

INTRODUCTION

The purpose of this document is to provide a comprehensive overview of the system's architecture and components. This document is intended for use by system administrators and developers. It describes the system's design, including the hardware and software components, and provides detailed information on the system's operation and maintenance. The document is organized into several sections, each covering a different aspect of the system. The sections are: 1. System Overview, 2. Hardware Components, 3. Software Components, 4. System Configuration, 5. System Operation, and 6. System Maintenance. Each section contains detailed information on the system's design and operation, and provides instructions on how to configure and maintain the system. The document is intended to be used as a reference for system administrators and developers, and is intended to provide a comprehensive overview of the system's architecture and components.

Information contained in the following supplements are FAA approved. Changes in these operating limitations are required by Federal Aviation Regulations.



FAA APPROVED Airplane Flight Manual Supplement

FOR

MODELS	SERIALS	MODELS	SERIALS
172	17271035 thru 17276673	F182	F18200095 thru F18200169
F172	F17201750 thru F17202254	R182	R18200584 thru R18202041
R172	R1722930 thru R1723454	FR182	FR18200021 thru FR18200070
FR172	FR17200631 thru FR17200675	185	18503684 thru 18504448
172RG	172RG0001 thru 172RG1191	U206/TU206	U20604650 thru U20607020
180	18053001 thru 18053203	207/T207	20700483 thru 20700788
182/T182	18266591 thru 18268615	210/T210	21062955 thru 21065009

Serial No. 74575

Registration No. SE-1XV

This supplement must be attached to the Pilot's Operating Handbook/FAA Approved Airplane Flight Manual when the Secondary Seat Stop modification is installed in accordance with Cessna Single-Engine Service Bulletin SEB89-2.

The information contained herein supplements or supersedes the information of the basic Pilot's Operating Handbook/FAA Approved Airplane Flight Manual and Checklists. For limitations, procedures, and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook/FAA Approved Airplane Flight Manual.

FAA APPROVED

Cessna Aircraft Co., Aircraft Div.
Delegation Option Manufacturer, CE-1

D. Hamilton Executive Engineer

Date MARCH 21, 1989

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SECTION 1 GENERAL

A secondary seat stop installation is provided for the pilot's seat to prevent the seat from inadvertently sliding aft beyond the adjusted flight position if it is not securely locked by the standard seat lock.

The secondary seat stop installation (see Figure 1) consists of a seat stop lever assembly mounted to the inboard seat rail and floor structure and a stop plate attached to the inboard side of the pilot's seat pedestal or frame. The stop lever rotates and is spring-loaded to maintain contact with the seat rail, and thereby serves as a secondary seat stop to prevent rearward movement of the seat beyond the stop. Either the aft seat roller housing or the tabs which protrude from the seat stop plate will contact the stop lever, preventing additional rearward movement. Depending on the seat position selected by the seat occupant, the secondary stop may be slightly aft of the entire seat or it may be in a position forward of the aft roller or one of the tabs on the seat stop plate when the seat is adjusted to the desired flight position. Regardless of where the seat is positioned, rearward seat travel will be restricted in the event the seat occupant fails to lock the seat in position by normal means. When rearward seat movement is desired for additional leg room or when exiting the airplane, the stop lever can be manually rotated to the UNLATCH position while the normal seat lock release is simultaneously operated. This will allow clearance between the stop lever and the seat rail for passage of the seat roller housing or seat stop plate tabs as the seat is moved aft.

SECTION 2 LIMITATIONS

There is no change to the airplane limitations when a secondary seat stop is installed.

SECTION 3 EMERGENCY PROCEDURES

The pilot must advise all passengers of the operation of the pilot's seat lock release and secondary seat stop to assist those wishing to exit the airplane through the door on the pilot's side or in case an emergency

NOTE

- The installation shown depicts a seat stop lever and seat stop plate installed on the inboard seat rail and inboard side of a pilot's seat.
- On airplanes with a floorboard tunnel, the retainer shape is modified to clear all tunnel structure.

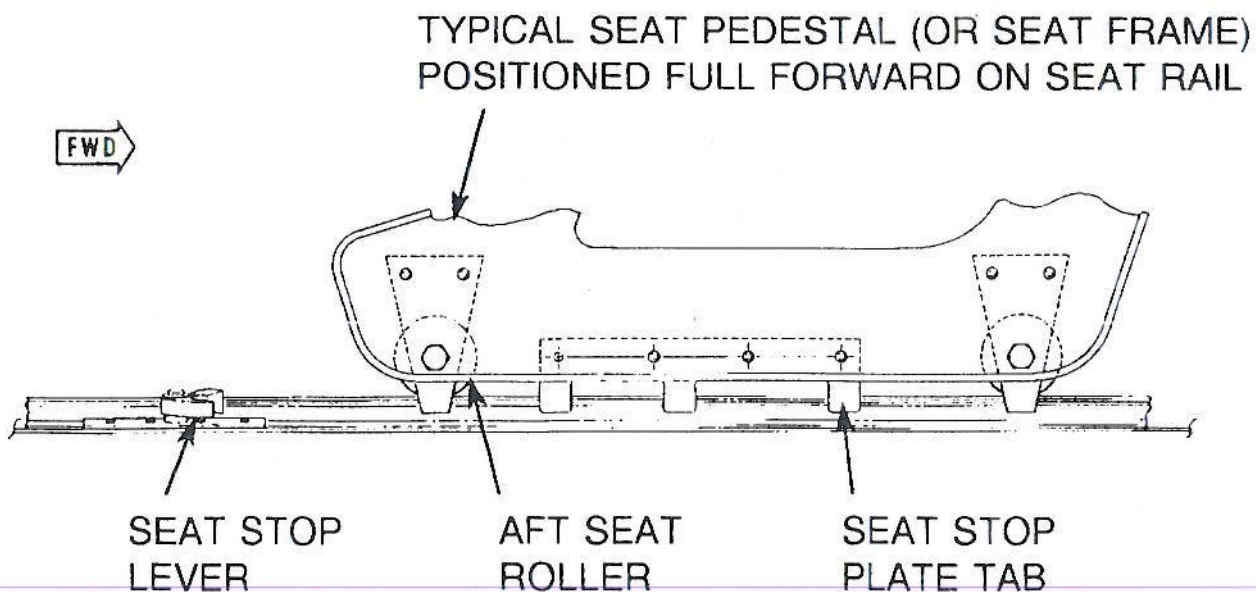
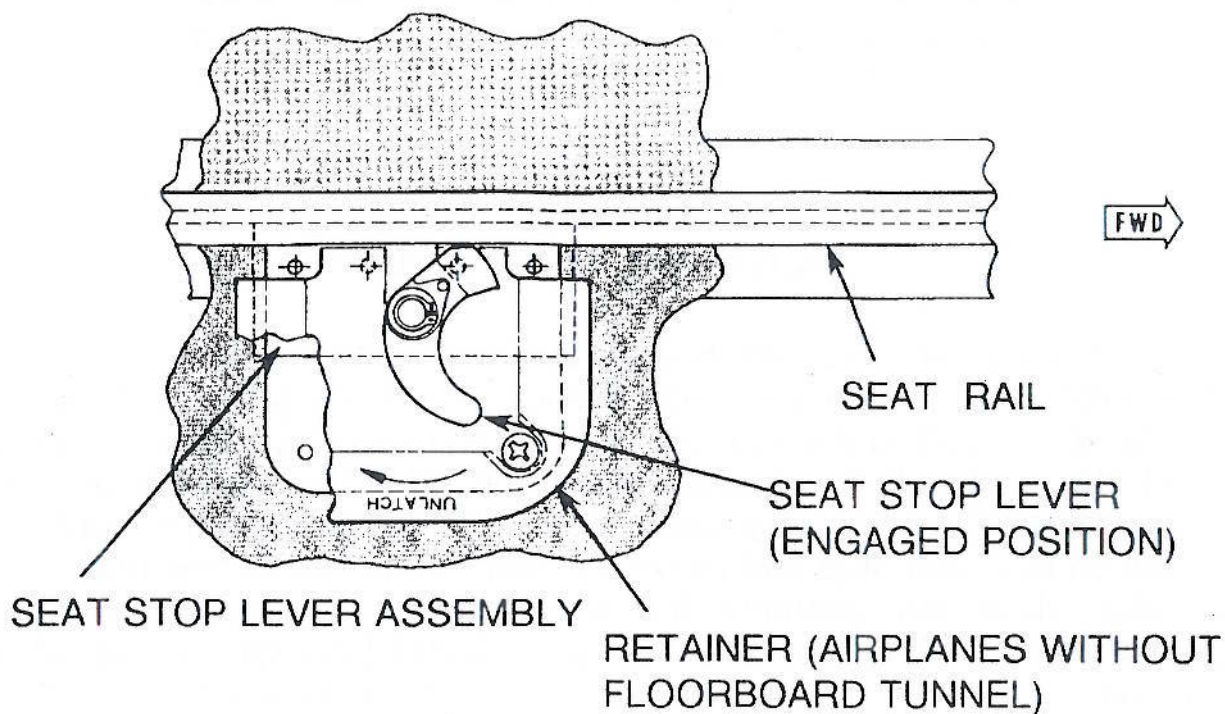


Figure 1. Secondary Seat Stop Installation

ground egress is required after a forced landing or ditching.

 **WARNING**

The pilot seat cannot be moved aft appreciably without releasing both the normal locking device and the secondary seat stop simultaneously.

SECTION 4 NORMAL PROCEDURES

During the Preflight Inspection, test the pilot's seat for proper operation by releasing the seat locking pins, moving the seat full forward, and then pushing the seat aft. If operating normally, rearward movement of the seat will be stopped when the aft roller housing on the seat contacts the secondary seat stop. Then momentarily unlatch the secondary seat stop and move the seat farther aft to test that each seat stop plate tab contacts the secondary seat stop to restrict seat movement. When the seat is again moved full forward, the secondary seat stop should momentarily rotate to an unlatched position to allow the passage of each stop plate tab and the aft seat roller housing.

The pilot should demonstrate the operation of all seats to the passengers before flight.

SECTION 5 PERFORMANCE

There is no change to the airplane performance when the pilot's secondary seat stop is installed.

SUPPLEMENT

FLOATPLANE

SECTION 1

GENERAL

INTRODUCTION

This supplement, written especially for operators of the Cessna Skyhawk floatplane, provides information not found in the basic handbook. It contains procedures and data required for safe and efficient operation of the airplane equipped with Edo Model 89-2000 floats.

Information contained in the basic handbook for the Skyhawk, which is the same as that for the floatplane, is generally not repeated in this supplement.

PERFORMANCE - SPECIFICATIONS

SPEED:

Maximum at Sea Level	96 KNOTS
Cruise, 75% Power at 4000 Ft	95 KNOTS

CRUISE: Recommended lean mixture with fuel allowance for
engine start, taxi, takeoff, climb and 45 minutes reserve.

75% Power at 4000 Ft	Range	360 NM
40 Gallons Usable Fuel	Time	3.8 HRS
75% Power at 4000 Ft	Range	475 NM
50 Gallons Usable Fuel	Time	5.0 HRS
Maximum Range at 10,000 Ft	Range	435 NM
40 Gallons Usable Fuel	Time	5.6 HRS
Maximum Range at 10,000 Ft	Range	565 NM
50 Gallons Usable Fuel	Time	7.3 HRS

RATE OF CLIMB AT SEA LEVEL 740 FPM

SERVICE CEILING 15,000 FT

TAKEOFF PERFORMANCE:

Water Run	1400 FT
Total Distance Over 50-Ft Obstacle	2160 FT

LANDING PERFORMANCE:

Water Run	590 FT
Total Distance Over 50-Ft Obstacle	1345 FT

STALL SPEED (KCAS):

Flaps Up, Power Off	48 KNOTS
Flaps Down, Power Off	44 KNOTS

MAXIMUM WEIGHT:

Ramp (Dock)	2227 LBS
Takeoff or Landing	2220 LBS

STANDARD EMPTY WEIGHT:

Skyhawk Floatplane	1593 LBS
Skyhawk II Floatplane	1619 LBS

MAXIMUM USEFUL LOAD:

Skyhawk Floatplane	634 LBS
Skyhawk II Floatplane	608 LBS

BAGGAGE ALLOWANCE 120 LBS

WING LOADING: Pounds/Sq Ft 12.7

POWER LOADING: Pounds/HP 13.9

FUEL CAPACITY: Total

Standard Tanks	43 GAL.
Long Range Tanks	54 GAL.

OIL CAPACITY 8 QTS

ENGINE: Avco Lycoming O-320-D2J
160 BHP at 2700 RPM

PROPELLER: Fixed Pitch, Diameter 80 IN.

The above performance figures are based on the indicated weights, standard atmospheric conditions, and no wind. They are calculated values derived from flight tests conducted by the Cessna Aircraft Company under carefully documented conditions and will vary with individual airplanes and numerous factors affecting flight performance.

DESCRIPTIVE DATA

PROPELLER

Propeller Manufacturer: McCauley Accessory Division.

Propeller Model Number: 1A175/ETM8042.

Number of Blades: 2.

Propeller Diameter, Maximum: 80 inches.

Minimum: 78.5 inches.

Propeller Type: Fixed Pitch.

MAXIMUM CERTIFICATED WEIGHTS

Ramp (Dock): 2227 lbs.

Takeoff: 2220 lbs.

Landing: 2220 lbs.

Weight in Baggage Compartment:

Baggage Area 1 (or passenger on child's seat) - Station 82 to 108: 120 lbs. See note below.

Baggage Area 2 - Station 108 to 142: 50 lbs. See note below.

NOTE

The maximum combined weight capacity for baggage areas 1 and 2 is 120 lbs.

STANDARD AIRPLANE WEIGHTS

Standard Empty Weight, Skyhawk Floatplane: 1593 lbs.

Skyhawk II Floatplane: 1619 lbs.

Maximum Useful Load, Skyhawk Floatplane: 634 lbs.

Skyhawk II Floatplane: 608 lbs.

SPECIFIC LOADINGS

Wing Loading: 12.7 lbs./sq. ft.

Power Loading: 13.9 lbs./hp.

1
FLOATPLANE
MODEL 172P

PILOT'S OPERATING HANDBOOK
SUPPLEMENT

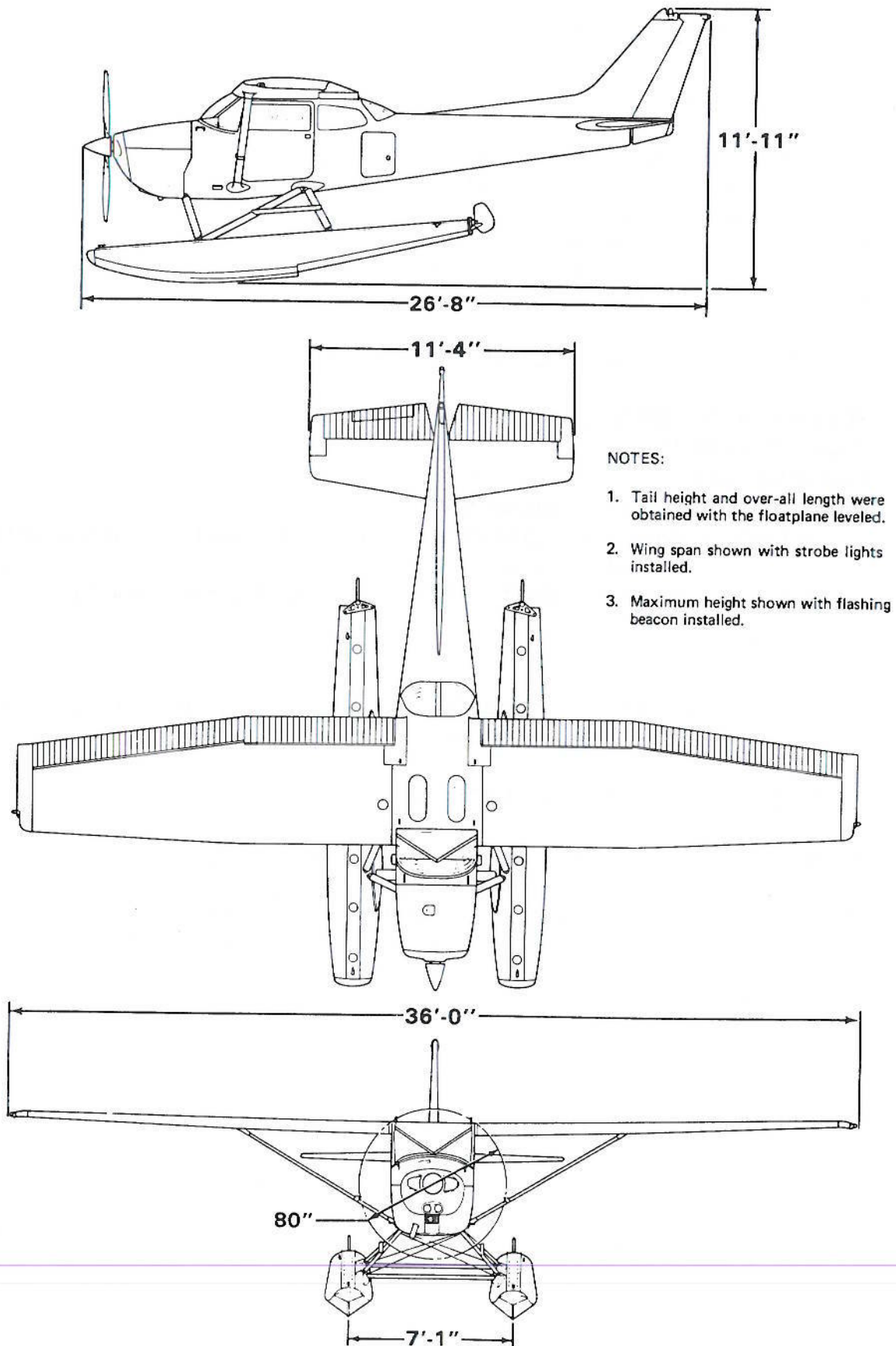


Figure 1. Three View

SECTION 2 LIMITATIONS

INTRODUCTION

Except as shown in this section, the floatplane operating limitations are the same as those for the Skyhawk landplane. The limitations in this section apply only to operations of the Model 172P equipped with Edo Model 89-2000 floats. The limitations included in this section have been approved by the Federal Aviation Administration. Observance of these operating limitations is required by Federal Aviation Regulations.

AIRSPEED LIMITATIONS

Airspeed limitations and their operational significance are shown in figure 2.

	SPEED	KCAS	KIAS	REMARKS
V _{NE}	Never Exceed Speed	157	158	Do not exceed this speed in any operation.
V _{NO}	Maximum Structural Cruising Speed	126	127	Do not exceed this speed except in smooth air, and then only with caution.
V _A	Maneuvering Speed: 2220 Pounds 2020 Pounds 1820 Pounds	95 91 86	96 91 86	Do not make full or abrupt control movements above this speed.
V _{FE}	Maximum Flap Extended Speed 10° Flaps 10° - 30° Flaps	111 87	110 85	Do not exceed this speed with flaps down.

Figure 2. Airspeed Limitations

AIRSPEED INDICATOR MARKINGS

Airspeed indicator markings are the same as those shown in the basic handbook. Due to minor differences in airspeed system calibration and stall speeds with floats installed, the indicated stall speeds as shown in Section 5 of this supplement are different than those reflected by the airspeed indicator markings.

POWER PLANT LIMITATIONS

Engine Operating Limits for Takeoff and Continuous Operations:
Maximum Engine Speed: 2700 RPM.

NOTE

The static RPM range at full throttle (carburetor heat off) is 2470 to 2570 RPM.

Propeller Manufacturer: McCauley Accessory Division.
Propeller Model Number: 1A175/ETM8042.
Propeller Diameter, Maximum: 80 inches.
Minimum: 78.5 inches.

WEIGHT LIMITS

Maximum Ramp (Dock) Weight: 2227 lbs.
Maximum Takeoff Weight: 2220 lbs.
Maximum Landing Weight: 2220 lbs.
Maximum Weight in Baggage Compartment:
Baggage Area 1 (or passenger on child's seat) - Station 82 to 108: 120 lbs. See note below.
Baggage Area 2 - Station 108 to 142: 50 lbs. See note below.

NOTE

The maximum combined weight capacity for baggage areas 1 and 2 is 120 lbs.

NOTE

When floats are installed, it is possible to exceed the maximum takeoff weight with all seats occupied and minimum fuel.

CENTER OF GRAVITY LIMITS

Center of Gravity Range:

Forward: 36.4 inches aft of datum at 1825 lbs. or less, with straight line variation to 39.8 inches aft of datum at 2220 lbs.
Aft 45.5 inches aft of datum at all weights.

Reference Datum: Lower portion of front face of firewall.

MANEUVER LIMITS

The floatplane is certificated in the normal category. The normal category is applicable to aircraft intended for non-aerobatic operations. These include any maneuvers incidental to normal flying, stalls (except whip stalls), lazy eights, chandelles, and steep turns in which the angle of bank is not more than 60°. Aerobatic maneuvers, including spins, are not approved.

FLIGHT LOAD FACTOR LIMITS

Flight Load Factors (Maximum Takeoff Weight - 2220 lbs.):

*Flaps Up	+3.8g, -1.52g
*Flaps Down	+3.0g

*The design load factors are 150% of the above, and in all cases, the structure meets or exceeds design loads.

OTHER LIMITATIONS

FLAP LIMITATIONS

Approved Takeoff Range: 0° to 10°.
Approved Landing Range: 0° to 30°

WATER RUDDER LIMITATIONS

Water rudders must be retracted for all flight operations.

PLACARDS

The following information must be displayed in the form of composite or individual placards in addition to those specified in the basic handbook.

1. In full view of the pilot: (The "DAY-NIGHT-VFR-IFR" entry, shown on the example below, will vary as the airplane is equipped.)

The markings and placards installed in this airplane contain operating limitations which must be complied with when operating this airplane in the Normal Category. Other operating limitations which must be complied with when operating this airplane in this category are contained in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

No acrobatic maneuvers, including spins, approved.

Flight into known icing conditions prohibited.

This airplane is certified for the following flight operations as of date of original airworthiness certificate:

DAY—NIGHT—VFR—IFR

2. Near water rudder stowage hook:

WATER RUDDER ALWAYS UP
EXCEPT WATER TAXIING

3. In full view of the pilot:

WATER RUDDER MUST BE RETRACTED
FOR TAKEOFF, FLIGHT, AND LANDING.

4. Near the airspeed indicator:

MANEUVER SPEED - 96 KIAS.

SECTION 3 EMERGENCY PROCEDURES

INTRODUCTION

Checklist and amplified procedures contained in the basic handbook generally should be followed. The additional or changed procedures specifically required for operation of the Model 172P equipped with Edo Model 89-2000 floats are presented in this section.

AIRSPEEDS FOR EMERGENCY OPERATION

The speeds listed below should be substituted, as appropriate, for the speeds contained in Section 3 of the basic handbook.

Engine Failure After Takeoff:

Wing Flaps Up	65 KIAS
Wing Flaps Down 10°	60 KIAS

Maneuvering Speed:

2220 Lbs	96 KIAS
2020 Lbs	91 KIAS
1820 Lbs	86 KIAS

Maximum Glide	65 KIAS
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Precautionary Landing With Engine Power, Flaps Down	60 KIAS
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Landing Without Engine Power:

Wing Flaps Up	70 KIAS
Wing Flaps Down	60 KIAS

OPERATIONAL CHECKLISTS

ENGINE FAILURE

ENGINE FAILURE DURING TAKEOFF RUN

1. Throttle -- IDLE.
2. Control Wheel -- FULL AFT.
3. Mixture -- IDLE CUT-OFF.
4. Ignition Switch -- OFF.
5. Master Switch -- OFF.

FORCED LANDINGS

EMERGENCY LANDING ON WATER WITHOUT ENGINE POWER

1. Airspeed -- 70 KIAS (flaps UP).
60 KIAS (flaps DOWN).
2. Mixture -- IDLE CUT-OFF.
3. Fuel Selector Valve -- OFF.
4. Ignition Switch -- OFF.
5. Water Rudders -- UP.
6. Wing Flaps -- AS REQUIRED.
7. Master Switch -- OFF.
8. Doors -- UNLATCH PRIOR TO APPROACH.
9. Touchdown -- SLIGHTLY TAIL LOW.
10. Control Wheel -- HOLD FULL AFT as floatplane decelerates.

EMERGENCY LANDING ON LAND WITHOUT ENGINE POWER

1. Airspeed -- 70 KIAS (flaps UP).
60 KIAS (flaps DOWN).
2. Mixture -- IDLE CUT-OFF.
3. Fuel Selector Valve -- OFF.
4. Ignition Switch -- OFF.
5. Water Rudders -- UP.
6. Wing Flaps -- AS REQUIRED (30° recommended).
7. Master Switch -- OFF.
8. Doors -- UNLATCH PRIOR TO APPROACH.
9. Touchdown -- LEVEL ATTITUDE.
10. Control Wheel -- FULL AFT (after contact).

AMPLIFIED PROCEDURES

MAXIMUM GLIDE

After an engine failure in flight, the best glide speed as shown in figure 3 should be established as quickly as possible. In the likely event the propeller should stop, maintain the speed shown.

* PROPELLER WINDMILLING

* SPEED 65 KIAS

* ZERO WIND

* FLAPS UP

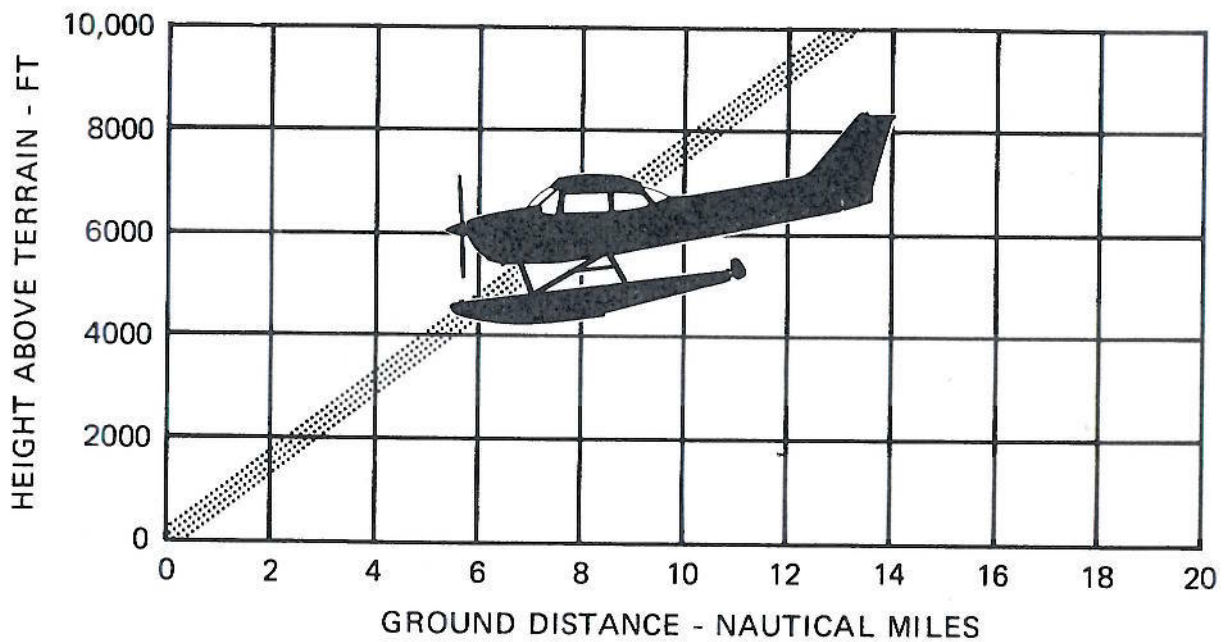


Figure 3. Maximum Glide

SECTION 4 NORMAL PROCEDURES

INTRODUCTION

Checklist and amplified procedures contained in the basic handbook generally should be followed. The additional or changed procedures specifically required for operation of the Model 172P equipped with Edo Model 89-2000 floats are presented in this section.

SPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum weight of 2220 pounds and may be used for any lesser weight.

Takeoff:

Normal Climb Out	65 KIAS
Maximum Performance, Flaps 10°, Speed at 50 Feet	53 KIAS

Enroute Climb, Flaps Up:

Normal	60-70 KIAS
Best Rate of Climb, Sea Level	64 KIAS
Best Rate of Climb, 10,000 Feet	57 KIAS
Best Angle of Climb, Sea Level thru 10,000 Feet	53 KIAS

Landing Approach:

Normal Approach, Flaps Up	65-75 KIAS
Normal Approach, Flaps 30°	55-65 KIAS
Maximum Performance Approach, Flaps 30°	53 KIAS

Balked Landing:

Maximum Power, Flaps 20°	55 KIAS
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Maximum Recommended Turbulent Air Penetration Speed:

2220 Lbs	96 KIAS
2020 Lbs	91 KIAS
1820 Lbs	86 KIAS

Maximum Demonstrated Crosswind Velocity:

Takeoff or Landing	10 KNOTS
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CHECKLIST PROCEDURES

PREFLIGHT INSPECTION

1. Pilot's Operating Handbook and Floatplane Supplement -- AVAILABLE IN THE AIRPLANE.
2. Floats, Struts, and Float Fairings -- INSPECT for dents, cracks, scratches, etc.
3. Float Compartments -- INSPECT for water accumulation.

NOTE

Remove rubber balls which serve as stoppers on the standpipe in each float compartment and pump out any accumulation of water. Reinstall rubber balls with enough pressure for a snug fit.

3. Water Rudders -- CHECK freedom of movement and security.

BEFORE STARTING ENGINE

1. Water Rudder Operation -- CHECK VISUALLY.
2. Water Rudders -- DOWN for taxiing (retraction handle removed from stowage hook).

TAKEOFF

1. Water Rudders -- UP (retraction handle secured on stowage hook).
2. Wing Flaps -- 0° - 10° (10° preferred).
3. Carburetor Heat -- COLD.
4. Control Wheel -- HOLD FULL AFT.
5. Throttle -- FULL (advance slowly).
6. Mixture -- RICH (or LEAN to obtain maximum RPM above 3000 feet).
7. Control Wheel -- MOVE FORWARD when the nose stops rising to attain planing attitude (on the step).
8. Airspeed -- 45-50 KIAS.
9. Control Wheel -- APPLY LIGHT BACK PRESSURE to lift off.

NOTE

To reduce takeoff water run, the technique of raising one float out of the water may be used. This procedure is described in the amplified procedures in this section.

10. Climb Speed -- 55-65 KIAS (flaps 10°).
60-70 KIAS (flaps UP).
With obstacles ahead, climb at 53 KIAS (flaps 10°).
11. Wing Flaps -- UP after all obstacles are cleared.

ENROUTE CLIMB

NORMAL CLIMB

1. Airspeed -- 60-70 KIAS.

MAXIMUM PERFORMANCE CLIMB

1. Airspeed -- 64 KIAS (sea level) to 57 KIAS (10,000 feet).

BEFORE LANDING

1. Water Rudders -- UP.
2. Wing Flaps -- AS DESIRED.
3. Airspeed -- 65-75 KIAS (flaps UP).
55-65 KIAS (flaps DOWN).

LANDING

1. Touchdown -- SLIGHTLY TAIL LOW.
2. Control Wheel -- HOLD FULL AFT as floatplane decelerates to taxi speed.

NOTE

With forward loading, a slight nose-down pitch may occur if the elevator is not held full up as floatplane comes down off step.

AFTER LANDING

1. Water Rudders -- DOWN.

SECURING AIRPLANE

1. Fuel Selector Valve -- LEFT TANK or RIGHT TANK to minimize cross-feeding and ensure maximum fuel capacity when refueling.

AMPLIFIED PROCEDURES

TAXIING

Taxi with water rudders down. It is best to limit the engine speed to 800 RPM for normal taxi because water piles up in front of the float bow at higher engine speeds. Taxiing with higher engine RPM may result in engine overheating and will not appreciably increase the taxi speed. In addition, it may lead to water spray striking the propeller tips, causing propeller tip erosion.

During all low speed taxi operations, the elevator should be positioned to keep the float bows out of the water as far as possible. Normally this requires holding the control wheel full aft.

For minimum taxi speed in close quarters, use idle RPM with full carburetor heat and a single magneto. This procedure is recommended for short periods of time only.

Although taxiing is very simple with the water rudders, it is sometimes necessary to "sail" the floatplane under high wind conditions. In addition to the normal flight controls, the wing flaps and cabin doors will aid in "sailing". Water rudders should be retracted during "sailing"

To taxi great distances, it may be advisable to taxi on the step with the water rudders retracted. Turns on the step from an upwind heading may be made with safety providing they are not too sharp and if ailerons are used to counteract any overturning tendency.

TAKEOFF

Start the takeoff by applying full throttle smoothly while holding the control wheel full aft. When the nose stops rising, move the control wheel forward slowly to place the floatplane on the step. Slow control movement and light control pressures produce the best results. Attempts to force the floatplane into the planing attitude will generally result in loss of speed and delay in getting on the step. The floatplane will assume a planing attitude which permits acceleration to takeoff speed, at which time the floatplane will fly off smoothly.

The use of 10° wing flaps throughout the takeoff run is recommended. Upon reaching a safe altitude and airspeed, retract the wing flaps slowly, especially when flying over glassy water because a loss of altitude is not very apparent over such a surface.

If porpoising is encountered while on the step, apply additional control wheel back pressure to correct the excessively nose-low attitude. If this does not correct the porpoising, immediately reduce power to idle and allow the floatplane to slow to taxi speed, at which time the takeoff can again be initiated.

MAXIMUM PERFORMANCE TAKEOFF

To clear an obstacle after takeoff with 10° wing flaps, use an obstacle clearance speed of 53 KIAS for maximum performance. Takeoff distances are shown in Section 5 for this technique, and on water conditions that are smooth but non-glassy. Under some adverse combinations of takeoff weight, pressure altitude, and air temperature, operation on glassy water may require significantly longer takeoff distances to accelerate to the liftoff speed, and allowance should be made for this.

If liftoff is difficult due to high lake elevation or glassy water, the following procedure is recommended: With the floatplane in the planing attitude, apply full aileron to raise one float out of the water. When one float leaves the water, apply slight elevator back pressure to complete the takeoff. Care must be taken to stop the rising wing as soon as the float is clear of the water, and in crosswinds, raise only the downwind wing. With one float out of the water, the floatplane accelerates to takeoff speed almost instantaneously.

CROSSWIND TAKEOFF

For a crosswind takeoff, start the takeoff run with wing flaps up, ailerons deflected partially into the wind and water rudders extended for better directional control. Flaps should be extended to 10° and the water rudders retracted when the floatplane is on the step; the remainder of the takeoff is normal. If the floats are lifted from the water one at a time, the downwind float should be lifted first.

ENROUTE CLIMB

Recommended procedures for enroute climb are the same as for the landplane. For maximum rate of climb performance refer to figure 8 of this supplement.

CRUISE

Cruise power settings and corresponding fuel consumption are shown on the Cruise Performance chart, figure 9 in this supplement. Range and endurance information is shown in figures 10 and 11 in this supplement.

It should be noted that the tachometer stepped green arc markings representing 75% power at sea level, 5000 feet and 10,000 feet are based on the landplane. Refer to the cruise tables in Section 5 for percent power information applicable to the floatplane.

LANDING

Normal landings can be made power on or power off using approach speeds of 65-75 KIAS with flaps up and 55-65 KIAS with flaps down.

GLASSY WATER LANDING

With glassy water conditions, flaps should be extended to 20° and enough power used to maintain a low rate of descent (approximately 200 feet per minute). The floatplane should be flown onto the water at this sink rate with no flare attempted since height above glassy water is nearly impossible to judge. Power should be reduced to idle and control wheel back pressure increased upon contacting the surface. As the floatplane decelerates off the step, apply full back pressure on the control wheel. If this glassy water technique is used in conjunction with an obstacle clearance approach, allowance should be made for appreciably longer total distances than are shown in Section 5 to clear a 50-foot obstacle.

CROSSWIND LANDING

The wing-low slip method should be used with the upwind float contacting the surface first.

NOISE CHARACTERISTICS

The certificated noise level for the Model 172P Floatplane at 2220 pounds maximum weight is 72.2 dB(A). No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any landing area.

SECTION 5 PERFORMANCE

INTRODUCTION

The information presented in the Introduction, Use of Performance Charts, and Sample Problem paragraphs in Section 5 of the basic handbook is applicable to the floatplane. Using this information, and the performance charts in this supplement, complete flight planning may be accomplished.

DEMONSTRATED OPERATING TEMPERATURE

Satisfactory engine cooling has been demonstrated for this floatplane with an outside air temperature 23°C above standard. This is not to be considered as an operating limitation. Reference should be made to Section 2 for engine operating limitations.

AIRSPEED CALIBRATION NORMAL STATIC SOURCE

CONDITION:

Power required for level flight or maximum rated RPM dive.

FLAPS UP													
KIAS	40	50	60	70	80	90	100	110	120	130	140	150	160
KCAS	47	54	62	71	80	90	99	109	119	129	139	149	159
FLAPS 10°													
KIAS	40	50	60	70	80	90	100	110	---	---	---	---	---
KCAS	46	53	62	72	82	91	101	111	---	---	---	---	---
FLAPS 30°													
KIAS	40	50	60	70	80	85	---	---	---	---	---	---	---
KCAS	45	52	62	72	82	87	---	---	---	---	---	---	---

Figure 4. Airspeed Calibration

STALL SPEEDS

CONDITIONS:
 Power Off

- NOTES:**
1. Altitude loss during a stall recovery may be as much as 200 feet.
 2. KIAS values are approximate.

MOST REARWARD CENTER OF GRAVITY

WEIGHT LBS	FLAP DEFLECTION	ANGLE OF BANK							
		0°		30°		45°		60°	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
2220	UP	38	48	41	52	46	57	55	68
	10°	35	46	38	49	42	55	50	65
	30°	36	44	39	47	44	52	53	62

MOST FORWARD CENTER OF GRAVITY

WEIGHT LBS	FLAP DEFLECTION	ANGLE OF BANK							
		0°		30°		45°		60°	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
2220	UP	41	50	44	54	49	59	58	71
	10°	37	47	40	51	45	56	54	66
	30°	36	44	39	47	44	52	53	62

Figure 5. Stall Speeds

TAKEOFF DISTANCE

MAXIMUM PERFORMANCE

CONDITIONS:

- Flaps 10°
- Full Throttle
- Zero Wind

NOTE:

Decrease distances 10% for each 9 knots headwind.

WEIGHT LBS	TAKEOFF SPEED KIAS		PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
	LIFT OFF	AT 50 FT		WATER RUN	50 FT OBS	TOTAL TO CLEAR	WATER RUN	50 FT OBS	TOTAL TO CLEAR	WATER RUN	50 FT OBS	TOTAL TO CLEAR	WATER RUN
2220	47	53	S.L.	1185	1870	1325	2060	1480	2270	1660	2505	1870	2780
			1000	1380	2140	2365	1750	2625	1975	2920	2245	3265	
			2000	1625	2470	2750	2095	3075	2395	3455	2750	3905	
			3000	1945	2890	3245	2555	3665	2960	4165	3460	4770	
			4000	2365	3430	3900	3195	4460	3775	5150	4520	6015	

Figure 6. Takeoff Distance

MAXIMUM RATE OF CLIMB

CONDITIONS:

Flaps Up
 Full Throttle

NOTE:

Mixture leaned above 3000 feet for maximum RPM.

WEIGHT LBS	PRESS ALT FT	CLIMB SPEED KIAS	RATE OF CLIMB - FPM		
			0°C	20°C	40°C
2220	S.L.	64	790	725	655
	2000	62	690	625	560
	4000	61	590	530	465
	6000	60	495	435	375
	8000	59	395	340	---
	10,000	57	300	245	---

Figure 7. Maximum Rate of Climb

TIME, FUEL, AND DISTANCE TO CLIMB

MAXIMUM RATE OF CLIMB

CONDITIONS:

Flaps Up
Full Throttle
Standard Temperature

NOTES:

1. Add 1.1 gallons of fuel for engine start, taxi and takeoff allowance.
2. Mixture leaned above 3000 feet for maximum RPM.
3. Increase time, fuel and distance by 10% for each 10°C above standard temperature.
4. Distances shown are based on zero wind.

WEIGHT LBS	PRESSURE ALTITUDE FT	TEMP °C	CLIMB SPEED KIAS	RATE OF CLIMB FPM	FROM SEA LEVEL		
					TIME MIN	FUEL USED GALLONS	DISTANCE NM
2220	S.L.	15	64	740	0	0	0
	1000	13	63	695	1	0.3	2
	2000	11	62	655	3	0.7	3
	3000	9	62	610	4	1.0	5
	4000	7	61	570	6	1.4	7
	5000	5	61	525	8	1.7	9
	6000	3	60	485	10	2.1	11
	7000	1	59	440	12	2.5	14
	8000	-1	59	400	15	3.0	16
	9000	-3	58	355	17	3.4	20
10,000	-5	57	315	20	3.9	23	

Figure 8. Time, Fuel, and Distance to Climb

CRUISE PERFORMANCE

CONDITIONS:
 2220 Pounds
 Recommended Lean Mixture

PRESSURE ALTITUDE FT	RPM	20°C BELOW STANDARD TEMP			STANDARD TEMPERATURE			20°C ABOVE STANDARD TEMP		
		% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
2000	2650	---	---	---	75	94	8.5	71	93	7.9
	2600	77	92	8.6	71	92	8.0	67	91	7.5
	2500	68	88	7.6	64	87	7.2	61	86	6.8
	2400	61	84	6.8	57	82	6.5	54	80	6.2
	2300	55	79	6.2	51	77	5.9	49	74	5.7
4000	2700	---	---	---	75	95	8.4	71	95	7.9
	2600	72	92	8.1	68	91	7.6	64	90	7.2
	2500	65	88	7.3	61	86	6.8	58	85	6.5
	2400	58	83	6.5	55	81	6.2	52	78	5.9
	2300	52	77	6.0	49	75	5.7	46	72	5.5
6000	2700	76	95	8.6	71	95	8.0	67	94	7.5
	2600	69	91	7.7	64	90	7.2	61	88	6.8
	2500	62	87	6.9	58	85	6.5	55	82	6.2
	2400	56	81	6.3	52	79	6.0	49	76	5.7
8000	2700	72	95	8.1	68	94	7.6	64	92	7.2
	2600	65	90	7.3	61	89	6.9	58	86	6.5
	2500	59	85	6.6	55	83	6.2	52	80	6.0
	2400	53	79	6.0	50	77	5.8	47	73	5.5
10,000	2700	69	94	7.7	64	92	7.2	61	90	6.8
	2600	62	89	6.9	58	87	6.5	55	84	6.2
	2500	56	83	6.3	53	81	6.0	49	77	5.8

Figure 9. Cruise Performance

RANGE PROFILE

45 MINUTES RESERVE 40 GALLONS USABLE FUEL

CONDITIONS:

2220 Pounds

Recommended Lean Mixture for Cruise

Standard Temperature

Zero Wind

NOTE:

This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the distance during climb.

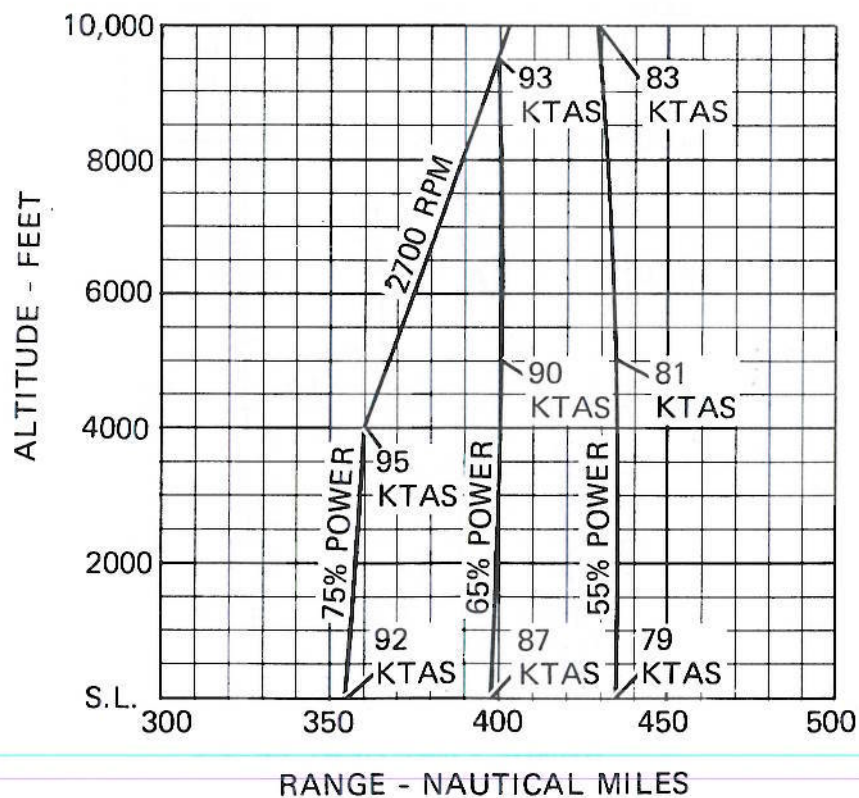


Figure 10. Range Profile (Sheet 1 of 2)

RANGE PROFILE

45 MINUTES RESERVE

50 GALLONS USABLE FUEL

CONDITIONS:
2220 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature
Zero Wind

NOTE:
This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the distance during climb.

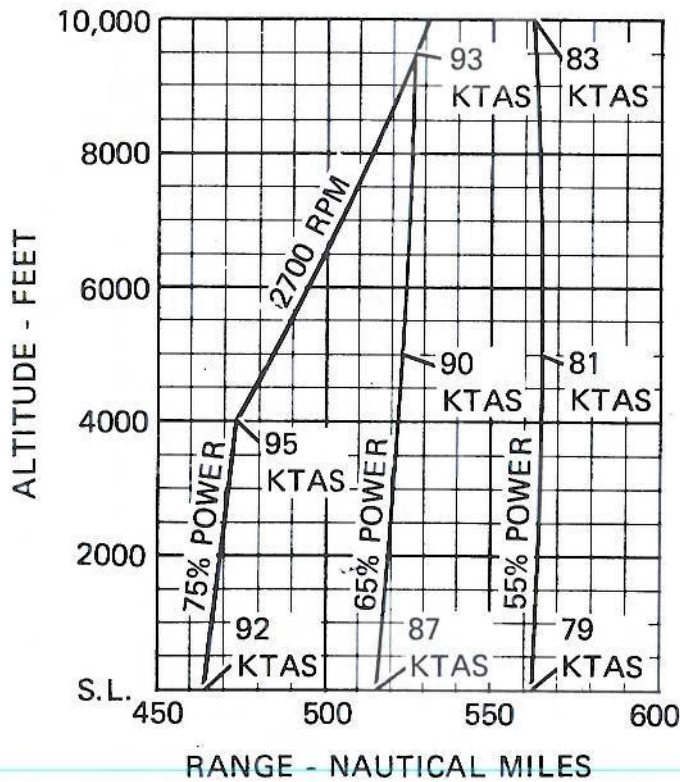


Figure 10. Range Profile (Sheet 2 of 2)

ENDURANCE PROFILE 45 MINUTES RESERVE 40 GALLONS USABLE FUEL

CONDITIONS:
2220 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature

NOTE:
This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the time during climb.

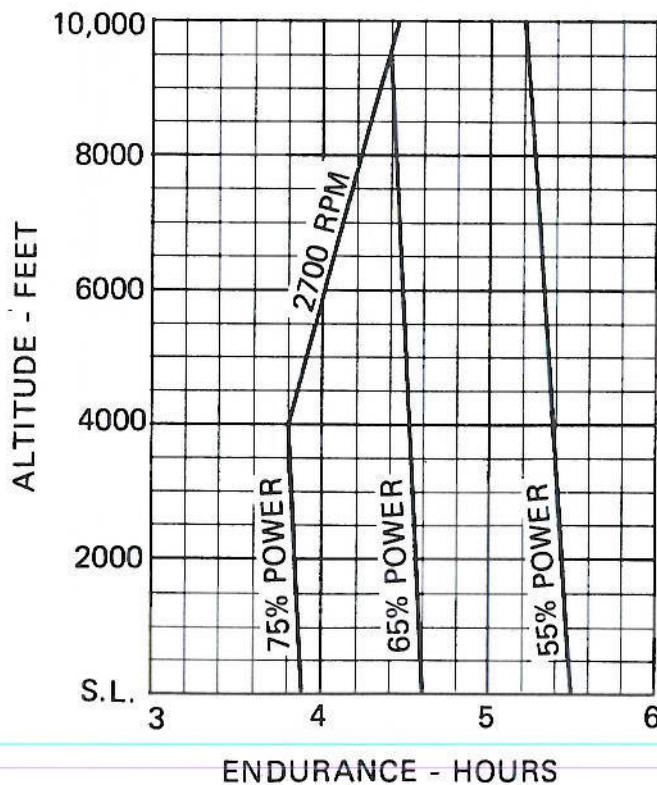


Figure 11. Endurance Profile (Sheet 1 of 2)

ENDURANCE PROFILE

45 MINUTES RESERVE
50 GALLONS USABLE FUEL

CONDITIONS:
2220 Pounds
Recommended Lean Mixture for Cruise
Standard Temperature

NOTE:
This chart allows for the fuel used for engine start, taxi, takeoff and climb, and the time during climb.

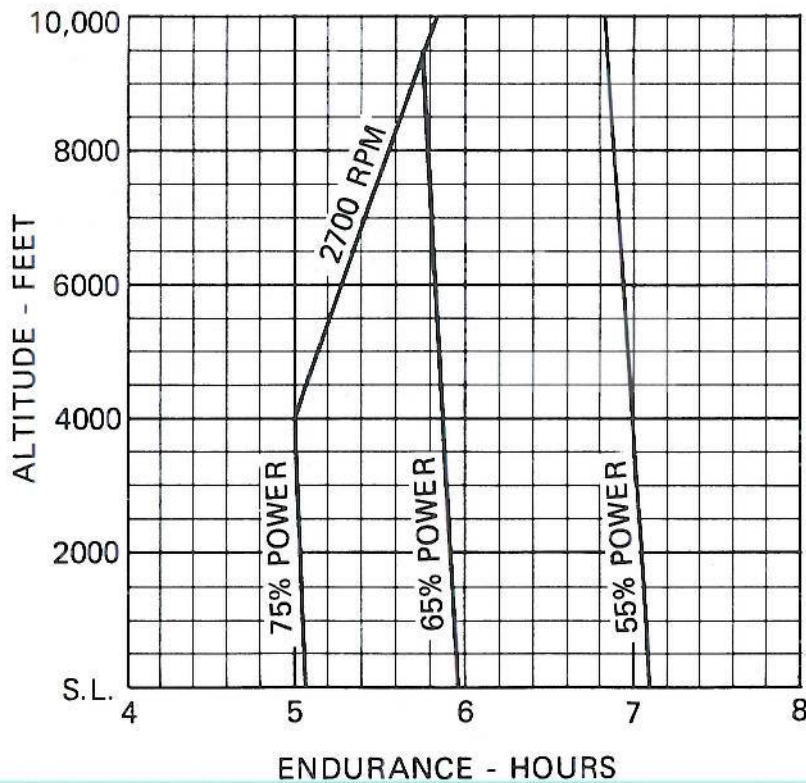


Figure 11. Endurance Profile (Sheet 2 of 2)

LANDING DISTANCE

MAXIMUM PERFORMANCE

CONDITIONS:

- Flaps 30°
- Power Off
- Zero Wind

NOTES:

1. Refer to Section 4 for recommended technique if water surface is glassy.
2. Decrease distances 10% for each 9 knots headwind.

WEIGHT LBS	SPEED AT 50 FT KIAS	PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
			WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS	WATER RUN	TOTAL TO CLEAR 50 FT OBS
2220	53	S.L.	560	1300	580	1330	600	1360	620	1390	640	1420
		1000	580	1330	600	1360	620	1390	645	1425	665	1455
		2000	600	1360	625	1395	645	1430	670	1465	690	1495
		3000	625	1395	645	1430	670	1465	695	1500	715	1530
		4000	650	1435	670	1465	695	1500	720	1540	740	1570

Figure 12. Landing Distance

SECTION 6 WEIGHT & BALANCE

INTRODUCTION

Weight and balance information contained in the basic handbook generally should be used, and will enable you to operate the floatplane within the prescribed weight and center of gravity limitations. The changed information specifically required for operation of the Model 172P equipped with Edo Model 89-2000 floats is presented in this section.

NOTE

When floats are installed, it is possible to exceed the maximum takeoff weight with all seats occupied and minimum fuel.

It is the responsibility of the pilot to ensure that the floatplane is loaded properly.

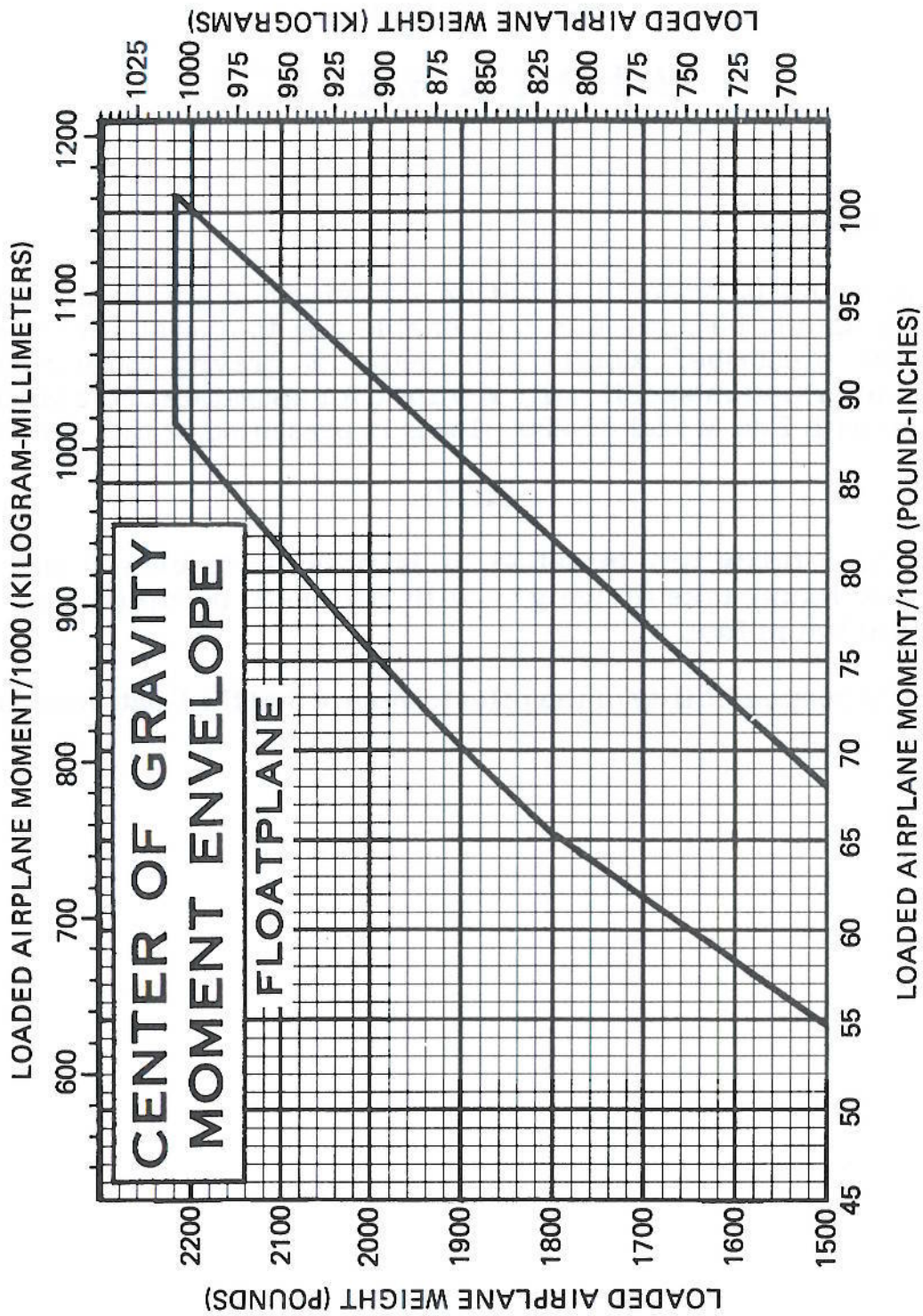


Figure 13. Center of Gravity Moment Envelope

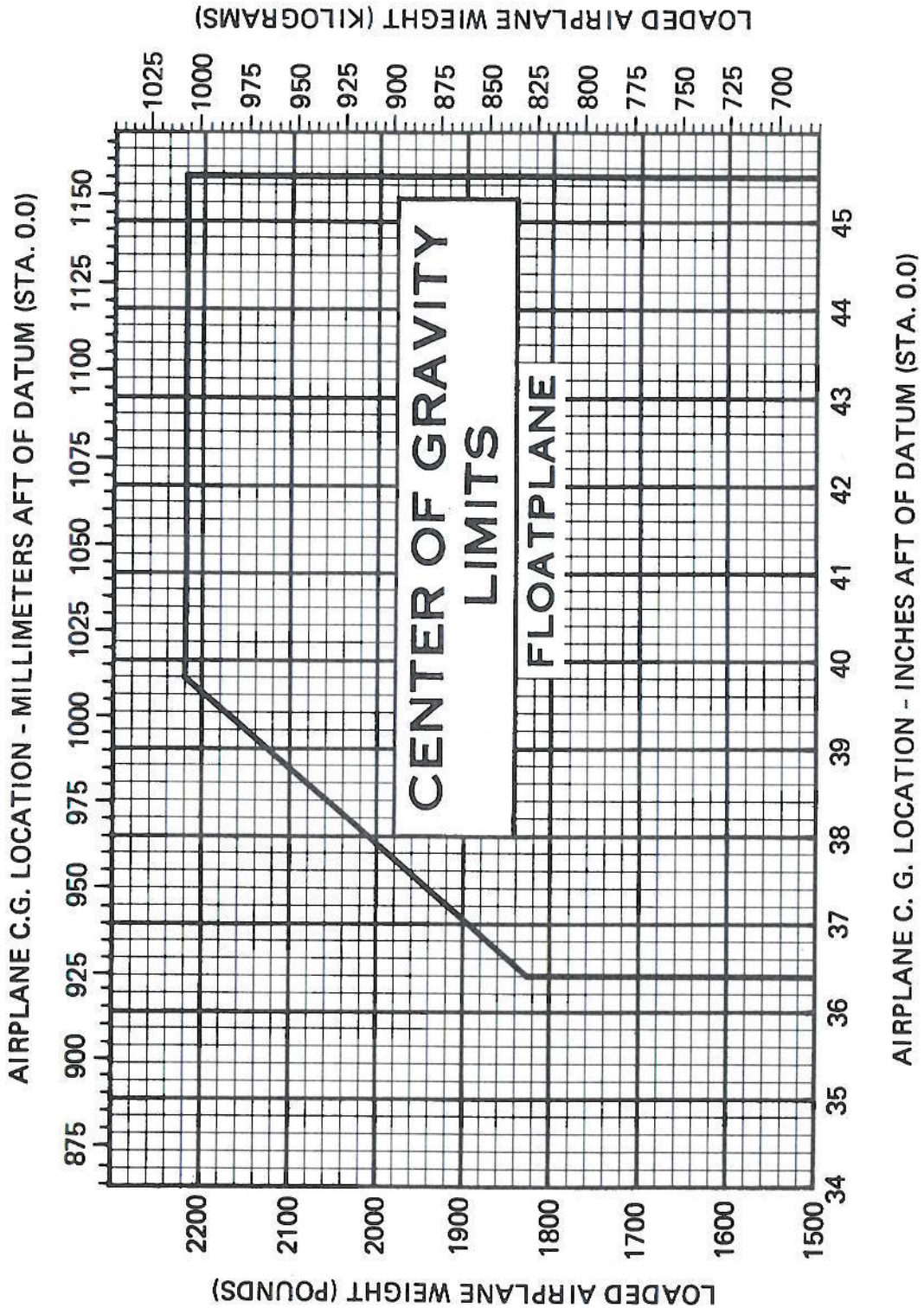


Figure 14. Center of Gravity Limits

SECTION 7

AIRPLANE & SYSTEMS DESCRIPTIONS

INTRODUCTION

This section contains a description of the modifications and equipment associated specifically with the installation of Edo Model 89-2000 floats on the Model 172P.

THE FLOATPLANE

The floatplane is identical to the landplane with the following exceptions:

1. Floats, incorporating a water rudder steering system, replace the landing gear. A water rudder retraction handle, connected to the dual water rudders by cables and springs, is located on the cabin floor.
2. Additional fuselage structure is added to support the float installation.
3. An additional structural "V" brace is installed between the top of the front door posts and the cowl deck.
4. The airplane has additional corrosion-proofing and stainless steel cables.
5. Interconnect springs are added between the rudder and aileron control systems.
6. The fuel strainer installation is modified for floatplane use.
7. The standard propeller is replaced with a propeller of larger diameter (80 inches) and flatter pitch.
8. A lower cowl with a larger cooling air exit for better engine cooling replaces the standard lower cowl.
9. Hoisting provisions are added to the top of the fuselage.
10. Fueling steps and assist handles are mounted on the forward fuselage, and steps are mounted on the wing struts to aid in refueling the airplane.
11. Floatplane placards are added.

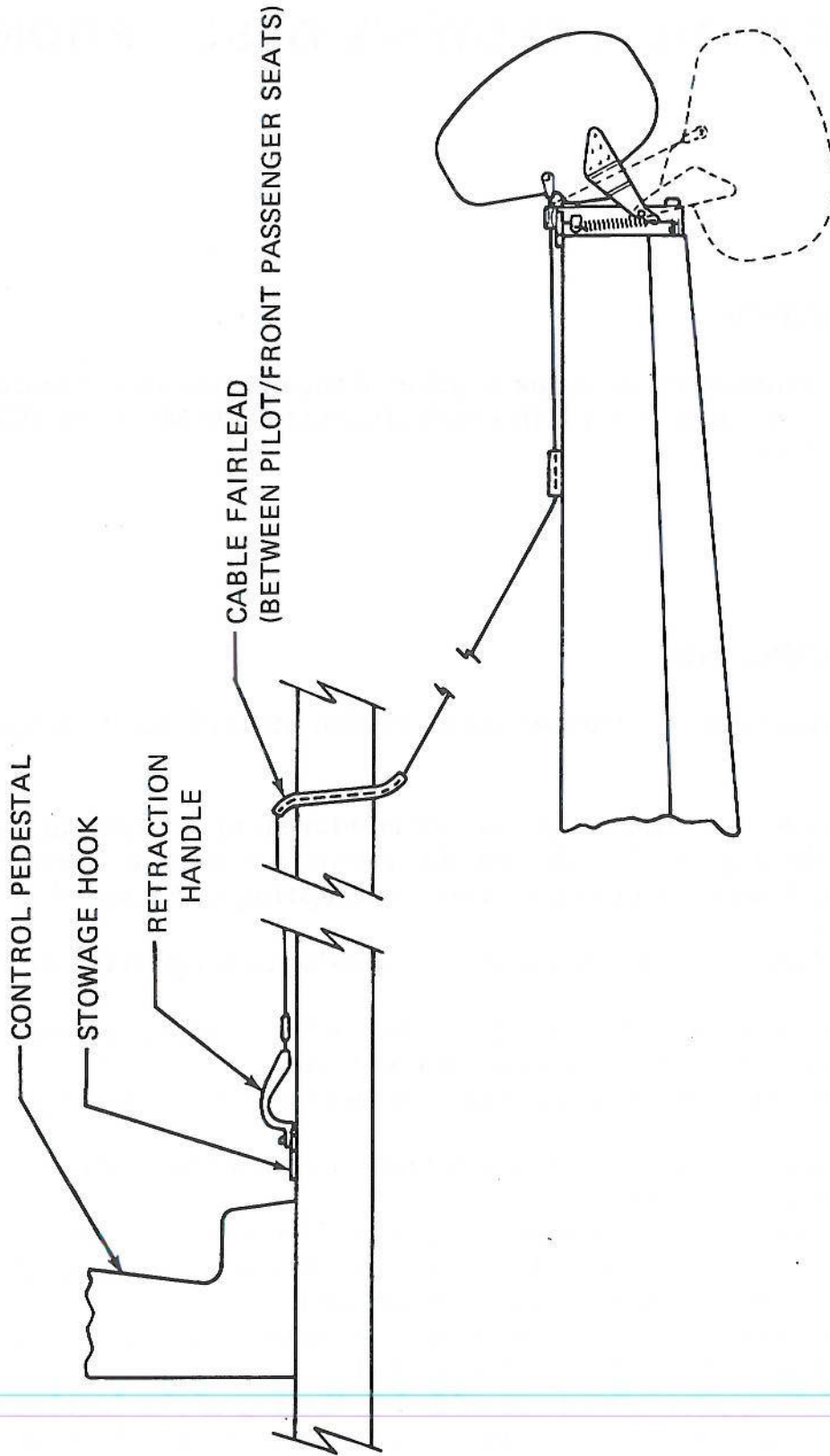


Figure 15. Water Rudder Retraction System

WATER RUDDER SYSTEM

Retractable water rudders (figure 15), mounted at the aft end of each float, are connected by a system of cables and springs to the rudder pedals. Normal rudder pedal operation moves the water rudders to provide steering control (figure 16) for taxiing.

The water rudders are equipped with centering cams (attached to each retraction hinge) which, when the water rudders are retracted, make contact with a plate on the stern of each float, locking the rudders in the centered position. Springs within the water rudder steering system permit normal airplane rudder action with the water rudders retracted and improve directional stability in flight.

A water rudder retraction handle, located on the cabin floor between the front seats, is used to manually raise and lower the water rudders. During takeoff, landing, and in flight, the handle should be secured on the stowage hook located on the cabin floor just aft of the control pedestal. With the handle in this position, the water rudders are up. When the handle is removed from the hook and allowed to move full aft, the water rudders extend to the full down position for taxiing.

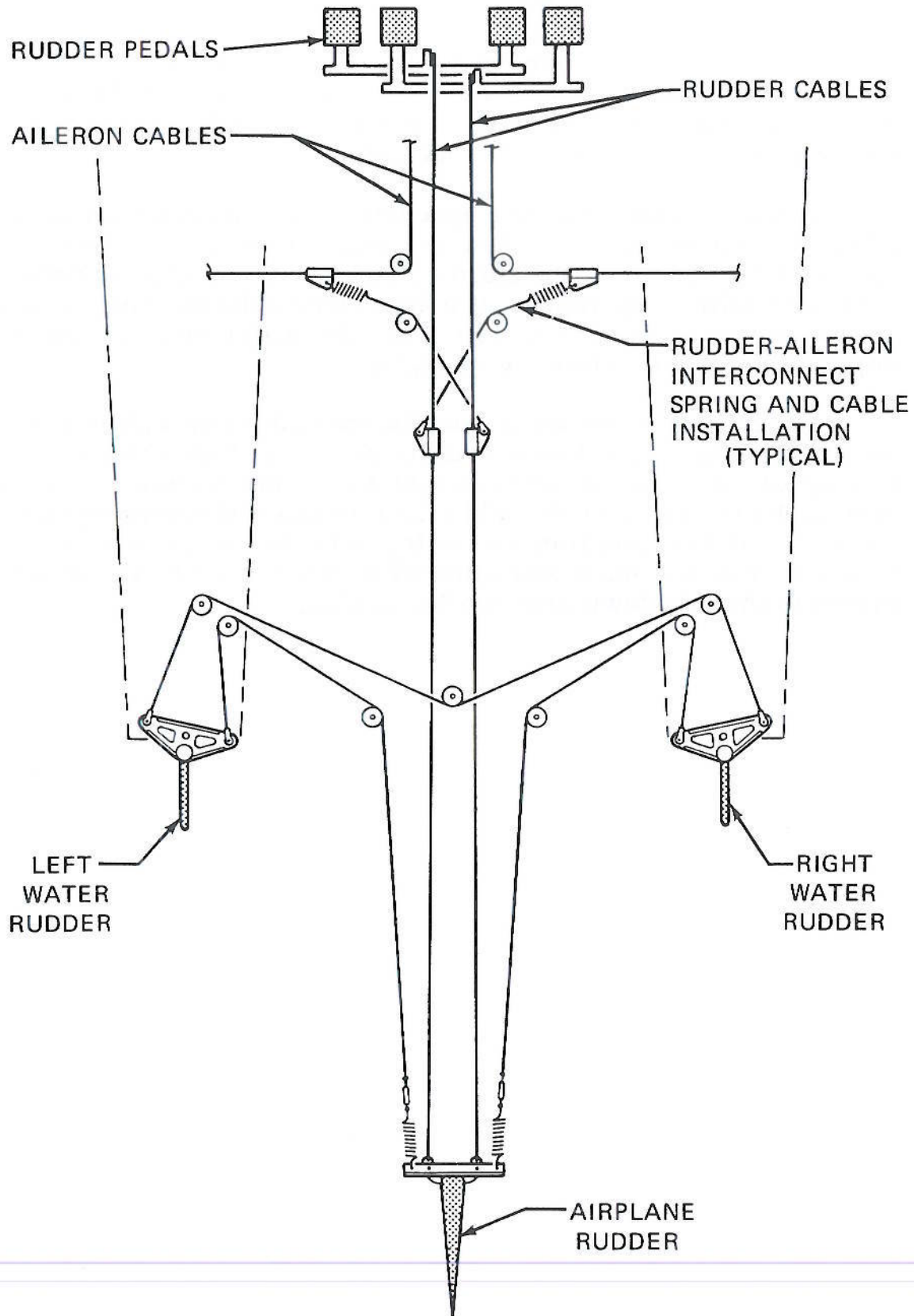


Figure 16. Water Rudder Steering System

SECTION 8

AIRPLANE HANDLING, SERVICE & MAINTENANCE

INTRODUCTION

Section 8 of the basic handbook applies, in general, to the floatplane. The following recommended procedures apply specifically to floatplane operation. (Cleaning and maintenance of the floats should be accomplished as suggested in the Edo Corporation Service and Maintenance Manual for Floats.)

MOORING

Proper securing of the floatplane can vary considerably, depending on the type of operation involved and the facilities available. Each operator should use the method most appropriate for his operation. Some of the most common mooring alternatives are as follows:

1. The floatplane can be moored to a buoy, using a yoke tied to the forward float cleats, so that it will freely weathervane into the wind.
2. The floatplane can be secured to a dock using the fore and aft cleats of one float, although this method is generally not recommended unless the water is calm and the floatplane is attended.
3. The floatplane may be removed from the water (by use of a special lift under the spreader bars) and secured by using the wing tie-down rings and float cleats. If conditions permit the floatplane to be beached, ensure that the shoreline is free of rocks or abrasive material that may damage the floats.

