



U.S. Department
of Transportation
**Federal Aviation
Administration**

SAFO

Safety Alert for Operators

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Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

Subject: Magnetic Variation Errors with Pegasus FMC on B-717, MD-10, and MD-11

Purpose: This SAFO alerts operators of B-717, MD-10, and MD-11 aircraft equipped with Honeywell Pegasus flight management computers (FMC) that the Pegasus FMC calculation of the internal magnetic variation (magnetic declination) was found to contain errors of up to 15 degrees. These magnetic variation (MAGVAR) errors adversely impact operations at all latitudes between 0 degrees and 6 degrees West longitude and affect many navigational bearing references. These errors are attributable to math miscalculations that resulted from an operating system software rewrite.

Discussion: All FMC "bearing" or course information that is dependent upon MAGVAR from the FMC will be in error. This error will affect a number of flight management system (FMS) functions and will preclude flightcrews from using the FMS navigation (NAV) mode to conduct non-directional radio beacon (NDB) approaches, course, and heading legs, and from flying any published holding patterns unless the holding fix is co-located at a VHF omni-directional range station (VOR), VHF omni-directional range station/distance measuring equipment (VOR-DME), or Collocated VOR and TACAN (VORTAC) Navigational Aid (NAVAID). The MAP and PLAN displays, if affected by MAGVAR error, will depict misaligned tracks and courses. If the FMS NAV mode is engaged, guidance will reflect these errors. Missed Approach HOLDS associated with all approaches must not be flown in NAV due to misalignment of the HOLD pattern, unless they are referenced to holding fixes located at VOR-type NAVAIDS. Course and heading legs, and holding patterns referenced to any non-VOR type waypoint should not be flown in FMS NAV mode.

FMS NAV mode is usable for routes constructed of unmodified FMS NAV database waypoints and will provide accurate FMS NAV guidance, since the geographic location of these waypoints is correct. Data which uses VOR, VOR-DME, or VORTACs have correct station declination values are considered to be fully usable. In addition, all basic and auto flight modes of compass heading and track are usable as well as are localizer and instrument landing system approaches.

Recommended Action: Directors of safety, directors of operations, chief pilots, fractional ownership program managers, training managers, and dispatchers of aircraft equipped with Honeywell Pegasus should instruct pilots to always check FMS Flight Plans by comparing the PLAN mode displayed route and MCDU route with air traffic control clearance and the appropriate charts. Route misalignment in the PLAN mode indicates a segment affected by the MAGVAR error. The Boeing Company published FCOM Advisory Bulletins for all known models equipped with Pegasus FMS. These Advisory Bulletins should be observed until notified by The Boeing Company.