1.d Hover Performance

Test Objective

The objective of this test is to demonstrate that the FSTD hover performance is compliant with the helicopter reference data.

Tolerances and Evaluation Criteria

FTD Level 3 and FNPT Level III:

Parameter [U oM]	**Tolerance**
Engine 1 Torque [%]	CT&M

Evaluation Criteria to be applied to values in Test Results table.

Applicability

Test applicable both to FTD Level 3 and FNPT Level III.

References

EASA CS-FSTD(H)

Test Case Results Summary

Parameter [U oM]		**A1**	**A2**
Engine 1 Torque [%]	Min**	1	1
	FSTD	2	2
	Max**	3	3
Engine 1 Torque [%]	Min**	1	1
	FSTD	2	2
	Max**	3	3

** The Min value is computed as the Reference value minus the specific tolerance value.
The Max value is computed as the Reference value plus the specific tolerance value

1.d Hover Performance

Test Procedure

On the IOS select ’Maintenance’ page then ’QTG-Test’. The test can be run either in automatic or manual mode.

Automatic testing: drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed. Cockpit controls and switches status will be overwritten by the QTG Tool.

Press ’Start QTG Execution’ to start the test.

The flight controls will be controlled according to the following table:

Flight Controls	Status
Longitudinal	DIRECT DRIVEN
Lateral	DIRECT DRIVEN
Collective	DIRECT DRIVEN
Pedals	DIRECT DRIVEN

Manual testing: follow the Manual Procedure steps indicated in the next page.

Manual Procedure

1. Drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed.
2. In the Test Selection list toggle from ’Automatic’ to ’Manual’.
3. Press ’Start QTG execution’. Wait for the completion message of the initialization phase.
4. Setup the cockpit as indicated in the Cockpit Configuration table below.
5. Press the Spare button on the Cyclic stick to run the simulation.
6. Stabilize and maintain current flight condition.
7. Press the Spare button on the Cyclic stick to start recording. On the IOS ’Manual QTG’ page, check that an indication of the test elapsed time is shown.
8. Press the Spare button on the Cyclic stick to complete the test or to proceed with the next test.

Initial Conditions

Parameter [UoM]	Reference*	FSTD
Mass Properties		
Gross Weight	2757.9	7500.0
Fuel Weigth	341.1	0.0
CG Longitudinal	4232	-4.7
CG Lateral	23	0.0
Moment of Inertia XX	2825	9638.0
Moment of Inertia XZ	-981	2226.0
Moment of Inertia YY	10635	33240.0
Moment of Inertia ZZ	12261	25889.0
Environment Parameters		
Pressure Altitude	1307.1	344.90347448792386
OAT	13.8	13.8
Wind Direction	0.0	0.0
Wind Speed	0.0	0.0
Flight Parameters		
Airspeed	0.2	-0.0007328300784191671
Ground Speed	0.0	0.008344186369269284
Vertical Velocity	0.0	0.013288436214678432
Radar Altitude	5.7	187.67051261194212
Rotor Speed	103.0	28.797932657908333
Engine 1 Torque	57.9	31.95777495505339
Engine 2 Torque	57.9	31.95777495505339
Pitch Angle	6.1	0.04253490439090714
Bank Angle	-2.5	0.046752386160144134
Heading	64.7	1.1314822542825382
Pitch Rate	0.0	0.00038809458831355273
Roll Rate	-0.0	-0.003734954692935167
Yaw Rate	-0.0	0.02717967586248816
X Body Acceleration	-0.1	0.0
Y Body Acceleration	-0.0	0.0
Z Body Acceleration	-0.0	0.0
Longitudinal Cyclic Pos.	69.1	-0.228729248046875
Lateral Cyclic Pos.	54.4	-0.080810546875
Pedals Pos.	42.8	-0.011199951171875
Collective Pos.	57.8	-0.3538818359375
Engine 1 Main Switch	FLIGHT	FLIGHT
Engine 2 Main Switch	FLIGHT	FLIGHT
AFCS State	DSAS	SCAS
HINR Button	HINR	HINR

* Snapshot Tests: Reference initial conditions are computed as mean values over data time histories

Test Results

Parameter [U oM]	**Reference**	**Min****	**FSTD**	**Max****
Snapshot Data				
Engine 1 Torque [%]	1	2	3	4

** The Min value is computed as the Reference value minus the specific tolerance value.
The Max value is computed as the Reference value plus the specific tolerance value

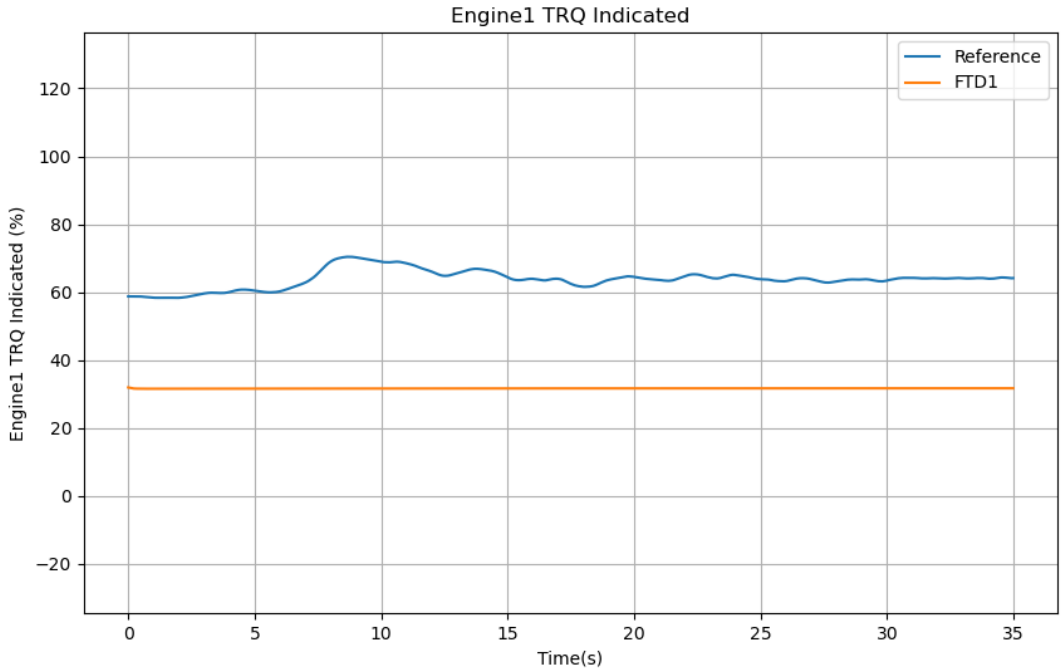
Notes and Rationales

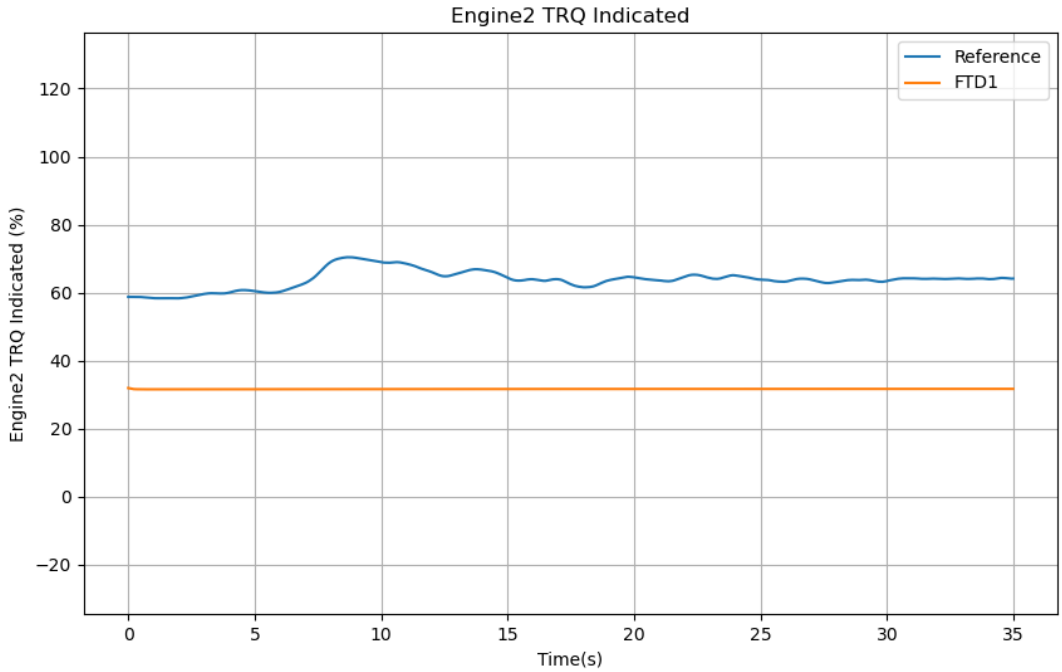
Notes
No Notes related to the entire Test are present
No Notes related to current SubCase are present

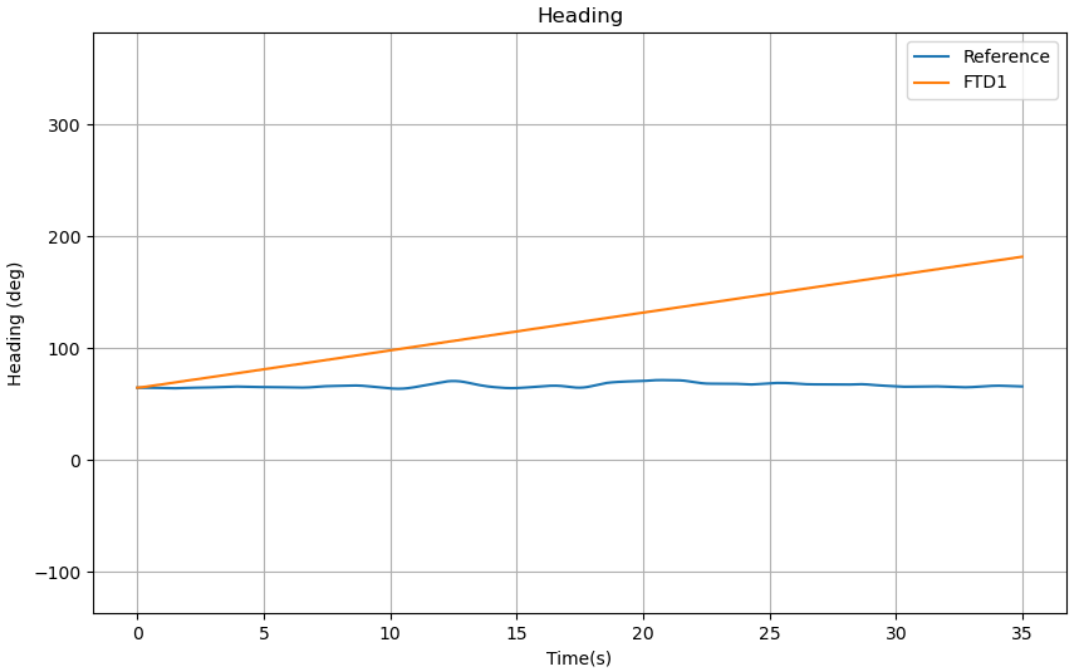
Rationales (Validation Data)	
Rationale 1 (All Subcases)	In the Hover flight maneuver Vertical Speed values are not reliable due to Rotor Downwash effects. In each current Test SubCases a stable Hover maneuver has been performed.

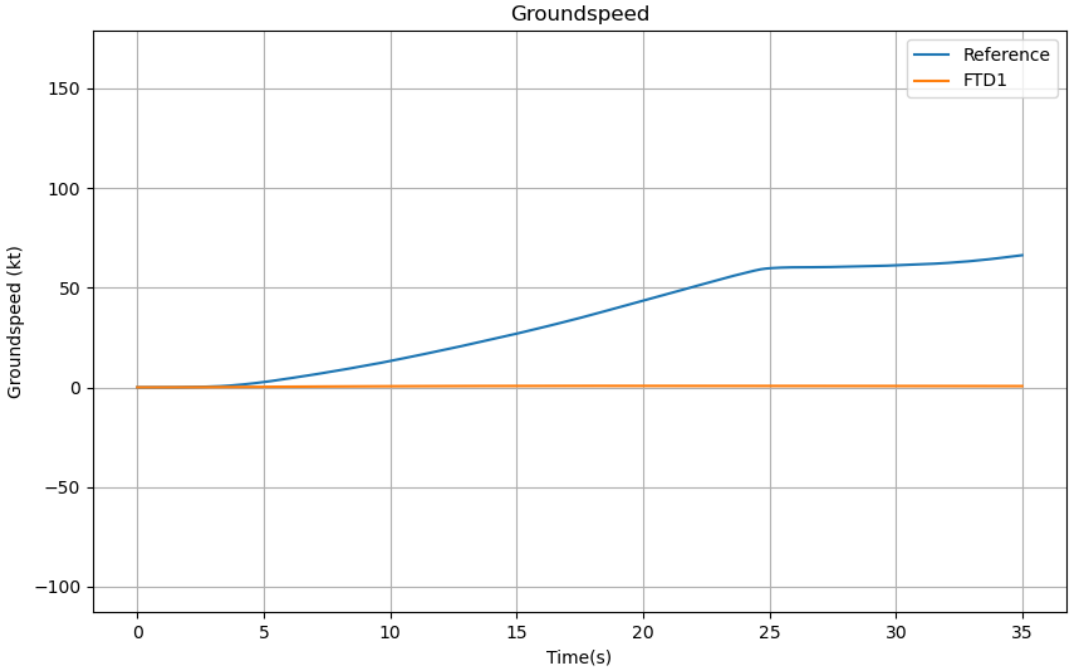
No Rationales related to current SubCase are present

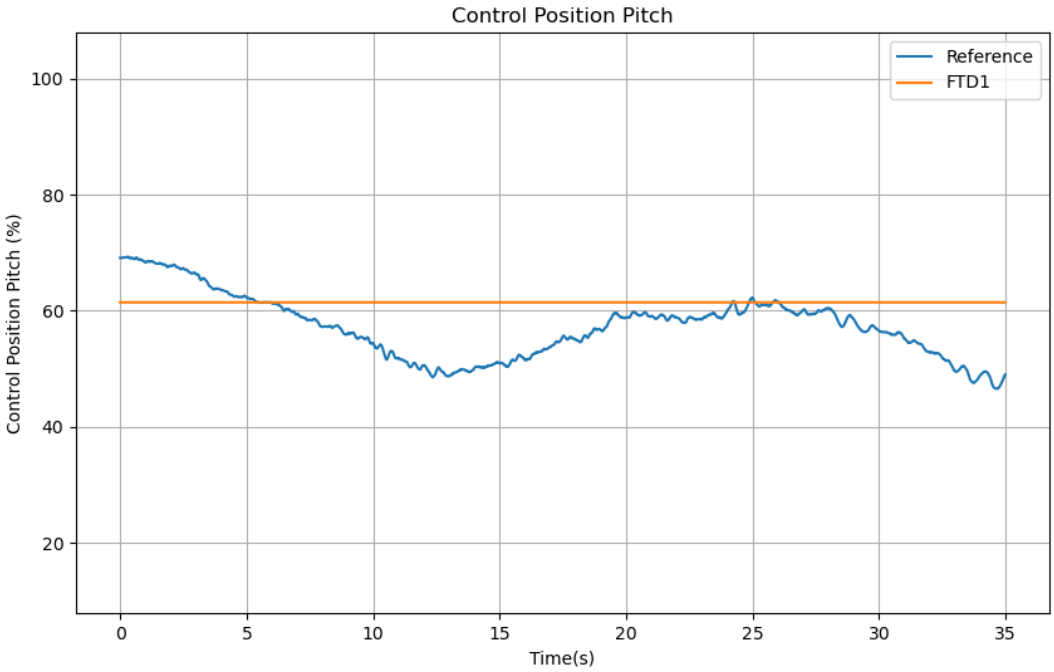
Rationales (Results)
No Rationales related to the entire Test are present
No Rationales related to current SubCase are present

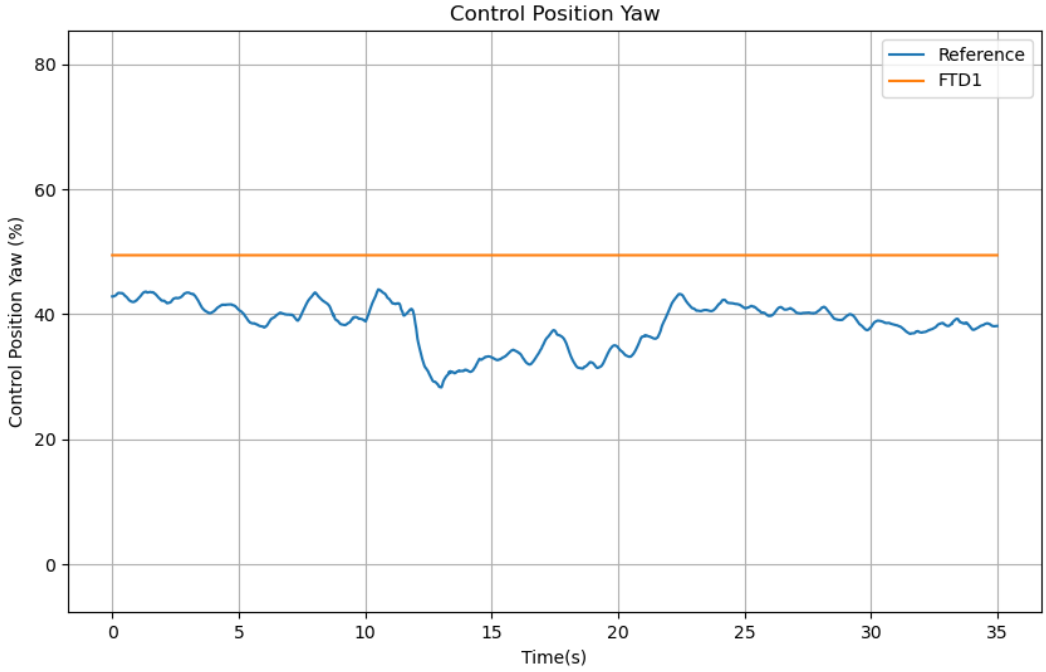

Engine1 TRQ Indicated
Reference
FTD1
Engine1 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

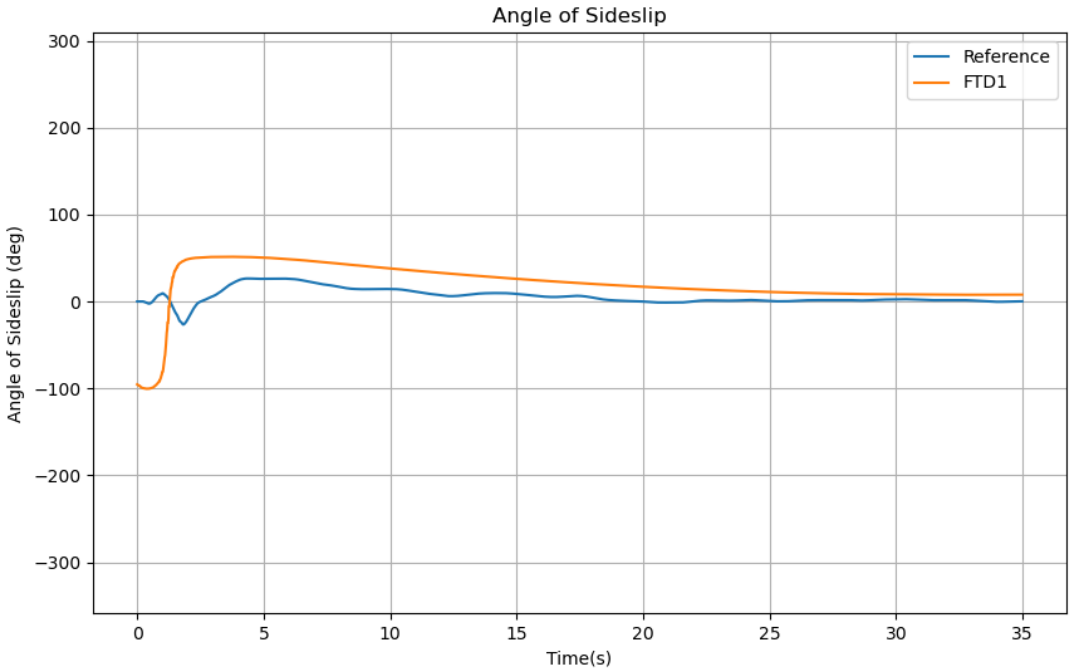

Engine2 TRQ Indicated
Reference
FTD1
Engine2 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

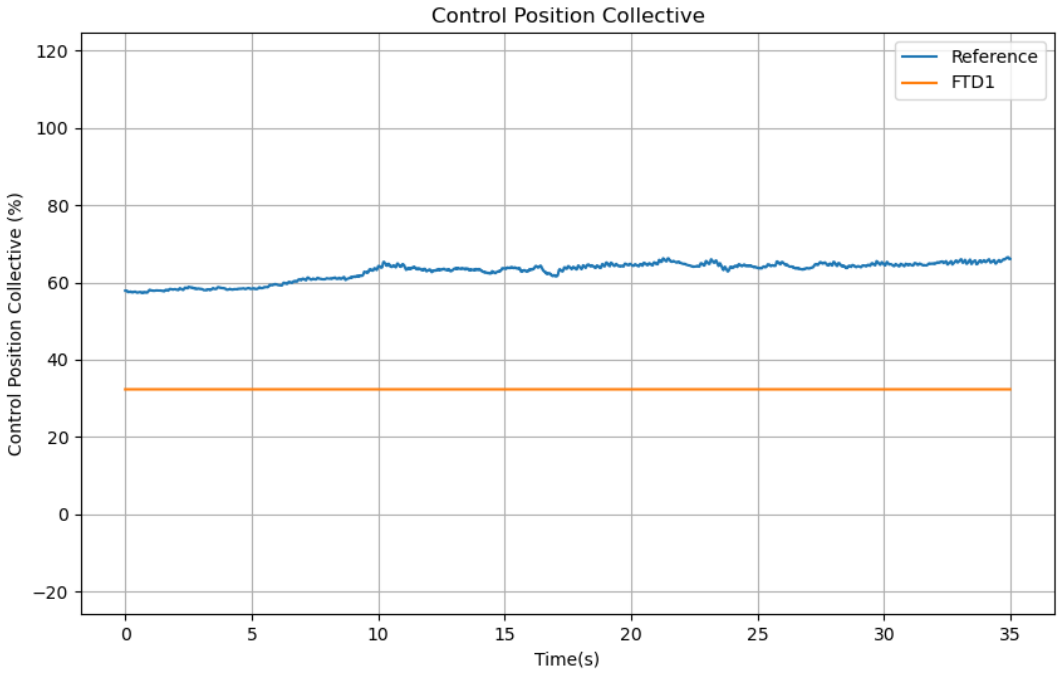

Heading
Reference
FTD1
300
200
100
0
−100
Heading (deg)
0
5
10
15
20
25
30
35
Time(s)

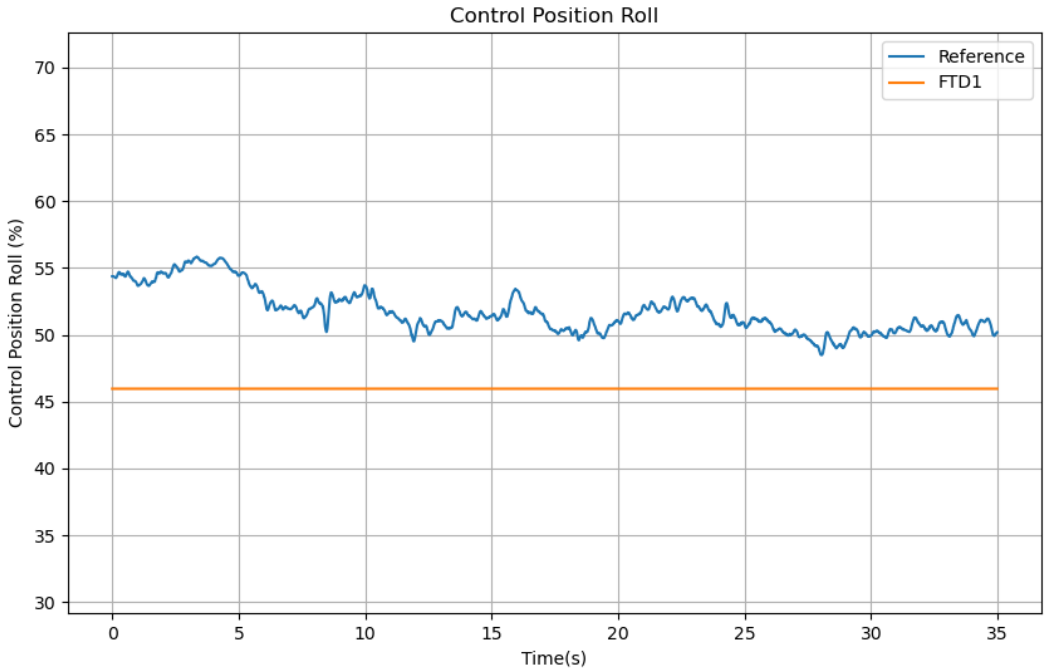

Groundspeed
Reference
FTD1
150
100
50
0
−50
−100
Groundspeed (kt)
0
5
10
15
20
25
30
35
Time(s)

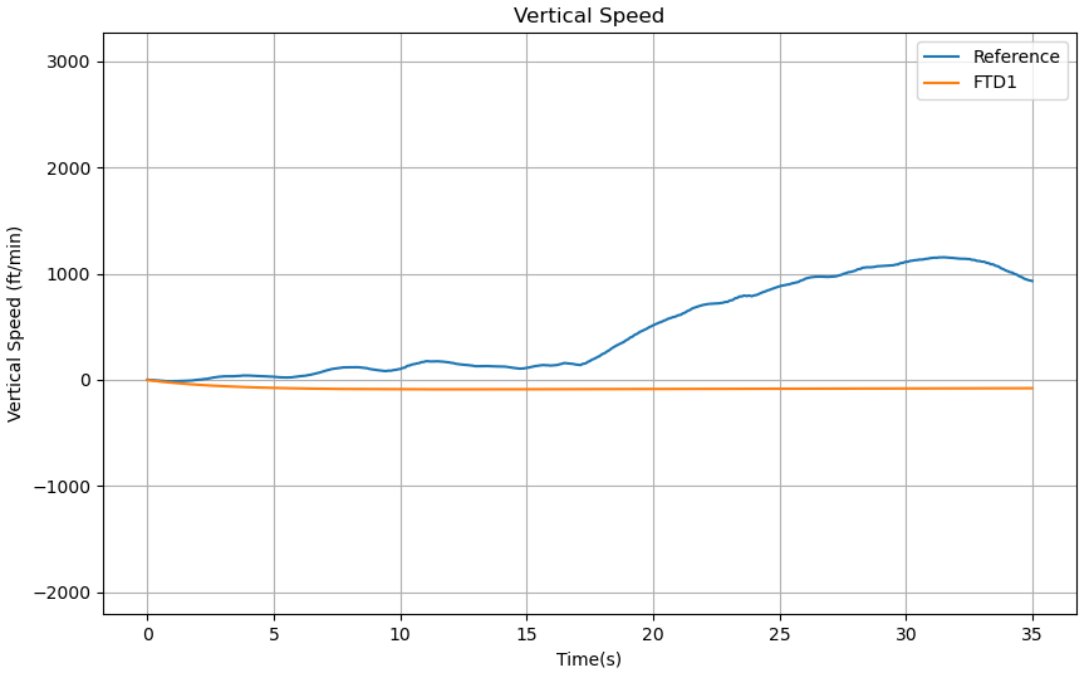

Control Position Pitch
Reference
FTD1
Control Position Pitch (%)
100
80
60
40
20
0
5
10
15
20
25
30
35
Time(s)

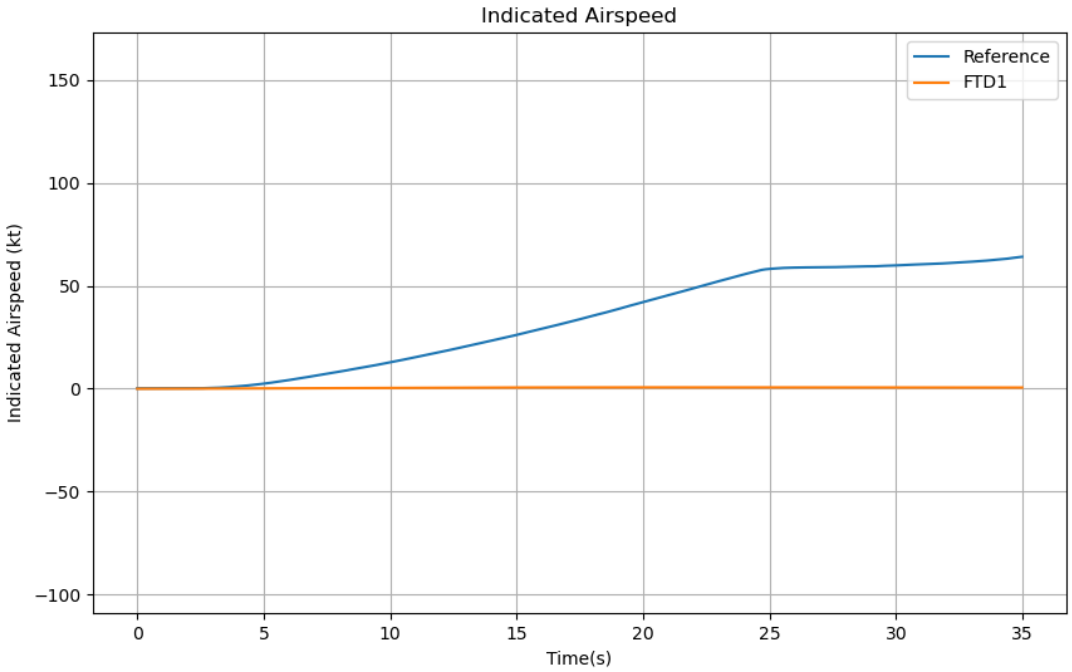

Control Position Yaw
Reference
FTD1
Control Position Yaw (%)
80
60
40
20
0
0
5
10
15
20
25
30
35
Time(s)

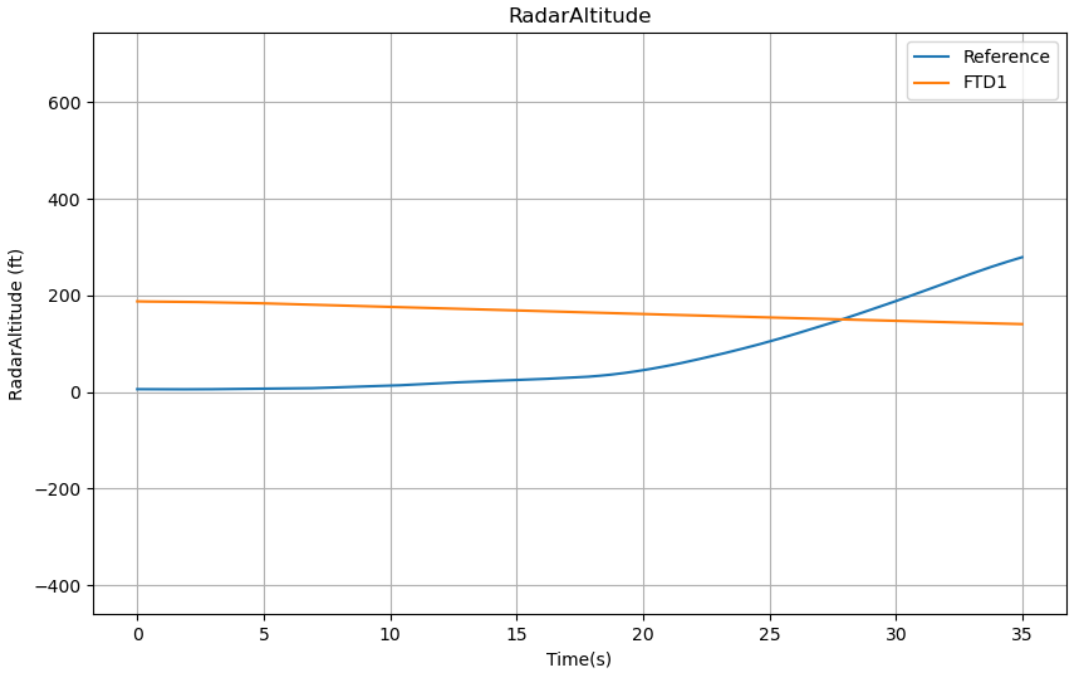

Angle of Sideslip
Reference
FTD1
Angle of Sideslip (deg)
300
200
100
0
−100
−200
−300
0
5
10
15
20
25
30
35
Time(s)

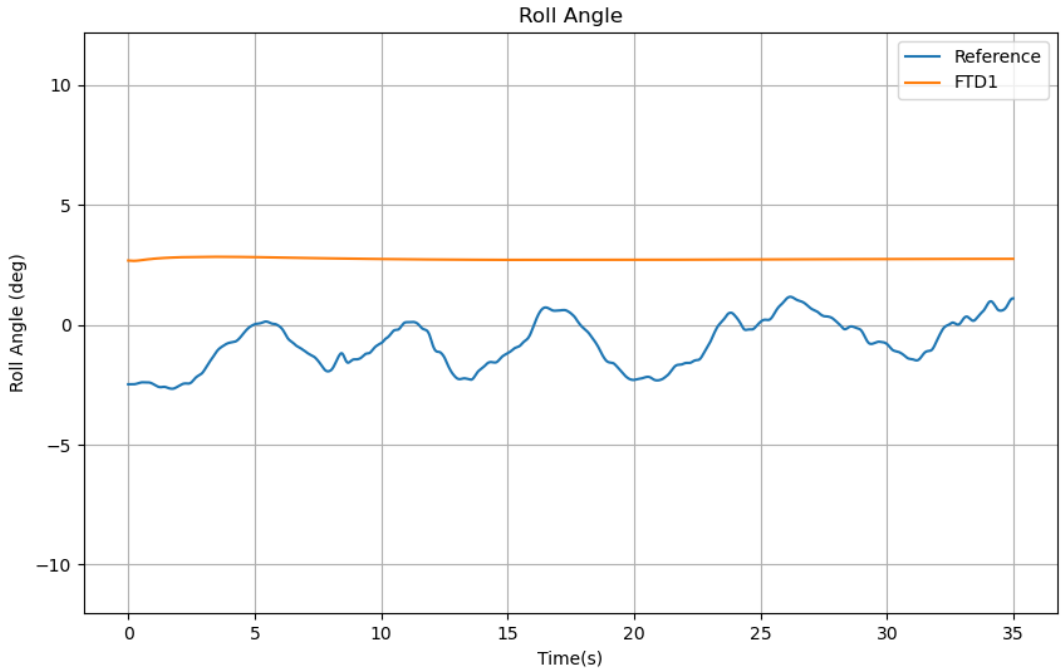

Control Position Collective
Reference
FTD1
Control Position Collective (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

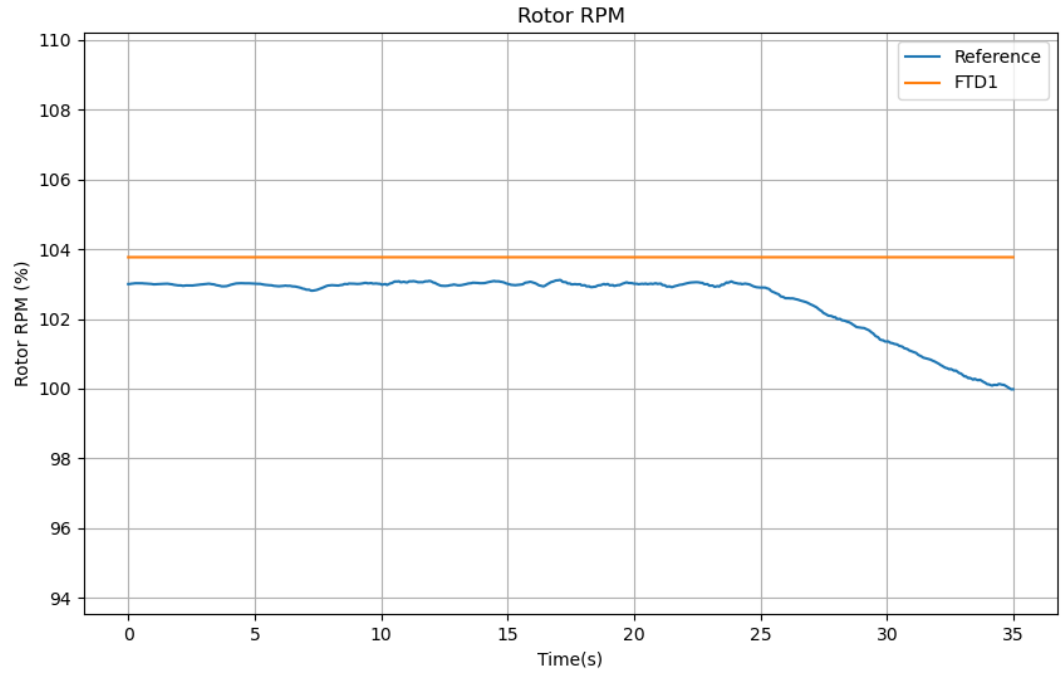

Control Position Roll
Reference
FTD1
Control Position Roll (%)
70
65
60
55
50
45
40
35
30
0
5
10
15
20
25
30
35
Time(s)

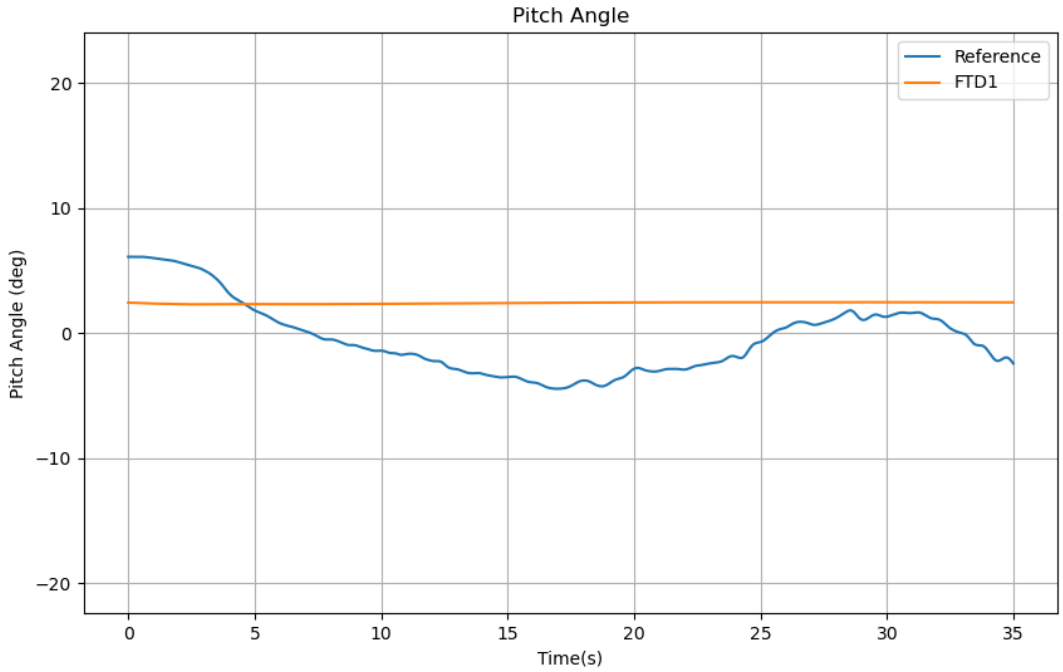

Vertical Speed
Reference
FTD1
Vertical Speed (ft/min)
3000
2000
1000
0
−1000
−2000
0
5
10
15
20
25
30
35
Time(s)


Indicated Airspeed
Reference
FTD1
Indicated Airspeed (kt)
150
100
50
0
−50
−100
0
5
10
15
20
25
30
35
Time(s)


RadarAltitude
Reference
FTD1
RadarAltitude (ft)
600
400
200
0
−200
−400
0
5
10
15
20
25
30
35
Time(s)


Roll Angle
Reference
FTD1
Roll Angle (deg)
10
5
0
−5
−10
0
5
10
15
20
25
30
35
Time(s)


Rotor RPM
Reference
FTD1
Rotor RPM (%)
110
108
106
104
102
100
98
96
94
0
5
10
15
20
25
30
35
Time(s)


Pitch Angle
Reference
FTD1
Pitch Angle (deg)
20
10
0
−10
−20
0
5
10
15
20
25
30
35
Time(s)

1.d.A1 Light GW, Aft CG - 3 ft AGL

Test Procedure

On the IOS select ’Maintenance’ page then ’QTG-Test’. The test can be run either in automatic or manual mode.

Automatic testing: drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed. Cockpit controls and switches status will be overwritten by the QTG Tool.

Press ’Start QTG Execution’ to start the test.

The flight controls will be controlled according to the following table:

Flight Controls	Status
Longitudinal	DIRECT DRIVEN
Lateral	DIRECT DRIVEN
Collective	DIRECT DRIVEN
Pedals	DIRECT DRIVEN

Manual testing: follow the Manual Procedure steps indicated in the next page.

Manual Procedure

1. Drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed.
2. In the Test Selection list toggle from ’Automatic’ to ’Manual’.
3. Press ’Start QTG execution’. Wait for the completion message of the initialization phase.
4. Setup the cockpit as indicated in the Cockpit Configuration table below.
5. Press the Spare button on the Cyclic stick to run the simulation.
6. Stabilize and maintain current flight condition.
7. Press the Spare button on the Cyclic stick to start recording. On the IOS ’Manual QTG’ page, check that an indication of the test elapsed time is shown.
8. Press the Spare button on the Cyclic stick to complete the test or to proceed with the next test.

Initial Conditions

Parameter [UoM]	Reference*	FSTD
Mass Properties		
Gross Weight	2757.9	7500.0
Fuel Weigth	341.1	0.0
CG Longitudinal	4232	-4.7
CG Lateral	23	0.0
Moment of Inertia XX	2825	9638.0
Moment of Inertia XZ	-981	2226.0
Moment of Inertia YY	10635	33240.0
Moment of Inertia ZZ	12261	25889.0
Environment Parameters		
Pressure Altitude	1307.1	344.90347448792386
OAT	13.8	13.8
Wind Direction	0.0	0.0
Wind Speed	0.0	0.0
Flight Parameters		
Airspeed	0.2	-0.0007328300784191671
Ground Speed	0.0	0.008344186369269284
Vertical Velocity	0.0	0.013288436214678432
Radar Altitude	5.7	187.67051261194212
Rotor Speed	103.0	28.797932657908333
Engine 1 Torque	57.9	31.95777495505339
Engine 2 Torque	57.9	31.95777495505339
Pitch Angle	6.1	0.04253490439090714
Bank Angle	-2.5	0.046752386160144134
Heading	64.7	1.1314822542825382
Pitch Rate	0.0	0.00038809458831355273
Roll Rate	-0.0	-0.003734954692935167
Yaw Rate	-0.0	0.02717967586248816
X Body Acceleration	-0.1	0.0
Y Body Acceleration	-0.0	0.0
Z Body Acceleration	-0.0	0.0
Longitudinal Cyclic Pos.	69.1	-0.228729248046875
Lateral Cyclic Pos.	54.4	-0.080810546875
Pedals Pos.	42.8	-0.011199951171875
Collective Pos.	57.8	-0.3538818359375
Engine 1 Main Switch	FLIGHT	FLIGHT
Engine 2 Main Switch	FLIGHT	FLIGHT
AFCS State	DSAS	SCAS
HINR Button	HINR	HINR

* Snapshot Tests: Reference initial conditions are computed as mean values over data time histories

Test Results

Parameter [U oM]	**Reference**	**Min****	**FSTD**	**Max****
Snapshot Data				
Engine 1 Torque [%]	1	2	3	4

** The Min value is computed as the Reference value minus the specific tolerance value.
The Max value is computed as the Reference value plus the specific tolerance value

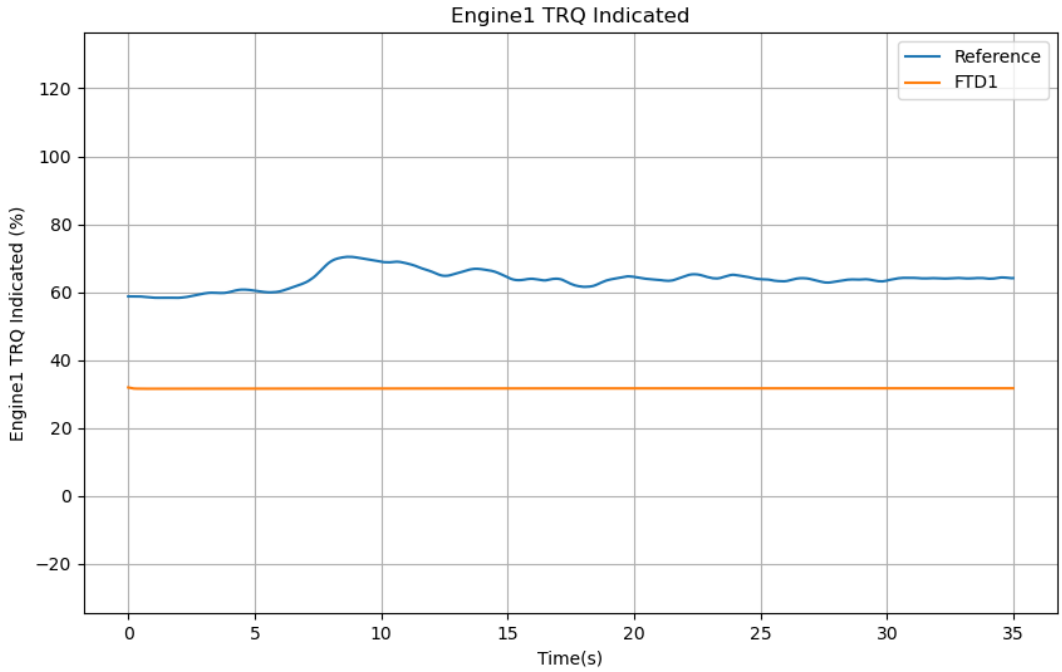
Notes and Rationales

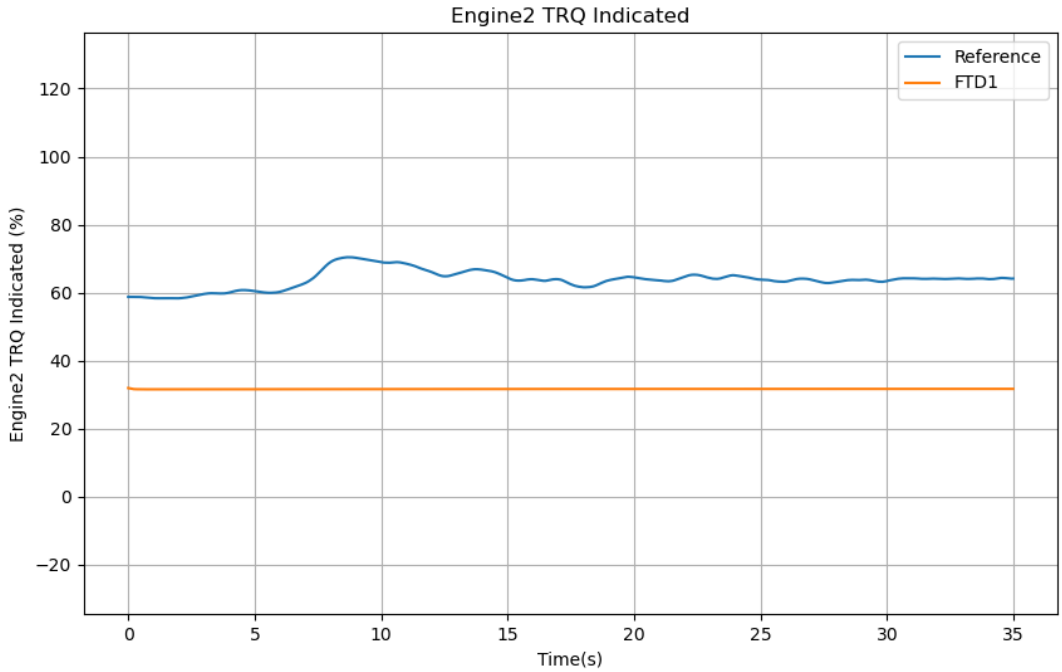
Notes
No Notes related to the entire Test are present
No Notes related to current SubCase are present

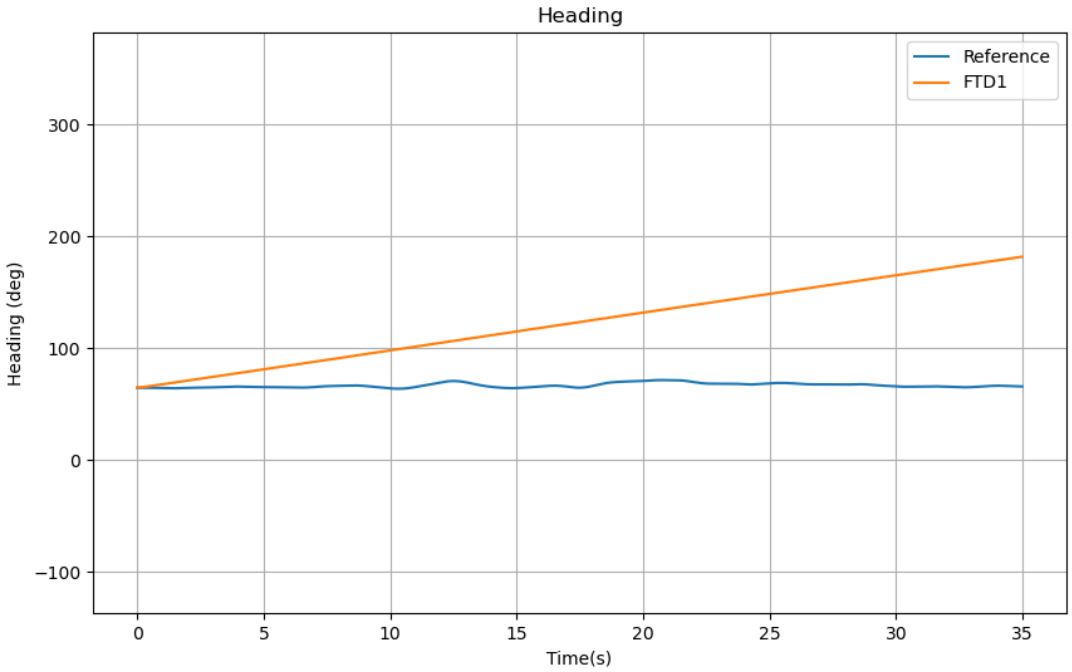
Rationales (Validation Data)	
Rationale 1 (All Subcases)	In the Hover flight maneuver Vertical Speed values are not reliable due to Rotor Downwash effects. In each current Test SubCases a stable Hover maneuver has been performed.

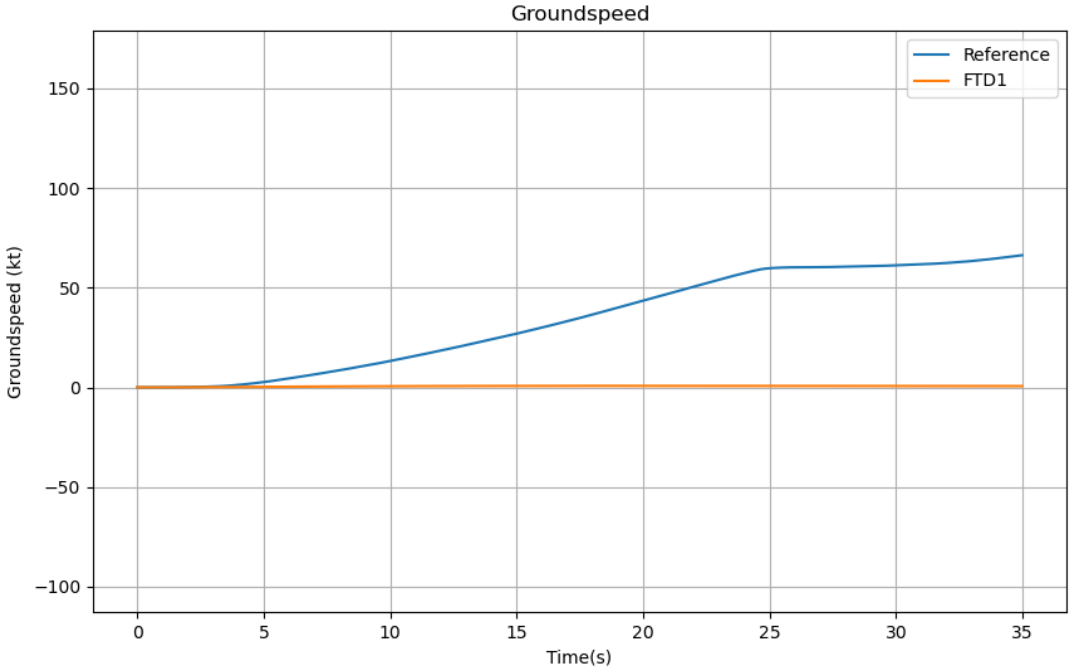
No Rationales related to current SubCase are present

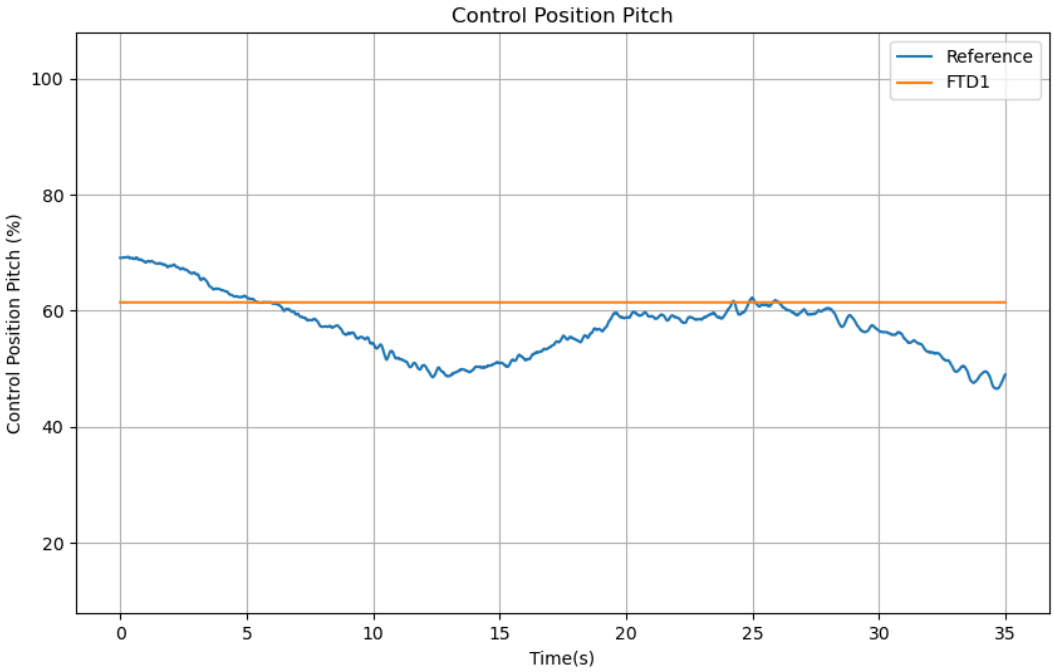
Rationales (Results)
No Rationales related to the entire Test are present
No Rationales related to current SubCase are present

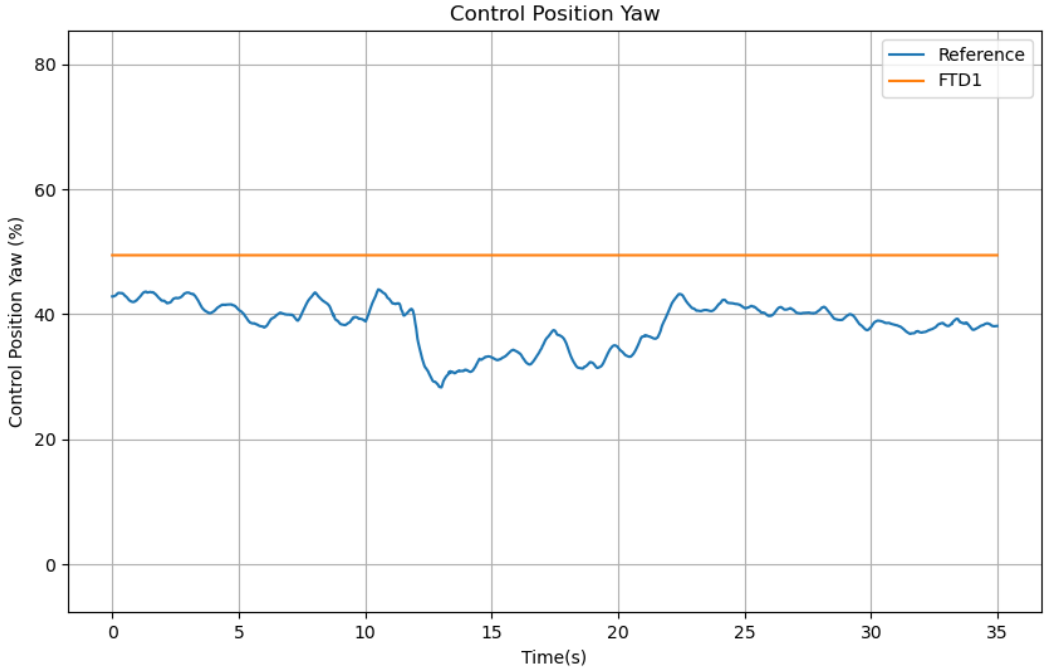

Engine1 TRQ Indicated
Reference
FTD1
Engine1 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

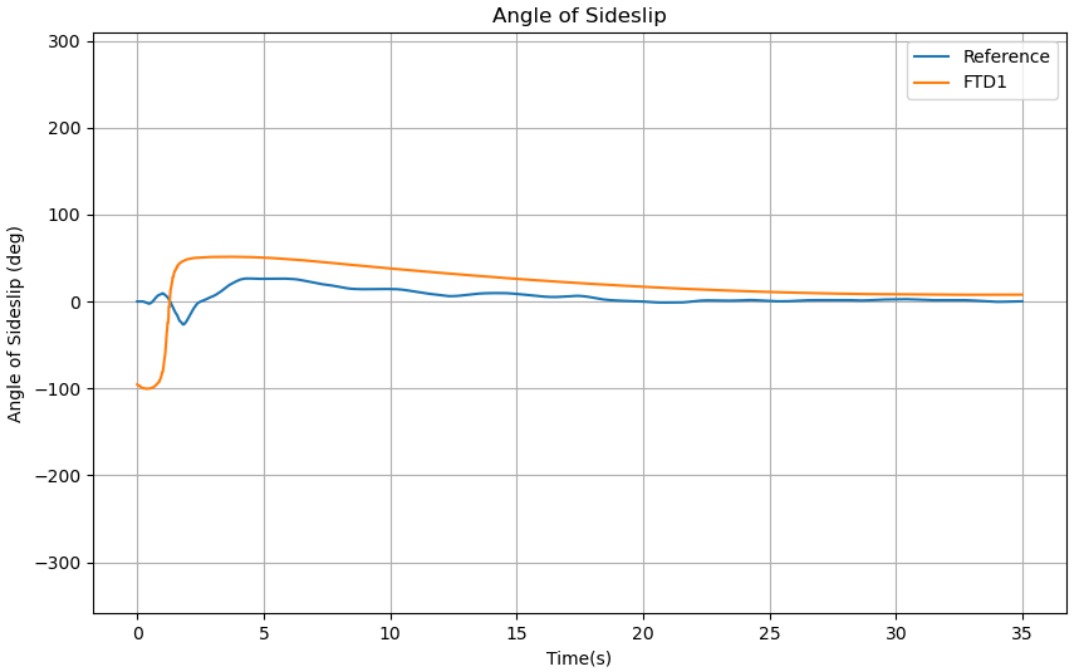

Engine2 TRQ Indicated
Reference
FTD1
Engine2 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

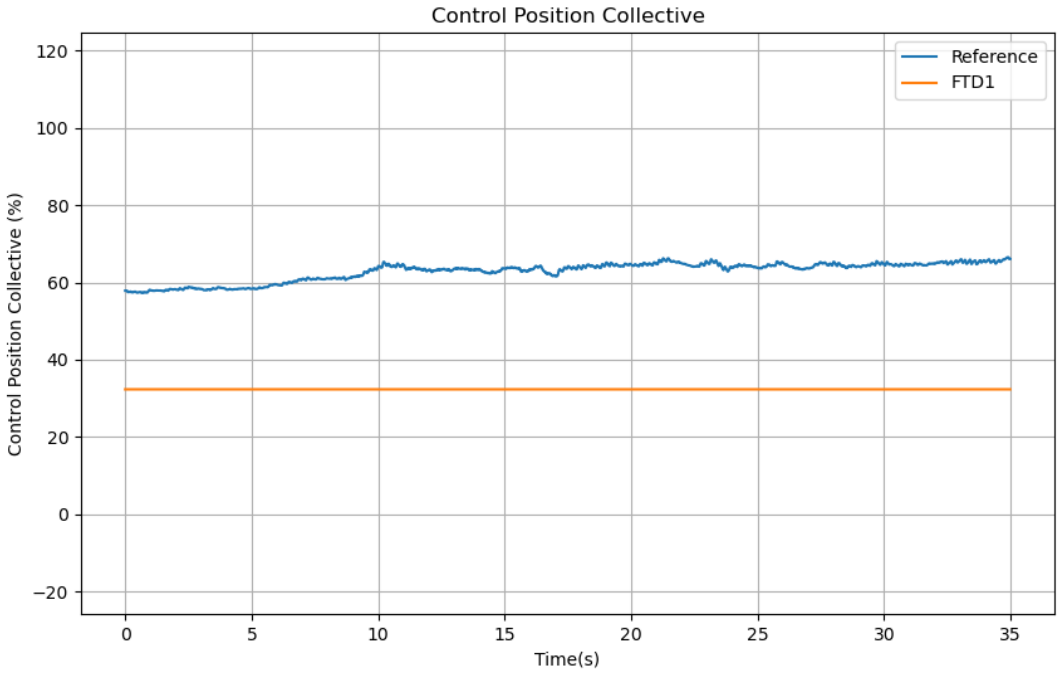

Heading
Reference
FTD1
300
200
100
0
−100
Heading (deg)
0
5
10
15
20
25
30
35
Time(s)

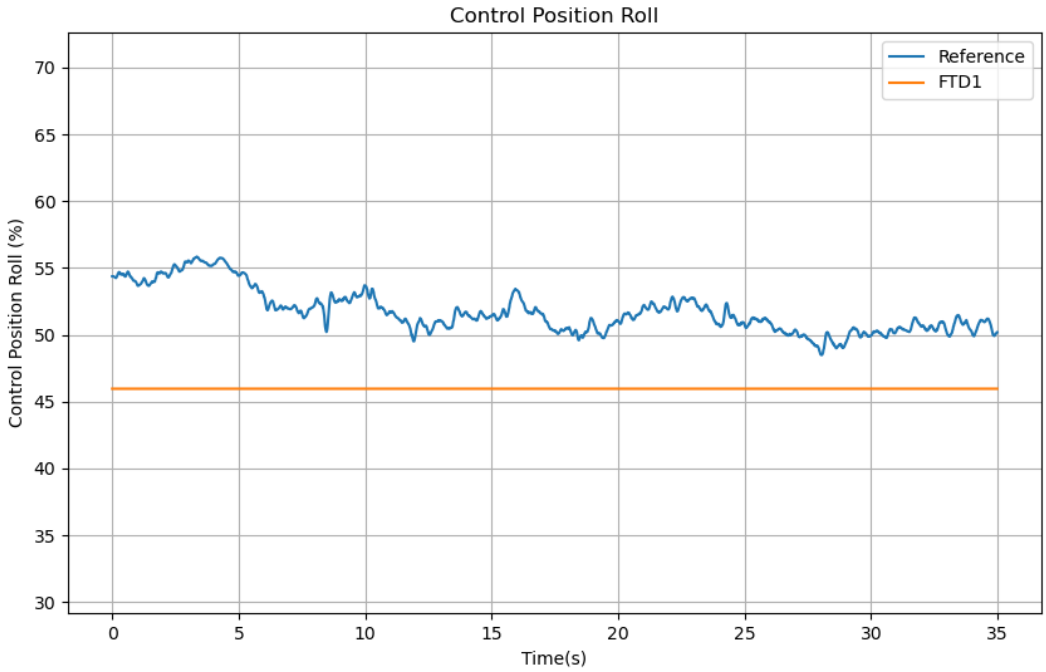

Groundspeed
Reference
FTD1
150
100
50
0
−50
−100
Groundspeed (kt)
0
5
10
15
20
25
30
35
Time(s)

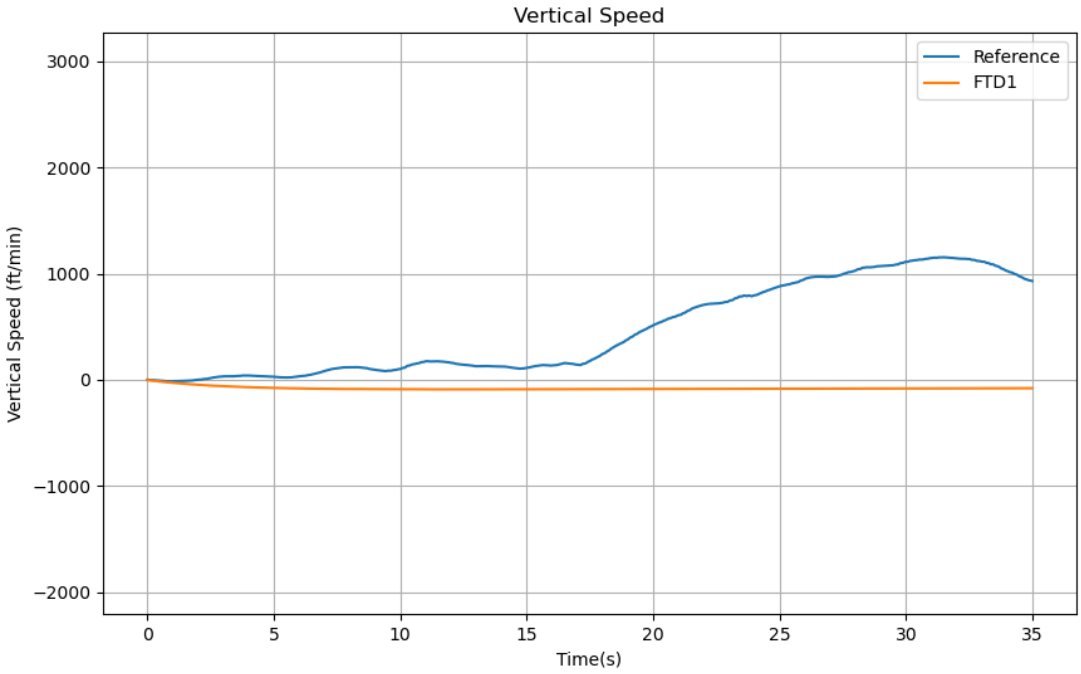

Control Position Pitch
Reference
FTD1
Control Position Pitch (%)
100
80
60
40
20
0
5
10
15
20
25
30
35
Time(s)

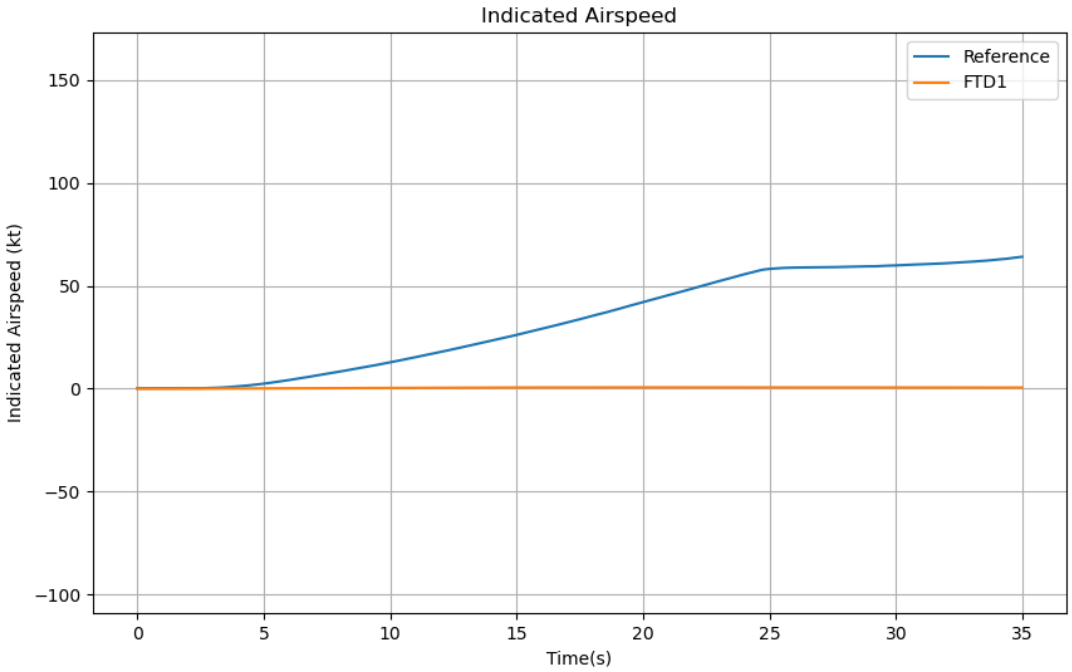

Control Position Yaw
Reference
FTD1
Control Position Yaw (%)
80
60
40
20
0
0
5
10
15
20
25
30
35
Time(s)

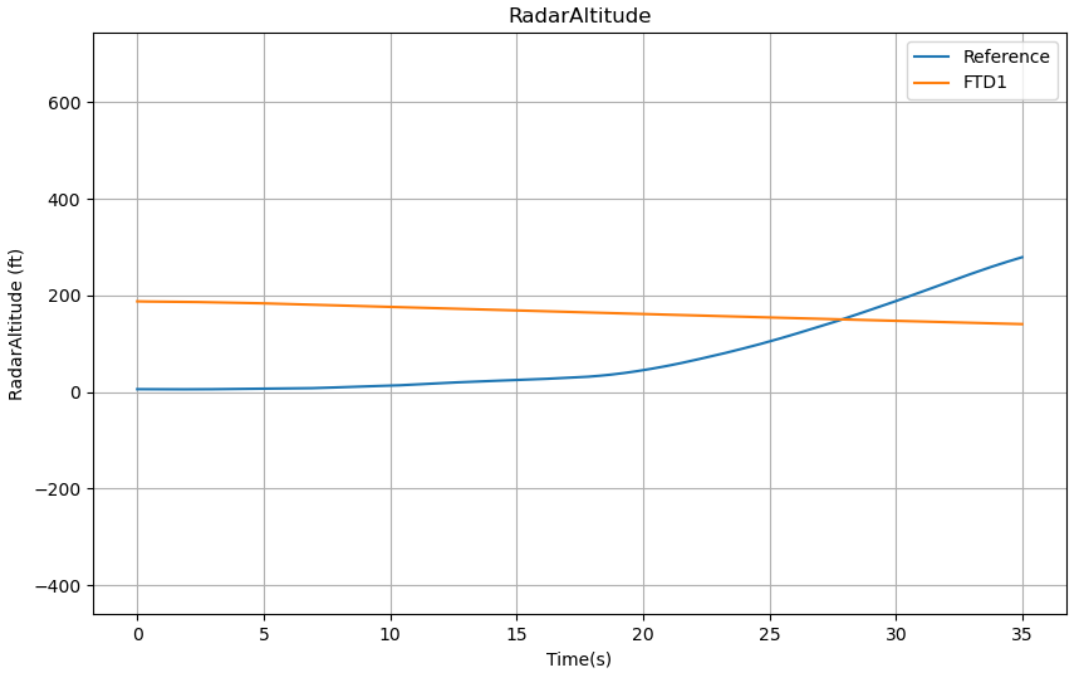

Angle of Sideslip
Reference
FTD1
Angle of Sideslip (deg)
300
200
100
0
−100
−200
−300
0
5
10
15
20
25
30
35
Time(s)

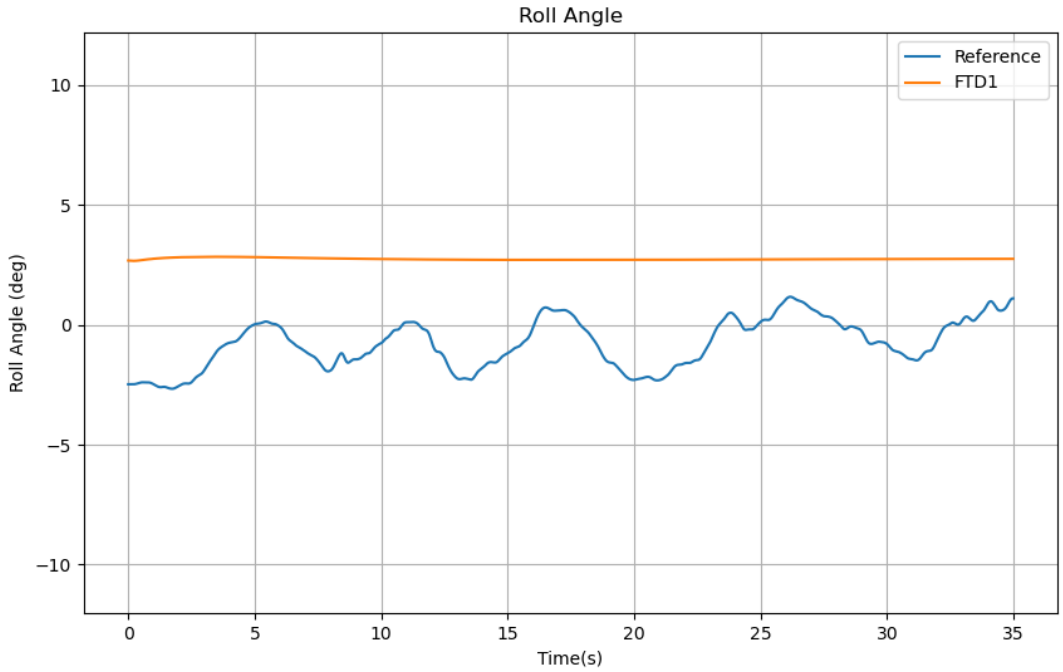

Control Position Collective
Reference
FTD1
Control Position Collective (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

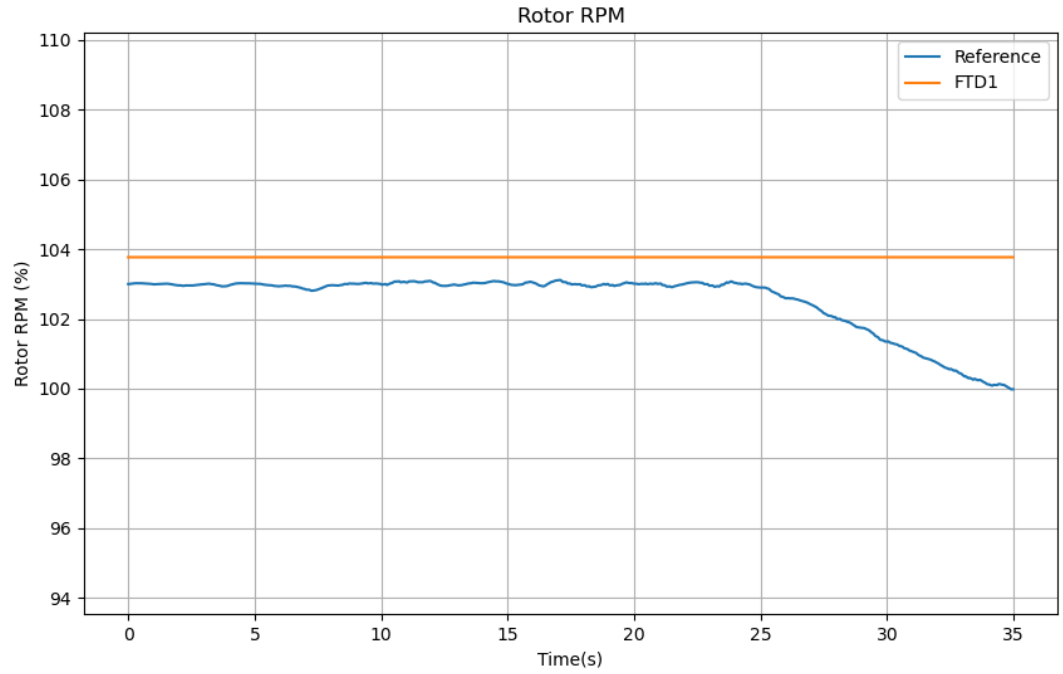

Control Position Roll
Reference
FTD1
Control Position Roll (%)
70
65
60
55
50
45
40
35
30
0
5
10
15
20
25
30
35
Time(s)

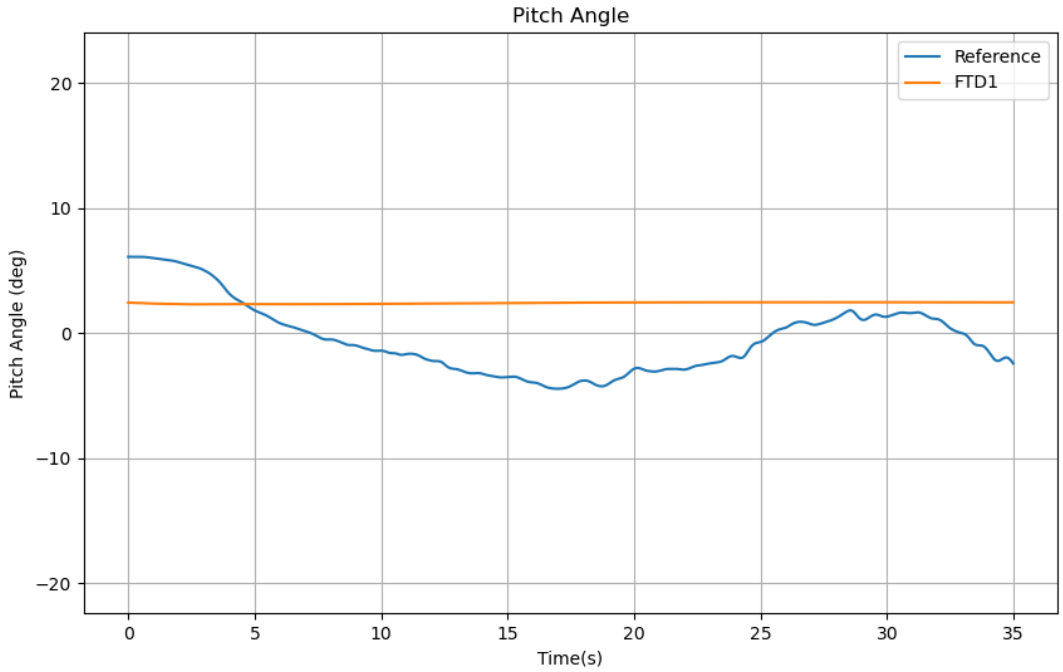

Vertical Speed
Reference
FTD1
Vertical Speed (ft/min)
3000
2000
1000
0
−1000
−2000
0
5
10
15
20
25
30
35
Time(s)


Indicated Airspeed
Reference
FTD1
Indicated Airspeed (kt)
150
100
50
0
−50
−100
0
5
10
15
20
25
30
35
Time(s)


RadarAltitude
Reference
FTD1
RadarAltitude (ft)
600
400
200
0
−200
−400
0
5
10
15
20
25
30
35
Time(s)


Roll Angle
Reference
FTD1
Roll Angle (deg)
10
5
0
−5
−10
0
5
10
15
20
25
30
35
Time(s)


Rotor RPM
Reference
FTD1
Rotor RPM (%)
110
108
106
104
102
100
98
96
94
0
5
10
15
20
25
30
35
Time(s)


Pitch Angle
Reference
FTD1
Pitch Angle (deg)
20
10
0
−10
−20
0
5
10
15
20
25
30
35
Time(s)

1.d.A2 Light GW, Aft CG - 10 ft AGL

Test Procedure

On the IOS select ’Maintenance’ page then ’QTG-Test’. The test can be run either in automatic or manual mode.

Automatic testing: drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed. Cockpit controls and switches status will be overwritten by the QTG Tool.

Press ’Start QTG Execution’ to start the test.

The flight controls will be controlled according to the following table:

Flight Controls	Status
Longitudinal	DIRECT DRIVEN
Lateral	DIRECT DRIVEN
Collective	DIRECT DRIVEN
Pedals	DIRECT DRIVEN

Manual testing: follow the Manual Procedure steps indicated in the next page.

Manual Procedure

1. Drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed.
2. In the Test Selection list toggle from ’Automatic’ to ’Manual’.
3. Press ’Start QTG execution’. Wait for the completion message of the initialization phase.
4. Setup the cockpit as indicated in the Cockpit Configuration table below.
5. Press the Spare button on the Cyclic stick to run the simulation.
6. Stabilize and maintain current flight condition.
7. Press the Spare button on the Cyclic stick to start recording. On the IOS ’Manual QTG’ page, check that an indication of the test elapsed time is shown.
8. Press the Spare button on the Cyclic stick to complete the test or to proceed with the next test.

Initial Conditions

Parameter [UoM]	Reference*	FSTD
Mass Properties		
Gross Weight	2757.9	7500.0
Fuel Weigth	341.1	0.0
CG Longitudinal	4232	-4.7
CG Lateral	23	0.0
Moment of Inertia XX	2825	9638.0
Moment of Inertia XZ	-981	2226.0
Moment of Inertia YY	10635	33240.0
Moment of Inertia ZZ	12261	25889.0
Environment Parameters		
Pressure Altitude	1307.1	344.90347448792386
OAT	13.8	13.8
Wind Direction	0.0	0.0
Wind Speed	0.0	0.0
Flight Parameters		
Airspeed	0.2	-0.0007328300784191671
Ground Speed	0.0	0.008344186369269284
Vertical Velocity	0.0	0.013288436214678432
Radar Altitude	5.7	187.67051261194212
Rotor Speed	103.0	28.797932657908333
Engine 1 Torque	57.9	31.95777495505339
Engine 2 Torque	57.9	31.95777495505339
Pitch Angle	6.1	0.04253490439090714
Bank Angle	-2.5	0.046752386160144134
Heading	64.7	1.1314822542825382
Pitch Rate	0.0	0.00038809458831355273
Roll Rate	-0.0	-0.003734954692935167
Yaw Rate	-0.0	0.02717967586248816
X Body Acceleration	-0.1	0.0
Y Body Acceleration	-0.0	0.0
Z Body Acceleration	-0.0	0.0
Longitudinal Cyclic Pos.	69.1	-0.228729248046875
Lateral Cyclic Pos.	54.4	-0.080810546875
Pedals Pos.	42.8	-0.011199951171875
Collective Pos.	57.8	-0.3538818359375
Engine 1 Main Switch	FLIGHT	FLIGHT
Engine 2 Main Switch	FLIGHT	FLIGHT
AFCS State	DSAS	SCAS
HINR Button	HINR	HINR

* Snapshot Tests: Reference initial conditions are computed as mean values over data time histories

Test Results

Parameter [U oM]	**Reference**	**Min****	**FSTD**	**Max****
Snapshot Data				
Engine 1 Torque [%]	1	2	3	4

** The Min value is computed as the Reference value minus the specific tolerance value.
The Max value is computed as the Reference value plus the specific tolerance value

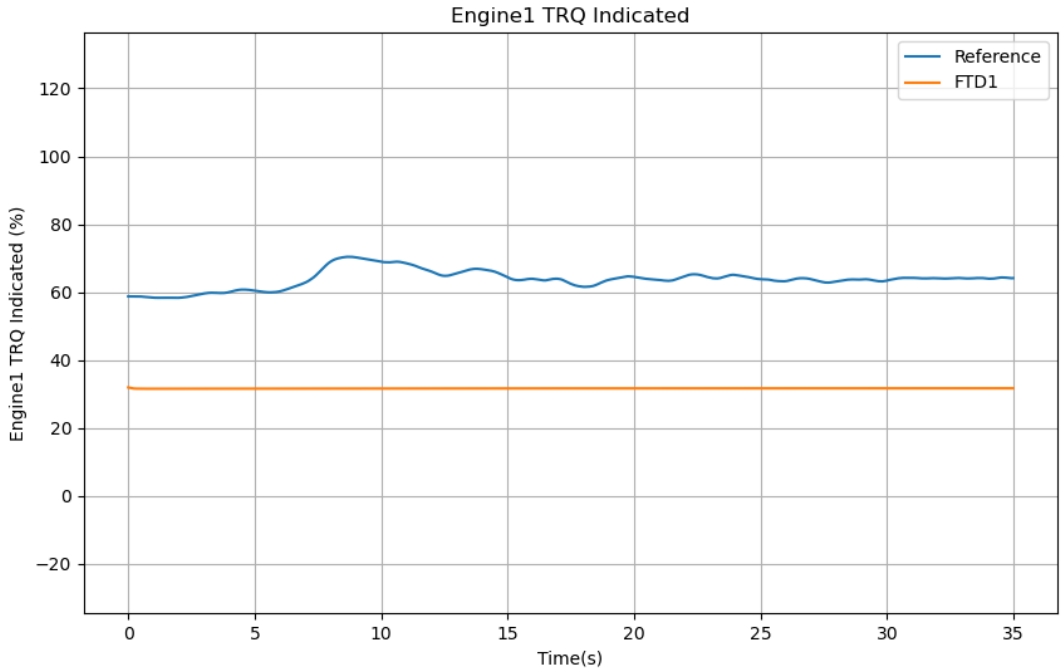
Notes and Rationales

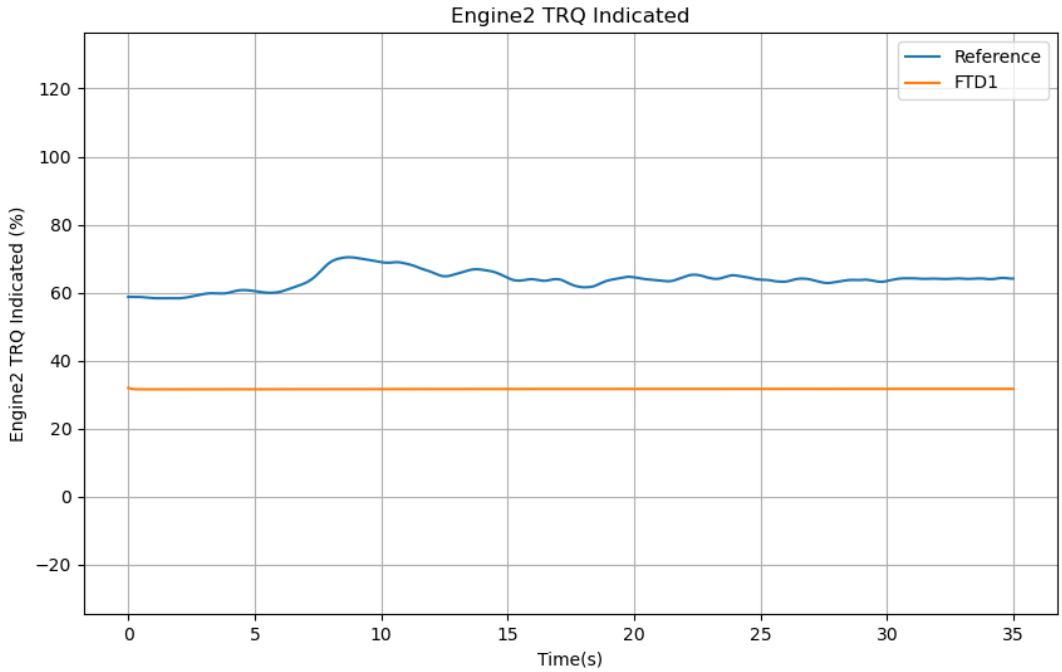
Notes
No Notes related to the entire Test are present
No Notes related to current SubCase are present

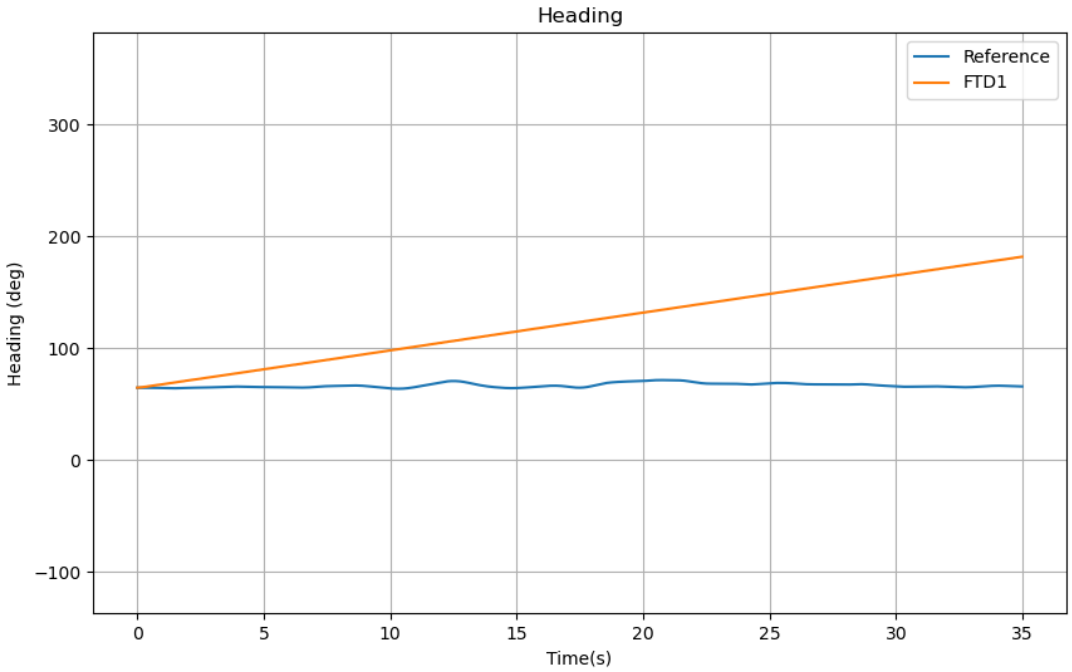
Rationales (Validation Data)	
Rationale 1 (All Subcases)	In the Hover flight maneuver Vertical Speed values are not reliable due to Rotor Downwash effects. In each current Test SubCases a stable Hover maneuver has been performed.

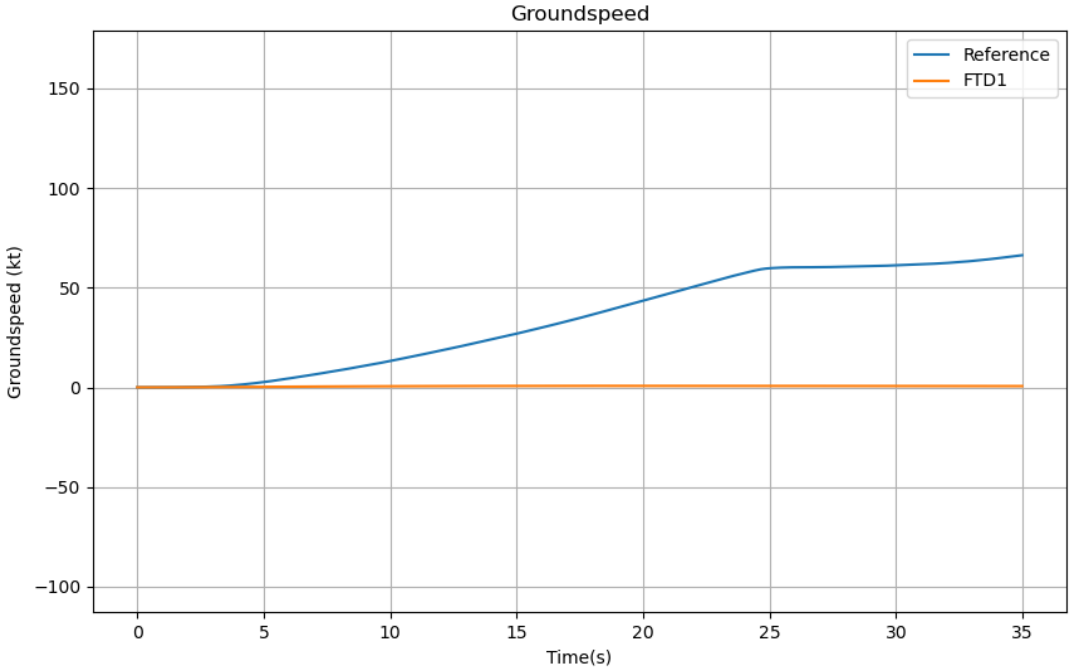
No Rationales related to current SubCase are present

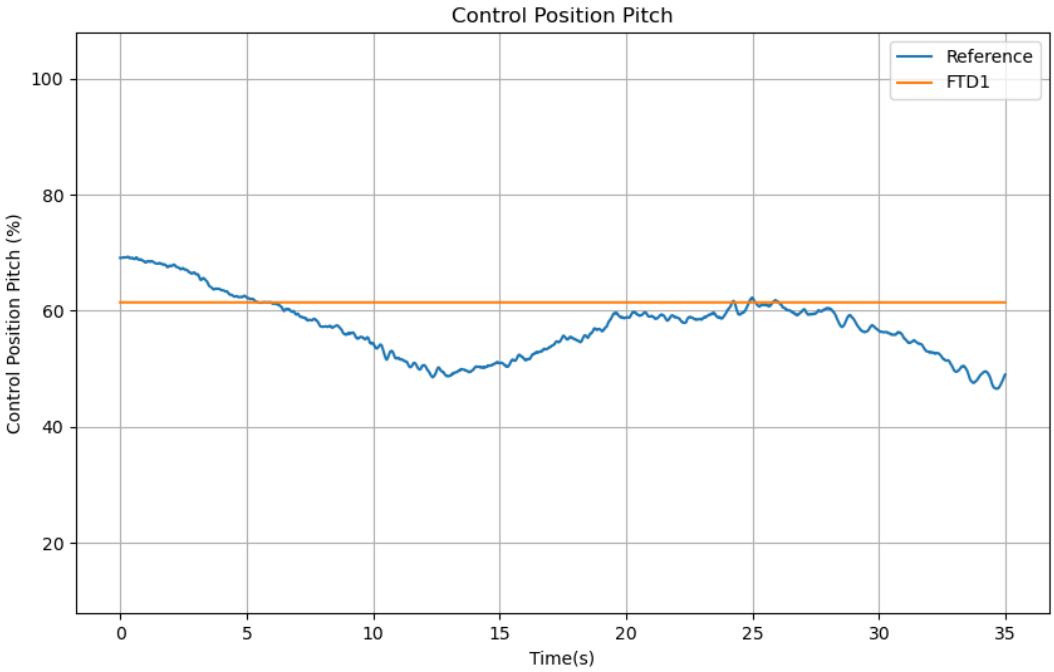
Rationales (Results)
No Rationales related to the entire Test are present
No Rationales related to current SubCase are present

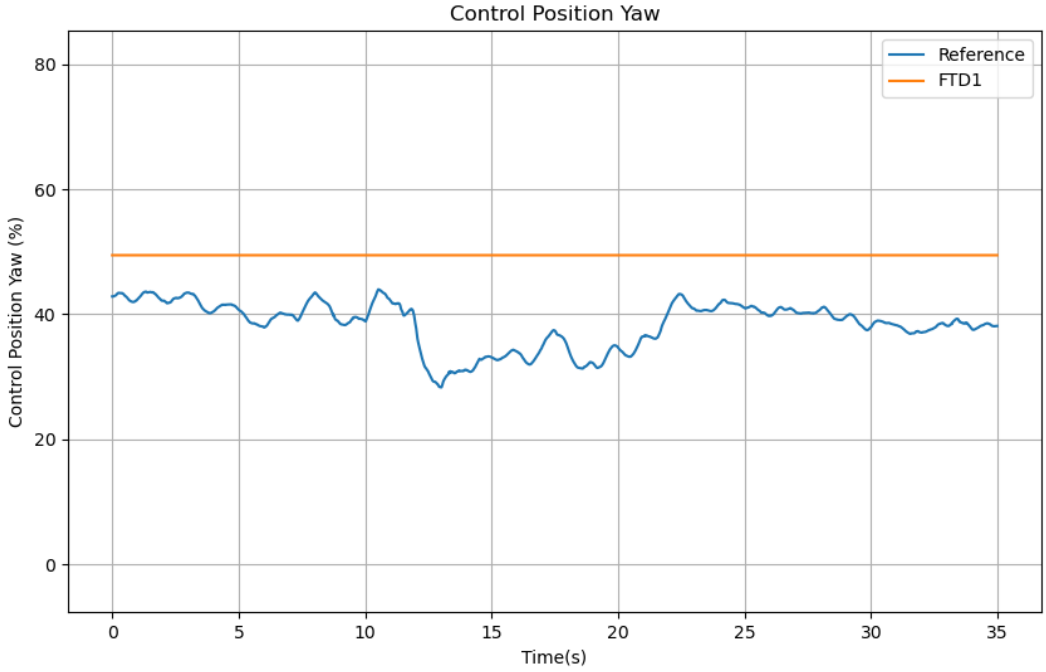

Engine1 TRQ Indicated
Reference
FTD1
Engine1 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

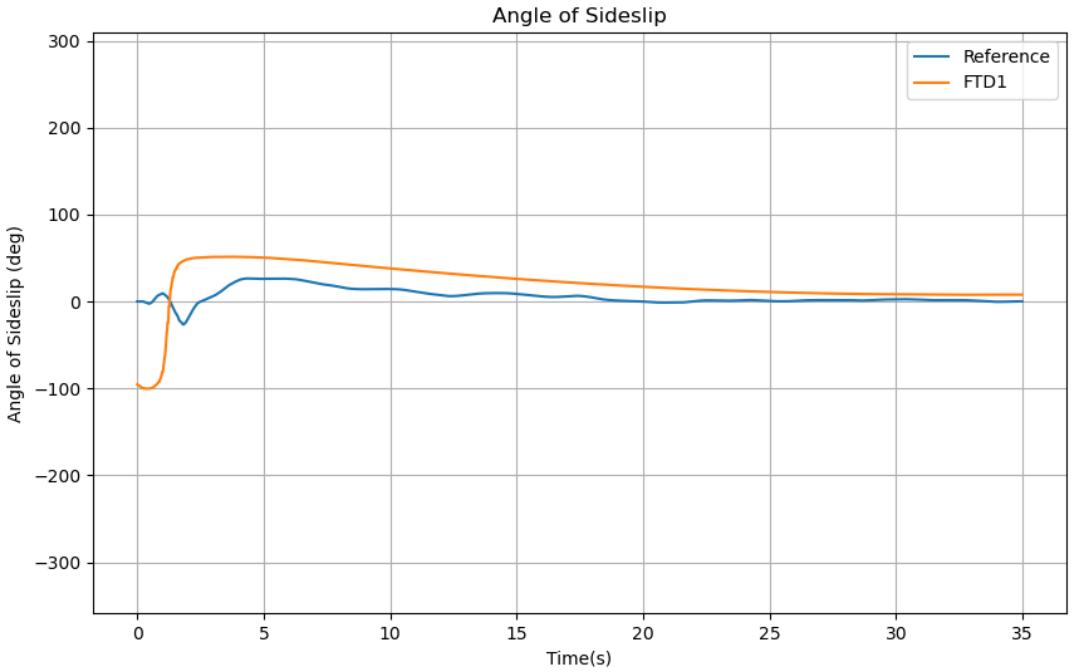

Engine2 TRQ Indicated
Reference
FTD1
Engine2 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

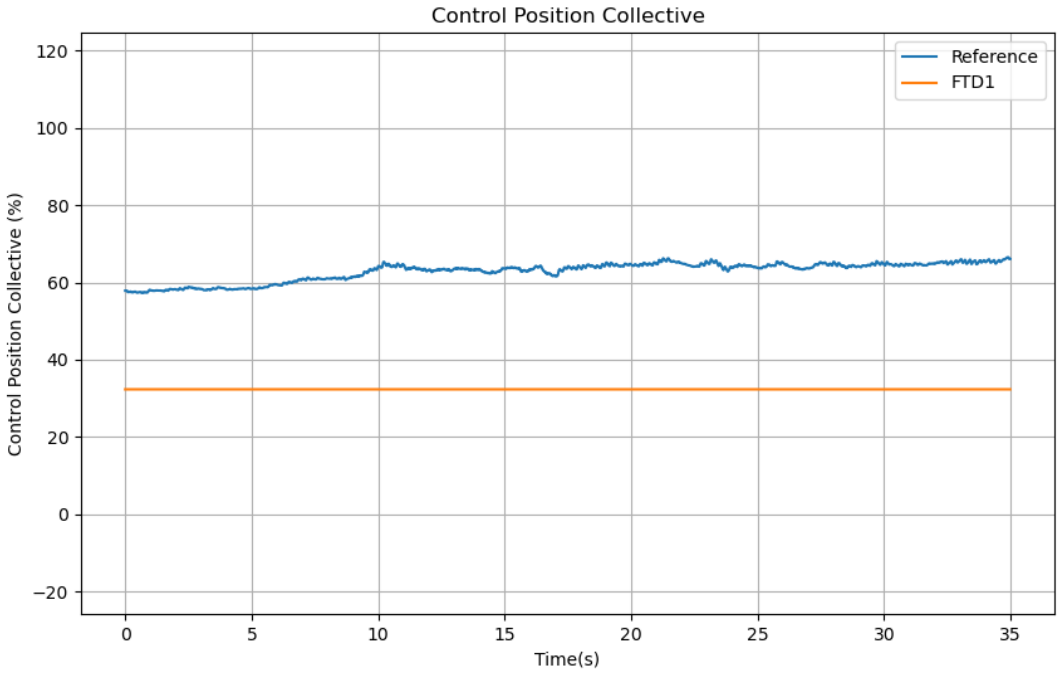

Heading
Reference
FTD1
300
200
100
0
−100
Heading (deg)
0
5
10
15
20
25
30
35
Time(s)

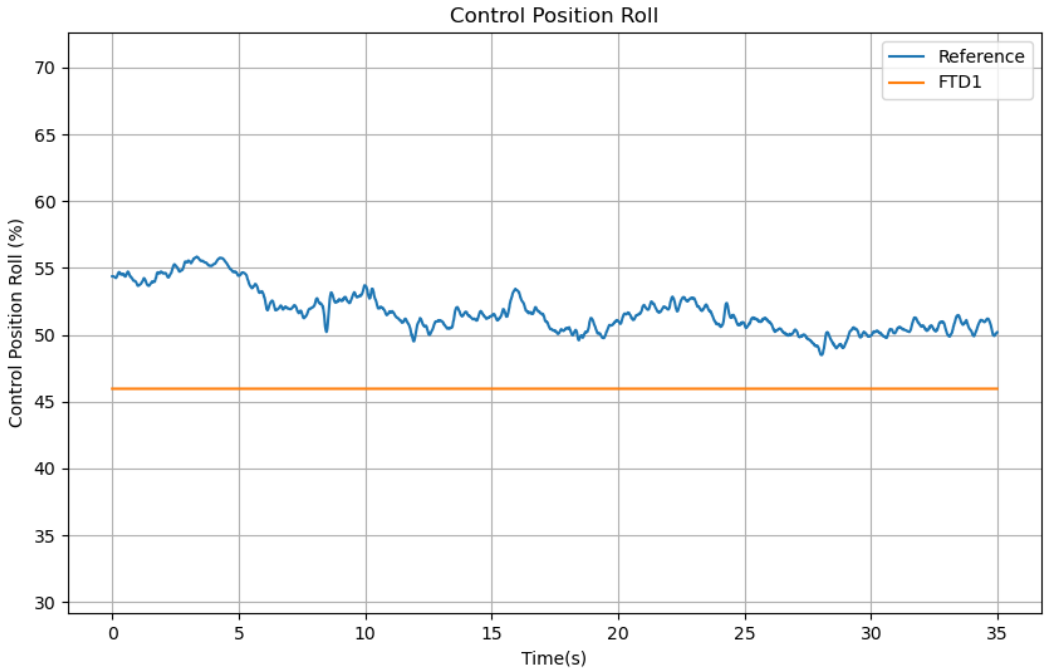

Groundspeed
Reference
FTD1
150
100
50
0
−50
−100
Groundspeed (kt)
0
5
10
15
20
25
30
35
Time(s)

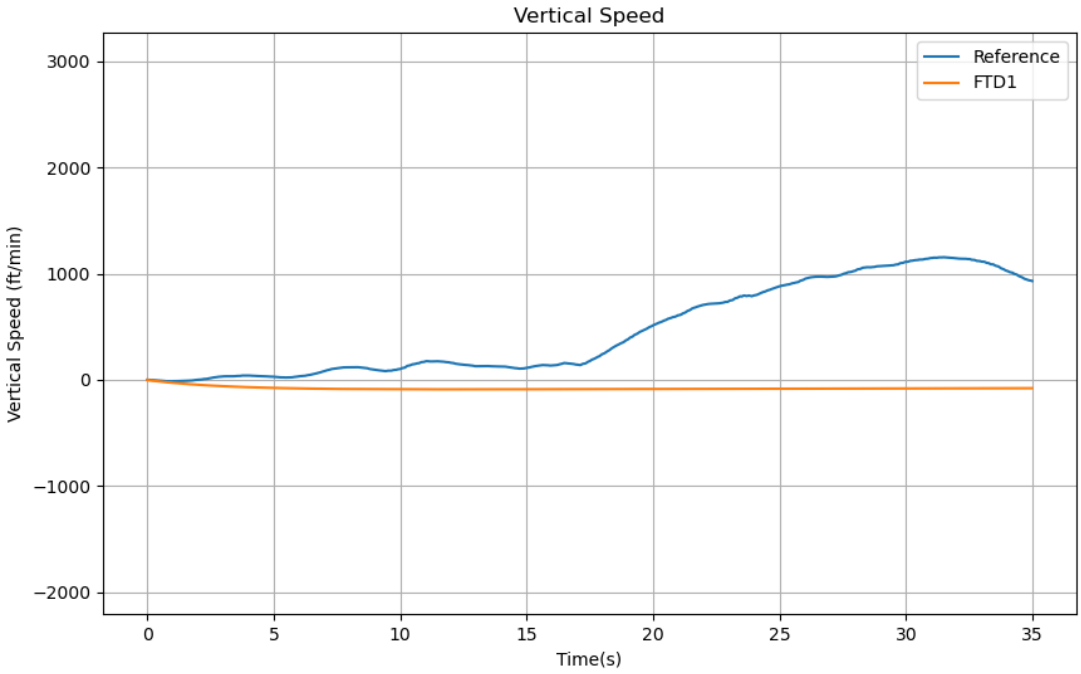

Control Position Pitch
Reference
FTD1
Control Position Pitch (%)
100
80
60
40
20
0
5
10
15
20
25
30
35
Time(s)

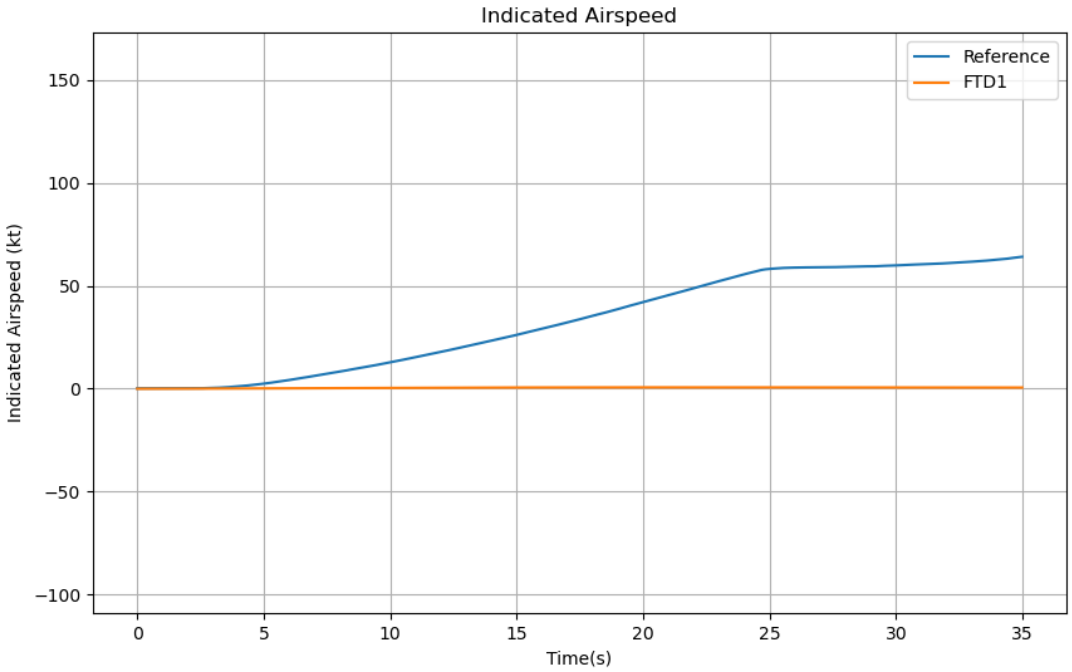

Control Position Yaw
Reference
FTD1
Control Position Yaw (%)
80
60
40
20
0
0
5
10
15
20
25
30
35
Time(s)

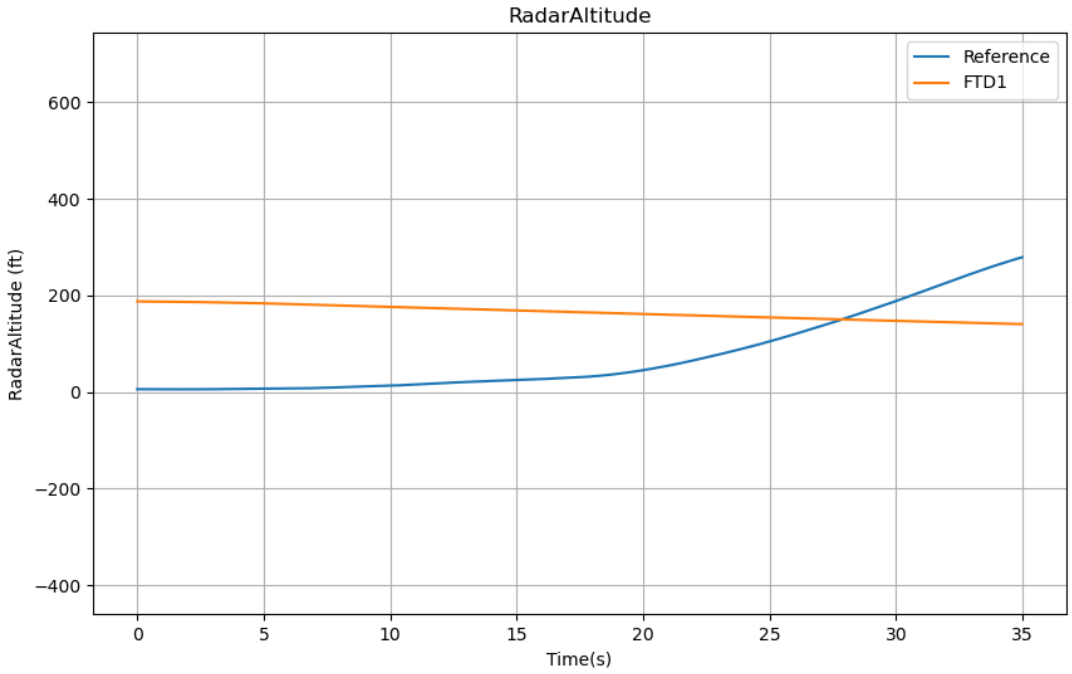

Angle of Sideslip
Reference
FTD1
Angle of Sideslip (deg)
300
200
100
0
−100
−200
−300
0
5
10
15
20
25
30
35
Time(s)

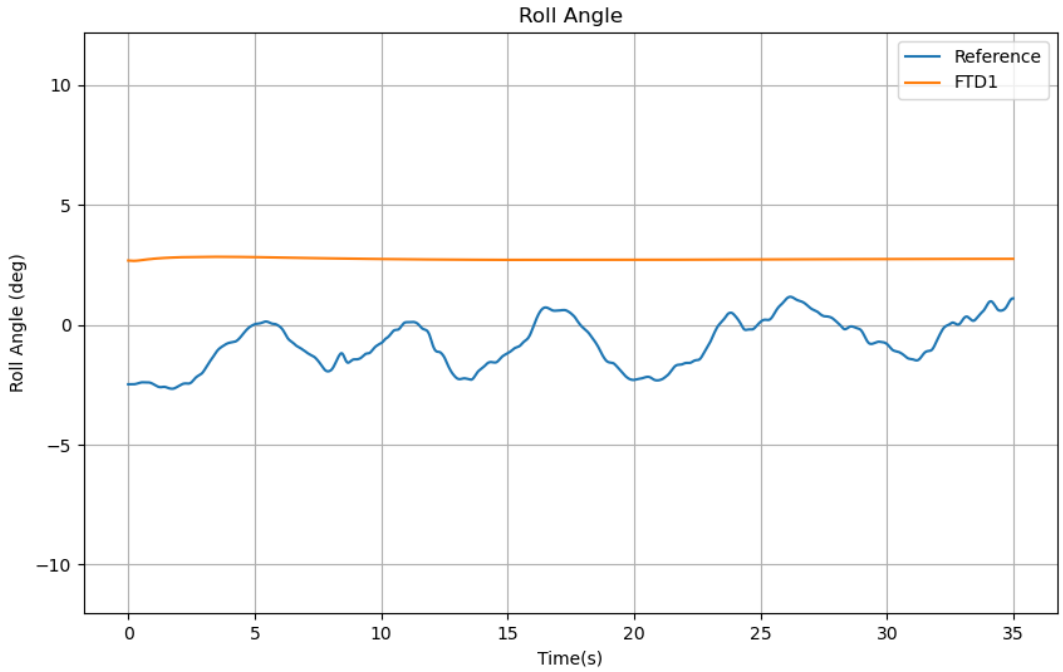

Control Position Collective
Reference
FTD1
Control Position Collective (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

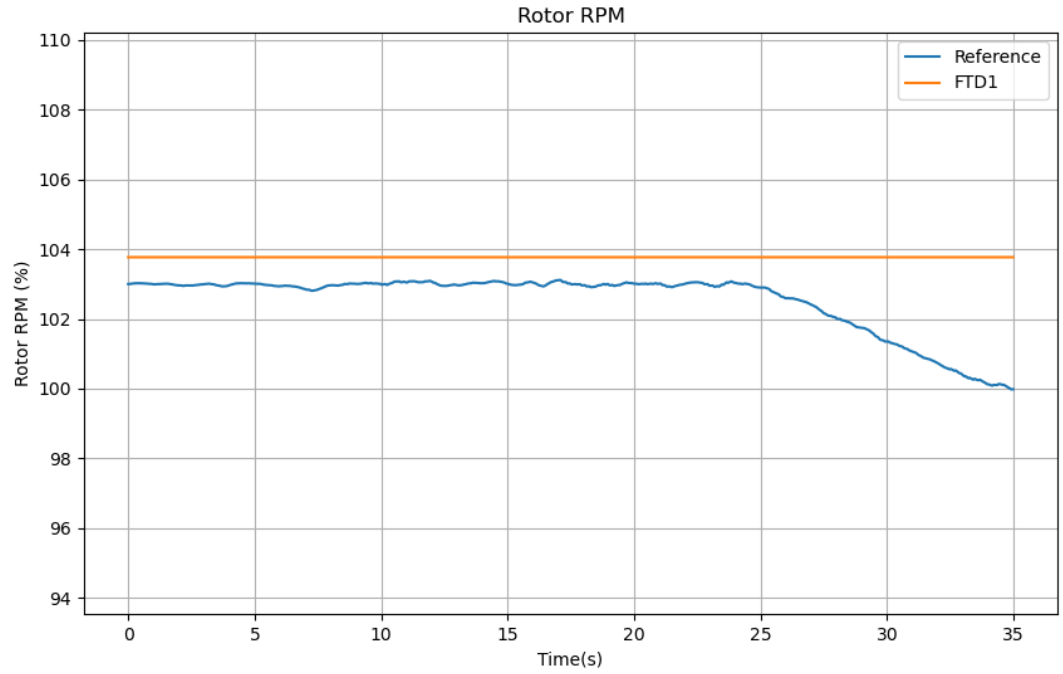

Control Position Roll
Reference
FTD1
Control Position Roll (%)
70
65
60
55
50
45
40
35
30
0
5
10
15
20
25
30
35
Time(s)

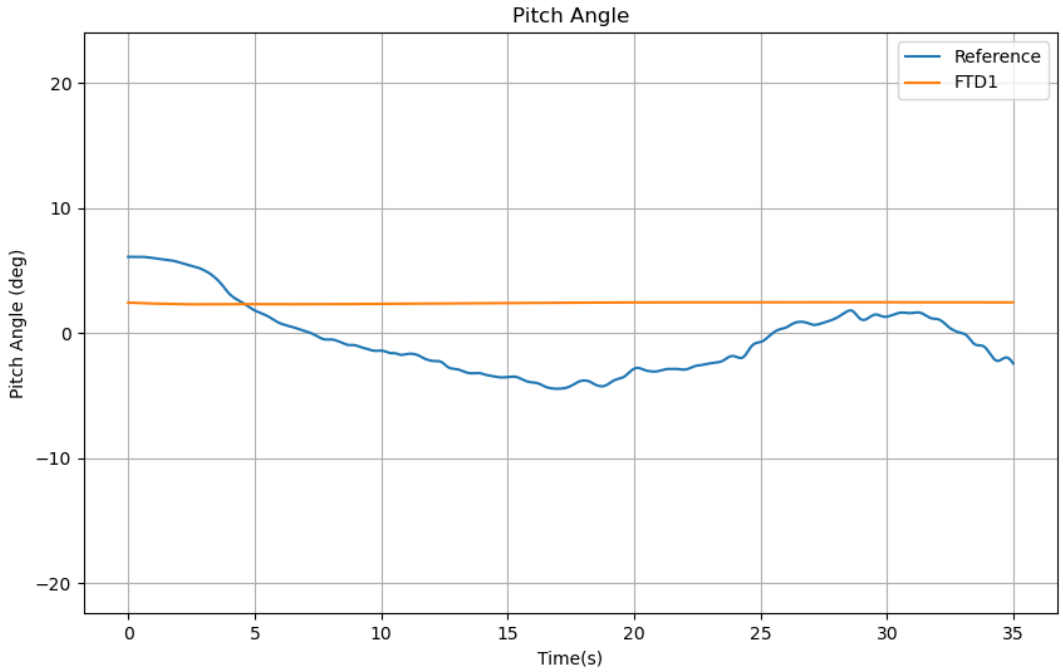

Vertical Speed
Reference
FTD1
Vertical Speed (ft/min)
3000
2000
1000
0
−1000
−2000
0
5
10
15
20
25
30
35
Time(s)


Indicated Airspeed
Reference
FTD1
Indicated Airspeed (kt)
150
100
50
0
−50
−100
0
5
10
15
20
25
30
35
Time(s)


RadarAltitude
Reference
FTD1
RadarAltitude (ft)
600
400
200
0
−200
−400
0
5
10
15
20
25
30
35
Time(s)


Roll Angle
Reference
FTD1
Roll Angle (deg)
10
5
0
−5
−10
0
5
10
15
20
25
30
35
Time(s)


Rotor RPM
Reference
FTD1
Rotor RPM (%)
110
108
106
104
102
100
98
96
94
0
5
10
15
20
25
30
35
Time(s)


Pitch Angle
Reference
FTD1
Pitch Angle (deg)
20
10
0
−10
−20
0
5
10
15
20
25
30
35
Time(s)

1.d.A3 Light GW, Aft CG - 25 ft AGL

Test Procedure

On the IOS select ’Maintenance’ page then ’QTG-Test’. The test can be run either in automatic or manual mode.

Automatic testing: drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed. Cockpit controls and switches status will be overwritten by the QTG Tool.

Press ’Start QTG Execution’ to start the test.

The flight controls will be controlled according to the following table:

Flight Controls	Status
Longitudinal	DIRECT DRIVEN
Lateral	DIRECT DRIVEN
Collective	DIRECT DRIVEN
Pedals	DIRECT DRIVEN

Manual testing: follow the Manual Procedure steps indicated in the next page.

Manual Procedure

1. Drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed.
2. In the Test Selection list toggle from ’Automatic’ to ’Manual’.
3. Press ’Start QTG execution’. Wait for the completion message of the initialization phase.
4. Setup the cockpit as indicated in the Cockpit Configuration table below.
5. Press the Spare button on the Cyclic stick to run the simulation.
6. Stabilize and maintain current flight condition.
7. Press the Spare button on the Cyclic stick to start recording. On the IOS ’Manual QTG’ page, check that an indication of the test elapsed time is shown.
8. Press the Spare button on the Cyclic stick to complete the test or to proceed with the next test.

Initial Conditions

Parameter [UoM]	Reference*	FSTD
Mass Properties		
Gross Weight	2757.9	7500.0
Fuel Weigth	341.1	0.0
CG Longitudinal	4232	-4.7
CG Lateral	23	0.0
Moment of Inertia XX	2825	9638.0
Moment of Inertia XZ	-981	2226.0
Moment of Inertia YY	10635	33240.0
Moment of Inertia ZZ	12261	25889.0
Environment Parameters		
Pressure Altitude	1307.1	344.90347448792386
OAT	13.8	13.8
Wind Direction	0.0	0.0
Wind Speed	0.0	0.0
Flight Parameters		
Airspeed	0.2	-0.0007328300784191671
Ground Speed	0.0	0.008344186369269284
Vertical Velocity	0.0	0.013288436214678432
Radar Altitude	5.7	187.67051261194212
Rotor Speed	103.0	28.797932657908333
Engine 1 Torque	57.9	31.95777495505339
Engine 2 Torque	57.9	31.95777495505339
Pitch Angle	6.1	0.04253490439090714
Bank Angle	-2.5	0.046752386160144134
Heading	64.7	1.1314822542825382
Pitch Rate	0.0	0.00038809458831355273
Roll Rate	-0.0	-0.003734954692935167
Yaw Rate	-0.0	0.02717967586248816
X Body Acceleration	-0.1	0.0
Y Body Acceleration	-0.0	0.0
Z Body Acceleration	-0.0	0.0
Longitudinal Cyclic Pos.	69.1	-0.228729248046875
Lateral Cyclic Pos.	54.4	-0.080810546875
Pedals Pos.	42.8	-0.011199951171875
Collective Pos.	57.8	-0.3538818359375
Engine 1 Main Switch	FLIGHT	FLIGHT
Engine 2 Main Switch	FLIGHT	FLIGHT
AFCS State	DSAS	SCAS
HINR Button	HINR	HINR

* Snapshot Tests: Reference initial conditions are computed as mean values over data time histories

Test Results

Parameter [U oM]	**Reference**	**Min****	**FSTD**	**Max****
Snapshot Data				
Engine 1 Torque [%]	1	2	3	4

** The Min value is computed as the Reference value minus the specific tolerance value.
The Max value is computed as the Reference value plus the specific tolerance value

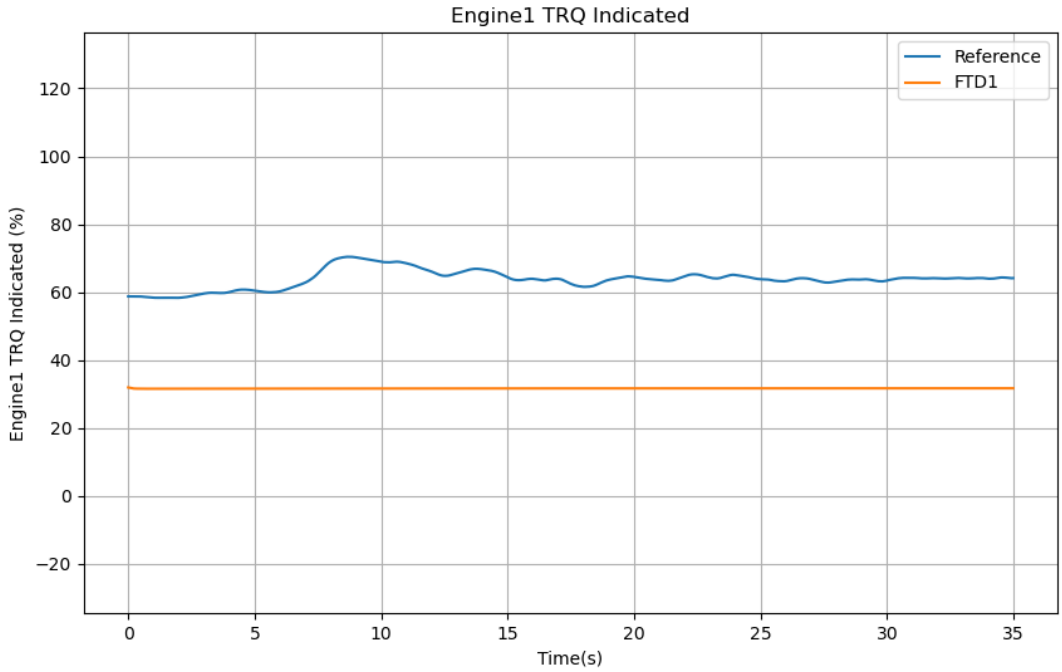
Notes and Rationales

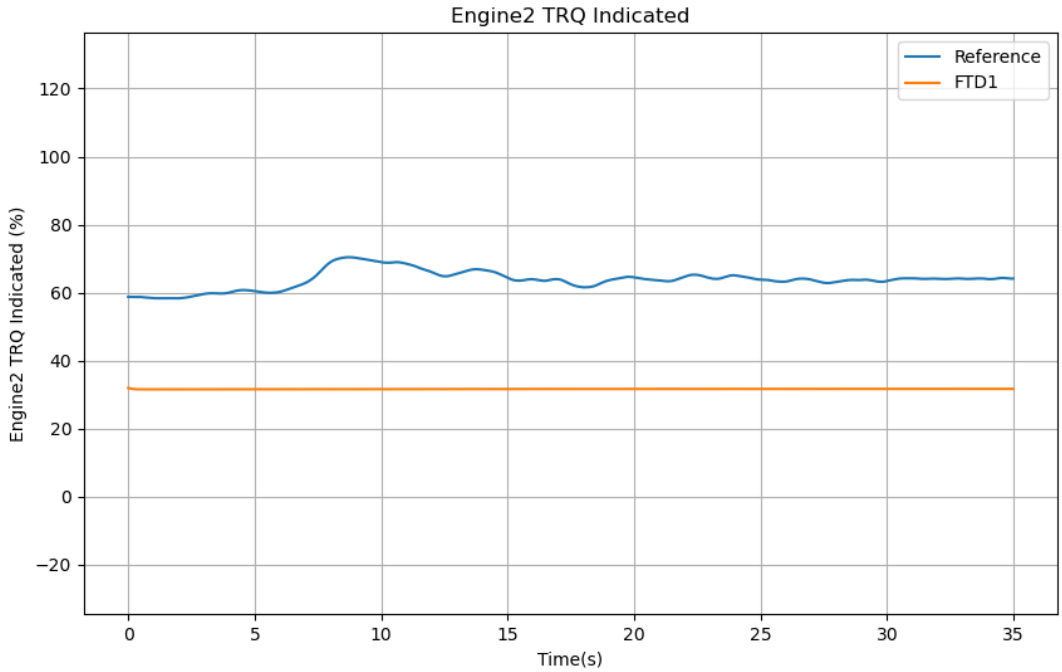
Notes
No Notes related to the entire Test are present
No Notes related to current SubCase are present

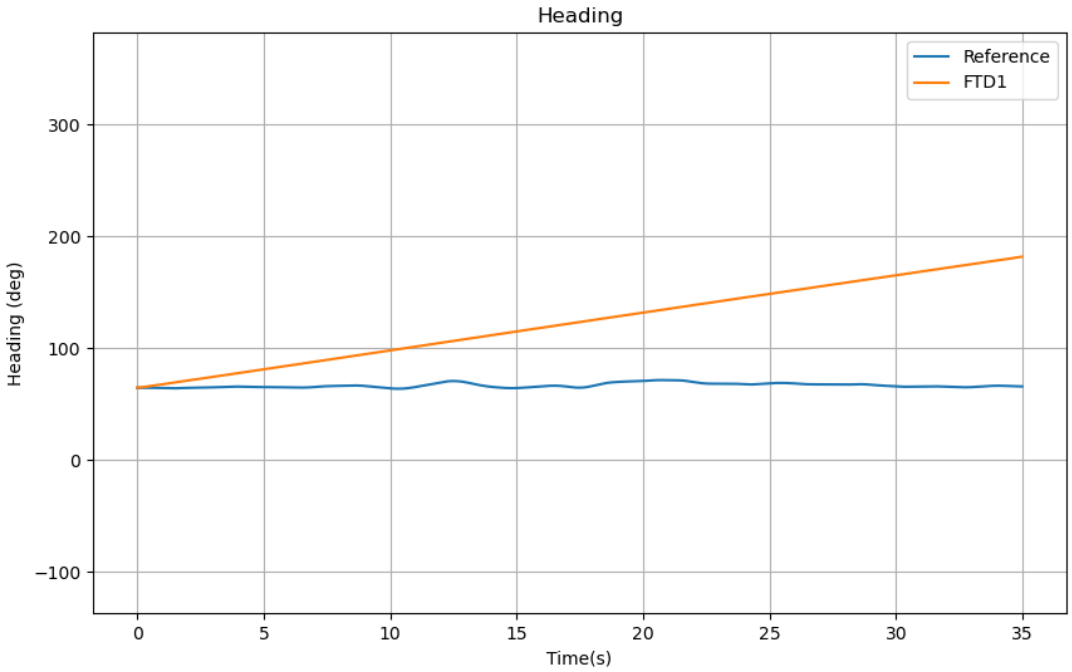
Rationales (Validation Data)	
Rationale 1 (All Subcases)	In the Hover flight maneuver Vertical Speed values are not reliable due to Rotor Downwash effects. In each current Test SubCases a stable Hover maneuver has been performed.

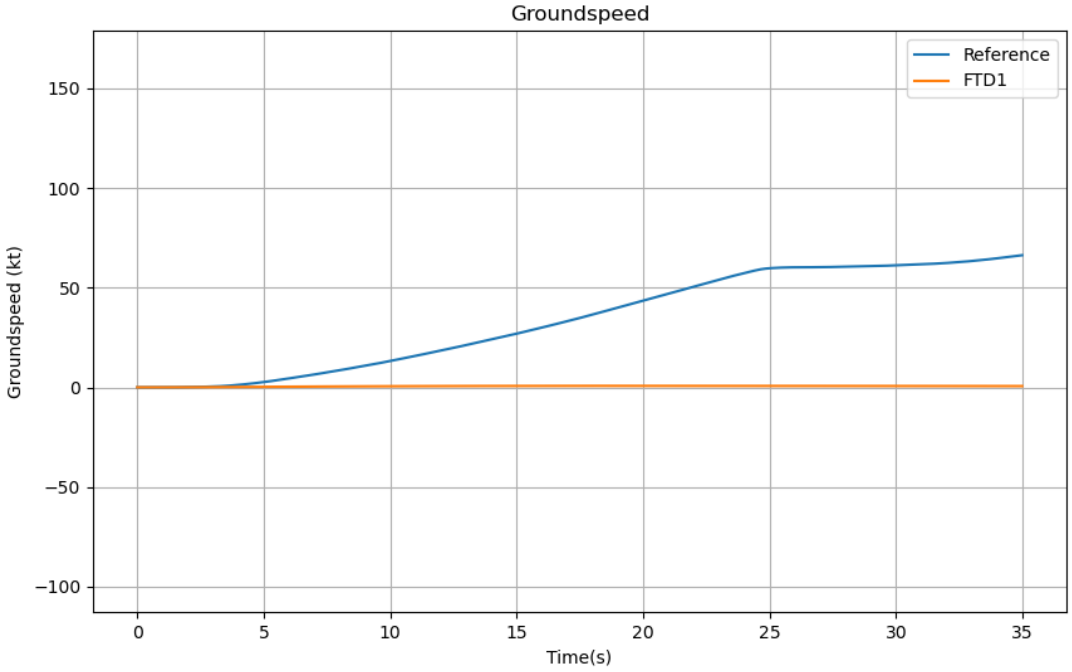
No Rationales related to current SubCase are present

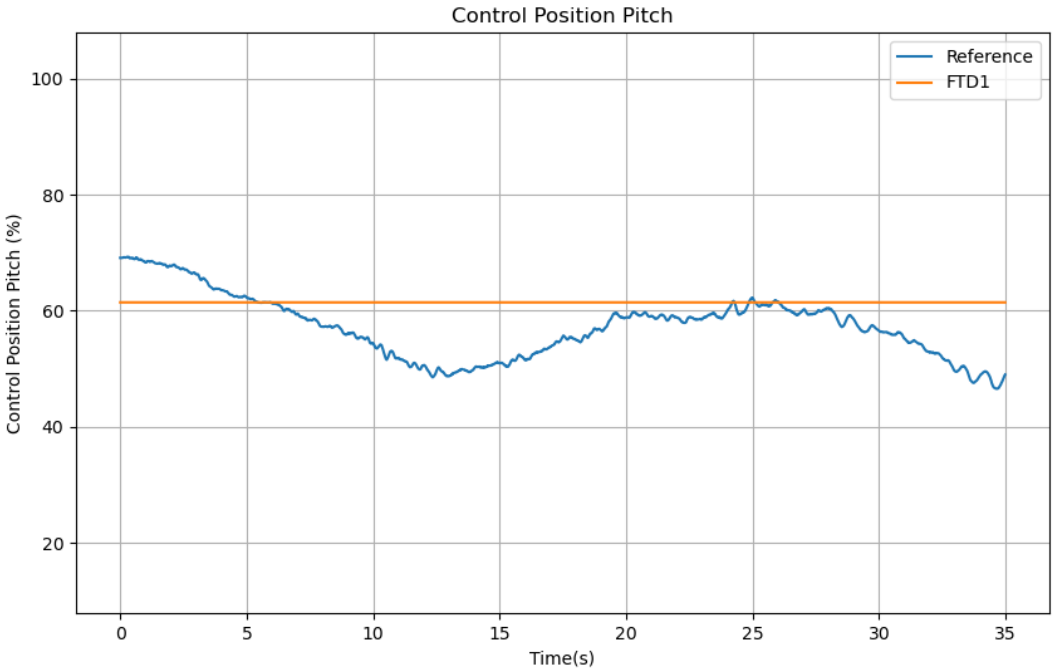
Rationales (Results)
No Rationales related to the entire Test are present
No Rationales related to current SubCase are present

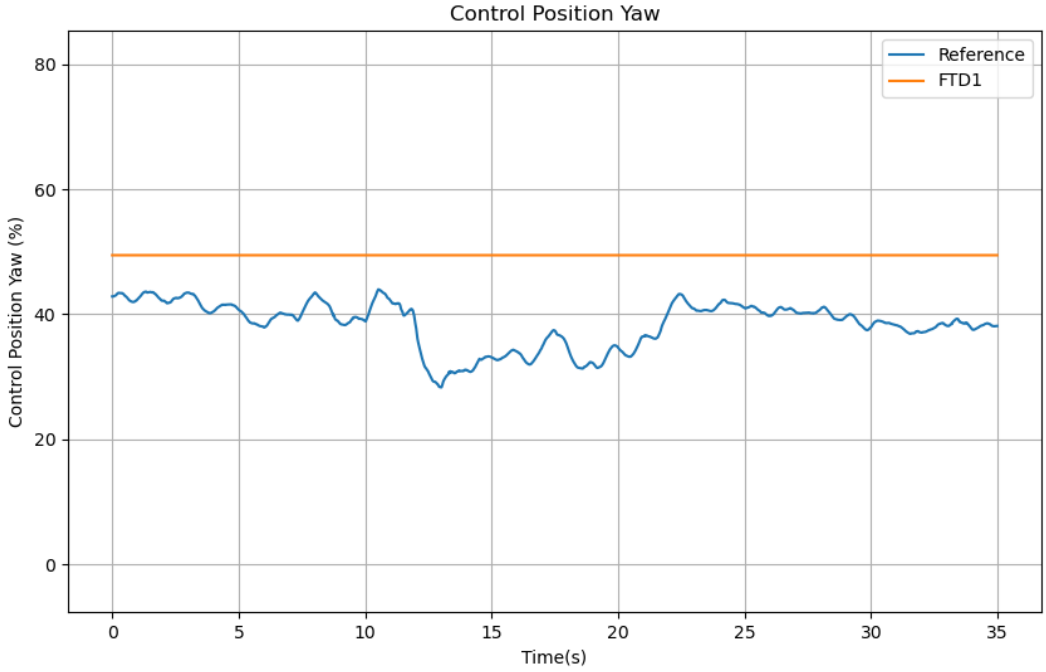

Engine1 TRQ Indicated
Reference
FTD1
Engine1 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

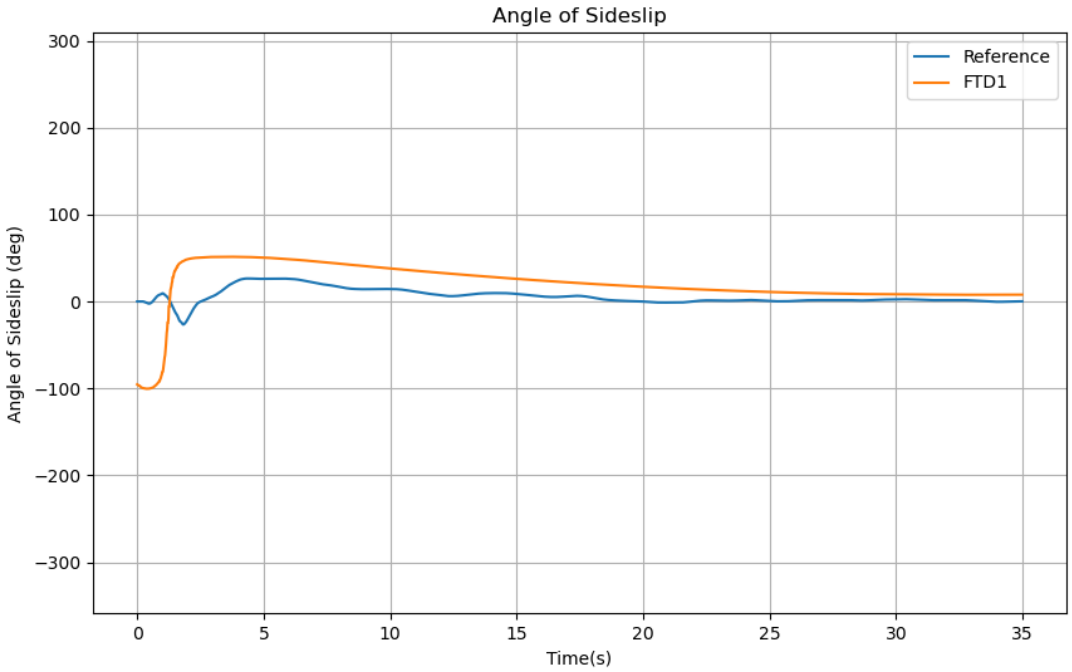

Engine2 TRQ Indicated
Reference
FTD1
Engine2 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

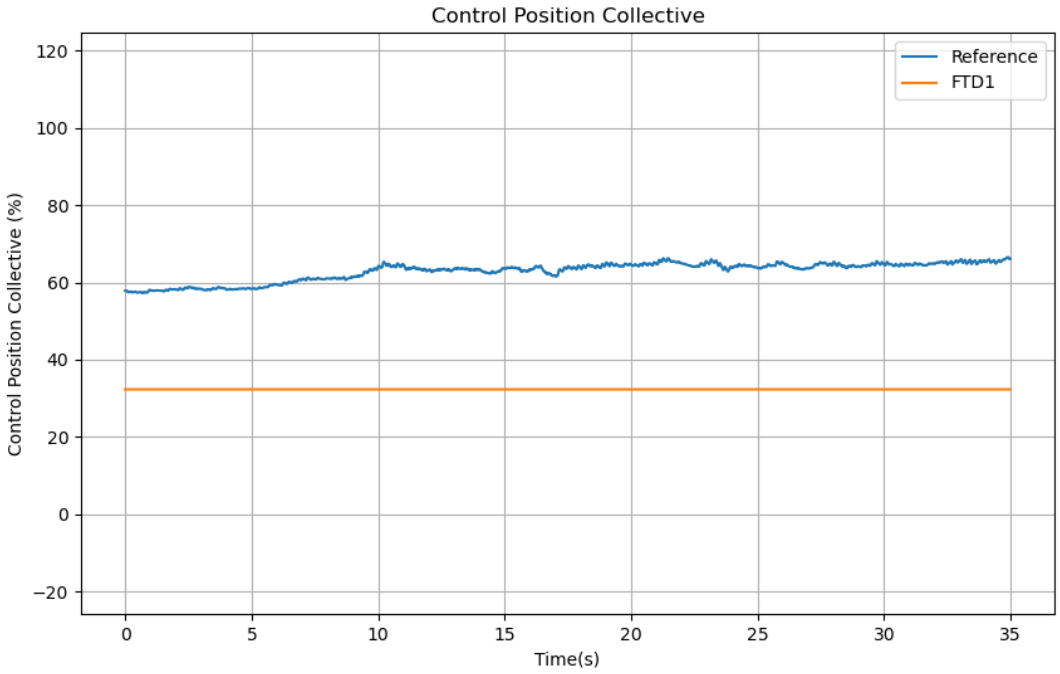

Heading
Reference
FTD1
300
200
100
0
−100
Heading (deg)
0
5
10
15
20
25
30
35
Time(s)

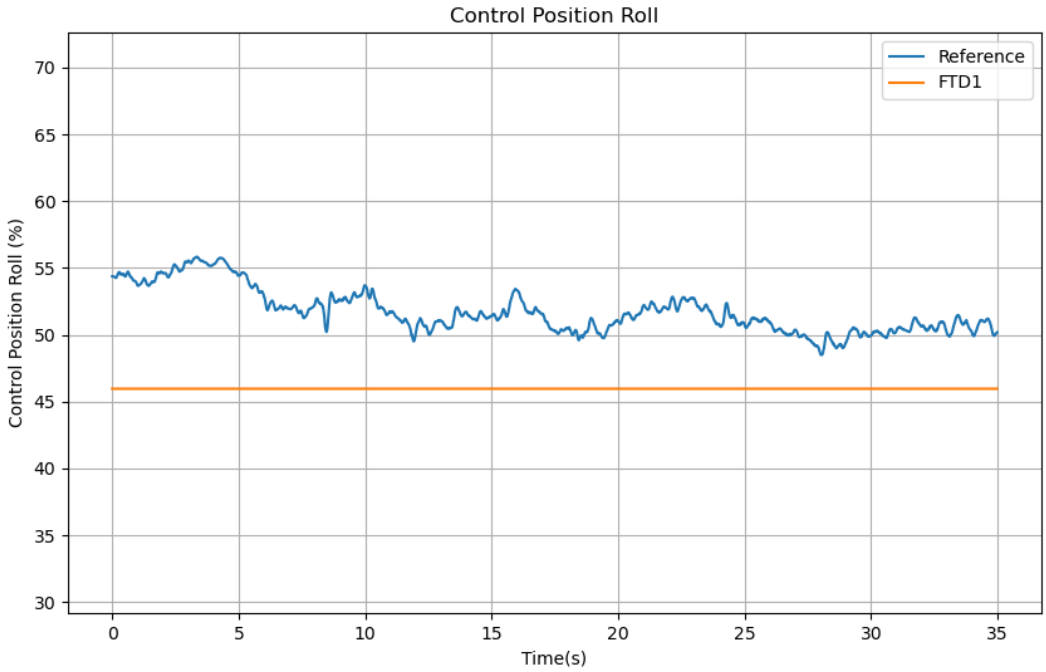

Groundspeed
Reference
FTD1
150
100
50
0
−50
−100
Groundspeed (kt)
0
5
10
15
20
25
30
35
Time(s)

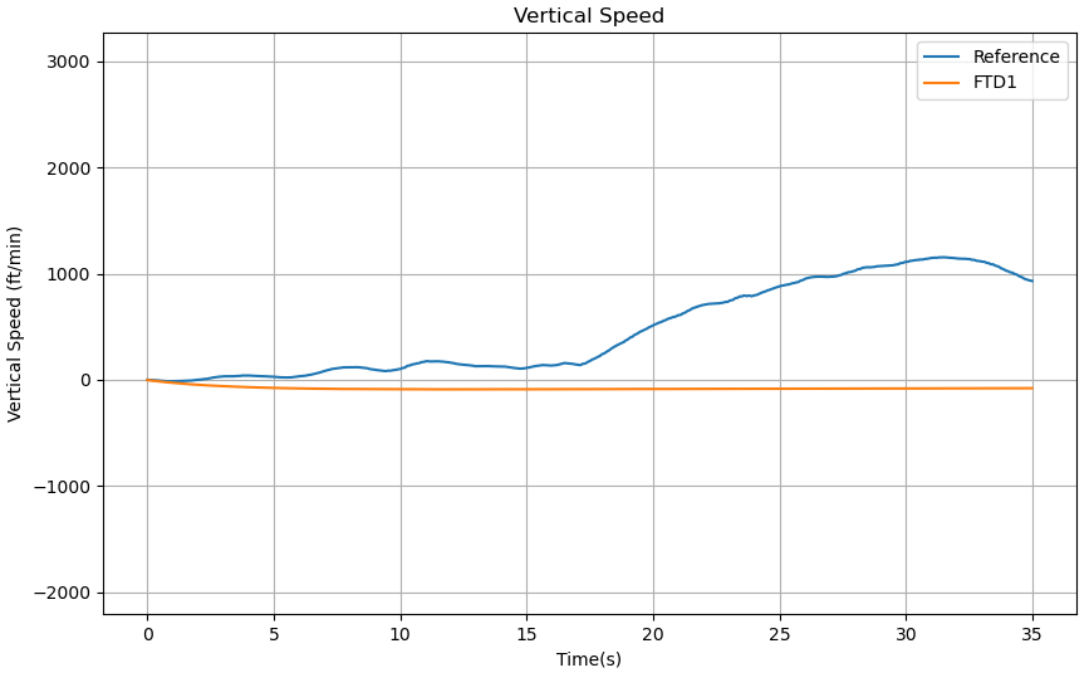

Control Position Pitch
Reference
FTD1
Control Position Pitch (%)
100
80
60
40
20
0
5
10
15
20
25
30
35
Time(s)

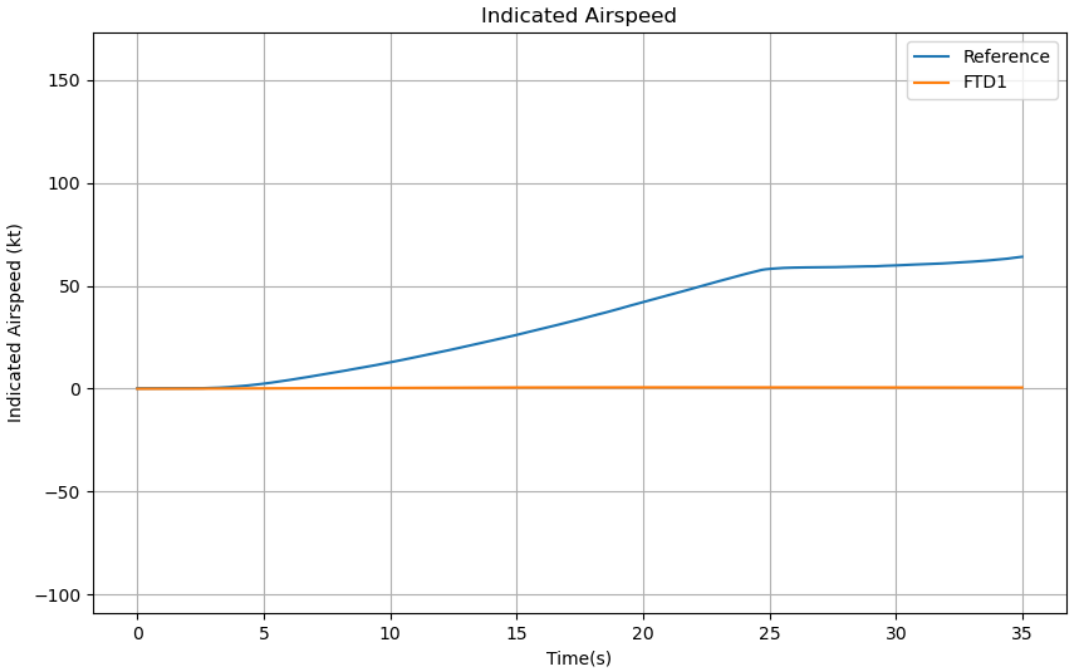

Control Position Yaw
Reference
FTD1
Control Position Yaw (%)
80
60
40
20
0
0
5
10
15
20
25
30
35
Time(s)

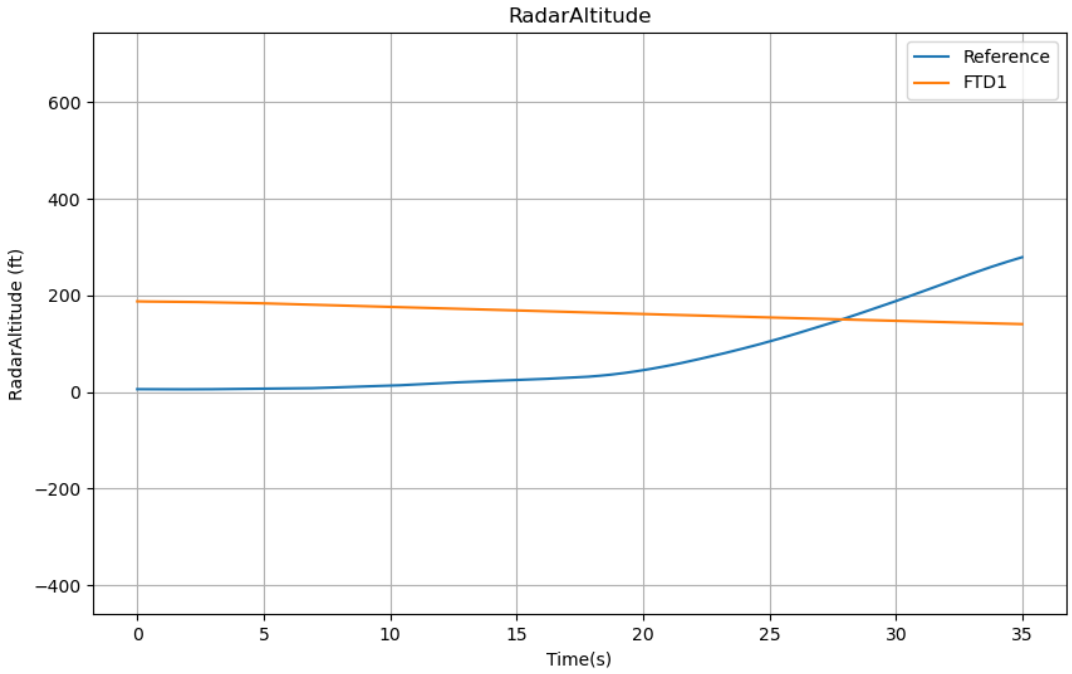

Angle of Sideslip
Reference
FTD1
Angle of Sideslip (deg)
300
200
100
0
−100
−200
−300
0
5
10
15
20
25
30
35
Time(s)

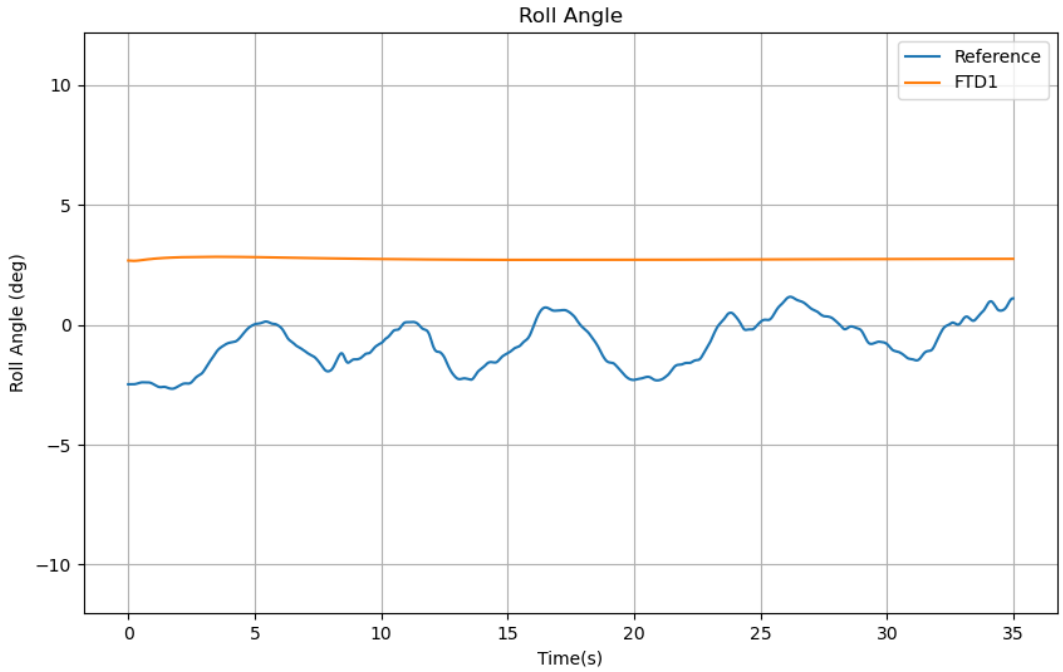

Control Position Collective
Reference
FTD1
Control Position Collective (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

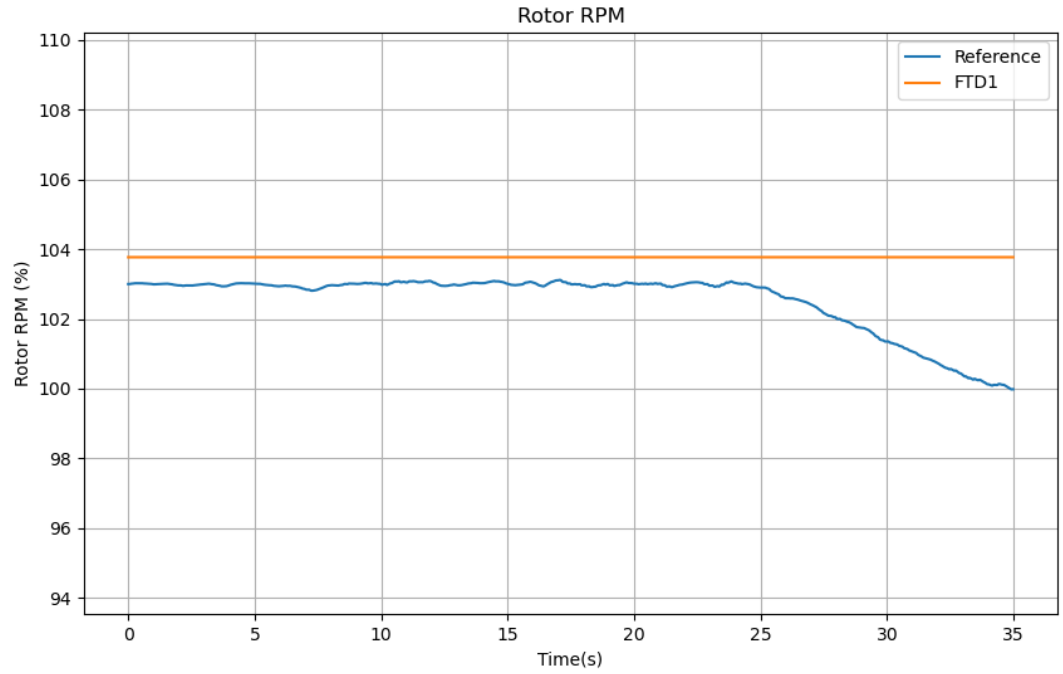

Control Position Roll
Reference
FTD1
Control Position Roll (%)
70
65
60
55
50
45
40
35
30
0
5
10
15
20
25
30
35
Time(s)

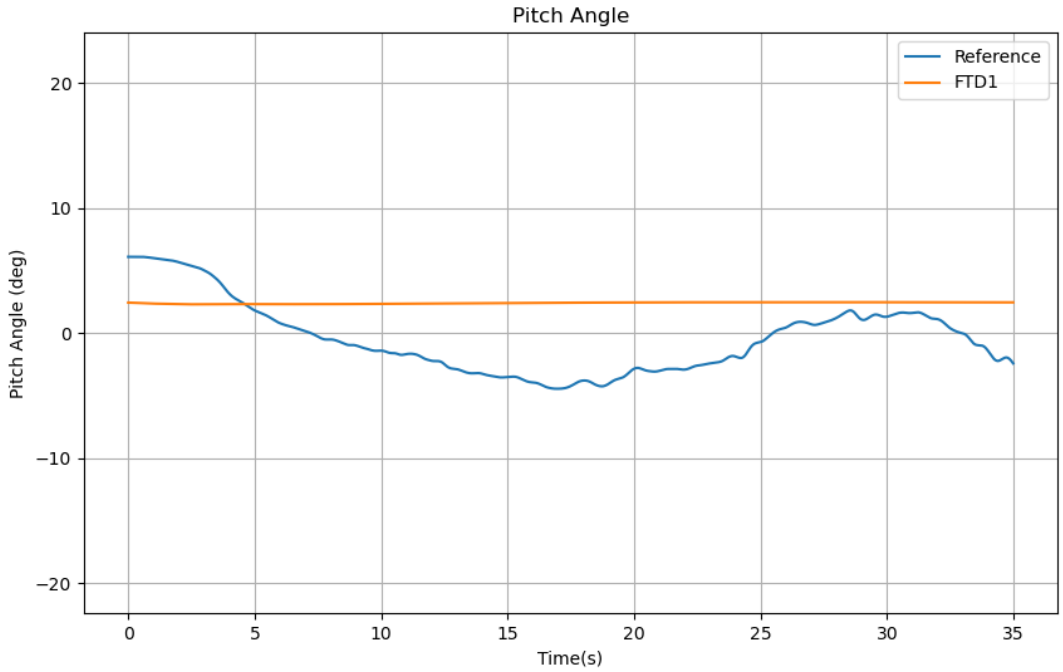

Vertical Speed
Reference
FTD1
Vertical Speed (ft/min)
3000
2000
1000
0
−1000
−2000
0
5
10
15
20
25
30
35
Time(s)


Indicated Airspeed
Reference
FTD1
Indicated Airspeed (kt)
150
100
50
0
−50
−100
0
5
10
15
20
25
30
35
Time(s)


RadarAltitude
Reference
FTD1
RadarAltitude (ft)
600
400
200
0
−200
−400
0
5
10
15
20
25
30
35
Time(s)


Roll Angle
Reference
FTD1
Roll Angle (deg)
10
5
0
−5
−10
0
5
10
15
20
25
30
35
Time(s)


Rotor RPM
Reference
FTD1
Rotor RPM (%)
110
108
106
104
102
100
98
96
94
0
5
10
15
20
25
30
35
Time(s)


Pitch Angle
Reference
FTD1
Pitch Angle (deg)
20
10
0
−10
−20
0
5
10
15
20
25
30
35
Time(s)

1.d.A4 Light GW, Aft CG - 70 ft AGL

Test Procedure

On the IOS select ’Maintenance’ page then ’QTG-Test’. The test can be run either in automatic or manual mode.

Automatic testing: drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed. Cockpit controls and switches status will be overwritten by the QTG Tool.

Press ’Start QTG Execution’ to start the test.

The flight controls will be controlled according to the following table:

Flight Controls	Status
Longitudinal	DIRECT DRIVEN
Lateral	DIRECT DRIVEN
Collective	DIRECT DRIVEN
Pedals	DIRECT DRIVEN

Manual testing: follow the Manual Procedure steps indicated in the next page.

Manual Procedure

1. Drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed.
2. In the Test Selection list toggle from ’Automatic’ to ’Manual’.
3. Press ’Start QTG execution’. Wait for the completion message of the initialization phase.
4. Setup the cockpit as indicated in the Cockpit Configuration table below.
5. Press the Spare button on the Cyclic stick to run the simulation.
6. Stabilize and maintain current flight condition.
7. Press the Spare button on the Cyclic stick to start recording. On the IOS ’Manual QTG’ page, check that an indication of the test elapsed time is shown.
8. Press the Spare button on the Cyclic stick to complete the test or to proceed with the next test.

Initial Conditions

Parameter [UoM]	Reference*	FSTD
Mass Properties		
Gross Weight	2757.9	7500.0
Fuel Weigth	341.1	0.0
CG Longitudinal	4232	-4.7
CG Lateral	23	0.0
Moment of Inertia XX	2825	9638.0
Moment of Inertia XZ	-981	2226.0
Moment of Inertia YY	10635	33240.0
Moment of Inertia ZZ	12261	25889.0
Environment Parameters		
Pressure Altitude	1307.1	344.90347448792386
OAT	13.8	13.8
Wind Direction	0.0	0.0
Wind Speed	0.0	0.0
Flight Parameters		
Airspeed	0.2	-0.0007328300784191671
Ground Speed	0.0	0.008344186369269284
Vertical Velocity	0.0	0.013288436214678432
Radar Altitude	5.7	187.67051261194212
Rotor Speed	103.0	28.797932657908333
Engine 1 Torque	57.9	31.95777495505339
Engine 2 Torque	57.9	31.95777495505339
Pitch Angle	6.1	0.04253490439090714
Bank Angle	-2.5	0.046752386160144134
Heading	64.7	1.1314822542825382
Pitch Rate	0.0	0.00038809458831355273
Roll Rate	-0.0	-0.003734954692935167
Yaw Rate	-0.0	0.02717967586248816
X Body Acceleration	-0.1	0.0
Y Body Acceleration	-0.0	0.0
Z Body Acceleration	-0.0	0.0
Longitudinal Cyclic Pos.	69.1	-0.228729248046875
Lateral Cyclic Pos.	54.4	-0.080810546875
Pedals Pos.	42.8	-0.011199951171875
Collective Pos.	57.8	-0.3538818359375
Engine 1 Main Switch	FLIGHT	FLIGHT
Engine 2 Main Switch	FLIGHT	FLIGHT
AFCS State	DSAS	SCAS
HINR Button	HINR	HINR

* Snapshot Tests: Reference initial conditions are computed as mean values over data time histories

Test Results

Parameter [U oM]	**Reference**	**Min****	**FSTD**	**Max****
Snapshot Data				
Engine 1 Torque [%]	1	2	3	4

** The Min value is computed as the Reference value minus the specific tolerance value.
The Max value is computed as the Reference value plus the specific tolerance value

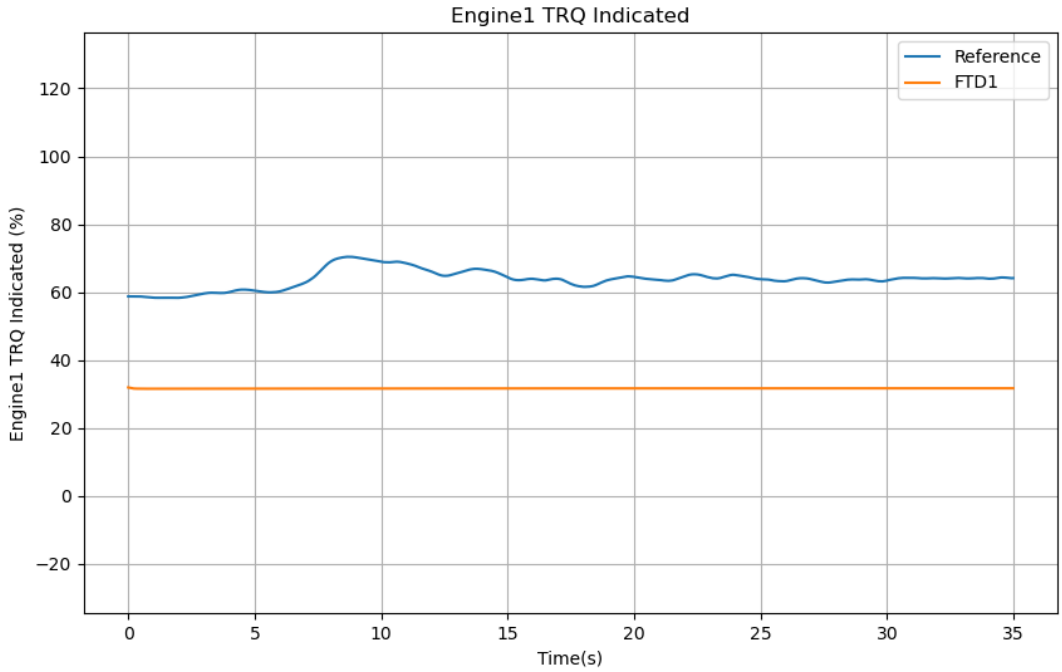
Notes and Rationales

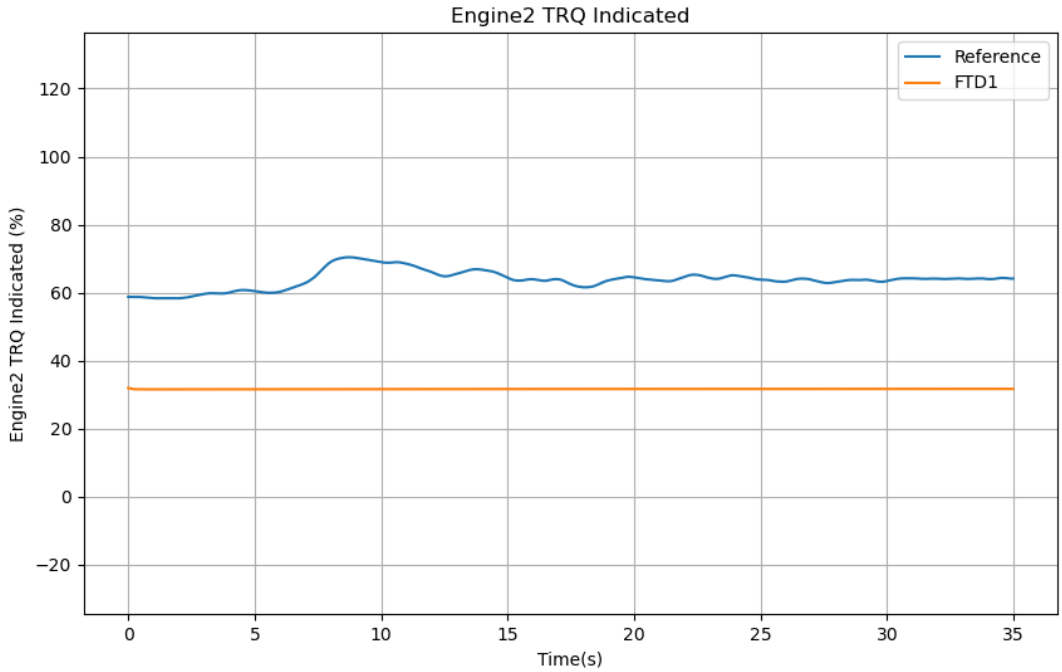
Notes
No Notes related to the entire Test are present
No Notes related to current SubCase are present

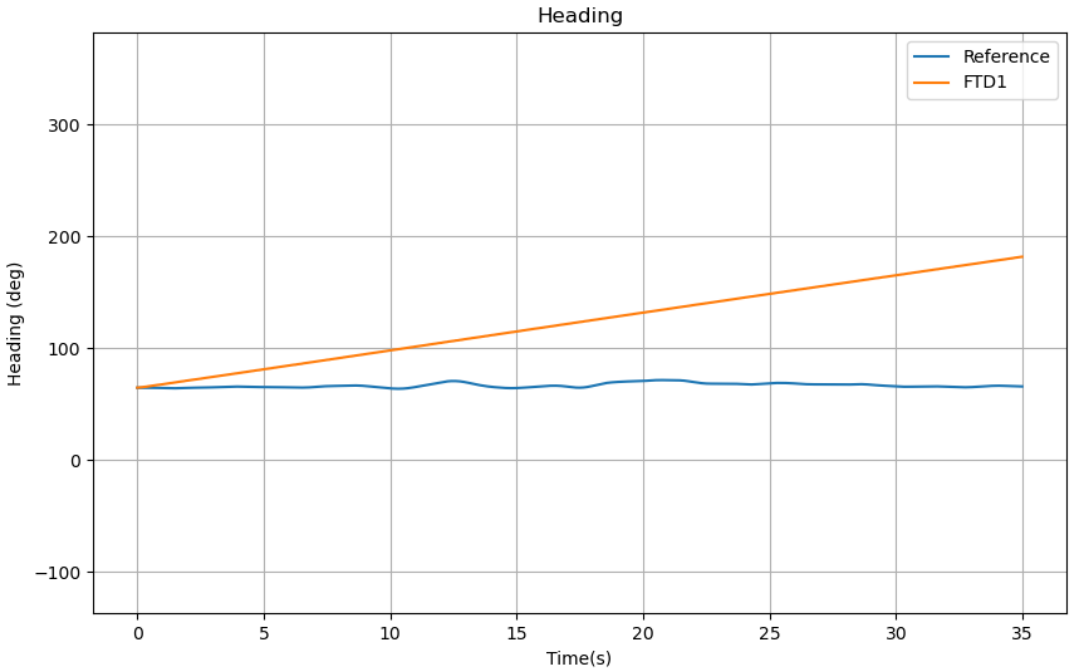
Rationales (Validation Data)	
Rationale 1 (All Subcases)	In the Hover flight maneuver Vertical Speed values are not reliable due to Rotor Downwash effects. In each current Test SubCases a stable Hover maneuver has been performed.

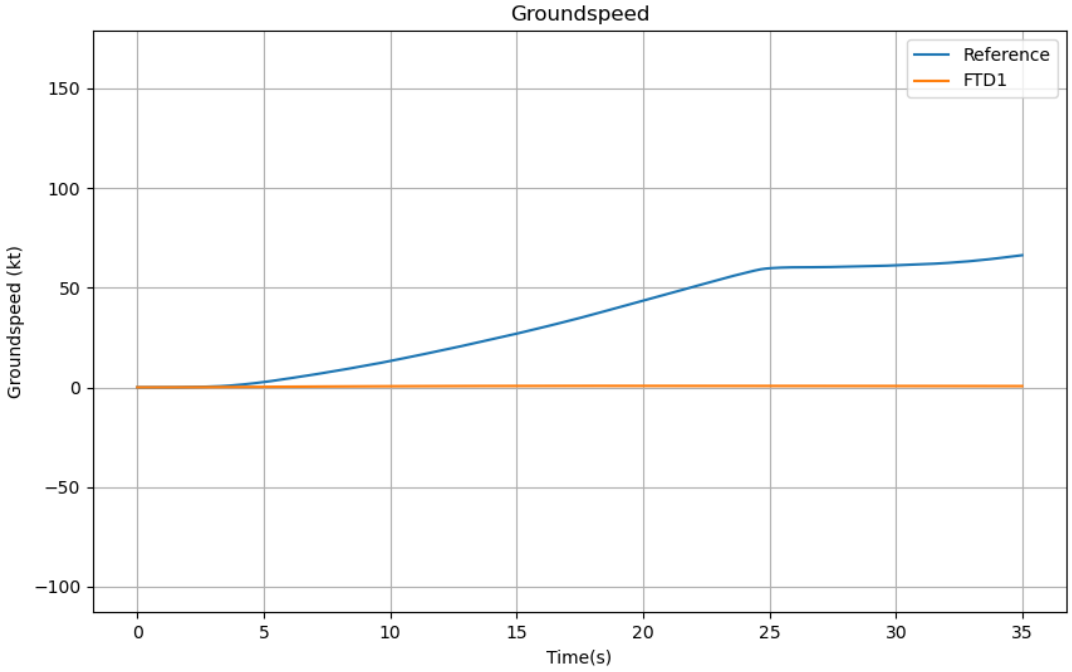
No Rationales related to current SubCase are present

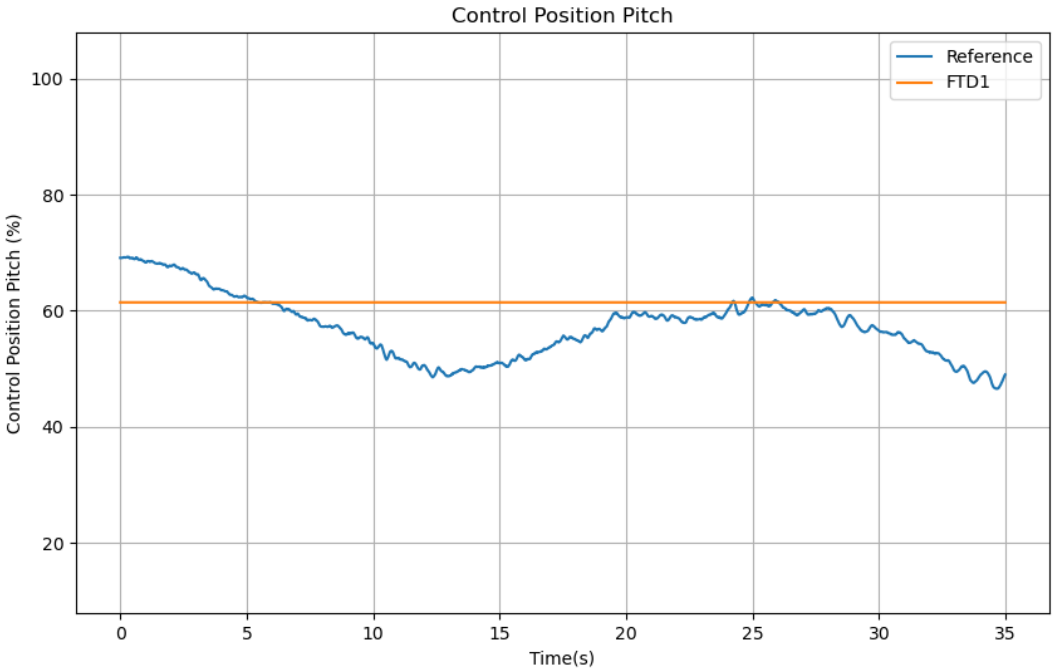
Rationales (Results)
No Rationales related to the entire Test are present
No Rationales related to current SubCase are present

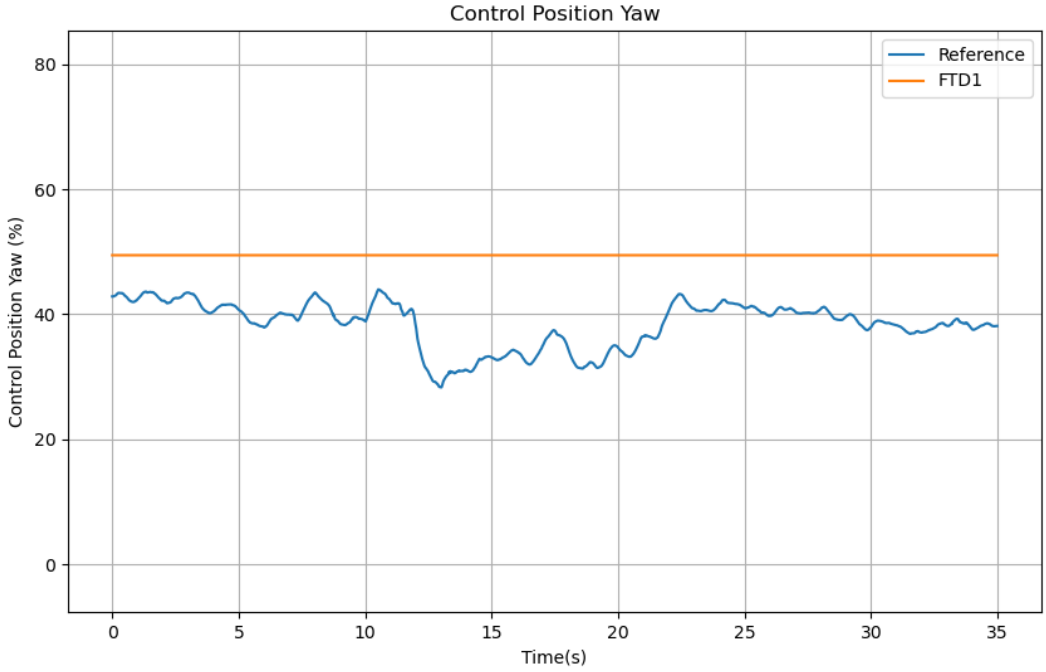

Engine1 TRQ Indicated
Reference
FTD1
Engine1 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

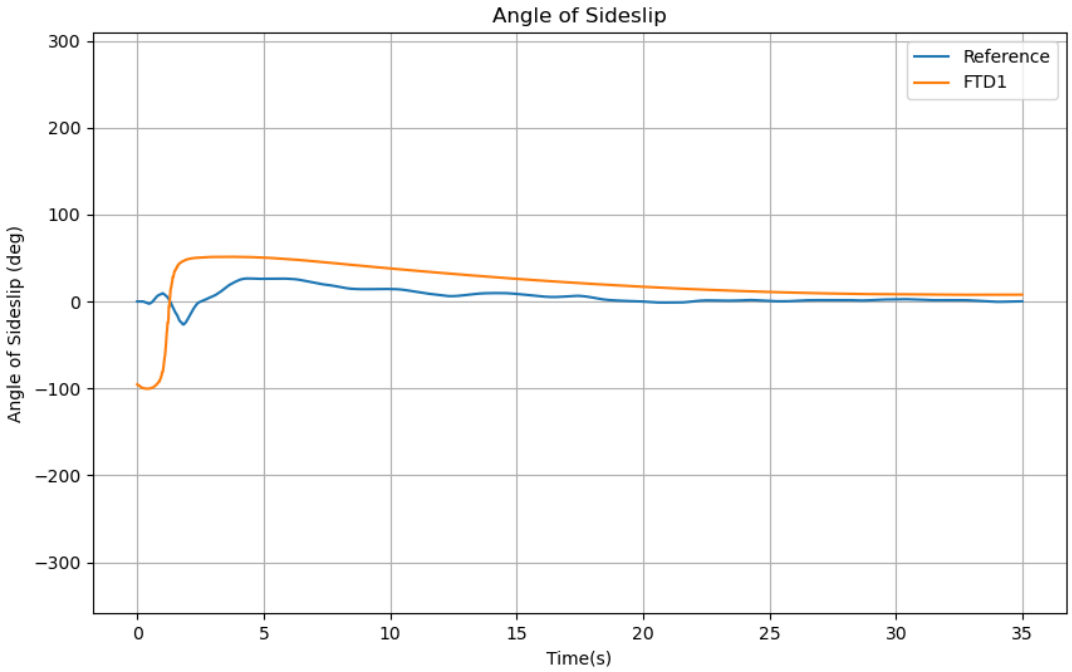

Engine2 TRQ Indicated
Reference
FTD1
Engine2 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

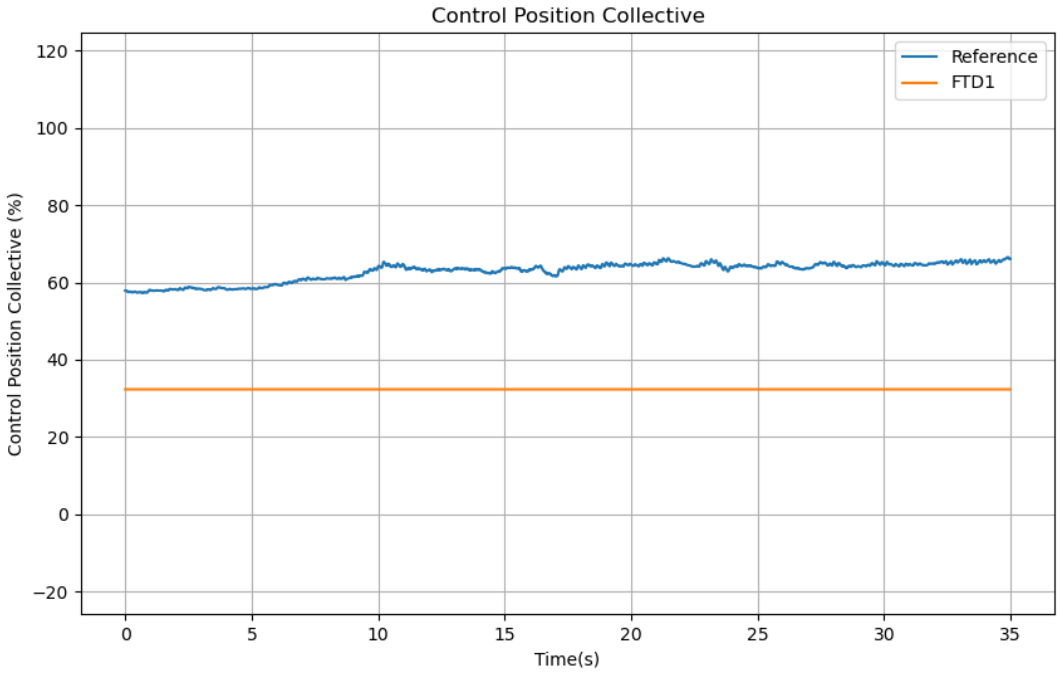

Heading
Reference
FTD1
300
200
100
0
−100
Heading (deg)
0
5
10
15
20
25
30
35
Time(s)

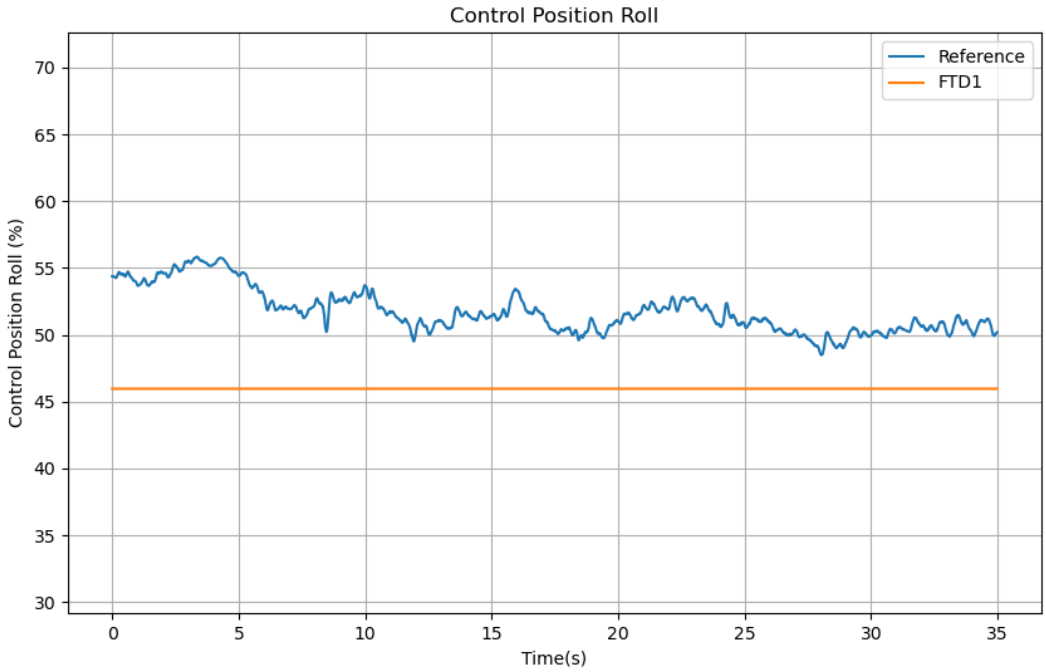

Groundspeed
Reference
FTD1
150
100
50
0
−50
−100
Groundspeed (kt)
0
5
10
15
20
25
30
35
Time(s)

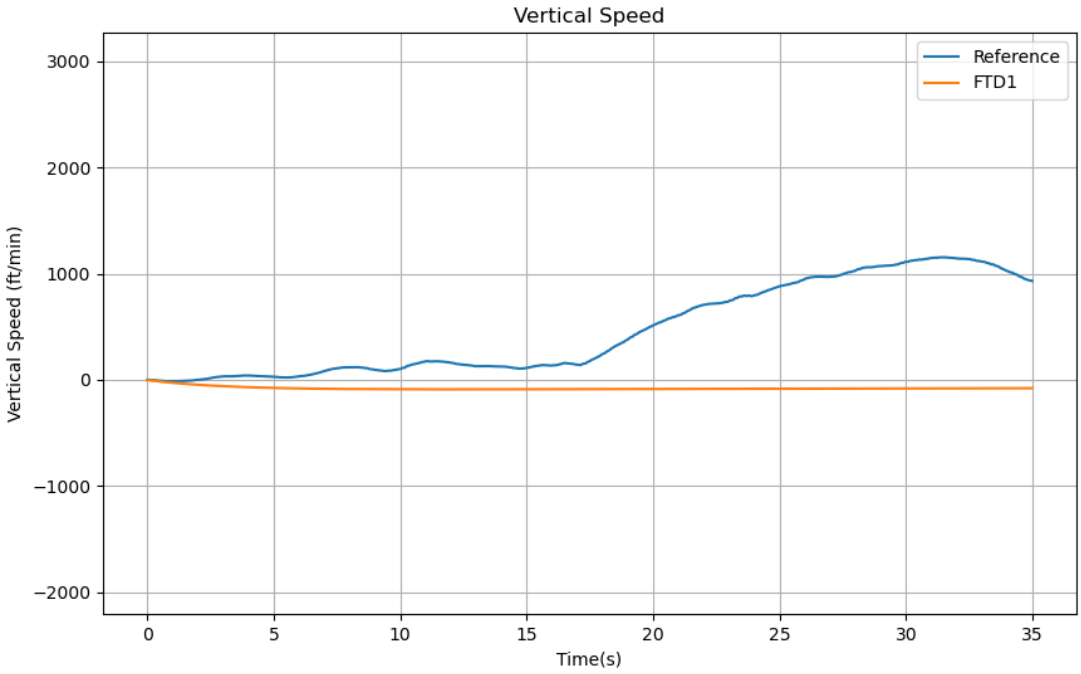

Control Position Pitch
Reference
FTD1
Control Position Pitch (%)
100
80
60
40
20
0
5
10
15
20
25
30
35
Time(s)

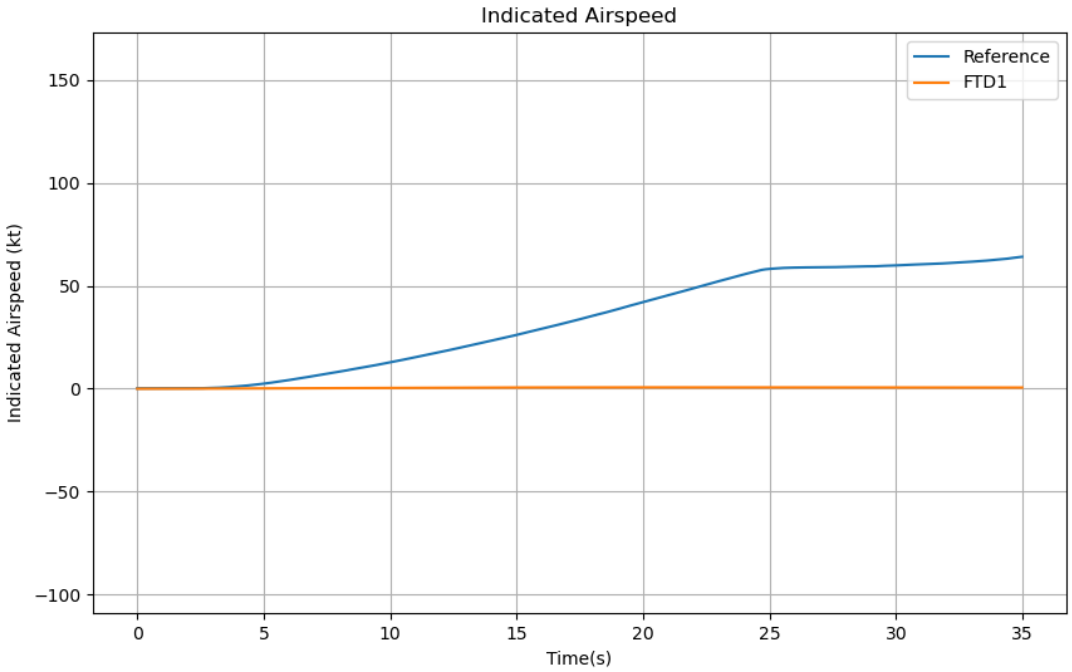

Control Position Yaw
Reference
FTD1
Control Position Yaw (%)
80
60
40
20
0
0
5
10
15
20
25
30
35
Time(s)

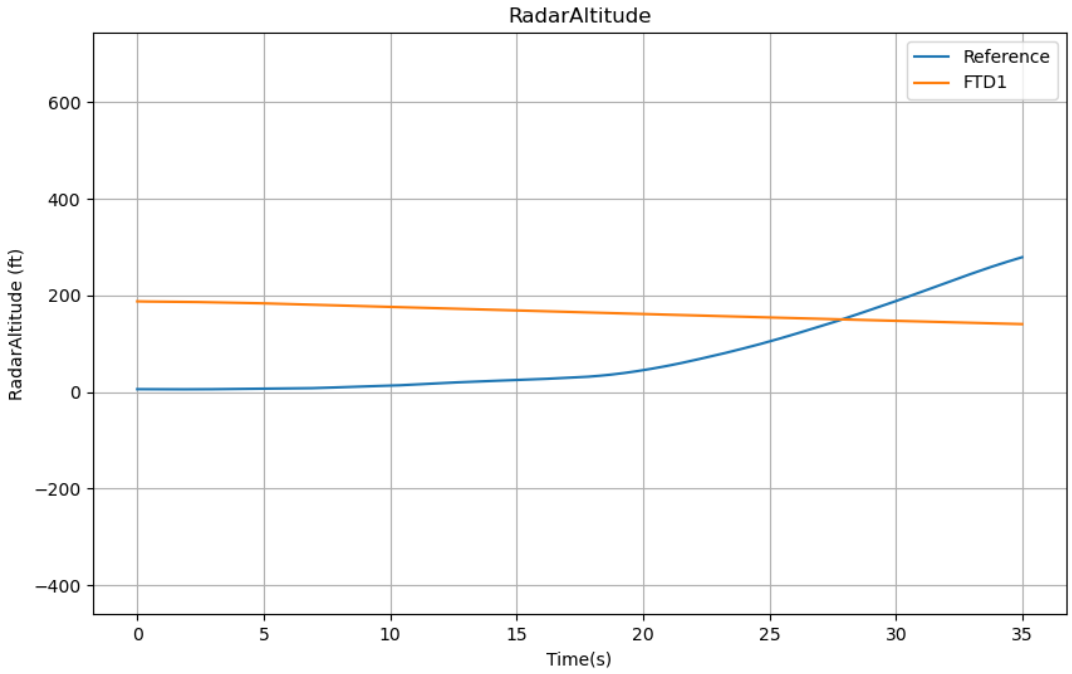

Angle of Sideslip
Reference
FTD1
Angle of Sideslip (deg)
300
200
100
0
−100
−200
−300
0
5
10
15
20
25
30
35
Time(s)

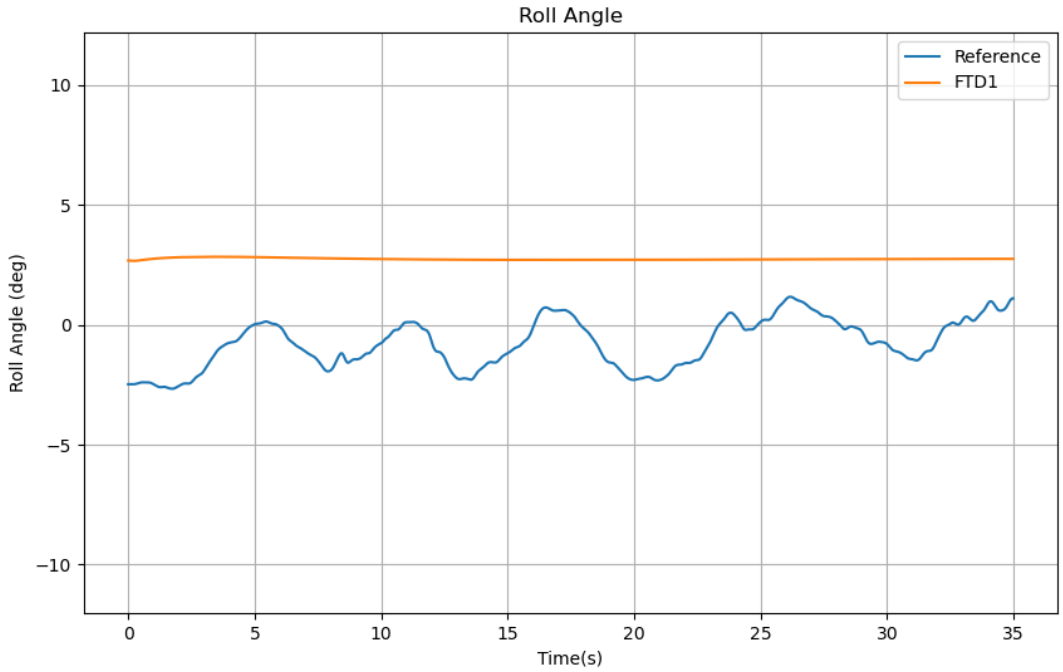

Control Position Collective
Reference
FTD1
Control Position Collective (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

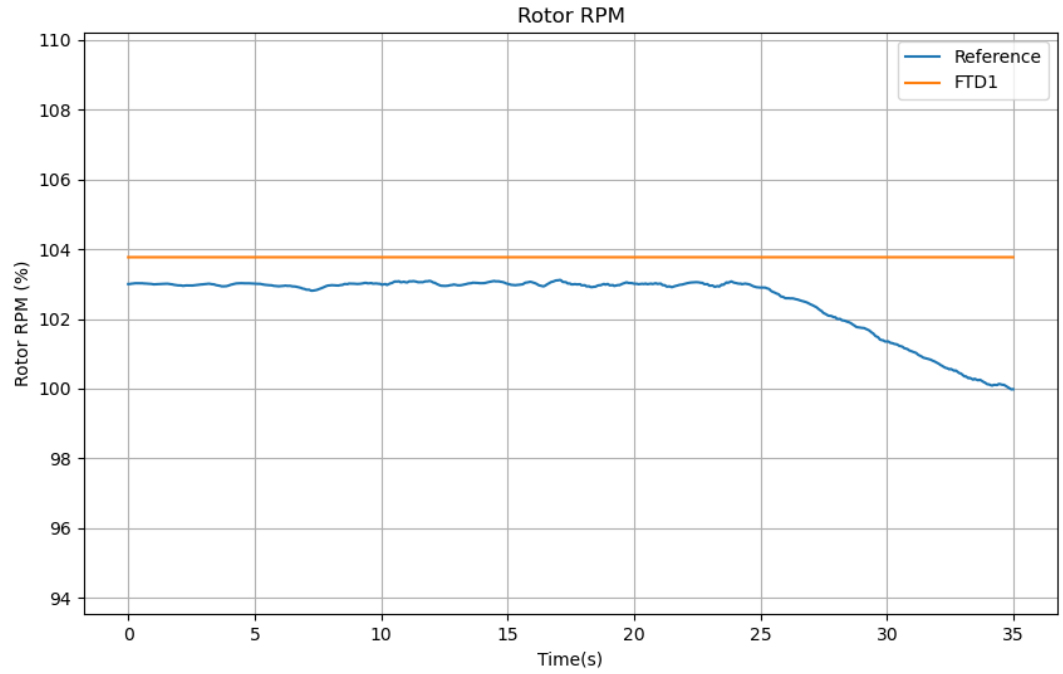

Control Position Roll
Reference
FTD1
Control Position Roll (%)
70
65
60
55
50
45
40
35
30
0
5
10
15
20
25
30
35
Time(s)

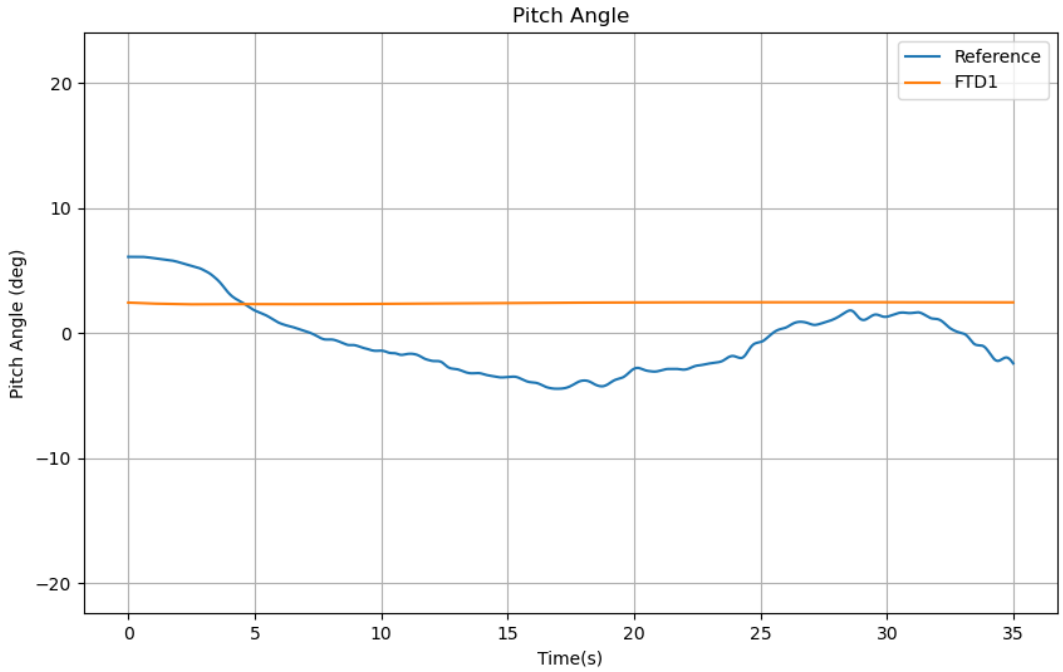

Vertical Speed
Reference
FTD1
Vertical Speed (ft/min)
3000
2000
1000
0
−1000
−2000
0
5
10
15
20
25
30
35
Time(s)


Indicated Airspeed
Reference
FTD1
Indicated Airspeed (kt)
150
100
50
0
−50
−100
0
5
10
15
20
25
30
35
Time(s)


RadarAltitude
Reference
FTD1
RadarAltitude (ft)
600
400
200
0
−200
−400
0
5
10
15
20
25
30
35
Time(s)


Roll Angle
Reference
FTD1
Roll Angle (deg)
10
5
0
−5
−10
0
5
10
15
20
25
30
35
Time(s)


Rotor RPM
Reference
FTD1
Rotor RPM (%)
110
108
106
104
102
100
98
96
94
0
5
10
15
20
25
30
35
Time(s)


Pitch Angle
Reference
FTD1
Pitch Angle (deg)
20
10
0
−10
−20
0
5
10
15
20
25
30
35
Time(s)

1.d.B1 Heavy GW, Aft CG - 3 ft AGL

Test Procedure

On the IOS select ’Maintenance’ page then ’QTG-Test’. The test can be run either in automatic or manual mode.

Automatic testing: drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed. Cockpit controls and switches status will be overwritten by the QTG Tool.

Press ’Start QTG Execution’ to start the test.

The flight controls will be controlled according to the following table:

Flight Controls	Status
Longitudinal	DIRECT DRIVEN
Lateral	DIRECT DRIVEN
Collective	DIRECT DRIVEN
Pedals	DIRECT DRIVEN

Manual testing: follow the Manual Procedure steps indicated in the next page.

Manual Procedure

1. Drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed.
2. In the Test Selection list toggle from ’Automatic’ to ’Manual’.
3. Press ’Start QTG execution’. Wait for the completion message of the initialization phase.
4. Setup the cockpit as indicated in the Cockpit Configuration table below.
5. Press the Spare button on the Cyclic stick to run the simulation.
6. Stabilize and maintain current flight condition.
7. Press the Spare button on the Cyclic stick to start recording. On the IOS ’Manual QTG’ page, check that an indication of the test elapsed time is shown.
8. Press the Spare button on the Cyclic stick to complete the test or to proceed with the next test.

Initial Conditions

Parameter [UoM]	Reference*	FSTD
Mass Properties		
Gross Weight	2757.9	7500.0
Fuel Weigth	341.1	0.0
CG Longitudinal	4232	-4.7
CG Lateral	23	0.0
Moment of Inertia XX	2825	9638.0
Moment of Inertia XZ	-981	2226.0
Moment of Inertia YY	10635	33240.0
Moment of Inertia ZZ	12261	25889.0
Environment Parameters		
Pressure Altitude	1307.1	344.90347448792386
OAT	13.8	13.8
Wind Direction	0.0	0.0
Wind Speed	0.0	0.0
Flight Parameters		
Airspeed	0.2	-0.0007328300784191671
Ground Speed	0.0	0.008344186369269284
Vertical Velocity	0.0	0.013288436214678432
Radar Altitude	5.7	187.67051261194212
Rotor Speed	103.0	28.797932657908333
Engine 1 Torque	57.9	31.95777495505339
Engine 2 Torque	57.9	31.95777495505339
Pitch Angle	6.1	0.04253490439090714
Bank Angle	-2.5	0.046752386160144134
Heading	64.7	1.1314822542825382
Pitch Rate	0.0	0.00038809458831355273
Roll Rate	-0.0	-0.003734954692935167
Yaw Rate	-0.0	0.02717967586248816
X Body Acceleration	-0.1	0.0
Y Body Acceleration	-0.0	0.0
Z Body Acceleration	-0.0	0.0
Longitudinal Cyclic Pos.	69.1	-0.228729248046875
Lateral Cyclic Pos.	54.4	-0.080810546875
Pedals Pos.	42.8	-0.011199951171875
Collective Pos.	57.8	-0.3538818359375
Engine 1 Main Switch	FLIGHT	FLIGHT
Engine 2 Main Switch	FLIGHT	FLIGHT
AFCS State	DSAS	SCAS
HINR Button	HINR	HINR

* Snapshot Tests: Reference initial conditions are computed as mean values over data time histories

Test Results

Parameter [U oM]	**Reference**	**Min****	**FSTD**	**Max****
Snapshot Data				
Engine 1 Torque [%]	1	2	3	4

** The Min value is computed as the Reference value minus the specific tolerance value.
The Max value is computed as the Reference value plus the specific tolerance value

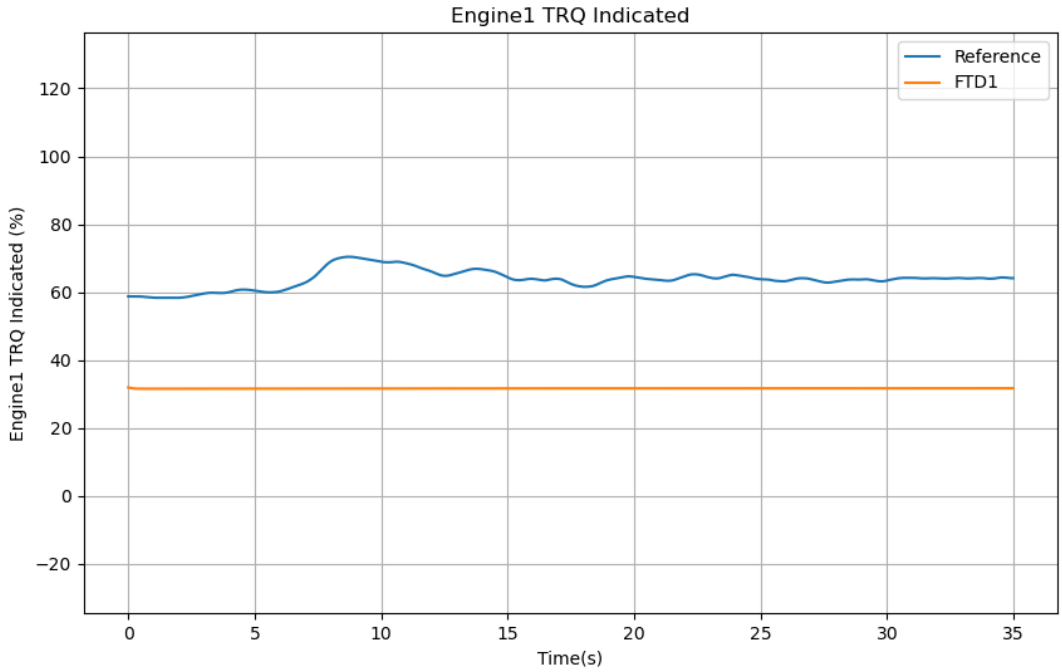
Notes and Rationales

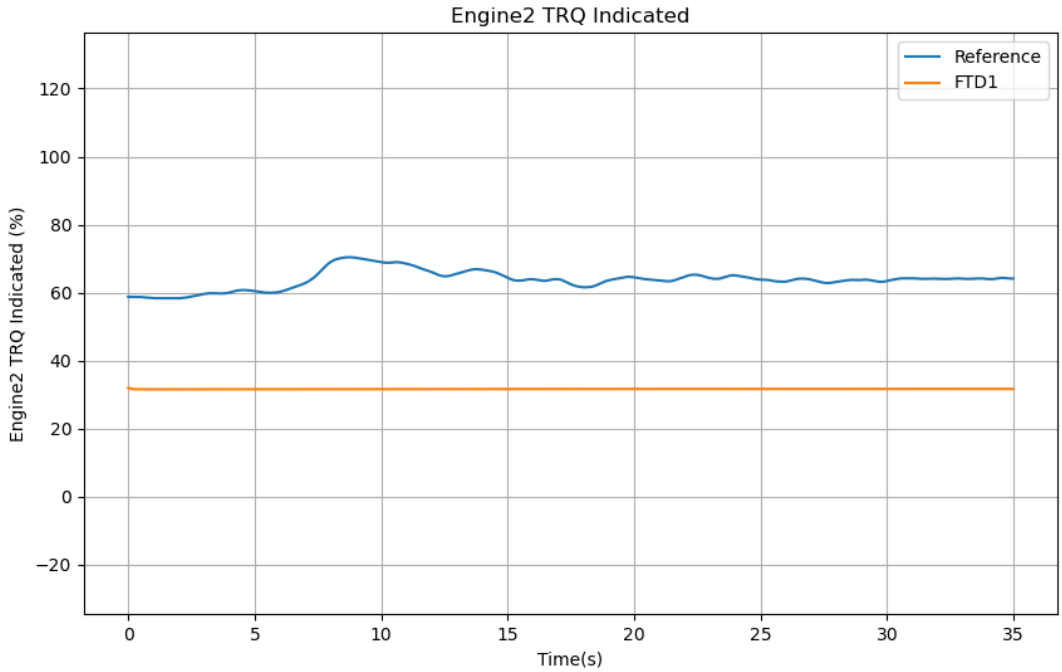
Notes
No Notes related to the entire Test are present
No Notes related to current SubCase are present

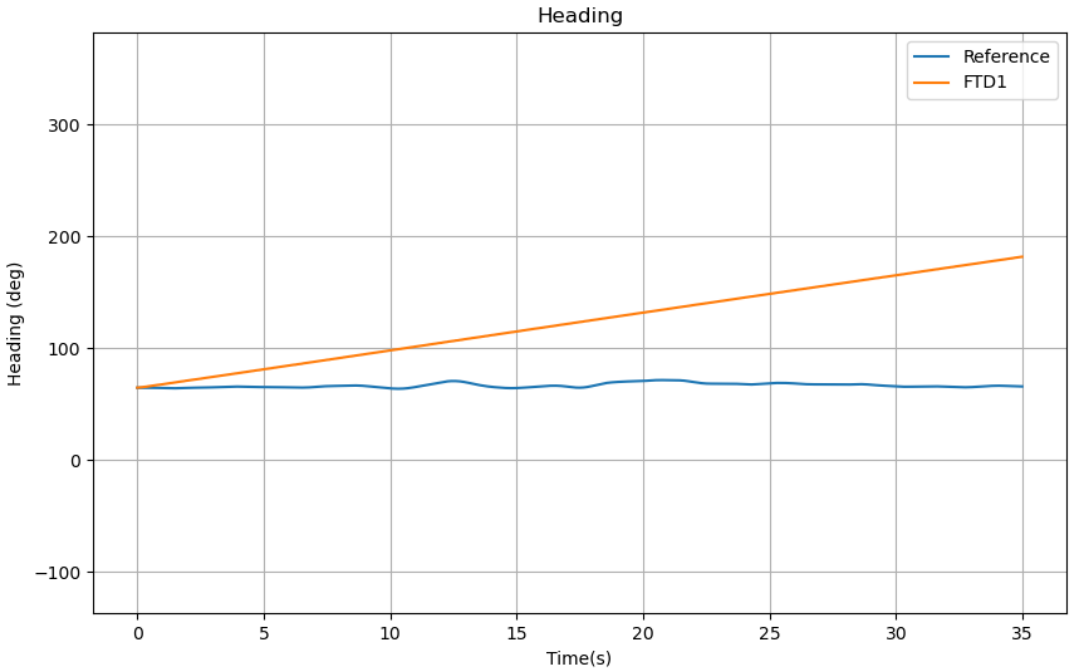
Rationales (Validation Data)	
Rationale 1 (All Subcases)	In the Hover flight maneuver Vertical Speed values are not reliable due to Rotor Downwash effects. In each current Test SubCases a stable Hover maneuver has been performed.

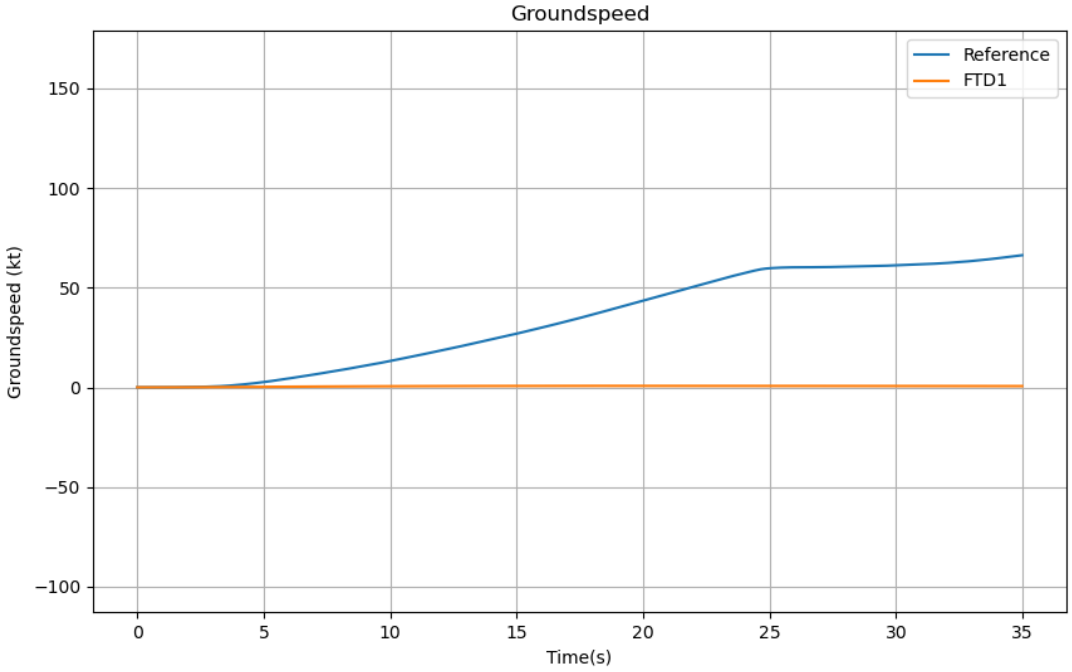
No Rationales related to current SubCase are present

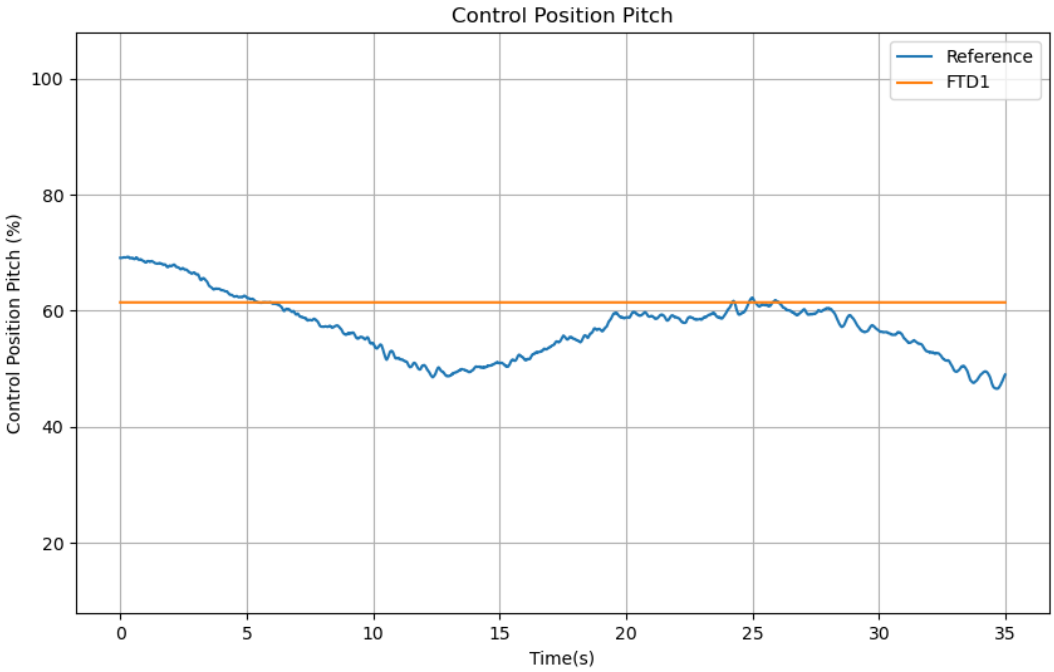
Rationales (Results)
No Rationales related to the entire Test are present
No Rationales related to current SubCase are present

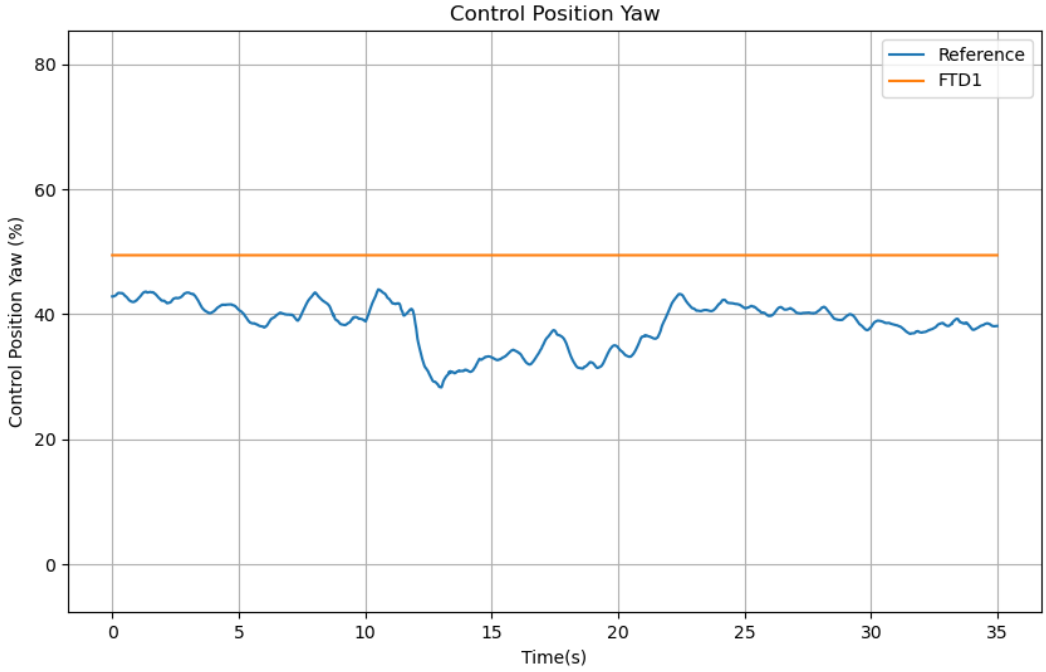

Engine1 TRQ Indicated
Reference
FTD1
Engine1 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

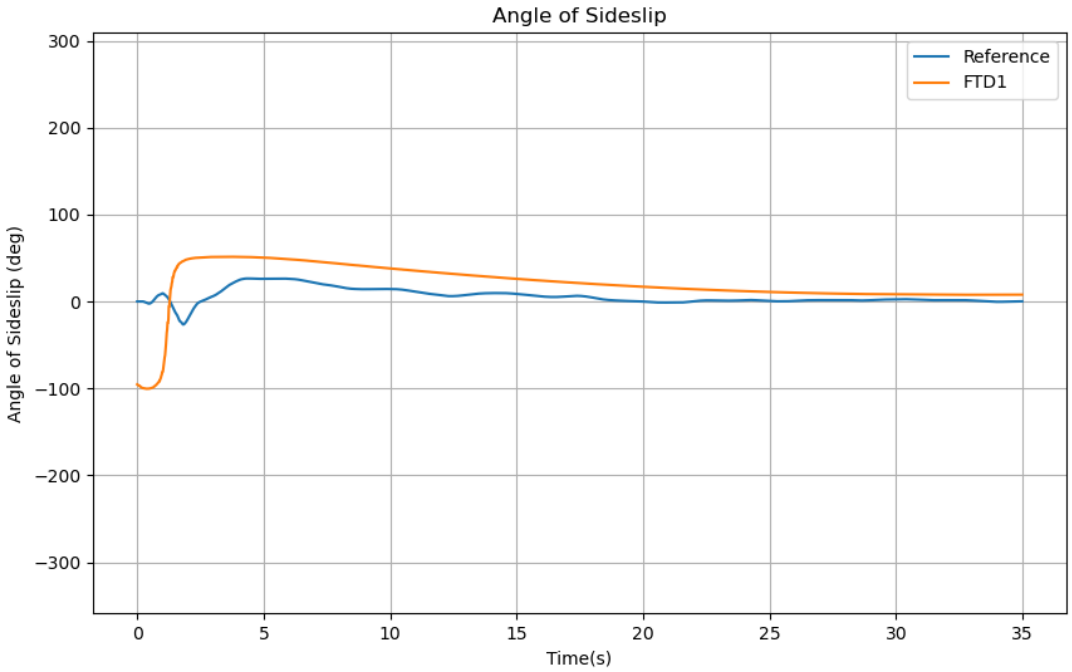

Engine2 TRQ Indicated
Reference
FTD1
Engine2 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

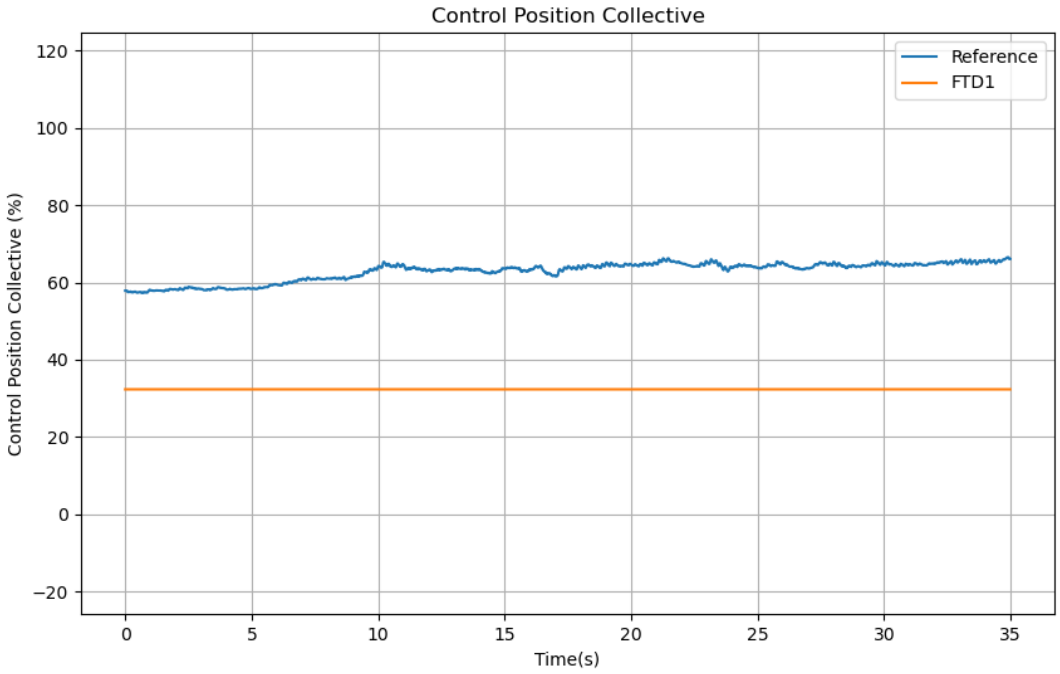

Heading
Reference
FTD1
300
200
100
0
−100
Heading (deg)
0
5
10
15
20
25
30
35
Time(s)

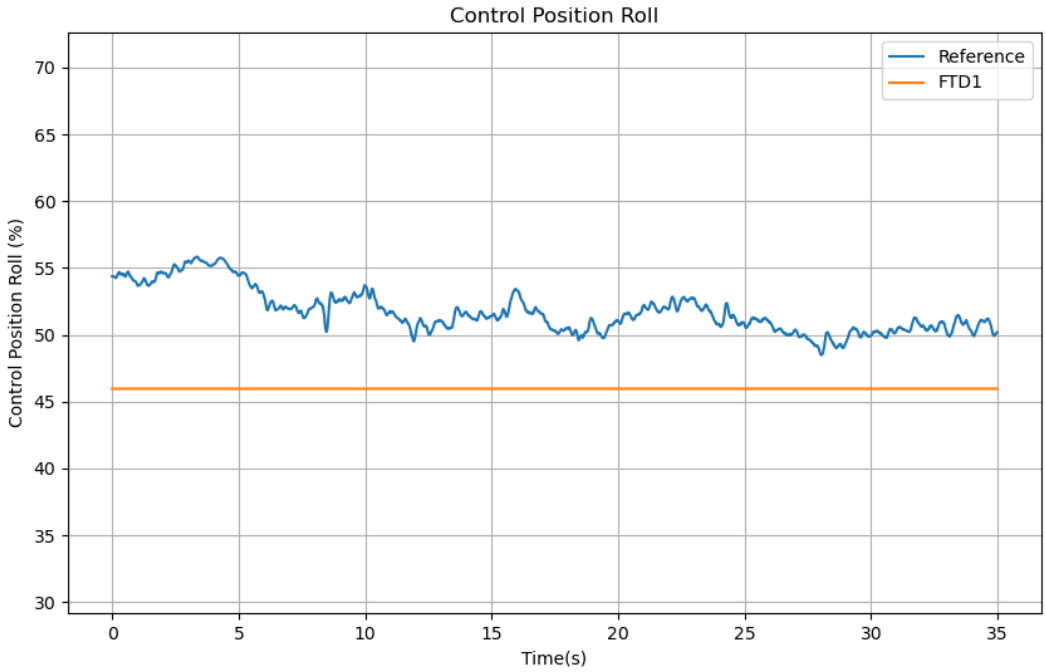

Groundspeed
Reference
FTD1
150
100
50
0
−50
−100
Groundspeed (kt)
0
5
10
15
20
25
30
35
Time(s)

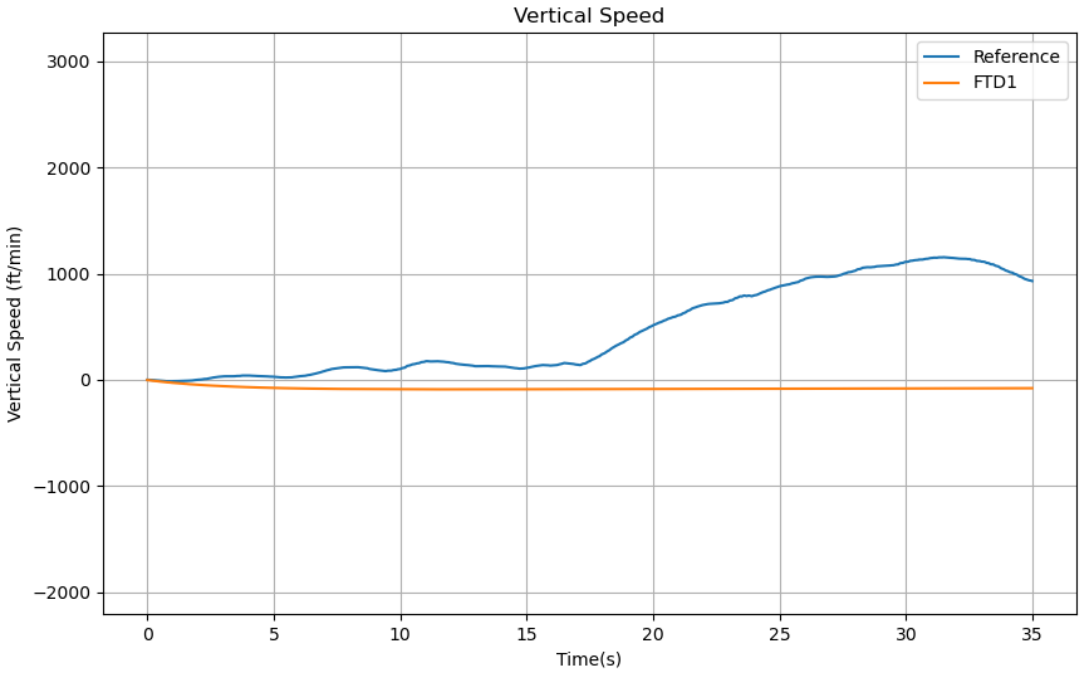

Control Position Pitch
Reference
FTD1
Control Position Pitch (%)
100
80
60
40
20
0
5
10
15
20
25
30
35
Time(s)

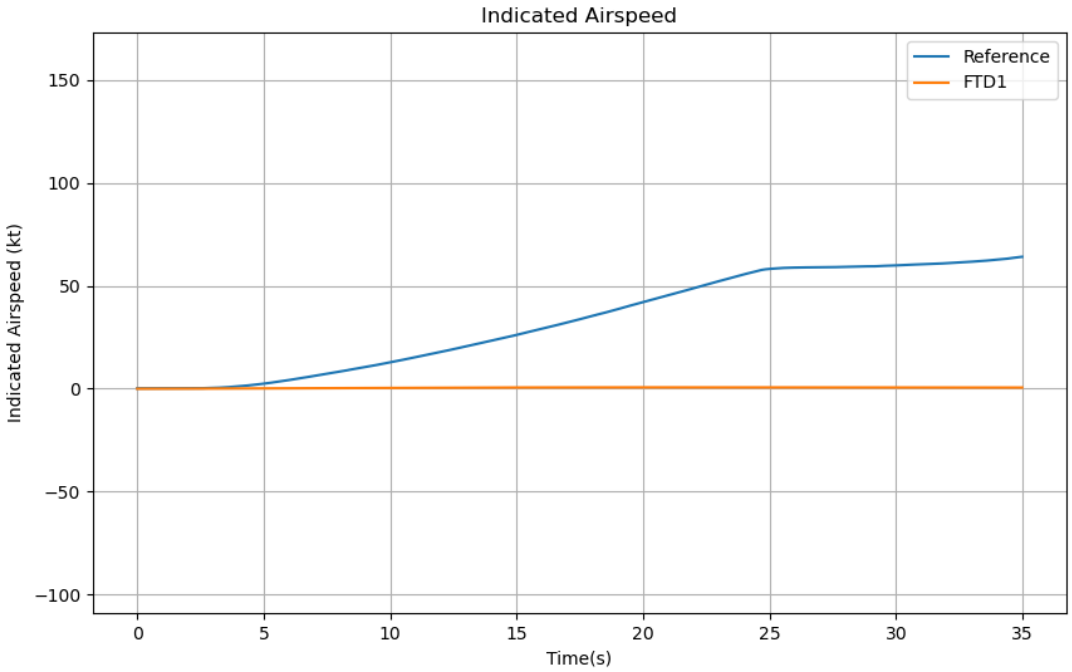

Control Position Yaw
Reference
FTD1
Control Position Yaw (%)
80
60
40
20
0
0
5
10
15
20
25
30
35
Time(s)

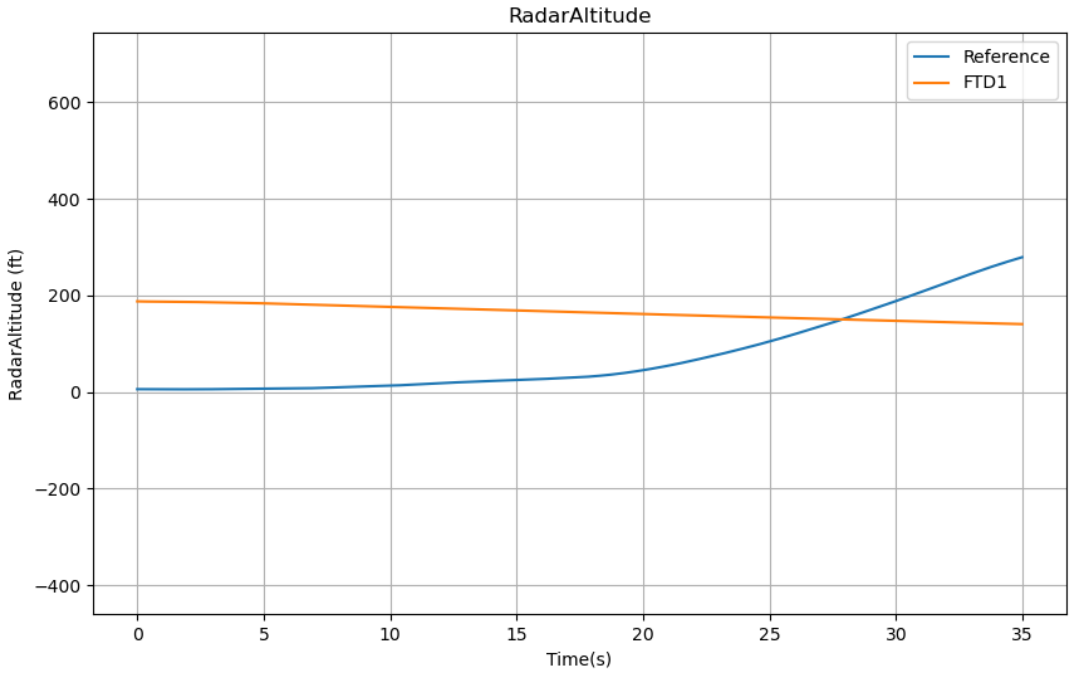

Angle of Sideslip
Reference
FTD1
Angle of Sideslip (deg)
300
200
100
0
−100
−200
−300
0
5
10
15
20
25
30
35
Time(s)

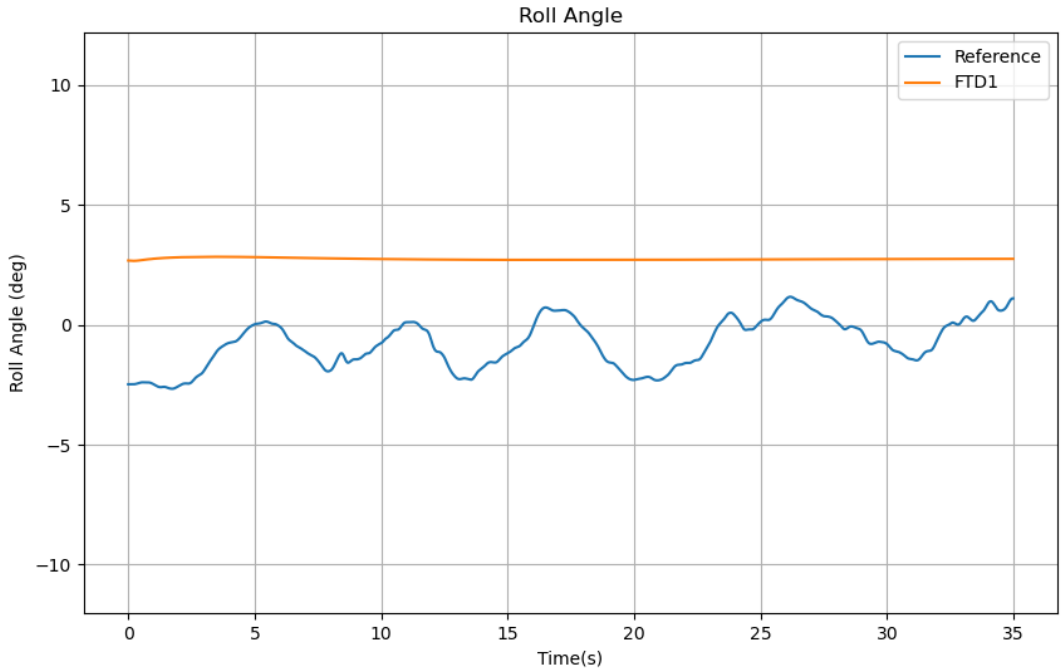

Control Position Collective
Reference
FTD1
Control Position Collective (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

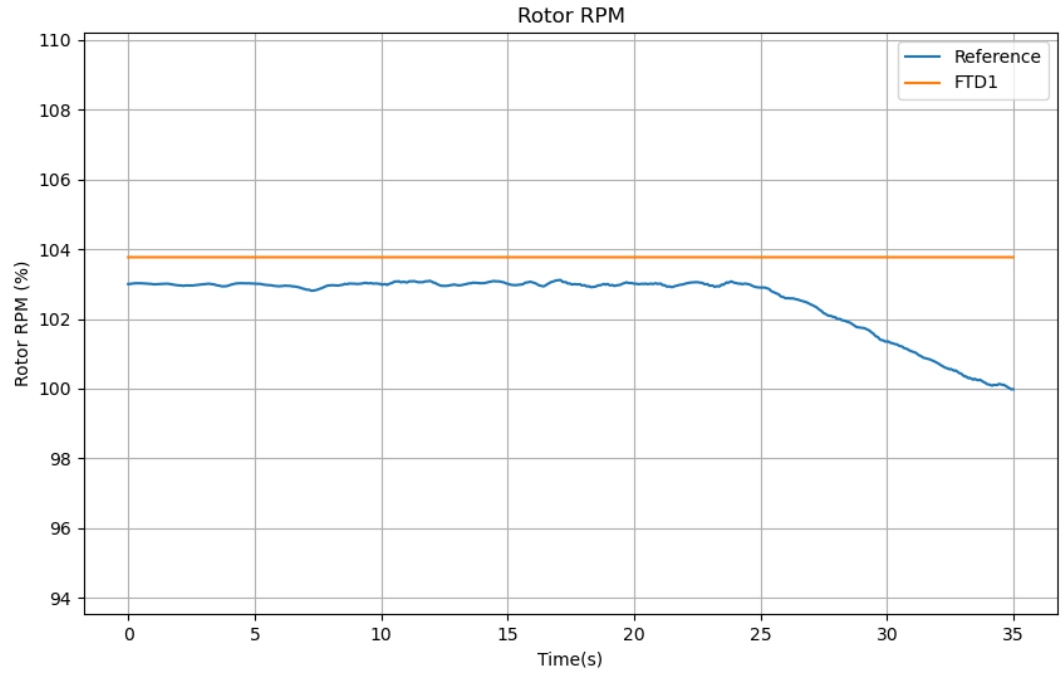

Control Position Roll
Reference
FTD1
Control Position Roll (%)
70
65
60
55
50
45
40
35
30
0
5
10
15
20
25
30
35
Time(s)

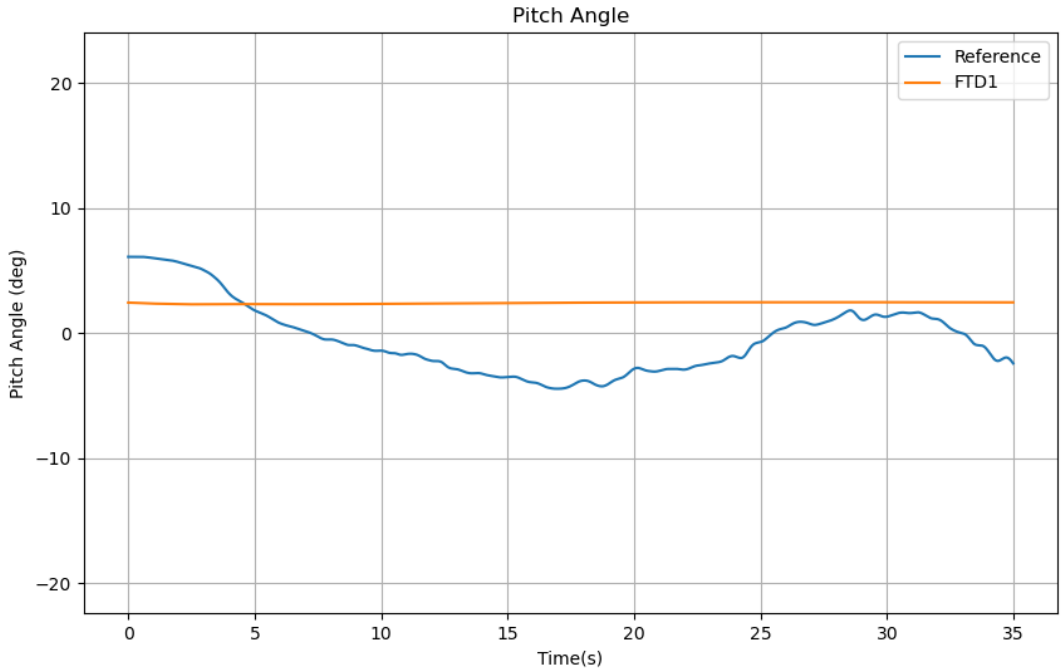

Vertical Speed
Reference
FTD1
Vertical Speed (ft/min)
3000
2000
1000
0
−1000
−2000
0
5
10
15
20
25
30
35
Time(s)


Indicated Airspeed
Reference
FTD1
Indicated Airspeed (kt)
150
100
50
0
−50
−100
0
5
10
15
20
25
30
35
Time(s)


RadarAltitude
Reference
FTD1
RadarAltitude (ft)
600
400
200
0
−200
−400
0
5
10
15
20
25
30
35
Time(s)


Roll Angle
Reference
FTD1
Roll Angle (deg)
10
5
0
−5
−10
0
5
10
15
20
25
30
35
Time(s)


Rotor RPM
Reference
FTD1
Rotor RPM (%)
110
108
106
104
102
100
98
96
94
0
5
10
15
20
25
30
35
Time(s)


Pitch Angle
Reference
FTD1
Pitch Angle (deg)
20
10
0
−10
−20
0
5
10
15
20
25
30
35
Time(s)

1.d.B2 Heavy GW, Aft CG - 10 ft AGL

Test Procedure

On the IOS select ’Maintenance’ page then ’QTG-Test’. The test can be run either in automatic or manual mode.

Automatic testing: drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed. Cockpit controls and switches status will be overwritten by the QTG Tool.

Press ’Start QTG Execution’ to start the test.

The flight controls will be controlled according to the following table:

Flight Controls	Status
Longitudinal	DIRECT DRIVEN
Lateral	DIRECT DRIVEN
Collective	DIRECT DRIVEN
Pedals	DIRECT DRIVEN

Manual testing: follow the Manual Procedure steps indicated in the next page.

Manual Procedure

1. Drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed.
2. In the Test Selection list toggle from ’Automatic’ to ’Manual’.
3. Press ’Start QTG execution’. Wait for the completion message of the initialization phase.
4. Setup the cockpit as indicated in the Cockpit Configuration table below.
5. Press the Spare button on the Cyclic stick to run the simulation.
6. Stabilize and maintain current flight condition.
7. Press the Spare button on the Cyclic stick to start recording. On the IOS ’Manual QTG’ page, check that an indication of the test elapsed time is shown.
8. Press the Spare button on the Cyclic stick to complete the test or to proceed with the next test.

Initial Conditions

Parameter [UoM]	Reference*	FSTD
Mass Properties		
Gross Weight	2757.9	7500.0
Fuel Weigth	341.1	0.0
CG Longitudinal	4232	-4.7
CG Lateral	23	0.0
Moment of Inertia XX	2825	9638.0
Moment of Inertia XZ	-981	2226.0
Moment of Inertia YY	10635	33240.0
Moment of Inertia ZZ	12261	25889.0
Environment Parameters		
Pressure Altitude	1307.1	344.90347448792386
OAT	13.8	13.8
Wind Direction	0.0	0.0
Wind Speed	0.0	0.0
Flight Parameters		
Airspeed	0.2	-0.0007328300784191671
Ground Speed	0.0	0.008344186369269284
Vertical Velocity	0.0	0.013288436214678432
Radar Altitude	5.7	187.67051261194212
Rotor Speed	103.0	28.797932657908333
Engine 1 Torque	57.9	31.95777495505339
Engine 2 Torque	57.9	31.95777495505339
Pitch Angle	6.1	0.04253490439090714
Bank Angle	-2.5	0.046752386160144134
Heading	64.7	1.1314822542825382
Pitch Rate	0.0	0.00038809458831355273
Roll Rate	-0.0	-0.003734954692935167
Yaw Rate	-0.0	0.02717967586248816
X Body Acceleration	-0.1	0.0
Y Body Acceleration	-0.0	0.0
Z Body Acceleration	-0.0	0.0
Longitudinal Cyclic Pos.	69.1	-0.228729248046875
Lateral Cyclic Pos.	54.4	-0.080810546875
Pedals Pos.	42.8	-0.011199951171875
Collective Pos.	57.8	-0.3538818359375
Engine 1 Main Switch	FLIGHT	FLIGHT
Engine 2 Main Switch	FLIGHT	FLIGHT
AFCS State	DSAS	SCAS
HINR Button	HINR	HINR

* Snapshot Tests: Reference initial conditions are computed as mean values over data time histories

Test Results

Parameter [U oM]	**Reference**	**Min****	**FSTD**	**Max****
Snapshot Data				
Engine 1 Torque [%]	1	2	3	4

** The Min value is computed as the Reference value minus the specific tolerance value.
The Max value is computed as the Reference value plus the specific tolerance value

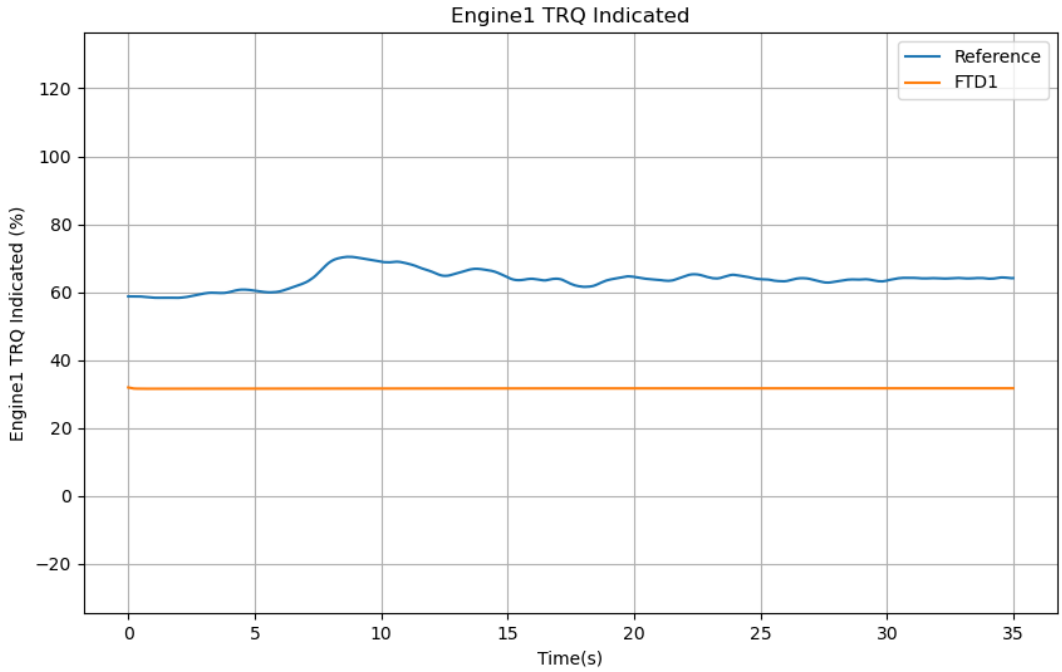
Notes and Rationales

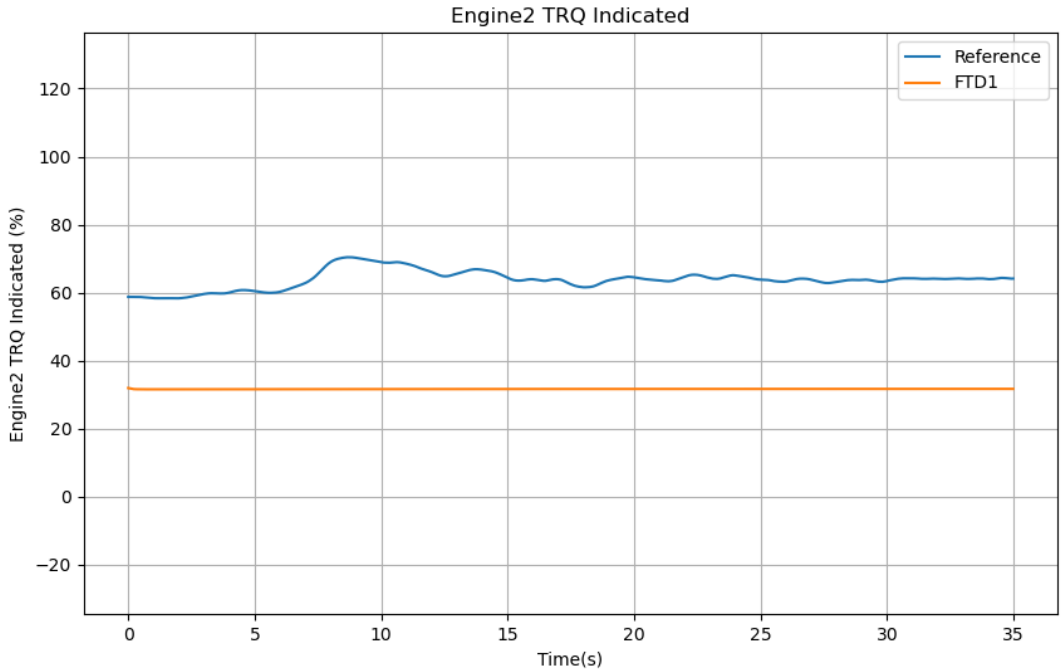
Notes
No Notes related to the entire Test are present
No Notes related to current SubCase are present

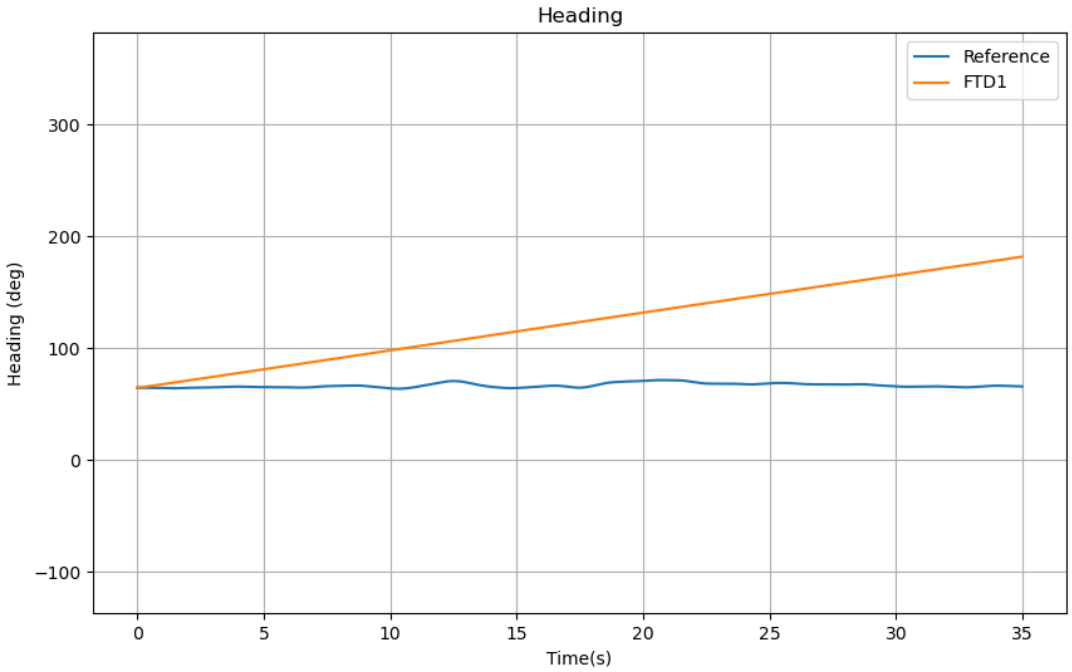
Rationales (Validation Data)	
Rationale 1 (All Subcases)	In the Hover flight maneuver Vertical Speed values are not reliable due to Rotor Downwash effects. In each current Test SubCases a stable Hover maneuver has been performed.

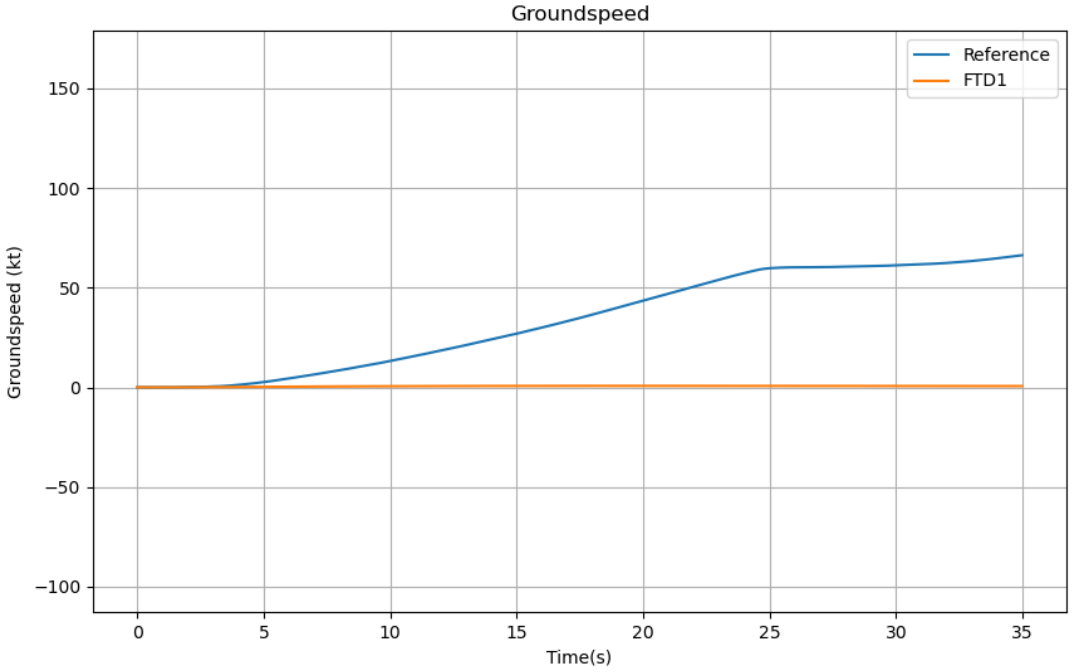
No Rationales related to current SubCase are present

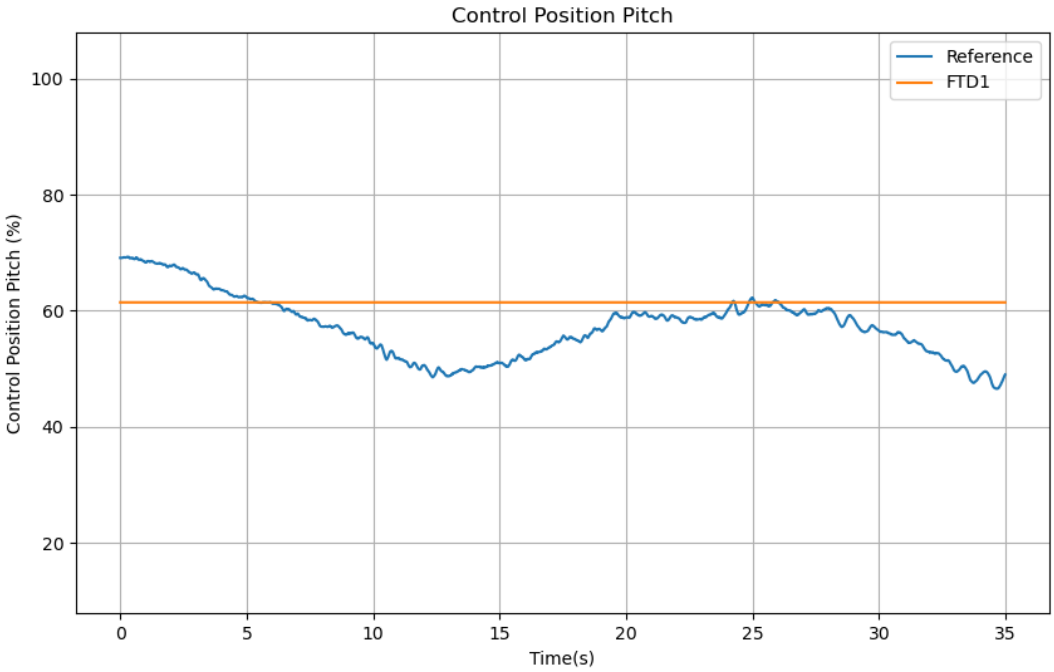
Rationales (Results)
No Rationales related to the entire Test are present
No Rationales related to current SubCase are present

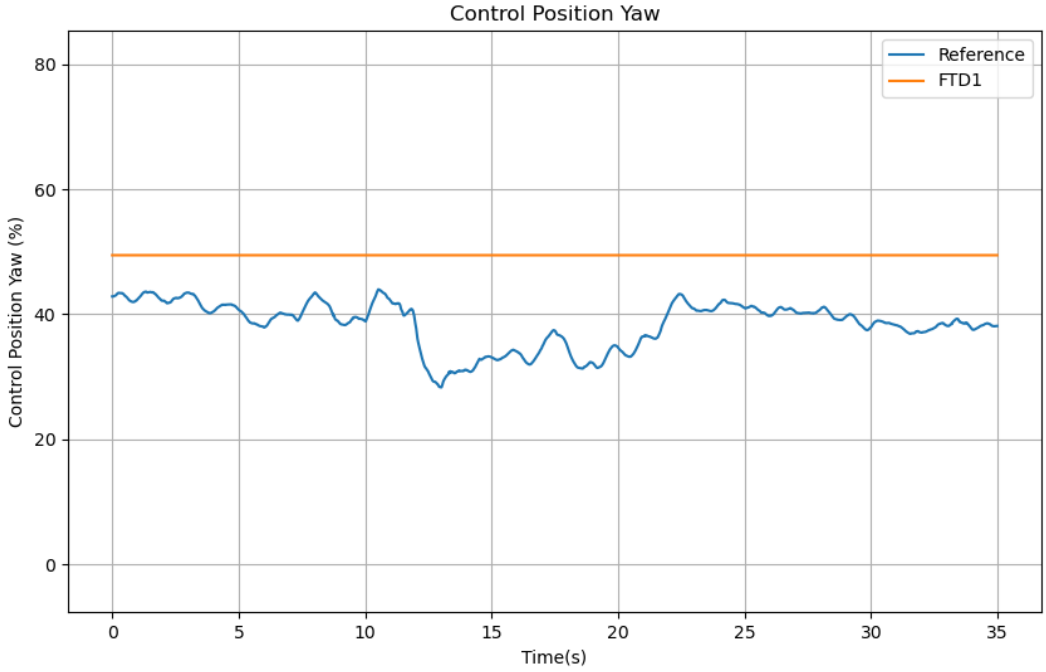

Engine1 TRQ Indicated
Reference
FTD1
Engine1 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

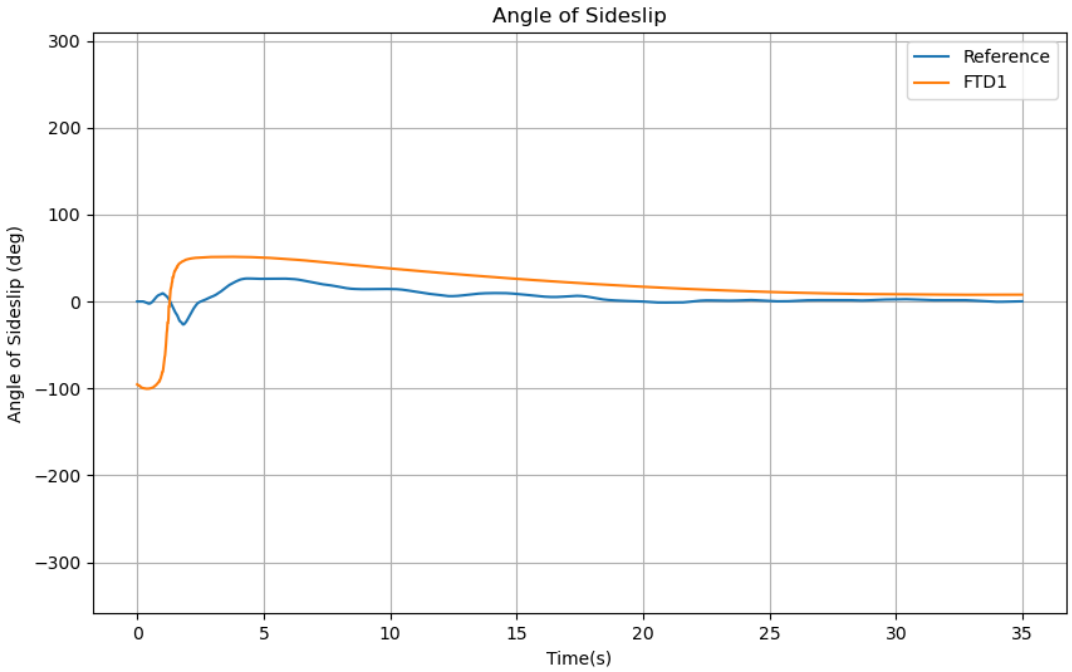

Engine2 TRQ Indicated
Reference
FTD1
Engine2 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

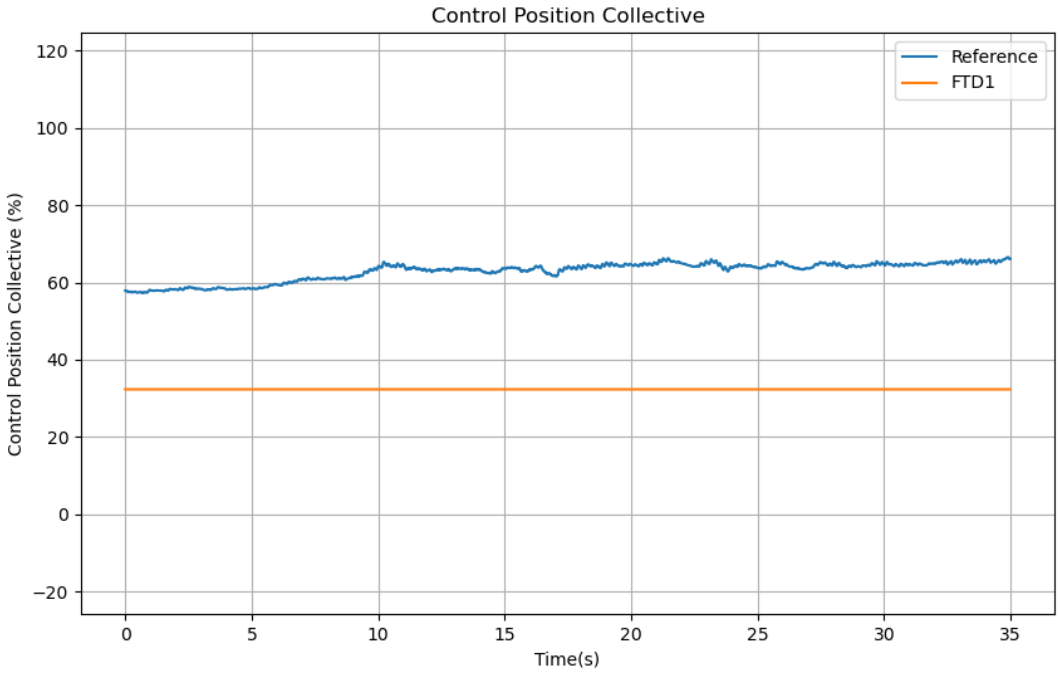

Heading
Reference
FTD1
300
200
100
0
−100
Heading (deg)
0
5
10
15
20
25
30
35
Time(s)

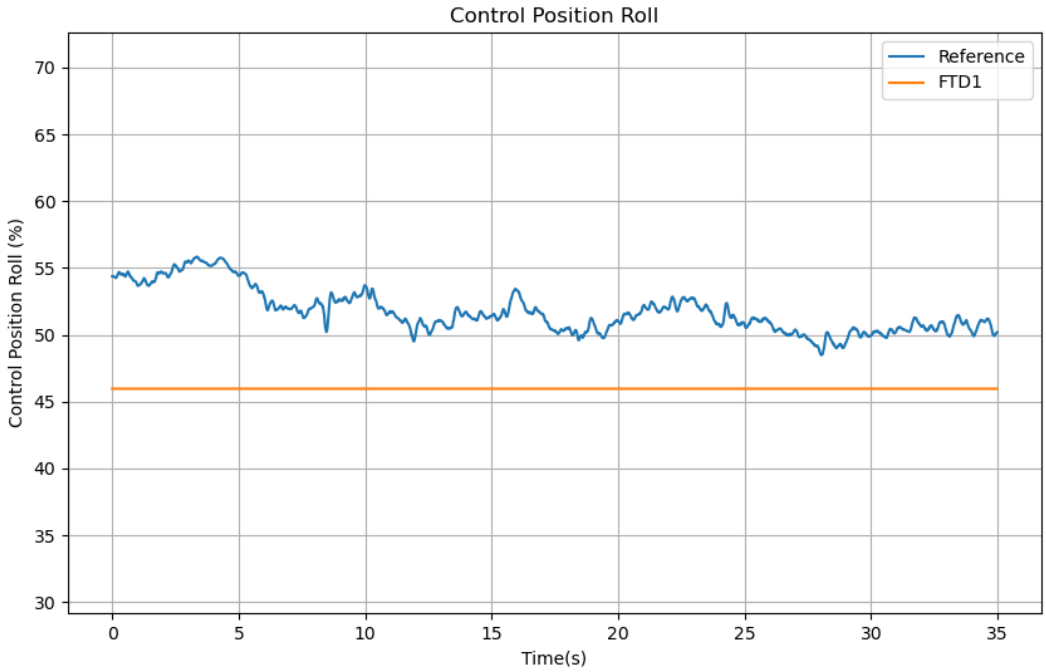

Groundspeed
Reference
FTD1
150
100
50
0
−50
−100
Groundspeed (kt)
0
5
10
15
20
25
30
35
Time(s)

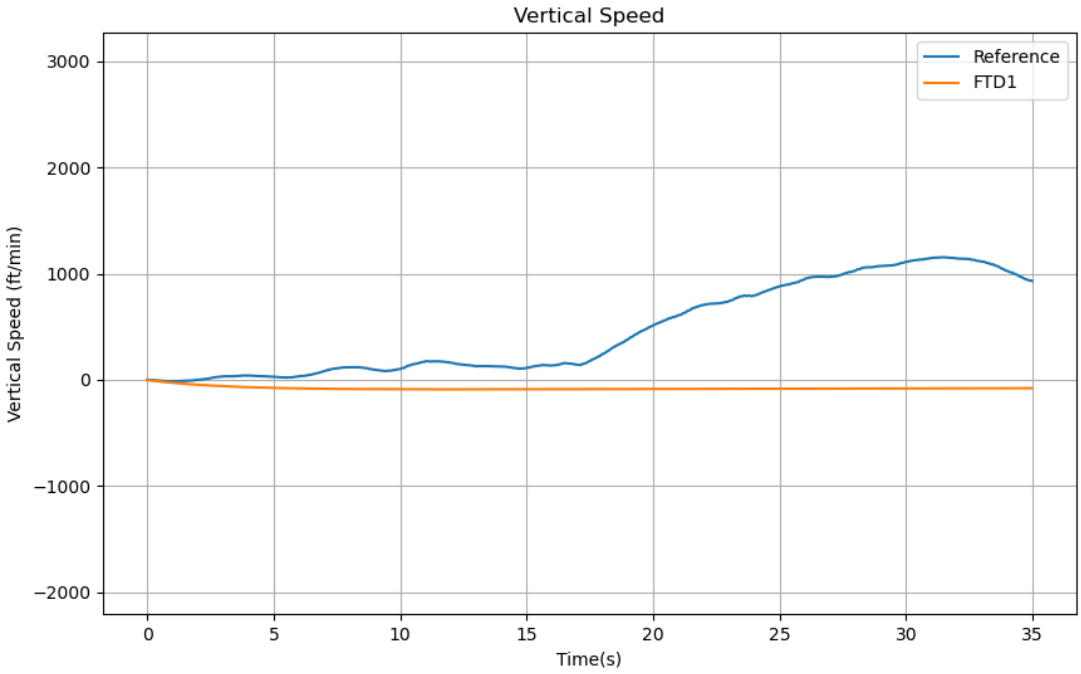

Control Position Pitch
Reference
FTD1
Control Position Pitch (%)
100
80
60
40
20
0
5
10
15
20
25
30
35
Time(s)

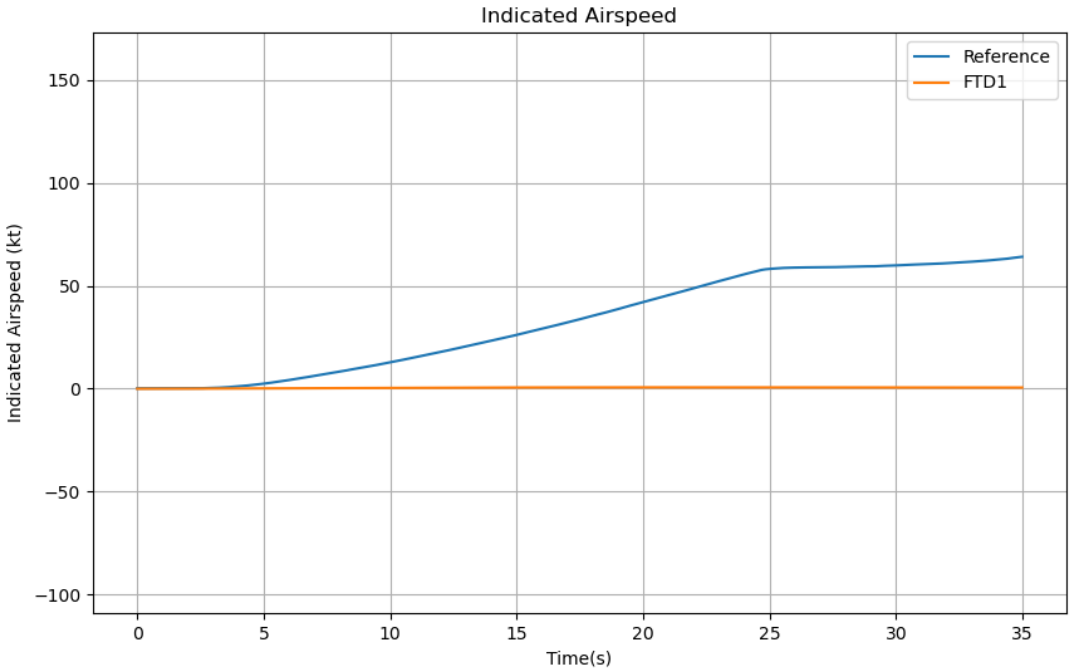

Control Position Yaw
Reference
FTD1
Control Position Yaw (%)
80
60
40
20
0
0
5
10
15
20
25
30
35
Time(s)

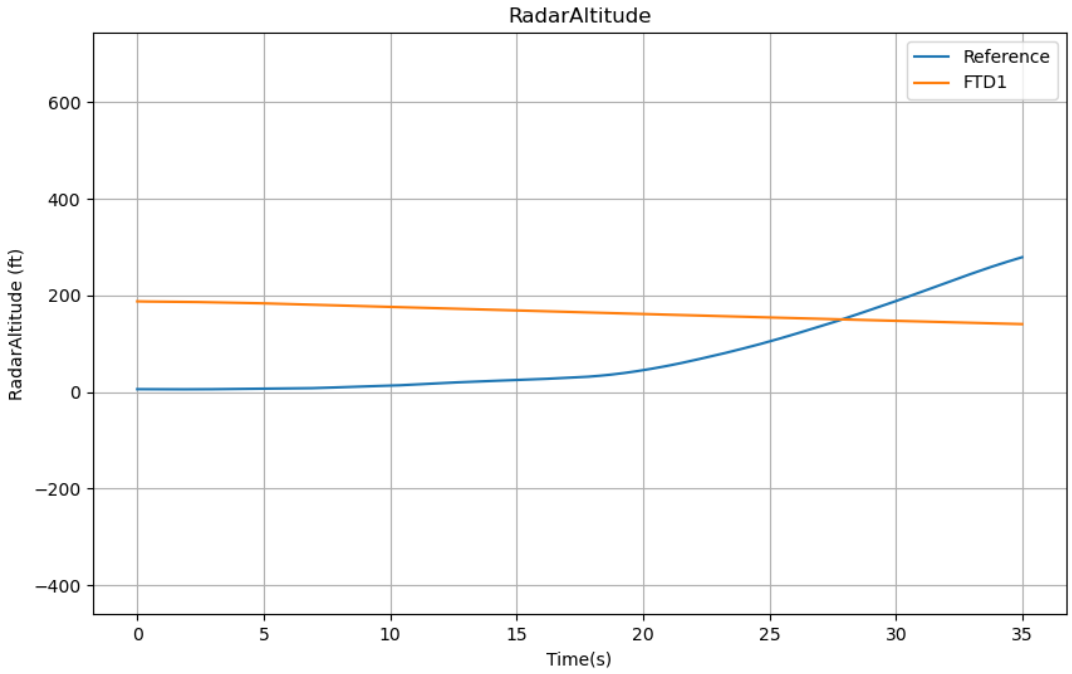

Angle of Sideslip
Reference
FTD1
Angle of Sideslip (deg)
300
200
100
0
−100
−200
−300
0
5
10
15
20
25
30
35
Time(s)

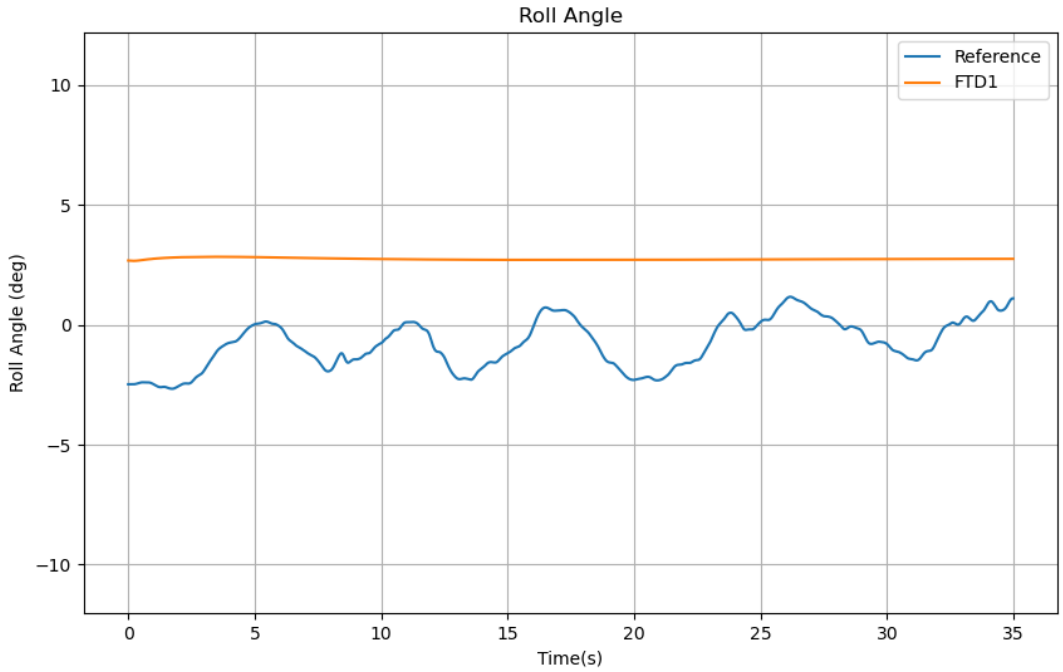

Control Position Collective
Reference
FTD1
Control Position Collective (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

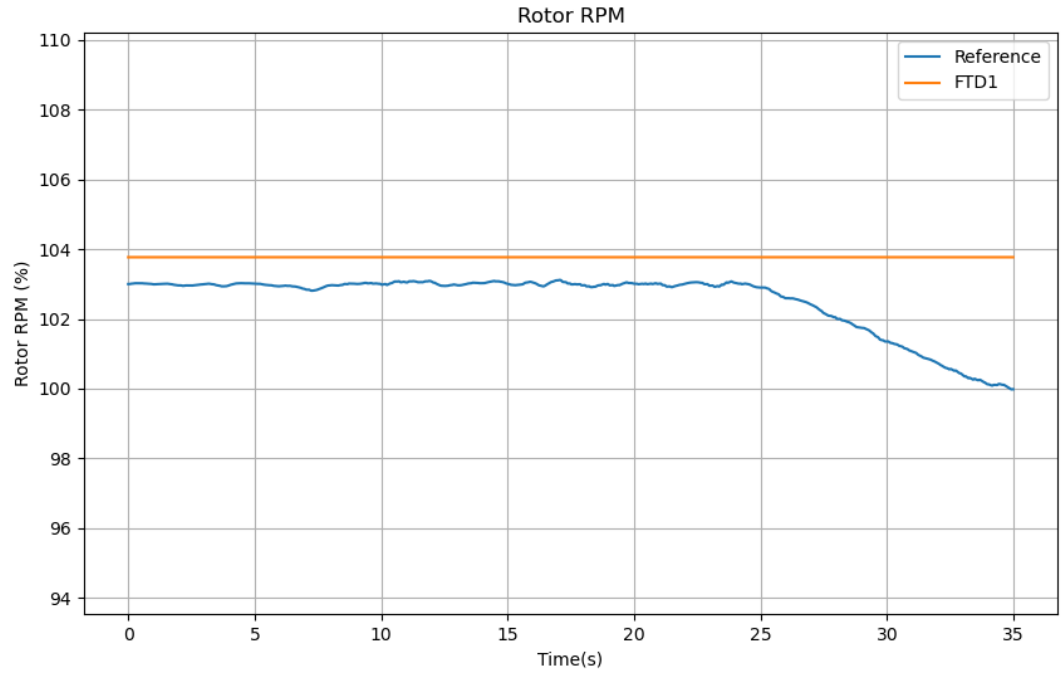

Control Position Roll
Reference
FTD1
Control Position Roll (%)
70
65
60
55
50
45
40
35
30
0
5
10
15
20
25
30
35
Time(s)

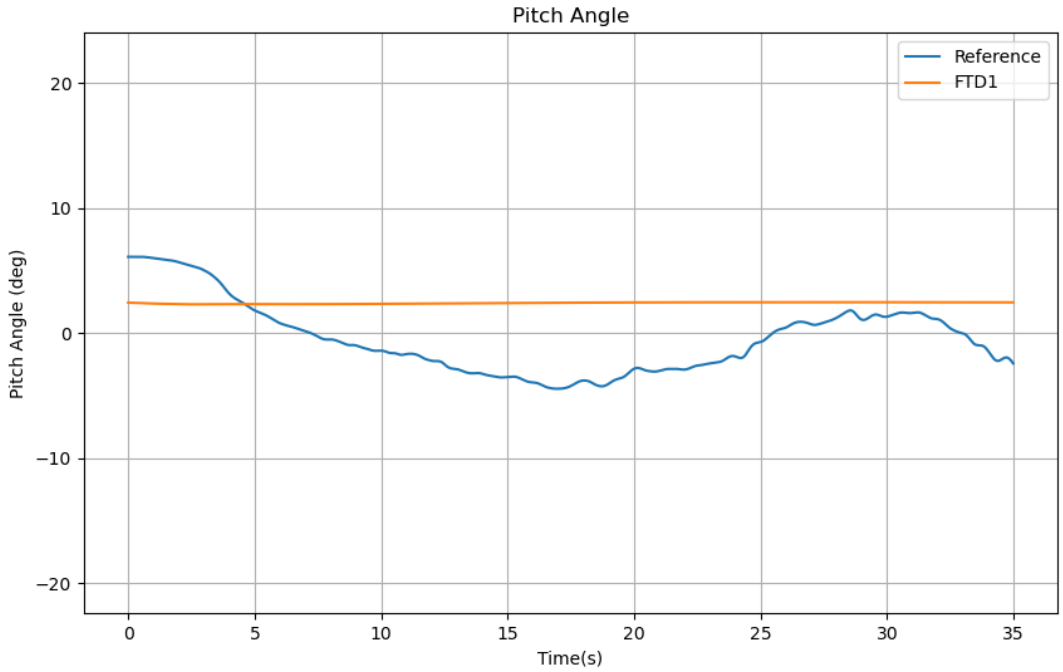

Vertical Speed
Reference
FTD1
Vertical Speed (ft/min)
3000
2000
1000
0
−1000
−2000
0
5
10
15
20
25
30
35
Time(s)


Indicated Airspeed
Reference
FTD1
Indicated Airspeed (kt)
150
100
50
0
−50
−100
0
5
10
15
20
25
30
35
Time(s)


RadarAltitude
Reference
FTD1
RadarAltitude (ft)
600
400
200
0
−200
−400
0
5
10
15
20
25
30
35
Time(s)


Roll Angle
Reference
FTD1
Roll Angle (deg)
10
5
0
−5
−10
0
5
10
15
20
25
30
35
Time(s)


Rotor RPM
Reference
FTD1
Rotor RPM (%)
110
108
106
104
102
100
98
96
94
0
5
10
15
20
25
30
35
Time(s)


Pitch Angle
Reference
FTD1
Pitch Angle (deg)
20
10
0
−10
−20
0
5
10
15
20
25
30
35
Time(s)

1.d.B3 Heavy GW, Aft CG - 25 ft AGL

Test Procedure

On the IOS select ’Maintenance’ page then ’QTG-Test’. The test can be run either in automatic or manual mode.

Automatic testing: drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed. Cockpit controls and switches status will be overwritten by the QTG Tool.

Press ’Start QTG Execution’ to start the test.

The flight controls will be controlled according to the following table:

Flight Controls	Status
Longitudinal	DIRECT DRIVEN
Lateral	DIRECT DRIVEN
Collective	DIRECT DRIVEN
Pedals	DIRECT DRIVEN

Manual testing: follow the Manual Procedure steps indicated in the next page.

Manual Procedure

1. Drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed.
2. In the Test Selection list toggle from ’Automatic’ to ’Manual’.
3. Press ’Start QTG execution’. Wait for the completion message of the initialization phase.
4. Setup the cockpit as indicated in the Cockpit Configuration table below.
5. Press the Spare button on the Cyclic stick to run the simulation.
6. Stabilize and maintain current flight condition.
7. Press the Spare button on the Cyclic stick to start recording. On the IOS ’Manual QTG’ page, check that an indication of the test elapsed time is shown.
8. Press the Spare button on the Cyclic stick to complete the test or to proceed with the next test.

Initial Conditions

Parameter [UoM]	Reference*	FSTD
Mass Properties		
Gross Weight	2757.9	7500.0
Fuel Weigth	341.1	0.0
CG Longitudinal	4232	-4.7
CG Lateral	23	0.0
Moment of Inertia XX	2825	9638.0
Moment of Inertia XZ	-981	2226.0
Moment of Inertia YY	10635	33240.0
Moment of Inertia ZZ	12261	25889.0
Environment Parameters		
Pressure Altitude	1307.1	344.90347448792386
OAT	13.8	13.8
Wind Direction	0.0	0.0
Wind Speed	0.0	0.0
Flight Parameters		
Airspeed	0.2	-0.0007328300784191671
Ground Speed	0.0	0.008344186369269284
Vertical Velocity	0.0	0.013288436214678432
Radar Altitude	5.7	187.67051261194212
Rotor Speed	103.0	28.797932657908333
Engine 1 Torque	57.9	31.95777495505339
Engine 2 Torque	57.9	31.95777495505339
Pitch Angle	6.1	0.04253490439090714
Bank Angle	-2.5	0.046752386160144134
Heading	64.7	1.1314822542825382
Pitch Rate	0.0	0.00038809458831355273
Roll Rate	-0.0	-0.003734954692935167
Yaw Rate	-0.0	0.02717967586248816
X Body Acceleration	-0.1	0.0
Y Body Acceleration	-0.0	0.0
Z Body Acceleration	-0.0	0.0
Longitudinal Cyclic Pos.	69.1	-0.228729248046875
Lateral Cyclic Pos.	54.4	-0.080810546875
Pedals Pos.	42.8	-0.011199951171875
Collective Pos.	57.8	-0.3538818359375
Engine 1 Main Switch	FLIGHT	FLIGHT
Engine 2 Main Switch	FLIGHT	FLIGHT
AFCS State	DSAS	SCAS
HINR Button	HINR	HINR

* Snapshot Tests: Reference initial conditions are computed as mean values over data time histories

Test Results

Parameter [U oM]	**Reference**	**Min****	**FSTD**	**Max****
Snapshot Data				
Engine 1 Torque [%]	1	2	3	4

** The Min value is computed as the Reference value minus the specific tolerance value.
The Max value is computed as the Reference value plus the specific tolerance value

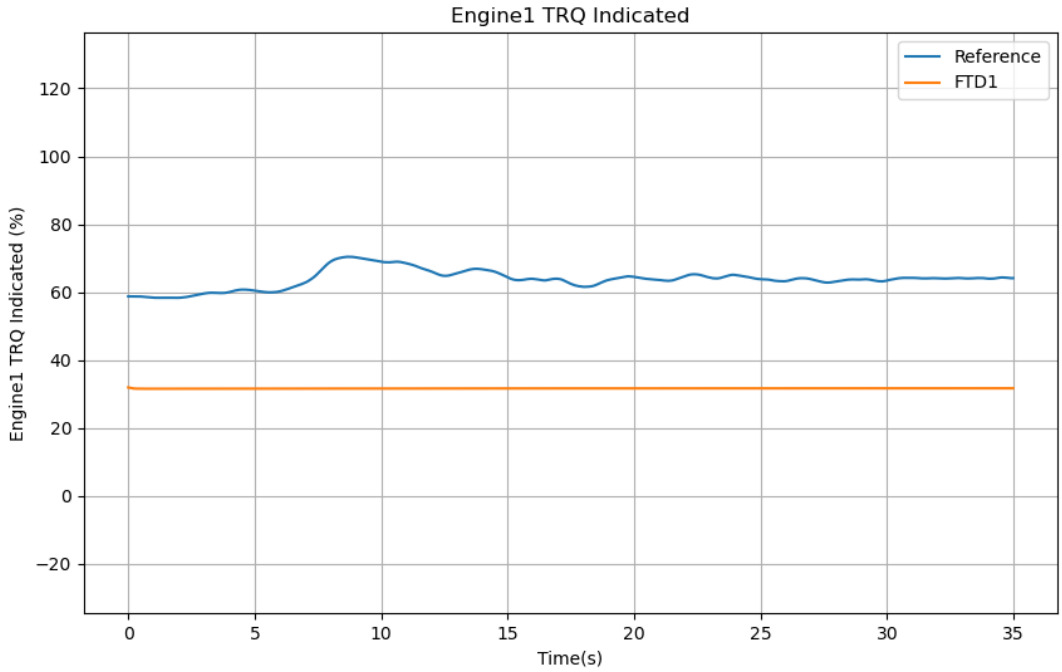
Notes and Rationales

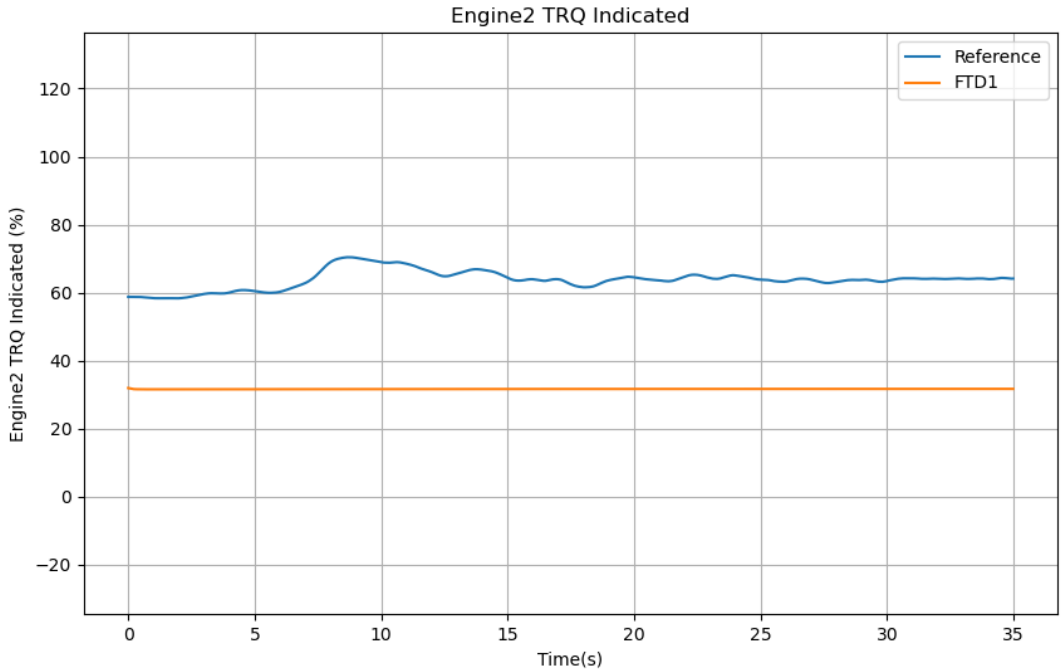
Notes
No Notes related to the entire Test are present
No Notes related to current SubCase are present

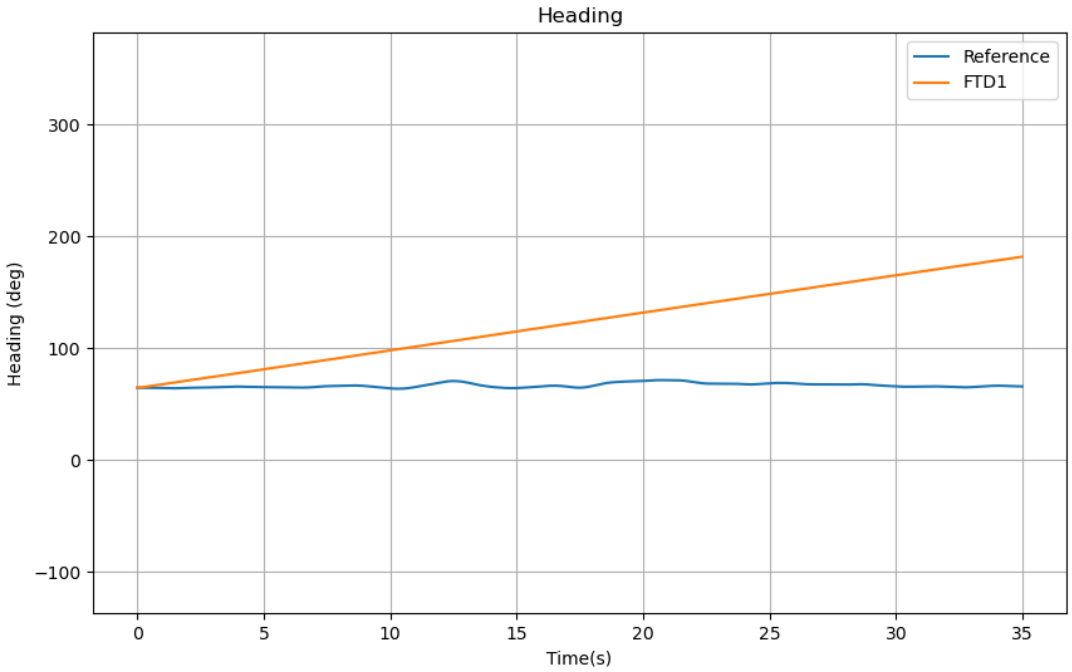
Rationales (Validation Data)	
Rationale 1 (All Subcases)	In the Hover flight maneuver Vertical Speed values are not reliable due to Rotor Downwash effects. In each current Test SubCases a stable Hover maneuver has been performed.

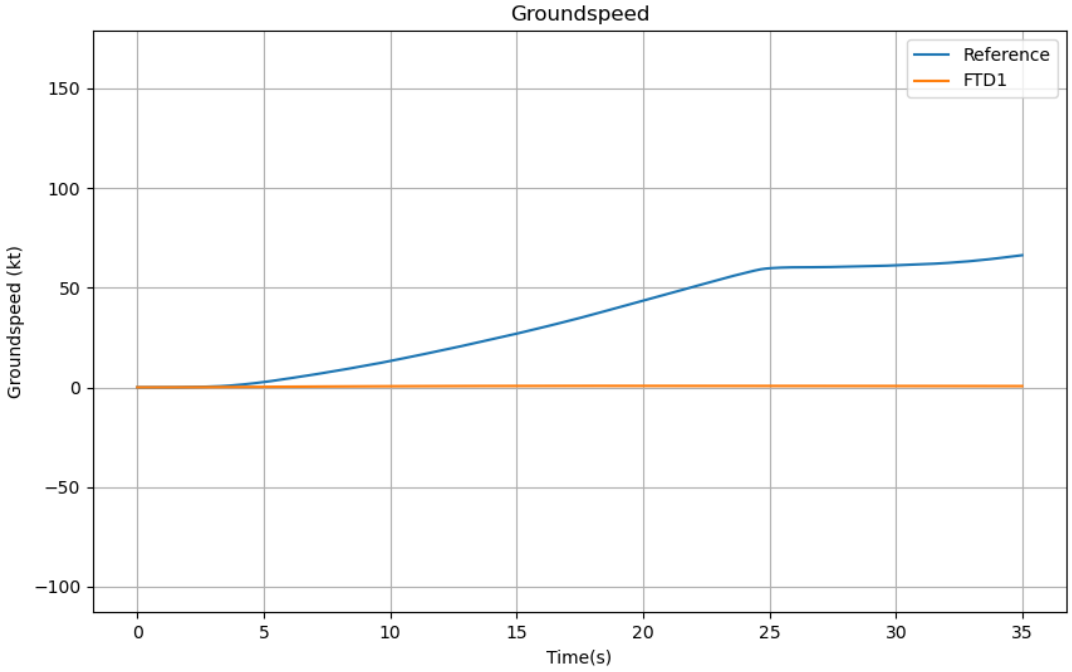
No Rationales related to current SubCase are present

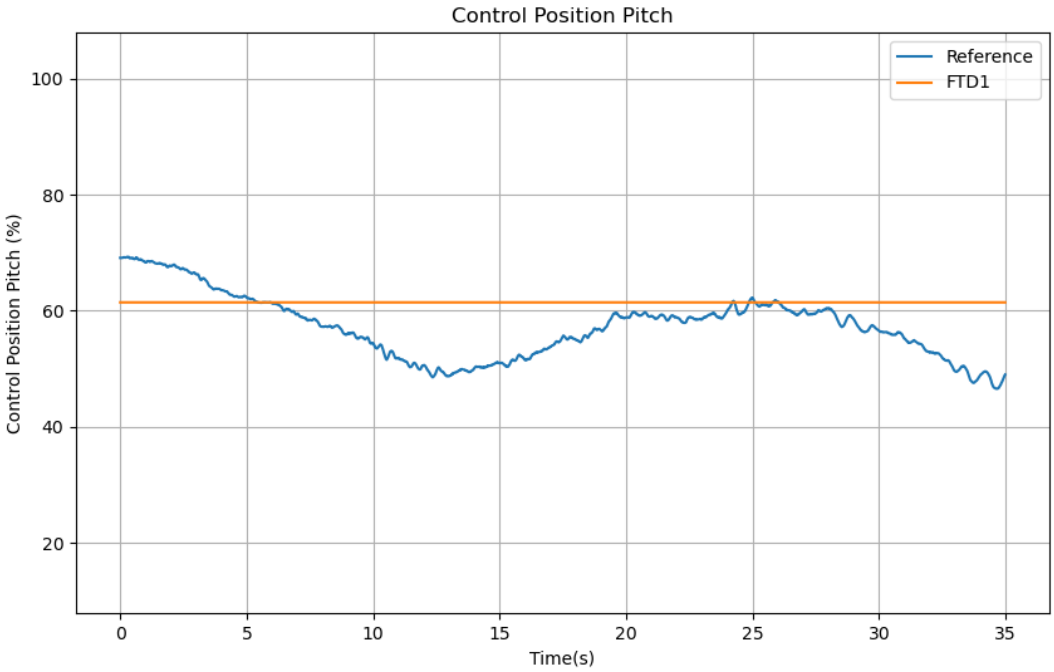
Rationales (Results)
No Rationales related to the entire Test are present
No Rationales related to current SubCase are present

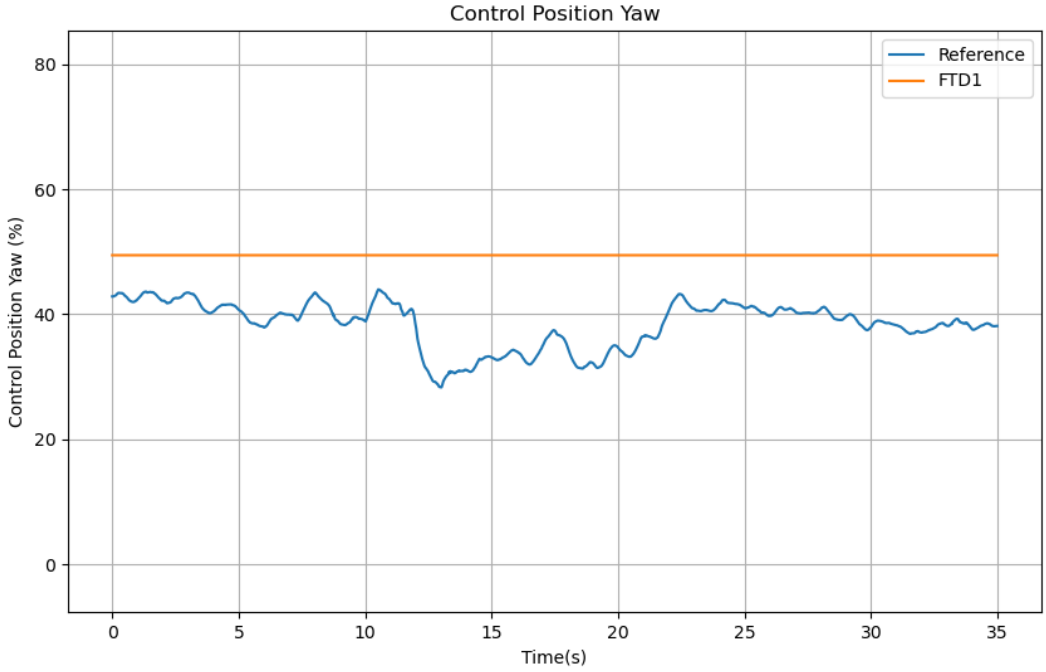

Engine1 TRQ Indicated
Reference
FTD1
Engine1 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

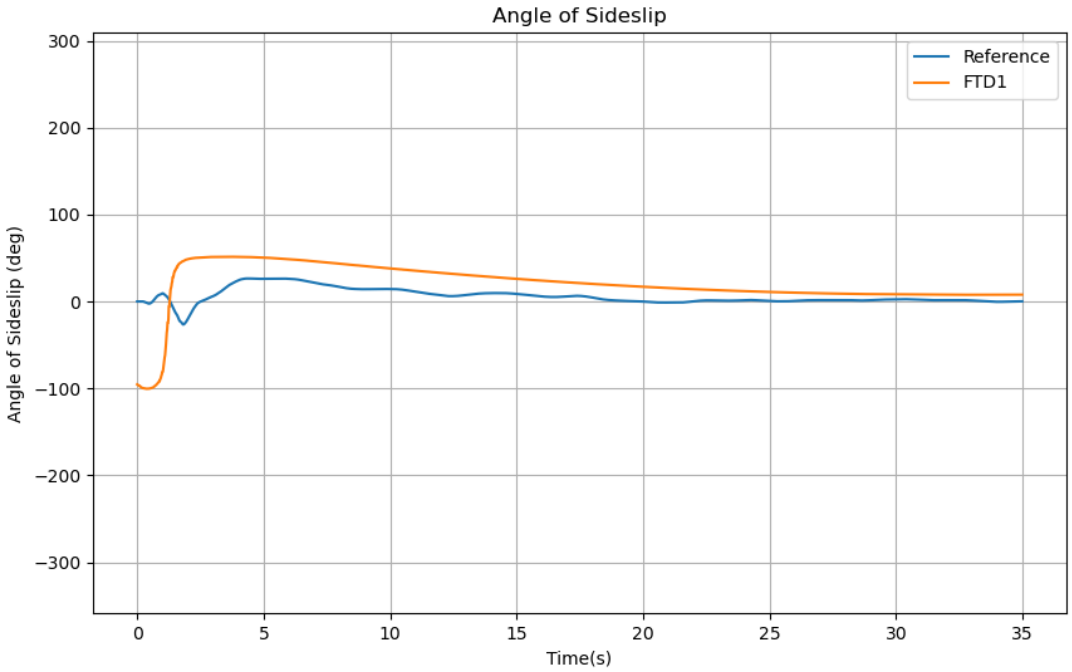

Engine2 TRQ Indicated
Reference
FTD1
Engine2 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

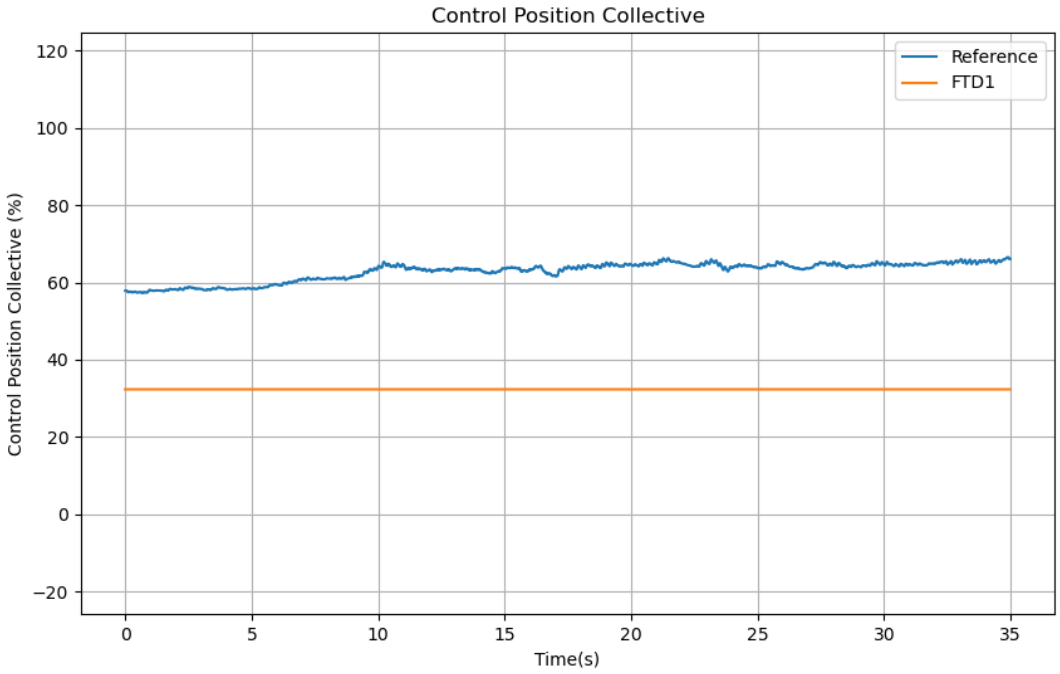

Heading
Reference
FTD1
300
200
100
0
−100
Heading (deg)
0
5
10
15
20
25
30
35
Time(s)

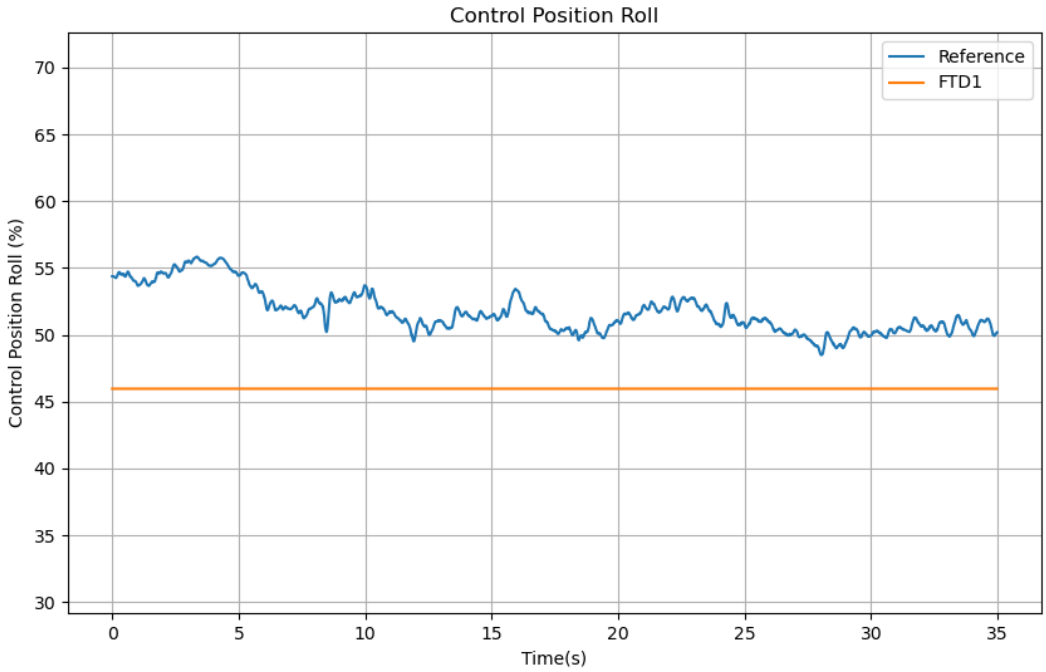

Groundspeed
Reference
FTD1
150
100
50
0
−50
−100
Groundspeed (kt)
0
5
10
15
20
25
30
35
Time(s)

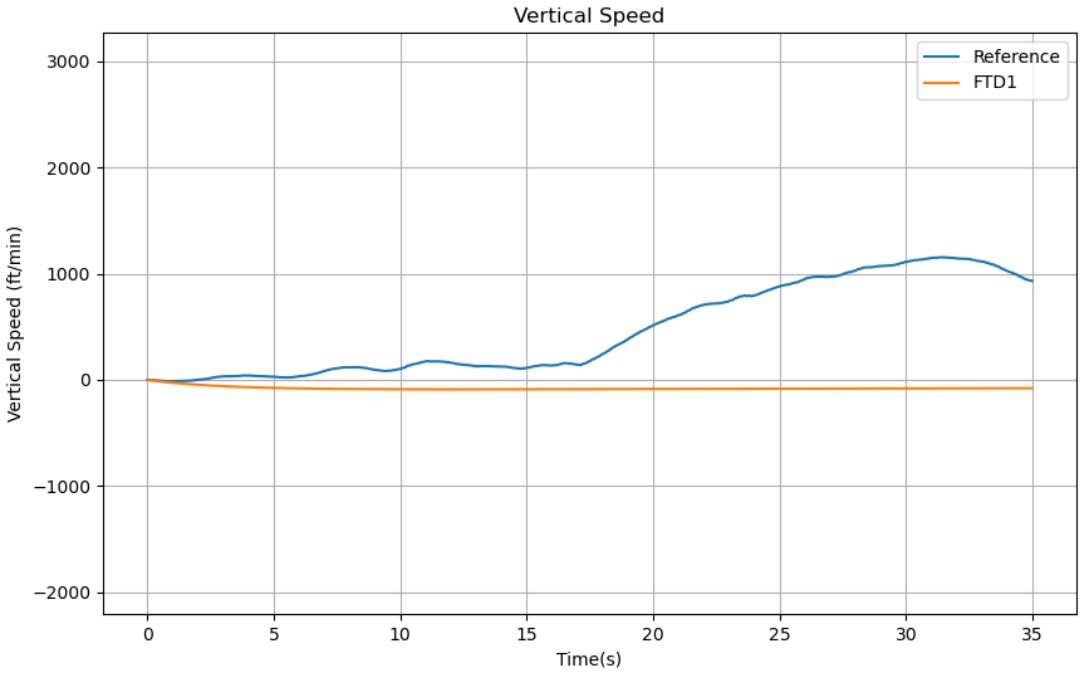

Control Position Pitch
Reference
FTD1
Control Position Pitch (%)
100
80
60
40
20
0
5
10
15
20
25
30
35
Time(s)

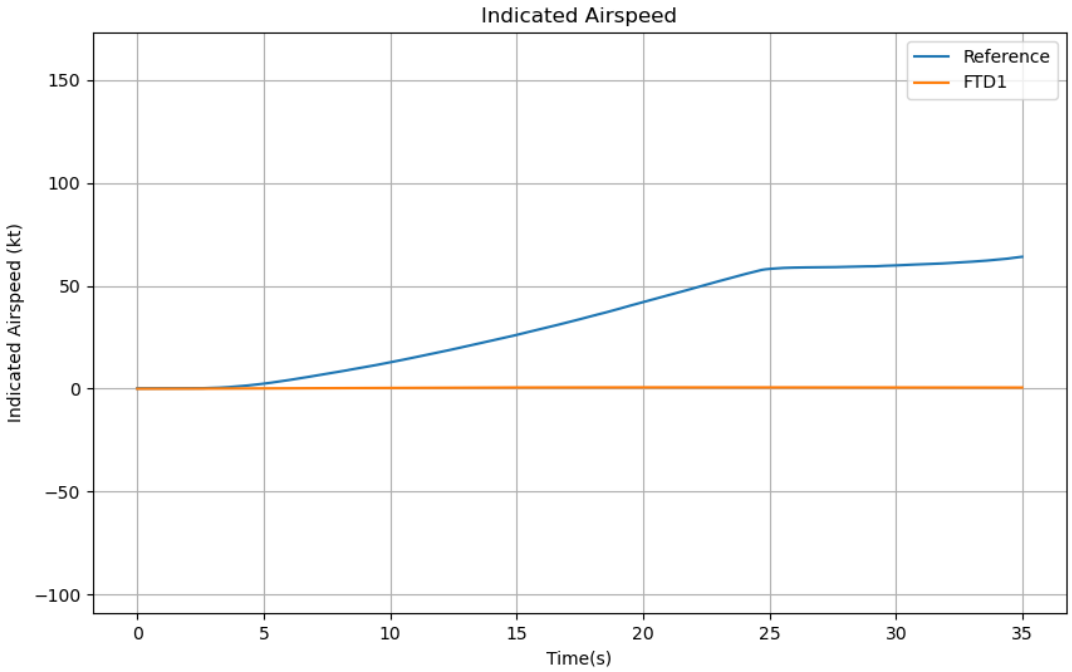

Control Position Yaw
Reference
FTD1
Control Position Yaw (%)
80
60
40
20
0
0
5
10
15
20
25
30
35
Time(s)

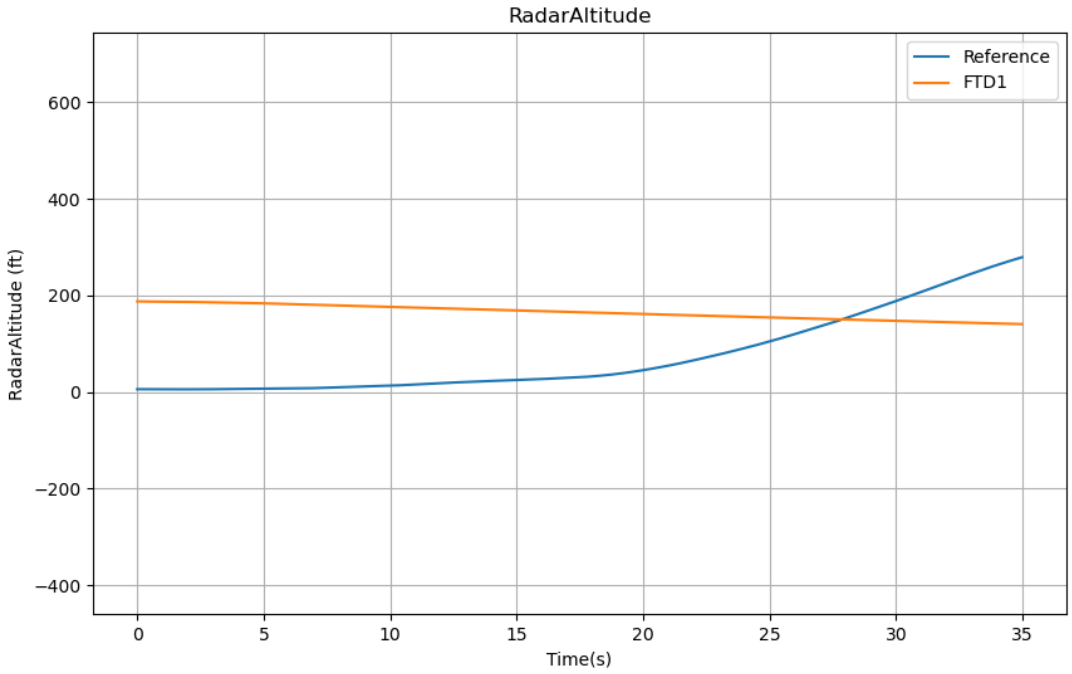

Angle of Sideslip
Reference
FTD1
Angle of Sideslip (deg)
300
200
100
0
−100
−200
−300
0
5
10
15
20
25
30
35
Time(s)

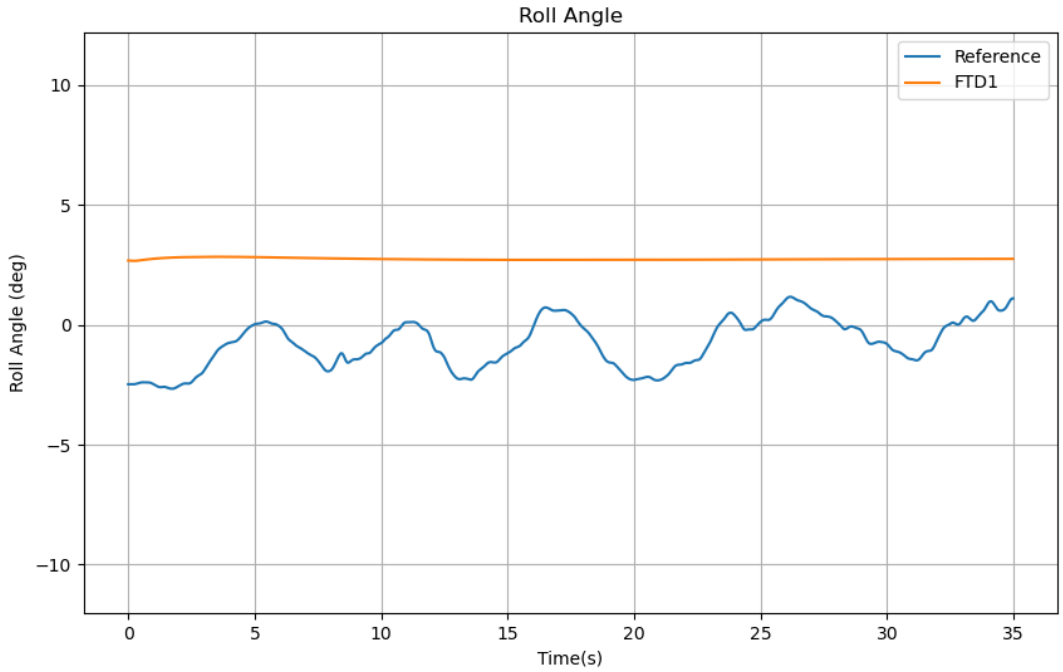

Control Position Collective
Reference
FTD1
Control Position Collective (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

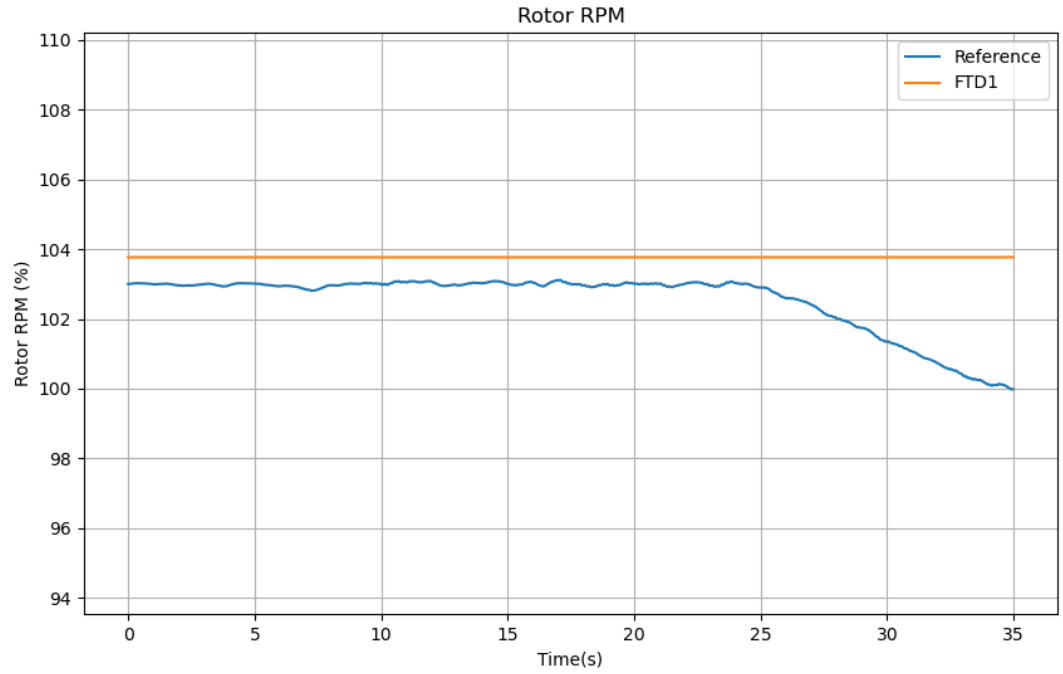

Control Position Roll
Reference
FTD1
Control Position Roll (%)
70
65
60
55
50
45
40
35
30
0
5
10
15
20
25
30
35
Time(s)

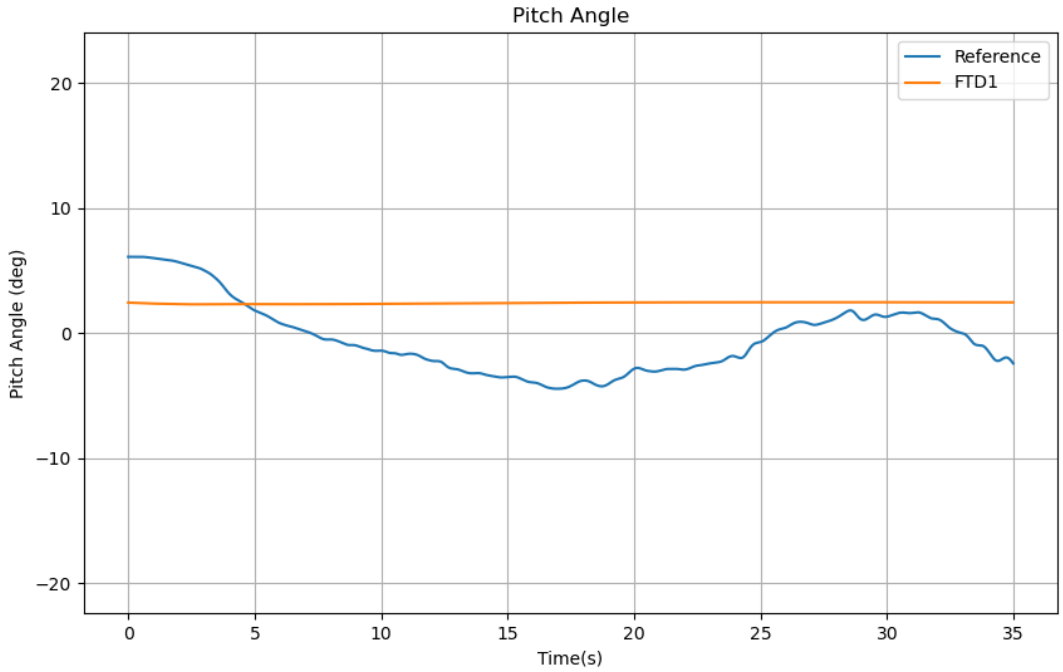

Vertical Speed
Reference
FTD1
Vertical Speed (ft/min)
3000
2000
1000
0
−1000
−2000
0
5
10
15
20
25
30
35
Time(s)


Indicated Airspeed
Reference
FTD1
Indicated Airspeed (kt)
150
100
50
0
−50
−100
0
5
10
15
20
25
30
35
Time(s)


RadarAltitude
Reference
FTD1
RadarAltitude (ft)
600
400
200
0
−200
−400
0
5
10
15
20
25
30
35
Time(s)


Roll Angle
Reference
FTD1
Roll Angle (deg)
10
5
0
−5
−10
0
5
10
15
20
25
30
35
Time(s)


Rotor RPM
Reference
FTD1
Rotor RPM (%)
110
108
106
104
102
100
98
96
94
0
5
10
15
20
25
30
35
Time(s)


Pitch Angle
Reference
FTD1
Pitch Angle (deg)
20
10
0
−10
−20
0
5
10
15
20
25
30
35
Time(s)

1.d.B4 Heavy GW, Aft CG - 70 ft AGL

Test Procedure

On the IOS select ’Maintenance’ page then ’QTG-Test’. The test can be run either in automatic or manual mode.

Automatic testing: drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed. Cockpit controls and switches status will be overwritten by the QTG Tool.

Press ’Start QTG Execution’ to start the test.

The flight controls will be controlled according to the following table:

Flight Controls	Status
Longitudinal	DIRECT DRIVEN
Lateral	DIRECT DRIVEN
Collective	DIRECT DRIVEN
Pedals	DIRECT DRIVEN

Manual testing: follow the Manual Procedure steps indicated in the next page.

Manual Procedure

1. Drag and drop the corresponding Test 1.d SubCase A1 into the ’Test Selection’ column, to add it to the list of tests to be executed.
2. In the Test Selection list toggle from ’Automatic’ to ’Manual’.
3. Press ’Start QTG execution’. Wait for the completion message of the initialization phase.
4. Setup the cockpit as indicated in the Cockpit Configuration table below.
5. Press the Spare button on the Cyclic stick to run the simulation.
6. Stabilize and maintain current flight condition.
7. Press the Spare button on the Cyclic stick to start recording. On the IOS ’Manual QTG’ page, check that an indication of the test elapsed time is shown.
8. Press the Spare button on the Cyclic stick to complete the test or to proceed with the next test.

Initial Conditions

Parameter [UoM]	Reference*	FSTD
Mass Properties		
Gross Weight	2757.9	7500.0
Fuel Weigth	341.1	0.0
CG Longitudinal	4232	-4.7
CG Lateral	23	0.0
Moment of Inertia XX	2825	9638.0
Moment of Inertia XZ	-981	2226.0
Moment of Inertia YY	10635	33240.0
Moment of Inertia ZZ	12261	25889.0
Environment Parameters		
Pressure Altitude	1307.1	344.90347448792386
OAT	13.8	13.8
Wind Direction	0.0	0.0
Wind Speed	0.0	0.0
Flight Parameters		
Airspeed	0.2	-0.0007328300784191671
Ground Speed	0.0	0.008344186369269284
Vertical Velocity	0.0	0.013288436214678432
Radar Altitude	5.7	187.67051261194212
Rotor Speed	103.0	28.797932657908333
Engine 1 Torque	57.9	31.95777495505339
Engine 2 Torque	57.9	31.95777495505339
Pitch Angle	6.1	0.04253490439090714
Bank Angle	-2.5	0.046752386160144134
Heading	64.7	1.1314822542825382
Pitch Rate	0.0	0.00038809458831355273
Roll Rate	-0.0	-0.003734954692935167
Yaw Rate	-0.0	0.02717967586248816
X Body Acceleration	-0.1	0.0
Y Body Acceleration	-0.0	0.0
Z Body Acceleration	-0.0	0.0
Longitudinal Cyclic Pos.	69.1	-0.228729248046875
Lateral Cyclic Pos.	54.4	-0.080810546875
Pedals Pos.	42.8	-0.011199951171875
Collective Pos.	57.8	-0.3538818359375
Engine 1 Main Switch	FLIGHT	FLIGHT
Engine 2 Main Switch	FLIGHT	FLIGHT
AFCS State	DSAS	SCAS
HINR Button	HINR	HINR

* Snapshot Tests: Reference initial conditions are computed as mean values over data time histories

Test Results

Parameter [U oM]	**Reference**	**Min****	**FSTD**	**Max****
Snapshot Data				
Engine 1 Torque [%]	1	2	3	4

** The Min value is computed as the Reference value minus the specific tolerance value.
The Max value is computed as the Reference value plus the specific tolerance value

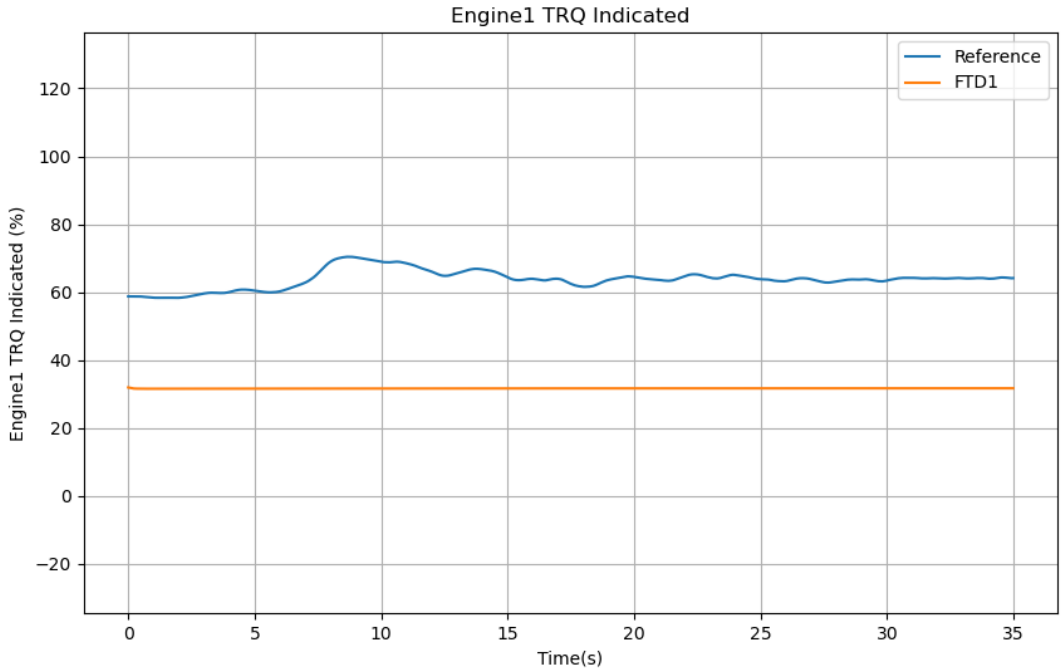
Notes and Rationales

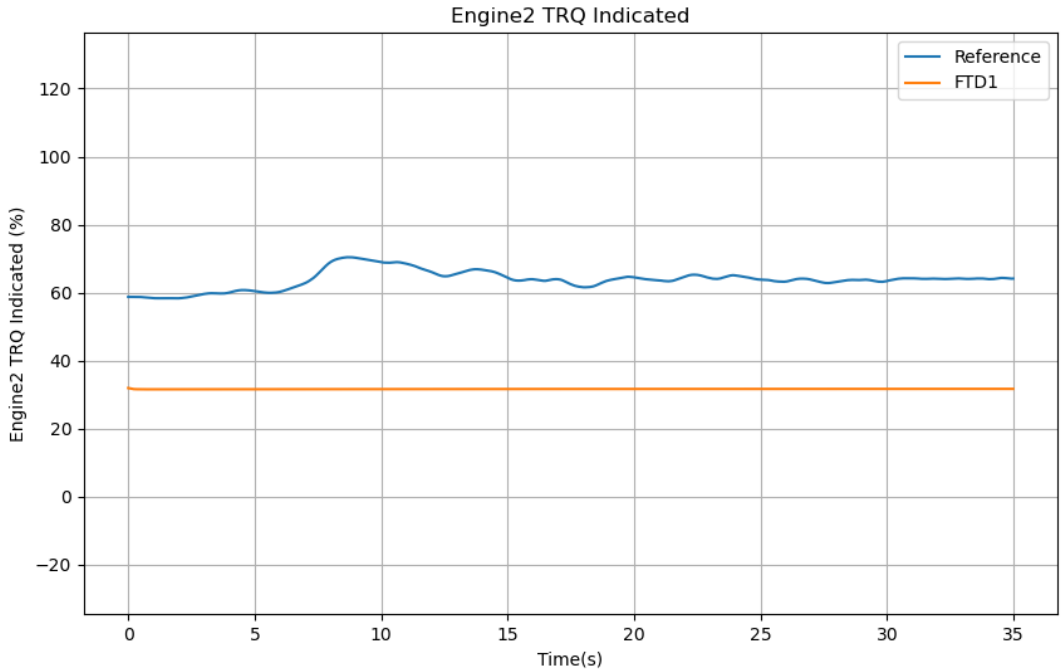
Notes
No Notes related to the entire Test are present
No Notes related to current SubCase are present

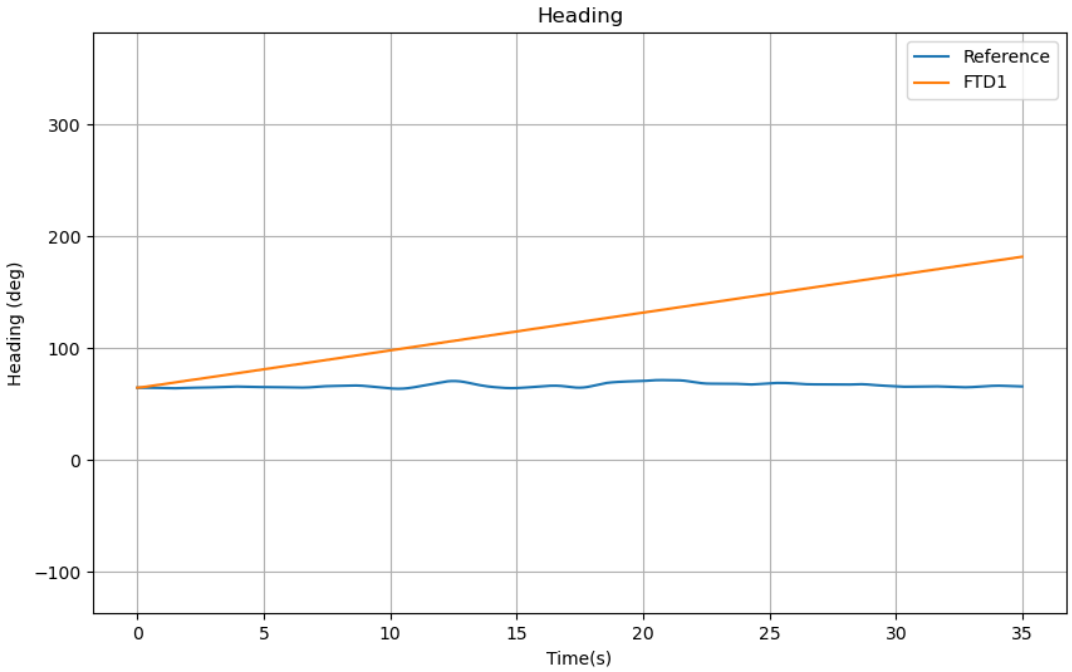
Rationales (Validation Data)	
Rationale 1 (All Subcases)	In the Hover flight maneuver Vertical Speed values are not reliable due to Rotor Downwash effects. In each current Test SubCases a stable Hover maneuver has been performed.

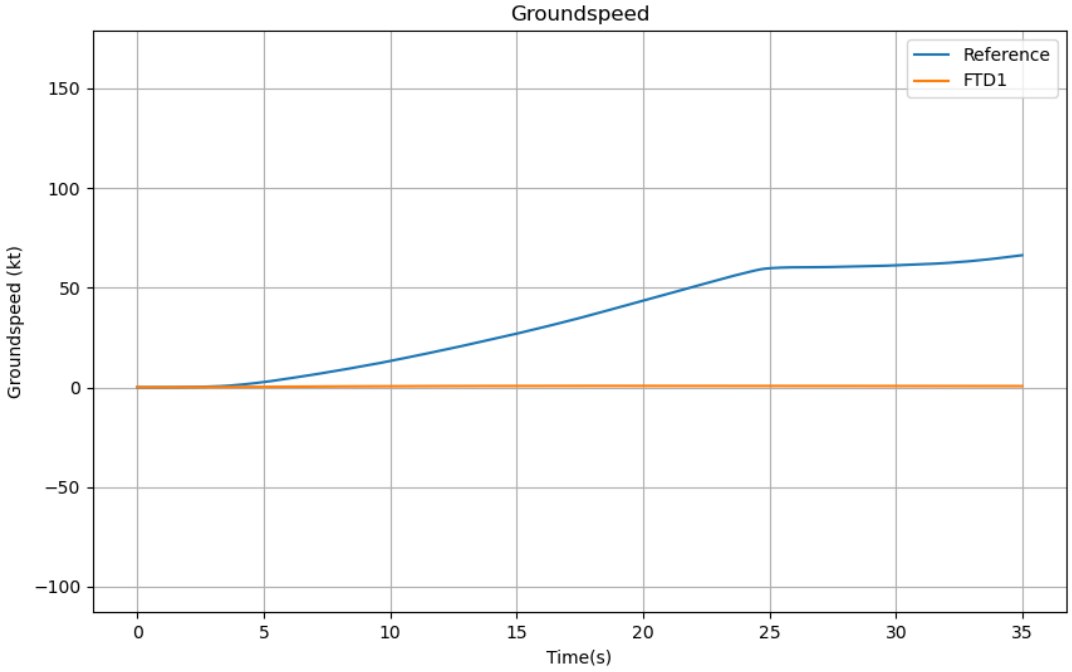
No Rationales related to current SubCase are present

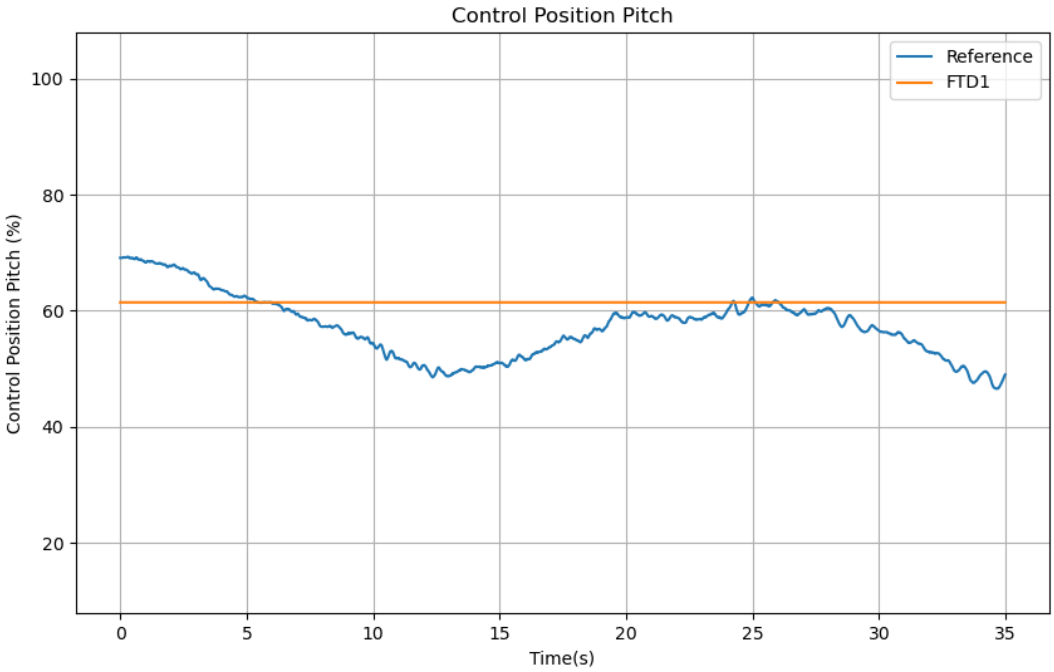
Rationales (Results)
No Rationales related to the entire Test are present
No Rationales related to current SubCase are present

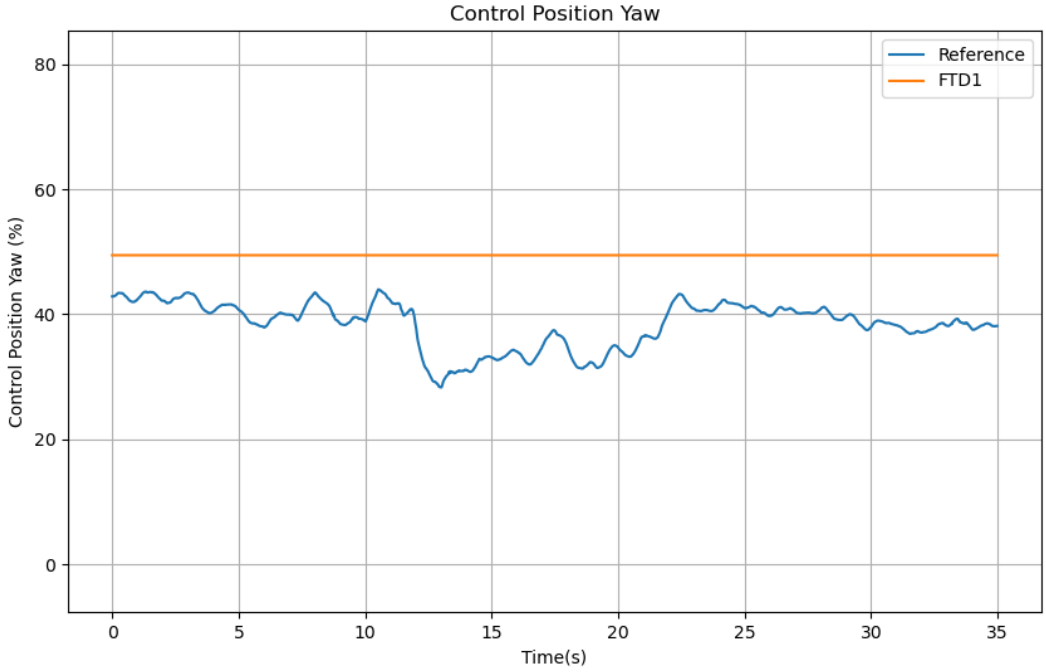

Engine1 TRQ Indicated
Reference
FTD1
Engine1 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

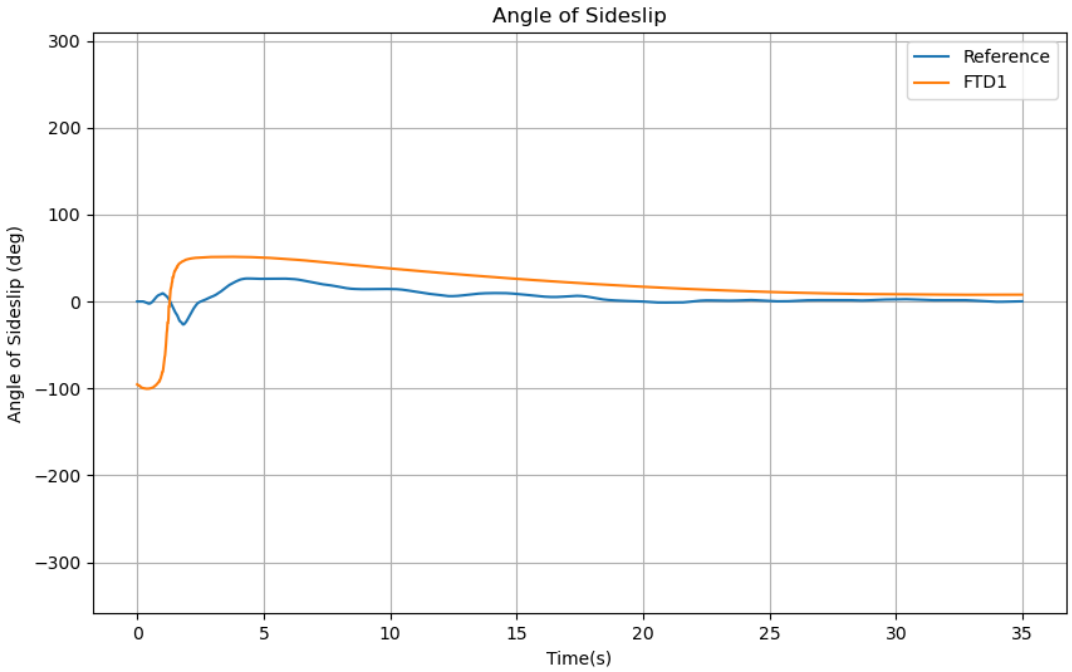

Engine2 TRQ Indicated
Reference
FTD1
Engine2 TRQ Indicated (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

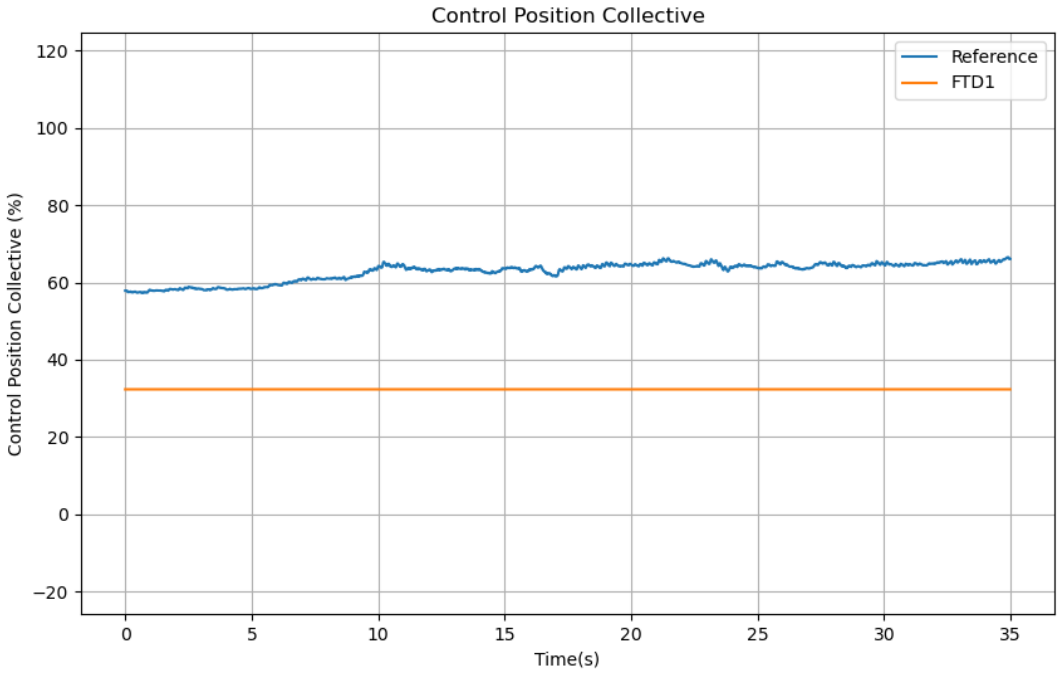

Heading
Reference
FTD1
300
200
100
0
−100
Heading (deg)
0
5
10
15
20
25
30
35
Time(s)

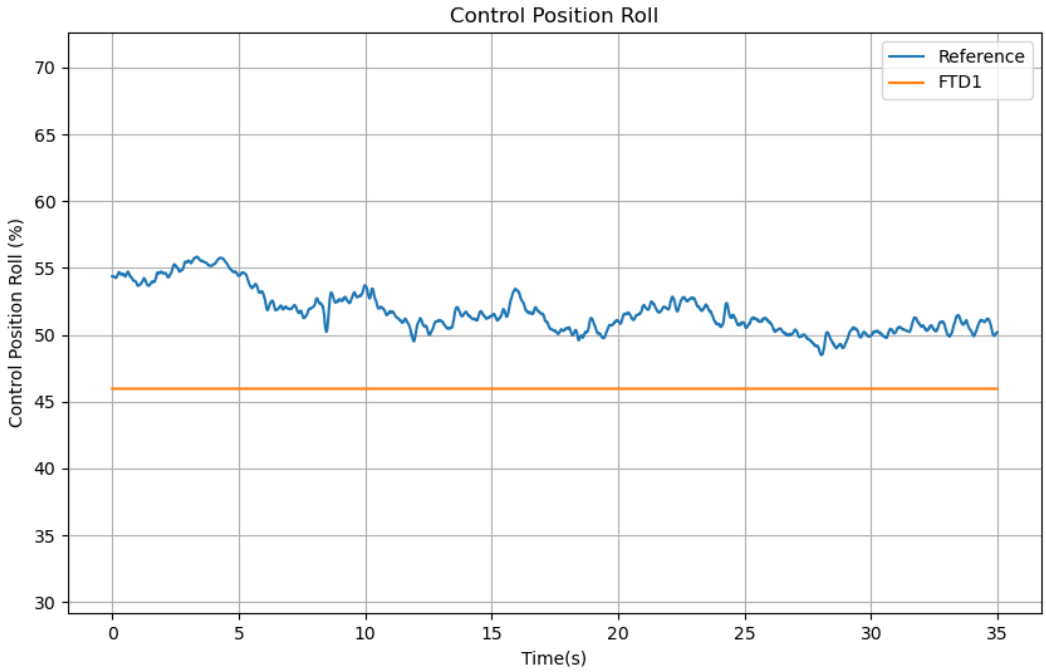

Groundspeed
Reference
FTD1
150
100
50
0
−50
−100
Groundspeed (kt)
0
5
10
15
20
25
30
35
Time(s)

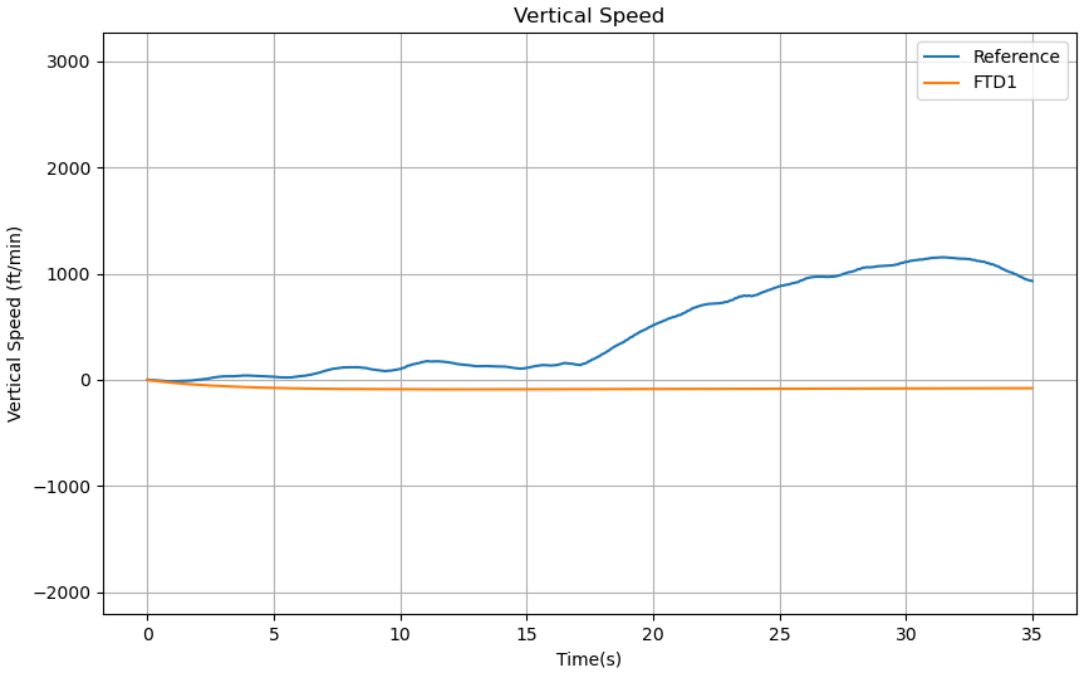

Control Position Pitch
Reference
FTD1
Control Position Pitch (%)
100
80
60
40
20
0
5
10
15
20
25
30
35
Time(s)

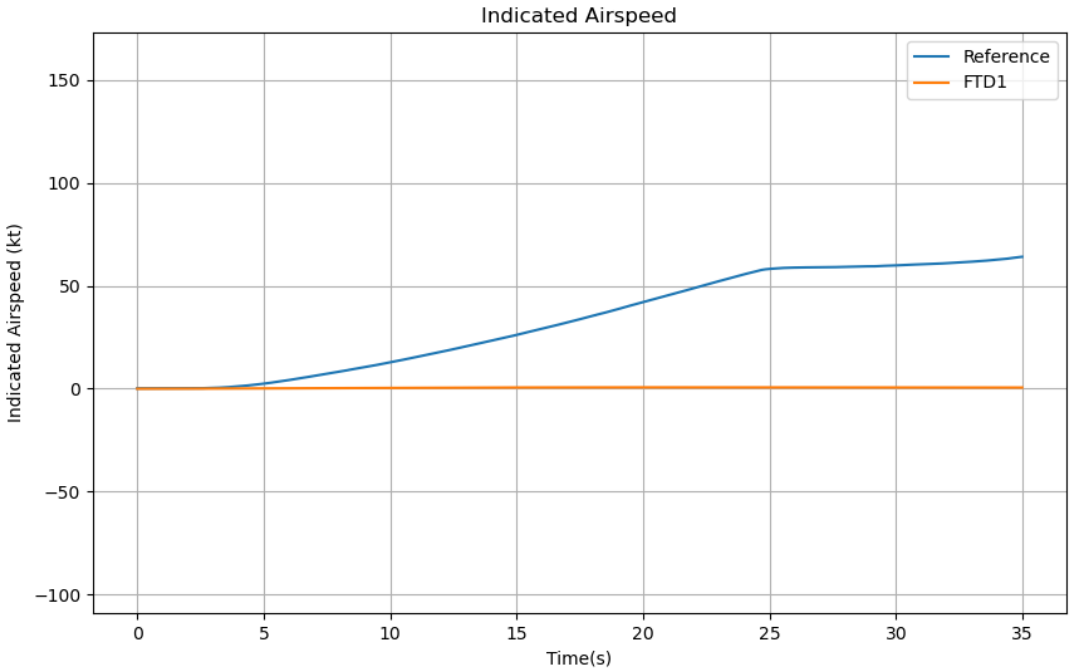

Control Position Yaw
Reference
FTD1
Control Position Yaw (%)
80
60
40
20
0
0
5
10
15
20
25
30
35
Time(s)

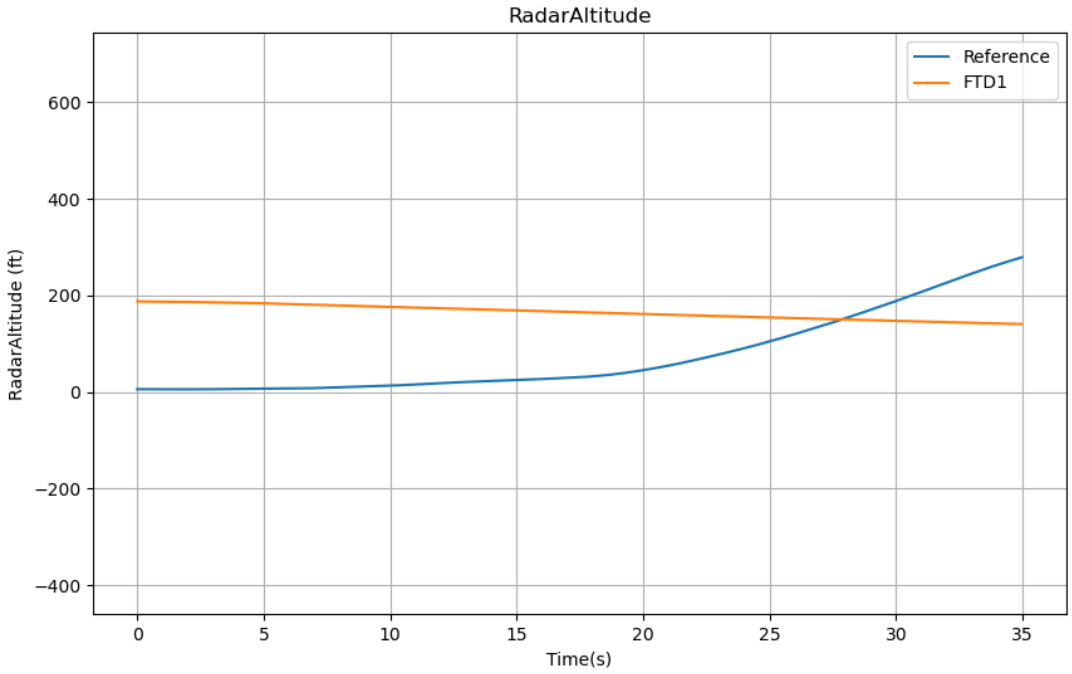

Angle of Sideslip
Reference
FTD1
Angle of Sideslip (deg)
300
200
100
0
−100
−200
−300
0
5
10
15
20
25
30
35
Time(s)

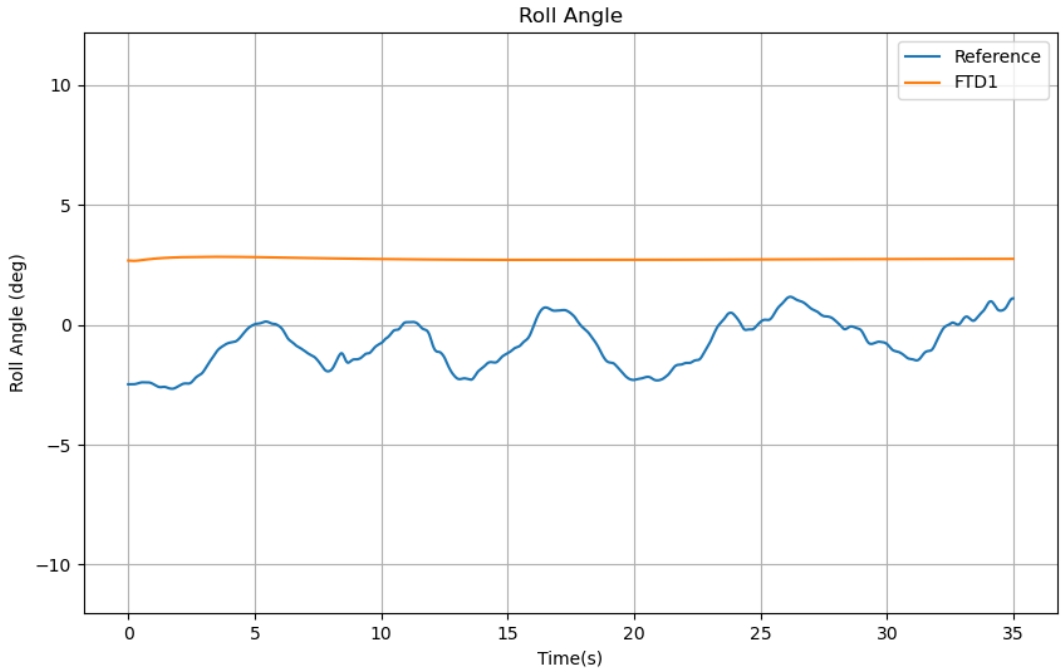

Control Position Collective
Reference
FTD1
Control Position Collective (%)
120
100
80
60
40
20
0
−20
0
5
10
15
20
25
30
35
Time(s)

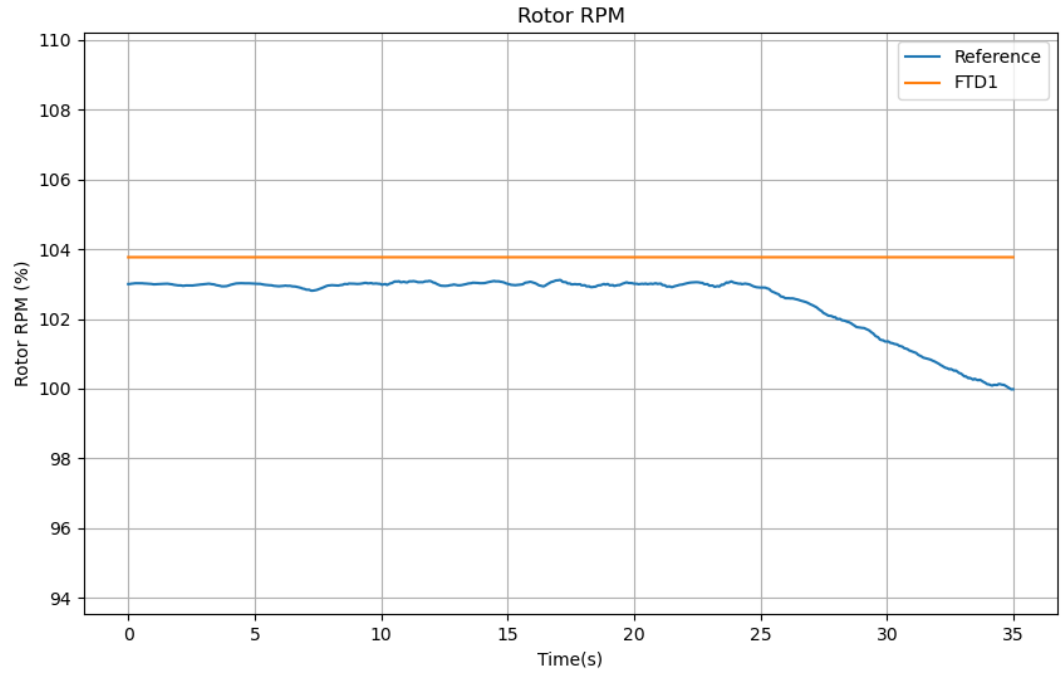

Control Position Roll
Reference
FTD1
Control Position Roll (%)
70
65
60
55
50
45
40
35
30
0
5
10
15
20
25
30
35
Time(s)

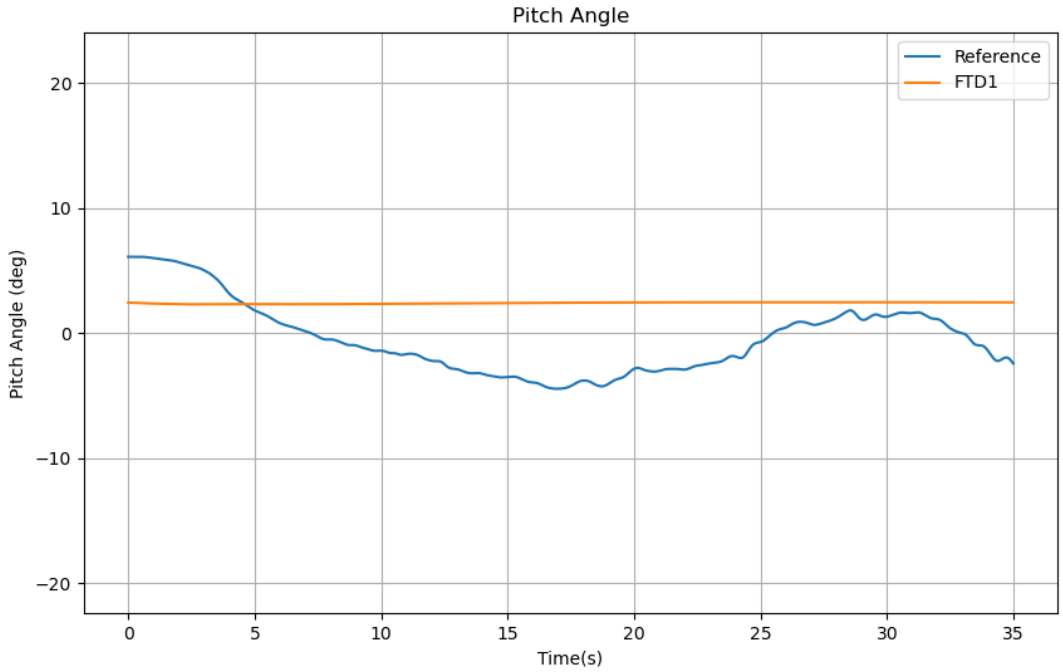

Vertical Speed
Reference
FTD1
Vertical Speed (ft/min)
3000
2000
1000
0
−1000
−2000
0
5
10
15
20
25
30
35
Time(s)


Indicated Airspeed
Reference
FTD1
Indicated Airspeed (kt)
150
100
50
0
−50
−100
0
5
10
15
20
25
30
35
Time(s)


RadarAltitude
Reference
FTD1
RadarAltitude (ft)
600
400
200
0
−200
−400
0
5
10
15
20
25
30
35
Time(s)


Roll Angle
Reference
FTD1
Roll Angle (deg)
10
5
0
−5
−10
0
5
10
15
20
25
30
35
Time(s)


Rotor RPM
Reference
FTD1
Rotor RPM (%)
110
108
106
104
102
100
98
96
94
0
5
10
15
20
25
30
35
Time(s)


Pitch Angle
Reference
FTD1
Pitch Angle (deg)
20
10
0
−10
−20
0
5
10
15
20
25
30
35
Time(s)