SERIOUS INCIDENT

Aircraft Type and Registration:	Boeing 757-3CQ, G-JMAB
No & Type of Engines:	2 Rolls-Royce RB211-535E4-B-37 turbofan engines
Year of Manufacture:	2001 (Serial no: 32242)
Date & Time (UTC):	31 October 2014 at 1130 hrs
Location:	During takeoff from London Gatwick
Type of Flight:	Commercial Air Transport (Passenger)
Persons on Board:	Crew - 10 Passengers - 239
Injuries:	Crew - None Passengers - None
Nature of Damage:	Slide carrier, pivot forging and actuator deformed, slide loss and fuselage scuff marks
Commander's Licence:	Airline transport pilot's licence
Commander's Age:	50 years
Commander's Flying Experience:	15,300 hours (of which 8,765 were on type) Last 90 days - 196 hours Last 28 days - 57 hours
Information Source:	AAIB Field Investigation

Synopsis

A 'wing slide' advisory message activated on the Engine Indication and Crew Alerting System (EICAS) during takeoff. The crew entered a hold to burn off fuel until the aircraft was at an appropriate landing weight and returned to Gatwick. Whilst positioning for final approach, the right over-wing slide unravelled from the slide carrier and subsequently detached from the aircraft. Although the crew experienced some uncommanded roll on final approach, the aircraft landed safely. The investigation determined that a series of technical issues with the slide panel and carrier locking devices caused the slide carrier to deploy and the slide to unravel. A Service Bulletin was already in existence to address some of these issues, but it had not been actioned on this aircraft at the time of the incident. During the course of the investigation, issues were identified on aircraft door designations and the Quick Reference Handbook. Two Safety Recommendations are made.

History of the flight

The aircraft was on a scheduled flight from London Gatwick Airport to Hurghada Airport, Egypt. During the takeoff run, at a reported 70 kt, the R WING SLIDE advisory message appeared on the Engine Indication and Crew Alerting System (EICAS). The commander advised the co-pilot, who was pilot flying (PF), to continue the takeoff. The crew reported that the aircraft handled normally during the takeoff and there were no other abnormal indications or symptoms. The crew decided they would continue with the departure

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and assess the situation when the aircraft was safely established in the climb. After the immediate departure procedures, they alerted the cabin manager and asked her if anyone had heard or seen anything unusual in the cabin. They also completed the Quick Reference Handbook (QRH) procedure which, with the continued absence of any other indications, showed that no further action was required. The crew diagnosed that the warning was probably spurious and continued the climb. Subsequently, they contacted company operations to alert them to the problem and this consultation resulted in the crew deciding to return to Gatwick Airport.

At this stage, the aircraft was approximately nine tonnes above the normal landing weight and, sharing the crews' suspicion that the warning was probably spurious, the operator's operations department advised the crew to hold and burn off fuel rather than carry out an overweight landing. London ATC vectored the crew to an extended holding pattern where the crew used a combination of landing gear, flap and speedbrake to achieve a high drag and fuel-burn rate configuration. The crew did not declare an emergency.

After approximately 40 minutes of holding, ATC vectored the aircraft to a normal approach onto Runway 26L at Gatwick. The aircraft was on base leg, descending to 3,000 ft at a speed of 188 kt with flaps 20 selected, when some of the cabin crew and passengers heard a number of bangs or felt a brief period of airframe "shuddering". Two passengers reported seeing a white object detach from the aircraft on the right side. The cabin manager passed this information to the flight crew.

The crew established the aircraft on final approach and selected flaps 30. Shortly afterwards the commander noticed that the control yoke was offset to the left and commented that the autopilot seemed to be "struggling" to maintain wings level. He disconnected the autopilot and took manual control of the aircraft. He reported that a "significant amount of left aileron" was required to maintain the centreline, although the aircraft remained fully controllable.

The commander landed the aircraft and taxied onto the parallel taxiway where the aircraft was shut down. Subsequently, following inspection by the fire and rescue service and engineers, it was discovered that the right over-wing slide had detached from the aircraft. The aircraft was then towed to a stand where the passengers were able to disembark normally. The total flight time was 2 hours 6 minutes.

Aircraft over-wing escape system description (Figure 1)

The Boeing 757-300 is fitted with an over-wing emergency escape and evacuation system which consists of two hatches fitted side by side above the wing and an automatic slide deployment system. The system is duplicated on the left and right sides of the aircraft. When either of the wing escape hatches are manually opened and lifted clear, by the crew or passengers during an emergency, the over-wing slide automatically deploys and inflates over the inboard flap trailing edge. The slide activation system consists of a stored energy gas bottle and valve, a slide pack mounted on a carrier, various mechanical locking devices and a pneumatic actuator. The actuator is situated behind a small maintenance access panel in the fuselage just above the flap trailing edge. The action of opening either of the two wing escape hatches initiates an electrical input to a discharge valve assembly squib

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which releases gas pressure. The gas charge is held in the bottle situated behind the forward bulkhead of the cargo bay. The gas pressure energises a pneumatic slide panel release and slide deployment actuator which unlocks and rotates the slide carrier out of its stowage to its slide inflation position. The last few degrees of movement causes the slide container bag unlacing pin to withdraw and as the slide carrier abuts a fixed stop the remainder of the gas pressure inflates the slide ready for use.

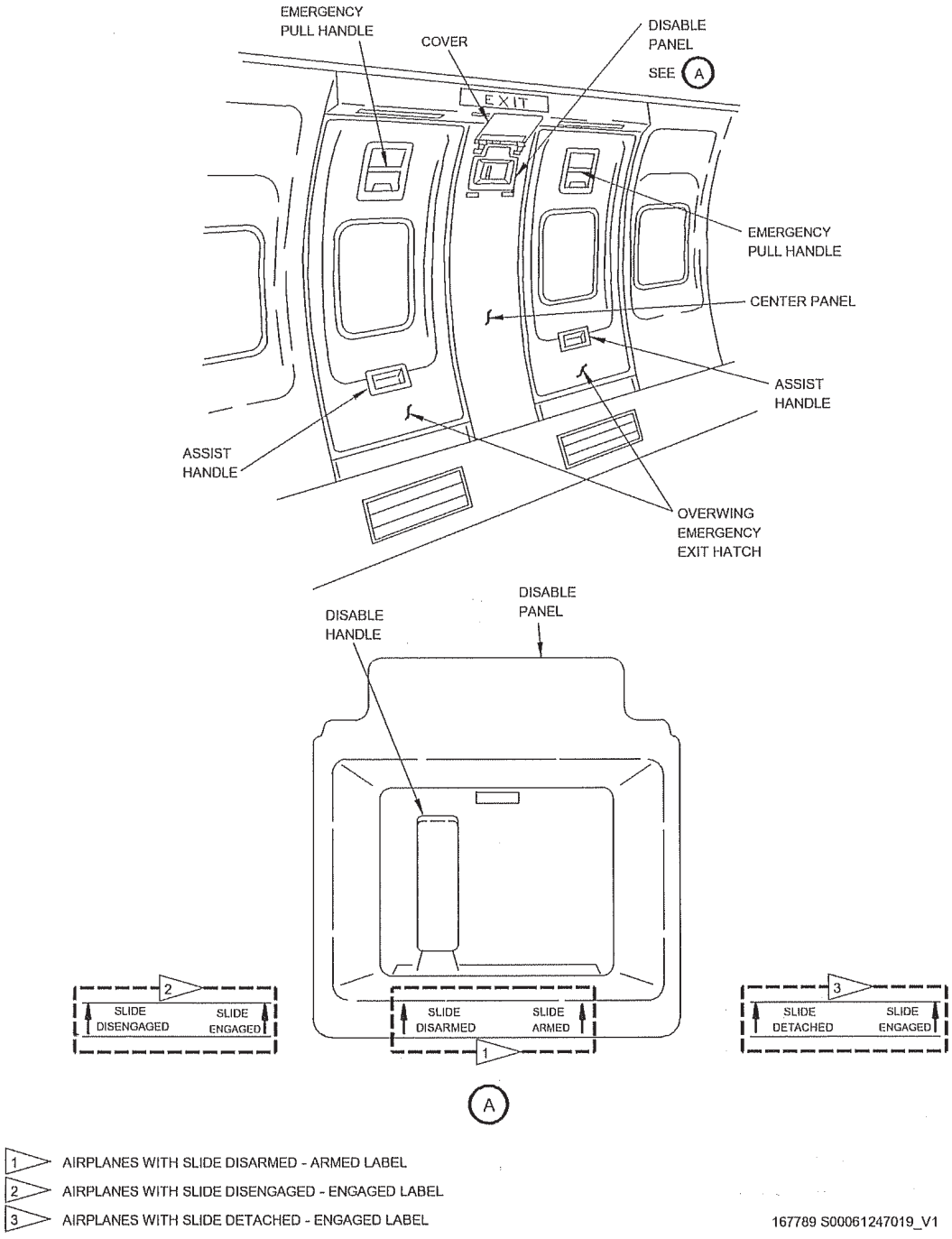

Figure 1

Over-wing escape hatches general arrangement within the cabin
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Figure 1 shows the general arrangement of the over-wing escape hatches. For safety the system is fitted with a several interlocks to prevent unwanted slide deployment during maintenance. The electrical input to the squib is isolated by a SLIDE ENGAGED and SLIDE DISENGAGED lever situated between the two escape hatches behind a plastic trim cover on the cabin sidewall.

The actuator (Figure 2) is fitted with a vent lever, coloured red, which when rotated outwards to the 'manual' position allows the actuator piston to be moved manually and prevents gas pressure acting on the actuator. When the vent lever is in the manual position its handle protrudes outside the fuselage and its access panel cannot be closed.

In addition to the vent lever there is also a yellow crank handle fitted alongside the actuator. It is normally in the down, just below horizontal, position. When it is moved upwards, to approximately 30º above the horizontal, it releases the slide door, by retracting the door latch tube, and withdraws the slide carrier restraint device. Its purpose is to replicate the unlocking actions of the actuator to allow maintenance and inspection of the slide and its carrier without having to operate the actuator using gas pressure. The crank handle has a secondary function whereby the lifting of a trigger assembly on the handle and rotating it back down engages a hook on the slide carrier with the door latch tube to lock the slide carrier in the deployed position. To enable maintenance staff to check for the correct orientation of the crank handle, yellow paint marks are specified on the doubler plate, known as the land, surrounding the access hole on the inside, which abuts against and supports the back of the access panel when it is closed. The marks align with the lever when it is correctly positioned with the slide carrier locked and the slide panel closed. Figure 2 shows the slide actuator and crank handle assembly.

The slide bay panel is hinged along its top edge and is fitted with a proximity switch which provides an EICAS R WING SLIDE or L WING SLIDE caution if the panel opens; this is also recorded on the Flight Data Recorder (FDR). The slide panel latch assembly consists of two tappets mounted on a spring-loaded door latch tube. The latch tube runs along the bottom outboard edge of the bay and the tappets engage in machined slot plates fitted to the inner front and rear corners of the panel. The spring provides a constant positive engagement of the tappets in their slots providing the crank handle is in the shut position.

Recorded information

The aircraft was fitted with a 2-hour CVR and an FDR which recorded just over 26 hours of operation. The FDR captured the entire flight, but due to the duration of the flight, the CVR recording began just over an hour after takeoff.

The FDR data shows that as the aircraft accelerated (at a groundspeed of approximately 14 - 37 kt) on takeoff, the recorded right wing slide door parameter[1] changed state from CLOSED to OPEN. After takeoff, at approximately 1,500 ft, the autopilot was engaged and approximately 5.5º of left control wheel was applied in order to maintain a wings-level attitude. As the flaps were retracted, the aircraft climbed and the airspeed increased, the amount of left control wheel applied reduced to less than 1º.

Footnote

[1] This parameter is only recorded once every four seconds so this could have occurred any time within the preceding four seconds.

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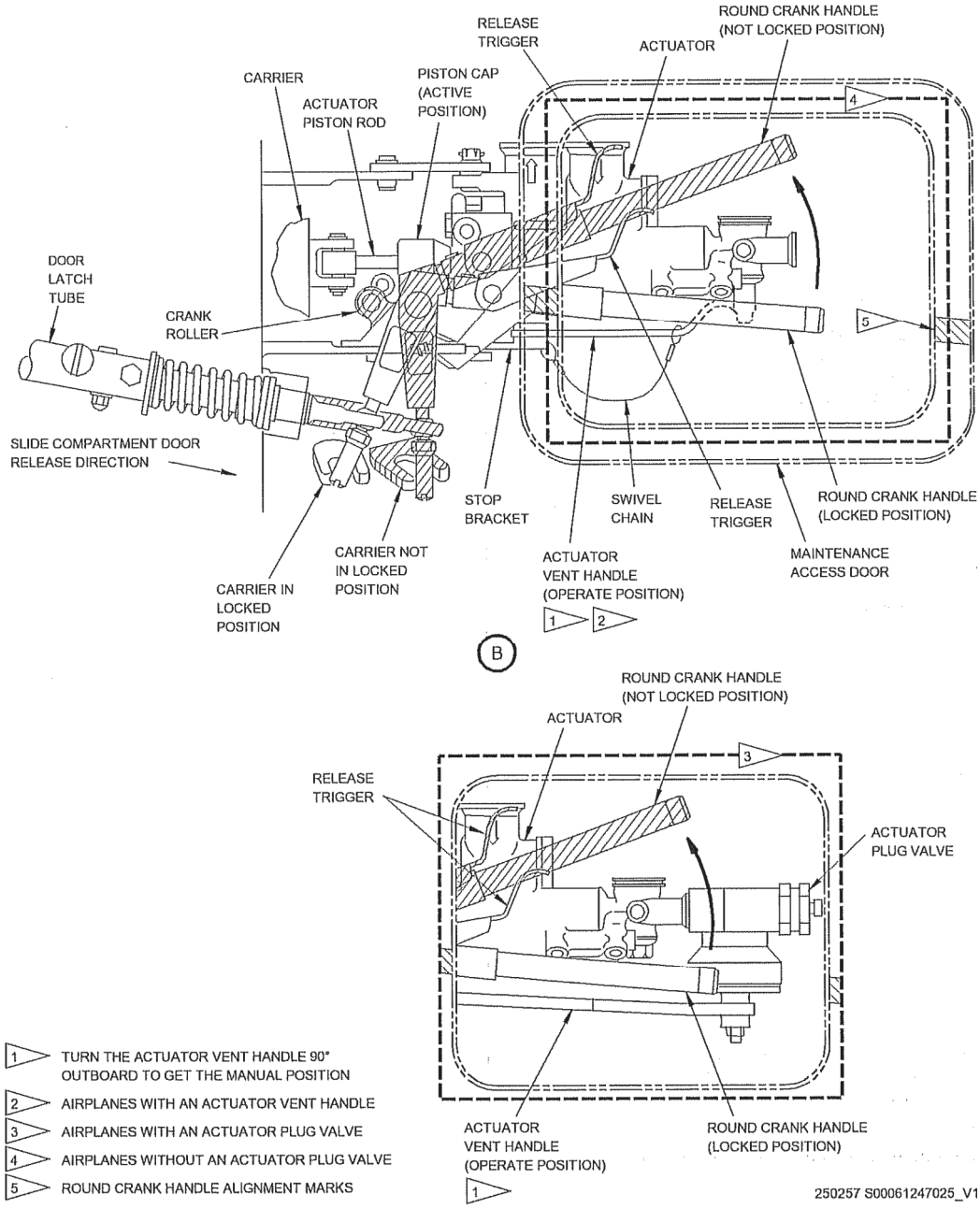

Figure 2

Slide carrier actuator assembly (left side shown)
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Ten minutes prior to entering a holding pattern, the CVR recording commenced. The aircraft was established in the hold for approximately 40 minutes before turning to a heading for the base leg return to Runway 26L. With the autopilot still engaged, flaps 20 was selected and approximately 5º of left control column was applied in order to maintain a wings-level attitude.

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Analysis of the recorded accelerations, aircraft attitude and manoeuvring could not identify any obvious reasons why the slide would deploy as the aircraft flew abeam the location where the escape slide was eventually found. Just over a minute after passing the point where the slide was discovered, the CVR recorded the cabin crew reporting to the flight crew a loud bang and that something had fallen off the aircraft.

Flaps 30 was selected after the turn onto the final approach after which the control wheel input increased to an average of 20º to the left (see Figure 3). The autopilot was disconnected as the aircraft descended through 1,400 ft on the final approach.

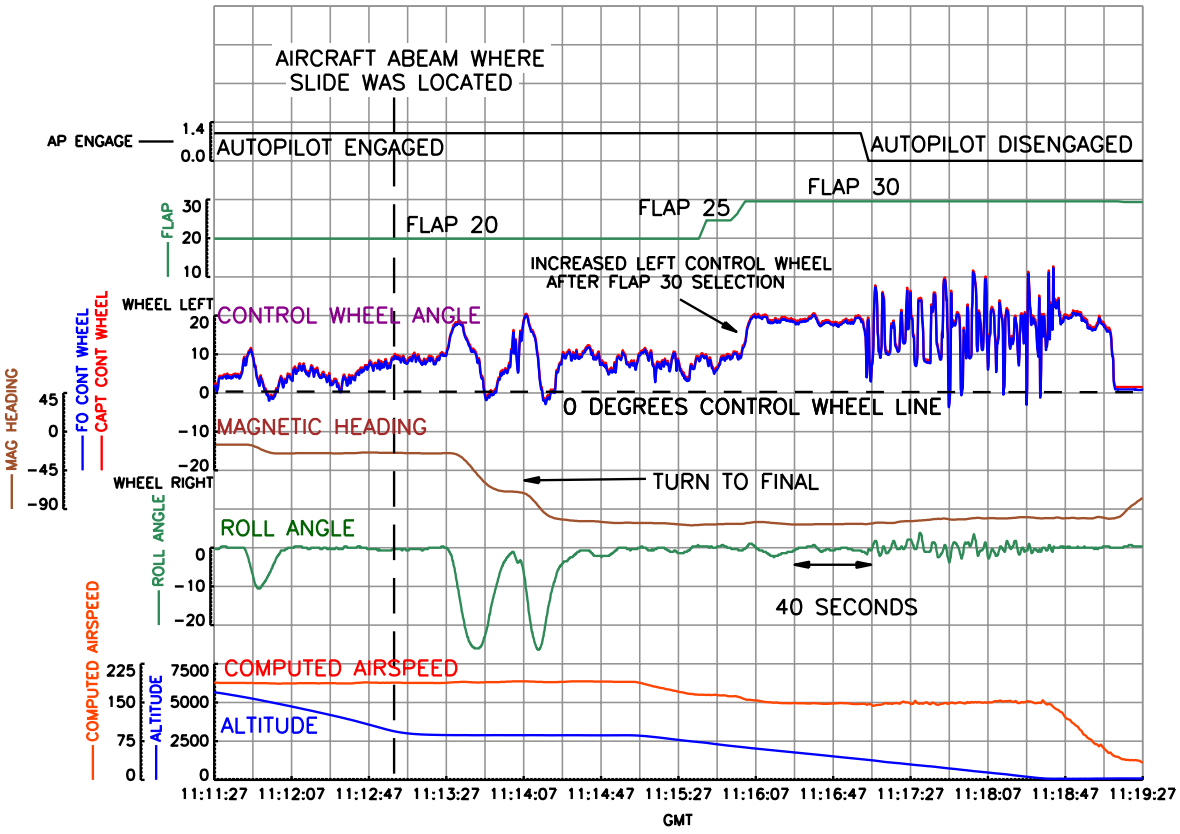

Figure 3

G-JMAB FDR data during approach to Gatwick Airport

Aircraft examination

On examination it was evident that the right over-wing slide carrier had deployed and had rotated outwards. The carrier bay panel was open, attached by its hinges, and resting on the carrier. The slide pack cover was open and the slide was missing. The outer rigid sideboard of the pack had detached and was on the hardstanding beneath the aircraft. The carrier outward travel stop hook had broken from its mounting tube and detached. The carrier had over-rotated causing damage to the fuselage wing root upper fairing, forcing the actuator rod to extend and bend and cause damage to the carrier pivot forging. The slide pack lacing pin had withdrawn from the slide cover and was hanging loose attached to the aircraft by its pip-pin and lanyard. Figure 4 and Figure 5 show the slide carrier as found.

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Figure 4
The slide carrier as it was found after landing

Figure 5
A close-up of the slide carrier after landing

The carrier locking device was retracted into its release position and was undamaged as were the panel latch rod tappets and slots. The forward and aft slots and tappets were covered in a protective layer of grease. The aft slot and tappet grease layer exhibited marks indicating where the tappet had been located. One of the marks was within the forward end

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of the slot, the locked position, and the other more pronounced mark was at the opening to the slot indicating movement of the panel during tappet and slide disengagement. The forward tappet and slot had the only marks in the grease on top of the slot edges and indicated that the tappet had not been engaged within the slot in any position as shown in Figure 6 and Figure 7.

Figure 6

The slide panel aft latch tappet imprints within the slot

Figure 7

Slide panel forward latch slot with the tappet imprint in the grease on the slot outer face

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The slide gas bottle was fully charged and none of the initiation devices had activated. The actuator access panel was found closed. The vent lever was found positioned in the 'operate' position. However, the yellow crank lever was in the slide panel OPEN AND CARRIER RELEASE position. The lever and its trigger assembly were undamaged.

The left crank handle was examined as a comparison and found to be in the closed position as was the associated vent lever. Further checks were carried out after the aircraft had been removed from service. This included a visual examination and pull-off checks on the crank handles. The pull-off checks found that the left lever required 50 N (11.25 lb) and the right lever required 25.4 N (5.71 lb). Both these figures are within the manufacturer's maximum of 25 lb. The levers had a smooth action with no detectable backlash in their mechanisms. It was observed that the access panels and crank handle assembly differed from the line diagrams shown in the Aircraft Maintenance Manual (AMM). There should have been yellow painted markers on the land of the panel to indicate the correct closed and locked position of the crank handle. The paint marks were not present on this aircraft. However, on the inside of the panel there was a placard giving instructions on how to operate the crank handle and includes a lever position picture, but it did not include or draw attention to safety alignment marks. Figure 8 and Figure 9 show the right and left slide release cranked handles with the maintenance access panel open.

Figure 8

Right slide release cranked handle in the up position as found after the incident

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Figure 9

Left slide release cranked handle in the correct down position.
(Note the absence of alignment marks in Figures 8 and 9)

The slide unravelled in the slipstream and struck the aircraft fuselage, causing no damage except for some light scoring on one of the cabin windows. Eventually the doubler material where it attaches to the carrier and the gas inflation pipe collar failed leaving the uninflated slide to detach and fall to the ground and land in a tree. Apart from the attachment material and pipe collar damage the slide was intact. Figure 10 shows the slide (face down) after recovery.

Figure 10

The recovered slide

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Maintenance history and activity

The last recorded maintenance activity on the slide and carrier was on 18 February 2013 and involved removal and replacement of the right over-wing slide for routine servicing. On 24 February 2013, a work order was raised which recorded the right over-wing slide pack carrier access door had been found open at its rear edge during a walk-round inspection. Subsequent inspection at the time found the yellow door lock handle incorrectly positioned. The door was checked and reclosed satisfactorily.

Immediately prior to the incident work had been carried out on the right over-wing slide system on the night of 30 October 2014. This involved removal and replacement of the stored energy bottle for scheduled out of phase maintenance. This activity was carried out in accordance with the Boeing AMM procedure. Part of the procedure details the actions to be taken in order to make the slide deployment initiation system safe, both electrically and mechanically. It was made safe electrically by moving the slide arming handle in the cabin to SLIDE DISENGAGED, fitting a safety pin to the master control valve and removal of the electrical connector on the squib. In addition, the AMM instructs rotation of the vent lever to isolate the actuator and open the gas pressure supply line to atmosphere as a precaution should an inadvertent bottle discharge occur. These actions were carried out by the maintenance team without difficulty. The replacement fully charged bottle was fitted and the work completed and certified during the shift. The bottle which had been removed remained fully charged. Other servicing work was carried out and completed on the aircraft during the shift on unrelated systems and therefore have no bearing on this incident. It was not a particularly high workload shift with all the staff commenting that, although they were busy, all the work allocated was completed in a timely and unrushed manner. The work on the slide system was carried out by more manpower than would normally be required. This was because it was considered to be an infrequent task and so was a good learning opportunity.

After the incident the aircraft was withdrawn from service for a C check. Whilst this work was being carried out the maintenance engineers found that the No 6 flap screw jack trunnion bush was missing and one of the flap track attachment brackets loose. These components are attached to the fuselage structure in the wing root beneath the right over-wing slide compartment. This fault had not been directly reported by crews but an examination of the aircraft records showed that on several occasions a technical log entry had been made concerning a 'vibration noise'. A number of actions were taken to locate the source of the noise including an examination of the wing slide panels for wear and security. This led to replacement of the spring loaded hinges on the left and right side of the aircraft as a precaution. However, on 15 September 2014 an entry noted;

> *'in the cruise around Row 24 there is very loud droning noise and vibration, at times you almost cannot hear yourself talk.'*

The cause could not be found at the time so a note was made to monitor the problem in the technical log and the G-JMAB vibration sheet.

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Previous events

Several operators had previously reported in-flight over-wing uninflated escape slide losses. The cause was identified as the slide compartment panel not being fully locked and secured, even though appearing to be so, after access for maintenance. Accordingly the manufacturer issued Service Bulletin (SB) 757-25-0298 which was subsequently mandated by a FAA Airworthiness Directive (AD) 2012-01-09. The SB instructed operators to fit modified parts to the panel latching mechanism to provide more positive locking. It also introduced placards for better visual indication of the correct position of the crank handle (Figure 11). The AD required the actions of the SB to be completed by end of February 2017. SB 757-25-0298 was not embodied on G-JMAB at the time of the incident.

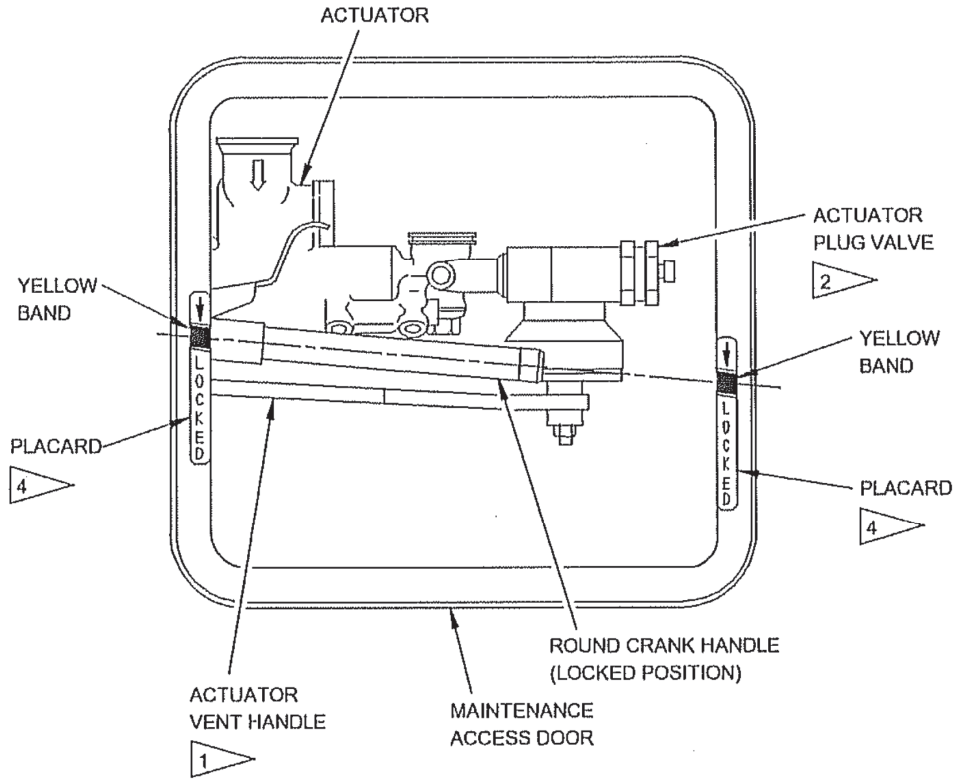

Figure 11

Revised safety markings (Boeing Proprietary. Copyright © Boeing Reprinted with permission of The Boeing Company)

Aircraft doors

The Boeing 757-300 is fitted with three passenger entry doors on each side of the aircraft, the forward and centre entry doors serve the forward section of the cabin and are located forward of the wing and the aft entry door is at the rear of the cabin. The passenger entry doors also serve as emergency exits. In addition, there is one emergency door located on each side of the fuselage just aft of the wing. These doors are hinged at the bottom, equipped with evacuation slides and are only used as emergency exits. Finally, there is a pair of smaller over-wing escape hatches located side-by-side over the wing on each side of the aircraft. These escape hatches are only used as emergency exits.

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During the course of the investigation, it became apparent that the system used by the cabin crew to designate entry and exit doors at the rear of the aircraft was different from that expected by the airport fire and rescue service (AFRS). The operator had, a few days before the incident, changed their numbering system for the doors. Before this change, aircraft doors were designated L1 to L4 on the left side and R1 to R4 on the right side with the escape hatches not being part of the sequence. After the change, the over-wing escape hatches were included and were designated L3 and R3 respectively with the doors in the rear fuselage assumed the designations L4, L5, R4 and R5. The AFRS stated that they would expect to use a similar system for designating doors but do not include any over-wing exits in the door count. Table 1 summarises the different methods of door designation used with this aircraft.

Door description	EICAS designation (Light: advisory messages)[1] (See note)	Cabin crew designation, post-numbering system change	AFRS expected designations
Forward passenger entry doors	ENTRY DOORS: L FWD, R FWD	L1, L2	L1, L2
Centre passenger entry doors	ENTRY DOORS: L CTR, R CTR	L2, R2	L2, R2
Escape Hatches	EMER DOORS: L FWD, L AFT, R FWD, R AFT	L3, R3	Over-wing exits
Emergency doors	EMER DOORS: L EMER DOOR, R EMER DOOR	L4, R4	L3, R3
Aft passenger entry doors	ENTRY DOORS: L AFT, R AFT	L5, R5	L4, R4

NOTE: [1] The generic exterior door annunciator lights are on the overhead console. The specific advisory messages are shown on the EICAS primary display.

Table 1

Table showing the different door designation on the incident aircraft

A survey of major aircraft manufacturers and a cross section of UK airline operators, revealed that there appears to be no standardised system for operating crews and AFRS to use to designate aircraft doors.

Roll control with wing slide door / carrier open

Immediately after takeoff, an average of 5.5º of left control wheel was required to maintain the wings level . This observation is consistent with the right wing slide panel, and possibly the slide carrier entering the airflow, generating an uncommanded right rolling moment. As the flaps were retracted, the amount of control wheel required for wings-level flight decreased.

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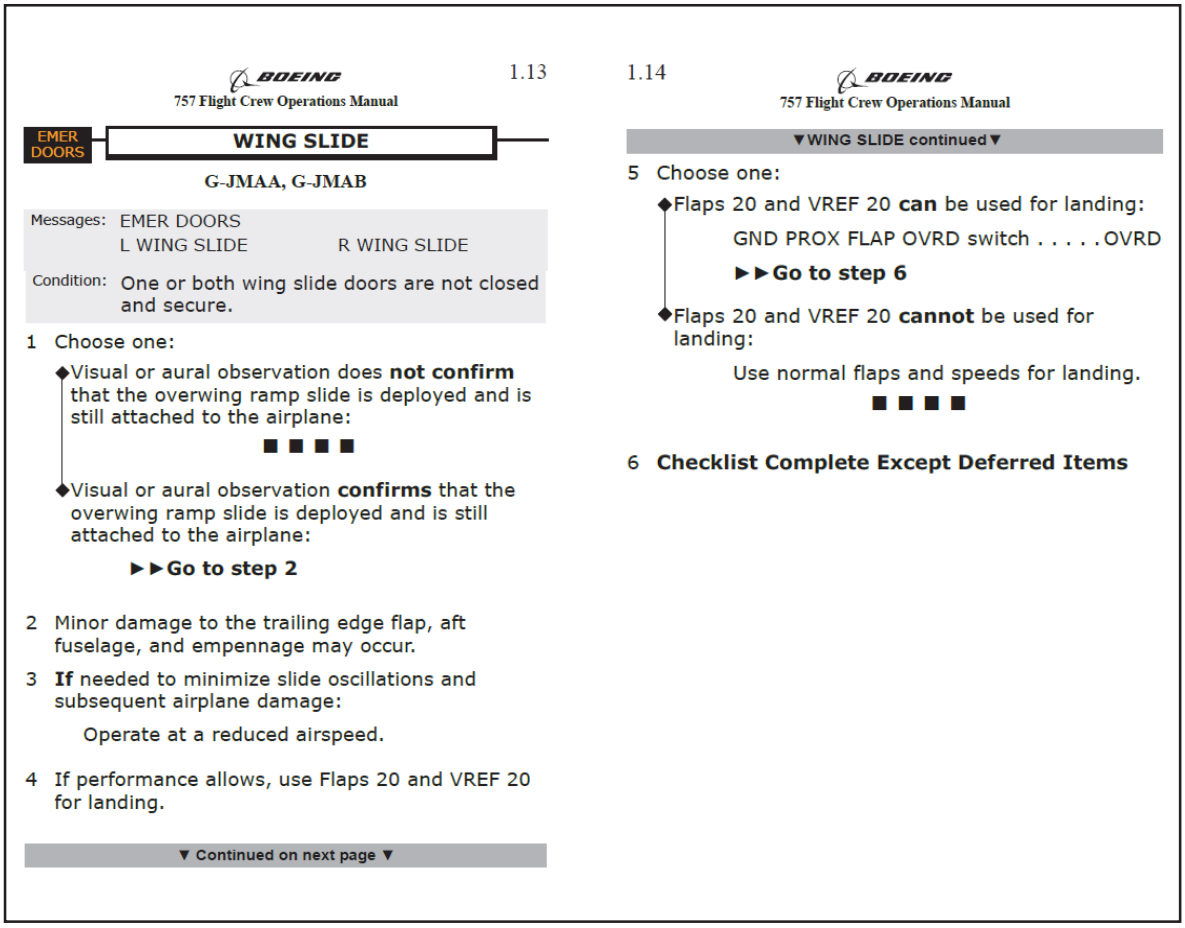
From comments recorded on the CVR, the uncommanded roll was apparent to the crew during the approach once flaps 30 was selected. The manufacturer stated that in their experience of in-flight wing slide deployments, small amounts of uncommanded roll were not unusual. They confirmed that as the flaps were extended, the amount of uncommanded roll increased and that above flaps 20, this is more noticeable. Once flaps 30 was selected, the amount of control wheel deflection required to maintain level flight increased from approximately 10º to 20º to the left. This was still within the autopilot control authority and equated to approximately 25% of the control wheel's maximum deflection.

Quick reference handbook

The QRH procedure for a WING SLIDE warning is shown in Figure12.



BOEING 1.13
757 Flight Crew Operations Manual

EMER DOORS

WING SLIDE

G-JMAA, G-JMAB

Messages: EMER DOORS
L WING SLIDE R WING SLIDE

Condition: One or both wing slide doors are not closed and secure.

1 Choose one:

◆Visual or aural observation does **not confirm** that the overwing ramp slide is deployed and is still attached to the airplane:

■ ■ ■ ■

◆Visual or aural observation **confirms** that the overwing ramp slide is deployed and is still attached to the airplane:

►►**Go to step 2**

2 Minor damage to the trailing edge flap, aft fuselage, and empennage may occur.

3 **If** needed to minimize slide oscillations and subsequent airplane damage:

Operate at a reduced airspeed.

4 If performance allows, use Flaps 20 and VREF 20 for landing.

▼ Continued on next page ▼

1.14 BOEING
757 Flight Crew Operations Manual

▼WING SLIDE continued▼

5 Choose one:

◆Flaps 20 and VREF 20 **can** be used for landing:

GND PROX FLAP OVRD switch . . . . . OVRD

►►**Go to step 6**

◆Flaps 20 and VREF 20 **cannot** be used for landing:

Use normal flaps and speeds for landing.

■ ■ ■ ■

6 **Checklist Complete Except Deferred Items**

Figure 12

QRH procedure for Wing Slide alerts. (Boeing Proprietary. Copyright © Boeing Reprinted with permission of The Boeing Company)

The QRH procedure for wing slide alert messages covers only two possibilities. Firstly, the wing slide is not confirmed as being deployed, in which case no further action is required. Secondly, the procedure considers the possibility that the wing slide has deployed and is still attached to the aircraft. In this eventuality, the QRH procedure states that, if performance allows, use flaps 20 and V_{REF} 20 for the subsequent landing.

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In this incident, the crew experienced an unexpected and uncommanded roll on final approach once flaps 30 was selected, with the slide carrier deployed into the airflow but with the slide detached, a configuration not covered by the QRH procedure.

Deployment of the wing slide in-flight was assessed by the manufacturer during the design and certification process. They determined that if a wing slide deployed in-flight and detached from the aircraft, it would most likely pass underneath the empennage. However, should the slide strike the horizontal stabiliser, moderate buffet might result, and the horizontal stabiliser's leading edge is capable of sustaining relatively severe damage across the major portion of its span without a significant reduction of aircraft controllability. Any damage to the hydraulic system at the leading edge of the stabiliser would only render two of the six elevator actuators inoperative and should the horizontal stabiliser should become inoperative, the Boeing 757 can be safely landed using elevator control only. Also, in their assessment they concluded that should the wing slide remain attached after the slide has been deployed, it would not cause a controllability or performance problem.

Analysis

Engineering aspects

Examination of the aircraft right over-wing escape slide carrier and its fittings indicated that a series of interrelated events occurred leading to the opening of the cover panel and deployment of the carrier. The marks within the grease of the tappet and slide assemblies, designed to hold the panel shut, show that only the rear tappet was properly engaged. The forward marks show that the tappet was not engaged within the slot but was only in contact with the top surface of the slot. It also appears that its adjustment was such that the panel did not sit proud of the surrounding fuselage skin and therefore remained unnoticed by ground staff and crews doing visual inspections. It is possible that this existed for some time. The last recorded specific right wing slide and panel maintenance took place in February 2013. More recently the left and right slide panel hinges were replaced as a precaution as part of the vibration diagnosis.

Boeing 757-300 fleet-wide experience and manufacturer's data shows that on a number of occasions the tappet and slot mis-engagement has resulted in the opening of the slide panel leading to carrier deployment in flight. However, on this occasion this appears not to be the primary cause but would have increased the risk of opening in flight.

The absence of mechanical damage to the panel latches and the carrier locking device show that these items had become fully disengaged at the time of the incident. For this to happen the cranked handle, which as part of its movement withdraws the latches, must have moved upwards to the release position as it was found.

There are several possibilities for this to occur. Maintenance work was carried out on the slide gas bottle the night before the incident. Part of the preparatory procedure prior to carrying out the work was to make the gas pressure side of the actuation system safe by moving the vent lever to the open position. This was carried out in accordance with the AMM. Then, following the AMM instructions, the team of engineers changed the gas bottle

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and re-established the slide gas system into the service condition by closing the vent lever and securing its access panel. When carrying out this action the individual concerned did not recall touching or moving the crank handle. Furthermore he would not have needed to do so due to the position and design of the vent lever. None of the engineering staff involved at the time noticed anything unusual about the cranked handle or its position. However, with hindsight they were not completely sure that it was correctly positioned when later compared to diagrams in the AMM. The possibility that the lever was inadvertently knocked towards the release position cannot be discounted. However, had it been fully moved to the release position, the slide carrier panel would have opened slightly and been seen by the engineers. It would also have caused an immediate EICAS caution of R WING SLIDE during pre-flight checks. However, it is possible it had only been partially moved such that it remained closed but in a position that it would require an additional factor to cause its continued travel. It may therefore be concluded that the crank handle was not fully down in the safe position but was engaged enough to hold the panel and slide carrier in place. The absence of the alignment markings on the panel, designed to indicate if a crank lever is not correctly secured, would have reduced the possibility of its mis-position being identified by the engineers. SB 757-25-0298 mandated under FAA AD 2012-01-09 introduces clearer crank handle position indication but it had not been incorporated on G-JMAB.

The lever and its mechanism were found to have a smooth and backlash free action but when compared to the left side crank handle required less force to initiate movement, ie it had a reduced breakout friction. In addition the No 6 loose screw jack right flap system, which is in close proximity to the slide cranked handle, had been causing high vibration and noise. As the handle required less force to move, it is possible that the flap system vibration and resonance resulted in a gradual movement upwards of the crank handle over a period of time to the point whereby it allowed the slide carrier and panel to open with its locking devices in the released condition. Once open, it was in the air flow with the slide itself now no longer restrained within its pack. Thus it eventually unravelled in the slipstream flailing about against the fuselage until its attachment material failed allowing it to detach and fall to the ground. There was no pre-existent damage or faults found with the slide and therefore it has no bearing on the incident. On this occasion the slide had not contacted the tailplane.

Operational aspects

During the takeoff run, the EICAS displayed a R WING SLIDE message to the flight crew. On seeing the message the commander instructed the PF to continue the takeoff. Rejecting a takeoff carries additional risk and would normally only be carried out for warnings, significant cautions or significant non-annunciated events such as a blocked runway

Aircraft doors

The investigation discovered that the there was a discrepancy between the system used by the AFRS and the cabin crew to designate the exit doors of this aircraft. In the event of an emergency evacuation, had the AFRS needed to communicate information to the aircraft crew relating to the safety or otherwise of a particular exit, then it is possible that this information would have been communicated incorrectly. It is vital that this information be

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communicated in a clear and unambiguous manner, so a standard system for referring to aircraft exits would reduce the potential for a misunderstanding. As no such standardised system for exit door identification exists, the following Safety Recommendation is made:

Safety Recommendation 2015-022

It is recommended that the European Aviation Safety Agency, in conjunction with the Federal Aviation Administration and other regulators, implement a standardised system of door and emergency exit designations to reduce potential misunderstanding between aircraft crews and airport emergency services in the event of an emergency evacuation.

Quick Reference Handbook (QRH)

Should a wing slide unravel or deploy in flight, it is visible from the cabin. However, should only the wing slide carrier enter the airflow or a wing slide door open, neither are visible from the cabin. Therefore, in the case of a R(L) WING SLIDE EICAS message, without any visible slide deployment, the crew are not able to establish the position of the wing slide door or the slide carrier. Should either of these enter into the airflow, the effect is an uncommanded roll, which is exacerbated once the flaps reach a position of greater than 20.

The current QRH procedure only recommends the use of flaps 20 for landing when the slide is confirmed as deployed, but still attached to the aircraft. As there is a case where the R(L) WING SLIDE EICAS message is generated but cannot be followed up with a visual confirmation of the wing slide door or carrier position by the crew, the following Safety Recommendation is made.

Safety Recommendation 2015-023

It is recommended that Boeing Commercial Airplanes amend the Quick Reference Handbook WING SLIDE alert procedures for Boeing 757-300 aircraft to make the instructions on the use of flaps 20 for landing applicable to all cases of WING SLIDE alerts.

Conclusion

The right over-wing slide carrier deployed in flight, allowing the slide to unravel possibly as a result of the crank handle with a reduced breakout friction progressively moving, over an indeterminate period of time, to an unsafe position. A contributory factor was possibly the loose number 6 screw jack in the flap system which resulted in vibration in the area of the crank handle. The insecurity of the lever went undetected whilst the maintenance panel was open due to the lack of alignment marks and unfamiliarity of the observer(s) with how the crank handle should look when correctly positioned. SB 757-25-0298 addresses locking of the compartment door and provides revised and clearer alignment placards for the lever.

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