



# SPECIAL AIRWORTHINESS INFORMATION BULLETIN

Aircraft Certification Service  
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of Transportation

**Federal Aviation  
Administration**

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<http://www.faa.gov/aircraft/safety/alerts/>

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*This is information only. Recommendations aren't mandatory.*

## Introduction

This Special Airworthiness Information Bulletin alerts you, owners and operators of **Bell Helicopter Textron Model 407 helicopters**, that you could experience a fault in the full authority digital electronic control (FADEC) system that may cause the FADEC to transition from automatic to manual mode.

Although the possibility of a FADEC system failure is unlikely, you should have an operational understanding of the FADEC system and its emergency procedures. You can get this information from the Bell 407 Rotorcraft Manufacturers Data (BHT-407-MD-1).

## Background

We've received reports that Bell 407 aircraft have experienced FADEC faults requiring the pilots to transition from automatic mode to manual mode of the FADEC. The reversion to manual mode operation is automatic, but this transition takes between 2 and 7 seconds to complete. The time delay variation is dependent on fuel flow and flight conditions when transition is initiated.

Following a transition from an initial condition of low fuel flow there is approximately a 2 second delay. Following a transition from an initial condition of high fuel flow there is approximately a 7 second delay. During this time you must be aware that an increase or decrease in  $N_P/N_R$  may occur.

You may experience an increase in  $N_P/N_R$  speed while in transition to manual mode from a condition from a lower to higher fuel flow. You may experience a decrease in  $N_P/N_R$  speed during the transition from a higher to a lower fuel flow. Once the transition is complete the Manual mode allows you to control  $N_P/N_R$  with coordinated control of collective and throttle (similar to a helicopter with a reciprocating engine).

Even though the transition from FADEC automatic mode to manual mode is automatic, it is your responsibility to complete the transition in accordance with Bell 407 Rotorcraft Flight Manual procedures following the FADEC FAIL cockpit indications. Not following the flight manual could result in rotor droop, rotor over-speed, or an accident.

## Training

As a part of your initial and recurrent flight training in the Bell 407, you should get training in FADEC manual mode operation and reversion from automatic to manual mode. You should receive training from either Bell Helicopter, Textron, Inc. or from a training program that has been developed incorporating information from the Bell Helicopter Textron, Inc. Rotorcraft Manufacturer's Data for the Model 407 (BHT-407-MD-1) and the Emergency/Malfunction Procedures in the Rotorcraft Flight Manual for the Model 407 (BHT-407-FM-1).

Prior to actual flight training in the manual mode, you should have an operational understanding of the FADEC system along with a sound knowledge of emergency procedures. We recommend that you first be trained in a cockpit procedural environment (engine not running if in a helicopter). This can provide a simulation of the horn and caution lights associated with a FADEC failure direct to manual mode and familiarize you with the required cockpit actions. Ground training should be followed by a takeoff/hover/traffic pattern and landing in manual mode, which will allow you to become familiar with the required manipulation of the throttle and controls.

Once you are comfortable with flight in manual mode, simulated FADEC failure emergency procedures can be carried out in flight. In flight training should include the scenarios listed in the recommendations section of this bulletin. Training flights should not be conducted in those flight conditions where altitude/airspeed combinations does not allow sufficient time to recover within the 2-7 seconds.

### **Recommendations**

- Review and understand the information concerning the Engine Controls - FADEC System section of the Bell 407 Rotorcraft Manufacturer's Data (BHT-407-MD-1).
- Receive ground and flight training to recognize and respond to FADEC failures.
- During training perform successful transitions from automatic to manual mode using the following scenarios:

- High power cruise or a take-off.
  - Low power setting in an approach profile.
  - Hover over a place where a landing can be made.
  - Hover over a place where a landing cannot be made and must continue to fly during and after the transition.
  - On ground at FLY setting. (Recommend to perform this scenario in a flight training device).
- Get training from manufacturer approved training program, or from a training program that incorporates information from the FADEC Training In Manual Mode section of the Bell 407 Rotorcraft Manufacturer's Data (BHT-407-MD-1) and the emergency procedures in the Bell 407 Aircraft Flight Manual (BHT-407-FM-1).
  - You should report all commanded and uncommanded reversions to manual mode associated with a cockpit warning indication, uncommanded power change, or other indication of a control system manual function to the Chicago Aircraft Certification Office (ACO) point of contact below.

### **For Further Information Contact**

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### **Report Reversions To Manual Mode To**

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