Pylon inspections follow DC-10 crash

DC-10 N110AA of American Airlines crashed shortly after take-off from Chicago O'Hare Airport on May 25 killing 259 passengers, 13 crew and two people on the ground. The aircraft was making a scheduled flight to Los Angeles.

The left engine was seen to separate from the aircraft at rotation and this was accompanied by a trail of fuel or smoke of sufficient intensity to cause an air traffic controller to radio a warning to the aircraft's captain. This warning was not acknowledged. The aircraft started its initial climb but lateral control appeared to be lost and it dived into the ground after rolling to the left until vertically banked. Impact was alongside a caravan site less than a mile from the runway but the complete left engine and pylon had come to rest two thirds of the way along the runway. The main wreckage disaster was integrated and there was a severe fire.

Analysis of the accident centred at first on the discovery near the runway of both halves of a broken bolt from the thrust link assembly. The pylon is built forward from the lower primary structure at the top of the pylon to a pair of angle members bolted to the lower-wing surface. The unit acts like a single link of a bicycle chain and the loads are taken by lubricated bushes. These are located by half-inch bolts which pass through the hollow centres and carry washers to prevent lateral movement of the bushing. It was one of these bolts that was discovered broken by the side of the runway.

McDonnell Douglas advised operators on May 27 by means of a telexed Alert Service Bulletin to inspect the thrust-link bolts on their aircraft and this inspection was upgraded to an Airworthiness Directive by the US Federal Aviation Administration. Compliance was required by 0700 GMT on May 29. Britain's Civil Aviation Authority, along with other airworthiness bodies, endorsed the directive but the two Gatwick-based operators, Laker Airways and British Caledonian, had already started to inspect their aircraft.

By the morning of May 29 first inspections were completed and the thrust-link bushes to be removed and visually inspected. Both, however, had decided to renew the thrust-link bolts, later that day the FAA revised its AD, saying that “grave and potentially dangerous deficiencies” had been revealed during investigation of the Chicago accident.

The revised AD called for “a detailed visual inspection of the upper and lower plug areas of the pylon-to-front spar attachment fitting, the aft monoball joint attachment and the pylon upper spar web. . . . In addition conduct a thorough visual inspection of the entire remaining pylon-to-wing attach area paying particular attention to the thrust-link support fittings, wing and pylon, the pylon-to-front-spar attach fitting and the aft pylon support bulkhead and associated wing support fitting for evidence of cracks, condition and security of fasteners and other signs of structural distress. . . . To ensure the integrity of the thrust bushings remove and visually inspect the thrust-link bolts, fore and aft, and visually inspect the interior surface of the bushings for any cracking or structural distress. . . . Note: difficulty in removing the bolts is a possible indication of distress within the bushing.”

The FAA now requires this inspection to be carried out every 10 days or 100 flying hours. Before the first inspection the FAA also requires the thrust-link bushings to be removed for magnetic-particle examination.

The FAA revision of its AD on May 29 included the A300 as an affected type because of an alleged similarity between its pylon mountings and those of the DC-10. The FAA order that the A300s operated by Eastern should also be inspected was rescinded within hours after repre-