

// The number 5 conrod failed with the engine at full power, due to it having been slightly bent some time previously. The end result was a destroyed engine on the takeoff roll.

# HYDRAULIC LOCK

## DOESN'T AFFECT JUST RADIAL ENGINES

Photo courtesy of CAA/Colin Grounsell

You need to be careful when you're priming horizontally opposed engines because excess fuel can cause a hydraulic lock.

**A** hydraulic lock in a cylinder is not limited to radial type engines and this has been highlighted in four relatively recent occurrences here in New Zealand.

Teledyne Continental Motors (TCM) states that the most common cause of hydraulic lock is over-priming during start.

This results in fuel pooling in the inlet manifold in the vicinity of the number 5 and 6 cylinders. The excess fuel is then drawn into the cylinder when the engine starts.

This can result in catastrophic failure of the engine. In one recent instance, the aircraft was about to take off from an island and fly over water – not a happy place to be for an engine failure. (See defect 19/501 at [aviation.govt.nz](http://aviation.govt.nz) > aircraft > GA-defect-reports, and key '2019' into 'year'.)

TCM service bulletin SB96-11B provides information and advice for a suspected hydraulic lock. The CAA has also published continuing airworthiness notice 85-003

recommending operators and maintainers comply with the TCM service bulletin.

This issue is most likely to affect tricycle gear aircraft where the engine is horizontal or slightly nose-down. The inlet manifold drains for excess fuel may not be effective if the aircraft is parked in a slightly nose-down position.

The engine may start, but if hydraulic lock has occurred, there could be damage, usually in the form of a bent conrod. This could later result in catastrophic engine failure.

### To summarise:

- Be familiar with your aircraft's engine and its start-up procedures.
- With tricycle gear aircraft fitted with TCM engines, have the aircraft on level ground for starting, or if that isn't possible, be extra cautious about priming.
- If more priming than usual seems to be needed, best to take a break and check excess fuel has drained away.
- If you suspect that a hydraulic lock may have occurred, now or in the past, consult the service bulletins and your maintenance provider. 🛠️

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