

FLAPS - MAINTENANCE PRACTICES

1. General

- A. The wing trailing edge section consists of riveted ribs, stringers, gussets and skins. A flap is attached to each wing. On the Model 208B and 208 (with TKS installed), four vortex generator boots are attached to the leading edge of the flap assembly. The wing trailing edge structure contains fittings for flap attachment. Fittings are shown in Figure 201

2. Tools, Equipment and Materials

- A. For a list of required tools, equipment and materials, refer to Wings - General.

3. Flap Removal/Installation

- A. Remove Flap Assembly (Refer to Figure 201).
 - (1) Lower the flaps to the fully extended (30 degrees) position.
 - (2) Disconnect the flap push-pull rods by removing the bolts at the inboard and center hinge positions. Keep the spacers.
 - (3) At the outboard hinge position, disconnect the cable by removing the cotter pin and clevis pin.
 - (4) At the outboard hinge position, remove the nut, bolt, and roller from the flap track attachment.
 - (5) At the inboard and center hinge positions, remove the nut, bolt, washers, bushing, and roller, from each forward flap track attachment.
 - (6) Support the flap assembly and remove the nut, bolt, and roller, from each inboard rear and center rear flap track attachment. Remove the flap assembly.
- B. Install the Flap Assembly (Refer to Figure 201.)
 - (1) Position the flap assembly on the wing flap tracks and install the roller, bolt, and nut at each inboard rear and center rear flap track attachment.
 - (2) At the inboard and center hinge positions, install the roller, bushing, washers, bolt, and nut at each forward flap track attachment.
 - (3) At the outboard hinge position, install the roller, bolt, and nut. Connect the cable to the flap by installing the clevis pin and cotter pin.
 - (4) With spacers positioned on each side of the flap push-pull rod end, install the bolt and nut at each inboard and center hinge position.
 - (5) Check the flap control system cable tensions and the flap travels in accordance with Chapter 27. Rig again as required.

4. Adjustment of Fuselage-Mounted Flap Roller

NOTE: This procedure applies to Airplanes 208 and 208B thru 208B0194 Not Incorporating SK208-71.

- A. Procedure (Refer to Figure 201).
 - (1) After the installation of the flaps, check the clearance between the lower surface of the roller and the upper surface of the flap track channel. Do this check at five different flap settings from 30 degrees down. Maintain an 1/8-inch clearance if possible.
 - (2) Do not allow the top of the roller to run above the top of the flange on the flap track channel. It is possible that the 1/5-inch clearance will have to be decreased in order to prevent the top of the roller from running above the top of the flap track channel.
 - (3) Install the spacer as required between the roller support assembly and the fuselage to make sure the roller engages with the flap track properly.

NOTE: If interference occurs with the washer and roller support assembly as a result of the extreme wing spar eccentric adjustment, grind the washer flat on the outside diameter to eliminate the interference.

5. Flap Vortex Generator Boots Removal/Installation

- A. Remove Flap Vortex Generator Boot (Refer to Figure 201).

WARNING: Cement and solvent vapors are toxic and extremely flammable. Use only in a well ventilated area away from sparks or vapors. Excess exposure could cause injury or death. If dizziness or nausea occur, obtain fresh air immediately. Avoid contact with skin or eyes. Use solvent resistant gloves to minimize skin exposure. Use safety glasses to minimize chance of eye contact. If eye contact

occurs, flush eyes with water for 15 minutes and see a physician. If skin contact occurs, wash thoroughly with soap and water. If swallowed, do not induce vomiting. See a physician immediately.

WARNING: Confirm that the aircraft is electrically grounded to prevent static sparks which could ignite solvent vapors.

- (1) Remove flap. Refer to Flap Removal/Installation.
- (2) Using a pressure handle squirt can filled with methyl n-propyl ketone and starting at one corner of the upper trailing edge of the boot, apply a minimum amount of methyl n-propyl ketone to the seam line while tension is applied to peel back the corner of the boot.
- (3) Using methyl n-propyl ketone, separate boot from flap for a distance of four inches all the way along the upper trailing edge.
- (4) If boot is to be preserved, continue to use methyl n-propyl ketone to soften the adhesion line and pull down and toward the lower trailing edge with uniform tension.
- (5) Remove installation cement using BF Goodrich KE 9002 paint remover or equivalent.
- (6) Clean area thoroughly using methyl n-propyl ketone.

B. Install Flap Vortex Generator Boots (Refer to Figure 201).

- (1) Using one inch masking tape, mask off area to be covered by Vortex Generator boot. Allow one-half inch extra on each side. If an adhesion test is to be made, allow one inch on end to install adhesion test strip.
- (2) Thoroughly clean the metal surfaces with cleaning solvent at least twice.
- (3) Remove all paint and primer within the masked area.
- (4) For final cleaning, swab with clean solvent and quickly wipe dry with a clean, dry cloth to avoid leaving a film.
- (5) Apply GACO N-700-A neoprene coating to the leading edge skin to avoid fuel degradation of the boot or installation cement.
- (6) Fill gaps of skin splices that lead under boots with GACO N-700-A.
- (7) Moisten a lint free cloth with cleaning solvent and carefully clean the rough, back surface of the boot at least twice. Change cloths frequently to avoid recontamination of the cleaned areas.

WARNING: EC1300L cement is extremely flammable. Extinguish all open flames. Avoid sparks. Use only in well ventilated areas. Avoid prolonged breathing of vapors. Avoid skin contact.

- (8) Thoroughly mix the EC1300L installation cement.
- (9) Apply one even brush coat to the cleaned back surface of the Vortex Generator boot and to the cleaned installation surface.
- (10) Allow the cement to dry a minimum of one hour at 50°F (10°C) or above when the relative humidity is less than 75%. If the humidity is 75% to 90%, allow additional drying time.

NOTE: Do not apply the cement if the relative humidity is higher than 90% or if the temperature is below 50°F (10°C).

- (11) Snap a chalk line along the centerline of the leading edge of the flap. Intensify chalk line on leading edge with a ball point pen.
- (12) Stir cement again and apply a second coat to both surfaces and allow to air dry a minimum of one hour.

NOTE: Vortex Generator boot and leading edge may be cemented for a maximum of 48 hours before actual installation if cemented parts are covered and kept clean.

- (13) Position boot so its centerline is against the centerline leading edge of the flap.

NOTE: Installation may best be accomplished using two people: one to hold and guide the boot during installation, the other to reactivate the cement and roll the boot down.

- (14) Using a clean, lint free cloth dampened with Methyl n-Propyl Ketone (MPK), reactivate a 3-inch by 18-inch long section of cement on the flap leading edge.
- (15) Reactivate a matching section on the boot cemented surface. Vortex Generator boot will adhere only where cement is reactivated.
- (16) When cement is tacky, press boot to flap making sure that centerlines coincide. Then rubber roll boot firmly against

flap skin in the tacky area.

- (17) If boot should attach off course (centerline not coinciding with leading edge centerline), apply methyl n-propyl ketone with a small brush or squirt can to soften the bond line. Apply only a minimum of solvent to bond line while applying sufficient tension to peel back boot.
- (18) Remove slowly enough to allow solvent to soften cement, thus preventing removal of cement coat or injury to boot.
- (19) Do not use excess quantities of solvent.
- (20) To avoid boot damage, avoid twisting, bending boot sharply, or jerking boot loose from bonded area.
- (21) Allow to dry thoroughly before continuing with application. Reapply cement if any has pulled loose.
- (22) After boot is fastened in place along its centerline, begin to reactivate cement on either upper or lower surface.
- (23) Start at inboard end and wipe with a Methyl n-Propyl Ketone (MPK) moistened cloth, first along cemented aircraft surface in one direction, and return to start by wiping corresponding cemented surface of boot (approximately three inches wide). Too much wiping will remove cement.
- (24) Hold boot back to reveal bond line and begin reactivating.
- (25) Keep moistened cloth tight into fold of bond line of the boot to flap skin.
- (26) To avoid trapping air, do not allow boot to touch reactivated cement until desired time.
- (27) Roll down boot with rubber roller, starting at bond line, and roll spanwise while working toward trailing edge.
- (28) Work carefully to avoid trapping air. Let the roller do the work of mating the two surfaces.

NOTE: If boot lifts after rolling, and cement cobwebs, the cement is too wet. Wait until cement is tacky, and roll again. Keep bond line as straight as possible. This helps to better monitor where the bond line is and eliminate pockets where air can be trapped.

- (29) When boot is being installed in a recess, install boot up to edges of recess, then, using a hook knife, trim boot edges and/or ends, as applicable to fit recessed leading edge skin or to butt against adjacent boot or aircraft structure.
- (30) Rubber roll spanwise over entire surface of boot, applying pressure to ensure good bond.
- (31) Remove all masking tapes.
- (32) Apply masking tape to boot edges at trimmed ends or at gaps between sections.
- (33) Apply GACO N-700-A neoprene coating to protect cut edges of a boot and fair it to adjacent surface.
- (34) Apply masking tape to boot surface approximately 1/4-inch forward from trailing edges and any trimmed edges.
- (35) On aircraft surface, apply masking tape approximately 1/8-inch back from area initially cleaned and cemented, forming a neat, straight line.
- (36) Apply a heavy brush coat of GACO N-700-A neoprene coating to surfaces between tapes (including trimmed edges). Ensure sealer is continuous. (No voids).
- (37) Remove masking tape immediately after applying coating (before coating dries).
- (38) Install flap. Refer to Flap Removal/Installation.

C. Adhesion Test.

- (1) Using excess boot material, prepare test specimen one inch wide and four or more inches long.
- (2) Cement specimen to installation surface adjacent to installed boot, following the identical procedure used for boot installation.
- (3) Leave one inch of the strip uncemented to attach a clamp.
- (4) Four hours or more after boot installation, attach a spring scale to uncemented end of each strip and measure force required to remove the strip at a rate of one inch per minute. The pull shall be applied 180 degree to the surface. (Strip doubled back on itself).
- (5) A minimum of five pounds tension (pull) shall be required to remove test strip.

NOTE: Required acceptability of the boot adhesion shall be based on carefully lifting one corner of the boot in question sufficiently to attach a spring clamp and attaching a spring scale to this clamp. Pull with force 180 degree to the surface, and in such a direction that the boot tends to be removed on the diagonal. If a force of five pounds per inch of width can be exerted under these conditions, the installation shall be considered satisfactory. Width increases as corner peels back.

Figure 201 : Sheet 1 : Flap Installation

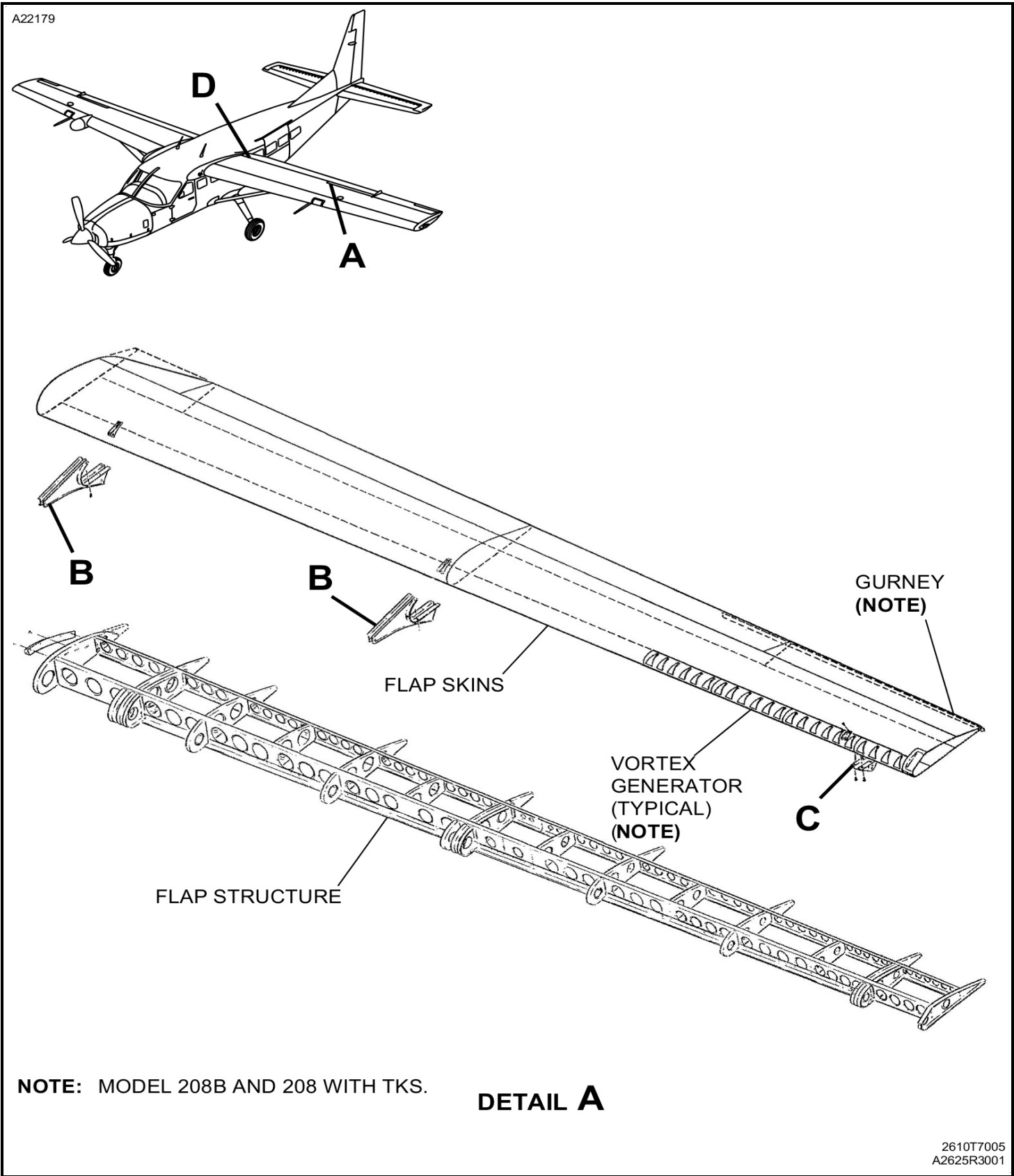


Figure 201 : Sheet 2 : Flap Installation

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