TEST 2.a.1 - Pitch Controller Position vs Force and Surface Position Calibration

Test Objective

To demonstrate that the simulator pitch controller position vs. pitch controller force and the pitch controller position vs. elevator position characteristics conform to the aeroplane.

Demonstration Procedure

Starting from the neutral position, move the pitch controller at a very slow rate over its full range to the aft or forward limit, then back through neutral to the opposite limit, then back to neutral again.

References

Validation source:
Aircraft Flight Test (D27301905)

Validation document:
Pitch, Roll, Yaw Static Control Checks & Yaw Dynamic Control Checks Doc. # D27301905

Data source:
D27301905, page(s) 7-8, 10-12

Initial Conditions

Not applicable.

Math Pilots and Driven Parameters

PARAMETER	
Sidestick Angle - Pitch	Driven
Sidestick Angle - Roll	Driven
Rudder Pedal Position	Driven
Stabiliser	Free
Speedbrake Handle Position	Driven
Left Engine Throttle Resolver Angle	Driven
Right Engine Throttle Resolver Angle	Driven
Flap Handle Position	Driven
Left Brake Pedal	Driven
Right Brake Pedal	Driven
Tiller Angle	Driven

Manual Test Procedure

1. Initialise test 2.a.1 in manual mode using the QTG tool on the maintenance console.
2. Confirm Initial Conditions are set correctly.

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3. Set cockpit controls to correct configuration. These can be checked in the IOS eQTG page.
4. When ready, begin the test by pressing the TAKE OVER P/B on either sidestick.
5. Starting from neutral, after 2 seconds pitch up completely in approx 30 seconds.
6. From 32 seconds into the test, return to neutral and pitch down completely in approx 50 seconds.
7. From 82 seconds into the test, return to neutral in approx 20 seconds.
8. Maintain constant velocity throughout the sweep. Total sweep should take 102 seconds and will terminate automatically.

Automatic Test Procedure

Run test 2.a.1 using the QTG tool on the maintenance console.

Evaluation Criteria

Ref: EASA CS-FSTD(A), Level D, page 54

$\pm$ 2° elevator angle

Test Equipment

None required.

Expected and Test Results

Refer to overplots.

Comparison of Results

Refer to overplots.

Airbus Rationales

None.

Comments

Test was conducted in EFCS normal control law.

Forces are generated solely by use of aeroplane hardware in the FSTD. Therefore testing of position versus force is not applicable.

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Approval

Signatures for test OK:

_____
Operator
Date:

_____
Authority
Date:

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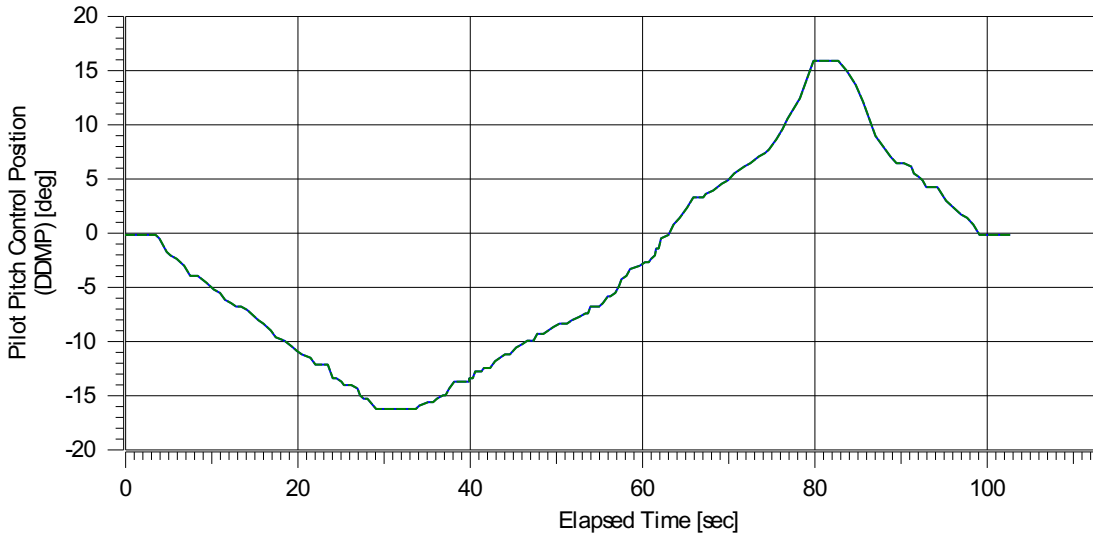
A/C Type: A320-200 FFS, Level D
Engine Fit: CFM56-5B4 / IAE V2527-A5
Standard: DGCA - INDONESIA
Simulator: A320 CFM/IAE SM SBV 12/04

Run Time: June 04, 2025 at 10:18:54
Engine Type: CFM56-5B4
Tester: PPI CURUG
Test Mode: AUTO
Software Load: 1.23



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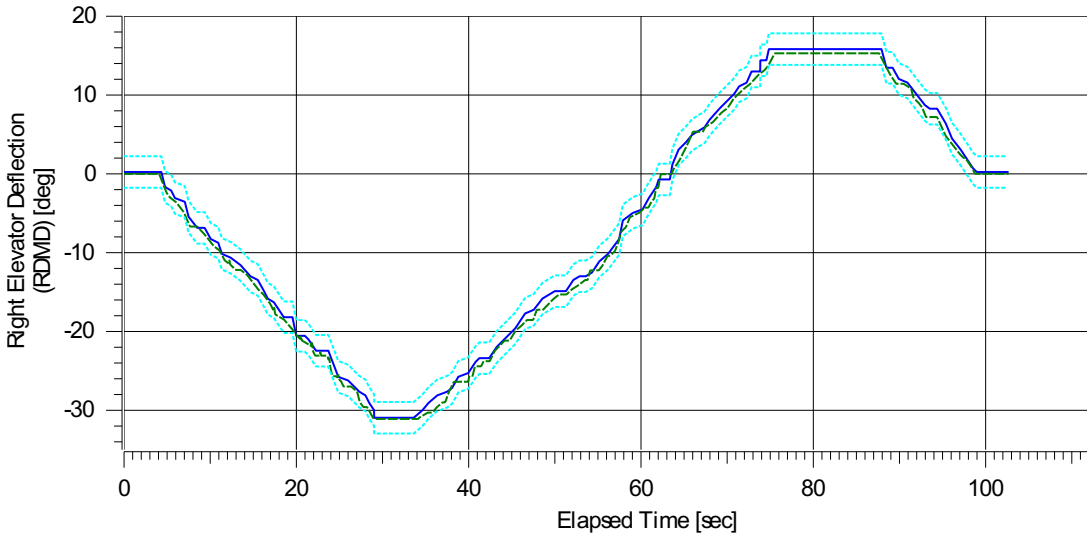

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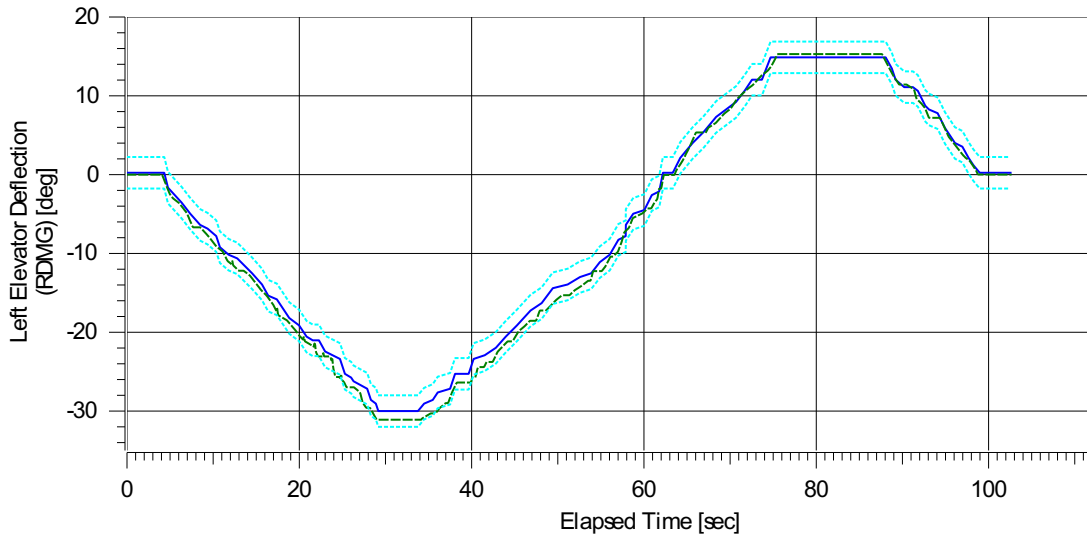

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Validation data	Airbus Proof of Match
FSTD results	Tolerance

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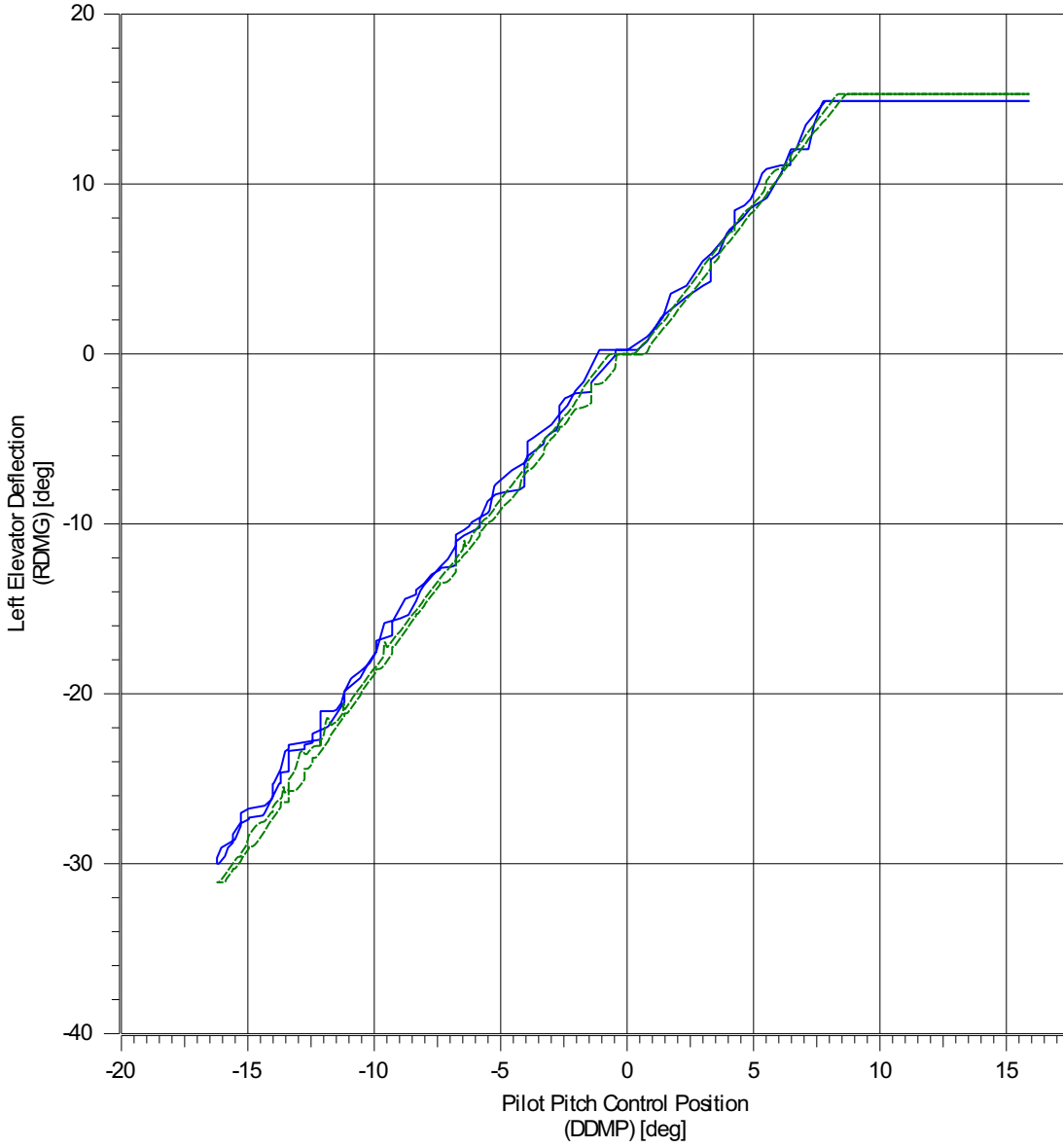
2.a.1 - Pitch Controller Position vs Force and Surface Position Calibration

A/C Type: A320-200 FFS, Level D
Engine Fit: CFM56-5B4 / IAE V2527-A5
Standard: DGCA - INDONESIA
Simulator: A320 CFM/IAE SM SBV 12/04

Run Time: June 04, 2025 at 10:18:54
Engine Type: CFM56-5B4
Tester: PPI CURUG
Test Mode: AUTO
Software Load: 1.23



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Validation data	Airbus Proof of Match
FSTD results	Tolerance

Proprietary Information - Copyright Sim-Industries - A Lockheed Martin Company

A/C Type: A320-200 FFS, Level D
Engine Fit: CFM56-5B4 / IAE V2527-A5
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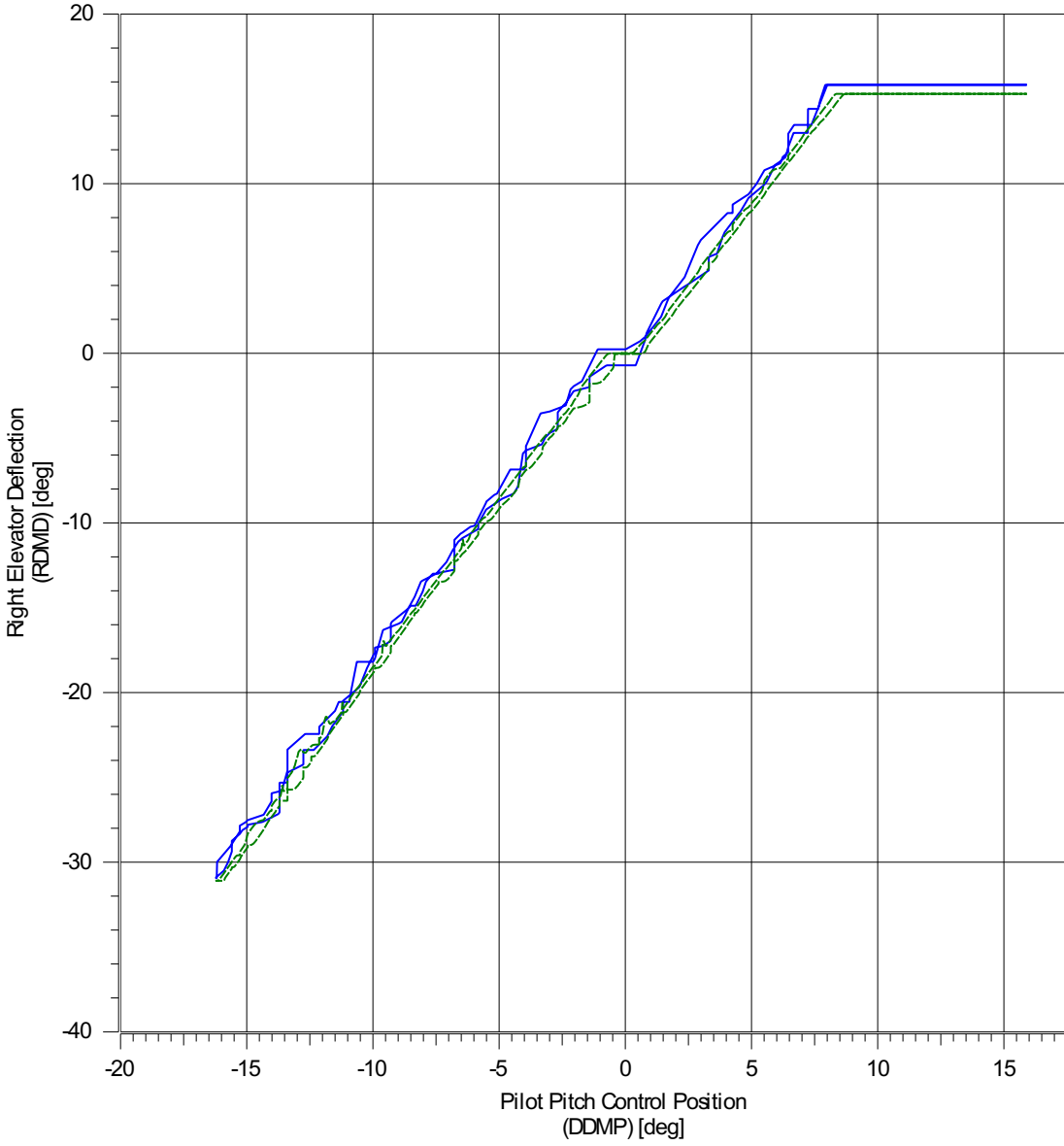

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Validation data	Airbus Proof of Match
FSTD results	Tolerance

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2. HANDLING QUALITIES	a. STATIC CONTROL CHECKS	1. Pitch Controller Position vs. Force and Surface Position Calibration.	Conditions: Ground

A – Requirements

Standard: CS-FSTD(A) Book 2: Chapter 2.3 Table of FSTD Validation Tests or ICAO 9625-AN/938 second edition, Appendix B

Tolerance: ± 0.9 daN (2 lbs.) Breakout. ± 2.2 daN (5 lbs.) or ± 10 % Force. ± 2 degs Elevator Angle.

Flight Condition: Ground

Comments: Uninterrupted Control Sweep to stops. Should be validated with in flight data from tests such as Longitudinal Static Stability, Stall, etc. Static and dynamic flight control tests should be accomplished at the same feel or impact pressures.

Level

A	B	C	D
Correct Trend and Magnitude	✓	✓	✓

B – Data Package

Configuration

#	ELAC					Flight Test Validation Data	Engineering Validation Data	Proof of Match
1	L93					D27301903		
2								
3								
4								
5								
6								

Rationales

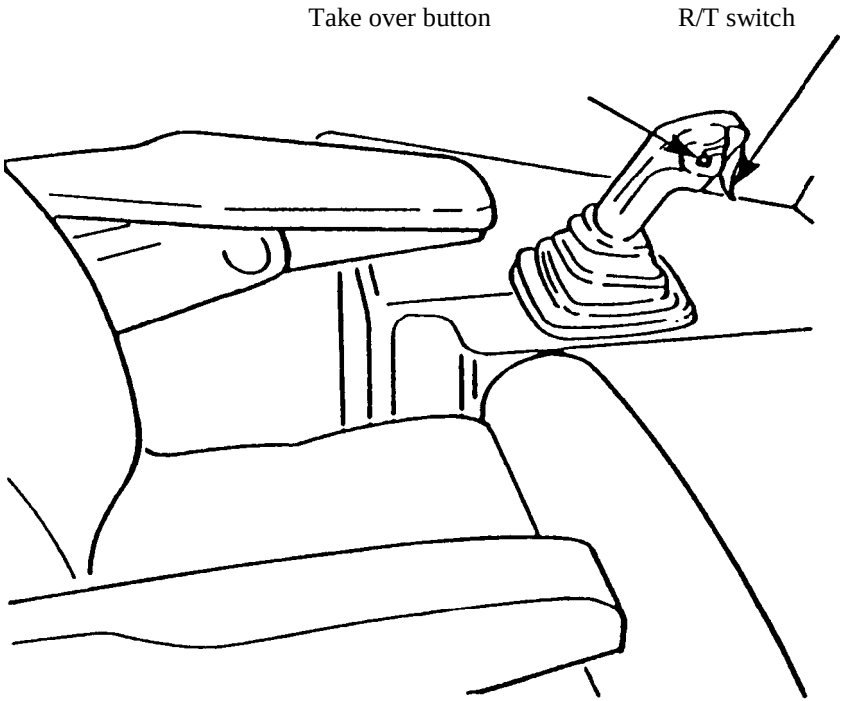
#	
1	
2	
3	
4	
5	
6	

Sidestick armrest - Characteristics

A318/A319/A320/A321

Sidestick controller

	PITCH	ROLL	
		i/b	o/b
Max. load	10 daN	3 daN	2 daN
Threshold	0.5 daN	0.4 daN	0.4 daN
Deflection *	± 16°	20°	20°
Orientation * in neutral	20 Forward	12° Inboard	
Axes	Horizontal-orthogonal TOE - OUT : 6°		



(*) : relative to the axes

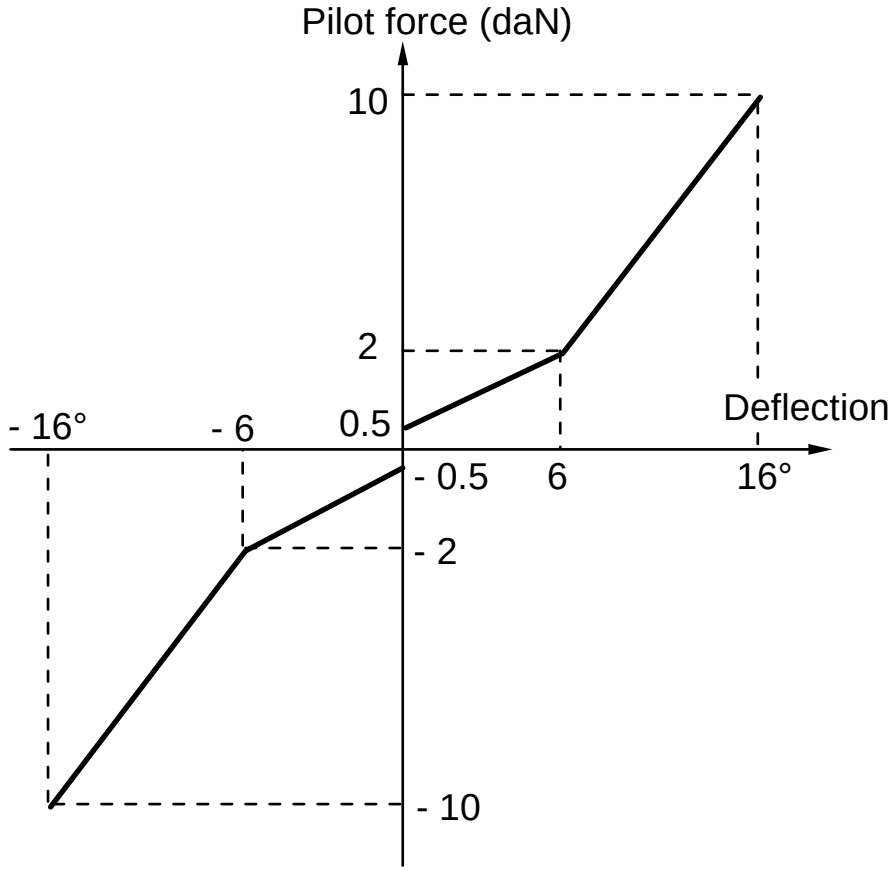
Arm rest
Arm rest linked to the seat by means of a supporting arm

Adjustment of the arm rest position : : +20°, - 15°
Adjustment of the supporting arm position : +15°, -12°

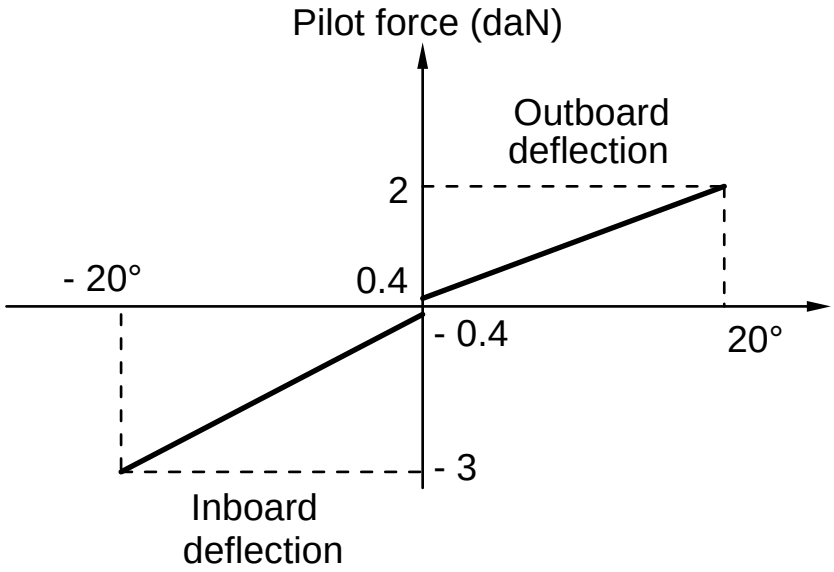
With alphanumeric indicators

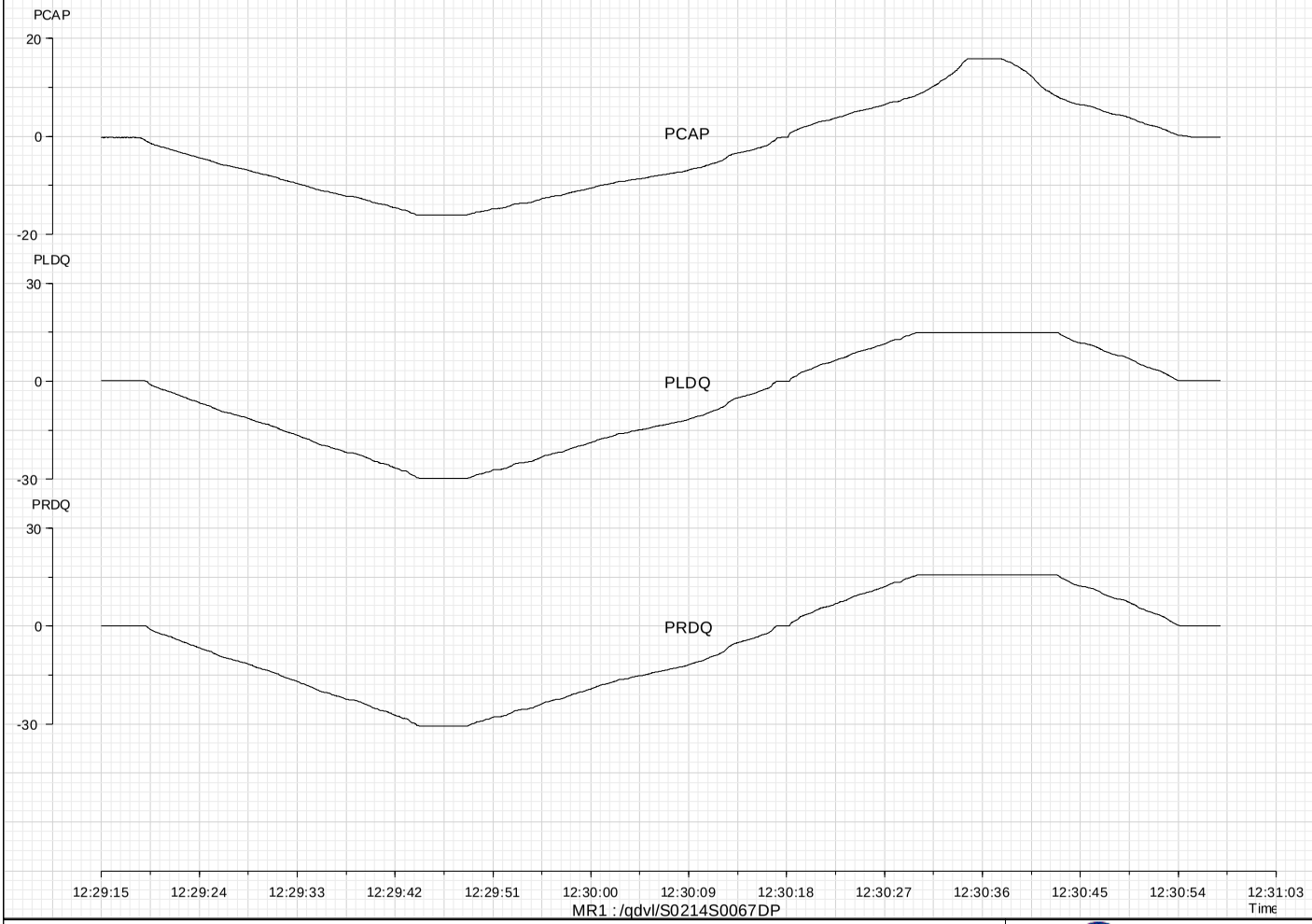
Sidestick characteristics

Pitch



Roll





A/C : SIMU-sa **MSN 0214** **GROUND** **No 0067** SIMsimu **Test date : 24/3/2009**

ELEVATORS = F(T)

/-1

NORMAL LAW CG=30% CONF 0

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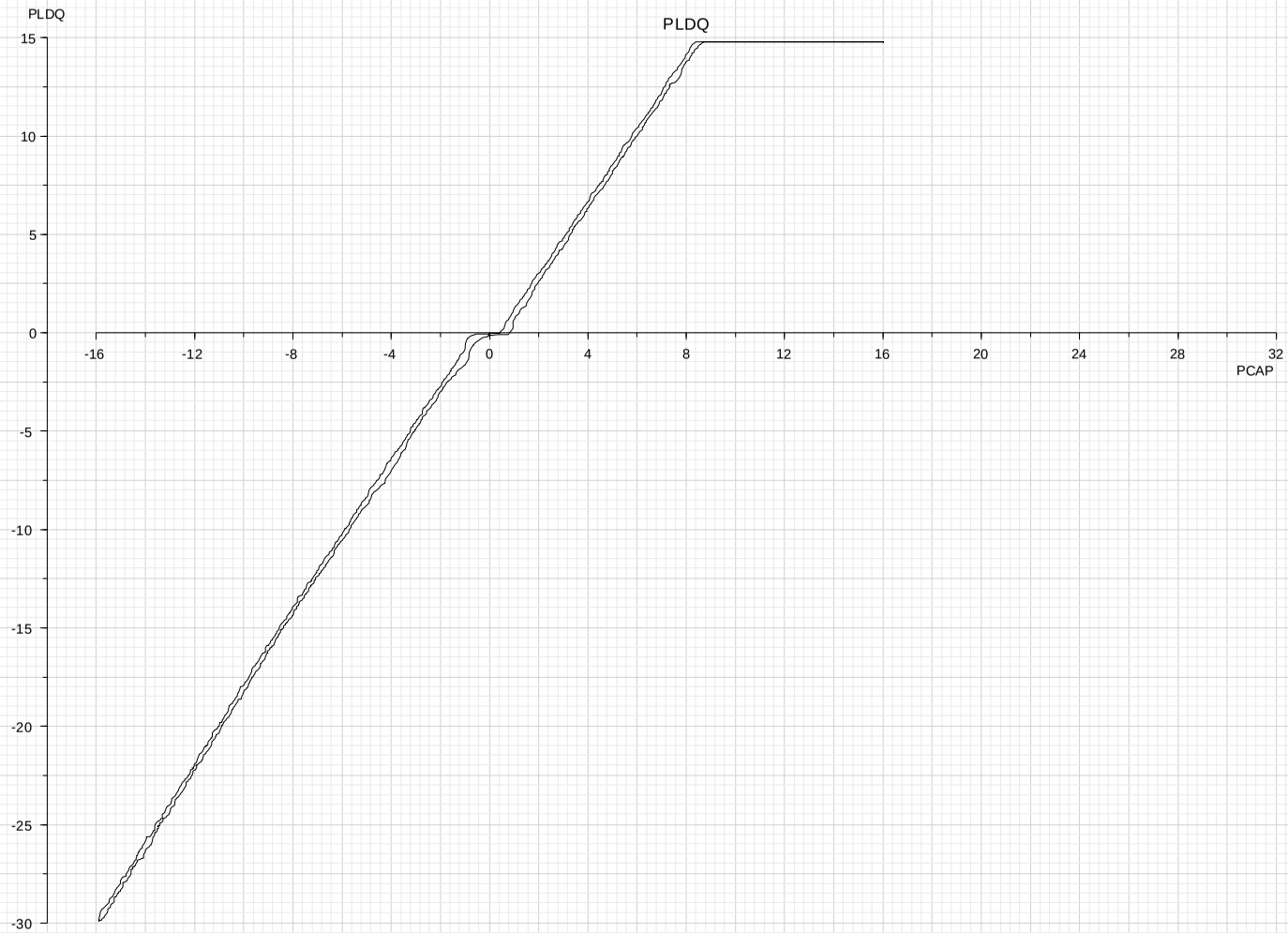
Figure 1.6.1



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A/C : SIMU-sa	**MSN 0214**	**GROUND**	**No 0067**	SIMsimu	**Test date : 24/3/2009**

CINEMATIQUE ELEVATOR GAUCHE

/-1

NORMAL LAW CG=30% CONF 0

/workgroup/control/qdvl/visage/planches/simu/DATAPACKAGE/static_control_check_A320/PLDQ-f-PCAP.ilv

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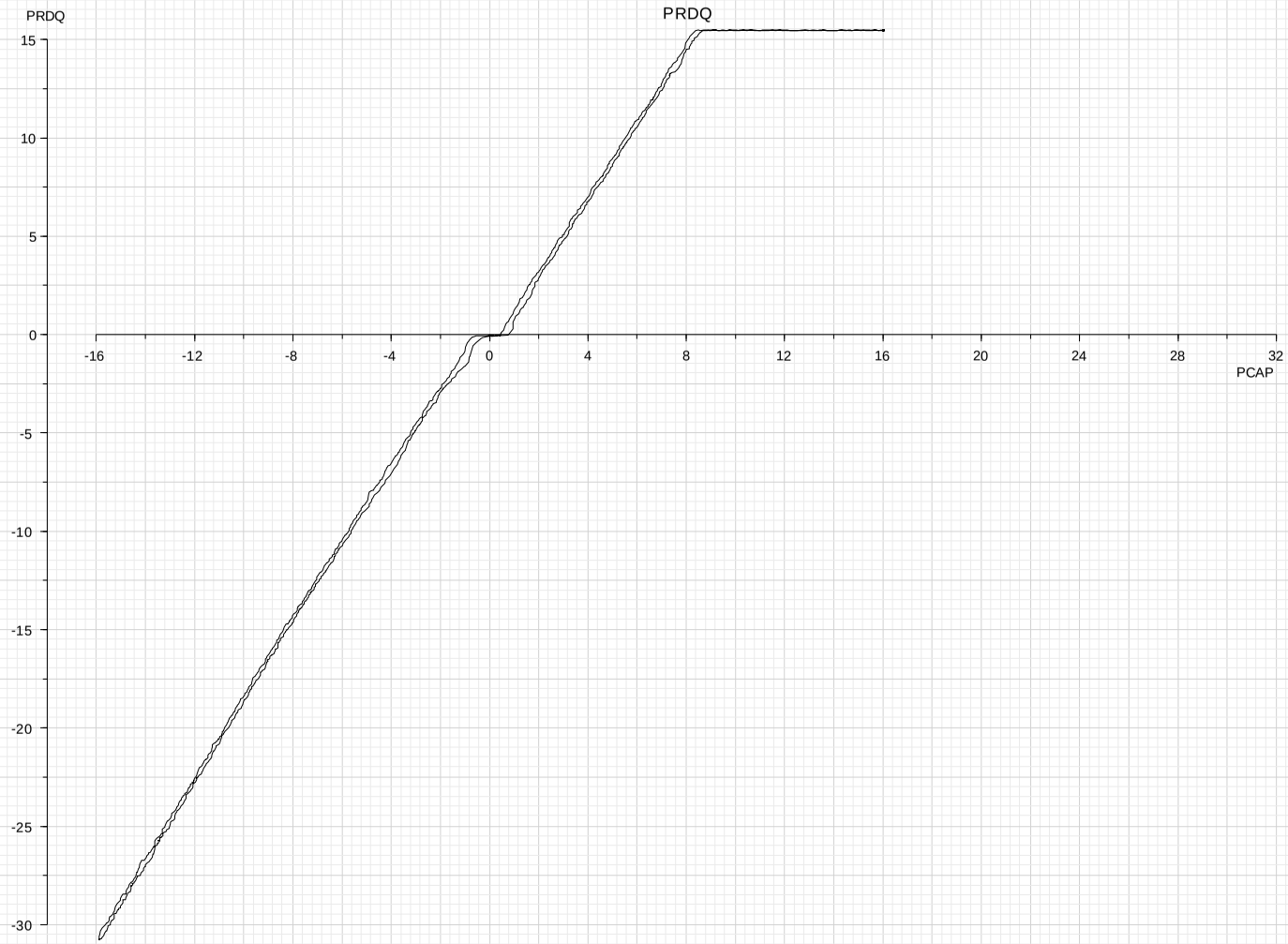
Figure 1.6.2



MR1 : /qdvl/S0214S0067DP

A/C : SIMU-sa	**MSN 0214**	**GROUND**	**No 0067**	SIMsimu	**Test date : 24/3/2009**	
CINEMATIQUE ELEVATOR DROIT						
/-1						
NORMAL LAW CG=30% CONF 0						
/workgroup/control/qdvl/visage/planches/simu/DATAPACKAGE/static_control_check_A320/PRDQ-f-PCAP.ilv						

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Figure 1.6.3