



**NTSB** National Transportation Safety Board

---

*Office of Aviation Safety*

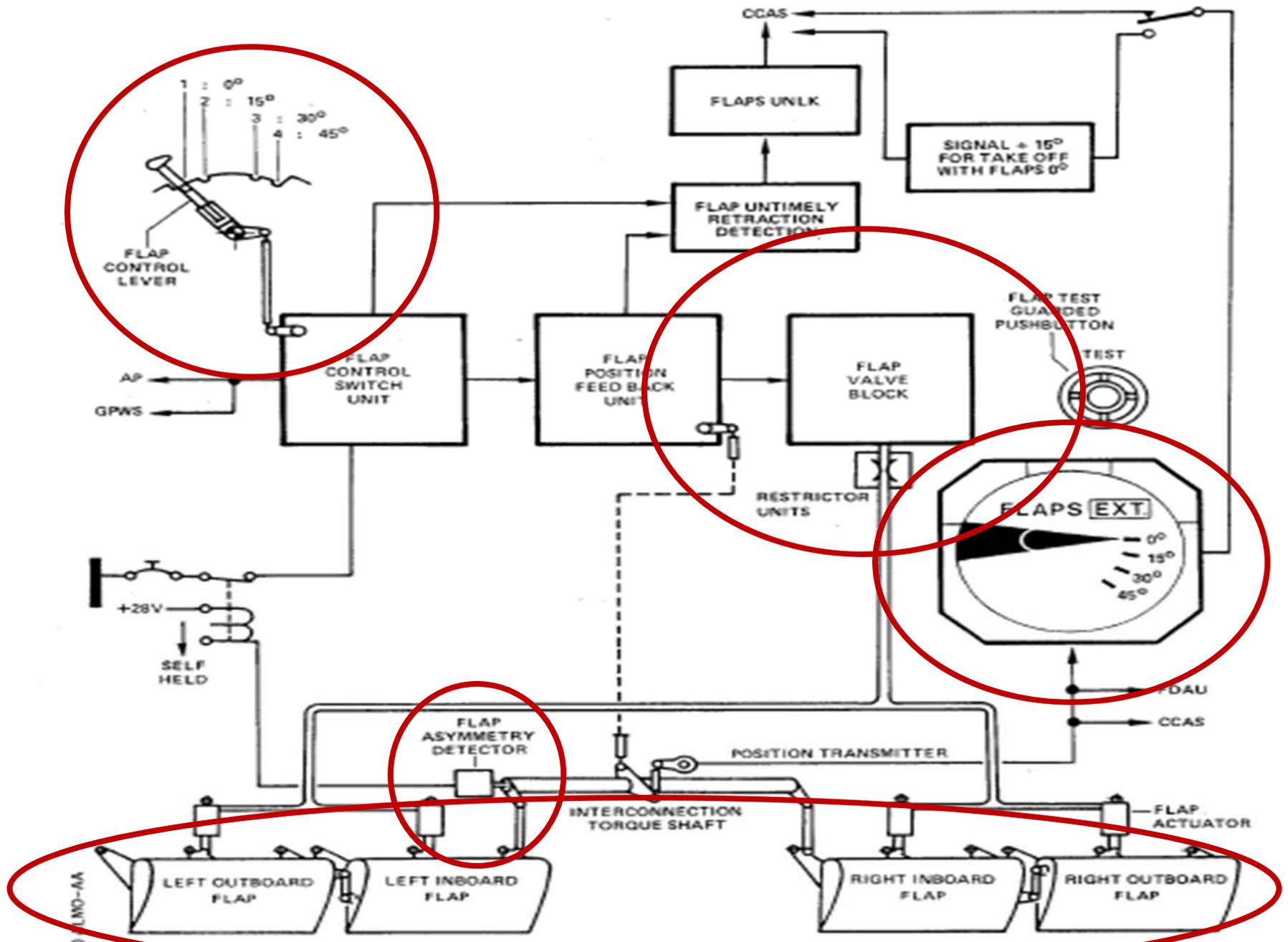


# Flap System and Asymmetry

Kristi Dunks

# Flap System

- Four trailing-edge flaps
- Electric hydraulic system
- Three normal positions
  - 0°(cruise)
  - 15° (takeoff/approach)
  - 30° (landing)



MS 27 50 00 0 LNO-AA

# Flap Asymmetry

- Detector interrupts system when difference between left and right flaps is  $8^{\circ}$  to  $10^{\circ}$
- Once asymmetry detected, moving flap control lever has no effect
- System must be reset on ground
- During approach, left flaps extended  $8^{\circ}$  to  $10^{\circ}$ , right flaps  $0^{\circ}$

# Hydraulic Balancing

- If blockage removed, flap system balances
- About 25 seconds before impact, flaps became symmetrical
- Left flaps retracted to about  $4.5^\circ$ , right flaps extended to about  $4.5^\circ$

# Flap Asymmetry Evaluation

- ATR service history
  - 1 previous flap asymmetry on different ATR 42, landing uneventful, reason undetermined
- Potential reasons
  - Contaminated hydraulic fluid
  - Restricted movement of flaps
  - Actuator jamming

# Flap Asymmetry Evaluation



# Flap Asymmetry Evaluation

- Meteorological information
  - Weather reports and flight crew interviews indicate operation in freezing precipitation
  - Ice found on right aileron



**NTSB**