

WORKSHOP MANUAL

63,4 cm³ chainsaws



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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

I.



p/n 3055125

II.



p/n 001000392A

III.



p/n 001000785

Index



1) Performance

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



2) Fuel system

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



3) Ignition system

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



4) Oil pump, bar and shock absorber

- a) Oil tank breather inspection
- b) Oil filter inspection
- c) Sprocket/power mate ring inspection
- d) Oil pump inspection
- e) Chain brake inspection
- f) Lubrication and bar maintenance
- g) Shock absorber replacement



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- e) Carburetion tuning



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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) on cylinder. Pull energetically the rope 10 times
 - Verify that the compression value is not less than 8 bar – 130 psi
 - If the value is higher than 8 bar – 130 psi, start inspection **c)**, if lower, carry on with inspection **b)**



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 1,0 mm)

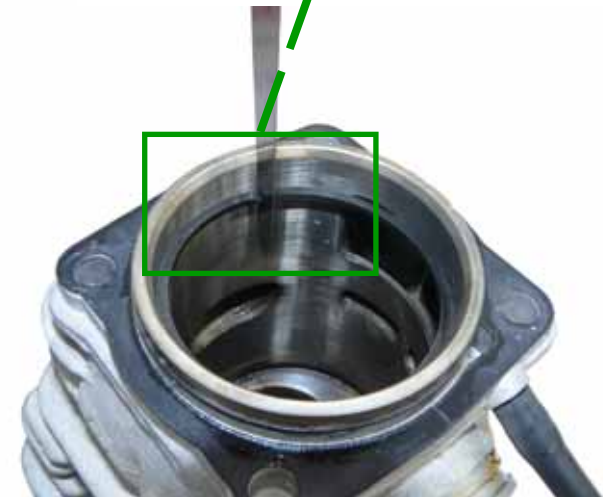
Tightening torque cylinder-screws
1,2 Kgm (106,20 in lb) + Loctite 243



Warning: during assembly
make sure the circlip has
the feet pointing up



Warning:
The arrow on the top of the
cylinder points towards the
exhaust port.



c) Decompressor inspection

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

Important:

- Clean **weekly** the cooling system. For heavy duty work, clean it **every day**
- Use Loctite 243 to tighten plastic component

Tightening torque cover-basement
0,4 kgm (35,4 in lb) + Loctite 243

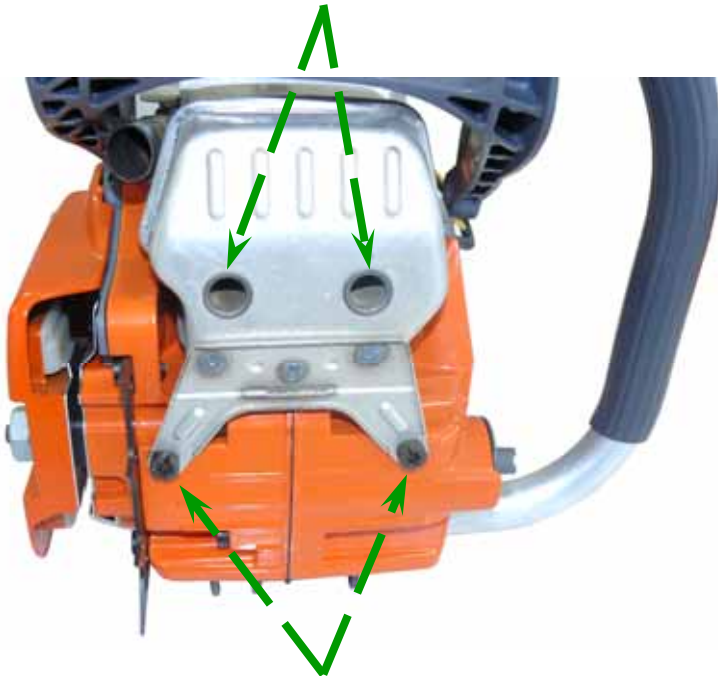
Tightening torque
Cover
**0,4 kgm (35,4 in lb)
+ Loctite 243**



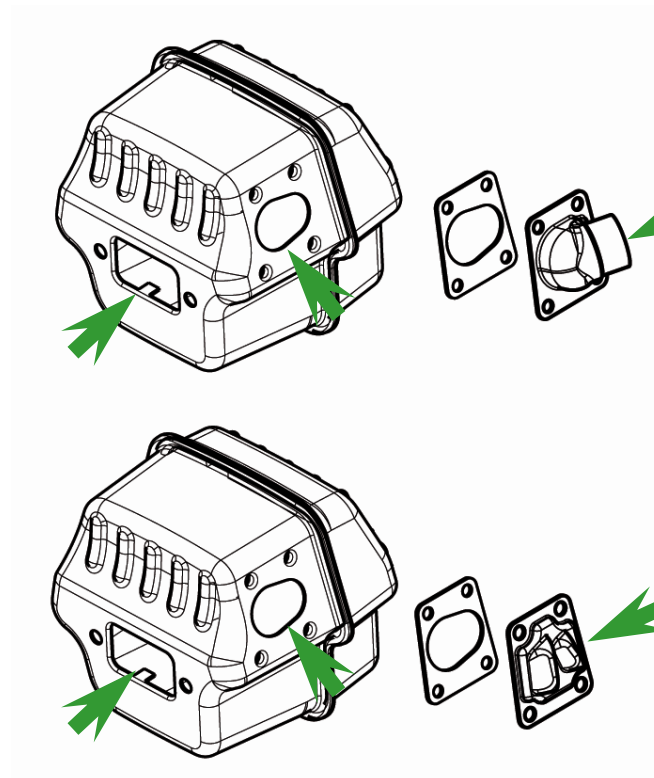
e) Muffler inspection

If the muffler is blocked or damaged, clean or replace it

Tightening torque muffler-cylinder
1,0 kgm (88,5 in lb) + Loctite 243



Tightening torque cover muffler-basement
0,6 kgm (52,1 in lb) + Loctite 243



2) Fuel system

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



- 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 at the carburetor parts

Go to

Carburetor inspection



c) **Tank breather inspection**

- Dismount the breather and check the components
- Apply the pressure gauge (I), supplied with Emak tool kit, at the breather valve and verify the correct working in both ways. To check the inlet direction use the adaptor (II), supplied with the pressure gauge's box, as shown on the photo. Replace or clean if necessary



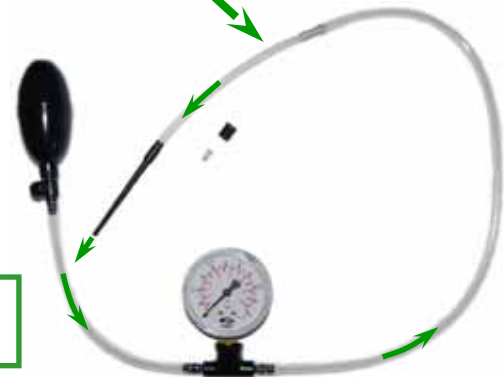
I
p/n 1043900

Breather sealing test:
0,2 – 0,3 bar



II

Breathing system test:
0,00 bar



d) Engine seal test

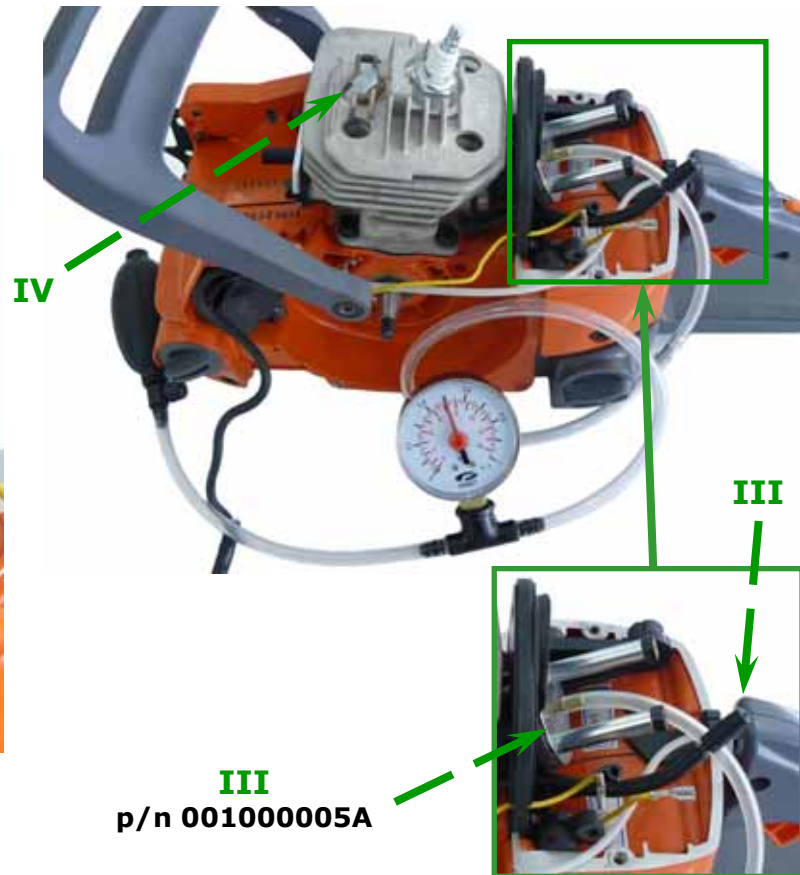
- Remove air filter, cover, air filter support, carburetor and muffler. Cover the intake side with insulator and exhaust side using the special flanges supplied with Emak tool kit (**I** and **II**). Tap the impulse's tube with a cap (**III**) and replace the decompressor with a special cap (**IV**)



I

p/n 001000368B

- The pressure has to remain stable at 0,5 bar. If the engine loses pressure, find the leakage and fix it. Repeat seal test



e) Manifold inspection

Check the manifold for wear. Verify that the manifold's rubber is not deteriorated or hardened and check that there are no cuts or holes. Replace if necessary



3) Ignition system

- a) Check housing inspection
- b) Spark plug inspection
- c) Spark 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

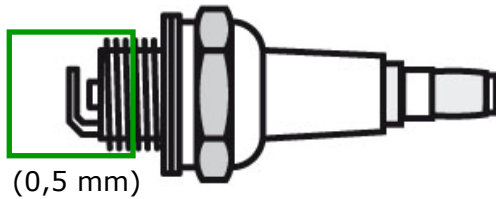
Wind the spring 7 times
Ø 4,0 x 1035 mm



Important: grease moving parts

b) Spark plug inspection

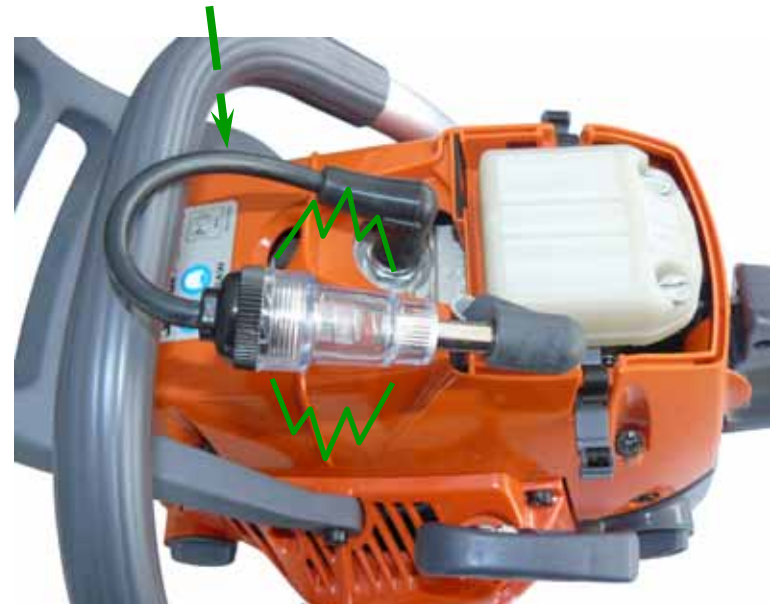
Remove the spark plug and check the gap between the electrodes (0,5 mm)



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
- Check the two wires, ignition coil and switch

I
p/n 001000515R



d) Flywheel-coil air gap inspection

- Check the air gap using the shim (**II**-0,3 mm)
- Adjust if not correct

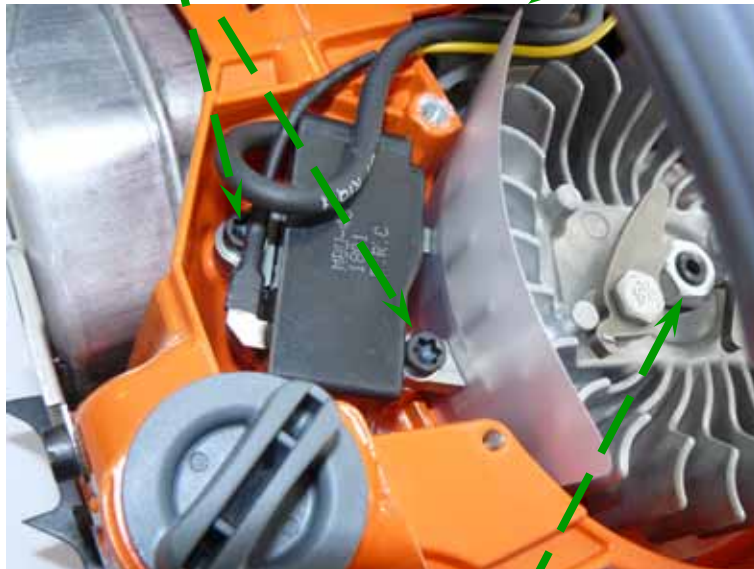
e) Flywheel key way inspection

- Remove flywheel with corrector tool (**III**)
- Inspect key way's condition and position. If necessary, replace or adjust

Tightening torque coil-screws
0,35 kgm (30,98 in lb) + Loctite 243

II

cod. 001000004



Tightening torque flywheel-nut
2 kgm (177,0 in lb)

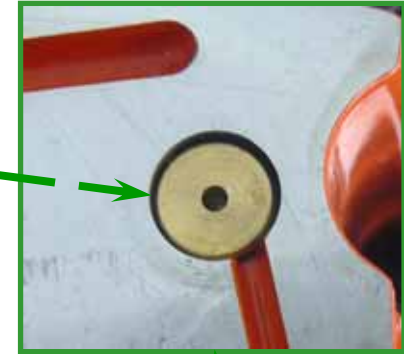
III
cod. 001000782



4) Oil pump, bar and shock absorber

- a) **Oil tank breather inspection**
- b) **Oil filter inspection**
- c) **Sprocket/power mate ring inspection**
- d) **Oil pump inspection**
- e) **Chain brake inspection**
- f) **Lubrication and bar maintenance**
- g) **Shock absorber replacement**

Make sure that the height of the oil tank breather is 1 mm lower than bar face



- a) **Oil tank breather inspection**
 - Clean with compressed air
 - Verify the quality of the bar and chain oil

- b) **Oil filter inspection**
Check the oil filter. If it is dirty, clean it

Tightening torque crankcase-screws
0,8 kgm (69,44 in lb)
+ **Loctite 243**



c) **Sprocket/power mate ring inspection**

Check the sprocket/power mate ring wear periodically. Replacement is suggested every 100 hrs or before



Attention: always replace the snap ring after removing.

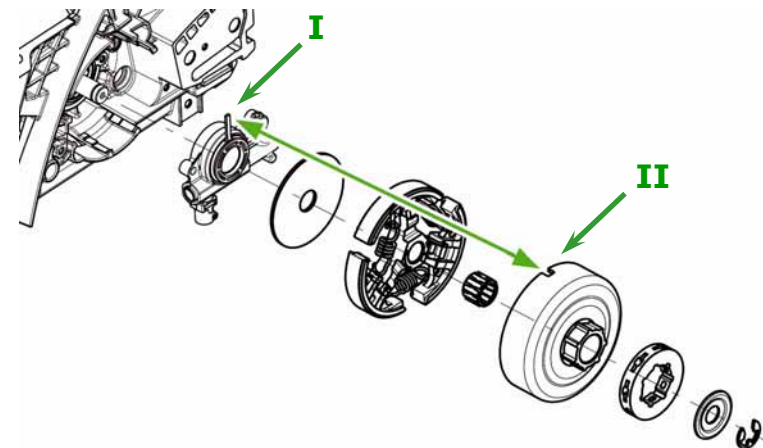


OK



REPLACE

Attention: When reassembling the clutch make sure that the worm gear drive spring (I) lodges into the clutch drum correctly (II)



c) **Oil pump inspection**

- Insert the piston stop (**I**) in the spark plug hole and remove the clutch
- Remove the oil pump, check the pump and worm gear



I
p/n 001000684



Tightening torque clutch
4,5 kgm (398,3 in lb)
+ Loctite 270



Important: If the gear inside the pump is hard to turn, disassemble all components and clean them using Emak detergent

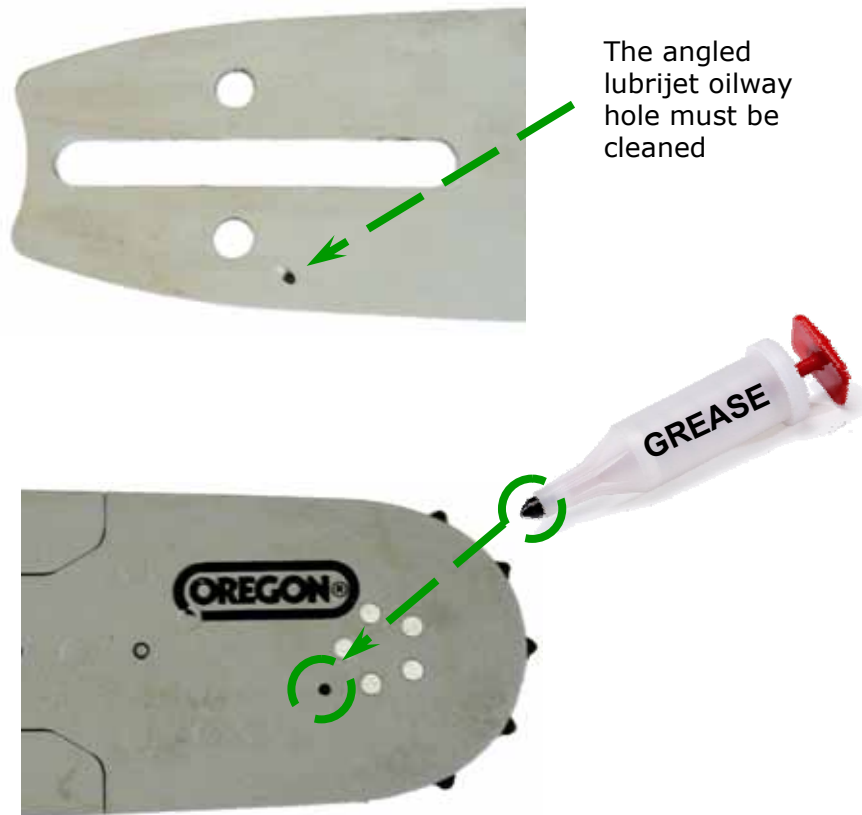
e) Chain brake inspection

Check the brake band for wear. This must be changed if the wear limit is less than 0,6 mm



f) **Lubrication and bar maintenance**

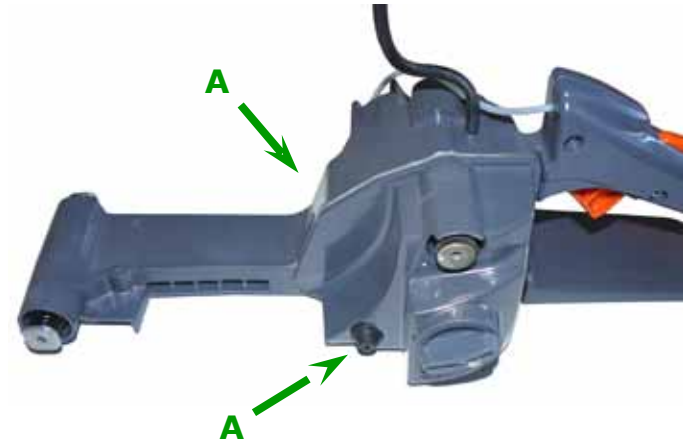
- Lubricate the sprocket nose
- Keep the rail and the lubrication holes cleaned
- Check the parallelism of the guide bar and for sharp metal edges
- Turn the bar every 8 hrs to grant uniform wear



g) Shock absorber replacement

- Control the AV mounts for wear or damage (A).
Change when necessary

- In case of wear or breakage replace the parts with special tool (I), supplied with Emak tool kit, as in photo

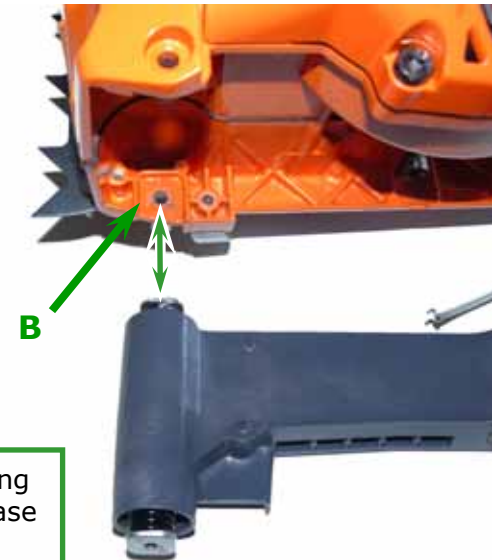
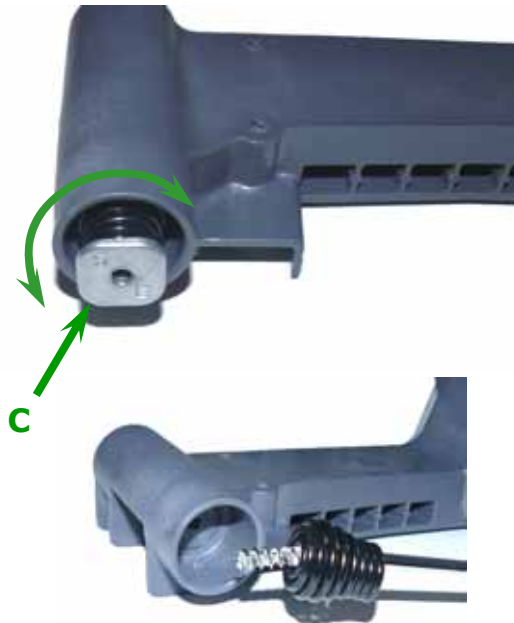


I
p/n 001000680A



Substitute spring AV mounts

- Check for wear or damage of the AV mounts exchange if necessary.
Substitute spring AV mounts:
 - loosen the spring support (C)
 - insert the screwdriver and loosen the spring.



Important: Make sure when assembling the springs fit correctly into the crankcase (B), as shown in photo

Substitute AV mounts on inlet flange

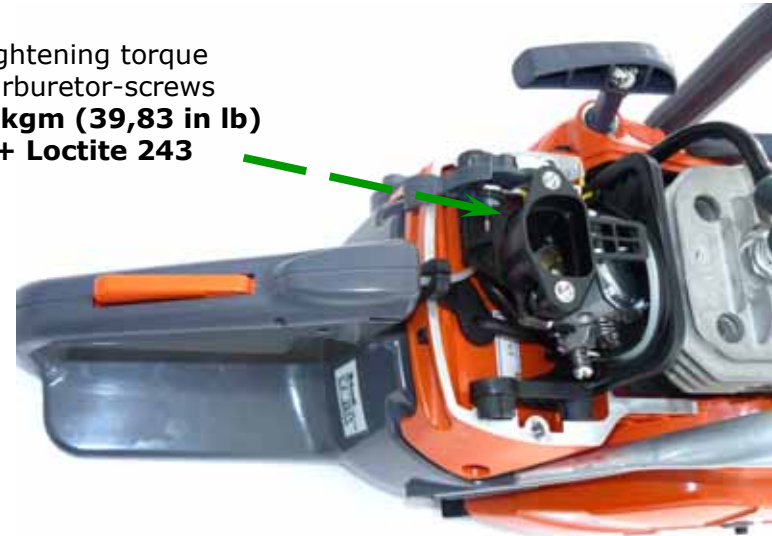
- Control the wear and damage and exchange if necessary.



5) Tuning

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

Tightening torque
carburetor-screws
0,45 kgm (39,83 in lb)
+ Loctite 243

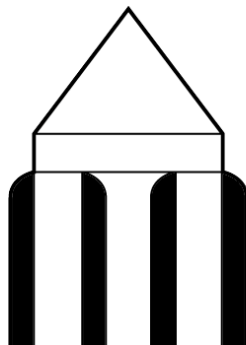


- a) **Air filter inspection**
 - Clean with Emak detergent, rinse with water and blow with compressed air in the opposite direction of the normal air flow
 - Replace the filter when damaged



b) Needle valve inspection

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



OK

Needle



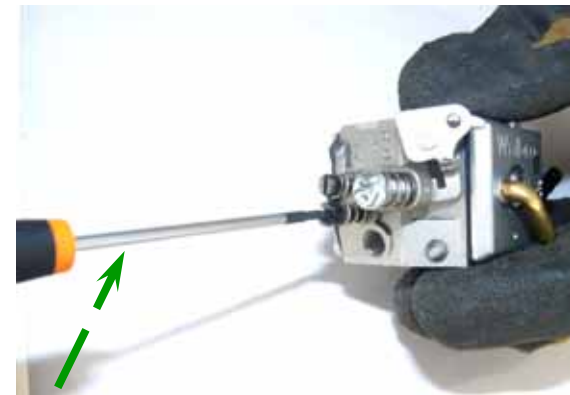
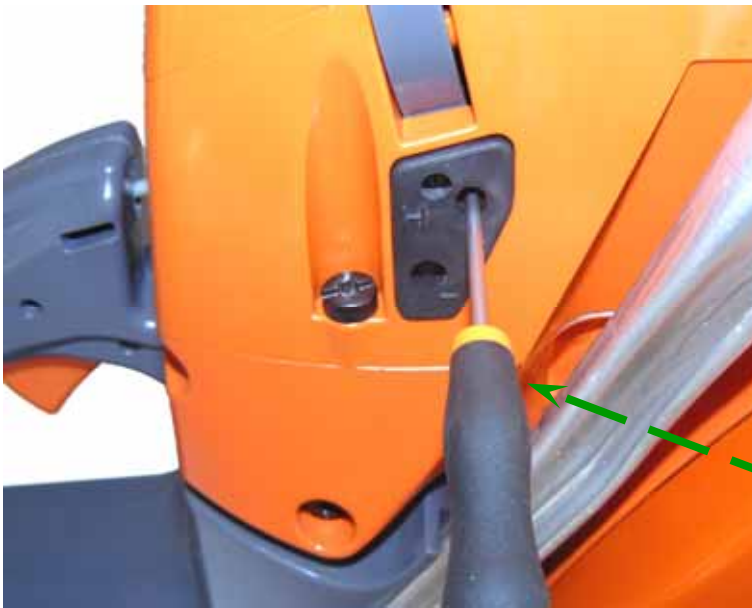
REPLACE

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



- d) **Suggested tools for carburetion setting (Euro 0)**
Special screwdriver (I) to adjust the jets "L" e "H"



I
p/n 001001070R

Suggested tools for carburetion setting (Euro 1)

Special screwdriver (I) to adjust the jets: for adjustment the jets "L" e "H"



I
p/n 3055130

Insert the special screwdriver
(as shown on the photo) and
adjust the jets

e) Carburetor tuning

Correct tuning of the **EURO 0** and **EURO 1** (direttiva 97/68/CE + 2002/88/CE).

The jets have the following factory registration: **L=1; H=1**

When, following a repair or engine overhaul, you are obliged to re-tune the carburetor to its' original setting

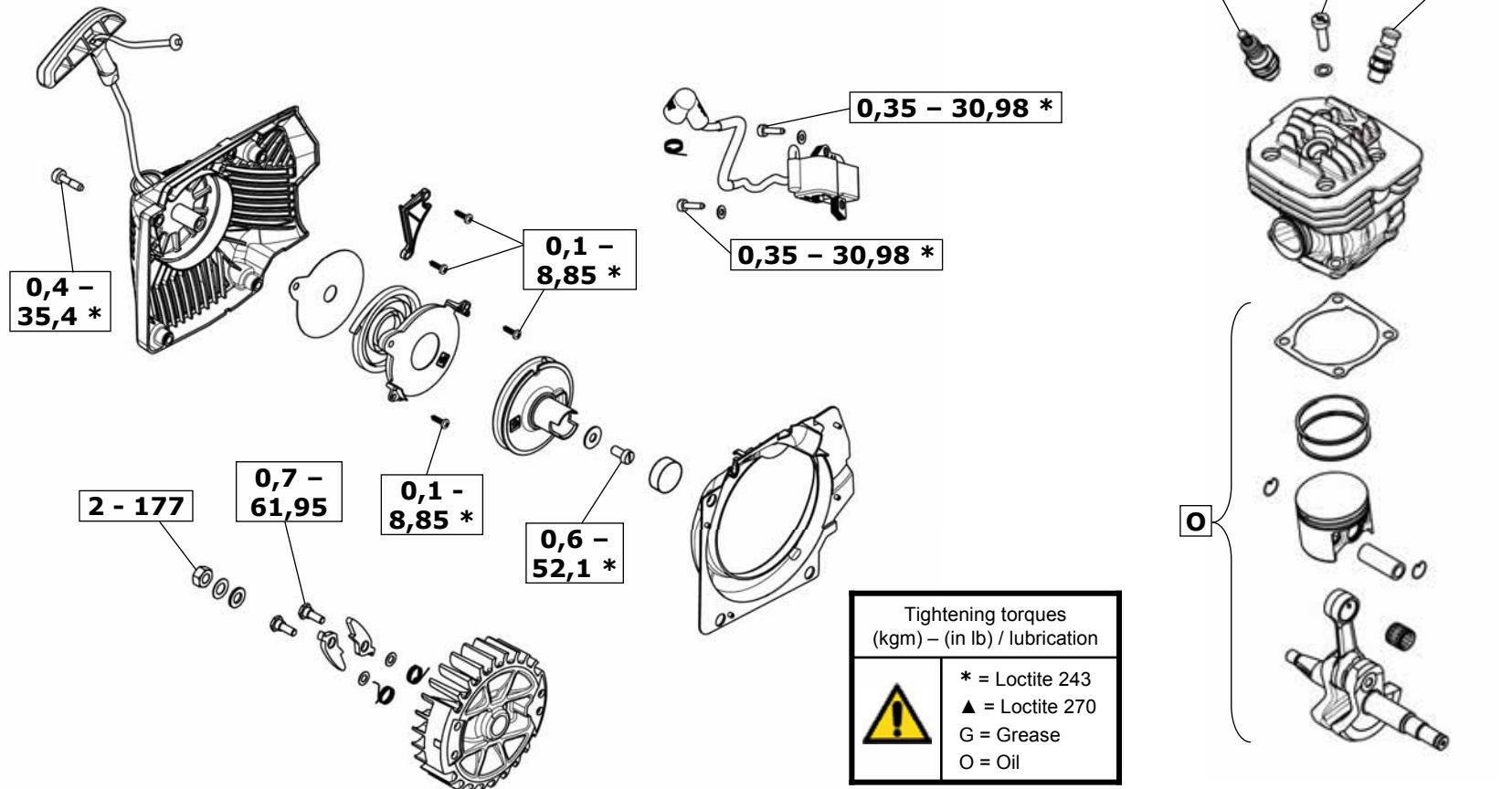
Idling adjustment (L)

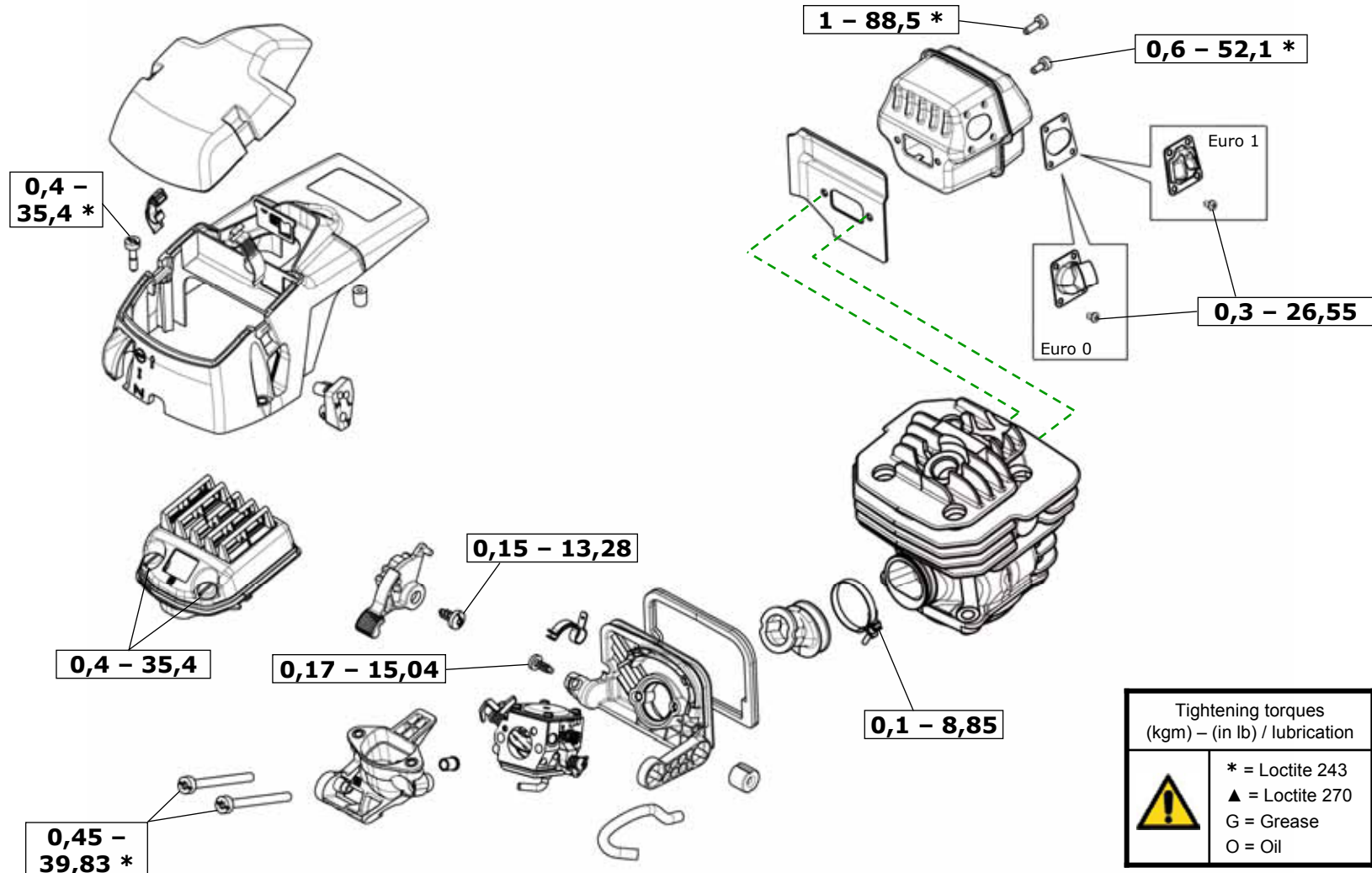
1. Start the unit and warm up for 60 seconds. If the engine stop, readjust T screw
2. Close the L jet until the maximum number of rpm is reached (stop rotating the jet before the rpms drop or the unit stalls);
3. Adjust the T screw until the unit reaches an idle rpm between: **3700** and **4100 RPM**
4. Open the jet L until the rpm go from **3700/4100** to **2700/3100 RPM**

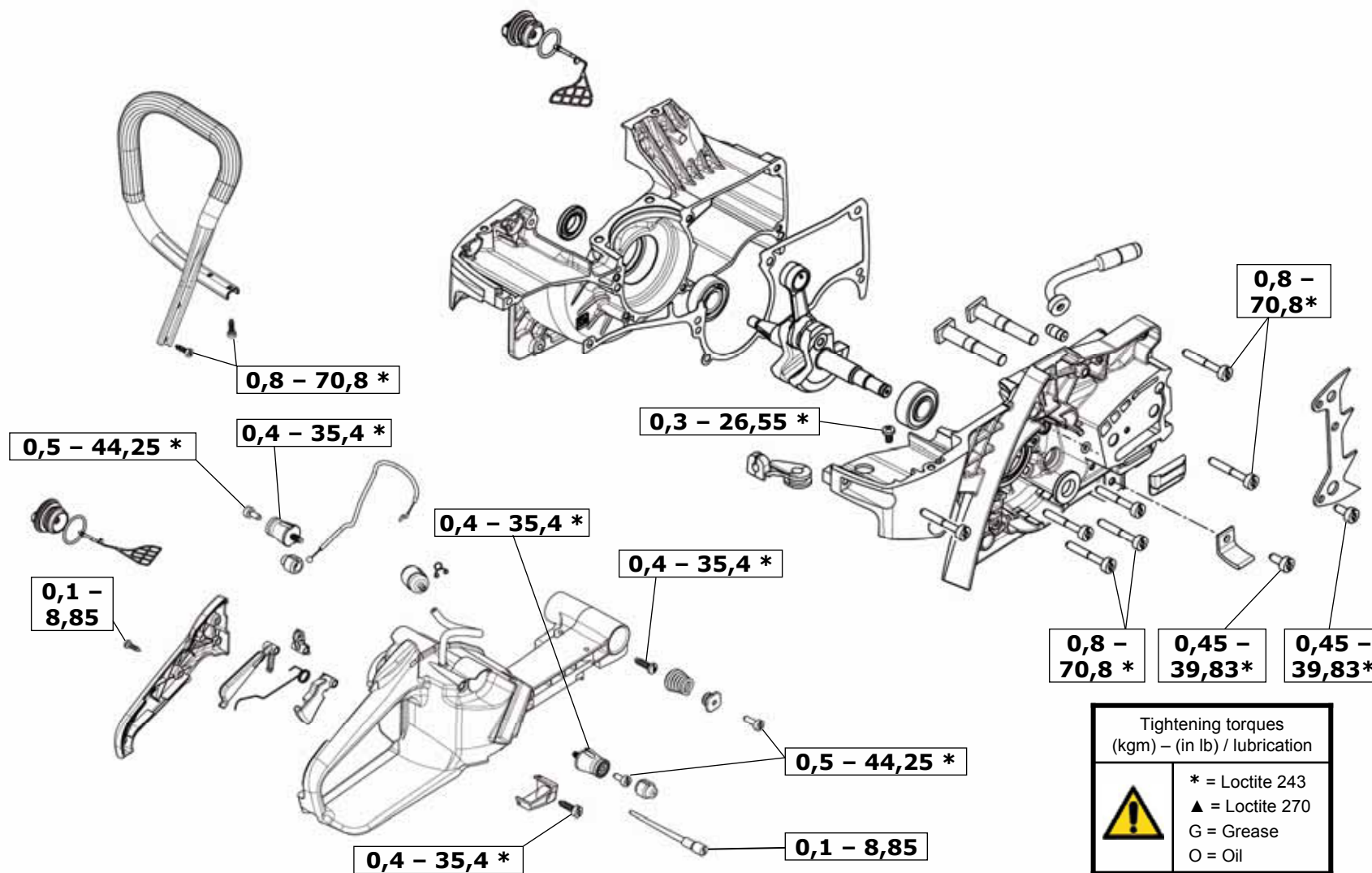
Maximum adjustment (H)

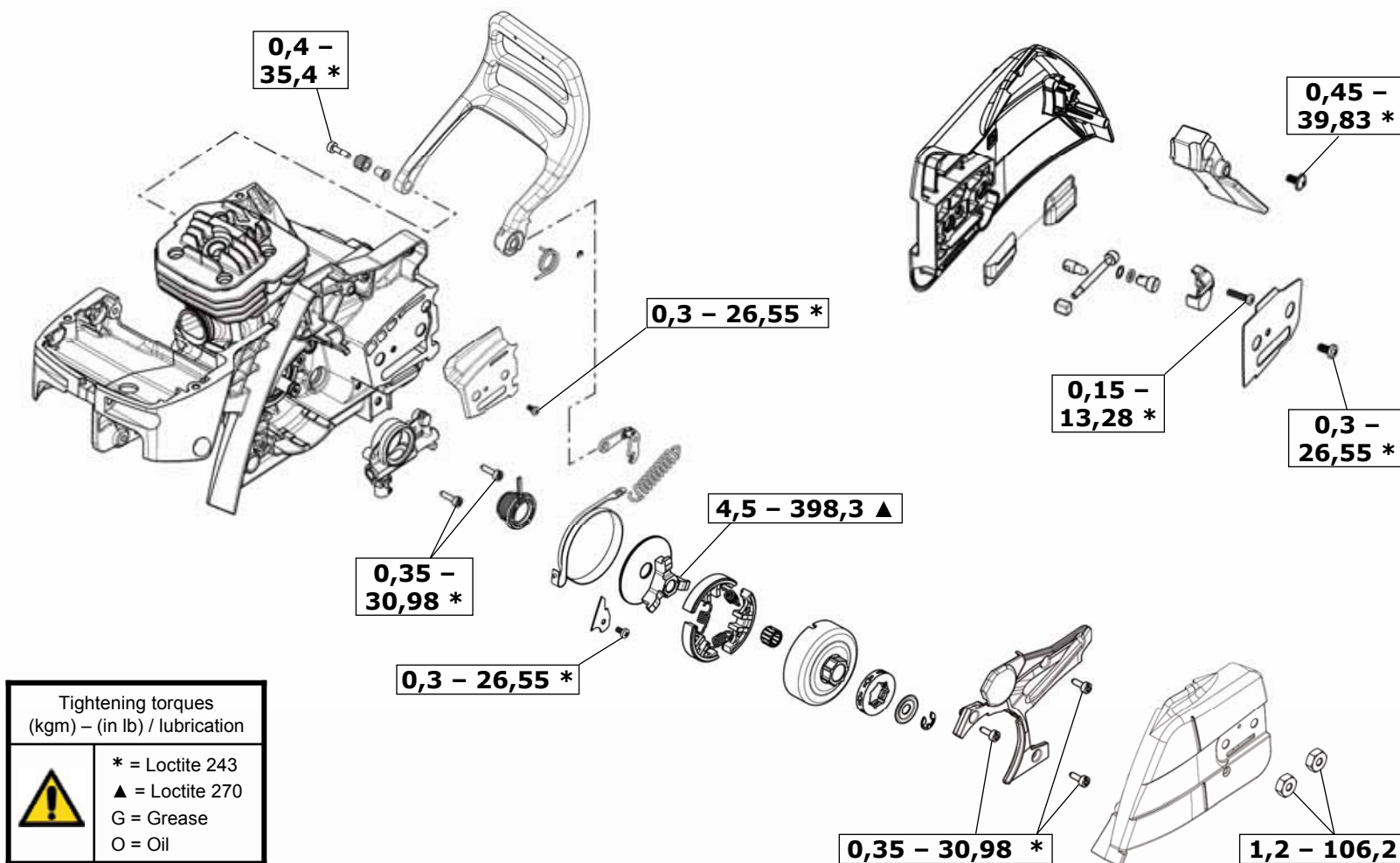
5. Adjustment of the jet H for wide open throttle operation whit bar (standard 20" - 51 cm) and chain until the unit reaches an maximum rpm between: **11800 RPM** and **12800 RMP**

6) Tightening torques











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 Spark plug looses 2.b Piston ring, cylinder and piston worn	2.a Tighten spark plug. 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.c Broken spark plug or wrong type	3.a Switch "ON" and restart 3.b Inspect and/or replace 3.c Replace the spark plug	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 Manifold problems	5.a Clean or replace 5.b Adjust the carburetion according the above 5.c Carburetor inspection 5.d Manifold tightness	Section 5 Section 5 Section 5 Section 2

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 spark plug 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 Seizure	2.d Replace the components	Section 1
	2.e Faulty carburetor or diaphragm	2.e Check and replace	Section 5

Trouble shooting: ADDITIONAL PROBLEMS

Symptoms	Causes	Remedies	Go to
<p>1. The chain does not work correctly or does not rotate</p>	<p>1.a Bended or worn bar</p> <p>1.b Lubrication system blocked</p> <p>1.c Worn sprocket</p> <p>1.d The chain is not sharp</p> <p>1.e Chain too tight</p>	<p>1.a Replace or maintain</p> <p>1.b Clean or replace</p> <p>1.c Replace sprocket</p> <p>1.d Sharpen the chain</p> <p>1.e Correct tension/assembly bar and chain</p>	<p>Section 4</p> <p>Section 4</p> <p>Section 4</p> <p> Owner's manual</p> <p> Owner's manual</p>