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1 August 2017

### **Testimonial: Very hard to start**

To whom it may concern,

My Yamaha XT600 2003 model air cooled, single cylinder, 4 valve, 4-stroke, road-trail motorcycle with an electric start was bought second hand (4,000 km) in 2007.

#### **Background**

Air cooled motorbike engines run at almost twice the temperature (~180 °C) of water cooled engines (~100 °C). Thus wear is always an issue and air-cooled engines tend to wear at roughly double the rate of water cooled motors. This is one reason this bike had a recommended oil change interval of only 3,000 km.

#### **Tight**

The engine on this bike was unusually tight and didn't like to start. It was so bad it was almost impossible to start in the cold. The tappets were checked and opened as far as possible (better breathing). An oversize battery was added (more cranking amps). An iridium spark plug was added (better spark). A Unifilter foam air filter was added (better air flow). Nothing helped and it was obvious that on a really cold night the bike would not start. Normally the engine is run in ~10,000 km before treating with Xcelplus but in this case, having exhausted all the normal options it was treated at ~7,000 km. About 60 mL of Xcelplus was used as it's treating not just the engine but the gearbox and clutch. As soon as Xcelplus was added starting became easy.

#### **Ping**

Single cylinder bikes tend to ping on acceleration. Pinging is not obvious when the bike is new, but it gets progressively worse as the bike ages. Xcelplus reduces pinging but can only treat the parts which oil passes over, so the 2-stroke treatment was added via the carburettor to treat the top end of the bike. This made the engine smoother and no pinging was ever noticed.

#### **Wear**

The wear on an air-cooled motorcycle is truly frightening. By using a magnetic sump plug it was possible to see a large halo of ferrous metal attached to the magnet when the oil was changed. After treating with Xcelplus the metal on the sump plug was reduced by >50 %.

## **Gears**

XT600's often have notchy gears, which can be hard to select and they sometimes jump out of gear under load. A lot of the ferrous metal found in the oil comes from the gears. After treatment with Xcelplus, the gear changes were much smoother and the bike was no longer prone to jump out of gear.

## **Tappets**

XT600's have adjustable screw and locknut tappets which normally need adjustment every 10,000 km. If they are not adjusted they either become very noisy or they close up and you can burn out the valves. To adjust tappets carefully normally takes ~2 hours. The seat and tank have to be removed, the valve adjustment ports need to be opened, the crank needs to be rotated to top dead centre using the inspection port on the crankcase to check the position, the gaps must be checked with a feeler gauge and adjusted with a spanner. There are 4 valves that need to be adjusted and you never get it right the first time. The better you adjust the tappets the quieter and smoother the bike runs. After treatment with Xcelplus, it wasn't necessary to keep adjusting the tappets anymore. Despite checking the tappets periodically during the bikes life they neither closed down nor opened up enough to warrant adjustment. Tappet adjustment became an optional service item saving a lot of time.

## **Noise**

Big singles tend to rattle. After treatment with Xcelplus, this bike went from being quite noisy to very quiet. This was the quietest big single you're ever likely to hear.

## **Temperature**

Prior to treatment with Xcelplus, the engine crankcase covers were so hot you could not comfortably put your hand on them for more than an instant. After Xcelplus the crankcase covers cooled down significantly and you could rest your hand on them without getting burned.

## **Reduced friction**

The engine idle increased by 200-300 rpm after adding Xcelplus and had to be adjusted down. It remained raised for the life of the bike. Xcelplus coated the metal separator plates in the clutch without affecting the fibre plates. The clutch was unaffected by the treatment and did not slip or wear out. In fact, the clutch worked better.

## **Durability**

The treatment was very durable as these improvements remained for the life of the XT. The bike had travelled ~86,000 km when it was sold: the engine was very quiet (no cam chain rattle), did not smoke and compression was normal. Nothing inside the engine ever had to be replaced or repaired.

## **Oil**

Using a high-quality oil with Xcelplus reduced wear more than using a poor-quality oil. The difference was obvious when the oil was changed: The amount of ferrous metal on the magnetic sump plug varied according to which oil was used. A high quality semi-synthetic 20-50 W provided good lubrication at a reasonable price point.

The lifespan of the oil is also improved when you use Xcelplus. In XT's you often notice that the engine develops a vibration when the oil needs changing (the mirrors start to shake). That's simply because the oil is not carrying as many wear particles and not working as hard.

The increase in oil life can be judged by when the vibration starts. Despite the oil change intervals typically being 3,000 it was possible to change the oil every 5,000 km after treating with Xcelplus (no vibrations). Oil life is improved by roughly 1/3 when you use Xcelplus. Normally you should stick to the oil change recommendations, but 3,000 km is just too annoying if you like to ride a lot.

### **Chain**

Motorcycle chains on these bikes are quite lightweight (520 O-ring) and don't last very long ~12,000 km. However, by fitting a chain oiling system, you can often improve the lifespan to 28,000-38,000 km (a big saving). A Scottoiler was fitted to the bike at ~8,000 km when the chain was starting to wear, and ~1 mL of Xcelplus was added to the chain oil. The effect was not immediately obvious but while driving past the Melbourne Cemetery suddenly the chain went quiet (you never notice the rattle until it's not there) as if it had come off. Fortunately, it was just the Xcelplus starting to work. The chain ended up lasting 57,777 km. This was a saving of ~\$1,200 in parts.

BTW: Scottoilers are very fussy and stop working (leak uncontrollably) if you use a non-Scottoiler oil. You have to replace the whole unit as the O-ring is not replaceable and that's expensive! Xcelplus did not affect the O-ring presumably because it is not an oil but a metal treatment?

### **Electrical**

Xcelplus reduces friction which reduces the cranking amps and volts required to start the bike: It takes fewer turns of the starter to start the bike so the starter lasts longer. The starter motor brushes wear out and the stator and rotor needs machining on XT's at ~80,000 km. A reconditioned starter motor usually costs ~\$350. On this XT the brushes were barely worn and would have lasted another 80,000 km. Even the battery lasted longer!

### **Mileage**

A log book was kept for the life of the bike and the fuel use (Shell 91 octane) along with the mileage of each tank was noted over the lifespan of the bike. The bike averaged 18-19 km/L over its life. Prior to treatment, it was getting ~17 km/L. This means the mileage improvement was in the order of 5-10 %.

Yours sincerely

Michael Czajka



Figure 1 XT 600 2003 model at ~86,000 km circa 2014



Figure 2 XT600 ~80,000 km magnetic sump plug during oil change showing almost no ferrous metal