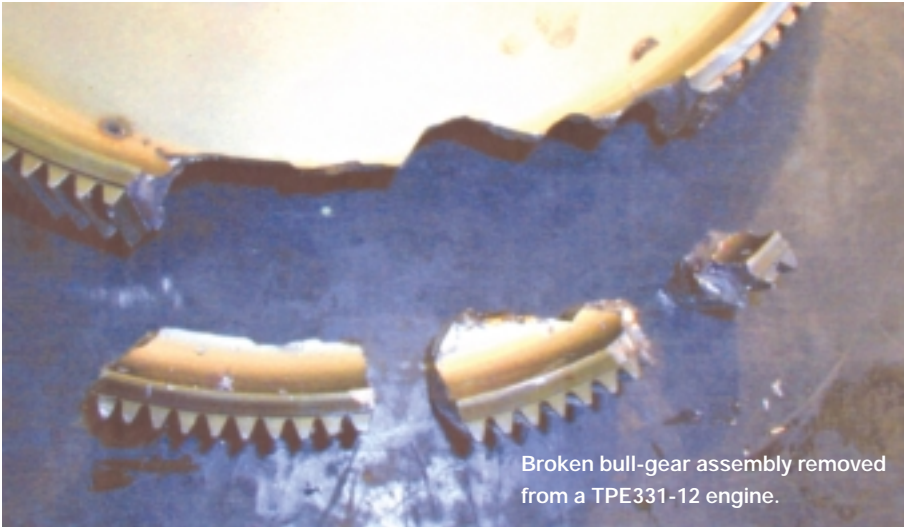


Maintenance alerts



Broken bull-gear assembly removed from a TPE331-12 engine.

Boeing 737: Spoiler control cable failure

ON A FLIGHT FROM Adelaide to Sydney the pilot of a Boeing 737 had difficulty keeping the wings level when he extended the speed brakes. With speed brakes deployed, the aircraft rolled right. When speed brakes were retracted, the aircraft rolled left to wings level. After landing the fault was reported to maintenance.

On the ground, the maintenance personnel observed that when spoilers were selected up number-three flight spoiler remained down. On investigation, flight spoiler control cable WSA2-3 was found broken in the vicinity of WBL 73.00 LH, approximately eight inches outboard of the turnbarrel. At the point of failure, the strand wires were very rusty and their cross section were no longer round due to wear.

The cable failure was due to the effects of corrosion and wear. The operator concluded that the corrosion was initiated by the inadequate reapplication of inhibiting fluid (Boeshield T9, BMS 3-23) during the life of the cable. It was noted that some protective film was applied to the failed cable, but where the failure occurred the area was dry, seemingly not protected over a long period time.

Manufacturer's instructions for continuous airworthiness normally include regular inspection of control cables for wear and corrosion through zonal or specific inspection. Application of corrosion inhibiting coating is also recommended at regular intervals. If the manufacturer's instructions are deficient in this respect, operators

should consider including these in their system of maintenance.

Maintenance engineers carrying out zonal or specific control cable inspection should ensure that they cover the complete cable run. Application of protective coating should also be uniform so no part of the cable remains unprotected.

In this case, the corrosion could have been prevented if the protective coating was applied properly. Also, the engineers should have detected the impending failure during the appropriate schedule inspection.

Cessna 182: Rudder stop

DURING MAINTENANCE on a Cessna 182 aircraft at a maintenance facility in Longreach Queensland, the right-hand rudder stop tee-clip was found detached in the tail cone of the aeroplane. The two MS20426-AD4 rivets attaching the tee-clip to the support were sheared.

The absence of the tee-clip meant there was effectively no rudder stop for right-hand rudder application. It was therefore possible to position the rudder further to the right than normal and in doing so, limit the amount of up elevator available.

The original tee-clip was riveted back to the support. The maintenance organisation reporting this defect considers that the most likely cause for detachment of the stop was a gust of wind, whirlwind or storm. The aircraft involved is normally parked in the open at Mt Isa where this kind of weather is quite common.

The incident underscores the importance of protecting light aircraft from wind related

damage on the ground. As in this case, the damage may not always be visible from outside. When bad weather is expected, aircraft should be parked inside the hangar. If parked outside control locks should be fitted and the manufacturer's recommendations followed.

TPE331-12 Engine: Reduction gear

DURING CRUISE on a scheduled flight from Sydney to Moruya NSW, the crew of a Fairchild Metro suffered a right-hand engine failure with the relevant chip detector light flashing. The flight was diverted to nearby Nowra Naval Air Station where a single engine landing was made.

After landing, oil drained from the engine was found to be heavily contaminated with metal. The engine was replaced and the aircraft returned to service.

Disassembly of the engine reduction gearbox revealed that the in-flight shut down resulted from the failure of the gearbox sun/bull-gear assembly. Approximately 12 per cent of the bullgear rim had separated from the bull gear. There was significant secondary damage evident inside the gearbox. However, the failure was contained inside the gearbox housing.

CASA issued AD/TPE331/55 (currently Amendment 1) in December 2000 to require oil system monitoring of TPE331-12 engines by spectrometric oil analysis (SOAP) and oil filter sampling in accordance with Honeywell Service Bulletin TPE331-A79-0034. The directive was issued in response to FAA advice of several bull gear failures as of late November 2000. Four of these failures had not been contained within the gearbox housing. One had resulted in bull gear fragments penetrating the aircraft fuselage and lodging in the opposite cabin wall. Fortunately no one was injured on board the Jetstream 3200.

However, the SOAP sample taken from the failed engine three, hours before failure, did not detect abnormal oil system contamination level. The engine manufacturer has requested access to the failed gearbox to identify the cause of the failure.

Considering the serious nature of the failure CASA is currently considering several preventive actions. In the mean time, operators of TPE331-12 engines should closely monitor their engines for any sign of failure.