

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

FOR FAA USE ONLY
OFFICE IDENTIFICATION

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form.

1. AIRCRAFT	MAKE Cessna	MODEL A185F
	SERIAL NO. 18502213	NATIONALITY AND REGISTRATION MARK N3946Q
2. OWNER	NAME (As shown on registration certificate) Dr. J. Wallace Graham	ADDRESS (As shown on registration certificate) 1571 E. Tomahawk Drive Salt Lake City, Utah 84103

3. FOR FAA USE ONLY

4. UNIT IDENTIFICATION

UNIT	MAKE	MODEL	SERIAL NO.	5. TYPE	
				REPAIR	ALTERATION
AIRFRAME (As described in item 1 above)				XX
POWERPLANT					
PROPELLER					
APPLIANCE	TYPE				
	MANUFACTURER				

6. CONFORMITY STATEMENT

A. AGENCY'S NAME AND ADDRESS Robertson Aircraft Corporation 839 West Perimeter Road Renton, WA 98055	B. KIND OF AGENCY	C. CERTIFICATE NO. 415-23
	<input type="checkbox"/> U.S. CERTIFICATED MECHANIC	
	<input type="checkbox"/> FOREIGN CERTIFICATED MECHANIC	
	<input checked="" type="checkbox"/> CERTIFICATED REPAIR STATION	
	MANUFACTURER	

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

DATE June 18, 1980	SIGNATURE OF AUTHORIZED INDIVIDUAL <i>David M. Davis</i> David M. Davis - Chief Inspector
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7. APPROVAL FOR RETURN TO SERVICE

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is APPROVED REJECTED

BY	FAA FLT. STANDARDS INSPECTOR	MANUFACTURER	INSPECTION AUTHORIZATION	OTHER (Specify)
	FAA DESIGNEE	<input checked="" type="checkbox"/> REPAIR STATION	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT	
DATE OF APPROVAL OR REJECTION 6-18-80	CERTIFICATE OR DESIGNATION NO. ARS 415-23	SIGNATURE OF AUTHORIZED INDIVIDUAL <i>David M. Davis</i> David M. Davis - Chief Inspector		

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. DESCRIPTION OF WORK ACCOMPLISHED (If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

Robertson STOL full span wing trailing edge flap system and recontoured wing leading edge has been installed in accordance with Robertson Aircraft Corporation Drawing List 10. Approved by STC SA1441WE, dated 2-10-75.

Weight Increase 13.0 Lbs., at 60.00 Inches.

Tach Time 0805.3.

END

**ROBERTSON AIRCRAFT CORPORATION**Headquarters: RENTON MUNICIPAL AIRPORT
839 WEST PERIMETER ROAD, RENTON, WASHINGTON 98055
Phone (206) 228-5000 Cable: R/STOL

**ROBERTSON AIRCRAFT CORPORATION
PILOT'S OPERATING HANDBOOK SUPPLEMENT
FOR CESSNA MODEL A185F SKYWAGON
SERIAL NUMBERS 18502839 AND UP**

This document includes material required to be furnished to the pilot by CAR Part 3. It also contains supplemental data supplied by Robertson Aircraft Corporation.

This document must be carried in the airplane at all times when the airplane is Robertson-equipped in accordance with STC SA1441WE.

The information in this document supersedes the basic POH only where covered in the items contained herein. For limitations, procedures, and performance not contained in this supplement, consult the manual proper.

Aircraft Registration H3946QSerial Number 18502213

Approved by:

ROBERTSON AIRCRAFT CORPORATION
Headquarters:
Renton Municipal Airport
839 West Perimeter Road
Renton, Washington 98055

ROBERTSON AIRCRAFT CORPORATION
Robertson-Approved Pilot's Operating Handbook Supplement
to
Cessna A185F

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Robertson-Approved

Date 7-18-77

ROBERTSON NORMAL PROCEDURES

For Your

R/STOL-Equipped Naturally-Aspirated Cessna 185 Skywagon
A185F S/N 18502839 and on

Robertson NORMAL Operation is specifically tailored for the average pilot who desires increased safety margins, utility, and peace of mind.

This check list and associated performance data are designed to provide comfortable margins to allow for normal tolerance in the proficiencies of the average pilot.

It is recommended that Robertson NORMAL Operation be utilized except for conditions described as "ROBERTSON STOL OPERATION."

Refer to Cessna Pilot's Operating Handbook for sections which are not changed by Robertson Modification.

CESSNA
MODEL A185FSECTION 2
LIMITATIONS

INTRODUCTION

Section 2 includes operating limitations, instrument markings, and basic placards necessary for the safe operation of the airplane. The limitations for the Robertson modified aircraft have been approved by the Federal Aviation Administration.

For operation of its engine, standard systems and standard equipment, see Cessna Pilot's Operating Handbook.

Robertson-Approved

Date 7-18-77

SECTION 2
LIMITATIONS

AIRSPEED LIMITATIONS

Airspeed limitations and their operational significance are shown in Figure 2-1.

	SPEED	KCAS	KIAS	REMARKS
V _{NE}	Never Exceed Speed	178	182	Do not exceed this speed in any operation.
V _{NO}	Maximum Structural Cruising Speed	144	146	Do not exceed this speed except in smooth air, and then only with caution.
V _A	Maneuvering Speed: 3350 Pounds 2650 Pounds 1950 Pounds	117 104 90	118 105 90	Do not make full or abrupt control movements above this speed.
V _{FE}	Maximum Flap Extended Speed: To 20° Flaps 20° - 40° Flaps	95 96	95 93	Do not exceed these speeds with the given flap settings.

Figure 2-1 Airspeed Limitations

AIRSPEED INDICATOR MARKINGS

Airspeed indicator markings and their color code significance are shown in Figure 2-2.

MARKING	KIAS VALUE OR RANGE	SIGNIFICANCE
White Arc	44 - 93	Full Flap Operating Range. Lower limit is maximum weight V _{S0} in landing configuration. Upper limit is maximum speed permissible with flaps extended.
Green Arc	55 - 146	Normal Operating Range. Lower limit is maximum weight V _S with flaps retracted. Upper limit is maximum structural cruising speed.
Yellow Arc	146 - 182	Operations must be conducted with caution and only in smooth air.
Red Line	182	Maximum speed for all operations.

Figure 2-2 Airspeed Indicator Markings

SECTION 4
NORMAL PROCEDURES

TAKEOFF**ROBERTSON NORMAL TAKEOFF:**

- (1) Wing Flaps -- 20°.
- (2) Cowl Flaps -- OPEN.
- (3) Power -- FULL THROTTLE and 2850 RPM.
- (4) Mixture -- LEAN FOR FIELD ELEVATION.
- (5) Elevator Control -- BEGIN LIFTOFF 36 KIAS.
- (6) Climb Speed -- 47 KIAS.
- AFTER OBSTACLES ARE CLEARED -
- (7) ACCELERATE TO 63 KIAS.
- (8) Wing Flaps -- UP.
- (9) Power -- FULL THROTTLE and 2700 RPM.

MAXIMUM PERFORMANCE TAKEOFF: (Robertson STOL)

- (1) Wing Flaps -- 30°.
- (2) Cowl Flaps -- OPEN.
- (3) Brakes -- APPLY.
- (4) Power -- FULL THROTTLE and 2850 RPM.
- (5) Mixture -- LEAN FOR FIELD ELEVATION.
- (6) Brakes -- RELEASE.
- (7) Elevator Control -- MAINTAIN TAIL LOW. Liftoff at 32 KIAS.
- (8) Climb Speed -- 37 KIAS at maximum takeoff weight (until all obstacles are cleared).
- AFTER OBSTACLES ARE CLEARED
- (9) ACCELERATE TO 63 KIAS.
- (10) Wing Flaps -- UP.
- (11) Power -- FULL THROTTLE and 2700 RPM.

BEFORE LANDING: (Robertson Normal)

- (1) Seats, Belts, Harnesses -- ADJUST and LOCK.
- (2) Fuel Selector Valve -- BOTH ON.
- (3) Mixture -- RICH.
- (4) Cowl Flaps -- CLOSED.
- (5) Propeller -- HIGH RPM.
- (6) Airspeed -- 75-85 KIAS (Flaps Up).
- (7) Wing Flaps -- 10° - 40° (below 93 KIAS for 10°. Final Approach 58 KIAS 40°).
- (8) Airspeed -- 58 - 65 KIAS (Flaps DOWN).
- (9) Stabilizer and Rudder Trim -- ADJUST for landing.

NOTE

The ability of the airplane to land three-point is dependent upon the stabilizer being adjusted for hands-off trim in the glide.

- (10) Tail Wheel Lock -- AS DESIRED.

Robertson-Approved

Date 7-18-77

CESSNA
MODEL A185FSECTION 4
NORMAL PROCEDURESBEFORE LANDING: (Robertson STOL)

- (1) Seats, Belts, Harnesses -- ADJUST and LOCK.
- (2) Fuel Selector Valve -- BOTH ON.
- (3) Mixture -- RICH.
- (4) Cowl Flaps -- CLOSED.
- (5) Propeller -- HIGH RPM.
- (6) Airspeed -- 75 - 85 KIAS (flaps UP).
- (7) Wing Flaps -- 10° - 40° (below 93 KIAS for 10°, Final Approach 54 KIAS 40°).
- (8) Airspeed -- 54 - 63 KIAS (flaps DOWN).
- (9) Stabilizer and Rudder Trim -- ADJUST for landing.

NOTE

The ability of the airplane to land three-point is dependent upon the stabilizer being adjusted for hands - off trim in the glide.

- (10) Tail Wheel Lock -- AS DESIRED.

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Date 7-18-77

ROBERTSON NORMAL TAKE-OFF DATA - ROBERTSON R/STOL Cessna 185 SkywagonTake-off distance with 20° flaps from hard surfaced runway (feet)

GROSS WEIGHT LBS.	KIAS @50'	HEAD WIND KNOTS	@ S.L. & 59°F.		@ 2500' & 50°F.		@ 5000' & 41°F.		@ 7500' & 32°F.	
			GROUND RUN	TOTAL TO 50' ELEV.	GROUND RUN	TOTAL TO 50' ELEV.	GROUND RUN	TOTAL TO 50' ELEV.	GROUND RUN	TOTAL TO 50' ELEV.
3350	50	0	490	870	595	1015	715	1200	860	1485
		10	345	660	415	765	505	910	625	1125
		20	220	465	235	550	335	655	420	820
2800	46	0	330	655	390	735	465	840	665	975
		10	220	485	265	545	325	630	395	735
		20	135	335	165	385	205	445	255	525
2300	42	0	210	500	255	545	300	615	360	695
		10	135	365	165	405	200	455	245	515
		20	75	245	95	275	115	310	150	355

- NOTES: 1. Increase distances 10% for each 25°F. above standard temperature for particular altitude.
2. For take-off on a dry, grass runway, increase distances (both "ground run" and "total to 50'") by 6% of the "total to 50'" distance.
3. For operations in gusty or severe crosswind conditions, increase speeds 4.4 KIAS for each 10 knot wind increment.

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Date 7-18-77

ROBERTSON NORMAL OPERATION
R/STOL-Equipped Cessna 185 Skywagon

- Maximum Rate-of-Climb Data
- Cruise Performance
- Maximum Glide

Your Robertson-equipped aircraft will perform in climb, cruise, and glide according to the charts in your Cessna Owner's Manual. Therefore, use the data directly.

ROBERTSON NORMAL LANDING DATA - ROBERTSON R/STOL Cessna 185 Skywagon

Landing Distance with 40° Flaps on Hard Surfaced Runway (feet)

GROSS WEIGHT LBS.	KIAS @50'	@ S.L. & 59°F.		@ 2500' & 50°F.		@ 5000' & 41°F.		@ 7500' & 32°F.	
		GROUND ROLL	TOTAL TO CLEAR 50'	GROUND ROLL	TOTAL TO CLEAR 50'	GROUND ROLL	TOTAL TO CLEAR 50'	GROUND ROLL	TOTAL TO CLEAR 50'
3350	58	310	890	325	945	345	1005	370	1070
2800	54	260	815	275	860	290	910	310	965
2300	49	215	740	225	775	240	815	255	860

- NOTES:
1. Distances shown are based on zero wind, power off, and heavy braking.
 2. Reduce landing distances 10% for each 5 knots headwind.
 3. For operation on a dry, grass runway, increase distances (both "ground roll" and "total to clear 50'") by 20% of the "total to clear 50'" figure.
 4. For operating in gusty or severe crosswind conditions, increase speeds 4.4 KIAS for each 10 knot wind increment.

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Date 7-18-77

R/STOL-Equipped Cessna 185 Skywagon

AIRSPEED CORRECTION TABLE (Gross Weight - 3350 Lbs.)

For Airspeed Correction Table, see 1976 Pilot's Operating Handbook
Maximum Flap Speeds:

0° - 20° - 95 KIAS, 20° - 40° - 93 KIAS

STALL SPEEDS, ZERO THRUST					
CONDITION		ANGLE OF BANK			
		0°	20°	40°	60°
3350 Lbs.	FLAPS UP	53	55	62	81
GROSS	FLAPS 20°	42	43	52	68
WEIGHT	FLAPS 40°	37	39	47	64

SPEEDS ARE KIAS

Robertson-Approved

7-18-77

Date _____

Department of Transportation — Federal Aviation Administration
Supplemental Type Certificate

Number SA1441WE

This certificate, issued to ROBERTSON AIRCRAFT CORPORATION

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations, effective 15 May 1956 as amended by 3-1 through 3-5.

Original Product — Type Certificate Number: 3A24
 Make: Cessna
 Model: 185, 185A thru 185E, A185E, A185F Landplane, Floatplane, Amphibian, and Skiplane.

Description of Type Design Change:

Installation of drooped ailerons in flaps down mode, recontoured wing leading edge (except A185F) stall fence and as options, a flap actuated elevator trim system and installation of the SC-100 stall warning system in accordance with Robertson Aircraft Corporation FAA Sealed Drawing List No. 10. This change in type design is also eligible on Cessna Model 185 thru 185E Skiplane conversion under STC No. SA3-717.

Limitations and Conditions:

The approval of this change in type design applies basically to the above model aircraft only. This approval should not be extended to other aircraft of this model on which other previously approved modifications are incorporated unless it is determined that the interrelationship between this change and any other previously approved modifications will introduce no adverse effect upon the airworthiness of that aircraft. This determination should include consideration (See Continuation Sheet 3)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: 12 May 1967

Date issued: 01/15/69; 08/04/69/ 04/26/72;
11/5/73

Date of issuance: 29 June 1967

Date amended: 08/14/68; 08/04/69; 02/19/70;
11/30/70; 03/13/72; 04/26/72; 03/21/73;
By direction of the Administrator 02/10/75



Charles C. Schroeder
 (Signature)

Chief, Engineering and Manufacturing Branch

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

INSTRUCTIONS: The transfer endorsement below may be used to notify the appropriate FAA Regional Office of the transfer of this Supplemental Type Certificate.

The FAA will reissue the certificate in the name of the transferee and forward it to him.

TRANSFER ENDORSEMENT

Transfer the ownership of Supplemental Type Certificate Number _____

to (Name of transferee) _____

(Address of transferee) _____

(Number and street)

(City, State, and ZIP code)

from (Name of grantor) (Print or type) _____

(Address of grantor) _____

(Number and street)

(City, State, and ZIP code)

Extent of Authority (if licensing agreement): _____

Date of Transfer: _____

Signature of grantor (In ink): _____

Department of Transportation—Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SA1441WELimitations and Conditions Continued:

of significant changes in weight distribution, such as an increase in the fixed disposable weight in the fuselage.

Supplemental Type Certificate Addendum No. SA1441WE is a part of this certificate. A copy of this certificate must be maintained as part of the permanent records for each aircraft so modified.

This certificate is valid only if accompanied by a fee of not exceeding \$1,000, or improvement not exceeding 50% of the original value.

Department of Transportation — Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet) DATE: _____

Number SALL41WE

Cessna 185
185A thru 185E
A185E, A185F

SUPPLEMENTAL TYPE CERTIFICATE ADDENDUM NO. SALL41WE

The limitations and conditions of Type Certificate Data Sheet 3A24 apply except as follows:

This Addendum which is part of Supplemental Type Certificate No. SALL41WE prescribes conditions and limitations under which the product for which the STC was issued meets the airworthiness requirements of the Civil Air Regulations. A copy of this Addendum shall be maintained as part of the modified aircraft permanent records.

Supplemental Type Certificate Holder: ROBERTSON AIRCRAFT CORPORATION

- I. MODEL 185 6PCU-SM (NORMAL CATEGORY)
- MODEL 185A 6PCU-SM (NORMAL CATEGORY)
- MODEL 185B 6PCU-SM (NORMAL CATEGORY)
- MODEL 185C 6PCU-SM (NORMAL CATEGORY)
- MODEL 185D 6PCU-SM (NORMAL CATEGORY)

C. G. King

AMPHIBIAN:

(+41.0) to (+46.5) @ 3100 lb.
(+36.8) to (+46.5) @ 2500 lb. or less
straight line variation between points

Control Surface Moments

AILERONS:

Flap Setting	Drop from Neutral $\pm 2^\circ$	Up $\pm 2^\circ$	Down $\pm 2^\circ$
0°	0°	20°	14°
25°	15°	1°	26°
38° + 2°	13°	5°	26°
- 1°			

This certificate is transferable by a fee of not exceeding \$1000 or imprisonment not exceeding 3 years or both.

II. MODEL 185E 6PCL-SM (NORMAL CATEGORY)

C. G. Range

AMPHIBIAN:

Same as I above.

Control Surface
Movements

AILERONS:

Same as I above.

III. MODEL A185E 6PCL-SM (NORMAL CATEGORY)

C.G. Range

AMPHIBIAN:

(+42.3) to (+46.5) @ 3265 lb. Wheels Takeoff Only
(+41.0) to (+46.5) @ 3100 lb.
(+36.8) to (+46.5) @ 2500 lb. or less
straight line variation between points

Control Surface
Movements

AILERONS:

Flap Setting	Droop from Neutral $\pm 2^\circ$	Up $\pm 2^\circ$	Down $\pm 2^\circ$
0°	0°	20°	14°
25°	15°	1°	26°
38° +2° -1°	13°	5°	26°

IV. MODEL A185E 6 PCL-SM (NORMAL CATEGORY)

C.G. Range

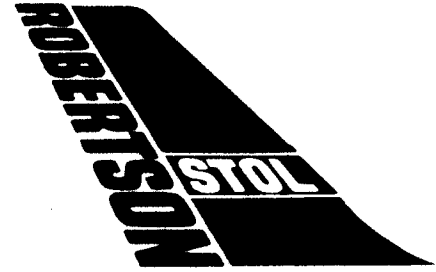
AMPHIBIAN

Same as III above.

Control Surface
Movements

AILERONS

Same as III above.

**ROBERTSON AIRCRAFT CORPORATION**

Headquarters: RENTON MUNICIPAL AIRPORT
839 WEST PERIMETER ROAD, RENTON, WASHINGTON 98065
Phone: (206) 228-5000, Cable, R/STOL, Toll Free 800-426-7892
TWX 910-423-1555

ROBERTSON AIRCRAFT CORPORATION
SERVICE and MAINTENANCE MANUAL
For CESSNA 150, 172, 180, 182,
A182, 185, 205, & 210A,B, & C

This manual contains factory recommended procedures and instructions for servicing and maintaining the Robertson R/STOL Systems to the Cessna 150, 172, 180, 182, A182, 185, 205, and early model 210A,B, and C.

Besides serving as a reference for the experienced aircraft mechanic, this manual also covers simplified rigging procedures for the less experienced mechanic. The manual should be kept in a handy place for ready reference. If properly used, it will enhance maintenance of Robertson-modified aircraft and thereby continue a reputation for reliable service.

The information in this book is based on data available at the time of publication, and is supplemented and kept current by service letters and service news letters published by Robertson Aircraft Corporation. These are sent to all Robertson dealers so that they have the latest authoritative recommendations for servicing Robertson STOL airplanes. Therefore, it is recommended that Robertson owners utilize the knowledge and experience of the factory-trained dealer service organization.

In addition to the information in this service manual, a group of vendor publications is available from the Robertson Service Parts Center which describe complete overhaul and parts breakdown of some of the various vendor equipment items. A listing of the available publications is issued periodically in service letters.

Information for Nav-O-Matic autopilots and Brittain autopilots is not included in this manual. These manuals are available from the Cessna Service Parts Center or the Brittain Manufacturing Company.

All Service and Maintenance inquiries should be directed to the Operations Manager, Robertson Aircraft Corporation.

1. INSPECTIONS.

In order to inspect the Robertson High Lift System, it will be necessary to remove only the inspection covers from mid-wing aft, as in most cases the droop system starts at the flap bellcrank outboard to the aileron bellcrank.

If the aircraft has a trim system installed, it will not be necessary to remove the interior side panel to inspect unless there is some indication of problems in this area. It will, however, be necessary to remove the rear baggage bulkhead to allow access to the tail cone. In the case of the 210 models, open the landing gear doors by simply pumping the manual hydraulic pump, and once the gear doors are open, momentarily turn on the master switch to reset the Gear Down locks. Remove the rear panel in wheel well to allow access to the tail cone.

Using the inspection guide provided (Attachment 1), proceed with the inspection.

T A B L E O F C O N T E N T S

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2. RIGGING INSTRUCTIONS.

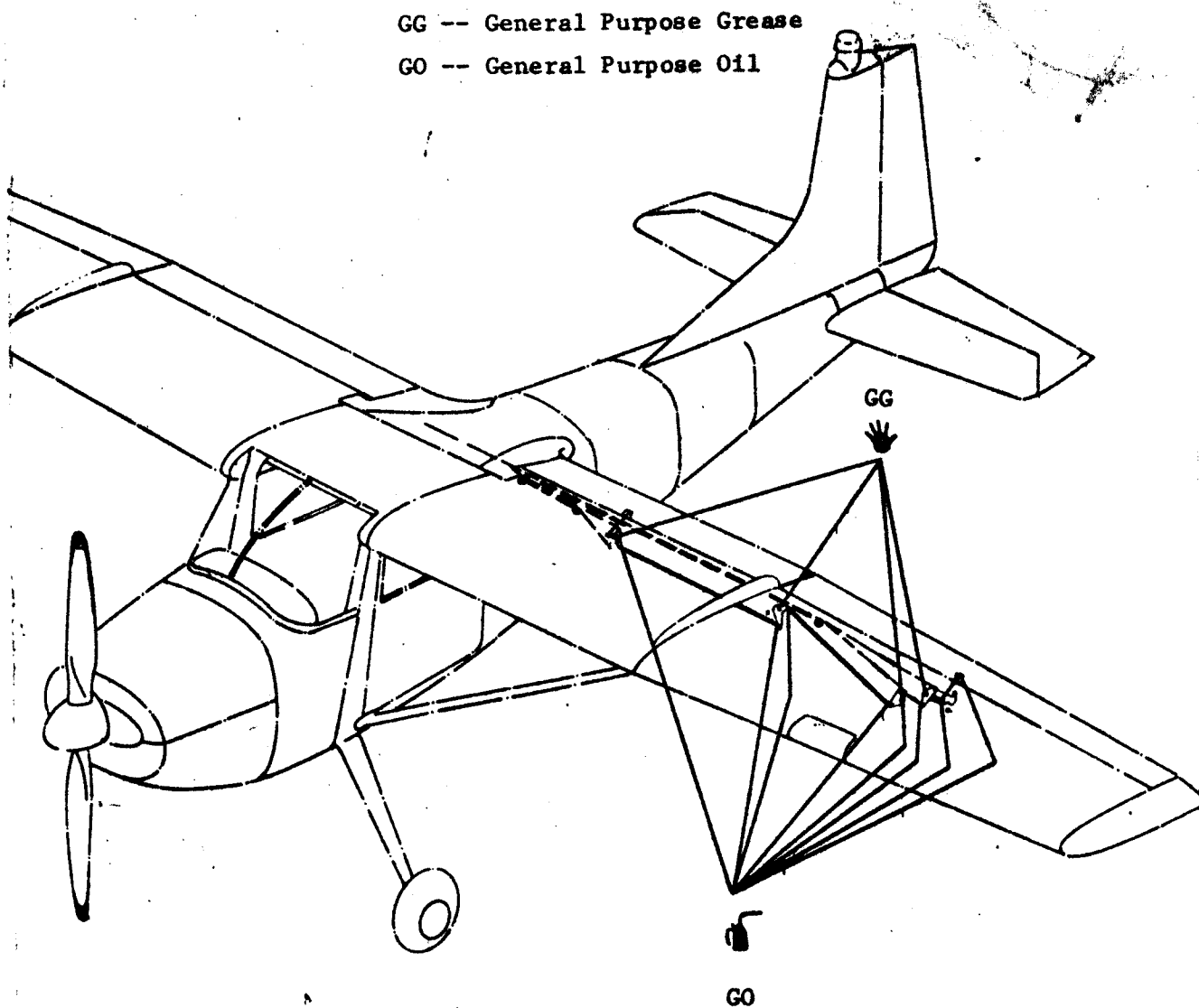
- A. Attach aileron cables and adjust for equal control wheel travel with aileron bellcranks contacting up stops and down stops equally. Tension cables to 30 ± 10 pounds.
- B. Lock control wheel in neutral, install ailerons and (with hook closed on 10-310 aileron bellcrank) adjust aileron pushrod to fair aileron with the wing tip or flap (whichever is higher.)
- C. Insert rigging pins in 10-320 bellcranks. Adjust 10-302 pushrods to fit between hook assembly (closed) and 10-320 bellcrank and install. Remove rigging pins from 10-320 bellcranks.
- D. Install 10-303 pushrod to 10-320 bellcrank and with 10-330 bellcrank arm on "top dead center" adjust 10-303 pushrod until 14° of aileron droop is shown.
- E. With flaps full up, adjust and install 10-304 pushrod between 10-330 and 10-340 bellcranks. Shorten the 10-304 pushrod enough to slightly preload the hook assembly on the 10-310 aileron bellcrank carriage assy.
- F. Check all cables, pushrods, bellcranks and aileron drive assemblies for clearance, free movement and lack of binding after installation. Operate ailerons stop to stop at all flap positions to check above items and proper travel direction. Check aileron droop and travel per below:

<u>FLAPS</u>	<u>AILERON DROOP*</u>	<u>AILERON POSITION AT MAXIMUM DEFLECTION</u>	
0°	$0^\circ \pm 2^\circ$	$14^\circ \pm 2^\circ$ DOWN	$20^\circ \pm 2^\circ$ UP
10°	$8^\circ \pm 2^\circ$	$21^\circ \pm 2^\circ$ DOWN	$11^\circ \pm 2^\circ$ UP
20°	$13^\circ \pm 2^\circ$	$25^\circ \pm 2^\circ$ DOWN	$6^\circ \pm 2^\circ$ UP
30°	$15^\circ \pm 2^\circ$	$26^\circ \pm 2^\circ$ DOWN	$4^\circ \pm 2^\circ$ UP
40°	$12.5^\circ \pm 0^\circ$ 2°	$24^\circ \pm 2^\circ$ DOWN	$6^\circ \pm 2^\circ$ UP

Secure all turn barrels -- 4 in the manual flap system, 2 in the electrical system and 3 in the aileron system.

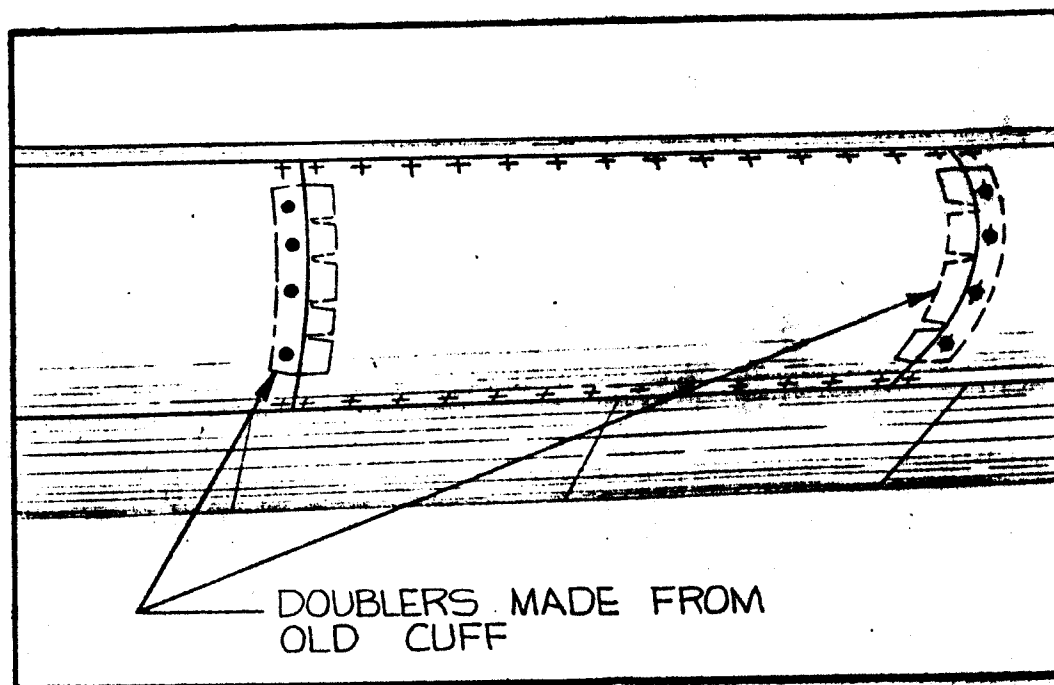
3. LUBRICATING.

The lubrication of the Robertson System is in most cases, a matter of a few drops of oil or the application of some general purpose grease. Refer to the applicable lubrication chart for serving the System.



Cessna Models
150, 172, 180, 182, 185
205, 210 A, B, C

Lubrication Chart



4. REPAIRS AND/OR COMPONENT REPLACEMENT.

Normally the only repairs that are required are to the leading edge, as this is the most vulnerable component of the High Lift Installation. Minor damage can be repaired by sanding the damaged area and filling with epoxy. Contour and sand to a smooth finish. Prime and paint.

If the damage is severe and it is necessary to replace a section of the leading edge cuff, simply draw a line from top to bottom of the cuff well outboard of the damaged area; with a hacksaw, cut the damaged area out. Remove the epoxy at the top of the cuff and drill out the rivets, both upper and lower.

Make two small doublers from the removed piece of cuff and install on wing with hard countersunk rivets to support. Repair cuff, and locate new section of the cuff and cut to fit, or a little oversize. Dress to a very tight fit.

Mark the location of drilled holes on the wing so that reinstallation or repair can be made by drilling new holes.

Drill and rivet the new section into place. Replace epoxy and contour sand to a smooth finish, prime and paint. (Parts for the repair along with instructions can be obtained from Robertson Aircraft Corporation, Renton, Washington).

Repairs to the wing tips (if they are Robertson tips) can be made with fiberglass and finished with epoxy.

Component replacement is quite simple and straight forward. (Example - simply adjust new part to removed part's dimensions and reinstall.)

5. FINISH CARE.

Production leading edge finish is of a synthetic enamel paint which requires washing with a detergent (or equivalent) and waxing only with a non-abrasive wax.

6. FLIGHT TEST AND TRIM SYSTEM ADJUSTMENTS.

Although a thorough flight test was performed at the time the High Lift System was installed, minor adjustments may be required from time to time due to other repairs or adjustments being made to the airframe.

The first test to be performed is a straight and level trim check, for this will effect all phases of the flight test and aircraft rigging.

All strut wing Cessna's except the 337 are equipped with a rear spar cam that allows the wing to be washed in or out. This eliminates wing heaviness and permits rigging the aircraft for level flight.

(CAUTION: Assure that the fuel load is equal, as this will have a severe effect on the aircraft trim.)

After the straight and level flight has been accepted, lower the flaps and recheck aircraft trim. If the ship is wing heavy, the problem lies in the flap travel or aileron droop. (Refer to the rigging section.) Also, a check on the trim system is made at this point.

Reduce the power to idle and trim full nose up. The ship should trim at 65 ± 5 MPH. If adjustments are required, it is accomplished by either lengthening or shortening the cable in the tail section from the trim system bellcrank to the up elevator cable attachment.

A turnbuckle is provided for the adjustment. Shortening the cable will lower the speed and lengthening will raise it. Insure that the turnbuckle is re-safetied after adjustment.

7. TROUBLE SHOOTING.

<u>PROBLEM</u>	<u>CORRECTION</u>
<u>FLAPS:</u>	
1. Flaps do not fully retract.	<p>A. Manual System--readjust push rods so that flap/flaps are up tight.</p> <p>B. Electrical--readjust micro and limit switches, adjust as necessary.</p>
2. Flaps do not fully extend.	<p>A. Manual--check inboard bellcrank at over center stop. Re-rig if stop is limiting flap travel.</p> <p>B. Electrical--check and adjust micro or limit switches.</p>
3. Flap travel is unequal.	<p>A. Flap bellcranks improperly rigged; check service manual and re-rig flap system.</p>
4. Flap handle hard to lock down.	<p>A. Readjust flap pushrods, as flaps are bottoming out in tracks.</p> <p>B. Check over center (inboard) bellcranks to assure that over center stop is not limiting flap travel. If this problem exists, re-rig per rigging instructions.</p>
5. Flap handle hard to lock up.	<p>A. Readjust flap pushrods if flaps are bottoming in flap tracks.</p> <p>B. Check flap bellcranks for proper rigging; refer to Cessna Service Manual for proper rigging.</p>
6. Cable rubbing noise when activating flap system.	<p>A. Flap cable in belly riding on other control pulleys; reroute cable.</p> <p>B. Flap cable riding on door latch mechanism; reroute cable.</p> <p>C. Flap cable out of pulleys in cabin overhead; reroute cables.</p> <p>D. Flap cable/cables under flap pushrod; reroute cables.</p>
7. Flap system feels tight.	<p>A. Check cable tension.</p> <p>B. Check flap bellcranks for freedom of movement.</p> <p>C. Check droop system bellcranks for freedom of movement.</p> <p>D. Lubricate flap track and flap system.</p>
8. Catching and jerking of flap handle when activating flap system.	<p>A. Check flap tracks for foreign matter and lubrication.</p>

PROBLEM

CORRECTION

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| <p>9. Flap indicator does not work.</p> | <p>A. Check transmitter in right wing for the following:</p> <ol style="list-style-type: none"> 1. Proper rigging. 2. Electrical connections. <p>B. Check indicator and instrument panel for:</p> <ol style="list-style-type: none"> 1. Connections. 2. Power. |
| <p>10. Flap indicator operates intermittently.</p> | <p>A. Check for loose connection at the transmitter in the wing.</p> <p>B. Check for faulty transmitter.</p> |
| <p>11. Flap indicator out of calibration.</p> | <p>A. If electrical: Re-rig transmitter in right wing.</p> <p>B. If mechanical: Adjust push-pull cable either at wing bellcrank or flap selector in cockpit.</p> |

AILERONS:

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| <p>1. Wheel travel is unequal.</p> | <p>A. Refer to rigging instructions and re-rig.</p> |
| <p>2. Rubbing noise as wheel is rotated.</p> | <p>A. Check aileron cable and door post at door latch and re-rig as necessary.</p> <p>B. Check aileron cables at flap pushrods and re-rig as necessary.</p> |
| <p>3. Controls feel very stiff - flaps up.</p> | <p>A. Excessive preload at the ailerons bellcrank; refer to rigging instructions and re-rig.</p> <p>B. Check for excessive aileron cable tension.</p> <p>C. Check aileron bellcranks for freedom of movement.</p> |
| <p>4. Controls stiff -- flaps down.</p> | <p>A. Check for excessive cable tension.</p> <p>B. Check aileron bellcranks for freedom of movement.</p> |
| <p>5. Control wheel feels solid in one direction and soft in the other.</p> | <p>A. Turn the aileron in the direction of soft feeling and check the downward deflection aileron for the following:</p> <ol style="list-style-type: none"> 1. Interference of aileron pushrod at bellcrank or cove; re-rig per rigging instructions. <p>B. Interference of lower lip of aileron at aileron cove.</p> <ol style="list-style-type: none"> 1. Re-rig aileron per instructions. 2. Remove more material at aileron lip. 3. Check aileron cove, rework per drawing. |

PROBLEM

CORRECTION

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| 6. Wheel feels OK flaps up, but will not travel its full travel left or right flaps at max aileron droop. | A. Check ailerons for too much droop, rerig per instructions.
B. Not enough material has been removed from lower lip of aileron; refer to installation instructions and drawing for aileron rework. |
| 7. Snapping or catching noise when wheel is rotated left or right. | A. Aileron seals too tight catching on aileron; remove excessive material with file. |

FLIGHT:

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| 1. Rolls right from level flight. | A. Right wing heavy; wash in right wing. |
| 2. Rolls left from level flight. | A. Left wing heavy, wash in left wing. |
| 3. Control wheel cocked left in level flight. | A. Aileron out of rig; re-rig aileron per rigging instructions.
B. Readjust right aileron down and left aileron up a maximum of one turn at a time. |
| 4. Control wheel cocked right in level flight. | A. Aileron out of rig -- re-rig aileron per rigging instructions.
B. Readjust right aileron up and left aileron down a maximum of one turn at a time. |
| 5. Cruise speed too low. | A. Check airspeed system for leaks.
B. Check static system for leaks.
C. Check pitot mass for obstructions. |
| 6. Aircraft rolls left when flaps are lowered. | A. Re-rig flaps per rigging instructions; left flap is lagging the right.
B. In the event of a trim system being installed check flap cable tension per rigging instructions. Should be 90 lbs. on power cable, flaps up. |
| 7. Flaps hunt when lowered. | A. Readjust micro switches in preselect system. |
| 8. Aircraft rolls right when flaps are lowered. | A. Re-rig flaps; refer to rigging instructions right flap within flap range. |

PROBLEMCORRECTIONF-1C
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| 9. Circuit breaker trips when flaps are lowered. | A. High airspeeds create excessive flap loads; lower flaps within flap range.
B. Once flaps are lowered, continue running of flap motor. If system does not have limit switches installed, it may cause a flap circuit breaker to trip, limit flap motor operation to full flap position only. |
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| 10. Control wheel cocked left in takeoff or landing flap setting. | A. Re-rig droop per instructions. There is more droop in left wing than in right. |
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| 11. Control wheel cocked right in takeoff or landing flap setting. | A. Re-rig droop per instructions. There is more droop in right wing than in left. |
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| 12. Nose pitches up when flaps applied. | A. Trim System set too high; lower trim speed in accordance with rigging instructions. |
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| 13. Nose pitches down when flaps lowered. | A. Trim system set too low; raise trim system in accordance with rigging instructions. |
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| 14. Aircraft breaks left in stall. | A. Check landing light lens for tight fit, as any gaps in the landing light frame can generate a stall in this area.
B. Recheck leading edge contour for damage; repair as necessary per instructions. |
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| 15. Aircraft breaks right in stall. | A. Check landing edge for damage; repair as necessary. Refer to repair section of service manual. |
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| 16. Stall warning set too high. | A. Lower stall warning transmitter in left wing. |
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| 17. Stall warning set too low. | A. Raise stall warning transmitter in left wing. |
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| 18. Stall speed too high. | A. Check airspeed indicator for leaks.
B. Check static system for leaks.
C. Check airspeed indicator for air in low speed range. |
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| 19. Trim speed too low. | A. Readjust trim system; refer to rigging instructions in service manual. |
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| 20. Trim speed too high. | A. Readjust trim system; refer to service manual. |
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| 21. Aircraft lacks flare power on landing. | A. Check elevator cables for proper tension.
B. Check elevator travel for proper travel; rerig as necessary.
C. Assure that the elevator is contacting the up-stop when the wheel is pulled full back in the cockpit. |
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STANDARD WARRANTY

ROBERTSON AIRCRAFT CORPORATION

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