Australian Government
Civil Aviation Safety Authority

AIRWORTHINESS BULLETIN

Pacific Scientific Reel-O-Matic
Inertia Reel - Correct Installation

AWB 20-003 **Issue** : 1
Date : 27 November 2013

1. Effectivity

All Sikorsky/Schweitzer 269 (HU269) series helicopters and all aircraft equipped with Pacific Scientific Reel-O-Matic inertia reels or inertia shoulder harness reels of similar design.

2. Purpose

Advise operators, pilots and maintenance personnel of the potentially fatal consequences resulting from incorrect installation of safety harnesses using inertial reels for upper body restraint.

3. Background

An investigation into a Sikorsky/Schweitzer 269 (HU269) accident found both occupants' shoulder harness inertia reel webbing had been neatly sliced off at the webbing exit point of the inertia reel housing. The inertia reels had been incorrectly installed. The slot or opening in the reel housing was incorrectly positioned during installation which meant that the lower edge of the slotted opening in the reel housing interfered with the webbing coming on and off the reel, so as to force the webbing to rub on the edge the exit slot.

Over the time preceding the accident, each time the webbing reeled in or out of the inertia reels, the webbing rubbed on the edge of the slot and sharpened the edge of the aluminium exit slot to a knife-edge. During the emergency landing sequence, the knife-edge on each of the reel drum exit slots sliced completely through the webbing and released both shoulder harnesses.

The investigation focussed on the HU269 and while Hughes issued Service Instruction N-194 for incorporation into the Handbook of Maintenance Instruction (HMI) to clarify the inertia reel installation requirements for the HU269 helicopter, this type of reel design may be found on a wide range of aircraft.

The reel can be installed so as to extend/rewind the webbing from the top or the bottom of the reel, and has adjustable mounting feet which can index the exit slot at 60º increments and it is therefore quite possible, in the absence of clear instructions or cautions in the aircraft data, that the slot or opening in the reel housing may be incorrectly oriented and force the webbing to rub on an edge of the exit slot.

The incorrect installation of an inertia reel may remain undetected and result in injury or death to the occupant in an otherwise survivable accident.

4. Recommendations

Inspect HU269 series helicopter inertia reel installations in accordance with Hughes Service Instruction N-194 (Annex 1) and the HU269 HMI.

All shoulder harness inertia reel installations should be checked to detect any interference between the webbing and the reel housing exit slot over the full range of the specified webbing exit angles for a particular installation. Note that the plastic shield should be removed to ensure a proper check. Inspect the edges of the opening in the reel drum for evidence of contact with the belt.

5. Reporting

Instances of incorrect inertia reel installations and interference between the inertia reel belt and reel drum opening and any adverse wear/damage discovered should be reported to CASA via normal SDR reporting.

6. Enquiries

Enquiries with regard to the content of this Airworthiness Bulletin should be made via the direct link e-mail address:

AirworthinessBulletin@casa.gov.au

or in writing, to:

Airworthiness and Engineering Standards Branch
Standards Division
Civil Aviation Safety Authority
GPO Box 2005, Canberra, ACT, 2601

SCHWEIZER Hughes 300C

SCHWEIZER SERVICE INFORMATION NOTICE

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MANDATORY MANDATORY MANDATORY

SUBJECT: ONE-TIME INSPECTION AND REWORK OF 269A4262 INERTIA REEL SHOULDER HARNESS ASSEMBLIES AND INSTALLATION.

MODELS AFFECTED: All 269A, TH-55A, 269A-1, 269B and 269C Series helicopters equipped with 269A4262 inertia reel shoulder harness assemblies and all harness assemblies in spares inventory at date of this notice.

TIME OF COMPLIANCE: Shall be accomplished within next 50 hours of helicopter operation.
Shall be accomplished prior to installation of affected spares shoulder harness assemblies.

PREFACE: Reports indicate that the inertia reel harness assemblies may exhibit one or more of the following problems.

1. inertia reel improperly installed
2. harness assembly reel strap folded over on inertia reel

Information given in this service information notice lists the procedure for inspection, repair or replacement of the inertia reel shoulder harness assembly. This information will be added at the next revision of the HMI Appendix A and next revision of 269A4258 Installation Instruction.

Reference

269A4258 Installation Instructions, Issue 20 May 1972
269 Series - HMI Appendix A, re-issued April 1, 1980

INSPECTION PROCEDURES:

The inertia reel assembly should be inspected to insure that it is installed in accordance with figure 1 or figure 2. The following items should be closely observed.

1. The reel may be installed with the harness strap coming off the top or bottom of the reel, whichever will allow correct positioning of the harness on the wearer.

2. With the harness strap coming off the top of the inertia reel the slotted opening in the metal reel housing is to be positioned facing forward with the top of the opening at an angle of $15^{o} \pm 5^{o}$ relative to the 269A2103 panel. See figure 1.

Customer Service Department

FORM 9578-S
(12/83)

Schweizer Aircraft Corp. P.O. Box 147 Elmira, N.Y. 14902
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With the harness strap coming off the bottom of the inertia reel, the slotted opening in the metal reel housing is to be positioned facing forward with the bottom at the opening at an angle of $15^{o} \pm 5^{o}$ relative to the 269A2103 panel. See figure 2.

3. The belts should be pulled out to the full extent of travel and ensure that the harness strap is not folded over itself (twisted) and that it rewinds flat on the inertia reel.

4. The harness strap should be closely inspected for wear or fraying.

5. With the inertia reel properly installed, the harness should be positioned so that the tensioning buckles on the shoulder straps lay flat against the pilot's chest with no twist in the individual belts or harness strap.

REPAIR PROCEDURE: (Refer to figure 1 or 2)

1. If harness assembly cannot be properly positioned on user, i.e. tensioning buckles press against users chest, reverse inertia reel installation so strap comes off the top or bottom, (whichever is opposite the installed reel).

2. To position the slotted opening correctly, remove mounting feet from reel assembly and reindex to proper position.

   NOTE: The mounting feet simply pull off from the end of the inertia reel assembly and can be indexed at 60^{o} increments.

3. To fix belts which are folded over or twisted within the inertia reel; pull out to extent of travel which allows twist to be removed and inspect for fraying, wear or cuts in this area. Work harness in and out of housing to assure smooth travel.

4. All worn or frayed harness must be replaced with new units per AC 43.13-1A.

   CAUTION: ABSOLUTELY NO ATTEMPT SHOULD BE MADE TO REMOVE THE INERTIA REEL STRAP FROM THE INERTIA REEL OR TO DISASSEMBLE THE INERTIA REEL ITSELF.

WEIGHT AND BALANCE DATA: Weight and balance not affected.

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The resultant alteration to the affected helicopters described by the inspection and rework procedures of this notice has been shown to comply with the applicable Federal Aviation Regulations and is FAA Approved.

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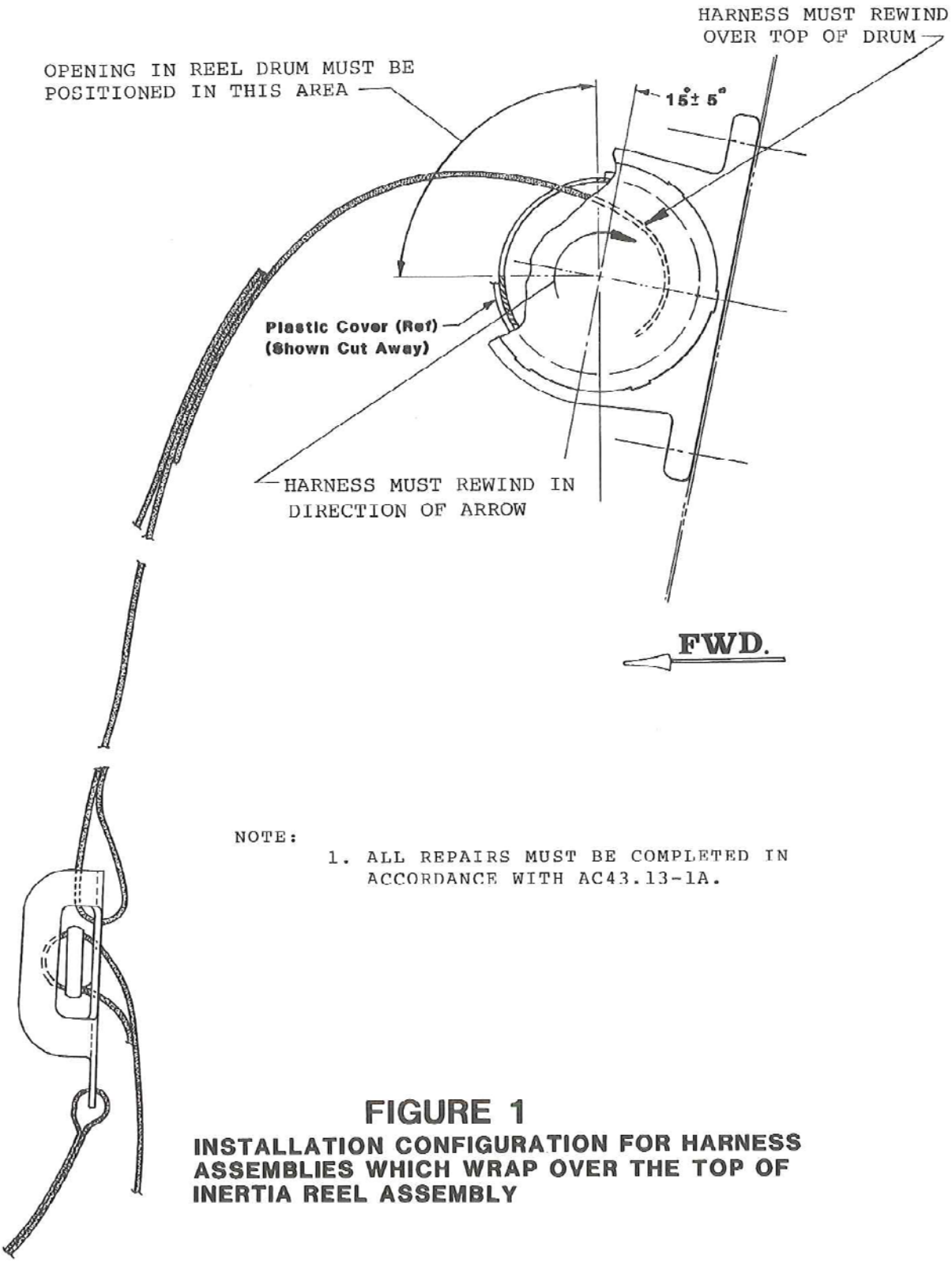

NOTE:

1. ALL REPAIRS MUST BE COMPLETED IN ACCORDANCE WITH AC43.13-1A.

FIGURE 1
INSTALLATION CONFIGURATION FOR HARNESS ASSEMBLIES WHICH WRAP OVER THE TOP OF INERTIA REEL ASSEMBLY

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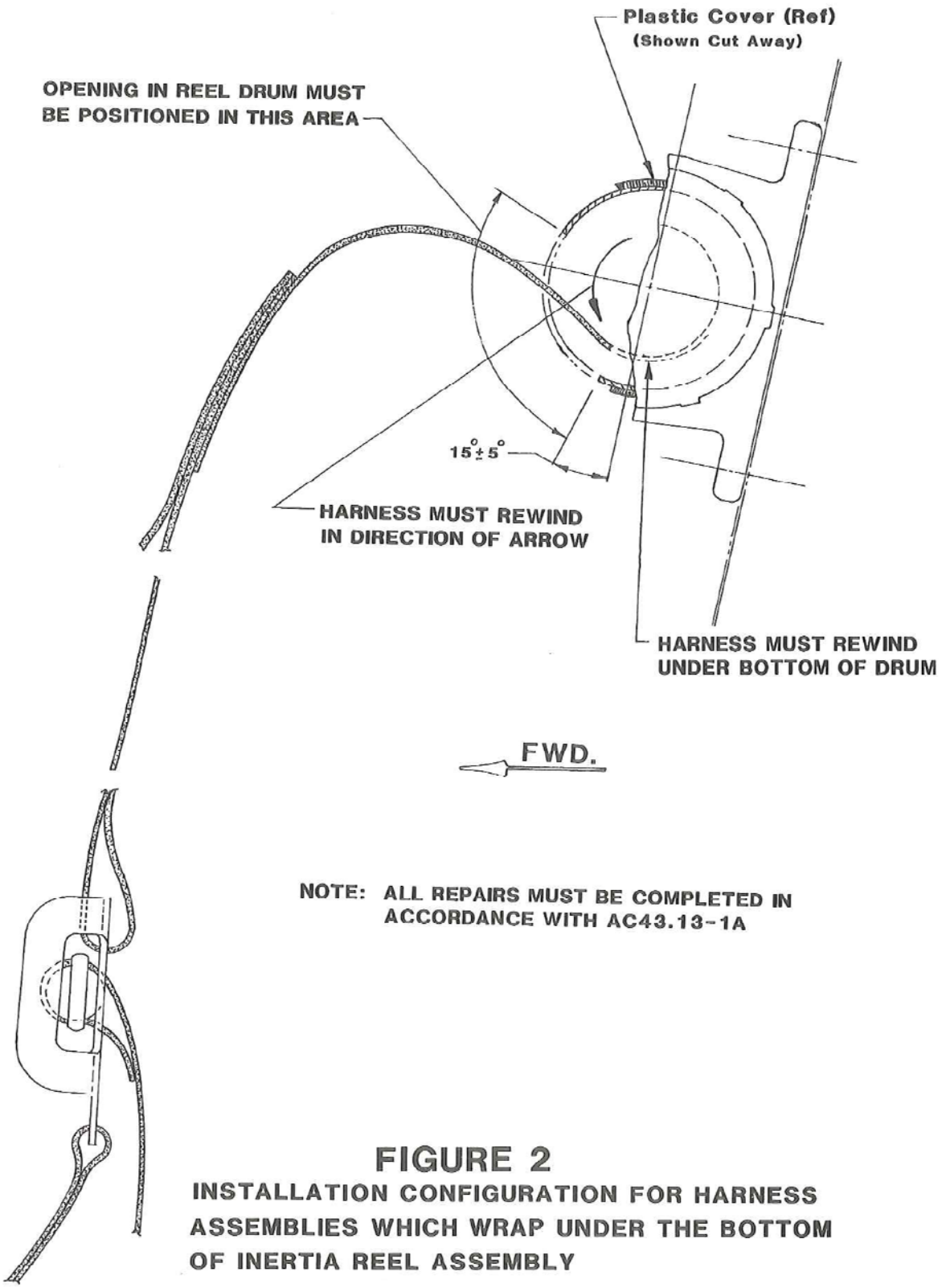

NOTE: ALL REPAIRS MUST BE COMPLETED IN ACCORDANCE WITH AC43.13-1A

FIGURE 2
INSTALLATION CONFIGURATION FOR HARNESS ASSEMBLIES WHICH WRAP UNDER THE BOTTOM OF INERTIA REEL ASSEMBLY