SCHWEIZER AIRCRAFT CORPORATION
ELMIRA, NEW YORK

SGS 1-23H & SGS H-15

FLIGHT MANUAL

Form F-103
Rev. 2-64

GENERAL DESCRIPTION

The 1-23H and 1-23H-15 are conventional single-place high-performance sailplanes manufactured by Schweizer Aircraft Corporation, Elmira, New York. They are all-metal construction and the overall dimensions are identical except for wing span.

	SGS 1-23H	SGS 1-23H-15
Length	20' 9"	20' 9"
Span	52' 8"	49' 2" (15 meters)

FLIGHT CONTROLS-

1. Tow release knob (red)-
   Located center bottom of instrument panel. To release - pull red knob full out.

2. Dive brakes and wheel brake-
   Handle located at left side of fuselage below instrument panel. To use dive brakes, unlock control by turning handle inboard and down and then pull straight back. Can be used partially or full depending on what rate of descent is needed. These are the terminal velocity type dive brakes and will keep the airspeed at placard speed while ship is going straight down. The wheel brake is actuated when last half inch of dive brake lever is pulled (pull extra hard). Control can be locked in the "Off" position by pushing handle fully forward and turning handle up until notch in control rod engages pin.

3. Control stick-
   Conventional, and is mounted on a torque tube.

4. Rudder Pedals-
   Conventional toe pedals not quick adjustable, but may be adjusted on ground to one of three holes located for them.

5. Trim lever-
   A small T-handle located under bottom right of instrument panel. May be adjusted to any position desired, to reduce stick-back pressure required. Turn left to unlock and right to lock into position.

6. Instruments-
   ASI is required. Additional instruments are optional up to full panel as desired.

PREFLIGHT INSPECTION

1. Wing

   Check all dive brake hinges and connections (top and bottom)
   Check all aileron hinges, connections and pushrods

2. Tail Assembly

   Check all hinge points
   Check pushrod attachment to elevator horn and safety.
   Check stab attachment to fuselage
   Check rudder cable connection to rudder horn and safety.
   Check tail wheel assembly
   Check aft end of fuselage.

3. Fuselage

   Check release
   Check all controls for free movement
   Check instruments
   Check canopy attach points
   Check safety belt and shoulder harness
   Check wheel, tire and brake
   Check static and pitot tubes for condition and foreign matter
   Check wing and control attachments

4. Check tow rope

AERO TOWING

1. The elevator controls are quire sensitive and extra caution is needed to keep from over controlling.

2. Towing procedure is normal

3. Recommended towing speed is 50-60 mph.

WINCH OR AUTO TOWING

PRECAUTIONS-

1. Be sure equipment is suitable for purpose.

2. Person driving car or operating winch should be experienced with equipment and know towing characteristics of the 1-23.

3. Never attach rope or wire to empty sailplane.

Winch or auto tows may be executed in the usual manner. There is no tendency to oscillate. Maximum auto or winch towing speed is 68 mph.

CAUTION:

1. DO NOT climb at full back-stick position until a safe altitude for stall recovery is reached.

2. Level out before releasing.

3. Be sure airspeed is indicating less than placard speed for winch or auto tow.

FREE FLIGHT

FLYING SPEEDS-

Best gliding speed and L/D:

1-23H-15	-	50 MPH, 28-30	(29-2)
1-23H	-	50 MPH, 29-31	

Minimum sinking speed:

1-23H-15	-	2.2 f/sec., 40 MPH
1-23H	-	2.1 f/sec., 40 MPH

Placard speeds:

Dive	140 mph
Aero Tow	110 mph
Dive brakes extended	140 mph
Auto or winch tow	68 mph
V_A	87 mph

Aerobatics-
The 1-23H or 1-23H-15 is aerobatic, but extreme caution should be taken not to exceed placard speed. Pilots with no aerobatic experience should not attenpt inverted or difficult maneuvers without an adequate amount of dual in such. The 1-23H or H-15 accelerates very rapidly, and it is quite easy to exceed placard speed of 140 in a very few seconds.

Stalls-
Straight-ahead stalls can result in a fall-off to either direction or straight ahead. Stalls while turning - sailplane always stalls off in direction of the turn and a spin will occur unless immediate correction is executed.

Spins-
Can be entered from a straight-ahead stall or in a turn. Recovery is normal. Care should be taken not to dump stick too much as ship may go beyond vertical.

Useful Load-
The placard weights on the instrument panel should be strictly followed.

Example

Minimum Pilot Weight, Seat Fwd.	- 138
Minimum Pilot Weight, Seat Aft.	- 165
Maximum Pilot Weight	= 227

NOTE: Seat ballast must be used if pilot's weight is less than placard.

Nose Lead (Ballast)-
Varies in weight according to the extra equipment, such as radio and oxygen, which is installed and is used to keep the loaded C.G. within limits.

Slipping
The 1-23H or 1-23H-15 can be slipped straight ahead or in a turn in the conventional maneuver. Keep airspeed between 47-52 mph.

Spiralling-
In order to remain aloft or gain altitude in a thermal, it is necessary to spiral to stay within its limits. The average thermal diameter is relatively small, therefore, a steep bank of 30° - 40° and sometimes more, is required. The best speed to fly is just a mile an hour or so above the buffet. Keep in mind that the stalling speed and rate of sink increases with the increase of degree of bank. Sometimes it is necessary to sacrifice low speed and sink to remain in the thermal. This is especially true in strong, small diameter thermals.

Dive Brakes-
The dive brakes are speed limiting brakes which can be opened at speeds up to 140 MPH, placard -(VNE.) Speeds from 130 to 140 are considered as abnormal, i.e., emergency or inadvertant speeds, and are yellow arced on ASI. For all normal operation speeds are to be limited to 130 MPH.

The use of shoulder harness is mandatory in this aircraft since brake opening at high speed results in a substantial forward acceleration of pilot.

The dive brakes provide a large amount of drag and raise the stalling speed 3-4 MPH, and a stall will result if they are opened close to the stalling speed. The proper approach technique with a sailplane is to fly at least 10-15 MPH above stall in the landing pattern. Observing this speed rule, the dive brakes give excellent approach control. The rate of descent can be increased by increasing the speed. The rate of descent can be quite high and the pilot should familiarize himself with the flareout characteristics with the brakes extended. The landing can be made with the brakes extended and the wheel brake is actuated by applying pressure to the dive brake control. The landing should normally be made on the wheel with tail slightly down. A full stall landing would result in a tail wheel first attitude and a resultant drop in on the main wheel and is not recommended for normal operation.

The use of a dive brake as a speed limiting brake would occur only in an emergency such as loss of control in instrument flight. They should be used promptly before a speed of 130 MPH is obtained. They can be opened up at 140 MPH, however, if necessary. In flight the brake has been opened up at 160 MPH, but this is not recommended. In such an emergency, the pilot should attempt to control his speed to 140 before applying the dive brakes.

There is considerable force required to close the brakes at high speeds, and the brakes can be closed at speeds up to 105-108 MPH depending on the pilot's strength. This is not critical since it is recommended that the brakes normally should not be closed at speeds over 95 MPH due to the fact that the attitude of the sailplane at high speeds with brakes extended is very steep and rapid retraction of brakes will cause rapid acceleration of speed. (At 140 MPH with brakes, the attitude is a vertical dive.)

LANDING

Pattern-
It is general procedure to fly a rectangular pattern. Downwind and base legs and the approach. Extra speed is also used depending on wind velocity and gust conditions. It is good practice to add 1 MPH to the airspeed for each MPH of wind.

Touchdown-
It is desirable to flare out or flatten the glide path only a foot or so off the ground at 45-47 MPH. This will allow the sailplane to settle gently to the ground as the airspeed slows down. Be careful not to flare out too high because dropping-in or pancaking-in will result. This can be done with or without dive brakes open.

There is no danger of nosing-over when touchdown is made with dive-brakes open and wheel-brake on, provided the field is good. The ship will merely rock forward on the skid and stop with a minimum ground-roll.

CAUTION-
Be careful when landing in high grass or crops with dive brakes full open. One of the bottom brakes may contact high grass or crops before the other and cause a ground loop. It would be best in this case to land with dive brakes only 1/3 to 1/2 open.

Getting out of 1-23H or 1-23H-15---on the ground, it is tail down when empty and nose down with pilot in cockpit. When the pilot gets out, he should keep his weight on the side of the cockpit until he is in a position to let the tail down gently.

GENERAL FLIGHT PROCEDURES IN HIGH WIND

1. Be careful during ground handling operation. Keep tail high going to and from tie-down area.

2. Keep well up-wind of your landing area.

3. When going against the wind, it is good practice to add the wind velocity to speed at best L/D.

EXAMPLE

Speed at best L/D	47 mph
Wind Velocity	10 mph
Desired speed	57 mph

4. Land into wind whenever possible. In crosswind landing, crab into wind just enough to maintain desired path over ground and at last instant straighten ship in line of flight and touchdown. Be careful while ship is rolling. Downwind landing in high winds - land with brake full on and maintain control as long as possible.

5. The 1-23H or 1-23H-15 should never be left unattended in high winds.

TIE-DOWNS

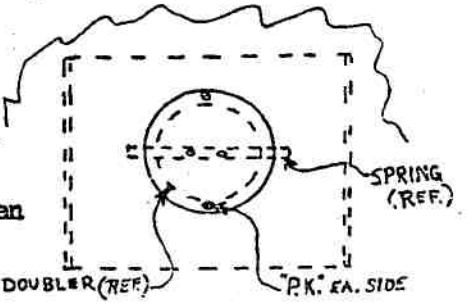
1- 3/16" hole through each wing at the spar
1-23H - approx. 6'10" inboard from tip
1-23H-15 - approx. 5'6" inboard from tip

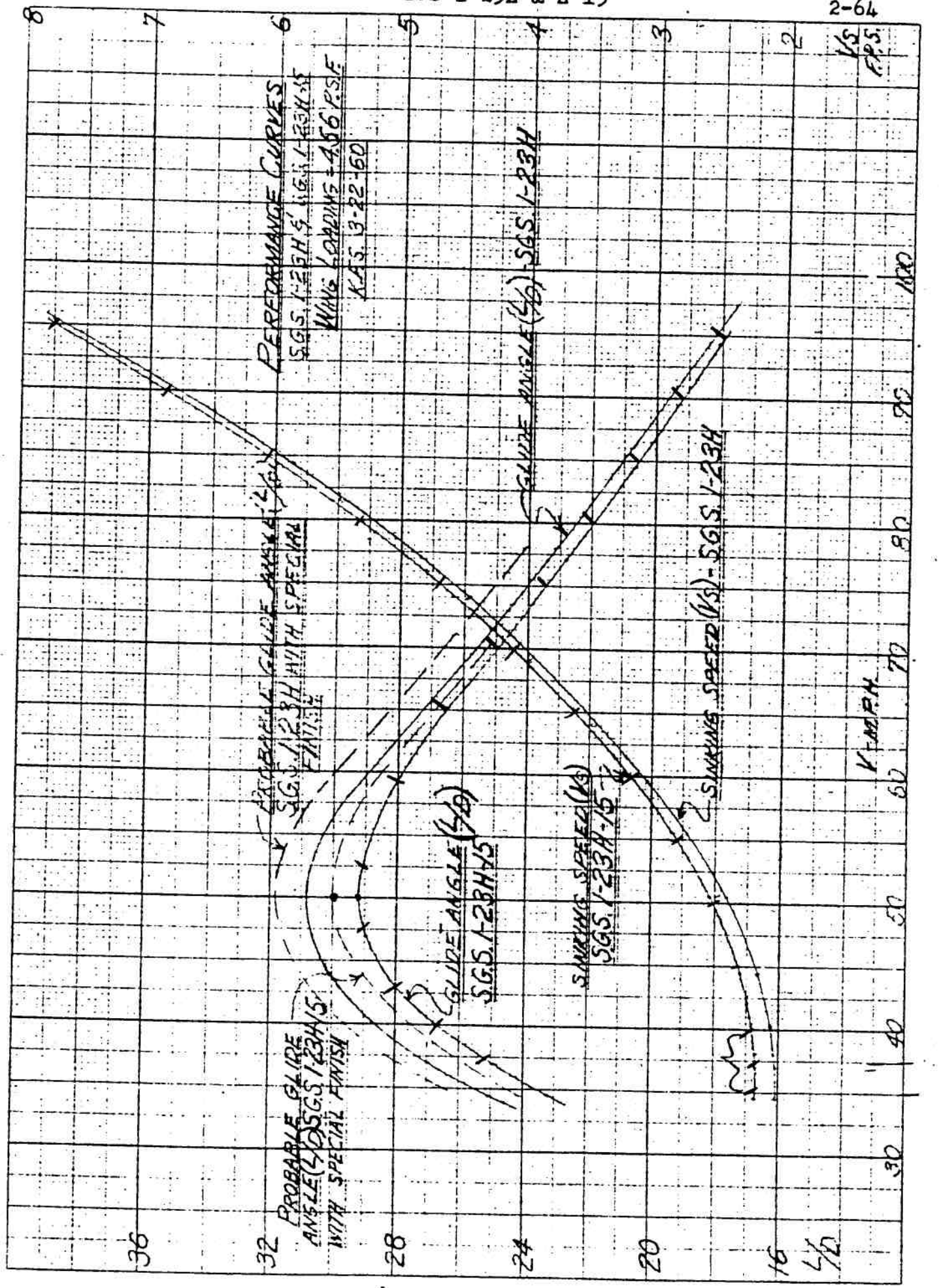
1- 3/16" hole forward of wheel in tail wheel bracket.

GENERAL NOTES

1. USE OF MASKING OR ELECTRICAL TAPE - by sealing the wing-fuselage junction and aft hatch, the buffeting before stall can be retarded several miles per hour. This also will reduce the sound level a great amount.

R. 2. INSPECTION HOLE COVERS Have been lost in flight during dives made at or near placard speed (140 MPH). If high speed dives or acrobatic flight is contemplated, it is recommended that the edges of the hole covers either be taped over with electrical tape, or, (2) #4 x 1/4, type Z PK screws be added at the edges of the plates, 90° to the centerline of the retainer-spring as shown. Drill #44 (.083) hole through cover and doubler, open holes in cover to #31 (.120) for clearance.




PERFORMANCE CURVES
SGS 1-23H & 1-23H/S WING LOADING = 4.56 P.S.F.
KAS. 3-22-60
GLIDE ANGLE (γ) - SGS 1-23H
SINKING SPEED (Vs) - SGS 1-23H
PROBABLE GLIDE ANGLE (γ) SGS 1-23H/S WITH SPECIAL FINISH
SGS 1-23H WITH SPECIAL FINISH
GLIDE ANGLE (γ) SGS 1-23H/S
SINKING SPEED (Vs) SGS 1-23H/S
K.T.A.S.
K.M.P.H.

SCHWEIZER AIRCRAFT CORPORATION
ELMIRA, NEW YORK

ERECTION AND MAINTENANCE INSTRUCTIONS

MODEL SGS 1-23H and H-15

TABLE OF CONTENTS

ASSEMBLY PROCEDURE MODEL SGS 1-23H & H-1

Before placing wing on fuselage, check to be sure there is no dirt on the spar butt or between the fuselage carry thru plates. A soft rag can be used to wipe these surfaces clean. The taper pin holes and the rear carry thru fittings should be checked for the same condition.

A step-by-step procedure should be followed each time to prevent trouble. The following procedure is recommended:

1. The fuselage placed in normal position with accessory hatch removed.

2. Wings placed on the ground or in racks on the correct side of fuselage.

3. Line up pins, taper pins, and rear carry thru bolts located so they are readily accessible. The taper pins are to be 23B-449-1"C" pins and are to be used with 23A-914-1 washers and AN365-720 nuts. It is recommended that the taper pins be coated with graphite powder to prevent seizing when pins are installed properly.

4. If the wing has been on the ground, check again to be sure it has picked up no dirt.

5. One person level the fuselage standing on the same side of the fuselage as the first wing to be installed. Two people pick up the wing, one at the tip and one at the root. The leading edge of the wing is handed to the man still supporting the fuselage, and the man carrying the wing root supports the root trailing edge.

   In attaching wings to the fuselage, care must be exercised to guide the slotted fittings for the dive brake torque tube over the drive fitting on either end of the drive tube in the fuselage. The spar butt is placed into the carry thru, and the aileron push rod and dive brake torque tube are started thru the fuselage slot. The rear wing fitting is now in position to be inserted into the rear carry thru. Extreme care should be taken by all people so that the person guiding the rear fitting into the hole does not have his fingers damaged between the sharp wing skin and the fuselage. A friction plate is installed to keep the rear wing fitting straight.

   When the rear fitting has been placed into the carry thru hole, the wing may be rocked to slide it into position so that the tapered holes in the spar line up with those in the carry thru. Check for positive engagement of the cross bolt in the fuselage drive tube with slots in the dive brake torque tube. Two 3/8" holes are provided on each side of the spar and carry thru structure. A 3/8" tapered drift-pin, S.A.C. Part No. 23A-444 or 2372-A should be used in these holes to align taper pin holes. Do NOT use a drift-pin in the taper pin holes. After lining up the tapered holes, the (2) 233449-1 taper pins are inserted with finger pressure only. The wing should be rocked and the pins seated using a light tap with a soft faced hammer. The AN 5-17 bolt on the rear carry thru is then inserted. It may be necessary to move the wing fore and aft at wing tip to line the hole in rear carry thru. The 23A-914-1 washers and AN 365-720 nuts are placed on the taper pins and the safety pin installed in the rear carry thru bolt. The wing which

was installed first can be placed on the ground and left in this position while the opposite wing is installed. If another person is available, he can hold the first wing in level position while the three people install the opposite wing in the same manner already outlined.

After both wings are in place, check the taper pins to assure that the required washers are installed. The nuts may then be tightened. (Torque nuts only enough to prevent washers from turning.) Excessive torque applied on the taper pins will create a problem upon removal. The two aileron push tubes are attached to the aileron idler horn either by (2) AN 3-6 bolts, AN 960-10 washers, AN 310-3 nuts and AN 380-2-2 cotter pins or by (2) AN 393-11 clevis pins and (1) safety pin. (The one safety pin being used to safety both clevis pins.)

6. Stabilizer and Elevator Installation to Fuselage:

The stabilizer and elevator normally are left attached to the fuselage when trailering, but may be removed at the owner's discretion. Use the following hardware when reinstalling the Stabilizer Elevator Ass'y. The front spar is attached to the fuselage fitting with (2) AN4-33A bolts, (2) AN960-416 washers and (2) AN365-428 nuts. The rear spar is attached to the fuselage fitting with (2) AN5-41A bolts, (2) AN960-516 washers and (2) AN365-524 nuts. The elevator push rod is attached to the elevator horn by one each AN3-7 bolt, AN310-3 nut, AN960-10 washer and AN380-2-2 cotterpin. "Caution": DO NOT USE a safety pin on the push rod to elevator attachment as this may cause jamming of the controls.

7. Disassembly of Wings from Fuselage:

The disassembly procedure is the reverse of that used for the assembly. When removing the wing taper pins, use a taper pin puller, SAC Part No. 23A-425-1. This is accomplished by placing the puller over the head of the taper pin on the forward side of the carry thru, then threading a AN5-6 bolt into the taper pin. The bolt length should be checked to assure that it engages in the taper pin by at least 4 threads before any great amount of torque is applied. Apply pressure to the taper pin by tightening puller bolt, at the same time tap the pin with a plastic hammer while another person rocks the wing. "CAUTION" If the pins are not readily loosened by the above method, do not attempt to loosen them by applying further torque on the puller bolt as this will strip the bolt threads. It is recommended that a nut be placed on the taper pin threads and the pin unseated with the aid of a few hammer blows. When the pin is loosened, the puller should be removed and the taper pin can be completely removed by driving it from the rear with a plastic hammer. The person driving the taper pins should place his hand in front of the pin head to prevent it from striking the instrument panel.

GENERAL MAINTENANCE INSTRUCTIONS SGS 1-23H & H-15

A. General Maintenance:

The Sailplane can be serviced with a minimum of two lubricants; a good grade of lubricating oil and No. 2 cup grease.

1. Lubrication should be accomplished as follows: See Table I.

   a. Lubricating oil should be used on the following parts:

Aileron hinges	Elevator hinges
Aileron Idler Horn Bearing	Torque Tube bearings (Control Stick)
Rudder hinges	Torque Tube bearings (Dive Brake) in fuse.

   b. Cup grease should be used on the dive brake sliding control in cockpit.

   c. Lubricate at the following intervals:

      (1) Oil hinges every 20 hours flying time or 6 months elapsed time, whichever is sooner.

      (2) Grease dive brake sliding control every 20 hours flying time or 6 months elapsed time, whichever is sooner.

      (3) Oil dive brake torque tube bearing blocks every periodic Inspection, these are located just aft of the fwd. carry-thru structure on left and right side of fuselage.

      (4) Oil aileron idler horn bearing every 20 hours flying or 6 months elapsed time, whichever is sooner.

   d. Rod End Bearings are the sealed type and require no lubrication under normal conditions.

   e. Control pulleys are the sealed type and require no lubrication under normal conditions.

2. Leveling:

   a. To level fuselage laterally, prop up the wing tips, insert line-up pins in the forward wing carry thru structure and test for horizontal across the pins.

   b. To level fuselage longitudinally, prop up the tail and test for horizontal on upper surface of stabilizer between front and rear spars near fuselage.

3. Rigging:

a. The proper dihedral angle and angle of incidence are built into the wing and fuselage at the factory.

b. Elevator and Rudder Control System rigging is accomplished by turnbuckles on the cables. Elevator cables are rigged to 30 ± 5 pounds tension. Rudder control system tension is maintained by springs on rudder pedals, however, cables should be rigged with turnbuckle threads flush with the barrel. Double safety turnbuckles in accordance with CAM 18.

c. Tow hook release spring tension is checked by applying a force of 6-12 lbs. at the end of the release arm, the hook should then release. If tension is not within this tolerance, the spring should be replaced.

B. Inspection (Preflight)

1. Inspect the following for condition, operation, security of attachment.

a. Wing and attachment pins.

b. Ailerons and Gap Tapes.

c. Dive Brakes and Torque Tubes

d. Stabilizer

e. Elevator

f. Fin

g. Rudder

h. Fuselage structure and skins.

i. Control Cables

j. Control and control system pushrods.

k. Main wheel and brake

l. Tire (Maintain tire)

m. Tail wheel and bracket

n. Skid and Skid Shoe (Skid should be replaced if cracks or splits are evident. Shoe need not be replaced except where there is excessive wear or breakage.)

o. Shoulder harness and safety belts.

p. Instruments for zero reading.

q. Canopy and latch mechanism.

r. Plexiglass for cracks or excessive crazing.

s. Pitot System (after prolonged tie-down or exposure to rainy weather, remove lines from instruments and blow out any water which may have collected.

CAUTION: DO NOT BLOW INTO PITOT TUBE WITH INSTRUMENTS CONNECTED.

C. Inspection (Periodic and/or 100 hr.)

1. Fuselage Group

a. Check control stick and Torque Tube Assembly. Oil Torque tube support bearings.

1. Inspect internal surface of torque tube for corrosion, clean and apply Paralketone if necessary.

b. Check controls for ease of operation.

c. Check control cables for safety, corrosion, wear and security of attachment.

d. Check elevator push tubes for condition, wear especially at fairlead and security of cable attachment.

e. Check fuselage structure and skins for corrosion, loose rivets and other signs of structural failure or damage.

f. Check safety belts, shoulder harness, brackets and bolts.

g. Check cable pulleys for wear and attachment, replace if necessary.

h. Check dive brake controls for condition, attachment and operation. Grease dive brake sliding control.

i. Check springs for corrosion, cracks and wear at ends.

j. Check instruments for attachment, zero reading and condition.
(1) Airspeed markings: Yellow Arc 130-140 mph; Red radial at 140 MPH.

k. Check canopy and latch mechanism for condition, attachment and operation.

l. Check plexiglass for cracks or excessive crazing.

2. Landing Gear Group.

a. Remove wheel, inspect for cracks.

b. Inspect wheel bearings for condition, repack.

c. Inspect tire for wear and cuts.

d. Inspect brake for wear and operation.

e. Reassemble and inflate tire to 30-35 lbs. pressure.

f. Inspect tail wheel and bracket for cracks, loose rivets and wear.

g. Inspect skid and shoe for cracks, wear and attachment.

3. Empennage Group

a. Inspect stabilizer for condition and attachment.

b. Inspect stabilizer fittings and bolts for wear and signs of failure.

c. Inspect elevator and hinges for condition, attachment and operation.

d. Inspect elevator horn for condition and pushrod for security of attachment.

e. Inspect fin for condition and attachment.

f. Inspect rudder and hinges for condition, attachment and operation.

g. Inspect rudder horn for condition and cables for security of attachment.

4. Wing Group

a. Inspect wing attachment fittings and pins for condition and security of attachment.

b. Inspect fixed surfaces for corrosion, loose rivets and other signs of structural failure or damage.

c. Inspect aileron pushrods for wear especially at fairleads, misalignment and security of attachment.

d. Inspect dive brake torque tube for condition and security of attachment.

e. Inspect ailerons and hinges for condition, operation and attachment.

f. Inspect dive brakes for condition, operation and attachment.

g. Inspect aileron bellcranks for condition, evidence of damage and attachment.

h. Inspect aileron gap tapes for attachment and absence of binding.

5. Tow Hook

a. Inspect hook for wear, cracks, roughness and attachment

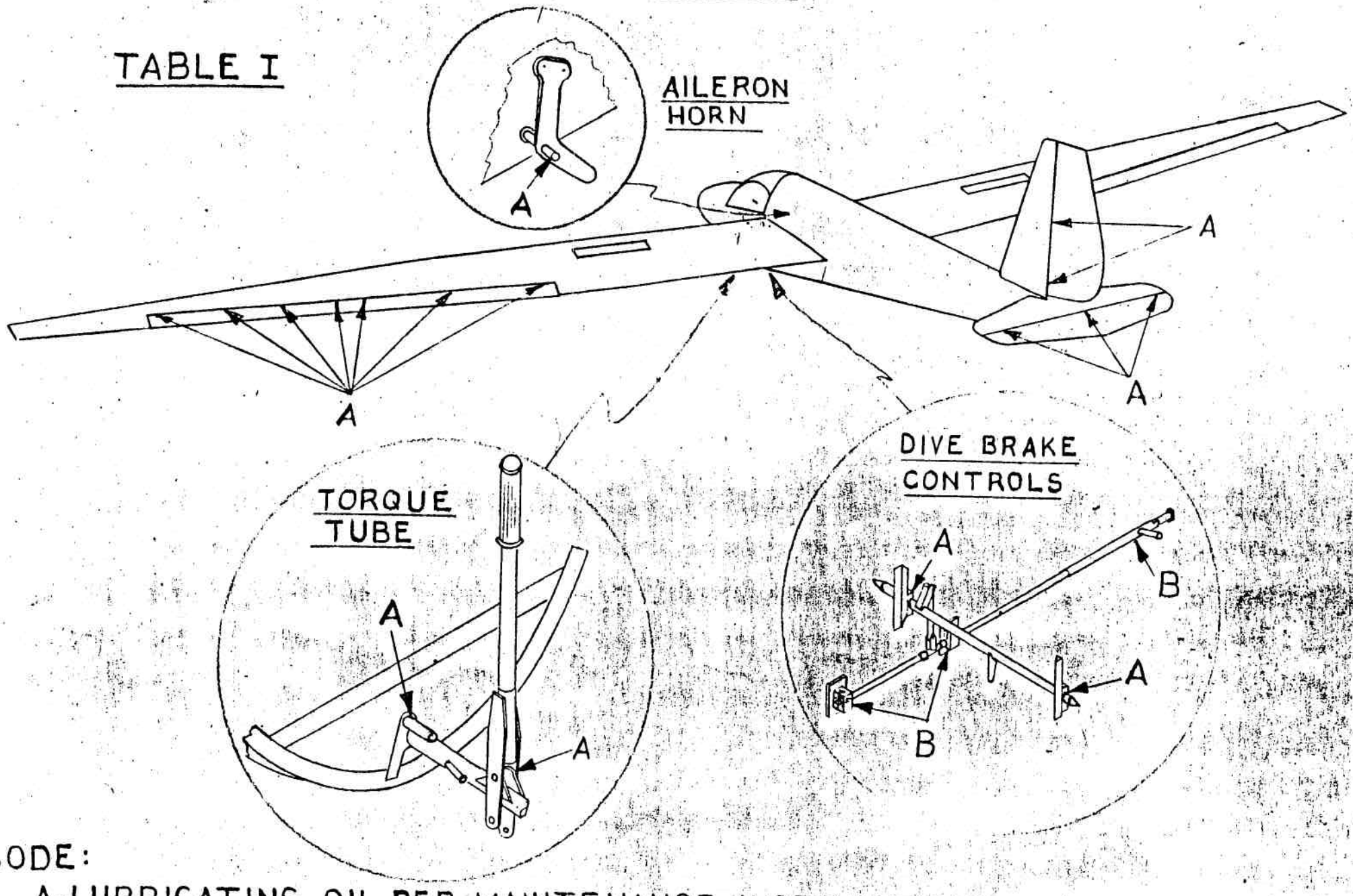
b. Check mechaniam for freedom of operation.

c. Check release mechanism by applying a force of 6-12 lbs. as outlined in paragraph A3(d).

d. Check ring clearance between hook and fuselage when hook is closed, with a ring made from 5/16" dia. stock.

LUBRICATION
SGS 1-23H & 1-23H-15

TABLE I



CODE:

A-LUBRICATING OIL PER MAINTENANCE INSTRUCTIONS

B-NO. 2 CUP GREASE PER MAINTENANCE INSTRUCTIONS