FINAL REPORT
of civil aviation safety investigation

CLASSIFICATION
Serious Incident

Owner  Primul Meridian SRL
Operator  Primul Meridian SRL
Manufacturer  Diamond Aircraft Industries / Austria
Aircraft  Diamond DA 42MPP
Registration country  România
Registration:  YR – XXA
Location:  Craiova International Airport
Lat.  44°19´6.14ʺ N; Long. 023°53´1.87"E
Date and time:  19.07.2017 / 10:37 LT (07:37 UTC)

No.  A 17 – 14
Date:  13.12.2017
### RUNWAY EXCURSION

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Diamond DA 42MPP/ YR-XXA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date and time</td>
<td>19.07.2017 / 10:37 LT (07:37 UTC)</td>
</tr>
<tr>
<td>Operator</td>
<td>Primul Meridian SRL</td>
</tr>
<tr>
<td>Flight type</td>
<td>Aerial work</td>
</tr>
<tr>
<td>Persons onboard</td>
<td>2 / Pilot, camera operator</td>
</tr>
<tr>
<td>Victims</td>
<td>N/A</td>
</tr>
<tr>
<td>Pilot</td>
<td>CPL(A) / 31.05.2018</td>
</tr>
<tr>
<td>Damage</td>
<td>Slightly damaged aircraft: main left landing gear burst tire, left engine propeller blades impact marks on the tips</td>
</tr>
<tr>
<td>Location</td>
<td>The northern side of Craiova International Airport runway, approx. 800 m from threshold 09 Coordenates: Latitude: 44°19´6.14ʺ N, Longitude: 023°53´1.87&quot;E</td>
</tr>
</tbody>
</table>

### 1. HISTORY OF OCCURRENCE

On 19.07.2017, the aircraft Diamond DA42 type, registered YR-XXA, took-off from Craiova International Airport (LRCV) in order to perform a photogrammetry mission in the area of Petroșani City. After a 4 hours flight without any incident, the pilot started the maneuvers for landing. At 10:37 LT (07:37 UTC), the aircraft landed on the same airport from where it took-off. Landing went normally and, after touchdown, the aircraft rolled approximately 300 m, when the main left landing gear tire burst, which made the aircraft to turn left. The pilot made maneuvers to maintain the aircraft on the runaway direction, but after almost another 150 m, the aircraft made a runaway excursion of approximately 10 m on the grass surface near the runway (see Figure 1).

After this serious incident, the aircraft crew suffered no injury, and the damage to aircraft was minor: burst tire of main left landing gear, impact marks on the tips of left engine propeller blades.

Runway excursion location:

Coordinates: Latitude: 44°19´6.14ʺ N, Longitude: 023°53´1.87"E
2. ADDITIONAL INFORMATION

2.1 Meteorological information

The METAR information issued by Craiova International Airport (LRCV) valid on the date of the occurrence for 07:30 UTC (10:30 LT) was as follows:

METAR LRCV 190730Z 17002KT CAVOK 26/15 Q1020=

- wind from 170° heading with 2 knots speed (1 m/s), visibility over 10 km, temperature 26°C, atmospheric pressure 1020 hPa.

2.2 Airport information

Craiova International Airport (LRCV), is situated at the altitude of 191 m (626 ft) and has a concreted take-off/landing runway (RWY 09/27) with dimensions of 2500 m length and 45 m width.

2.3 Aircraft information

The aircraft involved in this occurrence is a Diamond DA42 MPP, an aircraft equipped with two Thiellert TAE 125-02-99 propeller engines. In MPP version this aircraft is equipped with a ground surface laser scanning system.

The airplane structure is made of fiber-reinforced composite material. This gives a very strong but lightweight structure.

The tricycle landing gear is fully retractable and hydraulically operated.
The main landing gear legs are attached to mounting points in the wing center-section. The main landing gear retracts into integral compartments in the wing center. Landing gear doors seal the landing gear bays when the gear is retracted.

The nose landing gear is steerable and is attached to the lower front of the fuselage. The nose landing gear bay is integral with the front fuselage and doors seal the bay when the gear is retracted.

The engines are equipped with constant speed propellers with 3 blades. The propellers are driven through an integral reduction gearbox.

The engine is controlled by a Full Authority Digital Electronic Control (FADEC) system.

The model DA 42 has a full range of flight instruments contained in an integrated pilotage system (ICS), which has 2 display screens. Both of them are able to show at the airplane flight instrumentation data, navigation data, engine data and other airplane system data. The ICS also displays all the airplane warnings, cautions and alerts. The ICS can also be configured to show ground and flight check lists.
The aircraft Diamond DA42, registered YR-XXA, serial number 42272, had 2438 operation hours on the date of the occurrence.

According to the aircraft documents, it holds a valid airworthiness certificate, and the technical maintenance was performed in accordance with the approved maintenance schedule.

2.3 Analysis

The aircraft landing in the day of the incident went normally. According to his own statement, after runway touchdown, the pilot operated the brakes for a short time, and then he released it, the aircraft rolled for another 300 m, and after the second brakes action, the tire on the left side burst.

![Fig. 4 Left-side wheel of YR-XXA aircraft](image)

In the tire maintenance manual, in the chapter referring tire wear inspection it is presented the mark appearing when the wheel rotation is stopped while the airplane is moving:

![Skid](image)
Thus, it can be stated that burst tire resulted after blocking the wheel rotation while the airplane was still moving.

There are many scenarios that can lead to such a result and can be analyzed.

The investigation commission checked the tires condition, these being within the acceptable wear limits specified in the maintenance manual.

It is possible that the braking system of the wheel on the left side may have not temporary worked properly, blocking the wheel, which led to the thinning of the tire rubber layers on a portion of the circumference, followed by its burst.

It is also possible that during landing, when the wheel touched down the runway, the left wheel may have been slightly braked, which favored the thinning of the rubber layers on a portion having the footprint size left by the wheel on ground.

Another possible variant: that the second braking might have been made more firmly, which could have led to the temporary stopping of the left wheel rotation.

None of the presented scenarios can be supported by arguments to substantiate the occurrence of this serious incident.

The impossibility to maintain steering due to the burst tire led to the aircraft runway excursion, which made the left engine propeller blades to hit the ground.

After the subsequent checks performed by the authorized technical staff, no malfunctions were detected in the operation of the aircraft braking system.

3 CONCLUSIONS

3.1 Findings

1. The pilot hold a MEP license (land) and medical certificate, both valid;

2. The aircraft hold a valid airworthiness certificate, and the technical maintenance was performed in accordance with the approved maintenance schedule;

3. The aircraft braking system was checked in detail; according to the checks and tests performed, no malfunction was detected in its operation;

4. The cause that led to the left wheel blockage could not be determined with certainty.
3.2 Cause of the occurrence

The cause of the serious incident is the left tire burst as a consequence of the temporary wheel blockage. The wheel blockage cause could not be determined.

3.3 Safety recommendations

After this serious incident, the investigation commission does not issue any safety recommendations.

Note: The documents and analysis objects used for the issuance of the flight safety investigation Report are confidential and are archived at the Civil Aviation Safety Investigation and Analysis Center, according to legal provisions.