Establish Pilot Training and Experience Qualification Criteria and Stall Test Plan for Postmaintenance Stall Test Flights in Certain Hawker Airplane Models

Introduction

The National Transportation Safety Board (NTSB) is providing the following information to urge Textron Aviation Inc. (the current type certificate holder for the airplane models), the Federal Aviation Administration (FAA), and the National Business Aviation Association (NBAA) to take immediate action on the safety recommendations in this report.[1] We identified the need for action during our investigations of two fatal accidents in 2025 and 2024 that occurred during manufacturer-required postmaintenance stall test flights conducted in Hawker 800XP and 900XP airplanes after routine, 4-year inspections were performed.[2]

Both accident flights were flown by the respective operator's flight crews who, although qualified to fly the airplanes, were unprepared to safely address the adverse stall behavior they encountered during the stall test flights. We are concerned that, due to deficiencies we identified in the information available to airplane owners, operators, and pilots related to the training and procedures needed to safely perform manufacturer-required postmaintenance stall test flights in certain Hawker airplane models, other flight crews tasked to perform such flights may be similarly

[1] The NBAA is an organization that represents "companies that rely on general aviation aircraft to help make their businesses more efficient, productive, and successful." The NBAA Safety Committee provides NBAA members with advice and guidance related to the safety of operations and identifies safety priorities intended to "promote safety-enhancing discussions and initiatives within flight departments and among owner-flown operations." More information about NBAA's safety activities, including safety information that is publicly available to nonmembers, can be found by searching the NBAA website at https://nbaa.org.

[2] Visit ntsb.gov to find additional information in the public docket for this NTSB safety recommendation report, case DCA26SR003. Use the CAROL Query to search the accident investigations discussed in this report, cases ANC26FA002 and WPR24FA083.

unprepared. Based on the safety issues discussed in this report, the NTSB is issuing five urgent safety recommendations to Textron Aviation Inc., one urgent safety recommendation to the FAA, and one urgent safety recommendation to the NBAA.

Background

The purpose of the stall test flight required for certain Hawker airplanes is to ensure that the airplane's stall behavior and the stall identification and warning system exhibit acceptable characteristics before the airplane is returned to service following certain maintenance actions involving the wing leading-edge assemblies, deicing distribution panels, or stall trigger assemblies. This is because the wing design for the specified airplanes is sensitive to minor wing component installation or condition defects, such as those that could be introduced inadvertently during maintenance activities, that could result in unacceptable stall characteristics (that is, any stall or stall identification and warning system behavior that is not in accordance with the type design standards for airworthiness).[3] Per the respective airplane manuals, unacceptable behavior includes a stall that occurs before stick shaker or stick pusher activation or an uncommanded roll that exceeds 20° and cannot be limited by a pilot's aileron control input.

Per the Hawker Structural Repair Manual (SRM) that applies to the Hawker 750, 800, 800XP, 850XP, and 900XP airplanes and specifies the stall flight test requirements, the range of acceptable tolerances for some wing component installations must be achieved within a few hundredths of an inch to avoid introducing unacceptable stall characteristics.[4] Similarly, discontinuities or ridges in the sealant between the leading edge and upper wing skin can also result in unacceptable stall characteristics.

The possibility of encountering unacceptable stall characteristics during the stall test flight is implied, as the SRM also provides additional maintenance actions to be taken to attempt to correct such behavior and states that a stall test flight recheck

[3] The Hawker 800XP, 900XP, and other airplanes on the same type certificate are designed such that, during normal operations, the flight crew should never experience an actual stall. The airplanes are equipped with a stall identification and warning system that includes a stick shaker and stick pusher. The stick shaker, which is designed to operate at an indicated airspeed of 7% to 9% above the stalling speed, warns the pilots when the airplane is approaching a stall. If the pilot does not respond appropriately by moving the control column forward (to command airplane-nose-down pitch) to decrease the airplane's angle of attack, the stick pusher is designed to automatically activate and move the control column forward to lower the airplane's nose and avoid the stall. Per the respective manuals for the airplanes, should a stall occur concurrent with the stick pusher activation, "acceptable" stall behavior can include roll behavior that the pilot can restrain to within 20° with normal use of aileron control.

[4] For example, when a wing leading edge is reinstalled, the gap between the leading-edge skin and wing skin must be between 0.02 and 0.15 inches, and the profile must be between -0.01 and +0.02 inches.

must be done. Further, should the airplane continue to exhibit unacceptable stall characteristics (such as excessive roll at stall onset) after all identified defects have been corrected, the SRM specifies adjusting the position of the leading edge spoiler (which is bolted into place) by no more than 0.05 inches to correct the behavior.[5] However, incorrect spoiler position adjustments can exacerbate unacceptable stall behavior.

The SRM refers the airplane operator to the respective airplane manual for the "procedure and technique" for performing the stall test flight. For some airplane models, the SRM refers to the Pilot's Operating Manual (POM); for others, it refers to the Airplane Flight Manual (AFM).[6] The POM for the Hawker 800XP and 900XP accident airplanes, respectively, contains stall "conditions" and "techniques," which include ensuring that the airplane external surface is free of ice; maintaining the specified minimum altitudes, airplane configuration, and target airspeeds; and allowing the airplane to pitch nose down until the stick pusher is canceled, among other specified information.

Beyond the information in the SRM and the POM for each airplane, we identified no other current document from the airplane manufacturer specifying any additional experience, training, or qualification criteria for pilots tasked to perform a stall test flight or any additional plan or procedures for performing a stall test flight.

As discussed in the next section, in addition to the two fatal accidents, we investigated an incident in 2006 and are aware of two previous events involving airplane models that are on the same type certificate as the Hawker 800XP and 900XP airplanes and that exhibited an excessive uncommanded roll or other adverse stall behavior during postmaintenance stall test flights.

Fatal Accidents

On October 16, 2025, a Hawker 800XP airplane, XA-JMR, crashed during a stall test flight near Bath Township, Michigan. The pilot, copilot, and the passenger (a company maintenance representative) were fatally injured. The pilot and copilot were the operator's primary flight crew for the airplane, which had been down for maintenance for the preceding 7 months. The pilot held a pilot-in-command (PIC) type rating and the copilot held a second-in-command (SIC) type rating for airplanes that included the Hawker 800XP.

[5] The SRM refers to this component on each wing as "leading edge spoiler," "spoiler," "stall trigger," and "wing spoiler." It is different than the aerodynamic spoiler surfaces, such as speed brakes and ground spoilers, that can be deployed, as applicable, during different phases of flight.

[6] Although the SRM refers operators of Hawker 900XP airplanes to the AFM, we identified that the stall test information is actually contained in the POM. We discuss this issue in the "Manual Inconsistences" section of this report.

The pilot's and copilot's logbooks showed that they flew the accident airplane exclusively, typically about 150 hours per year, and had completed their most recent training in a flight simulator at a commercial training facility about 5 months before the accident. Training records for the simulator sessions indicated that the pilot was trained to the equivalent of 14 *Code of Federal Regulations* (*CFR*) 61.58 PIC standards, and the copilot was trained to the equivalent of 14 *CFR* 61.55 SIC standards. Their stall training in the simulator covered stall prevention procedures in various airplane configurations, stall recovery with idle thrust procedures, and a stick pusher demonstration; the stall training sessions were focused on recognizing and avoiding stalls and were not graded. Maintenance facility personnel stated that they provided the flight crew with a list of experienced stall test pilots-for-hire, but the flight crew instead flew the accident stall test flight themselves.

Preliminary information from our ongoing investigation included automatic dependent surveillance broadcast (ADS-B) flight track data, air traffic control (ATC) communications information, and weather data. The flight track data showed that the airplane departed from Battle Creek Executive Airport at Kellogg Field (BTL), Battle Creek, Michigan, about 1708 local time then climbed until it leveled off at 15,000 ft mean sea level (msl), which was within the flight crew's requested and ATC-approved block altitude of 14,000 to 16,000 ft msl. Weather conditions at BTL about the time of the departure included clear skies, temperature 57° F, and dew point 39° F, which represents a relative humidity of 51%.

At 1727, the airplane began a rapid descent from 14,000 ft msl, and a flight crewmember made an unintelligible transmission on the ATC frequency followed by a transmission in Spanish that translated to "in a stall, recovering, sorry." There was no further communication from the flight crew.

Examination of the accident site revealed that the airplane impacted terrain in a relatively flat attitude. A postimpact fire consumed a large portion of the main wreckage; however, all major structures were accounted for at the accident site. The cockpit voice recorder (CVR) and various components were recovered for additional examination and testing.

Although our investigation of this accident is ongoing, the descent profile and other aspects of the flight are similar to those identified during our investigation of a stall test flight accident that occurred about 20 months earlier. In that accident, a Hawker 900XP airplane, N900VA, crashed near Westwater, Utah, on February 7, 2024, fatally injuring the pilot and copilot.

The Hawker 900XP accident flight crewmembers were the operator's line pilots, and the PIC was the pilot flying during the accident flight. Both crewmembers had attended separate simulator training sessions during the previous year that covered the operation of the stall warning and identification system (stick shaker and

stick pusher); the training was focused on recognizing and avoiding stalls.[7] The pilot had participated in a stall test flight 4 years before the accident as SIC, and the copilot had never participated in a stall test flight.

ADS-B data for the accident flight showed that the airplane departed from Grand Junction Regional Airport (GJT), Grand Junction, Colorado, about 1037 local time and climbed to near the top of the flight crew's requested block altitude of flight level (FL) FL180 to FL200 before leveling off.[8] Areas of clouds and precipitation were in the vicinity of the departure airport. About 1047, the airplane entered a rapid, vertical descent consistent with a flat spin from which the flight crew did not recover airplane control. The airplane rolled through 360° multiple times in a corkscrew descent (see figure 1).

Data recovered from the airplane's flight data recorder (FDR) indicated that the airplane was configured with the flaps retracted and the autopilot off. Before the airplane entered the spin, it decelerated and its pitch attitude increased, consistent with the flight crew preparing to perform the stall warning and identification system checks. The data showed that the airplane entered the stall at the same time the stick shaker activated and before the stick pusher activated, providing no indication to the flight crew that the stall was imminent. We determined that this stall identification and warning system activation sequence, with the stall occurring at the same time the stick shaker activated, was likely due to wing performance degradation from structural ice that accumulated as the airplane entered the clouds during part of its climb.

[7] According to an instructor at the simulator facility where the pilot and copilot completed their training, typical stall training consists of a demonstration of the features of the stall protection system. The trainees are instructed to slow the airplane on autopilot until the stick shaker activates so they can observe that the autopilot will disengage. The trainees are then instructed to wait before recovering the airplane so they can observe that the stick pusher will activate if recovery is not initiated in response to the stick shaker. The instructor stated that it's a demonstration and that no proficiency is required. Per FAA Order 8900.1, Volume 3, Chapter 19, Section 6, the stall training provided during a Part 135 PIC and SIC initial new-hire, initial equipment, and recurrent training includes en route "Stall Prevention" simulator training events involving "approaches to stalls" in various specified configurations, such that, "the approved recovery procedure must be initiated at the first indication of a stall (buffet, stick shaker, aural warning)."

[8] A flight level is an aircraft's altitude, expressed as three digits representing hundreds of feet, as determined by a barometric altimeter setting of the reference datum of 29.92 inches of mercury. Flight level references are used for operations conducted at or above 18,000 ft msl.

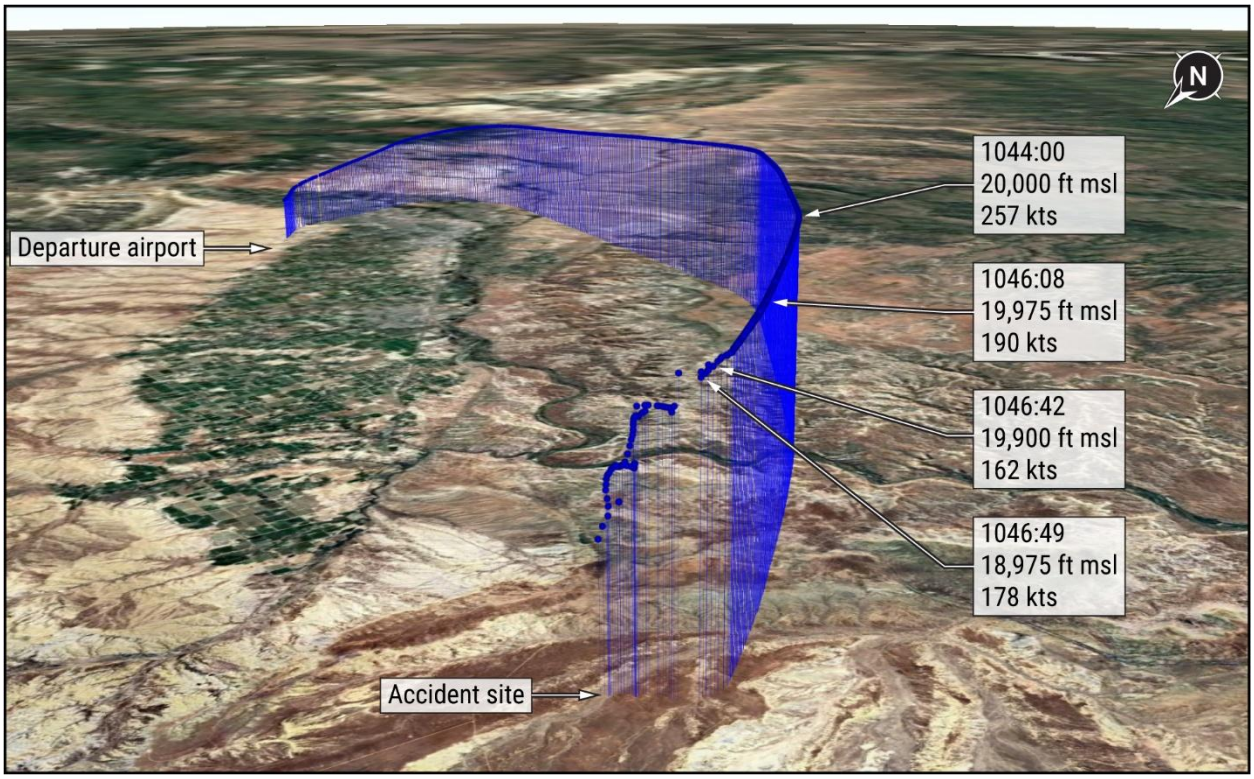

Figure 1. Flight track showing corkscrew descent of the February 7, 2024, Hawker 900XP accident flight near Westwater, Utah.

According to the stall technique guidance in the Hawker 900XP POM, "the stall is identified by a short forward movement of the control column provided by the stall identification system." It states that "the airplane should be allowed to pitch nose down until the stick pusher is canceled and should then be recovered to normal controlled flight. Any tendency to roll should be corrected by the use of ailerons." Although the POM contains a caution that references "unacceptable stall characteristics," including a roll behavior that may result in an unusual attitude, it does not provide clear information or recovery procedures beyond a statement that the elevator control must be moved forward (airplane-nose-down pitch) to decrease the angle of attack and allow the return of normal aileron control (see figure 2).

Hawker Beechcraft Corporation

Pilot's Operating Manual

Stall Characteristics

CAUTION: A FREQUENT REASON FOR UNACCEPTABLE STALL CHARACTERISTICS IS A TENDENCY TO ROLL AT THE STALL. IT IS ACCEPTABLE FOR A MODERATE ROLL TO OCCUR, PROVIDED THAT NORMAL USE OF AILERONS CAN LIMIT THE ROLL ANGLE TO NO MORE THAN 20°.

AILERON SNATCH MAY OCCUR AT OR PRIOR TO STALL AND IS NOT ACCEPTABLE. THE AILERON SNATCH MAY BE STRONG ENOUGH TO AFFECT RECOVERY USING AILERON INPUT, IN WHICH CASE THE ELEVATOR CONTROL MUST BE MOVED FORWARD TO DECREASE THE ANGLE OF ATTACK AND ALLOW THE RETURN OF NORMAL AILERON CONTROL. IN SUCH AN EVENT THE PILOT MUST BE PREPARED TO RECOVER FROM AN UNUSUAL ATTITUDE.

PILOTS CONDUCTING STALL CHECKS SHOULD HAVE PRIOR EXPERIENCE IN PERFORMING STALLS IN THE HAWKER AND MUST BE PREPARED FOR UNACCEPTABLE STALL BEHAVIOR AT ANY POINT LEADING UP TO AND THROUGHOUT THE MANEUVER.

There is no natural stall warning or aerodynamic buffet prior to the stall.

Stall warning is provided by a stick shaker which is set to operate at an indicated airspeed of 7% to 9% above the stalling speed.

It is acceptable for stick pusher operation to be coincident with the natural stall, provided that any rolling tendency can be restrained to within 20° of bank angle by normal use of ailerons. Some aerodynamic buffet may occur briefly at the point of stall.

Power-off stalling speeds in terms of indicated air speed (IAS) are given for various configurations in the Airplane Flight Manual, Section 5 - PERFORMANCE, Sub-section 5.05 - GENERAL. These airspeeds apply to an altitude of 15,000 feet and are the stall identification speeds at forward CG and therefore differ from the values shown in the AFM Figure 5.10.4 which are based on the minimum airspeed obtained during the stall.

Figure 2. Hawker 900XP POM caution statement about unacceptable stall behavior.

According to the FDR data for the accident flight, after the airplane entered the stall, it abruptly rolled to the right, and the flight crew responded with full left-wing-down aileron control input, full power, and full aft (airplane-nose-up pitch) elevator control input, which aggravated the aerodynamic stall and spin.

Previous Incident and Other Uncommanded Roll Events

We previously investigated a stall test flight incident and are aware of two other stall test flight events involving uncommanded roll behavior in airplane models that are on the same type certificate as the accident Hawker 800XP and 900XP airplanes. Type certificate A3EU, which has been held by numerous manufacturers before it was transferred to Textron Aviation Inc. in 2016, includes 51 unique airplane models that have been added over the years since the 1960s.[9]

The incident, which occurred on May 4, 2006, involved a Corporate Jets Limited BAE 125-800A airplane that entered a stall without the expected stick shaker and stick pusher activation and rolled uncommanded through 360° during a stall test flight near Lincoln, Nebraska.[10] The pilot (who was the PIC and pilot flying), copilot, and the four technicians on board sustained minor injuries. The flight crewmembers were pilots for Raytheon Aircraft Company, the airplane type certificate holder at the time.

The flight crew reported that the stall test was conducted with the autopilot engaged and that the stall occurred at a higher airspeed than they had calculated.[11] The flight crew reported that the right wing dropped abruptly and that, during the uncontrolled descent, the airplane rolled through 360° multiple times, both to the right and the left. FDR data for the flight showed that the airplane became inverted 4 seconds after the initial upset and lost about 11,000 ft of altitude within 30 seconds before the pilot regained control of it. During the incident, the airplane sustained a downward acceleration force that exceeded 6 g and received minor damage to seats, arm rests, and cabin interior panels.

[9] The type certificate indicates that it was transferred from Raytheon Corporate Jets Inc. (United Kingdom) to Raytheon Aircraft Company (United States) on August 1, 1995, at which time, the FAA accepted status as the state of design and manufacture. The type certificate was subsequently transferred to Hawker Beechcraft Corporation on March 26, 2007, and then Beechcraft Corporation on April 12, 2013, before it was transferred to Textron Aviation Inc. on October 12, 2016.

[10] See NTSB case CHI06IA127 for more information.

[11] The AFM stated that intentional stalls were to be performed with the autopilot off. However, the Raytheon maintenance test flight procedures required it be engaged to enable verification of autopilot disconnect at stick shaker before approving the airplane for return to service. Following this event, Raytheon discontinued the practice of approaching intentional stalls with the autopilot connected for in-service airplanes until the stall characteristics were ascertained.

We found that, contrary to the guidance specified in the AFM, the flight crew initiated the stall test with ice contamination on the wings and that this contamination resulted in the airplane's adverse stall behavior. The flight crew had activated the deice system after takeoff and did not observe any icing advisory light or any ice on the wings. However, a mechanic on board saw that frost was present on the wing surface near the root (which was out of the pilots' field of view) and reported it to the flight crew, but they continued to perform the stall test.

Following this incident, Raytheon Aircraft issued a stall training syllabus that outlined operational considerations for stall testing and clarified approved recovery procedures. However, Raytheon added this syllabus only to its internal Production Flight Test Procedure and did not include it in any AFM or POM.

The NTSB is also aware of two previous events involving airplanes that exhibited unacceptable stall characteristics during stall test flights.[12] On March 3, 2005, a Raytheon Corporate Jets Hawker 800XP airplane entered an aerodynamic stall without stick shaker or stick pusher activation and rolled uncommanded three times to the right during a stall test flight in West Palm Beach, Florida. The airplane lost about 3,000 ft of altitude before the flight crew regained control of it. No flight crew injury or airplane damage was reported.

Maintenance personnel identified that some of the airplane's vortex generators were deformed and that this condition was likely present before the airplane departed on the stall test flight.[13] All vortex generators were subsequently replaced, and the manufacturer's test pilots performed a second stall test flight, which identified no discrepancies with the airplane's stall characteristics.

The potential adverse effect of deformed vortex generators resulting in unacceptable stall characteristics was identified after a previous event involving a Hawker 125-800 airplane and was the subject of Service Information Leaflet, SER No. 180, issued December 14, 1993, by Raytheon Corporate Jets (the type certificate holder at the time). The leaflet reported that the subject airplane exhibited unsatisfactory stall characteristics during a stall test flight, which included stalling before activation of the stick shaker and stick pusher and rolling uncommanded to the right. The leaflet advised operators of Hawker 125-800 and -1000 series airplanes to exercise caution when cleaning wing top surfaces and to straighten or replace any distorted vortex generators.

[12] No information about the stall test flight procedures in effect at the time or flight crew training and experience was available for either event. The limited factual information we obtained for these events can be found in the public docket for this safety recommendation report, DCA26SR003.

[13] Vortex generators are small, fin-like structures located on the top of the wings that are designed to optimize airflow over the wing.

Analysis

We note that the current stall test requirements specified in the Hawker SRM for the Hawker 800XP and 900XP airplanes (the accident airplanes) also apply to the Hawker 750, 800, and 850XP model airplanes. Based on findings from our ongoing and completed investigations and the circumstances of other reported events, the NTSB is concerned that the pilots tasked to perform the postmaintenance stall test flights required for Hawker 750, 800, 800XP, 850XP, and 900XP airplanes may not have adequate training, experience, and procedures to safely perform the flights. Further, due to the similarity in wing design of other airplanes on the same type certificate, we are concerned about these issues for those airplanes as well.

Need for Stall Test Pilot Qualification Criteria and Stall Test Plan

The SRM that applies to the Hawker 750, 800, 800XP, 850XP, and 900XP airplanes provides only general information about stall test flights. It indicates that the stall test flight must be flown by a pilot "familiar" with the stall identification system and stall characteristics of the airplane and cautions that the pilots should have "prior experience" in performing stalls in the Hawker. Based on these broad, subjective criteria, pilot qualification to perform a stall test flight is open to interpretation.

For example, the operator's flight crew involved in the 2024 Hawker 900XP accident, who were line pilots fully qualified to conduct normal flight operations, had only simulator-based exposure to the airplane's stall indication and warning system activation, and the pilot had only once acted as SIC during a stall test flight conducted years previously. Similarly, the operator's flight crew involved in the 2025 Hawker 800XP accident were line pilots who typically flew the airplane; our investigation into their training and experience is ongoing.

Further, we identified that Hawker 900XP and 800XP POMs do not specify procedures or checklists for pilots on how to recover the airplane from the stall. Each POM advises that the airplane will exhibit no natural stall warning or aerodynamic buffet before the stall and contains vague information in a "caution" statement that advises that the pilot must be "prepared for unacceptable stall behavior" and "prepared to recover from an unusual attitude." However, each POM's emergency procedures and abnormal procedures contain no procedure for responding to unacceptable stall behavior or recovering from unusual attitudes.

Although the flight crews involved in the 2024 Hawker 900XP accident and the 2006 BAE 125-800A incident did not comply with the stall test flight condition for ensuring that the wing surfaces were free from ice, the circumstances of these events highlight the airplane control challenges that stall test flight crews may face when adverse stall behavior is encountered, regardless of the reason for the behavior. Although the BAE 125-800A flight crewmembers safely recovered the airplane, it

rolled multiple times, lost about 11,000 ft of altitude, and sustained damage and forces exceeding 6 g before the pilot regained control of it.

Thus, the NTSB concludes that, although the flight crew of the accident Hawker 900XP airplane was properly trained and qualified for normal operations, their remedial actions during the postmaintenance stall test flight suggest that their training, experience, and the procedures available in the applicable airplane manual were inadequate to prepare them to safely respond to the adverse stall behavior they encountered.

FAA guidance has indicated that, "since operational pilots may not be required, or trained, to fly an angle of attack beyond that for stall warning, any exposure to the behavior of the airplane in an actual stall would be both unexpected and unfamiliar."[14] Further, longstanding industry safety guidance has highlighted risks associated with postmaintenance check flights and indicated that "it is not safe to assume that any pilot is qualified" to perform the flights.[15]

According to information provided by a former Hawker production test pilot we interviewed during our investigation of the Hawker 900XP accident, there are no schools that provide training on performing stall test flights. He stated that he learned to perform stall test flights years ago while flying with other production test pilots and that the flights were performed by production flight test pilots in accordance with a production flight test procedure plan. However, we note that the airplanes on type certificate A3EU that are subject to the postmaintenance stall test flight requirement are no longer in production; therefore, there are no production test pilots for these airplanes.

We are aware of at least one other airplane manufacturer that developed and currently uses a stall flight operations manual for its airplane models that requires a return-to-service stall test flight following certain maintenance activities to ensure that the airplane's stall characteristics and stall warning behavior comply with the type design standards. This manufacturer's manual specifies ground and flight training requirements for the manfuacturer-authorized pilots who perform the flights, stall test

[14] The guidance was issued in Advisory Circular 25-7D, "Flight Test Guide for Certification of Transport Category Airplanes." We note that, although this guidance is intended for certification test flights, the statement about operational pilot training regarding stall encounters is a relevant consideration for postmaintenance stall test flights in certain Hawker airplanes.

[15] In 2011, a Flight Safety Foundation–led steering team held a symposium dedicated to addressing the higher risks associated with conducting functional check flights. Following the symposium, in 2012, the Flight Safety Foundation issued the "Functional Check Flight Compendium" document, which contains considerations (including the quoted statement) and best practices for conducting functional test flights. The document can be found by searching the Flight Safety Foundation website at https://flightsafety.org. Per the website, the Flight Safety Foundation is "an independent, nonprofit, international organization engaged in research, education, advocacy, and publishing to improve aviation safety."

flight standard operating procedures and checklists, recovery techniques, and safety considerations and precautions.[16]

We believe that the safety of Hawker 700, 800, 800XP, 850XP, and 900XP postmaintenance stall test flights can be enhanced with defined, manufacturer-authorized pilot training and experience qualification criteria and a clear and thorough stall test plan that specifies, at a minimum, pilot and copilot assignments; preflight, flight, and postflight procedures and checklists; safety considerations; and stall recovery techniques. We believe that the pilot training must be manufacturer-authorized to mitigate the risk of a training flight accident.[17]

Therefore, the NTSB recommends that Textron Aviation Inc. define manufacturer-authorized pilot training and experience qualification criteria for pilots who perform postmaintenance stall test flights in Hawker 700, 800, 800XP, 850XP, and 900XP airplanes to ensure that they are prepared with the competencies needed to safely respond to an encounter with unacceptable stall characteristics.

Further, the NTSB also recommends that Textron Aviation Inc. develop a stall test plan that describes unacceptable stall characteristics, recovery procedures, and safety considerations needed to prepare manufacturer-authorized flight crewmembers to safely perform postmaintenance stall test flights in Hawker 750, 800, 800XP, 850XP, and 900XP airplanes.

We selected the subject airplanes for these two safety recommendations based on our investigative findings for the accidents involving airplane models with stall test flight requirements defined by the SRM that applies to Hawker 750, 800, 800XP, 850XP, and 900XP airplanes. However, as stated previously, type certificate A3EU includes 51 unique airplane models. According to the FAA, type certificate A3EU represents about 1,188 airplanes in service worldwide, with the Hawker 750, 800, 800XP, 850XP, and 900XP series airplanes alone comprising about 664 of those airplanes.

As evidenced by the 2006 incident involving the Corporate Jets Limited BAE 125-800A airplane and the previous event involving a Hawker 125-800 airplane (referenced in the 1993 service information leaflet), other airplanes on type certificate A3EU are subject to manufacturer-required postmaintenance stall test flights. We are

[16] For example, Bombardier Aerospace developed such a stall flight operations manual for specified Learjet models.

[17] In 2003, we investigated a fatal accident involving a training flight conducted in a Hawker Siddeley HS-125-700A, N45BP, that occurred in Beaumont, Texas. The flight instructor and the two pilot trainees, who were preparing for their Part 135 proficiency checks, received fatal injuries. The airplane stalled and entered a flat spin after the flight instructor asked a pilot trainee to demonstrate an approach-to-landing stall. See NTSB case DEN03FA155 for more information.

concerned that, due to similarities in wing design, other airplane models may exhibit unacceptable stall behavior during stall test flights.

Thus, the NTSB concludes that, due to similarities in wing design, other airplane models on type certificate A3EU that are subject to manufacturer-required postmaintenance stall test flights have the potential to exhibit unacceptable stall characteristics during such stall test flights.

Therefore, the NTSB recommends that Textron Aviation Inc. review all other airplane models (besides the Hawker 750, 800, 800XP, 850XP, and 900XP) listed on type certificate A3EU, and, for each model that is subject to postmaintenance stall test flights, define stall test flight pilot training and experience qualification criteria and develop a stall test plan, as specified in Safety Recommendations A-26-1 and -2.

Manual Inconsistencies

As stated previously, during our ongoing investigation of the 2025 Hawker 800XP accident, we identified that, although the applicable SRM refers the operator to the AFM (specifically, Section 4.10) for the applicable stall test plan procedure and technique, the information actually exists in the POM for the airplane. For 900XP airplanes, the SRM refers the operator to the POM (specifically, Section V).

Although our review of these manuals is ongoing, we note that the stall test-related language in the Hawker 800XP POM appears to be based on Hawker 800XP Temporary Revision (TR) No. 28, which the FAA approved on August 11, 2005. The purpose of TR 28 (which Raytheon developed after the 2005 uncommanded roll event involving the Raytheon Corporate Jets Hawker 800XP in West Palm Beach, Florida) was to "provide clarification and additional information" concerning stall flight checks.

However, our ongoing investigation has identified that TR 28 contained both unclear and inaccurate instructions for incorporating the information. For example, TR 28 did not specify which publication or serial numbers to which it applied. The investigation identified that, for the Hawker 800XP, the manual location TR 28 referenced, "Section 4.10, Normal Procedures, between pages 8 and 9," exists in the AFM, but the AFM contains a different TR (related to after-takeoff checks) in that location. Further, all the other information in that section of the AFM is in checklist format, and the information provided by TR 28 is inconsistent with that format.

Also, although TR 28 specified that "the stall information should be placed in the 'Handling' section" to replace "the existing procedure," we identified that the AFM has no Handling section or an existing stall procedure in Section 4.10. Based on our ongoing investigation, we identified that the stall language from TR 28 appears to have been incorporated instead into the Hawker 800XP POM in "Section V, Normal Handling." We note that the incorporated language also includes a reference to an

unacceptable "aileron snatch" behavior but does not define it or provide detailed recovery procedures.[18]

We also identified that the AFMs for the Hawker 750, 800, 800XP, 850XP, and 900XP airplanes are FAA-approved manuals. Although the POMs for these airplanes do not indicate whether they are FAA-approved or FAA-accepted, each states that it is "incomplete without the current FAA-approved AFM." We are aware that, for any inconsistencies between manuals, the FAA-approved AFM is the governing document.

Although our investigative review of these manuals is ongoing, we are concerned that, since the purpose of the postmaintenance stall test flight is to assess the possibility of unacceptable stall characteristics (that is, airplane behavior that is not in accordance with its type design standards for airworthiness), the inclusion of "stall test flight" among the POM and AFM references may be inappropriate. For example, according to industry guidance, "functional check flights are not certification test flights. There should never be a situation where an airplane is flown…to meet certification performance specifications."[19]

Based on the inconsistencies we identified across the applicable Hawker SRM, POM, AFM, and TR publications, the NTSB is concerned about the adequacy of the FAA's review and approval of previous manual revisions related to stall test flights. Thus, the NTSB concludes that the FAA's review and approval of the stall test flight information referenced in the SRM applicable to Hawker 750, 800, 800XP, 850XP, and 900XP airplanes and the TR 28 document were inadequate because they did not ensure it provided clear and accurate instructions for incorporating the information into the appropriate airplane manual or document.

Therefore, the NTSB recommends that the FAA require Textron Aviation Inc. to complete the actions specified in Safety Recommendations A-26-1 through -3, and ensure that the information is accurate and correctly incorporated into the appropriate FAA-approved manual or document for each airplane.

Further, although we continue to investigate the appropriateness of including stall test references in the POM and AFM, we recognize the value of providing information about adverse stall behavior and recovery procedures in these manuals. We believe this information is needed because some conditions, such as wing component condition defects or wing ice accretion, can be encountered during

[18] The caution statement in the POM references the possibility that "aileron snatch" may occur and "may be strong enough to affect recovery using aileron input," but it does not define the behavior or provide recovery information beyond stating that the elevator control must be moved forward to allow the return of normal aileron control. According to the SRM, aileron snatch behavior is indicative of a defect in the wing leading edge in front of the aileron.

[19] Flight Safety Foundation, "Functional Check Flight Compendium," 20.

normal operations and result in the airplane's stall identification and warning system not activating in time to alert the flight crew of an imminent stall or to prevent a stall from occurring.

For example, wing surface defects, such as bending deformation of some vortex generators reported for the two stall test flight events, could result from improper ground handling or other damaging contact and may be imperceptible to the flight crew during preflight inspection. Similarly, as evidenced in the 2006 Corporate Jets Limited BAE 125-800A incident near Lincoln, Nebraska, the airplane accumulated frost near the wing root in an area where the flight crew could not see it. Although a mechanic on board informed them about the frost, they chose to perform the stall test flight anyway, suggesting that they did not understand the seriousness of such contamination.

We are also concerned that, since operational flight crews should never experience an actual stall (due to stick shaker and stick pusher activation), they may be unprepared to respond to an inadvertent encounter with a stall, particularly one that exhibits adverse roll or other behavior.

Thus, the NTSB concludes that the flight crews of certain Hawker airplanes may not fully understand that the wing is sensitive to surface anomalies, such as visually imperceptible wing component defects or light ice accretion, that can result in a stall before stick shaker and stick pusher activation, and they may be unprepared to recover the airplane from an inadvertent encounter with a stall and adverse stall behavior.

Therefore, the NTSB recommends that Textron Aviation Inc. review the POM and AFM for the airplanes on type certificate A3EU and revise them, as necessary, to provide a description of the adverse effects of certain wing surface anomalies, such as visually imperceptible defects or light ice accretion, on the airplane's stall behavior, including:

- the possibility of stall before stick shaker or stick pusher activation;
- a description of unacceptable stall characteristics; and
- procedures for recovering the airplane from an inadvertent encounter with a stall and adverse stall behavior.

Interim Safety Considerations for Owners, Operators, and Pilots

The NTSB recognizes that, although the actions to establish manufacturer-authorized pilot training and qualification criteria and develop stall flight test plans can be completed in a timely manner, postmaintenance stall test flights continue to occur now. We believe that increasing owner, operator, and pilot

awareness of the circumstances of these accidents can help mitigate the risk of accidents.

We are aware that Textron Aviation Inc., as the holder of type certificate A3EU, has the ability to issue communications to the owners and operators of these airplanes. Further, the NBAA, an aviation industry group whose membership includes owners, operators, and pilots of these types of airplanes, can quickly and effectively disseminate information to its members and the public to increase awareness of this safety issue.

Thus, the NTSB concludes that owners, operators, and pilots of certain Hawker airplanes subject to manufacturer-required postmaintenance stall test flights may not be aware of the severity of unacceptable stall behavior that flight crews may encounter and that the flight crew training and experience needed to safely recover airplane control exceeds that which is typically provided to operational line pilots.

Therefore, the NTSB recommends that Textron Aviation Inc. inform owners and operators of the airplane models on type certificate A3EU that are subject to postmaintenance stall flight tests of the circumstances of these accidents to increase their awareness of the possibility of unacceptable stall behavior, such as an uncommanded roll through 360° and entry into a spin, and that the flight crew training and experience needed to ensure the safety of these flights exceeds that which is typically provided to operational line pilots.

Additionally, the NTSB recommends that the NBAA inform its members about the recent accidents that occurred during postmaintenance stall flight tests required for certain Hawker airplanes, including the Hawker 750, 800, 800XP, 850XP, 900XP, and others on type certificate A3EU, to increase owner, operator, and pilot awareness that unacceptable stall behavior may occur and that the flight crew training and experience needed to ensure the safety of these flights exceeds that which is typically provided to operational line pilots.

Conclusions

Findings

1. Although the flight crew of the accident Hawker 900XP airplane was properly trained and qualified for normal operations, their remedial actions during the postmaintenance stall test flight suggest that their training, experience, and the procedures available in the applicable airplane manual were inadequate to prepare them to safely respond to the adverse stall behavior they encountered.
2. Due to similarities in wing design, other airplane models on type certificate A3EU that are subject to manufacturer-required postmaintenance stall test flights have the potential to exhibit unacceptable stall characteristics during such stall test flights.
3. The Federal Aviation Administration's review and approval of the stall test flight information referenced in the structural repair manual applicable to Hawker 750, 800, 800XP, 850XP, and 900XP airplanes and the Temporary Revision No. 28 document were inadequate because they did not ensure it provided clear and accurate instructions for incorporating the information into the appropriate airplane manual or document.
4. The flight crews of certain Hawker airplanes may not fully understand that the wing is sensitive to surface anomalies, such as visually imperceptible wing component defects or light ice accretion, that can result in a stall before stick shaker and stick pusher activation, and they may be unprepared to recover the airplane from an inadvertent encounter with a stall and adverse stall behavior.
5. Owners, operators, and pilots of certain Hawker airplanes subject to manufacturer-required postmaintenance stall test flights may not be aware of the severity of unacceptable stall behavior that flight crews may encounter and that the flight crew training and experience needed to safely recover airplane control exceeds that which is typically provided to operational line pilots.

Recommendations

As a result of our investigations, the National Transportation Safety Board makes the following new urgent safety recommendations.

To Textron Aviation Inc.:

Define manufacturer-authorized pilot training and experience qualification criteria for pilots who perform postmaintenance stall test flights in Hawker 700, 800, 800XP, 850XP, and 900XP airplanes to ensure that they are prepared with the competencies needed to safely respond to an encounter with unacceptable stall characteristics. (A-26-1) (Urgent)

Develop a stall test plan that describes unacceptable stall characteristics, recovery procedures, and safety considerations needed to prepare manufacturer-authorized flight crewmembers to safely perform postmaintenance stall test flights in Hawker 750, 800, 800XP, 850XP, and 900XP airplanes. (A-26-2) (Urgent)

Review all other airplane models (besides the Hawker 750, 800, 800XP, 850XP, and 900XP) listed on type certificate A3EU, and, for each model that is subject to postmaintenance stall test flights, define stall test flight pilot training and experience qualification criteria and develop a stall test plan, as specified in Safety Recommendations A-26-1 and -2. (A-26-3) (Urgent)

Review the Pilot's Operating Manual and Airplane Flight Manual for the airplanes on type certificate A3EU and revise them, as necessary, to provide a description of the adverse effects of certain wing surface anomalies, such as visually imperceptible defects or light ice accretion, on the airplane's stall behavior, including:

- the possibility of stall before stick shaker or stick pusher activation;
- a description of unacceptable stall characteristics; and
- procedures for recovering the airplane from an inadvertent encounter with a stall and adverse stall behavior. (A-26-4) (Urgent)

Inform owners and operators of the airplane models on type certificate A3EU that are subject to postmaintenance stall flight tests of the circumstances of these accidents to increase their awareness of the possibility of unacceptable stall behavior, such as an uncommanded roll through 360° and entry into a spin, and that the flight crew training and experience needed to ensure the safety of these flights exceeds that which is typically provided to operational line pilots. (A-26-5) (Urgent)

To the Federal Aviation Administration:

Require Textron Aviation Inc. to complete the actions specified in Safety Recommendations A-26-1 through -3, and ensure that the information is accurate and correctly incorporated into the appropriate Federal Aviation Administration-approved manual or document for each airplane. (A-26-6) (Urgent)

To the National Business Aviation Association:

Inform your members about the recent accidents that occurred during postmaintenance stall flight tests required for certain Hawker airplanes, including the Hawker 750, 800, 800XP, 850XP, 900XP, and others on type certificate A3EU, to increase owner, operator, and pilot awareness that unacceptable stall behavior may occur and that the flight crew training and experience needed to ensure the safety of these flights exceeds that which is typically provided to operational line pilots. (A-26-7) (Urgent)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

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Report Date: January 2, 2026

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