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SERVICE BULLETIN No: BO-24/2016 MDM-1 FOX

DESIGNATION-TYPE/MODEL: MDM-1 FOX

SERIA / NUMBER: All S/N MDM-1 FOX model gliders,
variants: MDM-1 FOX, MDM-1P FOX-P, MDM-1M FOX

CONCERNS: Location, weight and method of attaching a fixed ballast for
adjustment of empty glider C.G. (Center of Gravity)

COMPLIANCE TIME: At operator discretion,
when adjustment of the empty glider C.G. position is necessary

The technical content of this document is approved
under the authority of DOA ref. EASA.21J.117

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1. GROUNDS FOR ISSUANCE OF THIS BULLETIN

In long-term glider operation and maintenance a (Center of Gravity) C.G. position of empty glider might be moved outside the limitations allowed in Flight Manual item 2.8 CENTER OF GRAVITY, due to a change in installed equipment, performed repair, repainting or modification introduced. In every such case an adjustment is needed before return to operation, where one of available methods is installation in a glider of corrective fixed ballast, bringing the C.G. position to the allowed range. This Bulletin is defining location, weight and recommended method of attaching the fixed ballast in a glider.

2. LIST OF FACTORY NOS COVERED WITH THIS BULLETIN

This Bulletin concerns all Serial Nos of MDM-1 FOX glider,
all variants: MDM-1 FOX, MDM-1P FOX-P, MDM-1M FOX

3. PROCEDURE

1. Weigh and determine the C.G. position of empty glider in accordance with Technical Service Manual item 2.6 WEIGHING THE GLIDER.
2. Calculate the necessary weight of fixed ballast with the formula given below (basing on results of weighing per item 1):

(use the arm of front mounted ballast for moving the C.G. forward, and
the arm of rear mounted ballast for moving the C.G. rearward)

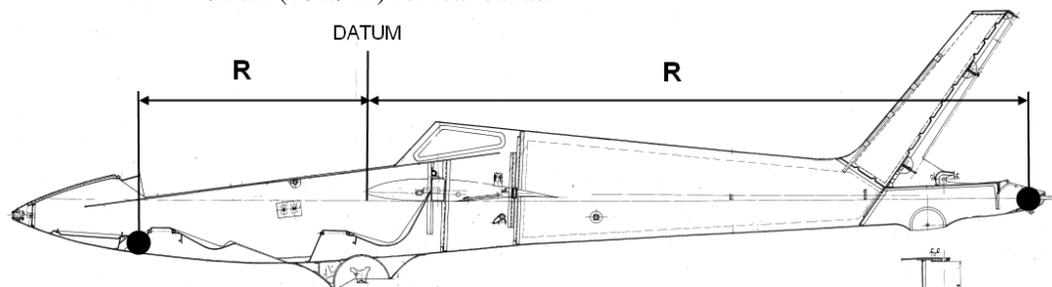
$$Q_B = \frac{(X_{Expected} - X_{Empty})}{(R - X_{Expected})} \cdot Q_{Empty}$$

where:

- | | |
|----------------|----------------------------------------|
| Q_B | necessary weight of fixed ballast |
| Q_{Empty} | weight of empty glider |
| $X_{Expected}$ | expected C.G. position of empty glider |
| X_{Empty} | actual C.G. position of empty glider |
| R | arm of fixed ballast |

all dimensions – in reference to wing leading edge, being a reference basis/Datum for glider weighing, whereas the arm of fixed ballast is:

- $R = -143$ cm (-56.3 in) for front ballast
 $R = 462$ cm (181.9 in) for rear ballast



- Suitable location for installation of a front, fixed ballast is the fore web of seat pan, below front floor. Access to the site of ballast installation is achieved after removal of access hole caps in front floor.

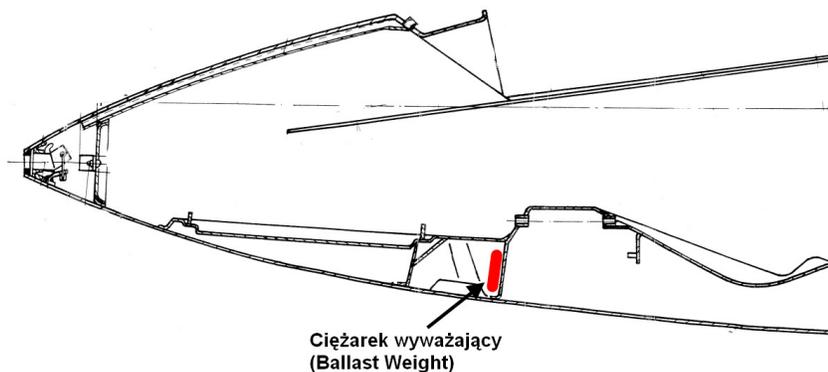


Fig. 1 Area of front fixed ballast installation.



Fig. 2 Two round openings
facilitate embedding the ballast on front web of seat pan

Adjustment of glider balancing can be achieved by installation of either 1 or 2 ballast weights, the combined weight of which cannot exceed 4.5 kg (9.9 lb).

Ballast tightened with bolts

Each of ballast weights (1) can be fixed to the web of seat pan by tightening with two M8 steel bolts (3). To ensure correct fastening to seat pan web, its thickness on the area supporting the ballast must be locally increased to approx. 2.5 mm, either by gluing-up the separately fabricated composite flat plate (2) or by direct lamination of glass fabrics (symmetric glass fabric, 200 g/m^2 , $\pm 45^\circ$) – in the amount corresponding to 1.0 mm thickness in either case. The reinforcement should extend $L=25 \text{ mm}$ above the top edge of ballast or, if impractical for the sake of ballast dimensions, over the whole height of web as illustrated in Fig. 3. Employ self-locking nuts. The ballast weight is to be produced of bronze, brass or steel.

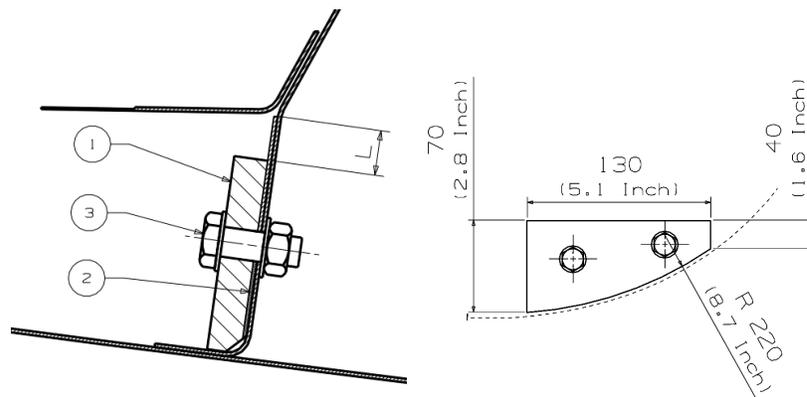


Fig. 3 Ballast bolt-tightening, with approximate dimensions

Ballast fastened by lamination:

Each of ballast weights (2) can be embedded on composition of epoxy resin and aerosil with chopped glass, and covered with 4 layers of glass fabric (symmetric fabric, 200 g/m^2 , $\pm 45^\circ$). Before embedding, wrap the ballast with 1 layer of 200 g/m^2 glass fabric. Material of ballast: bronze, brass, steel, lead or lead shot mixed with a composition: epoxy/ aerosil/ chopped glass.

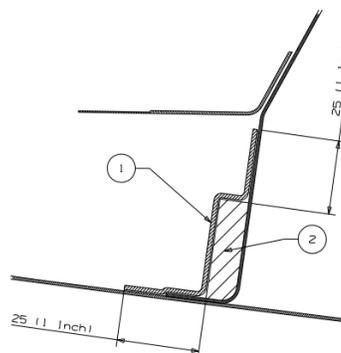


Fig. 4 Ballast embedding by lamination

4. Suitable location for installation of a rear, fixed ballast is the end of fuselage, in the area where the rear hand grip for glider lifting is attached. Maximum weight of ballast installed at this location is limited to 2.2 kg.

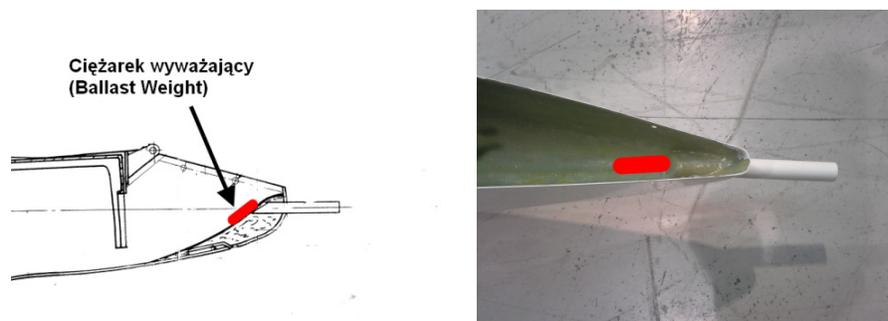


Fig. 5 Area of rear fixed ballast installation.

Ballast laminating:

Ballast (1) must be embedded on composition of epoxy resin with aerosil and chopped glass, and next covered with 4 layers of glass fabric (2) (symmetric fabric, 200 g/m²). Reinforcement fibers direction +/- 45°. Before embedding, wrap the ballast with 1 layer of 200 g/m² glass fabric. Material of ballast: bronze, brass, steel, lead or lead shot mixed with a composition: epoxy/ aerosil/ chopped glass.

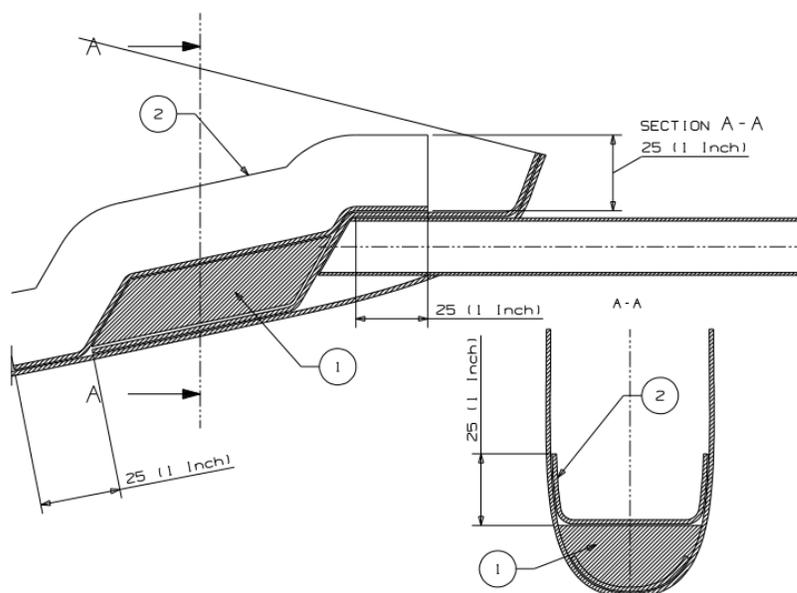


Fig. 6 Installation of rear ballast.

5. Record modification in the glider logbook.

LABOUR DEMAND

Time required to complete the modification : 2 days/2 persons

(1 of a.m. persons – mainly to assist in glider weighing)

1. MASS (WEIGHT) AND BALANCE

Repeat weighing and C.G. calculation of empty glider, after modification - in accordance with Technical Service Manual item 2.6 WEIGHING THE GLIDER.

2. ENCLOSURES

No Enclosures

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