

MD – RA

Minister's Delegates - Recreational Aviation
Représentants du Ministre - Aviation de loisir

Inspection Service

Service d'inspection

Magnetic Direction Indicator / Compass Deviation Card / EFIS / Back-up Battery

Definition:

Magnetic Compass,

Contains ferrous-magnets which interact with the earth's magnetic field and aligns itself to the direction of the local magnetic field.

Stand-Alone,

Means that the compass is in no way connected to any other directional devices and/or electrical power source, in the aircraft. Generally use as the sole source of magnetic direction on light aircraft and as back-up in more sophisticated aircraft.

Magnetic Sensor/Magnetometer,

Solid state electronic device which interacts with the earth's magnetic field and electronically produce outputs proportional to the local magnetic lines of forces. Magnetic heading source of information as displayed on the EFIS Magnetic Direction Indicator. The magnetic sensor/magnetometer is an integrated element of an Air Data Attitude/Heading Reference System, (ADAHRS), in an EFIS.

Magnetic Direction Indicator,

Displays the heading and/or track, (course) of the aircraft, together with the source of navigation information. The, displays can be slaved to magnetic compass, track to next waypoint, VOR radials etc... It is the main direction indicator on an IFR instrument panel.

Independent,

Means that when the primary electrical power source fails, the EFIS system will automatically switch to the back-up battery to display magnetic heading for a minimum of 45 minute on the EFIS. Where multiple EFIS are installed, the builder/operator of the aircraft should have complete knowledge of the failure modes and effects of the complete system. As part of the final/import inspection the builder/operator will be required to demonstrate the different failure modes and their effects to the inspector.

Aircraft Magnetic Deviation,

When the aircraft generated magnetic field(s) are aligned with the earth magnetic field, it causes a deviation of the output of the magnetic sensor. The aircraft generated magnetic field(s) can change location, vary in magnitude and intensity dependant on what is operated at the time. When calibrating a compass the status of the electrical and mechanical equipment should replicate as close a possible the actual in-flight conditions. The engine should be running with all electrical power activated.

Compass Deviation Card,

A card recording the aircraft magnetic deviation at no less than 30 degrees increment through 360 degrees. The card must be installed in view of the Magnetic Direction Indicator and as close as possible.

Magnetic Direction Indicator Calibration,

Magnetic Direction Indicator(s) must be calibrated before the issue of the Special Certificate of Airworthiness. Each calibration reading must be in terms of magnetic headings in not more than 30° increments. The results of the calibration must be written in the journey log book and a compass deviation card must be installed on the instrument panel as close as possible from the Magnetic Direction Indicator. When a deviation of more than 10 degrees is encountered, caused by the operation of electrical equipment, the compass deviation card must state which electrical load, or combination of loads, causes the deviation of more than 10 degrees when turned on.

Basically nothing has changed concerning the process of testing, calibrating and displaying the results of the calibration. Manufacturers may have additional and/or different testing requirements; the basic procedure as stated above must be performed.

Amateur built aircraft are neither certified nor certifiable but they must operate in the all encompassing environment which is defined in the CAR's.

Below are the applicable paragraphs used as reference to write the above document.

Part VI - General Operating and Flight Rules

Division II — Aircraft Equipment Requirements

Power-driven Aircraft — Day VFR

605.14 No person shall conduct a take-off in a power-driven aircraft for the purpose of day VFR flight unless it is equipped with

(d) a magnetic compass or a magnetic direction indicator that operates independently of the aircraft electrical generating system;

523.1327 Magnetic Direction Indicator

Except as provided in paragraph (b) of this section:

(1) Each magnetic direction indicator must be installed so that its accuracy is not excessively affected by the aeroplane's vibration or magnetic fields; and

(2) The compensated installation may not have a deviation, in level flight, greater than ten degrees on any heading.

(b) A magnetic non-stabilised direction indicator may deviate more than ten degrees due to the operation of electrically powered systems such as electrically heated windshields if either a magnetic stabilised direction indicator, which does not have a deviation in level flight greater than ten degrees on any heading, or a gyroscopic direction indicator, is installed. Deviations of a magnetic non-stabilised direction indicator of more than 10 degrees must be placarded in accordance with 523.1547 (e).

523.1547 Magnetic Direction Indicator

(a) A placard meeting the requirements of this section must be installed on or near the magnetic direction indicator.

(b) The placard must show the calibration of the instrument in level flight with the engines operating.

(c) The placard must state whether the calibration was made with radio receivers on or off.

(d) Each calibration reading must be in terms of magnetic headings in not more than 30° increments.

(e) If a magnetic non-stabilised direction indicator can have a deviation of more than 10 degrees caused by the operation of electrical equipment, the placard must state which electrical loads, or combination of loads, would cause a deviation of more than 10 degrees when turned on.

Standard 625 APPENDIX C - Out of Phase Tasks and Equipment Maintenance Requirements

10. Non-stabilized Magnetic Direction Indicators (MDIs)

(a) Except as provided in (b) and (c), non-stabilized magnetic direction indicators shall be calibrated, and a dated correction card installed for each indicator, at intervals not exceeding 12 months;