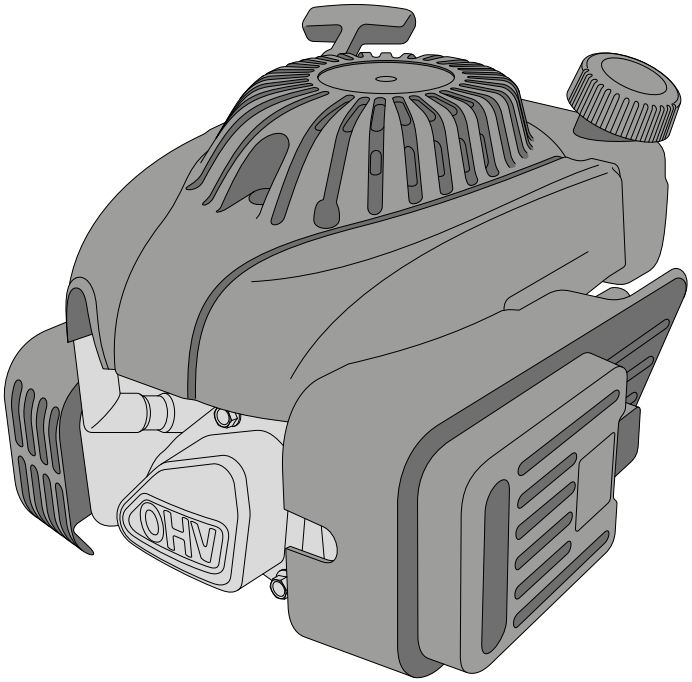
STIGA

RS100 - RSC100

WORKSHOP MANUAL

Rel. 0.0		PRODUCTION YEAR 2018

The manufacturer reserves the right to make all the necessary technical or commercial improvements to its products, so there may be some differences between the series of engines and the contents of this manual. However the basic specifications and different operating procedures will remain the same.



IMPORTANT NOTICE : The information contained herein is intended for Service Operations and professionals only, able to competently perform the operations described herein, using the appropriate equipment in order to safeguard se-curity and performance of the machine. The manufacturer is not liable for damages or injuries arising from operations performed by individuals or inadequate facilities.

ALPINA Mountfield ATCO CASTELGARDEN

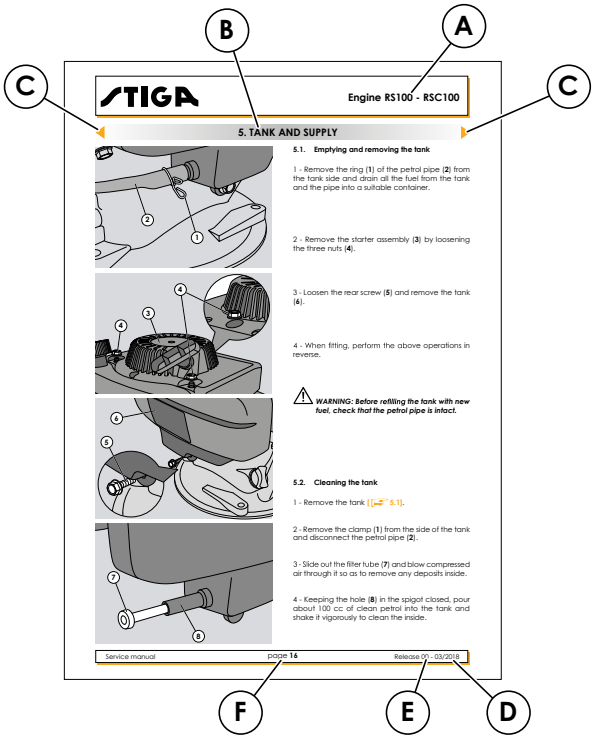
CONTENTS

CONTENTS

INTRODUCTION

The purpose of this manual is to provide to Service Centres the information necessary for a correct maintenance, dismantling and repair procedure for **engines RS100** and **RSC100**.
Interventions on the engine must be performed in accordance with instructions in the following pages and with safety regulations in force in the country in which the engine is operated, and only by authorised and appropriately trained personnel.

In every manual page the following informations are described:



A: Motor typ for which the page is valid.

B: Reference to the chapter and the argument with the relative numbering.

C: Presence of previous or following chapters from the present chapter.

D: Issue date or possible audit.

E: Audit number.

F: Page progressive numbering.

Certain symbols are used in the manual, highlighting particularly important information, risks, warnings and prescriptions:

Warns of operations that should be carried out with utmost care to avoid impairing the functionality and safety of the lawnmower.

Warns of operations that should be carried out with utmost care to avoid injury to the operator.

NOTE: Refers to specific advice by the manufacturer.

Reference to another procedure or part of the manual.

Recommends that washers and O-rings are checked and replaced if necessary.

Refers to use of special tools.

Shows all the operations requiring different intervention methods depending on the engine version.

NOTE: During the description of procedures, the indications "right", "left", "front", "rear", "upper" and "lower" refer to the engine mounted on the lawn tractor seen from the user's perspective.

Please read all the contents of this manual to become familiar with the basics of the engine, which is fundamental for operating in a logical manner without making errors or wasting time.

1. RULES AND PROCEDURES FOR SERVICE CENTRES

1.1. Guarantee validity

The warranty is supplied under the terms, procedures and limits stated in the contract.

1.2. Service repairs after guarantee period

The Service Centre must write a report for each intervention containing the serial number of the engine [[☞ 3.1], and summary information about the problems complained of, the intervention made and possible spare parts used..
A copy of these reports must be kept and made available to the manufacturer together with the replaced parts, in case clients should make further complaints.

1.3. Fault notification

The manufacturer should be informed of all faults that recur frequently; this allows it to carefully examine the problem and make corrections on the production line.
Similarly, the manufacturer shall report any faults traced on its engines, indicating the best troubleshooting procedure.

1.4. Spare parts request

When asking for spare parts, you must quote their code by referring to the exploded views corresponding to the year of manufacture reported on the nameplate [[☞ 3.1].

2. GENERAL AND SAFETY REGULATIONS

IMPORTANT: Before commencing with any intervention, carefully read the information provided in the present manual, in particular the following safety regulations.

2.1. Qualification of operators

All maintenance, disassembly and repairs must be carried out by expert mechanics who are familiar with all the accident prevention and safety regulations after reading through the procedures in this manual.

2.2. Safety measures

All the engines are built in conformity with the European safety regulations in force.
To maintain initial safety levels in the long term, the Service Centre should take proactive measures by making checks whenever possible.
Every time you are asked to service the engine (or the lawnmower on which it is installed), you should:

- check:

- **that the safety devices function correctly;**
- **that the casings and protection covers have not been removed;**
- **that the nameplates or specification labels have not been removed or made illegible, (as they form an integral part of the safety devices).**

- also:

- **restore to proper working order any safety devices which have been manipulated or removed;**
- **replace ineffective, damaged or missing guards and covers;**
- **replace illegible labels;**
- **do not carry out operations or modifications on the lawnmower or on the engine that could affect their performance or lead to an improper or different use from the one for which it has been designed and approved;**
- **warn the customer that the failure to comply with the above points automatically voids the warranty and the responsibility of the manufacturer.**

2.3. Precautions during servicing

As well as following the usual accident prevention regulations that apply to most repair shops, we recommend you:

- **disconnect the spark plug cap before servicing;**
- **protect hands with suitable working gloves, especially when working near the cutting unit;**
- **check that you do not cause accidental petrol leaks or other losses;**
- **do not smoke when working on the tank or when handling petrol;**
- **do not inhale oil or petrol fumes;**
- **clean up all traces of spilt petrol immediately;**
- **do not pollute the environment with oil, petrol or other waste and dispose of all waste in accordance with the laws in force.**

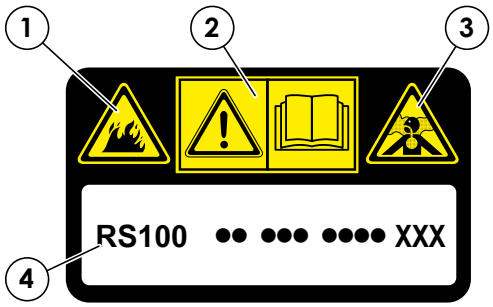
Exhaust gas contains carbon monoxide, which is highly toxic, odourless and colourless. Avoid inhaling.

- **Perform tests on the engine in a well-ventilated environment or in the presence of adequate exhaust gas extraction systems.**

2. GENERAL AND SAFETY REGULATIONS

2.4. Warning labels

On the canopy motor, in a immediately identification position, are some indication or prescription plates for the safety operator.
The plates are as follows:



1 - Fire hazard due to:
- Petrol or oil
Prevent by following the precautions below:
- Do not smoke or ignite a flame in the vicinity of the petrol or oil;
- Turn engine off before adding petrol;
- Do not spill petrol on overheated or electric parts of the engine;
- Handle or store petrol or oil in well-ventilated areas;
- Use non-flammable oil for cleaning engine parts.

- Accumulation of flammable material
Prevent by following the precautions below:
- Remove dry leaves, chips, pieces of paper, dust or other flammable material which has accumulated in or is attached to the engine.

- Electrical cabling
Short circuits can cause fires. Prevent by following the precautions below:
- Always keep the electrical connections of the machine clean and tightly sealed;
- Tighten any loose connectors or cabling clamps. Replace those that are damaged.

2 - Observe the instructions and warnings contained in the present manual and on the safety plates on the engine.
Inappropriate functioning and maintenance can result in serious injury or even death.

3 - Ventilation of closed areas:
In the event that it is necessary to start the engine in a closed environment or if petrol or cleaning oil is being used, open doors and windows to ensure adequate ventilation and, therefore, avoid gas poisoning.

4 - Motor label (see [[☞ 3.1])

2.5. Necessary equipment

All the operations can be carried out with the tools normally used in a good garage.

The  , symbol used for certain interventions indicates that special tools or equipment are recommended.

2.6. Symbols and terms used for safety purposes

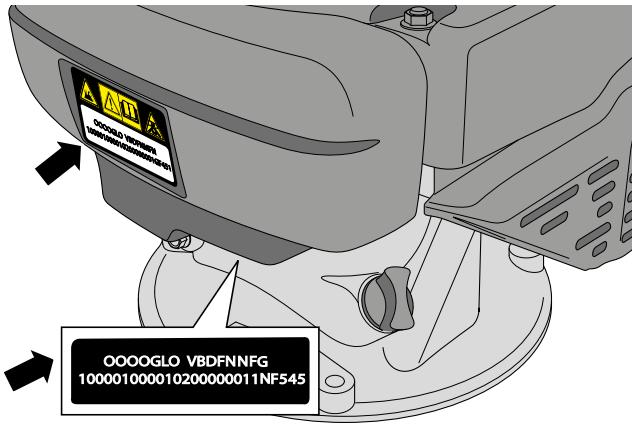
Some paragraphs in this manual are preceded by symbols which indicate the following:

 ***Operations that should be carried out with utmost care to avoid impairing the functionality and safety of the engine and/or lawnmower on which it is installed.***

 ***Operations that should be carried out with utmost care to avoid injury to operators.***

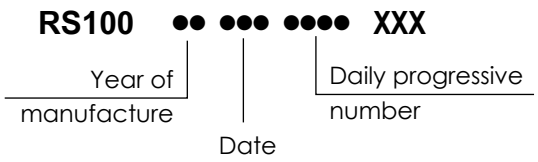
"WARNING" stresses the risk of injury to oneself and others if instructions and regulations are not observed.

3. TECHNICAL DATA AND SPECIFICATIONS



3.1. Identification

Every motor is marked with a serial number on the base and applied on the canopy; this serial number characters and can identify:



The serial number must be reported on every operating sheet in the warranty application and is fundamental for identifying and ordering spare parts.

3.2. Technical data

	RSC100	RS100
Displacement	100 cc	
Bore	58 mm	
Stroke	37,8 mm	
Compression ratio	8,5 : 1	
Minimum speed (SLOW) (r.p.m.)	1800 (±100)	-
Maximum speed (FAST) (r.p.m.)	2900 (±100)	2800 (±100)
Fuel tank capacity	0,85 litres	
Oil sump capacity	0,40 litres	
Dry weight	7,80 kg	

3.3. Adjustments

Distance between spark plug electrodes	0,6 - 0,8 mm
Coil air gap	0,35 - 0,45 mm
Inlet valve clearance	0,15 - 0,20 mm
Exhaust valve clearance	0,15 - 0,20 mm

3.4. Expendable materials

		RSC100	RS100
Petrol		Unleaded (green) minimum 90N.O.	
Engine oil	- da 5 a 35 °C - da -15 a + 35°C	SAE 30 10W30	
Spark plug		GGP K7 RTC	
Starter rope		ø 3x2350 mm	

3.5. Limiti di utilizzo

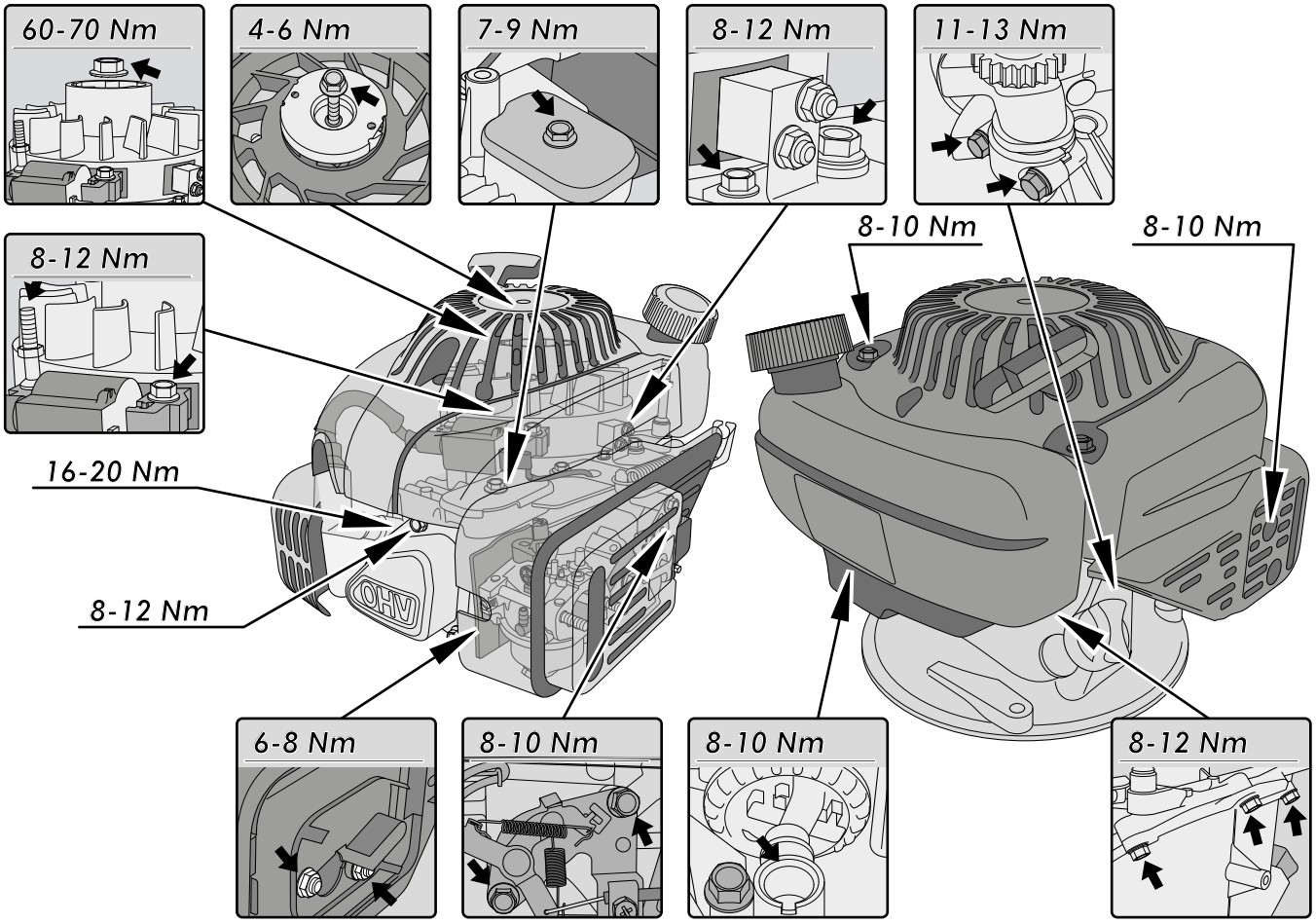
The following table gives the use limits of certain components subject to wear, after which the component must be replaced.

		RSC100	RS100
Minimum inlet valve stem diameter		5,45 mm	
Minimum exhaust valve stem diameter		5,42 mm	
Minimum inlet valve head rim thicknesse		0,6 mm	
Minimum exhaust valve head rim thickness		1,0 mm	
Minimum valve spring length		29,4 mm	
Maximum gap between ends of cylinder rings		0,8 mm	
Max. axial gap for compression rings		0,12 mm	
Minimum gudgeon pin diameter		11,95 mm	
Max. gudgeon pin-piston seat diameter		12,05 mm	
Maximum connecting rod diameter	gudgeon pin side	12,05 mm	
	crank side	24,07 mm	

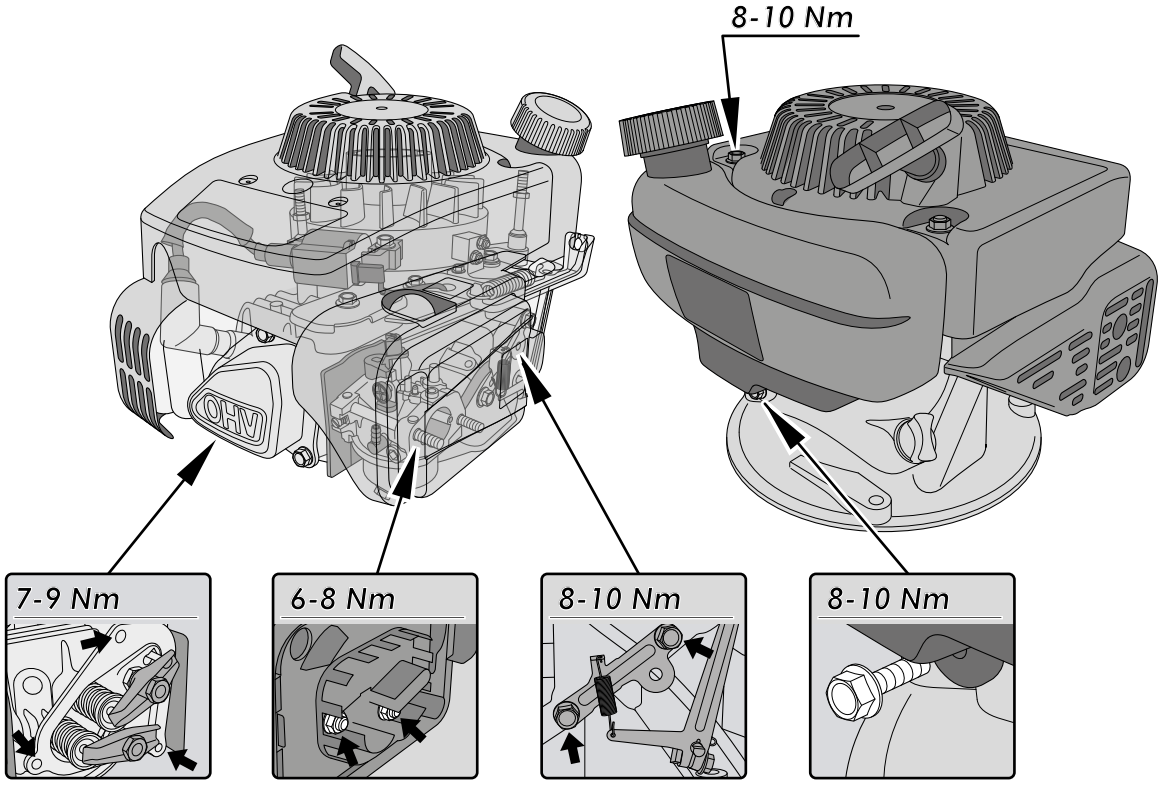
3. TECHNICAL DATA AND SPECIFICATIONS

3.6. Tightening torques

Mod. RSC 100



Mod. RS 100



3. TECHNICAL DATA AND SPECIFICATIONS

3.7. Table of Tightening torques

Chapter Ref.	Description of screw	Tightening torques
5	Assembly fixing nut	8 - 10 Nm
5	Tank fixing screw	8 - 10 Nm
6	Fixing nuts, starter assembly	8 - 10 Nm
6	Starter screw	4 - 6 Nm
8 - 9	Fixing nuts carburettor and filter	6 - 8 Nm
10	Support screw, governor assembly	8 - 12 Nm
11 - 14	Spark plug tightening torque	16 - 20 Nm
11	Fixing screw reel	8 - 12 Nm
11	Coil fixing stud	8 - 12 Nm
12	Brake support screws	8 - 12 Nm
13	Muffler fixing nuts	8 - 10 Nm
13	Muffler fixing screw	8 - 10 Nm
14	Screws valve cover	7 - 9 Nm
14	Fan fixing nut	60 - 70 Nm
14	Blow-by closure plate screw	7 - 9 Nm
15	Union screws under carter and sump	8 - 12 Nm
15	Counterweight governor fixing screw	8 - 12 Nm
15	Fixing screws lower connecting rod cap	11 - 13 Nm

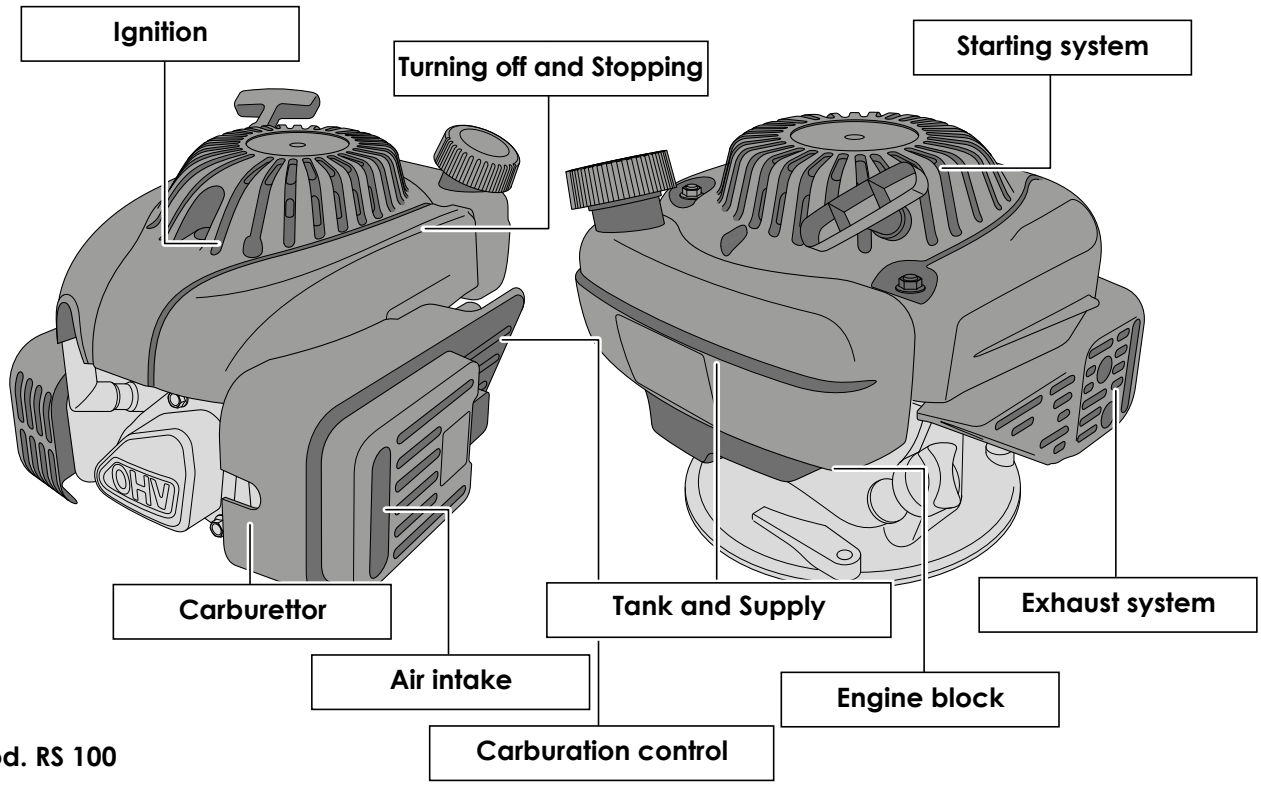
P.S. For the coupling tourque of all standard screws refer to the single table.

3. TECHNICAL DATA AND SPECIFICATIONS

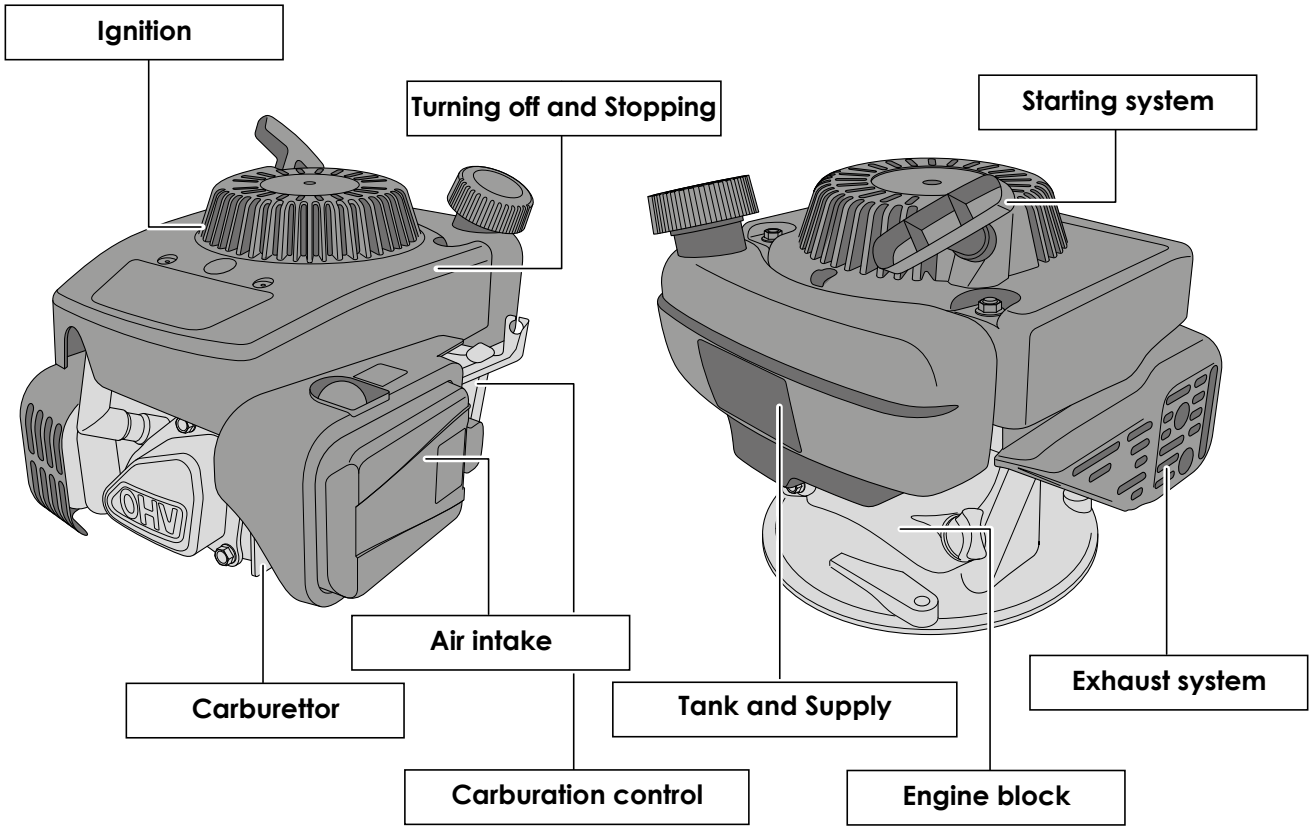
3.8. Identification of engine units

For ease of reference, this manual has subdivided maintenance operations into different sections, each of which refers to an engine component unit as indicated in the diagrams below.

Mod. RSC 100



Mod. RS 100



4. ENGINE TUNING AND TESTING

4.1. Operating guidelines

The engine requires a series of interventions (shown in the table below) in order to ensure minimum basic maintenance.

Operation	First 5 hours	Every 5 hours or daily	Every 25 hours or every season	Every 50 hours or every season	Every 100 hours
Check oil level	-	■	-	-	-
Change oil *(1)	■	-	-	■	-
Clean muffler and engine	-	■	-	-	-
Check air cleaner *(2)	-	■	-	-	-
Replace air cleaner *(2)	-	-	■	-	-
Check spark plug	-	■	-	-	-
Replace spark plug	-	-	-	■	-

*(1) Replace the oil every 25 hours if the engine is working at full load or at high temperatures.
*(2) Clean the air filter more often if the machine is working in dusty areas.

For the operations that are not difficult for the final user the assistance centre must maintain the motor in perfect efficiency, in accordance with two intervention lines:

- Tuning the engine whenever possible.
- Recommending the client a routine maintenance program at set intervals (e.g. at the end of the season or before a long period of inactivity).

4.2. Engine tuning program

As part of general engine tuning or any intervention on the lawn tractor, it is recommended that the Service Centre performs a series of operations aimed at maintaining the engine's efficiency.

Tuning should involve:

- external blowing and cleaning the cylinder head, cylinder and muffler by removing any remains of grass and mud;
- checking the oil level, topping up or replacing parts if necessary;
- inspecting the condition of the starter rope and checking that it functions correctly [[☞ 6.2]];
- cleaning and oiling the air filter [[☞ 7.1] e [[☞ 7.1a]];
- emptying and cleaning the fuel tank and checking the breather pipe [[☞ 5.2]];
- adjusting minimum [[☞ 8.3] and maximum speeds [[☞ 10.2] **(➤ RSC100)**
- adjusting maximum speeds [[☞ 10.2a] **(➤ RS100)**;
- inspecting the condition of the spark plug; checking the distance between the electrodes [[☞ 11.1]];
- tightening the screws [[☞ 15.2]];
- functional test [[☞ 4.3]].

Should the checks and adjustments fail to achieve a satisfactory result, refer to chapter [[☞ 16]] for troubleshooting.

4. ENGINE TUNING AND TESTING

4.3. Functional test

A functional test needs to be carried out at the end of each servicing operation, to check that the operations made are effective. The test must be performed in compliance with the safety regulations regarding the use of the lawnmower on which the engine is installed.

The functional test is carried out as follows:

a. Refuelling and checking the supply system

When you have refuelled the tank with new petrol, check the seal of the tank, the cap and the carburettor pipe.

b. Cold starting test (➢ RSC100)

With the throttle control in "CHOKE", start the engine a few times to check it runs normally.

c. Check the engine rpm

When the engine is hot enough, check the engine speed with the throttle control set to "SLOW" and "FAST" **(➢ RSC100)**; the readings should be equal to the specifications **[[☞ 3.2]**.

d. Hot start test

With the engine hot and the throttle control set to "SLOW" **(➢ RSC100)**, start the engine a few times to check it runs normally.

If all of these operations have a positive result, the engine can be considered fully serviceable and be returned to the client.

5. TANK AND SUPPLY

IMPORTANT: Carefully read the information below before commencing any intervention.

General Information

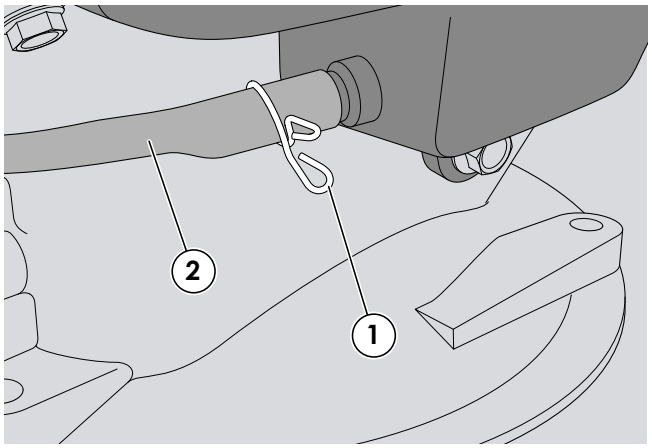
The **fuel supply system** comprises the petrol tank connected to the carburettor by a pipe; a mesh filter at the bottom of the tank prevents deposits and impurities from reaching the carburettor.
The tank is equipped with a filter, located at the bottom of the tank, which prevents deposits and impurities from reaching the carburettor.
The supply to the carburettor float chamber is caused by gravity and the volume of petrol taken from the tank as the engine runs is compensated by a breather pipe in the cap.

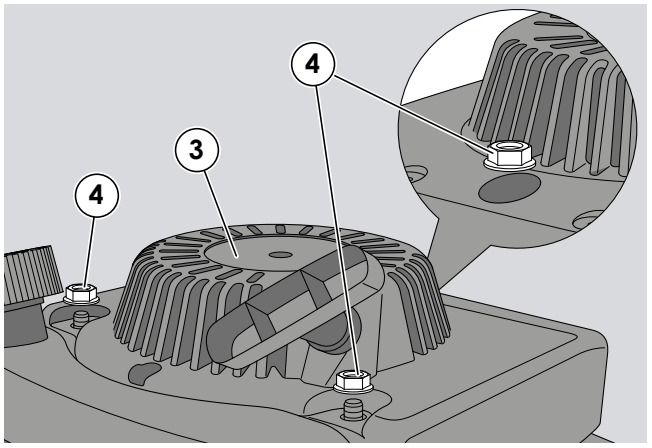
See the relevant section [[☞ 16] for advice on resolving problems due to the malfunctioning of the petrol supply system.

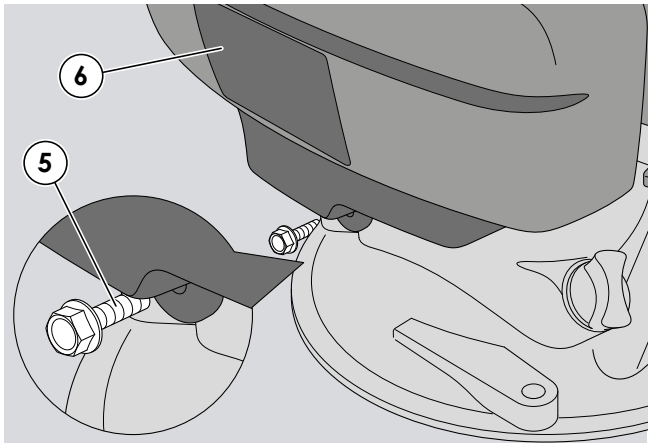
WARNING: All interventions on the supply system must be performed in safe conditions, therefore:

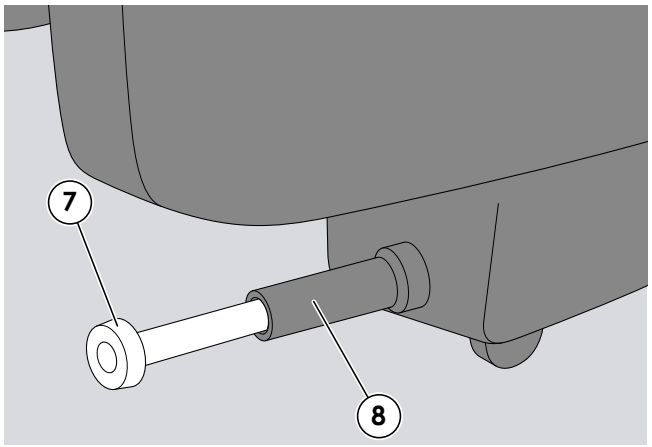
- **do not smoke;**
- **always empty the tank;**
- **work in a ventilated environment away from naked flames or unprotected sources of heat;**
- **collect any remaining petrol by positioning a suitable container under the engine, avoiding soiling the work bench;**
- **remove all traces of spilt petrol immediately;**
- **check you have connected the pipes before pouring petrol back into the tank.**

5. TANK AND SUPPLY









5.1. Emptying and removing the tank

1 - Remove the ring (**1**) of the petrol pipe (**2**) from the tank side and drain all the fuel from the tank and the pipe into a suitable container.

2 - Remove the starter assembly (**3**) by loosening the three nuts (**4**).

3 - Loosen the rear screw (**5**) and remove the tank (**6**).

4 - When fitting, perform the above operations in reverse.

WARNING: Before refilling the tank with new fuel, check that the petrol pipe is intact.

5.2. Cleaning the tank

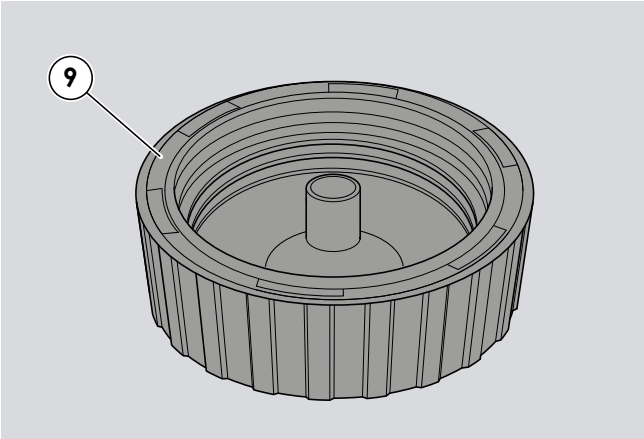
1 - Remove the tank [[☞ 5.1].

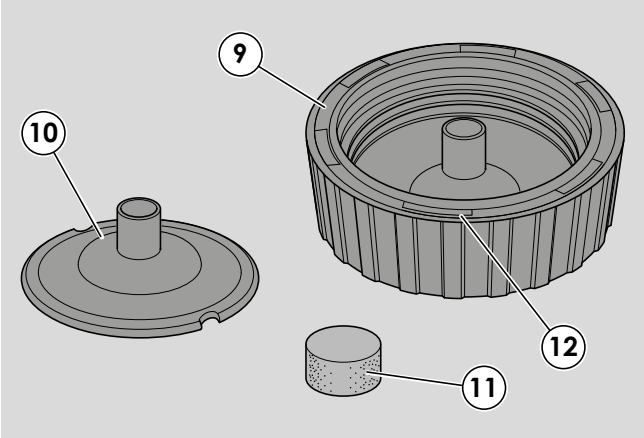
2 - Remove the clamp (**1**) from the side of the tank and disconnect the petrol pipe (**2**).

3 - Slide out the filter tube (**7**) and blow compressed air through it so as to remove any deposits inside.

4 - Keeping the hole (**8**) in the spigot closed, pour about 100 cc of clean petrol into the tank and shake it vigorously to clean the inside.

5. TANK AND SUPPLY





5 - Empty the tank and dispose of the petrol used for cleaning in accordance with the laws in force.

6 - Refit the tank [[☞ 5.1] tightening the screws (**5**) to the torques indicated.

7 - Replace the starter assembly by securing the nuts (**4**) at the specified torque.

WARNING: Before refilling the tank with new fuel, check that the petrol pipe is intact.

5.3. Checking and cleaning the breather pipe

1 - Remove the cap (**9**) and pull out the gasket (**10**) and the sponge (**11**).

2 - Check that:

- the gasket (**10**) is intact and without cracks or fissures;

- the air passages (**12**) inside the cap are not clogged;

- the sponge (**11**) is not crushed or broken.

NOTE: Always replace the entire cap if the gasket or sponge is damaged.

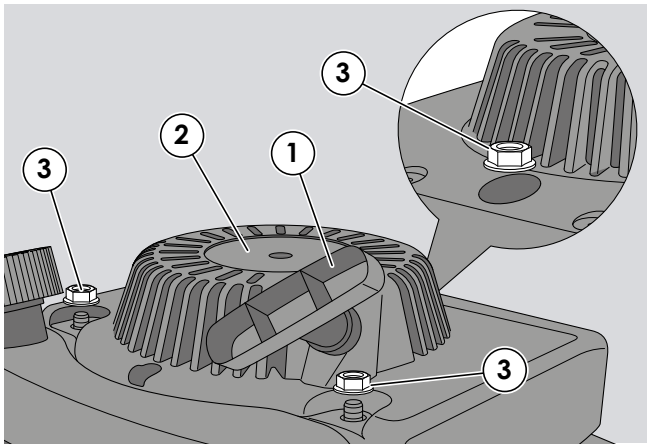
Tightening torques		
4	Assembly fixing nut	8-10 Nm
5	Tank fixing screw	8-10 Nm

6. STARTING SYSTEM

General information

The **starter assembly** inside the cover consists of a rope wound around a pulley. The movement from the pulley to the fan (and therefore to the engine shaft) is transmitted through a pair of couplings. The return of the pulley and the rewinding of the rope are obtained from a spiral spring.

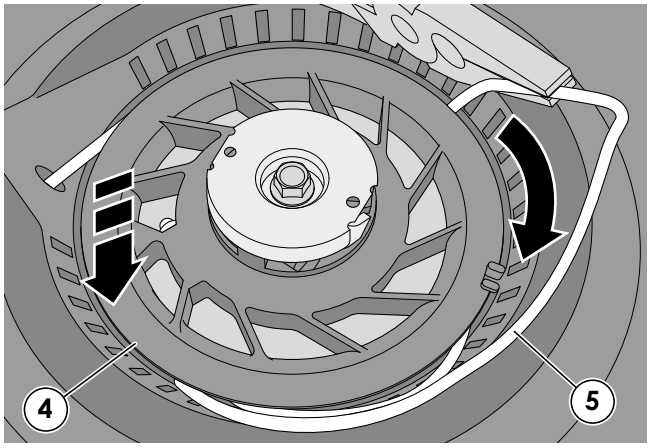
See the relevant section [[☞ 16] for advice on resolving problems due to the malfunctioning of the starting system.



6.1. Removing the starter assembly

1 - To get access to the starter assembly (**1**), the cover (**2**) must be removed by unscrewing the three nuts (**3**).

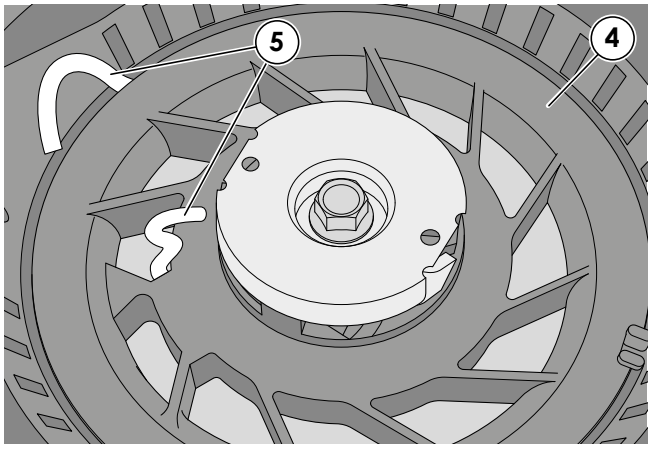
2 - Refit the starter assembly (**1**) by tightening the cover nuts (**3**) to the torque indicated.



6.2. Replacing the rope

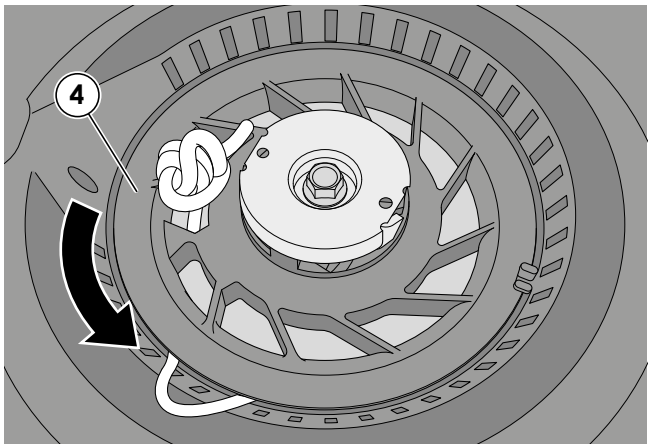
1 - Remove the starter assembly [[☞ 6.1].

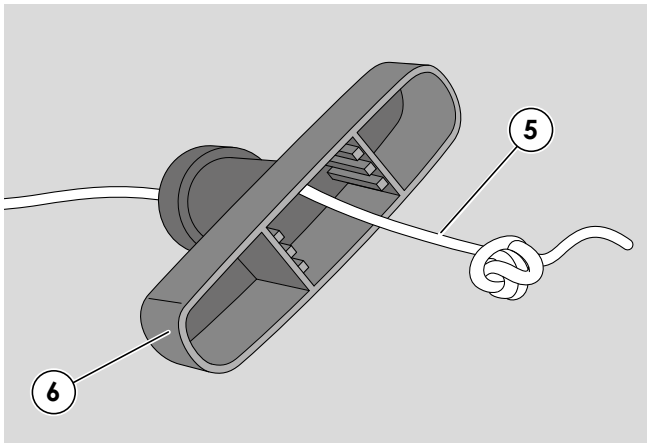
2 - Keep hold of the pulley (**4**) and slowly unwind (clockwise) the entire rope (**5**) to gradually release the return spring.
If the rope breaks, the spring will be already released and you will only have to unwind the rope.

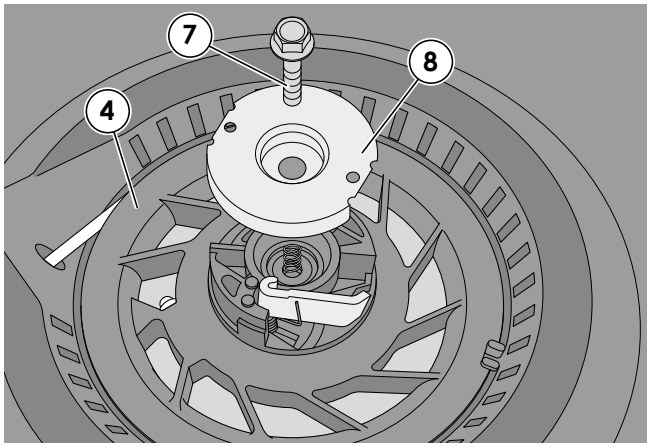


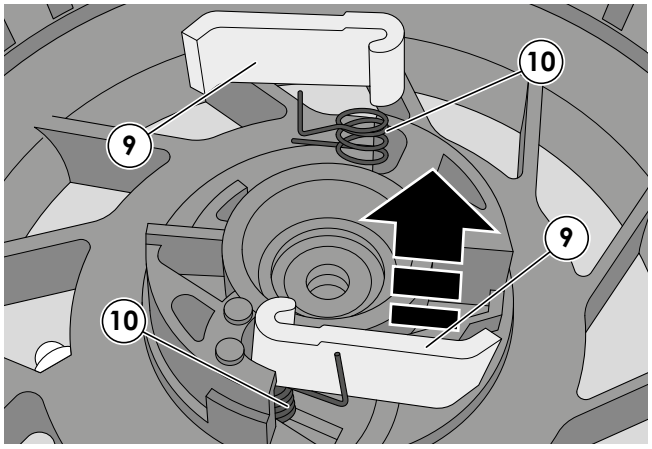
3 - Undo or cut the knot at the end of the rope (**5**) and remove the section still attached to the pulley.

6. STARTING SYSTEM









4 - Rotate the pulley (**4**) through about 6 complete turns anticlockwise in order to load the spring and hold it still.

5 - Insert one end of the rope (**5**) (ø 3mm - length 2350mm) through the guide in the ventilation grille, into the hole in the pulley (**4**), and fasten it by tying a knot.

6 - Insert the other end of the rope into the grip (**6**), fasten it with a knot and carefully release the pulley to allow the rope to rewind itself completely onto the pulley.

7 - Check that the pulley rotates freely.

8 - After pulling the entire length of the rope, check that the pulley (**4**) is able to complete another 2-3 turns before compressing the spring.

9 - Refit the starter assembly [[☞ 6.1].

6.3. Replacing the hooks

1 - Remove the starter assembly [[☞ 6.1].

2 - Loosen the screw (**7**) and remove the cover (**8**), putting the spring to one side. Be careful not to slip the pulley (**4**) off its seat.

3 - Remove the couplings (**9**) and take out the springs (**10**) from their seats.

☑ ***NOTE: Always replace the complete set consisting of hooks, return springs, cover and screw, as a unit.***

4 - When fitting, tighten the screw (**7**) to the torque indicated.

5 - Refit the starter assembly [[☞ 6.1].

☑ ***NOTE: Check that the spring lever (10) is outside the coupling (9).***

Tightening torques		
3	Fixing nuts, starter assembly	8-10 Nm
7	Starter screw	4-6 Nm
Technical information		
Starter rope dimensions		ø 3x2350 mm

7. INTAKE SYSTEM

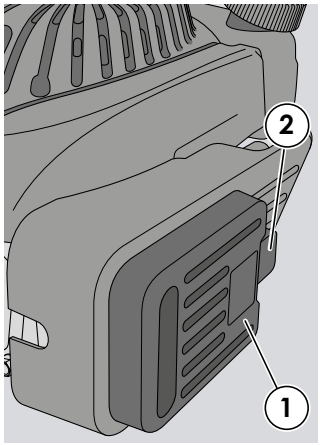
General information

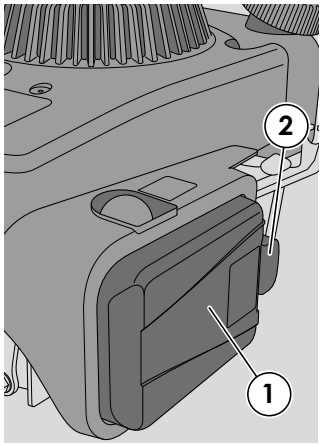
The **intake system** uses an air filter directly connected to the carburettor by means of a manifold which conveys the air/petrol mixture to the inlet valve.

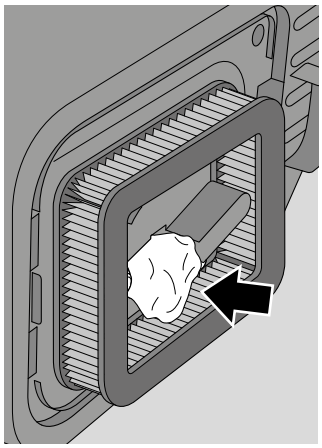
See the relevant section [[☞ 16] for advice on resolving problems due to the malfunctioning of the air intake system.

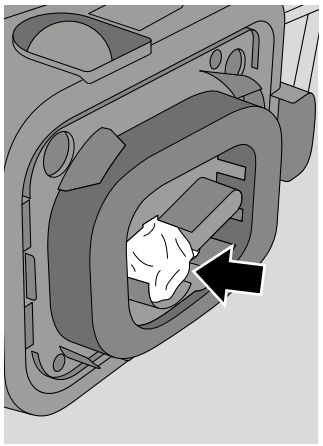
An inefficient filter can let dust or debris enter the cylinder, causing premature wear to the piston rings and cylinder.

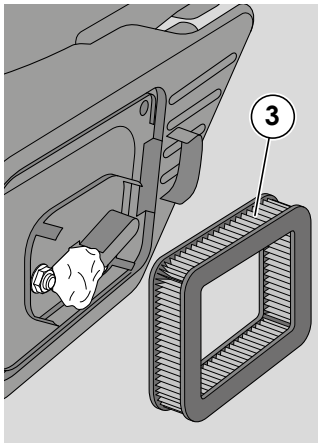
The air filter is found on the left hand side of the engine and can be inspected without having to remove other parts.
The filter assembly is to be removed only to accede the carburettor.

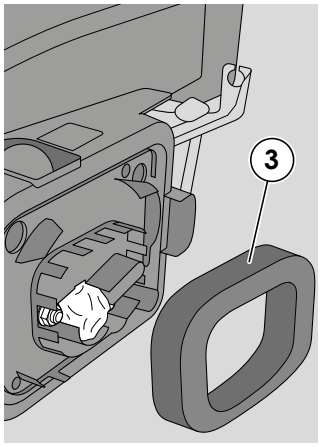












7.1. Maintenance and replacement of the filter element

⚠ ***WARNING: Never run the engine without air filter. The engine would certainly be damaged.***

1 - Clean the area around the filter cover (**1**) by blowing it with compressed air.

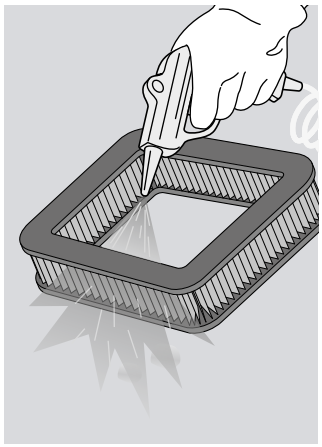
2 - Remove the cover (**1**) by pressing on the upper tab (**2**).

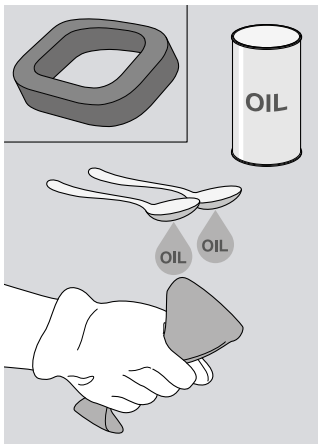
⚠ ***WARNING: Close the intake duct to prevent the entry of foreign objects (see figure).***

3 - Remove the filter element (**3**).

4 - Check carefully that the element has no holes or tears, and replace it, if damaged.

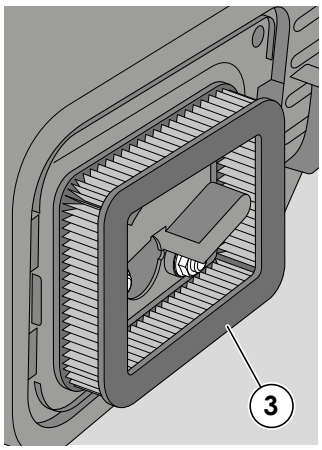
7. INTAKE SYSTEM

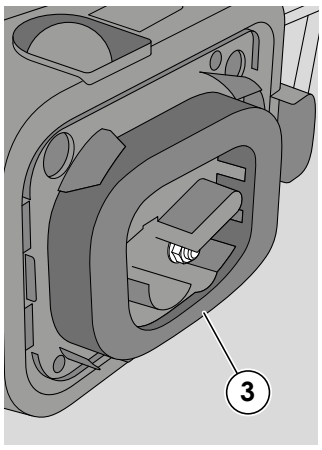




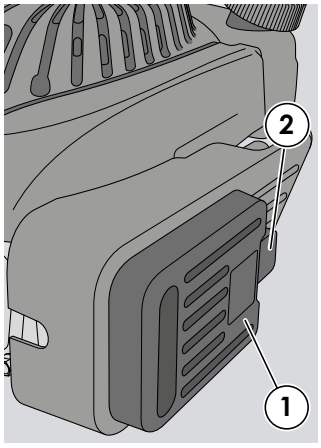
5 - ➢ **Cartridge filter element:** Bang the air filter element on a hard surface so as to remove excess dirt, and blow it through with compressed air, outwards from the inside.
Replace the element if it is too dirty.

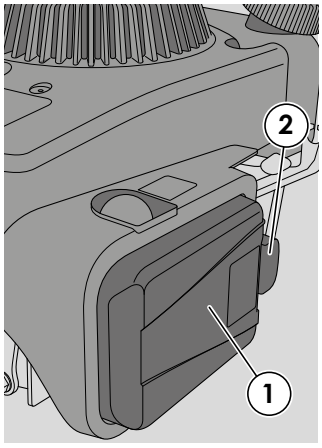
6 - ➢ **Sponge filter element:** Perform the maintenance referred to in the paragraph **[[☞ 7.1a]**.

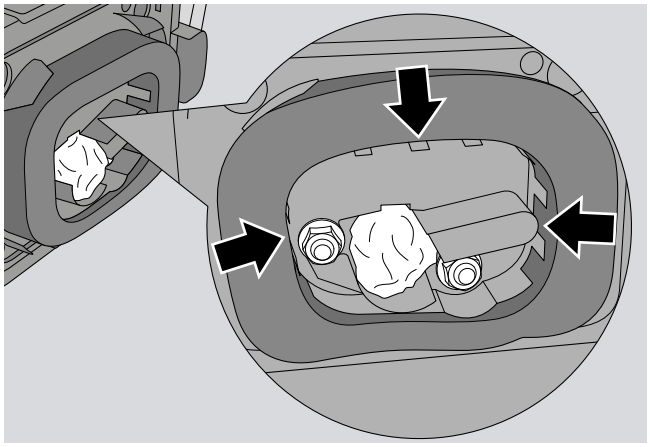




7 - Refit the element (**3**) and the cover (**1**) into their housings, into its housing, paying attention to hook up the clips correctly (**2**).

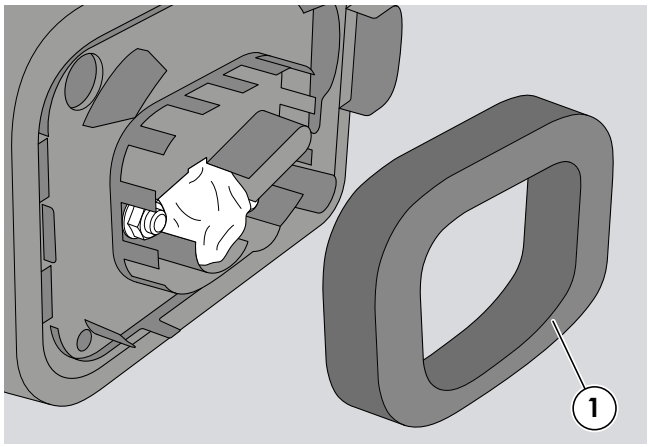


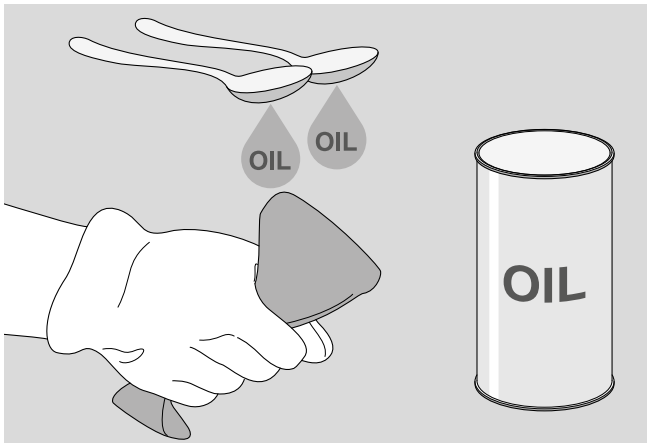




8 - ➢ **model RS100** During the installation of the sponge filter element, make sure it is properly positioned between the tabs, as shown in the figure.

7. INTAKE SYSTEM





7.1a. Maintenance of sponge filtering element (➤ model RS100)

1 - Remove the cover [[☞ 7.1] and remove the filter element (**1**).

WARNING: Close the intake duct to prevent the entry of foreign objects.

2 - Check carefully that the element has no holes or tears, and replace it, if damaged.

WARNING: The filter element must be kept clean and oil soaked and must be replaced if broken, cut or if it is crumbling.
Do not use compressed air to clean the filter element.

3 - Wash the filter element with water and detergent and dry with a clean cloth.

4 - Pour two spoons of clean motor oil onto the element and wring the sponge repeatedly until the oil is evenly spread.

5 - Remove any excess oil with a clean cloth.

6 - Replace the filter element as shown in points 6 and 7 of the paragraph [[☞ 7.1].

8. CARBURATION (➢ valid for RSC100 model)

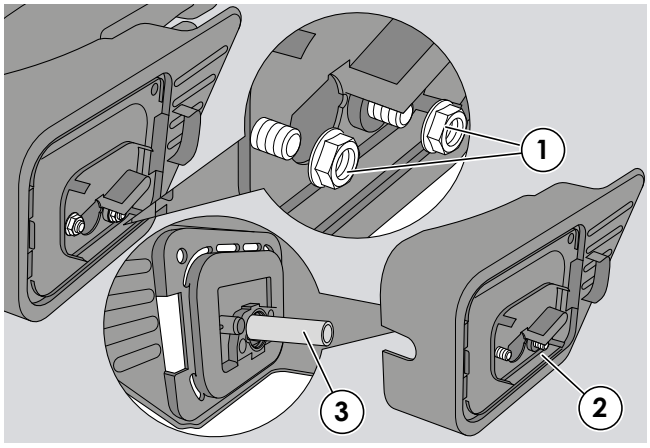
General information

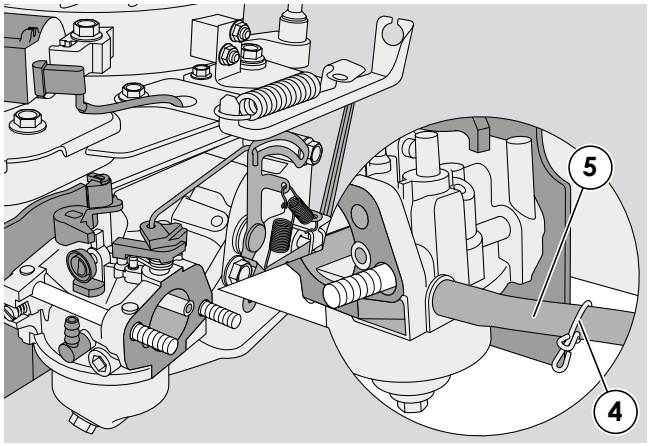
The **carburettor** has a float with a fixed jet and a "CHOKE" control.

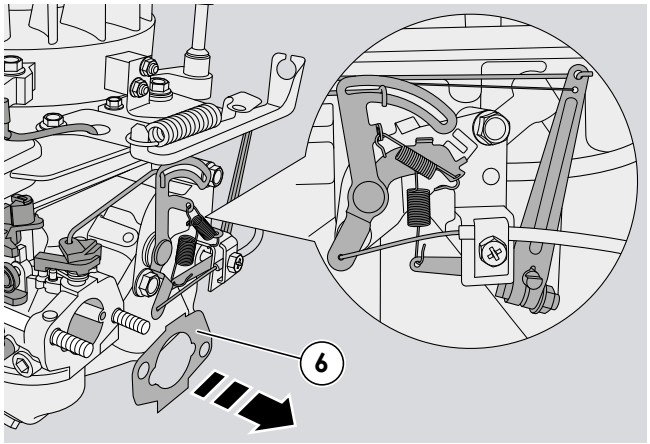
See the relevant section [[☞ 16] for advice on resolving problems due to carburation.

The carburettor is located on the left-hand side of the engine. For maintenance operations it is necessary to dismantle the air intake filter in the sequence shown below.

Dismantle the engine from the machine following the instructions in section [[☞ 15.1].







⚠ ***WARNING! All operations on the tank and supply system must be carried out in safe conditions, so:***

- **do not smoke;**
- **always empty the tank if petrol is not strictly necessary for the operation to be carried out;**
- **work in a ventilated environment away from naked flames or unprotected sources of heat;**
- **collect petrol in a suitable container with a cap using a funnel and avoid spilling it on the work bench;**
- **remove all traces of spilt petrol immediately;**
- **check you have connected the pipes before pouring petrol back into the tank.**

8.1. Removing and cleaning the carburettor

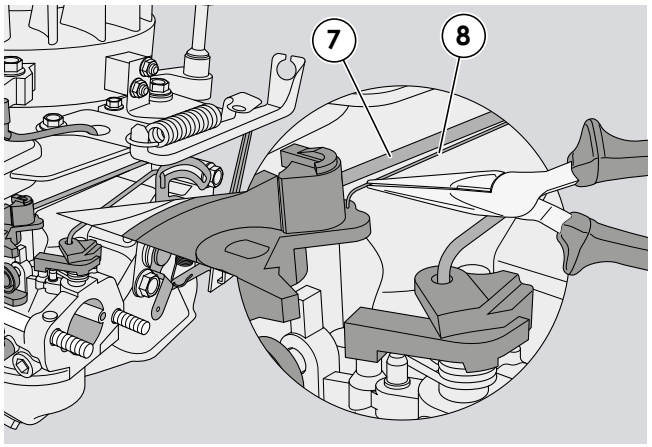
1 - Remove the filter element [[☞ 7.1].

2 - Unscrew the two nuts (**1**) holding the filter carrier (**2**) to the engine and remove it. Pull off the breather tube (**3**).

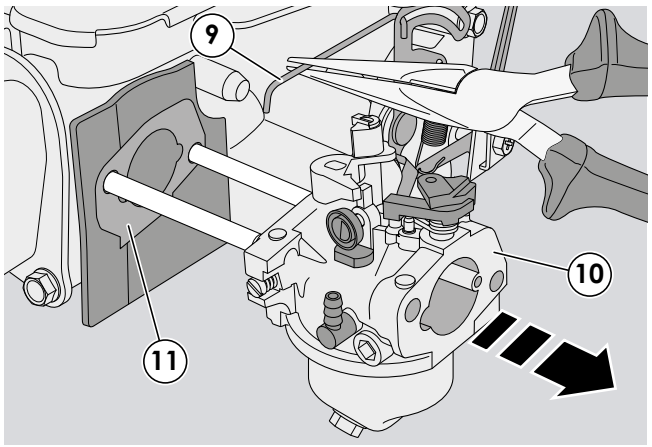
3 - Remove the clamp (**4**) for the petrol pipe (**5**) from the side of the carburettor and use a suitable container to collect all the petrol in the pipe.

4 - Remove the gasket (**6**) and bring the intake throttle rod to a minimum, pulling out the carburettor.

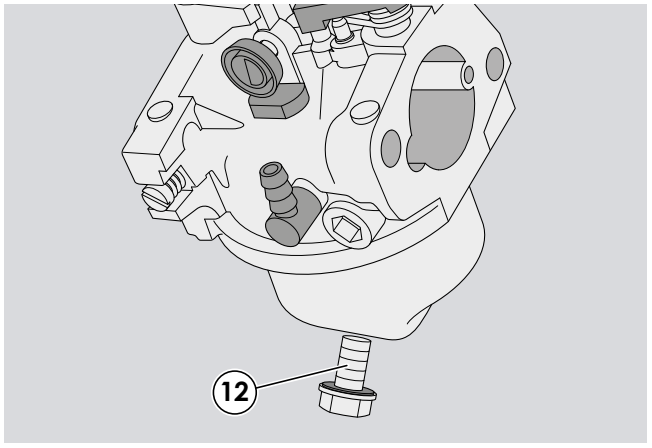
8. CARBURATION (➢ valid for RSC100 model)



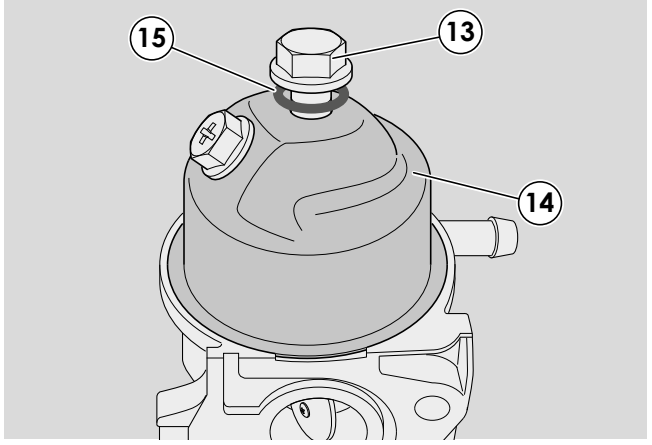
5 - Using pliers, disconnect the intake butterfly rod (**7**) and slide the small rod (**8**) for the relative compensation spring upwards.



6 - Disconnect the wire (**9**) from the choke butterfly lever, completely remove the carburettor (**10**) for the relative compensation spring upwards (**11**).

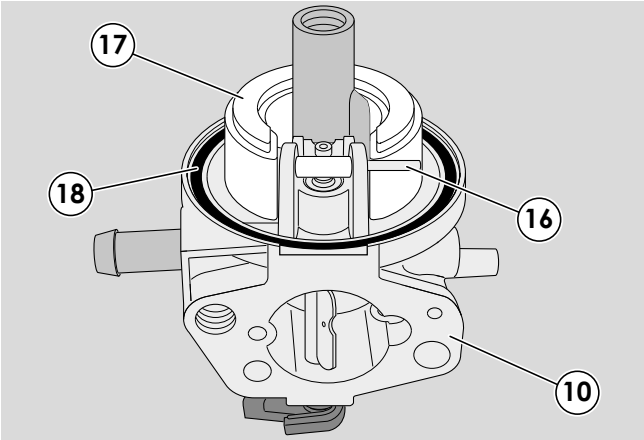


☑ ***NOTE: Empty any remaining petrol from the tank by removing the drain screw (12) as shown in the figure. When finished, replace the screw.***



7 - Unscrew the central screw (**13**) securing the tank (**14**) and remove the corresponding OR (**15**).

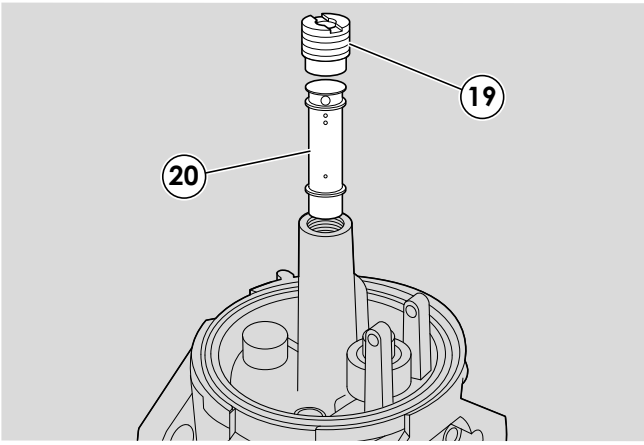
8. CARBURATION (➢ valid for RSC100 model)



8 - Pull out the pin (**16**), dismount the float (**17**) and remove the gasket (**18**).

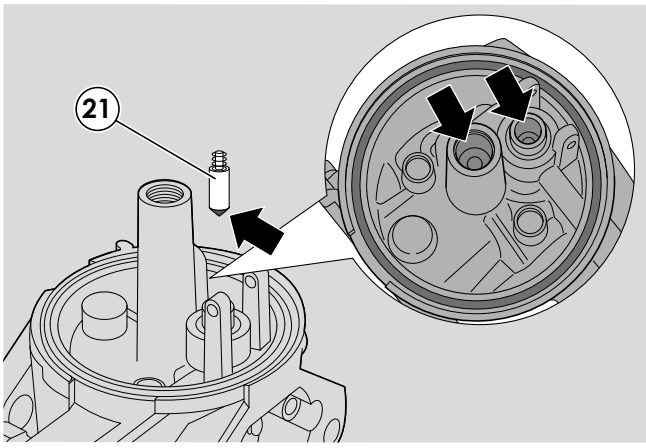
9 - Undo the main jet (**19**) and pull out the pilot jet (**20**).

10 - Check that no impurities or dirt are deposited in the seat of the needle (**21**) and of the pilot jet. **Make sure the rubber tip of the needle and the float are not marked or worn. If they are, replace them.**



11 - Clean the carburettor (**10**) the main jet (**19**) and the pilot jet (**20**) thoroughly by immersing them in clean petrol (or a detergent) for 24 hours.
Dry with compressed air, blowing well through the carburettor holes.

12 - Mount the carburettor following the previous points 8, 7 and 6 in reverse order, remembering that:



- It is always advisable to replace the washer (**18**) and the O-Ring (**15**) of the float chamber;

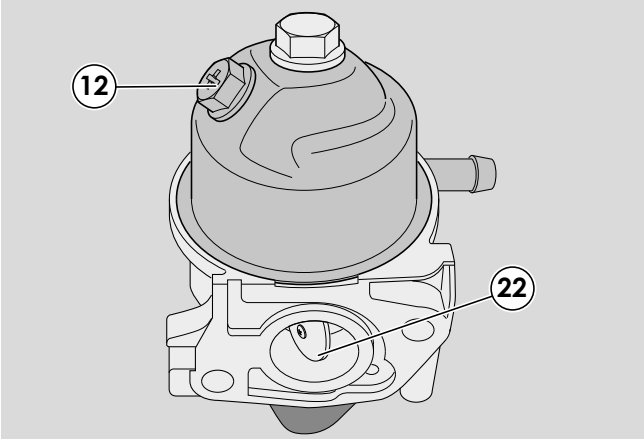
- the float (**17**) must oscillate freely on the pin (**16**);

- the jet (**19**) should never be modified or replaced with others even if they seem to have the same specifications;

- the choke (**22**) must open and close regularly;

- the screw (**12**) to drain the tank should be facing the front of the engine.

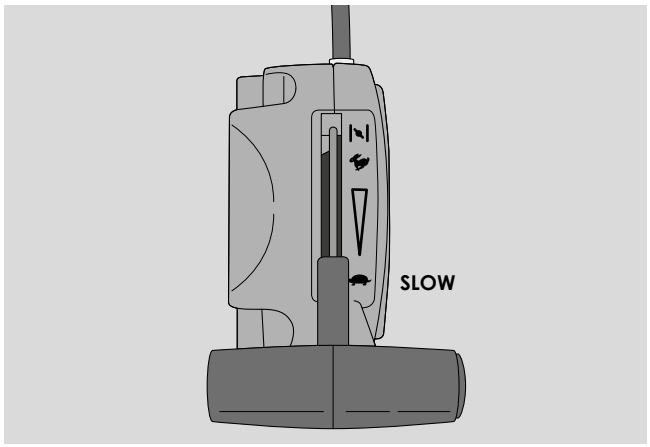
13 - Remount the tie rods (**7**), (**8**) and (**9**) checking that the governor system moves smoothly without stopping.

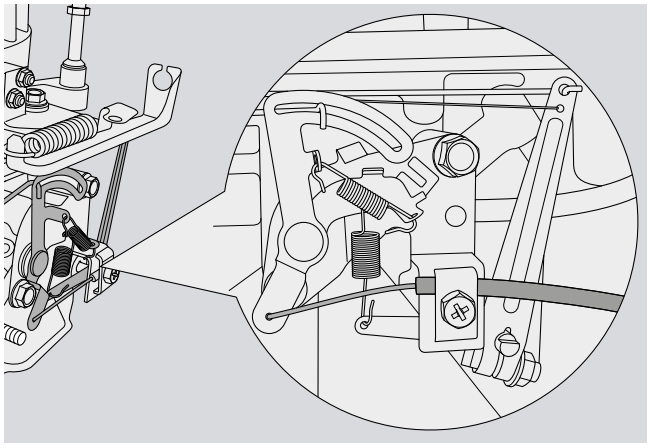


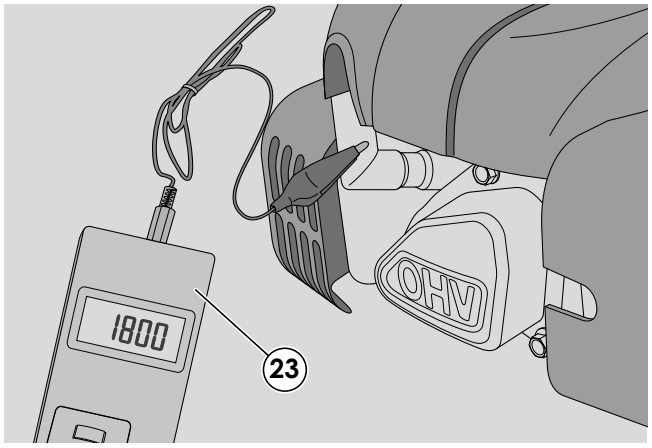
14 - Always replace washers (**6**) and (**11**) when re-mounting the carburettor onto the engine.

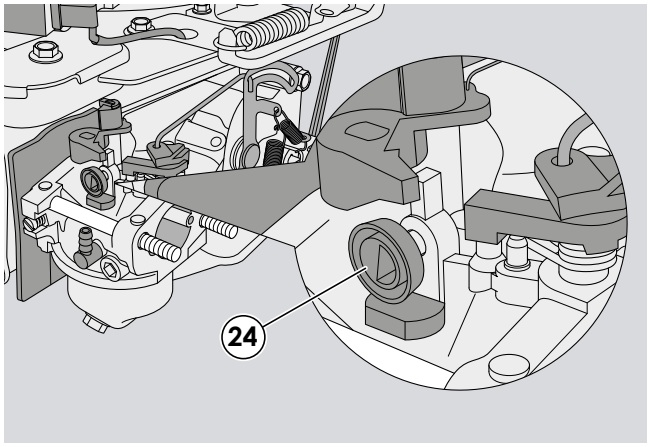
15 - Fit the filter and tighten the relative nuts (**1**) to the torque indicated. Refit the filter element [[☞ 7.1].

8. CARBURATION (➢ valid for RSC100 model)









8.2. Replacing the carburettor

1 - Perform operations 1 - 2 - 3 - 4 - 5 - 6 - 12 - 13 - 14 - 15 indicated in section [[☞ 8.1] above.

8.3. Adjusting minimum speed

1 - Check that the throttle cable is adjusted correctly [[☞ 10.1].

2 - Let the engine heat up for a few minutes, then set the throttle control to "**SLOW**".

Check the rotation speed on the speed indicator (**23**).

NOTE: The engine's minimum speed must be between 1800 (±100) rpm.

3 - Turn the screw (**24**) until you achieve a stable minimum speed within the above values.

8.4. Adjusting maximum speed

NOTE: This operation is carried out by adjusting the governor system [[☞ 10.2].

8.5. Adjusting the carburation

NOTE: The carburation is set in the factory and does not normally need changing. In the event of irregular functioning, clean the carburettor as indicated in section [[☞ 8.1].

Tightening torques		
1	Carburettor nuts/filter	6-8 Nm
Technical information		
Minimum speed (SLOW)		1800 (±100) g/1'
Special equipment		
23	Speed indicator	

9. CARBURATION (➢ valid for RS100 model)

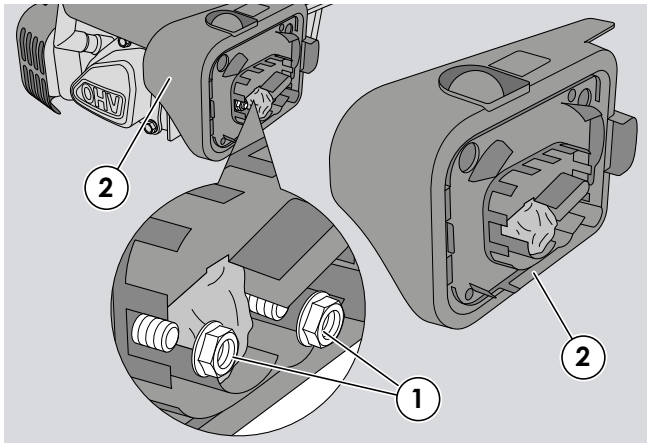
General information

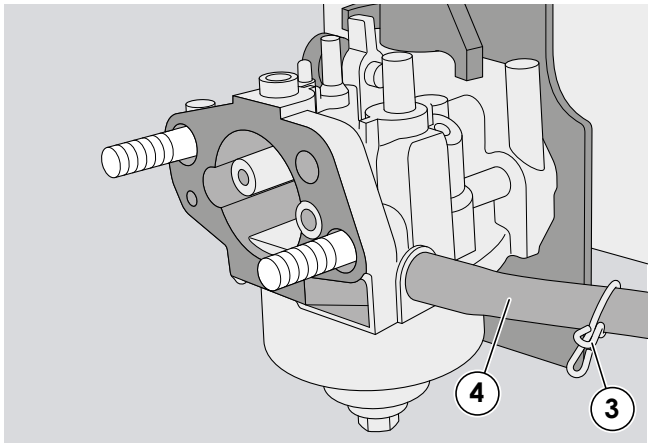
The **carburettor** is a fixed jet floating type with "PRIMER".

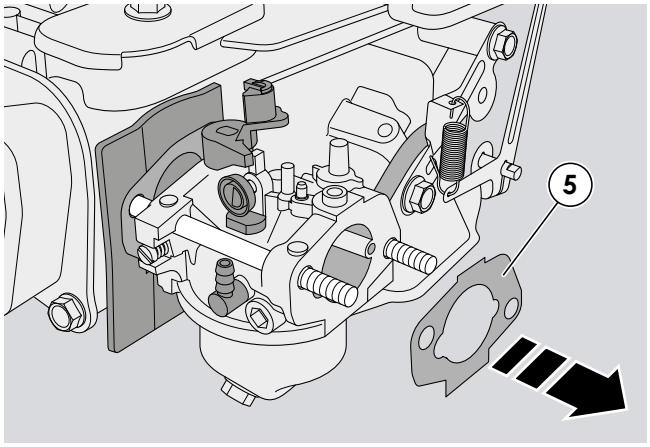
See the relevant section [[☞ 16] for advice on resolving problems due to carburation.

The carburettor is located on the left-hand side of the engine. For maintenance operations it is necessary to dismantle the air intake filter in the sequence shown below.

Dismantle the engine from the machine following the instructions in section [[☞ 15.1].







⚠ ***WARNING! All operations on the tank and supply system must be carried out in safe conditions, so:***

- **do not smoke;**
- **always empty the tank if petrol is not strictly necessary for the operation to be carried out;**
- **work in a ventilated environment away from naked flames or unprotected sources of heat;**
- **collect petrol in a suitable container with a cap using a funnel and avoid spilling it on the work bench;**
- **remove all traces of spilt petrol immediately;**
- **check you have connected the pipes before pouring petrol back into the tank.**

9.1. Removing and cleaning the carburettor

1 - Remove the filter element [[☞ 7.1].

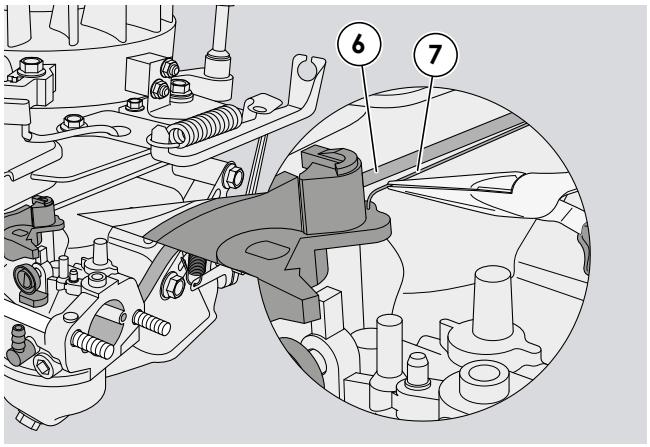
2 - Remove the two nuts (**1**) securing the filter holder (**2**).

3 - Remove the filter holder (**2**), disconnecting the vent pipe and paying attention to the "PRIMER" pipe.

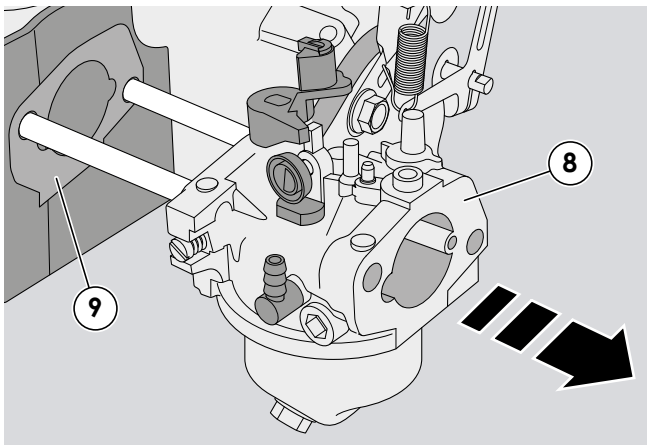
4 - Remove the clamp (**3**) and the "PRIMER" pipe (**4**). Use a suitable container to collect all the petrol in the pipe.

5 - Remove the gasket (**5**) and bring the intake throttle rod to a minimum, pulling out the carburettor.

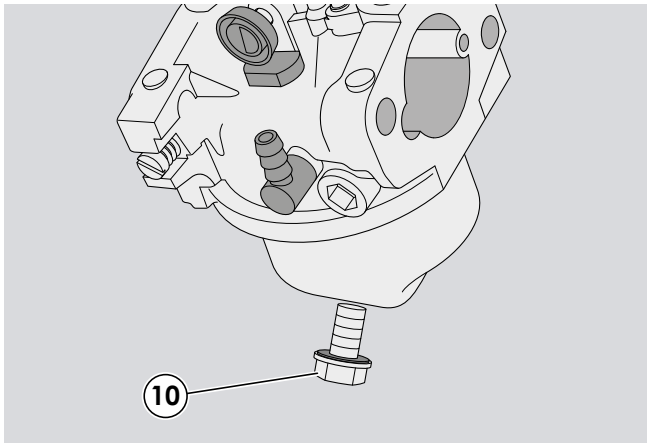
9. CARBURATION (➢ valid for RS100 model)



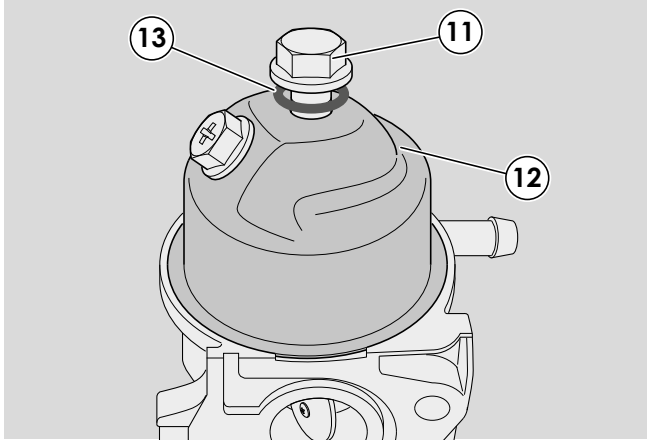
6 - Using pliers, disconnect the intake butterfly rod (**6**) and slide the small rod (**7**) for the relative compensation spring upwards.



7 - Completely remove the carburettor (**8**) and the gasket (**9**).

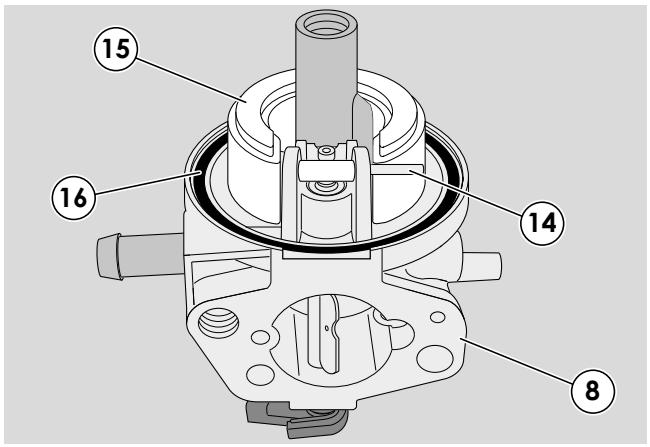


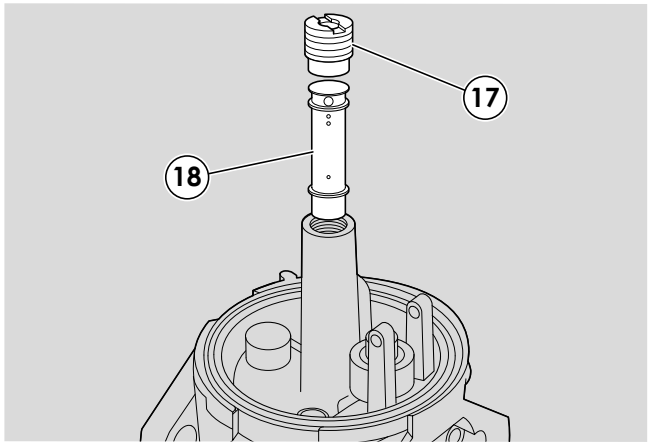
☑ ***NOTE: Empty any remaining petrol from the tank by removing the drain screw (10) as shown in the figure. When finished, replace the screw.***

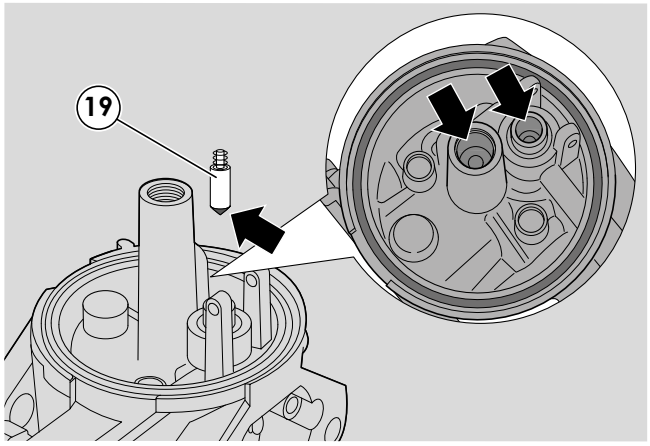


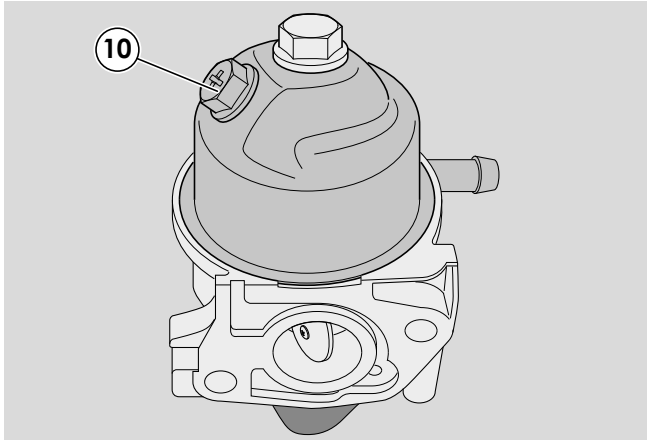
8 - Unscrew the central screw (**11**) securing the tank (**12**) and remove the corresponding OR (**13**).

9. CARBURATION (➢ valid for RS100 model)









9 - Pull out the pin (**14**), dismount the float (**15**) and remove the gasket (**16**).

10 - Undo the main jet (**17**) and pull out the pilot jet (**18**).

11 - Check that no impurities or dirt are deposited in the seat of the needle (**17**) and of the pilot jet. **Make sure the rubber tip of the needle and the float are not marked or worn. If they are, replace them.**

12 - Clean the carburettor (**8**) the main jet (**17**) and the pilot jet (**18**) thoroughly by immersing them in clean petrol (or a detergent) for 24 hours.
Dry with compressed air, blowing well through the carburettor holes.

13 - Mount the carburettor following the previous points 9, 8 and 7 in reverse order, remembering that:

- It is always advisable to replace the washer (**16**) and the O-Ring (**13**) of the float chamber;

- the float (**15**) must oscillate freely on the pin (**14**);

- the jet (**17**) should never be modified or replaced with others even if they seem to have the same specifications;

- the screw (**10**) to drain the tank should be facing the front of the engine.

14 - Remount the tie rods (**6**) and (**7**) checking that the governor system moves smoothly without stopping.

15 - Always replace washers (**5**) and (**9**) when re-mounting the carburettor onto the engine.

16 - Fit the filter and tighten the relative nuts (**1**) to the torque indicated. Refit the filter element [[☞ 7.1].

9. CARBURATION (➢ valid for RS100 model)

9.2. Replacing the carburettor

1 - Perform operations 1 - 2 - 3 - 4 - 5 - 6 - 7 - 13 - 14 - 15 - 16 indicated in section [[☞ 9.1] above.

9.3. Adjusting maximum speed

☑ ***NOTE: This operation is carried out by adjusting the governor system*** ***[[☞ 10.2a]***.

9.4. Adjusting the carburation

☑ ***NOTE: The carburation is set in the factory and does not normally need changing. In the event of irregular functioning, clean the carburettor as indicated in section*** ***[[☞ 9.1]***.

Tightening torques		
1	Carburettor nuts/filter	6-8 Nm

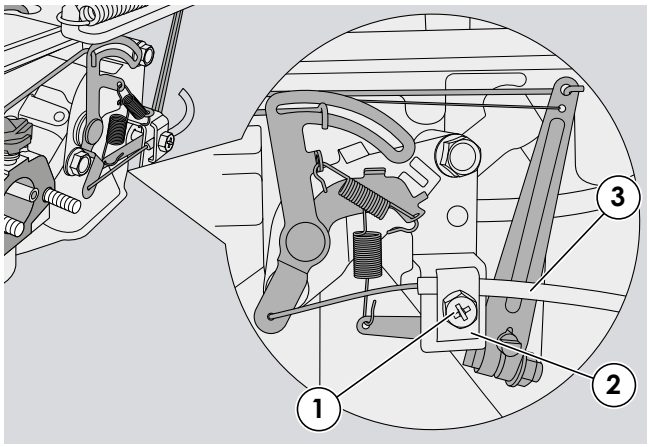
10. GOVERNOR SYSTEM OF THE CARBURETTOR

General information

The **carburettor governor system** uses a engine shaft linkage fitted on a support fixed to the left-hand side of the engine, completed by a counterweight device, driven by the camshaft, and thus sensitive to changes in the engine's revolution pattern depending on load.

The force of the counterweights, transferred to the control lever, tends to shut the main carburettor butterfly, in opposition with the spring that would keep it open; the balance between the spring loading and the thrust of the counterweights on the control lever modifies the butterfly opening and adapts the flow of fuel to the engine so that the revolution speed is kept constant with engine load changes.

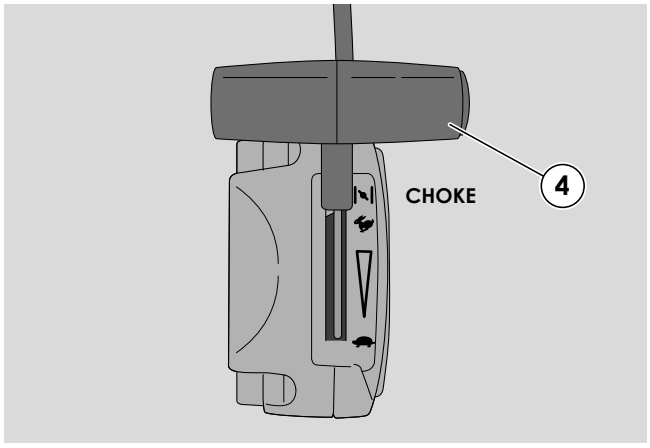
See the relevant section [[☞ 16] for advice on resolving problems related to the governor system.



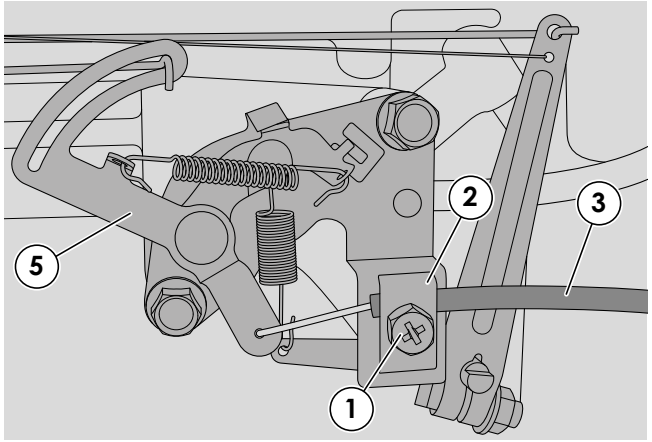
10.1. Adjusting of accelerator cable (➤ model RSC100)

1 - Remove the filter holder [[☞ 8.1].

2 - Loosen the screw (**1**) of the clamp (**2**) so that the cable casing (**3**) is free to move.

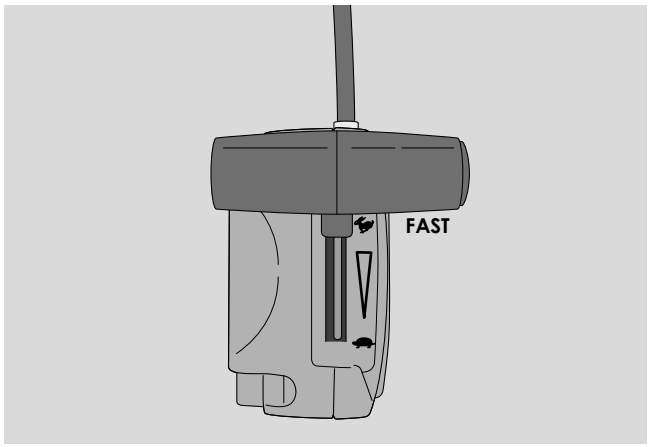


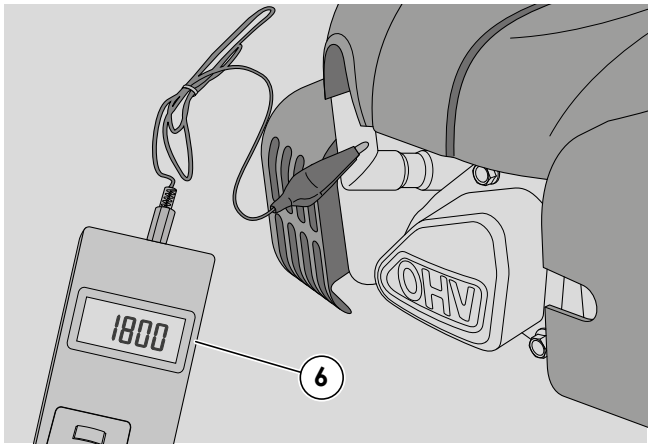
3 - Set the throttle control lever (**4**) to "**CHOKE**".

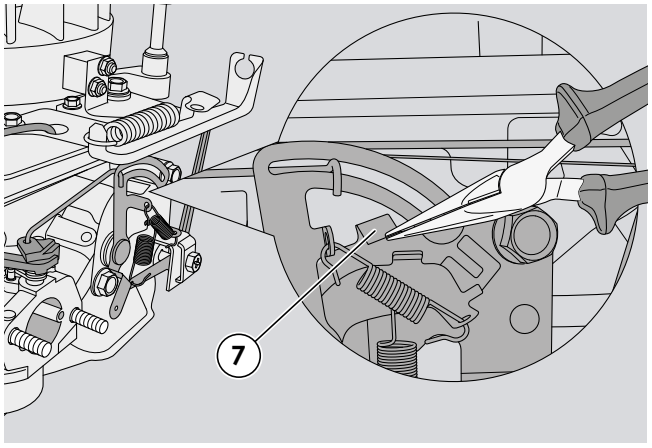


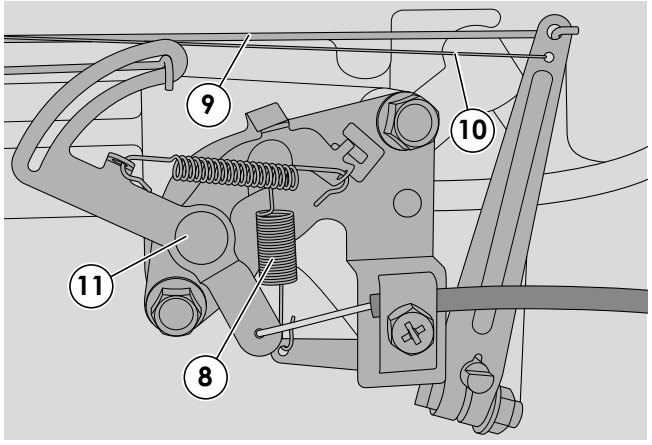
4 - Move governor control lever (**5**) forward as far as possible and, by keeping it in this position, lock the casing (**3**) full tightening the screw (**1**) of the clamp (**2**).

10. GOVERNOR SYSTEM OF THE CARBURETTOR









10.2. Adjusting maximum speed (➤ model RSC100)

1 - Check that the throttle cable is adjusted correctly [[☞ 10.1].

2 - Let the engine heat up for a few minutes then set the throttle control to "**FAST**".

3 - Check the rotation speed on the speed indicator (**6**).

4 - Bend the plate (**7**) slightly upwards using pliers to increase the engine RPM and downwards to decrease it.

5 - Check by moving the lever to the "**SLOW**" position and then to the "**FAST**" position to eliminate any slack. Check the RPM again using the engine speed indicator.

Make sure the accelerator is in the "FAST" position and check the air lever rod is not already activated or in contact.

NOTE: The engine's maximum speed must be between 2900 (±100) rpm; if you do not read this value, proceed as follows.

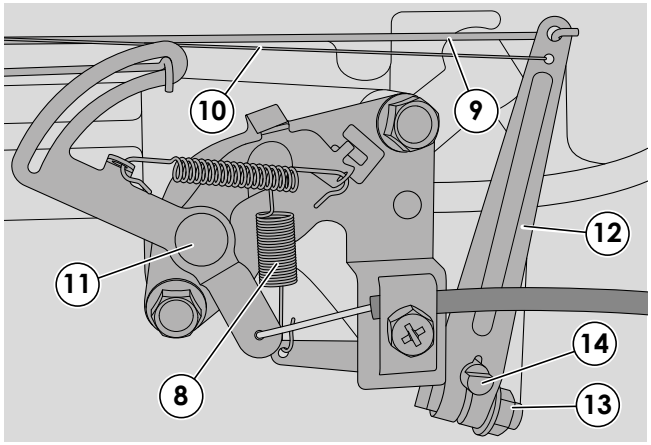
6 - Check:

- that the spring (**8**) is intact and that it is properly positioned in its seat;

- that the wire (**9**) and the relative spring (**10**) are intact and not deformed;

- that the moving levers (**11**) are not bent or deformed and replace the entire support if necessary [[☞ 10.3].

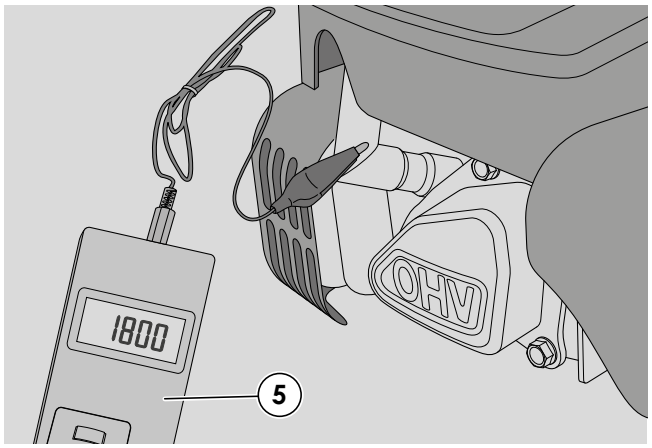
10. GOVERNOR SYSTEM OF THE CARBURETTOR



7 - If the above checks do not show any faults, the phasing of the governor's control lever (**12**) with respect to the counterweight device must be checked:

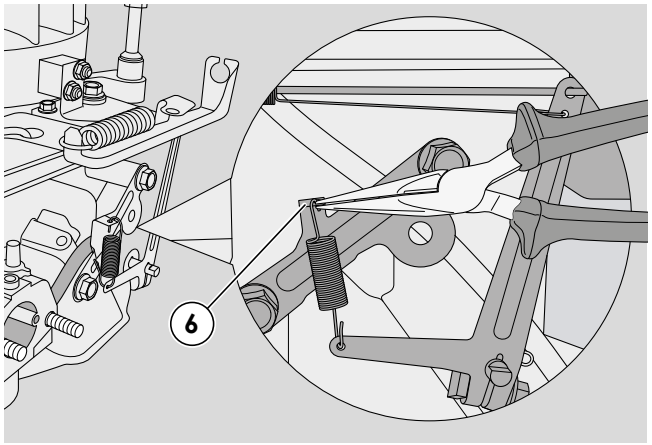
- stop the engine and move the accelerator control to "**FAST**";
- slacken off the control lever (**13**) locknut (**12**);
- without changing the lever (**12**) position determined by the spring (**10**) and tie-engine shaft (**9**), use a screwdriver to turn pin (**14**) clockwise to the end of its stroke and then lock the nut (**13**).

10. GOVERNOR SYSTEM OF THE CARBURETTOR



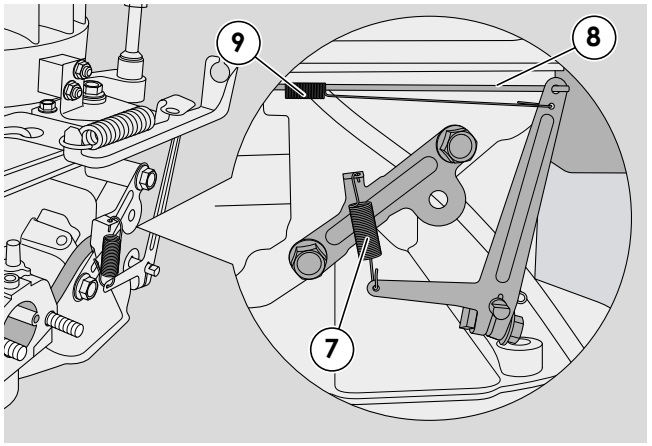
10.2a. Adjusting maximum speed (➤ model RS100)

1 - Check the rotation speed on the speed indicator (**5**).



2 - Bend the plate (**6**) slightly upwards using pliers to increase the engine RPM and downwards to decrease it.

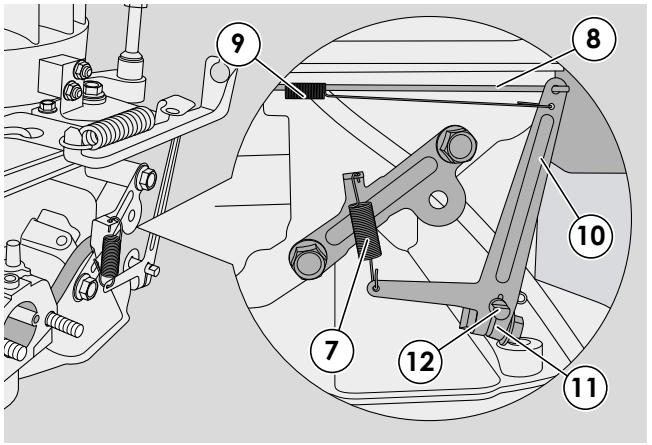
NOTE: The engine's maximum speed must be between 2800 (±100) rpm; if you do not read this value, proceed as follows.



3 - Check:

- that the spring (**7**) is intact and that it is properly positioned in its seat;

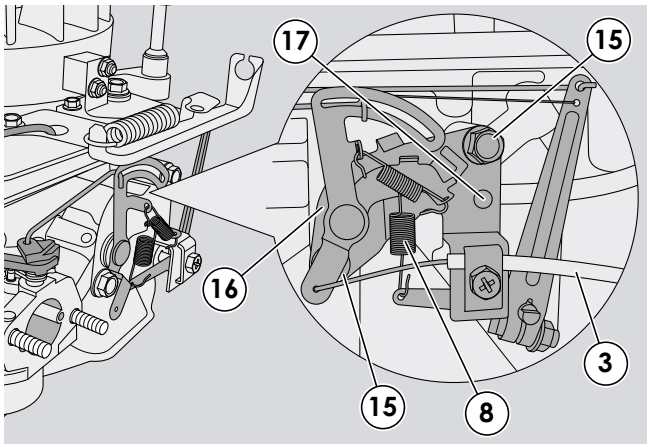
- that the wire (**8**) and the relative spring (**9**) are intact and not deformed;

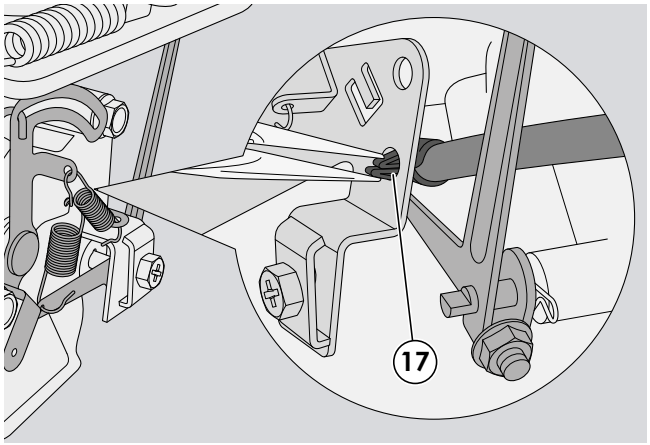


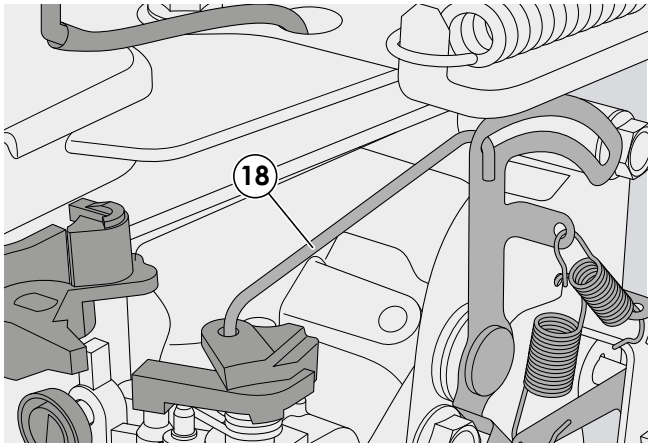
4 - If the above checks do not show any faults, the phasing of the governor's control lever (**10**) with respect to the counterweight device must be checked:

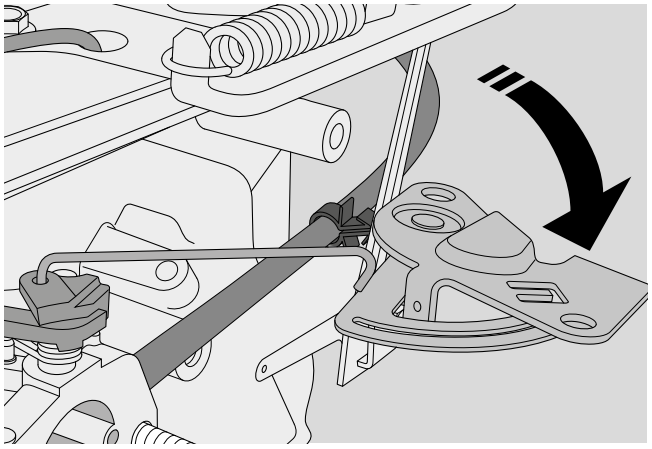
- stop the engine and make sure that the lever (**10**) is in the end run position;
- slacken off the control lever (**11**) locknut (**10**);
- without changing the lever (**10**) position determined by the spring (**9**) and tie-engine shaft (**8**), use a screwdriver to turn pin (**12**) clockwise to the end of its stroke and then lock the nut (**11**).

10. GOVERNOR SYSTEM OF THE CARBURETTOR









10.3. Replacing the lever support (➤ model RSC100)

1 - Remove the filter element [[☞ 7.1] and the filter holder [[☞ 8.1].

2 - Position the choke lever to minimum ("**SLOW**" position).

3 - Disconnect the accelerator cable (**3**) and the spring (**8**).

4 - Loosen the two screws (**15**) securing the support (**16**) to the engine and the clip (**17**) securing the petrol pipe.

5 - Turn the lever support and remove the tie-rod (**18**) on the starter throttle lever (CHOKE).

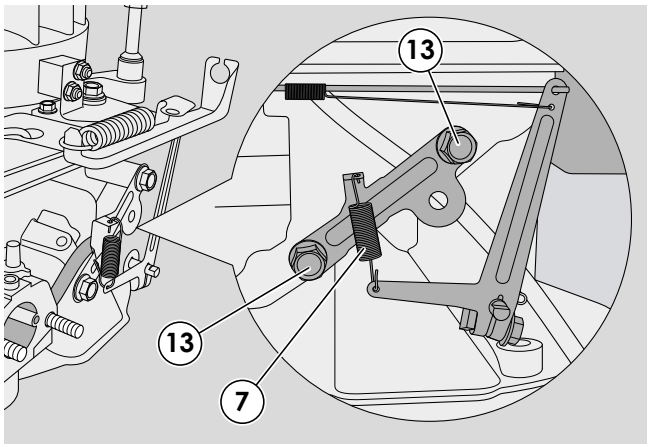
6 - Perform the above operations in reverse order when assembling.

7 - Replace the filter holder [[☞ 8.1] and the filter element [[☞ 7.1].

8 - Adjust the maximum speed [[☞ 10.2].

Tightening torques		
15	Support screw, governor assembly	8-12 Nm
Technical information		
Maximum speed (FAST)		2900 (±100) g/1'
Special equipment		
6	Speed indicator	

10. GOVERNOR SYSTEM OF THE CARBURETTOR



10.3a. Replacing the lever support (➤ model RS100)

1 - Remove the filter element [[☞ 7.1] and the filter holder [[☞ 9.1].

2 - Disconnect the spring (**7**).

3 - Remove the two screws (**13**) and replace the lever support.

4 - Perform the above operations in reverse order when assembling.

7 - Replace the filter holder [[☞ 9.1] and the filter element [[☞ 7.1].

8 - Adjust the maximum speed [[☞ 10.2a].

Tightening torques		
13	Support screw, governor assembly	8-12 Nm
Technical information		
Maximum speed		2800 (±100) g/1'
Special equipment		
5	Speed indicator	

11. IGNITION

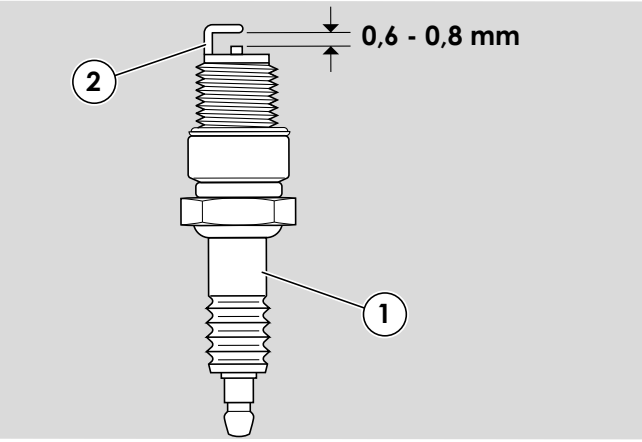
General information

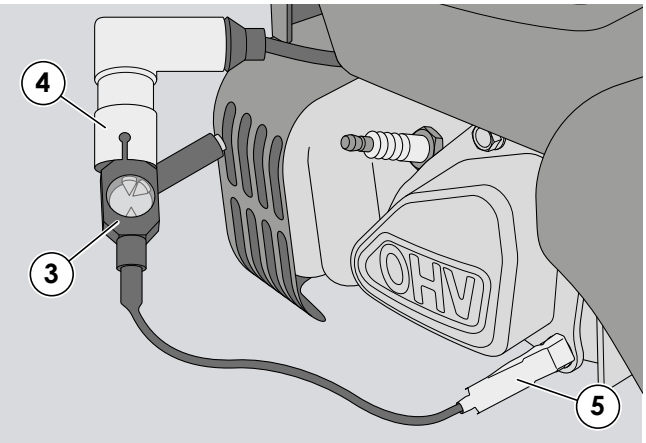
The **ignition system** has a fan with an electronic coil which supplies high voltage to the spark plug.

See the relevant section [[☞ 16] for advice on resolving problems related to the ignition.

The coil and complete fan are accessible by removing the cowl.

Dismount the engine from the machine by following the instructions in section [[☞ 15.1].





11.1. Checking the efficiency of the ignition system

1 - Dismount the spark plug (**1**) and look at the colour on the end of the thread. This can give you a good idea of the carburation:
- **black**: mixture too greasy due to clogged air filter;
- **nut brown:** regular carburation.

Replace the spark plug (with one of the same or equivalent characteristics) **if the electrodes (2) are burnt or if the porcelain is broken or cracked.**

FIRE HAZARD:

- do not check the ignition system if the spark plug is not screwed in place;

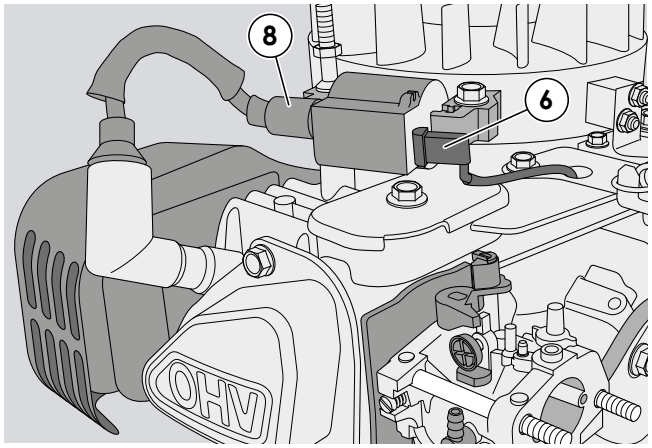
- always use the specific tool for the spark test.

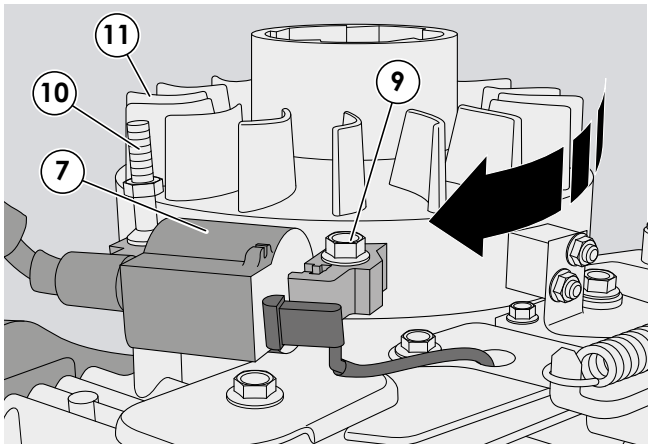
2 - Connect the tester (**3**) to the spark plug cap (**4**) and to earth on the engine (**5**). Activate the starter and see in the instrument if the spark jumps.

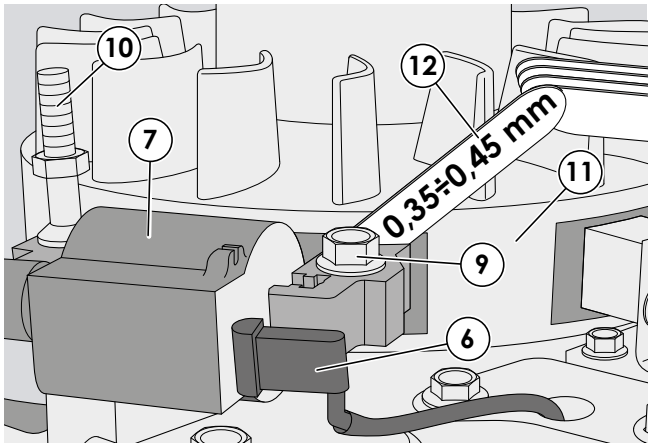
3 - If the test has a positive result, clean the electrodes (**2**) with compressed air and adjust the distance to 0.6-0.8 mm. Remount the spark plug and tighten it to the specified levels.

Unless otherwise required, proceed to verify system components as indicated in section [[☞ 11.2].

11. IGNITION







11.2. Adjusting the air gap and checking the coil

1 - Remove the starter assembly [[☞ 6.1].

2 - Make sure that the earth cable faston (**6**) of the coil (**7**) is not oxidized; if it is, disconnect, clean and remount it, spraying it with a special antioxidant.

3 - Check that the coil earth cable is intact. The black spark plug cable (**8**) should not have any cracks or signs of deterioration or burns which reduce its efficiency and insulation level.

4 - Slack off the screw (**9**) and the stud (**10**) which secure the coil (**7**).
At the bottom of the machine to which the engine is fitted, release the safety brake.
Rotate the fan (**11**) so as to bring the magnetic inserts next to the poles of the core of the coil.

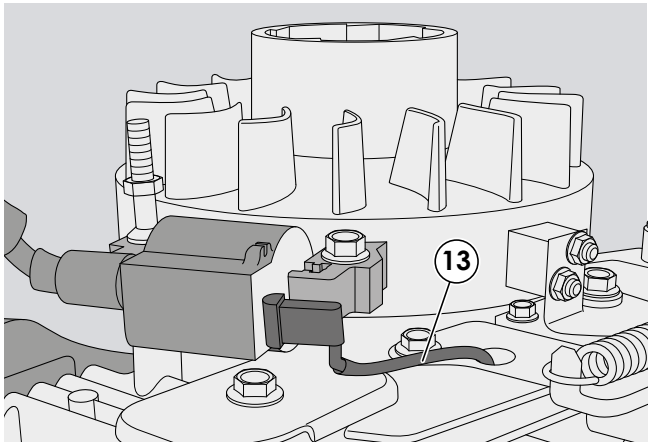
5 - Insert a 0.35 mm thickness gauge (**12**) between the complete fan (**11**) and the coil poles (**7**), push the coil until the poles come in contact with the thickness gauge and secure screw (**9**) and stud (**10**); with the flywheel locked, the airgap must be between 0.35 and 0.45 mm.

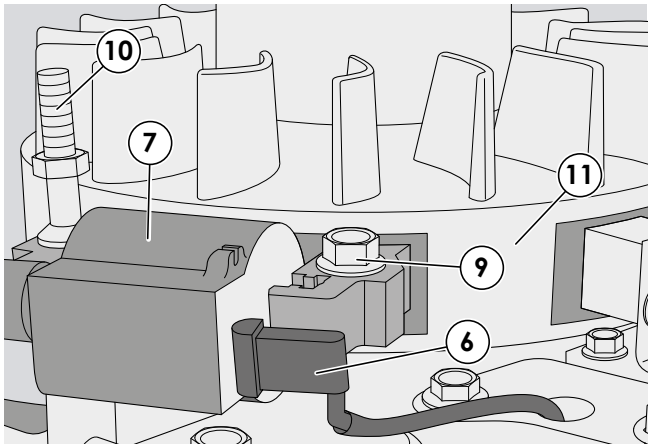
☑ ***NOTE: An accurate inspection of the efficiency of a coil can only be carried out in a laboratory equipped with a oscilloscope.***

To make a brief check, proceed as follows:

6 - Disconnect the earth cable faston (**6**) of the coi (**7**).

11. IGNITION





7 - Perform a spark test as indicated in [11.1].

- **If the spark jumps:** the coil functions properly and in the event of malfunction, verify that the cut-off cable (**13**) is not earthed.
- **if the spark does not jump:** the coil is faulty and must be replaced [11.3].

8 - Refit the starter assembly [6.1].

11.3. Replacing the coil

1 - Remove the starter assembly [6.1].

2 - Disconnect the faston of the earth cable (**6**).

3 - Undo the screw (**9**) and the stud (**10**) and remove the coil (**7**).

4 - Mount the new coil and regulate the air gap according to the procedure indicated in points 4 and 5 in section [11.2].

5 - Connect the faston of the earth cable (**6**).

6 - Refit the starter assembly [6.1].

Tightening torques		
1	Spark plug tightening torque	16-20 Nm
9	Coil fixing screw	8-12 Nm
10	Coil fixing stud	8-12 Nm
Technical information		
Type of spark plug		GGP K7 RTC
Distance between electrodes		0,6-0,8 mm
Air gap/fan		0,35-0,45 mm
Special equipment		
3	Tester for spark test	

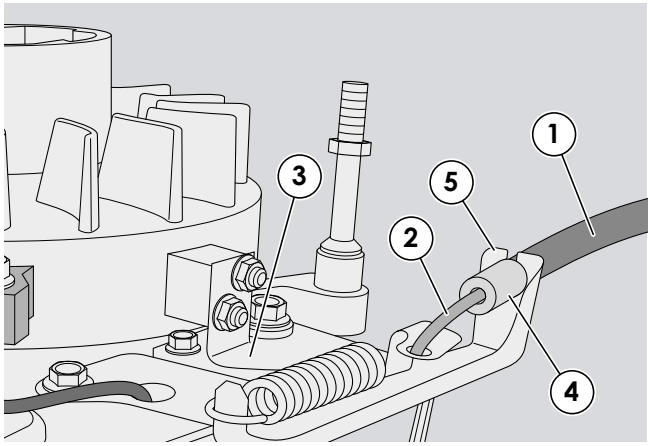
12. TURNING OFF AND STOPPING THE ENGINE

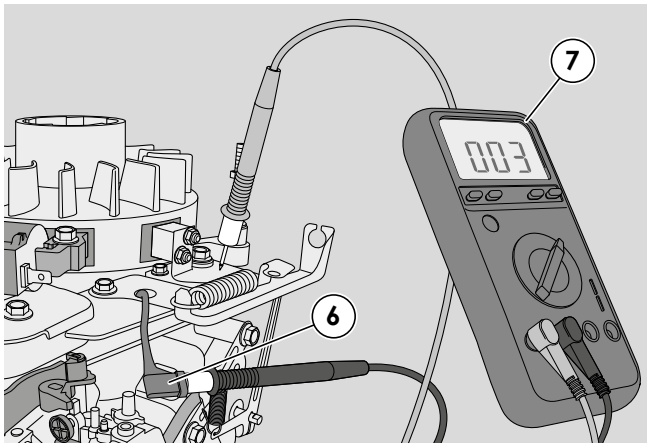
General information

The **engine is turned off and stopped** by releasing a lever on the lawnmower. The cable acts on a lever which simultaneously activates a microswitch that sends the coil to earth as well as a brake which acts on the flywheel.
The brake must be able to stop the engine within 3 seconds after it is turned off.

To solve problems in the system for turning off and stopping the engine, see the relevant chapter [[☞ 16].

To get access to the system for turning off and stopping the engine, remove the starter assembly.





12.1. Checking the control cable

1 - Remove the starter assembly [[☞ 6.1]].

2 - Remove the filter assembly [[☞ 8.1]] ➤ **mod. RSC100** (or [[☞ 9.1]] ➤ **mod. RS100**).

3 - Check that the sheath (**1**) is not bent, that the wire (**2**) is securely connected to both the lawnmower lever and the lever (**3**) on the engine and that the terminal (**4**) is correctly fastened to the support (**5**).

4 - Check that the wire (**2**) runs freely inside the sheath (**1**) when you move the lever.

5 - Check that the end of the wire (**2**) is slightly loose when you release the lawnmower lever.

6 - Refit the filter assembly [[☞ 8.1]] ➤ **mod. RSC100** (or [[☞ 9.1]] ➤ **mod. RS100**).

7 - Refit the starter assembly [[☞ 6.1]].

12.2. Checking the system for turning off the engine

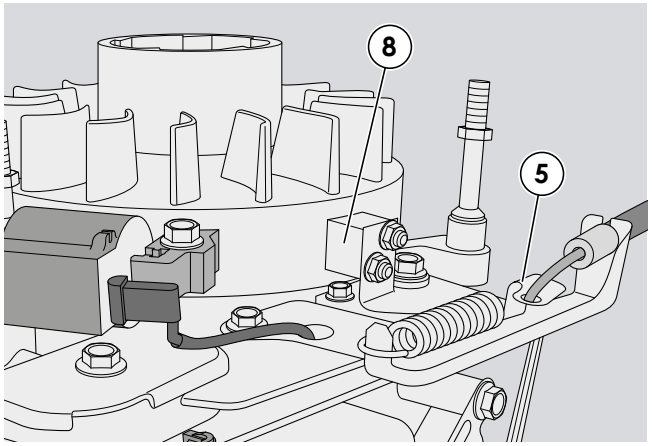
1 - Disconnect the coil Faston connector (**6**).

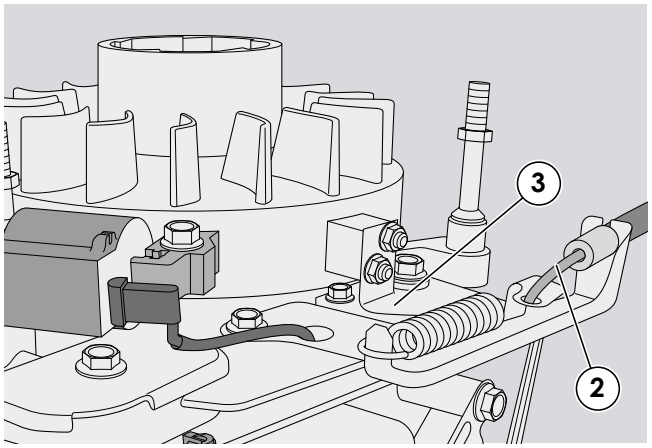
2 - Using a multimeter (**7**) as an ohmmeter, make contact with the leads on the points indicated in the figure.
The instrument should read:

- **∞** = microswitch pressed (lever pulled);
- **0** = microswitch free (lever released);

Otherwise, replace the system for turning off and stopping the engine.

12. TURNING OFF AND STOPPING THE ENGINE





12.3. Checking the brake

1 - Remove the starter assembly [[☞ 6.1].

2 - Check that the thickness of the friction pad (**8**) is not less than 2 mm at its thinnest point.

3 - Make sure that the control lever (**5**) moves freely and remove any remains of grass and mud.

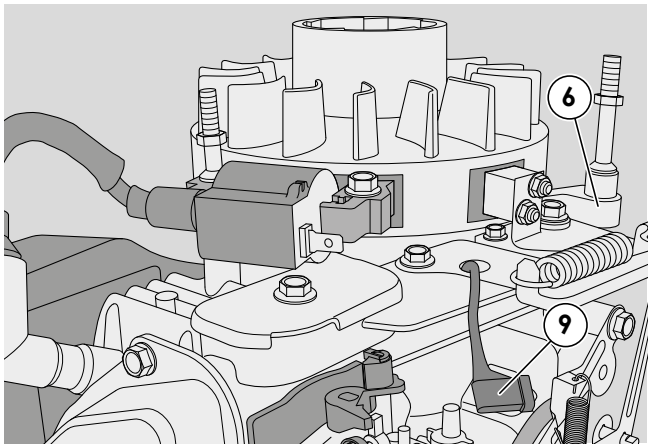
4 - Refit the starter assembly [[☞ 6.1].

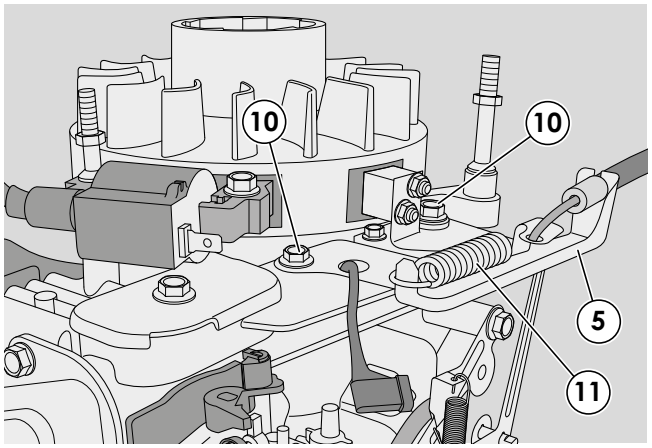
5 - Start the engine, release the lawnmower lever and check that the engine stops within 3 seconds.

6 - If it stops after 3 seconds, replace the entire assembly [[☞ 12.4], because the spring or the friction pad are not capable of ensuring compliance with braking times.

⚠ ***WARNING! Never return the lawnmower to your client without checking brake efficiency.***

12. TURNING OFF AND STOPPING THE ENGINE





12.4. Replacing the system for turning off and stopping the engine

1 - Remove the starter assembly [[☞ 6.1].

2 - Remove the filter assembly [[☞ 8.1] ➤ **mod. RSC100** (or [[☞ 9.1] ➤ **mod. RS100**).

3 - Disconnect the brake wire (**2**) from the lever (**3**).

4 - Disconnect the earth cable Faston connector (**9**).

5 - Loosen the two screws (**10**) and the spring (**11**). Remove the support bracket (**5**).

6 - When fitting, perform the above operations in reverse, tightening the screws (**10**) to the torque indicated.

7 - Refit the starter assembly [[☞ 6.1] and the filter assembly [[☞ 8.1] ➤ **mod. RSC100** (or [[☞ 9.1] ➤ **mod. RS100**).

8 - Start the engine, release the lawnmower lever and check that the engine stops within 3 seconds.

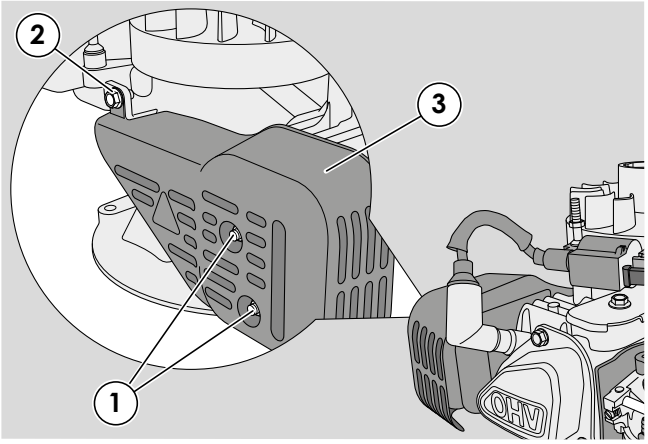
Tightening torques		
10	Brake support screws	8-12 Nm
Special equipment		
7	Universal tester	

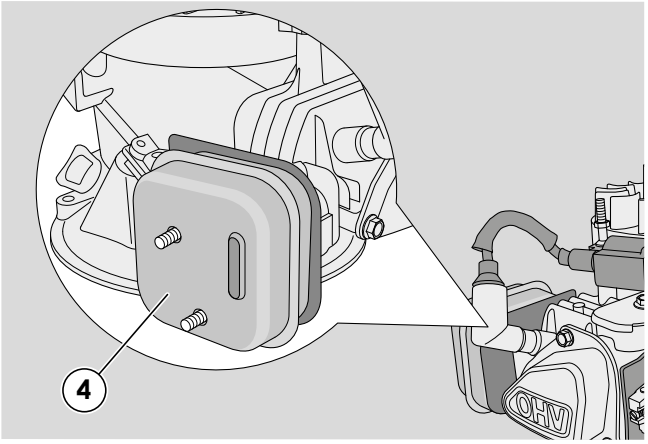
13. EXHAUST SYSTEM

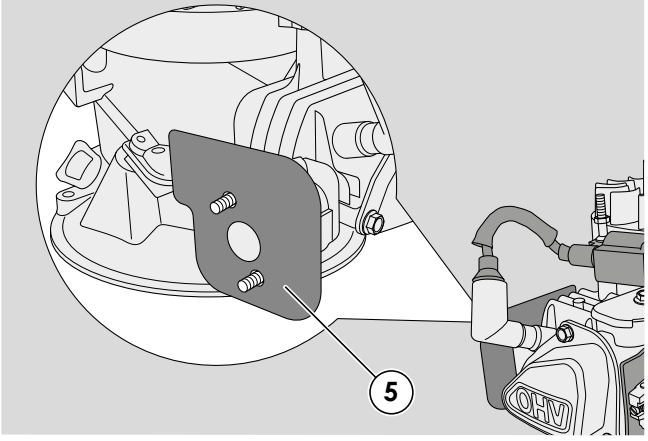
General information

The **exhaust system** consists of a muffler installed on the cylinder together with a gasket, a spacer and a heatproof baffle.

To solve problems in the exhaust system, see the relevant chapter [[☞ 16].







13.1. Removing and replacing the muffler

1 - Remove the two nuts (**1**) and the screw (**2**) that fix the guard (**3**) and the muffler.

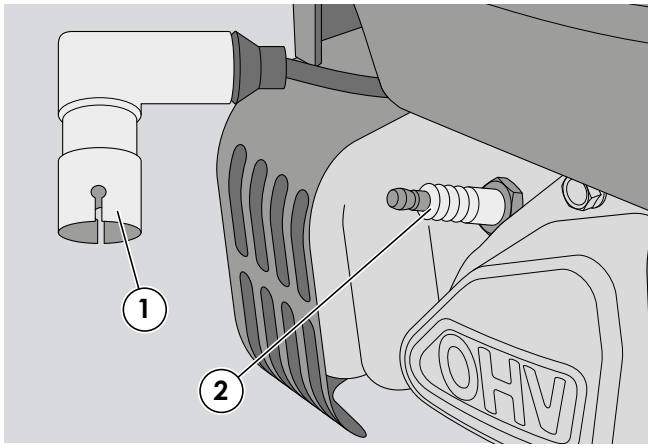
2 - Take out the muffler (**4**) and the heatproof baffle (**5**).

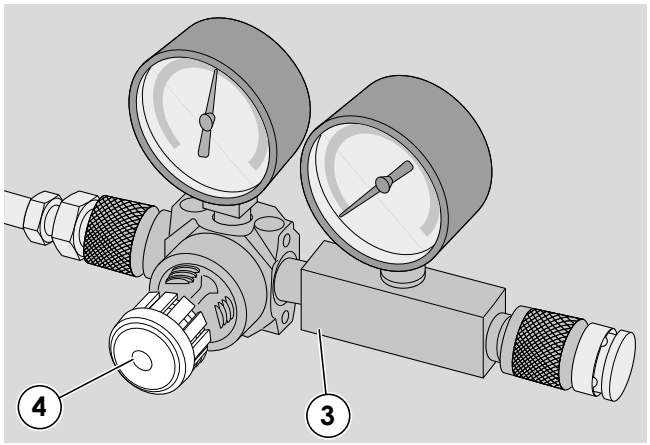
3 - On assembly:

- thoroughly clean the cylinder contact surface, removing all deposits or fragments on the heatproof baffle;
- always replace damaged mufflers;
- always replace the heatproof baffle (**5**) if it is broken or cracked;
- tighten the two nuts (**1**) and the screw (**2**) to the specified levels.

Tightening torques		
1	Muffler fixing nuts	8-10 Nm
2	Muffler fixing screw	8-10 Nm

14. ENGINE BLOCK - External operations





14.1. Checking the heating unit seal

1 - Remove the cap (**1**) and take out the spark plug (**2**).

2 - Manually set the piston to the TDC (Top Dead Centre) of the compression stroke so that both valves are closed.

3 - Screw the terminal of the compression testing tool (**3**) into the spark plug hole and connect the supply pipe to a compressed air socket with a pressure of approximately 4 bar (58 psi).

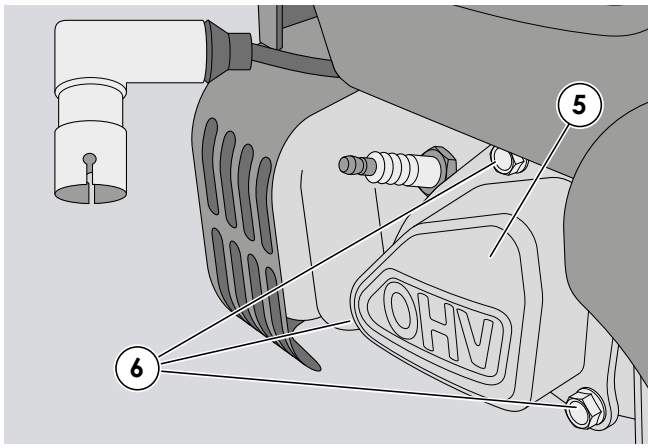
4 - On opening the air tap (**4**), the manometer gauge on the engine side should position itself in the green zone and remain there for about 30 seconds. If the gauge falls rapidly it means that the compression is poor.

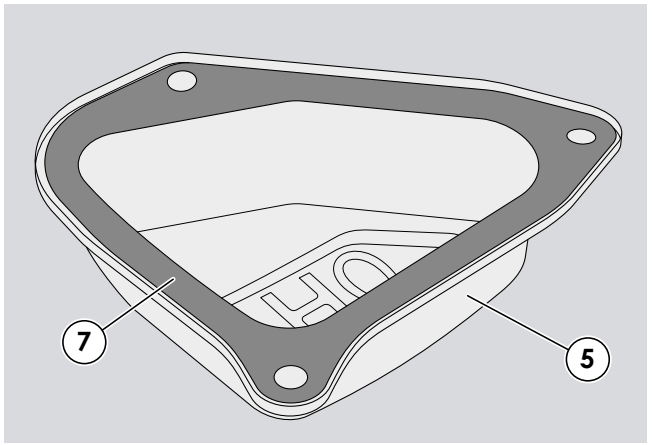
NOTE: Lack of compression could be due to:

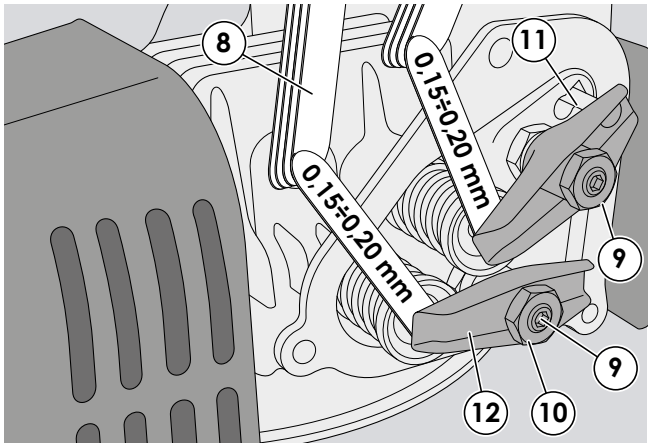
- incorrect valve clearance [[☞ 14.2];
- lack of seal in the valves [[☞ 15.5];
- piston rings worn [[☞ 15.4].

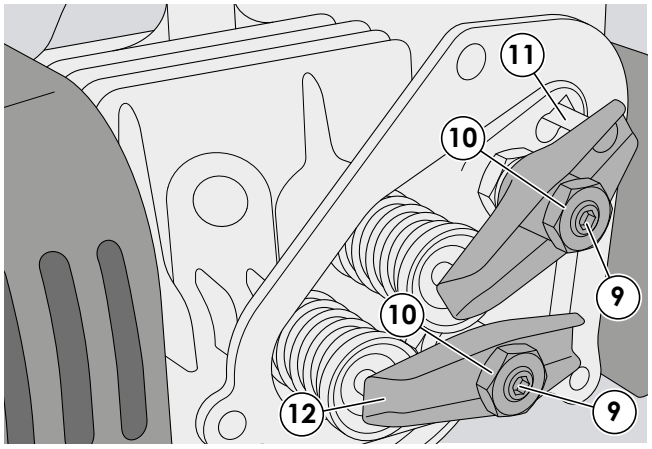
5 - Refit the spark plug (**2**) and close it to the indicated couple.

14. ENGINE BLOCK - External operations









14.2. Adjusting the valve clearance

WARNING: The adjustment must be made with the engine is cold.

1 - Remove the cover and demount the spark plug [[☞ 14.1].

2 - Remove lid (**5**) which is secured with three screws (**6**) and remove the washer (**7**).

3 - Manually set the piston to the TDC (Top Dead Centre) of the compression stroke so that both valves are closed.

4 - Use a feeler gauge (**8**) to check the gap between the rocker arm and the tip of the valve stem; the gauge should pass between without forcing and without a further gap.

5 - Slack is adjusted by loosening the dowel (**9**) and suitably adjusting the register nut (**10**) to obtain the following values:

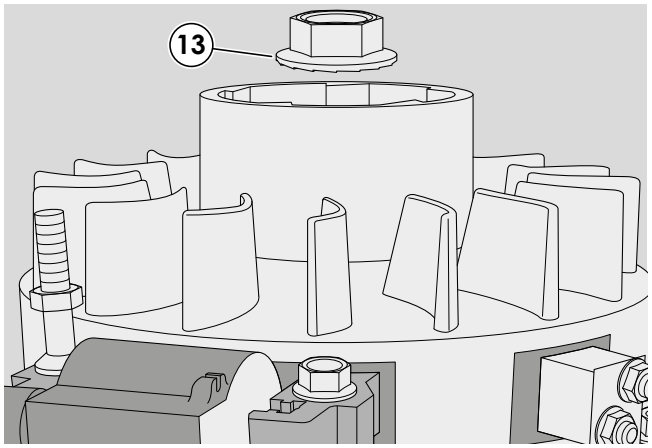
Inlet - IN = 0,15 - 0,20 mm
Exhaust - EX = 0,15 - 0,20 mm

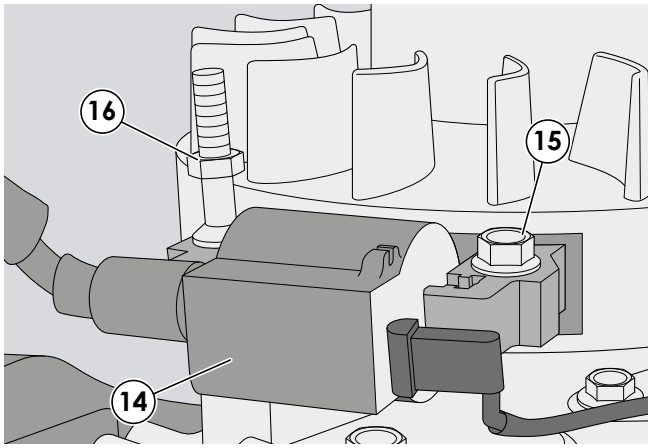
6 - Following adjustment, check that the pushrods (**11**) are properly inserted in the rocker arm housings (**12**) and always fully tighten the dowel (**9**).

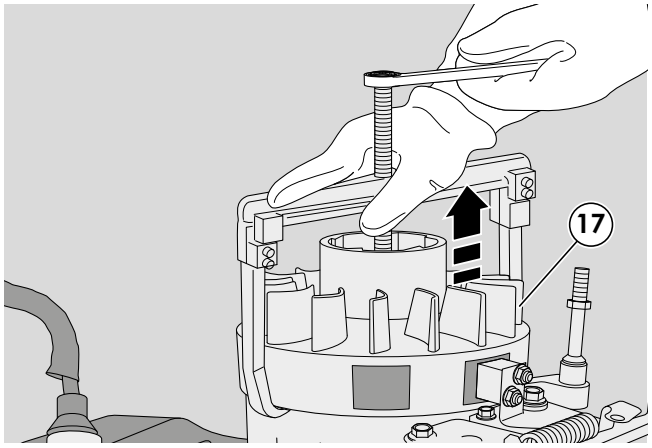
7 - When reassembling check the condition of the gasket (**7**) of the cover (**5**) and replace it if it is damaged. Tighten the screws (**6**) to the torque indicated.

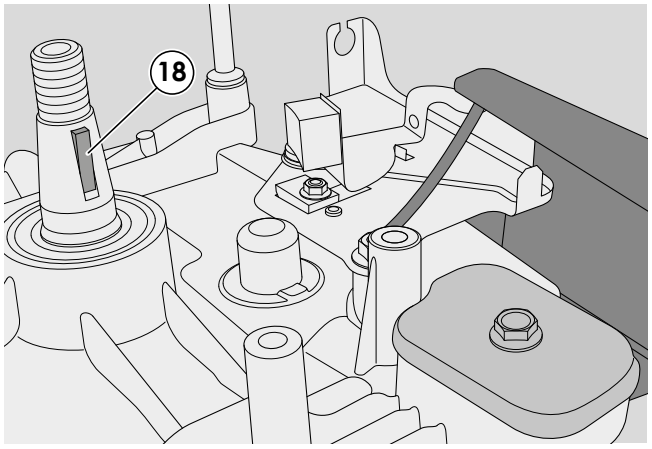
8 - Assemble the spark plug [[☞ 14.1].

14. ENGINE BLOCK - External operations









14.3. Dismantling and replacing the complete fan

1 - Remove the starter assembly [[☞ 6.1].

2 - Operate the exhaust brake.

3 - Using an airgun, undo the nut (**13**).

4 - Undo the screw (**14**) and the stud (**15**) and remove the electronic coil (**16**).

5 - Using a suitable extraction tool, remove the complete fan (**17**) as indicated in the diagram. **Ensure that the engine shaft key is retained.**

NOTE: If it is difficult to disassemble the fan, use a hammer and hit the extractor screw.

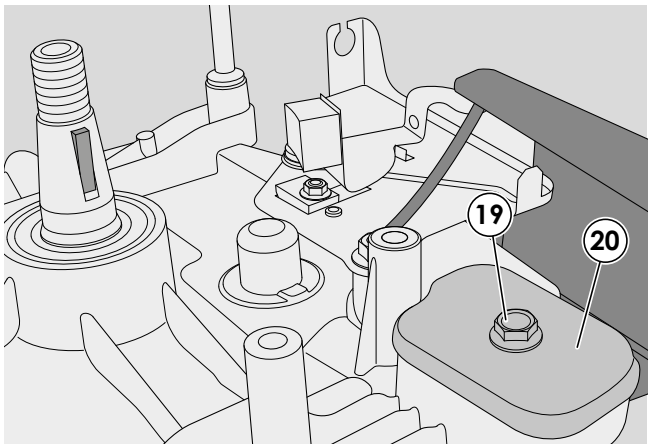
6 - When fitting the complete fan check that the key (**18**) is in good condition and replace it, if deformed. Close the nut (**13**) to the indicated couple.

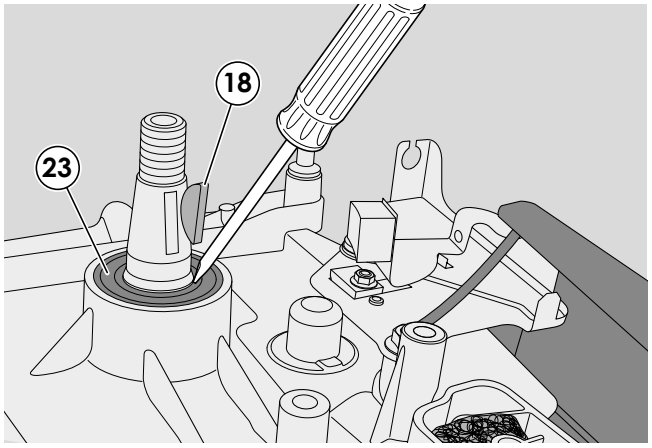
7 - Refit the coil (**14**), tightening the screw (**15**) and the stud (**16**) to the torque indicated.

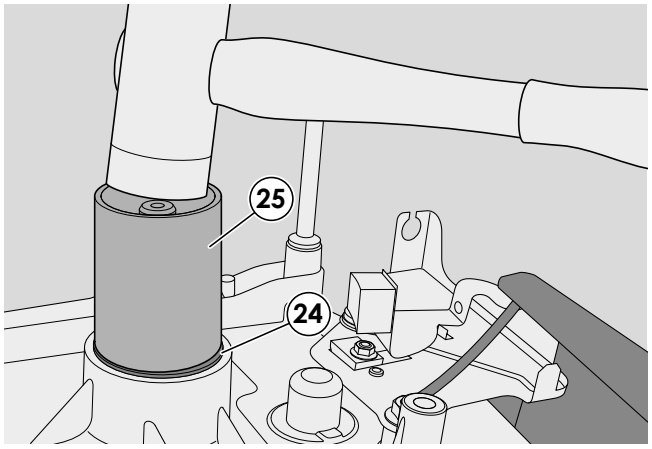
8 - Readjust the airgap until it is correct [[☞ 11.2].

9 - Refit the starter assembly [[☞ 6.1].

14. ENGINE BLOCK - External operations







14.4. Blow-by check

1 - Remove the complete fan [[☞ 14.3].

2 - Unscrew the screw (**19**) fixing the closing plate (**20**).

3 - Check that the reed (**21**) is not blocked or deformed. Replace if this is the case.
If necessary wash with water and neutral detergents.

4 - If necessary, replace the gasket (**22**) and refit the closure plate (**20**), tightening the screw to the torque indicated.

5 - Refit the complete fan [[☞ 14.3].

14.5. Replacing the upper compression ring of the engine shaft (fan side)

1 - Remove the complete fan [[☞ 14.3].

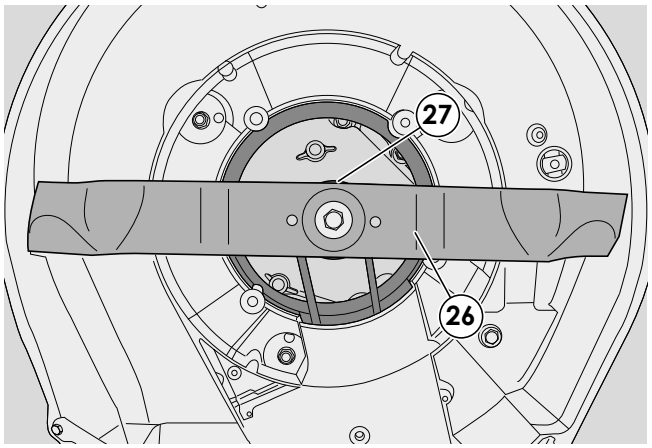
2 - Take out the spline key (**18**).

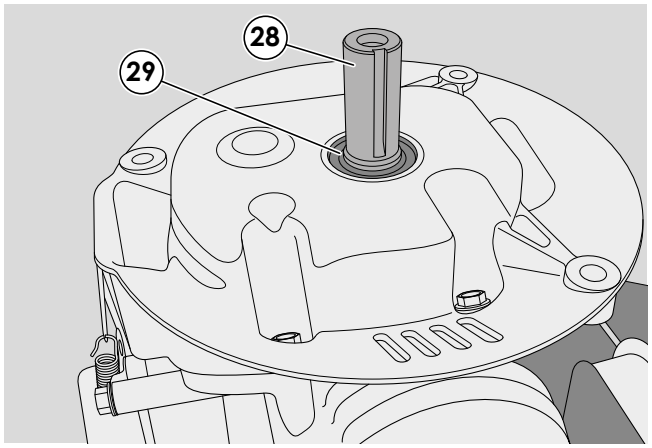
3 - Use a thin screwdriver inserted under the sealing lip to extract the oil seal ring (**23**).

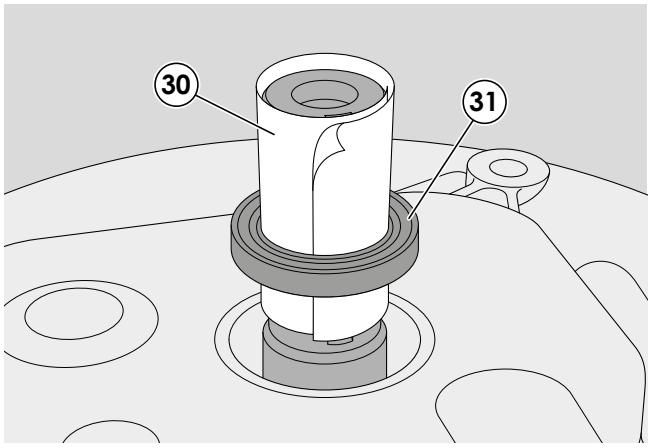
4 - The new ring (**24**) must be inserted with the help of a pipe (**25**) with a diameter of approximately 35-40 mm, taking care not to damage the sealing lip.

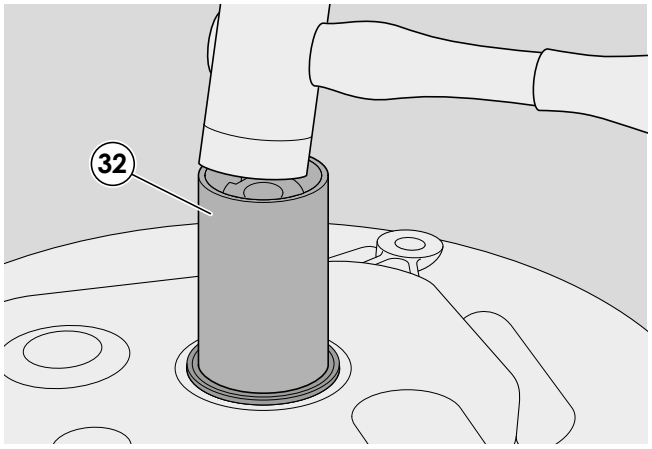
5 - Refit the key (**18**) and the complete fan [[☞ 14.3].

14. ENGINE BLOCK - External operations









14.6. Replacing the lower compression ring of the engine shaft (sump side)

NOTE - Before executing this operation discharge all the oil from the bowl and rotate 180° the motor.

1 - Remove the blade (**26**) and hub (**27**).

2 - Take out the spline key (**28**).

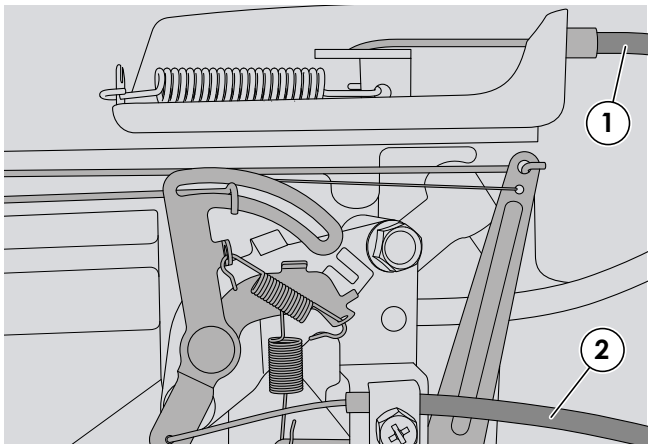
3 - Use a thin screwdriver inserted under the sealing lip to extract the oil seal ring (**29**).

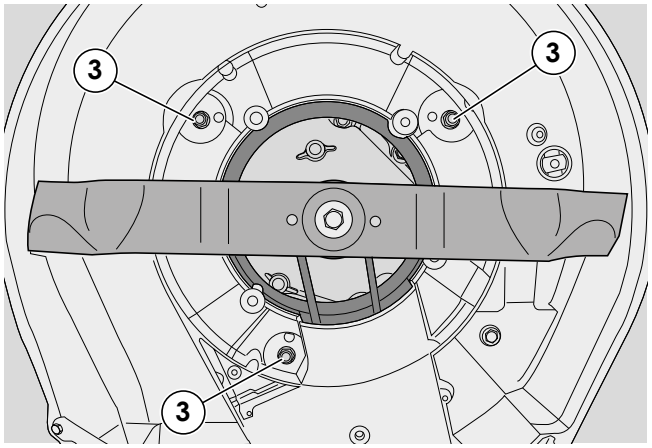
4 - Make a paper tube (**30**) around the shaft to protect the sealing lip and insert the new ring (**31**) so that it enters its housing.

5 - Complete the insertion with the help of a pipe (**32**) of a diameter of approximately 30-35 mm.

Tightening torques		
2	Spark plug tightening torque	16-20 Nm
6	Valve cover fixing screws	7-9 Nm
13	Fan fixing nut	60-70 Nm
19	Blow-by closure plate screw	7-9 Nm
Technical information		
Inlet valve clearance		0,15-0,20 mm
Exhaust valve clearance		0,15-0,20 mm
Special equipment		
3	Compression testing tool	

15. ENGINE BLOCK - Overhauling internal parts





15.1. Removing the engine

1 - Empty the tank of fuel [[☞ 5.1].

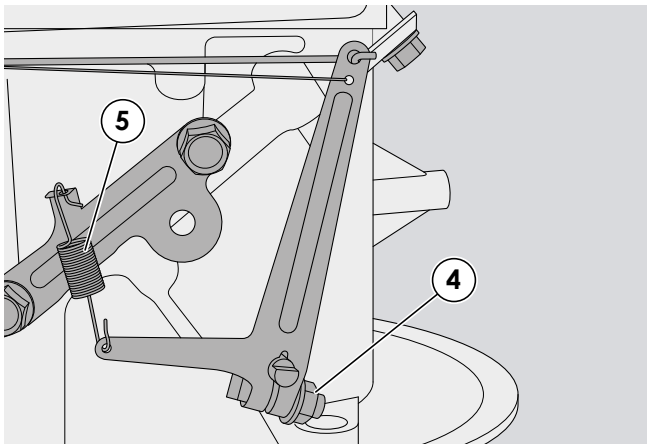
2 - Drain the oil in the sump by removing the filler plug and turning the mower on its side.

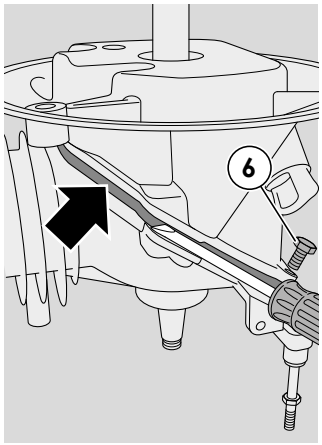
3 - Disconnect the engine brake cable (**1**) and the throttle cable (**2**) **(➤ RSC100)**.

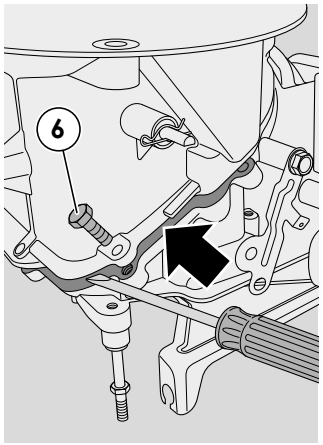
4 - Remove the blade assembly and undo the three screws (**3**) which are accessible from the bottom of the lawnmower.

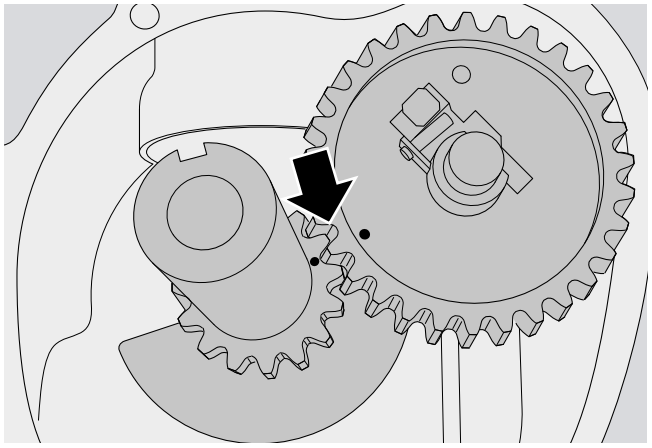
⚠ **Grasp the engine at points which offer a secure grip, taking account of the overall weight given in the relevant table** [[☞ 3.2].

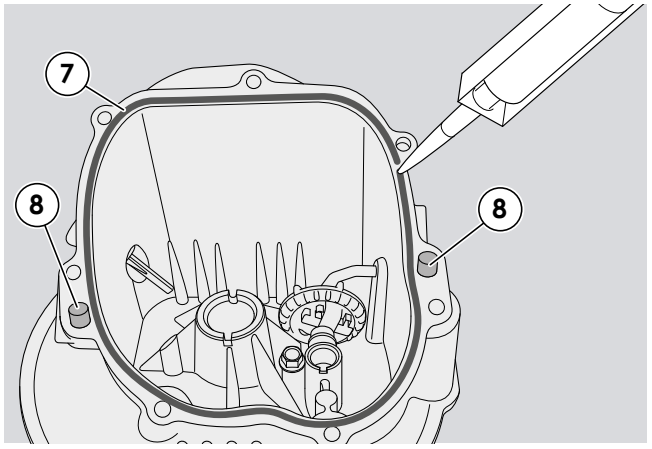
15. ENGINE BLOCK - Overhauling internal parts











All the following operations on the grass cutter necessitate the removal of the motor.

15.2. Carter opening

1 - **(➤ RSC100 model only)** Remove the carburettor [[☞ 8.1] and remove the lever support [[☞ 10.3].

2 - Loosen the lever fixing nut (**4**), release the spring (**5**) and remove the control lever.

3 - Position the engine on a stable support and remove the sparkplug.
Bring the piston to the TDC (Top Dead Centre).

4 - Turn the engine upside down and place it with the shaft pointing upwards.

5 - Loosen the seven screws (**6**) and remove the engine sump with the help of levers in the two points indicated.

6 - verify the phasing between the engine shaft and the camshaft;

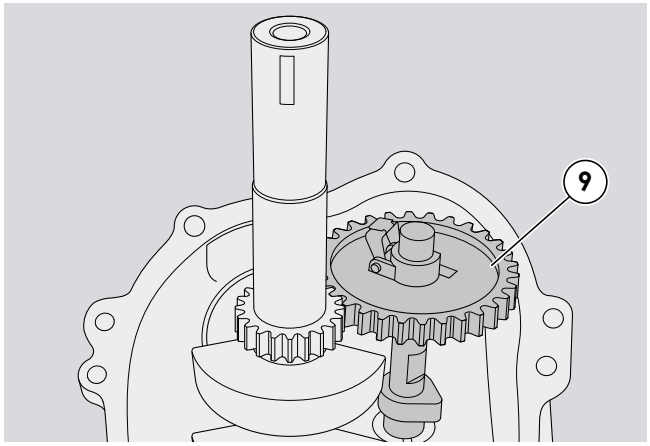
If necessary, re-set the phasing, referring to the indications provided.

7 - On assembly, follow the steps described in reverse and:
- clean the contact surfaces, removing any remaining silicone;
- evenly distribute the silicone seal (THREE BOND 1207) (**7**) as shown in the figure;
- ensure that the two centring pins (**8**) are properly inserted;
- always replace the compression ring from the sump side [[☞ 14.6].
- close the screws (**6**) intersection lock bowl to the indicated couple;

8 - After installing the engine on the machine:
- refill the sump and make sure that the filler plug is tight.
- check the adjustment of the brake cable [[☞ 12.1] and the throttle cable [[☞ 10.1] **(➤ RSC100 model only)**.

9 - Following reassembly it is advisable to check the engine's peak rpm [[☞ 10.2] **(➤ RSC100)** [[☞ 10.2a] **(➤ RS100)** .

15. ENGINE BLOCK - Overhauling internal parts

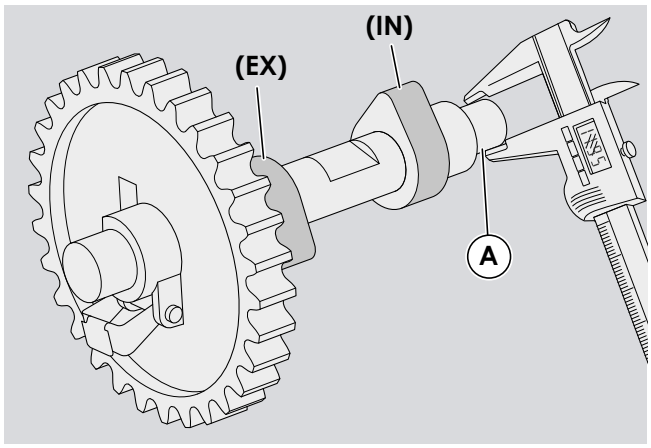


15.3. Dismantling and checking the camshaft and counterweight governor

1 - Bring the piston to the TDC (Top Dead Centre).

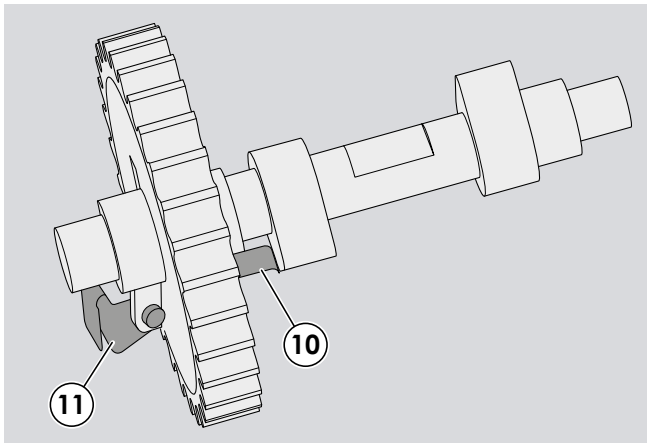
2 - Open the crank case [[☞ 15.2].

3 - Remove the camshaft (**9**).

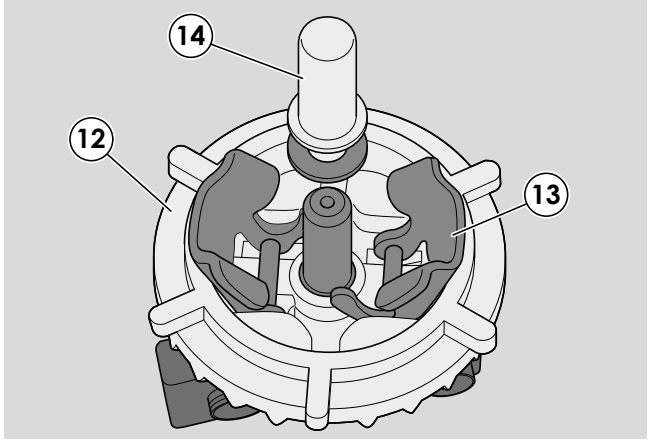


4 - Measure seat (**A**) of the camshaft, checking for wear and tear. The value must not be lower than 11,95 mm.

5 - Measure the cams (IN and EX) on the camshaft, checking for wear. The value must not be lower than 24,10 mm (IN) and 24,13 mm (EX).



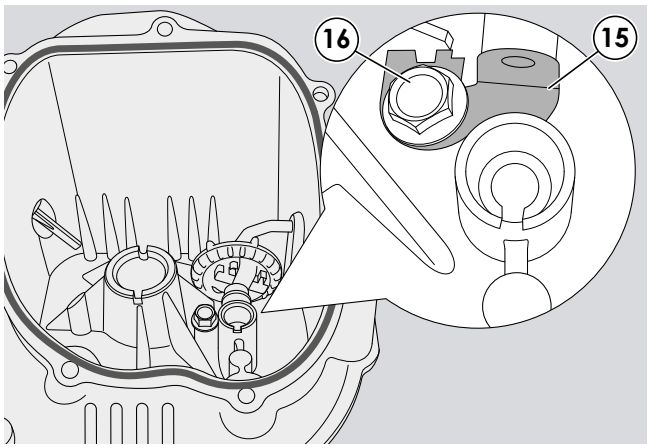
6 - Check the regular movement of the pressure reducer (**10**) and the efficiency of the spring (**11**); the whole group must always be replaced in the case of breakage or irregular operation of the pressure reducer.



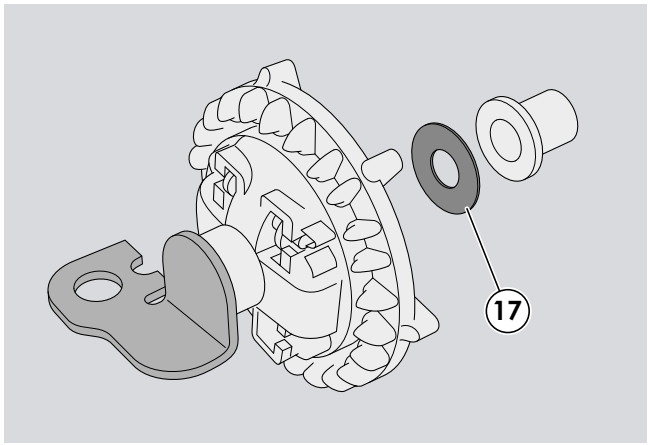
7 - Check that the irregolar centrifugal (**12**) that are not present ruptures of the lubrication pallets.

8 - Turn the governor's gears quickly and check that the counterweights (**13**) expand correctly, causing the pin (**14**) to be moved axially.

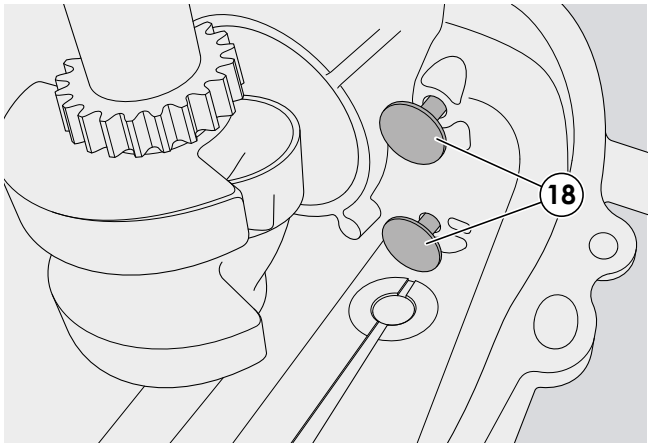
15. ENGINE BLOCK - Overhauling internal parts



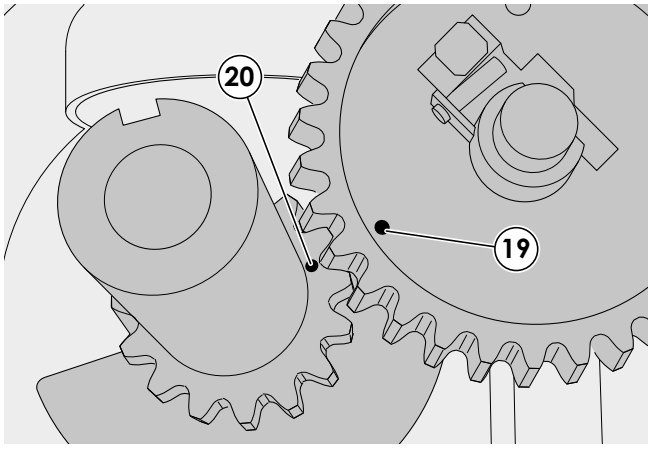
9 - In the case of breakage or irregular operation of the counterweights the whole group, fixed by a plate (**15**) and a screw (**16**) must be replaced.



10 - When installing the new unit, take care to position the washer (**17**) correctly on the opposite side.



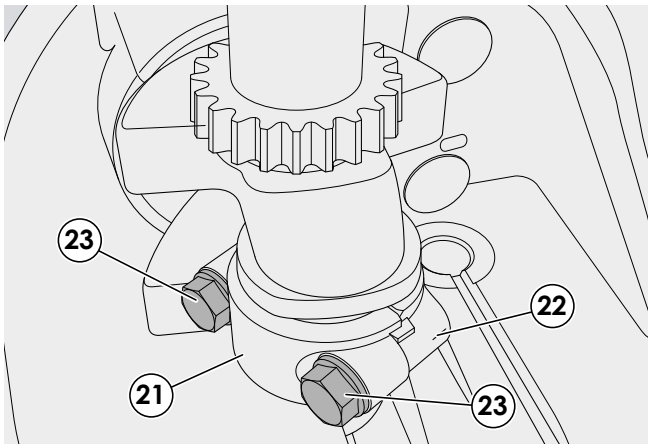
11 - Before fitting the camshaft ensure that the two tappets (**18**) are correctly housed in their seats.

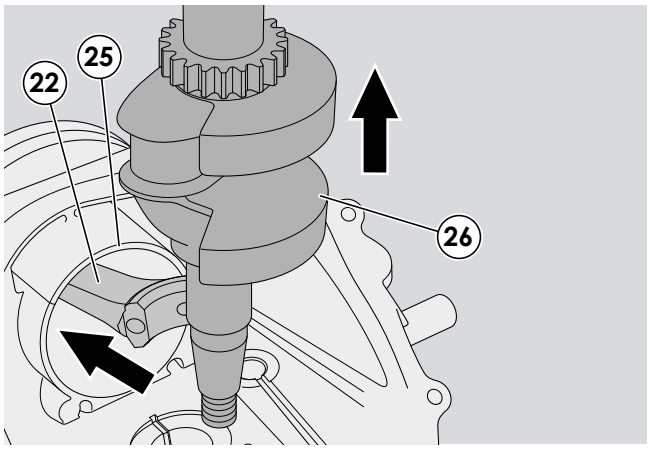


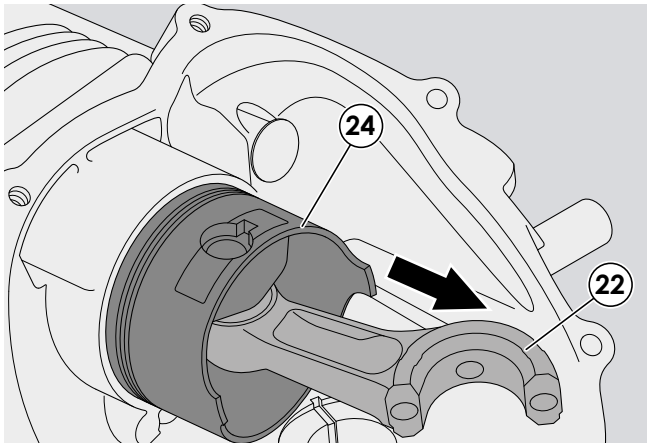
12 - When refitting the camshaft, maximum care must be taken to match up the two references (**19**) and (**20**) punched on the gears, so as to ensure correct distribution phasing.

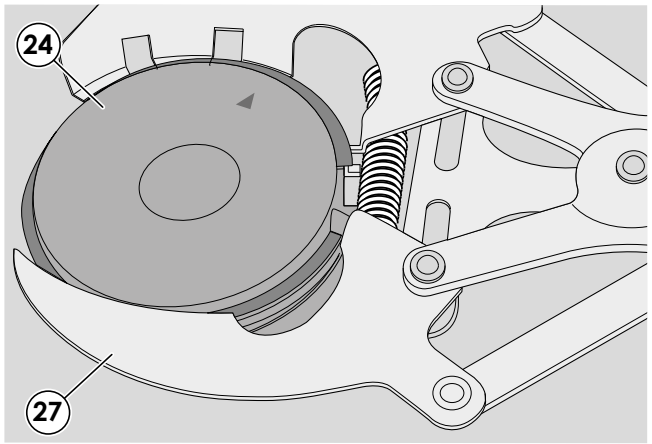
13 - During assembly, refer to the operations in section [[☞ 15.2] always remembering to replace the washer (**7**) between the sump and the housing.

15. ENGINE BLOCK - Overhauling internal parts









15.4. Dismantling and checking the piston, piston rings, connecting rod and engine shaft

NOTA - These paragraphs describe all the operations for checking and overhauling the thermal components of the engine; it is left to the operator to assess the advisability of performing all the operations described or only part of them, depending on the type of engine problems encountered.

1 - Remove the engine from the machine [[☞ 15.1]].

2 - Remove the complete fan [[☞ 14.3]].

3 - Open the cover [[☞ 15.2]].

4 - Remove the camshaft [[☞ 15.3]].

5- Dismantle the connecting rod (**21**) cap (**22**), fixed with two screws (**23**) (take note of any reference marks for refitting).

6 - Push the connecting rod (**22**) so as to ensure the piston (**24**) enters the cylinder (**25**) fully.

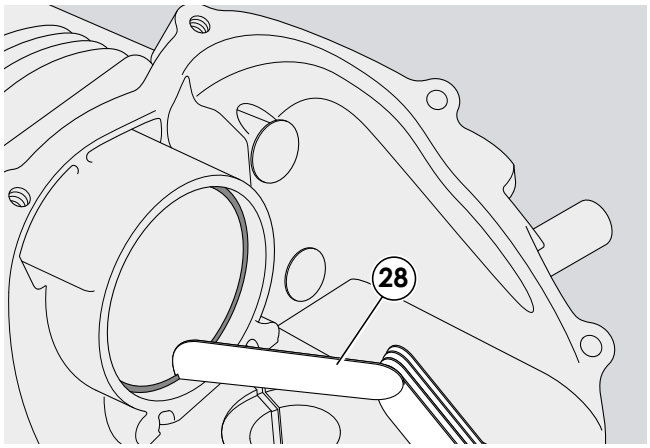
7 - Pull the engine shaft (**26**) out completely.

8 - To remove the piston (**24**) pull the connecting rod (**22**) as shown in the figure.

9 - Use the special expanding tool (**27**) to remove the two compression rings and the oil scraper ring from the piston (**24**).

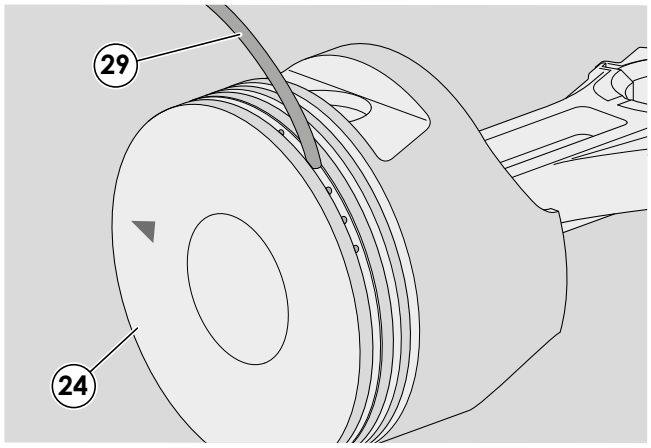
10 - Carefully remove all carbon deposits from the compression rings, the inside of the cylinder and the piston head.

15. ENGINE BLOCK - Overhauling internal parts

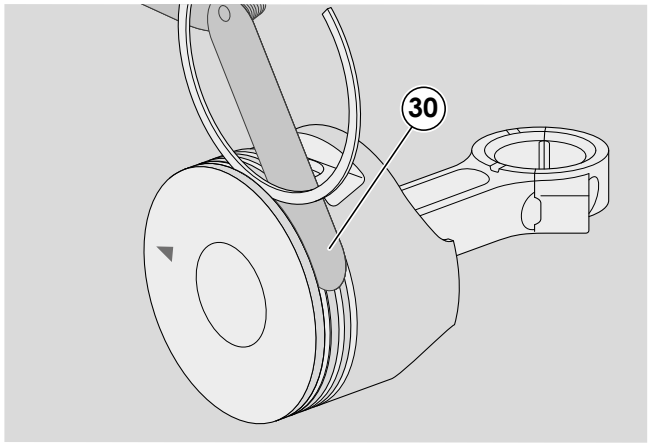


9 - To check the wear in the compression rings, insert them one at a time into the cylinder (**25**) by about 10-15 mm and measure the gap between the two ends with a feeler gauge (**28**); the rings must be replaced if the gap is more than 0.8 mm.

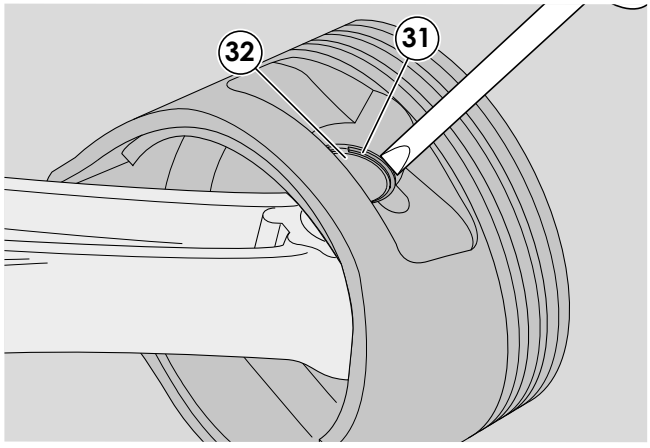
NOTE - If a gap of more than 0.4 mm is measured with new rings it means that the cylinder is worn beyond the acceptable limits and must be replaced. The cylinder must be replaced if it shows striping due to a seizure.



10 - Use a section of an old ring (**29**) to carefully clean the inside of the piston (**24**) ring housings, ensuring that the oil passage holes are not blocked.

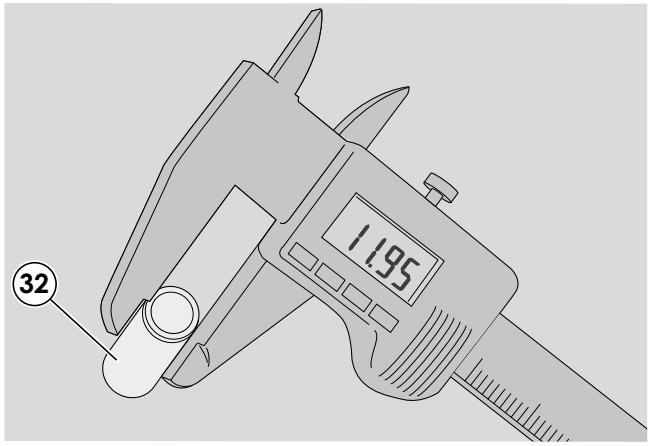


11 - To check the wear in the piston ring housings, fit a new ring and measure the residual space with a feeler gauge (**30**). The piston must be replaced if it is greater than 0.12 mm in the two compression ring housings.

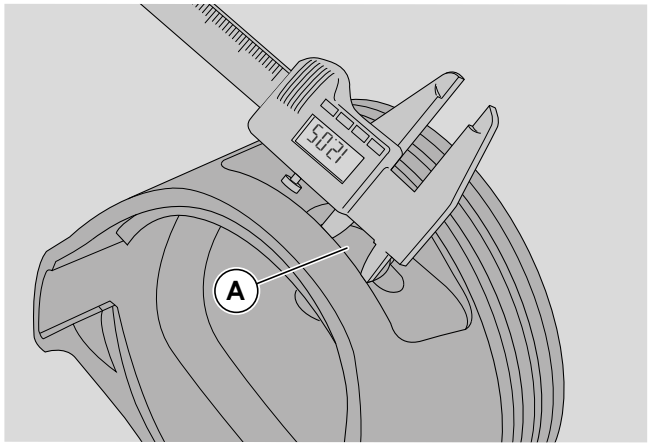


12 - Use a screwdriver to remove the clamping ring (**31**) and remove the gudgeon pin (**32**) from the piston (**24**).

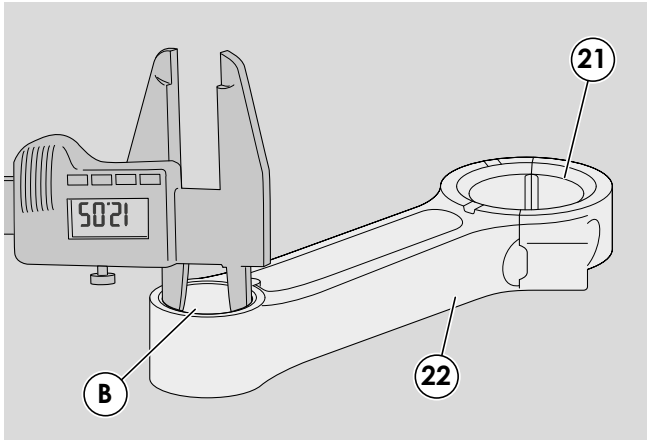
15. ENGINE BLOCK - Overhauling internal parts



13 - Check the diameter of the gudgeon pin (**32**) in several places and replace it if it is less than 11.95 mm, even at a single point.



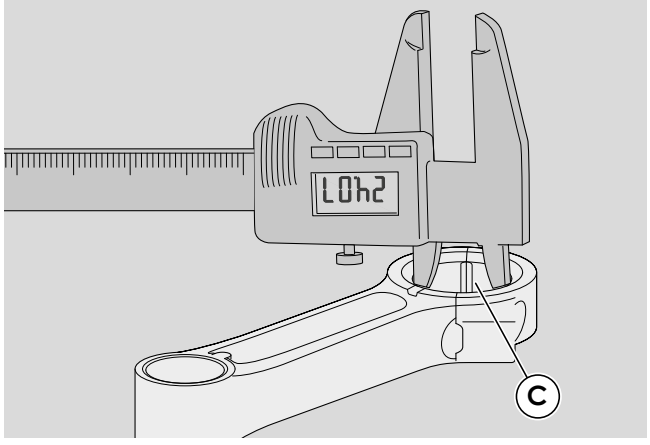
14 - Check the diameters of the gudgeon pin housings (**A**) on the piston (**24**) and replace the piston if they are more than 12.05 mm, even at a single point.



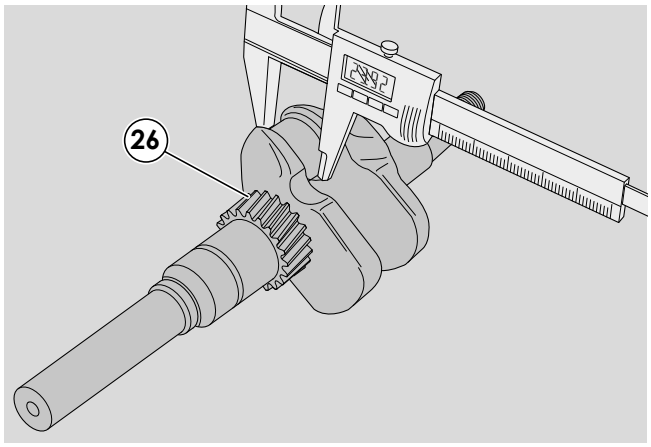
15 - Fit the cap (**21**) to the connecting rod (**22**) and check the diameter from the gudgeon pin side and the crank side; replace the connecting rod if the values are greater than:

B : 12,05 mm on the gudgeon pin side;
C : 24,07 mm on the crank side.

If the connecting engine shaft is outside measurement tolerances or has small scratches or marks, it is necessary to replace it.

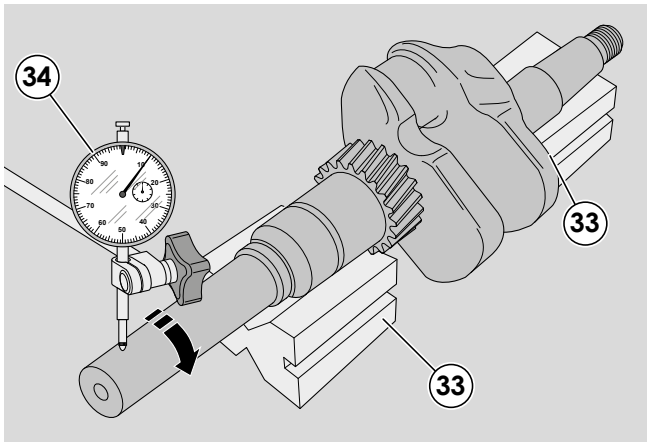


15. ENGINE BLOCK - Overhauling internal parts



16 - On the engine shaft (**26**), removed beforehand, use a digital gauge to check the diameter of the connecting rod pin.
The value must not be less than 23.92 mm or the engine shaft will have to be replaced.

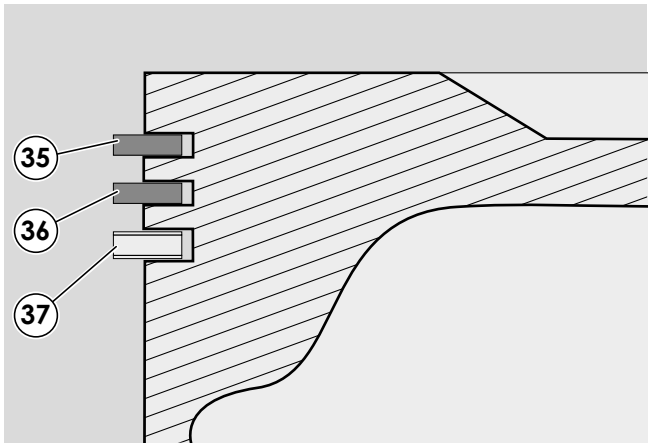
NOTE - In the case of seizing, the manifolds can be polished with fine emery cloth, only removing foreign matter and checking that the final size remains within the aforementioned limit.



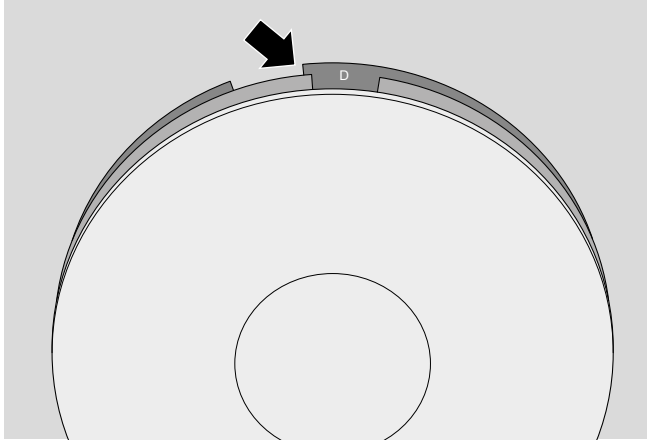
17 - To check the alignment between the manifolds and the protruding part of the shaft, place the engine shaft on two prismatic guides (**33**) and, with the help of a comparator (**34**) placed at the end, check the displacement by rotating the shaft. The shaft must be replaced if the displacement exceeds 0.10 mm.

IMPORTANT: A bent shaft must never be repaired!

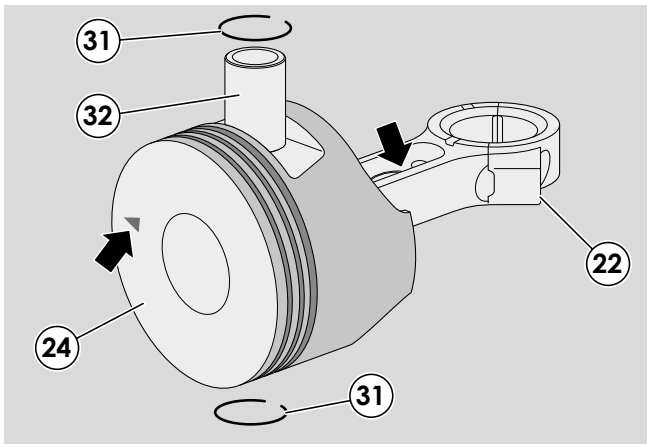
WARNING - DANGER: A bent shaft causes abnormal vibrations and could be dangerous when the machine is used!



18 - To refit the rings to the piston, first fit the three oil scraper rings (**35**), then the ring with a round edge (**36**) and finally the ring with a sharp edge (**37**), being careful over the markings (which must face the piston head) and in arranging the gaps to ensure that they are not aligned with each other;



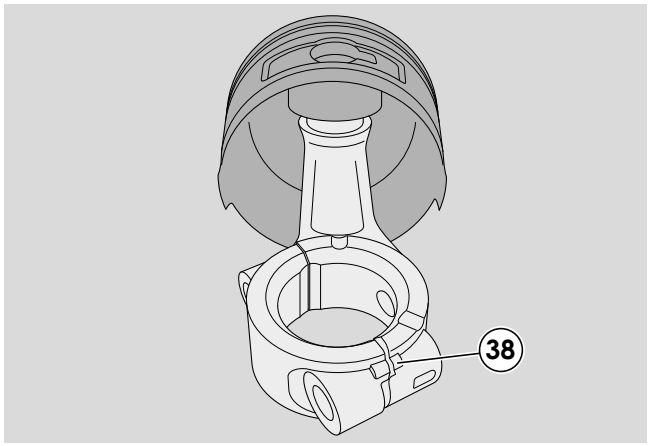
15. ENGINE BLOCK - Overhauling internal parts

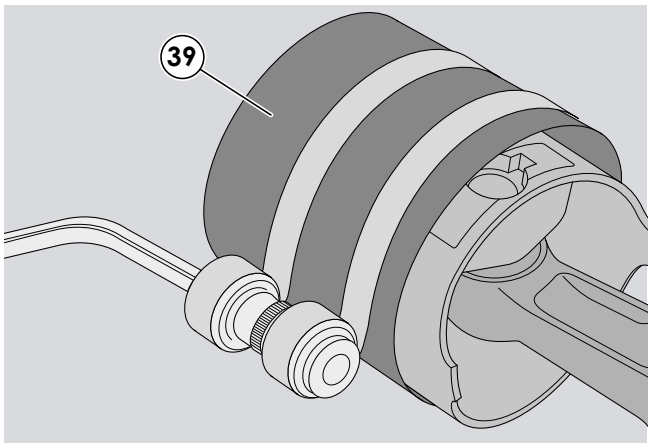


19 - Fit the connecting rod (**22**), gudgeon pin (**32**) and clamping rings (**31**) to the piston (**24**).

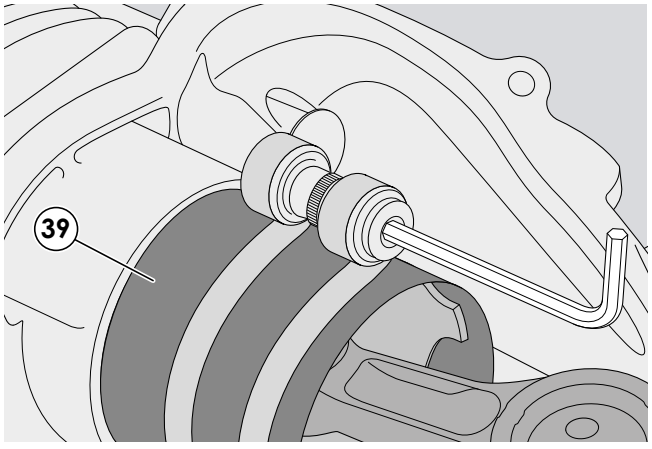
NOTE - The marking on the piston must be directed towards the intake.

The connecting rod must be mounted with the marking (38) facing upwards.



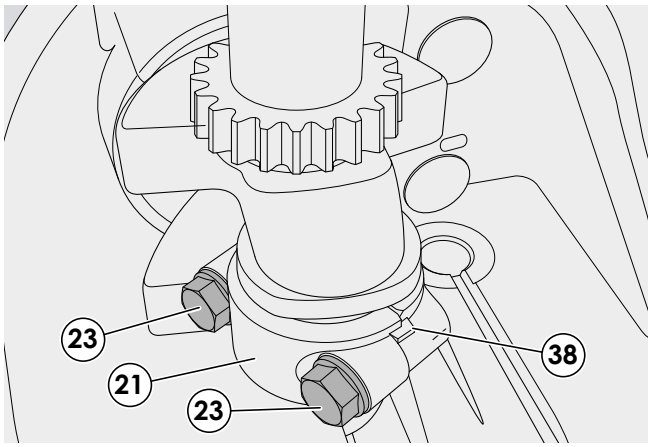


20 - Put the piston into the ring compression tool (**39**).

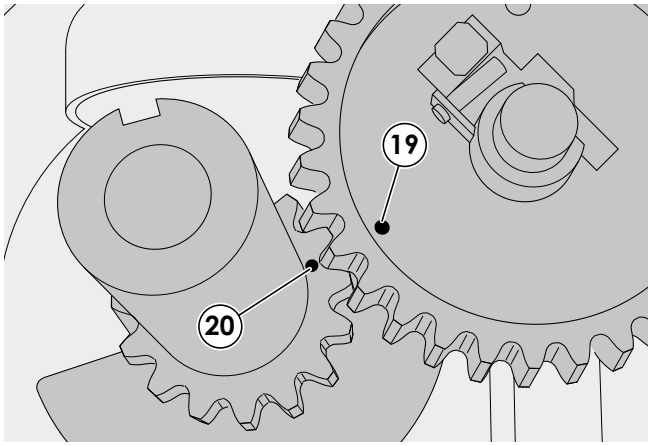


21 - Oil the inside of the piston liberally and insert the piston, with the marking facing the exhaust.

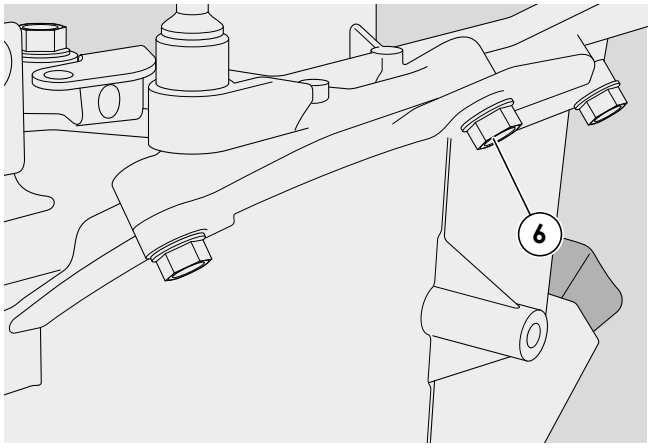
15. ENGINE BLOCK - Overhauling internal parts



22 - Mount the engine shaft (**26**) and the connecting rod cap (**21**) with the relative screws (**23**), taking care with the position references (**38**) so as to avoid inverting the mounting direction of the cap.
Close the screws (23) to the indicated couple.



23 - After having fixed the connecting rod cap, take the greatest care to ensure that the two position references (**19**) and (**20**) punched on the engine shaft and camshaft gears, coincide, ensuring the correct distribution phasing.

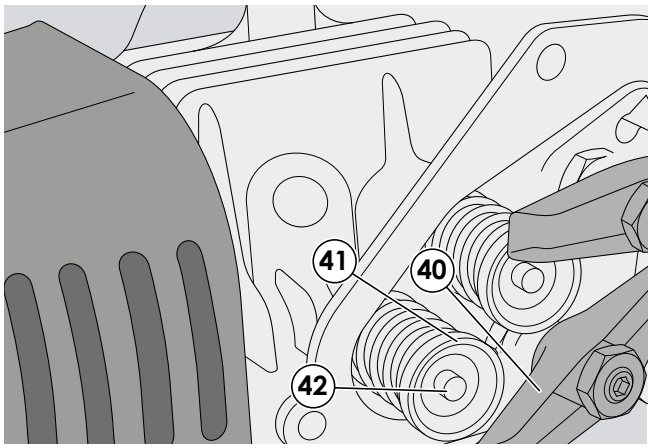


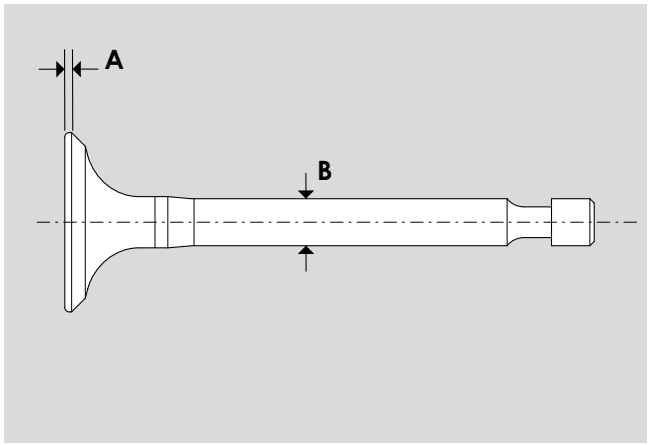
24 - Close the carter and fix the screws (**6**) to the indicated couple [[☞ 15.2].

25 - Whenever the engine shaft is dismantled and refitted, it is always necessary to:
- replace the sealing ring on the fan side [[☞ 14.5];
- replace the sealing ring on the sump side [[☞ 14.6].

26 - During assembly perform the operations indicated in section [[☞ 15.2] always remember to replace the silicone gasket (**7**) between the sump and the casing

15. ENGINE BLOCK - Overhauling internal parts





15.5 Overhauling the valves

NOTE - These paragraphs describe all the operations for checking and overhauling the valves;

it is left to the operator to assess the advisability of performing all the operations described or only part of them, depending on the type of engine problems encountered.

1 - Remove the starter assembly [[☞ 6.1].

2 - Open the crank case [[☞ 15.2] and remove the piston [[☞ 15.4].

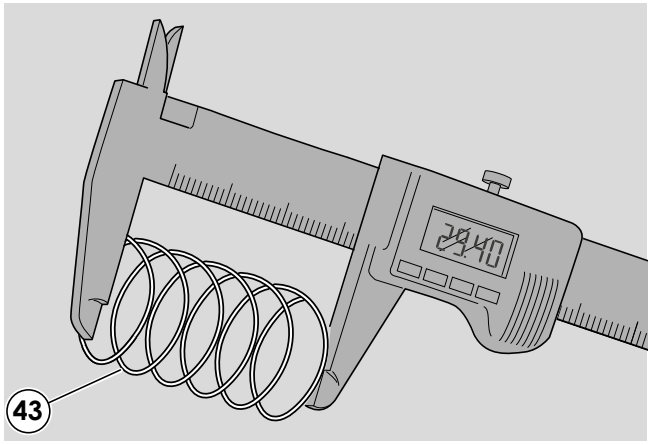
3 - Move the rocker arms (**40**); press down the spring seal cap (**41**) and move it sideways to remove from the valve stem (**42**).

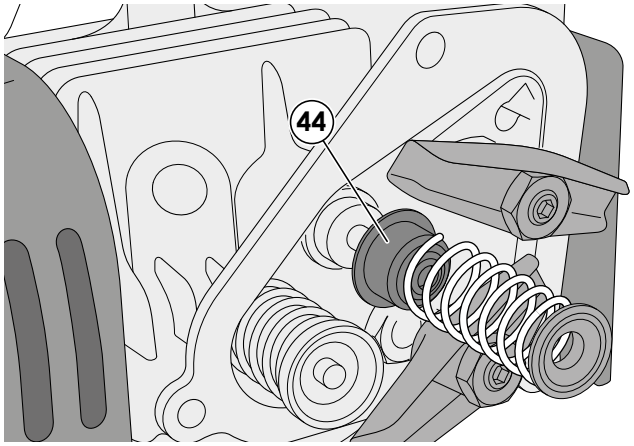
IMPORTANT - The intake and exhaust valves are of different sizes.

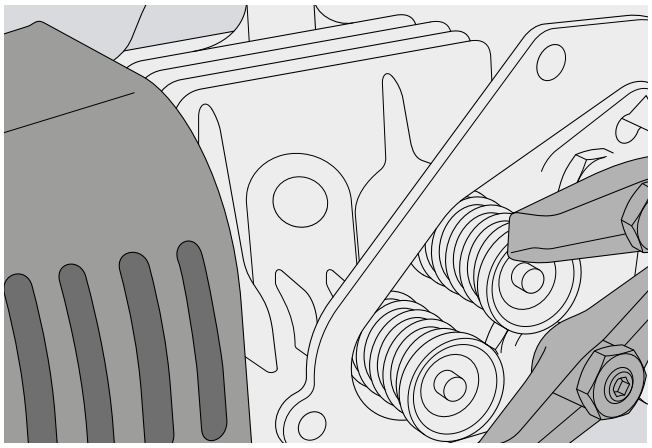
4 - Use an emery cloth to remove all incrustations from the valve head and check the thickness of the rim (**A**); the valve must be replaced if the margin (**A**) is less than 0,6 mm or if it shows signs of burning.

5 - Check the diameter of stem (**B**) in several points and replace the valve if it is less than the following, even if only in one point:
5,45 mm (inlet - IN)
5,42 mm (exhaust - EX)

15. ENGINE BLOCK - Overhauling internal parts







6 - Check the free length of the spring (**43**) and replace the spring of it is less than 29,4 mm.

7 - When mounting:

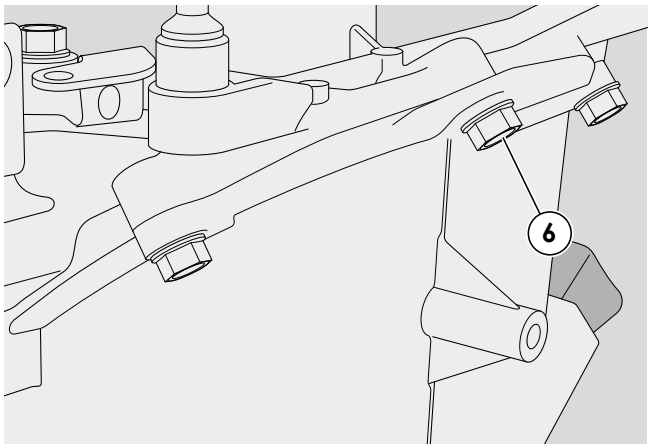
- carefully clean the valve guides and housings of any foreign body;

- apply a film of oil on the valve stems before inserting them in their respective housings;

- ensure the proper position of the intake valve and exhaust valve, which can be notice by the different sizes (Intake: larger, Exhaust: smaller).

8 - Replace the intake valves and check that the oil seal (**44**) is in place.

15. ENGINE BLOCK - Overhauling internal parts



9 - Close the carter and fix the screws (**6**) to the indicated couple [[☞ 15.2].

10 - During assembly perform the operations indicated in section [[☞ 15.2] always remember to replace the silicone gasket (**7**) between the sump and the casing.

11 - Refit the starter assembly [[☞ 6.1].

Tightening torques		
6	Union screws under carter and sump	8-12 Nm
17	Counterweight governor fixing screw	8-12 Nm
28	Fixing screws lower connecting rod cap	11-13 Nm

Technical information	
Oil sump capacity	0,40 litri
Diameter aspiration cam	24.1 mm
Diameter discharge cam	24,13 mm
Maximum segments gap in the cylinder	0,8 mm
Max. compression ring axial gap	0,12 mm
Minimum gudgeon pin diameter	11,95 mm
Max. gudgeon pin housing diameter on piston	12,05 mm
Max. connecting rod diameter	
gudgeon pin side	12,05 mm
crank side	24,07 mm
Diam. connecting rod's pin on engine shaft	23,92 mm
Verify the engine shaft extremes	0,10 mm
Minimum inlet valve stem diameter	5,45 mm
Minimum exhaust valve stem diameter	5,42 mm
Valve head margin min. thickness	0,6 mm
Minimum valve spring length	29,4 mm

Special equipment	
28	Piston ring removal expander
40	Piston ring compressing tool

16. TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
The engine does not start or starts badly	The engine brake cable is faulty or unfastened	Adjust and/or replace the cable [12.1]
	The OFF microswitch is faulty	Replace the whole shut-down group [12.2]
	Coil earth connection	Check electrical cabling of earth wire [11.1]
	Earth wire is flattened	Replace the whole shut-down group [12.4]
	The coil is faulty and does not supply current or the air gap is too large	Check coil [11.2]
	Carburettor dirty	Check and clean the carburettor [8.1] **(➤ RSC100)** and [9.1] **(➤ RS100)**
	Poor seal of carburettor needle valve	Clean the carburettor housing and needle valve [8.1] **(➤ RSC100)** and [9.1] **(➤ RS100)** or replace the carburettor [8.2] **(➤ RSC100)** and [9.2] **(➤ RS100)**
	Choke blocked /not closed **(➤ RSC100)**	Check and clean the carburettor and the choke [8.1]
	The spark plug is badly connected or faulty	Check spark [11.1] or replace spark plug
	Blocked air filter	Execute the filter cleaning [7.1] and [7.1a] **(➤ only for RS100)**
	Valve malfunction	Check the valve clearance [14.2]
	Insufficient pressure	Check tightness of cylinder head screws, replace washer if necessary. Check wear and tear of the piston rings [15.4]
	The Primer is faulty **(➤ RS100)**	Check the effective operation of the Primer
Starting is difficult and strains the rope	Presence of oil in the combustion chamber	Clean the combustion chamber
	Pressure reducer fault	Check the pressure reducer and counterweights [15.3]

16. TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
The engine starts but does not run	The tank cap has a clogged breather pipe	Clean and/or replace the cap [5.3];
	Insufficient pressure	Check correct valve operation [15.5]. Check that the spark plug is secured [11.1]. Check for any cracks in the casing. Check wear and tear of the piston rings [15.4]
	Exhaust is blocked	Check that there is airflow through the exhaust system and replace if necessary [13.1]
The engine is inefficient or the runs irregularly	The throttle cable is not well adjusted **(➤ RSC100)**	Check and/or adjust the throttle cable [10.1]
	The governor malfunctions or there is a problem with the rods	Check the entire governor system [10]
	Air seepage in the carburettor	Replace the carburettor gaskets [8.1] **(➤ RSC100)** and [9.1] **(➤ RS100)**
	Carburettor dirty	Check and clean the carburettor [8.1] **(➤ RSC100)** and [9.1] **(➤ RS100)**
	Insufficient pressure	Check correct valve operation [15.5]. Check that the spark plug is secured [11.1]. Check for any cracks in the casing. Check wear and tear of the piston rings [15.4]
	The coil air gap has been poorly adjusted	Adjust the air gap [11.2] and if the problem persists, replace the coil [11.3]
	Oxidation or loosening of spark plug connections	Perform spark test [11.1] or replace spark plug
The engine overreved	Governor blocked due to breakage of centrifugal assembly or breakage of external governor springs. It is possible that the governor is dirty	Check the entire governor system [10 and 15]
The engine judders	Engine screws loose	Tighten the screws
	Engine shaft off-centre	Replace the engine shaft [15.4]
	Engine timing faulty	Check wear and tear of the connecting rod of the engine shaft, replace shaft if necessary [15.4]

16. TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
The engine does not turn off	The engine brake cable is bent or jammed	Check and/or adjust the cable [[☞ 12.1]
	The earth cable is disconnected or broken	Check and/or replace oil breather tab [[☞ 11.1]
The engine does not stop within 3 seconds after it has turned off	Faulty or no clutch lining	Replace the engine stopping system [[☞ 12.4]
The engine uses a lot of oil	Faulty blow-by operation	Check and/or replace the blow-by system [[☞ 14.4]. Check the condition of the air filter [[☞ 7.1]
	Poor piston ring seal	Replace the rings [[☞ 15.4]
	Excessive gap between the guide and the inlet valve stem	Check and/or replace the valve [[☞ 15.5]
	Ring assembly error	Check the assembly of the rings [[☞ 15.4]