

## ACCIDENT

<b>Aircraft Type and Registration:</b>	Gardan GY80-160 Horizon, G-ATGY	
<b>No &amp; Type of Engines:</b>	1 Lycoming O-320-B3B piston engine	
<b>Year of Manufacture:</b>	1965	
<b>Date &amp; Time (UTC):</b>	1 October 2011 at 1455 hrs	
<b>Location:</b>	Yeovilton Airfield, Somerset	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - 2
<b>Injuries:</b>	Crew - None	Passengers - None
<b>Nature of Damage:</b>	Landing gear, propeller and engine shock-loaded	
<b>Commander's Licence:</b>	Airline Transport Pilot's Licence	
<b>Commander's Age:</b>	67 years	
<b>Commander's Flying Experience:</b>	14,328 hours (of which 14 were on type) Last 90 days - 98 hours Last 28 days - 25 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and subsequent AAIB enquiries	

## Synopsis

Following a normal landing, during which the aircraft touched down on the mainwheels, the landing gear collapsed during the ground roll, shortly after the nosewheel had been lowered onto the runway.

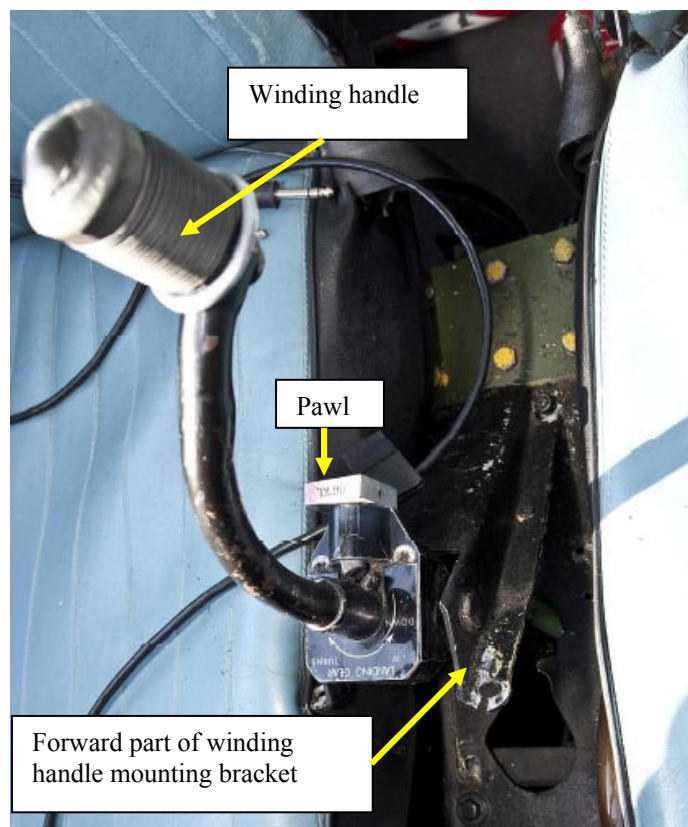
## History of the flight

The pilot undertook a 20-minute local flight following which he lowered the landing gear by turning the gear winding handle as far as it would go in the 'down' direction, confirmed that the green 'gear down' indicator light had illuminated and made a normal approach to Runway 09. The aircraft landed normally on its mainwheels and shortly after the nosewheel was lowered onto the runway, it collapsed and the tips of the

propeller blades struck the ground. The mainwheels then collapsed and the aircraft ran off the right side of the runway and came to a stop on the grass. The pilot later noticed that the forward part of the landing gear winding handle, located between the two front seats, had come away from the control pedestal. See Figure 1.

## System information

The aircraft is equipped with a tricycle landing gear that can be partially retracted into wells located under each wing and the fuselage. The landing gear is manually operated by a winding handle located on a pedestal between the two front seats, with 19 turns of the handle required to extend the gear. This winding



**Figure 1**

Landing gear winding handle

handle operates a screw jack which through a system of bell cranks, struts and a torque tube cause the landing gear to extend or retract. See Figure 2. Brace struts, located between the main legs and the torque tube, move over-centre (by 0.7 +/- 0.05 mm) as the gear is extended, locking the main legs in the down position. Similarly, a nose leg brace strut also moves over-centre (0.8 +/- 0.1 mm) to lock the nose leg in the down position. A pawl at the base of the winding handle engages a ratchet assembly which prevents the handle from moving in flight.

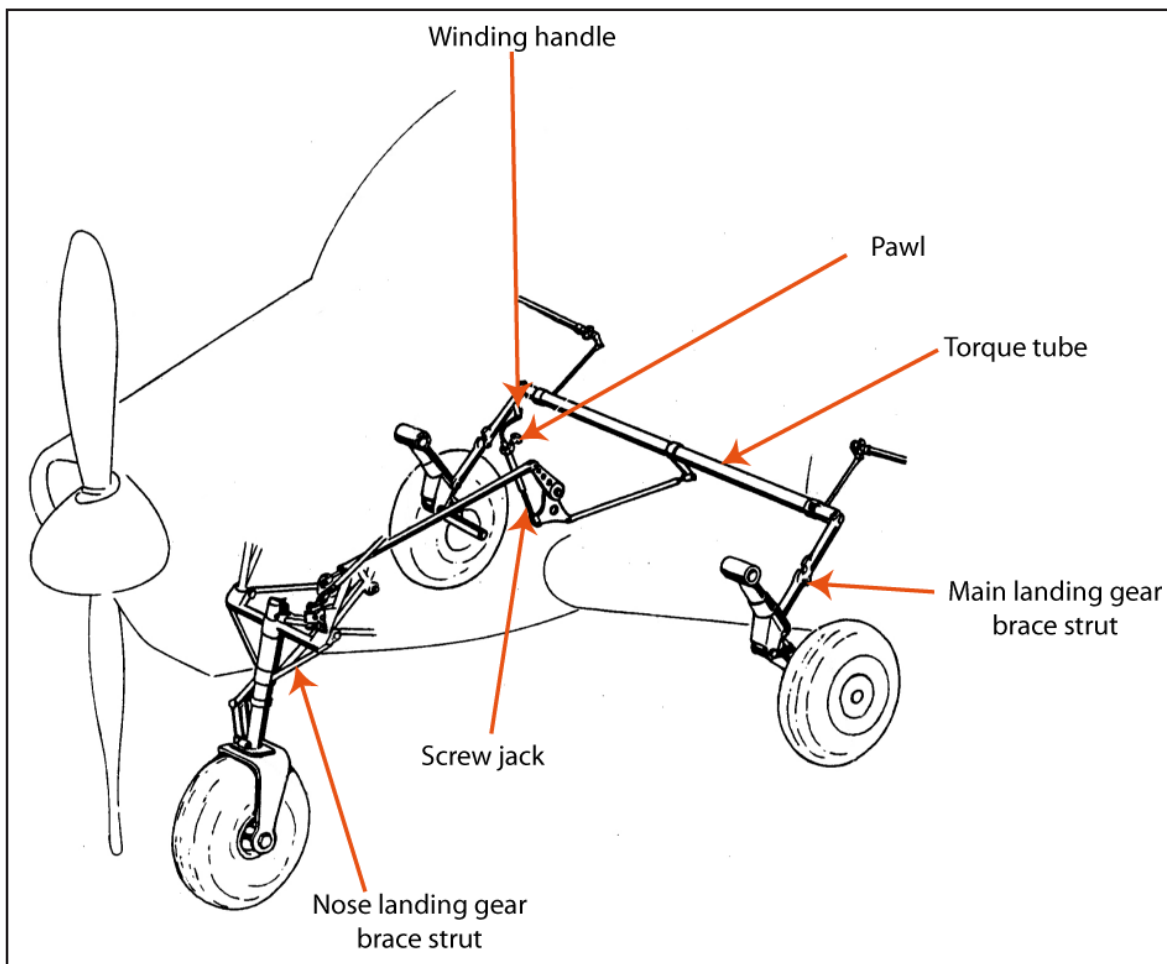
The landing gear is also equipped with two position indicator lights operated by microswitches: a green light illuminates when the landing gear is fully down and a red light illuminates when the landing gear is in transit (interim position). A warning horn will also

sound if the landing gear is not in the extended position and the throttle is moved to the idle position.

The procedure for lowering the landing gear is to rotate the winding handle 19 turns, when it should then stiffen as the three brace struts go over-centre. The handle should then be rotated a further ¼ of a turn before engaging the pawl, which locks the winding handle in place.

#### **Previous occurrences**

There have been a number of occurrences in both the UK and France when the landing gear on Gardan 80 aircraft has collapsed on landing. In June 1970, following a number of landing gear incidents, none of which caused injury to the pilot or passenger, the aircraft manufacturer issued a Service Bulletin



**Figure 2**

Landing gear operating mechanism

(SB 31/1) which required the examination and testing of the landing gear every 100 flying hours or following a 'rough' landing.

G-ATGY underwent its annual inspection approximately nine flying hours prior to the incident during which SB 31/1 was carried out.

### Comment

The landing gear position microswitches only give the relevant position of the screw jack and do not detect if the brace struts have moved into the over-centre position. The pilot reported that he had a 'green' gear indicating light and the nose landing gear retracted during the

ground roll shortly after the nosewheel made contact with the runway. This suggests that the nosewheel brace strut might not have been fully over-centred and, consequently, the nose landing gear would have started to collapse rearwards as the wheel was lowered onto the runway. As it collapsed, a force would have been transmitted through the control linkages sufficient to detach the forward part of the winding handle securing bracket away from the pedestal. At the same time, the main landing gear torque tube would have rotated, causing the main landing gear brace strut to move out of the over-centre position and thereby allowing the main landing gear to retract under the weight of the aircraft.