

1.0 INTRODUCTION

This analysis was written to record the steps of the investigation, present the findings, and discuss the conclusions for a Marotta 3 way – 2 position pressure operated valve, the operation of which was suspect during an emergency gear blow-down on the Gulfstream 200. The Marotta model PV101 is part of an emergency landing gear system on the Gulfstream 200 aircraft. Valve model PV101, serial number (S/N) 481 was returned to Marotta to validate that it functioned properly on the aircraft, during an emergency landing on May 27, 2011.

2.0 IDENTIFICATION

2.1 Marotta Valve Model: PV101, Part No.: 283279-0001
2.2 Marotta Serial Number: 481

3.0 DOCUMENTATION REQUIREMENTS

3.1 Marotta Acceptance Test Procedure: ATP283279-0001
3.2 Marotta Assembly & Installation Drawing: 283279-0001
3.3 Israel Aircraft Industries, Inc. Drawing: V25W716009

4.0 DESCRIPTION OF PROBLEM

On May 27, 2011, at 0928 eastern daylight time, a Gulfstream 200, N749QS, incurred minor damage when it's right main landing gear collapsed during an emergency landing at Stewart International Airport (SWF), Newburgh, New York.

The Marotta PV101 is a hydraulic component within the emergency system that diverts pressure to allow the gear to drop and lock into place. Prior to the landing gear collapse the flight crew actuated the emergency gear blow-down system. The landing gear did drop when the emergency system was actuated, but failed to lock the rear gear.

As part of the National Transportation Safety Board (NTSB) and Gulfstream's investigation all components on the emergency blow-down system were tested for functionality.

5.0 HISTORY OF VALVE

Marotta PV101, S/N 481:

<u>Date</u>	<u>Description</u>
02-28-2007	Shipped new to Israel Aircraft Industries, Inc.
08-23-2011	Returned to Marotta for investigation.

6.0 INVESTIGATION & RESULTS

To accurately document and record the findings of this investigation Marotta followed the Acceptance Test Procedure (ATP) for the PV101 and took photographs of the unit as received, during test and after post test disassembly. The ATP with results forms Attachment A of this report. The investigation was completed on August 23, 2011 with witnesses from NTSB, Gulfstream and Marotta.

6.1 Photographs were taken of the valve in “as received” condition.



Figure 1. “As Received” packaging of S/N 481



Figure 2. PV101 identification nameplate.

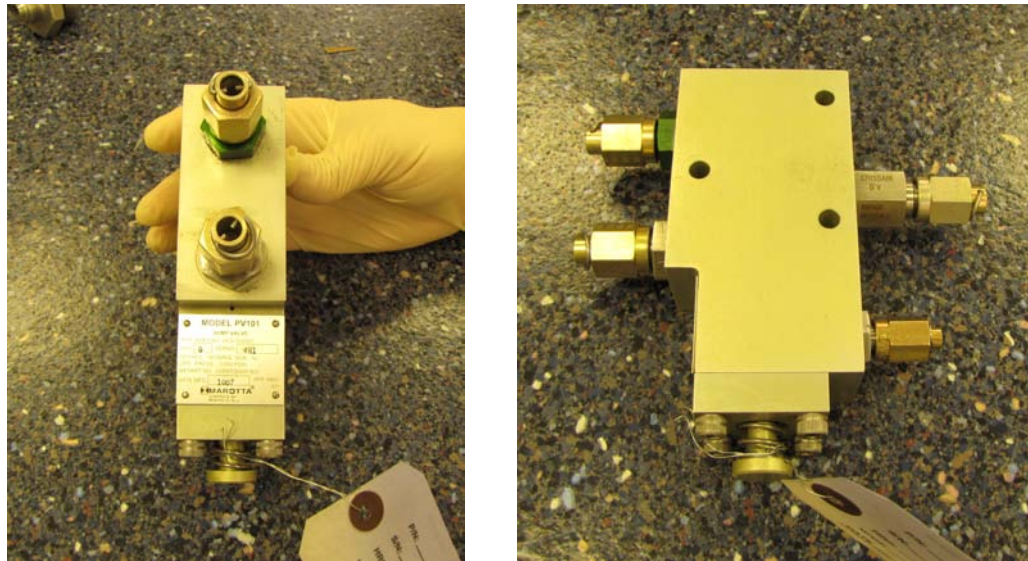


Figure 3. PV101 “As Received” Condition

6.2 The valve was acceptance tested on a Skydrol LD-4 test stand per ATP283279-0001, Rev E. All tests were performed with exception of the proof pressure test.



Figure 4. Marotta Skydrol LD-4 test stand with PV101 installed.



Figure 5. PV101 Setup for ATP Paragraph 5 Flow Test.

6.3 The PV101 successfully passed all the acceptance tests (See Attachment A) and was disassembled for inspection of all detailed components. All detailed components exhibited normal wear and no anomalies were noted.



Figure 6. PV101 S/N481 completely disassembled.



Figure 7. PV101 Poppet, Retainer and Seat.



Figure 8. PV101 Spring, Poppet and Retainer.

7.0 CONCLUSION

This particular PV101, S/N 481 was returned to Marotta Controls, Inc. due to questionable performance when actuated to blow-down landing gear on a Gulfstream 200. This incident occurred on May 27, 2011, at 0928 eastern daylight time when a Gulfstream 200, N749QS, right main landing gear collapsed during an emergency landing at Stewart International Airport (SWF), Newburgh, New York.

Marotta with customer witnesses from the NTSB and Gulfstream successfully tested the PV101 per acceptance test procedure ATP283279-0001, revision E. At the completion of testing the valve was disassembled and inspected for discrepancies. Photographs were taken during all stages of the investigation and no anomalies were noted post disassembly of the hardware.

The valve was reassembled and tagged "NOT FOR FLIGHT" and was returned to Gulfstream for further processing.

8.0 CORRECTIVE ACTION

Marotta Controls, Inc. concludes that a corrective action is not applicable, since the valve satisfactorily met all the Acceptance Test requirements.