

## SUMMARY

The incident occurred during a scheduled flight from Gällivare to Stockholm. At the time, the runway was dry and the weather conditions were good.

The airworthiness organisation had decided to replace the rudder control sensor (RVDT) despite the fact that there was no open remark in the technical logbook. The replacement was carried out by the contracted maintenance organisation.

The crew was aware that technical maintenance had been performed on the aircraft's nose wheel steering system the day before the flight.

After starting the engines, the commander taxied out the aircraft to take off from runway 30.

At take-off, the aircraft immediately turned left after the brakes were released and the aircraft began to roll. The commander tried to correct the course with the right rudder pedal to steer the aircraft to the right without stopping the aircraft's turning movement to the left. The commander decided to abort the take-off and the aircraft finally stopped with the nose wheel outside the runway.

Flight data showed that nose wheel steering with the rudder pedals steered the aircraft in the opposite direction from what was expected, which was also found in the technical examination.

An examination showed that the mechanical stop inside the rudder control sensor had been broken off. The examination also showed that if the mechanical stop is broken off, the missing spline on the sensor shaft can be installed two splines off from the rig position, without any systems warnings. The polarity of the electrical output signal will then be reversed, resulting in that steering with the rudder pedals steers the aircraft in the opposite direction.

The maintenance manual did not describe that a verification of the sensor function should be performed before installation. The maintenance manual also lacked a clear description how the sensor shaft should be aligned at installation.

After installation of the sensor, neither the steering direction nor the angle of the deflection was verified during a function test of the nose wheel steering with the rudder pedals.

The cause for the excursion was that the sensor for the nose wheel steering was incorrectly installed and that the prescribed functional test after installation of the sensor was not performed according to the maintenance manual. This led to that the nose wheel steering with the rudder pedals steered the aircraft in the opposite direction from the expected.

Contributing factors:

- The maintenance manual lacked sufficiently clear instructions to determine the correct function of the sensor before installation.
- The description in the maintenance manual on how to install the sensor did not include sufficiently detailed instructions on how the required sensor shaft alignment could be achieved in regards to the sensor design, function and the position.
- The lack of verification of the steering deflections with the rudder pedals during the function test indicates deficiencies in the maintenance organisation's and technician's

routines regarding line maintenance planning and grouping of tasks for sign-off to prevent omissions during maintenance.

- The airworthiness organisation's participation in the safety management system lacked a focus on identifying risks between the maintenance organisation and the airworthiness organisation.

## **SAFETY RECOMMENDATIONS**

None.