

FLIGHT CONTROL SYSTEM

AERODYNAMIC DEVICES

DESCRIPTION

Aerodynamic devices, as described below, are the trailing edge flaps, leading edges, and airbrakes (spoilers).

Trailing edge flaps

The trailing edge flaps consist of four all-metal slotted sections, two on each wing, mechanically connected together. The flaps move aft and down in the extension process. They are electrically controlled and hydraulically actuated from No 1 system pressure. A single hydraulic motor operates a torque drive linkage to one jack screw on each inboard flap section and two on each outboard section. Emergency extension is by means of manual crank operation. The socket for emergency crank operation is in the left cabin aisle wall, parallel to the wing trailing edge. This manual crank is stowed at frame 7, behind the copilot seat.

In the event of hydraulic failure of No 1 system, the flaps can be operated from the transfer jack using the "FLAPS EMERG" button on the pedestal.

Leading edges

Airplanes equipped with drooping leading edges (DLE's)
(FJF basic, Series D, E and MYSTERE-FALCON 20-C5, -D5, -E5 airplanes)

The DLE's extend from the fence to the tip of each wing.

The DLE's are electrically controlled and are actuated by two hydraulic actuators supplied No 1 hydraulic system pressure and located each in the wing leading edge. Depending on the position of the control handle, the DLE's are either fully extended (25° down) or fully retracted. Internal locks at the extend and retract ends of the actuator cause the actuators to retain the position they are in if a hydraulic failure occurs.

Extension of the DLE's is initiated by selecting the flap control handle from the CLEAN position to the 15 degree detent corresponding to the first flap deflection position.

Retraction of the DLE's is initiated by selecting the flap control handle from the 15° position to the CLEAN position. The DLE's start retracting when the trailing edge flaps have retracted (0° flap deflection).

Position, operation indicator lights and warning lights are provided. The DLE position has an effect on the horizontal stabilizer range of nose-up travel and on the operation of the Arthur failure lights.

Airplanes with DLE's and slats (FJF Series F and MYSTERE-FALCON 20-F5 airplanes)

These leading edge sections cover the whole wing span and consist :

- From the wing root to the fence, of a DLE section. Sliding on tracks it extends $17^{\circ}30'$ downwards.
- From the fence to the wing tip, of two slotted sections (slats) sliding on tracks and extending 25° downwards.

These leading edge sections are electrically controlled. Each section is actuated by a hydraulic jack which is supplied No 1 system pressure and incorporates a locking device activated when the sections are in the retracted position. The sections are either extended or retracted depending on the input signal from the flap control handle.

Extension is initiated by displacing the control handle from the "CLEAN" position to the first detent corresponding to 10° flap extension.

Retraction is initiated after the flap control handle has been selected from the 10° detent back to the "CLEAN" position and the flaps have fully retracted (0° flap deflection).

Position, operation indicator lights and warning lights are provided. The leading edge position has an effect on the horizontal stabilizer range of nose-up travel and on the operation of the Arthur failure lights.

Airbrakes

The airbrakes consist of two panels mounted on the upper surface of each wing.

They are electrically controlled by a pedestal mounted control handle and they operate off No 1 hydraulic system pressure. In the event No 1 hydraulic system should fail, the transfer jack can be used for airbrake operation.

In MYSTERE-FALCON 20-()5 airplanes and FAN JET FALCON airplanes, incorporating AMD Service Bulletin No 537, the stand-by pump is available for airbrake operation if the No 1 system happens to fail.

Although the airbrakes of the LH and RH wings are not synchronized, a dual solenoid valve ports pressure evenly to the two actuators.

The airbrakes can assume two positions only: they are either extended (70 degrees or less depending on airspeed) or retracted. Asymmetric operation of the airbrakes to help control the airplane in roll is not provided.

SB F20-376 not accomplished

When in the retracted position, the airbrakes are mechanically locked and no hydraulic pressure is applied to the actuators, they are maintained in extended position by hydraulic pressure only and they retract but do not lock if the hydraulic pressure is lost.

SB F20-376 accomplished

The airbraked are maintained extended or retracted by hydraulic pressure only.

SYSTEM COMPONENTS

Flaps motor

The hydraulic flap motor is located in the left wing root against the rear wing spar, and incorporates a hydraulic brake to prevent motor coasting. The motor output shaft transmit power to a gear box. The emergency drive also connects into this gear box. Cam operated microswitches in a box attached to the gear box slave the flaps position to that of the flaps control handle. Left and right flaps position indication is provided by transmitters located at the outboard end of each wing flaps.

Leading edge actuators

Airplanes with DLE's (FJF basic, Series D, E and MYSTERE-FALCON 20-C5, -D5 and -E5 airplanes)

A hydraulic actuator in each wing leading edge structure actuates push-pull rods and bellcranks to extend or retract the associated DLE. Microswitches are actuated by the DLE's.

Airplanes with DLE's and slats (FJF Series F and MYSTERE-FALCON 20-F5 airplanes)

Each section is actuated by a separate hydraulic jack. These six jacks are hinged to both the front wing spar and the associated section. An internal mechanism locks them in the retracted position and they carry a microswitch for indication and sequencing.

Airbrakes actuators

Each wing houses a hydraulic jack which actuates the associated two airbrakes panels.

- The jacks not modified per SB F20-376 incorporate a locking mechanism which holds the airbrakes in the retracted position and is released when hydraulic pressure is applied to the extend side of the jack.
A double pole microswitch mounted on each jack causes the airbrakes lights to illuminate when the associated airbrake is not retracted and locked.
These microswitches also cause hydraulic pressure to be dumped to return when both airbrakes are locked in the retracted position.
- The jacks modified per SB F20-376 have no internal locking mechanism to hold the airbrakes in the retracted position. The airbrakes are held retracted by No 1 hydraulic system or transfer jack pressure.

Airbrakes control valve

A dual, solenoid operated valve delivers pressure for simultaneous extension or retraction of the two airbrakes. It maintains full hydraulic pressure to hold the LH and RH airbrakes extended or retracted (SB F20-376 accomplished) or it dumps pressure to return when the airbrakes on the LH and RH wings are retracted and locked (SB F20-376 not accomplished). In the event of a hydraulic or electrical failure, the control valve allows the airbrakes to retract.

CONTROLS - INDICATION AND WARNING

Leading edges - flaps control handle

Located at the aft part of the pedestal, this control handle can be selected to 4 positions which electrically control flaps and leading edges operation. The "CLEAN" position corresponds to the configuration where flaps and leading edges are retracted. The other 3 positions correspond to the leading edges extended position associated with the flaps extension; to wit:

15° - 25° - 40°
or 10° - 25° - 40° for FJF Series F and MYSTERE-FALCON 20-F5 airplanes.

The leading edges - flaps control handle is latched in any of these positions and the control handle must be pulled upwards to release the latch.

An additional latch is provided at the 15° detent only (10° detent for FJF Series F and MYSTERE-FALCON 20-F5 airplanes). When depressed, a push button releases this latch and the "CLEAN" or 25 degree position can be selected. The purpose of this additional latch is to make sure no split flat condition exists prior to extending the flaps further down.

Leading edges - flaps indication

This indicator panel is located in the center instrument panel. It includes:

- A flaps position indicator, with two pointers associated with the LH and RH wing flaps.
- A green indicator light for "flaps not retracted".
- A green indicator light for "L/E extended".
- A red indicator light for "L/E in transit".
- A "TEST" button for the above lights.

The following tables show the correspondance between the leading edges - flaps control handle position, the leading edges - flaps position and the light status.

Airplanes with DLE's (FJF basic, Series D, E and MYSTERE-FALCON 20-C5, -D5 and -E5 airplanes)

FLAPS CONTROL HANDLE POSITION	DLE EXTENSION	FLAPS EXTENSION	INDICATION		
			DLE		FLAPS NOT RETRACTED Green light
			IN TRANSIT Red light	EXTENDED Green light	
CLEAN	0°	0°	OUT	OUT	OUT
			ON	OUT	
15°	25°	15°	OUT	ON	ON
25°	25°	25°	OUT	ON	ON
40°	25°	40°	OUT	ON	ON

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Airplanes with DLE's and slats (FJF Series F and MYSTERE-FALCON 20-F5 airplanes)

FLAPS CONTROL HANDLE POSITION	L/E EXTENSION		FLAPS EXTENSION Red light	INDICATION		
	INBOARD	CENTER OUTBOARD		L/E		FLAPS NOT RETRACTED Green light
				IN TRANSIT Red light	EXTENDED Green light	
CLEAN	0°	0°	0°	OUT	OUT	OUT
				ON	OUT	
10°	17°30	25°	10°	OUT	ON	ON
25°	17°30	25°	25°	OUT	ON	ON
40°	17°30°	25°	40°	OUT	ON	ON

Airbrakes control handle

Located on the aft part of the pedestal this two-position handle ("IN" for retraction and "EXT" for extension) activates a solenoid-operate valve supplying hydraulic pressure for extension or retraction of the airbrakes.

Airbrakes position indication

A rectangular amber light identified AB incorporated to the leading edges-flaps-airbrakes indicator panel is illuminated whenever the airbrakes are not retracted.

A large rectangular red light located below the glare shield and identified "AIR BRAKES" illuminates for the following conditions:

- Either airbrake is not retracted.
- The flaps are extended (landing gear position irrelevant).
- Either power lever is advanced to above 88 % N1 for FJF airplanes and 85 % N1 for MYSTERE-FALCON 20-()5 airplanes.

If SB F20-277 is accomplished :

- Either airbrake is not retracted.
- The landing gear is down and locked (flaps position irrelevant).
- Either power lever is advanced to above 88 % N1 for FJF airplanes and 85 % N1 for MYSTERE-FALCON 20-()5 airplanes.

Emergency flap extension (manual control)

The flaps can be extended or retracted by means of a manual control which uses a square-tipped crank normally stowed behind the copilot seat.

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In the wall of the cabin aisle, parallel with the wing trailing edge is a square socket. If the square end of the crank is engaged into the socket and a force then exerted the locking mechanism is released and the crank permitted to rotate. Clockwise rotation causes the flaps to extend to any desired position.

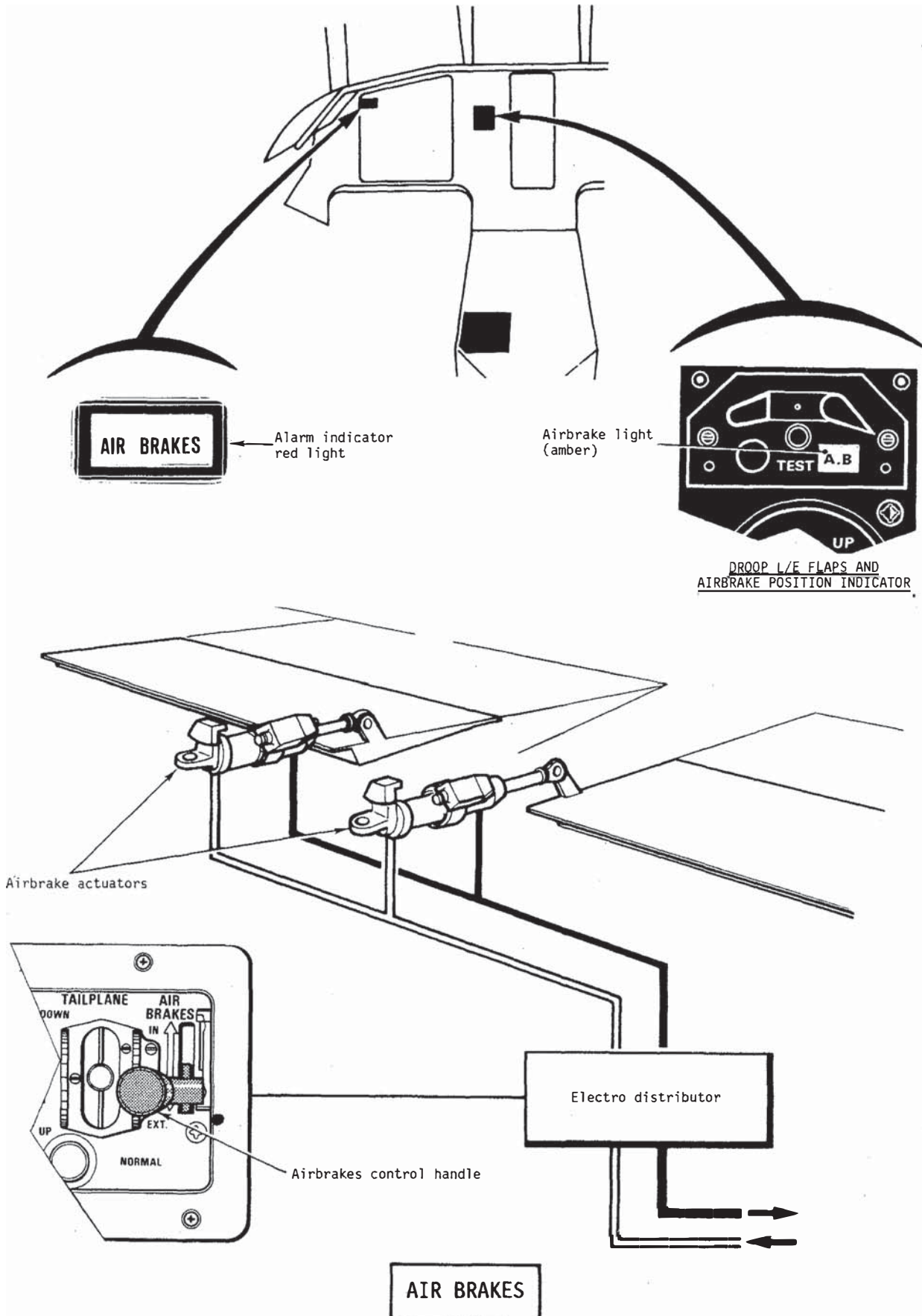
Extension of the flaps from 0 to 25° requires 200 turns of the crank.

NOTE : Do not extend the flaps further than 25° in the event a missed approach should be initiated.

After the crank has been used, make sure the square socket in the aisle wall is effectively in its proper locked position.

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FEB 24 '00 11:39AM FAL JET SUPPORT

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AVIONS MARCEL DASSAULT
BREGUET AVIATIONSUIVI TECHNIQUE DES
AVIONS CIVILSAPPLICATION DE C.M.O.S.
LISTE POUR UN AVIONIDENTIFICATION DU BORDEREAU
TYPE: NRDATE: 24/02/00
HEURE: 17:31:53

AVIONNEUR : AMD

NUMERO DE L'AVION : 083

NUMERO DU C.M.O.S. : A001

NATURE DU TRAITEMENT (L,M) : L COMMENTAIRES: NON
TYPE DU C.M.O.S. : SB TYPE D'AVION : P2

TYPE DES GRILLES : 030 ETAT DES GRILLES : C

AMENDEMENT : NOUVELLE APPLICATION :

PARAMETRES D'EDITION

CMOS LIES: EXCLUSION MODIFS RESERVEES: CMOS APPLICABLES: EDITION (Y/N) :

LISTE DES APPLICATIONS

C.M.O.S.	APPL.	C.M.O.S.	APPL.	C.M.O.S.	APPL.
269	C	270	A	271	C
277	C	278	C	279	N
282	N	284	C	286	C
288	C	289	C	293	C
299	A	301	C	302-	C
306	C	307	C	308	C
311	C	312-	C	313	C
315	N	318	C	324	C
329	C	330-	C	331	C
334	A	335	C	336	C
				272	C
				280	C
				287	C
				298	C
				305	C
				309	C
				314	C
				327	C
				333	A
				340	N

VEUILLEZ EFFECTUER LES MISES A JOUR NECESSAIRES

FEB 24 '08 11:59AM FALCON JET SUPPORT

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AVIONS MARCEL DASSAULT
BREGUET AVIATIONSUIVI TECHNIQUE DES
AVIONS CIVILS

APPLICATION DE C.M.O.S.

LISTE POUR UN AVION

AVIONNEUR : AMD

NUMERO DE L'AVION : 083

NUMERO DU C.M.O.S. : A001

NATURE DU TRAITEMENT(L,M): L COMMENTAIRES: NON

TYPE DU C.M.O.S. : SB

TYPE DES GRILLES : 030 ETAT DES GRILLES : C

AMENDEMENT : NOUVELLE APPLICATION :

PARAMETRES D'EDITION

CMOS LIES: EXCLUSION MODIFS RESERVEES: CMOS APPLICABLES: EDITION (Y/N):

C.M.O.S.	APPL.	C.M.O.S.	APPL.	C.M.O.S.	APPL.
342	C	344	C	345	C
347	C	350	C	351	C
356	C	357	C	358	C
361	C	362	C	363	C
365	C	367	C	369	C
373	C	374	C	375	C
378	C	379	C	381	C
388	C	389	C	403	C
408	C	410	C	412	C
427	C	428	C	429	C
				346	C
				354	C
				359	C
				364	C
				370	C
				376	C
				383	C
				406	C
				422	C
				430	N

VEUILLEZ EFFECTUER LES MISES A JOUR NECESSAIRES