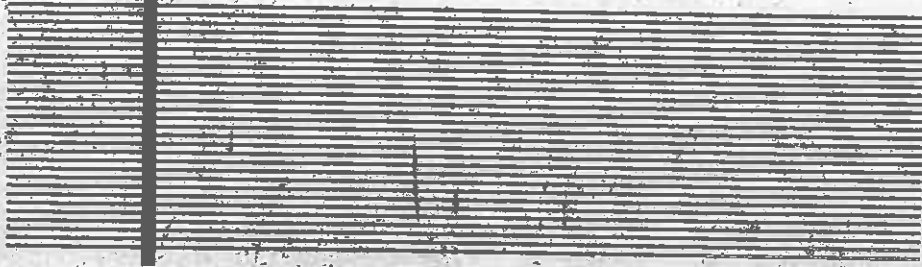


1969




Cessna

SKYWAGON
185

FLOATPLANE
AMPHIBIAN
AND
SKIPLANE

OWNER'S MANUAL SUPPLEMENT



D711-13-CES-150-3/69

PERFORMANCE - SPECIFICATIONS



FLOATPLANE	FLOATPLANE	AMPHIBIAN	SKIPLANE
(Edo Model 249A-2870 Floats)	(Edo Model 528-2950 Floats)	(Edo Model 597-2790 Floats)	(Fluidyne Model C-3200 and CT-3600 Skis)

	3190 lbs	3320 lbs	3265 lbs*	3350 lbs
GROSS WEIGHT				
SPEED, BEST POWER MIXTURE				
Top Speed at Sea Level	163 mph	162 mph	156 mph	157 mph
Cruise, 75% Power at 7500 ft	156 mph	155 mph	149 mph	150 mph
RANGE, NORMAL LEAN MIXTURE:				
Cruise, 75% Power at 7500 ft	605 mi	600 mi	575 mi	580 mi
82 Gallons, No Reserve	3.9 hrs	3.9 hrs	3.9 hrs	3.9 hrs
Cruise, 75% Power at 7500 ft	155 mph	154 mph	148 mph	149 mph
81 Gallons, No Reserve	790 mi	785 mi	753 mi	760 mi
Optimum Range at 10,000 ft	5.1 hrs	5.1 hrs	5.1 hrs	5.1 hrs
82 Gallons, No Reserve	155 mph	154 mph	148 mph	149 mph
Optimum Range at 10,000 ft	755 mi	745 mi	695 mi	705 mi
81 Gallons, No Reserve	6.9 hrs	6.9 hrs	6.9 hrs	6.9 hrs
Optimum Range at 10,000 ft	110 mph	108 mph	101 mph	126 mph
81 Gallons, No Reserve	990 mi	970 mi	910 mi	930 mi
RATE OF CLIMB AT SEA LEVEL	9.0 hrs	9.0 hrs	9.0 hrs	7.4 hrs
SERVICE CEILING	110 mph	108 mph	101 mph	126 mph
TAKE-OFF:	1040 fpm	960 fpm	970 fpm	970 fpm
Ground Run or Water Run	17,350 ft	16,400 ft	15,300 ft	15,300 ft
Total Distance Over 50-ft Obstacle	970 ft	1105 ft	On Land	On Water
LANDING:	1550 ft	1740 ft	870 ft	885 ft*
Ground Roll or Water Run	640 ft	780 ft*	1275 ft	1430 ft*
Total Distance Over 50-ft Obstacle	1530 ft	1530 ft	1240 ft*	1480 ft*
EMPTY WEIGHT (Approximate)	1865 lbs	1890 lbs	2135 lbs	1725 lbs
BAGGAGE (Cabin Area)	350 lbs	350 lbs	350 lbs	350 lbs
AFT BAGGAGE	50 lbs	50 lbs	50 lbs	50 lbs
WING LOADING: Pounds/Sq Foot	18.3	19.1	18.8	19.3
POWER LOADING: Pounds/HP	10.6	11.1	10.9	11.2
FUEL CAPACITY: Total	65 gal.	65 gal.	65 gal.	65 gal.
Standard Tanks	84 gal.	84 gal.	84 gal.	84 gal.
Optional Long Range Tanks	12 qts.	12 qts.	12 qts.	12 qts.
OIL CAPACITY: Total	86 in.	86 in.	86 in.	86 in.
Propeller: Constant Speed (Dia)	IO-520-D	IO-520-D	IO-520-D	IO-520-D
ENGINE:				
Continental Fuel Injection Engine	300 rated BHP @ 2850 RPM (5-Minute Take-Off Rating)	285 rated BHP @ 2700 RPM (Maximum Continuous Rating)		
WING SPAN	36 ft., 2 in.	36 ft., 2 in.	36 ft., 2 in.	36 ft., 2 in.
LENGTH	27 ft.	27 ft.	27 ft., 6 in.	25 ft., 9 in.
HEIGHT	12 ft., 2 in.	12 ft., 2 in.	12 ft., 8 in.	7 ft., 9 in.

*A gross weight of 3265 pounds is allowed for the amphibian for take-off on land only. For take-off on water or landing on land or water, the maximum allowable gross weight is 3100 pounds.

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FLOATPLANE *Section 1*

INTRODUCTION

This supplement, written especially for operators of the Cessna Skywagon 185 floatplane, amphibian and skiplane, provides information not found in the Owner's Manual. It contains procedures and data required for safe and efficient operation of airplanes equipped with either standard floats, amphibious floats, retractable wheel type skis or fixed type wheel replacement skis.

Information contained in the Owner's Manual for the landplane, which is the same as that for the floatplane, amphibian and skiplane, is not repeated in this supplement.

The information provided herein is applicable to airplanes equipped with one of the following:

- (1) Floatplane - Edo Model 249A-2870 Floats.
Floatplane - Edo Model 628-2960 Floats. *
- (2) Amphibian - Edo Model 597-2790 Amphibious Floats.
- (3) Skiplane (Retractable Wheel Type Skis) - FluiDyne Model C-3200 Main Wheel Skis and FluiDyne Model CT-3600 Tail Wheel Ski.
Skiplane (Wheel Replacement Skis) - FluiDyne Model A3500A Main Wheel Skis and FluiDyne Model CT-3600 Tail Wheel Ski.

OPERATING CHECK LIST

BEFORE ENTERING THE FLOATPLANE.

- (1) Inspect the floats and fairings for dents, cracks, scratches, etc.
- (2) Remove rubber balls (which serve as a stopper on the standpipe in each float compartment) and pump out any accumulation of water. Reinstall rubber balls with enough pressure for a snug fit.

BEFORE STARTING ENGINE.

- (1) Operate and visually check the water rudders for proper retraction and rudder action.
- (2) Water Rudders -- Down for taxiing.

TAKE-OFF.

- (1) Water Rudders -- Up.
- (2) Set wing flaps 20° (second notch).
- (3) Hold the control wheel full back and advance the throttle slowly.
- (4) Place the airplane in a planing attitude (on the step) by slowly moving the control wheel forward when the bow wave moves aft of the wing strut position.
- (5) As the airplane accelerates, apply light control wheel back pressure and allow the airplane to fly off smoothly.

NOTE

To reduce take-off water run, the technique of raising one float out of the water may be used. This procedure is described on page 1-5 under paragraph "Normal Take-Off."

(6) Climb out at 75-85 MPH. With obstacles ahead, climb at 65 MPH.

CLIMB.

The maximum rate of climb is obtained with flaps retracted at full throttle and 97 MPH (Edo Model 249A-2870 Floats), 98 MPH (Edo Model 628-2960 Floats). Refer to the Take-Off and Maximum Rate-Of-Climb Data charts, figure 1-6 (Edo Model 249A-2870 Floats), figure 1-7 (Edo Model 628-2960 Floats).

BEFORE LANDING.

- (1) Water Rudders -- Up.
- (2) Maintain 70-80 MPH with wing flaps extended.

LANDING.

- (1) Landing technique is conventional for all wing flap settings.

AFTER LANDING.

- (1) Water Rudders -- Down.

DESCRIPTION AND OPERATING DETAILS

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 water rudders by cables and springs, is located on the cabin floor tunnel.
- (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) The standard propeller is replaced with a propeller of larger diameter (86 inches).
- (6) A reinforced engine mount replaces the standard engine mount.
- (7) A drain line is added to the front of the induction air manifold.
- (8) Hoisting provisions are added to the top of the fuselage.
- (9) Floatplane placards are added.
- (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. Inboard fuel fillers are added when long range fuel tanks are installed.

NOTE

A reduction of approximately five gallons of usable fuel in each tank will result when inboard fillers are used to fill the long range fuel tanks.

WATER RUDDER STEERING SYSTEM.

Retractable water rudders, mounted at the aft end of each float, are connected by a system of cables and springs to the airplane rudder pedals. When the water rudders are extended, normal pedal operation moves the water rudders to provide steering control for taxiing.

A water rudder retraction handle, located on the cabin floor tunnel, is

used to manually raise and lower the water rudders. During take-off, landing, and in flight, the retraction handle is normally full aft in the "RETRACT" position. With the handle in this position, the water rudders are up. When the handle is moved full forward to the "EXTEND" position, the water rudders are down.

The retraction handle incorporates a spring-loaded catch device located near the cross-bar at the end of the handle. The catch is designed to latch over a locking pin when the retraction handle is pulled aft to "RETRACT," thereby securing the handle in the retracted position.

Pulling the exposed end of the retraction handle catch aft, while pushing downward slightly on the retraction handle with the right hand, will release the handle from the retraction locking pin. The handle then can be rotated full forward to extend the water rudders for taxiing.

TAXIING.

Taxi with water rudders down. It is best to limit the engine speed to 1000 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.

The rudder trim control wheel may be used to reduce rudder pedal forces while taxiing in crosswinds.

For minimum taxi speed in close quarters, use idle RPM 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 in close quarters. In addition to the normal flight controls, the wing flaps, cabin doors, and water rudders will aid in "sailing."

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

TAKE-OFF.

NORMAL TAKE-OFF.

The use of 20° wing flaps (second notch) throughout the take-off run is recommended. Take-off distances are given on figure 1-6 (Edo Model 249A-2870 Floats), figure 1-7 (Edo Model 628-2960 Floats).

Apply full throttle smoothly and hold the control wheel full back. Watch the point where the bow wave leaves the float and move the control wheel forward slowly as this point moves aft of the wing strut. Slow control movement and light control pressures produce the best results. Attempts to force the airplane into the planing attitude will generally result in loss of speed and delay in getting on the step. The airplane will assume a planing attitude which permits acceleration to take-off speed (50 to 60 MPH) at which time the airplane will fly off smoothly.

If lift off is difficult due to high lake elevation or glassy water, the following procedure is recommended: With the airplane in the planing position, 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 take-off. 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 airplane accelerates to take-off speed almost instantly.

If porpoising is encountered while on the step, apply additional control wheel back pressure to correct the excessively nose-low attitude.

CROSSWIND TAKE-OFF.

Start run with flaps up and water rudders extended for better directional control. Flaps are extended to 20° and the water rudders are retracted when the airplane is on the step; the remainder of the take-off is normal.

CLIMB.

Normal climbs are conducted at 100-110 MPH with wing flaps retracted and cowl flaps opened as required for engine cooling. If optimum climb performance with wing flaps retracted is desired, climb at 97 MPH (Edo Model 249A-2870 floats) or 98 MPH (Edo Model 628-2960 floats) at sea level, with full throttle. Reduce this climb speed about 1 MPH for each 1000 feet above sea level.

To climb steeply over an obstacle with wing flaps retracted, use an obstacle clearance speed of 70 MPH.

NOTE

Steep climbs at these low speeds should be of short duration to improve engine cooling.

To clear an obstacle after take-off with 20° wing flaps, use an obstacle clearance speed of 65 MPH. 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.

CRUISE.

Observe the same engine speed limits as for the landplane. Speed, range and endurance are shown on the Cruise Performance charts, figure 1-8.

NOTE

Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill the long range fuel tanks.

LANDING.

Power-off landings may be made with any wing flap setting. However, with glassy water it is recommended that a power approach and landing be made with 0° - 20° wing flaps to maintain a low rate of descent.

OPERATING LIMITATIONS

MAXIMUM GROSS WEIGHT.

Floatplane with Edo Model 249A-2870 Floats 3190 lbs
 Floatplane with Edo Model 628-2960 Floats 3320 lbs

WEIGHT AND BALANCE.

The following information will enable you to operate your floatplane within the prescribed weight and center of gravity limitations.

In figuring your loading problems, be certain that you use the Licensed Empty Weight of your particular floatplane as shown in its Weight and Balance Data sheet. This sheet, plus an Equipment List, is included with each floatplane as it leaves the factory. When floats have been installed by anyone other than the factory, the Repair and Alteration Form FAA-337 must be consulted for proper weight and balance information.

The loading instructions given in the Owner's Manual for the landplane should be used as a guide when figuring floatplane weight and balance problems. In conjunction with these instructions, use the Seating-Cargo Arrangements Diagram and Cabin Stations Diagram in the Owner's Manual and the Sample Problem, Loading Graph and Center of Gravity Moment Envelope in this supplement.

SAMPLE AIRPLANE		YOUR AIRPLANE	
		Weight (lbs.)	Moment (lb.-ins./1000)
SAMPLE			
LOADING PROBLEM			
FLOATPLANE			
1. Licensed Empty Weight (Sample Airplane)	1984	78.7	
2. Oil (12 qts. - Full oil may be assumed for all flights.)	22	-0.4	-0.4
3. Fuel (Standard - 62 gal. @ 6 lbs./gallon)	372	17.9	
Fuel (Long Range - 81 gal. @ 6 lbs./gallon)	340	12.2	
4. Pilot and Copilot			
5. Center Passengers (6-place version)			
Aft Passengers IV (6-place version)			
Rear Passengers V (4-place version)			
6. Baggage V *			
Cargo "A" *			
Cargo "B" *	500	35.0	
Cargo "C" *	102	10.1	
Cargo "D" *			
Aft Baggage *			
7. TOTAL WEIGHT AND MOMENT	3320	153.5	
8. Locate this point (3320 at 153.5) on the floatplane center of gravity moment envelope in this section, and since this point falls within the envelope, the loading is acceptable.			

*Refer to the seating and cargo arrangements diagram in the Owner's Manual for maximum allowable weights in these areas.

Figure 1-1.

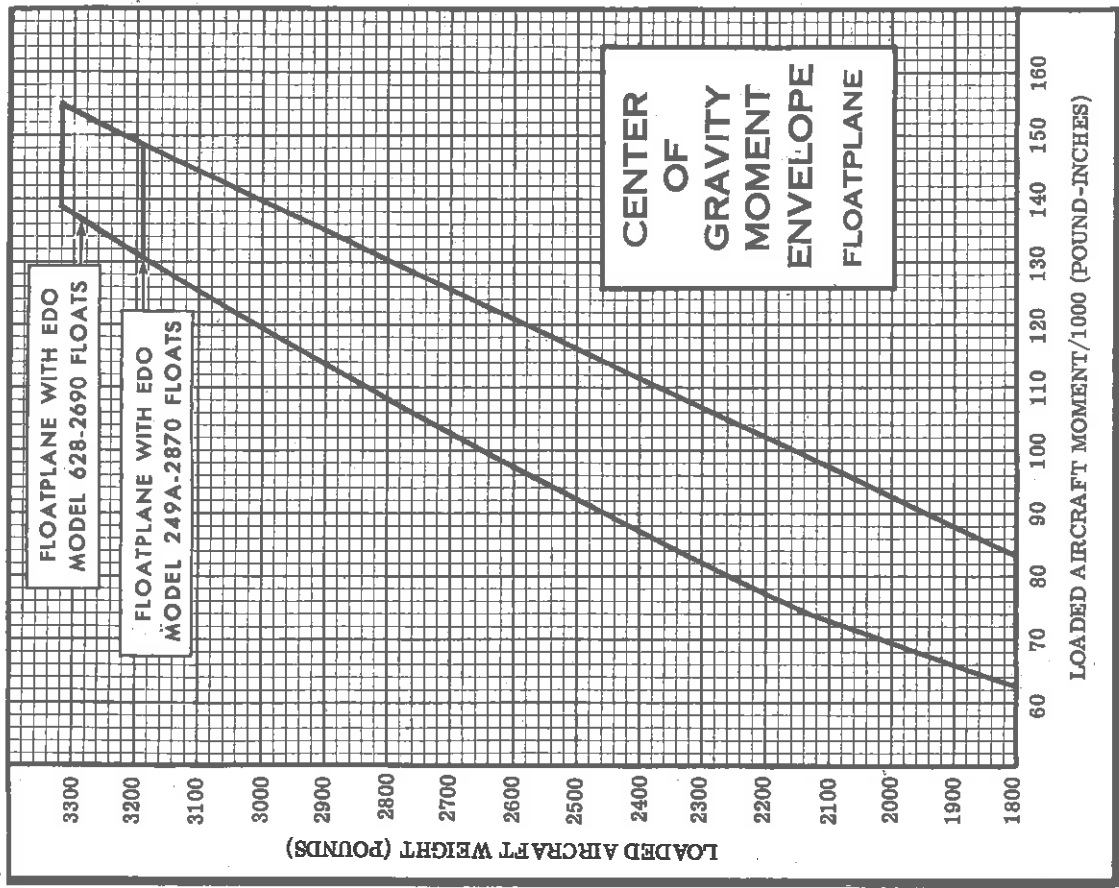


Figure 1-3.

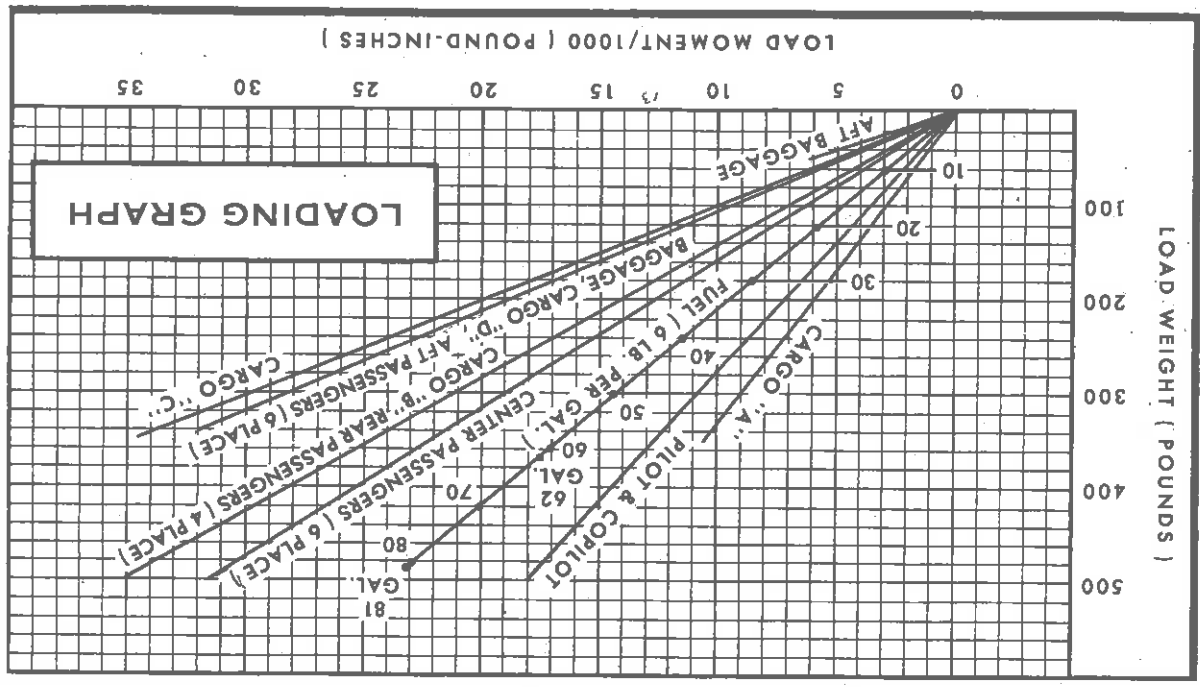


Figure 1-2.

OPERATIONAL DATA

In the Cruise Performance charts, figure 1-8, range and endurance are given for normal lean mixture, and are based on an aircraft equipped with Edo Model 628-2960 Floats at zero wind, a gross weight of 3320 pounds and standard conditions. (There are no significant differences in performance for aircraft having Edo Model 249A-2870 Floats at 3190 pounds gross weight). Range and endurance figures are supplied for both the "ON-OFF" fuel system with 62 and 81 gallons, and the "SELECTOR VALVE" system with 59 and 78 gallons of fuel for cruise.

Allowances for fuel reserve, headwinds, take-off and climb, and variations in mixture leaning technique should be made and are in addition to those on the charts. Other indeterminate variables such as fuel metering characteristics, engine and propeller conditions, and turbulence of the atmosphere may account for variations of 10% or more in maximum range.

NOTE

Cargo Pack Installation

When a cargo pack is installed on the floatplane, no change in take-off, climb, or landing performance will be incurred. For cruise performance, subtract approximately five miles per hour from the cruise performance figures shown.

AIRSPEED CORRECTION TABLE		FLOATPLANE					
FLAPS 0°	IAS-MPH	60	80	100	120	140	160
	CAS - MPH	66	81	99	117	136	156
*FLAPS 20°	IAS-MPH	50	60	70	80	90	100
	CAS - MPH	60	65	71	80	90	99
*FLAPS 40°	IAS-MPH	50	60	70	80	90	100
	CAS - MPH	61	66	73	82	91	101
* MAXIMUM FLAP SPEED 110 MPH, CAS							
							110 113




Figure 1-4.

STALLING SPEEDS

POWER OFF _____ MPH - CAS
FLOATPLANE WITH EDO MODEL
628-2960 FLOATS _____

Gross Weight
3320 LBS

ANGLE OF BANK

			
CONFIGURATION	0°	30°	60°
FLAPS UP	65	70	93
FLAPS 20°	58	62	91
FLAPS 40°	57	61	80

NOTE: WHEN THE AIRCRAFT IS EQUIPPED WITH EDO MODEL 249A-2870 FLOATS, STALL SPEEDS ARE APPROXIMATELY 1 MPH LESS THAN THE FIGURES SHOWN ABOVE BECAUSE OF REDUCED GROSS WEIGHT.

Figure 1-5.

FLATPLANE MAXIMUM RATE-OF-CLIMB DATA

NOTE: FULL THROTTLE, 2700 RPM, MIXTURE AT RECOMMENDED LEANING SCHEDULE, FLAPS UP, FUEL USED INCLUDES WARM-UP AND TAKE-OFF ALLOWANCE.

GROSS WEIGHT POUNDS	AT SEA LEVEL & 59°F			AT 5000 FEET & 41°F			AT 10,000 FEET & 23°F			AT 15,000 FEET & 5°F			AT 20,000 FEET & -12°F		
	IAS MPH	RATE OF CLIMB FT/MIN USED	GAL. OF FUEL USED	IAS MPH	RATE OF CLIMB FT/MIN USED	GAL. OF FUEL USED	IAS MPH	RATE OF CLIMB FT/MIN USED	GAL. OF FUEL USED	IAS MPH	RATE OF CLIMB FT/MIN USED	GAL. OF FUEL USED	IAS MPH	RATE OF CLIMB FT/MIN USED	GAL. OF FUEL USED
3320	98	960	2.0	94	700	4.1	90	430	6.9	85	170	11.8	80	---	---
2800	94	1290	2.0	90	990	3.6	86	690	5.5	82	400	8.1	77	100	13.4
2400	92	1610	2.0	87	1270	3.2	83	940	4.6	79	610	6.4	74	280	9.1

Figure 1-7.

* FLOATPLANE WITH EDO MODEL 628-2960 FLOATS

FLATPLANE TAKE-OFF DATA

TAKE-OFF DISTANCE WITH 20° FLAPS FROM SMOOTH WATER

NOTE: INCREASE DISTANCES 10% FOR EACH 25°F ABOVE STANDARD TEMPERATURE FOR PARTICULAR ALTITUDE.

GROSS WEIGHT POUNDS	AT SEA LEVEL & 59°F			AT 5000 FT & 41°F			AT 10,000 FT & 23°F			AT 15,000 FT & 5°F			AT 20,000 FT & -12°F		
	IAS @ 50 FT	WIND KNOTS	HEAD	IAS @ 50 FT	WIND KNOTS	HEAD	IAS @ 50 FT	WIND KNOTS	HEAD	IAS @ 50 FT	WIND KNOTS	HEAD	IAS @ 50 FT	WIND KNOTS	HEAD
3320	66	0	1105	66	0	1105	66	0	1105	66	0	1105	66	0	1105
2800	61	0	1100	61	0	1100	61	0	1100	61	0	1100	61	0	1100
2400	56	0	1100	56	0	1100	56	0	1100	56	0	1100	56	0	1100

N170208

* FLOATPLANE WITH EDO MODEL 249A-2870 FLOATS

FLATPLANE MAXIMUM RATE-OF-CLIMB DATA

NOTE: FULL THROTTLE, 2700 RPM, MIXTURE AT RECOMMENDED LEANING SCHEDULE, FLAPS UP, FUEL USED INCLUDES WARM-UP AND TAKE-OFF ALLOWANCE.

GROSS WEIGHT POUNDS	AT SEA LEVEL & 59°F			AT 5000 FEET & 41°F			AT 10,000 FEET & 23°F			AT 15,000 FEET & 5°F			AT 20,000 FEET & -12°F		
	IAS MPH	RATE OF CLIMB FT/MIN USED	GAL. OF FUEL USED	IAS MPH	RATE OF CLIMB FT/MIN USED	GAL. OF FUEL USED	IAS MPH	RATE OF CLIMB FT/MIN USED	GAL. OF FUEL USED	IAS MPH	RATE OF CLIMB FT/MIN USED	GAL. OF FUEL USED	IAS MPH	RATE OF CLIMB FT/MIN USED	GAL. OF FUEL USED
3190	97	1040	2.0	93	770	4.0	89	500	6.5	84	230	10.5	80	---	---
2800	94	1290	2.0	90	990	3.6	86	690	5.5	82	400	8.1	77	100	13.4
2400	92	1610	2.0	87	1270	3.2	83	940	4.6	79	610	6.4	74	280	9.1

Figure 1-6.

FLATPLANE TAKE-OFF DATA

TAKE-OFF DISTANCE WITH 20° FLAPS FROM SMOOTH WATER

NOTE: INCREASE DISTANCES 10% FOR EACH 25°F ABOVE STANDARD TEMPERATURE FOR PARTICULAR ALTITUDE.

GROSS WEIGHT POUNDS	AT SEA LEVEL & 59°F			AT 5000 FT & 41°F			AT 10,000 FT & 23°F			AT 15,000 FT & 5°F			AT 20,000 FT & -12°F		
	IAS @ 50 FT	WIND KNOTS	HEAD	IAS @ 50 FT	WIND KNOTS	HEAD	IAS @ 50 FT	WIND KNOTS	HEAD	IAS @ 50 FT	WIND KNOTS	HEAD	IAS @ 50 FT	WIND KNOTS	HEAD
3190	65	0	970	65	0	970	65	0	970	65	0	970	65	0	970
2800	61	0	1100	61	0	1100	61	0	1100	61	0	1100	61	0	1100
2400	56	0	1100	56	0	1100	56	0	1100	56	0	1100	56	0	1100

CRUISE PERFORMANCE

FLOATPLANE

NORMAL LEAN MIXTURE

Standard Conditions \rightarrow Zero Wind \rightarrow Gross Weight- 3320 Pounds
2500 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.				"SELECTOR VALVE" FUEL SYS.			
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	25	79	151	16.5	3.8	565	4.9	740	3.6	540	4.7	715
	24	75	147	16.6	4.0	585	5.2	765	3.8	555	5.0	735
	23	70	144	14.7	4.2	605	5.5	790	4.0	575	5.3	760
	22	66	140	13.9	4.5	625	5.8	820	4.2	595	5.6	790
2500	25	76	149	16.0	3.9	575	5.1	755	3.7	550	4.9	725
	24	72	146	15.1	4.1	595	5.3	780	3.9	565	5.2	750
	23	68	142	14.3	4.3	615	5.7	805	4.1	585	5.4	775
	22	64	139	13.5	4.6	635	6.0	830	4.4	605	5.8	800
2400	25	71	145	14.9	4.2	605	5.4	785	4.0	570	5.2	755
	24	68	142	14.2	4.4	620	5.7	810	4.2	590	5.5	780
	23	64	138	13.4	4.6	640	6.0	835	4.4	605	5.8	805
	22	60	134	12.7	4.9	655	6.4	855	4.7	625	6.2	825
2300	25	67	141	14.1	4.4	620	5.8	815	4.2	580	5.6	785
	24	63	138	13.3	4.7	640	6.1	835	4.4	610	5.9	805
	23	60	134	12.6	4.9	655	6.4	860	4.7	625	6.2	825
	22	56	129	11.9	5.2	675	6.8	880	5.0	640	6.5	845
2200	25	62	136	13.0	4.8	645	6.2	845	4.5	615	6.0	815
	24	59	132	12.4	5.0	665	6.5	865	4.8	630	6.3	835
	23	55	128	11.7	5.3	675	6.9	885	5.0	645	6.6	855
	22	52	123	11.1	5.6	690	7.3	900	5.3	655	7.0	865
	21	49	118	10.5	5.9	700	7.7	915	5.6	665	7.4	880
	20	45	113	9.9	6.3	710	8.2	930	6.0	675	7.9	895
	19	42	107	9.2	6.7	720	8.8	940	6.4	685	8.5	905
	18	38	100	8.6	7.2	725	9.4	945	6.9	690	9.1	910

NOTE: Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill long range fuel tanks.

Figure 1-8 (Sheet 1 of 5).

CRUISE PERFORMANCE

FLOATPLANE

NORMAL LEAN MIXTURE

Standard Conditions \rightarrow Zero Wind \rightarrow Gross Weight- 3320 Pounds
5000 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.				"SELECTOR VALVE" FUEL SYS.			
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	25	81	156	17.0	3.7	570	4.8	745	3.5	540	4.6	715
	24	77	153	16.1	3.8	585	5.0	765	3.7	560	4.8	740
	23	73	149	15.2	4.1	605	5.3	795	3.9	575	5.1	765
	22	69	146	14.4	4.3	625	5.6	820	4.1	595	5.4	790
2500	25	79	154	16.5	3.8	580	4.9	760	3.6	550	4.7	730
	24	75	151	15.6	4.0	600	5.2	780	3.8	570	5.0	750
	23	71	147	14.8	4.2	615	5.5	805	4.0	590	5.3	775
	22	67	144	14.0	4.4	635	5.8	835	4.2	605	5.6	800
2400	25	73	149	15.3	4.0	605	5.3	790	3.9	575	5.1	760
	24	70	146	14.6	4.3	625	5.6	815	4.0	595	5.3	785
	23	66	143	13.8	4.5	640	5.9	835	4.3	610	5.6	805
	22	62	139	13.1	4.7	660	6.2	860	4.5	625	6.0	830
2300	25	69	146	14.4	4.3	625	5.8	820	4.1	595	5.4	790
	24	65	142	13.7	4.5	645	6.1	840	4.3	610	5.7	810
	23	62	139	13.0	4.8	660	6.4	860	4.5	630	6.0	830
	22	58	134	12.3	5.0	675	6.6	885	4.8	645	6.3	850
2200	25	64	140	13.4	4.6	650	6.1	850	4.4	620	5.8	820
	24	60	137	12.7	4.9	665	6.4	870	4.6	635	6.1	840
	23	57	133	12.1	5.1	680	6.7	890	4.9	645	6.4	855
	22	54	128	11.5	5.4	690	7.1	905	5.1	660	6.8	870
	21	51	123	10.9	5.7	705	7.5	920	5.4	670	7.2	885
	20	47	118	10.2	6.1	715	7.9	930	5.8	680	7.6	895
	19	44	112	9.6	6.5	725	8.4	945	6.1	690	8.1	910
	18	40	105	9.0	6.9	725	9.0	950	6.6	690	8.7	915

NOTE: Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill long range fuel tanks.

Figure 1-8 (Sheet 2 of 5).

CRUISE PERFORMANCE

FLOATPLANE

NORMAL LEAN MIXTURE

Standard Conditions \searrow Zero Wind \searrow Gross Weight- 3320 Pounds
7500 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.				"SELECTOR VALVE" FUEL SYS.			
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	23	75	156	15.8	3.9	610	5.1	795	3.7	580	4.9	765
	22	71	151	14.9	4.2	630	5.4	820	4.0	600	5.2	790
	21	67	147	14.1	4.4	650	5.8	845	4.2	615	5.5	815
	20	63	142	13.2	4.7	670	6.1	870	4.5	635	5.9	840
2500	23	73	153	15.3	4.1	620	5.3	810	3.9	590	5.1	780
	22	69	149	14.5	4.3	640	5.6	835	4.1	610	5.4	805
	21	65	145	13.7	4.5	655	5.9	860	4.3	625	5.7	825
	20	61	140	12.8	4.8	675	6.3	885	4.6	645	6.1	850
2400	23	68	148	14.3	4.3	645	5.7	840	4.1	615	5.5	810
	22	64	144	13.5	4.6	660	6.0	860	4.4	630	5.8	830
	21	61	140	12.8	4.9	675	6.3	885	4.6	645	6.1	850
	20	57	134	12.1	5.1	690	6.7	905	4.9	660	6.5	870
2300	23	64	144	13.4	4.6	660	6.0	865	4.4	630	5.8	835
	22	60	139	12.7	4.9	680	6.4	885	4.6	645	6.1	855
	21	57	134	12.0	5.2	690	6.7	905	4.9	660	6.5	870
	20	53	129	11.4	5.5	705	7.1	920	5.2	670	6.9	885
2200	23	59	137	12.5	5.0	685	6.5	890	4.7	650	6.3	860
	22	56	133	11.9	5.2	695	6.8	910	5.0	660	6.6	875
	21	53	128	11.2	5.5	705	7.2	925	5.2	675	6.9	890
	20	49	123	10.6	5.8	715	7.6	935	5.6	680	7.3	900
	19	46	117	10.0	6.2	725	8.1	950	5.9	690	7.8	915
	18	42	110	9.3	6.6	730	8.7	955	6.3	695	8.4	920

NOTE: Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill long range fuel tanks.

Figure 1-8 (Sheet 3 of 5).

CRUISE PERFORMANCE

FLOATPLANE

NORMAL LEAN MIXTURE

Standard Conditions \searrow Zero Wind \searrow Gross Weight- 3320 Pounds
10,000 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.				"SELECTOR VALVE" FUEL SYS.			
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	21	70	153	14.6	4.3	650	5.6	850	4.0	620	5.4	815
	20	66	148	13.7	4.5	670	5.9	875	4.3	635	5.7	840
	19	61	142	12.9	4.8	685	6.3	895	4.6	655	6.1	865
	18	57	136	12.0	5.2	705	6.7	920	4.9	670	6.5	885
2500	21	67	150	14.1	4.4	660	5.7	860	4.2	625	5.5	830
	20	63	145	13.3	4.7	680	6.1	885	4.4	645	5.9	855
	19	59	140	12.5	5.0	695	6.5	905	4.7	660	6.2	875
	18	55	134	11.7	5.3	710	6.9	925	5.0	675	6.6	890
2400	21	63	145	13.2	4.7	680	6.1	885	4.5	645	5.9	855
	20	59	140	12.5	5.0	695	6.5	905	4.7	660	6.2	875
	19	55	134	11.7	5.3	710	6.9	925	5.0	675	6.6	890
	18	51	128	11.0	5.6	720	7.4	940	5.4	685	7.1	905
2300	21	59	139	12.4	5.0	695	6.5	910	4.7	660	6.3	875
	20	55	134	11.8	5.3	710	6.9	925	5.0	675	6.6	890
	19	52	128	11.1	5.6	720	7.3	940	5.3	685	7.1	905
	18	48	122	10.4	6.0	730	7.8	955	5.7	695	7.5	920
2200	21	55	133	11.6	5.3	710	7.0	930	5.1	675	6.7	895
	20	51	128	11.0	5.6	720	7.4	940	5.4	685	7.1	905
	19	48	122	10.4	6.0	730	7.8	955	5.7	695	7.5	920
	18	44	115	9.7	6.4	735	8.3	960	6.1	700	8.0	925
	17	41	108	9.0	6.9	740	9.0	965	6.5	705	8.6	930

NOTE: Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill long range fuel tanks.

Figure 1-8 (Sheet 4 of 5).

CRUISE PERFORMANCE

FLOATPLANE

NORMAL LEAN MIXTURE

Standard Conditions \nearrow Zero Wind \nearrow Gross Weight- 3320 Pounds
15,000 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.						"SELECTOR VALVE" FUEL SYS.					
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	17	57	141	12.1	5.1	720	6.7	945	4.9	685	6.4	910				
	16	53	133	11.2	5.5	735	7.2	960	5.3	700	6.9	925				
	15	48	124	10.4	6.0	745	7.8	970	5.7	710	7.5	935				
	14	43	114	9.5	6.6	750	8.6	980	6.2	715	8.3	940				
2500	17	55	138	11.7	5.3	730	6.9	950	5.0	695	6.6	915				
	16	51	130	10.9	5.7	740	7.4	965	5.4	705	7.2	930				
	15	46	121	10.1	6.2	745	8.1	975	5.9	710	7.8	940				
	14	42	111	9.2	6.7	750	8.8	980	6.4	715	8.5	945				
2400	17	52	132	11.1	5.6	740	7.3	965	5.3	700	7.0	930				
	16	48	124	10.3	6.0	745	7.9	970	5.7	710	7.6	935				
	15	43	115	9.5	6.5	750	8.5	980	6.2	715	8.2	940				
	14	39	105	8.6	7.2	755	9.4	985	6.8	720	9.0	950				
2300	17	48	125	10.4	5.9	745	7.8	970	5.7	705	7.5	935				
	16	44	117	9.7	6.4	750	8.4	975	6.1	710	8.1	940				
	15	40	108	8.9	6.9	755	9.1	985	6.6	715	8.7	945				
	14	36	100	8.2	7.6	760	9.9	990	7.2	720	9.6	955				
2200	17	45	118	9.8	6.3	745	8.3	975	6.0	710	8.0	940				
	16	41	110	9.1	6.8	750	8.9	980	6.5	715	8.6	945				
	15	37	102	8.4	7.4	755	9.7	990	7.0	720	9.3	950				
	14	33	94	7.7	8.1	765	10.6	1000	7.7	725	10.2	960				

NOTE: Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill long range fuel tanks.

Figure 1-8 (Sheet 5 of 5).

FLOATPLANE LANDING DISTANCE

LANDING DISTANCE WITH 40° FLAPS AND POWER OFF

GROSS WEIGHT POUNDS	APPROACH IAS MPH	@ SEA LEVEL & 59° F		@ 2500 FEET & 50° F		@ 5000 FEET & 41° F		@ 7500 FEET & 32° F	
		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.
3320	73	640	1530	690	1610	740	1690	800	1790

NOTE: Reduce landing distances 10% for each 5 knots headwind.

Section II

AMPHIBIAN

OPERATING CHECK LIST

BEFORE ENTERING THE AMPHIBIAN.

- (1) Inspect the floats and fairings for dents, cracks, scratches, etc.
- (2) Remove rubber balls (which serve as a stopper 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) Check the wheel struts for proper inflation; check the tires for cuts, bruises and proper inflation.

NOTE

Refer to placards on the nose wheel struts for strut inflation procedures. Proper tire inflation for 6.00 x 6 main wheel tires is 37 psi; tire inflation for the 10 x 3.50 nose wheel tires is 41 psi.

BEFORE STARTING ENGINE.

- (1) Landing Gear Lever -- "DOWN" (amphibian on land) or "UP" (amphibian on water).
- (2) Operate and visually check water rudders for proper retraction and rudder action. (With amphibian on land, pull water rudder retraction handle aft to "RETRACT" position for taxiing.)
- (3) Water Rudders -- Down (for taxiing on water) or up (for taxiing on land).

TAKE-OFF.

TAKE-OFF ON WATER.

- (1) Landing Gear Lever -- "UP."

- (2) Water Rudders -- Up.
- (3) Set wing flaps 20° (second notch).
- (4) Hold the control wheel full back and advance the throttle slowly.
- (5) Place the airplane in a planing attitude (on the step) by slowly moving the control wheel forward when the bow wave moves aft of the wing strut position.
- (6) As the airplane accelerates, apply light control wheel back pressure and allow the airplane to fly off smoothly.

NOTE

To reduce take-off water run, the technique of raising one float out of the water may be used. This procedure is described on page 2-7 under paragraph "Take-Off On Water."

- (7) Climb out at 75-85 MPH. With obstacles ahead, climb at 64 MPH.

TAKE-OFF ON LAND.

- (1) Set wing flaps 20° (second notch).
- (2) Power -- Full throttle and 2850 RPM.
- (3) When amphibian feels light (60-70 MPH), apply light back pressure to control wheel and allow airplane to fly off smoothly.
- (4) After take-off, level off slightly and accelerate to an efficient climb speed; then retract the landing gear.
- (5) Climb out at 75-85 MPH. With obstacles ahead, climb at 64 MPH.

CLIMB.

The maximum rate of climb is obtained with flaps retracted at full throttle and 93 MPH. Refer to the Maximum Rate-Of-Climb Data chart, figure 2-7.

BEFORE LANDING ON WATER.

- (1) Landing Gear Lever -- "UP."
- (2) Landing Gear Blue Indicator Light -- Check illuminated.
- (3) Water Rudders -- Up.
- (4) Maintain 70-80 MPH with wing flaps extended.

BEFORE LANDING ON LAND.

- (1) Landing Gear Lever -- "DOWN" below 130 MPH.
- (2) Landing Gear Amber Indicator Light -- Check illuminated.
- (3) Water Rudders -- Up.
- (4) Maintain 70-80 MPH with wing flaps extended.

LANDING.

NORMAL LANDING ON WATER.

- (1) Landing technique is conventional for all wing flap settings.

NORMAL LANDING ON LAND.

- (1) Land on main wheels first (nose slightly above level flight attitude).
- (2) Lower the nose wheels gently to the runway after speed is diminished.
- (3) Avoid excessive braking unless obstacle is ahead.

CROSSWIND LANDING ON LAND.

- (1) If field length permits, land with wing flaps retracted.
- (2) Use wing low, crab, or combination method of drift correction.
- (3) Land in nearly level attitude.
- (4) Lower nose wheels to runway immediately after touchdown and hold control wheel forward.
- (5) Maintain a straight path by using a combination of ailerons, upwind rudder (amphibian weathercocks downwind on land) and occasional upwind braking.

AFTER LANDING.

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

DESCRIPTION AND OPERATING DETAILS

THE AMPHIBIAN.

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

- (1) Amphibious floats, incorporating a water rudder steering system, replace the landing gear. Each float has a hydraulically-retractable main wheel and nose (or bow) wheel, both of which are mounted on air-oil shock struts. The main wheels retract to a position slightly above and aft of the float steps, which shield the wheels hydrodynamically. The nose wheels retract up to the bow point of the floats where they serve as bumpers for floating docks and obstructions. Each float also has a retractable water rudder. A water rudder retraction handle, connected to the water rudders by cables and springs, is located on the cabin floor tunnel.
- (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) The standard propeller is replaced with a propeller of larger diameter (86 inches).
- (6) A reinforced engine mount replaces the standard engine mount.
- (7) A drain line is added to the front of the induction air manifold.
- (8) Hoisting provisions are added to the top of the fuselage.
- (9) Floatplane placards are added.
- (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. Inboard fuel fillers are added when long range fuel tanks are installed.

NOTE

A reduction of approximately five gallons of usable fuel in each tank will result when inboard fillers are used to fill the long range fuel tanks.

WATER RUDDER STEERING SYSTEM.

Retractable water rudders, mounted at the aft end of each float, are connected by a system of cables and springs to the airplane rudder pedals. When the water rudders are extended, normal pedal operation moves the water rudders to provide steering control for taxiing.

A water rudder retraction handle, located on the cabin floor tunnel, is used to manually raise and lower the water rudders. During take-off, landing, and in flight, the retraction handle is normally full aft in the "RETRACT" position. With the handle in this position, the water rudders are up. When the handle is moved full forward to the "EXTEND" position, the water rudders are down.

The retraction handle incorporates a spring-loaded catch device located near the cross-bar at the end of the handle. The catch is designed to latch over a locking pin when the retraction handle is pulled aft to "RETRACT," thereby securing the handle in the retracted position.

Pulling the exposed end of the retraction handle catch aft, while pushing downward slightly on the retraction handle with the right hand, will release the handle from the retraction locking pin. The handle then can be rotated full forward to extend the water rudders for taxiing.

AMPHIBIOUS LANDING GEAR CONTROLS.

Gear actuation on the amphibian is accomplished by an engine-driven hydraulic pump (optional equipment) or by a hand-operated hydraulic pump located on the cabin floor tunnel. When the optional engine-driven hydraulic pump is installed, the hand-operated pump may be used as an emergency pump or as an aid to the engine-driven pump to speed up the gear actuation time when desired. Gear retraction or extension requires approximately 12 seconds. Using the hand pump only, approximately 26 complete strokes are required to retract or extend the gear.

Retraction and extension of the amphibious landing gear wheels are controlled by a two-position lever, marked "UP" and "DOWN," located on the bottom of the instrument panel. Beside the lever are two "press-to-test" position lights. The upper (blue) light comes on when the gear is fully retracted, remaining on until the gear is lowered. The lower (amber) light comes on when the gear is down and locked, remaining on until the gear is unlocked. Neither light burns while the gear is in an intermediate position.

Main gear position can be double-checked by glancing through a small opening on top of each float and noting the position of the retract mechanism lock. When the locking fitting is completely forward, the gear is retracted. When it is fully aft, the gear is down and locked. The nose gear can be seen over the bow of the floats when in the fully retracted position. However, it disappears from view when extended.

The electrical circuits for the gear position lights are protected by a "push-to-reset" circuit breaker on the left side of the landing gear control unit.

TAXIING.

TAXIING ON WATER.

Taxi with water rudders down. It is best to limit the engine speed to 1000 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.

The rudder trim control wheel may be used to reduce rudder pedal forces while taxiing in crosswinds.

For minimum taxi speed in close quarters, use idle RPM 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 amphibian in close quarters. In addition to the normal flight controls, the wing flaps, cabin doors, and water rudders will aid in "sailing."

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

Do not taxi the amphibian in water with the landing gear extended except when beaching the aircraft. If the landing gear is extended, there is a much stronger tendency for the bows to submerge while taxiing downwind.

TAXIING ON LAND.

The bow wheels are full swiveling on this aircraft. Steering is accomplished by use of the brakes installed on the main wheels. An occasional tapping of the brakes is all that is required to maintain the desired taxi path under normal conditions.

When taxiing in a strong crosswind it will be necessary to use a considerable amount of upwind brake since the amphibian weathercocks downwind on land, which is contrary to the normal tendency of the landplane. Winds in excess of 30 MPH may cause the downwind main strut to "bottom," which will allow the plane to tilt 3° to 5° in that direction. The amphibian will feel buoyant then since the wind can get under the upwind wing. Although the aircraft has been safely taxied in crosswinds of 40 MPH, this is recommended only in cases of emergency due to the excessive wear on the brakes.

TAKE-OFF.

TAKE-OFF ON WATER.

The use of 20° wing flaps (second notch) throughout the take-off run is recommended. Take-off distances are given on figure 2-6.

Apply full throttle smoothly and hold the control wheel full back. Watch the point where the bow wave leaves the float, and move the control wheel forward slowly as this point moves aft of the wing strut. Slow control movement and light control pressures produce the best results. Attempts to force the airplane into the planing attitude will generally result in loss of speed and delay in getting on the step. The airplane will assume a planing attitude which permits acceleration to take-off speed (50 to 60 MPH) at which time the airplane will fly off smoothly.

If lift off is difficult due to high lake elevation or glassy water, the following procedure is recommended: With the airplane in the planing position, 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 take-off. 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 airplane accelerates to take-off speed almost instantly.

If porpoising is encountered while on the step, apply additional control wheel back pressure to correct the excessively nose-low attitude.

CROSSWIND TAKE-OFF ON WATER.

Start the take-off run with the wing flaps up and the water rudders extended for better directional control. Wing flaps are lowered to 20° and the water rudders are retracted when the airplane is on the step; the remainder of the take-off is normal. If the floats are lifted from the water one at a time, the down-wind float should be lifted first.

TAKE-OFF ON LAND.

Take-offs are accomplished with the wing flaps extended 20° (second notch), full throttle and 2850 RPM. As speed increases, the elevator control should be gradually moved to the neutral position, and when the airplane feels light (60-70 MPH), a light back pressure on the control wheel will allow the airplane to fly off smoothly.

The landing gear should be retracted when the point is reached where a wheels down forced landing on that runway would be impractical.

CLIMB.

Normal climbs are conducted at 100-110 MPH with wing flaps retracted and cowl flaps opened as required for engine cooling. If optimum climb performance with wing flaps retracted is desired, climb at 93 MPH at sea level, with full throttle. Reduce this climb speed about 1/2 MPH for each 1000 feet above sea level.

To climb steeply over an obstacle with wing flaps retracted, use an obstacle clearance speed of 70 MPH.

NOTE

Steep climbs at this low speed should be of short duration to improve engine cooling.

To clear an obstacle after take-off with 20° wing flaps, use an obstacle clearance speed of 65 MPH. 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.

CRUISE.

Observe the same engine speed limits as for the landplane. Speed, range and endurance are shown on the Cruise Performance charts, figure 2-8.

NOTE

Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill the long range fuel tanks.

LANDING ON WATER.

Power-off landings may be made with any wing flap setting. However, with glassy water it is recommended that a power approach and landing be made with 0° - 20° wing flaps to maintain a low rate of descent.

LANDING ON LAND.

Power-off approaches and landings may be made with any wing flap setting. It is recommended, however, that a power approach and landing be made to reduce the rapid rate of descent which accompanies the power-off approach. The landing approach attitude and flare is the same as for an aircraft equipped with a tricycle gear. The approaches should be made at 80-90 MPH with the wing flaps up and 70-80 MPH with the flaps down, depending upon the air turbulence.

AMPHIBIAN EMERGENCY GEAR PROCEDURE.

The amphibian is not equipped with an emergency system to operate the landing gear, except when the optional engine-driven hydraulic pump is installed; then the hand pump may be considered an emergency system.

If the appropriate position light does not show the gear to be in a locked position (either "UP" or "DOWN"), a visual check may be made by observing the main landing gear latch fittings in the float inspection openings. The nose gear is partially visible over the float bow when in

the retracted position. The landing gear position lights should be checked by pushing them in to test. If there is no response, the landing gear position light circuit breaker should be checked. If it is ascertained that a mechanical failure has occurred, the recommended procedure in this case is to retract the other gear, if it was extended, and land on the sod. A dry grassy surface is preferable.

Landings of this sort have produced no tendency to nose over, even when conducted on hard surfaced runways, and will result in little or no damage to the floats.

IMPORTANT

DO NOT land in the water with the wheels either partially or fully extended. If the landing MUST be accomplished on water and the gear is partially or fully extended, it is suggested that a power-on full stall landing with full flaps (40°) would be the best procedure.

OPERATING LIMITATIONS

MAXIMUM GROSS WEIGHT.

Amphibian with Edo Model 597-2790 Floats 3265 lbs

NOTE

A gross weight of 3265 pounds is allowed for the amphibian for take-off on land only. For take-off on water or landing on land or water, the maximum allowable gross weight is 3100 pounds.

WEIGHT AND BALANCE.

The following information will enable you to operate your amphibian within the prescribed weight and center of gravity limitations.

In figuring your loading problems, be certain that you use the Licensed Empty Weight of your particular amphibian as shown on its Weight and Balance Data sheet. This sheet, plus an Equipment List, is included with each amphibian as it leaves the factory. When amphibious floats have been installed by anyone other than the factory, the Repair and Alteration Form FAA-337 must be consulted for the proper weight and balance information.

The loading instructions given in the Owner's Manual for the landplane should be used as a guide when figuring amphibian weight and balance problems. In conjunction with these instructions, use the Seating-Cargo Arrangements Diagram and Cabin Stations Diagram in the Owner's Manual and the Sample Problem, Loading Graph and Center of Gravity Moment Envelope in this supplement.

SAMPLE AIRPLANE		YOUR AIRPLANE	
Weight (lbs.)	Moment (lb.-ins. /1000)	Weight (lbs.)	Moment (lb.-ins. /1000)
SAMPLE LOADING PROBLEM AMPHIBIAN			
1. Licensed Empty Weight (Sample Airplane)	2228	88.4	
2. Oil (12 qts. - Full oil may be assumed for all flights.)	22	-0.4	-0.4
3. Fuel (Standard - 62 gal. @ 6 lbs./gallon)	372	17.9	
Fuel (Long Range - 81 gal. @ 6 lbs./gallon)			
4. Pilot and Copilot	340	12.2	
5. Center Passengers (6-place version)			
Aft Passengers IV (6-place version)			
Rear Passengers V (4-place version)			
6. Baggage V *	138	13.0	
Cargo "A" *			
Cargo "B" *			
Cargo "C" *			
Cargo "D" *			
Aft Baggage *			
7. TOTAL WEIGHT AND MOMENT	3100	131.1	
8. Locate this point (3100 at 131.1) on the amphibian center of gravity moment envelope in this section, and since this point falls within the envelope, the loading is acceptable.			
*Refer to the seating and cargo arrangements diagram in the Owner's Manual for maximum allowable weights in these areas.			

Figure 2-1.

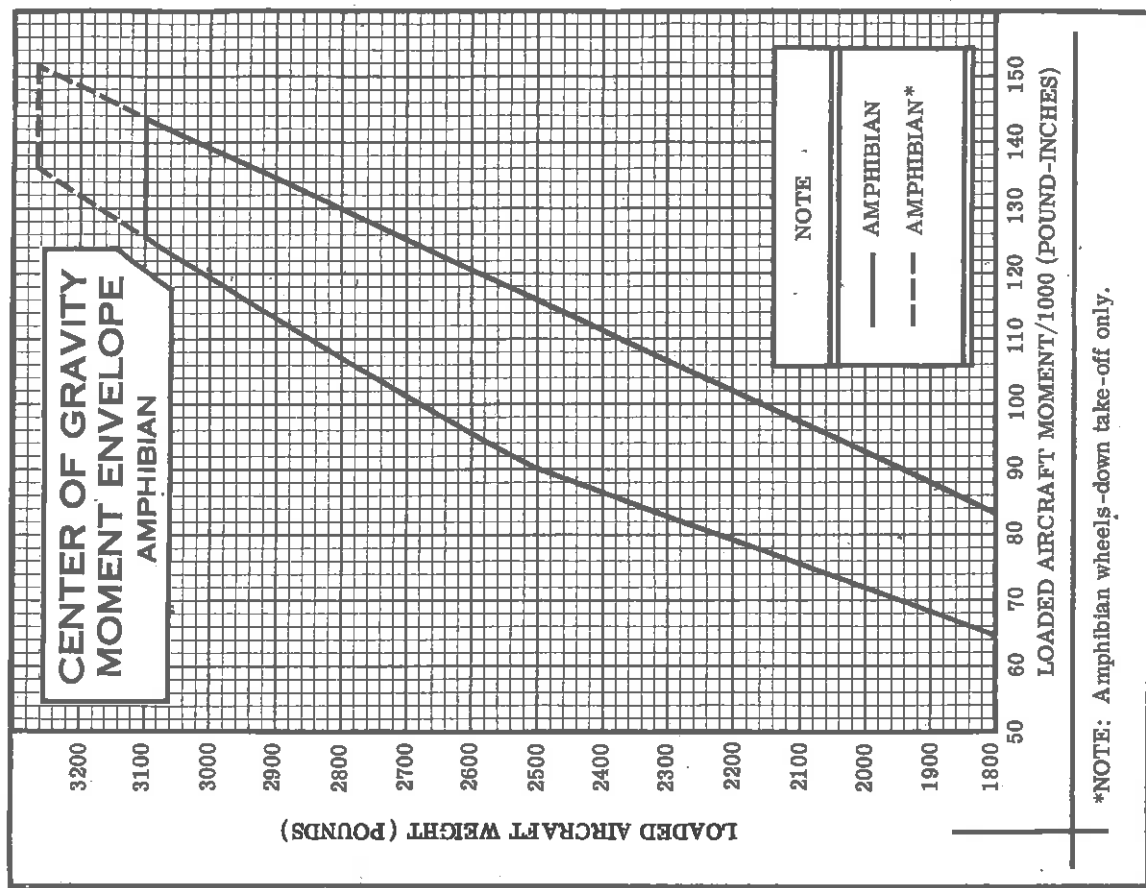


Figure 2-3.

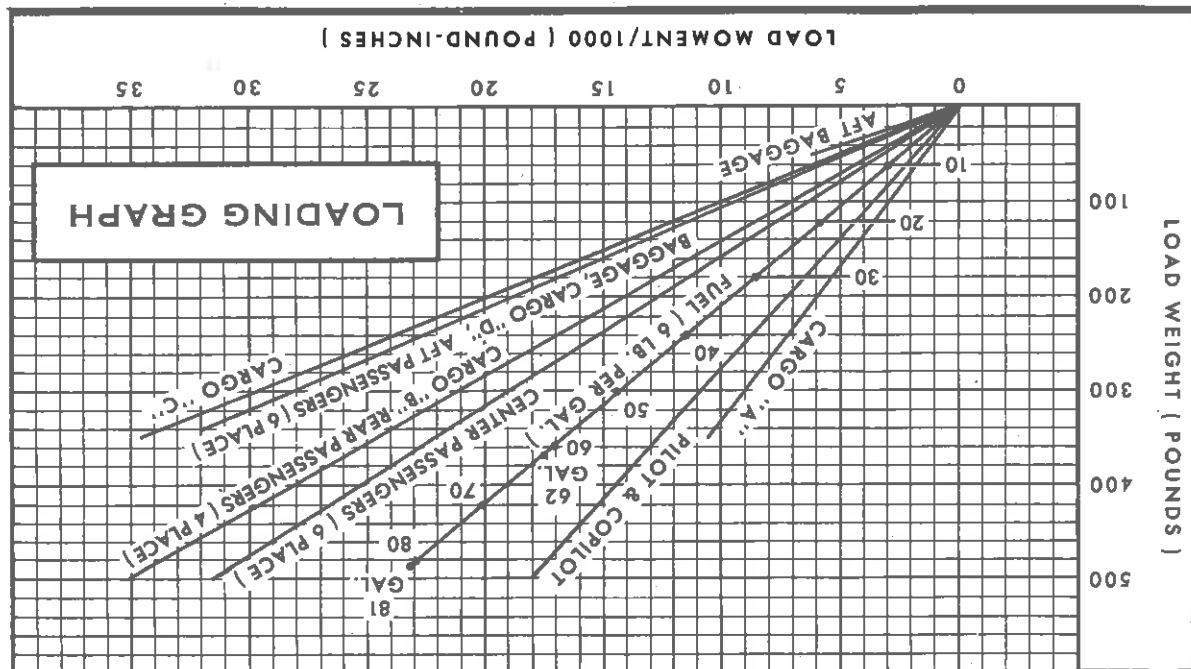


Figure 2-2.

OPERATIONAL DATA

In the Cruise Performance charts, figure 2-8, range and endurance are given for normal lean mixture, and are based on an aircraft equipped with Edo Model 597-2790 Amphibious Floats at zero wind, 3265 pounds gross weight and standard atmospheric conditions. Range and endurance figures are supplied for both the "ON-OFF" fuel system with 62 and 81 gallons, and the "SELECTOR VALVE" system with 59 and 78 gallons of fuel for cruise.

Allowances for fuel reserve, headwinds, take-off and climb, and variations in mixture leaning technique should be made and are in addition to those on the charts. Other indeterminate variables such as fuel metering characteristics, engine and propeller conditions, and turbulence of the atmosphere may account for variations of 10% or more in maximum range.

		AMPHIBIAN					
FLAPS 0°	IAS -MPH	60	80	100	120	140	160
	CAS-MPH	66	81	99	117	136	156
*FLAPS 20°	IAS -MPH	50	60	70	80	90	100
	CAS-MPH	59	65	73	82	91	100
*FLAPS 40°	IAS -MPH	50	60	70	80	90	100
	CAS-MPH	59	66	75	83	92	101
* MAXIMUM FLAP SPEED 110 MPH, CAS							

Figure 2-4.

STALL SPEED, POWER OFF		AMPHIBIAN		
<i>Gross Weight</i> 3100 LBS.	CONFIGURATION	ANGLE OF BANK		
		0°	30°	60°
FLAPS UP		65	70	92
FLAPS 20°		59	63	83
FLAPS 40°		57	61	80
SPEEDS ARE MPH, CAS				

Figure 2-5.

AMPHIBIAN MAXIMUM RATE-OF-CLIMB DATA

GROSS WEIGHT POUNDS	AT SEA LEVEL & 59° F		AT 5000 FEET & 41° F		AT 10,000 FEET & 23° F		AT 15,000 FEET & 5° F		AT 20,000 FEET & -12° F	
	IAS MPH	RATE OF CLIMB FT/MIN USED FUEL S.L.	IAS MPH	RATE OF CLIMB FT/MIN USED FUEL S.L.	IAS MPH	RATE OF CLIMB FT/MIN USED FUEL S.L.	IAS MPH	RATE OF CLIMB FT/MIN USED FUEL S.L.	IAS MPH	RATE OF CLIMB FT/MIN USED FUEL S.L.
3265	93	970	2	90	690	4.1	88	400	7.1	85
2800	90	1270	2	87	950	3.6	85	630	5.6	82
2400	86	1590	2	83	1230	3.2	81	870	4.7	78

NOTE: FULL THROTTLE, 2700 RPM, MIXTURE AT RECOMMENDED LEARNING SCHEDULE, FLAPS UP. FUEL USED INCLUDES WARM-UP AND TAKE-OFF ALLOWANCE.

Figure 2-7.

AMPHIBIAN TAKE-OFF DATA - WATER

TAKE-OFF DISTANCE WITH 20° FLAPS FROM SMOOTH WATER

GROSS WEIGHT POUNDS	IAS @ 50 FT	HEAD WIND KNOTS	AT SEA LEVEL & 59° F		AT 5000 FT & 41° F		AT 10,000 FT & 23° F		AT 15,000 FT & 5° F		AT 20,000 FT & -12° F	
			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
3100	64	20	885	1430	1015	1675	610	1510	2315	2095	1430	2305
2800	61	20	850	1100	765	1200	1060	1680	1415	1285	945	1575
2400	56	20	770	770	530	920	655	1110	845	1380	545	1380

NOTE: INCREASE DISTANCES 10% FOR EACH 25° ABOVE STANDARD TEMPERATURE FOR PARTICULAR ALTITUDE.

Figure 2-6.

AMPHIBIAN TAKE-OFF DATA - LAND

TAKE-OFF DISTANCE WITH 20° FLAPS FROM HARD-SURFACED RUNWAY

GROSS WEIGHT POUNDS	IAS @ 50 FT	HEAD WIND KNOTS	AT SEA LEVEL & 59° F		AT 5000 FT & 41° F		AT 10,000 FT & 23° F		AT 15,000 FT & 5° F		AT 20,000 FT & -12° F	
			GROUND RUN	TOTAL TO CLEAR 50 FT OBS	GROUND RUN	TOTAL TO CLEAR 50 FT OBS	GROUND RUN	TOTAL TO CLEAR 50 FT OBS	GROUND RUN	TOTAL TO CLEAR 50 FT OBS	GROUND RUN	TOTAL TO CLEAR 50 FT OBS
3265	64	20	670	1275	465	1500	960	1925	1165	2540	2010	1530
2800	59	20	475	915	320	1080	675	1295	815	1595	1225	985
2400	55	20	335	685	220	790	475	925	570	1105	830	885

NOTE: INCREASE DISTANCES 10% FOR EACH 25° ABOVE STANDARD TEMPERATURE FOR PARTICULAR ALTITUDE.

CRUISE PERFORMANCE

AMPHIBIAN

NORMAL LEAN MIXTURE

Standard Conditions \rightarrow Zero Wind \rightarrow Gross Weight-3265 Pounds
2500 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.						"SELECTOR VALVE" FUEL SYS.					
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	25	79	145	16.5	3.8	545	4.9	715	3.6	520	4.7	685	4.7	685		
	24	75	142	15.6	4.0	565	5.2	735	3.8	535	5.0	710	5.0	710		
	23	70	138	14.7	4.2	580	5.5	760	4.0	555	5.3	730	5.3	730		
	22	66	134	13.9	4.5	595	5.8	780	4.2	565	5.6	750	5.6	750		
2500	25	76	143	16.0	3.9	555	5.1	725	3.7	530	4.9	700	4.9	700		
	24	72	140	15.1	4.1	575	5.3	750	3.9	545	5.2	720	5.2	720		
	23	68	136	14.3	4.3	590	5.7	770	4.1	560	5.4	740	5.4	740		
	22	64	131	13.5	4.6	605	6.0	790	4.4	575	5.8	760	5.8	760		
2400	25	71	139	14.9	4.2	575	5.4	755	4.0	550	5.2	725	5.2	725		
	24	68	135	14.2	4.4	590	5.7	770	4.2	560	5.5	745	5.5	745		
	23	64	131	13.4	4.6	605	6.0	790	4.4	575	5.8	760	5.8	760		
	22	60	127	12.7	4.9	620	6.4	810	4.7	590	6.2	780	6.2	780		
2300	25	67	134	14.1	4.4	595	5.8	775	4.2	565	5.6	745	5.6	745		
	24	63	130	13.3	4.7	605	6.1	795	4.4	580	5.9	765	5.9	765		
	23	60	127	12.6	4.9	620	6.4	815	4.7	590	6.2	785	6.2	785		
	22	56	122	11.9	5.2	635	6.8	830	5.0	605	6.5	800	6.5	800		
2200	25	62	129	13.0	4.8	615	6.2	800	4.5	585	6.0	770	6.0	770		
	24	59	125	12.4	5.0	625	6.5	820	4.8	595	6.3	790	6.3	790		
	23	55	121	11.7	5.3	635	6.9	830	5.0	605	6.6	800	6.6	800		
	22	52	116	11.1	5.6	645	7.3	845	5.3	615	7.0	815	7.0	815		
	21	49	111	10.5	5.9	655	7.7	855	5.6	625	7.4	825	7.4	825		
	20	45	105	9.9	6.3	665	8.2	865	6.0	630	7.9	835	7.9	835		
	19	42	100	9.2	6.7	670	8.8	875	6.4	635	8.5	845	8.5	845		
	18	38	93	8.6	7.2	675	9.4	880	6.9	640	9.1	850	9.1	850		

NOTE: Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill long range fuel tanks.

CRUISE PERFORMANCE

AMPHIBIAN

NORMAL LEAN MIXTURE

Standard Conditions \rightarrow Zero Wind \rightarrow Gross Weight-3265 Pounds
5000 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.						"SELECTOR VALVE" FUEL SYS.					
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	25	81	150	17.0	3.7	550	4.8	715	3.5	520	4.6	680	4.6	680		
	24	77	147	16.1	3.8	565	5.0	740	3.7	535	4.8	710	4.8	710		
	23	73	143	15.2	4.1	580	5.3	760	3.9	555	5.1	730	5.1	730		
	22	69	139	14.4	4.3	595	5.6	780	4.1	570	5.4	750	5.4	750		
2500	25	79	148	16.5	3.8	560	4.9	730	3.6	530	4.7	700	4.7	700		
	24	75	145	15.6	4.0	575	5.2	750	3.8	545	5.0	725	5.0	725		
	23	71	141	14.8	4.2	590	5.5	770	4.0	560	5.3	740	5.3	740		
	22	67	136	14.0	4.4	605	5.8	790	4.2	575	5.6	760	5.6	760		
2400	25	73	144	15.3	4.0	580	5.3	760	3.9	555	5.1	730	5.1	730		
	24	70	140	14.6	4.3	595	5.6	775	4.0	565	5.3	745	5.3	745		
	23	66	136	13.8	4.5	605	5.9	795	4.3	580	5.6	765	5.6	765		
	22	62	132	13.1	4.7	625	6.2	815	4.5	595	6.0	785	6.0	785		
2300	25	69	139	14.4	4.3	595	5.6	780	4.1	565	5.4	750	5.4	750		
	24	65	135	13.7	4.5	610	5.9	795	4.3	580	5.7	765	5.7	765		
	23	62	131	13.0	4.8	625	6.2	815	4.5	595	6.0	785	6.0	785		
	22	58	126	12.3	5.0	635	6.6	830	4.8	605	6.3	800	6.3	800		
2200	25	64	133	13.4	4.6	615	6.1	805	4.4	585	5.8	775	5.8	775		
	24	60	129	12.7	4.9	630	6.4	825	4.6	600	6.1	790	6.1	790		
	23	57	125	12.1	5.1	640	6.7	835	4.9	610	6.4	805	6.4	805		
	22	54	121	11.5	5.4	650	7.1	850	5.1	620	6.8	820	6.8	820		
	21	51	115	10.9	5.7	660	7.5	860	5.4	625	7.2	830	7.2	830		
	20	47	110	10.2	6.1	665	7.9	870	5.8	625	7.6	840	7.6	840		
	19	44	104	9.6	6.5	675	8.4	880	6.1	640	8.1	845	8.1	845		
	18	40	98	9.0	6.9	680	9.0	885	6.6	645	8.7	855	8.7	855		

NOTE: Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill long range fuel tanks.

Figure 2-8 (Sheet 1 of 5).

Figure 2-8 (Sheet 2 of 5).

CRUISE PERFORMANCE

AMPHIBIAN

NORMAL LEAN MIXTURE

Standard Conditions \rightarrow Zero Wind \rightarrow Gross Weight-3265 Pounds
7500 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.				"SELECTOR VALVE" FUEL SYS.			
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	23	75	148	15.8	3.9	585	5.1	760	3.7	555	4.9	735
	22	71	144	14.9	4.2	600	5.4	780	4.0	570	5.2	765
	21	67	139	14.1	4.4	615	5.8	800	4.2	585	5.5	775
	20	63	135	13.2	4.7	630	6.1	825	4.5	600	5.9	795
2500	23	73	146	15.3	4.1	590	5.3	775	3.9	565	5.1	745
	22	69	142	14.5	4.3	605	5.6	790	4.1	575	5.4	765
	21	65	137	13.7	4.5	625	5.9	815	4.3	590	5.7	785
	20	61	132	12.8	4.8	635	6.3	835	4.6	605	6.1	800
2400	23	68	140	14.3	4.3	610	5.7	795	4.1	580	5.5	770
	22	64	136	13.5	4.6	625	6.0	815	4.4	595	5.8	785
	21	61	132	12.8	4.9	640	6.3	835	4.6	605	6.1	805
	20	57	126	12.1	5.1	650	6.7	850	4.9	620	6.5	820
2300	23	64	136	13.4	4.6	625	6.0	820	4.4	595	5.8	790
	22	60	131	12.7	4.9	640	6.4	835	4.6	610	6.1	805
	21	57	126	12.0	5.2	650	6.7	850	4.9	620	6.5	820
	20	53	121	11.4	5.5	660	7.1	860	5.2	630	6.9	830
2200	23	59	129	12.5	5.0	645	6.5	840	4.7	610	6.3	810
	22	56	125	11.9	5.2	655	6.8	855	5.0	620	6.6	825
	21	53	120	11.2	5.5	660	7.2	865	5.2	630	6.9	830
	20	49	114	10.6	5.8	670	7.6	875	5.6	635	7.3	840
	19	46	109	10.0	6.2	675	8.1	885	5.9	645	7.8	850
	18	42	103	9.3	6.6	680	8.7	890	6.3	650	8.4	860

NOTE: Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill long range fuel tanks.

Figure 2-8 (Sheet 3 of 5).

CRUISE PERFORMANCE

AMPHIBIAN

NORMAL LEAN MIXTURE

Standard Conditions \rightarrow Zero Wind \rightarrow Gross Weight-3265 Pounds
10,000 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.				"SELECTOR VALVE" FUEL SYS.			
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	21	70	145	14.6	4.3	615	5.6	805	4.0	585	5.4	775
	20	65	140	13.7	4.5	630	5.9	825	4.3	600	5.7	795
	19	61	134	12.9	4.8	645	6.3	845	4.6	615	6.1	815
	18	57	128	12.0	5.2	660	6.7	865	4.9	630	6.5	830
2500	21	67	142	14.1	4.4	625	5.7	815	4.2	595	5.5	785
	20	63	137	13.3	4.7	640	6.1	835	4.4	610	5.9	805
	19	59	131	12.5	5.0	655	6.5	855	4.7	620	6.3	820
	18	55	125	11.7	5.3	665	6.9	870	5.1	630	6.7	835
2400	21	63	137	13.2	4.7	640	6.1	835	4.5	610	5.9	805
	20	59	131	12.5	5.0	655	6.5	855	4.7	620	6.2	820
	19	55	126	11.7	5.3	665	6.9	865	5.0	630	6.6	835
	18	51	119	11.0	5.6	670	7.4	875	5.4	640	7.1	845
2300	21	59	131	12.4	5.0	655	6.5	855	4.7	620	6.3	820
	20	55	126	11.8	5.3	665	6.9	865	5.0	630	6.6	835
	19	52	120	11.1	5.6	670	7.3	875	5.3	640	7.1	845
	18	48	114	10.4	6.0	680	7.8	890	5.7	645	7.5	855
2200	21	55	125	11.6	5.3	665	7.0	870	5.1	635	6.7	835
	20	51	119	11.0	5.6	670	7.4	875	5.4	640	7.1	845
	19	48	113	10.4	6.0	680	7.8	890	5.7	645	7.5	855
	18	44	107	9.7	6.4	685	8.3	895	6.1	655	8.0	865
	17	41	101	9.0	6.9	690	9.0	900	6.5	655	8.6	870

NOTE: Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill long range fuel tanks.

Figure 2-8 (Sheet 4 of 5).

CRUISE PERFORMANCE

AMPHIBIAN

NORMAL LEAN MIXTURE

Standard Conditions Zero Wind Gross Weight- 3265 Pounds

15,000 FEET

RPM	MP	% BHP	TAS MPH	GAL/ HOUR	"ON-OFF" FUEL SYS.						"SELECTOR VALVE" FUEL SYS.					
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	17	57	132	12.1	5.1	675	6.7	880	4.9	640	6.4	850	5.3	650	6.9	860
	16	53	124	11.2	5.5	685	7.2	885	5.3	650	6.9	860	5.3	650	6.9	860
	15	48	116	10.4	6.0	695	7.8	905	5.7	660	7.5	875	5.7	660	7.5	875
	14	43	107	9.5	6.6	700	8.6	915	6.2	665	8.3	880	6.2	665	8.3	880
2500	17	55	129	11.7	5.3	680	6.9	885	5.0	645	6.6	855	5.0	645	6.6	855
	16	51	121	10.9	5.7	690	7.4	900	5.4	655	7.2	865	5.4	655	7.2	865
	15	46	113	10.1	6.2	695	8.1	910	5.9	665	7.8	875	5.9	665	7.8	875
	14	42	104	9.2	6.7	700	8.8	920	6.4	670	8.5	885	6.4	670	8.5	885
2400	17	52	123	11.1	5.6	685	7.3	895	5.3	655	7.0	865	5.3	655	7.0	865
	16	48	115	10.3	6.0	695	7.9	910	5.7	660	7.6	875	5.7	660	7.6	875
	15	43	107	9.5	6.5	700	8.5	915	6.2	665	8.2	880	6.2	665	8.2	880
	14	39	99	8.6	7.2	705	9.4	925	6.8	675	9.0	890	6.8	675	9.0	890
2300	17	48	117	10.4	5.9	695	7.8	905	5.7	660	7.5	870	5.7	660	7.5	870
	16	44	109	9.7	6.4	700	8.4	915	6.1	665	8.1	880	6.1	665	8.1	880
	15	40	102	8.9	6.9	705	9.1	920	6.6	670	8.7	885	6.6	670	8.7	885
	14	36	94	8.2	7.6	710	9.9	930	7.2	675	9.6	895	7.2	675	9.6	895
2200	17	45	110	9.8	6.3	700	8.3	910	6.0	685	8.0	880	6.0	685	8.0	880
	16	41	103	9.1	6.8	705	8.9	920	6.5	670	8.6	885	6.5	670	8.6	885
	15	37	96	8.4	7.4	710	9.7	925	7.0	675	9.3	895	7.0	675	9.3	895
	14	33	89	7.7	8.1	720	10.6	940	7.7	685	10.2	905	7.7	685	10.2	905

NOTE: Range and endurance figures must be reduced to allow for a reduction of approximately five gallons of usable fuel in each tank when inboard fillers are used to fill long range fuel tanks.

Figure 2-8 (Sheet 5 of 5).

AMPHIBIAN LANDING DISTANCE - WATER

LANDING DISTANCE WITH 40° FLAPS AND POWER OFF

GROSS WEIGHT POUNDS	APPROACH IAS MPH	@ SEA LEVEL & 59° F		@ 2500 FEET & 50° F		@ 5000 FEET & 41° F		@ 7500 FEET & 32° F	
		WATER RUN	TOTAL WATER RUN TO CLEAR	WATER RUN	TOTAL WATER RUN TO CLEAR	WATER RUN	TOTAL WATER RUN TO CLEAR	WATER RUN	TOTAL WATER RUN TO CLEAR
3100	72	600	1480	640	1550	690	1630	750	1720

NOTE: Reduce landing distances 10% for each 4 knots headwind.

AMPHIBIAN LANDING DISTANCE - LAND

LANDING DISTANCE WITH 40° FLAPS AND POWER OFF ON HARD SURFACED RUNWAY

GROSS WEIGHT POUNDS	APPROACH IAS MPH	@ SEA LEVEL & 59° F		@ 2500 FEET & 50° F		@ 5000 FEET & 41° F		@ 7500 FEET & 32° F	
		GROUND ROLL	TOTAL GROUND ROLL TO CLEAR	GROUND ROLL	TOTAL GROUND ROLL TO CLEAR	GROUND ROLL	TOTAL GROUND ROLL TO CLEAR	GROUND ROLL	TOTAL GROUND ROLL TO CLEAR
3100	69	780	1240	830	1320	880	1390	930	1480

NOTE: Reduce landing distances 10% for each 4 knots headwind.

SKIPLANE

Section III

OPERATING CHECK LIST

BEFORE ENTERING THE SKIPLANE.

- (1) Check that the skis are not frozen to the snow or icy surface.
- (2) Check hydraulic components for leakage, and skis and attachments for condition (retractable wheel skis only).
- (3) Check the Weight and Balance Data, and load the airplane to maintain the center of gravity within designated limits.

NOTE

The installation of skis causes a significant forward shift in center of gravity location, and ballast is required under certain loading conditions. Refer to Weight and Balance, page 3-4, for additional information.

BEFORE TAKE-OFF.

- (1) A full throttle RPM check is recommended only when the condition of the engine is in doubt. Due to the absence of brakes on the skiplane, this check is normally done during the initial portion of the take-off.
- (2) Check that the gear is pumped to the maximum position (retractable wheel skis only).

LANDING.

- (1) Visually check position of main wheel ski. If a wheels landing is intended, the skis should be retracted; when a landing on skis is intended, the skis should be extended beneath the landing gear wheels.
- (2) Check that the gear is pumped to the maximum position (retractable wheel skis only).
- (3) The landing technique is conventional for all wing flap settings.

DESCRIPTION AND OPERATING DETAILS

THE SKIPLANE.

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

A. RETRACTABLE WHEEL SKIS.

- (1) Main wheel skis are attached to the landing gear strut at the wheel by a link which allows the ski to be moved aft and down so that the airplane rests on the ski for operation on snow, or forward and up so that the wheel protrudes below the bottom of the ski for operation on bare surfaces.

The skis are actuated by a hydraulic system consisting of a hand pump and selector valve in the cabin, and hydraulic actuators on each ski. The hydraulic controls are contained in a pedestal mounted on the cabin floor just to the right of the floor tunnel.

A fixed tail wheel ski, designed with an opening in the bottom of the ski, is mounted such that the tail wheel protrudes below the ski for operation on either snow or bare surfaces.

- (2) To retract or extend the main landing gear skis:

- (a) Move selector valve lever to "WHEELS" for operation on wheels, or to "SKIS" for operation on skis.
- (b) Operate hydraulic pump handle until it can no longer be moved (due to hydraulic pressure buildup when the ski actuators reach the end of their travel).
- (c) Return selector valve lever to "NEUT" position. This locks the hydraulic system and prevents creepage or further motion of the hydraulic components.

NOTE

Do not cycle the skis while taxiing or while parked on abrasive surfaces.

B. WHEEL REPLACEMENT SKIS.

- (1) The conventional wheel and brake assembly on each main landing gear are replaced with a main gear ski assembly including special attaching parts and rigging components together with specially designed Cessna ski axles.
- (2) A tail wheel ski, designed with an opening in the bottom of the ski, is mounted such that the tail wheel protrudes below the ski for operation on either snow or bare surfaces.

TAXIING.

Normal skiplane taxiing techniques are used. Due to the characteristics of tail ski steering, the minimum turning radius is increased as compared to landplane taxiing with the use of brakes.

NOTE

Do not extend or retract the skis while in motion on the ground. Landing gear drag, caused by one ski preceding the other during the retraction or extension cycle, will result in a ground looping tendency.

TAKE-OFF.

Under the most favorable conditions of smooth packed snow at temperatures approximately 32° F., skiplane take-off distance is approximately 10% greater than the distance for the landplane. Caution should be exercised in that lower temperatures or other snow conditions will usually increase this distance.

CLIMB.

Skiplane airspeeds and techniques used during climb are identical to those used for the landplane. The rate of climb is approximately 50 feet per minute lower due to the additional drag of the ski installation.

CRUISE.

Observe the same engine speed limits as for the landplane. Skiplane speed, range and endurance are shown on the Cruise Performance charts, figure 3-1.

LANDING.

The landing speeds and stalling speeds for the skiplane are identical to those for the landplane. Under the most favorable conditions of smooth packed snow at temperatures of approximately 32° F., the skiplane landing distance is approximately 20% greater than that shown for a landplane. Caution should be exercised in that other temperatures or other snow conditions may either decrease or increase this distance.

OPERATING LIMITATIONS

MAXIMUM GROSS WEIGHT.

Skiplane 3350 lbs

WEIGHT AND BALANCE.

The loading instructions given in the Owner's Manual for the landplane should be used when figuring skiplane weight and balance problems. However, it will be necessary to use the licensed empty weight and moment of your skiplane from your Weight and Balance Data Sheet. This empty weight will, in some cases, include a ballast weight which is installed on fuselage station 230 bulkhead. This weight must be installed and removed with the skis.

When skis have been installed by anyone other than the factory, the Repair and Alteration Form FAA-337 must be consulted for the licensed empty weight and moment of your skiplane.

OPERATIONAL DATA

In the Cruise Performance charts, figure 3-1, range and endurance are given for normal-lean mixture, and are based on zero wind, a gross weight of 3350 pounds and standard conditions. Range and endurance figures are supplied for both the "ON-OFF" fuel system with 62 and 81 gallons, and the "SELECTOR VALVE" system with 59 and 78 gallons of fuel for cruise.

NOTE

Performance figures were compiled from flight tests with an airplane equipped with Fluidyne Model C-3200 retractable wheel skis on the main gear and a Fluidyne Model CT-3600 ski on the tail gear. It is expected that performance of aircraft with other ski installations would be approximately the same.

Allowances for fuel reserve, headwinds, take-offs and climb, and variations in mixture leaning technique should be made and are in addition to those on the charts. Other indeterminate variables such as fuel metering-characteristics, engine and propeller conditions, and turbulence of the atmosphere may account for variations of 10% or more in maximum range. Comparison of estimated and actual performance on several flights will give you a basis on which to determine these allowances.

CRUISE PERFORMANCE SKIPLANE

NORMAL LEAN MIXTURE

Standard Conditions → Zero Wind → Gross Weight- 3350 Pounds
2500 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.				"SELECTOR VALVE" FUEL SYS.			
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	25	79	147	16.5	3.8	555	4.9	725	3.6	525	4.7	685
	24	75	144	15.6	4.0	575	5.2	750	3.8	545	5.0	720
	23	70	141	14.7	4.2	595	5.5	775	4.0	565	5.3	745
	22	66	138	13.9	4.5	615	5.8	805	4.2	585	5.6	775
2500	26	76	145	16.0	3.9	565	5.1	735	3.7	535	4.9	710
	24	72	143	15.1	4.1	585	5.3	760	3.9	555	5.2	735
	23	68	140	14.3	4.3	605	5.7	790	4.1	575	5.4	760
	22	64	137	13.5	4.6	625	6.0	820	4.4	595	5.8	790
2400	25	71	142	14.9	4.2	590	5.4	770	4.0	560	5.2	740
	24	68	139	14.2	4.4	610	5.7	795	4.2	580	5.5	765
	23	64	136	13.4	4.6	630	6.0	825	4.4	600	5.8	795
	22	60	133	12.7	4.9	650	6.4	850	4.7	620	6.2	820
2300	25	67	139	14.1	4.4	610	5.8	800	4.2	580	5.6	770
	24	63	136	13.3	4.7	635	6.1	825	4.4	600	5.9	795
	23	60	133	12.6	4.9	655	6.4	855	4.7	620	6.2	820
	22	56	129	11.9	5.2	670	6.8	875	5.0	640	6.5	845
2200	25	62	135	13.0	4.8	645	6.2	840	4.5	610	6.0	810
	24	59	132	12.4	5.0	660	6.5	860	4.8	630	6.3	830
	23	55	128	11.7	5.3	675	6.9	885	5.0	645	6.6	850
	22	52	123	11.1	5.6	690	7.3	900	5.3	665	7.0	865
	21	49	118	10.5	5.9	700	7.7	915	5.6	685	7.4	880
	20	45	111	9.9	6.3	700	8.2	915	6.0	685	7.9	880
	19	42	103	9.2	6.7	695	8.8	905	6.4	680	8.5	870
	18	38	93	8.6	7.2	670	9.4	880	6.9	640	9.1	845

Figure 3-1 (Sheet 1 of 4).

CRUISE PERFORMANCE SKIPLANE

NORMAL LEAN MIXTURE

Standard Conditions → Zero Wind → Gross Weight- 3350 Pounds
5000 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.				"SELECTOR VALVE" FUEL SYS.			
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	25	81	152	17.0	3.7	555	4.8	725	3.5	530	4.6	700
	24	77	149	16.1	3.8	575	5.0	750	3.7	545	4.8	725
	23	73	146	15.2	4.1	595	5.3	780	3.9	565	5.1	750
	22	69	143	14.4	4.3	615	5.6	805	4.1	585	5.4	775
2500	25	79	150	16.5	3.8	565	4.9	750	3.6	540	4.7	715
	24	75	148	15.6	4.0	585	5.2	785	3.8	555	5.0	735
	23	71	145	14.8	4.2	605	5.5	790	4.0	575	5.3	765
	22	67	142	14.0	4.4	630	5.8	820	4.2	600	5.6	790
2400	25	73	147	15.3	4.0	595	5.3	775	3.9	565	5.1	745
	24	70	144	14.6	4.3	610	5.6	800	4.0	585	5.3	770
	23	66	141	13.8	4.5	635	5.9	825	4.3	605	5.6	795
	22	62	138	13.1	4.7	655	6.2	855	4.5	625	6.0	825
2300	25	69	144	14.4	4.3	615	5.6	805	4.1	585	5.4	775
	24	65	141	13.7	4.5	635	5.9	830	4.3	605	5.7	800
	23	62	138	13.0	4.8	655	6.2	855	4.5	625	6.0	825
	22	58	134	12.3	5.0	675	6.6	880	4.8	640	6.3	850
2200	25	64	140	13.4	4.6	645	6.1	845	4.4	615	5.8	815
	24	60	136	12.7	4.9	665	6.4	865	4.6	630	6.1	835
	23	57	133	12.1	5.1	680	6.7	885	4.9	645	6.4	855
	22	54	128	11.5	5.4	690	7.1	905	5.1	660	6.8	870
	21	51	123	10.9	5.7	700	7.5	915	5.4	670	7.2	885
	20	47	116	10.2	6.1	705	7.9	920	5.8	670	7.6	895
	19	44	108	9.6	6.5	700	8.4	910	6.1	665	8.1	890
	18	40	98	9.0	6.9	680	8.0	890	6.6	650	8.7	855

Figure 3-1 (Sheet 2 of 4).

CRUISE PERFORMANCE

SKIPLANE

NORMAL LEAN MIXTURE

Standard Conditions \curvearrowright Zero Wind \curvearrowright Gross Weight- 3350 Pounds
7500 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.						"SELECTOR VALVE" FUEL SYS.							
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)		62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	23	75	152	15.8	3.9	595	5.1	780	3.7	570	4.9	750						
	22	71	149	14.9	4.2	620	5.4	810	4.0	590	5.2	780						
	21	67	146	14.1	4.4	645	5.8	840	4.2	610	5.5	810						
	20	63	142	13.2	4.7	665	6.1	870	4.5	635	5.9	835						
2500	23	73	150	15.3	4.1	610	5.3	795	3.9	580	5.1	765						
	22	69	147	14.5	4.3	630	5.6	825	4.1	600	5.4	795						
	21	65	144	13.7	4.5	655	5.9	855	4.3	620	5.7	820						
	20	61	139	12.8	4.8	675	6.3	880	4.6	640	6.1	850						
2400	23	68	147	14.3	4.3	635	5.7	830	4.1	605	5.5	800						
	22	64	143	13.5	4.6	655	6.0	860	4.4	625	5.8	825						
	21	61	139	12.8	4.9	675	6.3	880	4.6	645	6.1	850						
	20	57	134	12.1	5.1	690	6.7	905	4.9	660	6.5	870						
2300	23	64	143	13.4	4.6	660	6.0	860	4.4	625	5.8	830						
	22	60	139	12.7	4.9	675	6.4	895	4.6	645	6.1	850						
	21	57	134	12.0	5.2	690	6.7	905	4.9	660	6.5	870						
	20	53	128	11.4	5.5	705	7.1	920	5.2	670	6.9	885						
2200	23	59	137	12.5	5.0	685	6.5	890	4.7	650	6.3	860						
	22	56	133	11.9	5.2	695	6.8	910	5.0	660	6.6	875						
	21	53	128	11.2	5.5	705	7.2	920	5.2	670	6.9	885						
	20	49	121	10.6	5.8	710	7.6	925	5.6	675	7.3	890						

Figure 3-1 (Sheet 3 of 4).

CRUISE PERFORMANCE

SKIPLANE

NORMAL LEAN MIXTURE

Standard Conditions \curvearrowright Zero Wind \curvearrowright Gross Weight- 3350 Pounds
10,000 FEET

RPM	MP	% BHP	TAS MPH	GAL/HOUR	"ON-OFF" FUEL SYS.						"SELECTOR VALVE" FUEL SYS.							
					62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)		78 GALLONS (NO RESERVE)		62 GALLONS (NO RESERVE)		81 GALLONS (NO RESERVE)		59 GALLONS (NO RESERVE)	
					ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES	ENDR. HOURS	RANGE MILES
2550	21	70	152	14.6	4.3	645	5.6	840	4.0	615	5.4	810						
	20	66	147	13.7	4.5	665	5.9	870	4.3	635	5.7	835						
	19	61	142	12.9	4.8	685	6.3	895	4.6	655	6.1	865						
	18	57	136	12.0	5.2	700	6.7	915	4.9	670	6.5	885						
2500	21	67	149	14.1	4.4	655	5.7	855	4.2	625	5.5	825						
	20	63	145	13.3	4.7	675	6.1	885	4.4	645	5.9	850						
	19	59	140	12.5	5.0	695	6.5	905	4.7	660	6.3	875						
	18	55	133	11.7	5.3	710	6.9	925	5.1	675	6.7	890						
2400	21	63	145	13.2	4.7	680	6.1	885	4.5	645	5.9	850						
	20	59	140	12.5	5.0	695	6.5	905	4.7	660	6.2	870						
	19	55	134	11.7	5.3	705	6.9	925	5.0	670	6.6	880						
	18	51	126	11.0	5.6	710	7.4	930	5.4	675	7.1	895						
2300	21	59	139	12.4	5.0	695	6.5	905	4.7	660	6.3	875						
	20	55	134	11.8	5.3	705	6.9	925	5.0	670	6.6	890						
	19	52	127	11.1	5.6	710	7.3	930	5.3	675	7.1	895						
	18	48	118	10.4	6.0	705	7.8	925	5.7	675	7.5	890						
2200	21	55	133	11.6	5.3	710	7.0	925	5.1	675	6.7	890						
	20	51	126	11.0	5.6	710	7.4	930	5.4	675	7.1	895						
	19	48	118	10.4	6.0	705	7.8	925	5.7	680	7.5	890						
	18	44	109	9.7	6.4	695	8.3	910	6.1	660	8.0	875						

Figure 3-1 (Sheet 4 of 4).