FLAP - MECHANICAL LINE - ADJUSTMENT/TEST

EFFECTIVITY: ALL

1. General

A. This section gives the procedures to do:

- The operational check of the flap control system.
- The check of the flap surface backlash.
- The check of the lateral backlash of the flap surfaces at the zero degree position and at the 45-degree position.

B. The procedures in this section are given in the sequence below. The tasks identified with (♦) are part of the Scheduled Maintenance Requirements Document (SMRD).

TASK NUMBER	*DESCRIPTION*	*EFFECTIVITY*
27-51-00-700-801-A	FLAP CONTROL SYSTEM - OPERATIONAL CHECK	ALL
27-51-00-700-802-A	FLAP SURFACE BACKLASH	ALL
27-51-00-700-803-A	FLAP LATERAL BACKLASH	ALL

TASK 27-51-00-700-801-A
EFFECTIVITY: ALL

2. FLAP CONTROL SYSTEM - OPERATIONAL CHECK

A. General

(1) This task gives the procedures to do the operational check of the Flap Control System.

B. References

REFERENCE	*DESIGNATION*
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
S.B. 145-27-0020	-

C. Zones and Accesses

Not Applicable

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
GSE 044	Head set, Ramp	Used for communication	

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Cockpit
1	Does the task	Wing

I. Preparation

SUBTASK 841-002-A

(1) Make sure that the aircraft is safe for maintenance.

(2) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

J. Operational Check of the Flap Control System (Figure 501)

SUBTASK 710-002-A

WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE FLAP TRAVEL AREA.

(1) Do a Check of the Flap Control System.

(a) Set the flaps to the 9-degree position.

Result:

1 In transit, the position of the flaps on the EICAS display is indicated by a green dash.

2 The EICAS display does not show the FLAP FAIL caution message or the FLAP LOW SPEED advisory message.

3 The EICAS display shows that the flaps are in the 9-degree position.

(b) (Applicable only to aircraft equipped with Flap 18-degree) Set the flaps to the 18-degree position.

Result:

1 In transit, the position of the flaps on the EICAS display is indicated by a green dash.

2 The EICAS display does not show the FLAP FAIL caution message or the FLAP LOW SPEED advisory message.

3 The EICAS display shows that the flaps are in the 18-degree position.

(c) Set the flaps to the 22-degree position.

Result:

1 In transit, the position of the flaps on the EICAS display is indicated by a green dash.

2 The EICAS display does not show the FLAP FAIL caution message or the FLAP LOW SPEED advisory message.

3 The EICAS display shows that the flaps are in the 22-degree position.

(d) Set the flaps to the 45-degree position.

Result:

1 In transit, the position of the flaps on the EICAS display is indicated by a green dash.

2 (For aircraft PRE-MOD. S.B. 145-27-0020) When the flaps go through the 33-degree position, the dash indication changes to 33.

3 The EICAS display does not show the FLAP FAIL caution message or the FLAP LOW SPEED advisory message.

4 The EICAS display shows that the flaps are in the 45-degree position.

(e) Set the flaps to the 22-degree position.

Result:

1 In transit, the position of the flaps on the EICAS display is indicated by a green dash.

2 (For aircraft PRE-MOD. S.B. 145-27-0020) When the flaps go through the 33-degree position, the dash indication changes to 33.

3 The EICAS display does not show the FLAP FAIL caution message or the FLAP LOW SPEED advisory message.

4 The EICAS display shows that the flaps are in the 22-degree position.

(f) (Applicable only to aircraft equipped with Flap 18-degree) Set the flaps to the 18-degree position.

Result:

1 In transit, the position of the flaps on the EICAS display is indicated by a green dash.

2 The EICAS display does not show the FLAP FAIL caution message or the FLAP LOW SPEED advisory message.

3 The EICAS display shows that the flaps are in the 18-degree position.

(g) Set the flaps to the 9-degree position.

Result:

1 In transit, the position of the flaps on the EICAS display is indicated by a green dash.

2 The EICAS display does not show the FLAP FAIL caution message or the FLAP LOW SPEED advisory message.

3 The EICAS display shows that the flaps are in the 9-degree position.

(h) Set the flaps to the 0-degree position.

Result:

1 In transit, the position of the flaps on the EICAS display is indicated by a green dash.

2 The EICAS display does not show the FLAP FAIL caution message or the FLAP LOW SPEED advisory message.

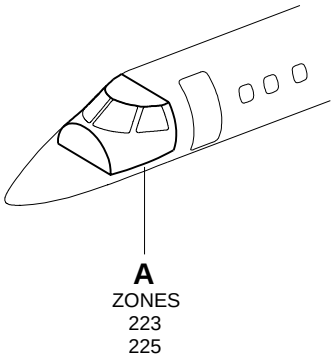
3 The EICAS display shows that the flaps are in the 0-degree position.

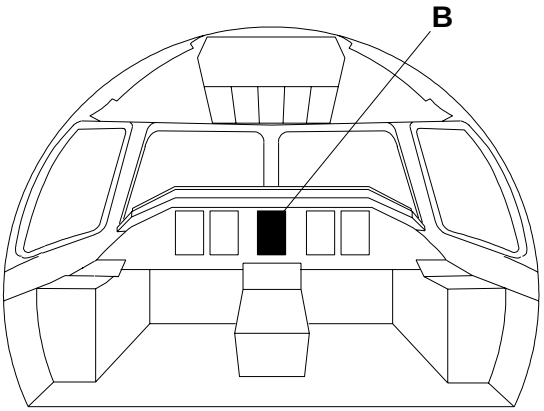
K. Follow-on

SUBTASK 842-002-A

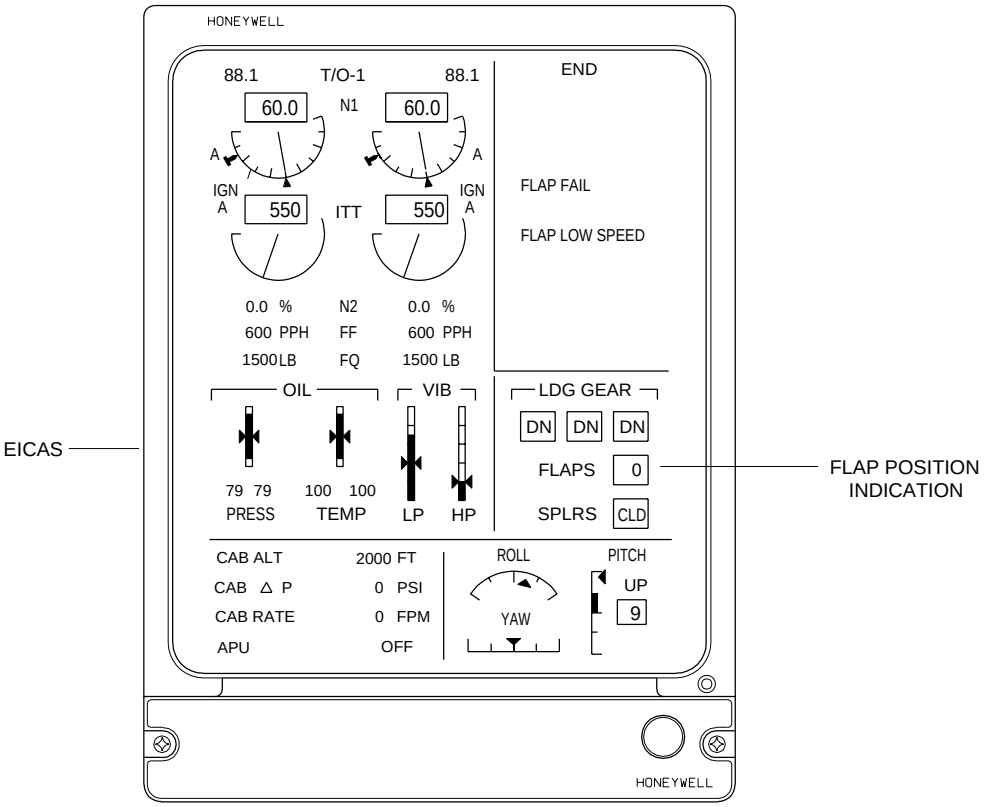
(1) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

EFFECTIVITY: ALL
Flap Control System - Test
Figure 501





DET. A



DET. B

145AMM270053.MCE B

TASK 27-51-00-700-802-A
EFFECTIVITY: ALL

3. FLAP SURFACE BACKLASH

A. General

(1) This task gives the procedures to do a check of the backlash of the flap surfaces.

B. Zones and Accesses

Not Applicable

C. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
GSE 056	Dynamometer	To apply loads to the flap surfaces	
GSE 060	Kit, Backlash Measurement, Aileron	To use the dynamometer support AGE-00313-403 to apply loads to the flap panels	
GSE 070	Digital Protractor	To measure the flap deflections	

D. Auxiliary Items

Not Applicable

E. Consumable Materials

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
Commercially available	Double-face adhesive-tape	AR

F. Expandable Parts

Not Applicable

G. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Flap area
1	Helps the other technician	Flap area

H. Preparation

SUBTASK 841-003-A

(1) Make sure that the aircraft is safe for maintenance.

(2) Make sure that the flaps are in the zero degree position.

(3) Do not do other tasks on the flap system.

(4) On the Circuit Breaker Panel, open the FLAP 1 and FLAP 2 circuit breakers and attach a DO-NOT-CLOSE tag to them.

(5) Install the GSEs to the trailing-edge of the left-wing inboard flap (Figure 502):

(a) Install the dynamometer support AGE-00313-403 near of the root of the inboard flap.

(b) Install the digital protractor on the inboard flap, near the dynamometer support AGE-00313-403, and as near as possible to the inboard-flap trailing edge.

(c) Install the dynamometer to the support AGE-00313-403.

(d) Set the digital protractor to zero.

I. Backlash of the Flap Surface

SUBTASK 720-002-A

WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE FLAP TRAVEL AREA.

(1) Use a dynamometer to apply an upward load of 30 kgf (66 lbf) to the inboard-flap trailing-edge. Write the deflection in Table 501.

(2) Use a dynamometer to apply an downward load of 15 kgf (33 lbf) to the inboard-flap trailing edge. Write the deflection in Table 501.

NOTE: Add all deflection values together, as positive, independently of their signal.

Table 501 - INBOARD FLAP BACKLASH

Applied Load		Inboard Flap Deflection (degrees)			
		Left Wing		Right Wing	
up	30 kgf (66 lbf)	A		A	
down[1]	15 kgf (33 lbf)	B		B	
measured deflection		A + B		A + B	
maximum deflection permitted			0.5		0.5

[1] When you measure the flap downward deflection, ignore the negative signal.

(3) Remove the GSEs from the inboard flap.

(4) Calculate the maximum deflection permitted. Use Table 501 for it.

- The maximum deflection permitted is 0.5 degrees.
- The measured deflection is A + B.

(5) Do steps 1 thru 4 for the inboard flap of the right wing. Use Table 501 for it.

(6) Do steps 1 thru 4 for the outboard flap of the left wing. Use Table 502 for it.

Table 502 - OUTBOARD FLAP BACKLASH

Applied Load		Outboard Flap Deflection (degrees)			
		Left Wing		Right Wing	
up	30 kgf (66 lbf)	A		A	
down[1]	15 kgf (33 lbf)	B		B	
measured deflection		A + B		A + B	
maximum deflection permitted			0.5		0.5

[1] When you measure the flap downward deflection, ignore the negative signal.

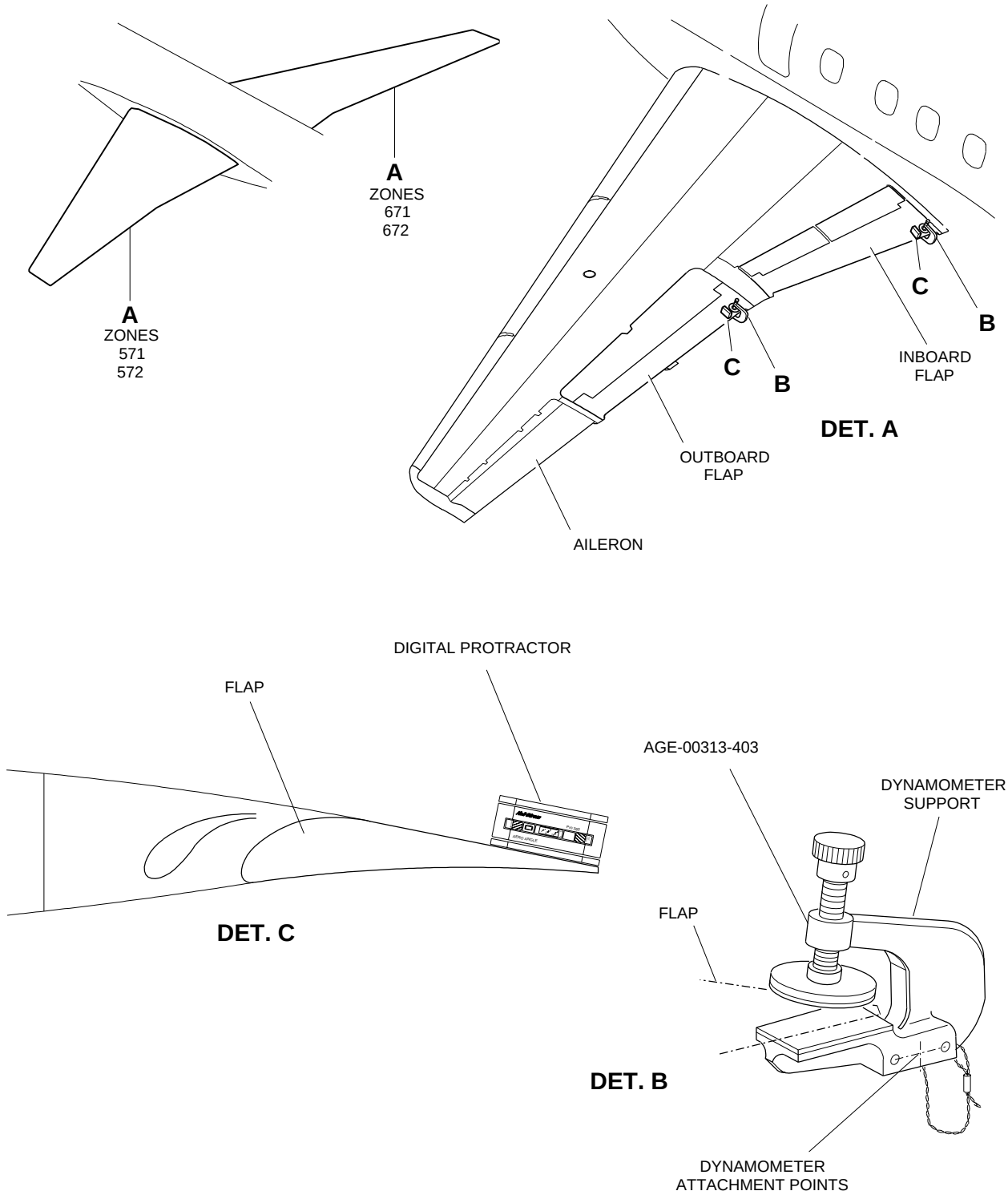
(7) Do steps 1 thru 4 for the outboard flap of the right wing. Use Table 502 for it.

J. Follow-on

SUBTASK 842-003-A

(1) On the Circuit Breaker Panel, close the FLAP 1 and FLAP 2 circuit breakers and remove the DO-NOT-CLOSE tag from them.

EFFECTIVITY: ALL
GSE Location
Figure 502



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TASK 27-51-00-700-803-A
EFFECTIVITY: ALL

4. FLAP LATERAL BACKLASH

A. General

(1) This task gives the procedures to do the check of the lateral backlash of the flap surfaces.

B. References

REFERENCE	*DESIGNATION*
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE

C. Zones and Accesses

Not Applicable

D. Tools and Equipment

Not Applicable

E. Auxiliary Items

Not Applicable

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Flap area
1	Helps the other technician	Flap area

I. Preparation

SUBTASK 841-004-A

(1) Make sure that the aircraft is safe for maintenance.

(2) Make sure that the flaps are in the zero degree position.

(3) On the Circuit Breaker Panel, open the FLAP 1 and FLAP 2 circuit breakers and attach a DO-NOT-CLOSE tag to them.

J. Flap Lateral Backlash

SUBTASK 720-003-A

(1) Measure the lateral backlash between the inboard flap and Torque Box 1, when the surface is in the zero degree position (Figure 503).

(a) Move the inboard flap fully to the root direction.

(b) Measure the lateral backlash of the inboard flap, on the wing underside, between the inboard flap and Torque Box 1. This lateral backlash value is “Measurement A” (MA).

NOTE: You can measure the lateral backlash of the inboard flap between the inboard flap and the Torque Box 2.

(c) Move the inboard flap fully to the tip direction.

(d) Measure the lateral backlash in the same point, on the wing underside, between the inboard flap and Torque Box 1. This lateral backlash value is “Measurement B” (MB).

(e) The lateral backlash between the inboard flap and Torque Box 1 is:

LATERAL BACKLASH = MB-MA

Table 503 - INBOARD-FLAP LATERAL BACKLASH

Inboard Flap (zero-degree position)	
Flap moved to the root	Measurement A = MA
Flap moved to the tip	Measurement B = MB
Lateral Backlash	MB-MA
Minimum backlash	3 mm
Maximum backlash	5 mm

(2) Measure the lateral backlash between the outboard flap and Torque Box 2, when the surface is in the zero degree position (Figure 503).

(a) Move the outboard flap fully to the root direction.

(b) Measure the lateral backlash of the outboard flap, on the wing underside, between the outboard flap and Torque Box 2. This lateral backlash value is “Measurement A” (MA).

(c) Move the outboard flap fully to the tip direction.

(d) Measure the lateral backlash in the same point, on the wing underside, between the outboard flap and Torque Box 2. This lateral backlash value is “Measurement B” (MB).

(e) The lateral backlash between the outboard flap and Torque Box 2 is:

LATERAL BACKLASH = MB-MA

Table 504 - OUTBOARD-FLAP LATERAL BACKLASH

Outboard Flap (zero-degree position)	
Flap moved to the root	Measurement A = MA
Flap moved to the tip	Measurement B = MB
Lateral Backlash	MB-MA
Minimum backlash	3 mm

Table 504 - OUTBOARD-FLAP LATERAL BACKLASH (Continued)

Outboard Flap (zero-degree position)	
Maximum backlash	5 mm

(3) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

(4) On the Circuit Breaker Panel, close the FLAP 1 and FLAP 2 circuit breakers and remove the DO-NOT-CLOSE tag from them.

WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE TRAVEL AREA.

(5) Set the flaps to the 45-degree position.

(6) On the Circuit Breaker Panel, open the FLAP 1 and FLAP 2 circuit breakers and attach a DO-NOT-CLOSE tag to them.

(7) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

(8) Measure the lateral backlash between the inboard flap and Torque Box 1, when the surface is in the 45-degree position.

(a) Make sure that the flaps are in the 45-degree position.

(b) Move the inboard flap fully to the root direction.

(c) Measure the lateral backlash, on the wing underside, between the inboard flap and Torque Box 1. This lateral backlash value is “Measurement A” (MA).

(d) Move the inboard flap fully to the tip direction.

(e) Measure the lateral backlash in the same point, on the wing underside, between the inboard flap and Torque Box 1. This lateral backlash value is “Measurement B” (MB).

(f) The lateral backlash between the inboard flap and Torque Box 1 is:

LATERAL BACKLASH = MB-MA

Table 505 - INBOARD-FLAP LATERAL BACKLASH

Inboard Flap (45-degree position)	
Flap moved to the root	Measurement A = MA
Flap moved to the tip	Measurement B = MB
Lateral Backlash	MB-MA
Minimum backlash	3 mm
Maximum backlash	5 mm

(9) Measure the lateral backlash between the outboard flap and Torque Box 2, when the surface is in the 45-degree position.

(a) Make sure that the flaps are in the 45-degree position.

(b) Move the outboard flap fully to the root direction.

(c) Measure the lateral backlash, on the wing underside, between the outboard flap and Torque Box 2. This lateral backlash value is “Measurement A” (MA).

(d) Move the outboard flap fully to the tip direction.

(e) Measure the lateral backlash in the same point, on the wing underside, between the outboard flap and Torque Box 2. This lateral backlash value is “Measurement B” (MB).

(f) The lateral backlash between the outboard flap and Torque Box 2 is:

LATERAL BACKLASH = MB-MA

Table 506 - OUTBOARD-FLAP LATERAL BACKLASH

Outboard Flap (45-degree position)	
Flap moved to the root	Measurement A = MA
Flap moved to the tip	Measurement B = MB
Lateral Backlash	MB-MA
Minimum backlash	3 mm
Maximum backlash	5 mm

K. Follow-on

SUBTASK 842-004-A

(1) Energize the aircraft with the External DC Power Supply (AMM TASK 20-40-01-860-801-A/200).

(2) On the Circuit Breaker Panel, close the FLAP 1 and FLAP 2 circuit breakers and remove the DO-NOT-CLOSE tag from them.

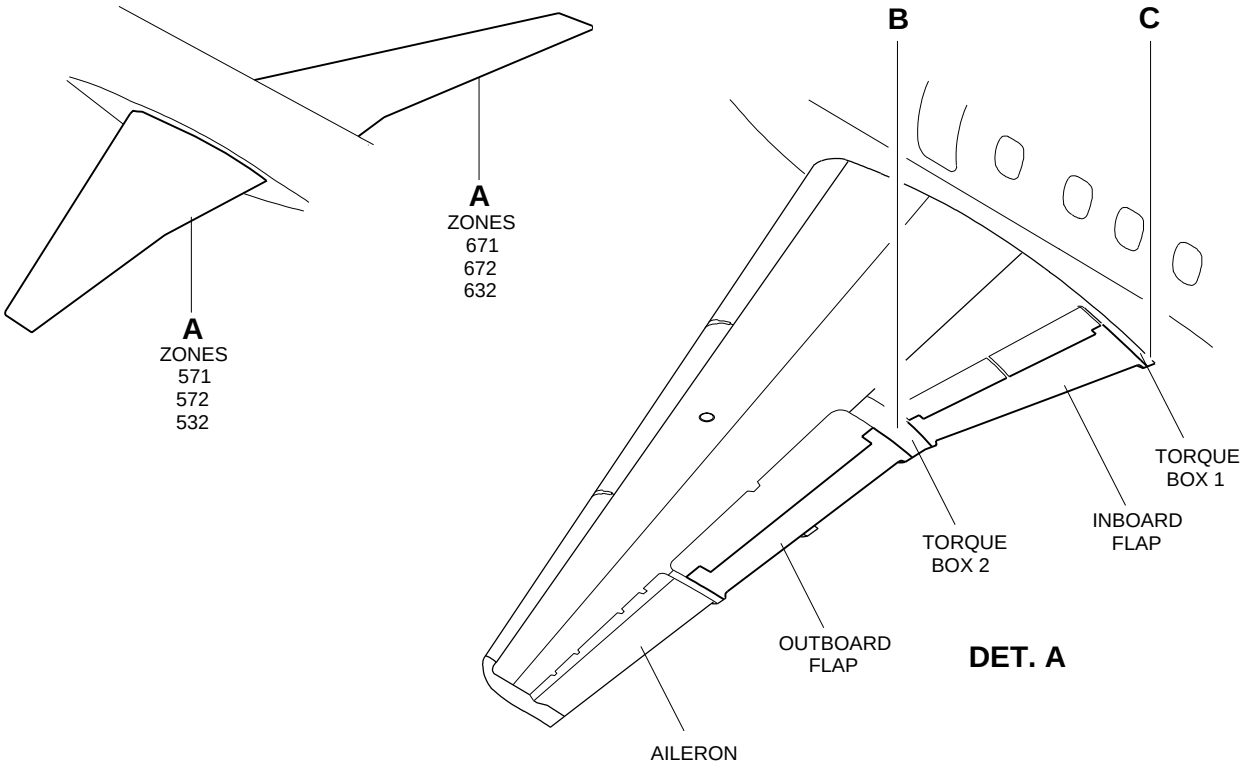
WARNING: MAKE SURE THAT THERE ARE NO PERSONS AND EQUIPMENT IN THE FLAP TRAVEL AREA.

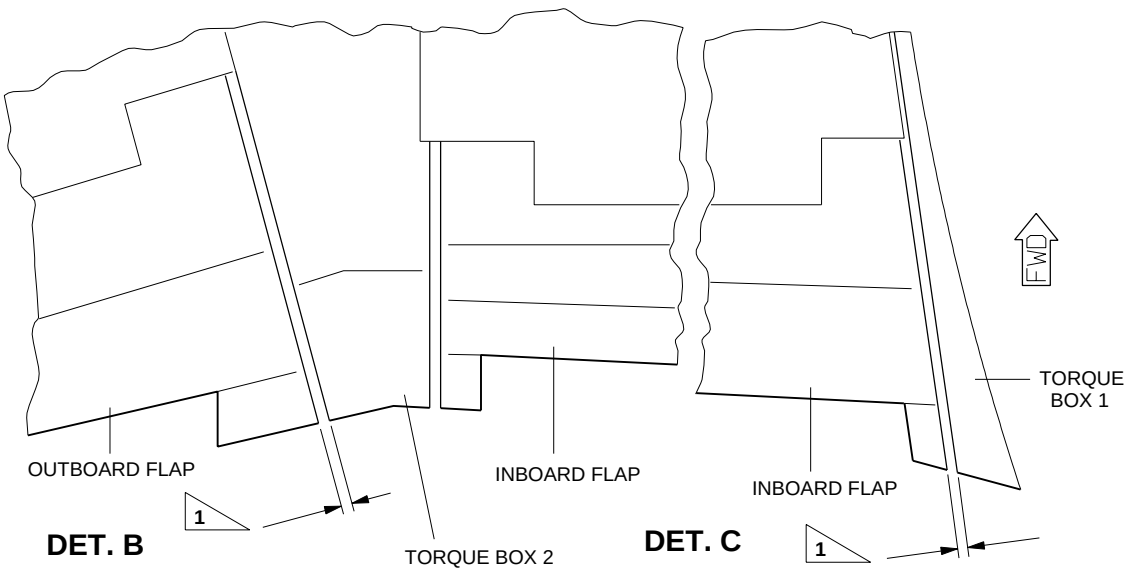
(3) Set the flaps to the zero degree position.

(4) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

EFFECTIVITY: ALL

Flap Lateral Backlash
Figure 503





1 "MA" WHEN YOU MOVE THE FLAP TO THE ROOT DIRECTION AND
"MB" WHEN YOU MOVE THE FLAP TO THE TIP DIRECTION

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