THE GLIDING FEDERATION OF AUSTRALIA

AIRWORTHINESS ADVICE NOTICE

GFA AN 77
Issue 1
26.2.1988
Sheet 1 of 1

TYPES AFFECTED: Tug aircraft

BACKGROUND: Tug aircraft do not come under GFA jurisdiction (airworthiness) however the information provided by this A.N. is purely advisory and is considered to be in the interests of operational safety.

Some of these A.N. items may also be the subject of separate D o TC publications.

ITEM 1: Schweizer banner towing/gliding towing hooks.

SUBJECT: Maintenance and modification

BACKGROUND: Schweizer "latch type" releases are used in many tugs, despite the removal of that style of release from Australian sailplanes over 25 years ago.

The attached documents refer to maintenance and modification of Schweizer releases, the applicability of the documents may only be established by inspecting each release individually, keeping in mind many releases in service may not be Schweizer originals, but locally produced "look alikes" and many of the Schweizer hooks mentioned may be restricted to American operated sailplanes only.

DOCUMENTATION: Available with this A.N. are:-

1. Towplane hook design and operational tests.
2. Schweizer Service Bulletin SA-001.2 (FAA AD 87-17-01)
3. Schweizer Service Bulletin SA 005
4. BGA modification T/1/85

NOTE: GFA policy is to not support installation of latch type releases in tug aircraft.

NOTE: The New Zealand CAA removed Schweizer type releases from service in 1986, due to evidence of malfunctions found during accident investigations.

TOWPLANE HOOK DESIGN AND OPERATIONAL TESTS

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G. P. Layton, Jr., Edwards, Calif., U.S.A.

INTRODUCTION

In the past, a number of glider/towplane upsets have occurred. Typically, these upsets have started when the glider either pulled directly upward in straight flight or high and outside on a turn. These types of maneuvers have then exceeded the nose-up pitch control capability of the towplane, resulting soon thereafter in a near vertical attitude of the towplane from which recovery is impossible unless the towline is released. Postflight discussions with the pilots have revealed that they made every effort to release the towline from the towplane but could not exert enough force on the mechanism to do so. In cases where recovery was affected, it was subsequently discovered that the towline broke after altitude losses exceeding 1000 ft.

As a result of the tow pilots' observations that the release mechanism could not be operated under load, a study was made of the characteristics of these mechanisms.

An analytical study of the tow hook was performed and several tow hook configurations were load tested as was a typical operating linkage in a tow aircraft.

ANALYTICAL STUDY

In the analysis, the following contributions to hook release load were included:

(a) hook stability
(b) friction.

The effect of the diameter of the latch pin was not included since, for most hooks, this contribution is an order of magnitude smaller than the other factors. To more easily separate variables, the release load was determined as a function of moment about the hook pivot, then this moment was determined as a function of tow tension and tow angle as shown in Fig. 1.

It was assumed that each component could be analyzed separately then added to obtain the total release load. Figure 1 is a sketch of the hook and defines the symbols used in the following analysis.

CONTRIBUTION OF HOOK STABILITY

As shown in Fig. 1, the angle of the hook arm with respect to the latch arm tends to return the latch arm to a closed position; hence, it is a stable configuration.

The magnitude of this force is determined by the force normal to the latch arm at the point where the latch pin rides on the hook arm. The normal force on the latch pin (N) is:

$$N = \frac{M_P}{b + c \sin \alpha}$$

Resolving this force into components normal and parallel to the latch arm yield the force normal to the latch arm as:

$$N \cos \beta \sin (\alpha - \beta)$$

Then, taking moments about the latch arm pivot, the unlatching force due to stability is:

$$T_{2_{stability}} = \left(\frac{M_P\, C}{b + c \sin \alpha}\right)\left(\frac{\cos \beta}{d + c}\right)\left[\sin (\alpha - \beta)\right]$$

CONTRIBUTION OF FRICTION

As shown in Fig. 1, the friction contribution is a function of the release latch angle. This friction is determined by the magnitude of the normal force (N) resolved parallel to the axis of the latch arm. This force is:

$$N \cos B \cos (\alpha - \beta)$$

Multiplying by the coefficient of friction yields the force normal to the latch arm at the point of contact of the latch pin with the hook arm. Taking moments about the latch arm pivot, the unlatching force due to friction is:

$$T_{2_{friction}} = \left(\frac{M_P\, C}{b + c \sin \alpha}\right)\left(\frac{\cos \beta}{d + c}\right)\left(f \cos (\alpha - \beta)\right)$$

Also, the contribution due to friction is a function of the coefficient of friction. A value of 0.75 was assumed for the static coefficient and a value of 0.40 was assumed for sliding friction.

Thus the total load is:

$$T_{2_{total}} = \left(\frac{M_P \cdot C}{b + c \sin \alpha}\right)\left(\frac{\cos \beta}{d + c}\right)\left(f \cos (\alpha - \beta) + \sin (\alpha - \beta)\right)$$

The determination of M_P as a function of γ and T, then, must be determined for each type of hook geometry.

LOAD TESTS

By means of a weight and fulcrum arrangement, the hooks in question were load tested at loads from zero to 764 lb, and the release load measured. Due to the limitations of the test equipment, all loads were applied parallel to the axis of the hook, i.e., with no vertical- or side-force component.

Tests on Hooks

Four hooks were tested: the basic hook, Schweizer Part Number 12112-15 (Configuration A); a basic hook with a radius on the hook arm (Configuration B); a basic hook with a radius on the hook arm and a longer and articulated latch arm, arm (Configuration C), a longer latch arm, and a ball bearing race on the latch pin (Configuration D). These hooks are described in Figs. 2a and 2b.

Tests on Airplanes

In addition to loading the hooks, the installation in the aircraft from the hook to the cockpit was tested. In the installation tested, the mechanism consisted of a flexible push-pull cable (choke cable) from the cockpit back to a point four feet forward of the hook. At this point, a length of stranded aircraft cable was attached. This cable passed through a tube out the tail of the aircraft where it was terminated at the hook.

The release load at the cockpit was measured with a steady load applied at the latch arm.

COCKPIT ACTUATOR LOAD CRITERION

Based on discussions with tow pilots, it was determined that it must be possible to release the towline with a tension equal to the breaking strength of the towline applied at an angle of 30 deg. The breaking strength of towlines in common use average up to 900 lb.

From tests on typical "T" handles, it was determined that a practical maximum allowable release load at the cockpit actuator was 35 lb.

RESULTS AND DISCUSSION

Analytical Study

The equation developed in the analysis was applied to the operational tow release, Schweizer Part #12112-15, (Fig. 2

Configuration A). The physical characteristics of this hook and the variation of the dimension, a, with the tow angle α are shown in Fig. 3.

The variation of M_p with γ and T was first calculated and is shown in Fig. 4.

The variation of T_2 with M_p was calculated for the four cases listed below and is shown in Fig. 5:

Case I $\alpha = \alpha_o$, f = 0.75 (static)

Case II $\alpha = \alpha_o$, f = 0.40 (sliding)

Case III $\alpha = \alpha_f$, f = 0.75

Case IV $\alpha = \alpha_f$, f = 0.40

Case I then represents the load necessary to start unlatching the hook, and Case IV represents the most likely maximum unlatching load.

Hook Load Tests

The operational release (Configuration A) was tested and compared with the analysis. As shown in Fig. 6, the analytical result, when corrected for the zero load release force, compares reasonably well at the lower towline tensions, but deviates considerably at the larger towline tensions. Also shown in Fig. 6, the basic hook exceeds the 35-lb release criterion at a 435-lb towline load even without any further amplification of this load by the releaseable installation.

Configuration B was then tested to explain the difference between the analytical result and the test result for Configuration A. This configuration had the same mechanical advantage as Configuration A, but the hook arm was radiused so that the friction component was the only contribution to latch load. The results of these tests (Fig. 6) showed that a coefficient of sliding friction of 0.46 was required to match the initial slope. It is also likely that the assumption of a constant friction coefficient was in error, since the function is not a straight line.

A third configuration, C, was tested to determine the characteristics of another typical hook. This hook had a radiused hook arm and a latch arm with more mechanical advantage. The latch arm was also segmented in an attempt to provide a prying action on the hook arm. The characteristics of this hook are shown in Fig. 6.

A fourth hook, Configuration D, was built and tested to demonstrate the combined effect of radiusing the hook arm, increasing the mechanical advantage, and decreasing the friction by means of a ball bearing race on the latch pin. As shown in Fig. 6, these combined effects resulted in only a 5-lb latch load at a 750-lb towline load. Based on the hook geometry, the latch load for this hook would increase to 11 lb with a towline load of 900 lb applied with γ = 30 deg.

Aircraft Mechanism Tests

The results of the tests to determine the actuation load at the cockpit as a function of the release load at the hook are shown in Fig. 7. This curve indicates that, even with no towline load applied, the 35-lb criterion would be exceeded.

Some preliminary tests with a series of pulleys indicated that the release load could be transferred from the hook to the cockpit with no more than a 10% increase, thus satisfying the 35-lb criterion with even Configuration B or C.

CONCLUSIONS

1. With the operational system tested, the tow pilot would not be able to release his hook at towline tensions exceeding 225 lb.

2. A reasonable maximum release load at the cockpit is 35 lb with a towline tension of 900 lb at an angle of 30 deg from the horizontal.

3. The basic hook with no allowance for the mechanism between the hook and the cockpit exceeds reasonable release load limits for towline tensions exceeding 435 lb.

4. The release load at the hook can be reduced by:

   (a) increasing the mechanical advantage

   (b) reducing friction

   (c) reducing the hook stability.

5. By the proper combination of relieving the hook release load and reducing the friction between the hook and the cockpit, the hook can be made to release with reasonable force.

Tow Hook Geometry

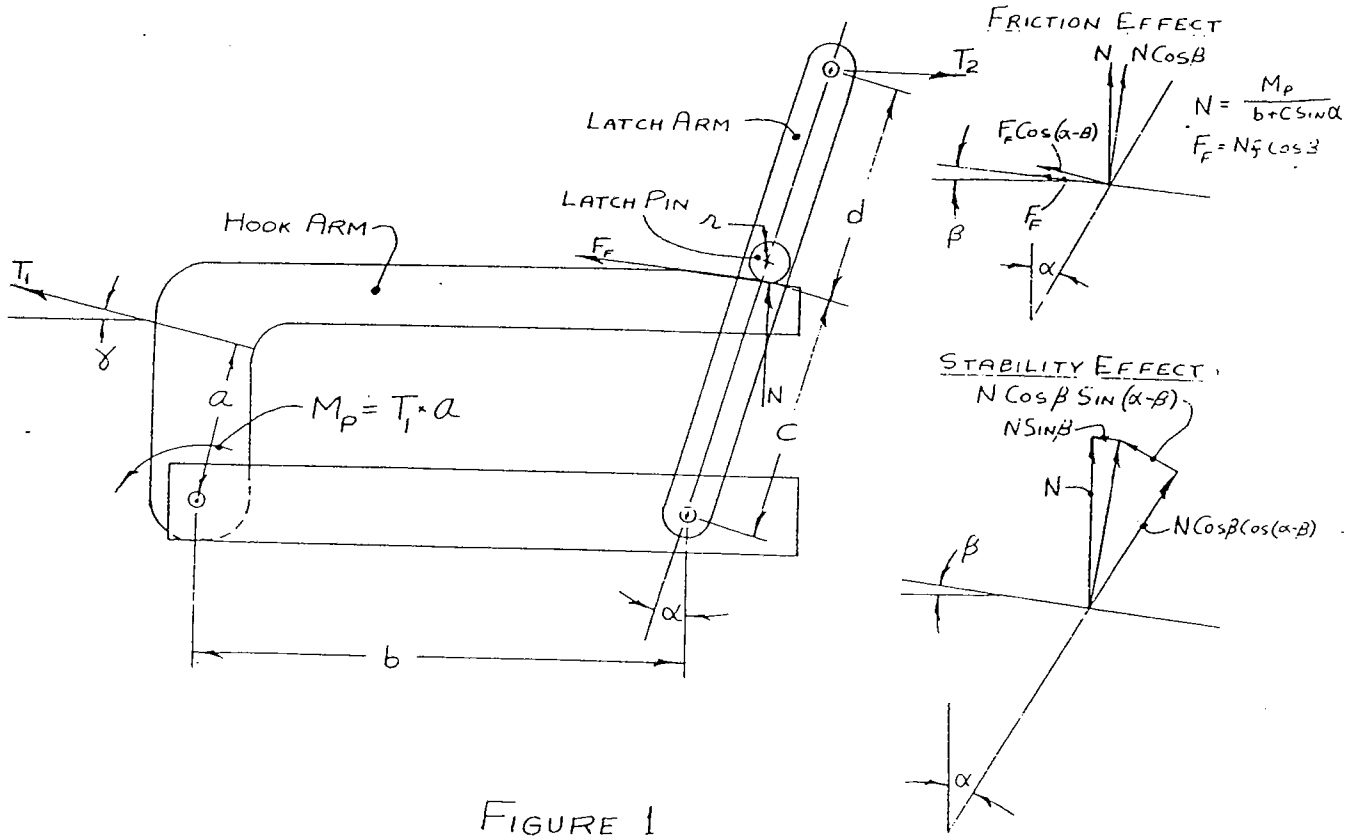


Figure 1

Figure 2b. Tow Hooks Tested--Physical Characteristics

		DIMENSION					
		b (in.)	C (in.)	d (in.)	α_0 (deg)	α_f (deg)	β (deg)
CONFIGURATION	A	1.75	1.02	0.75	11.5	30.5	11.5
	B	1.75	1.02	0.75	0.0	32.0	$\beta = \alpha$
	C	1.75	--	--	--	--	--
	D	1.75	1.02	1.40	0.0	32.0	$\beta = \alpha$

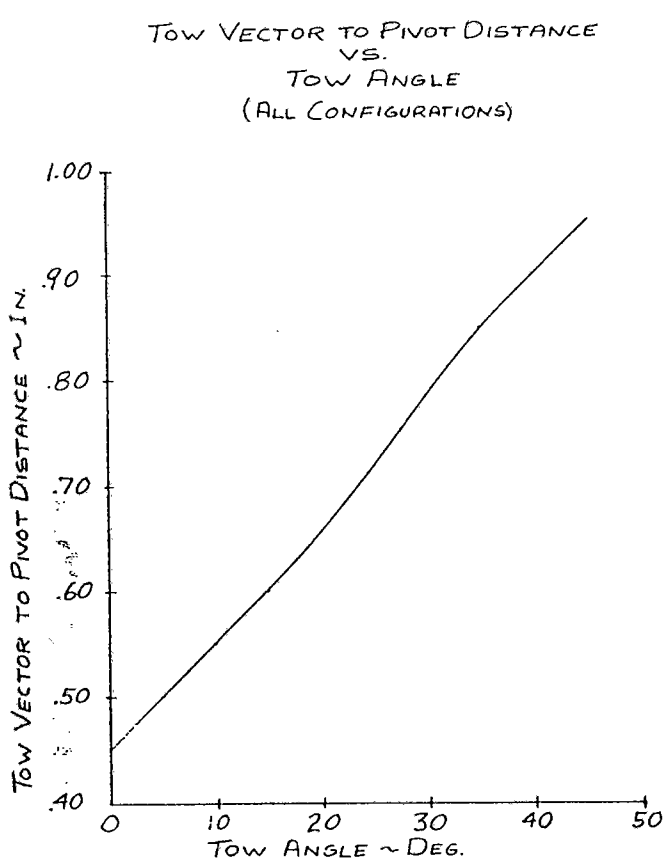


FIGURE 3

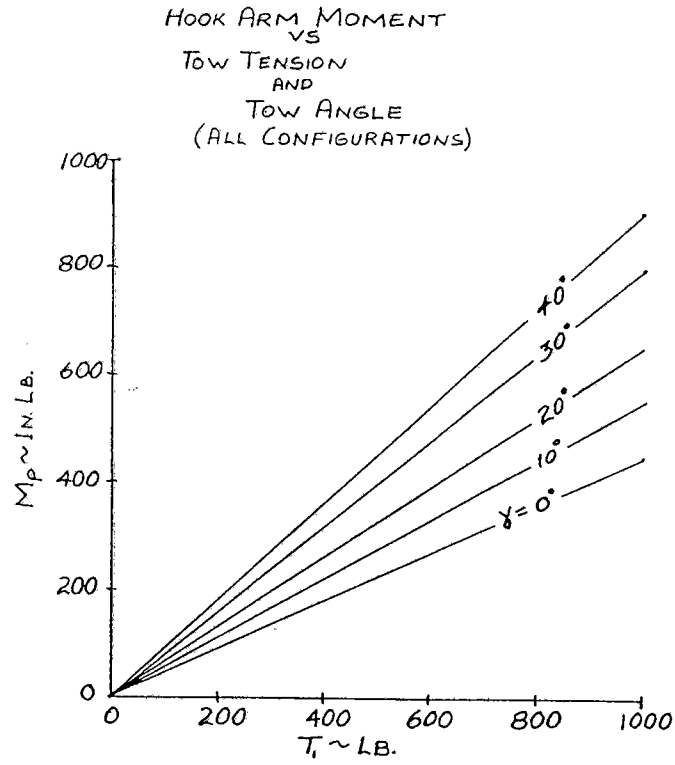


FIGURE 4

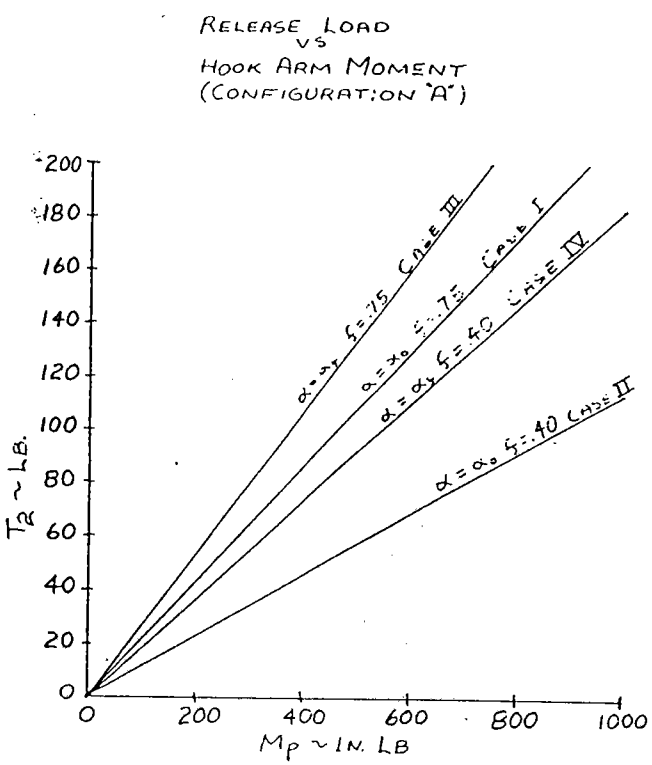


FIGURE 5

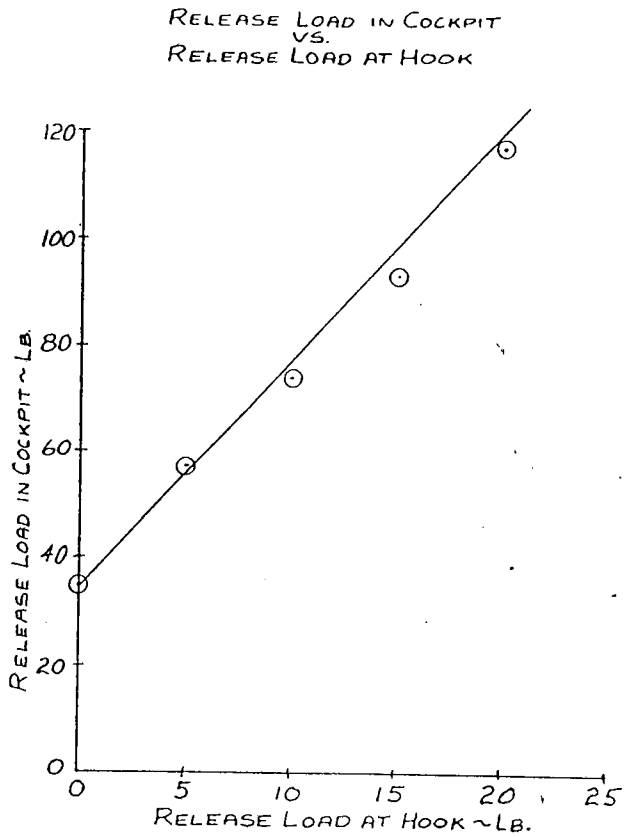


FIGURE 7

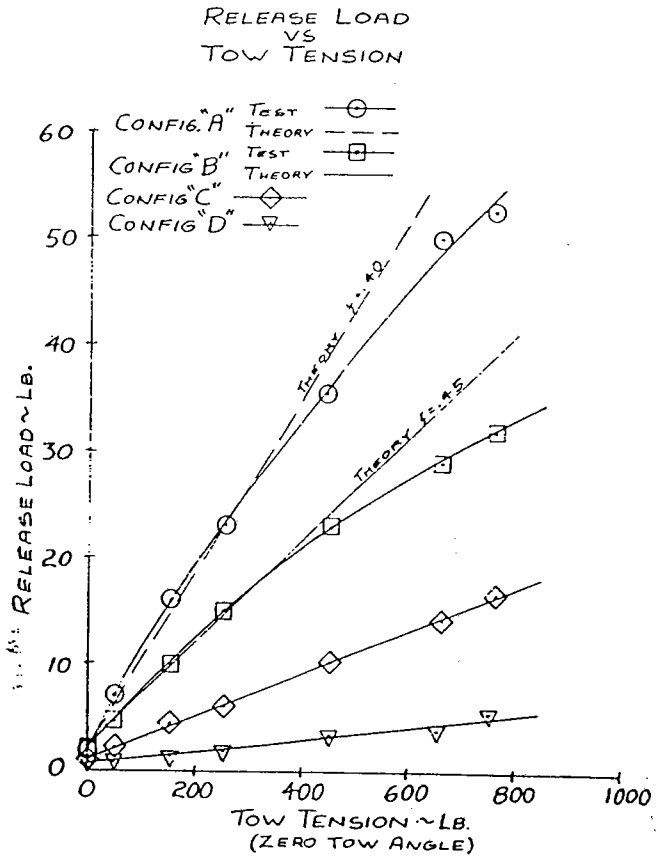


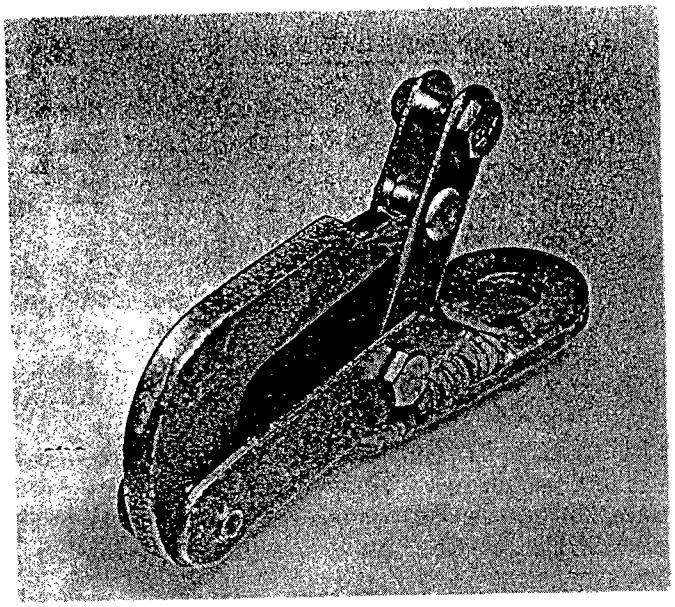
FIGURE 6

EDITOR'S NOTE

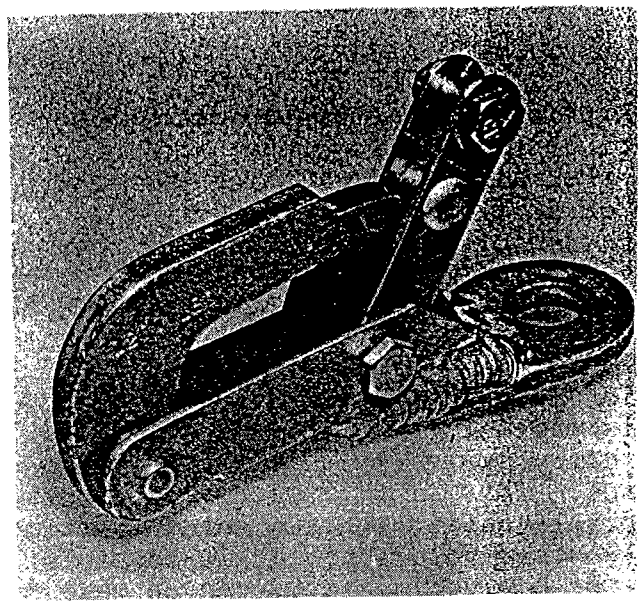
Schweizer Aircraft Corporation has pointed out to us that all production hooks are tested to release under 60 lb at 600 lb line pull using control lever 3414D. The mechanical advantage has been increased from about 1.9 to about 3.3 and no difficulty should be encountered in meeting the 35 lb maximum criteria. An adequate release control system should be used on existing hooks. All new installations should be tested with at least 600 lb on the tow line. Furthermore, periodic maintenance checks of the hook and release mechanism are very desirable.

The editors have observed that these hooks mounted on Cessna aircraft and retained with a single vertical pin have the possibility of rotating under side load and thereby greatly increasing the release load. We invite correspondence from readers who may have observed this in flight or ground tests.

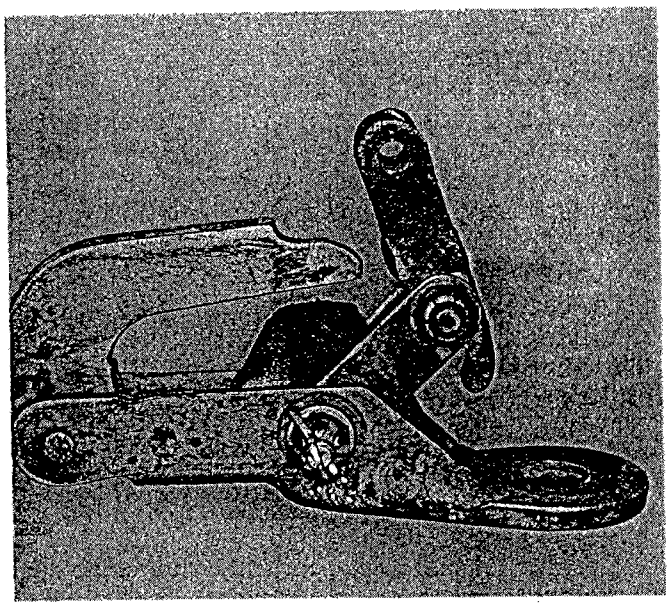
TOW HOOKS TESTED



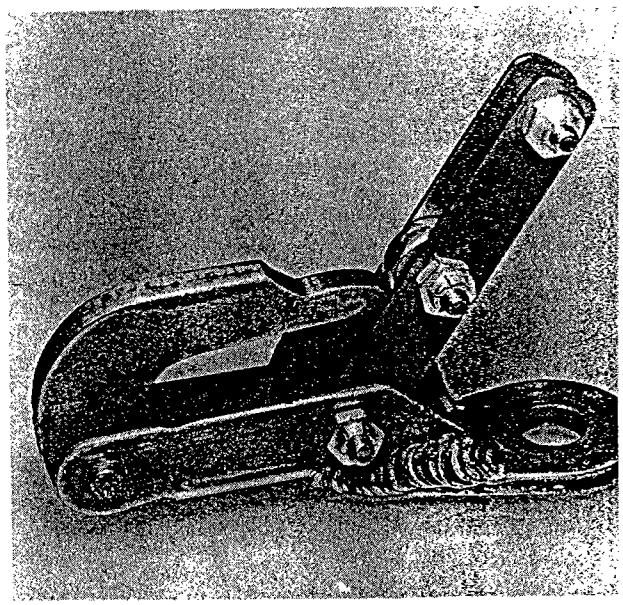
CONFIGURATION A



CONFIGURATION B



CONFIGURATION C



CONFIGURATION D

FIGURE 2a

SERVICE

BULLETIN

BULLETIN NO. SA-001.2*

DATE: 19 May 1987

* Supersedes Service Bulletin
No. SA-001.1, Dated 2 Feb 1987

SUBJECT: SCHWEIZER SAILPLANE TOW RELEASE, PROPER ATTACHMENT OF TOW LINE, INSPECTION, MAINTENANCE PROCEDURES AND REWORK OF TOW HOOK, RELEASE ASSEMBLY AND RELEASE DAMPER.

AFFECTED AIRCRAFT: All Schweizer manufactured and Kit built Schweizer gliders and sailplane models listed below. All Serial numbers of each model. Also affected are all sailplanes retrofitted with a Schweizer tow hook installation.

SGU 1-7
SGS 2-8 (TG-2)
SGS 2-12 (TG-3)
SGU 1-19
SGU 1-20
SGU 1-21
SGU 2-22, 2-22A, 2-22C, 2-22CK, 2-22E, 2-22EK
SGS 1-23, 1-23B, 1-23C, 1-23D, 1-23E, 1-23F, 1-23G, 1-23H, 1-23H15
SGS 1-24
SGS 1-26, 1-26A, 1-26B, 1-26C, 1-26D, 1-26E
SGS 2-32
SGS 2-33, 2-33A, 2-33AK
SGS 1-34, 1-34R
SGS 1-35C
SGS 1-36 (Sprite)

NOTE

In the text of this writing, the terms "GLIDER" and "SAILPLANE" are to be considered synonymous.

(▮) - Denotes a change.

NOTE

It is absolutely necessary that all pilots and ground personnel received proper training with respect to the subject matter of this bulletin prior to flight.

PREFACE: Reports indicate that a possibility exists that the sailplane tow hook may inadvertently release during tow without any input by the sailplane pilot on the tow release control.

This Service Bulletin lists possible causes, precautions, maintenance practices, inspection and corrective action to be taken in order to minimize this situation.

NOTE

An inadvertent release can occur due to various conditions such as improper hookups, towing equipment failures, as well as improper maintenance practices. Also, the tow hook is of the overriding type so that the tow line will release if overrun due to pilot error or under conditions which could leave the tow line attached to the sailplane without the pilot's knowledge.

NOTE

As compliance with this bulletin could not completely eliminate the possibility of an inadvertent release due to pilot error, rope break, or abort of tow, any sailplane operation must be carried out so that there is sufficient airfield available to accommodate these not uncommon situations. Also, proper pilot instruction in dealing with these situations is an essential part of all pilot training programs. In any event a premature release and properly executed recovery procedure should in no way result in damage to the aircraft or injury to any of its occupants or ground personnel.

NOTE

Excessive tow release wear can result during all tow operations when the tow line is released under full towing pressure. This should not be done since proper piloting practice requires easing off the tow line pressure before releasing.

CAUTION

AT RELEASE THE PILOT SHOULD HOLD THE RELEASE KNOB FOR 3 TO 5 SECONDS TO ALLOW ADEQUATE TIME FOR THE TOW LINE TO CLEAR THE SAILPLANE AND WATCH FOR VISUAL CONFIRMATION OF TOW LINE RELEASE.

* TIME OF COMPLIANCE:

Part 1: Must be completed prior to the first flight of the aircraft each day

Part 2: Must be completed prior to every flight of the aircraft

Part 3: Must be completed within 30 days of this notice or at the next 100 hour inspection, whichever is first

Part 4: Must be completed at every 100 hour inspection

PROCEDURES:

Part 1: Perform a daily visual inspection of the tow release assembly and its components in accordance with Table 2 of this Service Bulletin.

NOTE

This inspection does not require disassembly of the aircraft or release assembly. However, if a component fails to pass the inspection as outlined, the aircraft must be removed from service and receive proper maintenance procedures to correct the problem prior to further flight of the aircraft.

Part 2: A release check is to be made by the pilot prior to takeoff. To accomplish this have the ground personnel attach the tow line to the tow hook and apply a light pull on the line in the direction of tow. The pilot should then pull the release control to check for proper release of the tow line. After reattachment of the tow line to the sailplane, a check should be made for positive attachment of the tow line to the sailplane by applying a moderate jerk on the tow line in the direction of the tow. The release assembly should then be inspected to insure that it has remained completely closed. If the release is found to be opened, even partially, inspection and maintenance procedures must be performed to correct the problem prior to continuing with operation of the aircraft.

NOTE

Figure 1 shows the positions for the tow hook and release arm when correctly hooked-up. Note that the step of the tow hook should be tight against the release arm assembly. The tow hook step must fully engage the release arm to allow the release assembly to work properly. The tow hook must not be allowed to extend through the release arm beyond the step on the hook since this creates a condition which defeats the design of the release and increases the possibility of an inadvertent release.

NOTE

The tow rope must not be allowed to wrap around the release arm or any part of the sailplane. It must extend, unobstructed, directly forward from the sailplane to the tow vehicle.

Part 3:

A. Several tow release arms and hooks have been manufactured for use on Schweizer gliders. Table 1 lists the proper hook/release combinations for each model sailplane. Each aircraft must be inspected to insure that it is equipped with the proper tow hook and release arm as indicated in Table 1.

B. Wear of the tow hook step will cause improper engagement of the hook and release. The tow hook must be inspected in accordance with Figure 2. Any tow hook which does not meet the minimum specified dimensions, after inspection and/or rework, as listed in Figure 2 must be replaced.

NOTE

Tow hook must engage release arm in accordance with Figure 1A & Figure 4. If hook is able to pass through release arm beyond step as shown in Figure 1C, release arm and/or hook must be reworked with slug or replaced.

NOTE

If tow hook fails to engage completely as shown in Figure 1B, check release control rigging. Shortening the rubber bumper stop between the release knob and instrument panel will allow the release assembly to close further.

C. All tow release arms must be reworked in accordance with Figure 3 or replaced with a new superseding Schweizer release arm as listed in Table 1. If the release arm wear exceeds the dimensions given in Figure 3, rework is NOT allowed and replacement is MANDATORY.

D. Perform complete inspection in accordance with Item 4 of this bulletin.

NOTE

All repairs must be conducted in accordance with AC43.13 by an authorized, licensed mechanic.

NOTE

If excessive or accelerated wear of the release mechanism is evident a review and correction of piloting practices and ground personnel tow line attachment procedures is in order.

Part 4: Conduct inspection of tow release at 100 hour intervals in accordance with Table 2 and Figure 4 of this bulletin.

Record compliance with Part 3 and keep a copy of this Service Bulletin in the Aircraft Log Book. If a flight manual or pilot's handbook is provided with the aircraft, a copy of this notice should be kept with that manual until incorporated into the text.

Aircraft Weight and Balance not affected.

The operational checks, rework and inspection procedures given in this Bulletin comply with Federal Aviation Regulations and are FAA approved.

TABLE I

AIRCRAFT	TOW HOOK	STANDARD RELEASE ARM	SUPERSEDING/REPLACEMENT RELEASE ARM
SGU 1-7	R-200-9A or 1A-218-1A or 1B-221-3	R-200-12A or 1B-217-1A	10-217-9
SGS 2-8 (TG-2)	R-200-9A or 1A-218-1A or 1B-221-3	R-200-12A or 1B-217-1A	10-217-9
SGS 2-12 (TG-3)	R-200-9A or 1A-218-1A or 1B-221-3	12B-141 or 1B-217-1A	10-217-9
SGU 1-19	R-200-9A or 1A-218-1A or 1B-221-3	R-200-12A or 1B-217-1A	10-217-9
SGU 1-20	R-200-9A or 1A-218-1A or 1B-221-3	R-200-12A or 1B-217-1A	10-217-9
SGU 1-21	R-200-9A or 1A-218-1A or 1B-221-3	R-200-12A or 1B-217-1A	10-217-9
SGU 2-22 (All models)	R-200-9A or 1A-218-1A or 1B-221-3	R-200-12A or 1B-217-1A	10-217-9
SGS 1-23 (All models)	R-200-9A or 1A-218-1A or 1B-221-3	R-200-12A or 1B-217-1A	10-217-9
SGS 1-24	R-200-9A or 1A-218-1A or 1B-221-3	R-200-12A or 1B-217-1A	10-217-9
SGS 1-26, A, B, C, & C.G. Hook	R-200-9A or 1A-218-1A or 1B-221-3	R-200-12A or 1B-217-1A	10-217-9
SGS 1-26 D, E	1A-218-1A or 1B-221-1	10-222-7	10-222-13
SGS 1-26 D & E (CG Hook)	1B-221-1	10-222-1	10-222-11
SGS 1-26E (opt.)	10232A-1	1B-217-5	1B-217-11
SGS 2-32	1B-221-1	10-222-1	10-222-11
SGS 2-33, 2-33A, 2-33AK	1A-218-1A or 1B-221-3	1B-217-1A	10-217-9
SGS 2-33, 2-33A, 2-33AK (opt.)	10232A-1	1B-217-5	10-217-11
SGS 1-34, 1-34R	1A-218-1A or 1B-221-1	340170-1	340170-11
SGS 1-35C	1A-218-1A or 1B-221-1	10-222-7	10-222-13
SGS 1-35C (opt.)	10232A-1	1B-217-5	10-217-11
SGS 1-36	10232A-1	1B-217-5	10-217-11

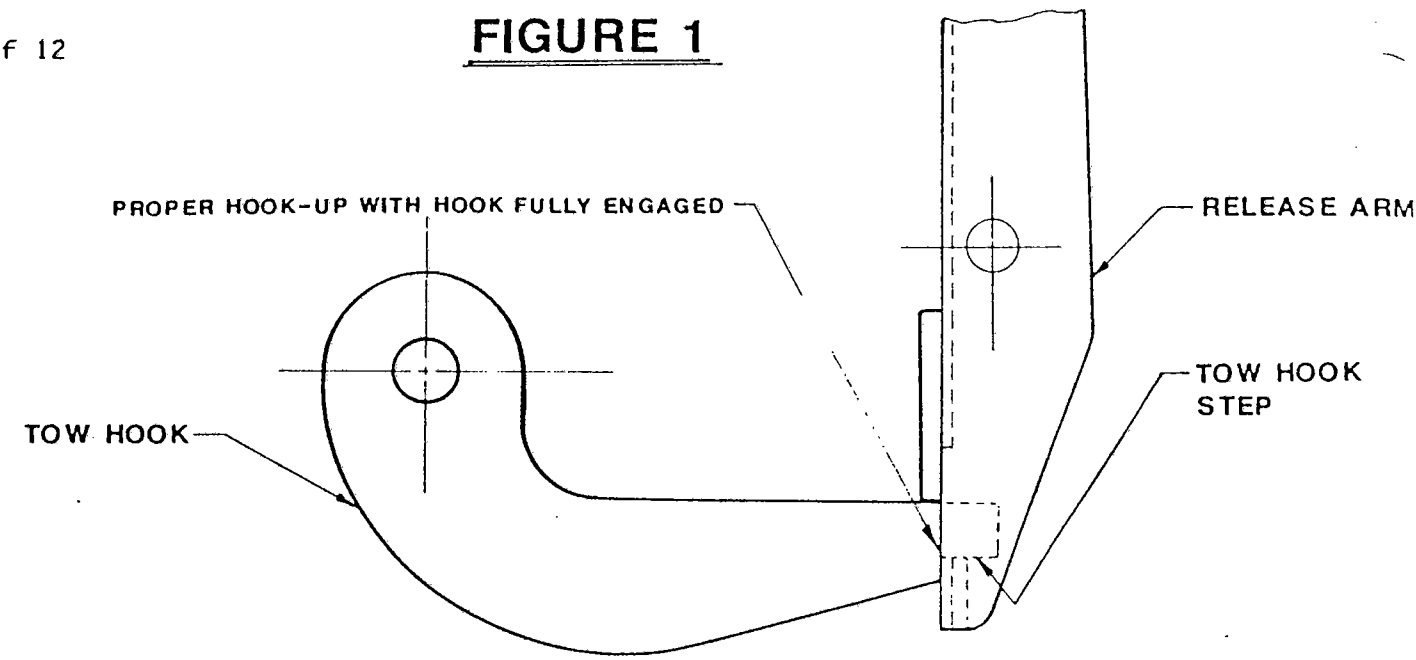
CAUTION

INSTALLATION OF THE SMALL TOW HOOK #10232A-1 AND APPROPRIATE RELEASE ARM REQUIRES RELOCATION OF THE RELEASE ARM ON THE AIRCRAFT. CONTACT SCHWEIZER AIRCRAFT FOR THE INSTALLATION DRAWING REQUIRED FOR YOUR AIRCRAFT TO INSURE PROPER INSTALLATION.

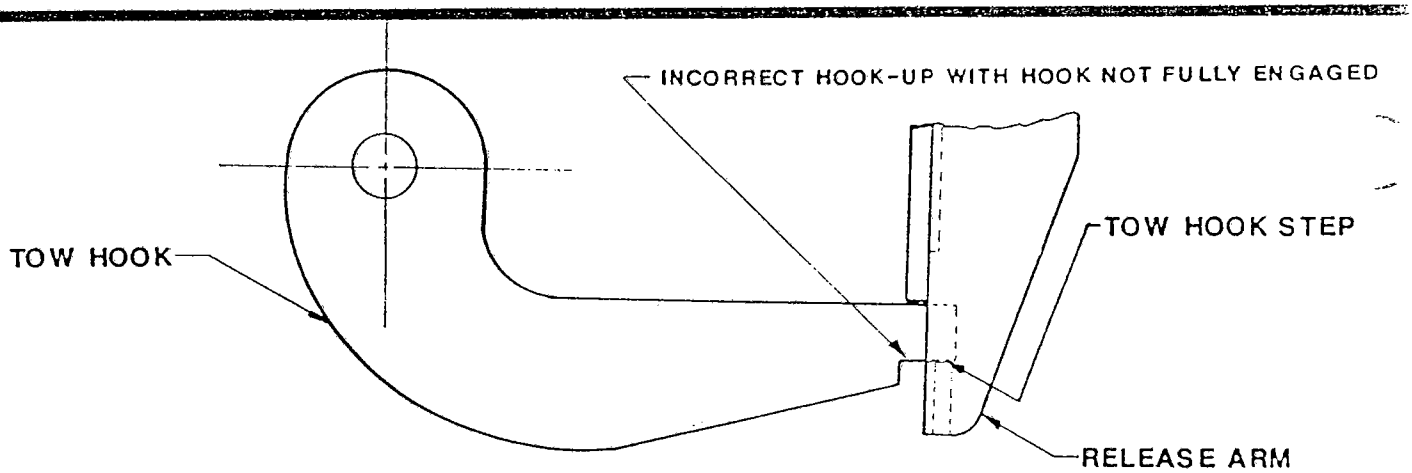
TABLE 2
DAILY AND 100-HOUR INSPECTION

	Daily	100 Hour
Visually inspect release arm for damage, cracks, deformation, and freedom of movement on pivot bolt.	X	X
Visually and physically inspect release arm slot for excessive wear which would allow the tow hook to engage beyond the hook step. (See Figure 1, Item C.)	X	X
Dimensionally measure the slot in the release arm to insure that it is within the tolerance as shown on Figure 3.		X
Visually inspect tow hook for damage, cracks, deformation, and freedom of movement on pivot bolt.	X	X
Visually check tow hook to insure that surface "x" and "y" of step as shown in Figure 2 are flat, smooth and properly engages release arm.	X	X
Dimensionally check tow hook to insure that all dimensions are within tolerances in accordance with Figure 2 and for elongation of attach hole in accordance with Figure 4.		X
Inspect release damper for general condition and proper engagement of tow hook.	X	X
Perform an operation check per Part 2.	X	X
Perform a release check for proper release tension in accordance with Figure 4.		X
Lubricate attach hardware for tow hook and release arm.		X
Lubricate guide-tubes in release control with dry stick type lubricant.		X
Insure that tow hook moves freely on pivot bolt.	X	X

FIGURE 1

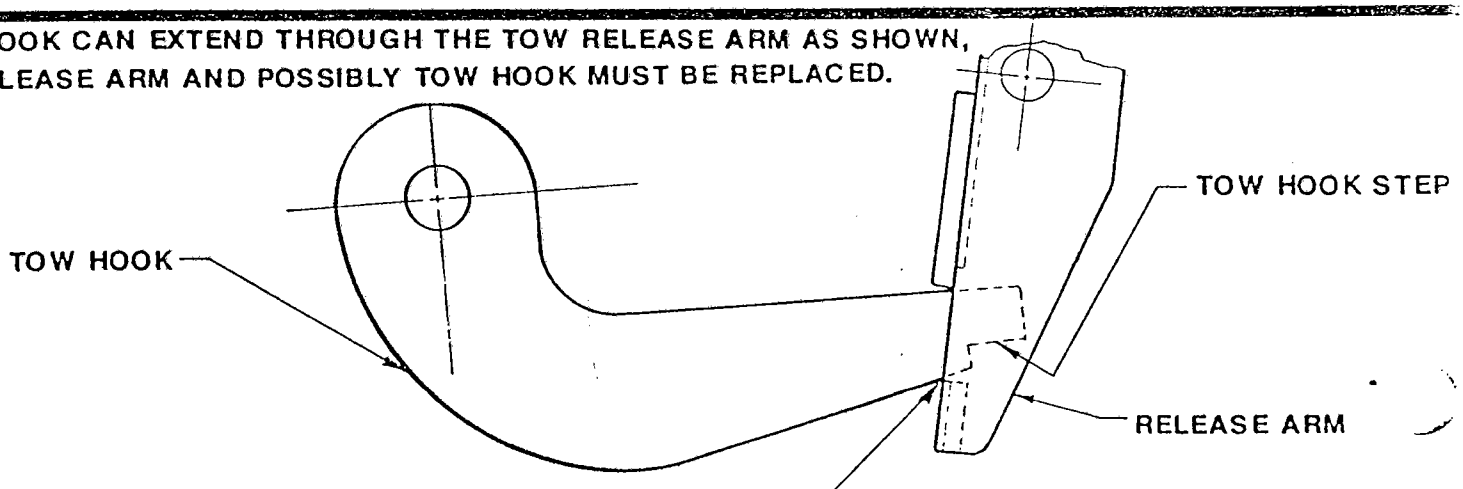


CORRECT HOOK-UP



INCORRECT HOOK-UP

W HOOK CAN EXTEND THROUGH THE TOW RELEASE ARM AS SHOWN, RELEASE ARM AND POSSIBLY TOW HOOK MUST BE REPLACED.



INCORRECT HOOK-UP

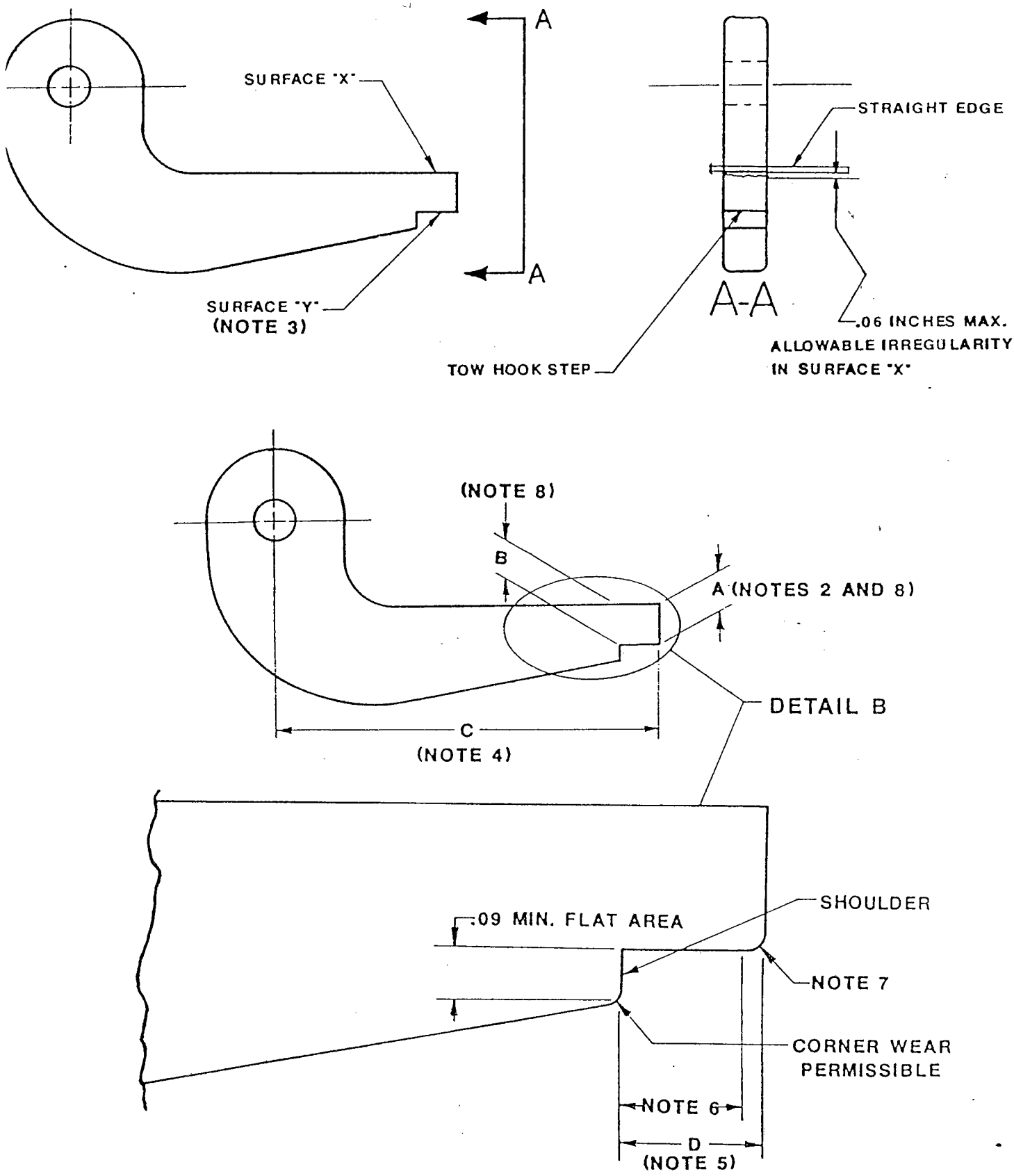


FIGURE 2. TOW HOOK INSPECTION AND REWORK (SHEET 1 OF 2)

1. IF WEAR OCCURS ON SURFACE "Y" IT MUST BE POLISHED FLAT WITHIN TOLERANCES PROVIDED IN FIGURE 2 (SHEET 1). IF THE HOOK CANNOT MEET THESE REQUIRED DIMENSIONS IT MUST BE REPLACED. UNDER NO CONDITIONS SHOULD SURFACE "X" BE POLISHED OR MACHINED TO CHANGE ITS ANGLE.

2. DIMENSION "A" ON 10232A-1 HOOK SHALL BE .21 INCHES MIN. & .28 INCHES MAX. DIMENSION "A" ON 1A-218-1A, 1B-221-1, 1B-221-3, & R-200-9A HOOKS SHALL BE .25 INCHES MIN. & .31 INCHES MAX.

3. SURFACE "Y" MUST REMAIN FLAT, SMOOTH, AND WITHIN TOLERANCES SHOWN ON SHEET 1. (SEE ILLUSTRATION.)

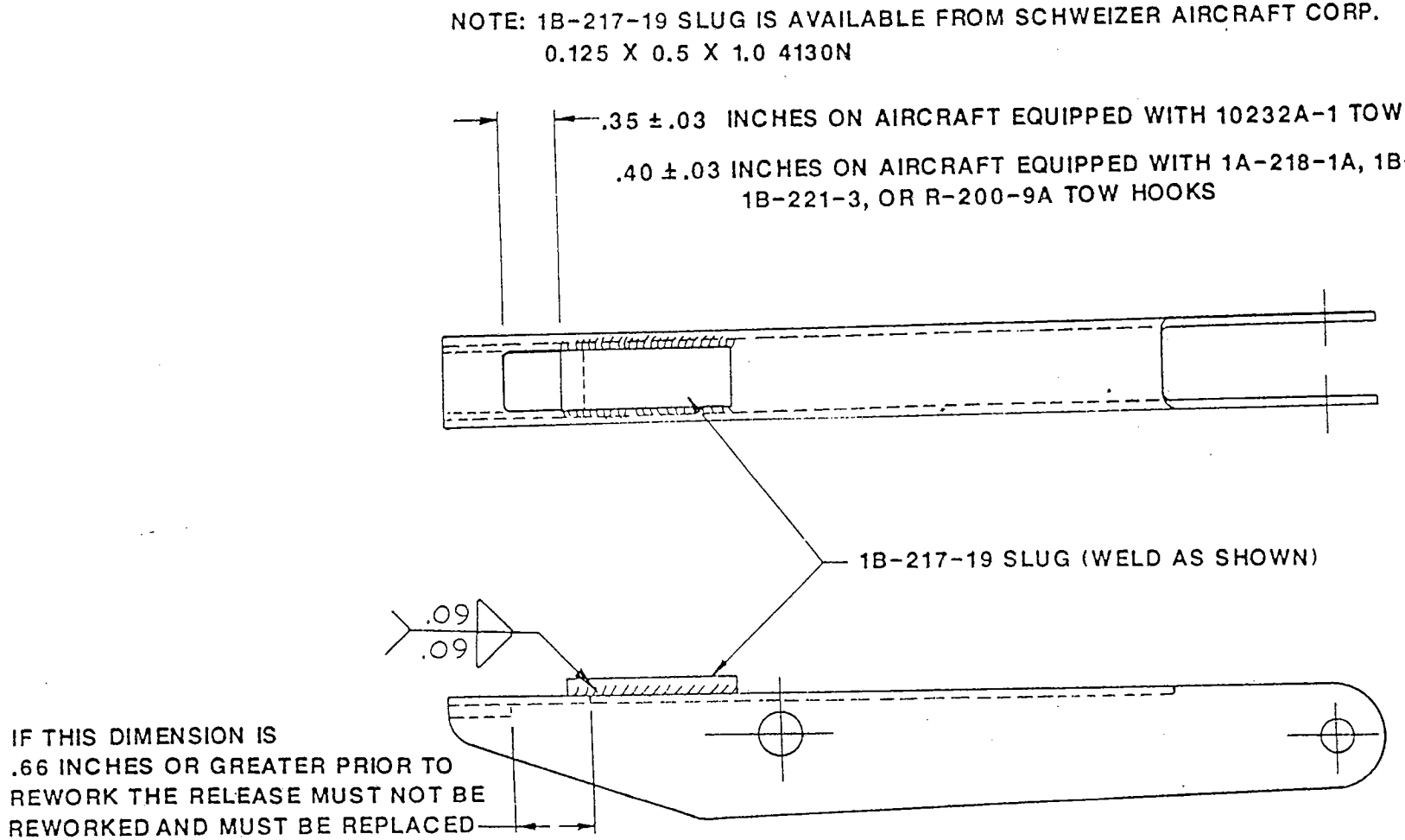
4. DIMENSION "C" ON 10232A-1 HOOK SHALL BE 2.06 $\pm$.03 INCHES. DIMENSION "C" ON 1A-218-1A, 1B-221-1, 1B-221-3, & R-200-9A SHALL BE 3.00 $\pm$.03 INCHES.

5. DIMENSION "D" SHALL BE .31 $\pm$.03 INCHES.

6. HOOK MUST REMAIN FLAT IN THIS AREA FOR A MIN. OF .21 INCHES FROM SHOULDER OF HOOK.

7. WEAR OUTSIDE OF THE .21 MIN. FLAT AREA IS PERMISSIBLE.

8. DIMENSION "B" MUST BE EQUAL TO DIMENSION "A", OR LESS THAN DIMENSION "A" BY NO MORE THAN .015 INCHES AND CANNOT BE GREATER THAN DIMENSION "A".

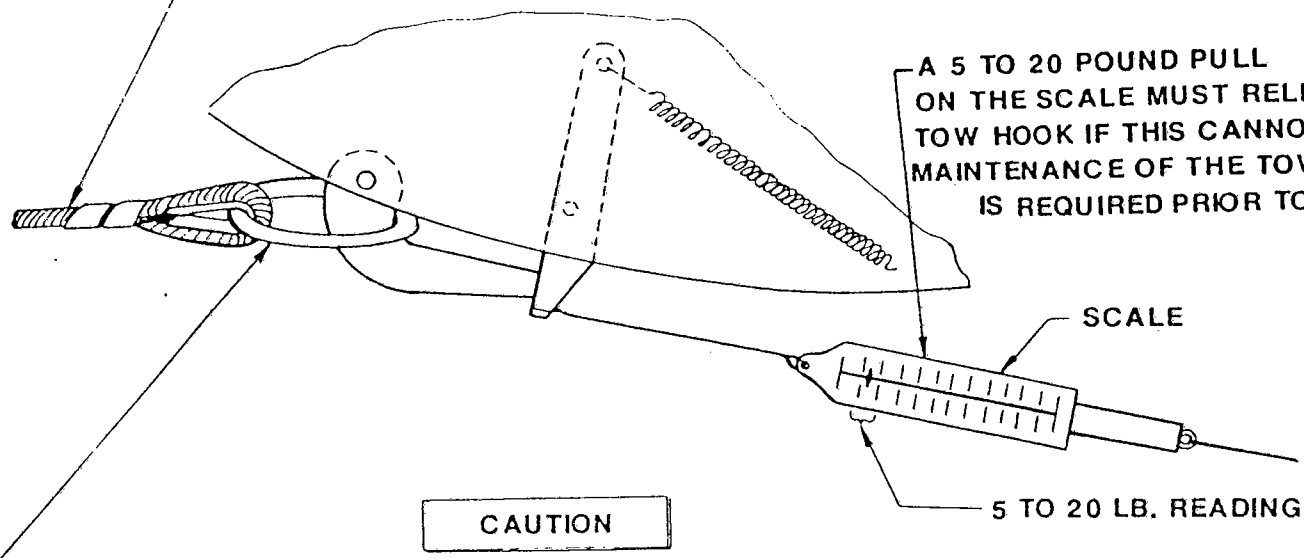


NOTICE...ALL TOW RELEASE ARMS MUST BE REWORKED AS SHOWN ABOVE OR REPLACED WITH THE PROPER SUPERSEDING UNIT PER TABLE 1

FIGURE 3

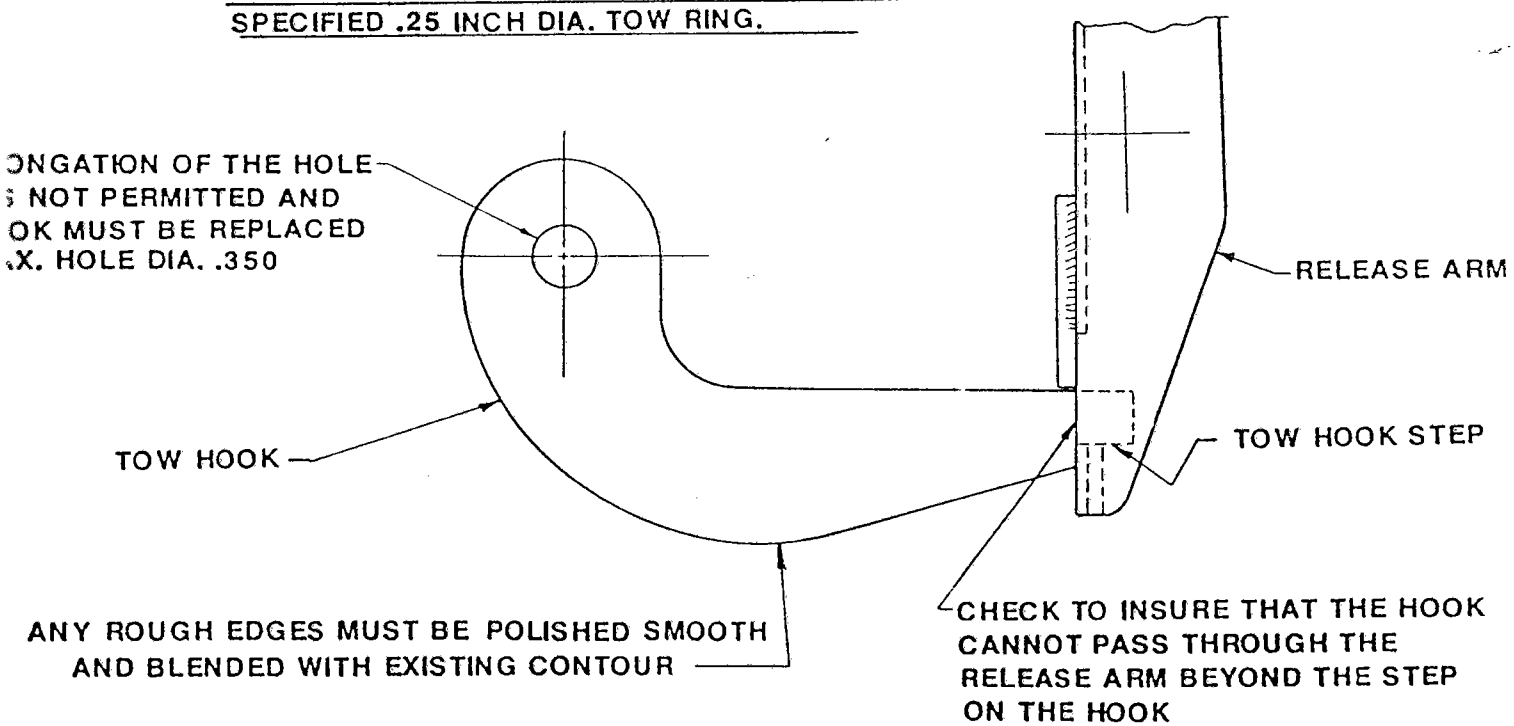
REWORK OF RELEASE ARM

FIGURE 4



CAUTION

SCHWEIZER TOW RELEASES ARE DESIGNED TO OPERATE WITH A .25 INCH DIA. TOW RING. CHECK WITH SCHWEIZER AIRCRAFT ENGINEERING DEPARTMENT FOR WRITTEN APPROVAL PRIOR TO USING ANY ATTACHMENT DEVICE OTHER THAN THE SPECIFIED .25 INCH DIA. TOW RING.



IF TOW HOOK CAN EXTEND THROUGH THE TOW RELEASE ARM, RELEASE ARM AND POSSIBLY TOW HOOK MUST BE REPLACED.

REFER TO FIGURE 1

SERVICE

BULLETIN

SERVICE BULLETIN SA-005

DATE: 1 June 1987

SUBJECT: ONE-TIME INSPECTION AND POSSIBLE REPLACEMENT OF TOW RELEASE ARM.

MODELS AFFECTED: All Schweizer manufactured and kit built Schweizer gliders and sailplane models listed below. All Serial numbers of each model. Also affected are all sailplanes retrofitted with a Schweizer tow hook installation.

SGU 1-7
SGS 2-8 (TG-2)
SGS 2-12 (TG-3)
SGU 1-19
SGU 1-20
SGU 1-21
SGU 2-22, 2-22A, 2-22C, 2-22CK, 2-22E, 2-22EK
SGS 1-23, 1-23B, 1-23C, 1-23D, 1-23E, 1-23F, 1-23G, 1-23H, 1-23H15
SGS 1-24
SGS 1-26, 1-26A, 1-26B, 1-26C, 1-26D, 1-26E
SGS 2-32
SGS 2-33
SGS 2-33, 2-33A, 2-33AK
SGS 1-34, 1-34R
SGS 1-35C
SGS 1-36 (Sprite)

NOTE

In the text of this writing, the terms "GLIDER" and "SAILPLANE" are to be considered synonymous.

TIME OF COMPLIANCE:
1. Must be completed prior to the next auto or winch tow of any sailplane equipped with the affected release arm.
2. Must be completed within 60 days on all sailplanes equipped with an affected release arm.
3. Affected release arms in spares inventory must not be installed on sailplanes and are to be returned to Schweizer Aircraft for warranty replacement.

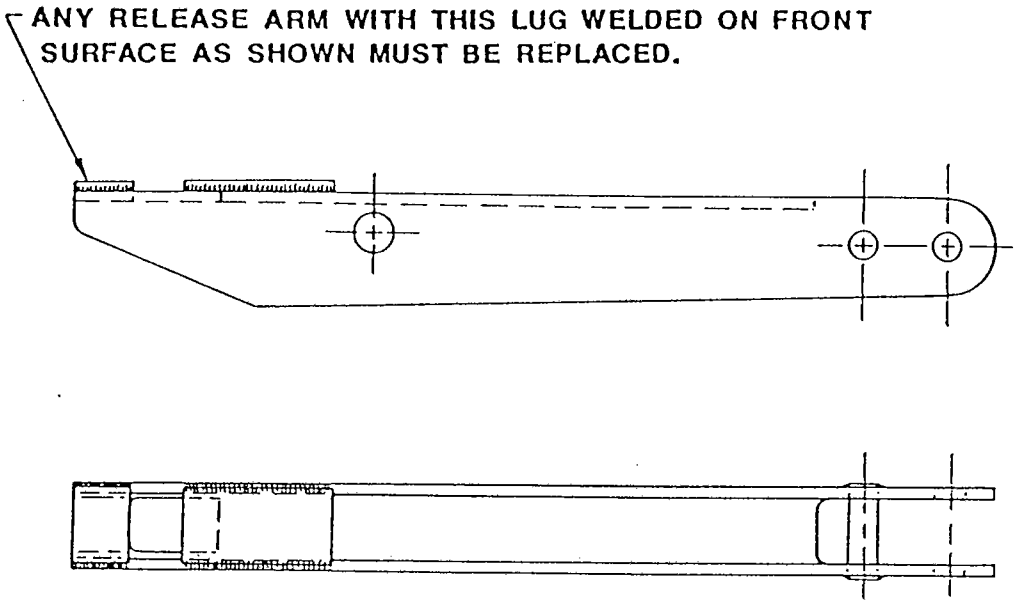
PREFACE: Reports indicate the possibility that the tow line could fail to release properly from Schweizer sailplanes equipped with a new tow release arm part number 10217-13, 10222-15, 10222-17, or 34017-13. The possibility of this incident occuring greatly increases during auto and winch tow operations or during an overrun of the tow line. This Bulletin requires replacement of the affected tow release arms with a new arm.

PROCEDURE

1. Inspect release arm for lug welded on front, below tow hook slot as shown in Figure 1. Any affected release arm must be removed and replaced within the time of compliance stated on this Bulletin. Return affected release arms to Schweizer Aircraft within 90 days of the date of this notice for free warranty replacement. Contact Schweizer Sailplane Product Support Department for exchange information. Arms received after 90 days will not be given warranty consideration.

2. Upon replacement of release arm, perform an operations check and maintain periodic and preflight inspections in accordance with the procedures outlined in Schweizer Bulletin SA-001.2.

3. Record Compliance with this Notice in the aircraft log book.



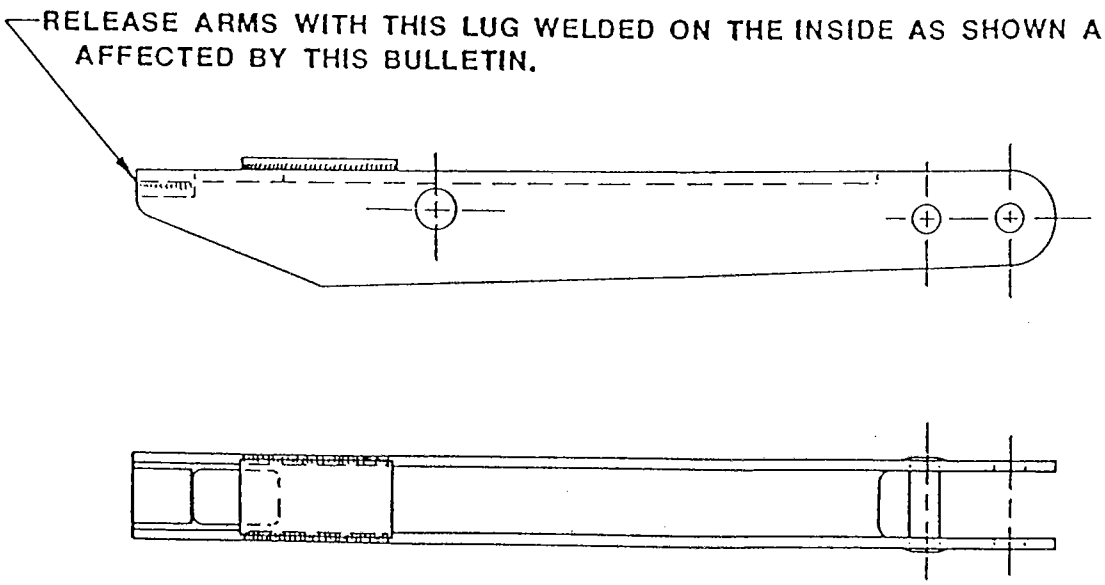


FIGURE 1. RELEASE ARM

...rthiness Division

To: Applicant
Avionic/Electrical Section (Survey)
Surveyor
Aircraft Projects Department
Flight Manuals Section
Applications & Certification Section

OR MODIFICATION

No. .....

...raft Type: PA 18 CUB, PA 25 PAWNEE, CHIPMUNK, CITABRIA ...n Marks: ETC ETC	Name and Address of Applicant R. B. STRATTON BRITISH GLIDING ASSOCIATION KIMBERLEY HOUSE VAUGHAN WAY LEICESTER	Applicant's Modification No BGA/T/1/85 Issue No 27/2/85
...ginal Drawings affected/Issue Nos -	New Drawings to be raised by -	New Drawings introduced/Issue Nos SKETCH BGA/T/1/85 ATTACHED

...tails of Modification GLIDER TOWING HOOKS

To improve the operation of Schweitzer Type Tow Hooks, (normally used for both Banner and Glider Towing), when used for Glider Towing, by replacing the roller by 1" O.D. sealed ball race.

The pull-off loads to release the tow cable under tension are reduced from 95lbs (approx) to 25lbs (approx).

Ground and Air Tested by BGA Ref DAI/8378/73.

R. B. STRATTON
Chief Technical Officer

(Details to be continued overleaf if necessary)

...Suitable for installation in this aircraft *only/*and any other where Schweitzer type ..... aircraft
Banner hooks are installed

Limitations, Conditions, or Exemptions

NIL

Amendments in accordance with BCAR, Section A, Chapter A5-1, A6-1, A6-2, A6-4 or A6-7, as appropriate, are required to the following:*

Weight and C of G Schedule Flight Manual or equivalent Maintenance Manual Overhaul Manual	NIL	Repair Manual Maintenance Schedule Crew Manual Electrical Load Analysis	NIL

The above modification is approved and may be embodied subject to compliance with British Civil Airworthiness Requirements, Chapter A4-1. & Chapter K4-10.

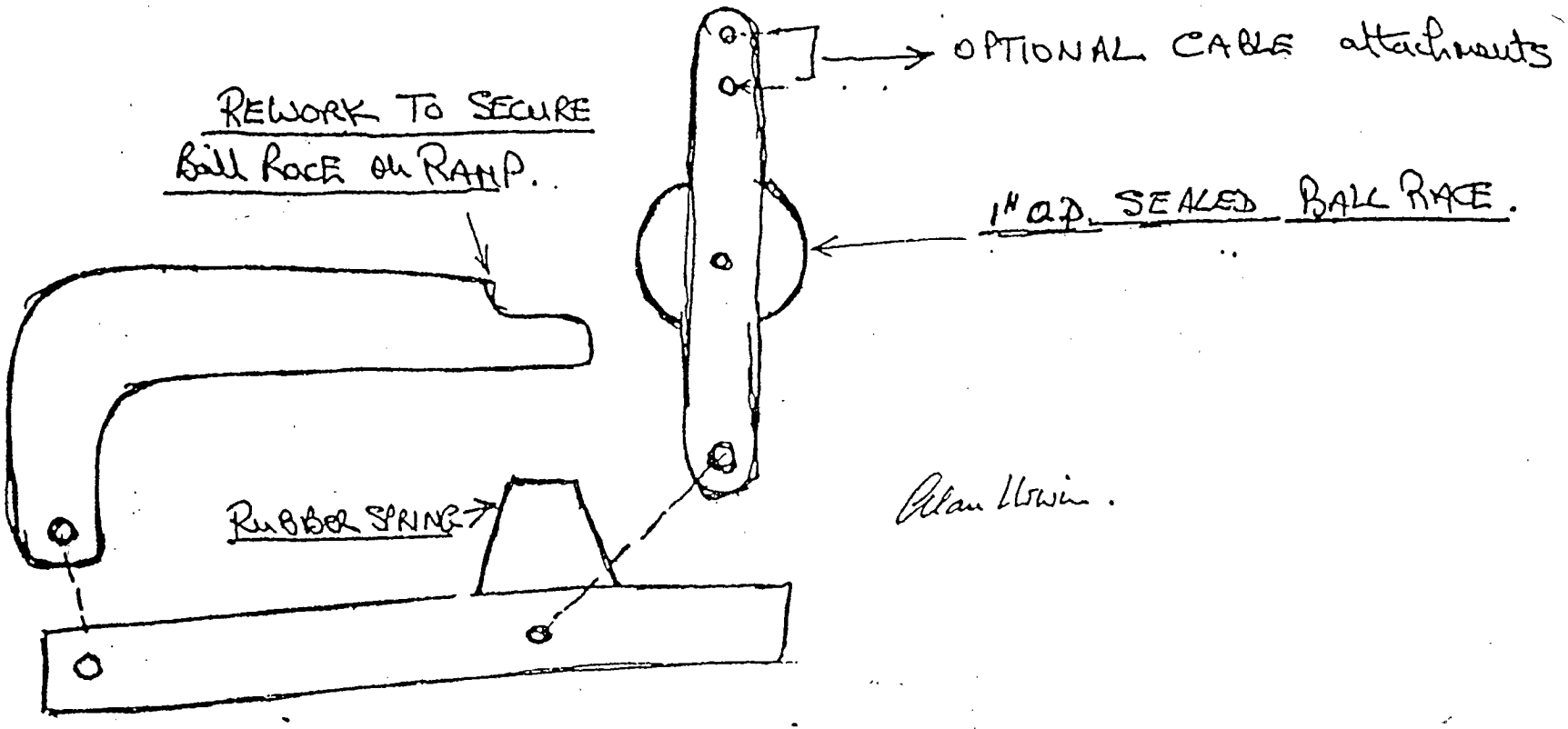
Date .....

For the Civil Aviation Authority .....

*Delete as appropriate

AD 261
080382

This is a rough sketch to show what it is, if you would like to have detailed drawing or photo let me know.



Alan Urwin.

Schweitzer Type Hook (MODIFIED), BGA MOD|T|1|85.

with 1" o.d. Sealed Ball Race – to reduce the Release load. (By 75% under tension applied).

For BGA.

ALAN URWIN 28/2/85.