737MAX-SRP-21-0296

737 MAX – ATA 21 Erroneous Electrical Ground Signal Resulting in Hot Cabin and Flight Deck

Presenter: Kevin West
ECS Service Engineer

Out of Sequence Call
January 27, 2026

737 MAX – ATA 21

Erroneous Electrical Ground Signal Resulting in Hot Cabin and Flight Deck

Affected Models:
All 737 MAX
(737NG not affected)
SRP: 737MAX-21-0296
FTD: 737MAX-FTD-21-26001
OMB: TBD
SB: TBD

Ram Air Inlet Deflector Door Deployed

Overview:

- Two in-service events where BAT BUS SECT 2 Circuit Breaker (C/B) C3062 on Standby Power Control Unit (SPCU) tripped resulted in loss of downstream power (per design)
- Air Conditioning system effects also occurred resulting in excessive cabin and flight deck temperatures
    - The flight crew was unable to mitigate the hot temperatures per the current Non-Normal Checklists (NNC)
- In both events, the flight crew reset the circuit breaker, which restored systems, and landed safely

Boeing Safety Review Board (SRB) Process

- Determined the excessive flight deck and cabin temperature effects to be Airplane Safety – Safety SRP initiated
- Root cause has been identified
- Interim mitigation and final solution have been identified and are currently in work

The 737NG fleet is NOT affected

- Validated by analysis and airplane testing

737 MAX – ATA 21
Erroneous Electrical Ground Signal Resulting in Hot Cabin and Flight Deck

Flight Deck and Air Conditioning Effects – Covered by Existing Non-Normal Checklists

- When C/B C3062 trips, the flight crew will get a Master Caution annunciation with the following amber lights on the P5 overhead:
    - STANDBY PWR OFF
    - Right REVERSER LIMITED
    - Left and Right PACK
    - Flight Deck, Forward Cabin, and Aft Cabin ZONE TEMP
    - Autopilot B disengage (if active), Autopilot A not affected
- Cabin Pressure Manual Mode control loses power, but both AUTO and ALTN channels continue to operate
- Loss of Left and Right PACK Overheat Protection and P5 PACK Switch Functionality
- *A more comprehensive list of flight deck and system effects will be included in a Flight Crew Operations Manual Bulletin (OMB)*

Air Conditioning Effects – Not Covered by Existing Non-Normal Checklists

- During the power loss condition, both Left and Right Smart Ram Air Door Actuators (SRADA) move to the on-ground mode configuration due to an erroneous electrical ground signal on the SRADA.
- In this ground mode configuration, the following occur in air:
    - Both ram air deflector doors deploy which reduces ambient cooling air flow into the pack ram air inlets
    - This restricts the heat exchangers from adequately cooling the bleed air supply
    - The air conditioning packs will supply excessively hot air to both the flight deck and passenger cabin

737 MAX – ATA 21
Erroneous Electrical Ground Signal Resulting in Hot Cabin and Flight Deck

Current Status:

- Partnered with an Operator to perform testing on 737NG eFlow and non-eFlow aircraft to determine if susceptible to the same Safety of Flight condition from a tripped C/B C3062
    - Testing has been completed and 737NG is not affected
    - Air Conditioning Accessory Unit (ACAU) electrical architecture change unique to 737 MAX

- **Interim Mitigation Identified:** Flight Crew OMB and revised STANDBY POWER OFF NNC to mitigate risk of excessive flight deck/cabin temperatures
    - Descend to lowest safe altitude or 10,000ft, and plan to land at nearest suitable airport
    - One-time reset of C/B C3062 is permitted
    - If C/B C3062 trips again:
        - Select engine bleed switches OFF,
        - After level off, Set Digital Selector Panel Landing Altitude to 1,000 ft above aircraft altitude which drives Outflow Valve to full open position and configures aircraft into alternate ventilation configuration to maintain acceptable flight deck and cabin temperatures, and CO_2 levels
    - *A more comprehensive list of flight crew actions will be included in the revised STANDBY POWER OFF NNC*

- **Final Solution Identified:** wiring change (production and retrofit) to isolate SRADAs and ACAUs to prevent erroneous ground signal during C/B C3062 tripped condition
    - Change has been tested and verified to correct SRADA behavior

737 MAX – ATA 21

Erroneous Electrical Ground Signal Resulting in Hot Cabin and Flight Deck

Sequence of Events: Currently

SPCU C/B C3062 trips

Effects covered by existing Non-Normal Checklists

Master Caution Annunciation, and immediate flight deck effects:

- STANDBY PWR OFF
- Right REVERSER LIMITED
- Left and Right PACK
- Flight Deck, Forward Cabin, and Aft Cabin ZONE TEMP
- Autopilot B disengage

1. Root Cause
   Circuit electrical ground to SRADA occurs
   (immediate effect)

   \+

   Relevant System effect:
   Loss of pack overheat protection & P5 Switch Control
   (immediate effect)

2. SRADAs deploy deflector doors which degrade ram air cooling (~10 sec)

3. Zone temps begin to increase due to hot supply air from air conditioning packs
   (1.5°F per minute/ 0.83°C per minute)

4. Flight crew and cabin crew will notice increasing temperatures, and temperatures continue to increase until crew action is taken

737 MAX – ATA 21
Erroneous Electrical Ground Signal Resulting in Hot Cabin and Flight Deck

Sequence of Events: Interim Mitigation

SPCU C/B C3062 trips

Effects covered by existing Non-Normal Checklists

Master Caution Annunciation, and immediate flight deck effects:
- STANDBY PWR OFF
- Right REVERSER LIMITED
- Left and Right PACK
- Flight Deck, Forward Cabin, and Aft Cabin ZONE TEMP
- Autopilot B disengage

1. Root Cause
   Circuit electrical ground to SRADA occurs
   (immediate effect)

   \+

   Relevant System effect:
   Loss of pack overheat protection & P5 Switch Control
   (immediate effect)

2. SRADAs deploy deflector doors which degrade ram air cooling (~10 sec)

3. Zone temps begin to increase due to hot supply air from air conditioning packs
   (1.5°F per minute/ 0.83°C per minute)

4. Flight crew and cabin crew will notice increasing temperatures, and temperatures continue to increase until crew action is taken

Interim Mitigation:

Detailed via OMB + Revised STANDBY POWER OFF NNC

- **Plan to land at nearest suitable airport**
- **Descend to lowest safe altitude or 10,000ft, whichever is higher**
- **Guidance provided for successful circuit breaker reset, and unsuccessful reset scenarios**

737 MAX – ATA 21

Erroneous Electrical Ground Signal Resulting in Hot Cabin and Flight Deck

Sequence of Events: Final Solution

SPCU C/B C3062 trips

Effects covered by existing Non-Normal Checklists

Master Caution Annunciation, and immediate flight deck effects:

- STANDBY PWR OFF
- Right REVERSER LIMITED
- Left and Right PACK
- Flight Deck, Forward Cabin, and Aft Cabin ZONE TEMP
- Autopilot B disengage

Relevant System effect:
Loss of pack overheat protection & P5 Switch Control
(immediate effect)

Root Cause
Circuit electrical ground to SRADA occurs
(immediate effect)

SRADAs deploy deflector doors which degrade ram air cooling (~10 sec)

Zone temps begin to increase due to hot supply air from air conditioning packs
(1.5°F per minute/ 0.83°C per minute)

Flight crew and cabin crew will notice increasing temperatures, and temperatures continue to increase until crew action is taken

Final Solution

- **Root Cause eliminated by wiring change**

737 MAX – ATA 21
Erroneous Electrical Ground Signal Resulting in Hot Cabin and Flight Deck

The 737NG fleet is not affected

- Validated by analysis and airplane testing

Key Milestones:

- Event #1: 21-Jun-2025
- Event #2: 4-Nov-2025
- Boeing Production 737 MAX Aircraft Testing: Dec-2025 (complete)
- Boeing Safety Determination: 7-Jan-2026 (complete)
- 737NG Aircraft Testing: 17-Jan-2026 (complete)

Next Steps:

- Fleet Team Digest (FTD) Article Release: 29-Jan-2026 (target)
- Flight Operations Manual Bulletin and Non-Normal Checklist Release: 30-Jan-2026 (target)
- Final Solution (Production and Retrofit SB) Release: TBD
- Continue fleet communication
    - Fleet Team Digest Article Updates
    - Fleet Team Calls / Out of Sequence Calls

Questions?