

SNOW ENGINEERING CO. WICHITA FALLS, TEXAS	ENGINEERING REPORT ORDER <table border="1"> <tr><td></td></tr> <tr><td>X</td></tr> </table>			X	NUMBER SL #364
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TITLE SERVICE LETTER #364	BY KS		MODEL ALL TURBINES		
	CHK'D JH		SERIAL ALL		
	DATE 11/29/17		PAGE 1 OF 2		

SUBJECT:

Dangers of Using Propeller Beta in Flight

PURPOSE:

The purpose of this Service Letter is to warn pilots and operators about the dangers of using propeller "Beta" or Reverse in flight. The use of Beta mode in flight is not authorized on Air Tractor aircraft and can result in a dangerous situation, leading to aircraft loss of control and possibly a fatal accident.

WHAT IS "BETA"?:

"Beta" mode is the term used to describe an operating mode where the propeller blade angle is below the minimum blade angle allowed for flight operation of the aircraft. In this mode, the propeller blade angle is no longer controlled by the propeller governor. Instead, the propeller blade angle and engine speed (Ng) is directly controlled by the pilot with the Power Lever. The Prop Lever has no effect on propeller speed or angle in this mode. Beta and Reverse are intended for ground use only.

To enter Beta mode, the pilot must pull the Power Lever back to the idle stop and operate the reverse trigger to continue to move the Power Lever past the idle stop.

As the Power Lever is moved aft past the idle stop, the initial effect is that propeller blade angle will decrease below the minimum blade angle, flattening the blades.

Further aft movement of the Power Lever will move the propeller blade angle into reverse pitch and will begin increasing engine speed (Ng) to create reverse thrust.

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WARNING:

DO NOT USE BETA MODE OR PROPELLER REVERSE IN FLIGHT!

Using Beta mode by moving the Power Lever past the idle stop is not authorized on Air Tractor aircraft while the aircraft is in flight. Although some pilots are tempted to use Beta mode on final approach to steepen their descent angle, this is a risky and potentially dangerous practice.

A specific risk of using Beta mode in flight is disrupted airflow over the flaps and empennage, leading to lack of control authority and unknown/unexpected control issues that could result in loss of aircraft control at low altitude. Use of Beta mode in flight could result in a steep unrecoverable descent angle and subsequent impact with the ground. This problem would be made worse if the propeller governor beta valve plunger is sticking. Proper care and maintenance of the beta valve plunger is critical to safe operation (See Service Letter 172).

Additionally, when the Power Lever is in Beta mode, there is no protection against inadvertent movement into Reverse thrust if the Power Lever is bumped due to turbulence or any other reason. Inadvertent reverse thrust during final approach would likely result in an unrecoverable loss of control situation.

AUTHORIZED USE OF BETA MODE AND REVERSE:

Beta mode and reverse thrust settings are only authorized for ground operations. These settings may be used during taxi operations to reduce brake system wear and to reduce taxi speeds. Beta mode and reverse thrust may be used during the landing rollout, but only after all three wheels are on the ground.