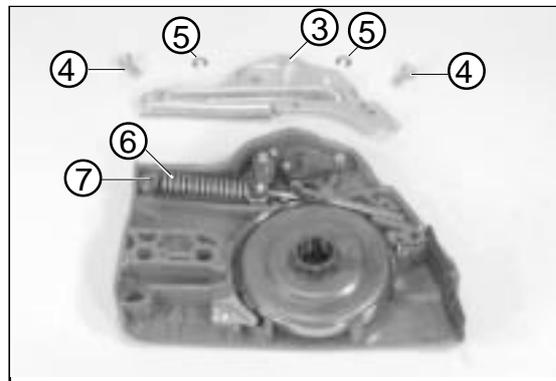
Setting gauge for  
ignition armature  
944 500 890

## 01 Chain brake



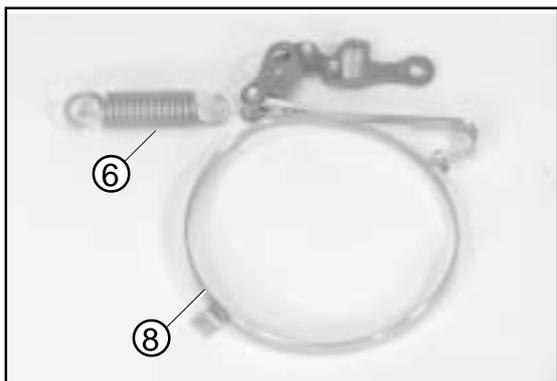
### 01-02 Releasing the chain brake

Insert the clutch drum (1) and by levering down the brake gate, using a screwdriver (2), release the chain brake.



### 01-02 Relieving the tension spring

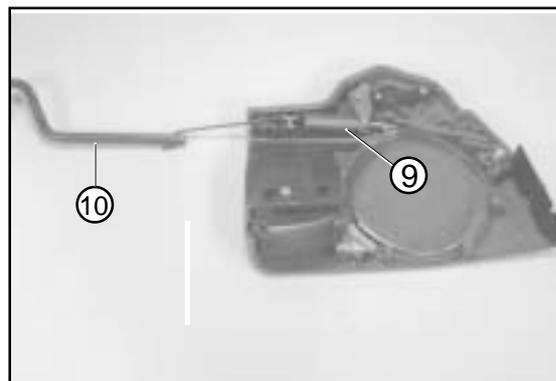
To remove the brake band it is necessary to remove the cover plate (3). For this purpose unscrew screws (4) and remove retaining rings (5). Relieve the tension spring (6) by levering it off the housing peg (7).



### 01-02 Replacing the brake band

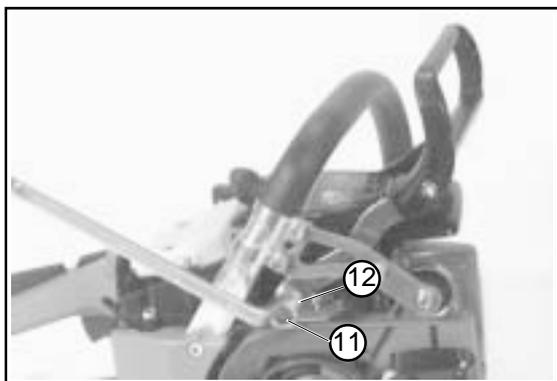
A damaged or defective brake band (8) and a damaged or defective tension spring must be replaced without delay (6).

**Caution: Safety components**



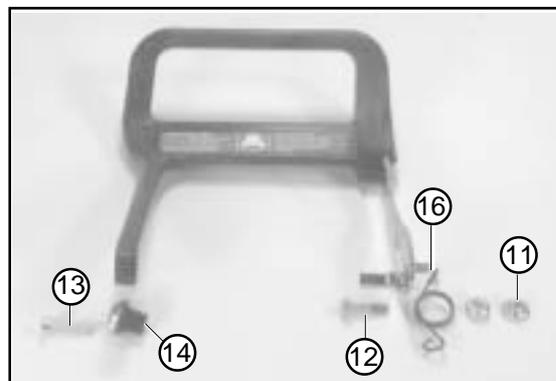
### 01-02 Pretensioning the tension spring and the brake gate

Following the installation of the brake band, engage the tension spring in the brake gate (9) and using the pulling hook (10) no. 950.237.000 pass the spring over the peg (7).



### 01-04 Removing the hand guard

Remove the nut (11) and push the screw (12) in direction of the cylinder. Unscrew screw (13) on the starter side and remove the insert (14).

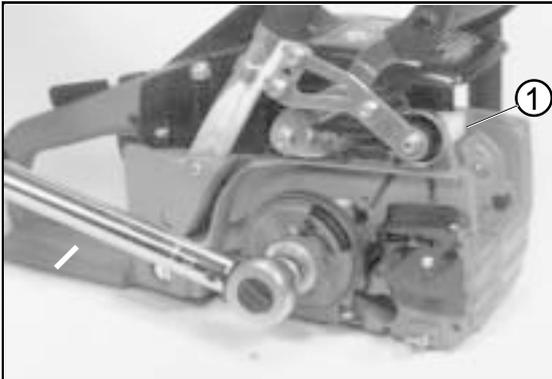


### 01-04 Fitting the hand guard

When fitting the hand guard, ensure that the compression spring (16) is installed correctly.



## 02 Clutch drum



### 02-01 Removing the clutch drum

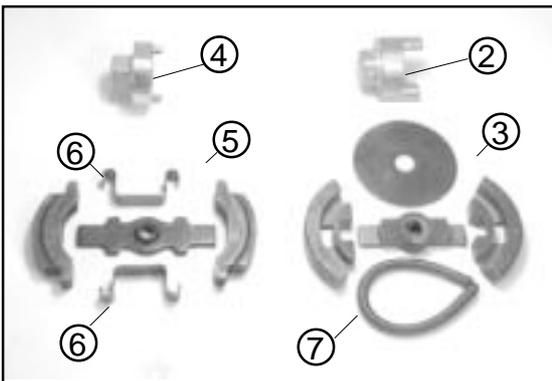
For the removal of the clutch/clutch drum it is necessary to immobilize the cylinder unit. For this purpose unscrew the silencer and insert the piston stopper wedge (1) into the exhaust duct of the cylinder.



### 02-01 Unscrewing the clutch

Use spanner (2), no. 944 500 680 for clutch (3) and use spanner (4) no. 944 500 690 for clutch (5).

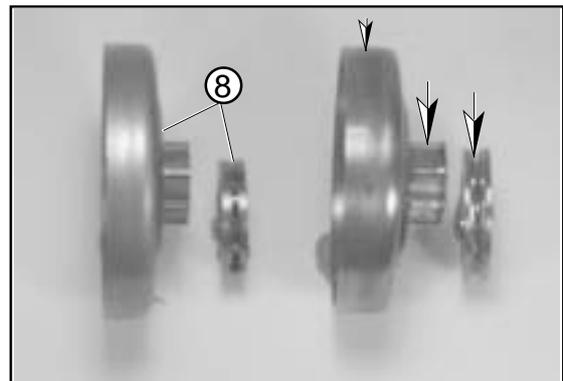
**Caution: Left-hand thread**



### 02-01 Differing clutch designs

Clutch (5) for models 109, 110, 111.  
Clutch (3) for model 115.

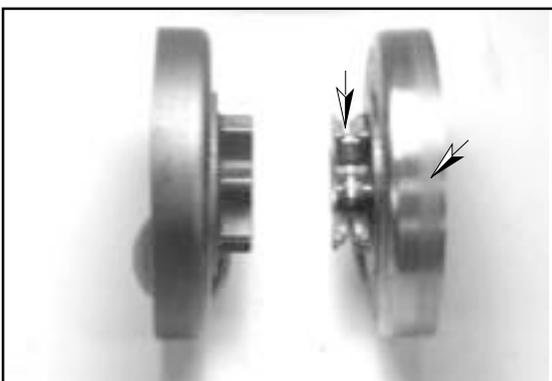
Clutch springs may be replaced as a complete set (6) or individually (7).



### 02-03 Checking the clutch drum /sprocket

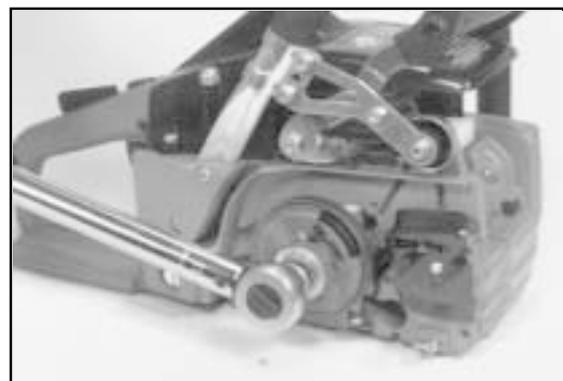
Worn sprockets (arrows) or clutch drums must be replaced.

Ring pinion system (8) is standard equipment only for models 110/115. As replacement also available for models 109/111.



### 02-03 Checking the clutch drum /sprocket of models 109 / 111

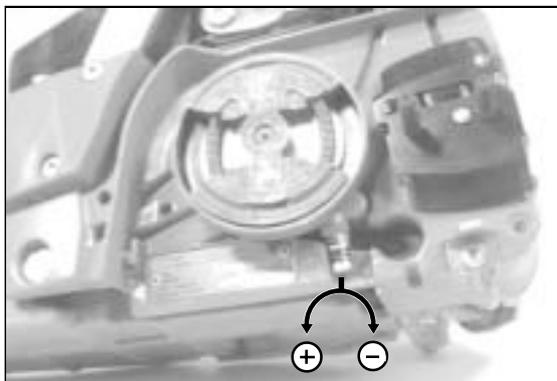
Worn sprockets or clutch drums (arrows) must be replaced.



### 02-03 Mounting the clutch drum and clutch

Prior to installation, lightly grease the clutch drum bearing and tighten the clutch using a torque of 35 Nm.

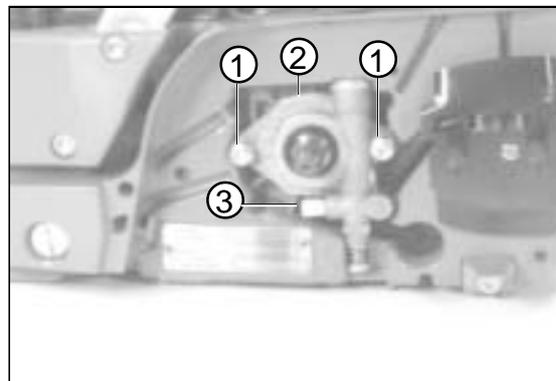
## 03 Oil pump



### 03-02 Adjusting the oil pump delivery

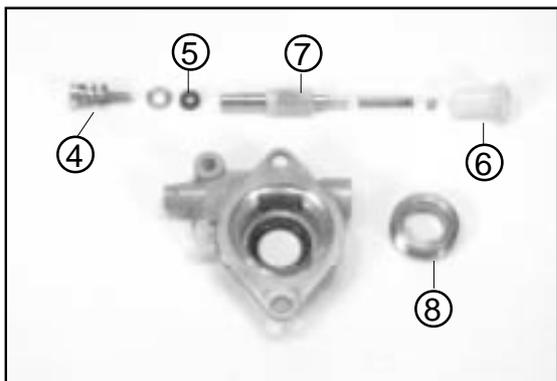
Turn the screw:

clockwise for less chain oil  
anti-clockwise for more chain oil.



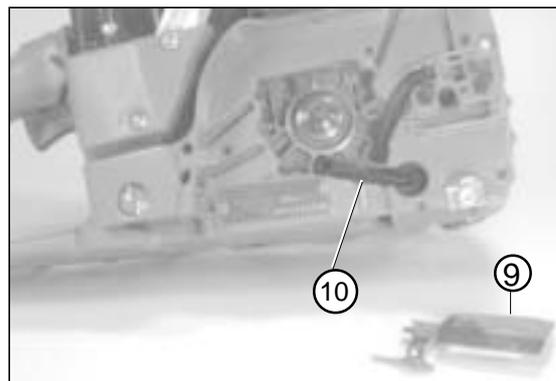
### 03-02 Removing the oil pump

Unscrew screw (1) and remove the pump housing (2) from the crankcase. Separate the intake pipe from the angular nipple (3).



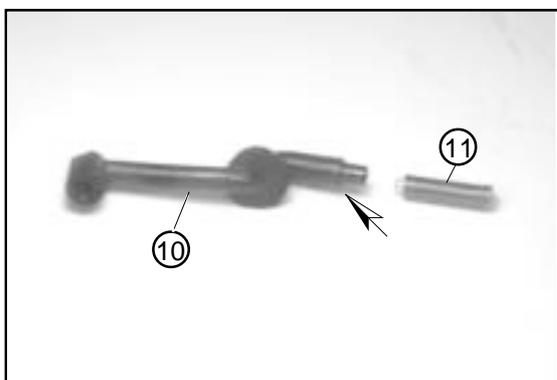
### 03-03 Checking the oil pump for wear

Unscrew the set screw (4) and check the condition (5). Unscrew the guide bush (6) and check the pump plunger (7) for damage. Replace defective parts and clean the housing prior to assembling.



### 03-04 Removing the intake pipe

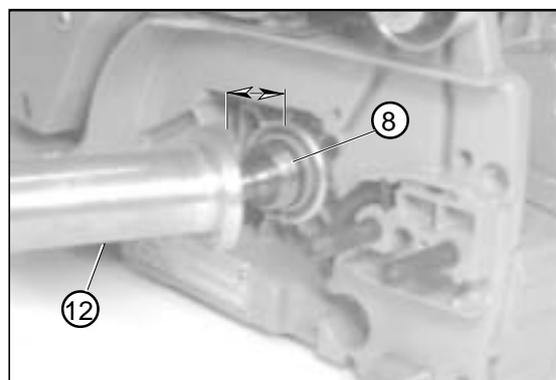
Unscrew the chain guide plate (9) and withdraw the intake pipe (10) from the oil reservoir.



### 03-03 Cleaning the intake pipe

Withdraw the oil filter (11) prior to cleaning the intake pipe (10).

When installing the oil filter, pass the spring over the intake pipe against the stop (arrow).



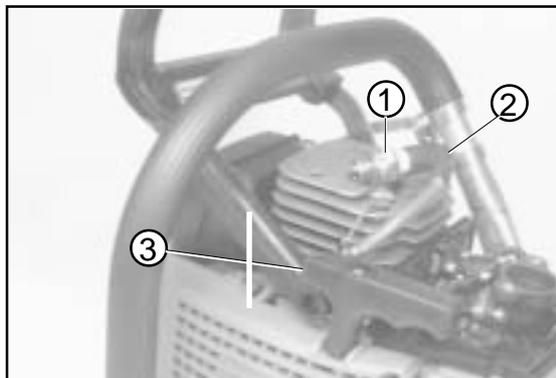
### 03-05 Withdrawing the worm

To remove the worm (8), screw the tool (12) onto the worm against the stop. Withdraw the worm from the crankshaft by tightening the screw.

**Caution: Use the protective cap!**



## 04 Ignition system



### 04-01 Checking the spark plug

Unscrew the spark plug (1) and connect it to the spark plug terminal (2). Hold the spark plug against cylinder ground and withdraw the starter rope (3). If no spark is generated, repeat using new spark plug.



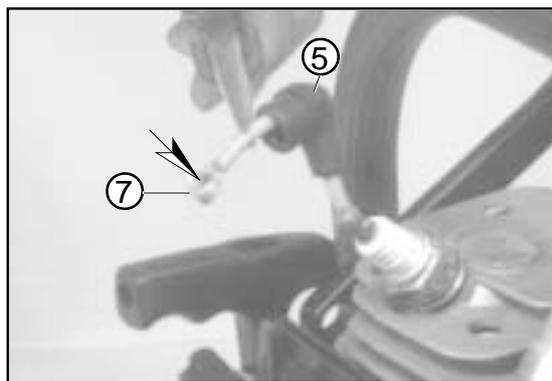
### 04-01 Checking the spark plug

Clean or renew contaminated or defective spark plugs.



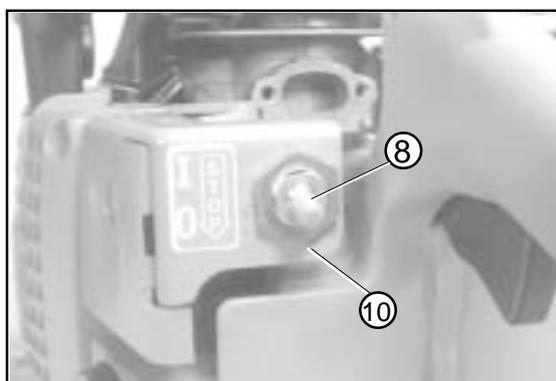
### 04-02 Replacing the spark plug terminal

Remove the hood (07-01) for removing the spark plug terminal. Using a pair of pointed pliers hold the spring (7) of the plug connector and pass the rubber cap (5) towards the rear over the ignition cable (6).



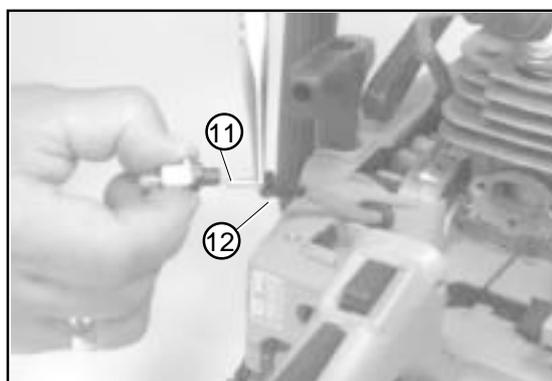
### 04-02 Installing the spark plug terminal

First pass the rubber cap (5) over the ignition cable. Then engage the spring (7) in the existing hole of the ignition cable. In case of new ignition cables, press in the tip of the spring (refer to arrow).



### 04-03 Replacing the short-circuiting switch

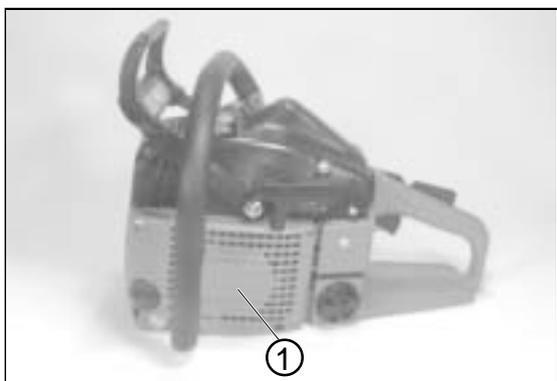
To remove the short-circuiting switch (8) first remove the filter hood, carburettor and bottom part (07-06). Unscrew the nut (10) and withdraw the switch from the short-circuiting cable.



### 04-03 Installing the short-circuiting switch

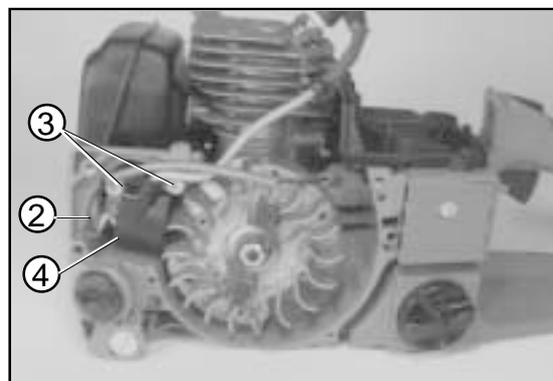
Push the short-circuiting cable (11) into the switch and install the rubber cap (12) in place. Install the switch in the crankcase ensuring that the flat side faces upwards. Screw on nut (10) with the toothed side facing the housing.

## 04 Ignition system



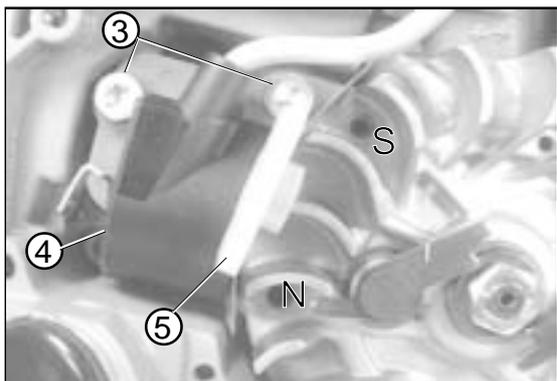
### 04-04 Removing the ignition armature and the flywheel

For the removal of the ignition armature unscrew the cover (07-01) and the starting assembly (1).



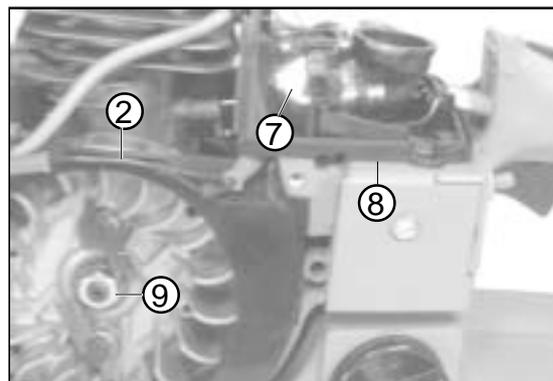
### 04-04 Removing ignition armature/flywheel

Withdraw short-circuiting cable (2) from the armature and unscrew screws (3). When replacing, remove ignition cable from the ignition armature (4). Screw new ignition cable forcefully into the ignition armature.



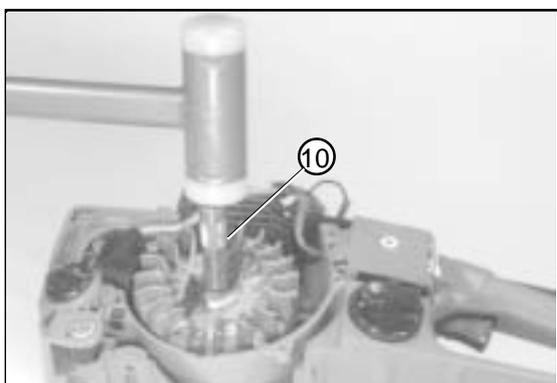
### 04-04 Installing the ignition armature

Install the ignition armature and secure in place using screws (3). For setting the air gap, fit gauge (5), no. 944 500 890, between flywheel and armature. Turn the N/S marking of the flywheel towards the ignition armature.



### 04-04 Replacing the short-circuiting cable

For the removal of the short-circuiting cable (2) it is necessary to remove carburettor (7) and bottom part (8). When installing the cable, ensure that it is not caught when fitting the bottom part.



### 04-04 Withdrawing the flywheel

Unscrew nut (9). Screw the punch (10), 944 500 880, on the crankshaft and remove the flywheel by striking a jarring blow.

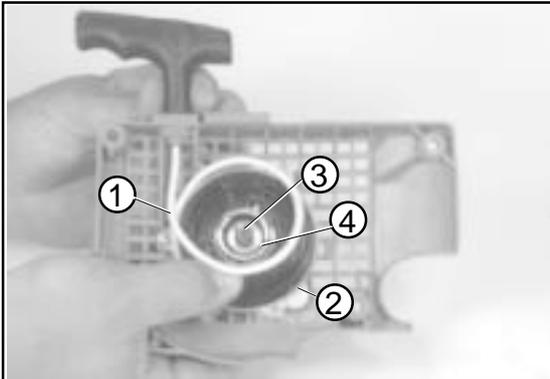


### 04-04 Installing the flywheel

Ensure that the cone on the flywheel and on the crankshaft is free from grease. Tighten the nut using a torque of 25 Nm (refer to table 995 709 180).

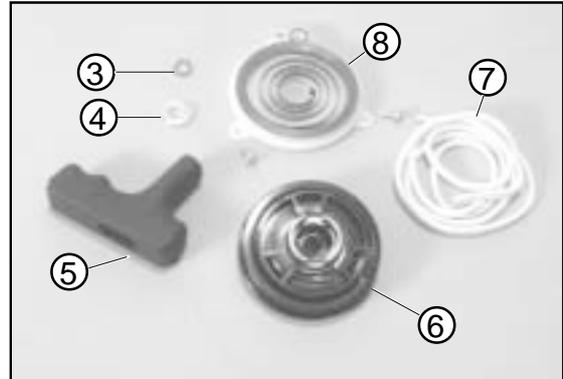


## 05 Starter assembly



### 05-02 Removing the starter assembly

Relieve the return spring before removing the starter assembly. For this purpose slightly withdraw the starter rope (1), while holding the rope drum (2). Remove the rope from the drum and allow the drum to rewind slowly.



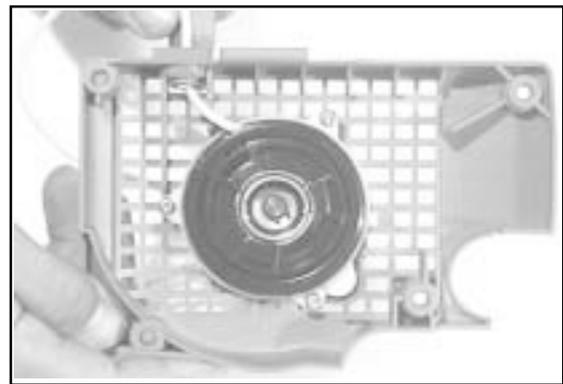
### 05-02 Removing the return spring

Remove retaining ring (3) and washer (4). Separate handle (5) from rope (7), lift the rope drum from housing (6). Return spring and cassette (8) are secured to the ventilator housing by means of three screws.



### 05-02 Attachment of the starter rope in the rope drum

In case of this rope drum a knot prevents the starter rope from being withdrawn.



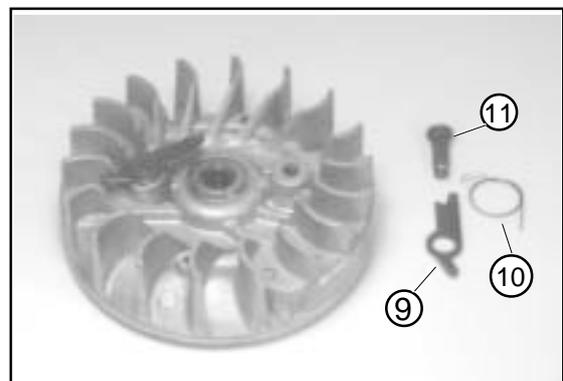
### 05-02 Pretensioning the return spring

After fitting the starting assembly, completely withdraw the starter rope and hold it in this position. It must now be possible to turn the rope drum by another 1/2 turn. Reduce the pretensioning force, when this is not possible.



### 05-03 Replacing the starter ratchets

Using a punch, remove the locating pin of the starter ratchet from the flywheel.



### 05-03 Replacing the starter ratchets

Starter ratchet (9) with spring (10) and pin (11) must be replaced as a complete assembly only. Push the pin into the flywheel until it is flush with the inner edge. Before installing the pin, apply locking agent 980 009 000.



## 06 Carburettor



### 06-01 Adjusting the carburettor

To perform the basic adjustment, carefully screw in screws L and H against the stop. Then back off:

idling jet (L) = 1 turn (max. +1/4)  
 compensation jet (H) = 1 turn (max. -1/4)



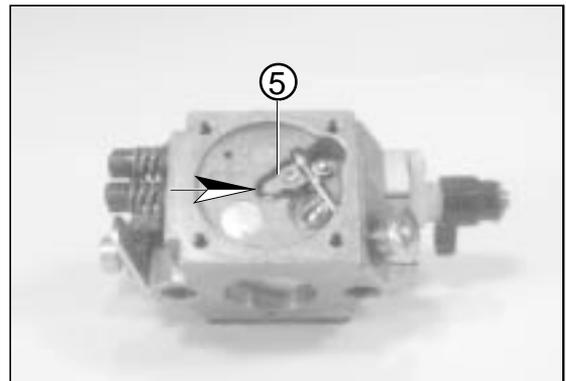
### 06-01 Adjusting the carburettor

Adjustment of engine speed during idling is by idling adjustment screw (S). When the engine speed is excessive (moving chain) or too low (engine stops) correct accordingly by means of the idling adjustment screw.



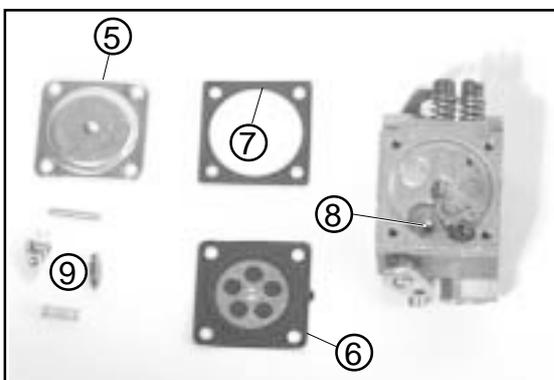
### 06-02 Removing the carburettor

Remove filter cover and hood. Separate the fuel pipe (1) from the connection nipple. Unscrew the screws (2). Remove the choke lever (3) and carburettor linkage (4) after removal of the carburettor.



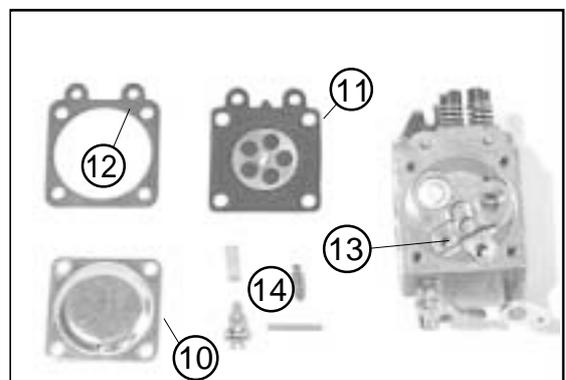
### 06-03 Adjusting the control lever

The control lever (5) must be aligned so that its surface is in parallel with the carburettor body (refer to arrow).



### 06-03 Carburettor (Tillotson) control side

Remove cover (5), control diaphragm (6) and seal (7). Unscrew the screw (8). The control assembly (9) comprises the inlet needle, rocker arm, spring and shaft.

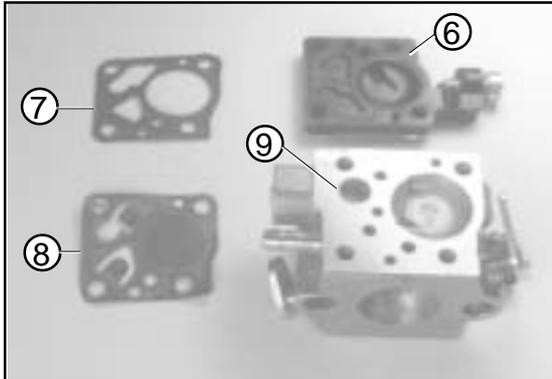


### 06-03 Carburettor (Walbro) control side

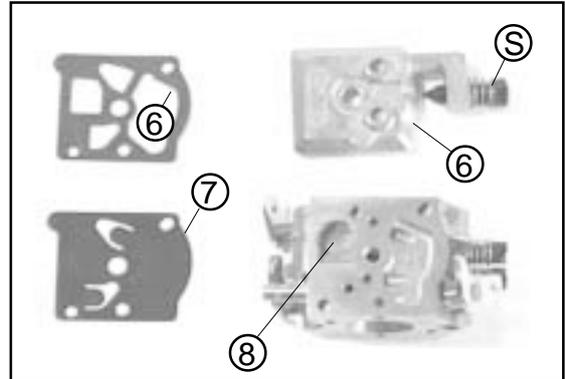
Remove cover (10) control diaphragm (11) and seal (12). Unscrew the screw (13). The control assembly (14) comprises the inlet needle, rocker arm and shaft.



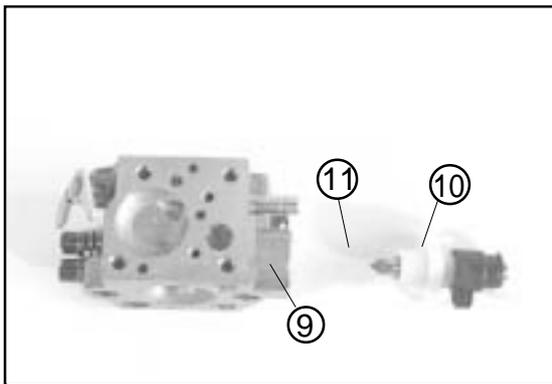
## 06 Carburettor



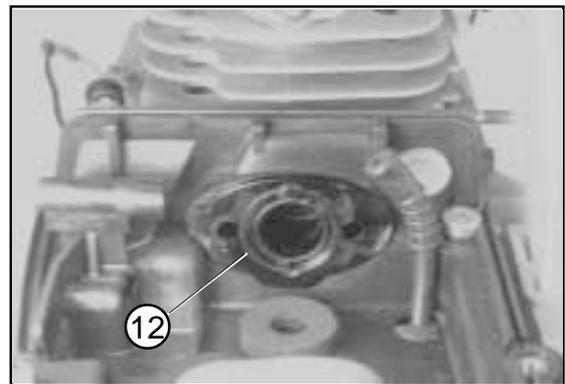
**06-04 Carburettor (Tillotson) pump side**  
 Unscrew cover (6). Remove seal (7) and diaphragm (8). Carefully remove the fuel filter (9) for cleaning.



**06-04 Carburettor (Walbro) pump side**  
 Unscrew cover (5) with idling adjustment screw ("S"). Remove seal (6) and diaphragm (7). Carefully remove the fuel filter (8) for cleaning.

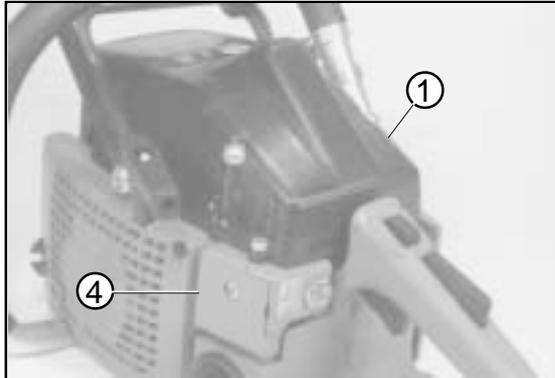


**06-05 Removing the injection valve**  
 Unscrew attachment screw (9) and remove the valve assembly (10) from the carburettor body. Use new valve, if the needle tip (11) is worn.

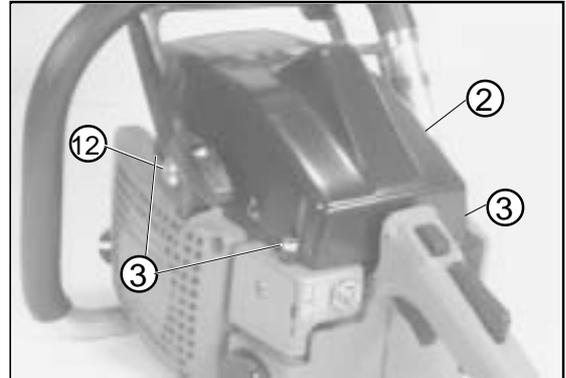


**06-08 Removing the intermediate flange**  
 The intermediate flange (12) can be taken out after the carburettor has been removed.

## 07 Cover system, air filter



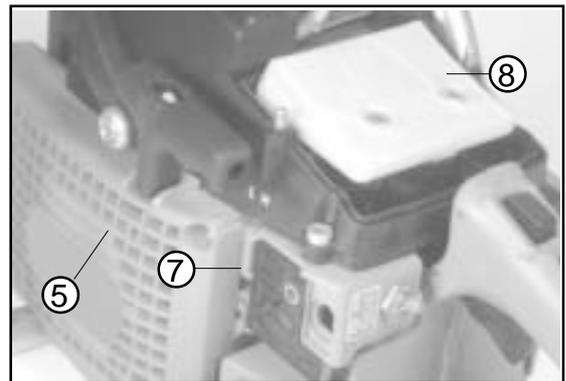
**07-01 Removing the air filter cover**  
For cleaning the air filter, remove cover (1).  
For cleaning the auxiliary filter, remove cover (4).



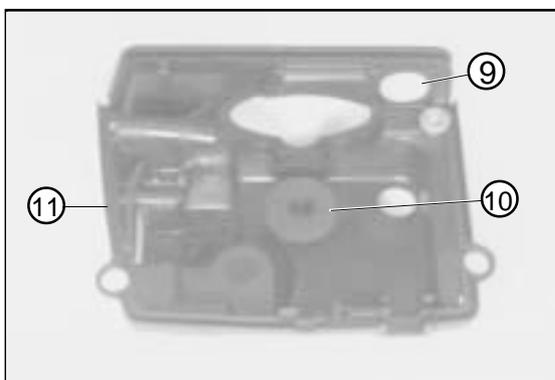
**07-01 Removing the cover**  
In case of model 109 cover assembly (2) must be removed to clean the air filter. For this purpose remove lever attachment screw (12) and the three cover attachment screws (3).



**07-03 Cleaning the air filter**  
Remove auxiliary filter (5) and unscrew the main filter (6).



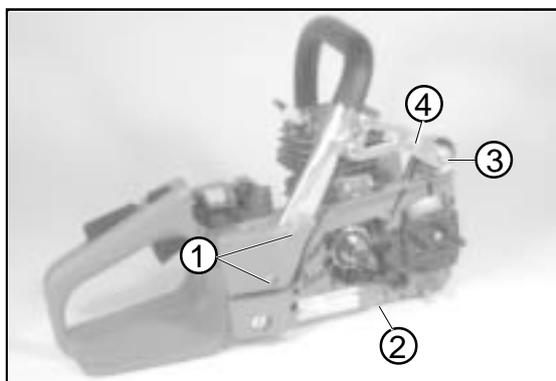
**07-03 Cleaning the air filter**  
To clean the main filter, separate the upper (7) and the lower part (8).



**07-06 Removing the bottom part**  
Following the removal of the carburettor, the bottom (11) can be removed. Integrated into the bottom are: - plug (9) for the winter heating system - ventilation bore/seal (10) for the carburettor control side.



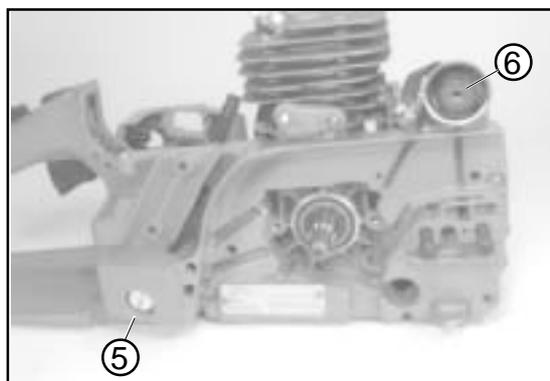
## 08 Vibration damping system, handle



### 08-01 Removing and fitting the handle

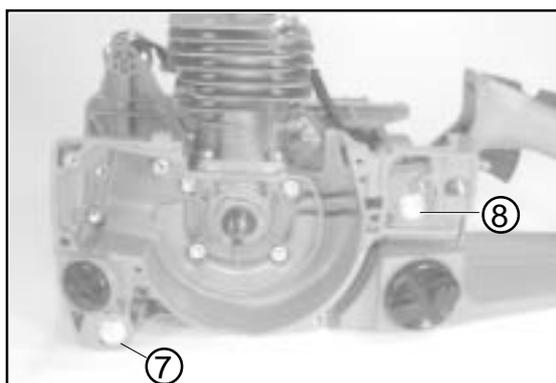
For the removal of the handle unscrew

- (1) 2 x tank screws (lateral)
- (2) 2 x tank screws (bottom)
- (3) 1 x vibration damper
- (4) catching band.



### 08-02 Replacing the vibration damper (KS)

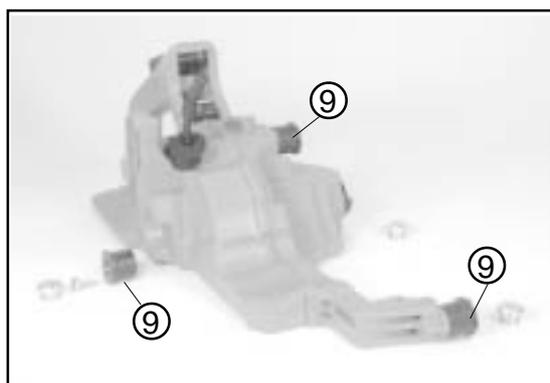
Unscrew screws (5), (3) + (4). Always use special tool, no. 944 500 621 when removing or fitting vibration dampers (6).



### 08-02 Replacing the vibration damper (MS)

Remove screws (7) + (8), and using a Torx spanner unscrew the screws located underneath.

Note: screw(8) is located under the auxiliary filter.



### 08-02 Damping system design

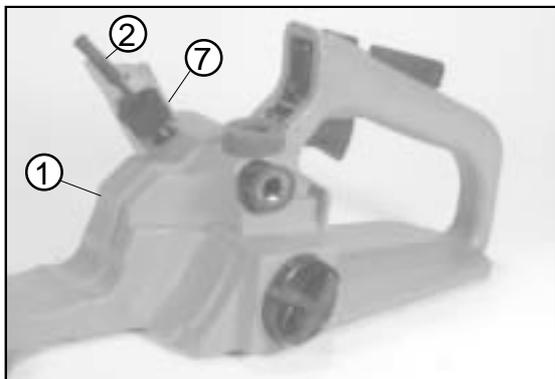
Three identical vibration dampers (9) are provided on the tank housing.



### 08-03 Damper system design

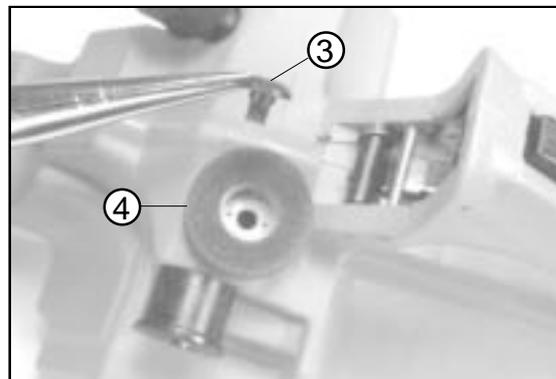
The fourth vibration damper (6) with pot (10) and catching band (4) is located between the supporting web (11) and the crankcase.

## 09 Fuel tank



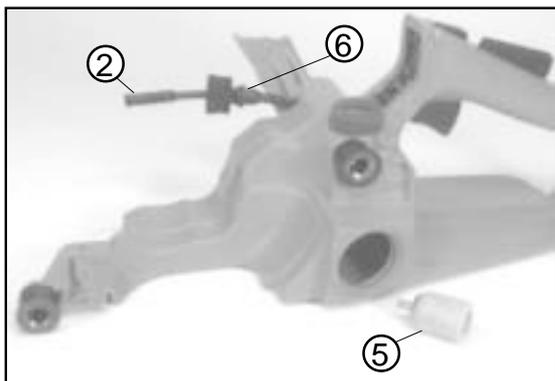
### 09-01 Removing and installing the fuel tank

For the removal of the fuel tank (1) it is necessary to remove the vibration damper (08-02). Separate the fuel pipe (2) from the carburettor (06-02). Install seal (7) between tank and bottom part.



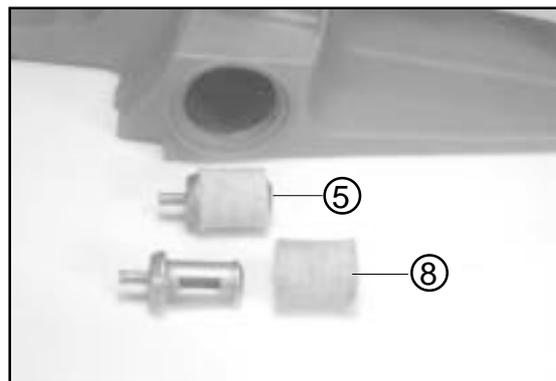
### 09-02 Replacing the ventilation valve

Remove carburettor (06-02) and bottom (07-06). Using a pair of pointed pliers, remove the ventilation valve (3) from the tank. Seal (4) will prevent contamination of the ventilation valve.



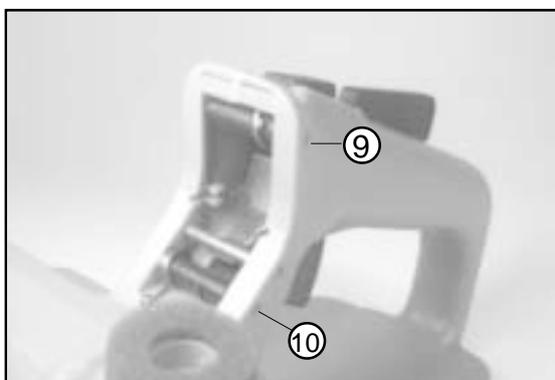
### 09-03 Replacing the fuel pipe

For the removal of the fuel pipe (2) withdraw the intake head (5) and withdraw the fuel pipe from the tank. When installing the fuel pipe, ensure that the sealing face (6) rests close against the tank.



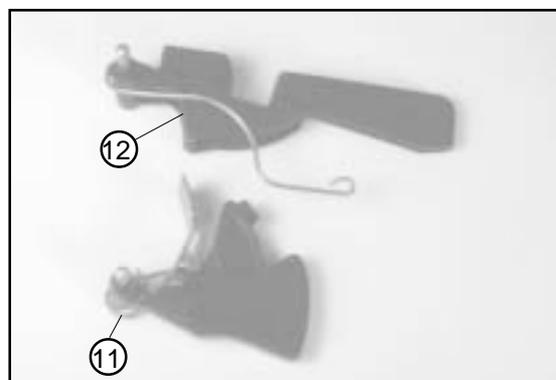
### 09-04 Replacing the intake head

Separate the intake head (5) from the fuel pipe. Note: The felt (8) can be replaced as an individual part.



### 09-05 Removing the throttle lever and the starting throttle locking system

For this purpose push out the cylindrical pins (9) + (10). Remove the throttle lever and torsion spring (11).

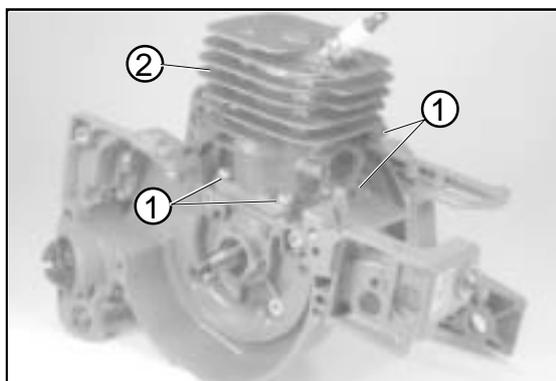


### 09-05 Removing the throttle lever and the starting throttle locking system

Remove the half-throttle and compression spring (12) from the housing.

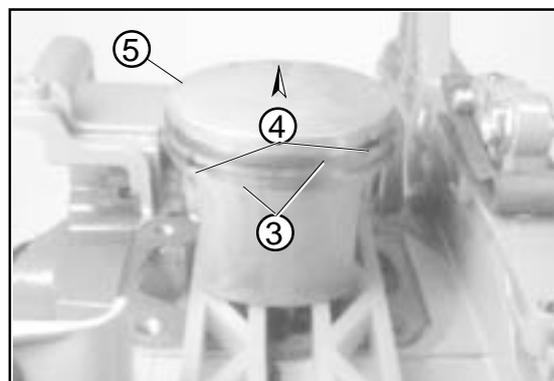


## 10 Cylinder and piston



### 10-01 Removing the cylinder

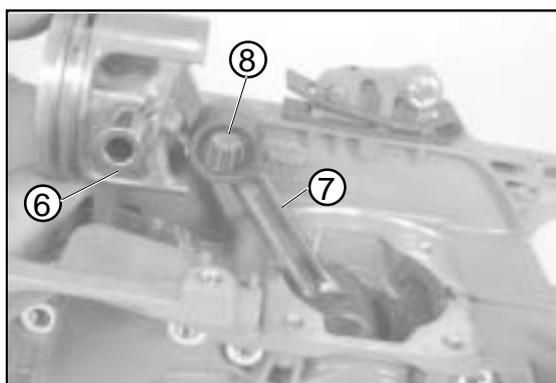
To remove the cylinder, unscrew the four cylinder attachment screws (1). Lift off the cylinder from the housing and piston.



### 10-01 Replacing the piston rings

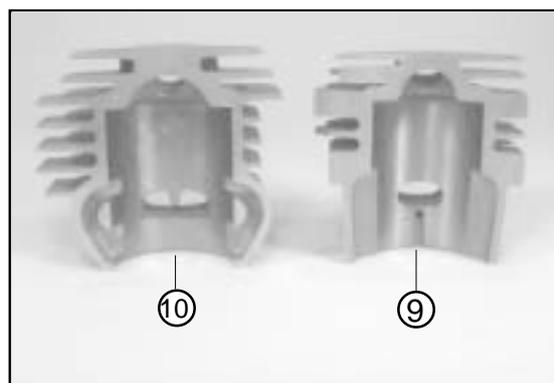
Spread the piston rings (3) at the ring cap (4) and carefully remove the piston (5).

Note: When assembling, ensure that the arrow points to the silencer.



### 10-01 Removing the cylinder

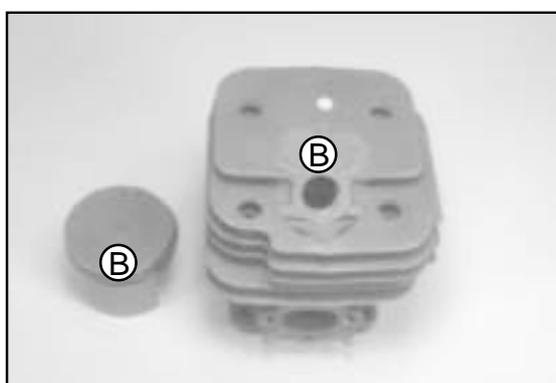
Remove the gudgeon pin retaining ring and press out the gudgeon pin (6). Remove the piston from piston rod (7) with bearing (8).



### 10-01 Different cylinder design

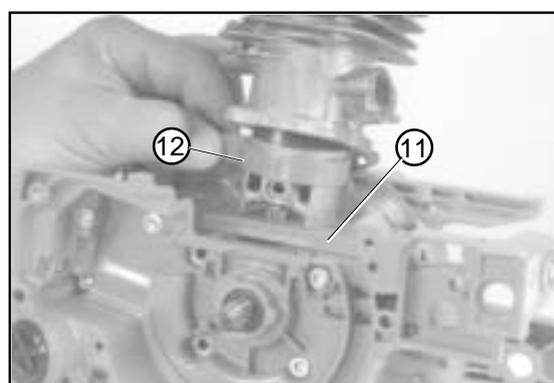
Die cast cylinder (9) for models 109/111 and piston with one piston ring.

Henkel cylinder (10) for models 110/115 and two piston rings.



### 10-01 Cylinder and piston marking

In case of Henkel duct cylinders, piston and cylinder are precision-machined to form a single assembly. The identification A, B or C can be found on the top part.

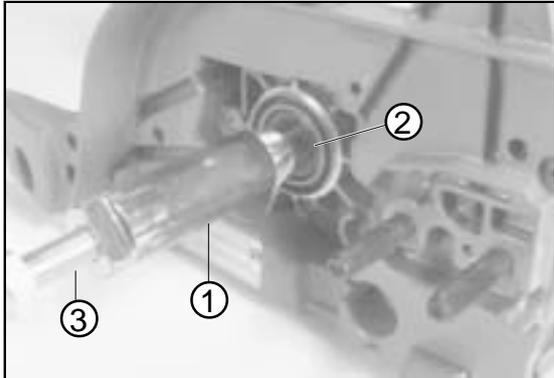


### 10-01 Installing the cylinder

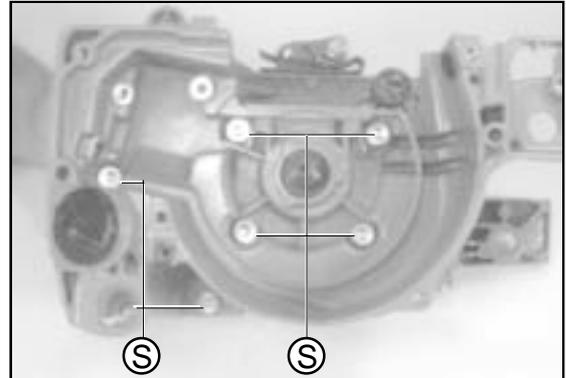
Place the fork (11), no. 944 600 001, on the crankcase, align the piston rings (3) and compress them using the tension band (12). Pass the cylinder over the piston while sliding the tension band downwards.



## 11 Crankcase, crankshaft



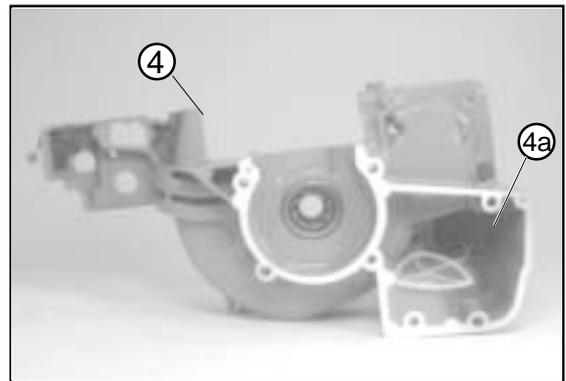
**11-01 Replacing the radial sealing rings**  
Tightly screw tool (1), no. 944 500 900, into the sealing ring (2) and withdraw it from the crankcase by means of the spindle (3).



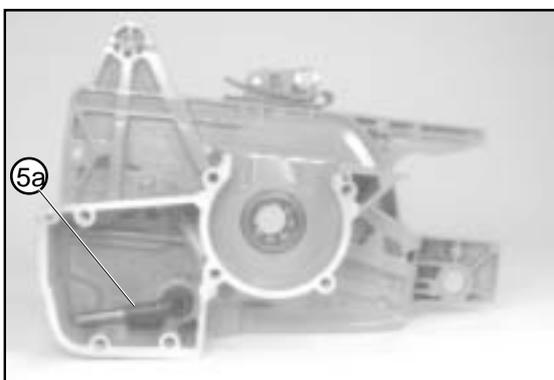
**11-03 Dismantling the crankcase**  
For dismantling the crankcase and oil reservoir remove the seven attachment screws.



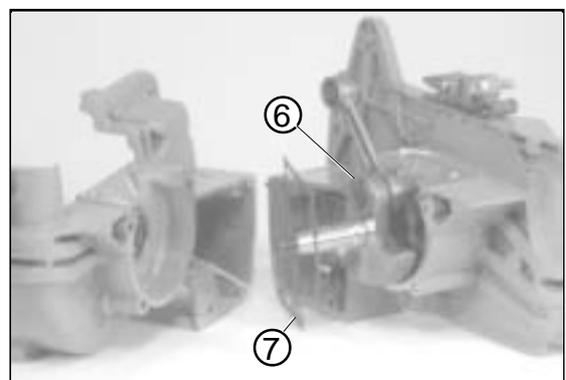
**11-03 Removing the crankcase**  
After removing the attachment screws, separate the crankcase using a plastic hammer.



**11-03 Crankcase is divided**  
into a magnet side -MS- (4) including the oil reservoir (4a) and tank closing mechanism.



**11-03 Crankcase is divided**  
into a clutch side -KS- (5) including the oil reservoir and the intake pipe (5a).  
Note: Housings supplied as spare parts are already fitted with needle bearings and radial sealing rings.



**11-03 Assembling the crankcase halves**  
Start by inserting the crankshaft (6) into the -KS- half. Place the seal (7) and press both halves together.



## 12 Checking operations



### 12-02 Checking the ignition system

Use tester no. 956.010.300 for checking the ignition system / spark plug.



### 12-03 Checking the carburettor

For in-situ checking of the carburettor separate the fuel pipe from the connection nipple. Fit pressure tester no. 965.004.000 to the connection nipple.



### 12-03 Checking carburettor and crankcase

Pressure-testing of the carburettor or crankcase is to be performed at max. 0.5 bar.



### 12-04 Use a torque wrench for tightening screwed connections

Cylinder base screw, crankcase screws, silencer screws, the flywheel nut and the clutch hub, must be tightened using the prescribed torque.



### 12-05 Checking the crankcase with cylinder

For pressure-testing the crankcase blank off the exhaust duct using flange no. 944 603 030. Screw flange no. 944 603 020 to the inlet duct.

## Torques

| <b>Assy. set</b>           | <b>Type</b> | <b>109/110i/111/111i/115i</b> |
|----------------------------|-------------|-------------------------------|
| <b>Muffler</b>             |             | <b>8,5 + 0,5</b>              |
| <b>Crankcase</b>           |             | <b>10,0 + 1,0**</b>           |
| <b>Cylinder</b>            |             | <b>10,0 ± 1,0**</b>           |
| <b>Ignition Coil</b>       |             | <b>6,0 + 1,0</b>              |
| <b>Turbular handle</b>     |             | <b>2,7 + 0,3</b>              |
| <b>Rubber buffer</b>       |             | <b>2,0 ± 0,2</b>              |
| <b>Intermediate flange</b> |             |                               |
| <b>Carburattor</b>         |             | <b>5,0 + 0,5</b>              |
| <b>Clutch hub</b>          |             | <b>35,0 + 0,5</b>             |
| <b>Flywheel</b>            |             | <b>25,0 + 5,0</b>             |
| <b>Spark plug</b>          |             | <b>25,0 ± 5,0</b>             |