Attachment 8

To Operations Group Factual Report

DCA13FA094

Piedmont Training Slides on Gear Up Landings

Other Landing Gear Failures

Intro

Nose Up, Mains Down

All Gear Up

One Main Unsafe

Structural failure of the landing gear is not covered under Type Certification, therefore, no specific Airplane Flight Manual procedure covering this malfunction is provided or required.

The intent of the following is to provide a list of considerations that may assist the flight crew in the decision making process.

The information presented will not always be appropriate for the conditions being experienced by the flight crew.

Ultimately, the flight crew will have to make the final decisions given the information presented to them in the particular emergency situation.

Nose Gear Up (or questionable), Mains Down

If, after the Alternate Landing Gear Extension procedure has been completed, it cannot be verified that the nose gear is down & locked by normal means, the flight crew must make a decision to perform a landing with nose gear unsafe or an all gear up landing.

Nose Gear Up (or questionable), Mains Down

It is possible to safely land the Dash with the nose gear retracted. The geometry of the airplane is such that the props will not come in contact with the ground with both the main gear extended & the nose gear retracted.

In addition to the direction of AFM paragraph 3.16, Emergency Landing Checklist, the following additional items are offered for consideration.

Nose Gear Up (or questionable), Mains Down

- Reduce the landing weight through fuel burn
- Attempt to achieve an aft CG by moving pax
- Select a runway with minimal crosswind
- Land with flaps 35°
- Fly the appropriate Vref for the landing weight
- Touchdown off center if there is centerline lighting
- Hold the nose off the runway as long as possible
- Prior to losing elevator effectiveness, lower the nose gently
- If the nose gear is not extended or collapses, maintain directional control w/ the rudder until ineffective, then use asymmetric braking
- Brake or reverse thrust only after the nose gear is on the ground & appears to be locked
- If the nose gear is not extended or collapses, apply brakes only

All Gear Up

If, the Alternate Landing Gear Extension procedure has been completed, and it cannot be verified that both main gear are down & locked by normal means, the flight crew must make a decision to perform a landing with one main gear unsafe or, if the gear can be retracted, an all gear up landing.

All Gear Up

It is possible to safely land the Dash with all the gear retracted. The geometry of the airplane is such that the props should not come in contact with the ground with all the gear retracted, *IF IT IS POSSIBLE TO MAINTAIN THE WINGS LEVEL THROUGHOUT THE LANDING*. In addition to the direction of AFM paragraph 3.16, Emergency Landing Checklist, the following additional items are offered for consideration.

All Gear Up

- Reduce the landing weight through fuel burn
- Passengers must be moved from seats in the rotational plane of the props & seated elsewhere
- Select a runway with minimal crosswind
- Land with flaps 35°
- Fly the appropriate Vref for the landing weight
- Touchdown off center if there is centerline lighting
- Maintain a nose up pitch not exceeding 5° prior to runway contact
- On touchdown, maintain wings level using lateral control & directional control with rudder
- Feather & secure engines

One Main Unsafe

One Main Unsafe

If the Alternate Landing Gear Extension procedure has been completed, and it cannot be verified that both main gear are down & locked by normal means, and the landing gear cannot be retracted, the flight crew must perform a landing with one main landing gear unsafe. The flight crew must assume and prepare for the gear to collapse on landing. In addition to the direction of AFM paragraph 3.16, Emergency Landing Checklist, the following additional items are offered for consideration.

One Main Unsafe

1. Reduce the landing weight through fuel burn
2. Passengers must be moved from seats in the rotational plane of the props and seated elsewhere
3. Priority is to be given to the pax seated on the side w/the indicated unsafe main gear
4. Crosswind (if any) would be advantageous from the side w/the unaffected main gear
5. Land with flaps 35°
6. Fly the appropriate Vref for the landing weight
7. Giving due regard to the specific approach to be followed, flight conditions, and possible MAP; prior to commencing the final approach, feather and secure the engine on the side with the affected main gear.
8. On touchdown, maintain maximum wing down lateral control on the side w/the unaffected main gear. If the unsafe main gear collapses, to reduce turning toward the failed main gear, apply max. braking & rev. thrust on the side w/the unaffected main gear.
9. Feather & secure the operative engine
10. Be prepared to action an Engine Fire on Ground procedure