Nomad
ALERT SERVICE BULLETIN

WINGS — FLAP OPERATING LIMITATIONS

1. **PLANNING INFORMATION**

A. **Effectivity**

(1) Aircraft affected:

(a) **N22 Series** line sequence numbers 1 to 9, 11 to 29, 31, 33, 35, 37, 39 to 41, 43, 45, 47 to 59, 63, 65 to 70, 82 to 88, 90 to 95, 97, 100, 102 to 114, 116, 118, 125,126, 131 to 134, 136 to 138, 141, 143 to 170.

(b) **N24 Series** line sequence numbers 10, 30, 32, 34, 36, 38, 42, 44, 46, 60, 62, 64, 71 to 81, 89, 96, 98, 99, 101, 115, 117, 119 to 124, 127 to 130, 135, 139, 140, 142.

(c) **N22 series** fitted with option G218 Floatplane fixed fittings, line sequence number 61.

(2) Spares

Not applicable

B. **Reason**

(1) There have been several incidents over the years involving damage to Nomad ailerons in flight. These culminated in limitations being placed on the aircraft in 1994 as per ANMD-57-11. Following extensive flight tests and analysis to investigate loads and dynamic behaviour of the ailerons, it was concluded that the incidents were most likely to have arisen as a result of:

(a) operation outside the approved limits,

(b) pre-existing damage,

(c) poor maintenance of the ailerons.

(2) Revision 5 of ANMD-57-11 restored the original flight manual limitations. Subsequent amendments to flight manuals and maintenance manuals were instigated to help prevent recurrences.

(3) A recent incident has indicated that the possibility of aileron flutter when the flaps are at 38 degrees cannot be totally discounted, despite compliance with Revision 5 of ANMD-57-11 and the associated new maintenance instructions.

(4) Although the occurrence of aileron flutter is evidently rare and possibly a result of several contributing factors, as a precautionary measure and until further notice, it is necessary to prohibit flight operations with flap extensions greater than 10 degrees for N24A and N22S and 20 degrees for N22B and N22C models.

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C. **Reason for Revision One**

(1) Customer Option G218 concerned the fixed fittings and certain other hardware items for aircraft likely to be converted to either the floatplane or amphibian configurations per Wipline STCs SA 363GL or SA 428GL. G218 included primary structure that was designed to be compliant with seaplane loads calculated in accordance with FAR23.527 and FAR23.529. Although FAR23.527 and FAR23.529 did not exist at the time of certification, they correspond to similar FAR25 rules that were used in the design of G218.

(2) The seaplane loads were calculated to stall speeds in the normal landing configuration, that is, with 38 degrees of flap. In addition, though the floatplane variants were based on the N22 airframe, stability concerns resulted in a certified takeoff flap setting of 10 degrees rather than the 20 degrees of the normal N22. Preliminary examination has shown that for a flap setting restricted to 10 degrees, the landing weight (on water) for the floatplane variants would need to be significantly reduced for loads calculated in a similar manner to be compliant. Reducing the landing flap setting to 10 degrees will affect other areas of the amphibian certification and the STC that will require consultation with local airworthiness authorities to determine the affect of this revision.

D. **Description**

(1) This service bulletin specifies interim operating limitations and provides performance information for landing with:

(a) 10 degrees flap for all models,

(b) 20 degrees flap for N22B and N22C model aircraft only as listed in para 1.A.(1)(a).

(c) Aircraft fitted with G218 are subject to further limitations dependent on the use of G218. Operators should contact their local airworthiness authority for details.

(2) Instructions for the resetting of the power lever activated microswitches for the landing gear UP warning horn are provided. This provides a landing gear UP warning if the torque pressure of either or both engines is reduced to 30 psi (nominal), or lower, and the landing gear is not down and locked.

(3) Part 1 – Determination of the LH and RH Engine Power Lever Trigger Settings.

(4) Part 2 – Adjustment of Engine Power Lever Actuated Landing Gear ‘UP’ Aural Warning Microswitches

(5) Part 3 – Ground Test of Aural Warning System

(6) Part 4 – Interim Flap Extension Limitations

(7) Part 5 – Flap Extension Placards

(8) Part 6 – Flaps Down Operations

E. **Compliance**

(1) The compliance requirements of this Service Bulletin are mandatory.

(2) The requirements of this Service Bulletin are to be carried out within 50 hours TIS or one month, whichever occurs sooner, after receipt of this Service Bulletin.

F. **Approval**

The requirement detailed herein has been approved by a person authorised under the Civil Aviation Regulation 35.

G. **Manpower**

10 manhours

H. **Materials - Price and Availability**

None

I. **Tooling - Price and Availability**

None

J. **Weight and Balance**

Not applicable

K. **References**

(1) Maintenance Manual Chapter 7-00-00.

(2) Maintenance Manual Chapter 27-50-00.

(3) Service Bulletin ANMD-57-11.

(4) Flight Manual.

L. **Publications Affected**

To the extent that the requirements of this Service Bulletin differ from the requirements of the Flight Manual and the Maintenance Manual, the requirements of this Service Bulletin shall prevail.

2. **ACCOMPLISHMENT INSTRUCTIONS**

A. **Part 1 - Determination of the LH and RH Engine Power Lever Trigger Settings**

(1) Mark LH power lever trigger position for reference during subsequent adjustment of the microswitches for the LH landing gear UP warning system.

During a ground run of the LH engine:

(a) Advance LH power lever until 35 psi torque pressure is achieved.

(b) Slowly retard power lever until a torque pressure within the range of 28.0 to 31.0 psi is obtained.

(c) Mark this power lever trigger position.

(2) Use the same technique to determine RH engine power lever trigger position. Mark this power lever trigger position for reference during subsequent adjustment of microswitches for the RH landing gear UP warning system.

(3) Shut down both engines before proceeding.

B. **Part 2 – Adjustment of Engine Power Lever Actuated Landing Gear 'UP' Aural Warning Microswitches (Ref Fig 1)**

NOTE

Instructions in this Service Bulletin should be used in place of those in Maintenance Manual Chapter 32-60-00, para 2.A.

(1) Gain access to power lever operated landing gear microswitches through:

(a) access panel in the bottom of the flight manual stowage compartment,

(b) the rear of Frame STA 132.

(2) Set RH power lever full forward and LH power lever full aft.

NOTE

Only one adjustment is provided and is common to a bank of microswitches. N22 series aircraft have three microswitches in the bank. N24 series aircraft have two microswitches in the bank. The position giving the required over-travel for all microswitches in the bank will need to be determined.

(3) Check that over-travel of AA and CC microswitches is between 0.020 in to 0.030 in. If necessary, adjust as follows:

(a) Loosen nuts on the microswitch mounting rods.

(b) Adjust microswitch position accordingly.

(c) Lock mounting rod nuts when over-travel adjustment is complete.

(4) Confirm that all microswitches, when operated, have between 0.020 in and 0.030 in over-travel remaining.

(5) Set both power levers to full forward.

(6) Connect continuity tester across terminals C and NO of top microswitch AA.

NOTE

The continuity tester connection is used for both cam setting procedures as the contact operations being set are wired in parallel. Set the power lever not being adjusted to the full forward position where the contacts are open-circuit.

(7) Retard LH power lever to marked position corresponding to a torque pressure of 28.0 to 31.0 psi.

(8) Adjust cam A by loosening two locking screws on the cam. If the continuity tester indicates continuity, rotate cam A until continuity is broken. Adjust cam A until continuity is just indicated and lock the cam adjusting screws.

(9) Reset the LH power lever to full forward.

(10) Retard the RH power lever to the marked position.

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(11) Adjust cam C by loosening two locking screws on the cam. If the continuity tester indicates continuity, rotate cam C until continuity is broken. Adjust cam C until continuity is just indicated and lock the cam adjusting screws.

(12) Reset the RH power lever to full forward.

(13) Disconnect the continuity tester.

(14) Re-confirm the over-travel setting of each of the microswitches.

NOTE

N22 series aircraft only

Check that over-travel adjustment of flap retraction microswitch BB, operated by LH engine power lever, remains within the limits 0.020 in to 0.030 in when operated. Also check that microswitch switch BB is activated at a torque pressure of 60 $\pm$5 psi (engine protractor angle 76° $\pm$2°). Lever operated flap microswitch DD for RH engine power is not affected by the adjustments.

(15) Refit access panel and return power levers to the Flight Idle position.

C. **Part 3 – Ground Test of Aural Warning System**

NOTE

Instructions in this Service Bulletin should be used in place of those in Maintenance Manual Chapter 32-60-00, para 2.I, steps (1) to (9).

(1) Jack up aircraft until wheels are clear of the ground (Ref MM Chap 7-00-00).

(2) Set AURAL WARNING circuit breaker on battery relay panel located in main gear LH pod.

(3) Connect external 27.5 V DC power supply to aircraft.

(4) Set landing gear circuit breakers (3 off) located on flight compartment overhead console. Select battery switch to ON.

(5) Position LH and RH engine power levers to Flight Idle.

(6) Set landing gear selection switch to UP. Confirm that the aural warning unit emits an interrupted warning sound when the landing gear DOWN indicator light extinguishes.

(7) Advance both power levers together until landing gear warning horn stops. Confirm that the warning horn stops when both power levers have been advanced to a point forward of their respective marked trigger points.

(8) Advance both power levers to the full forward position.

(9) With landing gear retracted, retard LH power lever until the landing gear warning horn sounds. Confirm that this position corresponds to required LH power lever trigger position.

(10) Further retard LH power lever and confirm that warning horn sounds for all power lever positions between the trigger setting and Flight Idle.

(11) Advance LH power lever and confirm that warning horn stops as the power lever passes the trigger position.

(12) Advance LH power lever to full forward position.

(13) With landing gear retracted, retard RH power lever until the landing gear warning horn sounds. Confirm that this position corresponds to the required RH power lever trigger position.

(14) Further retard RH power lever and confirm that warning horn sounds for all power lever positions between the trigger setting and Flight Idle.

(15) Advance RH power lever and confirm that warning horn stops as RH power lever passes the trigger position.

(16) Advance RH power lever to the full forward position.

(17) With the landing gear retracted, retard both power levers together until the warning horn sounds. Confirm that the warning horn sounds when the first power lever is retarded aft past its respective marked trigger point.

(18) Further retard the LH and RH power levers together and confirm that the warning horn continues to sound for all power lever positions between the most forward LH or RH trigger setting and Flight Idle.

(19) With the landing gear retracted, advance both power levers together until the landing gear warning horn stops. Confirm that the warning horn stops when both power levers have been advanced to a point forward of their respective marked trigger points.

(20) Advance both power levers to the full forward position.

CAUTION

ENSURE CABIN DOORS ARE CLOSED AND LATCHED TO PREVENT DAMAGE WHEN OPERATING THE FLAPS.

(21) Set FLAP ACT and FLAP CONT circuit breakers on flight compartment overhead console.

(22) Operate flap control switch, extending flaps to 38°, check that as flaps pass the 25° (Post Mod N46) or 23° (Pre-Mod N46) extended position, the warning horn sounds and continues in all extended flap settings past these positions.

(23) Retract the flaps to the UP position and confirm that the warning horn stops when the flaps pass through the 25° or 23° position.

NOTE

For N24 series aircraft, carry out steps (24) to (28)

(24) Trip FLAP ACT and FLAP CONT circuit breakers.

(25) Return engine power levers to Flight Idle and check that the warning horn sounds.

(26) Set landing gear selector switch to DOWN, and confirm that warning horn stops when the landing gear DOWN indicator light comes on.

(27) Lower aircraft to the ground and move jacking equipment clear of the aircraft (Ref MM Chap 7-00-00).

(28) Disconnect external 27.5 V DC power supply from aircraft.

NOTE

For N22 series aircraft, carry out steps (29) to (34)

(29) Return engine power levers to Flight Idle and check that warning horn sounds.

(30) Set landing gear selector switch to DOWN, and confirm that warning horn stops when the landing gear DOWN indicator light comes on.

(31) Test engine power lever operated flap retraction microswitches in accordance with Maintenance Manual Chapter 27-50-00 for all N22 series aircraft.

(32) Trip FLAP ACT and FLAP CONT circuit breakers.

(33) Lower aircraft to the ground and move jacking equipment clear of the aircraft (Ref MM Chap 7-00-00).

(34) Disconnect external 27.5 V DC power supply from aircraft.

D. **Part 4 - Interim Flap Extension Limitations**

The maximum flap extension is limited as follows:

(1) N24A and N22S model aircraft: 10 degrees.

(2) N22B and N22C model aircraft: 20 degrees.

The Flight Manual airspeed limitations at these flap settings apply.

E. **Part 5 - Flap Extension Placards**

(1) Replace N22B and N22C placards introduced by Service Bulletin ANMD-57-11, Revision 5, with new placard (Ref Fig 2 N22B and N22C).

(2) Manufacture new placards as follows and locate on instrument panel where clearly visible to pilot:

(a) Figure 3 N24A Flap Extension limitation Placard.

(b) Figure 4 N22B and N22C Flap Extension Limitation Placard.

(c) Figure 5 N22S Flap Extension Limitation Placard.

F. **Part 6 - Flaps Down Operations**

(1) Perform landings as follows:

(a) N24A and N22S model aircraft: 10 degrees flap.

(b) N22B and N22C model aircraft: 10 or 20 degrees flap.

(2) Performance information is as follows, and is to be used in operations:

(a) Figure 6 N22B, N22C and N22S Landing Distance Chart 10 degrees flap.

(b) Figure 7 N22B and N22C Landing Distance Chart 20 degrees flap.

(c) Figure 8 N24A Landing Distance Chart 10 degrees flap.

G. **MATERIALS INFORMATION**

None

H. **SPECIAL TOOLS AND EQUIPMENT**

None

I. **RECORDING ACTION**

Record compliance with this Service Bulletin in the Airframe Log Book.

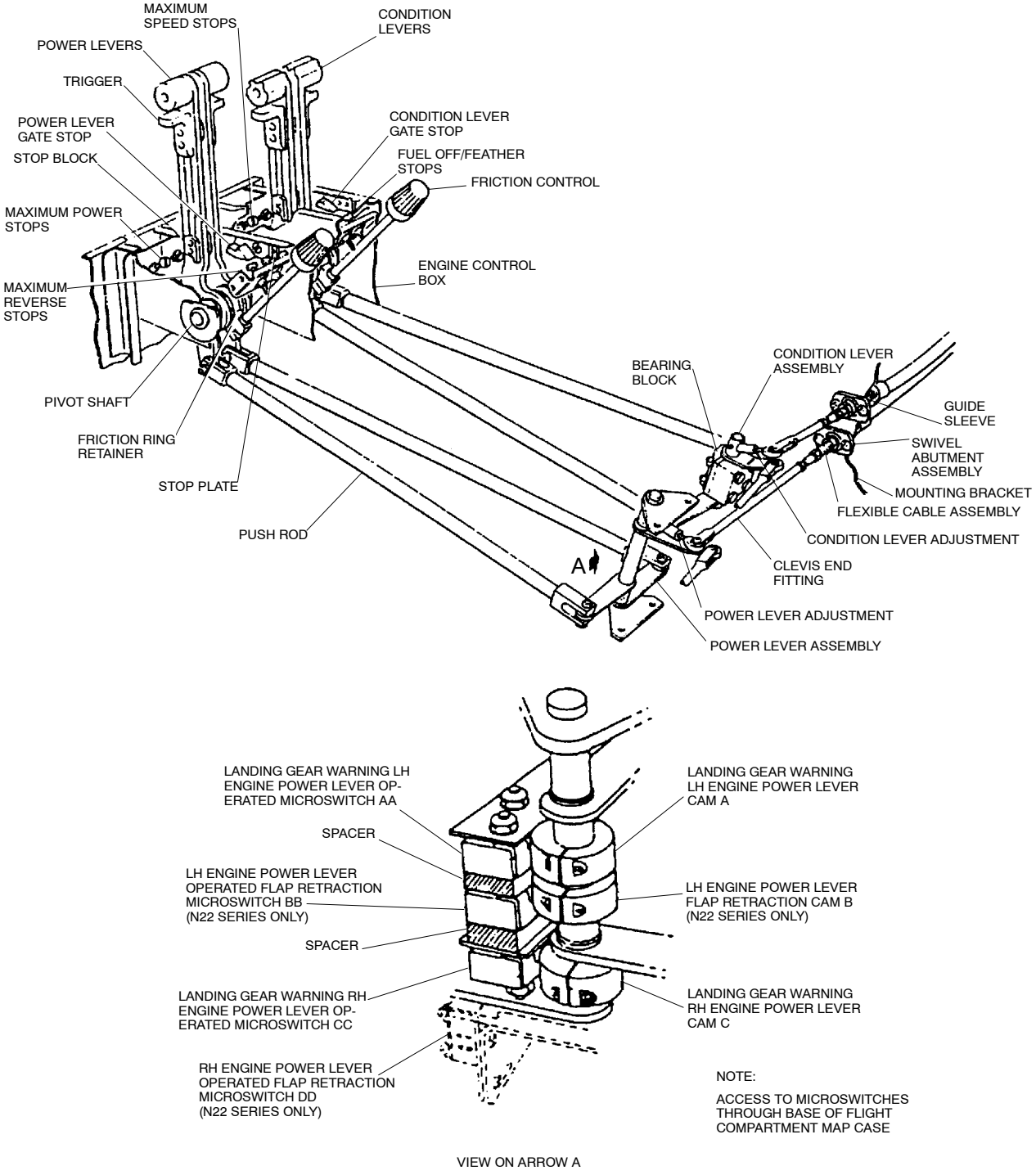

Figure 1 Engine Power lever Aural Warning Microswitches

Figure 2 N22B and N22C

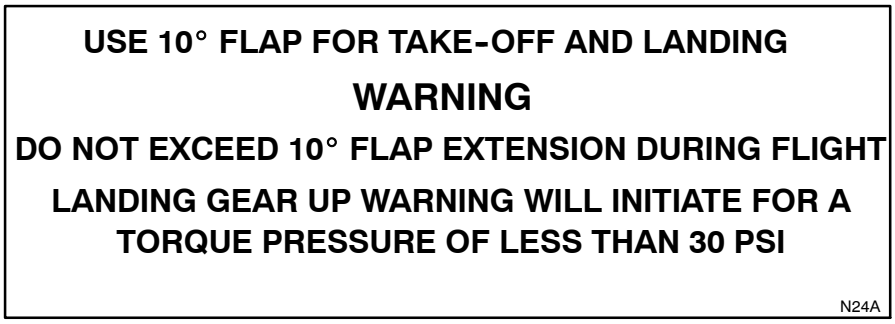

Figure 3 N24A Flap Extension Limitation Placard

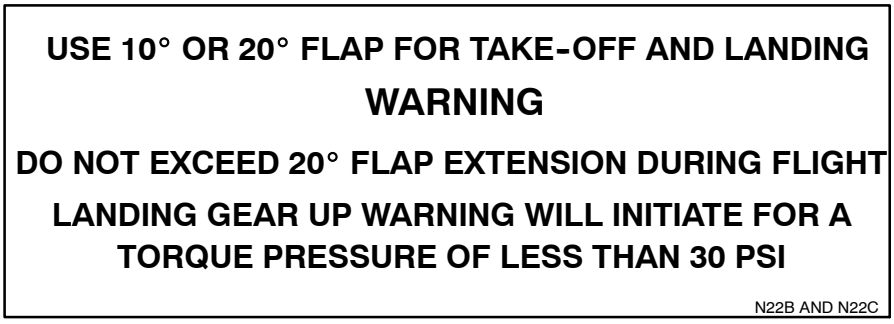

Figure 4 N22B and N22C Flap Extension Limitation Placard

USE 10° FLAP FOR TAKE-OFF AND LANDING

WARNING

DO NOT EXCEED 10° FLAP EXTENSION DURING FLIGHT

LANDING GEAR UP WARNING WILL INITIATE FOR A TORQUE PRESSURE OF LESS THAN 30 PSI

N22S

Figure 5 N22S Flap Extension Limitation Placard