

WORKSHOP MANUAL

36,3 cm³ - 40,2 cm³ brushcutters



36,3 cm³ - 40,2 cm³ brushcutters

Suggested tools

- I. **Emak tool kit**
- II. **Compression tester:** to check thermal group
- III. **Electronic tachometer:** for 2 and 4 stroke engines, measurement range from 100 to 30,000 RPM



p/n 3055125



p/n 001000392A



p/n 001000785

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1) Performance

- a) Compression test
- b) Cylinder and piston inspection
- c) Decompressor inspection
- d) Cooling system cleaning
- e) Muffler inspection



2) Fuel system

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- b) Fuel system test
- c) Tank breather inspection
- d) Insulator inspection
- e) Engine seal test



3) Ignition system

- a) Starter housing inspection
- b) Spark plug inspection
- c) Spark arrester test
- d) Flywheel-coil air gap inspection
- e) Flywheel key way inspection



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- b) Transmission shaft inspection
- c) Bevel gear inspection



5) Carburetion

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- a) The engine does not start
- b) Low performance
- c) Additional problems

1) Performance

- a) **Compression test**
- b) **Cylinder and piston inspection**
- c) **Decompressor inspection**
- d) **Cooling system cleaning**
- e) **Muffler inspection**

a) **Compression test**

- Apply the Emak compression tester (**I**) to cylinder. Pull energetically the rope 10 times
- Verify that the compression value is not less than 7 bar – 100 psi
- If the value is higher than 7 bar – 100 psi, start inspection **d)**, if lower, carry on with inspection **b)**

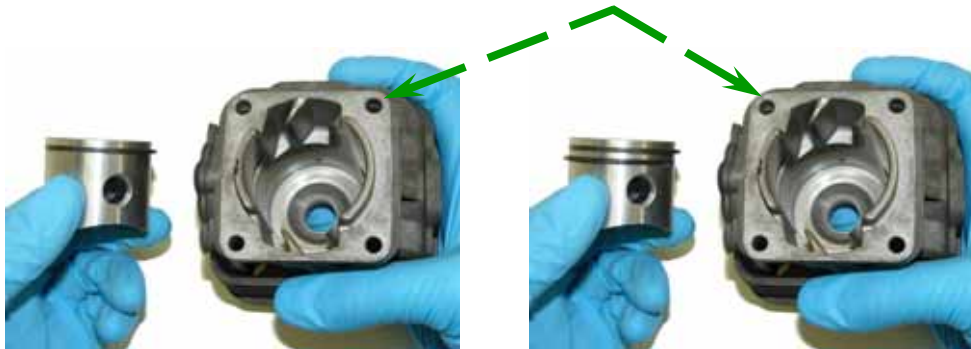
I
p/n 001000392A



b) Cylinder and piston inspection

- Verify the diamond scoring on piston and the nickel-lining on cylinder. Replace if necessary
- Verify the piston rings wear using feeler gauge (gap max 0,6 mm)

Tightening torque cylinder-screws
0,8 kgm (69.44 in lb) + Loctite 243

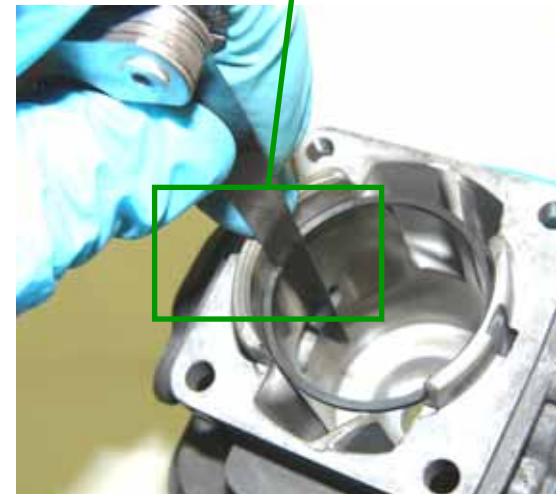


36,3 cm³ version

40,2 cm³ version

c) Decompressor inspection (only version with decompressor)

- Check decompressor
- Verify that the decompressor and the decompression hole on the cylinder is not closed to carbon deposits. Clean and/or replace if necessary.



d) Cooling system cleaning

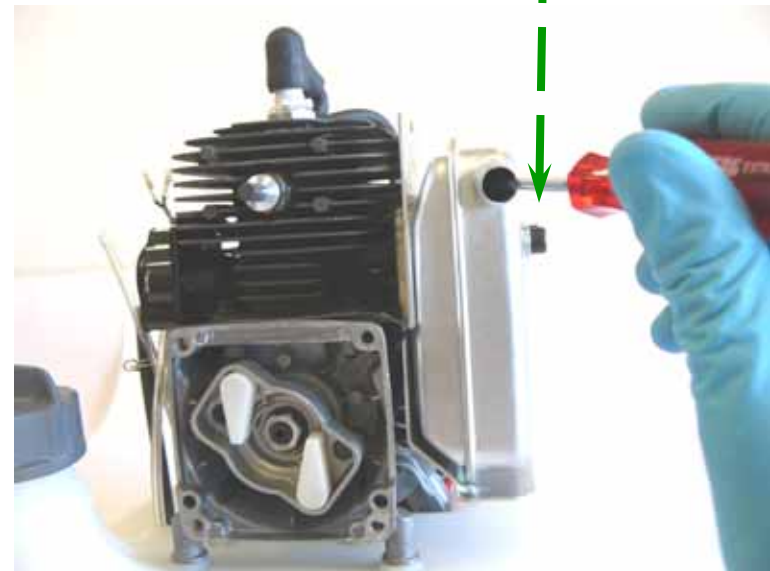
- Blow, with compressed air, cylinder fins, starter case and flywheel



e) Muffler inspection

- If the muffler is clogged or damaged, clean or replace it

Tightening torque muffler-screws
0,8 kgm (69.44 in lb) + Loctite 243



Important:

- Clean **weekly** the cooling system, more frequently in heavy duty work conditions
- Use Loctite 243 to tighten plastic component

2) Fuel system

- a) **Fuel and filter inspection**
- b) **Fuel system test**
- c) **Tank breather inspection**
- d) **Insulator inspection**
- e) **Engine seal test**



- a) **Fuel and fuel filter inspection**
 - Verify fuel quality odor
 - Dismount and check periodically the fuel filter and the sintered internal filter. In case of dirt or oxidation, replace it
- b) **Fuel system test**
 - Apply the pressure gauge at the fuel line. Check any possible leakage at 0,5 bar
 - If the pressure is not stable, it may indicate worn fuel system or loose carburetor parts

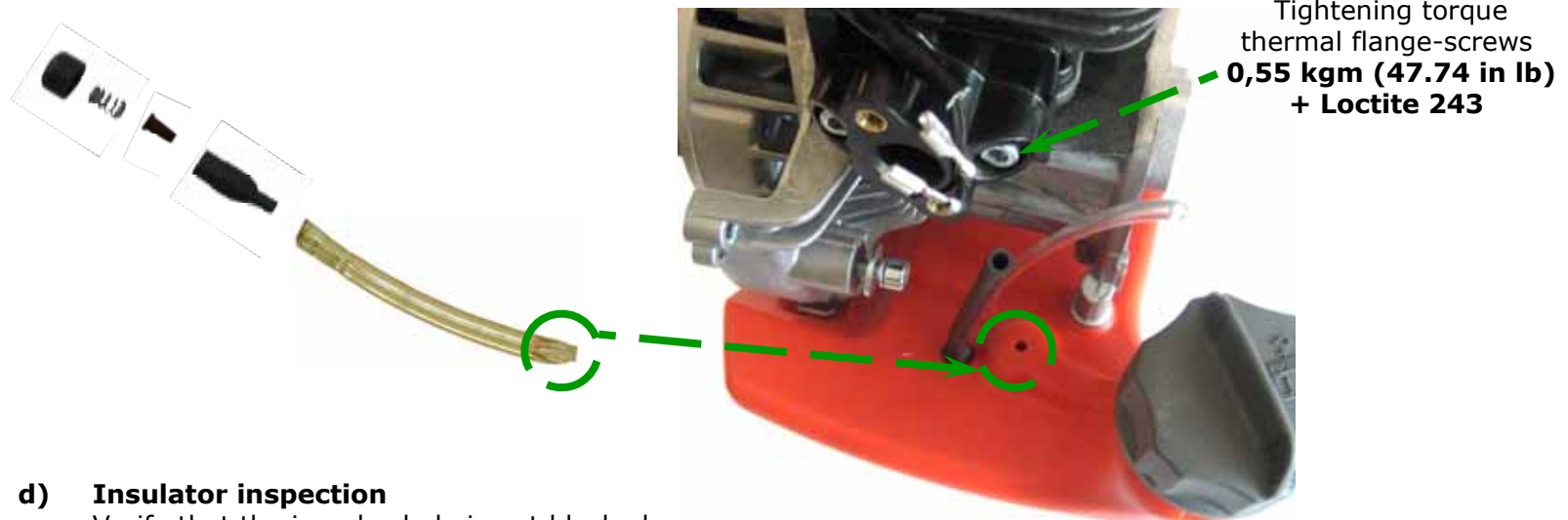
Go to

Carburetor inspection



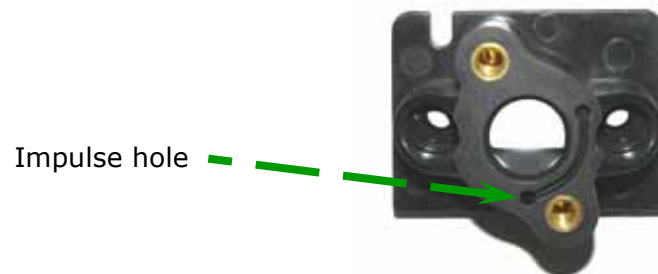
c) Tank breather inspection

- Dismount the breather and check the components



d) Insulator inspection

- Verify that the impulse hole is not blocked

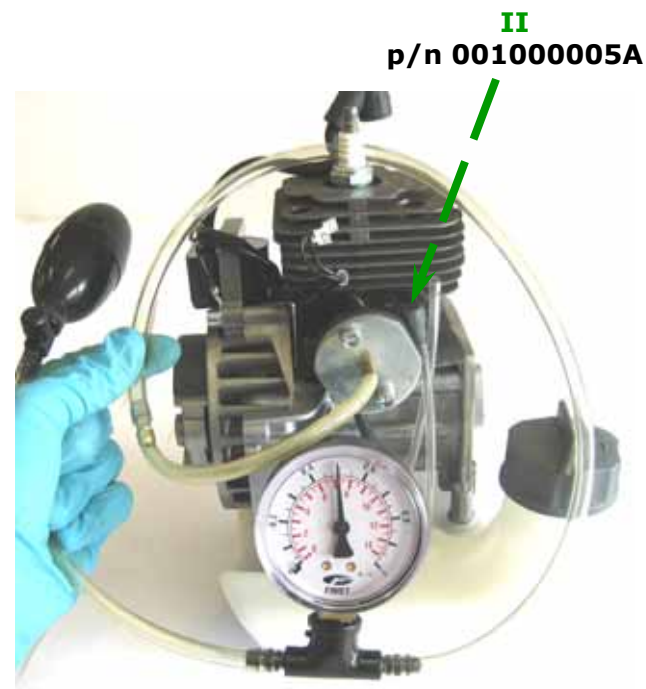


e) Engine test

- Remove carburetor and muffler. Cover the intake side, with insulator mount and exhaust side using the special flanges supplied inside Emak's tool kit (**I** and **II**)
- The pressure must remain stable at 0.5 bar. If the engine loses pressure, find the leak and repair. Retest for seal



Tightening torque screw-basement
0,8 kgm (69.44 in lb)



3) Ignition system

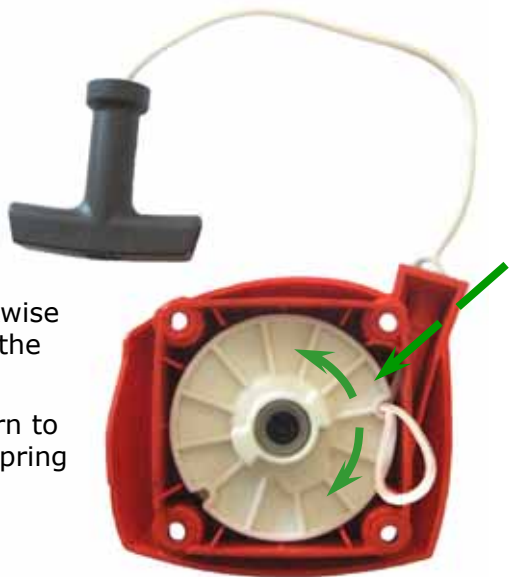
- a) Starter housing inspection
- b) Spark plug inspection
- c) Spark arrester test
- d) Flywheel-coil air gap inspection
- e) Flywheel key way inspection

- a) **Starter housing inspection**
 - Remove housing. Inspect parts for wear. If necessary clean or replace

Version:
DS 37 / 42
BC 37 / 42

Counterclockwise
turn to wind the
spring

Clockwise turn to
release the spring



Wind the
spring 7
times. Verify
that the spring
turns on ½
turn

Starter rope:
Ø 3,5 x 900 mm

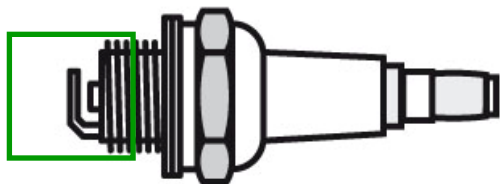
Important:
grease moving
parts

Version:
Stark 37 / 42
Sparta 37 / 42



b) Spark plug

- Take off the sparkplug and check the gap between the electrodes (0,5 - 0,7 mm)



NGK BPMR7A
Champion RCJ-7Y

(0,5 - 0,7 mm)

c) Spark test

- Fit the tester (**I**) between spark plug and spark plug cap. Pull the rope and verify the current
- Replace the spark plug if necessary. Verify that the spark plug thermal grade and type (R) are correct
- Check that the spark plug pipe is correctly connected, cables are not damaged and coil works properly



d) Flywheel-coil air gap inspection

- Check the air gap using the shim (II)(0.3 mm)
- Adjust if not correct



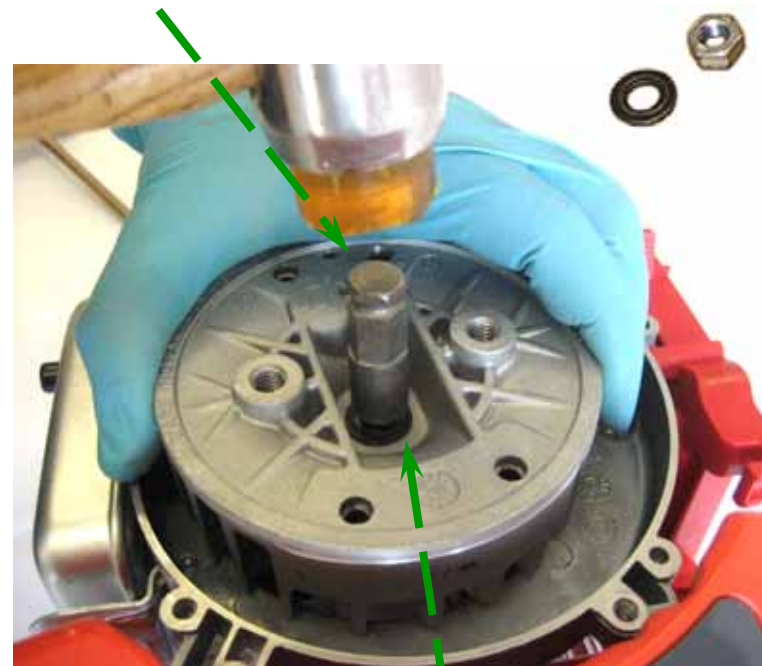
Tightening torque coil-screws
0,55 kgm (47.74 in lb) + Loctite 243

II
p/n 001000004

e) Flywheel key way inspection

- Remove flywheel with correct tool (III)
- Inspect the condition and the position of the key way. If necessary exchange

III
p/n 001000782



Tightening torque flywheel-nut
1,5 kgm (130.2 in lb)

4) Transmission

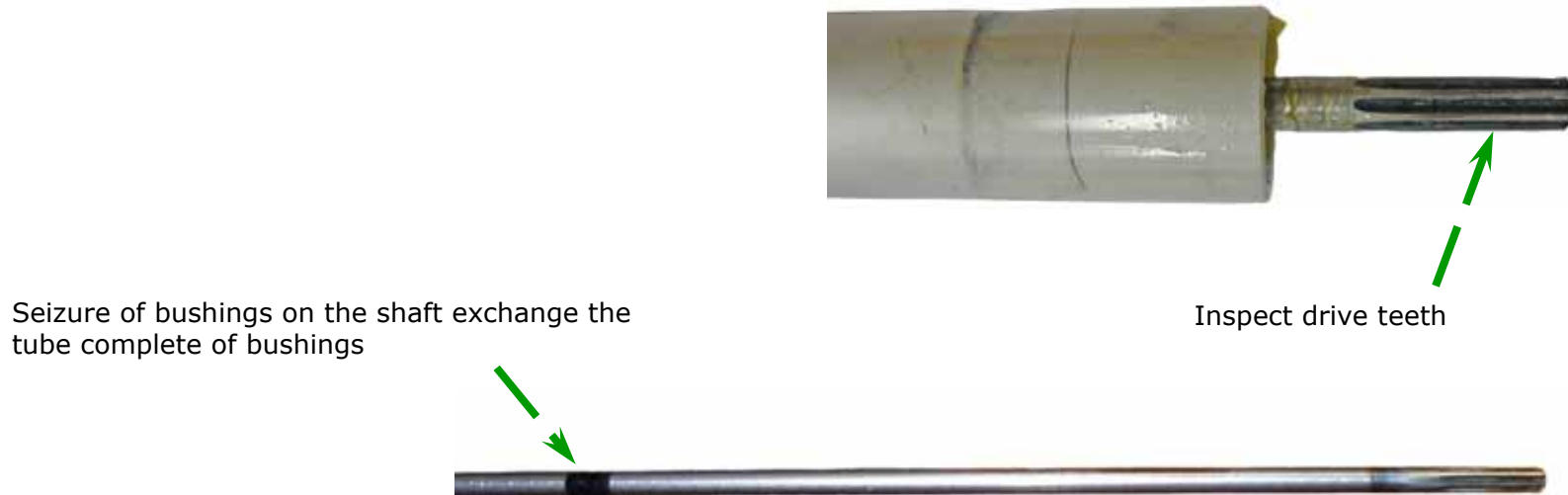
- a) Clutch inspection
- b) Transmission shaft inspection
- c) Bevel gear inspection

- a) **Clutch inspection**
 - Fit piston stop (I). Verify the clutch and the clutch drum
 - Replace components if they are worn



b) Transmission shaft inspection

- Extract the tube of transmission out from engine, take off the shaft from the tube of transmission
- inspect the shaft of transmission for wear. If there is wear or damage to the shaft drive teeth, exchange the complete shaft. If there are seizure signs from the bushings, you need to exchange the tube complete of bushings (see the photo)



Important: grease drive teeth transmission shaft (clutch drum side) **every 100 hrs**

c) **Bevel gear inspection**

- Remove the bevel gear with the special tool (**I** and **II**), shaft side (**Phase 1**) and then head one (**Phase 2**)
- Verify all components and replace when necessary

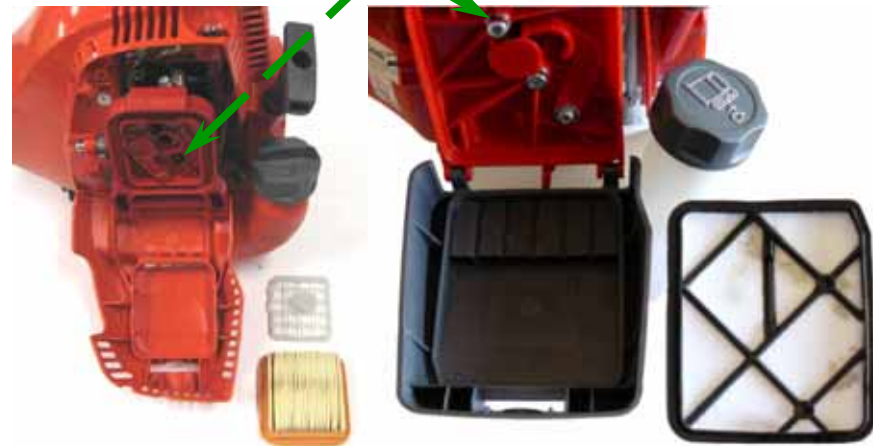


5) Carburetion

- a) **Air filter inspection**
- b) **Needle valve inspection**
- c) **Carburetor inspection**
- d) **Suggested tools**
- e) **Carburetor tuning**

- a) **Air filter inspection**
 - Blow with compressed air, at a distance
 - Replace the filter when damaged

Tightening torque
carburettor-screws
0,5 kgm (43.4 in lb)



Version: DS 37 / 42
BC 37 / 42

Version: Stark 37 / 42
Sparta 37 / 42

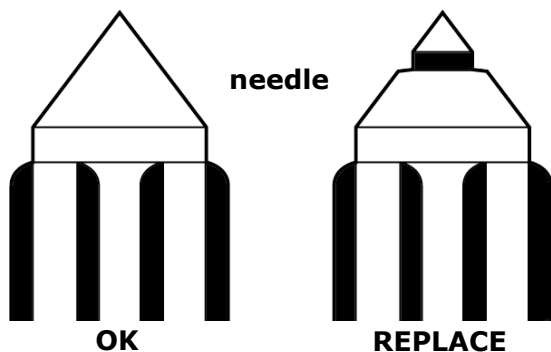
Important: a damaged air filter **compromises engine life**

b) Needle valve inspection

Check the right position of the valve using a caliper Adjust if necessary



WALBRO



c) Carburetor inspection

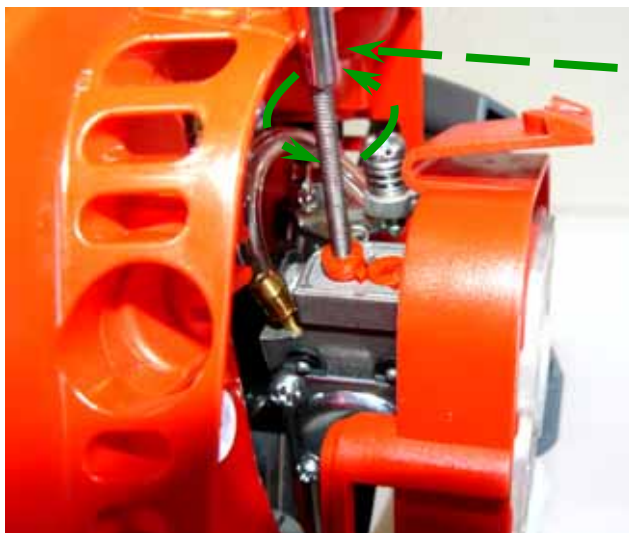
Check and clean all components (diaphragm, needle, filter). Use the repair kit to replace worn components. If the carburetor is oxidized, replace it



WALBRO

d) **Suggested tools for carburetion setting**

- I. Special screwdriver for caps lock:** to unblock the two caps-lock before adjusting the carburetor
- II. Special screwdriver to adjust the jets with caps-lock:** pass through the caps lock to turn the jets

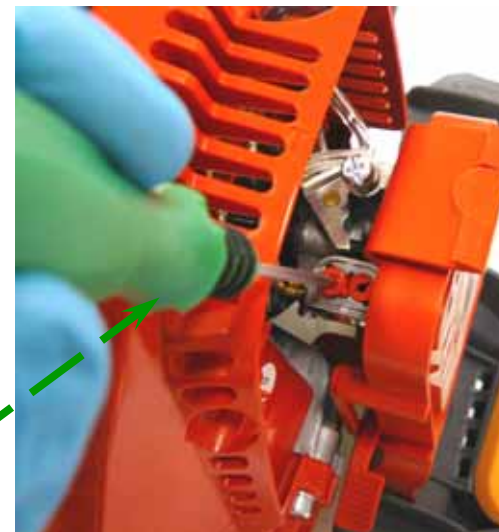


I
p/n 001001342

Screw anti-clock
wise and pull
out the caps
(5 mm)

To adjust the
carburetor use the
special
screwdriver

II
p/n 001001070R



e) Carburetor tuning

Correct tuning of the **EURO 1** version brushcutter (EC directives 97/68/EC + 2002/88/EC) and **EURO 2** version brushcutter (EC directives 97/68/EC + 2002/88/EC + 2004/26/EC), with limiter caps (caps locks) on the jets **L** & **H**. The jets are factory set by Emak to comply with the directives.

With the caps lock fitted the jets **L** & **H** have only 1/4 turn of adjustment, necessary when working in altitude

The Jets have the following factory registration: $L = 1 + \frac{1}{2} \pm \frac{1}{4}$; $H = 2 + \frac{7}{8} \pm \frac{1}{4}$

When following a repair or engine overhaul, you are obliged to re-tune the carburettor to it's original setting.

Our method is:

1) Remove the caps locks from the carburetor jets;

Idling adjustment (L)

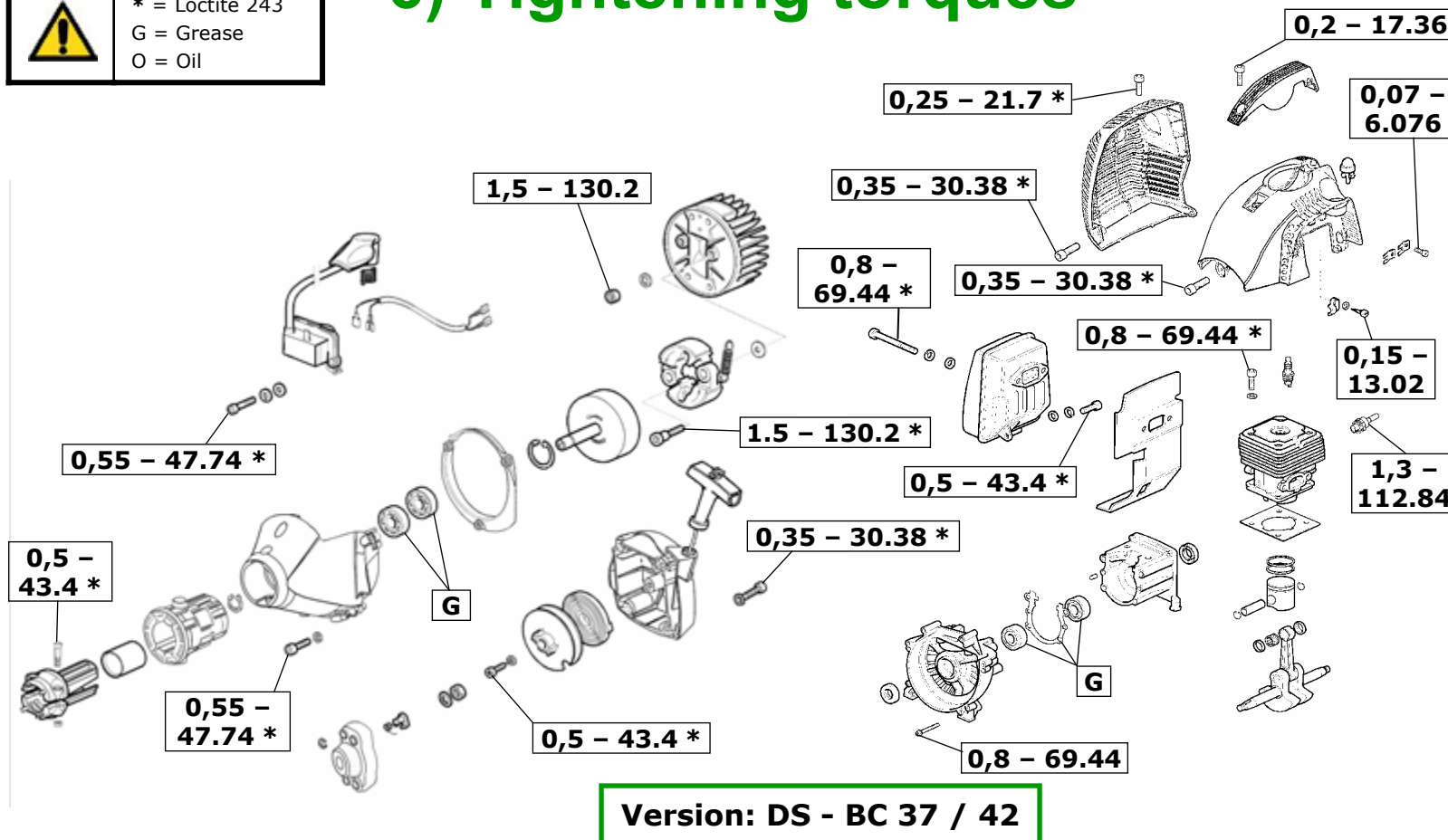
- 2) Start the unit and warm up for 60 seconds, accelerating and decelerating (**do not take the unit to full throttle no load**);
- 3) Close the L jet until the maximum number of rpm is reached (stop rotating the jet before the rpms drop or the unit stalls);
- 4) Adjust the T screw until the unit reaches an idle rpm between **3500/3700 RPM**
- 5) Open the jet L until rpm drops to between **2600/2900 RPM**

Maximum adjustment (H)

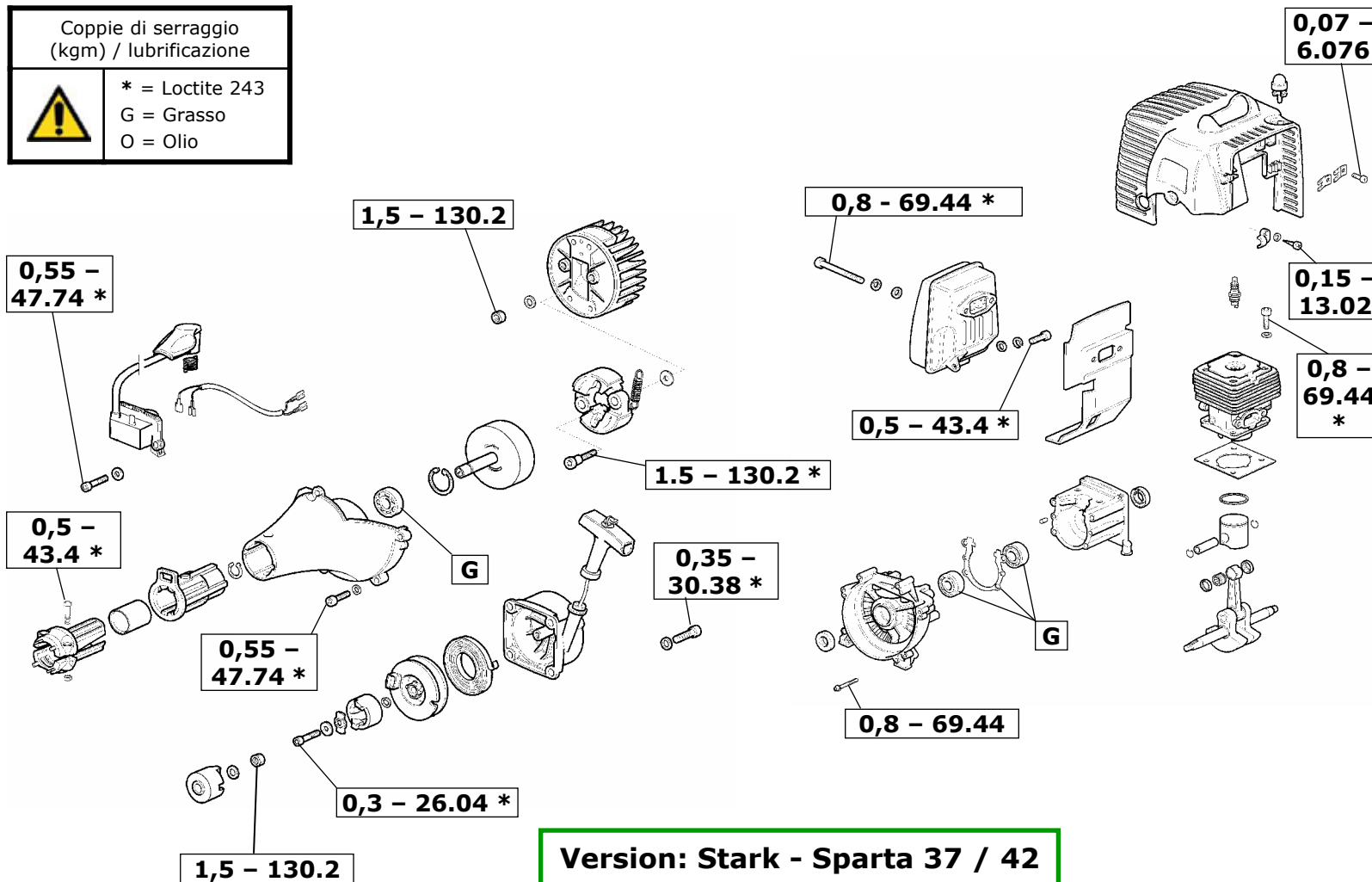
- 6) Adjustment of the jet H for wide open throttle operation with blade or nylon head with max 5 cm of nylon line: **10000 RPM** with new engine; **10500 RPM** with run-in engine
- 7) Block the new caps L & H with new caps.

Tightening torques (kgm) - (in lb) / lubrication	
	* = Loctite 243
	G = Grease
	O = Oil

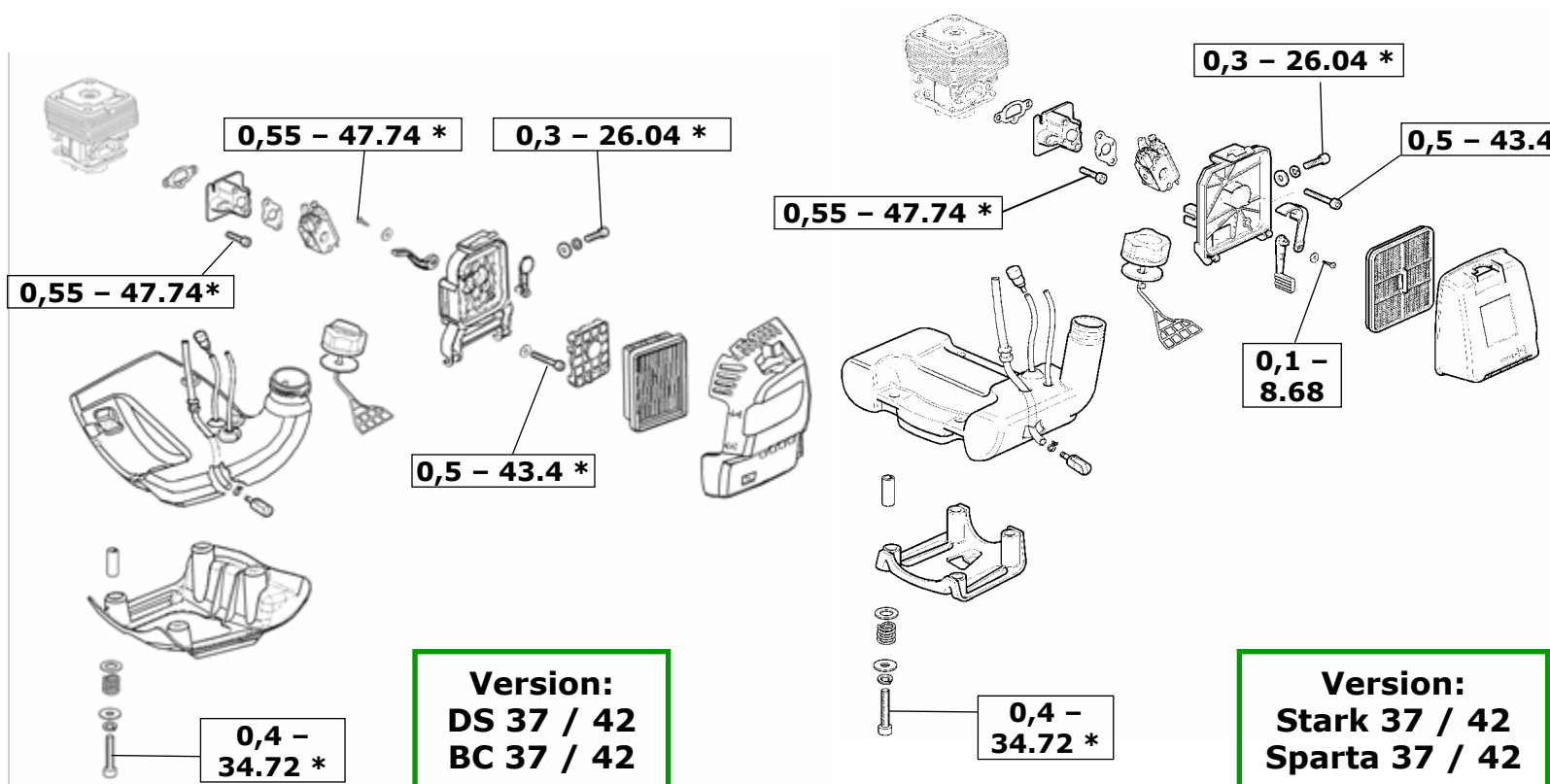
6) Tightening torques




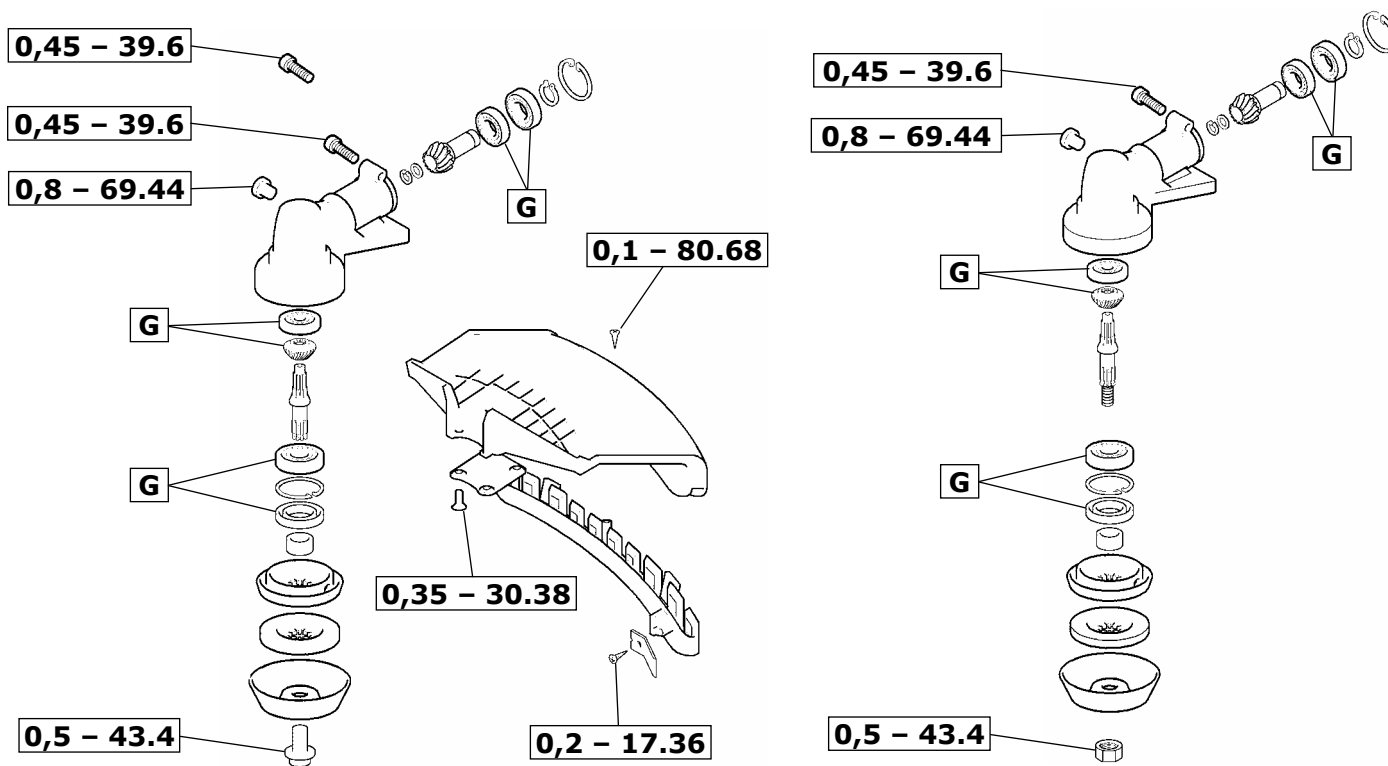
Coppie di serraggio (kgm) / lubrificazione	
	* = Loctite 243
	G = Grasso
	O = Olio




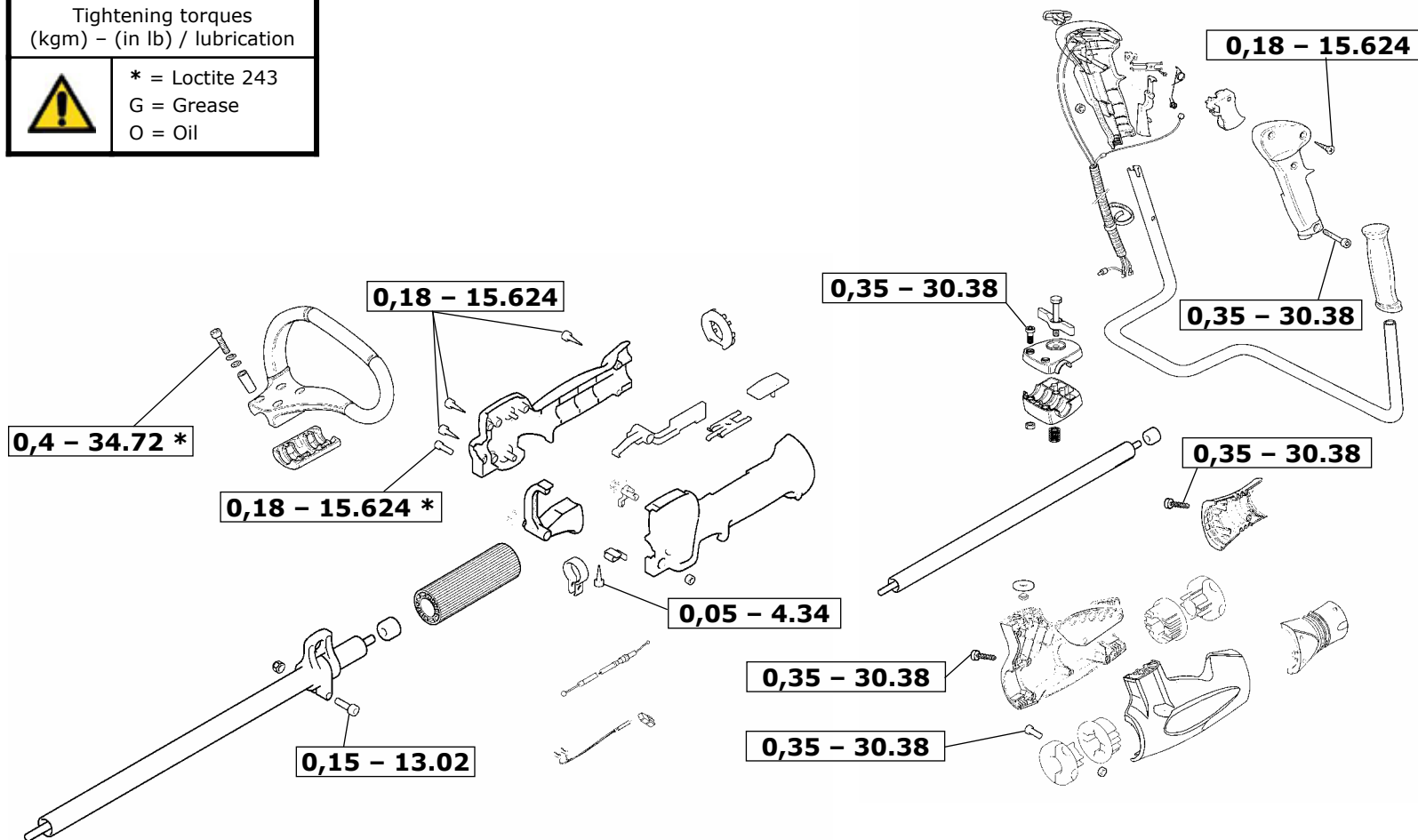
Tightening torques (kgm) - (in lb) / lubrication	
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Tightening torques (kgm) - (in lb) / lubrication	
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Tightening torques (kgm) - (in lb) / lubrication	
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	O = Oil



7) Trouble shooting: ENGINE DOES NOT START

Symptoms	Causes	Remedies	Go to
1. The engine does not turn over	1.a Starter assy defect or broken starter rope 1.b Internal damage	1.a Check starter assy or starter rope replacement 1.b Check thermal group and replace worn components	Section 3 Section 1
2. There is no compression	2.a Sparkplug looses 2.b Piston ring, cylinder and piston worn	2.a Tighten sparkplug. Compression test 2.b Replace worn or damaged parts. Compression test	Section 1 Section 1
3. No spark	3.a Ignition switch is in "OFF" position 3.b Ignition system defected 3.d Broken sparkplug or wrong type	3.a Switch "ON" and restart 3.b Inspect and/or replace 3.d Replace the sparkplug	Section 3 Section 3
4. Fuel does not reach the carburetor, the machine stops after 5 minutes	4.a Fuel filter or breather blocked 4.b Fuel system is leaking air 4.c Wet spark plug, flooded cylinder	4.a Clean or replace 4.b Tightness test on fuel system 4.c Carburetor inspection (point 5.c). Take off spark plug, rotate the engine, blow inside cylinder passing through spark plug hole, dry the spark plug and restart	Section 2 Section 2 Section 5
5. Wrong carburetion setting or erratic throttle response	5.a Air filter dirty 5.b Wrong L and H setting 5.c Carburetor problems 5.d Air leaking or blocked impulse hole 5.e Engine with low compression	5.a Clean or replace 5.b Adjust the carburetion according the above 5.c Carburetor inspection 5.d Insulator inspection, impulse hole inspection and fuel system test 5.e Compression test	Section 5 Section 5 Section 5 Section 2 Section 1

Trouble shooting: LOW PERFORMANCE

Symptoms	Causes	Remedies	Go to
1. Engine overheating	1.a Carburetor mixture too lean	1.a Set the carburetor	Section 5
	1.b Air leaking in the engine or in fuel system	1.b Find air leaking and eliminate it	Section 1
	1.c Wrong oil-fuel ratio	1.c Replace with fresh fuel and right oil ratio	Section 2
	1.d Fan, starter housing, cylinder fins dirty or damage	1.d Clean or replace it	Section 1
	1.e Carbon deposit on piston	1.e Eliminate deposit	Section 1
2. Engine performance is not stable	2.a Dirty air filter	2.a Clean or replace	Section 5
	2.b Loose sparkplug or damaged	2.b Tighten or replace	Section 3
	2.c Water in the fuel	2.c Clean the carburetor and replace fuel	Section 5
	2.d Engine with low compression	2.d Compression test	Section 1
	2.e Faulty carburetor or diaphragm	2.e Check and replace	Section 5

Trouble shooting: **ADDITIONAL PROBLEM**

Symptoms	Causes	Remedies	Go to
<p>1. The tool does not work correctly or does not rotate</p>	<p>1.a Damaged transmission components</p>	<p>1.a Check the bevel gear, transmission shaft and clutch drum</p>	<p>Section 4</p>
	<p>1.b Wear or damage to the shaft drive teeth</p>	<p>1.b Replace shaft transmission</p>	<p>Section 4</p>
	<p>1.c Worn clutch</p>	<p>1.c Replace the clutch</p>	<p>Section 4</p>
	<p>1.d Transmission tube is not fitted on the clutch drum</p>	<p>1.d Unscrew the handle and verify that the transmission shaft is in a right position</p>	
<p>2. Noisy or vibrating dire problem</p>	<p>2.a Bent shaft</p>	<p>2.a Exchange shaft complete</p>	<p>Section 4</p>
	<p>2.b Probable seizure of bushing in shaft</p>	<p>2.b Exchange shaft complete of bushings</p>	<p>Section 4</p>