

DATA SUMMARY

LOCATION

| | |
|---------------|--|
| Date and time | Tuesday, 25 August 2009; 14:30 local time |
| Site | Ibiza Airport |

AIRCRAFT

| | |
|----------------|---|
| Registration | N31145 |
| Type and model | PIPER PA 46-500TP "Malibu": Serial number 46-97215 |
| Operator | Private |

Engines

| | |
|----------------|-------------------------------------|
| Type and model | PRATT & WHITNEY PT6A-42A |
| Number | 1; Serial number RM0234 |

CREW

Pilot in command

| | |
|--------------------------|--|
| Age | 54 years old |
| Licence | Commercial Pilot License (CPL(A)) |
| Total flight hours | Not available |
| Flight hours on the type | Not available |

INJURIES

| | Fatal | Serious | Minor/None |
|---------------|-------|---------|------------|
| Crew | | | 1 |
| Passengers | | | 1 |
| Third persons | | | |

DAMAGE

| | |
|---------------|---|
| Aircraft | Damage to nose gear tire and wheel |
| Third parties | None |

FLIGHT DATA

| | |
|-----------------|--|
| Operation | General aviation – Private flight |
| Phase of flight | Climbing to cruising altitude |

REPORT

| | |
|------------------|--------------------|
| Date of approval | 9 June 2011 |
|------------------|--------------------|

1. FACTUAL INFORMATION

1.1. Description of event

The PIPER PA 46-500TP aircraft, registration N31145, was scheduled to make two flights on Tuesday, 25 August 2009: one, early in the morning, from Lausanne (Switzerland) to Ibiza (Balearic Islands), and then a return flight to the point of origin.

As reported by the pilot, the first leg of the flight was uneventful.

After picking up a passenger as planned, the return flight started under weather conditions suitable for the flight, with no clouds or wind and a high temperature. The airplane took off at 13:56 from runway 24 at Ibiza airport, after which the pilot requested to climb to 3,000 feet.

During the climb, the pilot noted that the red "GEAR" warning light remained lit on the warning panel. This indicated that the gear was not fully retracted, although the gear doors may have been shut (as defined in the Airplane Flight Manual).

After requesting permission to leave the flight level, the pilot reduced speed to the limits specified for lowering and raising the gear. During the first attempt, the pilot noted that on lowering the gear, the three green lights for the gear illuminated, indicating that the gear was down and locked. Upon raising it, the red "GEAR" warning was once again lit.

The pilot asked the passenger to look at the two main gear legs, which are visible from the rear seat she was occupying, while he cycled the gear three times, adjusting the speed to the limits specified in the flight manual. The results were the same as those noted earlier.

Upon concluding these maneuvers, he decided to report the problem and return to Ibiza Airport. While on final approach, the pilot noted that after lowering the gear, the three green gear lights turned on. He decided to make a long flare and land gently.

After the aircraft had slowed sufficiently, the pilot attempted to exit the runway by turning the rudder slightly to the right, which unexpectedly caused the aircraft to come to an abrupt halt. After repeated attempts to leave the runway, the pilot concluded that the aircraft would not move under its own power.

The pilot reported the situation to ATC and requested assistance from emergency services. After stopping the engines and securing the aircraft, both occupants left the airplane uninjured under their own power.

Upon reaching the scene, emergency services noticed that the airplane was in good overall condition, but that the nose gear wheel was turned 90° with respect to the aircraft’s longitudinal axis. The tire casing was destroyed and the wheel was worn from rolling on the pavement.

It was also noted that the scissor linkages on the nose gear (mechanism that transmits the torque on the wheel to the upper gear assembly and that limits the travel of the strut depending on the weight on the wheel while on the ground) had become loose.

1.2. Additional information on aircraft and pilot

The aircraft had a valid “normal” category Airworthiness Certificate, no. ODARF-511281-CF, issued by the FAA on 9 August 2005.

The manufacturer’s maintenance manual states that the inspection of the nose gear and its components must be conducted every 100 hours. This inspection includes a check of the torque on the bolts.

The following inspections were logged as part of the aircraft’s maintenance program:

| Inspection type | Date | TSN (Time Since New) |
|-----------------|------------|-------------------------|
| 100 h | 12/02/2009 | 414 |
| 200 h | 08/04/2009 | 433 |

Before the incident flight, the aircraft, manufactured in 2005, had accumulated a total of 500 flight hours.

1.3. Inspection of aircraft

Figure 1 shows a photograph of the nose gear after the incident, as seen from the front of the aircraft. Notice how, as mentioned earlier, the wheel is at a 90° angle with respect to the aircraft’s longitudinal axis. The scissor linkages on the gear, labeled on the figure, are separated, with the upper one pointing forward and

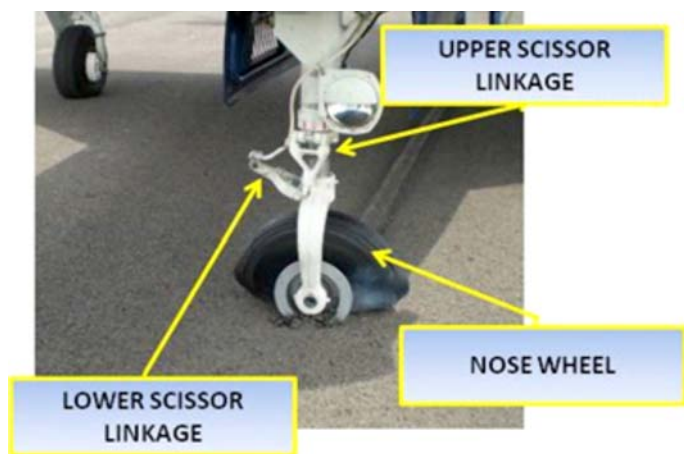


Figure 1. Nose landing gear

the bottom one pointing to the right of the aircraft. Finally, the tire is practically destroyed.

The screw that under normal conditions joins the scissor linkages through their lugs was found attached to the lower linkage, though without a nut. Under normal conditions, the screw has a crown nut that is held in place using a split pin. None of these components was found during the visual inspection.



Figure 2. Screw detail

Figure 2 shows a properly installed attaching screw and crown nut, which hold the two scissor linkages together.

As the figure shows, neither the body nor the orifice for the split pin on this screw exhibit any deformation or any other sign of having been subjected to excessive stresses. There is also no damage to the threaded portion.

The as-found condition of the screw indicates that, in all likelihood, the linkages separated when the screw became unthreaded.

2. ANALYSIS AND CONCLUSIONS

The facts analyzed above and the results of the inspections conducted point to the following conclusions:

- The incident took place because the linkages on the nose gear scissors separated. This separation caused the nose wheel assembly and its attachment fitting to the lower part of the strut to rotate about its axis while on the ground into a position that was perpendicular to the direction of motion. Judging by the position of the wheel in Figure 1, the assembly twisted to the right, and is consistent with the pilot's action to exit the runway.
- The normal appearance, integrity and characteristics of the screw that attaches the linkages, which exhibited no damage to its body, split pin orifice or thread, indicate that the separation did not occur as a consequence of possible overloading of the nose gear.
- The linkages separated as a result of the loss of the nut on the screw that holds the linkages together, even though the nut should have been crowned and had a split pin to hold it in place.
- Neither of these components (nut or pin) was found after the event, meaning they were not available for analysis. Nevertheless, in light of the good condition of the

screw that was recovered, the loss of the nut and the subsequent separation of the scissor linkages is believed to have occurred due to the progressive loosening of the nut from the screw and to an existing fault of the pin. This fault could have been due to the fracture of the pin as a result of using the incorrect material, to the improper installation of the pin or to its absence.

- The nut probably fell off during the takeoff run, with the resulting misalignment of the scissor linkages causing the cockpit warning that appeared when the gear was retracted.