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FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

FOR

AMPHIBIAN OPERATION

IN THE

CESSNA MODELS 172 I, K, L, M, N, P

WITH

WIPLINE MODEL 2350 AMPHIBIAN FLOATS

MODIFIED WITH PENN YAN AERO STC SA332GL

Wipaire Part Number: POHSA00900CH-A-PYA-5
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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 Owner's Manual only in those areas listed. For limitations, procedures and performance information not contained in this Supplement, consult the basic placards and the Pilot's Operating Handbook as applicable.

FAA APPROVED: _____
Manager, Southwest Flight Test Section, AIR-713
Federal Aviation Administration
Fort Worth, TX

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LOG OF REVISIONS

REV. NO.	PAGES	DESCRIPTION	DATE	FAA APPROVED
A		REFORMATTED DOCUMENT, UPDATED WATER RUDDER STEERING FIGURE, UPDATED SECTION 7 REQUIREMENTS TO MAKE INTERCONNECT SPRINGS OPTIONAL.	MAR 1 9 2015	RDM Elig
B	1, 14, 18, 34, 36	Added hydraulic fluid level system information. Added Appendix A. Updated STC SA332GL on title page.	FEB 15 2019	FAA Approved via form 8110-3. See Appendix A.
C	19-21, 23-24, 26-29	Added takeoff and landing performance charts.		

NOTE: Revised text is indicated by a vertical black line along outside margin.

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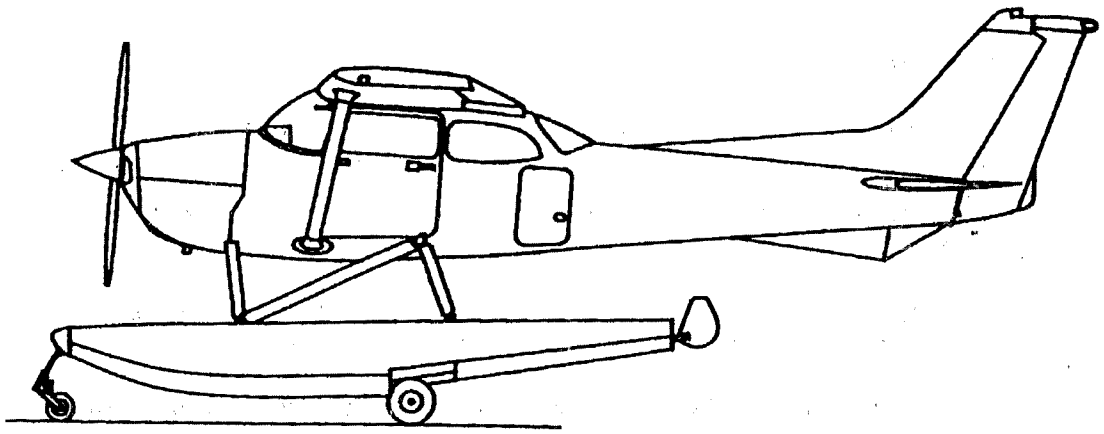


FIGURE 1

SECTION 1 - GENERAL INFORMATION

INTRODUCTION

This AFM, written especially for operators of the Cessna amphibian, provides information not found in the basic Pilot's Operating Handbook. It contains procedures and data required for safe and efficient operation of the Cessna 172 I, K, L, M, N, P modified with Penn Yan Aero SA332GL and equipped with Wipline Model 2350 amphibious floats.

Information contained in the basic handbook for the 172 I, K, L, M, N, P which is the same as that for the floatplane, is generally not repeated in this supplement.

Information contained in Penn Yan Aero supplement is not repeated in this supplement.

DESCRIPTIVE DATA

ENGINE

Engine:	O-360-A4A, A4M, or A4N
Maximum Power:	180 BHP Rating

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

PROPELLER

Propeller Manufacturer:	McCauley Accessory Division
Propeller Model Number:	McCauley 1A200/DFA8242 or DFA8243
Number of Blades:	2
Propeller Diameter:	Maximum: 82 in Minimum: 78 in
Propeller Type:	Fixed Pitch

MAXIMUM CERTIFICATED WEIGHTS

Ramp (Dock):	2508 lbs	172 I, K, L
	2558 lbs	172 M, N, P
Takeoff:	2500 lbs	172 I, K, L
	2550 lbs	172 M, N, P
Landing:	2500 lbs	172 I, K, L
	2550 lbs	172 M, N, P

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 Model 172 I, K, L, M, 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.

	SPEED	172 I, K, L, M MCAS	172 N, P KCAS	172 N, P KIAS	REMARKS
V_{NE}	Never exceed speed	160	139	140	Do not exceed this speed in any operation.
V_{NO}	Maximum structural cruising speed	145	126	127	Do not exceed this speed except in smooth air, and then only with caution.
V_A	Maneuvering speed	110	95	96	Do not make full or abrupt control movements above this speed.
V_{FE}	Maximum flap extended speed: 10° Flap 10-30° Flap	100	 111 87	 110 85	Do not exceed this speed with flaps down.
V_{LO} V_{LE}	Max speed for gear operation, Max speed with gear down.	140	139	140	Do not exceed this speed with gear extended or in operation.

AIRSPEED LIMITATIONS
FIGURE 2

POWER PLANT LIMITATIONS

ENGINE

Engine: O-360-A4A, A4M or A4N

Maximum Power: 180 BHP Rating

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

PROPELLER

Propeller Manufacturer: McCauley Accessory Division

Propeller Model Number: 1A200/DFA8242 or DFA8243
Number of Blades: 2
Propeller Diameter: Maximum: 82 in
Minimum: 78 in
Propeller Type: Fixed Pitch

POWER PLANT INSTRUMENT MARKINGS

Tachometer: RED LINE 2700 RPM

WEIGHT LIMITS

Maximum Ramp (Dock):	2508 lbs	172 I, K, L
	2558 lbs	172 M, N, P
Maximum Takeoff Weight:	2500 lbs	172 I, K, L
	2558 lbs	172 M, N, P
Maximum Landing Weight:	2500 lbs	172 I, K, L
	2550 lbs	172 M, N, P

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: 172 I, K, L

Forward: 37.0 inches aft of datum at 2100 lbs. or less, with straight line variation to 39.5 inches aft of datum at 2500 lbs.

Aft: 45.5 inches aft of datum at all weights.

Center of Gravity Range: 172 M, N, P

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

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.

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 basic handbook.

1. Locate below landplane operations limitations placard:

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. Locate near water rudder retraction in clear view of pilot:

WATER RUDDER UP FOR ALL FLIGHT OPERATIONS

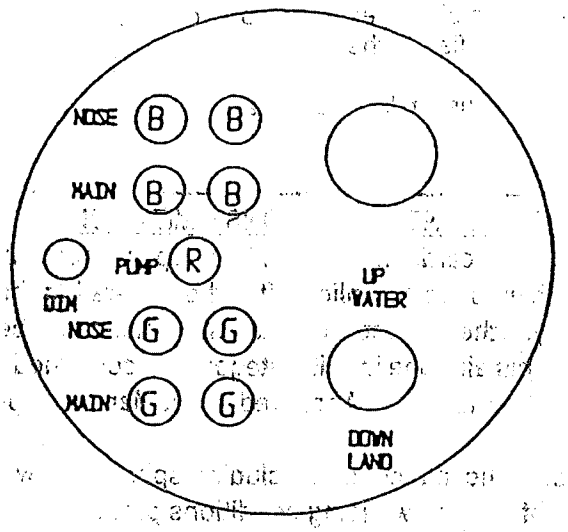
3. Locate in clear view of pilot:

DO NOT LAND ON WATER UNLESS GEAR IS FULLY RETRACTED.

4. Locate at the emergency gear hand pump:

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

5. Locate on the gear selector switch:



6. As near as practical to the Airspeed Indicator:

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

7. Locate in clear view of pilot:

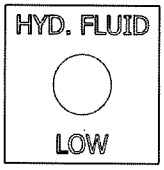
REFER TO WIPLINE AFM
SUPPLEMENT FOR OPERATION
WITH WIPLINE FLOATS
INSTALLED

8. At the water rudder retract handle:

WATER RUDDER
CONTROL

DOWN UP

9. On the fluid level indicator lamp (if equipped):



SECTION 3 – EMERGENCY PROCEDURES

INTRODUCTION

Checklist and amplified procedures contained in the basic Owner's Manual or Pilot's Operating Handbook generally should be followed. The additional or changed procedures specifically required for operation of the Model 172 I, K, L, M, 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 Operating Procedures Section of the basic Owner's Manual or Pilot's Operating Handbook.

Engine Failure After Takeoff:
- Wing Flaps Up (172 I, K, L, M) ..... 75 MIAS
- Wing Flaps Up (172 N, P) ..... 65 KIAS
- Wing Flaps Down 10° (172 I, K, L, M) ..... 70 MIAS
- Wing Flaps Down 10° (172 N, P) ..... 60 KIAS

Maneuvering Speed:
- 2500 Lbs (172 I, K, L) ..... 110 MIAS
- 2550 Lbs (172 M, N, P) ..... 96 KIAS

Maximum Glide:
- 172 I, K, L, M ..... 80 MIAS
- 172 N, P ..... 70 KIAS

Precautionary Landing with Engine Power - Flaps Down:
- 172 I, K, L, M ..... 70 MIAS
- 172 N, P ..... 60 KIAS

Landing Without Engine Power:
- Wing Flaps Up (172 I, K, L, M) ..... 80 MIAS
- Wing Flaps Up (172 N, P) ..... 70 KIAS
- Wing Flaps Down (172 I, K, L, M) ..... 70 MIAS
- Wing Flaps Down (172 N, P) ..... 60 KIAS

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: . . . . . 80 MIAS (172 I, K, L, M); 70 KIAS (172 N, P)**
   flaps DOWN: . . . . . 70 MIAS (172 I, K, L, M); 60 KIAS (172 N, P)
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: . . . . . 80 MIAS (172 I, K, L, M); 70 KIAS (172 N, P)**
   flaps DOWN: . . . . . 70 MIAS (172 I, K, L, M); 60 KIAS (172 N, P)
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 – RECHECK 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

NOTE

Problem may be THERMAL HYDRAULIC EXPANSION.
If gear motor fails to operate (Red Light On), cycle hand pump handle to gear position desired (UP or DOWN), then return handle to neutral, check pump on (Red Light On).

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 -- 70 MIAS (172 I, K, L, M); 60 KIAS (172 N, P)
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**
  GEAR RETRACTED
- **ZERO WIND**
- **SPEED**
  80 MIAS (172 I, K, L, M)
  70 KIAS (172 N, P)
- **FLAPS UP**

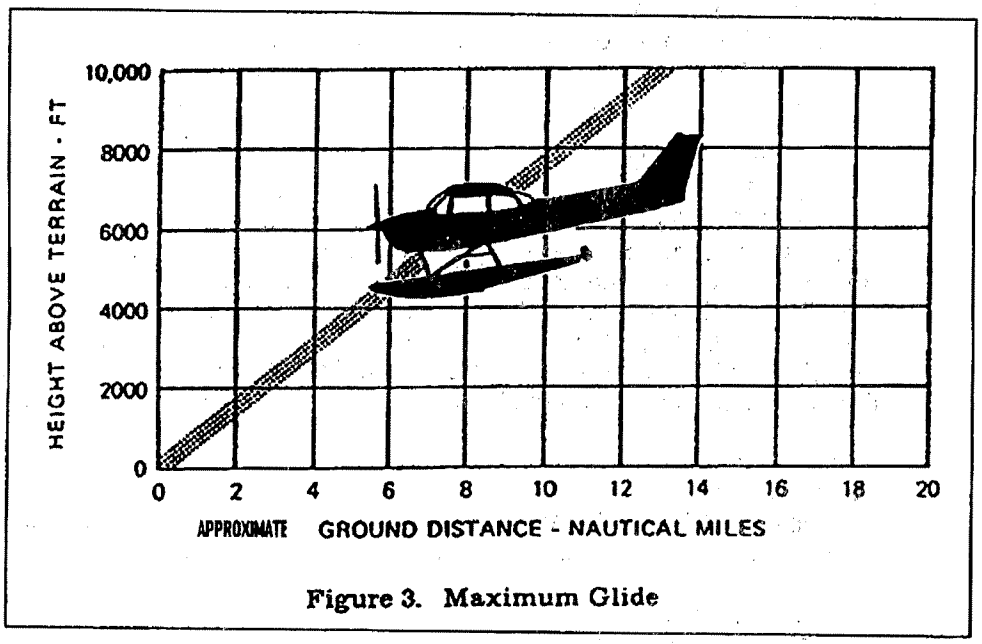


Figure 3. Maximum Glide

HYDRAULIC FLUID LEVEL INDICATOR (IF EQUIPPED)

HYDRAULIC FLUID LEVEL INDICATOR OPERATION	
OFF	Fluid level sufficient for normal operation
INTERMITTENT	Fluid level is low and must be serviced before next flight
ON	Fluid level is very low and may not be sufficient for normal gear operation. Must be serviced before next flight

SECTION 4 – NORMAL PROCEDURES

INTRODUCTION

Checklist and amplified procedures contained in the Pilot's Operating Handbook generally should be followed. The additional or changed procedures specifically required for operation of the Model 172 I, K, L, M, N, P modified with Penn Yan Aero STC 332GL and 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 2500 pounds (172 I, K, L) and 2550 pounds (172 M, N, P) and may be used for any lesser weight.

Takeoff:
- Normal Climb Out (172 I, K, L, M) ..... 75 MIAS
- Normal Climb Out (172 N, P) ..... 65 KIAS
- Maximum Performance, Flaps 10°, Speed at 50 ft:
  - 172 I, K, L, M ..... 70 MIAS
  - 172 N, P ..... 60 KIAS

Enroute Climb, Flaps Up:
- Normal (172 I, K, L, M) ..... 92-103 MIAS
- Normal (172 N, P) ..... 80-90 KIAS
- Best Rate of Climb, Sea Level (172 I, K, L, M) ..... 83 MIAS
- Best Rate of Climb, Sea Level (172 N, P) ..... 72 KIAS
- Best Rate of Climb, 10,000 Ft (172 I, K, L, M) ..... 76 MIAS
- Best Rate of Climb, 10,000 Ft (172 N, P) ..... 66 KIAS
- Best Angle of Climb, Sea Level thru 10,000 Ft (172 I, K, L, M) ..... 70 MIAS
- Best Angle of Climb, Sea Level thru 10,000 Ft (172 N, P) ..... 60 KIAS

Landing Approach:
- Normal Approach:
  - Flaps Up (172 I, K, L, M) ..... 75-85 MIAS
  - Flaps Up (172 N, P) ..... 65-75 KIAS
- Normal Approach
  - Flaps 30°(172 I, K, L, M) ..... 63-75 MIAS
  - Flaps 30°(172 N, P) ..... 55-65 KIAS

Balked Landing:
- Maximum Power, Flaps 20°
  - (172 I, K, L, M) ..... 63 MIAS
  - (172 N, P) ..... 55 KIAS

Maximum Recommended Turbulent Air Penetration Speed:
- 2500 Lbs (172 I, K, L) ..... 110 MCAS
- 2550 Lbs (172 M, N, P) ..... 96 KIAS

Maximum Demonstrated Crosswind Velocity:
- Takeoff or Landing ..... 10 KNOTS

CHECKLIST PROCEDURES

PREFLIGHT INSPECTION

1. Pilot's Operating Handbook (if applicable) and Amphibian Approved Flight Manual Supplement -- 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 -- 10°
4. Carburetor Heat -- COLD
5. Control Wheel -- HOLD FULL AFT
6. Throttle -- FULL (Advance Slowly)
7. Mixture -- RICH (or LEAN to obtain maximum RPM above 3000 ft)
8. Control Wheel -- MOVE FORWARD when the nose stops rising to attain planing attitude (on the step).
9. Airspeed – 52-57 MIAS (172 I, K, L, M); 45-50 KIAS (172 N, P)
10. Control Wheel -- APPLY LIGHT BACK PRESSURE to lift off.
11. Climb Speed -- flaps 10°:69-75 MIAS (172 I, K, L, M); 60-65 KIAS (172 N, P)
    With obstacles ahead, climb at flaps 10°: 70 MIAS (172 I, K, L, M); 60 KIAS (172 N, P).
12. Wing Flaps -- UP after all obstacles are cleared

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
4. Throttle -- FULL

NOTE

For short field takeoffs, apply and hold brakes while throttle and mixture are set.

5. Mixture -- RICH (or LEAN for max RPM above 3000 ft)
6. Rotate for Lift-off – 46 to 57 MIAS (172 I, K, L, M); 40 to 50 KIAS (172 N, P)
7. Climb Speed
   With obstacles ahead, climb (flaps 10°): 70 MIAS (172 I, K, L, M); 60 KIAS (172 N, P)
8. Wing Flaps -- UP after all obstacles are cleared.
9. Landing Gear -- RETRACT

ENROUTE CLIMB

NORMAL CLIMB

1. Airspeed . . . . . 92-103 MIAS (172 I, K, L, M); 80-90 KIAS (172 N, P)

MAXIMUM PERFORMANCE CLIMB

1. Airspeed –
   (172 I, K, L, M) . . . . . 83 MIAS (sea level) to 76 MIAS (10,000 feet)
   (172 N, P) . . . . . 72 KIAS (sea level) to 66 KIAS (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 –
   75-86 MIAS (172 I, K, L, M); 65-75 KIAS (172 N, P)
   Airspeed flaps DOWN –
   63-75 MIAS (172 I, K, L, M); 55-65 KIAS (172 N, P)

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
   75-86 MIAS (172 I, K, L, M); 65-75 KIAS (172 N, P)
   Airspeed -- flaps DOWN
   63-75 MIAS (172 I, K, L, M); 55-65 KIAS (172 N, P)

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 70 MIAS (172 I, K, L, M); 60 KIAS (172 N, P) 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), 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 70 MIAS (172 I, K, L, M); 60 KIAS (172 N, P) 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 75-86 MIAS (172 I, K, L, M); 65-75 KIAS (172 N, P) with flaps up and 63-75 MIAS (172 I, K, L, M); 55-65 KIAS (172 N, P) 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 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 172 I, K, L, M, N, P amphibian required under CAR3.

AIRSPEED CALIBRATION

The Airspeed Calibration Charts from the Float Owner's Manual Supplement or the aircraft Owner's Manual may be generally used.

STALL SPEEDS

CONDITIONS:
Power Off

MOST FORWARD CENTER OF GRAVITY
MODELS 172 M, N, P

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

STALL SPEEDS
FIGURE 5

RUNWAY TAKEOFF DISTANCE
SHORT FIELD
AT 2550 POUNDS

This chart applicable to 172 M, N, P models only.

CONDITIONS:
Flaps 10°
Full Throttle Prior to Brake Release
Paved, Level, Dry Runway
Zero Wind
Speed at 50 Ft: 60 KIAS, 70 MIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Ground Roll Ft	Total Ft To Clear 50 Ft Obstacle	Ground Roll Ft	Total Ft To Clear 50 Ft Obstacle	Ground Roll Ft	Total Ft To Clear 50 Ft Obstacle	Ground Roll Ft	Total Ft To Clear 50 Ft Obstacle	Ground Roll Ft	Total Ft To Clear 50 Ft Obstacle
S.L.	932	1800	1003	1937	1081	2079	1163	2234	1252	2400
1000	1020	1979	1103	2134	1185	2295	1279	2467	1373	2646
2000	1119	2183	1207	2350	1307	2534	1406	2731	1505	2928
3000	1229	2411	1329	2608	1439	2816	1544	3032	1659	3259
4000	1356	2681	1467	2902	1582	3142	1704	3381	1825	3639
5000	1494	2989	1621	3246	1748	3523	1880	3799	2018	4106
6000	1654	3358	1792	3665	1930	3973	2073	4305	2227	4675
7000	1830	3802	1979	4166	2134	4529	2299	4936	2470	5401
8000	2029	4352	2200	4784	2371	5236	2553	5764	---	---

1. Obstacle takeoff technique as described in Section 4.
2. Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
3. Distances are from point where power settings are established if brakes are not held.
4. Decrease distances 10% for each 12 knots headwind. For operation in tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
5. For operation in air colder than this table provides, use the coldest (leftmost) data for takeoff distances.
6. For operation in air warmer than this table provides, use caution.
7. Where distance value has been deleted, climb performance is minimal or calculated takeoff distances are not reliable.

WATER TAKEOFF DISTANCE
SHORT FIELD
AT 2550 POUNDS

This chart applicable to 172 M, N, P models only.

CONDITIONS:
Flaps 10°
Full Throttle
Rippled water
Zero Wind
Speed at 50 Ft: 60 KIAS, 70 MIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Water Run Ft	Total Ft To Clear 50 Ft Obstacle	Water Run Ft	Total Ft To Clear 50 Ft Obstacle	Water Run Ft	Total Ft To Clear 50 Ft Obstacle	Water Run Ft	Total Ft To Clear 50 Ft Obstacle	Water Run Ft	Total Ft To Clear 50 Ft Obstacle
S.L.	1608	2690	1798	2959	2009	3256	2253	3587	2538	3975
1000	1873	3073	2104	3390	2375	3757	2680	4172	3047	4657
2000	2205	3540	2497	3934	2843	4391	3250	4924	3732	5556
3000	2640	4132	3020	4630	3468	5220	4017	5920	4696	6764
4000	3210	4891	3712	5551	4336	6333	5123	7294	6134	8495

1. Takeoff technique as described in Section 4.
2. Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
3. Decrease distances 10% for each 12 knots headwind. For operation in tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
4. For operation in air warmer than this table provides, use extreme caution.
5. For operation on glassy water expect longer takeoff distances.
6. Due to the difficulty of determining altitude effects on water performance and the many variables associated with water conditions and pilot technique, these distances should be used as a rough guide only, particularly as altitude and temperature increase.

CLIMB PERFORMANCE

The Climb Performance of the Cessna Models 172 I, K, L, M, N, P on Wipline 2350 Floats equals or exceeds that required by CAR 3.

RUNWAY LANDING DISTANCE
SHORT FIELD
AT 2550 POUNDS

This chart applicable to 172 M, N, P models only.

CONDITIONS:
Flaps 30°
Power Idle
Paved, Level, Dry Runway
Zero Wind
Speed at 50 Ft: 62 KIAS, 71 MIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Ground Roll Ft	Total Ft To Clear 50 Ft Obstacle	Ground Roll Ft	Total Ft To Clear 50 Ft Obstacle	Ground Roll Ft	Total Ft To Clear 50 Ft Obstacle	Ground Roll Ft	Total Ft To Clear 50 Ft Obstacle	Ground Roll Ft	Total Ft To Clear 50 Ft Obstacle
S.L.	552	1370	572	1399	592	1429	612	1459	632	1489
1000	572	1400	593	1430	614	1461	635	1492	656	1524
2000	593	1431	615	1463	637	1495	659	1528	680	1562
3000	616	1463	638	1497	661	1532	683	1566	706	1602
4000	639	1498	662	1534	686	1570	709	1607	732	1644
5000	663	1535	687	1573	712	1611	736	1649	760	1689
6000	688	1575	714	1614	739	1654	764	1695	789	1736
7000	715	1616	741	1658	767	1700	794	1743	820	1786
8000	743	1660	770	1704	797	1749	824	1794	852	1840

1. Short field technique as described in Section 4.
2. Decrease distances 10% for each 11 knots headwind. For operation in tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation in air colder than this table provides, use the coldest (leftmost) data for landing distances.
4. For operation in air warmer than this table provides, use caution.

WATER LANDING DISTANCE
SHORT FIELD
AT 2550 POUNDS

This chart applicable to 172 M, N, P models only.

CONDITIONS:
Flaps 30°
Power Idle
Rippled water
Zero Wind
Speed at 50 Ft: 62 KIAS, 71 MIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Water Run Ft	Total Ft To Clear 50 Ft Obstacle	Water Run Ft	Total Ft To Clear 50 Ft Obstacle	Water Run Ft	Total Ft To Clear 50 Ft Obstacle	Water Run Ft	Total Ft To Clear 50 Ft Obstacle	Water Run Ft	Total Ft To Clear 50 Ft Obstacle
S.L.	655	1502	679	1536	703	1570	727	1605	751	1641
1000	679	1536	704	1572	729	1608	754	1645	779	1682
2000	704	1572	730	1610	756	1648	782	1687	808	1726
3000	731	1611	758	1651	784	1691	811	1731	838	1773
4000	758	1652	786	1693	814	1736	842	1778	869	1822

1. Short field technique as described in Section 4.
2. Decrease distances 10% for each 11 knots headwind. For operation in tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation in air warmer than this table provides, use caution.
4. For operation on glassy water expect longer landing distances.
5. Due to the difficulty of determining altitude effects on water performance and the many variables associated with water conditions and pilot technique, these distances should be used as a rough guide only, particularly as altitude and temperature increase.

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SECTION 6 - WEIGHT & BALANCE

INTRODUCTION

Weight and balance information contained in the basic Owner's Manual or Pilot's Operating 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 172 I, K, L, M, N, P modified with Penn Yan Aero STC 332GL and 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.

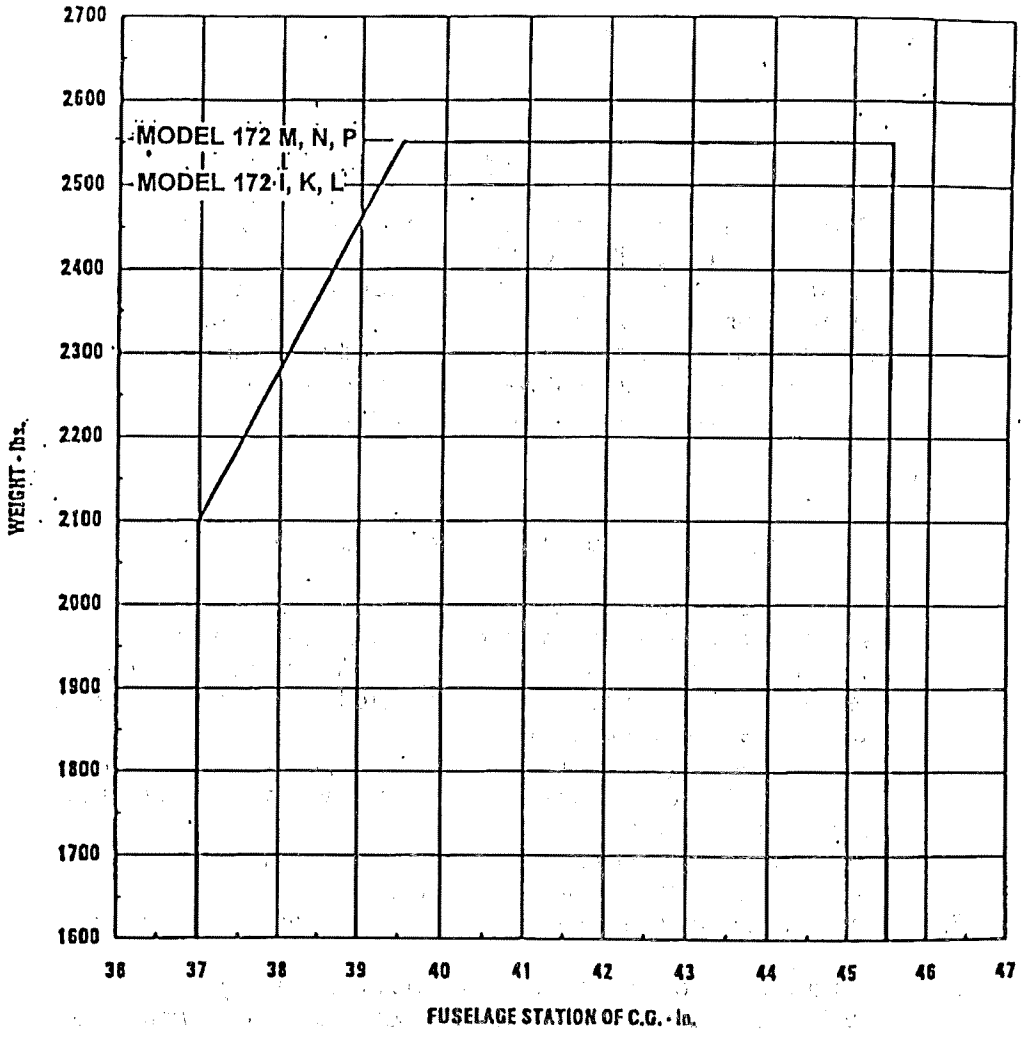
FLOAT BAGGAGE COMPARTMENTS

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

CESSNA 172 I, K, L, M, N, P AMPHIBIAN LOADING ENVELOPE

WIPLINE 2350 FLOATS



CENTER OF GRAVITY LIMITS
FIGURE 6

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 on the Cessna Model 172 I, K, L, M, N, P.

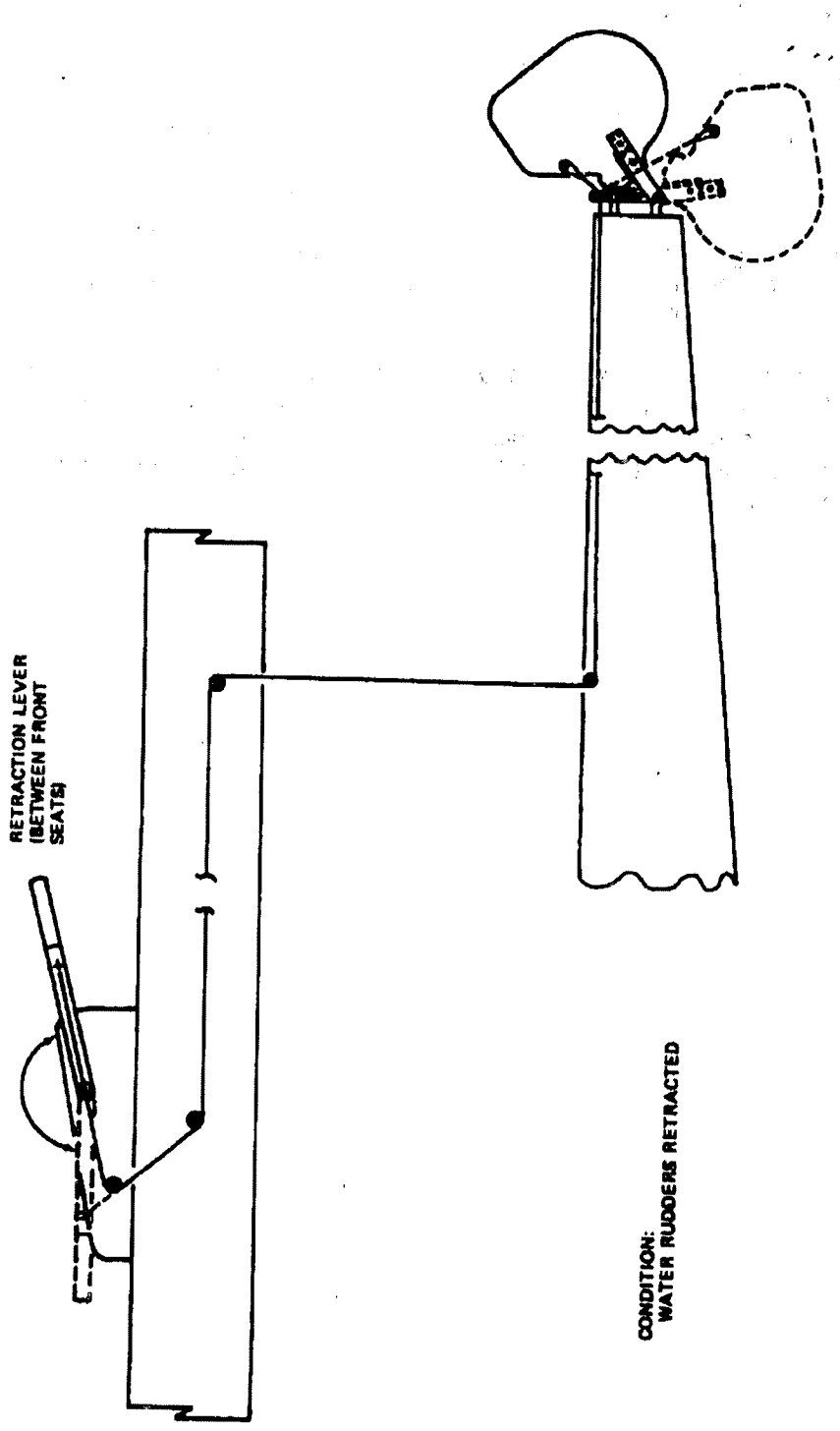
WARNING!!

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 amphibian 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. Optional interconnect springs are added between the rudder and aileron control systems for improved lateral stability.
5. The standard propeller is replaced with a propeller of larger diameter (82 inches).
6. Hoisting provisions are added to the top of the fuselage.
7. 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.
8. Amphibian placards are added.
9. A heavier rudder trim bungee is added.
10. A ventral fin is installed on the bottom of the tailcone for added directional stability.



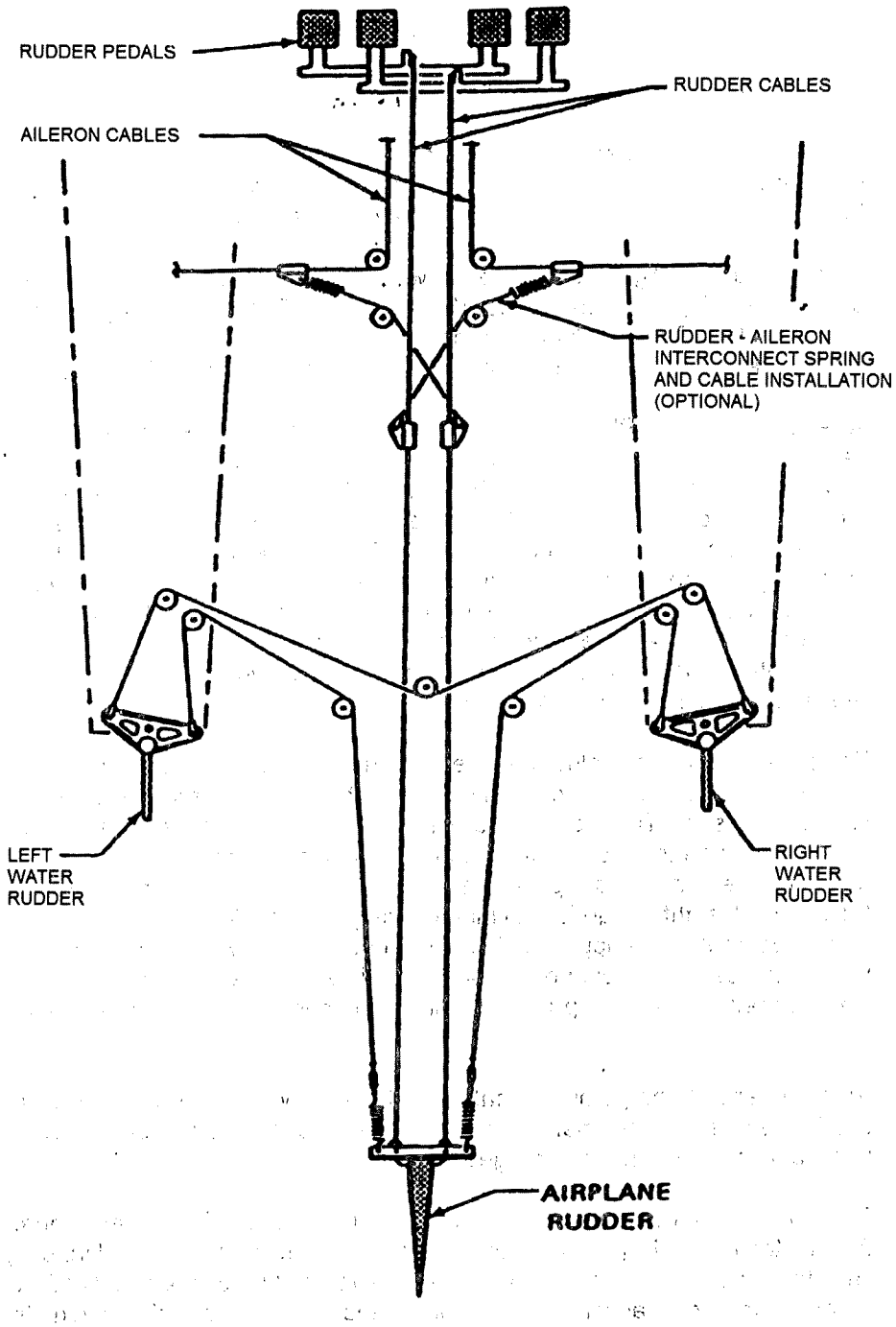
WATER RUDDER RETRACTION SYSTEM
FIGURE 7

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.



WATER RUDDER STEERING SYSTEM
FIGURE 8

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). An 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 gears are in the selected position, there is a noted increase in resistance of hand pump operation.

HYDRAULIC FLUID LEVEL INDICATOR (IF EQUIPPED)

NOTE: The hydraulic fluid level indication light is a non-required auxiliary aid to pilots for monitoring hydraulic fluid levels in between required 25 hour fluid level inspections.

The landing gear pump reservoir may be equipped with an optical fluid sensor which activates an amber light on the face of the instrument panel to alert the pilot of a possible low fluid situation in the hydraulic gear actuating system. The amber light is normally off when the sensor is submerged in hydraulic oil, but will activate when the fluid sensor is exposed to air.

Steep turns, sudden accelerations or decelerations may cause the light to activate intermittently if the level of fluid is close to the level of the optical sensor. If this occurs, the fluid level should be visually checked as soon as practicable and fluid added if necessary.

HYDRAULIC FLUID LEVEL INDICATOR OPERATION	
OFF	Fluid level sufficient for normal operation
INTERMITTENT	Fluid level is low and must be serviced before next flight
ON	Fluid level is very low and may not be sufficient for normal gear operation. Must be serviced before next flight

SECTION 8 - AIRPLANE HANDLING, SERVICE & MAINTENANCE

INTRODUCTION

Section 8 of the basic Pilot's Operating Handbook 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 basic handbook.

APPENDIX A FAA FORM 8810-3

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATIO STATEMENT OF COMPLIANCE WITH AIRWORTHINESS STANDARDS			1. DATE February 15, 2019
AIRCRAFT OR AIRCRAFT COMPONENT IDENTIFICATION			
2. MAKE Textron Aviation, Inc.	3. MODEL NO. 172, 175	4. TYPE *(Aircraft, Engine, Propeller, etc.)* Airplane	5. NAME OF APPLICANT Wipaire, Inc.

LIST OF DATA	
6. IDENTIFICATION	7. TITLE
POHSA00900CH-A-13 Rev: B dated 02/15/2019	FAA Approved Airplane Flight Manual Supplement for Amphibian Operation in the Cessna Models FR172E, F, G, H, J with Wipline Model 2350 Amphibian Floats
POHSA00900CH-A-15 Rev: B dated 02/15/2019	FAA Approved Airplane Flight Manual Supplement for Amphibian Operation in the 180 BHP Cessna Models 172M, N, P and F172M, N, P with Wipline Model 2350 Amphibian Floats
POHSA00900CH-A-16 Rev: B dated 02/15/2019	FAA Approved Airplane Flight Manual Supplement for Amphibian Operation in the 180 BHP Cessna Models 175A, B, C and P172D with Wipline Model 2350 Amphibian Floats
POHSA00900CH-A-PYA-5 Rev: B dated 02/15/2019	FAA Approved Airplane Flight Manual Supplement for Amphibian Operation in the Cessna Model 172I, K, L, M, N, P with Wipline Model 2350 Amphibian Floats Modified with Penn Yan Aero STC SA332GL
----------	----------END----------

8. PURPOSE OF DATA
Added placard, procedures, and description regarding optional hydraulic fluid level advisory system. Minor formatting or typographical corrections.

9. APPLICABLE REQUIREMENTS *(List specific sections)*
Certification basis per TCDS 3A12, A4EU and 3A17.
14 CFR Part 23 Sections 23.1581, 23.1583, 23.1585, 23.1587, 23.1589 effective amendment 6.
CAR 3 Sections: 3.777, 3.778, 3.779, 3.780 effective amendment 12.

10. CERTIFICATION - Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under 14 CFR Part 183, the data listed above and on attached sheets numbered ___N/A attached___ have been examined in accordance with established procedures and found to comply with applicable requirements of the Airworthiness Standards listed.

I (We) Therefore ☐ Recommend approval of these data
☒ Approve these data

11. SIGNATURE(S) OF DESIGNATED ENGINEERING REPRESENTATIVES(S)	12. DESIGNATION NUMBER(S)	13. CLASSIFICATION(S)
Elliot T. Bishop	DERY-834188-CE	FLIGHT ANALYST COMPANY

FAA Form 8110-3 (03/10) SUPERSEDES PREVIOUS EDITION