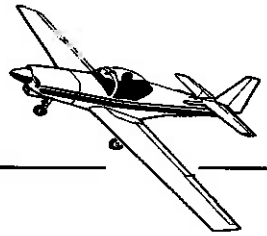
SLINGSBY AVIATION



Service Bulletin

S.B. No: 141

Title: **RECOMMENDED STIFFNUT MAINTENANCE PROCEDURES AND CLARIFICATION OF EXISTING MAINTENANCE MANUAL SCREW/BOLT TORQUE VALUES**

Classification: This Service Bulletin has been classified by SAL as Recommended

Compliance: At next screw/bolt/stiffnut removal and subsequent

Applicability: T67A, T67B, T67C Series, T67M, T67M-MkII, T67M200, T67M260 and T67M260-T3A

INTRODUCTION:

Isolated cases have been reported of metal stiffnuts "unscrewing". The metal stiffnut manufacturer recommends replacement of metal stiffnuts after 16 removals. Operators experiences were indicating that this may not be the case, with replacement required before the limit of 16.

SAL has carried out an extensive investigation into stiffnut replacement recommendations and related torque values, and produced the data which will be added to the MM's at their next amendment, as noted in the Action Section and Tables in this Service Bulletin.

During the investigation into the reusability of the metal stiffnut, a significant finding was that the bolts cadmium plating played a major factor in the correct functioning of the metal stiffnut locking. As the metal stiffnut is screwed onto the bolt cadmium dust is formed and after several removals, the dust build up can mask any drop off in stiffnut locking capability. By "blowing" the dust from the bolt and metal stiffnut the true state of the locking of the metal stiffnut is revealed.

This Service Bulletin is issued to clarify the re-usage of both the metal stiffnut/anchor nut and the nylon stiffnut/anchor nut. In addition it lists torque values in areas where normal metal to metal loads are inappropriate e.g. terminal blocks.

Definitions:

i) Metal stiffnut/anchor nut; is an all-metal, lightweight, elliptical self-locking nut. The elliptical part is a local deformation of the threaded portion, which forms the locking element.

Kaylok, together with Simmonds alternative, are used on all the T67 GRP variants.

ii) Nylon stiffnut/anchor nut; is a metal fabricated item with a nylon insert in the end of the threaded portion acting as the locking element.

These are Simmonds, mainly used on the T67A (wooden variant). It is acceptable to use the metal stiffnut as an alternative.

iii) Bolts in this S.B. are either; hexagon headed bolts, socket head cap screws or socket head countersunk screws.

ACTION:

CAUTION: TAKE PROTECTION AGAINST INHALATION OF CADMIUM DUST.

1. Nylon Stiffnuts:

Ensure when removing a nylon stiffnut, that a new nylon/metal stiffnut is used on replacement, as a nylon stiffnut is to be used once only.

2. Metal Stiffnuts/Anchor Nuts:

Following removal of bolt from metal anchor nut or removal of metal stiffnut from a bolt, then the following procedures are to be followed:

a. Metal Stiffnuts:

All metal stiffnuts should only be reused after the following tests have been found to be satisfactory:

i. "Blow" the internal metal stiffnut threads and the bolt threads.

ii. Screw the metal stiffnut onto the bolt threads using finger pressure only.

iii. If it is possible to turn the metal stiffnut far enough so that the bolt thread protrudes through the friction element then the locking is unsatisfactory.

iv. Disassemble.

v. "Blow" the bolt threads.

vi. Replace metal stiffnut and retry.

vii. If it is possible to turn the metal stiffnut far enough so that bolt thread protrudes through the friction element then the locking is unsatisfactory.

viii. Disassemble.

ix. "Blow" the internal metal stiffnut threads.

x. Replace bolt.

If in any doubt after completing the tests then replace.

b. Metal Anchor Nuts:

A method of checking the friction elements of metal anchor nuts:

i. "Blow" the internal metal anchor nut threads and the bolt threads.

ii. Screw the bolt into the female threads of the metal anchor nut using finger pressure only.

iii. If it is possible to turn the bolt far enough so that bottoming of the bolt's head is taking place, then the locking is unsatisfactory.

iv. Disassemble.

v. "Blow" the internal metal anchor nut threads.

vi. Replace bolt.

vii. Screw the bolt into the female threads of the metal anchor nut using finger pressure only.

viii. If it is possible to turn the bolt far enough so that bottoming is taking place then the locking is unsatisfactory.

ix. Disassemble.

x. Replace metal anchor nut only if this entails standard metal working procedures. If the glass fibre structure needs to be repaired for access to metal anchor nut or metal anchor nut mounting plate, then refer to SAL.

xi. If in any doubt after completing the tests then replace.

3. All bolts used in conjunction with metal stiffnuts should only be reused after the tests at a) and b) above have been found to be satisfactory.

4. Torque bolt to torque values applicable to fastener configuration, e.g. metal to metal, metal to grp, etc., refer to Tables 1 and 2.

For further information or replacement parts please contact SAL Customer Support Department.

SPECIFIED BOLT TORQUES FOR THE MAINTENANCE MANUAL FOR ALL MARKS OF T67

Description/Aircraft Type	T67M260		T67M2360-T3A		T67M200		T67M		T67M-Mk II		T67A		T67B		T67C		Remarks
	Nm	lbf in	Nm	lbf in	Nm	lbf in	Nm	lbf in	Nm	lbf in	Nm	lbf in	Nm	lbf in	Nm	lbf in	
Main wing mounting bolts M10	30	264	30	264	30	264	30	264	30	264	25	220	30	264	30	264	
Engine mounting frame attachment (main) bolts M8 to Fr.1	-	-	-	-	-	-	27.5	244	27.5	244	27.5	244	27.5	244	27.5	244	Pre Mod M442
Engine mounting frame attachment (main) bolts M10 to Fr. 1	40.7	360	40.7	360	40.7	360	-	-	40.7	360	-	-	-	-	40.7	360	
Engine mounting frame attachment (lug) bolts M6	11.4	101	11.4	101	11.4	101	11.4	101	11.4	101	11.4	101	11.4	101	11.4	101	
Engine Flexible Mount Bolts	50 - 68	444 - 600	50 - 68	444 - 600	22	195	22	195	22	195	22	192	22	192	22	192	
Engine mounting attachment bolts	41	360	41	360	-	-	-	-	-	-	-	-	-	-	-	-	
Engine Baffles M4	4	35	4	35	4	35	4	35	4	35	4	35	4	35	4	35	
Tailplane Mounting bolts M5	6.8	60	6.8	60	6.8	60	6.8	60	6.8	60	6.8	60	6.8	60	6.8	60	
Nose U/C Assy Bolts attachment to Frame 1 M6 (See Diagram)	13.5	120	13.5	120	13.5	120	13.5	120	13.5	120	13.5	120	13.5	120	13.5	120	
Main U/C Mounting Bolts M8	15 - 16.4	135 - 145	15 - 16.4	135 - 145	15 - 16.4	135 - 145	15 - 16.4	135 - 145	15 - 16.4	135 - 145	15 - 16.4	135 - 145	15 - 16.4	135 - 145	15 - 16.4	135 - 145	
Propellor Mounting Bolts	80-90	765-780	80-90	765-780	88-90	778-796.5	55-60	480-525	55-60	480-525	24.5	216	32-34	280-300	32-34	280-300	
Rudder Pedal Bar, Support Brkt Screws	6.5	58	6.5	58	6.5	58	6.5	58	6.5	58	6.5	58	6.5	58	6.5	58	
Exhaust Clamp Bolts	4.5	40	4.5	40	-	-	-	-	-	-	-	-	-	-	-	-	
Fuel Tank Drain Valve	5.6	50	5.6	50	5.6	50	-	-	5.6	50	-	-	-	-	5.6*	50*	*Wing Tank Only
Elevator attachment bolts tip	3.4	30 - 35	3.4	30 - 35	3.4	30 - 35	3.4	30 - 35	3.4	30 - 35	3.4	30 - 35	3.4	30 - 35	3.4	30 - 35	
M5 Socket Head Cap Screws in GRP no spacer	5.5	49	5.5	49	5.5	49	5.5	49	5.5	49	5.5	49	5.5	49	5.5	49	
M4 Csk in GRP	4	36	4	36	4	36	4	36	4	36	4	36	4	36	4	36	
M3 Socket head Cap Screw in GRP no spacer	0.55	5	0.55	5	0.55	5	0.55	5	0.55	5	0.55	5	0.55	5	0.55	5	
Rudder Lower Pivot Bolt	14.7	130	14.7	130	14.7	130	14.7	130	14.7	130	14.7	130	14.7	130	14.7	130	
Rudder Upper Pivot Bolt	4	35	4	35	4	35	4	35	4	35	4	35	4	35	4	35	
Control Column Bolts in main spar with O/D Washer 10mm	1.5	13	1.5	13	1.5	13	1.5	13	1.5	13	1.5	13	1.5	13	1.5	13	

Description/Aircraft Type	T67M260		T67M260-T3A		T67M200		T67M		T67M-Mk II		T67A		T67B		T67C		Remarks
	Nm	lbf in	Nm	lbf in	Nm	lbf in	Nm	lbf in	Nm	lbf in	Nm	lbf in	Nm	lbf in	Nm	lbf in	
Control Column Bolts in main spar with O/D Washer 20mm	2	18	2	18	2	18	2	18	2	18	2	18	2	18	2	18	
Canopy Strut Attachment	5.5	49	5.5	49	5.5	49	5.5	49	5.5	49	5.5	49	5.5	49	5.5	49	
Cleveland Nose Wheel Hub Nuts	10.2	90	10.2	90	10.2	90	10.2	90	10.2	90	10.2*	90*	10.2	90	10.2	90	*Post Mod M136A
Main U/C Caliper bolts	8.5-9+ 6.8	75-80+ 60	8.5-9+ 6.8	75-80+ 60	6.8	60	6.8	60	6.8	60	6.8*	60*	6.8	60	6.8	60	*Post Mod M136B +Post Mod M644
Cleveland Mainwheel Axle Bolt	61-67.8* 13.6-20.4+	540-600* 120-180+	61-67.8* 13.6-20.4+	540-600* 120-180+	61-67.8* 13.6-20.4+	540-600* 120-180+	61-67.8* 13.6-20.4+	540-600* 120-180+	61-67.8* 13.6-20.4+	540-600* 120-180+	-	-	61-67.8* 13.6-20.4+	540-600* 120-180+	61-67.8* 13.6-20.4+	540-600* 120-180+	*Initial torque +Final then to next locking hole (after back off)
Cleveland Mainwheel Axle Bolt	-	-	-	-	-	-	-	-	-	-	61-67.8* 13.6-20.4+	540-600* 120-180+	-	-	-	-	Post Mod M136B *Initial torque +Final then to next locking hole (after back off)
Prop Speed Governor Load Nuts	23	204	23	204	23	204	23	204	23	204	-	-	-	-	-	-	
Brake Master Cylinder Support Brkt	5.7-6.2	50-55	5.7-6.2	50-55	5.7-6.2	50-55	5.7-6.2	50-55	5.7-6.2	50-55	-	-	5.7-6.2	50-55	5.7-6.2	50-55	
Fuel Vent Fitting Rib 1	21.5	190	21.5	190	21.5	190	-	-	21.5	90	-	-	-	-	21.5*	190*	*Post Mod M156
Fuel Tank Filler and Access Panels	2.3-2.8	20-25	2.3-2.8	20-25	2.3-2.8	20-25	2.3-2.8	20-25	2.3-2.8	20-25	-	-	2.3-2.8	20-25	2.3-2.8	20-25	
Exhaust Strut Support Clamp	2.3-2.8	20-25	2.3-2.8	20-25	-	-	-	-	-	-	-	-	-	-	-	-	
Exhaust to Engine	23	204	23	204	23	204	23	204	23	204	23	204	23	204	23	204	
Typical Metal to GRP/Tapping Plate 5mm SKT Hd Cap Series	6.8	60	6.8	60	6.8	60	6.8	60	6.8	60	-	-	6.8	60	6.8	60	
Terminal Studs M3	0.6	5	0.6	5	0.6	5	0.6	5	0.6	5	0.6	5	0.6	5	0.6	5	
Flux Detector Nut	0.34	3	0.34	3	0.34	3	0.34	3	0.34	3	-	-	0.34	3	0.34	3	Aircraft with King KCS55 Compass System only

GENERAL TORQUES FOR METAL TO METAL FITTINGS AND FITTINGS WITH SPACERS

Bolt Dia Nom	Manufacturers Torque for Manual	
mm	Nm	lb in
3	1.9	16.8
4	4.2	37.17
5	8.6	76.11
6	14.7	130.1