

No: 1/91

Ref: EW/G90/08/30

Category: 1c

Aircraft Type and Registration: Piper PA-34-200T, G-BEHU

No & Type of Engines: 2 Continental piston engines TSIO-360-E (left)
LTSIO-360-E (right)

Year of Manufacture: 1978

Date and Time (UTC): 11 August 1990 at 0400 hrs

Location: East Midlands Airport

Type of Flight: Private

Persons on Board: Crew - 1 Passengers - 1

Injuries: Crew - None Passengers - None

Nature of Damage: Fire damage to aircraft nose

Commander's Licence: Commercial Pilot's Licence with IMC, Night and Instructor ratings

Commander's Age: 39 years

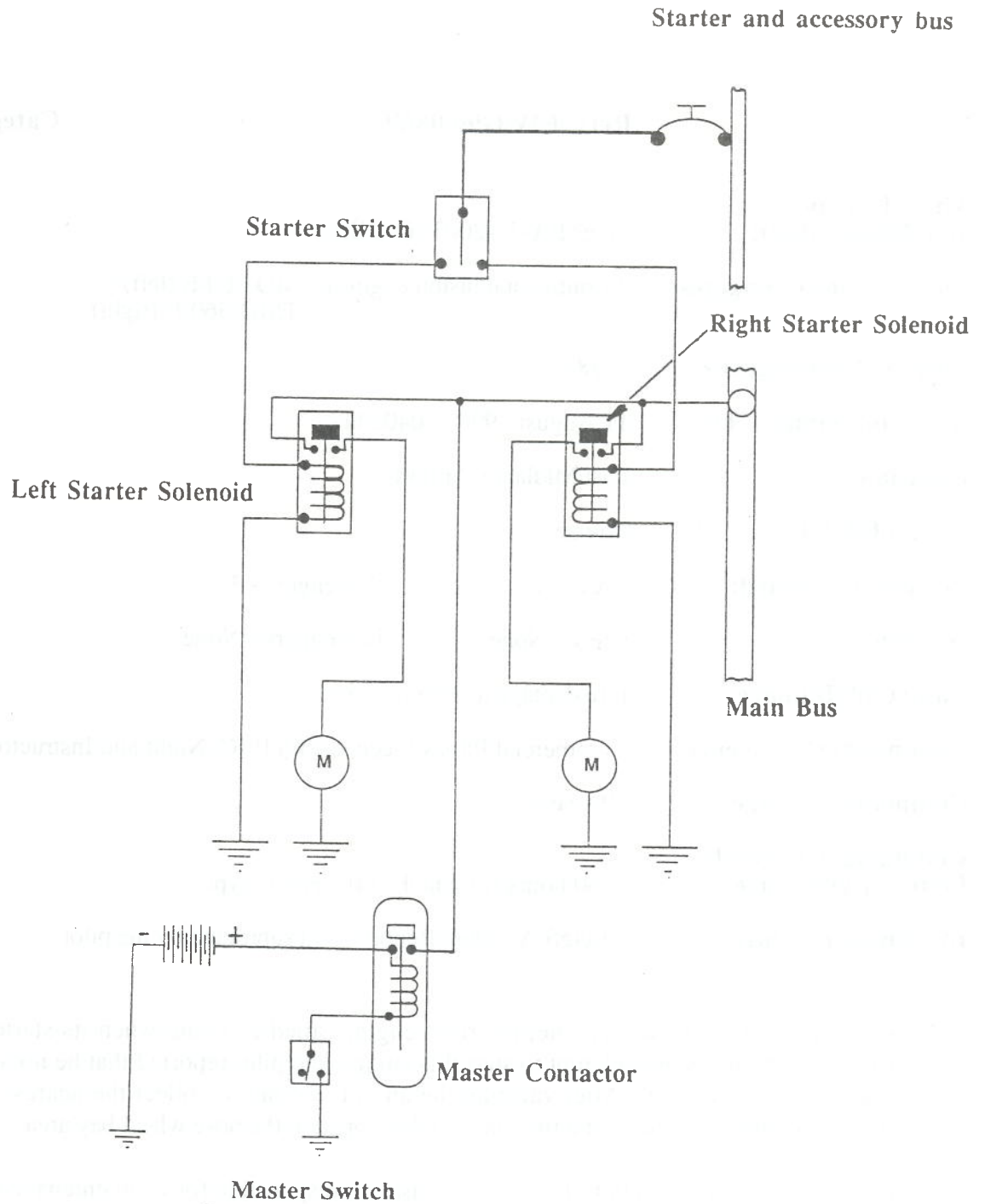
Commander's Total Flying Experience: 1800 hours (of which 100 were on type)

Information Source: Aircraft Accident Report Form submitted by the pilot

After a normal start of the left engine, the right engine failed to rotate when its starter circuit was energised. During the second attempt to start this engine, the pilot reported that he noticed a smell of burning and evidence of fire. After vacating the aircraft, he ran to collect the nearest available fire extinguisher. He then extinguished a fire that had developed in the nose wheel bay area.

Subsequent inspection of the aircraft by the organisation responsible for its maintenance revealed that the fire had started in the region of the battery, located at the forward end of the nose compartment beneath plastic trim. Further investigation revealed that the field coils within the right starter motor were loose and had probably been binding on the armature, thereby impeding its rotation. It was reported that, at the start of a flight on the previous day, this engine had been slow to turn over on the starter motor and that the cockpit lights had dimmed during the starting sequence.

A simplified version of the engine starter circuits is shown at figure 1 and, as may be seen, each motor is fed, in turn, from the main electrical busbar without the protection of a fuse or circuit breaker. Thus if the starter solenoid is energised for a period of time, any points of electrical resistance in that circuit will generate heat to a greater or lesser extent, dependant on the level of resistance, as a result of the excessively high current that can be delivered from the battery with such a stalled starter motor. In this situation it is likely that the internal resistance of the battery itself would be of most significance (typically 1 to 1.5 ohms), thereby generating heat internally and possibly inducing internal electrical "shorting" and consequent fire.



SIMPLIFIED STARTER MOTOR CIRCUIT

FIGURE 1