WIPAIRE, INC.

• MANUFACTURERS OF WIPLINE FLOATS & SKIS
• SPECIALISTS IN AIRCRAFT MODIFICATION
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FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT 15A

FOR

AMPHIBIAN OPERATION

IN THE

180 BHP CESSNA MODELS 172M, N, P

AND F172M, N, P

WITH

WIPLINE MODEL 2350 AMPHIBIAN FLOATS

REG. NO. EI-CFP

SER. NO. 172-74428

This AFM Supplement must be carried in the airplane readily available to the pilot when the airplane is modified by the installation of Wipline Model 2350 Amphibian floats, in accordance with STC SA00900CH. *The information contained herein supplements or supersedes the basic* Owners Manual only in those areas listed. For limitations, procedures and performance information not contained in this Supplement, consult the basic placards, manuals, the Owner's Manual, the Pilot's Operating Handbook, and the engine STC AFM Supplement as applicable.

FAA APPROVED: Joyce Mieras

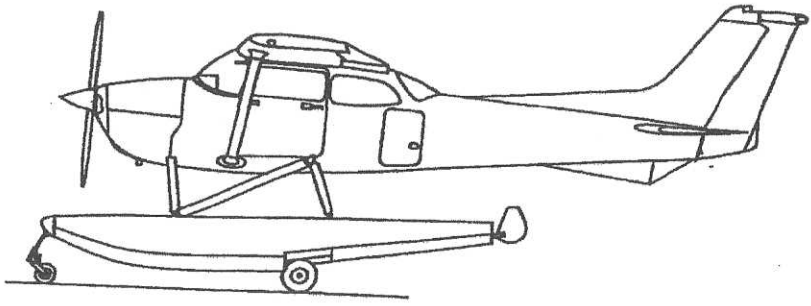
Royace Prather, Manager
Chicago Aircraft...
Certification Office
FAA Central Region
Date: 22 AUG 2005

LOG OF REVISIONS

REV. NO.	PAGES	DESCRIPTION	DATE	FAA APPROVED*

*Approved by Manager, Chicago Aircraft Certification Office.
NOTE: Revised text is indicated by a vertical black line along right margin.

Figure 1.



SECTION 1

GENERAL

INTRODUCTION

This AFM, written especially for operators of the Cessna Skyhawk amphibian, provides information not found in the Owner's Manual. It contains procedures and data required for safe and efficient operation of the Cessna 172M, N, P and F172M, N, P modified with a 180 BHP engine upgrade and equipped with Wipline Model 2350 amphibious floats.

Information contained in the Owner's Manual for the Skyhawk, or the engine STC AFM, which is the same as that for the floatplane, is generally not repeated in this supplement.

DESCRIPTIVE DATA

ENGINE
O-360 180 BPH Lycoming
IO-360 180 BPH Lycoming
PROPELLER

Propeller Manufacturer: McCauley Accessory Division

Propeller Model Number: McCauley 1A200/DFA8243 or 1A200/WFA8243
Number of Blades: 2
Propeller Diameter, Maximum: 82 inches.
Minimum: 80.4 inches.
Propeller Type: Fixed Pitch.
or
Propeller Manufacturer: Hartzell

Propeller Model Number: HC-C2YK-1BF/F8477-4 or HC-C2YR/F8477-4
Number of Blades: 2
Propeller Diameter, Maximum: 80 inches.
Minimum: 78.4 inches.
Propeller Type: Constant Speed

MAXIMUM CERTIFICATED WEIGHTS

Takeoff:	2550 Lbs.
Landing	2550 Lbs.

SPECIFIC LOADINGS

Wing Loading:	14.53	lbs./ft^2
Power Loading:	14.16	lbs./hp.

SECTION 2
LIMITATIONS

INTRODUCTION

Except as shown in this section, the amphibian operating limitations are the same as those for the Skyhawk landplane. The limitations in this section apply only to operations of the 180 BHP models 172M, N, P and F172M, N, P equipped with Wipline Model 2350 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

MODELS		172M F172M	172M, N F172M, N		172P
	SPEED	MCAS	KCAS	REMARKS	KCAS
V_{NE}	Never exceed speed	182	160	Do not exceed this speed in any operation.	158
V_{NO}	Maximum structural cruising speed	145	128	Do not exceed this speed except in smooth air, and then only with caution.	127
V_A	Maneuvering Speed	112	97	Do not make full or abrupt control movements above this speed.	99
V_{FE}	Maximum Flap Extended Speed:	100	87	Do not exceed this speed with flaps down.	87
V_{LO}, V_{LE}	Max speed for gear operation, max speed with gear down.	140	120	Do not exceed this speed with gear extended or in operation.	120

AIRSPEED INDICATOR MARKINGS

Airspeed indicator markings are the same as those for the Landplane. Due to small differences in airspeed system calibration and stall speeds with floats installed, the stall speeds as shown in Section 5 of this supplement are slightly different from those of the Landplane.

POWER PLANT LIMITATIONS

ENGINE
O-360 180 BPH Lycoming
IO-360 180 BPH Lycoming
PROPELLER

Propeller Manufacturer: McCauley Accessory Division

Propeller Model Number: McCauley 1A200/DFA8243 or 1A200/WFA8243
Number of Blades: 2
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Number of Blades: 2
Propeller Diameter, Maximum: 80 inches.
Minimum: 78.4 inches.
Propeller Type: Constant Speed

WEIGHT LIMITS

Maximum Takeoff Weight: 2550 Lbs.

Maximum Landing Weight: 2550 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 – 37.0 inches aft of datum at 2100 lbs. or less, with straight line variation to 39.5 inches aft of datum at 2550 lbs.

Aft - 45.5 inches aft of datum at all weights.

Reference Datum: Lower portion of front face of firewall.

MANEUVER LIMITS

The amphibian 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 including 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:
*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

WATER RUDDER LIMITATIONS

Water rudders must be retracted for all flight operations.

AMPHIBIAN OPERATION

Landing on water is PROHIBITED unless all four landing gear are fully retracted.

PLACARDS

The following information must be displayed in the form of composite or individual placards in addition to those specified in the Owner's Manual.

1. Locate below landplane operations limitations placard:
p/n 10A3-6284

In full view of the pilot:

FLOATPLANE OPERATIONS LIMITATIONS

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 Flight Manual Supplement.

No acrobatic maneuvers, including spins, approved.
Flight into known icing conditions prohibited.

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

DAY NIGHT VFR IFR

2. As near as practical to the airspeed indicator:
p/n 10A3-6452

FLOATPLANE
Stall speeds are approximately 5 KIAS lower than indicator markings.

3. In full view of the pilot:
p/n 6B3-2243-2

WATER RUDDER UP FOR ALL FLIGHT OPERATIONS

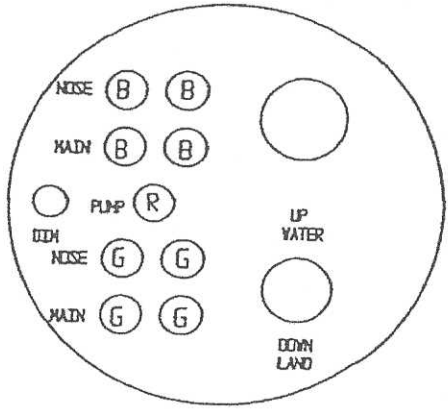
4. Locate in clear view of pilot: p/n 6B3-2243-3

DO NOT LAND ON WATER UNLESS GEAR IS FULLY RETRACTED.

5. Locate at the emergency gear hand pump: p/n 15A3-6283

EMERGENCY HANDPUMP PULL GEAR MOTOR CIRCUIT BREAKER SELECT DESIRED GEAR POSITION PUMP GEAR TO DESIRED POSITION"

6. Locate on the gear selector switch: p/n 10B3-6202



7. In clear view of pilot: p/n 15A3-6279

REFER TO WIPLINE AFM SUPPLEMENT FOR OPERATION WITH WIPLINE FLOATS INSTALLED

8. At the water rudder retract handle: p/n 3A3-1115-1, -2, -3

WATER RUDDER CONTROL

DOWN	UP

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SECTION 3

EMERGENCY PROCEDURES

INTRODUCTION

Checklist and amplified procedures contained in the basic Owner's Manual generally should be followed. The additional or changed procedures specifically required for operation of the 172M, N, P and F172M, N, P equipped with Wipline Model 2350 floats are presented in this section.

WARNING!

There is no substitute for proper and complete pre-flight planning habits and their continual review in minimizing emergencies. Be thoroughly knowledgeable of hazards and conditions which represent potential dangers, and be aware of the capabilities and limitations of the airplane.

AIRSPEEDS FOR EMERGENCY OPERATION

The speeds listed below should be substituted, as appropriate, for the speeds contained in the basic Owner's Manual for Cessna Models 172M, N, P and F172M, N, P.

Engine Failure After Takeoff:

Wing Flaps Down 10° .....65 KIAS ; 75 MIAS

Maneuvering Speed:
2550 Lbs 172M.....112 MCAS
172N.....97 KCAS
172P.....99 KCAS

Recommended Glide.....70 KIAS ; 80 MIAS

Precautionary Landing with Engine Power - Flaps Down.....65 KIAS ; 70 MIAS

Landing Without Engine Power

Wing Flaps Down.....65 KIAS ; 75 MIAS

OPERATIONAL CHECKLISTS

Procedures in the Operational Checklists portion of this section shown in **bold-face** type are immediate-action items which should be committed to memory.

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 -- flaps UP: .....70 KIAS – 80 MIAS**
flaps DOWN: ..... 65 KIAS ; 75 MIAS
2. Landing Gear -- **UP (4 blue lights).**
3. Mixture -- **IDLE CUT-OFF.**
4. Fuel Selector Valve -- **OFF.**
5. Ignition Switch -- **OFF.**
6. Water Rudders -- **UP.**
7. Wing Flaps -- **AS REQUIRED.**
8. Master Switch -- **OFF.**
9. Doors -- **UNLATCH PRIOR TO APPROACH.**
10. Touchdown -- **SLIGHTLY TAIL LOW.**
11. Control Wheel -- **HOLD FULL AFT as amphibian decelerates.**

EMERGENCY LANDING ON LAND WITHOUT ENGINE POWER

1. **Airspeed flaps UP: .....70 KIAS – 80 MIAS**
flaps DOWN: .....65 KIAS – 75 MIAS
2. Landing Gear -- **DOWN (4 green lights) for smooth terrain.**
UP (4 blue lights) for rough terrain.
3. Mixture -- **IDLE CUT-OFF.**
4. Fuel Selector Valve -- **OFF.**
5. Ignition Switch -- **OFF.**
6. Water Rudders -- **UP.**
7. Wing Flaps -- **AS REQUIRED (30° recommended).**
8. Master Switch -- **OFF.**
9. Doors -- **UNLATCH PRIOR TO APPROACH.**
10. Touchdown -- **LEVEL ATTITUDE.**
11. Control Wheel -- **FULL AFT (after landing).**
12. Brakes -- **AS REQUIRED.**

LANDING GEAR MALFUNCTION PROCEDURES

LANDING GEAR FAILS TO RETRACT OR EXTEND

1. Battery Switch -- ON.
2. Landing Gear Switch – RE-CHECK IN DESIRED POSITION.
3. Landing Gear Circuit Breaker -- CHECK IN.
4. Gear Lights - 4 BLUE for gear UP.
   4 GREEN for gear DOWN.
5. Gear Position - CHECK VISUALLY.

If gear still in improper position:

6. Gear Switch -- RECYCLE.
7. Landing Gear Motor -- CHECK red light ON.
8. Airspeed -- REDUCE to minimize air loads on gear.

If gear motor is inoperative or gear is still not in desired position:

9. Landing Gear Circuit Breaker -- PULL.
10. Landing Gear Switch -- DESIRED POSITION.
11. Emergency Valve -- SELECT DESIRED POSITION.
12. Emergency Hand pump -- PUMP until resistance becomes heavy (may be as many as 120 cycles).

13. Gear Position Lights -- CHECK DESIRED LIGHTS (4) ILLUMINATED.
14. Gear Position -- CONFIRM VISUALLY.

WARNING!

DO NOT LAND ON WATER UNLESS GEAR IS FULLY RETRACTED

GEAR UP OR PARTIALLY EXTENDED - LANDING ON LAND (ONLY)

1. Seats, Seat Belts, Shoulder Harness -- SECURE.
2. Runway -- SELECT longest smooth ground or grass surface available.
3. Gear Switch -- UP to permit partially extended gear to retract and maintain level attitude during ground run.
4. Wing Flaps -- FULL DOWN.
5. Airspeed .....60 KIAS – 70 MIAS
6. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
7. Master Switch -- OFF.
8. Touchdown -- LEVEL with MINIMUM SINK.
9. Control Wheel -- FULL AFT (after touchdown).
10. Mixture -- IDLE CUT OFF (after touchdown).
11. Fuel -- OFF (after touchdown).

AMPLIFIED PROCEDURES

MAXIMUM GLIDE

After an engine failure in flight, the recommended 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
	70 KIAS
	80 MIAS
* ZERO WIND	
	* FLAPS UP

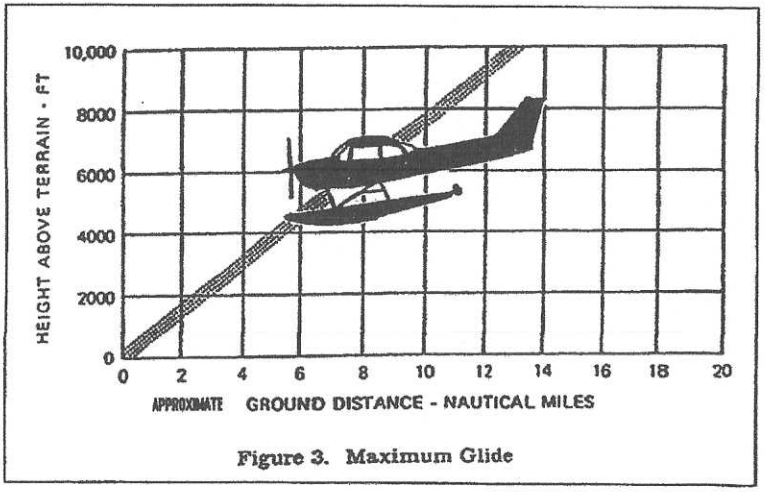


Figure 3. Maximum Glide

SECTION 4

NORMAL PROCEDURES

INTRODUCTION

Checklist and amplified procedures contained in the basic Owner's Manual generally should be followed. The additional or changed procedures specifically required for operation of the 172M, N, P and F172M, N, P equipped with Wipline Model 2350 floats are presented in this section.

SPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum weight of 2550 pounds and may be used for any lesser weight.

Takeoff:
Normal Climb Out (10° flaps).....65 KIAS ; 75 MIAS

Maximum Performance, Flaps 10°, Speed at 50 ft. . . . . .60 KAIS ; 70 MIAS

Enroute Climb, Flaps Up:
Normal .....70-80 KIAS ; 75-85 MIAS
Best Rate of Climb, Sea Level .....70 KIAS – 75 MIAS
Best Rate of Climb, 10,000 Ft .....65 KIAS – 70 MIAS

Landing Approach:
Normal Approach
Flaps Up..... 65-75 KIAS ; 75-85 MIAS
Normal Approach
Flaps Down.....60-70 KIAS ; 70-80 MIAS
Maximum Performance – Flaps Down – Speed at 50 ft.....60 KIAS ; 70 MIAS

Balked Landing:
Maximum Power, Flaps 20°. .....60 KIAS – 70 MIAS

Maximum Recommended Turbulent Air Penetration Speed:
2550 Lbs 172M..... 112 MCAS
172N.....97 MCAS
172P.....99 KCAS

CHECKLIST PROCEDURES

PREFLIGHT INSPECTION

1. Amphibian Approved Flight Manual AVAILABLE IN THE AIRPLANE.
2. Floats, Struts and Fairings -- INSPECT for dents, cracks,scratches,etc.
3. Float Compartments -- INSPECT for water accumulation.

NOTE

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

4. Water Rudders -- CHECK actuation cables.

BEFORE STARTING ENGINE

1. Water Rudder Operation -- CHECK VISUALLY.
2. Water Rudders -- DOWN for taxiing on water (retract lever. full fwd. UP for taxiing on land (retraction lever full aft).

TAKEOFF

TAKEOFF ON WATER

1. Landing Gear -- UP.
2. Water Rudders -- UP (retraction lever full aft).
3. Wing Flaps -- 0°- 10° (10° preferred).
4. Carburetor Heat (if applicable)-- COLD.
5. Control Wheel -- HOLD FULL AFT.
6. Power -- FULL THROTTLE (Advance Slowly), Prop Control (if applicable) to 2600 RPM.
7. Mixture – RICH or LEAN FOR ELEVATION. Max RPM above 3000' with fixed pitch Prop.
8. Control Wheel -- MOVE FORWARD when the nose stops rising to attain planing Attitude (on the step).
9. Airspeed – 45-50 KIAS ; 50-60 MIAS
10. Control Wheel -- APPLY LIGHT BACK PRESSURE to lift off.
11. Climb Speed -- flaps 10°: . . . . . .70 MIAS; 60 KIAS. With obstacles ahead, climb at flaps 10°: 70 MIAS ; 60 KIAS.
12. Wing Flaps -- UP after all obstacles are cleared and safe airspeed is attained

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.

TAKEOFF ON LAND

1. Water Rudders -- UP (retraction lever full aft).
2. Wing Flaps -- 0° to 10° (10° for short field).
3. Carburetor Heat – COLD (if applicable).
4. Power -- FULL THROTTLE (Advance Slowly), Prop Control (if applicable) to 2600 RPM.

NOTE

For short field takeoffs, apply and hold brakes while throttle, propeller (if applicable) and mixture are set.

5. Mixture – RICH or LEAN FOR ELEVATION. Max RPM above 3000' with fixed pitch Prop.
6. Rotate for Lift-off – 50-60 MIAS
7. Climb Speed - flaps 10° -- 60 KIAS ; 70 MIAS
   With obstacles ahead, climb (flaps 10°) at 60 KIAS ; 70 MIAS.
8. Wing Flaps -- UP after all obstacles are cleared and a safe airspeed is attained
9. Landing Gear -- RETRACT.

ENROUTE CLIMB

NORMAL CLIMB

1. Airspeed .....70-80 KIAS ; 75-95 MIAS

MAXIMUM PERFORMANCE CLIMB

1 Airspeed ..... 70 KIAS (Sea level) to 65 KIAS (10,000 feet)
.....85 MIAS (Sea level) to 70 MIAS (10,000 feet)

BEFORE LANDING

BEFORE LANDING ON WATER

1. Landing Gear -- UP.
2. Landing Gear Lights -- 4 BLUE (Check On).
3. Landing Gear Position -- CONFIRM VISUALLY.
4. Water Rudders -- UP.
5. Wing Flaps -- AS DESIRED.
6. Airspeed flaps UP -- 65-75 KIAS ; 75-85 MIAS
   Airspeed flaps DOWN..... 60-70 KIAS ; 70-80 MIAS
   With obstacle, use 60 KIAS ; 70 MIAS over the obstacle.

BEFORE LANDING ON LAND

1. Landing Gear -- DOWN.
2. Landing Gear Lights -- 4 GREEN (Check on).
3. Landing Gear Position -- CONFIRM VISUALLY.
4. Water Rudders -- UP.
5. Wing Flaps -- AS DESIRED.
6. Airspeed -- flaps UP
   65-75 KIAS ; 75-85 MIAS
   Airspeed -- flaps DOWN
   60-70 KIAS ; 70-80 MIAS

With obstacles, use 60 KIAS ; 70 MIAS over the obstacle.

LANDING
LANDING ON WATER

1. Touchdown -- SLIGHTLY TAIL LOW.
2. Control Wheel -- HOLD FULL AFT as amphibian 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.

LANDING ON LAND

1. Touchdown -- SLIGHTLY TAIL LOW.
2. Control Wheel -- LOWER NOSEWHEELS to runway.
3. Brakes -- USE AS REQUIRED.

AFTER LANDING

1. Water Rudders -- DOWN (except on land).

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 ON WATER

Taxi with water rudders down. It is best to limit the engine 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 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.

TAXIING ON LAND

The nose wheels are full swiveling on the amphibian. Steering is accomplished by use of the brakes installed on the main wheels. An occasional tapping of the brakes may be utilized to maintain the desired taxi path under normal conditions.

TAKEOFF ON WATER

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 amphibian 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.

To clear an obstacle after takeoff with 10° wing flaps, use an obstacle clearance speed of 60 KIAS – 70 MIAS for maximum performance. 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.

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. Takeoff from larger bodies of water should always be made into the wind. The chop/waves generated in winds of 10 knots and more may inhibit engine operation due to spray and may prevent the amphibian from attaining the step under these conditions in crosswinds.

TAKEOFF ON LAND

Normal takeoffs are accomplished with the wing flaps extended 0-10°. As speed increases, the elevator control should be gradually moved aft of the neutral position, and when the amphibian feels light (40-50 KIAS – 46-58 MIAS), a light back pressure on the control wheel will allow the amphibian to fly off smoothly.

To clear an obstacle after takeoff, use 10° wing flaps and an obstacle clearance speed of 60 KIAS – 70 MIAS for maximum performance. Upon reaching a safe altitude and airspeed, retract wing flaps slowly. The landing gear should be retracted when the point is reached where a wheels-down forced landing on that runway would be impractical. Recommended procedures for enroute climb are the same as for the landplane.

LANDING

Normal landings can be made power on or power off using approach speeds of 75-85 MIAS – 65-75 KIAS with flaps up; and 70-80 MIAS ; 60-70 KIAS with flaps down. If landing site is restricted, use full flaps with idle power and an airspeed of 70 MIAS ; 60 KIAS over any obstacle

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 typical of normal water conditions.

CROSSWIND LANDING

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

SECTION 5
PERFORMANCE

INTRODUCTION

This section provides the performance information on the 180 BHP 172M, N, P and F172M, N, P amphibian required under CAR3.

AIRSPEED CALIBRATION

The Airspeed Calibration Charts from the Float Owner's Manual, the Pilot's Operating Handbook, or the aircraft Owner's Manual may be generally used.

STALL SPEEDS

CONDITIONS:
Power Off

MOST FORWARD CENTER OF GRAVITY
MODEL 172M, N, P and F172M, N, P

		ANGLE OF BANK			
		0°	30°	45°	60°
WEIGHT	FLAP DEFLEC-TION	KCAS Or MCAS	KCAS Or MCAS	KCAS Or MCAS	KCAS Or MCAS
2550 lbs.	UP	55 KCAS	59 KCAS	65 KCAS	77 KCAS
	20	51 KCAS	54 KCAS	60 KCAS	71 KCAS
	30	50 KCAS	53 KCAS	59 KCAS	70 KCAS
2550 lbs.	UP	63 MCAS	68 MCAS	75 MCAS	88 MCAS
	20	59 MCAS	60 MCAS	69 MCAS	82 MCAS
	30	58 MCAS	61 KIAS	68 MCAS	81 MCAS

Figure 5. Stall Speeds

CLIMB PERFORMANCE

The Climb Performance of the Cessna models 172M, N, P and F172M, N, P on Wipline 2350 Floats equals or exceeds that required by CAR 3.

SECTION 6

WEIGHT & BALANCE

INTRODUCTION

Weight and balance information contained in the basic Owner's Manual 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 180 BHP equipped 172M, N, P and F172M, N, P equipped with Wipline Model 2350 Amphibian 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.

WARNING!!

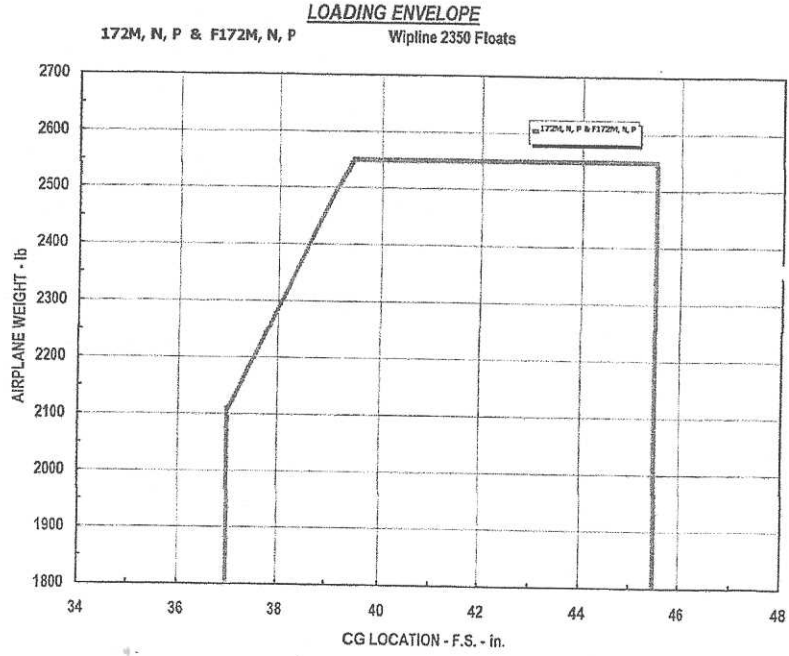
It is the responsibility of the pilot to ensure that the amphibian is loaded properly. Operation outside of prescribed weight and balance limitations could result in an accident and serious or fatal injury.

FLOAT BAGGAGE COMPARTMENTS

Baggage may be carried in the float baggage compartments in accordance with the following limitations:

COMPARTMENT	MAX WT	ARM	MOM
LEFT	50 Lbs.	20	1000
RIGHT	50 Lbs.	20	1000

Center of Gravity Limits



SECTION 7

AIRPLANE & SYSTEMS DESCRIPTION

INTRODUCTION

This section contains a description of the modifications and equipment associated specifically with the installation of Wipline Model 2350 amphibious floats.

WARNING !!

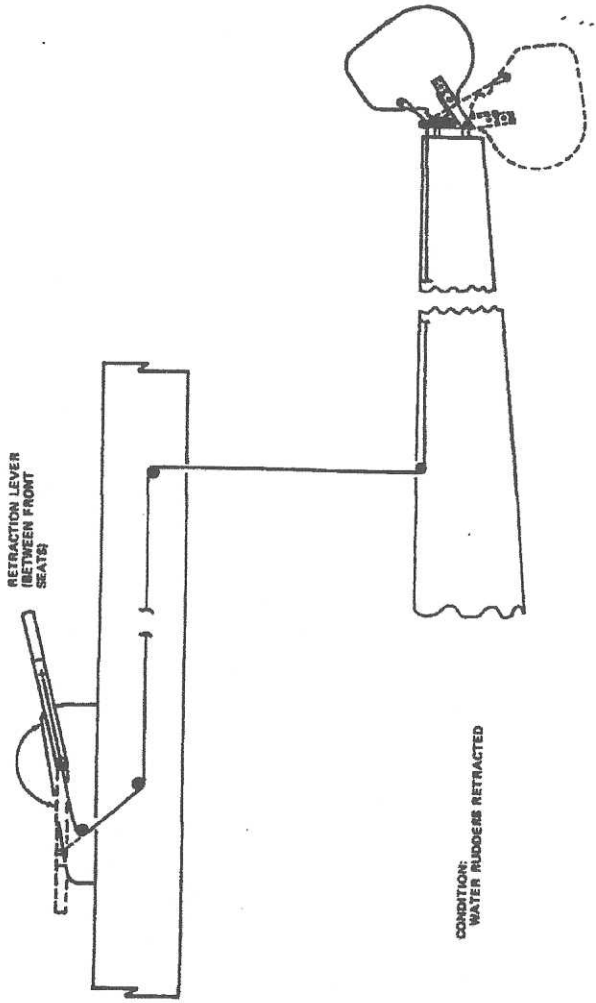
Complete familiarity with the airplane and its systems will not only increase the pilot's proficiency and ensure optimum operation, but could provide a basis for analyzing system malfunctions in case an emergency is encountered. Information in this section will assist in that familiarization. The responsible pilot will want to be prepared *to make proper and precise responses in every situation.*

THE AMPHIBIAN

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

1. Floats, incorporating retractable landing gear and a water rudder steering system, replace the landing gear. A water rudder retraction lever connected to the dual water rudders by cables is located on the cabin floor between the front seats. Water rudders are locked in center when retracted for improved directional stability.
2. Additional fuselage structure is added to support the float installation.
3. Additional structural "V" brace is installed between the top of the front door posts and the cowl deck.
4. Interconnect springs are added between the rudder and aileron control systems for improved lateral stability.
5. The fuel strainer installation is modified for floatplane use.
6. The standard propeller is replaced with a propeller of larger diameter (80 inches) and flatter pitch.
7. Hoisting provisions are added to the top of the fuselage.
8. 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.
9. Amphibian placards are added.
10. Water rudder stops are added to the water rudder blades for added directional stability.

Figure 7. Water Rudder Retraction System.



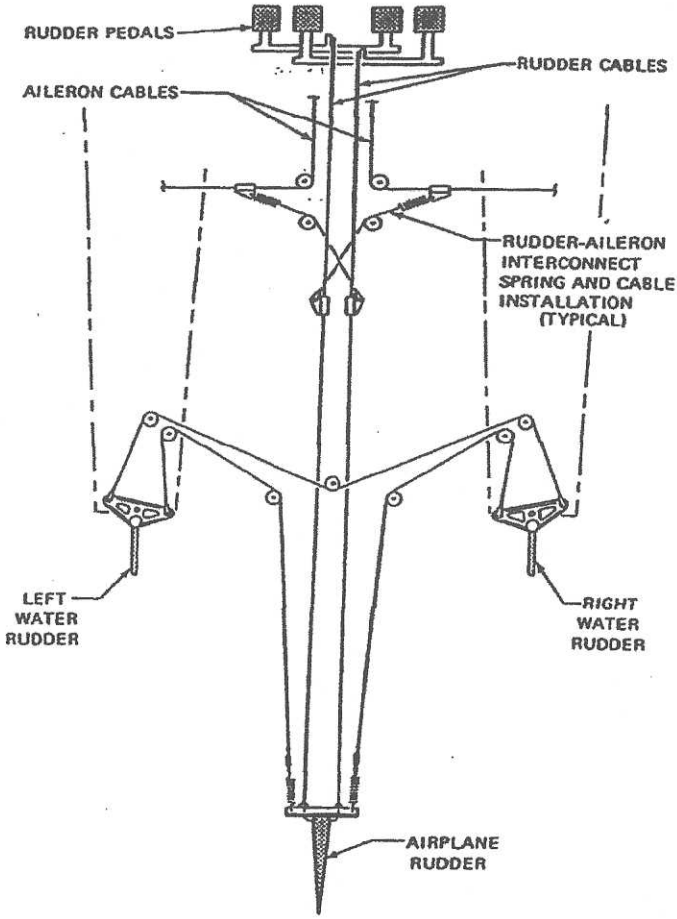
WATER RUDDER SYSTEM

Retractable water rudders (Figure 7), 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 8) for taxiing.

The water rudders are equipped with centering locks (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 lever, 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 in the UP (aft) position. With the handle in this position, the water rudders are up. When the lever is rotated forward to the DOWN position, the water rudders extend to the full down position for water taxiing.

Figure 8. Water Rudder Steering System



AMPHIBIAN OPERATION

1. Water operation procedures are similar to any common amphibian.

2. Landing gear operation.

   a. The aircraft is equipped with landing gear powered by an electrohydraulic power pack (located on the firewall of the aircraft). Am emergency hand pump is provided for operation of float landing gear in case of power or electrical failure.

   b. A set of four blue lights (one for each wheel) indicates gear up position and a set of four green lights indicates gear down position. The four blue lights indicate gear up and locked. The four lights of each color are the means of identifying that the landing gear is locked in the up or down position. There are visual indicators also.

   c. A red light marked "PUMP ON" is also provided to warn the pilot that the power pack is running during gear transit. It should shut off automatically after the desired gear position is attained by means of a pressure sensing switch cutting off the power when pressure builds up after gears are locked. Should this sensing device fail, and the pump does not shut off, the power can be manually turned off by pulling out the landing gear circuit breaker. The gear can still be operated using the power pack by turning the power back on (pushing the landing gear circuit breaker in) and selecting the next desired position and again manually turning off the power if necessary. The faulty pressure sensing switch should be repaired at the time of next landing.

   d. The pressure switch is also designed to turn on the power pack when pressure in the system drops below a certain value to rebuild the system pressure back up to shut off pressure. Therefore, if the pump comes on momentarily (an aural cue) when turning on the master switch, or the red light momentarily illuminates during flight, it merely means the pressure has fallen off and the pump is coming on to build it up. A sight gauge is provided on the power pack reservoir and the level should be kept in the upper 25% of the range. Excessive illumination of the red light indicates a significant hydraulic leak (either internal or external) and the circuit breaker should be pulled and fluid level checked followed by repair of the system.

   e. An emergency hand pump is located on the floor between the two front seats for use in the event the normal hydraulic system fails. The hand pump may be used to retract or extend the landing gear.

   f. Prior to utilizing the emergency hand pump, pull the circuit breaker to deactivate the electric hydraulic pump. Select UP or DOWN using the normal landing gear selector handle. Hand pump handle, pump vertically (approximately 120 cycles for extension or retraction). When a gear reaches the selected position, its indicator light will illuminate. After all four gear are in the selected position, there is a noted increase in resistance of hand pump operation.

SECTION 8

AIRPLANE HANDLING, SERVICE & MAINTENANCE

INTRODUCTION

Section 8 of the basic Pilot's Operating Handbook (if available) applies, in general, to the amphibian. The following recommended procedures apply specifically to the amphibian operation. (Cleaning and maintenance of the floats should be accomplished as suggested in the Wipline Floats Service and Maintenance Manual).

MOORING

Proper securing of the amphibian 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 amphibian 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 amphibian 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 amphibian is attended.
3. The amphibian may be removed from the water (by use of a special lift under the spreader bars) and secured by using the wing tiedown rings and float cleats. If conditions permit the amphibian to be beached, ensure that the shoreline is free of rocks or abrasive material that may damage the floats.

SERVICING

Service the airplane in accordance with Section 8 of the Owner's Manual.