# Tip for looking after PGL's new engine

As you all know, PGL has just come back from a heart transplant and needs extra care during her recovery. Here are some tips from Mr Lycoming, who provided the new heart, and Roger and co. at Northam Air Services, who conducted the open-heart surgery. It's all about running with the best mixture, enabling the rings to seat properly and avoiding fouling the plugs.

## Start and taxi

1. Don't over-prime. This may foul the plugs. Three primes, even on a cold day, is usually enough. If the aeroplane has just been flown, it may not need priming at all.
2. Set 1200 RPM for warm-up.
3. Once the temperature is in the green, lean to Best Power mixture:
    a. Lean slowly until RPM reduces, then enrich the mixture until the engine runs smoothly ie. Normal leaning technique without an EGT gauge.
4. Set 1000 RPM.
5. After your run-ups, set 1200 RPM.
6. Check the mixture to make sure you still have Best Power.
7. Set 1000 RPM.
8. Set full rich for take-off.

## Climb

1. Below 3000 ft, use full rich.
2. Above 3000 ft, lean for maximum RPM.
    a. Lean slowly until RPM reduces, then enrich until the engine runs smoothly.
    b. Turn the mixture knob an extra ½ turn after that.

## Cruise

1. Lean for maximum RPM, as above.

## The mixture-power curve

Just a bit of a refresher on mixture settings, which helps to explain some of Mr Lycoming's advice. This curve is a rough idea of the relationship between mixture setting and power output for a particular throttle setting. Some points of interest on the curve are:

1. Too lean to burn (about 1:20, or 1 kg of fuel to 20 kg of air): this is where you go when you move the mixture to idle cut-off.

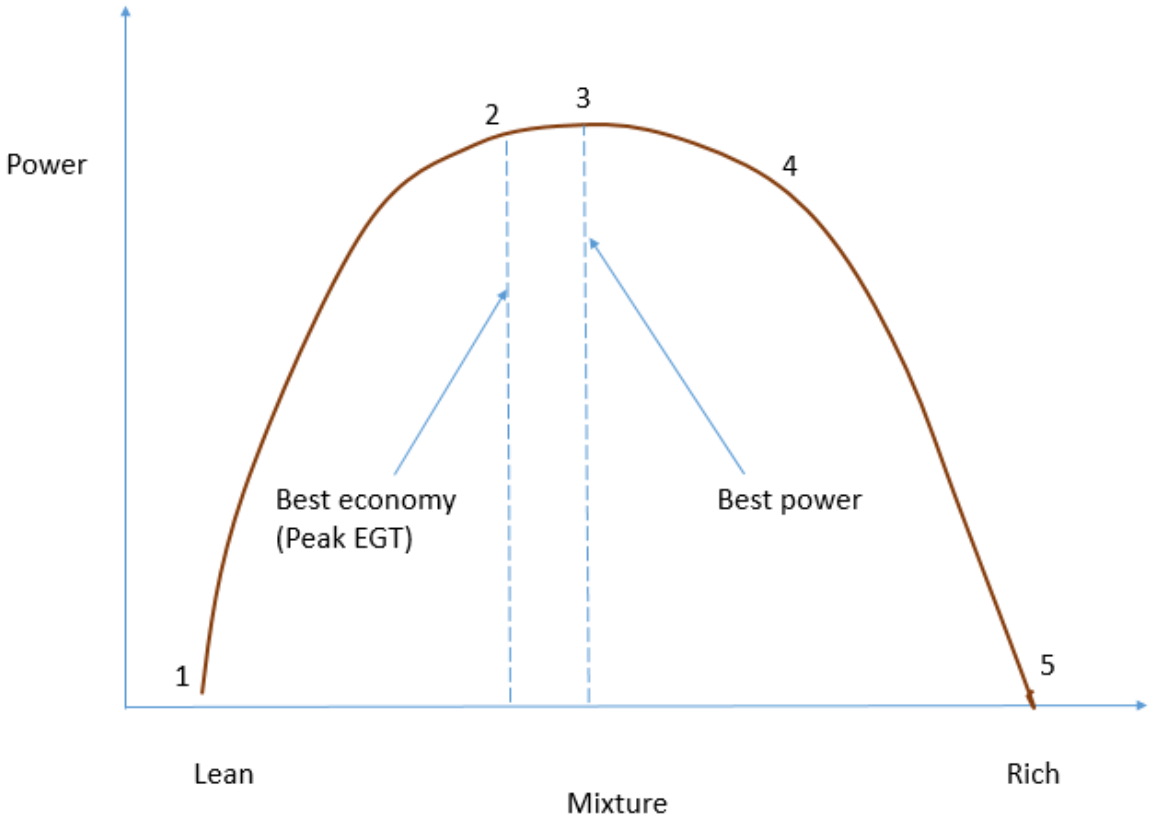
2. Best economy (about 1:16). This is the chemically correct ratio, where there is exactly the right amount of air to burn the fuel. It's also peak EGT because there's no excess fuel to evaporate and cool the cylinders, and no excess to cool the exhaust gas.

    This is what you set in a fuel-injected engine. The problem with a carburettor is that you don't have such precise control of the mixture strength in each cylinder, so if you set best economy then the leanest cylinder may be burning too lean. That's why you set the mixture a bit richer in an aircraft like PGL.

3. This is about 1:12 or 1:14, and it's what you're setting if you follow Mr Lycoming's advice above.

4. Full Rich is somewhere on the right-hand side of the curve. You set this for take-off so the excess fuel that isn't burnt will evaporate, which provides some cooling for the cylinders while you're using full power (maximum heating) and low speed (minimal air-cooling). The curve also explains why you get an RPM drop when you check the carby heat before take-off: you're putting warmer, thinner air into the cylinders, which means your mixture is getting richer, so you're sliding further down the right-hand side of the curve.

5. Too rich to burn, also known to the average punter as flooding the engine.




## Oil

If you're topping up the oil during the first 25 hours, use ordinary mineral oil, not ashless dispersant oil. Ashless dispersant oils are the ones with W in the name eg. W100. The oil in the hangar at the moment is plain mineral oil. After the first 25 hours, if the oil consumption is stable, we'll go back to using W100.