



U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

Ms. Ann-Charlott Söderquist
Administrator
Swedish Accident Investigation Authority
P.O. Box 6014
SE-102 31 Stockholm
Sweden

Dear Administrator Söderquist:

This is our final response to Federal Aviation Administration (FAA) Safety Recommendation 18.007 received on February 12, 2018. The Swedish Accident Investigation Authority (SHK) issued this recommendation as a result of the incident that occurred on September 29, 2016, during a regular flight from Malmö Airport (MMX) to Bromma Airport (BMA). At pre-flight inspection, damage was detected on the left hand airflow sensor. The sensor was replaced before the flight. The take-off was normal until 660 feet above ground level, when the stick shaker was activated. The flight crew quickly identified the warning as false. Thereafter, a normal landing was performed.

18.007. Encourage that components that require specially approved maintenance facilities are sealed to detect unauthorized manipulation. (RL 2017:08 R1)

FAA Comment. The FAA understands SHK's concern with tamper proofing aircraft/aviation components. The FAA, however, does not mandate that manufacturers of aircraft/aviation components have tamper proofing, as this can give a false sense of security for complex components that require verification and testing before installation. The FAA does encourage and support manufacturers who elect to implement a tamper proofing process, such as date stamping, lead seal, torque seal, and/or other methods.

While the FAA has no authority to require tamper proofing, the FAA does participate on many standards body meetings, such as the Radio Technical Commission for Aeronautics, Inc., SAE (Formerly known as the Society of Automotive Engineers), the International Organization for Standardization, and other industry led groups that provide tamper proofing standards for various warranty and product liability reasons.

However, the lack of tamper proofing alone does not make an aircraft component unsafe. SHK stated that it is likely the airflow sensor would not have been installed if a broken tamper or warrant seal had been identified. While SHK's statement is possible, it's also possible that the airflow sensor was incorrectly assembled or manipulated. Having

tamper proofing on the component could have increased the engineer's confidence, resulting in fewer tests being performed than actually were.

As stated in the SHK report, the incorrect tests were conducted after replacing the airflow sensor. The engineer applied test instructions for the installation of a "vane assembly" and not for replacement of the "airflow sensor," which was installed. The aircraft technical log references AMM-27-33-37 401 (Airflow Sensor Installed). The tests needed to be performed are listed in the aircraft's maintenance manual/procedures (AMM) for the change of the airflow sensor, e.g. functional test of the airflow sensor, double inspection, or re-inspection. According to the company's maintenance organization exposition, these tests were not performed.

Correctly following the AMM is critical to properly test a component. While tamper proofing can provide assurance of a component's operation, it should not replace adequate testing.

For the above reasons, the FAA does not believe that tamper proofing on the airflow sensor would have altered this incident. The FAA will continue to encourage and assist manufacturers who elect to implement tamper proofing processes.

I believe the FAA has effectively addressed Safety Recommendation 18.007 and consider our actions complete.

The FAA would like to thank SHK for submitting FAA Safety Recommendation 18.007 (RL 2017:08 R1) and its continued interest in aviation safety. If you have any questions or need additional information regarding this safety recommendation, please contact the FAA Safety Recommendations Program staff at 9-AVP-FAA-SafetyRecsfaa.gov. Alternatively, you may contact Ms. Nalee D. Romero, AVP-420, at (202) 267-4702 or nalee.romero@faa.gov.

Sincerely,

Steven J. Gottlieb
Aviation Safety
Executive Director
Office of Accident Investigation and Prevention