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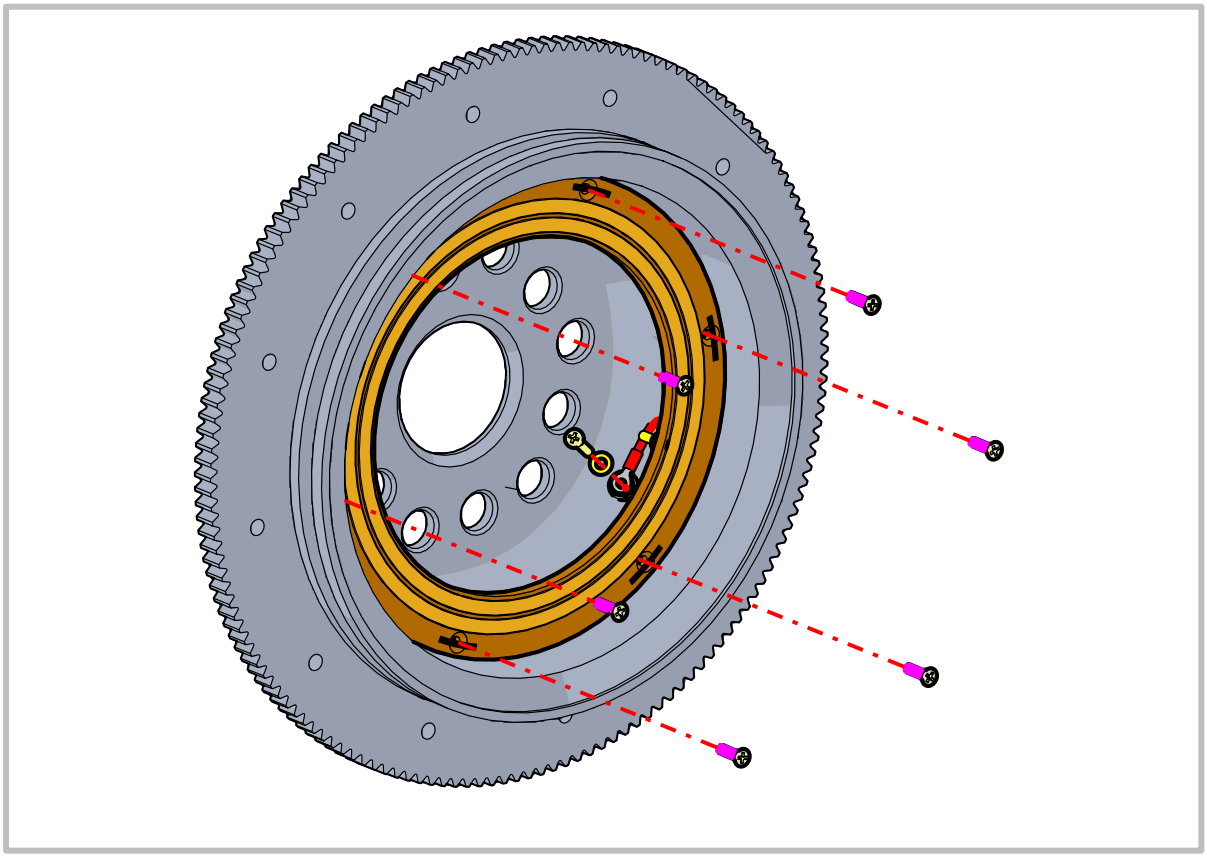
ASI-4-3-3

LYCOMING SLIPRING INSTALLATION (RING GEAR)

PROCEDURE



SUBJECT:	
Slipring Installation	
ASSEMBLY NO:	**APPLICABILITY:**
AR-LS(+RG)	All propeller models used with a Lycoming engine incorporating a ring gear (with large alternator pulley)

1. TOPIC

1.1 Introduction

This document covers the procedure for fitting an Airmaster Lycoming slipring assembly to a Lycoming starter ringer gear (with large alternator pulley). Installers must complete this task before mounting the hub and ring gear to the engine flange.

The existence of the starter ring gear in Lycoming engines interferes with the normal position of the slipring normally located behind the spinner backplate. As a result, the slipring is mounted inside the starter ring gear, and a multi-component sensor-brush bracket assembly is required.

> ⓘ *Note*
> *Generally, ring gears are pre-machined by Airmaster to suit the propeller, and the slipring is installed at the factory. Alternatively, a drawing for the required machining may be requested from Airmaster so that customers may arrange for their ring gear to be machined locally.*

> ⓘ *Note*
> *An alternative slipring assembly design is used for versions of the Lycoming starter ring gear that do not feature the alternator pulley.*

1.2 Lycoming Ring Gear

The existence of the starter ring gear in Lycoming engines interferes with the normal mounting position of the slipring which is typically behind the spinner backplate. As a result, the slipring is mounted inside the starter ring gear, and a multi-component sensor-brush bracket assembly is required.

Figure 1. *Airmaster Slipring Assembly inside Lycoming Ring Gear.*

1.2.1 Compatible Ring Gear Types

There are many variants of the Lycoming engine and only some of the ring gear types are compatible with the Airmaster slipring assembly. Essentially this must be the type with the largest diameter alternator pulley. This diameter inside the pulley should be 214mm (8.4in).

Some ring gears are already machined to accept sliprings for de-ice systems. These can still be used, but the mounting holes for the slipring must be rotated a few degrees. If you are not sure please contact Airmaster.

1.2.2 Ring Gear Preparation

To install the slipring assembly inside the ring gear, the ring gear must be pre-machined according to Airmaster specifications.

Airmaster can machine your ring gear for you and install the slipring assembly inside the ring gear. If you wish to machine the ring gear yourself, please contact Airmaster for the required drawing shown below.

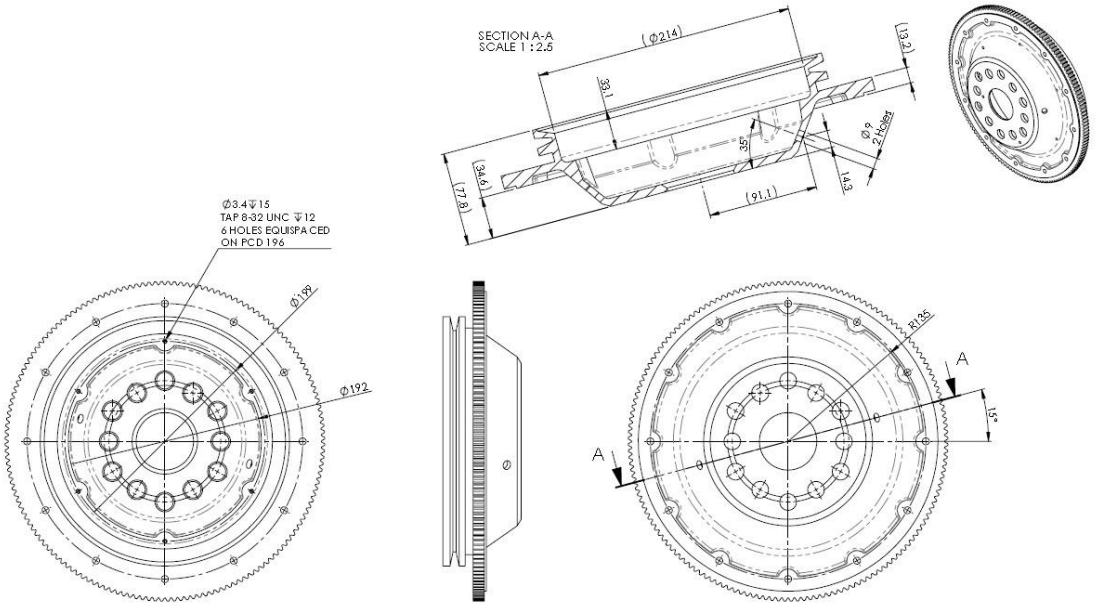


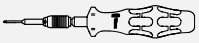
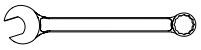
Figure 2. *Lycoming Ring Gear Machining Dimensions.*

2. MATERIAL REQUIREMENTS

2.1 Parts

ITEM	QTY	PART NO.	DESCRIPTION	IMAGE
1.	As required	AR-LS(+RG)	Airmaster Lycoming Slipring Assembly (incl. Ring Gear)	

2.2 Tooling

ITEM	QTY	DESCRIPTION	IMAGE
1.	1	PH2 Screwdriver	
2.	1	Torque Screwdriver (PH2) [1.6Nm]	
3.	1	Torque Screwdriver (11/32” Socket) [1.5Nm]	
4.	1	11/32” Spanner	
5.	1	Digital multimeter (with probes)	

2.3 Consumables

ITEM	QTY	DESCRIPTION	IMAGE
1.	As required	Loctite 222	
2.	As required	Loctite 243	
3.	As required	Loctite 263	
4.	As required	Loctite Primer 7471	
5.	As required	Torque-Seal	
6.	1	Permanent Marker	

2.4 Paperwork

ITEM	QTY	CODE	DESCRIPTION
1.	1	AR-LS(+RG)	Airmaster Lycoming Slipring Assembly (incl. Ring Gear) Drawing & BoM

2.5 PPE

ITEM	QTY	DESCRIPTION	IMAGE
1.	As required	Protective Gloves	

3. PROCEDURE

3.1 Install Isolating Bushes into Ring Gear

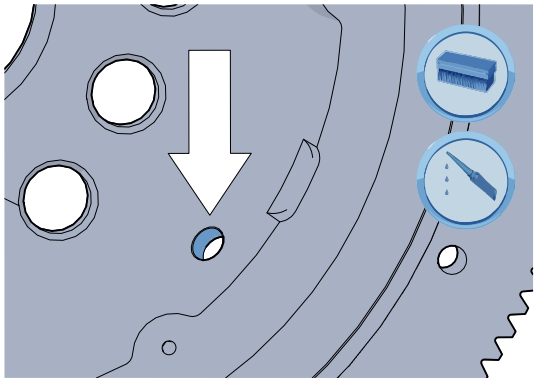
Note *Generally, this task is completed for ring gears that are machined by Airmaster.*

PROCEDURE

Step 1 Preparation

- Clean (2) holes machined through sides of ring gear.
- Blow out with dry compressed air.
- Apply primer to (2) machined holes and the outer diameter of (2) isolating bushes (*P0840*).

Attention *Cleaning agent, Loctite Primer 7471*



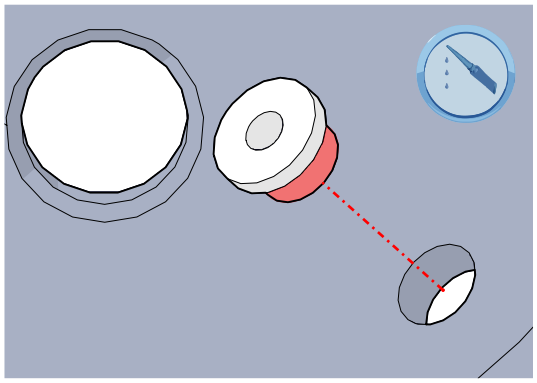
Step 2 Install Isolating Bushes in Ring Gear

- Apply a thin film of Loctite 263 to the outer diameter of (2) isolating bushes.
- Insert bushes into ring gear holes from inside.
- Ensure excess Loctite squeezes out. Wipe excess.
- Clamp bushes to maintain proper seating.
- Once cured, check bush can't rotate inside hole.

Note
If bushes can rotate, the slipring stud protruding through can rotate as well. This would allow the slipring wires to twist and result in damage.

Note
The length of the isolating washer must be at least 0.1mm less than the wall thickness of the ring gear to ensure correct compression with the isolating washer. Re-machine bush as necessary.

Attention *Loctite Primer 7471, Loctite 263*

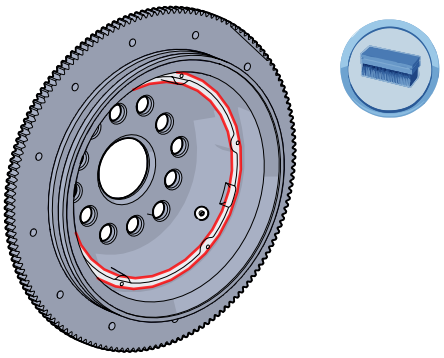


3.2 Assemble Slipring to Starter Ring Gear

PROCEDURE

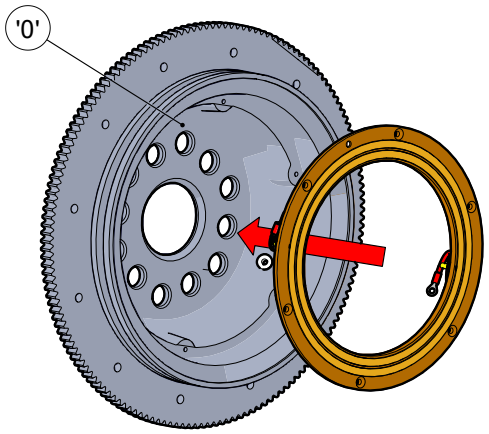
Step 1 Prepare Ring Gear

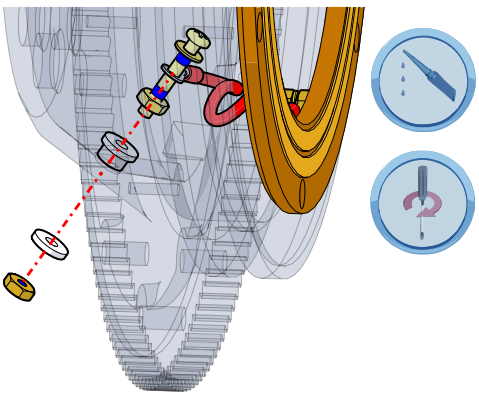
- Ensure stepped surface of ring gear where slipring will mount is clean and free from damage or defect.



Step 2 Assemble Ring Gear Studs

- Introduce slipring assembly into ring gear, note the alignment of link wires in relation to the '0 marker' on the ring gear (on prop-side).
- Connect each link wire to the ring gear as follows:
  - Fit brass washer (*P0232*) to 8-32UNC x 1.25" panhead screw (*P0232*).
  - Fit ring terminal of slipring link wire to screw.
  - Fit 8-32 UNC brass nut (*P0233*) to screw.
  - Apply a thin stripe of Loctite 243 to the screw threads underneath this nut.
  - Insert screw through bush from inside ring gear.
  - Fit isolating washer (*P0841*) on opposite side.
  - Fit 8-32 UNC brass nut (*P0233*) to screw.
  - Apply a thin stripe of Loctite 243 to the screw threads underneath this nut.



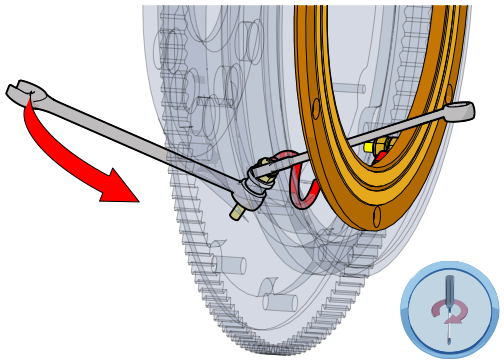


Note
A paperclip may be useful for applying Loctite.

Attention *Loctite 243*

Step 3 Secure Ring Gear Studs

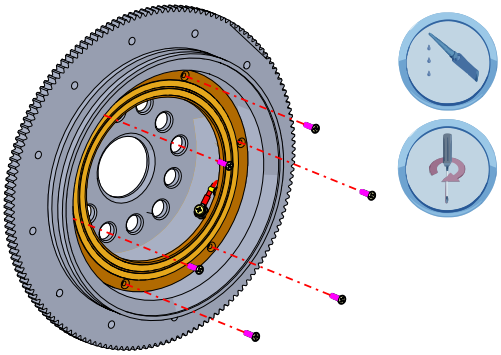
- Check the orientation and placement of both link wires. Manoeuvre the wires as necessary to avoid obstruction, pinching, or potential shorts.
- Check clearance around all locknuts, ensure they do not contact (short against) the ring gear.
- Secure both slipring studs:
  - Restrain brass screw inside ring gear (*P0233*).
  - Torque brass screw outside ring gear (*P0233*) to **1.5Nm (1.1ft-lbs).**
- Indicate with torque-seal.



> ⓘ *Attention*
> *Torque-seal, 11/32" Spanner, Torque Screwdriver (11/32" Socket)*

Step 4 Attach Slipring to Ring Gear

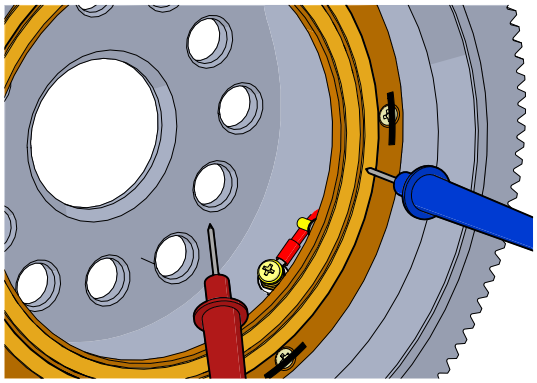
- Align (6) holes in slipring with those in ring gear.
- Apply a thin stripe of Loctite 222 to the threads of (6) 8-32 UNC countersunk screws (*P0161*).
- Attach slipring to ring gear with these screws.
- Torque screws to **1.6Nm (1.2ft-lbs)** in sequence of opposing pairs.
- Indicate with permanent marker line.



> ⓘ *Attention*
> *Loctite 222, PH2 Torque screwdriver, Permanent marker*

Step 5 Check Electrical Continuity

- Check there is not continuity between sliprings.
- Check there is not continuity between each slipring and the ring gear.



> ⓘ *Attention* *Digital multimeter (with probes)*

3.3 Subsequent Action

Perform the following tasks once this procedure is complete:

- Installers may find it easier to set up the sensor-brush assembly bracket at this point in accordance with procedure ***ASI-4-8-6***. This is more convenient while the ring gear can be easily removed from the engine flange, as it provides more space for installers to adjust and lock the brush block position.

- Mount the starter ring gear and hub to the engine flange in accordance with procedure ***ASI-4-4-5***.