

SERVICE INSTRUCTION

Propeller mass moment of inertia for ROTAX® Engine Type 916 i (Series), 915 i (Series), 912 i (Series), 912/914 (Series) and 2 Stroke Aircraft Engines

ATA System: 72-10-00 Propeller gearbox

1) Planning information

To obtain satisfactory results, procedures specified in this publication must be accomplished with accepted methods in accordance with prevailing legal regulations.

BRP-Rotax GmbH & Co KG cannot accept any responsibility for the quality of work performed in accomplishing the requirements of this publication.

1.1) Applicability

All versions of ROTAX® engine types:

Engine type	Serial number
916 i (Series)	all
915 i (Series)	all
912 i (Series)	all
912 (Series)	all
914 (Series)	all
2-stroke UL aircraft engines	all

1.2) Concurrent ASB/SB/SI and SL

In addition to this Service Instruction the following documents must be observed and complied with:

in general all relevant Alert Service Bulletins (ASB), Service Bulletins (SB), Service Instructions (SI), Service Letters (SL), Service Instruction - Parts and Accessories (SI-PAC).

1.3) Reason

In the course of continuous development and standardization, ROTAX® may release update.

1.4) Subject

Propeller mass moment of inertia for ROTAX® Engine Type 916 i (Series), 915 i (Series), 912 i (Series), 912/914 (Series) and 2 Stroke Aircraft Engines.

1.5) Compliance

NONE - For Information Only.

1.6) Approval

The technical content of this document is approved under the authority of the DOA ref. EASA.21J.048.

1.7) Labor time

None.

1.8) Mass data

Change of weight and inertia - - - see Fig. 2 diagram Chapter 3.

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1.9) Electrical load data

No change.

1.10) Software modifications

No change.

1.11) References

In addition to this technical information refer to current issue of

- in general Operators Manual (OM)
- in general Maintenance Manual (MM)
- in general Installation Manual (IM) and in particular: Chapter 61-00-00

NOTE: The status of the Manuals can be determined by checking the table of amendments. The 1st column of this table shows the revision status. Compare this number to the one listed on the ROTAX website:

www.flyrotax.com. Updates and current revisions can be downloaded for free.

1.12) Other Publications affected

None.

1.13) Interchangeability of parts

- Not affected

2) Material Information

2.1) Material

Price and availability will be provided on request by ROTAX® Authorized Distributors or their independent Service Centers.

2.2) Company support information

None.

2.3) Material requirement per engine

None.

2.4) Material requirement per spare part

None.

2.5) Rework of parts

None.

2.6) Special tooling/lubricants- /adhesives- /sealing compounds

None.

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3) Accomplishment/Instructions

- ROTAX® reserves the right to make any amendments to existing documents, which might become necessary due to this standardization, at the time of next revision or issue.

NOTE: Before maintenance, review the entire documentation to make sure you have a complete understanding of the procedure and requirements.

Accomplishment

All measures must be implemented and confirmed by at least one of the following persons or organizations:

- ROTAX® - Airworthiness representatives
- ROTAX® - Authorized Distributors or their independent Service Centers
- Persons approved by the respective Aviation Authorities
- Persons with type-specific training



All work has to be performed in accordance with the relevant Maintenance Manuals of the respective engine type.

General

Further material on general inspection, maintenance and repair can be found also in relevant Advisory Circular AC 43.13 from FAA.

Advisory Circular

This Advisory Circular (AC) contains maintenance methods, techniques and practices.

3.1) General

See Fig. 2. To facilitate determination of the actual mass moment of inertia of a given propeller, the following diagram has been established covering typical propellers commonly used for ultra-light aircraft (assuming they are applied according to their instructions of use).

3.2) Procedure

3.2.1) Propeller suspension

The following steps are necessary:

See Fig. 1.

Step	Procedure
1	Fit a suitable symmetrical suspension fixture to the propeller hub (see Fig. 1). It should be strong enough to support the propeller but as light as possible in order not to falsify the value determined.
2	Suspend the propeller on 2 thin wires of 1830 mm (72 in.) length (see Fig. 1), in a symmetrical distance of 152.5 mm (6 in.) from the propeller hub center, as per illustration.
3	Measure the wire length of 1830 mm (72 in.) between the connection points. Take care the wires hang down parallelly. Chose a wire diameter as small as practical (0.8 mm (0.032 in.) stainless steel safety wire is suitable for most propellers)) to keep the torsional and bending resistance as low as possible. Respect the indicated wire length and distance with maximum accuracy.

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3.2.2) Determination of time factor

See Fig. 1.

Step	Procedure
1	Turn the suspended propeller in its horizontal axis by 5° - 10° and determine with a stop watch the time for 30 horizontal oscillation cycles.

NOTICE

One cycle means a complete oscillation, forth and back, starting to count at "zero".

There should be no wind, fans, or air disturbance during the test that can influence the motion. Do not allow any pendulum effects only rotation.

Step	Procedure
2	Clock the time for 30 oscillations exactly in seconds - this is an essential factor for determination of mass moment of inertia.

3.2.3) Determination of propeller weight

Determine the total weight of propeller (as measured) in kg (lb.).

NOTE: Total weight includes all parts attached to the propeller flange. Example, propeller, retaining bolts, backing plate and spinner.

3.2.4) Determination of mass moment of inertia

See Fig. 2.

Step	Procedure
1	Mark the propeller weight on the diagram, connect it with the respective "time line" and read the mass moment of inertia (in kg cm ² / lb.ft. ²) vertically below the crossing point.

Example

Propeller total weight:	4.2 kg (9.3 lb.)
Time for 30 oscillating cycles:	175 sec.
Resulting in mass moment of inertia:	4500 kg cm ² (10.678 lb.ft. ²)

3.3) Admissible mass moment of inertia

Depending on construction of the various propeller gearboxes offered by ROTAX®, the maximal admissible mass moment of inertia of a propeller is for

	Min.	Max.
Gearbox "A" and "B"	-	3000 kg cm ² (7.119 lb.ft. ²)
Gearbox "C"	-	6000 kg cm ² (14.238 lb.ft. ²)
Gearbox for 916 iSc B	1500 kg cm ² (3.559 lb.ft. ²)	9000 kg cm ² (21.357 lb.ft. ²)
Gearbox for 915 i A	1500 kg cm ² (3.559 lb.ft. ²)	7500 kg cm ² (18.238 lb.ft. ²)
Gearbox for 912 i Sport	1500 kg cm ² (3.559 lb.ft. ²)	6000 kg cm ² (14.238 lb.ft. ²)
Gearbox for 912	1500 kg cm ² (3.559 lb.ft. ²)	6000 kg cm ² (14.238 lb.ft. ²)
Gearbox for 914	-	6000 kg cm ² (14.238 lb.ft. ²)

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NOTE: Moment of inertia values are only valid when propeller is proper balanced. A vibration limit of 0,15 IPS is acceptable, but it is recommended to continue with dynamic balance until 0,07 IPS or lower is achieved.

3.4) Warranty

Using propellers of a mass moment of inertia above the max. admissible values indicated by ROTAX® means reduced lifetime or damage of the gearbox.

For such defects due to propellers of excessive mass moment of inertia ROTAX® refuses any claims for indemnity regarding product liability and warranty.

3.5) Summary

These instructions (section 3) have to be followed in accordance with the deadlines specified in section 1.5.

The execution of the Service Instruction must be confirmed in the logbook.

NOTE: Work on EASA certified parts might affect the EASA Form 1 and does require appropriate documentation by authorized persons. Repairs must be entered into the engine logbook and also do apply for the EASA Form 1.

! A revision bar outside of the page margin indicates a change to text or graphic.

Translation into other languages might be performed in the course of language localization but does not lie within ROTAX® scope of responsibility.

In any case the original text in English language and the metric units are authoritative.

3.6) Inquiries

Inquiries regarding this Service Instruction should be sent to the ROTAX® Authorized Distributor of your area.

A list of all ROTAX® Authorized Distributors or their independent Service Centers is provided on www.flyrotax.com.

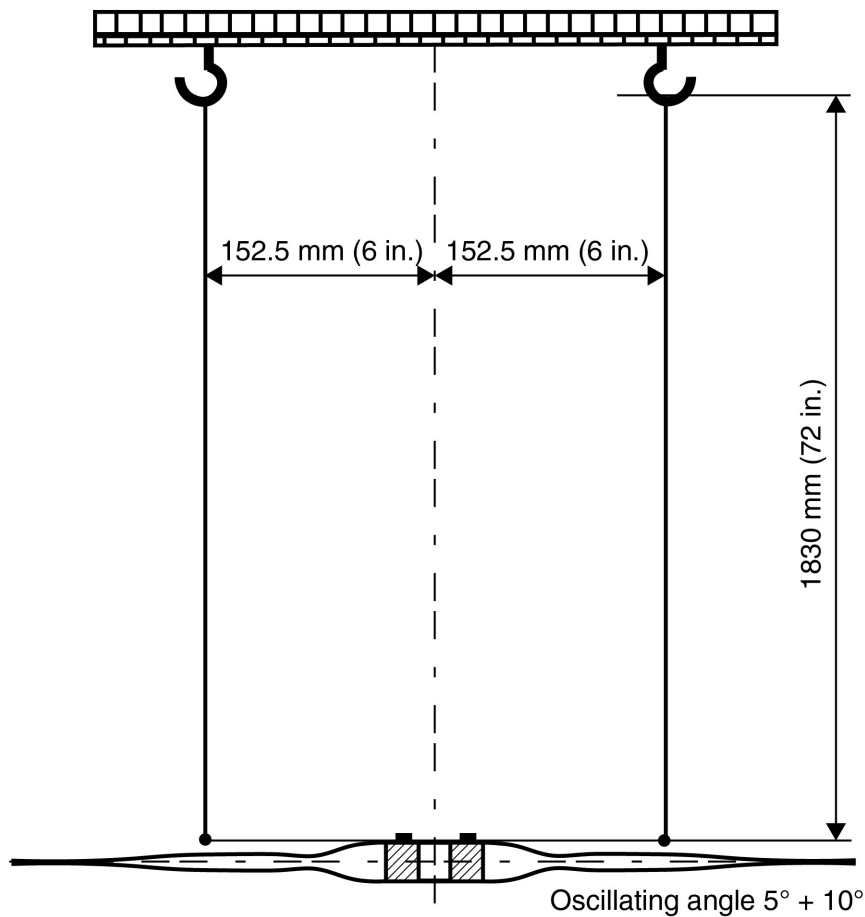
NOTE: The illustrations in this document show the typical construction. They may not represent full detail or the exact shape of the parts which have the same or similar function.

Exploded views are **not technical drawings** and are for reference only. For specific detail, refer to the current documents of the respective engine type.

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4) Appendix

The following schematic/diagram should convey additional information:



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Fig. 1
Test arrangement

NOTE: The suspension bracket should be fabricated as light as possible.

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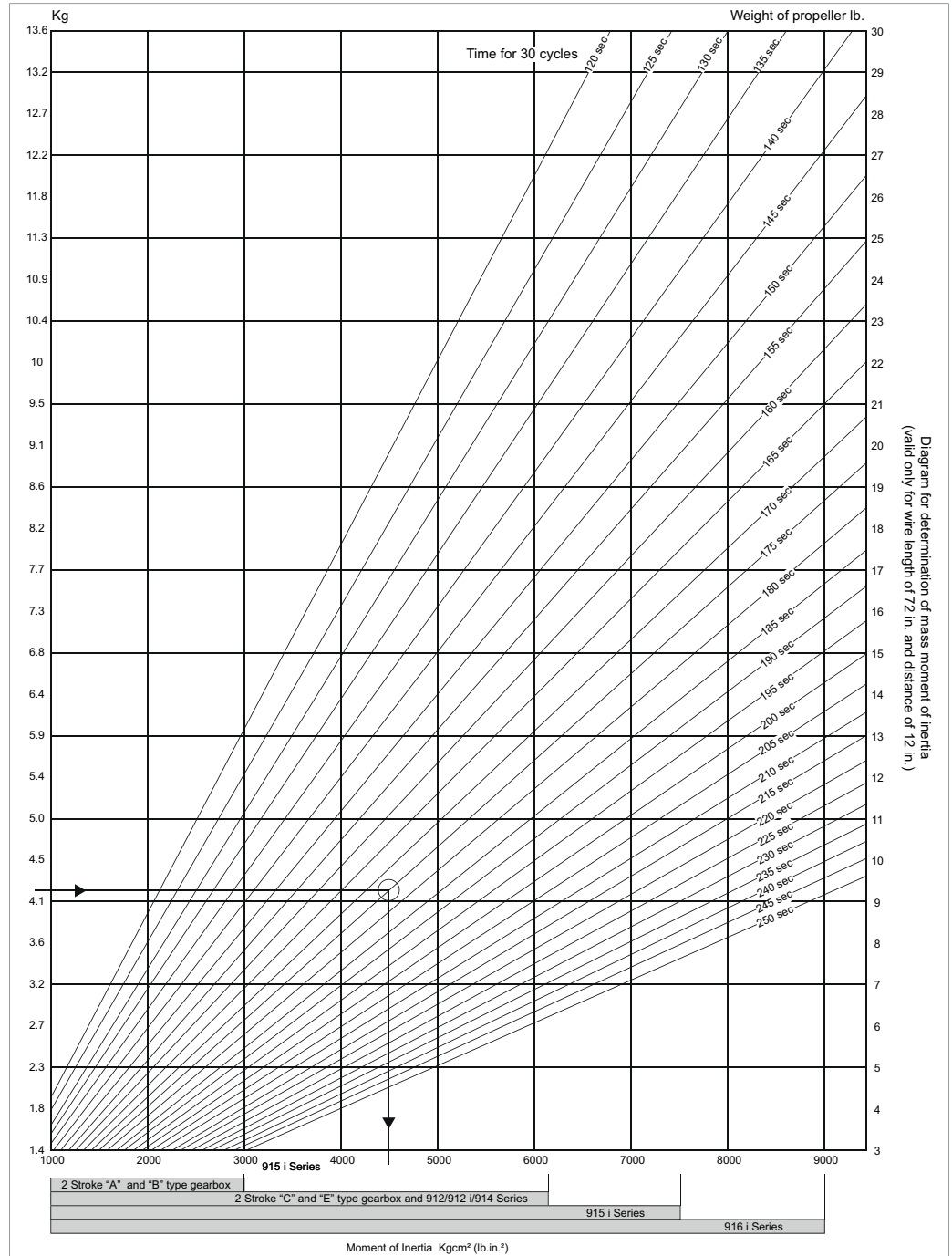


Fig. 2

Diagram for determination of mass moment

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