

## ENGINE BREAK-IN PROCEDURE

### BEFORE STARTING !

#### 1. Charge battery:

- The battery must be full charged before the first start using a desulphating charger with a low output current ( $\pm 0,5A$ )

#### 2. Oil level:

- Fill oil (around 0.4 liter) until the level is just above the middle of the inspection glass. It is absolutely imperative that you use the recommended oil of 0W-30. Do not use other oils! The oil membrane system won't work.
- Remove spark-plug and push start button during 10 seconds. Check oil level again and fill up if necessary.

#### 3. Radiator:

- Fill cooling system with approximately 0,7 liter water. (a 10% mix with anti-freeze is recommended) The cooling system purges automatically.

#### 4. Fuel:

- Be sure that the carburetor is filled with fuel before starting. You can do this by blowing on the breather pipe of the fuel tank with compressed air. (Do this smoothly to avoid fuel tank explosion!)

#### 5. Clutch housing needle bearing:

- Lubricate clutch housing needle bearing with copper grease.

#### 6. Temperature:

- In the summer (outside temperature 25°C à 30°C) the operating temperature of the water shall fluctuate between 55°C and 65°C.
- During winter, when the outside temperature is around  $\pm 5^{\circ}C$ , the operating temperature must be much higher to avoid condensation. An operation temperature between 75°C and 85°C is required.

## THE FIRST START

- Start the engine and let it run on a preferable 2.500rpm. Allow engine to run until cylinder head is warm to the touch, then switch off and drain the warm oil. Do not allow to idle.
- To drain the oil, remove plug below, then remove spark plug and push start button during 10 seconds. (remove all metal parts from magnetic drain plug)
- Clean oil filter. (We recommend you to clean it every time you change the oil)
- Now refill oil (repeat n°2 -oil level).
- Once this is done, your engine is ready to break-in.

## RUNNING IN THE ENGINE

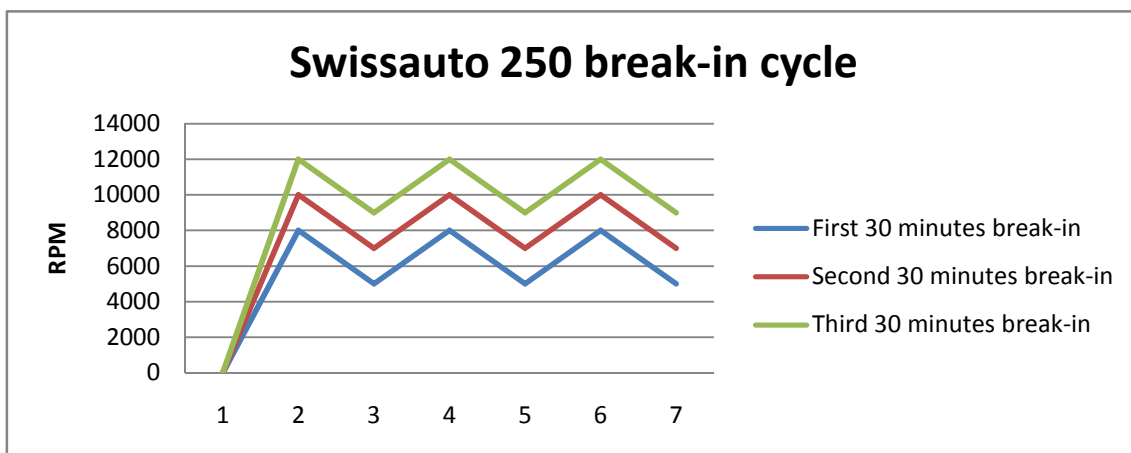
First of all it is important to know that the performance and the lifetime of an engine are highly dependable on the way that engine is ran in. With other words: Up to 10% of the engine performance can go lost if it isn't run in on the correct way. And this loss is permanent!

So if you want to have a reliable engine that has  $\pm 35$ hp and more, we suggest you to follow strictly our recommendations concerning the break-in procedure!

### In general:

Important for a good break-in of the engine is driving it FULL throttle to the predetermined rpm.

(See graph.) **Do not drive flat lines with half throttle!** This will overheat the piston and can cause serious engine damage!



In this particular case this means:

- Don't rev up higher than **8.000 rpm** during the 30 minutes.
- Replace oil after 30 minutes.
- Continue procedure, but don't rev up higher than **10.000 rpm** during another 30 minutes.
- Replace oil and clean oil filter again.
- Continue procedure, but increase load slowly until you have reached **12.000 rpm** on the end of the last 30 minutes.
- Replace oil and clean oil filter again.
- Now the break-in is complete and your engine is ready to race.

### CHECK DURING BREAK-IN

#### Temperature

- In case there should be quick temperature changes, stop immediately and control water level.

#### Oil level:

- In case you don't run stints of a complete hour, it is absolutely necessary you control the oil level every time you stop. It is recommended to do this just after you have switched off the engine. The oil level should be:

Minimum → just above the middle of the inspection glass.

Maximum → just below the top of the inspection glass.

### MORE SWISSAUTO 250 TIPS

#### Cold start:

- Not the water temperature, but the oil temperature is the most important! Dyno simulation showed that it takes up to 4 laps until the oil has reached its operating temperature. Therefore we suggest you to warm up the engine on the stand before you go on the track.
- The first lap you go out on the track you will find a drop back in water temperature because the engine isn't completely warmed up. Once you see the water temperature rising to a constant level, the oil is on temperature. The minimum temperature we advice to have before going full throttle is 65°C.

#### Gearing:

- Depending on the track and the weather circumstances we suggest you to gear the engine in such a way that it revs up to 11.800rpm on the quickest part of the track. Various testing taught us that this set-up mostly results in the best lap times.
- Always lubricate chain and sprockets when drive train is still hot. (Directly after coming in). By doing this, the lifetime of the gearing and chain will be extended.

#### Torque absorber:

- The Swissauto 250 torque absorbing sprocket carrier is a part that helps to prevent chassis fatigue caused by a kart engine. The new generation of kart engines does generate much more stress on the tubes where the engine is attached. This innovative sprocket carrier absorbs much of the power peaks so the bending of the chassis is a lot less. A must for each Swissauto 250 driver, but also very popular in other categories.