ACCIDENT

Aircraft Type and Registration:	Piper PA-23-160 Apache, G-MOLY
No & type of Engines:	2 Lycoming O-320-B3B piston engines
Year of Manufacture:	1959
Date & Time (UTC):	17 July 2006 at 1645 hrs
Location:	Little Shelford, Cambridge
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Damage to left wing tip, pitot mounting, left flap and left landing gear drag link
Commander's Licence:	Private Pilot's Licence
Commander's Age:	54 years
Commander's Flying Experience:	2,242 hours (of which 134 were on type) Last 90 days - 29 hours Last 28 days - 15 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and aircraft examination by the repair agency

Synopsis

While on the ground, the pilot inadvertently operated the landing gear retraction lever resulting in the collapse of the left gear and causing damage to the aircraft. The aircraft anti-retraction system was found to have been in the 'FLIGHT' position, thus allowing the gear to retract while on the ground.

History of the flight

The aircraft had completed an uneventful flight from White Waltham to Little Shelford in Cambridgeshire. Having landed on the easterly runway, the aircraft was taxied off the runway and, while stationary, the pilot inadvertently operated the landing gear retraction lever. Both left and right landing gear 'UNLOCKED' lights illuminated. Realising his mistake, the pilot stopped both engines in order to limit the damage and attempted to manually pump the landing gear into the down position. The right landing gear 'DOWN AND LOCKED' indication did illuminate, however the left landing gear collapsed causing damage to the left wing tip, left flap and its operating mechanism. The single occupant exited the aircraft without difficulty.

The aircraft was jacked, the left landing gear lowered and all three landing gear 'DOWN AND LOCKED' indications then illuminated.

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System description

The aircraft has a hydraulically actuated retractable tricycle landing gear system; each landing gear leg is individually actuated by a hydraulic actuator. When the landing gear is selected DOWN, hydraulic pressure causes each actuator to extend a drag link on the respective gear leg until the link reaches an over-centre position. The final movement of the actuator causes a mechanical lock to lock the drag link in the over-centre position. Once the landing gear has locked down, microswitches for each gear leg trigger their respective green lights in the cockpit and the gear selector returns to the neutral position. When the gear is selected UP, the actuators retract causing the downlocks to unlock and the drag links to collapse. Once the gear is locked up, microswitches cause an amber light in the cockpit to illuminate and the gear selector returns to the neutral position. When no lights are illuminated the landing gear is in an intermediate position.

If the engine-driven hydraulic pump fails, an emergency hand pump can be used in its place. In the event of a hydraulic system failure caused by a line rupturing, an emergency CO_2 bottle can be activated to blow the landing gear down.

The aircraft is fitted with an anti-retraction system to prevent the landing gear from retracting when the aircraft is on the ground. A landing gear anti-retraction valve is located on the left main gear strut housing. This restricts hydraulic fluid pressure from building up in the retraction system until the landing gear strut is fully extended, ie the aircraft weight is no longer on the wheels.

Aircraft examination

Figures 1 and 2 respectively show the anti-retraction valve in the closed position, ie aircraft in flight, and the open position, ie aircraft on the ground. The actuating rod is attached to the left main landing gear; when the oleo is in the compressed position, the rod is pushed

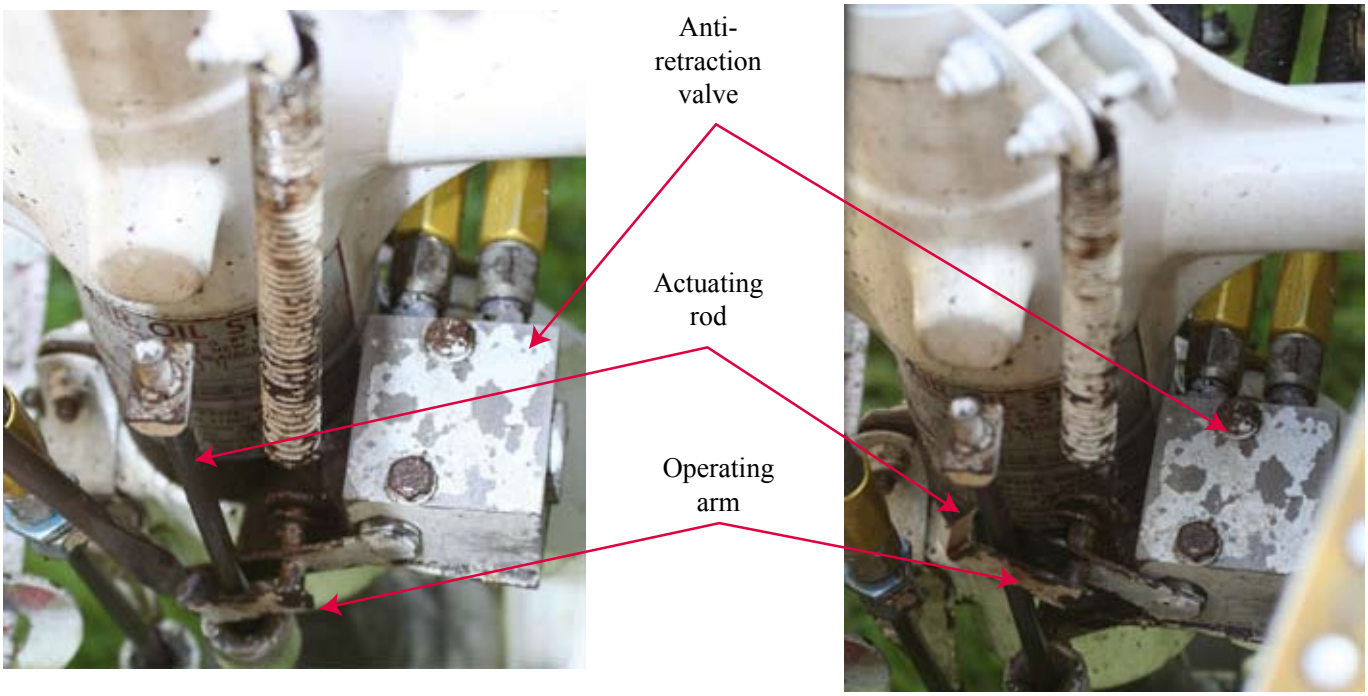

Figure 1

Anti-retraction valve in closed position
- aircraft in flight

Figure 2

Anti-retraction valve in open position
- aircraft on ground

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up which in turn pushes the valve operating arm up. Examination of the anti-retraction valve showed that the operating arm had been stuck in the closed position. Debris and corrosion in this area had built up causing the operating arm to become stuck. In the opinion of the repair agency it had been in this condition for some time and thus represented a dormant failure. With the anti-retraction valve in the 'FLIGHT' position it was possible for the landing gear to retract when the aircraft was on the ground.

The operating arm was manually freed, the spring pulled the operating arm into the ground position, and the valve then operated correctly.

The Piper Apache service manual requires a check of the anti-retraction system at every 50 hour inspection. The last check on G-MOLY was an annual inspection carried out on the 17 February 2006.

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