AILERON DAMPER - ADJUSTMENT/TEST

EFFECTIVITY: POST-MOD SB 145-27-0063 OR FAA/CTA-CERTIFIED AIRCRAFT

1. General

A. This section gives the procedures to do a check of the performance of the aileron damper.

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*
27-12-03-700-801-A ♦	AILERON-DAMPER DAMPING FORCE - FUNCTIONAL CHECK	POST-MOD SB 145-27-0063 OR FAA/ CTA-CERTIFIED AIR-CRAFT
27-12-03-700-802-A ♦	EXTERNAL LEAKAGE OF THE AILERON DAMPER - FUNCTIONAL CHECK	POST-MOD SB 145-27-0063 OR FAA/ CTA-CERTIFIED AIR-CRAFT

TASK 27-12-03-700-801-A
EFFECTIVITY: POST-MOD SB 145-27-0063 OR FAA/CTA-CERTIFIED AIRCRAFT

2. AILERON-DAMPER DAMPING FORCE - FUNCTIONAL CHECK

A. General

(1) This task gives the procedure to do a functional check of the aileron damper.

(2) The aileron damper uses hydraulic system 2 only.

B. References

REFERENCE	*DESIGNATION*
AMM MPP 06-44-00/100	- COMPONENT LOCATION
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
AMM TASK 27-11-07-000-801-A/400	AILERON NEUTRAL RECOVERY UNIT - REMOVAL
AMM TASK 27-11-07-400-801-A/400	AILERON NEUTRAL RECOVERY UNIT - INSTALLATION
AMM TASK 27-12-01-000-801-A/400	AILERON POWER-CONTROL ACTUATOR (PCA) - REMOVAL
AMM TASK 27-12-01-400-801-A/400	AILERON POWER-CONTROL ACTUATOR (PCA) - INSTALLATION
AMM TASK 27-12-03-870-801-A/300	AILERON DAMPER BLEEDING
AMM TASK 29-10-00-860-801-A/200	HYDRAULIC SYSTEM - PRESSURIZATION WITH HTS
AMM TASK 57-56-04-000-801-A/400	AILERON LOWER SHROUD - REMOVAL
AMM TASK 57-56-04-400-801-A/400	AILERON LOWER SHROUD - INSTALLATION
IPC 27-12-00	AILERON HYDRAULIC ACTUATION

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
551	551CB	Wing
651	651CB	Wing
5731		Wing
6731		Wing

D. Tools and Equipment

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
GSE 215	Load Sensing Clevis Pin System	To measure the damping force of the aileron damper	

E. Auxiliary Items

Not Applicable

F. Consumable Materials

SPECIFICATION (BRAND)	*DESCRIPTION*	*QTY*
MS20995C20	Lockwire	AR

G. Expendable Parts

ITEM	*IPC REFERENCE (VENDOR REFERENCE)*	*QTY*
Cotter pin	IPC 27-12-00	1
Cotter pin	IPC 27-12-00	1

H. Persons Recommended

QTY	*FUNCTION*	*PLACE*
1	Does the task	Wing
1	Helps the other technician	Cockpit

I. Preparation

SUBTASK 841-002-A

(1) Do not do other tasks on the aileron system.

(2) Make sure that hydraulic systems 1 and 2 are depressurized and off (AMM TASK 29-10-00-860-801-A/200).

(3) Remove access panels 551CB and 651CB (AMM MPP 06-44-00/100).

(4) Remove the aileron lower shroud (AMM TASK 57-56-04-000-801-A/400).

J. Functionally Check Aileron-Damper Damping Force (Figure 501) (Figure 502) (Figure 503)

SUBTASK 720-002-A

(1) Adjust the digital load indicator (GSE 215).

(a) Connect the digital load indicator cable to the shearing-stress sensor pin with no load applied and turn on the digital load indicator.

(b) See the value on the display and set it to zero if necessary.

(c) Wait one minute for the indicator to warm up and reset it to zero if applicable.

(d) Remove the electrical cable from the shearing-stress sensor pin.

(e) Turn off the digital load indicator.

(2) Do this procedure for the left aileron.

(a) Disconnect the NRU from the PCA removing the cotter pin, nut, washers, bushing, and bolt. Refer to AMM TASK 27-11-07-000-801-A/400.

(b) Disconnect the input rod from the PCA input lever (Figure 502). Refer to AMM TASK 27-12-01-000-801-A/400.

(c) Remove the cotter pin, nut, washers, bushing, and bolt that connects the PCA inboard piston end to the wing fitting (Figure 501). Refer to AMM TASK 27-12-01-000-801-A/400.

CAUTION: MAKE SURE THAT THE SHEARING-STRESS SENSOR PIN IS CORRECTLY INSTALLED, AS FOLLOWS:

- MAKE SURE THAT THE "EYE LOAD" MARK, ON THE SHEARING-STRESS SENSOR PIN BODY, POINTS DOWN AND THAT THE ARROW MARKED ON THE PIN BODY IS ALIGNED WITH THE PCA PISTONS.
- MAKE SURE THAT THE PIN IS PUT TOTALLY INTO THE LUGS, THUS THE PCA PISTON ROD END IS BETWEEN THE PIN GROOVES.

(d) Install the shearing-stress sensor pin with its bushings in the PCA inboard piston end to the wing fitting.

(e) Remove the cotter pin, nut, washers, bushing, and bolt that connects the PCA outboard piston end to the wing fitting (Figure 501). Refer to AMM TASK 27-12-01-000-801-A/400.

(f) Connect the electrical cable and digital load indicator to the shearing-stress sensor pin installed in the PCA inboard piston.

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

(h) Turn on the digital load indicator.

(i) Make sure that aileron system 1 and system 2 are off.

1 On the flight controls panel, on the overhead panel, the AILERON SHUTOFF SYS 1 and AILERON SHUTOFF SYS 2 pushbutton lights are on.

WARNING: WHEN THE HYDRAULIC SYSTEM IS PRESSURIZED, A SUDDEN MOVEMENT OF THE AILERON SURFACE MAY OCCUR. MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE AILERON TRAVEL AREA.

(j) Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

(k) Turn on aileron system 2 with the AILERON SHUTOFF SYS 2 pushbutton, on the flight controls panel of the overhead panel.

1 The AILERON SHUTOFF SYS 2 pushbutton light goes off.

(l) Measure the damping force of the aileron damper in the upward direction (from the fully down position to the fully up position), in three cycles (each cycle begins at step 1 and goes to step 5):

1 Move the aileron surface to the fully down position.

2 Again set the digital load indicator to zero, if necessary.

3 With the input lever, operate the aileron surface to the fully up position.

4 Write in the table below the higher value shown on the digital load indicator.

Write the values related to the cycle that you are doing. If you are doing the cycle 1 write the values in the column 1, if is the cycle 2 write in the column 2, if is cycle 3 write in the column 3.

Table 501

	Aileron surface operated upward.		
Cycles	1	2	3
Damping Force - N (lbf)	F1=	F2=	F3=
AF (Average Force) = (F1+F2+F3) / 3	AF=		

5 Reset to zero and clear the value shown on the digital load indicator.

6 Repeat steps 1, 2, 3, and 4 for cycles 2 and 3.

7 After the 3 cycles with the values in the table calculate the average force and write it in the table.

8 The result must be between 4003.4 and 6672.3 N (900 and 1500 lbf).

Table 502

4003.4 N (900 lbf) < Average damping force < 6672.3 N (1500 lbf)

(m) Again do step (l) to measure the damping force in the downward direction (from the fully up position to the fully down position).

Table 503

	Aileron surface operated downward.		
Cycles	1	2	3
Damping Force - N (lbf)	F1=	F2=	F3=
AF (Average Force) = (F1+F2+F3) / 3	AF=		

Table 504

4003.4 N (900 lbf) < Average damping force < 6672.3 N (1500 lbf)

(n) On the flight controls panel, push the AILERON SHUTOFF 2 to turn off aileron system 2.

1 The AILERON SHUTOFF 2 pushbutton light comes on.

(o) Turn off the digital load indicator.

(p) Depressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

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

(r) Remove the GSE from the aircraft.

(s) Install the cotter pins, nuts, washers, bushing, and bolts to connect the PCA piston ends to the wing fittings (Figure 501). Refer to AMM TASK 27-12-01-400-801-A/400.

(t) Connect the input rod to the PCA input lever (Figure 502). Refer to AMM TASK 27-12-01-400-801-A/400.

(u) Connect the NRU to the PCA installing the cotter pin, nut, washers, bushing, and bolt. Refer to AMM TASK 27-11-07-400-801-A/400

(3) Again do the procedure of step (2) for the right aileron.

(4) Do a check on the accumulator of the left aileron damper (Figure 503).

WARNING: MAKE SURE THAT THE HYDRAULIC SYSTEMS ARE DEPRESSURIZED.

(a) Cut the lockwire and open the bleed valve.

WARNING: DURING THE MEASUREMENT, DO NOT PRESSURIZE THE HYDRAULIC SYSTEM. THIS ACTION CAN CAUSE INJURE TO THE MECHANIC.

(b) Measure the extension "d" of the accumulator indicator.

1 The value of "d" must be lower than 1.8 mm (0.071 in).

Table 505

Accumulator depressurized (bleed valve open)	d < 1.8 mm (0.071 in)

(c) Bleed the aileron damper (AMM TASK 27-12-03-870-801-A/300) and keep the bleed valve closed.

(d) Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

1 On the flight controls panel of the overhead panel, keep aileron system 1 turned off.

a The AILERON SHUTOFF SYS 1 pushbutton light is on.

2 Turn on aileron system 2 with the AILERON SHUTOFF SYS 2 pushbutton, on the flight controls panel of the overhead panel.

a The AILERON SHUTOFF SYS 2 pushbutton light goes off.

(e) Move the pilot or copilot control yoke fully to the right and to the left and then move it back to the neutral position. Do this cycle 2 times.

(f) On the flight controls panel of the overhead panel, turn off aileron system 2 with the AILERON SHUTOFF SYS 2 pushbutton.

1 The AILERON SHUTOFF SYS 2 pushbutton light comes on.

(g) Depressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

WARNING: DURING THE MEASUREMENT, DO NOT PRESSURIZE THE HYDRAULIC SYSTEM. THIS ACTION CAN CAUSE INJURE TO THE MECHANIC.

(h) Measure the extension "d" of the accumulator indicator.

1 For aircraft with aileron damper -102, the value of "d" must be higher than 4.4 mm (0.173 in).

2 For aircraft with aileron damper -103 and -104, the value of "d" must be higher than 12.0 mm (0.472 in).

Table 506

	Aileron Damper	
	-102	-103 and -104
Accumulator pressurized (bleed valve closed)	d > 4.4 mm (0.173 in)	d > 12.0 mm (0.472 in)

(i) Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

1 On the flight controls panel of the overhead panel, keep aileron system 2 turned off.

a The AILERON SHUTOFF SYS 2 pushbutton light is on.

2 Turn on the aileron system 1 with the AILERON SHUTOFF SYS 1 pushbutton, on the flight controls panel of the overhead panel.

a The AILERON SHUTOFF SYS 1 pushbutton light goes off.

(j) Move the pilot or copilot control yoke fully to the right and to the left and then move it back to the neutral position. Do this cycle 10 times.

(k) On the flight controls panel of the overhead panel, turn off aileron system 1 with the AILERON SHUTOFF SYS 1 pushbutton.

1 The AILERON SHUTOFF SYS 1 pushbutton light comes on.

(l) Depressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

WARNING: DURING THE MEASUREMENT, DO NOT PRESSURIZE THE HYDRAULIC SYSTEM. THIS ACTION CAN CAUSE INJURE TO THE MECHANIC.

(m) After 20 minutes, measure the extension "d" of the accumulator indicator.

NOTE: During this time, hydraulic system 2 must not be turned on.

1 For aircraft with aileron damper -102, the value of "d" must be higher than 3.5 mm (0.138 in).

2 For aircraft with aileron damper -103 and -104, the value of "d" must be higher than 8.5 mm (0.335 in).

Table 507

	Aileron Damper	
	-102	-103 and -104
Check of the accumulator after 20 minutes	d > 3.5 mm (0.138 in)	d > 8.5 mm (0.335 in)

(n) Apply torque to the bleed valve and safety it, if required.

(5) Again do the procedure of step (4) for the right aileron damper.

K. Follow-on

SUBTASK 842-002-A

(1) Make sure that GSE 215 is outside the aircraft.

(2) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200), if applicable.

(3) Depressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200), if applicable.

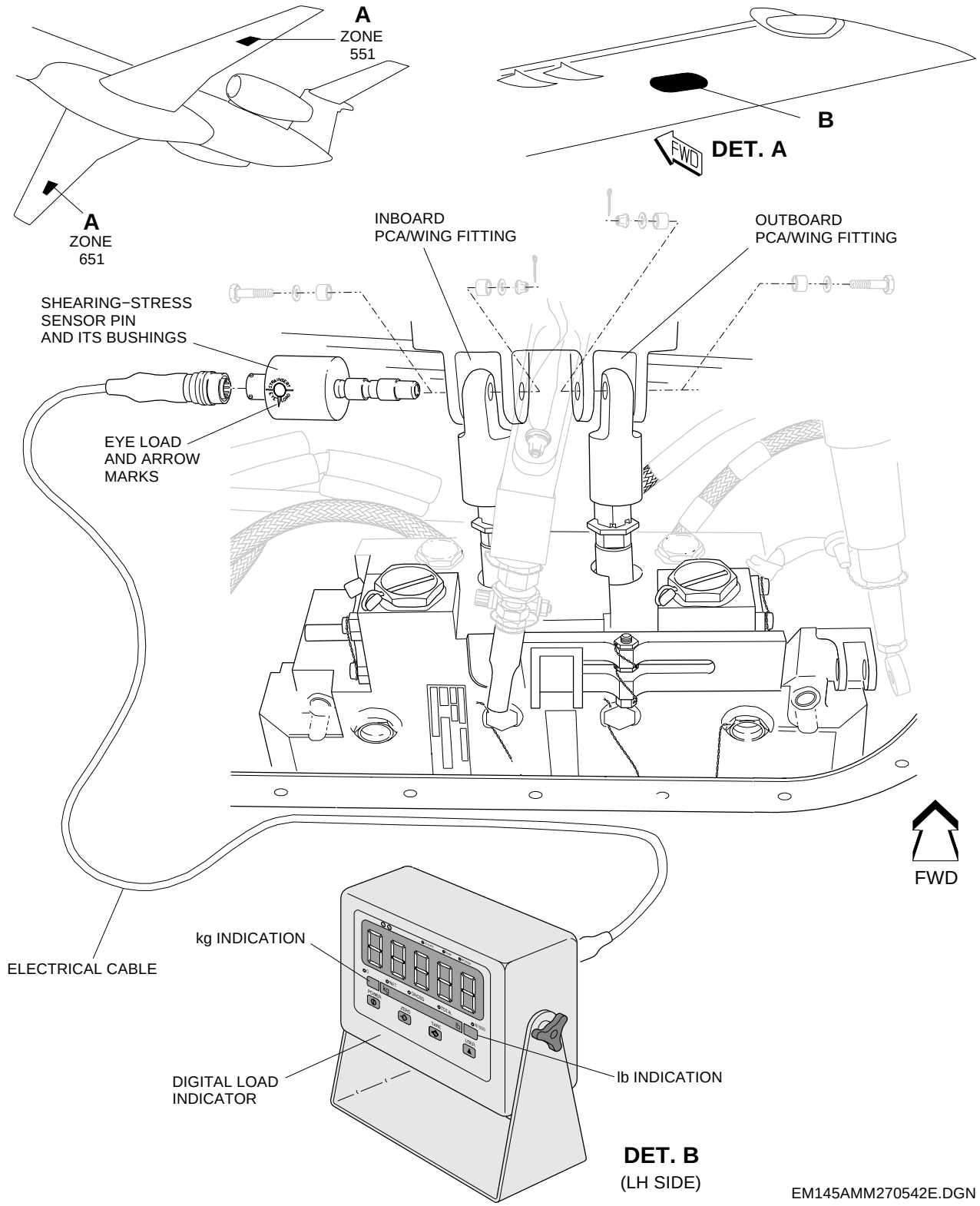
(4) Close access panels 551CB and 651CB (AMM MPP 06-44-00/100).

(5) Install the aileron lower shroud (AMM TASK 57-56-04-400-801-A/400).

EFFECTIVITY: POST-MOD SB 145-27-0063 OR FAA/CTA-CERTIFIED AIRCRAFT

GSE 215 - Load Sensing Clevis Pin System - Installation

Figure 501



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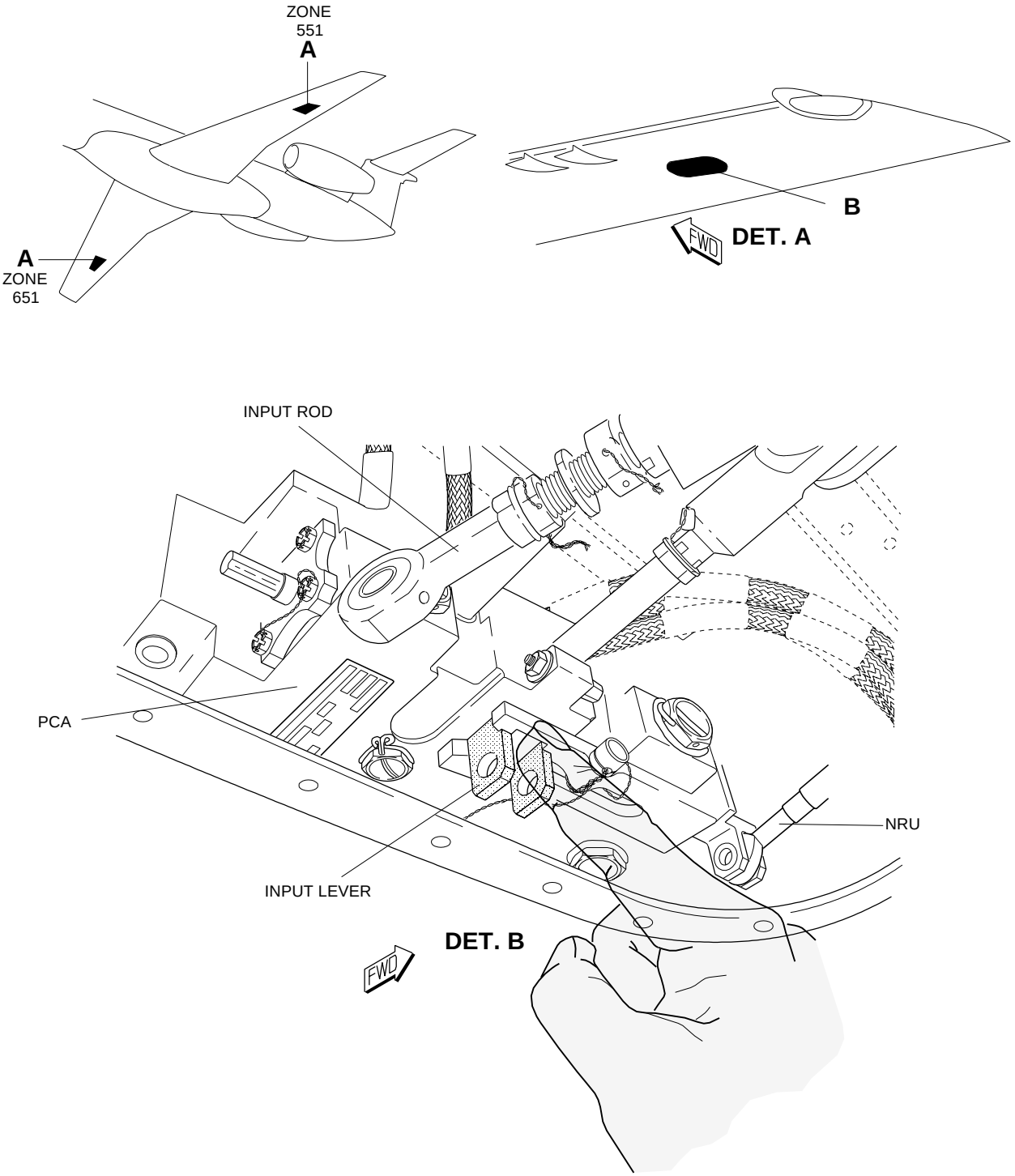
EFFECTIVITY: POST-MOD SB 145-27-0063 OR FAA/CTA-CERTIFIED AIRCRAFT

Operation of the Aileron Surface with the Input Lever

Figure 502



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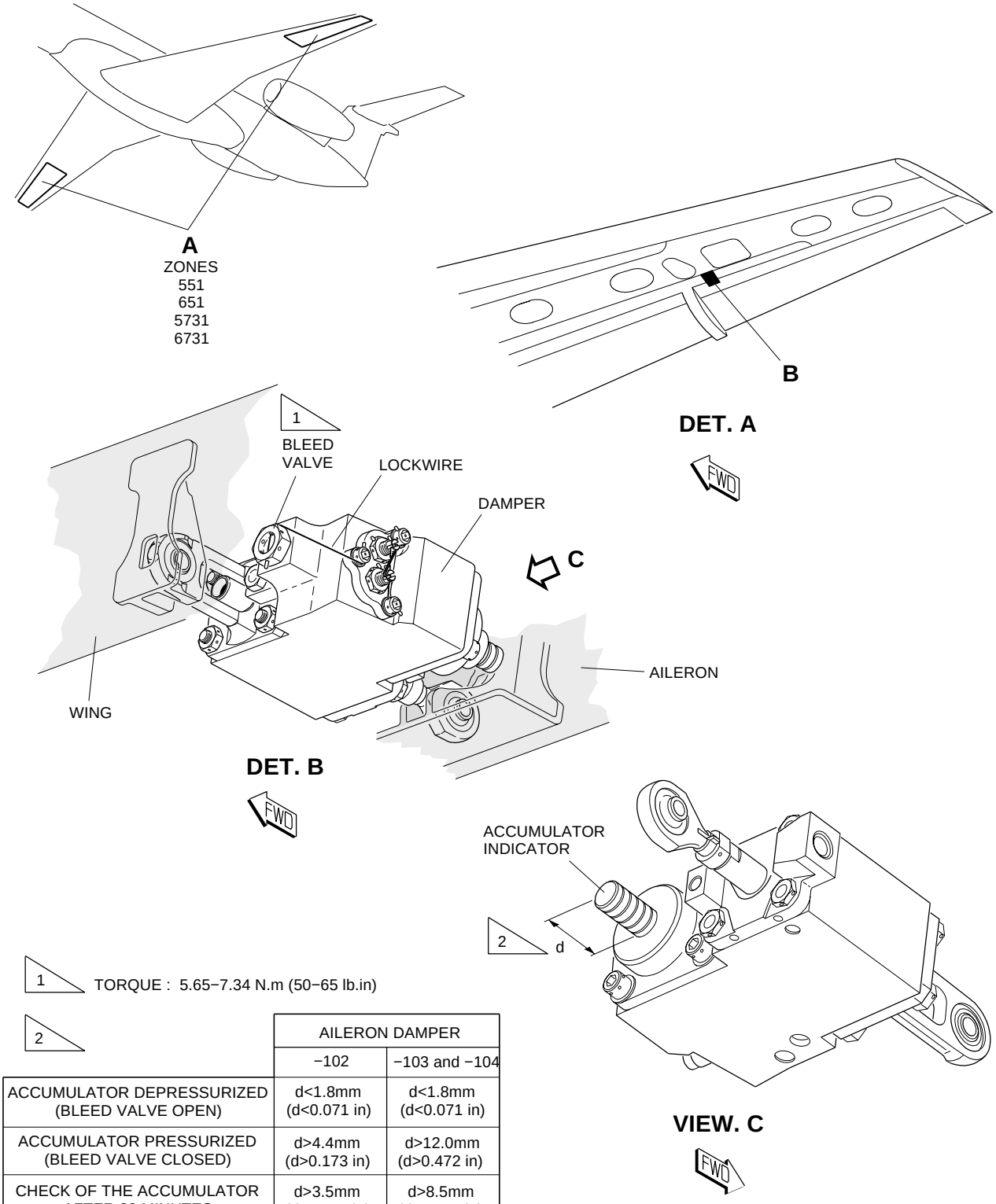
EFFECTIVITY: POST-MOD SB 145-27-0063 OR FAA/CTA-CERTIFIED AIRCRAFT

Aileron Damper Accumulator - Check

Figure 503



1 TORQUE : 5.65−7.34 N.m (50−65 lb.in)

2

	AILERON DAMPER	
	−102	−103 and −104
ACCUMULATOR DEPRESSURIZED (BLEED VALVE OPEN)	d<1.8mm (d<0.071 in)	d<1.8mm (d<0.071 in)
ACCUMULATOR PRESSURIZED (BLEED VALVE CLOSED)	d>4.4mm (d>0.173 in)	d>12.0mm (d>0.472 in)
CHECK OF THE ACCUMULATOR AFTER 20 MINUTES	d>3.5mm (d>0.138 in)	d>8.5mm (d>0.335 in)

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TASK 27-12-03-700-802-A
EFFECTIVITY: POST-MOD SB 145-27-0063 OR FAA/CTA-CERTIFIED AIRCRAFT

3. EXTERNAL LEAKAGE OF THE AILERON DAMPER - FUNCTIONAL CHECK

A. General

(1) This task gives the procedure to do a functional check of the external leakage of the aileron damper.

(2) The aileron damper uses hydraulic system 2 only.

B. References

REFERENCE	*DESIGNATION*
AMM TASK 20-40-01-860-801-A/200	ENERGIZATION OF THE AIRCRAFT WITH AN EXTERNAL POWER SOURCE
AMM TASK 27-12-03-000-801-A/400	AILERON DAMPER - REMOVAL
AMM TASK 29-10-00-860-801-A/200	HYDRAULIC SYSTEM - PRESSURIZATION WITH HTS
AMM TASK 57-56-04-000-801-A/400	AILERON LOWER SHROUD - REMOVAL
AMM TASK 57-56-04-400-801-A/400	AILERON LOWER SHROUD - INSTALLATION

C. Zones and Accesses

ZONE	*PANEL/DOOR*	*LOCATION*
5731		Wing
6731		Wing

D. Tools and Equipment

Not Applicable

E. Auxiliary Items

ITEM	*DESCRIPTION*	*PURPOSE*	*QTY*
Commercially available	Rubber Gloves, Phosphate Ester-Base, Fluid-Resistant	For protection of the hands	1
Commercially available	Rubber Goggles, Phosphate Ester-Base, Fluid-Resistant	For protection of the eyes	1

F. Consumable Materials

Not Applicable

G. Expandable Parts

Not Applicable

H. Persons Recommended

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

(Continued)

QTY	FUNCTION	PLACE
1	Does the task	Cockpit

I. Preparation

SUBTASK 841-003-A

(1) Do not do other tasks on the aileron system.

(2) Remove the aileron lower shroud (AMM TASK 57-56-04-000-801-A/400).

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

(4) Pressurize the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

J. Functionally Check the External Leakage of the Aileron Damper (Figure 504)

SUBTASK 720-003-A

WARNING: THE HYDRAULIC SYSTEM CONTAINS PHOSPHATE-ESTER HYDRAULIC FLUID. THE FLUID CAN CAUSE IRRITATION IN YOUR SKIN OR INJURY TO YOUR EYES. USE THE APPLICABLE RUBBER GOGGLES AND GLOVES. IF THE FLUID TOUCHES YOU, FLUSH YOUR SKIN WITH WATER. IF IT GETS IN YOUR EYES, FLUSH THEM WITH WATER AND GET MEDICAL HELP.

(1) Do a check on the aileron damper for leakage:

(a) Make sure that aileron system 1 and aileron system 2 are on.

1 On the flight controls panel, on the overhead panel, the AILERON SHUTOFF SYS 1 and AILERON SHUTOFF SYS 2 pushbutton lights are off.

(b) Move the pilot or copilot control yoke fully to the left and to the right and then move it back to the neutral position. Do this cycle 25 times.

WARNING: DO NOT PUT FINGERS OR OTHER MATERIAL IN THE SPACE BETWEEN THE WING AND AILERON.

1 The external leakage at each point of the aileron damper must not be more than 6 drops, during the 25 cycles. If it is, replace the aileron damper (AMM TASK 27-12-03-000-801-A/400).

NOTE: The points where to do the check are shown in Figure 504.

(2) Again do step (1) for the right aileron damper.

K. Follow-on

SUBTASK 842-003-A

(1) Release the pressure from the hydraulic system (AMM TASK 29-10-00-860-801-A/200).

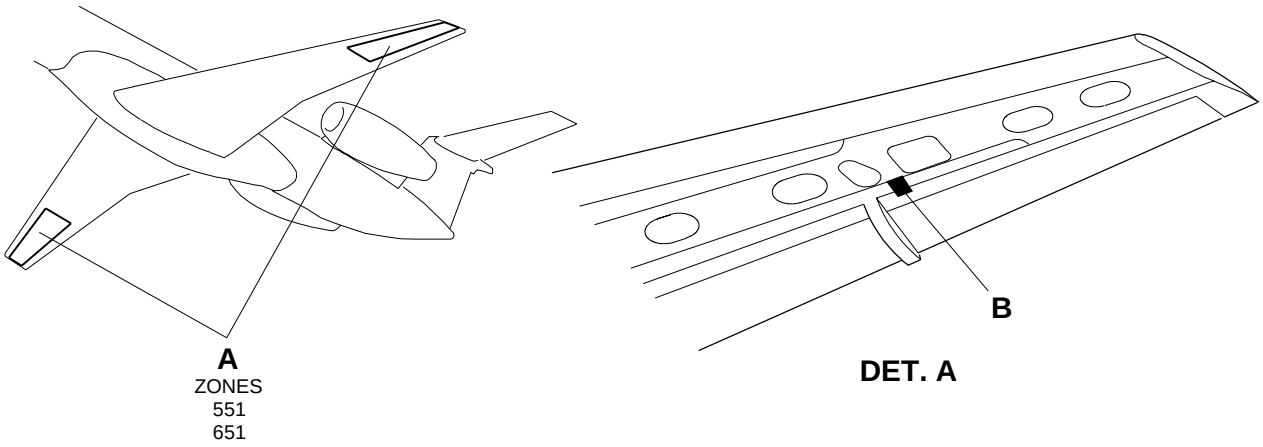
(2) Deenergize the aircraft (AMM TASK 20-40-01-860-801-A/200).

(3) Install the aileron lower shroud (AMM TASK 57-56-04-400-801-A/400).

EFFECTIVITY: POST-MOD SB 145-27-0063 OR FAA/CTA-CERTIFIED AIRCRAFT

External Leakage of the Aileron Damper

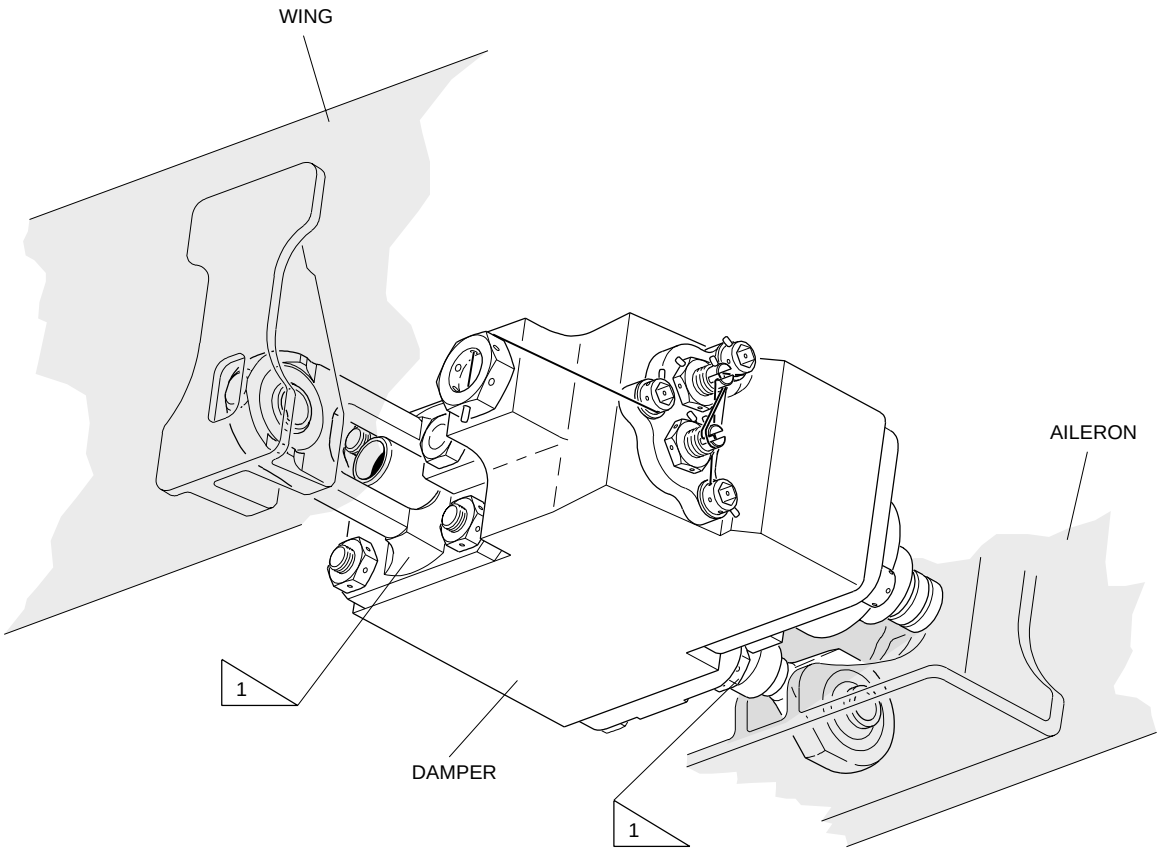
Figure 504



A

ZONES
551
651

DET. A



DET. B

1 DO AN INSPECTION FOR LEAKAGE

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