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AIRWORTHINESS

MAINTENANCE - AVIONICS

UNPROTECTED STARTER CIRCUITS IN AIRCRAFT

1. Over the past few years several incidents have occurred where starter relay contacts have remained energised after an engine start.
2. The main causes of relay failure are normally either internal corrosion of the relay or badly burnt relay contacts which finally arc together. A failure of this nature would normally go undetected after an engine start but could result in an electrical fire caused by the starter motor burning out or the starter cable overheating due to the continuous high current flow.
3. Unfortunately, owing to the construction of most starter relays it is not possible to examine them internally for condition during normal maintenance operations, with the result that the only time the malfunction of a relay will be detected is after a hazardous situation has developed.
4. Owing to the high current drawn by an aircraft starter, such circuits are not normally protected by fuses or circuit breakers and the normal circuit is such that the starter motor is connected directly to the battery through the starter relay and the battery master relay.
5. From the foregoing it can be seen that there is no simple way of obviating this hazardous situation, but for a very low cost it is possible to install a warning light(s) to indicate to the pilot that take-off should not be attempted, and that electrical power should be disconnected because the starter circuit is still energised.
6. In view of the foregoing, it is strongly recommended that all aircraft where this situation could develop be suitably modified to incorporate an engine starter warning light so that the pilot can be forewarned of impending danger.