

**Issue Title:** 737NG PSU Mask Panel Drop

**Current Owner:** David P Fritsch (943157)

**Company:** DELTA AIR LINES

**Issue Number:** ISE-25-19-28529

**Effectivity, Variable, Line or Serial #:**

**Engine:**

**Affected Operators:** DELTA AIR LINES

**Operators Not Experiencing Issue:** KLM ROYAL DUTCH AIRLINES

**Non-Applicable Operators:**

**Affected Model**

- 737-600/700/800/900/BBJ

**ATA**

- 2500-00 Equipment/Furnishing

**Issue Category:** Economic

**Process Step:** Discussion

**Child Issues:**

**Parent Issues:**

**On Behalf of Airline:**

**Consolidated with Issues:**

**Description:**

Description:

DAL has been experiencing involuntary openings of the PSU O2 mask doors on our 737 fleet, the majority of which have occurred between rows 20 and 30. DAL asks if any other 737 operators have experienced involuntary PSU door openings, and whether any mitigating action has been found to be successful.

PSU P/N 417N3011-( )

**References:**

| Type | Number | Revision Date | Title | Rev |
|------|--------|---------------|-------|-----|
|      |        |               |       |     |

**Attachments:**

**Timeline:**

| Milestone | Abbreviation | Visibility | Date | Owner | Leader |
|-----------|--------------|------------|------|-------|--------|
|           |              |            |      |       |        |

**Operator Burden:**

| Company                  | Initiator       | TI  | DR  | AU  | AC  | AM  |
|--------------------------|-----------------|-----|-----|-----|-----|-----|
| KLM ROYAL DUTCH AIRLINES | Roland Brandt   | N/A | N/A | N/A | N/A | N/A |
| DELTA AIR LINES          | David P Fritsch | 3   | 2   | 2   | 3   | 1   |

**Replies:**

**Reply Title:** 737NG PSU Mask Panel Drop - response by Vipul Misra On Sep 9, 2019 at 10:44 AM

**Description:**

Yes, we did specially the ones on which we had done high altitude mod(22 min o2 gen installation) or cabin rerconfig, meaning the PSU installation was disturbed.

We checked four faulty locks and thought there was only one finding, a thorough recheck and reaigning of latched, sorted ther issue.

**Reply Title:** 737NG PSU Drop Test - response by Andrew Sawyer On Jun 14, 2021 at 6:26 AM

**Description:**

DAL has found the PSU door actuators (P/N 78580-1) to be a primary factor in unintended PSU door openings. Within each actuator, a spring-loaded plunger is retained by a solenoid pin. When the solenoid is energized, the pin is pulled away from the plunger, which allows the spring to extend the plunger and thus operate the PSU door latch. Because the force of the solenoid is proportional to the voltage applied, wear between the pin and plunger surface is indicated by actuation at reduced voltages.

Analysis of multiple PSU door actuators has found that those involved in unintended PSU door openings required less voltage to actuate. While the circuit is provided with 28VDC during normal operation, incident related units were found to actuate with as little as 10.4VDC applied.

With the goal of mitigating unintended PSU door openings and improving troubleshooting techniques, DAL Engineering has developed new test equipment and a procedure which detects worn actuators on wing. The equipment is connected to the circuit which energizes either Left or Right sides of the cabin, which allows all of the PSU door actuators on either side to be tested at the same time. After worn actuators are identified, they are replaced in accordance with AMM 35-22-21.

**Reply Title:** 737NG PSU Mask Panel Drop - response by Zhao Bin 29 days ago at 12:54 AM

**Description:**

according to the analysis, DAL consider the Mask door open is caused by actuator actuate with less voltage,so under normal condition, where does the actuate voltage come from?  
 Afer the new test equipment is used,does DAL receive the reports of PSU Mask Panel Drop?

**Reply Title:** Response to Zhao Bin - response by Andrew Sawyer 9 days ago at 11:24 AM

**Description:**

DAL believes the uncommanded actuation is caused by vibration, and found through testing that incident related actuators tend to release at much lower voltages than new units. This supports the theory that plunger retention force within the actuator can degrade over time. Given that the release pin, which interfaces a machined edge on the spring loaded plunger, is controlled by an electrical solenoid - the so-called "retention force" is proportional to the voltage required to overcome it. Thus those actuators which release at lower voltages are also easier to trigger with vibration - or while handling with a quick tap on a hard surface.

**Reply Title:** one year update - response by Andrew Sawyer 9 days ago at 11:10 AM

**Description:**

Our PSU actuator health check went live on 05/06/2022, and we are currently accomplishing every 4500 cycles. No revisions to the procedure have been made since it was published, and thus far it's been performed on 40 aircraft. In the three year period prior to this change DAL experienced 282 occurrences of unintended PSU door openings, and in the last year we have not had a single event.

It's worth noting that many of the prior events were attributed to repeat offenders, with 41.5% of all faults caused by only 15 actuators, and we replaced those actuators first - independently of the health check. We have not yet expanded the test to other fleets.

Just to clarify, we only replace the P/N 78580-1 actuator (AMM 35-22-21) and not the entire PSU. Actuators do not come with connector or pins attached, so we also updated our AIPC accordingly. Connector P/N 103653-1, Pin P/N 5-104505-5, crimping tool P/N 91500-1. Removed actuators are discarded, with the exception of the 15 repeat offenders we used in developing the test.

**Minutes:**

| Details | Company | Date | Revision Date | Initiator |
|---------|---------|------|---------------|-----------|
|         |         |      |               |           |

**Actions:**

| Title | Visibility | Res Grp | ATA | Leader | Owner | Start DT | End DT |
|-------|------------|---------|-----|--------|-------|----------|--------|
|       |            |         |     |        |       |          |        |

**Meetings:**

| Subject | Date | Location | Organizer | SubModels |
|---------|------|----------|-----------|-----------|
|         |      |          |           |           |

## Revision History:

| Date         | Activity Type           | Description               | Modified By     | Company                  |
|--------------|-------------------------|---------------------------|-----------------|--------------------------|
| Apr 11, 2023 | Created a Reply         | 737NG PSU Mask Panel Drop | Zhao Bin        | HAINAN AIRLINES HOLDING  |
| Jun 14, 2021 | Edited a Reply          | 737NG PSU Drop Test       | Andrew Sawyer   | DELTA AIR LINES          |
| Jun 14, 2021 | Edited a Reply          | 737NG PSU Drop Test       | Andrew Sawyer   | DELTA AIR LINES          |
| Jun 14, 2021 | Created a Reply         | 737NG PSU Drop Test       | Andrew Sawyer   | DELTA AIR LINES          |
| Jun 14, 2021 | Created a Reply         | 737NG PSU Drop Test       | Andrew Sawyer   | DELTA AIR LINES          |
| Sep 16, 2019 | Created Operator Burden |                           | Roland Brandt   | KLM ROYAL DUTCH AIRLINES |
| Sep 10, 2019 | Created a Reply         | 737NG PSU Mask Panel Drop | Vipul Misra     | SPICEJET                 |
| Sep 09, 2019 | Published an Issue      | 737NG PSU Mask Panel Drop | David P Fritsch | DELTA AIR LINES          |
| Sep 09, 2019 | Created Operator Burden |                           | David P Fritsch | DELTA AIR LINES          |
| Sep 09, 2019 | Created the Issue       | 737NG PSU Mask Panel Drop | David P Fritsch | DELTA AIR LINES          |