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Flight Standardization Board (FSB) Report

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Manufacturer
Gulfstream Aerospace Corporation

Type Certificate Data Sheet (TCDS)	TCDS Identifier	Marketing Name	Pilot Type Rating
T00015AT	GVI	Gulfstream G650/650ER	GVI

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RECORD OF REVISIONS

Revision Number	Section(s)	Page(s)	Date
Original	All	All	08/29/2012
1	Cover Page, Table of Contents, Record of Revisions, Highlights of Change, 1.3, 1.7, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 4.1, 5.11, 5.5.1, 5.5.2, 6.2, 13.3, Appendix 1	5 thru 13, 15	07/16/2013
2	Cover Page, Table of Contents, Record of Revisions, Highlights of Change, 1.7, 5.2.4, 13.4, Appendix 6	5, 7, 11, 59, 60	07/16/2014
3	Cover Page, Table of Contents, Record of Revisions, Highlights of Change, 5.6, 13.5	9, 11	10/17/2014
4	Cover Page, Table of Contents, Record of Revisions, Highlights of Change, 1.1, 5.5.1, 6.2, 13.6, Appendices 1 and 2, Appendices 4 thru 6	4, 8, 9, 11 thru 15, 17 thru 19, 21, 22, 24 thru 29, 55, 58 thru 60	10/19/2015
5	Cover Page, Table of Contents, Record of Revisions, Highlights of Change, 5.2.4, 5.5.1, 5.5.2, Appendix 7	7 thru 9, 68	12/28/2016
6	Cover Page, Table of Contents, Record of Revisions, Highlights of Change, Appendix 3, Appendix 5	1, 2, 8, 12, 37, 40	01/24/2018
7	Cover Page, Table of Contents, Record of Revisions, Highlights of Change, 1.1, 1.7, 5.5.1, 5.5.2, 6.2, Appendices 4 thru 9	1 thru 7, 9 thru 12, 18, 19, 55, 56, 58 thru 65	02/21/2019

HIGHLIGHTS OF CHANGE

Revision 7:

Page 2: Updated Table of Contents page numbers and changed EVS to Enhanced Flight Vision System (EFVS) Operations.

Page 4: Added part 61 to the list of 14 CFR parts in section 1.1.

Pages 5 through 7: Added new acronyms and removed unused acronyms.

Page 10: In section 5.5.1, changed wording in zero flap landing paragraph.

Page 10: In Aerodynamics section, changed wording from with a single engine to with one-engine inoperative. Section 5.5.1, changed EVS to EFVS.

Page 11: Section 5.5.2, changed wording in zero flap landing paragraph. Changed EVS to EFVS.

Page 11: In Aerodynamics section, changed wording from with a single engine to with one-engine inoperative. Changed EVS to EFVS.

Page 12: Updated URL in section 6.2. Changed EVS to EFVS.

Page 18: Changed bullet to an asterisk.

Page 56: Changed wording in last sentence of first paragraph to “4 hours of flying in the left seat utilizing the HUD.”

Page 58: Updated Appendix 6, Enhanced Flight Vision System (EFVS) Operations.

Page 59: Added footnote to (RNP) to connect with footnote 3 on page 59.

Page 62: Added Appendix 9, documented FSB training/checking/currency requirements for steep approach landing operations (ASC 101).

1. PURPOSE AND APPLICABILITY

1.1. This report specifies master training, checking, and currency requirements applicable to crews operating GVI aircraft under Title 14 of the Code of Federal Regulations (14 CFR) parts 61, 91, 125, and 135. Provisions of this report:

- a) Identify the pilot “type rating” assigned to the GVI,
- b) Describe any unique requirement applicable to initial, differences, or recurrent training,
- c) Describe “Master Differences Requirements (MDR)” for flightcrews requiring differences qualification for mixed fleet flying or differences, if applicable,
- d) Provide examples of “Operator Differences Requirements (ODR)” tables, if applicable,
- e) Describe acceptable training program and training device characteristics when necessary to establish compliance with applicable MDRs,
- f) Identify checking and currency standards to be applied by the Federal Aviation Administration (FAA) or operators, and
- g) Provide a listing of regulatory compliance status (compliance checklist) for parts 91, 125, and 135, advisory circulars (AC), and other operationally related criteria.

1.2. This report addresses GVI aircraft as specified in FAA Type Certificate Data Sheet (TCDS) # T00015AT.

1.3. The provisions of this Flight Standardization Board (FSB) report are effective until amended, superseded, or withdrawn by subsequent revisions to this report.

1.4. Determinations made in this report are based on the evaluations of a GVI aircraft equipped in a given configuration and in accordance with current regulations and guidance. Modifications and differences made to the model described herein, or introduction of new related aircraft, may require amendment of the findings in this report. The FSB reserves responsibility/authority to re-evaluate and modify sections of this report based on new or revised AC material or revisions to parts 91, 125, and 135, aircraft Operating Experience (OE), or the testing of new or modified aircraft under the provisions of the current edition of AC 120-53, Guidance for Conducting and Use of Flight Standardization Board Evaluations.

1.5. Terminology. The term “must” is used in this FSB report and certain MDR footnotes even though it is recognized that this report provides one acceptable means, but not necessarily the only means, of compliance with parts 91, 125, and 135 requirements. This terminology acknowledges the need for operators to fully comply with this FSB report and MDR and ODR provisions, if applicable, if AC 120-53 is to be used by the operator as the means of complying with parts 91, 125, and 135 requirements.

1.6. This report includes:

- a) Minimum training, checking, and currency requirements for FAA field offices to use for approving operator programs (e.g., MDRs, type rating designations),
- b) General advisory information which may be approved for that operator (e.g., MDR footnotes, ODR tables), and
- c) Information which is used to facilitate FAA review of an aircraft type or related aircraft that is proposed for use by an operator (e.g., compliance checklist).

1.7. Relevant acronyms are defined as follows:

14 CFR	Title 14 of the Code of Federal Regulations
AC	Advisory Circular
ACFT	Aircraft
ADS	Air Data System
ADS-B	Automatic Dependent Surveillance-Broadcast
AEO	All Engines Operative
AFM	Airplane Flight Manual
AFMS	Airplane Flight Manual Supplement
AOA	Angle of Attack
AP	Autopilot
ASC	Aircraft Service Change
AT	Autothrottle
ATN	Aeronautical Telecommunications Network
AV	Audiovisual Presentation
BAAV	Bleed Air Augmentation Valve
CAS	Crew Alert System
CBT	Computer-Based Training
CPCS	Cabin Pressure Control System
CPDLC	Controller-Pilot Data Link Communication

CPT	Cockpit Procedures Trainers
DME	Distance Measuring Equipment
EBHA	Electric Backup Hydraulic Actuator
EFB	Electronic Flight Bag
EFIS	Electronic Flight Instrument System
EFVS	Enhanced Flight Vision System
EGLC	London City Airport
EGPWS	Enhanced Ground Proximity Warning System
EICAS	Engine Indicating and Crew Alerting System
ETP	Equal Time Point
EVAS	Emergency Vision Assurance System
EVS	Enhanced Vision System
FAA	Federal Aviation Administration
FANS	Future Air Navigation System
FCC	Flight Control Computer
FD	Flight Director
FFS	Full Flight Simulator
FMS	Flight Management System
FPA	Flight Path Angle
FSB	Flight Standardization Board
FTD	Flight Training Device
GPS	Global Positioning Satellite
HO	Handout
HSI	Horizontal Situation Indicator
HUD	Head-Up Display
IAP	Instrument Approach Procedure
ICBI	Interactive Computer-Based Instruction
ILS	Instrument Landing System
IRS	Inertial Reference System
LNAV	Lateral Navigation
LPV	Localizer Performance with Vertical Guidance
MDR	Master Differences Requirements
M _{MO}	Maximum Operating Mach Number
MTOW	Maximum Takeoff Weight
NIM	Noise Information Manual
NWS	Nose Wheel Steering
ODR	Operator Differences Requirements
OE	Operating Experience
OEI	One-Engine Inoperative
Part 91K	Part 91 Subpart K
PF	Pilot Flying
PFD	Primary Flight Display
PIC	Pilot in Command
PLI	Pitch Limit Indicator
PM	Pilot Monitoring
PNR	Point of no Return

POI	Principal Operations Inspector
PTS	Practical Test Standards
PTT	Part Task Trainers
QRH	Quick Reference Handbook
RA	Resolution Advisory
RAAS	Runway Awareness Advisory System
RAT	Ram Air Turbine
RNAV	Area Navigation
RNP AR	Required Navigation Performance Authorization Required
RNP	Required Navigation Performance
RTO	Rejected Takeoff
SFD	Standby Flight Display
SIC	Second in Command
SMC	Standby Multifunction Controller
SU	Stand-Up Instruction
TCAS	Traffic Alert and Collision Avoidance System
TCBI	Tutorial Computer-Based Instruction
TCDS	Type Certificate Data Sheet
TOLD	Takeoff and Landing Data
UPS	Uninterruptible Power Supply
V ₂	Takeoff Safety Speed
VMC	Visual Meteorological Conditions
V _{MO}	Maximum Operating Speed

2. PILOT TYPE RATING REQUIREMENTS

- 2.1.** In accordance with the provisions of part 61, FAA Order 8900.1, Flight Standards Information Management System, and AC 120-53, a new pilot type rating is assigned to the GVI aircraft and is designated “GVI”.
- 2.2.** Gulfstream Aerospace recognized that the GVI (G650) has many similar or identical systems to related Gulfstream aircraft: the GV-SP (G550/G500) and the GIV-X (G450/G350). Because of this, they asked the FSB to evaluate a “full” GVI (G650) initial training course, which is designed for a pilot with no previous Gulfstream experience, and a “shortened” GVI (G650) initial training course.
- 2.3.** Enrollment in the GVI “shortened” initial training course is contingent upon the pilot meeting specific prerequisite experience requirements. The FSB evaluated both the full and the shortened courses and found that pilots may be enrolled in the shortened GVI initial course who are type rated in the GV-SP (G550/G500) or the GIV-X (G450/G350) and have at least 150 hours in the GV-SP (G550/G500) or the GIV-X (G450/G350) aircraft within the last 24 months.
- 2.4.** The FSB also found that pilots may be enrolled in the shortened GV-SP (G550/G500) or the shortened GIV-X (G450/G350) initial courses who are type rated in the GVI and have at least 150 hours in the GVI aircraft within the last 24 months.

- 2.5. The minimum level of devices used to train pilots in a shortened GVI (G650), GV-SP (G550/G500), or GIV-X (G450/G350) initial course are listed in Section 4, ODR Tables, of this report.
- 2.6. It is important to note that the FSB did not evaluate, and does not allow for, any checking credits, currency credits, landing currency credits, or proving test credits between the GVI (G650) and the GV-SP (G550/G500) or between the GVI (G650) and the GIV-X (G450/G350) aircraft.

3. MASTER DIFFERENCES REQUIREMENTS (MDR)

MDRs for aircraft related to the GVI (the GV-SP (G550/G500) and the GIV-X (G450/G350)) are shown in Appendix 2, Master Differences Requirements (MDR) Table. They are a summary of the ODR tables, which show the highest level of devices required to train pilots in a shortened GVI (G650), GV-SP (G550/G500), or GIV-X (G450/G350) initial course.

4. OPERATOR DIFFERENCES REQUIREMENTS (ODR) TABLES

ODR tables list the differences between related aircraft: the GVI, the GV-SP (G550/G500), and the GIV-X (G450/G350). The sample ODR tables provided in Appendix 3, Operator Differences Requirements (ODR) Tables, were developed by Gulfstream and evaluated/modified by the FSB. They indicate the minimum level of training devices that may be used to instruct a pilot in a shortened GVI (G650), GV-SP (G550/G500), or GIV-X (G450/G350) initial course.

5. FSB SPECIFICATIONS FOR TRAINING

5.1. General.

5.1.1 The provisions of this section apply to programs for airmen who have experience in multi-engine transport turbojet aircraft, Electronic Flight Instrument System (EFIS), and flight management system (FMS). Additional requirements may be appropriate for airmen not having this experience.

5.2. Pilots Initial Training.

5.2.1 GVI ground training is accomplished as specified by part 91, § 91.1101; part 125, §§ 125.287 and 125.296; and part 135, § 135.345.

5.2.2 GVI flight training is accomplished as specified by §§ 91.1103, 125.287, 125.296, and 135.347.

5.2.3 Emergency training is accomplished as specified by §§ 91.1083 and 135.331.

5.2.4 Seat dependent tasks training.

The FSB has found the following seat dependent tasks for the GVI:

- a) Head-Up Display (HUD) (left seat).
- b) Enhanced Vision System (EVS) (left seat).
- c) Passenger oxygen system activation (right seat).
- d) Nose wheel steering (NWS) tiller (left seat).

5.3. Differences Training (§§ 91.1103, 125.287, 125.296, and 135.347).

Reserved.

5.4. Recurrent Training.

5.4.1 Recurrent ground training must include appropriate training in accordance with §§ 91.1107(a), 125.287, 125.296, and 135.351 and areas of emphasis identified in paragraph 5.5.

5.4.2 Recurrent flight training must include appropriate training in accordance with §§ 91.1107(b), 125.287, 125.296, and 135.351 and areas of emphasis identified in paragraph 5.5.

5.5. Areas of Emphasis.

5.5.1 A pilot trainee must receive special emphasis on the following events during ground training:

Flight control modes. This aircraft utilizes fly-by-wire flight controls. It is important to thoroughly understand the operation of the aircraft in each of the flight control modes. This item must be included in initial and recurrent training.

Fan blade out. This aircraft is unique in that the vibrations caused by the loss of an N_1 fan blade increase as the aircraft slows. It is not intuitive, but the pilot will need to speed up to maximum operating Mach number (M_{MO}) or maximum operating speed (V_{MO}) as applicable when the aircraft is vibrating severely due to a fan blade out. This item must be included in initial and recurrent training.

Zero flap landing, including the effects of wing anti-ice. Selecting the wing anti-ice ON changes the flight control logic for angle of attack (AOA) protection, increasing the available AOA and providing a lower approach speed. After main gear touchdown, the nose pitches up significantly and must be positively lowered. This item must be included in initial training.

Emergency descent procedure. The autopilot may disconnect due to AOA protection activation if the speedbrake is rapidly deployed. This item must be included in initial training.

Slow engine response. Engine response to full power requests is slow at high altitudes and during any maneuvers with flaps less than 22 degrees. This item must be included in initial training.

Aerodynamics. This item must be included in initial training.

- Yaw induced roll. The importance of not exceeding the commanded 9-degree fixed pitch attitude during rotation until required to capture takeoff safety speed (V_2) with one-engine inoperative (OEI).
- High induced drag. The risk of getting slow and the associated difficulty in recovering with the thrust available at or near maximum cruise altitude in level flight.

Triple FMS failure. It is possible for all three FMSs to fail temporarily while in the synchronous mode if an internal calculation error occurs. This item must be included in initial training.

HUD systems. See Appendix 5, Head-Up Display (HUD) Systems.

Enhanced flight vision system (EFVS). See Appendix 6, Enhanced Flight Vision System (EFVS) Operations.

NWS failure on landing. NWS may fail upon touchdown as indicated by the amber “Steer by Wire Fail” engine indicating and crew alerting system (EICAS) message. The accompanying aural indication will be inhibited, so the failure may not be readily detected. Tiller steering and rudder pedal controlled NWS will be inoperative. This will require the use of rudder and differential braking to maintain directional control on the runway. This item must be included in initial and recurrent training.

5.5.2 A pilot trainee must receive special emphasis on, and perform the following events during, flight training:

Flight control modes. This aircraft utilizes fly by wire flight controls. It is important to thoroughly understand the operation of the aircraft in each of the flight control modes. This item must be included in initial and recurrent training.

Fan blade out. This aircraft is unique in that the vibrations caused by the loss of an N_1 fan blade increase as the aircraft slows. It is not intuitive to speed up to M_{MO} or V_{MO} (as applicable) when the aircraft is vibrating severely. This item must be included in initial and recurrent training.

Zero flap landing, including the effects of wing anti-ice. Selecting the wing anti-ice ON changes the flight control logic for AOA protection, increasing the available AOA and providing a lower approach speed. After main gear touchdown, the nose pitches up significantly and must be positively lowered. This item must be included in initial and recurrent training.

Emergency descent procedure. The autopilot may disconnect due to AOA protection activation if the speedbrake is rapidly deployed. This item must be included in initial training.

Slow engine response. Engine response to full power requests is slow at high altitudes, during touch-and-go landings, and during any maneuvers with flaps less than 22 degrees. This item must be included in initial training.

Aerodynamics. The importance of not exceeding the commanded 9-degree fixed pitch attitude during rotation until required to capture V_2 with OEI. This item must be included in initial training.

HUD systems. See Appendix 5.

EFVS. See Appendix 6.

NWS failure on landing. Flight training in a simulator should include: 1) prior completion of the Airplane Flight Manual (AFM) Before Landing checklist to inhibit the associated aural warning, and 2) the fault being induced upon nose wheel touchdown with a 28-knot crosswind. NWS should be restored by following the AFM procedure with the aircraft straight ahead on the runway because improper use of differential braking to turn, while taxiing with a free-castering nose wheel, could cause damage if the nose wheel travels beyond its limits. The simulator should be capable of triggering the malfunction automatically upon nose wheel touchdown and allow crews to clear the fault by following the AFM procedure. This item must be in initial and recurrent training.

5.6. Specific Flight Characteristics for Training. (See Section 6.2 for Checking Requirements).

- All items listed in paragraph 5.5.2.
- The first indication of the approach to a stalling AOA is normally the activation of the stick shaker, but under some circumstances the blue “AOA Limiting” Crew Alert System (CAS) message may appear first.

6. FSB SPECIFICATIONS FOR CHECKING

6.1. General.

Checking must be conducted in accordance with part 61, practical test standards (PTS), parts 91 subpart K (part 91K), 125, and 135, as applicable, and specific flight characteristics in paragraph 6.2.

6.2. Specific Flight Characteristics (Reference FAA PTS (FAA-S-8081-5F) available at http://www.faa.gov/training_testing/testing/test_standards/media/atp_pts.pdf).

Landing from a no-flap or nonstandard flap approach. The FSB has determined that the probability of flap extension failure on the GVI is not extremely remote due to system

design. Therefore, demonstration of a no-flap approach and landing during pilot certification or a § 135.293(b) competency check is required. In accordance with FAA Order 8900.1, when the practical test is conducted in an airplane versus a simulator, touchdown from a no-flap approach is not required and must not be attempted. The approach should be flown to the point where the inspector or examiner can determine whether a touchdown at an acceptable point on the runway and a safe landing to a full stop could be made.

The FSB has found the following additional § 135.297 instrument proficiency check requirements:

- a) Precision approach using HUD and EFVS.
- b) Localizer performance with vertical guidance (LPV) approach.

7. FSB SPECIFICATIONS FOR CURRENCY

The FSB has found no additional currency requirements for the GVI other than those already specified in parts 61, 125, and 135.

8. FSB SPECIFICATIONS FOR RECENT EXPERIENCE

The FSB has found no additional “recent experience” requirements for the GVI other than those already specified in parts 61, 125 and 135.

9. AIRCRAFT REGULATORY COMPLIANCE CHECKLIST

Regulatory compliance checklist (see Appendix 4, Aircraft Regulatory Compliance Checklist.)

This list was provided to the FSB by Gulfstream Aerospace to show operational regulatory compliance of the production version GVI (G650). It has not been evaluated by the FSB.

10. FSB SPECIFICATIONS FOR DEVICES AND SIMULATORS

This section is intended to identify specific training or checking devices or simulators that must be used to train or check specific GVI systems, procedures, or maneuvers. The FSB has found no specific systems, procedures, or maneuvers that are unique to the GVI that require a specific device or simulator for training or checking.

11. APPLICATION OF FSB REPORT

11.1. All GVI operators are subject to the provisions of this report. This report becomes effective when given final approval by the FAA.

All training, checking, and currency for the GVI aircraft must be conducted in accordance with all provisions of this report. All training programs must incorporate the latest FAA-approved AFM procedures, AFM checklists, manufacturer's recommendations for training maneuvers, and all provisions of this report.

12. ALTERNATE MEANS OF COMPLIANCE

- 12.1.** Alternate means of compliance to the requirements of this report must be approved by the FSB. If alternate means of compliance is sought, operators must show that the proposed alternate means of compliance provides an equivalent level of safety to the provisions of the current edition of AC 120-53 and this FSB report. Analysis, demonstrations, proof of concept testing, differences documentation, or other evidence may be required.
- 12.2.** Equivalent safety. Significant restrictions may apply in the event alternate means of compliance is sought, and the reporting requirements may be increased to ensure equivalent safety. The FAA will generally not consider relief through alternate means of compliance unless sufficient lead-time has been planned by an operator to allow for any necessary testing and evaluation.
- 12.3.** Interim programs. In the event of clearly unforeseen circumstances in which it is not possible for an operator to comply with provisions of this report, the operator may seek an interim program approval rather than a permanent alternate means of compliance. Financial arrangements, scheduling adjustments, and other such reasons are not considered "unforeseen circumstances" for the purposes of this provision. Interim program approvals must be approved by the FSB Chair.

13. MISCELLANEOUS

- 13.1.** Approach Categories (Reference 14 CFR Part 97, § 97.3). The GVI is considered Category C aircraft for the purposes of determining "straight-in landing weather minima".
- 13.2.** Forward Observer Seat. The GVI forward observer seat is part of the type design. The FSB evaluated it using the criteria in the current edition of FAA AC 120-83, Flight Deck Observer Seat and Associated Equipment, and found that it is operationally suitable for §§ 125.317(b) and 135.75(b).
- 13.3.** Abnormal and emergency procedures. Gulfstream's philosophy is to not identify any steps in the GVI abnormal or emergency procedures as "memory items", yet Gulfstream expects pilots to perform some of the initial and critical steps without reference to any documentation. Gulfstream has advised that the initial, critical pilot responses for the following emergency procedures should be performed promptly without reference to a checklist: rejected takeoff, engine failure/fire after V₁, emergency descent, rapid decompression, autopilot (AP) or autothrottle (AT) uncommanded disconnect, engine exceedance, overspeed, stall protection/stall warning activation, flight control jams, total loss of braking, enhanced ground proximity warning system (EGPWS) alert, windshear

alert, and Traffic Alert and Collision Avoidance System (TCAS) Alert. In addition, pilots are expected to don oxygen masks promptly when appropriate (e.g., when smoke is detected). Operators and training providers should ensure pilots are trained accordingly.

- 13.4.** The PlaneView charts function is FAA-certified as part of the aircraft's type design. It is functionally equivalent to a Class 3 Electronic Flight Bag (EFB) with Type C software applications. The PlaneView enroute charts function does not contain all of the pertinent information for enroute operations (e.g., minimum enroute altitudes), so either paper charts or a Class 1 or Class 2 EFB that is accepted by the FAA and contains enroute charts must be readily available to the flightcrew.
- 13.5.** G650ER. The Gulfstream model GVI with the optional Aircraft Service Change (ASC) 014 installed, which increases the airplane maximum fuel weight capability and thereby increases airplane range, is designated "G650ER". ASC 014 installation increases the maximum ramp weight to 104,000 lb, the maximum takeoff weight (MTOW) to 103,600 lb, and the maximum fuel weight to 48,200 lb. The increased MTOW results in revised noise standards data. The G650ER has an independent AFM, quick reference handbook (QRH), and performance handbook. The G650 and G650ER are assigned the same pilot type rating: "GVI". Pilots transitioning between the G650 and G650ER should accomplish Level A differences training, which can be accomplished through self-instruction by becoming familiar with the aircraft weight and fuel capacity limitations and the aircraft effective perceived noise level data. There are no checking or currency requirements for transitioning between the G650 and G650ER.
- 13.6.** Flight control computer (FCC) version 6.2 software is installed with ASC 037 or as part of the production configuration. There are minor procedural changes associated with the version 6.2 software. Pilots transitioning to the FCC version 6.2 software should be trained on the differences using Level A training, which can be accomplished through self-instruction by reviewing the changes incorporated in G650 AFM Revision 10 or G650ER AFM Revision 1 and the Gulfstream Operating Manual Supplement describing the operationally significant changes. There are no checking or currency requirements for this transition.
- 13.7.** An automatic braking system ("autobrakes") can be installed with an optional ASC 055 or as part of the production configuration. The autobrakes installation includes a rotary-style mode selector switch mounted on the inertial reference system (IRS) selector panel in the flight deck center pedestal, modified brake control unit software, and a second outboard brakes hydraulic pressure accumulator. The autobrakes mode selector switch provides a rejected takeoff (RTO) position for takeoff, and LOW, MED, and HIGH settings for landing. The switch is spring-loaded to the OFF position. The LOW and MED landing modes use wheel speed and provide a defined deceleration after nose wheel touchdown. The HIGH landing mode provides maximum antiskid braking after nose wheel touchdown. The RTO mode provides maximum antiskid braking at wheel speeds greater than 80 knots and reduced brake pressure at wheel speeds between 60 and 80 knots. CAS messages are provided to inform the crew of the autobrakes operational status and failure conditions. Landing performance data when using autobrakes is provided in the associated AFM Supplement (AFMS) and in the FMS takeoff and landing data (TOLD) with the PlaneView

If avionics software version “Block 2” upgrade (ASC 902) installed. RTO accelerate-stop distances using the autobrake system RTO setting are equivalent to or less than those distances with maximum manual braking; therefore, the original takeoff performance data in the AFM is applicable. Pilots transitioning to a GVI (G650, G650ER) with autobrakes installed should accomplish Level E differences training, which can only be satisfied by the use of either a full flight simulator (FFS) qualified at Level C or D or an aircraft. There are no checking or currency requirements for transitioning to an airplane with autobrakes installed.

APPENDIX 1. DIFFERENCES LEGEND

Training Differences Legend

Differences Level	Type	Training Method Examples	Conditions
A	Self-Instruction	<ul style="list-style-type: none"> • Operating manual revision (HO) • Flightcrew operating bulletin (HO) 	<ul style="list-style-type: none"> • Crew has already demonstrated understanding on base aircraft (e.g., updated version of engine). • Minor or no procedural changes required. • No safety impact if information is not reviewed or is forgotten (e.g., different engine vibration damping mount). • Once called to attention of crew, the difference is self-evident.
B	Aided Instruction	<ul style="list-style-type: none"> • Audiovisual presentation (AV) • Tutorial computer-based instruction (TCBI) • Stand-up instruction (SU) 	<ul style="list-style-type: none"> • Systems are functionally similar. • Crew understanding required. • Issues need emphasis. • Standard methods of presentation required.
C	Systems Devices	<ul style="list-style-type: none"> • Interactive (full-task) computer-based instruction (ICBI) • Cockpit Procedures Trainers (CPT) • Part task trainers (PTT) • Level 4 or 5 flight training device (FTD 4–5) 	<ul style="list-style-type: none"> • Training can only be accomplished through systems training devices. • Training objectives focus on mastering individual systems, procedures, or tasks versus highly integrated flight operations or “real-time” operations. • Training devices are required to assure attainment or retention of crew skills to accomplish more complex tasks usually related to aircraft systems.
D	Maneuvers Devices	<ul style="list-style-type: none"> • Level 6 or 7 flight training device (FTD 6–7) • Level A or B full flight simulator (FFS A–B) 	<ul style="list-style-type: none"> • Training can only be accomplished in flight maneuver devices in a real-time environment. • Training requires mastery of interrelated skills versus individual skills. • Motion, visual, control loading, and specific environmental conditions may be required.
E	Level C/D FFS or Aircraft	<ul style="list-style-type: none"> • Level C or D full flight simulator (FFS C–D) • Aircraft (ACFT) 	<ul style="list-style-type: none"> • Motion, visual, control loading, audio, and specific environmental conditions are required. • Significant full task differences that require a high fidelity environment. • Usually correlates with significant differences in handling qualities.

Checking Differences Legend

Differences Level	Checking Method Examples	Conditions
A	None	None
B	<ul style="list-style-type: none"> • Oral or written exam • Tutorial computer-based instruction self-test (TCBI) 	<ul style="list-style-type: none"> • Individual systems or related groups of systems.
C	<ul style="list-style-type: none"> • Interactive (full-task) computer-based instruction (ICBI) • Cockpit Procedures Trainers (CPT) • Part task trainers (PTT) • Level 4 or 5 flight training device (FTD 4–5) 	<ul style="list-style-type: none"> • Checking can only be accomplished using systems devices. • Checking objectives focus on mastering individual systems, procedures, or tasks.
D	<ul style="list-style-type: none"> • Level 6 or 7 flight training device (FTD 6–7) • Level A or B full flight simulator (FFS A–B) 	<ul style="list-style-type: none"> • Checking can only be accomplished in flight maneuver devices in a real-time environment. • Checking requires mastery of interrelated skills versus individual skills. • Motion, visual, control loading, and specific environmental conditions may be required.
E	<ul style="list-style-type: none"> • Level C or D full flight simulator (FFS C–D) • Aircraft (ACFT) 	<ul style="list-style-type: none"> • Significant full task differences that require a high fidelity environment.

APPENDIX 2. MASTER DIFFERENCES REQUIREMENTS (MDR) TABLE

Highest Levels of Training Devices Required

Related Aircraft ↓	Base Aircraft →	GVI (G650)	GV-SP (G550/G500)	GIV-X (G450/G350)
GVI (G650)		N/A	E *	E *
GV-SP (G550/G500)		D	N/A	N/A
GIV-X (G450/G350)		D	N/A	N/A

* Level E differences are based on only one item: autobrakes. This is in accordance with FAA Advisory Circular (AC) 120-53B, Guidance for Conducting and Use of Flight Standardization Board Evaluations, dated 11/05/2013, Appendix 2, paragraph 4.b.(9)c.(4)(c).

APPENDIX 3. SAMPLE OPERATOR DIFFERENCES REQUIREMENTS (ODR) TABLES

Definitions	ODR Training Level
“HO” = Handout	A
“ST” = Slide/tape presentations “TCBI” = <u>Tutorial</u> computer-based instruction “SU” = Stand-up instructors “VT” = Video tapes	B
“ICBI” = <u>Interactive</u> computer-based instruction “CSS” = Cockpit system simulators “CPT” = Cockpit procedures trainers “PTT” = Part task trainers “FTD 2-5” = Flight training devices (Level 2-5)	C
“FTD 6-7” = Flight training devices (Level 6-7) “SIM A-B” = Simulators (Level A or B)	D
“SIM C-D” = Simulators (Level C or D) “ACFT” = Aircraft	E
NOTES: An “X” in an ODR table column indicates that any of the training methods listed for that level are acceptable. If a specific instruction method is specified in an ODR table column, it must be used.	

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GIV-X APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Weights	Max Takeoff Weight increased 25,000 lb	No	No	X				
	Airplane Configuration	Body Extension increased 126 in	No	No	X				
	Airplane Configuration	Wing Tip increased 273 in	No	No	X				
	Overhead Panel Layout	RAT Test Switch installed	No	Minor		X			
	Overhead Panel Layout	EBHA Battery Switch installed	No	Minor		X			
	Overhead Panel Layout	UPS Battery Switch installed	No	Minor		X			
	Overhead Panel Layout	Continuous Ignition switches combined into single switch and relocated to Overhead Panel	No	Minor	X				
	Overhead Panel Layout	Four ADS Probe Heat Switches installed	No	Minor		X			
	Overhead Panel Layout	Two Landing Gear Dump Switches installed	No	Minor		X			
	Instrument Panel Layout	Standby Flight Instruments located in each SMC	No	Minor			X		

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GIV-X APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Pedestal Panel Layout	RAT Handle installed	No	Minor		X			
	Pedestal Panel Layout	Different Parking Brake Handle	No	Minor	X				
	Pedestal Panel Layout	RAAS Inhibit Switch installed	No	Minor			X		
	Pedestal Panel Layout	FLT CTRL RESET Switch installed	No	Minor			X		
	Pedestal Panel Layout	Electric FCS Trim Panel installed	No	Minor			X		
	Pedestal Panel Layout	No Emergency STAB switch	No	Minor		X			
	Pedestal Panel Layout	No Alternate Flap switch	No	Minor		X			
	Pedestal Panel Layout	No Lateral Control switch	No	Minor		X			
	Pedestal Panel Layout	No CPCS Panel	No	Minor		X			
	Pedestal Panel Layout	No Weather Radar Panel	No	Minor		X			
	Pedestal Panel Layout	Autobrake switch installed	No	Minor		X			

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GIV-X APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Cockpit Side Panel	Oxygen Mask different model	No	Minor			X		
	Cockpit Side Panel	Pilot and copilot 60 Hz Outlet installed	No	Minor	X				
	Cockpit Side Panel	EVAS installed	No	Minor			X		
	Cockpit Side Panel	Security System installed	No	Minor	X				
	Limitations	Max Takeoff Weight increased from 74,600 lb to 99,600 lb	No	No	X				
	Limitations	Max Landing Weight increased from 66,000 lb to 83,500 lb	No	No	X				
	Limitations	Fuel quantity increased from 29,500 lb to 44,200 lb	No	No	X				
	Limitations	Maximum Operating Altitude 51,000 vs. 45,000 ft	No	No	X				
	Limitations	M _{MO} 0.925 vs. 0.880	No	No	X				
	Limitations	Different fuel imbalance values	No	No	X				

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GIV-X APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Limitations	APU and Engine limitations differences	No	No	X				

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GIV-X APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 21 Air Conditioning	CPCS Semi Mode on SMC	No	Minor			X		
	ATA 22 Autoflight	Different interface with flight controls	No	Minor			X		
	ATA 23 Communications	Minor differences in radio functions	No	Minor		X			
	ATA 25 Equipment/ Furnishings	Different Crew Oxygen Masks	No	Minor		X			
	ATA 25 Equipment/ Furnishings	EVAS installed	No	Minor		X			
	ATA 25 Equipment/ Furnishings	Security System installed	No	Minor		X			
	ATA 26 Fire Protection	Minor differences in Fire Protection plumbing	No	Minor		X			
	ATA 28 Fuel	Heated Fuel Return System installed	No	Minor		X			
	ATA 28 Fuel	Pressurized Fuel Servicing requires DC Electric Power	No	Minor			X		

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GIV-X APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 28 Fuel	Refueling Panel located on right body fairing and function incorporated into SMC	No	Minor			X		
	ATA 29 Hydraulic Power	Excessive Hydraulic Fluid Temperature does activate the Engine Hot Warning EICAS	No	Minor		X			
	ATA 30 Ice and Rain Protection	Ice Detector system classified primary vs. advisory	No	Minor		X			
	ATA 30 Ice and Rain Protection	Anti-Ice not automatically inhibited below 1,500 ft	No	Minor		X			
	ATA 30 Ice and Rain Protection	Closing Manifold Pressure Shutoff Valve does not block Cowl Anti-Ice	No	Minor		X			
	ATA 31 Indicating/ Recording Systems	Different Locations	No	Minor		X			

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GIV-X APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 32 Landing Gear	Autobrakes installed	No	Minor			X		
	ATA 33 Lights	Different locations	No	Minor		X			
	ATA 34 Navigation	SMC installed	No	Major				X	
	ATA 34 Navigation	No Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EBDI) combined into Standby Flight Instrument located in each SMC	No	Minor				X	
	ATA 34 Navigation	Weather Radar Control Panel located in SMC	No	Minor		X			
	ATA 34 Navigation	Predictive Windshear available	No	Signif.				X	
	ATA 34 Navigation	Head-Up Display (HUD) Systems	No	No		X			
	ATA 35 Oxygen	Different style mask and goggles	No	Minor			X		
	ATA 36 Pneumatic	Different bleed pressure values	No	Minor	X				

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GIV-X APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 49 Airborne Auxiliary Power	Different APUs installed both supplied by Honeywell	No	Minor		X			
	Limitations	Max Takeoff Weight increased from 74,600 lb to 99,600 lb	No	No	X				
	Limitations	Max Landing Weight increased from 66,000 lb to 83,500 lb	No	No	X				
	Limitations	Fuel quantity increased from 29,500 lb vs. 44,200 lb	No	No	X				
	Limitations	Maximum Operating Altitude is 51,000 vs. 45,000 ft	No	No	X				
	Limitations	M _{MO} 0.925 vs. 0.880	No	No	X				
	Limitations	Fuel Imbalance different values	No	No	X				
	Limitations	APU and Engine limitations differences	No	No		X			

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GIV-X APPROVED BY (POI)_____	MANUEVER	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Takeoff and Landing	Autobrake installed	No	Minor					X

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GV-SP APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Weights	Max Takeoff Weight 91,000 lb increased 8,600 lb	No	No	X				
	Airplane Configuration	Body Extension increased 39 in	No	No	X				
	Airplane Configuration	Wing Tip increased 73 in	No	No	X				
	Overhead Panel Layout	RAT Test Switch installed	No	Minor		X			
	Overhead Panel Layout	EBHA Battery Switch installed	No	Minor		X			
	Overhead Panel Layout	UPS Battery Switch installed	No	Minor		X			
	Overhead Panel Layout	Continuous Ignition Switches combined into single switch and relocated to Overhead Panel	No	Minor		X			
	Overhead Panel Layout	Four ADS Probe Heat Switches installed	No	Minor		X			
	Overhead Panel Layout	Two Landing Gear Dump Switches installed	No	Minor		X			

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GV-SP APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Instrument Panel Layout	Standby Flight Instruments located in each SMC	No	Minor			X		
	Pedestal Panel Layout	RAT Handle installed	No	Minor		X			
	Pedestal Panel Layout	Different Parking Brake Handle	No	Minor	X				
	Pedestal Panel Layout	RAAS Inhibit Switch installed	No	Minor	X				
	Pedestal Panel Layout	FLT CTRL RESET Switch installed	No	Minor			X		
	Pedestal Panel Layout	Electric FCS Trim Panel installed	No	Minor			X		
	Pedestal Panel Layout	No Emergency Stab Switch	No	Minor		X			
	Pedestal Panel Layout	No Spoiler Control Switch	No	Minor		X			
	Pedestal Panel Layout	No CPCS Panel	No	Minor		X			
	Pedestal Panel Layout	No Weather Radar Panel	No	Minor		X			
	Pedestal Panel Layout	Autobrake switch installed	No	Minor		X			

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GV-SP APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Cockpit Side Panel	Oxygen Mask different model	No	Minor			X		
	Cockpit Side Panel	Pilot and copilot 60 Hz Outlets installed	No	Minor	X				
	Cockpit Side Panel	EVAS installed	No	Minor			X		
	Cockpit Side Panel	Security System installed	No	Minor		X			
	Limitations	Max Takeoff Weight increased from 91,000 lb to 99,600 lb	No	No	X				
	Limitations	Max Landing Weight increased from 75,300 lb to 83,500 lb	No	No	X				
	Limitations	Fuel quantity increased from 41,300 lb to 44,200 lb	No	No	X				
	Limitations	M _{MO} 0.925 vs. 0.885	No	No	X				
	Limitations	APU and Engine limitations differences	No	No	X				

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GV-SP APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 21 Air Conditioning	CPCS Semi mode on SMC	No	Minor			X		
	ATA 22 Autoflight	Different interface with flight controls	No	Minor		X			
	ATA 23 Communications	Minor differences in radio functions	No	Minor			X		
	ATA 25 Equipment/ Furnishings	Different Crew Oxygen Masks	No	Minor		X			
	ATA 25 Equipment/ Furnishings	EVAS installed	No	Minor		X			
	ATA 25 Equipment/ Furnishings	Security System installed	No	Minor		X			
	ATA 26 Fire Protection	Minor differences in Fire Protection plumbing	No	Minor		X			
	ATA 28 Fuel	Pressurized Fuel Servicing requires DC Electric Power	No	Minor			X		

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GV-SP APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 28 Fuel	Refueling Panel located on right body fairing and function incorporated into SMC	No	Minor			X		
	ATA 30 Ice and Rain Protection	Ice Detector system classified primary vs. advisory	No	Minor		X			
	ATA 30 Ice and Rain Protection	Anti-ice not automatically inhibited below 1,500 ft	No	Minor		X			
	ATA 31 Indicating/ Recording Systems	Different locations	No	Minor		X			
	ATA 32 Landing Gear	Autobrakes installed	No	Minor			X		
	ATA 33 Lights	Different locations	No	Minor		X			
	ATA 34 Navigation	SMC installed	No	Major				X	

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GV-SP APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 34 Navigation	Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EDBI) combined into Standby Flight Instrument located in each SMC	No	Minor				X	
	ATA 34 Navigation	Weather Radar Control Panel located in SMC	No	Minor		X			
	ATA 34 Navigation	Predictive Windshear available	No	Signif.				X	
	ATA 34 Navigation	Head-Up Display (HUD) Systems	No	No		X			
	ATA 35 Oxygen	Different style mask and goggles	No	Minor			X		
	ATA 36 Pneumatic	Different bleed pressure values	No	Minor	X				
	ATA 49 Airborne Auxiliary Power	No BAAV installed	No	Minor		X			
	Limitations	Max Takeoff Weight increased from 91,000 lb to 99,600 lb	No	No	X				

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GV-SP APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Limitations	Max Landing Weight increased from 75,300 lb to 83,500 lb	No	No	X				
	Limitations	Fuel quantity increased from 41,300 lb vs. 44,200 lb	No	No	X				
	Limitations	APU and Engine limitations differences	No	No	X				

DIFFERENCE AIRCRAFT: GVI BASE AIRCRAFT: GV-SP APPROVED BY (POI)_____	MANUEVER	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Takeoff and Landing	Autobrake installed	No	Minor					X

DIFFERENCE AIRCRAFT: GIV-X BASE AIRCRAFT: GVI APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Weights	Max Takeoff Weight decrease of 25,000 lb	No	No	X				
	Airplane Configuration	Body Extension decreased 126 in	No	No	X				
	Airplane Configuration	Wing Tip decreased 273 in	No	No	X				
	Overhead Panel Layout	No RAT Test Switch	No	Minor		X			
	Overhead Panel Layout	No EBHA Battery Switch	No	Minor		X			
	Overhead Panel Layout	No UPS Battery Switch	No	Minor		X			
	Overhead Panel Layout	Continuous Ignition switches located in Throttle Quadrant	No	Minor	X				
	Overhead Panel Layout	ADS Probe Heat Switches only two installed	No	Minor		X			
	Overhead Panel Layout	Single Landing Gear Dump Switch installed	No	Minor		X			

DIFFERENCE AIRCRAFT: GIV-X BASE AIRCRAFT: GVI APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Instrument Panel Layout	Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EDBI) located on Lower Instrument Panel	No	Minor				X	
	Pedestal Panel Layout	No RAT Handle	No	Minor		X			
	Pedestal Panel Layout	Different Parking Brake Handle	No	Minor	X				
	Pedestal Panel Layout	No RAAS Inhibit Switch	No	Minor	X				
	Pedestal Panel Layout	No FLT CTRL RESET Switch	No	Minor			X		
	Pedestal Panel Layout	No Electric FCS Trim Panel	No	Minor			X		
	Pedestal Panel Layout	Emergency STAB switch installed	No	Minor		X			
	Pedestal Panel Layout	Alternate Flap switch installed	No	Minor		X			
	Pedestal Panel Layout	Lateral Control switch installed	No	Minor		X			

DIFFERENCE AIRCRAFT: GIV-X BASE AIRCRAFT: GVI APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Pedestal Panel Layout	CPCS Panel installed	No	Minor		X			
	Pedestal Panel Layout	Weather Radar Panel installed	No	Minor		X			
	Pedestal Panel Layout	Autobrake switch not installed	No	Minor	X				
	Cockpit Side Panel	Oxygen Mask different model	No	Minor			X		
	Cockpit Side Panel	Pilot and copilot 60 Hz Outlet not installed	No	Minor	X				
	Cockpit Side Panel	EVAS not installed	No	Minor	X				
	Cockpit Side Panel	Security System not installed	No	Minor	X				
	Limitations	Max Takeoff Weight decreased from 99,600 lb to 74,600 lb	No	No	X				
	Limitations	Max Landing Weight decreased from 83,500 lb to 66,000 lb	No	No	X				
	Limitations	Fuel quantity decreased from 44,200 lb to 29,500 lb	No	No	X				

DIFFERENCE AIRCRAFT: GIV-X BASE AIRCRAFT: GVI APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Limitations	Maximum Operating Altitude 45,000 vs. 51,000 ft	No	No	X				
	Limitations	M _{MO} 0.880 vs. 0.925	No	No	X				
	Limitations	Different fuel imbalance values	No	No	X				
	Limitations	APU and Engine limitations differences	No	No	X				

DIFFERENCE AIRCRAFT: GIV-X BASE AIRCRAFT: GVI APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 21 Air Conditioning	CPCS Semi Mode on Pressurization Control Panel	No	Minor			X		
	ATA 22 Autoflight	Different interface with flight controls	No	Minor			X		
	ATA 23 Communications	Minor differences in radio functions	No	Minor			X		
	ATA 25 Equipment/ Furnishings	Different Crew Oxygen Masks	No	Minor		X			
	ATA 25 Equipment/ Furnishings	No EVAS installed	No	Minor	X				
	ATA 25 Equipment/ Furnishings	No Security System installed	No	Minor	X				
	ATA 26 Fire Protection	Minor differences in Fire Protection plumbing	No	Minor		X			
	ATA 28 Fuel	Heated Fuel Return System not installed	No	Minor			X		
	ATA 28 Fuel	Fuel Servicing does not require DC Electric Power	No	Minor			X		

DIFFERENCE AIRCRAFT: GIV-X BASE AIRCRAFT: GVI APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 28 Fuel	Refueling Panel located on left cockpit bulkhead	No	Minor			X		
	ATA 29 Hydraulic Power	Excessive Hydraulic Fluid Temperature does not activate the Engine Hot Warning EICAS	No	Minor		X			
	ATA 30 Ice and Rain Protection	Ice Detector system classified advisory vs. primary	No	Minor		X			
	ATA 30 Ice and Rain Protection	Anti-Ice Automatically inhibited below 1,500 ft	No	Minor		X			
	ATA 30 Ice and Rain Protection	Closing Manifold Pressure Shutoff Valve blocks Cowl Anti-Ice	No	Minor		X			
	ATA 31 Indicating/ Recording Systems	Different Locations	No	Minor		X			
	ATA 32 Landing Gear	Autobrake switch not installed	No	Minor	X				

DIFFERENCE AIRCRAFT: GIV-X BASE AIRCRAFT: GVI APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 33 Lights	Different locations	No	Minor		X			
	ATA 34 Navigation	No SMC	No	Major				X	
	ATA 34 Navigation	Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EBDI) on lower Instrument Panel	No	Minor				X	
	ATA 34 Navigation	Weather Radar Control Panel located on Pedestal	No	Minor		X			
	ATA 34 Navigation	No Predictive Windshear	No	Minor		X			
	ATA 34 Navigation	Head-Up Display (HUD) Systems	No	No		X			
	ATA 35 Oxygen	New style mask with attached goggles	No	Minor			X		
	ATA 36 Pneumatic	Different bleed pressure values	No	Minor	X				
	ATA 49 Airborne Auxiliary Power	Different APU installed, both supplied by Honeywell.	No	Minor		X			

DIFFERENCE AIRCRAFT: GIV-X BASE AIRCRAFT: GVI APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Limitations	Max Takeoff Weight decreased from 99,600 lb to 74,600 lb	No	No	X				
	Limitations	Max Landing Weight decreased from 83,500 lb to 66,000 lb	No	No	X				
	Limitations	Fuel quantity decreased from 44,200 lb to. 29,500 lb	No	No	X				
	Limitations	Maximum Operating Altitude 45,000 vs. 51,000 ft	No	No	X				
	Limitations	Maximum Operating Altitude 45,000 vs. 51,000 ft	No	No	X				
	Limitations	M _{MO} 0.880 vs. 0.925	No	No	X				
	Limitations	Fuel Imbalance different values	No	No	X				
	Limitations	APU and Engine limitations differences	No	No	X				

DIFFERENCE AIRCRAFT: GIV-X BASE AIRCRAFT: GVI APPROVED BY (POI)_____	MANUEVER	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Takeoff and Landing	Autobrake not installed	No	Minor	X				

DIFFERENCE AIRCRAFT: GV-SP BASE AIRCRAFT: GVI APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Weights	Max Takeoff Weight decreased 8,600 lb	No	No	X				
	Airplane Configuration	Body Extension decreased 39 in	No	No	X				
	Airplane Configuration	Wing Tip decreased 73 in	No	No	X				
	Overhead Panel Layout	No RAT Test Switch	No	Minor	X				
	Overhead Panel Layout	No EBHA Battery Switch	No	Minor	X				
	Overhead Panel Layout	No UPS Battery Switch	No	Minor	X				
	Overhead Panel Layout	Continuous Ignition Switches located in Throttle Quadrant	No	Minor	X				
	Overhead Panel Layout	ADS Probe Heat Switches only two installed	No	Minor		X			
	Overhead Panel Layout	Single Landing Gear Dump Switch installed	No	Minor		X			

DIFFERENCE AIRCRAFT: GV-SP BASE AIRCRAFT: GVI APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Instrument Panel Layout	Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EBDI) located on lower instrument panel	No	Minor				X	
	Pedestal Panel Layout	No RAT Handle	No	Minor	X				
	Pedestal Panel Layout	Parking Brake Handle modified	No	Minor	X				
	Pedestal Panel Layout	No RAAS Inhibit Switch	No	Minor	X				
	Pedestal Panel Layout	No FLT CTRL RESET Switch	No	Minor			X		
	Pedestal Panel Layout	No Electric FCS Trim Panel	No	Minor			X		
	Pedestal Panel Layout	Emergency Stab Switch installed	No	Minor		X			
	Pedestal Panel Layout	Spoiler Control Switch installed	No	Minor		X			
	Pedestal Panel Layout	CPCS Panel added	No	Minor		X			

DIFFERENCE AIRCRAFT: GV-SP BASE AIRCRAFT: GVI APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Pedestal Panel Layout	Weather Radar Panel installed	No	Minor		X			
	Pedestal Panel Layout	Autobrake switch not installed	No	Minor	X				
	Cockpit Side Panel	Oxygen Mask different model	No	Minor			X		
	Cockpit Side Panel	Pilot and copilot 60 Hz Outlets not installed	No	Minor	X				
	Cockpit Side Panel	No EVAS installed	No	Minor	X				
	Cockpit Side Panel	No Security System installed	No	Minor	X				
	Limitations	Max Takeoff Weight decreased from 99,600 lb to 91,000 lb	No	No	X				
	Limitations	Max Landing Weight decreased from 83,500 lb to 75,300 lb	No	No	X				
	Limitations	Fuel quantity decreased from 44,200 lb to 41,300 lb	No	No	X				
	Limitations	M _{MO} 0.885 vs. 0.925	No	No	X				

DIFFERENCE AIRCRAFT: GV-SP BASE AIRCRAFT: GVI APPROVED BY (POI)_____	DESIGN	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Limitations	APU and Engine limitations differences	No	No	X				

DIFFERENCE AIRCRAFT: GV-SP BASE AIRCRAFT: GVI APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 21 Air Conditioning	CPCS Semi mode on Pressurization Control Panel	No	Minor			X		
	ATA 22 Autoflight	Different interface with flight controls	No	Minor			X		
	ATA 23 Communications	Minor differences in radio functions	No	Minor			X		
	ATA 25 Equipment/ Furnishings	Crew Oxygen Masks different model	No	Minor		X			
	ATA 25 Equipment/ Furnishings	No EVAS	No	Minor	X				
	ATA 25 Equipment/ Furnishings	No Security System	No	Minor	X				
	ATA 26 Fire Protection	Minor differences in Fire Protection plumbing	No	Minor		X			
	ATA 28 Fuel	Fuel Servicing does not require DC Electric Power	No	Minor			X		
	ATA 28 Fuel	Refueling Panel located on Left Cockpit Bulkhead	No	Minor			X		

DIFFERENCE AIRCRAFT: GV-SP BASE AIRCRAFT: GVI APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 30 Ice and Rain Protection	Ice detector system classified advisory vs. primary	No	Minor		X			
	ATA 30 Ice and Rain Protection	Automatic Anti-Ice automatically inhibited below 1,500 feet	No	Minor		X			
	ATA 31 Indicating/ Recording Systems	Different locations	No	Minor		X			
	ATA 32 Landing Gear	Autobrake switch not installed	No	Minor	X				
	ATA 33 Lights	Locations slightly different	No	Minor		X			
	ATA 34 Navigation	No SMC	No	Major				X	
	ATA 34 Navigation	Standby Flight Display (SFD) and Electronic Bearing Distance Indicator (EDBI) located on lower Instrument Panel	No	Minor				X	

DIFFERENCE AIRCRAFT: GV-SP BASE AIRCRAFT: GVI APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	ATA 34 Navigation	Weather Radar Control Panel located on Pedestal	No	Minor		X			
	ATA 34 Navigation	No Predictive Windshear	No	Minor	X				
	ATA 34 Navigation	Head-Up Display (HUD) Systems	No	No		X			
	ATA 35 Oxygen	New style mask with attached goggles	No	Minor			X		
	ATA 36 Pneumatic	Different bleed pressure values	No	Minor	X				
	ATA 49 Airborne Auxiliary Power	BAAV installed	No	Minor		X			
	Limitations	Max Takeoff Weight decreased from 99,600 lb to 91,000 lb	No	No	X				
	Limitations	Max Landing Weight decreased from 83,500 lb to 75,300 lb	No	No	X				
	Limitations	Fuel quantity decreased from 44,200 lb to 41,300 lb	No	No	X				

DIFFERENCE AIRCRAFT: GV-SP BASE AIRCRAFT: GVI APPROVED BY (POI)_____	SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Limitations	APU and Engine limitations differences	No	No		X			

DIFFERENCE AIRCRAFT: GV-SP BASE AIRCRAFT: GVI APPROVED BY (POI)_____	MANUEVER	REMARKS	FLT CHAR	PROC CHNG	TRNG LVL A	TRNG LVL B	TRNG LVL C	TRNG LVL D	TRNG LVL E
	Takeoff and Landing	Autobrake not installed	No	Minor	X				

I APPENDIX 4. AIRCRAFT REGULATORY COMPLIANCE CHECKLIST

I The GVI compliance checklist has been removed. It is retained on file at the Transport Aircraft Long Beach Branch, 3960 Paramount Boulevard, Suite 100, Lakewood, CA, 90712-4137.

APPENDIX 5. HEAD-UP DISPLAY (HUD) SYSTEMS

Flightcrew member training must be accomplished using a Level C simulator with a daylight visual display or a Level D simulator. The Flight Standardization Board (FSB) has determined that each pilot in command (PIC) of an aircraft equipped with a Head-Up Display (HUD) system should receive a minimum of 3 hours of ground school training followed by a minimum of 4 hours of simulator training in the left seat of a Level C simulator with a daylight visual display or a Level D simulator. A HUD equipped aircraft may also be used for in-flight training. In-flight training should consist of a minimum of 4 hours of flying in the left seat utilizing the HUD.

The 3 hours of ground school training listed above is intended for pilots receiving stand-alone training on the HUD system. A pilot who is progressing successfully through an initial training program that has HUD training (including all three elements listed below) integrated into the curriculum, is recommended by an instructor, and successfully completes the appropriate HUD proficiency check by a person authorized by the Administrator need not complete the 3 stand-alone hours of ground school training.

The 4 hours of simulator or aircraft in-flight training listed above is intended for pilots receiving stand-alone training on the HUD system. A pilot who is progressing successfully through an initial training program that has HUD training (including all nine elements listed below) integrated into the curriculum, is recommended by an instructor, and successfully completes the appropriate HUD proficiency check by a person authorized by the Administrator need not complete the 4 stand-alone hours of simulator/aircraft in-flight training.

The FSB recommends special training emphasis in the following areas:

Ground training:

- 1) Crew coordination.
- 2) Crew briefings and callouts.
- 3) Duties of pilot flying (PF) and pilot monitoring (PM).

Flight training:

- 1) Use of caged, uncaged, and clear modes (especially in crosswind conditions).
- 2) Use of the pitch limit indicator (PLI) during windshear escape.
- 3) Approaches to “black hole” airports using the Flight Path Angle (FPA).
- 4) Use of the acceleration cue as a potential FPA.
- 5) Relationship of the glidepath angle to the symbolic runway.
- 6) Approaches into the top of an undercast during daylight and night conditions.
- 7) Recovery from unusual attitudes.
- 8) Traffic Alert and Collision Avoidance System (TCAS) Resolution Advisory (RA).
- 9) Takeoff using the FPA to meet a required climb gradient.

Checking requires a proficiency check conducted in a Level C simulator with a daylight visual display, in a Level D simulator, or on a HUD equipped aircraft. The proficiency check will include at least one takeoff and departure procedure and one instrument approach and landing

utilizing the HUD. Testing and checking will also include a minimum of one takeoff or missed approach and one instrument approach and landing without utilizing the HUD. This is to ensure proficiency without the use of the HUD.

APPENDIX 6. ENHANCED FLIGHT VISION SYSTEM (EFVS) OPERATIONS

Refer to Title 14 of the Code of Federal Regulations (14 CFR) part 61, § 61.66 for training, recent flight experience, and proficiency requirements for enhanced flight vision system (EFVS) operations. Refer to the current edition of FAA Advisory Circular (AC) 90-106, Enhanced Flight Vision Systems, and 14 CFR part 91, § 91.1065(g) or part 135, § 135.293(i) as applicable for EFVS task requirements during part 91 subpart K (part 91K) or part 135 competency checks.

The Flight Standardization Board (FSB) has determined that EFVS operations are operationally suitable under § 91.176(a) or (b).

An operational suitability determination does not constitute an operational authorization.

APPENDIX 7. PLANEVIEW II AVIONICS SOFTWARE VERSION “BLOCK POINT I” (ASC 901)

The PlaneView II avionics software version “Block Point I” upgrade will be installed in all Gulfstream GVI (G650) airplanes S/N 6001 through 6093 via Aircraft Service Change (ASC) 901 and as standard equipment in S/N 6094 and subsequent, and includes the following functions (in alphabetical order):

- Alternate flight plan performance predictions.
- Automatic Dependent Surveillance-Broadcast, transmit only (ADS-B Out)¹.
- Automatic navigation preview of instrument landing system (ILS) approaches.
- Circling approaches in navigation approach database.
- Control of waypoint crossing time during cruise phase of flight.
- Enhanced ground proximity warning system (EGPWS) mode 5 (“glideslope”) alerting for localizer performance with vertical guidance (LPV) approaches.
- Engine-out drift down distance and altitude depiction.
- Flight plan route depiction on vertical situation display (including terrain and vertical weather radar depiction with respect to the flight plan route).
- Flight management system (FMS) automated speeds for all flight phases and airplane configurations.
- FMS crossing points: Equal Time Point (ETP), Point of no Return (PNR).
- FMS redundancy management modification.
- Future Air Navigation System (FANS) 2 – protected mode Controller-Pilot Data Link Communication (CPDLC)².
- Graphical make FROM waypoint.
- Increased flight plan waypoint capacity: 200 waypoints.
- Main entry door emergency switch access door on DOORS synoptic.
- Required Navigation Performance (RNP)³ for each leg segment of instrument approach retrieved from navigation database.
- Planned and optimal step climbs.
- Polar operations (above 89 degrees latitude).
- Range and time to reserve fuel quantity remaining.
- Area Navigation (RNAV) RNP 0.1 navigation capability².
- Secondary flight plan.

¹ Installation is in accordance with the criteria for ADS-B Out operations outside of U.S. designated airspace (e.g., Australian Advisory Circular (AC) 21-45, Airworthiness Approval of Airborne Automatic Dependent Surveillance Broadcast Equipment) and is not sufficient for compliance with Title 14 of the Code of Federal Regulations (14 CFR) part 91, §§ 91.225 and 91.227.

² Future Air Navigation System (FANS) 2/Aeronautical Telecommunications Network (ATN) B1 functionality will be an optional installation for aircraft S/N 6001 through 6093 via ASC 039.

³ RNAV Required Navigation Performance Authorization Required (RNP AR) approach capability authorization will be acquired separately.

- Subsequent flight plan leg course depiction on horizontal situation indicator (HSI) during waypoint transition (“ghost pointer”).
- Temperature compensation for FMS flight plan altitudes.
- Undo direct-to flight plan waypoint.
- “Vectors to Final” approach course intercept.
- Vertical direct-to waypoint altitude.

Pilots transitioning from the basic PlaneView II avionics software version to the “Block Point I” upgrade installed with ASC 901 in the Gulfstream GVI (G650) should be trained on the differences using any one of the following Level C differences training media: interactive computer-based training (CBT), cockpit systems simulators, cockpit procedures trainers (CPT), or part task trainers (PTT). There are no checking or currency requirements for the PlaneView II avionics software version upgrade installed with ASC 901.

I APPENDIX 8. PLANEVIEW II AVIONICS SOFTWARE VERSION “BLOCK 2” (ASC 902)

The PlaneView II avionics software version “Block 2” upgrade will be installed in all Gulfstream GVI (G650/G650ER) airplanes S/N 6001 through 6249 via Aircraft Service Change (ASC) 901 and as standard equipment in S/N 6250 and subsequent, and includes the following operationally significant changes:

- Advisory Crew Alert System (CAS) message text changed from “Rudder Steering Off” to “Pedal Steering Off”.
- Autopilot disengage indication on primary flight display (PFD) changed to red for commanded disengagement.
- Caution CAS message “Landing Gear Maint Req’d” logic changed to include tire overspeed.
- Caution CAS message text changed from “Rudder Steering Fail” to “Pedal Steering Fail”.
- Corrections to flight management system (FMS) takeoff and landing data (TOLD) takeoff data.
- Datalink weather coverage expanded to worldwide.
- Distance measuring equipment (DME) hold available with FMS as navigation source.
- Flight controls 2/3 synoptic retains last-selected format.
- Flight director (FD) FLCH vertical mode reverts to PIT when autopilot disengaged.
- FMS TOLD landing performance using autobrakes.
- Forward and aft emergency batteries voltages displayed on DC power synoptic.
- Hydraulic aux pump auto-activation with brake application (when SPDS Build 10 (ASC 051) is also installed).
- I-NAV MAP VSD reverts to track mode when autopilot disengaged and FMS lateral navigation (LNAV) active.
- Incremental terminal charts database loading.

Pilots transitioning to the PlaneView II avionics software “Block 2” upgrade installed with ASC 902 in the Gulfstream GVI (G650/G650ER) should be trained on the differences using Level A training, which can be accomplished through self-instruction by reviewing the changes incorporated in G650 Airplane Flight Manual (AFM) Revision 12 or G650ER AFM Revision 3, and the Gulfstream Operating Manual Supplement G650-OMS-08 describing the operationally significant changes. There are no checking or currency requirements for the PlaneView II avionics software version “Block 2”.

APPENDIX 9. STEEP APPROACH LANDING OPERATIONS (ASC 101)

1. BACKGROUND

In October 2018, a Flight Standardization Board (FSB) was convened to determine operational suitability and evaluate training, checking, and currency requirements for conducting steep approach landing operations in the GVI (G650/G650ER) aircraft.

The steep approach landing capability for approaches having a glidepath equal to or greater than 4.5 degrees and up to and including 6.0 degrees will be available as an optional installation for all Gulfstream GVI (G650/G650ER) airplanes S/N 6001 and subsequent via Aircraft Service Change (ASC) 101. An Airplane Flight Manual Supplement (AFMS) (G650-2017-01 or G650ER-2017-10, as appropriate) will accompany the ASC 101 installation.

The FSB evaluation included numerous steep approach operations in the actual aircraft using a specially modified Area Navigation (RNAV) (Global Positioning Satellite (GPS)) instrument approach procedure (IAP) to LPV minima. All engines operative (AEO) and one-engine inoperative (OEI) steep approach operations were flown, terminating in a landing, execution of a missed approach, and/or bailed landing procedure. Although steep approach operations in the GVI (G650/G650ER) aircraft must be conducted with AEO, the FSB evaluated piloting skills required to perform an OEI go-around in the event an engine fails prior to the decision to land, and an OEI landing if an engine fails after the decision to land.

2. PILOT TYPE RATING

Not applicable.

3. RELATED AIRCRAFT

Not applicable.

4. PILOT TRAINING

4.1 Experience/Prerequisite:

The pilot flying (PF) must be qualified and current on the GVI (G650/G650ER) aircraft.

The pilot monitoring (PM) must be:

- a) A qualified and current GVI (G650/G650ER) aircraft pilot; or
- b) A second in command (SIC) who has been properly qualified in the GVI (G650/G650ER) under Title 14 of the Code of Federal Regulations (14 CFR) part 61, § 61.55, part 91 subpart K (part 91K), or part 135.

NOTE 1: Steep approach operations training may be delivered as an integral part of the initial or recurrent GVI (G650/G650ER) aircraft training curriculum. However, steep approach operations training certificate of completion must be issued only upon successful completion of the initial/recurrent training.

NOTE 2: Steep approach operations training is generally conducted as a crew. However, a pilot training alone may attend the course with another pilot acting as PM current and qualified in steep approach procedures.

4.2 Special Emphasis Areas:

Ground and flight training:

- a) Steep approach landing speeds and performance calculations.
- b) Autopilot coupled go-around in gusting wind conditions and/or turbulence may result in the autopilot disconnecting.

4.3 Ground Training:

Ground training must consist of training in the following areas and is appropriate to both pilot positions:

- a) AFMS review to include steep approach mode operating description, limitations, normal and abnormal procedures, and landing performance.
- b) Takeoff operations at London City Airport (EGLC), as described in the Gulfstream Noise Information Manual (NIM).
- c) Stages of the steep approach to include stabilized approach concept (early configuration including proper airspeed, flap settings, and landing gear), glidepath capture, and flare altitude.
- d) Comparison of the steep approach sight picture to that of 3-degree (normal) approach.
- e) Pilot techniques to include early configuration, avoidance of abrupt control inputs, and discussion of the following illusions: runway dimension on height perception and ground rush illusion.

4.4 Flight Training:

4.4.1 Flight training must be conducted in a full flight simulator (FFS) Level D or the aircraft.

NOTE 3: If steep approach flight training is desired, it is possible to program the GVI (G650/G650ER) FMS to fly a steep approach to any runway in the navigation database for which a visual approach is available. Unless the airport has a designated steep approach in the FMS database, enhanced ground proximity warning system (EGPWS) alerts (“SINK RATE”, “PULL-UP”) may be heard in the final phase of the approach and landing. Steep approach flight training conducted in this manner should only be conducted in visual meteorological conditions (VMC). Before each approach, the flight instructor should brief the pilot on the EGPWS alerts that will be activated during the final phase of the

approach and landing. The flight instructor should emphasize that, for the purpose of flight training only, the pilot should not react to these alerts.

NOTE 4: In that some airports with steep approaches require steep approach experience prior to conducting a steep approach at that airport, practicing approaches may be accomplished by the method described in NOTE 3.

4.4.2 Flight training must contain the following tasks as PF while executing a 5.5 or 6.0-degree glidepath:

- a) One approach to landing and full stop using normal procedures.
- b) One approach to go-around using normal procedures.
- c) One approach with an engine failure during approach to a single engine go-around using abnormal procedures.
- d) One approach with an engine failure below 200 feet to a landing.
- e) One approach in nighttime conditions to a full stop using normal procedures.

5. PILOT CHECKING

There is no checking requirement for GVI (G650/G650ER) steep approach operation qualification. Documented satisfactory completion of steep approach operation training is sufficient.

6. PILOT CURRENCY

- 6.1 If no steep approach operations have been conducted in the previous 6 calendar-months, the pilot will conduct a self-review of the steep approach applicable information in the AFMS and any other operator identified material.
- 6.2 As a minimum, regardless of the number of steep approaches completed, a review of all ground training items must be accomplished annually and documented in a manner acceptable to the Administrator.

7. OPERATIONAL SUITABILITY

- 7.1 The FSB has determined that the conduct of steep approaches requires no higher piloting skill level than that of normal (3-degree) approaches. Although the sight picture at flare is definitely steeper, a pilot is able to easily adapt to the slight increase in flare rate as the aircraft approaches the ground and provides flare guidance. The FSB determined that the use of the Head-Up Display (HUD) is advantageous in executing steep approaches but not mandatory.
- 7.2 Any pilot in command (PIC)/SIC who has been properly qualified in the GVI (G650/G650ER) aircraft under parts 61, 91K, or 135 may conduct steep approach

operations provided the requirements of this appendix have been satisfactorily accomplished.

NOTE 1 An operational suitability determination does not constitute an operational authorization.

NOTE 2 Be advised, it is common that individual airport authorities have training and documentation requirements specific to their airfields with regards to steep approach requirement.