



THE GLIDING FEDERATION OF AUSTRALIA INC

C4/1-13 THE GATEWAY, BROADMEADOWS, VIC 3047
PHONE +61 (0) 3 9359 1613, FAX +61 (0) 3 9359 9865. ABN: 82 433 264 489

Airworthiness Alert 2019-2 **Austro Engine-Broken Studs**

Overview

A defect report was submitted detailing a broken engine housing stud on an Austro AE50R engine fitted to an ASH 31 Mi motor glider. Austro advised this is a known issue and have changed the stud specification to a better material.

Investigation

The owner reported he removed the engine due to an oil leak. On engine removal the broken nut and stud was found. A defect report was submitted and engine manufacturer advised. Austro replied that this is a known issue and have changed the stud specification to a better material. The engine manufacturer provided the Temporary Revision to the Repair Manual and covered the parts and labour under warranty.

Temporary Revision RM-TR-MDC-E1-188a covering the broken stud replacement is now approved in conjunction with the Design Change Advisory MDC-E1-188a and is valid in conjunction with the latest revision of the Repair Manual until this Temporary Revision is incorporated into the Repair Manual.

Recommendation/Action

- 1. Operators of Austro engines should be aware of this potential defect*
- 2. Pilot should inspect engine for oil leaks, nuts and possible broken studs loose in the engine bay at daily inspection*
- 3. Annual Inspector must inspect all engine studs and nuts at annual inspection*
- 4. Replacement of Component authorized inspectors must perform stud replacement IAW Austro Repair Manual / Temporary Revision RM-TR-MDC-E1-188a using correct tooling*
- 5. Replaced studs must be of updated specifications*
- 6. Report all cases of stud failure.*

Report

Notify the GFA of defects in the usual manner by submitting an online SDR ie Defect Report by the SOAR system on the GFA website.

Dennis Stacey
GFA CTO
8/07/2019

TEMPORARY REVISION

RM-TR-MDC-E1-188a Supersedes RM-TR-MDC-E1-188

Stud repair

This Temporary Revision RM-TR-MDC- E1-188a is approved in conjunction with the Design Change Advisory MDC-E1-188a and is valid in conjunction with the latest revision of the Repair Manual (RM) until this Temporary Revision has been incorporated into the RM.

The limitations and information contained herein either supplement or, in the case of conflict, override those in the RM.

The technical information contained in this document has been approved under the authority of DOA ref. EASA.21J.0399.

Doc. Nr.	Affected Section(s)	Affected Page(s)
E1.11.01	4.11	4-80a - j

Instruction:

- Print this document on yellow paper (single-sided)
- Insert this cover page as the first page of the RM
- Insert the other pages of this Temporary Revision adjacent to or in front of the corresponding RM pages

The following chapter is added:

4.11 Stud repair

4.11.1 General

This section describes how to change engine housing studs without disassembling the engine completely.

4.11.1.1 General Notes

- For failure-free operation of the engine it is crucial to precisely stick to the instruction.
- Corrosion prevention, securing and assembly of engine parts and fixtures are only permitted with the agents listed below.
- The manufacturer's instructions of every part and mounting device must be observed strictly.
- Prior to mounting all parts have to be properly and entirely cleaned with a degreasing cleaner. Beyond that every thread securing is to be cleaned separately with one of the cleaners listed below when Loctite 243 respectively 2701 is applied. Cleaning the stud threads in the front plate is not necessary if there is no contamination by oil, grease or other lubricants.
- The order of mounting steps must be observed. Steps may not be omitted or skipped.
- The mounting tools and mounting- and securing-devices shown in this document may only to be used for the according steps. Use for other purposes can lead to damaged tools and engine components.
- General installation guidelines must be observed. This means e.g. the usage of clean, intact standard tools and the use of plastic protection on striking and clamping tools so it can be assured that sensitive surfaces of engine components will not be damaged or scratched during assembly and disassembly.
- All components, which have to be mated, must be wetted with the mentioned mounting lubricant and mounted subsequently.
- If any failure such as excessive wear, cracks, dents, leaks or scratches on any part or assembly is detected during execution of the steps described in this section this part must be replaced or contact Austro Engine GmbH.

4.11.1.2 Approved cleaner

Loctite 7063

Förch R510 or equivalent

Quick cleaner

Brake cleaner

4.11.1.3 Special tools

- AEP-00271-00

4.11.2 Preliminary work

1. Remove engine from aircraft acc. to aircraft manufacturer's maintenance manual
2. Use suitable plugs or clean and dry cloth and tape to properly plug all engine orifices such as:
 - Inlet port
 - Exhaust port
 - Fuel lines
 - Water in- and outlets
 - Vacuum ports
 - Cooling air outlet
 - Oil feed line
3. Use brake cleaner to remove oil and dirt from the engine.



Do not use any corrosive detergents, high pressure cleaner or scraping tools!

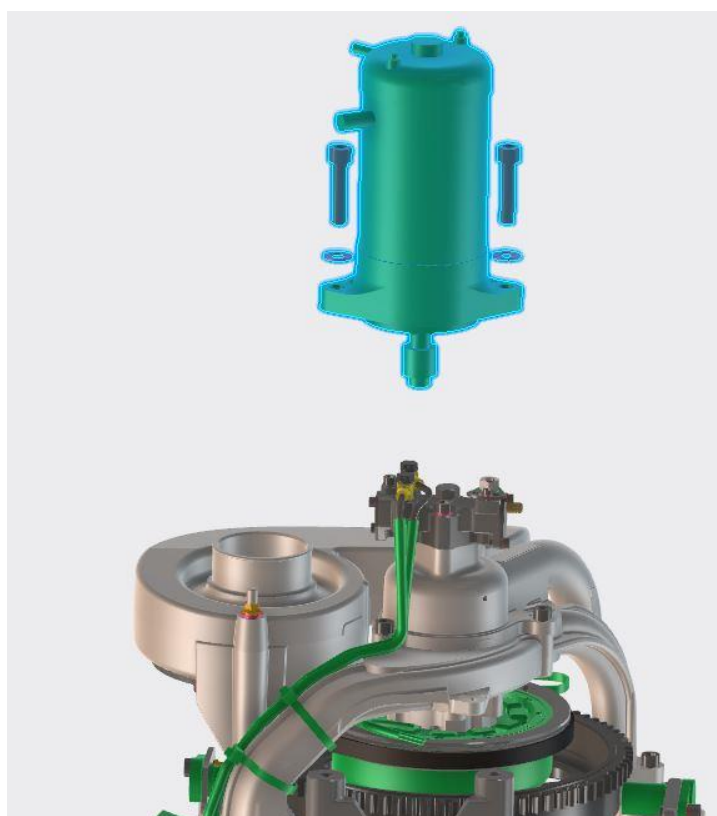
4. Bring engine into an upright position with the fan air filter facing upwards.

4.11.3 Engine disassembly

1. Remove fan air filter.



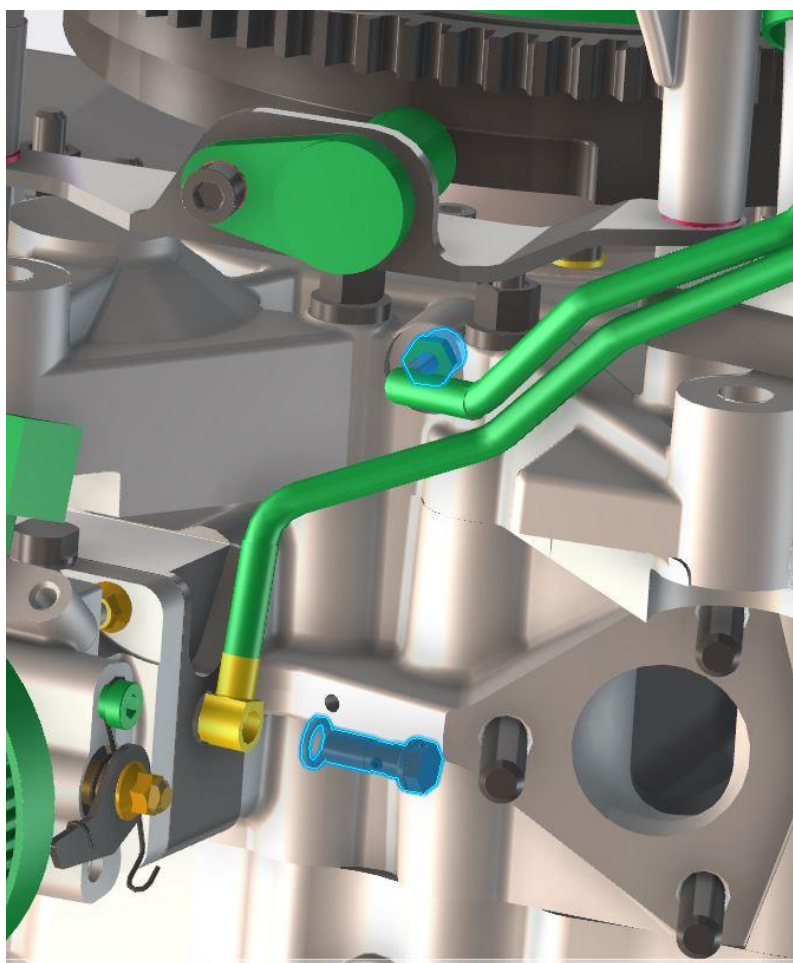
2. Remove starter motor.



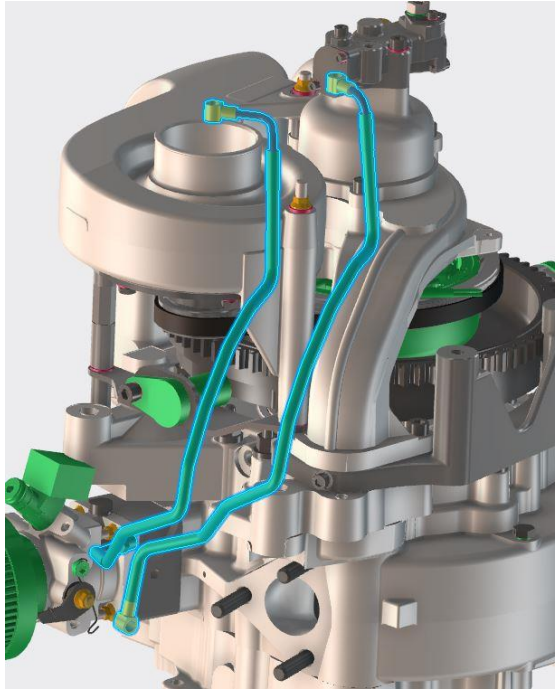
3. Remove oil line screws (2x) including sealing washers from the oil pump.



4. Remove oil line screw and nut from engine housing and throttle body.



5. Cut cable ties and remove oil lines (2x). Remove all sealing washers from the oil lines from the engine!



6. Cut cable tie and remove fan assy. Note position and number of washers for reinstallation. Remove distance sleeves and speed sensor assy.



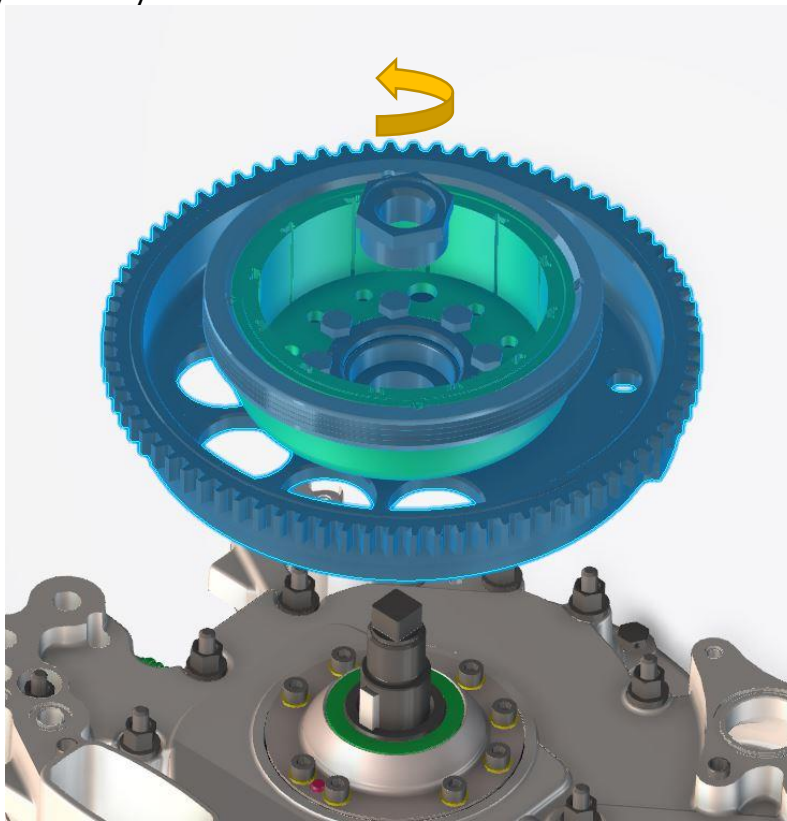
7. Remove water pump housing assy. Remove fan belt and shaft coupling. Remove all O-rings and positioning sleeves.



8. Remove starter bracket. Remove all O-rings from the starter bracket from the engine!



9. Remove flywheel assy

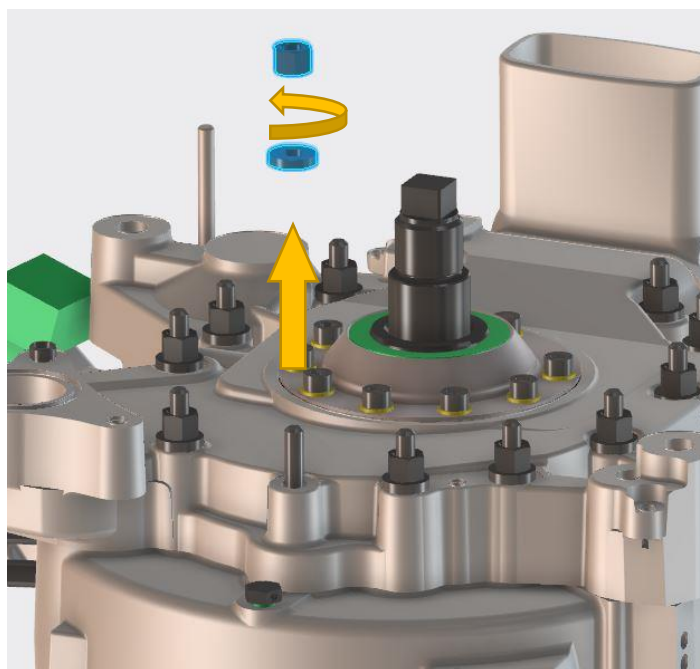


10. Inspect for signs of leakage from the combustion chamber. If there are signs of leakage, contact Austro Engine GmbH.

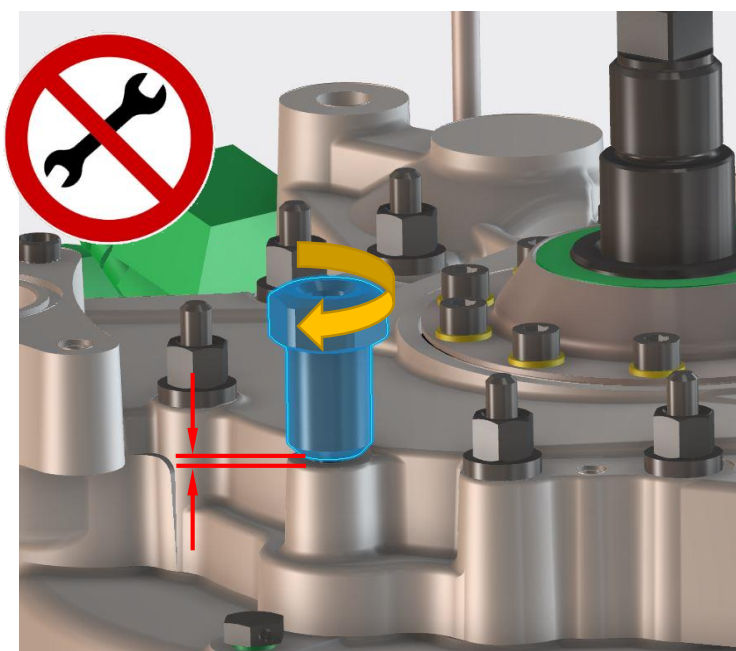
4.11.4 Replace studs

This section describes the replacement of one stud at a time. Repeat this section for every stud.

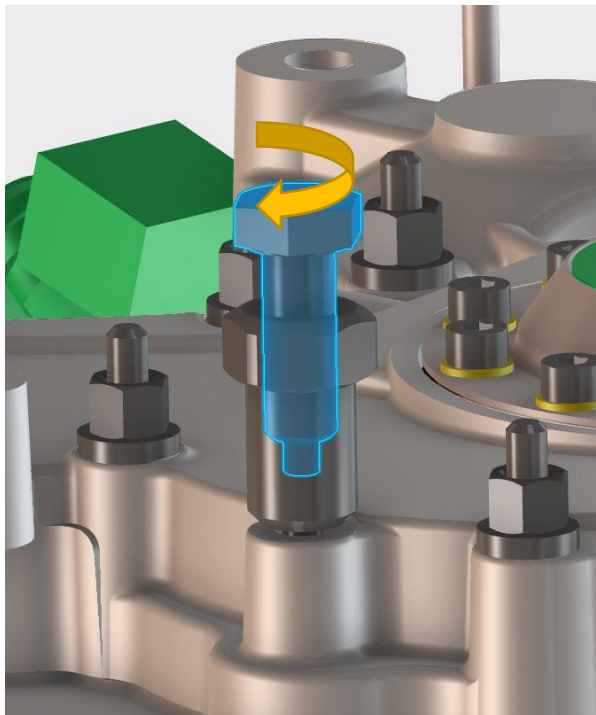
1. Remove housing nut and washer on one screw position only. If stud remains in nut, proceed with step 6 using new nut.



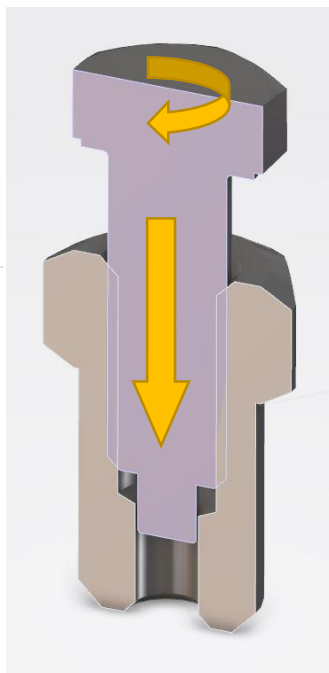
2. Screw lower part of stud removal tool (AEP-00271-01) onto housing stud leaving 1-2mm distance to engine housing by hand. DO NOT TIGHTEN!



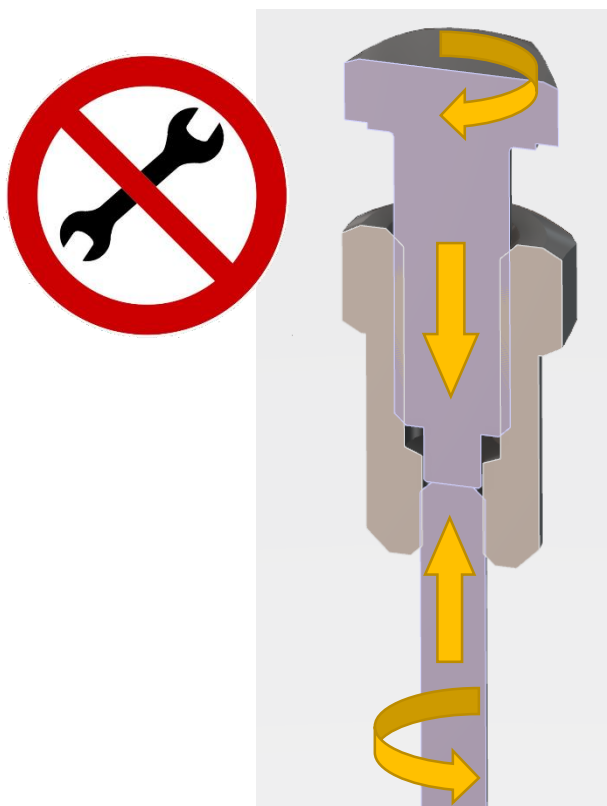
3. Insert upper part of stud removal tool (AEP-00271-02). Tighten together tool with approx. 25Nm while locking lower part with wrench. Check distance of tool to engine housing! Make sure that the tool is not tightened against engine housing!



4. Unscrew removal tool and stud using hex drive on lower part of the tool. Pull tool and stud out of the screw hole.
5. Untighten and remove tool from stud.
6. Reassemble and screw tool together until dead end by hand.



7. Screw assembled removal tool onto new stud



8. Apply Loctite 2701 onto other threaded end and screw into front plate by hand until dead stop. **DO NOT USE WRENCH OR PLIERS FOR TIGHTENING!**
9. Unscrew removal tool by untightening upper part while locking lower part with wrench.
10. Put washer back onto stud.
11. Apply Loctite 243 on freestanding thread of new stud screw down housing nut.
12. Pre-tighten housing nut by 12Nm.
13. Tighten nut with 16Nm (12 lbft).
14. Proceed with step 1 replacing one stud after another for all 13 studs.

4.11.5 Engine reassembly:

Reassemble engine acc. to Build manual E1.08.03 and E1.08.05 chap. 12.27 ff using new sealing washers, o-rings and lock nuts. Remove all plugs and cloths and check for pieces of fluff.

4.11.6 Re-installing engine

Re-install engine acc. to aircraft manufacturer's manual.