Gulfstream Aerospace Corporation (GAC) Document No.: GIV-GER-9980, NTSB Flight Test Report - GIV Gust Lock System, follows this page and is included after appropriate authorization from GAC per a redacted Proprietary Notice Restriction contained on the cover page of the report.

Gulfstream

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NTSB Flight Test Report - GIV Gust Lock System

[redacted]

DEPARTMENT: 691

SECTION: Project Engr

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REVISION HISTORY

REV	PARA	DESCRIPTION OF CHANGE
-	-	Initial Release, No Change (NC)

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1.0 SUMMARY

The Gulfstream IV gust lock testing was completed in accordance with the test plan GIV-GER-9979 (dated July 21, 2014). Any deviations from the original test plan are noted in the flight test report. The following results were noted:

NOTE: Engagement or disengagement of the gust lock system was verified via standard flight controls checks for freedom of movement

- The gust lock system could be disengaged manually with the hydraulic systems pressurized or depressurized if the gust lock system hooks were not preloaded.
- Aileron system manual inputs could not be used to preload the gust lock system to a level preventing disengagement.
- The elevator and rudder gust lock hooks may not disengage if one or more hydraulic systems are pressurized and the rudder gust lock system is sufficiently preloaded via the rudder trim system input.
- Elevator system inputs could not be used to preload the gust lock system to a level preventing disengagement.
- With combined hydraulic system pressurized, the rudder gust lock hook preloaded via rudder trim input, and the gust lock handle unlatched but not fully stowed, the gust lock system disengaged when the FPSOV was pulled.
    - NOTE: Aerodynamic or pilot-input preloading were not part of this test point.
- The RUDDER LIMIT CAS message will illuminate if sufficient rudder trim is input with the gust lock system engaged and one or more hydraulic systems are pressurized.
- The RUDDER LIMIT CAS message will illuminate with sufficient rudder pedal input with the gust lock system engaged and one or more hydraulic systems are pressurized.
- An active yaw damper can cause a RUDDER LIMIT CAS message to illuminate while taxiing during turns if the gust lock system is engaged.
- During taxi, with the yaw damper active, a noted reduction in rudder surface deflection was recorded with the gust lock system engaged.
- During taxi, with the GL in the unlatched but not fully stowed position and the rudder trim adjusted to the left, the RUDDER LIMIT CAS message would illuminate during right turns, and the gust lock system would disengage during left turns.
- With manual or autothrottle input, throttle advancement was impeded prior to reaching takeoff power with the gust lock handle latched ON.
    - NOTE: Autothrottle system disengaged when impeded by GL/throttle interlock.

- Throttle advancement to takeoff power was possible with the gust lock handle unlatched, but not fully stowed, with the rudder gust lock hook preloaded using rudder trim input.
- With the GL handle latched ON and the throttles advanced to the GL/throttle interlock, the angular displacement of the throttle levers was 20° as measured with a pedestal protractor and 18.75° PLA as recorded on the FDR, each with respect to the idle position.

2.0 ACRONYMS

ATENGAGE	Auto Throttle Engaged
CAS	Crew Alerting System / Calibrated Air Speed
CVR	Cockpit Voice Recorder
ENG1EPR	Engine 1 Engine Pressure Ratio
ENG1PLA	Engine 1 Power Lever Angle
EPR	Engine Pressure Ratio
FCS	Flight Control System
FDAU	Flight Data Acquisition Unit
FDR	Flight Data Recorder
FMS	Flight Management System
FPSOV	Flight Power Shut-off Valve
GL	Gust Lock
HDGMAG	Magnetic Heading
HYD	Hydraulics
PLA	Power Lever Angle (as recorded on FDR)
SFCRUDDER	Rudder Surface Position
TC	Type Certificated

3.0 INTRODUCTION

This document presents results of testing for the Gulfstream IV elevator, rudder, and aileron flight control systems gust lock operations, with NTSB & FAA witnesses.

The purpose of testing is to support NTSB Accident Investigation ERA14MA271 and to demonstrate how the gust lock system interacts with GIV flight control systems and throttle movement in different configurations. The tests also focused on gust lock handle behaviour, throttle movement, thrust (EPR) attainment and aircraft annunciations. Testing used static and dynamic conditions to simulate different configurations that may affect gust lock system functionality.

Testing was conducted on a Gulfstream model GIV aircraft, serial number [redacted].

3.1 Test Objective

Testing was performed to characterize the following:

- Gust Lock Freedom of Release
- FPSOV Activation
- Gust Lock/Throttle Interlock
- Control Surface Deflections
- Yaw Damper Characterization

3.2 Configuration

Testing was performed on Gulfstream GIV aircraft serial number [redacted]. The aircraft had all standard systems (with part numbers listed below) installed and is like aircraft serial number 1399.

Flight Data Recorder Part Number
FDR – P/N S800-2000-00 [redacted] (Per CMP)

Flight Data Acquisition Unit Part Number:
FDAU - P/N 2231230-14-A-1 [redacted] (Per CMP)

3.3 Test Scope

The scope of the tests was limited to investigating the test objectives listed above and as specified in the flight test plan (GIV-GER-9979). Testing was performed on 2 different days, July 28th and 29th, 2014.

TABLE 1 - SUMMARY TEST INFORMATION

A/C No.	Date	Test Cases	Personnel
[redacted]	280714	G1-G15	NTSB: Schiada, Hauf, Gottlieb, Babcock, Wentz, Huray FAA: [redacted] GAC: [redacted]
[redacted]	290714	T1-T4	NTSB: Schiada, Hauf, Gottlieb, Babcock, Wentz, Huray FAA: [redacted] GAC: [redacted]
[redacted]	N/A	F1	*Not Performed*

3.4 System Description

See GIV-GER-9979, Ground & Flight Test Plan (NTSB) – GIV Gust Lock System for system descriptions.

3.5 Instrumentation

The following instrumentation and fixturing were required for testing as specified by the test plan. See Section 4.2 for a list of deviations.

- Video and audio recording devices to record pilot inputs and handle/lever positions
- The standard TC configuration flight data recorder
- Protractor on the cockpit pedestal to measure gust lock handle positions
- Cable tensiometer to measure GL cable tension
- A protractor on the pedestal to measure the throttle lever angle
- Inclinometer and throw board to measure control surface deflections

4.0 TEST RESULTS AND DISCUSSION

4.1 Methodology

The following procedures outline the test methodology.

- The gust lock handle was considered unlatched when the spring-loaded handle is rotated towards the aft position such that the entire handle is capable of being moved slightly forward, out of its detent position.
- The gust lock system was considered OFF and unlocked when the aileron, rudder and elevator systems are able to move freely.
- The gust lock system was considered ON and locked when the handle is in the full aft position (in the detent, with handle latched) and the flight control systems are locked in place.
- The rudder trim was initially set to zero units before starting any test.
- FDR recorded data for all tests.

4.2 Deviations

Test case F1 was not performed due to lack of aircraft availability.

5.0 GROUND STATIONARY TESTS

5.1 Aircraft Preparation

1. Inspect the aircraft to ensure all standard TC components are installed and functioning correctly:
   -Gust Lock System
   -Flight Data Recorder
   -Cockpit Voice Recorder
   -FPSOV System
2. Install cockpit video/audio recorder
3. Install pedestal protractor

   Results: Protractor and video camera installed.

5.2 Ground Stationary Test-Baseline GL On, No Hyd (G1)

1. Initial A/C Configuration:
   -Hydraulic power OFF
   -Gust lock ON
   -Rudder trim set to zero
2. Check all FCS controls for freedom of motion, record results.

   Results: All surfaces are locked.
3. Proceed to next test.

5.3 Ground Stationary Test-Baseline GL On, Hyd On (G2)

1. Initial A/C configuration:
   -Hydraulic power OFF
   -Gust lock ON
   -Rudder trim set to zero
2. Provide Combined system hydraulic power to A/C (engines or cart).
3. Check all FCS controls for freedom of motion, record results.

   Results: All surfaces are locked.
4. Proceed with next test.

5.4 Ground Stationary Test-Baseline GL Unlatched, Hyd On (G3)

1. Initial A/C configuration:
   -Combined system hydraulic power ON
   -Gust lock ON
   -Rudder trim set to zero

   Note: For this test, both engines running with Combined and Flight hydraulic systems ON.

2. Unlatch GL handle, move slightly forward out of detent.
3. Check FCS controls for freedom of motion, record results.

   Results: Gust lock releases and goes full down and all control surfaces are free.

4. Ensure GL to OFF position, proceed to next test.

5.5 Ground Stationary Test-Baseline GL Unlatched Rudder Preload (G4)

1. Initial A/C configuration:
   -Combined system hydraulic power ON
   -Gust lock OFF
   -Rudder trim set to zero

   Note: For this test, both engines running with Combined and Flight hydraulic systems ON.

2. Move GL to ON position.
3. Input rudder trim until blue Rudder Limit CAS message illuminates and then back off rudder trim until message just extinguishes.
4. Check FCS controls for freedom of motion, record results.

   Results: All surfaces are locked.

5. Unlatch GL handle, move slightly forward out of detent.
6. Check FCS controls for freedom of motion, record results.

   Results: All surfaces are locked.

7. Remove rudder trim preload.

   Results: Gust lock releases and goes full down and all surfaces are free.

8. Ensure GL to OFF position, proceed to next test.

5.6 Ground Stationary Test-Baseline GL Unlatched Elevator Preload (G5)

1. Initial A/C configuration:
   -Combined system hydraulic power ON
   -Gust lock OFF
   -Rudder trim set to zero

   Note: For this test, both engines running with Combined and Flight hydraulic systems ON.

2. Move GL to ON position.
3. Input control column force in aft direction to preload the GL system. Hold.
4. Check FCS controls for freedom of motion, record results.
5. Unlatch GL handle, move slightly forward out of detent.

6. Check FCS controls for freedom of motion, record results.

   Results: Gust lock handle would not stay in the unlatched position and would go full down. All surfaces are free.

7. Release column.

8. Ensure GL to OFF position, proceed to next test.

5.7 Ground Stationary Test-Baseline GL Unlatched Aileron Preload (G6)

1. Initial A/C configuration:
   -Combined system hydraulic power ON
   -Gust lock OFF
   -Rudder trim set to zero

   Note: For this test, both engines running with Combined and Flight hydraulic systems ON.

2. Move GL to ON position.

3. Input wheel force to preload the GL system. Hold.

4. Check FCS controls for freedom of motion, record results.

   Results: All surfaces locked.

5. Unlatch GL handle, move slightly forward out of detent.

6. Check FCS controls for freedom of motion, record results.

   Results: Gust lock handle would not stay in the unlatched position and would go full down. All surfaces are free.

7. Release wheel preload

8. Ensure GL to OFF position, proceed to next test.

5.8 Ground Stationary Test-Baseline FPSOV Affect (G7)

1. Initial A/C configuration:
   -Combined system hydraulic power ON
   -Gust lock OFF
   -Rudder trim set to zero

   Note: For this test, both engines running with Combined and Flight hydraulic systems ON.

2. Move GL to ON position.

3. Check FCS controls for freedom of motion, record results.

   Results: All surfaces are locked.

4. Pull the FPSOV handle.

5. Check FCS controls for freedom of motion, record results.

Results: All surfaces are locked.

6. Reset GL to OFF position, proceed to next test.

5.9 Ground Stationary Test-FPSOV GL Unlatched Rudder Preload (G8)

1. Initial A/C configuration:
   -Combined system hydraulic power ON
   -Gust lock OFF
   -Rudder trim set to zero

   Note: For this test, both engines running with Combined and Flight hydraulic systems ON.

2. Move GL to ON position.
3. Input rudder trim until blue Rudder Limit CAS message illuminates and then back off rudder trim until message just extinguishes.
4. Check FCS controls for freedom of motion, record results.

   Results: All surfaces are locked.

5. Unlatch GL handle, move slightly forward out of detent.
6. Pull FPSOV handle.
7. Check FCS controls for freedom of motion, record results.

   Results: Gust lock immediately releases and goes to full down position and all surfaces are free.

8. Remove rudder trim preload.
9. Ensure GL to OFF position, proceed to next test.

5.10 Ground Stationary Test-Baseline GL/Throttle Interlock (G9)

1. Initial A/C configuration:
   -Combined system hydraulic power ON
   -Gust lock OFF
   -Rudder trim set to zero

   Note: For this test, both engines running with Combined and Flight hydraulic systems ON.

2. Move GL to ON position.
3. Check FCS controls for freedom of motion, record results.

   Results: All surfaces are locked.

4. Move thrust levers forward until GL interlock system prevents motion.
5. Record PLA position and protractor angle.

   Note: All throttle lever position recordings are reported for both Left/Right levers (i.e. XX°/YY°). Idle position on the protractor is 48°.

Results: The PLA from the FDR was 18.75°/18.75°; the protractor angle was 68°/68, and the corresponding EPR on the day of testing was 1.28/1.34.

6. Return thrust levers to idle position.
7. Reset GL to OFF position, proceed to next test.

5.11 Ground Stationary Test-GL/Throttle Interlock Release (G10)

1. Initial A/C configuration:
   -Combined system hydraulic power ON
   -Gust lock OFF
   -Rudder trim set to zero

   Note: Right engine only running
2. Move GL to ON position.
3. Check FCS controls for freedom of motion, record results.

   Results: All surfaces are locked.
4. Input rudder trim until blue Rudder Limit CAS message illuminates and then back off rudder trim until message just extinguishes.
5. Unlatch GL handle, move forward slightly out of detent.
6. Check FCS controls for freedom of motion, record results.

   Results: All surfaces are locked.
7. Move thrust levers forward until GL interlock system prevents motion OR GL handle begins moving.
8. Record PLA position and protractor angle.

   Results: Only the left engine throttle lever was moved for this test (left engine not running). The left throttle protractor angle was 89° (see Figure 1) and the left PLA was 35.4°.

FIGURE 1 – G10 THROTTLE PROTRACTOR POSITION (GL UNLATCHED/THROTTLE INTERLOCK)

9. Record GL handle position.

Results: The gust lock handle remained in the unlatched position. The angle was 56°. For reference, when the GL handle is UP and locked, the gust lock handle angle is 68°.

FIGURE 2 – GUST LOCK HANDLE PEDESTAL PROTRACTOR

10. Continue moving thrust levers forward until GL system disengages.
11. Record GL handle position when system disengages.

    Results: GL handle released to full forward and stowed position. Protractor measurement was not recorded.

12. Record PLA position and protractor angle.

    Results: The PLA position was 39°/39° and the protractor angle was not recorded.

    With hydraulics ON, the left engine OFF and the GL handle unlatched, the left throttle lever (only) was pushed forward until the GL/throttle interlock restricted movement. Further movement of the throttle was possible and correlated with additional forward movement of the GL handle. An increased friction force could be felt on the throttle lever as it "pulled" the GL handle with it. As soon as pilot input force was removed from the lever, both the lever and GL handle moved aft ("spring back"). Moving the throttle lever even further forward caused the GL handle to quickly release into the fully stowed position.

13. Return thrust levers to idle.
14. Remove rudder trim preload.
15. Ensure GL to OFF position, proceed to next test.

6.0 HANGAR TESTS

6.1 Hangar Test-Baseline GL On, Surface Deflections (G11)

1. Initial A/C configuration:
   -Hydraulic power OFF
   -Gust lock handle OFF
   -Rudder trim set to zero
   -*Tail stand required
2. Move GL to ON position.
3. Apply approx.. 20 lbs of force manually, in both directions, to:
   -One Aileron Surface
   -One Elevator Surface
   -Rudder Surface
4. Record surface deflection using protractor/inclinometer.

   Results: See Figure 3

6.2 Hangar Test-Hydraulics On, Surface Deflections (G12)

1. Initial A/C configuration:
   -Hydraulic power OFF
   -Gust lock handle ON
   -Rudder trim set to zero
   -*Tail stand required
2. Start Combined hydraulic power source (cart).
3. Apply approx. 20 lbs of force manually, in both directions, to:
   -One Aileron Surface
   -One Elevator Surface
   -Rudder Surface
4. Record surface deflection using protractor/inclinometer.

   Results: See Figure 3

6.3 Hangar Test-Hydraulic Preload, Surface Deflections(G13)

1. Initial A/C configuration:
   -Combined system hydraulic power ON

-Gust lock handle ON
-Rudder trim set to zero
-*Tail stand required

2. Input rudder trim until blue Rudder Limit CAS message illuminates and then back off rudder trim until message just extinguishes.

3. Apply approx. 20 lbs of force manually, in both directions, to:
-One Aileron Surface
-One Elevator Surface
-Rudder Surface

4. Record surface deflection using protractor/inclinometer.

Results:

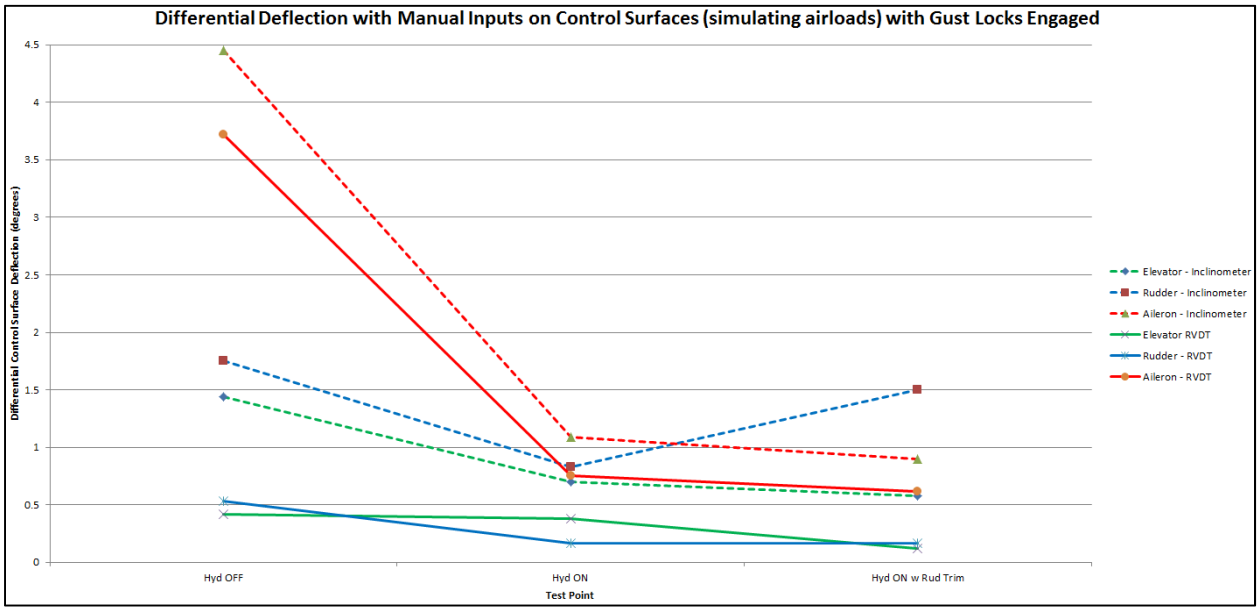

FIGURE 3 – G11, G12, G13 SUMMARY RESULTS (HANGAR TEST SURFACE DEFLECTIONS)

Note: One of the data points appears to be an outlier. The rudder deflection, as measured by the inclinometer with hydraulics ON and rudder trim input, is higher than expected. All other data points show expected results, with decreasing deflections as hydraulic power and rudder trim input are applied. The rudder deflection outlier is explained by a variation in test procedure. It was observed that the test technician applied differing amounts of force to the rudder surface for the different test cases. An increase in force was likely applied to the rudder surface for the final test case which resulted in a larger than expected deflection.

5. Remove hydraulic power.

6. Remove rudder trim preload.

7. Reset GL to OFF position.

6.4 Hangar Test-Pitch Trim Characterization(G14)

1. Initial A/C configuration:
   -Combined system hydraulic power OFF
   -Gust lock handle ON
2. Rotate pitch trim wheel to full aft position

   Results: Trim Wheel full aft: 21 degrees Nose Up (electric) 22 degrees Nose up (manual)
3. Rotate pitch trim wheel to full forward position

   Results: Trim wheel full forward: 6 degrees nose down (electric) 8 degrees nose down (manual)

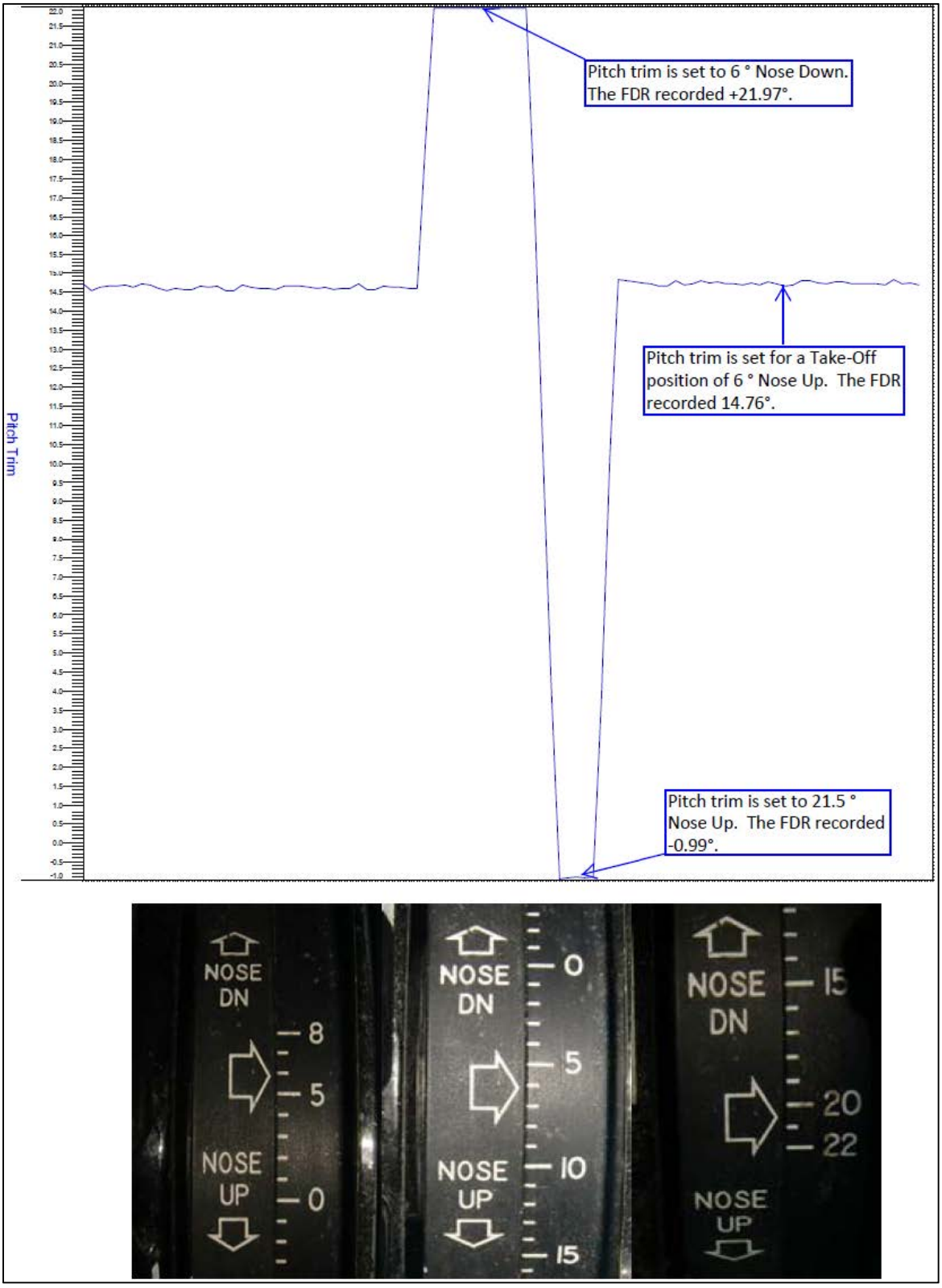

FIGURE 4 – G14 FDR/WHEEL RESULTS (PITCH TRIM POSITION)

4. Return pitch trim wheel to neutral
5. Reset GL to OFF position.

6.5 Hangar Test-GL Cable Tension(G15)

1. Initial A/C configuration:
   -Combined system hydraulic power OFF
   -Gust lock handle OFF

   Results:
   Tensiometer: 70537
   Calibration Date: 02-03-14
   Calibration Due: 08-14
   Temperature: 70°F
2. Install cable tensiometer on GL fuselage cables in the aft equipment bay or main wheel well and record tensions.

   Results: Tensiometer installed in aft equipment bay.
   Measurements: 25 lbs (upper cable), 25.5 lbs (lower cable).
3. Remove tensiometer.
4. Move GL to ON position.
5. Install cable tensiometer on GL fuselage cables in the aft equipment bay or main wheel well and record tensions.

   Results: Tensiometer installed in aft equipment bay.
   Measurements: 22 lbs (upper cable), 28.5 lbs (lower cable)
6. Remove tensiometer.
7. Reset GL to OFF position.

7.0 DYNAMIC TESTS

7.1 Dynamic Taxi Test-Yaw Damper Baseline (T1)

1. Initial A/C configuration:
   -Left & right engines on, ready for normal taxi operations
   -Gust lock OFF
   -Rudder trim set to zero
   -Yaw damper ON
2. Use rudder pedals to activate blue Rudder Limit CAS message. Record pedal position.

   Results: Moved rudder pedals both left and right to the surface stop. Then continued to push to obtain rudder limit CAS message.
3. Move rudder pedals back to neutral position.
4. Perform normal taxi operations.
5. C/W 2 left and right 90 degree turns at approximately 20 Knots. Ensure ground speed does not exceed 30kts including turns.

   Results:

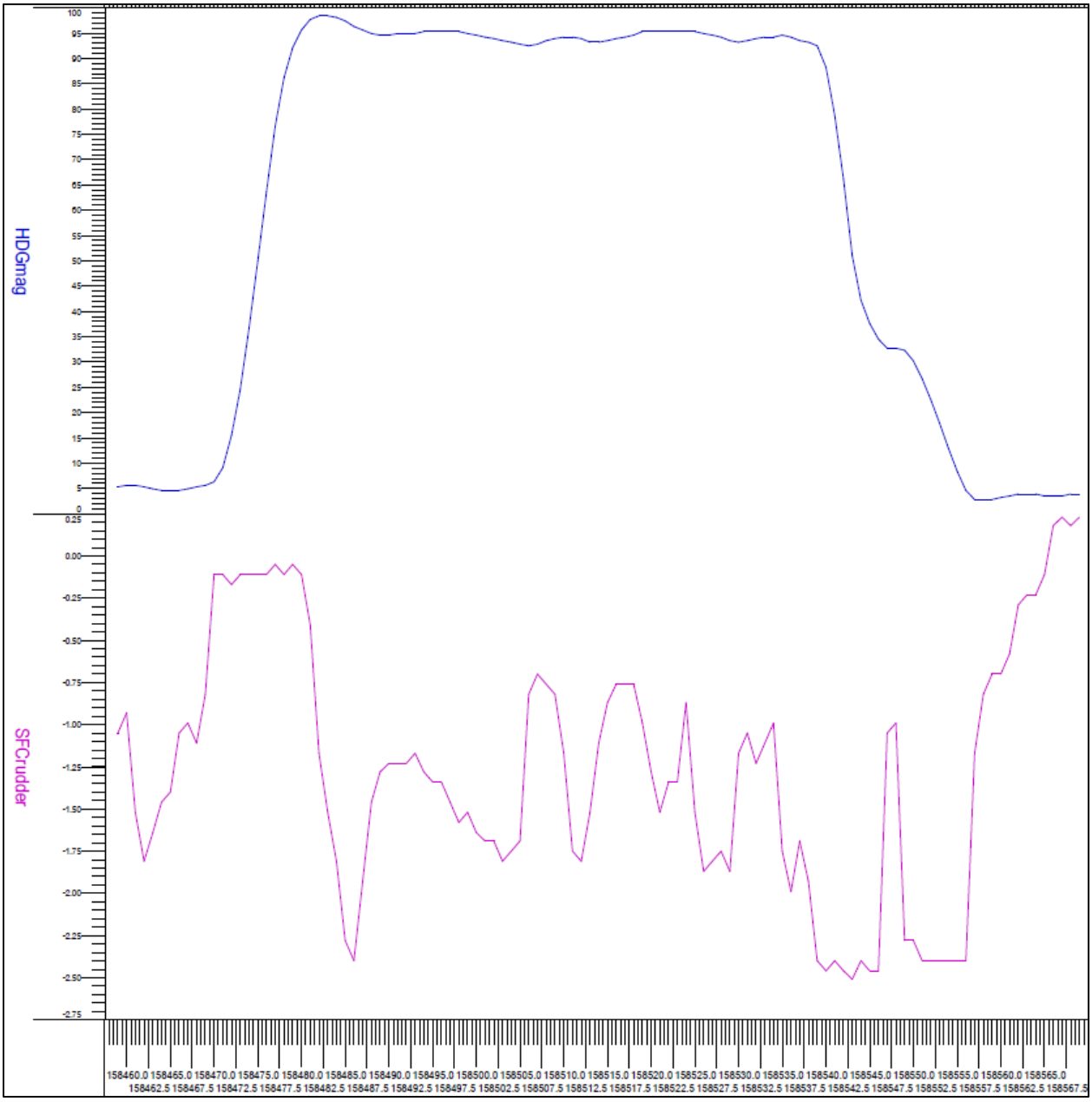

FIGURE 5 – T1 FDR RESULTS (YAW DAMPER, GL OFF)

6. Stop aircraft. Proceed with next test

7.2 Dynamic Taxi Test-Yaw Damper Characterization (T2)

1. Initial A/C configuration:
   -Left and right engines on, ready for normal taxi operations
   -Gust lock OFF
   -Yaw damper ON
   -Rudder trim set to zero
   -Ensure winds are calm
2. Pull back on column to move elevator mechanism away from elevator GL hooks. Hold.
3. Move GL handle to ON position.
4. Perform normal taxi operations.
5. C/W 2 left and right 90 degree turns at approximately 20 Knots. Ensure ground speed does not exceed 30kts including turns.

   Results:

   The rudder limit CAS message did illuminate when turning hard in either direction. The rudder limit CAS message was intermittent and was dependent on the rate of turn.

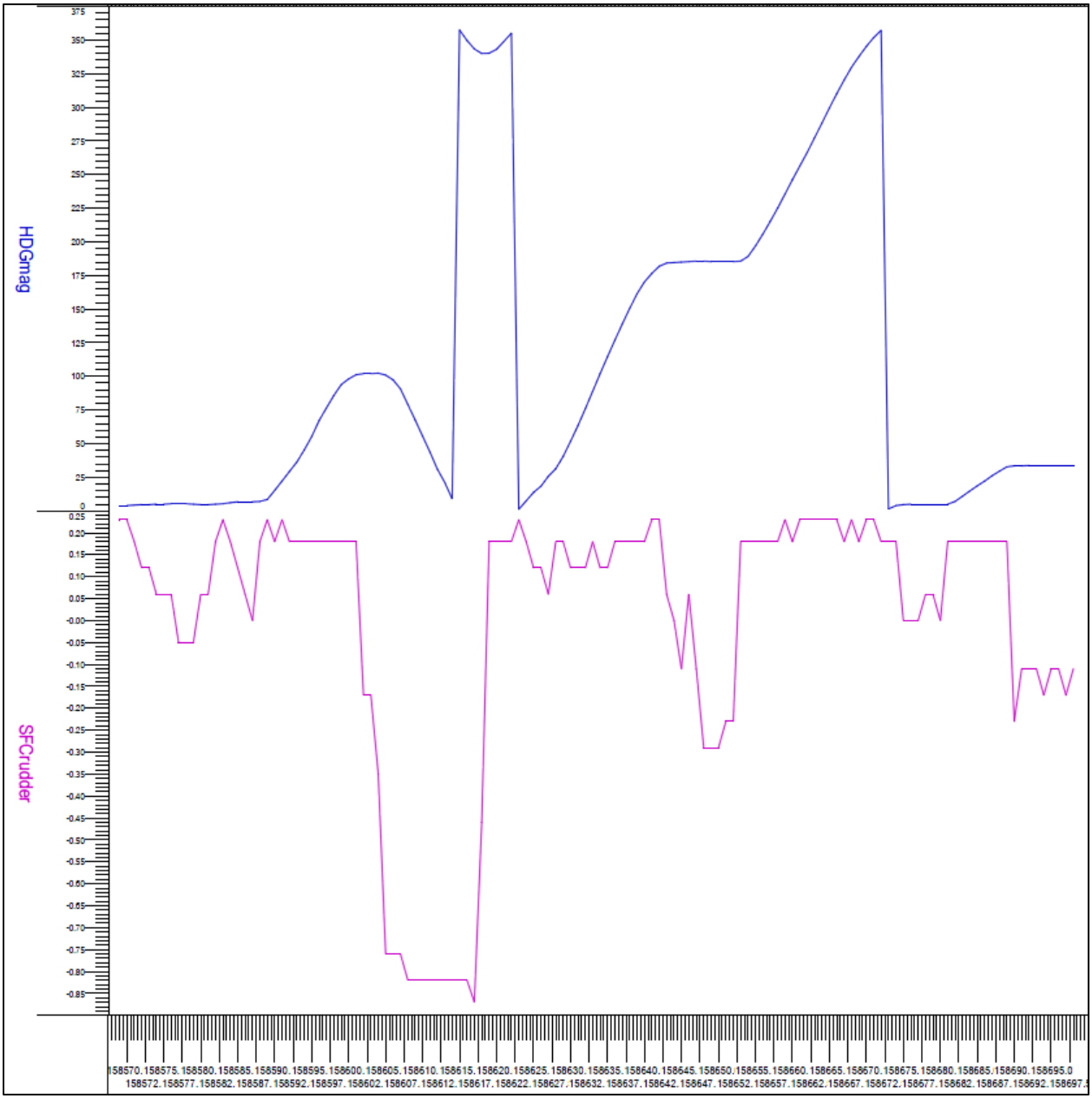

FIGURE 6 – T2 FDR RESULTS (YAW DAMPER, GL ON)

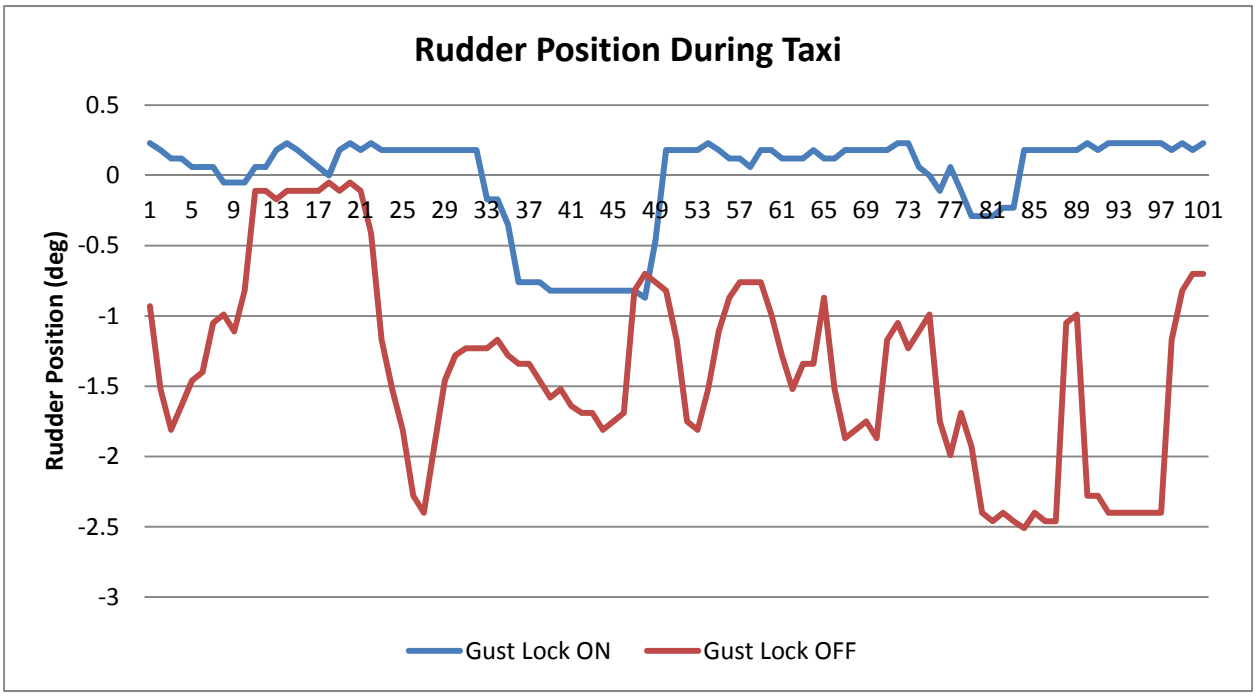

FIGURE 7 – T1/T2 RUDDER POSITIONS OVERLAID (GL ON VS OFF)

Min & Max Values: Gust Lock ON (-0.87, 0.23) Gust Lock OFF (-2.51, -0.05)

6. Stop aircraft. Proceed with next test

7.3 Dynamic Taxi Test-GL Unlatched Yaw Damper Characterization (T4)

1. Initial A/C configuration:
   -Left and right engines on, ready for normal taxi operations
   -Gust lock OFF
   -Yaw damper ON
   -Rudder trim set to zero
   -Ensure winds are calm
2. Pull back on column to move elevator mechanism away from elevator GL hooks. Hold.

   Deviation: Column was not pulled back. It was left in the normal, forward position.
3. Move GL to ON position.
4. Input rudder trim until blue Rudder Limit CAS message illuminates and then back off rudder trim until message just extinguishes.

   Results: Rudder trim was adjusted to the left
5. Unlatch GL handle, move slightly forward out of detent.
6. Verify that GL handle has not returned to OFF position.

7. Perform normal taxi operations.
8. Conduct 2 left and right 90 degree turns at approximately 20 Knots. Ensure ground speed does not exceed 30kts including turns.
9. Record/observe GL handle position and Rudder Limit CAS message status.

   Results: With rudder trim adjusted to the left, the rudder limit light would illuminate during right turns and the gust lock would release during left turns. This was repeated many times.
10. Stop aircraft. Proceed with next test
11. Remove rudder trim preload.

7.4 Dynamic Taxi Test-Auto Throttle Engaged Test (T3)

1. Initial A/C configuration:
   -Left & right engines on, ready for run-pad operations
   -Gust lock OFF
   -Yaw damper ON
   -Parking brakes ON
   -Set rudder trim to zero
2. Correlate EPR/PLA
3. Move GL handle to ON position.
4. Input rudder trim until blue Rudder Limit CAS message illuminates and then back off rudder trim until message just extinguishes..
5. Unlatch GL handle, move slightly forward out of detent.
6. Verify that GL handle has not returned to OFF position.
7. Manually set target EPR

   Results: The FMS calculated a flex EPR of 1.59. This was used for target EPR.
8. Engage Auto Throttle(AT).
9. Observe interaction of AT and GL/throttle interlock.
10. Record EPR value.

    Results: With gust lock in the unlatched position and the AT working normally, both engines reached 1.59 EPR (See Figure 8).

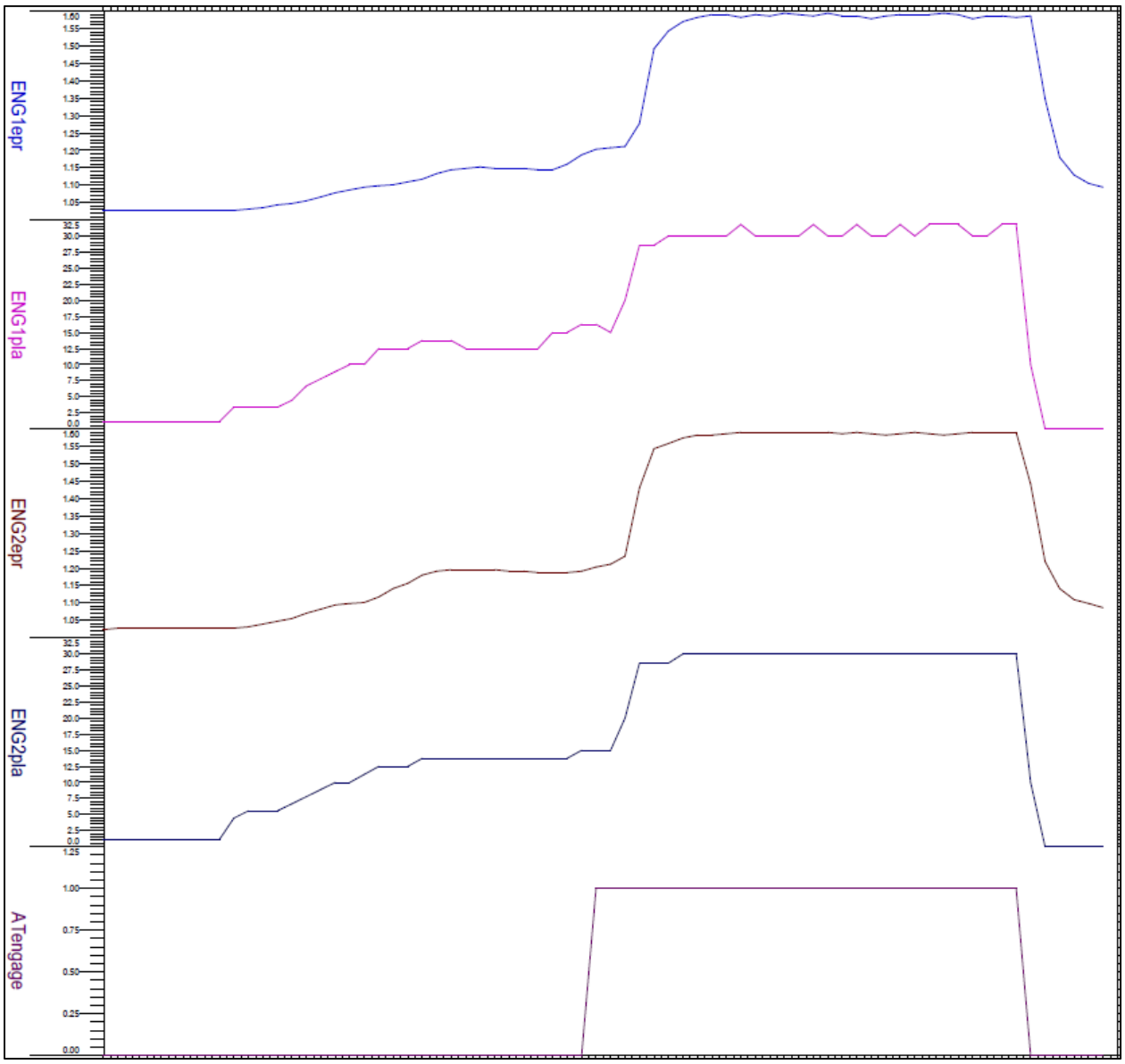

FIGURE 8 – T3 GL UNLATCHED, AT ENGAGED FDR RESULTS

11. Record PLA position and protractor angle.

    Results: The PLA angle was 30.00/30.00 degrees. Protractor angle was not recorded.

12. Record GL handle position.

    Results: The gust lock handle did not move. Previous test results (G10) showed that with GL handle in the unlatched position, the throttles did not contact the gust lock interlock nor move the gust lock until 35° PLA (reference Section 5.11).

    Additional testing was performed with the gust lock ON, with the same 1.59 target EPR (see Figure 9). With the throttles initially set at 1.17 EPR, the autothrottles were then selected ON and the PLA

moved to 21.4°/22.8° and reached a max EPR of 1.39. The autothrottles disconnected within 2 seconds of engagement and the PLA moved back to 18.7°/18.7°.

The next test had the throttles initially set as far forward as possible against the GL/throttle interlock. The autothrottles were then selected ON and the PLA moved to 22.8°/21.4°. The autothrottles disconnected within 2 seconds of engagement and the PLA moved back to 18.7°/18.7°.

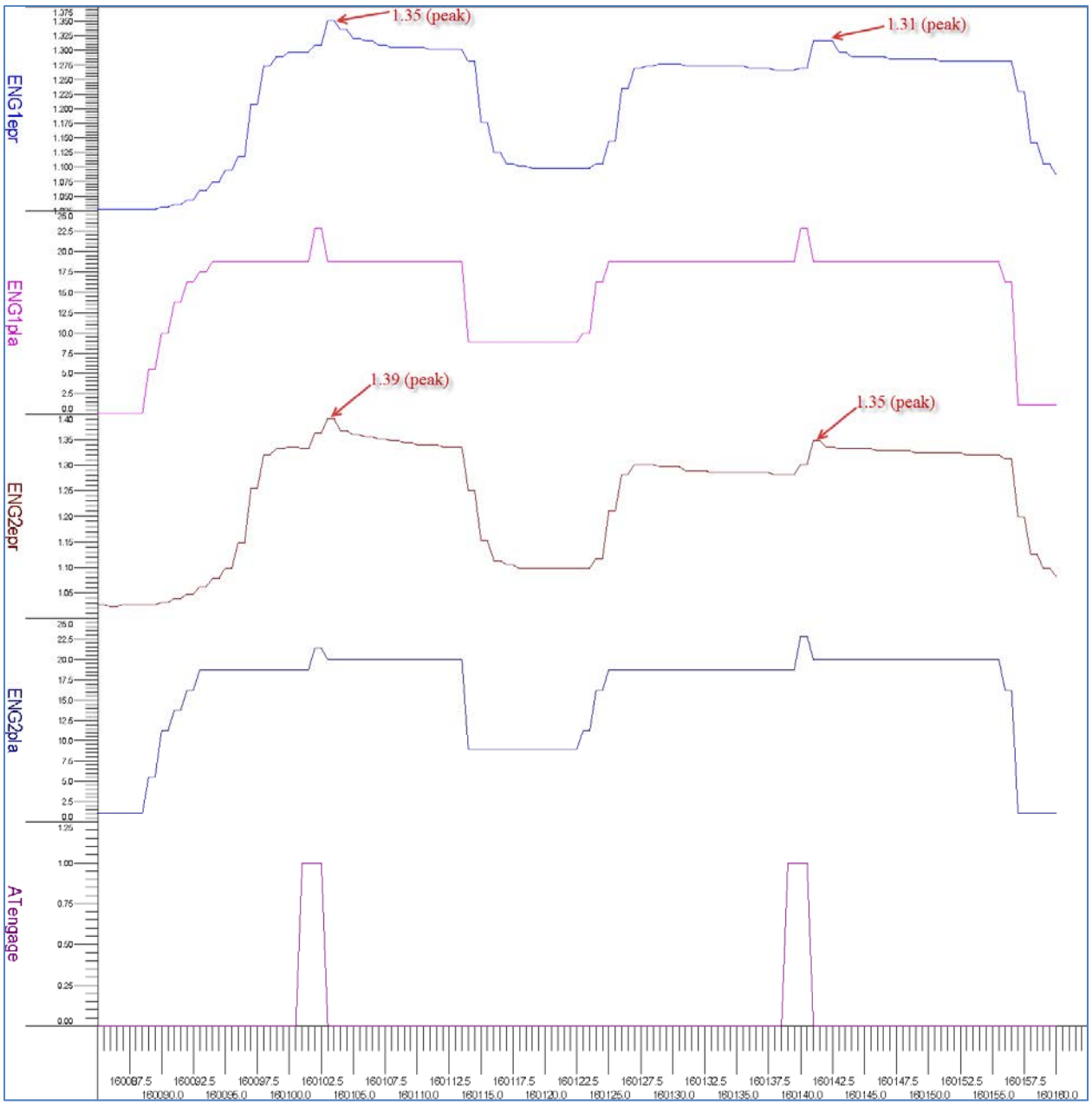

FIGURE 9 – T3 FDR RESULTS (GL ON, AT SELECTED ON)

13. Bring throttles back to idle.
14. Repeat Steps 7-13 for additional EPR targets deemed necessary for data collection/observation.

    Results: No other EPR targets were used.
15. Remove rudder trim input.
16. Verify GL handle is in OFF position.

7.5 Dynamic Flight Test-FPSOV/Control Surface Characterization (F1)

This test was not done. The aircraft did not fly due to customer restriction.

~~1. Initial A/C configuration:~~
~~-Left and right engines on, ready for flight~~
~~-Gust lock OFF~~
~~-Yaw damper ON~~

~~2. Perform normal takeoff, reach 10k-15k ft and 250 KCAS.~~

~~3. Perform modified GIV Condition Survey Test for Manual Reversion (as described below).~~

~~4. Pull FPSOV.~~

~~5. Record/observe/characterize flight control surface response/positions.~~

~~6. Reset FPSOV.~~

~~7. Repeat test with flaps at 20 and airspeed at 170 kts.~~

~~8. Pull FPSOV.~~

~~9. Record/observe/characterize flight control surface response/positions.~~

~~10. Reset FPSOV.~~

~~11. Return to base.~~

8.0 REFERENCES

Doc. No.: GIV-GER-9979, Ground & Flight Test Plan (NTSB) – GIV Gust Lock System, July 21, 2014

Doc. No.: GIV-GER-9978, Flight Test Report – GIV Gust Lock System, July 21, 2014

Doc. No.: GIV-GER-9977, GIV Ground & Flight Test Plan – Gust Lock System, June 19, 2014