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INTRODUCTION

The purpose of this section is to present the owner or operator with information needed to facilitate planning of flights with reasonable accuracy.

The Performance Data and charts presented herein are calculated, based on actual flight tests with the airplane and engine in good condition and the engine power control system properly adjusted.

The flight test data has been corrected to International Standard Atmosphere conditions and then expanded analytically to cover various airplane gross weights, operating altitudes, and outside air temperatures.

VARIABLES

It is not possible to make allowances in the charts for varying levels of pilot technique, proficiency or environmental conditions. Mechanical or aerodynamic changes are not authorized because they can affect the performance or flight characteristics of the airplane. The effect of such things as soft runways, sloped runways, winds aloft or airplane configuration changes must be evaluated by the pilot. However, the performance on the charts can be duplicated by following the stated procedures in a properly maintained MOONEY M20R OVATION 2 GX.

Examples are given to show how each chart is used. The only charts with no example are those where such an example of use would be repetitive.

To obtain effect of altitude and OAT on aircraft performance:

1. Set altimeter to 29.92 and read "pressure altitude".
2. Using the OAT grid for the applicable chart read the corresponding effect of OAT on performance.

-CAUTION-

Be sure to return to local altimeter setting in calculating aircraft elevation above sea level.

OPERATIONAL PROCEDURES FOR MAXIMUM FUEL EFFICIENCY

For maximum fuel efficiency on the M20R OVATION 2 GX, proper mixture leaning during cruise flight must be accomplished. The TCM IO-550-G(6) engine in the M20R OVATION 2 GX has been designed to attain maximum fuel efficiency at desired cruise power. Best power mixture (at 2400 RPM) has been determined to be 50°F (10°C) rich of peak EGT. EGT is usually a more accurate indication of engine operation and fuel burn than indicated fuel flow. Therefore, it is recommended that the mixture be set using EGT as the primary reference instead of setting to a particular fuel flow.

The following procedures is recommended for setting cruise power and leaning to best economy at 75% power or less.

1. After leveling off, set manifold pressure and RPM for the desired cruise power settings as shown in this SECTION. At this point, mixture is at full rich from the climb.
2. Slowly move mixture control toward lean while observing EGT indicator. If leaning mixture toward peak EGT causes the original manifold pressure setting to change, adjust throttle to maintain that desired cruise manifold pressure and continue leaning until best economy setting is obtained.



PERFORMANCE CONSIDERATIONS

RANGE and ENDURANCE ASSUMPTIONS

Range and endurance allowance is based on climbing at maximum continuous power to cruise altitude.

Range and endurance reserves of 45 minutes at cruise power have been allowed for. Other conditions used for Range and Endurance are listed on each chart.

OPTIONAL PROPELLER DE-ICE BOOTS

With the optional propeller de-ice boots installed, expect climb performance to be degraded approximately 50 FPM from what is presented in the manual.

LANDING GEAR DOORS

When snow and ice are likely to be present on taxi and runway surfaces, inboard landing gear doors should be removed. Accumulation of ice and snow could prevent landing gear operation.

If inboard landing gear doors are removed, a decrease in cruise speed and range can be expected and should be considered in preflight planning. To be conservative the following figures should be used:

Decrease of true airspeed at normal cruise power setting by approximately 5 KTAS.

An approximate adjustment to range data shown in this manual can be made based on flight time planned with landing gear doors removed from aircraft. For example, using the above cruise speed decrease for a 5 hour flight will result in a decrease in range of approximately 25 N.M.:

5 HR X 5 KTS = 25 N.M. reduction in range.

-CAUTION-

Zero wind conditions seldom occur. In addition, varying atmospheric conditions, aircraft weight, mechanical condition of the aircraft and piloting techniques all affect the actual flight time and fuel used during a flight.

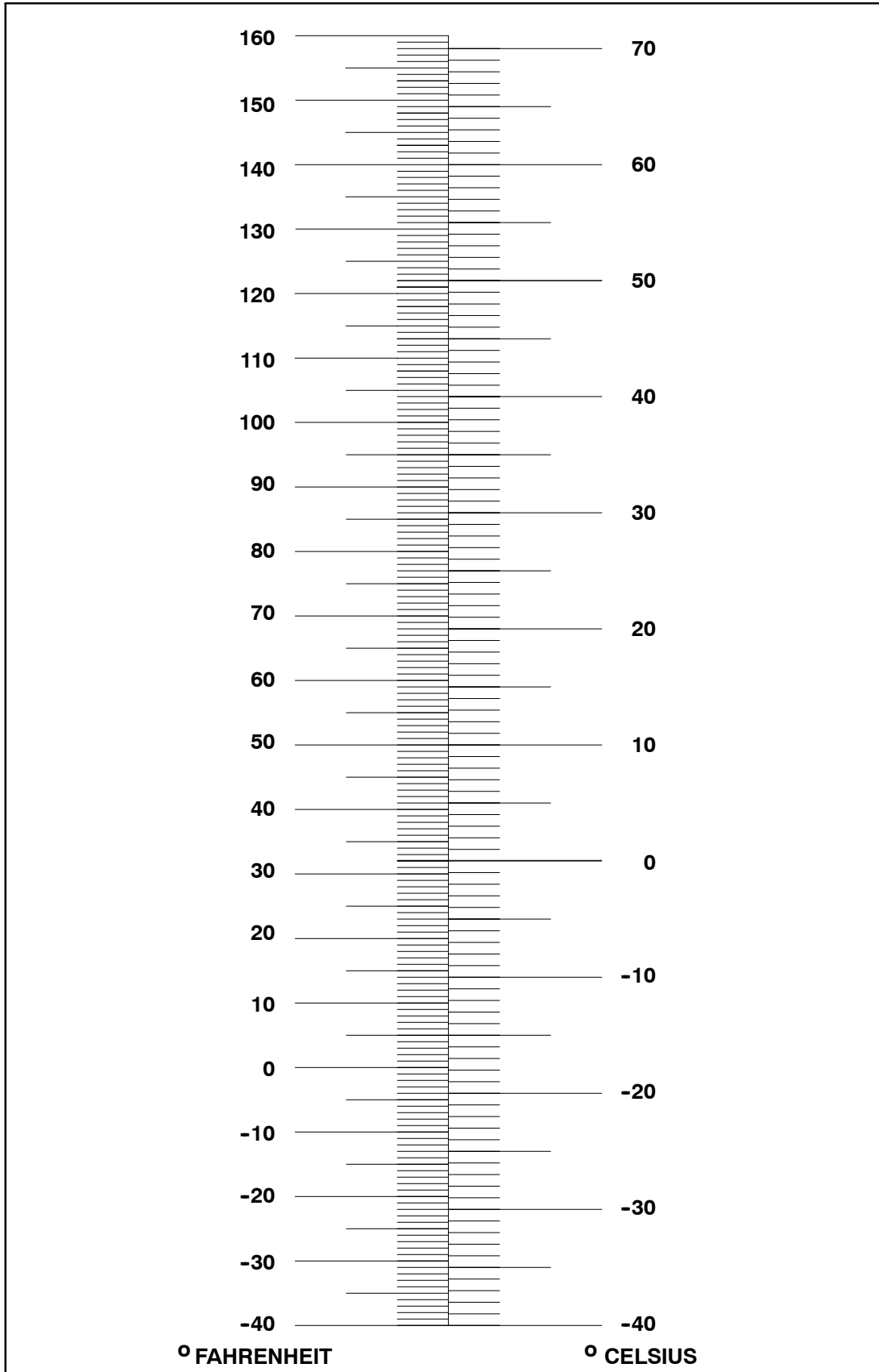
It is the pilot's responsibility to determine the actual operating conditions and plan the flight accordingly.

Performance with the Hartzell three-blade PHC-J3YF-1RF/F7693DF(B)-2 propeller and A-2295-10(P) Spinner installed is as follows:

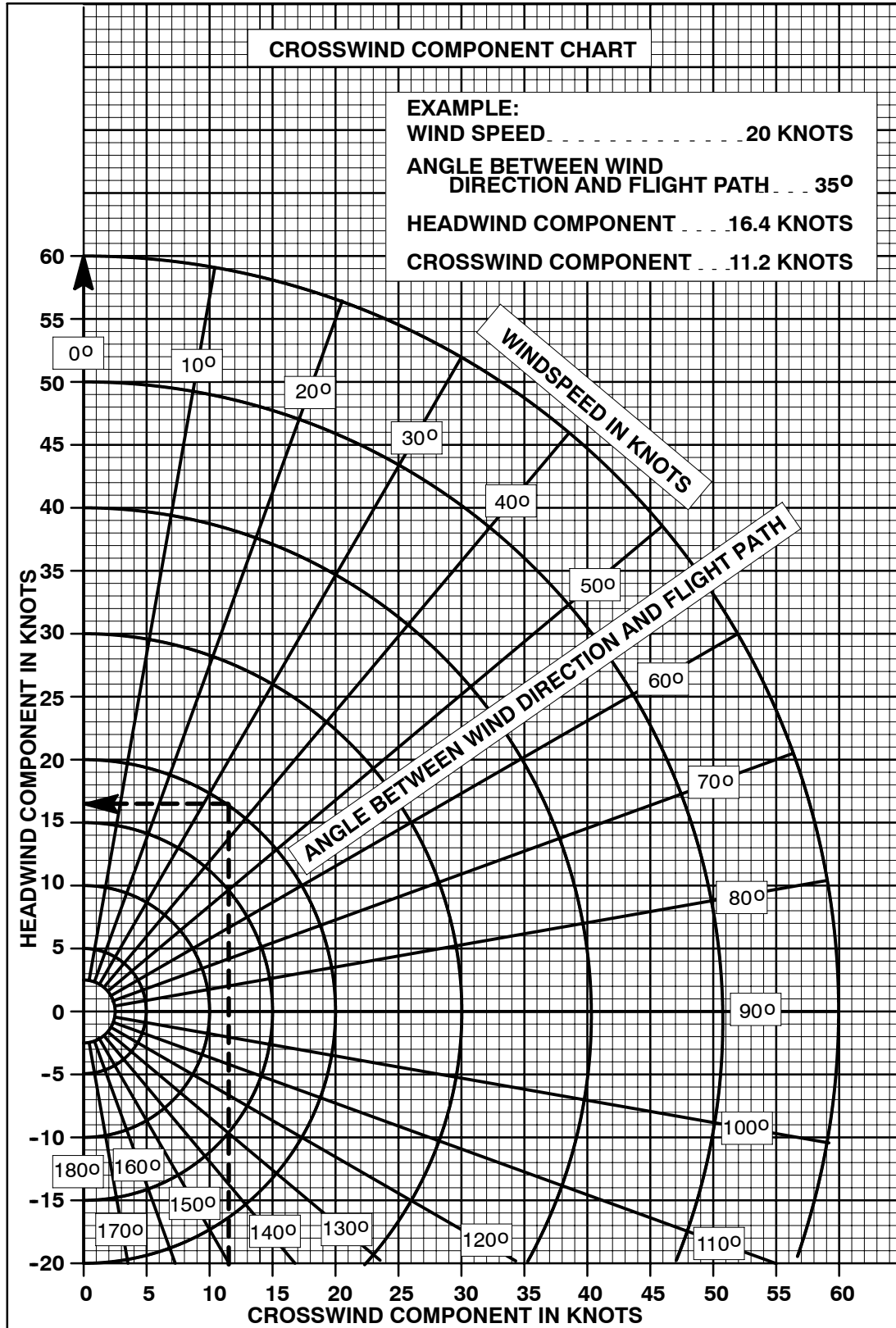
Takeoff Distance Reference Takeoff Distance Chart - Hard Surface (Normal)
Climb Performance Reference Maximum Rate of Climb Chart



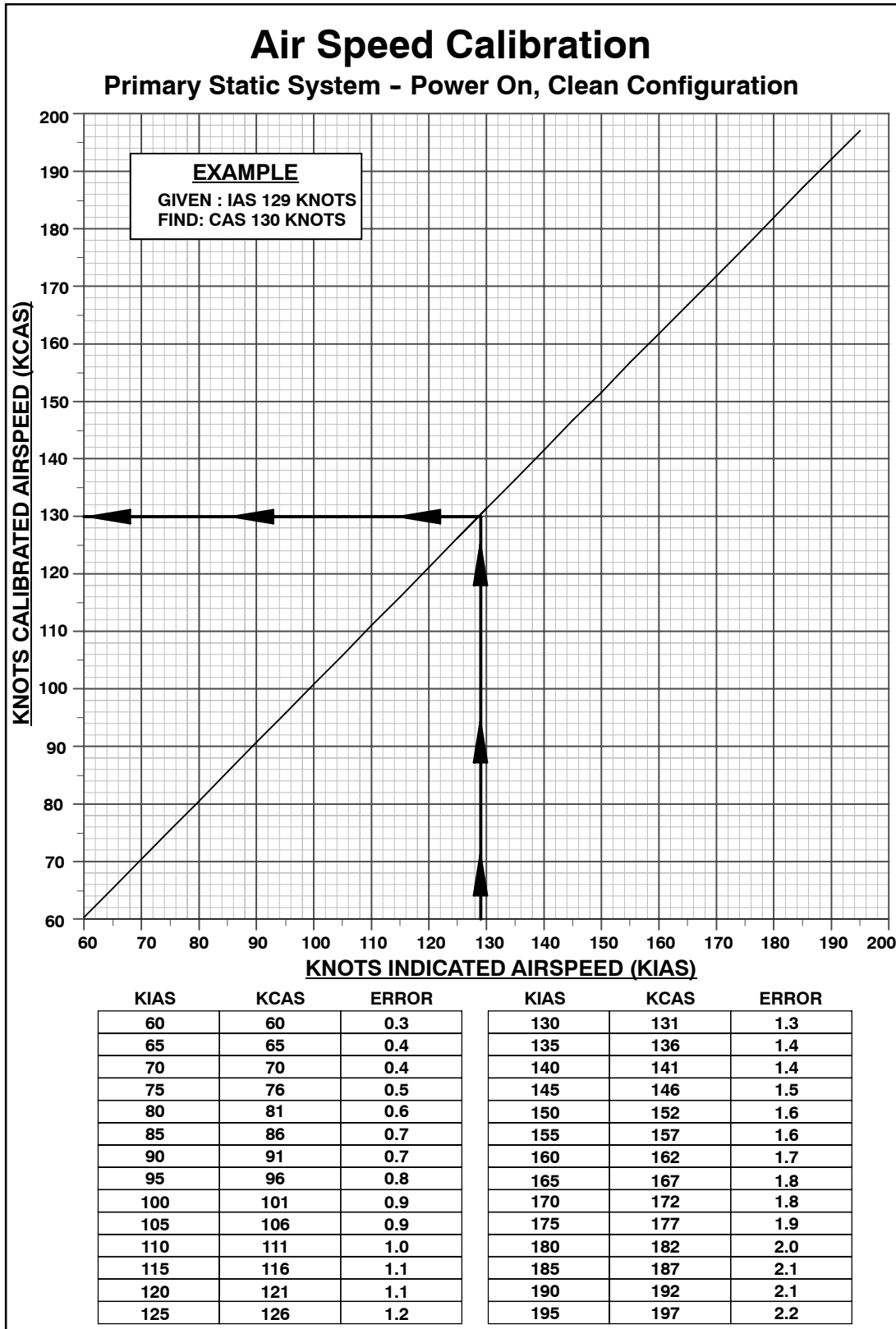
TEMPERATURE CONVERSION



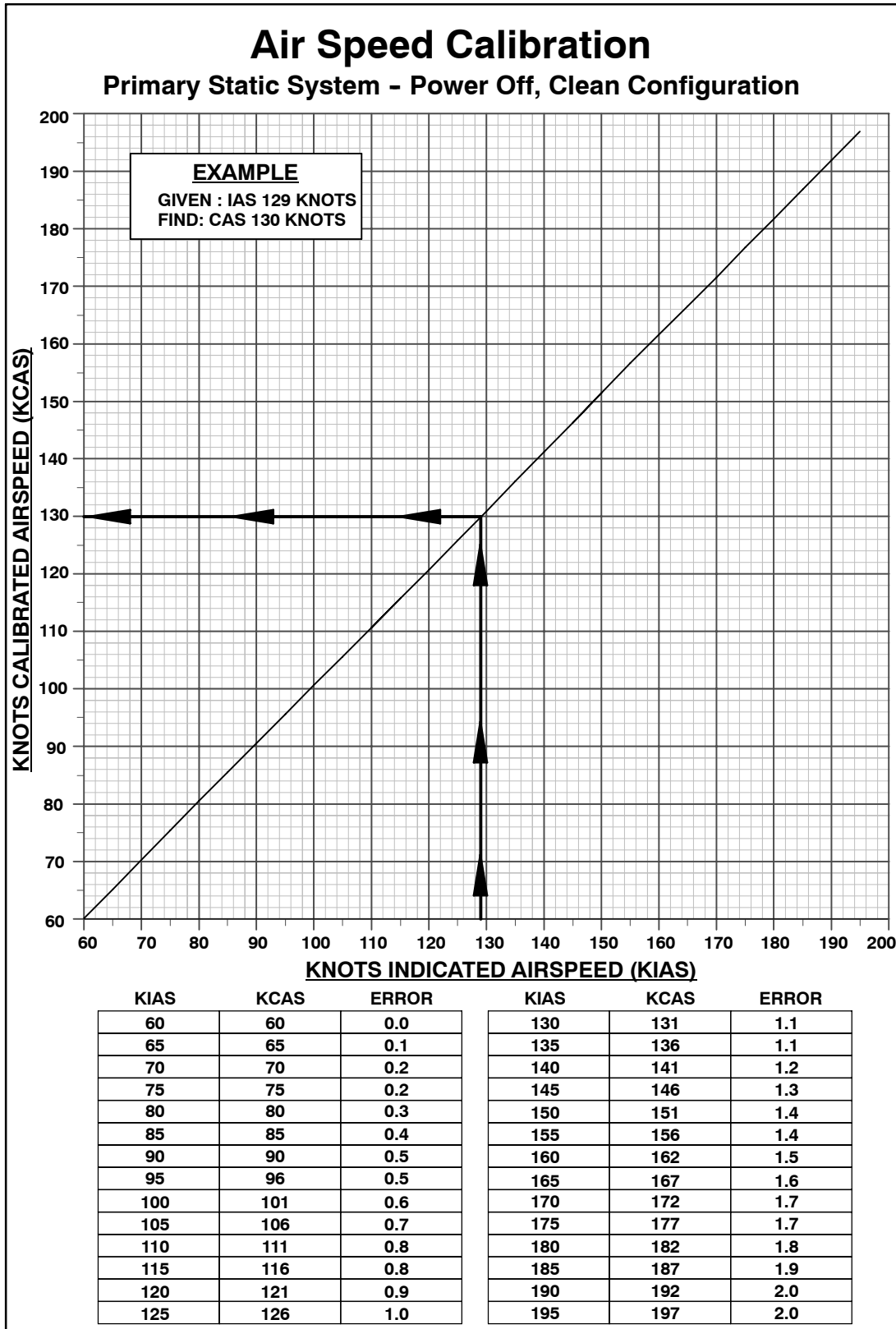
CROSSWIND COMPONENT CHART
DEMONSTRATED CROSS WIND IS 13 KNOTS (THIS IS NOT A LIMITATION)



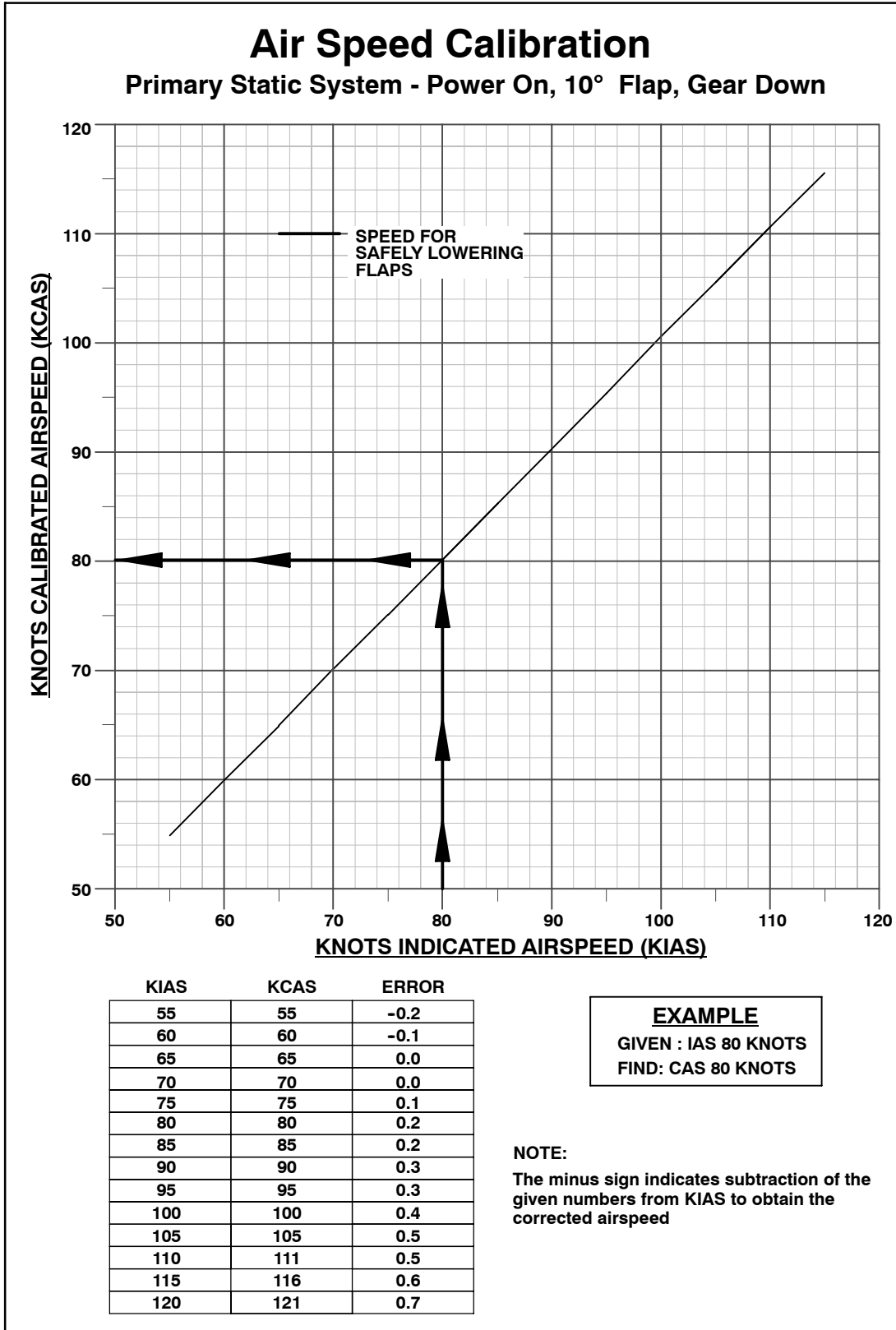
AIRSPEED CALIBRATION - PRIMARY STATIC SYSTEM
POWER ON, CLEAN CONFIGURATION



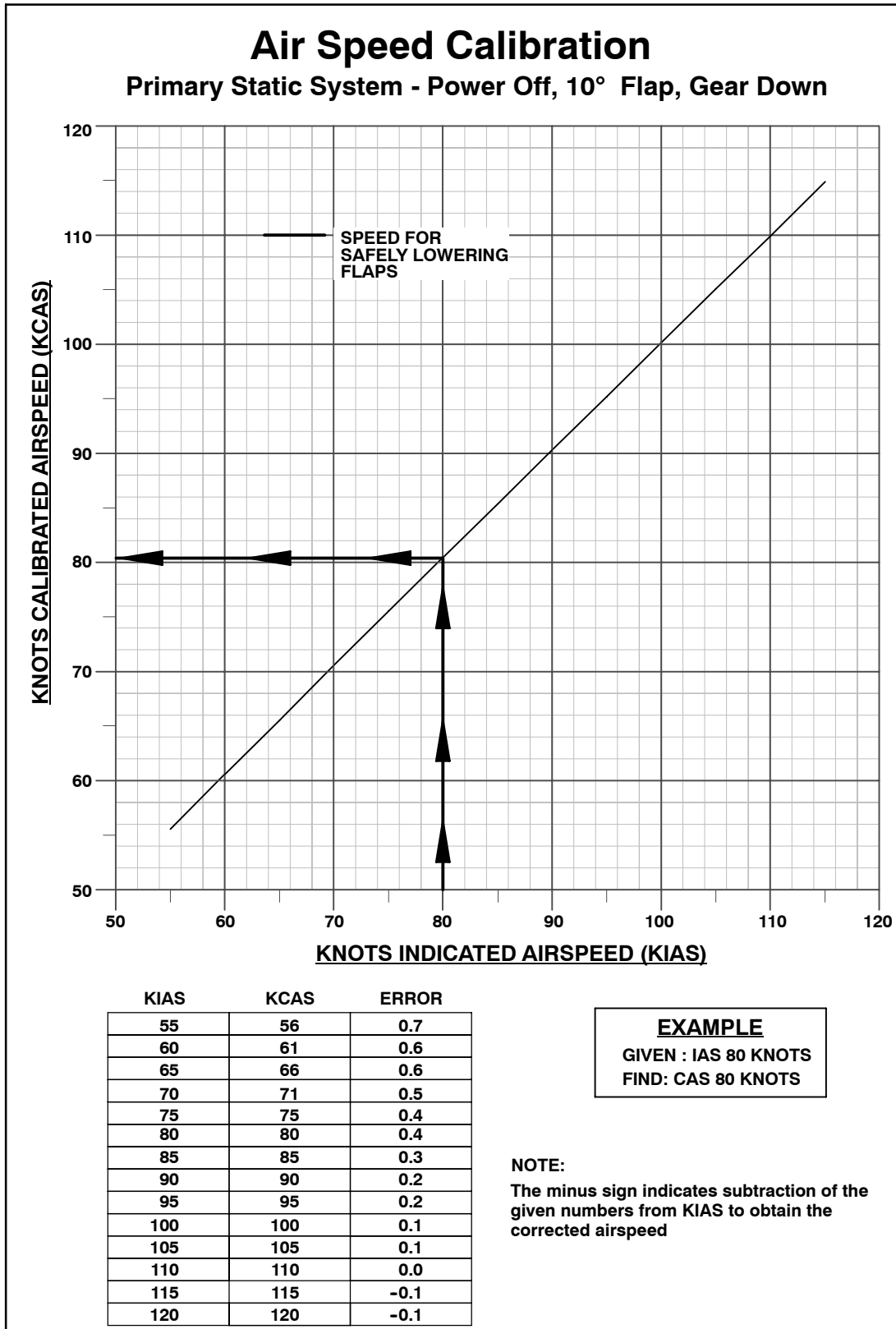
AIRSPEED CALIBRATION - PRIMARY STATIC SYSTEM
POWER OFF, CLEAN CONFIGURATION



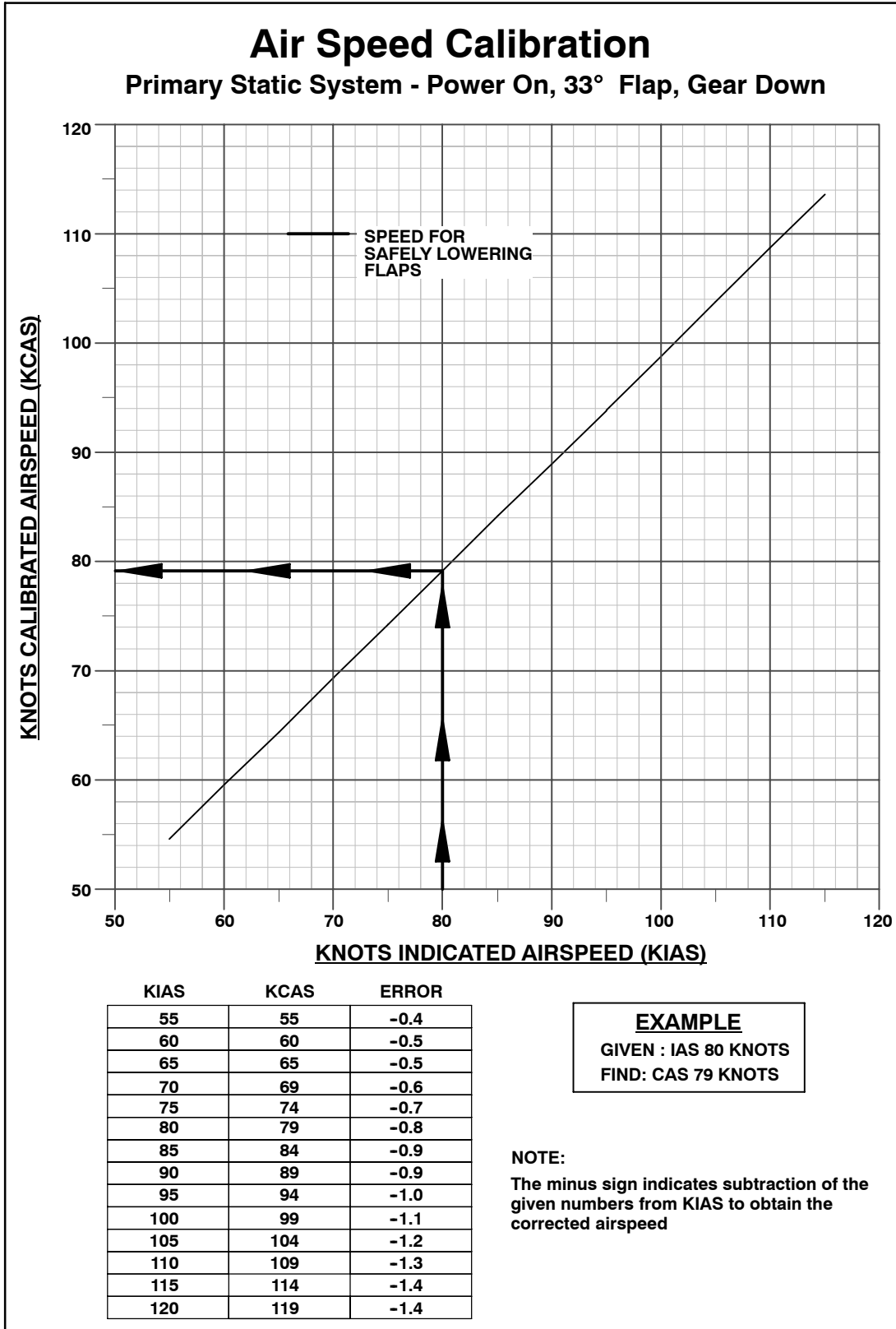
AIRSPEED CALIBRATION - PRIMARY STATIC SYSTEM
POWER ON, 10° FLAP, GEAR DOWN



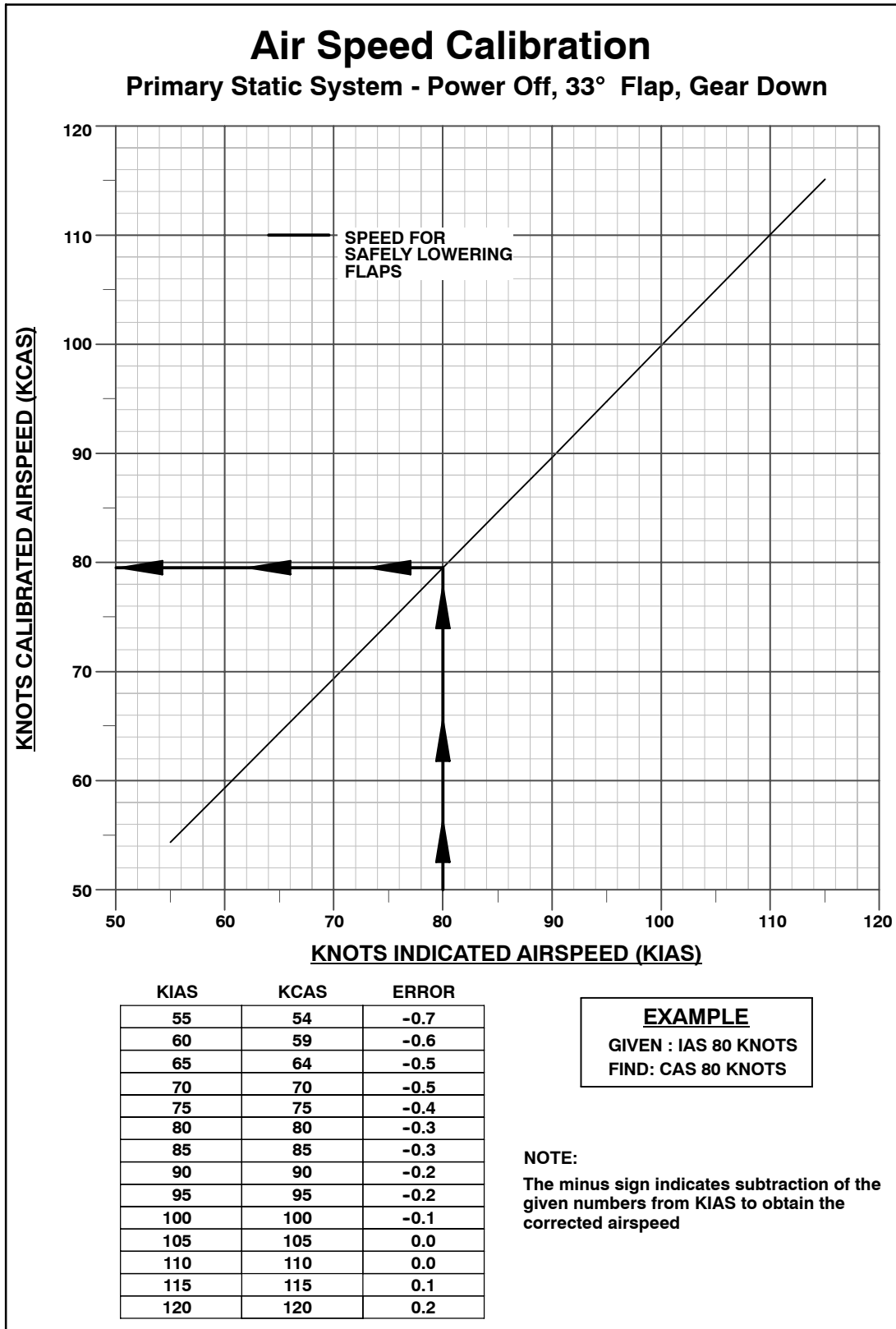
AIRSPEED CALIBRATION - PRIMARY STATIC SYSTEM
POWER OFF, 10° FLAP, GEAR DOWN



AIRSPEED CALIBRATION - PRIMARY STATIC SYSTEM
POWER ON, 33° FLAP, GEAR DOWN



AIRSPEED CALIBRATION - PRIMARY STATIC SYSTEM
POWER OFF, 33° FLAP, GEAR DOWN



AIRSPEED CALIBRATION - ALTERNATE STATIC SYSTEM

KIAS	GEAR & FLAPS UP KIAS	GEAR & FLAPS DN (10°) KIAS	GEAR & FLAPS DN (33°) KIAS
50	3.0	0.0	-1.0
60	1.5	-1.2	-2.0
70	0.0	-2.2	-3.2
80	-1.8	-3.2	-4.5
90	-2.8	-4.0	-6.0
100	-3.0	-4.7	-7.4
110	-3.0	-5.4	-8.8
120	-3.0	-	-
130	-3.6	-	-
140	-4.5	-	-
150	-5.1	-	-
160	-5.6	-	-
170	-6.1	-	-
180	-6.5	-	-
190	-7.2	-	-
200	-7.9	-	-

NOTE:

The minus sign indicates subtraction of the given numbers from KIAS to obtain the corrected airspeed.

**CONDITIONS: Power-ON, Storm Window & Vents - CLOSED,
Heater & Defroster - ON or OFF**



ALTIMETER CORRECTION - PRIMARY STATIC SYSTEM

---	SEA LEVEL			10,000 FT.			20,000 FT.		
	KIAS	Gear & Flaps UP	Gear Dn/10° Flaps	Gear DN/33° Flaps	Gear & Flaps UP	Gear Dn/10° Flaps	Gear DN/33° Flaps	Gear & Flaps UP	Gear Dn/10° Flaps
50	1	-1	-1	1	-1	-2	2	-2	-3
60	2	0	-2	2	0	-4	4	-1	-5
70	3	0	-4	4	0	-6	6	0	-8
80	4	1	-6	6	2	-8	9	2	-12
90	6	2	-8	9	3	-11	13	5	-16
100	8	4	-10	11	5	-14	17	8	-22
110	10	5	-13	15	8	-18	22	11	-27
120	12	-	-	18	-	-	27	-	-
130	15	-	-	22	-	-	33	-	-
140	18	-	-	27	-	-	40	-	-
150	22	-	-	31	-	-	47	-	-
160	25	-	-	37	-	-	55	-	-
170	29	-	-	42	-	-	63	-	-
180	33	-	-	48	-	-	72	-	-
190	38	-	-	55	-	-	82	-	-
200	42	-	-	62	-	-	92	-	-

NOTE:

The minus sign indicates subtraction of the given numbers from the indicated pressure altitude to obtain correct altitude, assuming zero instrument error.

EXAMPLE:

KIAS = 110 ALTIMETER CORRECTION: -7 ft.
 FLAPS = 10° (Subtract from Indicated Altitude)
 INDICATED PRESSURE ALTITUDE: 12,500 ft. PRESSURE ALTITUDE; = 12,493 ft.



ALTIMETER CORRECTION - ALTERNATE STATIC SYSTEM

---	SEA LEVEL			12,500 FT.			25,000 FT.		
	KIAS	Gear & Flaps UP	Gear Dn/10° Flaps	Gear DN/33° Flaps	Gear & Flaps UP	Gear Dn/10° Flaps	Gear DN/33° Flaps	Gear & Flaps UP	Gear Dn/10° Flaps
50	13	0	-4	20	0	-7	30	0	-10
60	8	-6	-11	12	-9	-16	18	-14	-24
70	0	-14	-20	0	-20	-29	0	-31	-45
80	-13	-23	-32	-19	-34	-47	-29	-51	-72
90	-23	-32	-48	-33	-47	-71	-50	-72	-108
100	-27	-42	-66	-39	-62	-97	-68	-94	-148
110	-30	-53	-87	-43	-78	-127	-66	-119	-194
120	-32	-	-	-48	-	-	-72	-	-
130	-53	-	-	-77	-	-	-118	-	-
140	-57	-	-	-84	-	-	-127	-	-
150	-69	-	-	-102	-	-	-155	-	-
160	-82	-	-	-128	-	-	-182	-	-
170	-95	-	-	-139	-	-	-211	-	-
180	-107	-	-	-158	-	-	-248	-	-
190	-126	-	-	-185	-	-	-282	-	-
200	-146	-	-	-215	-	-	-327	-	-

NOTE:

The minus sign indicates subtraction of the given numbers from the indicated pressure altitude to obtain correct altitude, assuming zero instrument error.

CONDITIONS:

Power - ON, Vents & Storm Window - CLOSED,
Heater & Defroster - ON or OFF.



STALL SPEED VS. ANGLE OF BANK

<p>ASSOCIATED CONDITIONS: FORWARD C.G. POWER IDLE</p>		<p>EXAMPLE: WEIGHT 3000 LBS (1361 KGS) LANDING GEAR DOWN FLAPS 10° ANGLE OF BANK 45° STALL SPEED 72.5 KCAS (73.0 KIAS)</p>											
		<p>NOTE: UP TO 500 FEET ALTITUDE LOSS MAY OCCUR DURING STALLS AT MAXIMUM WEIGHT</p>											
GROSS WEIGHT	GEAR AND FLAP POSITION	ANGLE OF BANK											
		0°		30°		40°		60°					
		KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS
3368 LBS (1528 KGS)	GEAR UP, FLAPS 0°	66.0	66.5	71.0	71.5	78.5	79.0	93.5	94.0				
	GEAR DOWN, FLAPS 10°	64.5	64.5	69.5	69.5	76.5	77.5	91.0	92.0				
	GEAR DOWN FLAPS 33°	59.0	59.0	63.5	63.5	70.0	70.0	83.5	84.5				
3000 LBS (1361 KGS)	GEAR UP, FLAPS 0°	62.5	63.0	67.0	67.5	74.5	75.0	88.5	89.5				
	GEAR DOWN, FLAPS 10°	61.0	61.0	65.5	65.5	72.5	73.0	86.5	87.5				
	GEAR DOWN FLAPS 33°	55.5	55.5	59.5	59.5	66.0	66.0	78.5	79.5				
2700 LBS (1225 KGS)	GEAR UP, FLAPS 0°	59.0	59.5	63.5	64.0	70.0	70.5	83.5	84.0				
	GEAR DOWN, FLAPS 10°	58.0	58.0	62.5	62.5	69.0	69.0	82.0	83.0				
	GEAR DOWN FLAPS 33°	53.0	53.0	57.0	57.0	63.0	63.0	75.0	76.0				



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TAKEOFF DISTANCE - HARD SURFACE (NORMAL)
CHART 1 OF 2

TAKEOFF DISTANCE - HARD SURFACE
(USE WITH CHART ON FOLLOWING PAGE)

TAKEOFF WEIGHT LBS (KGS)	TAKEOFF SPEED	SPEED AT 50 FT - KIAS
3368 LBS (1528 KGS)	67	82
3100 LBS (1406 KGS)	64	78
2700 LBS (1225 KGS)	59	74

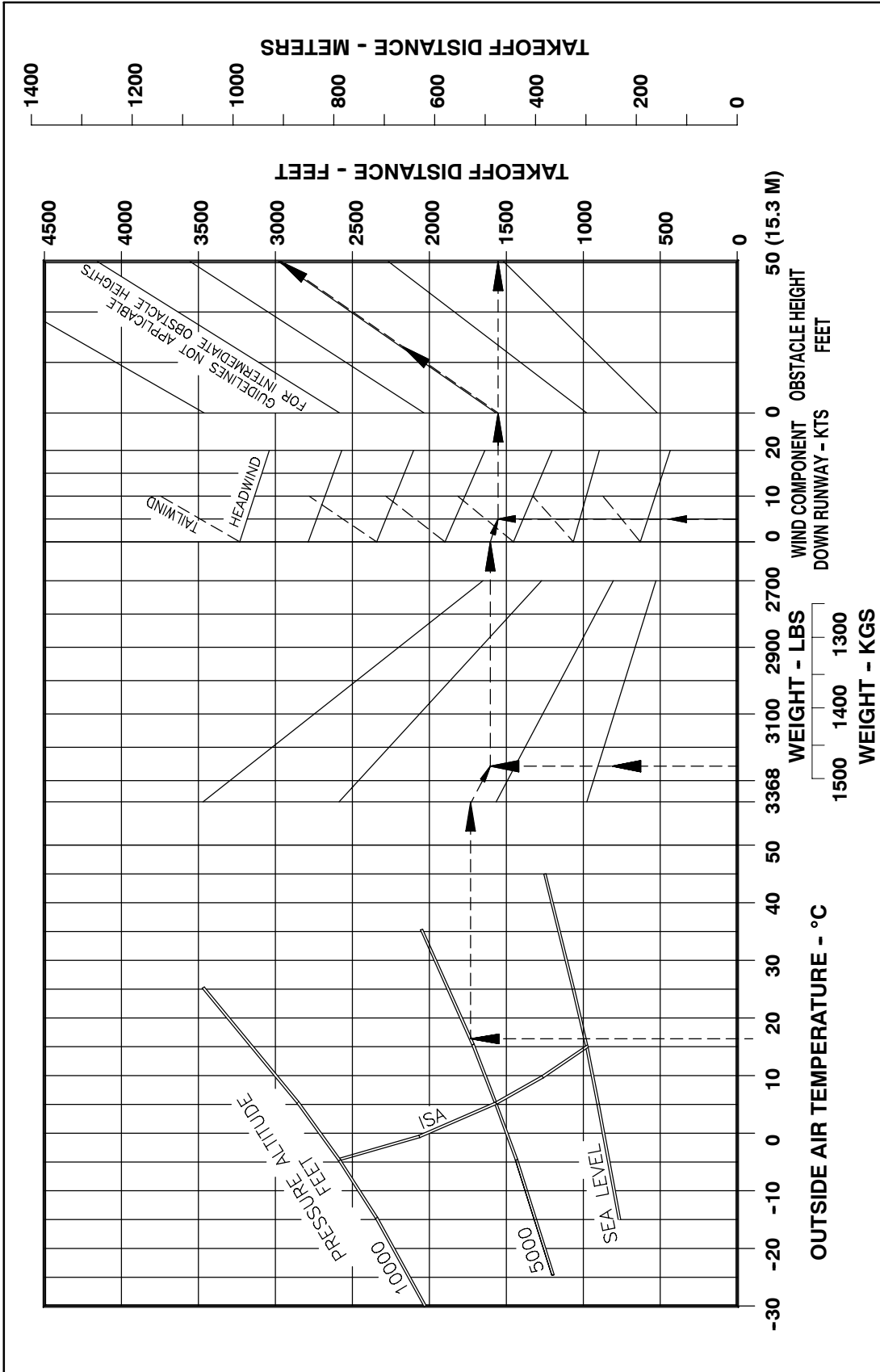
ASSOCIATED CONDITIONS:	
POWER:	FULL THROTTLE/2500 RPM
MIXTURE:	SET EGT TO TOP OF BLUE ARC AS REQUIRED
LDG GEAR:	DOWN UNTIL OBSTACLE CLEARED
WING FLAPS:	10°
RWY SURF.:	PAVED, LEVEL, DRY
HUMIDITY:	80% IS STANDARD

EXAMPLE:	
OAT:	17° C
PRESSURE ALTITUDE:	5000 FT
WEIGHT:	3250 LBS (1474 KGS)
HEADWIND COMPONENT:	5 KTS
GROUND ROLL:	1550 FT (472 M)
TOTAL TAKEOFF DISTANCE:	2900 FT (884 M) (50 FT OBSTACLE)

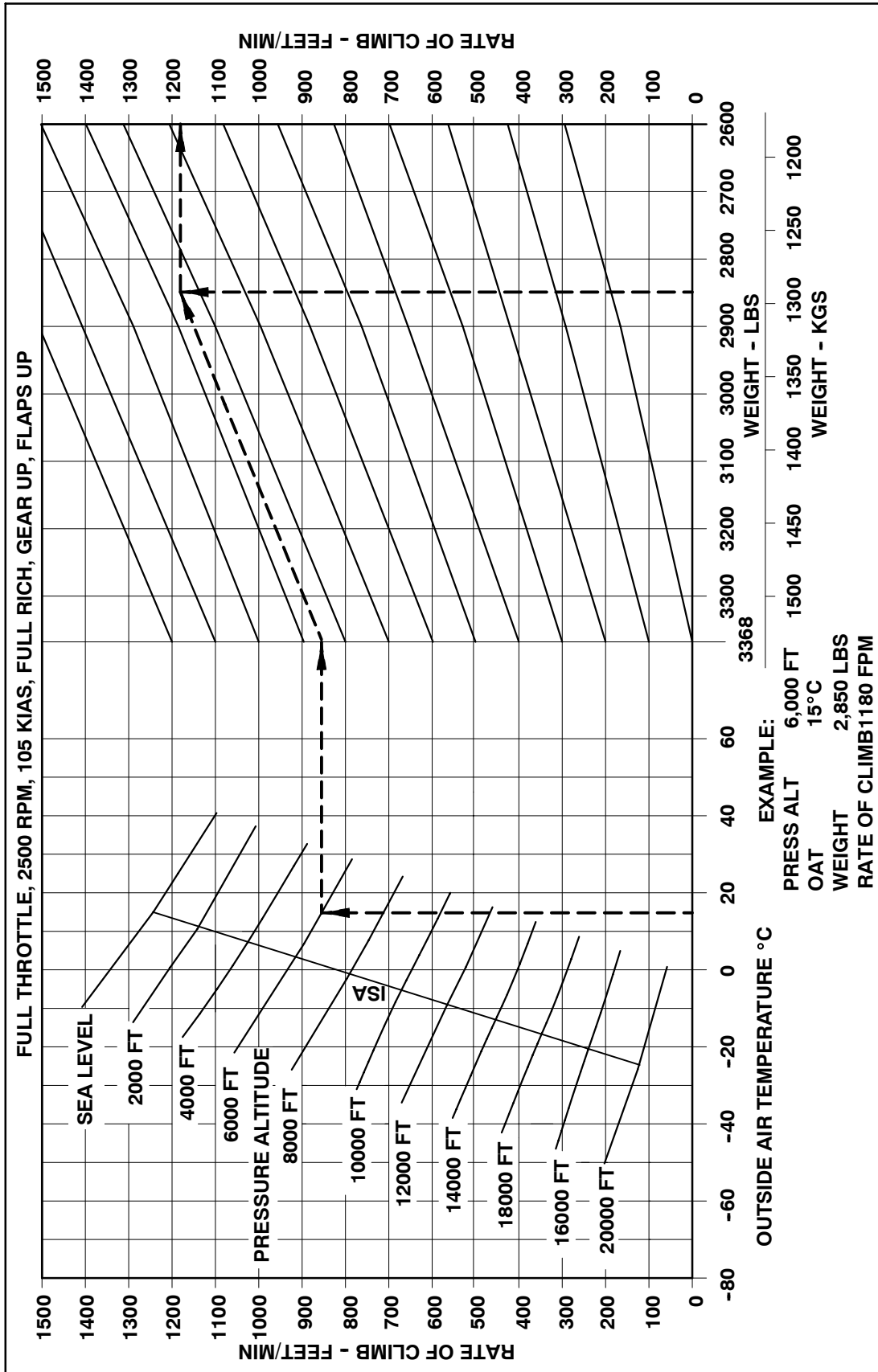
NOTE: 1. MAXIMUM DEMONSTRATED CROSSWIND IS 13 KNOTS.
2. CONDITIONS OF HIGH HUMIDITY CAN RESULT IN AN
INCREASE OF UP TO 10% TO THE TAKEOFF DISTANCE.



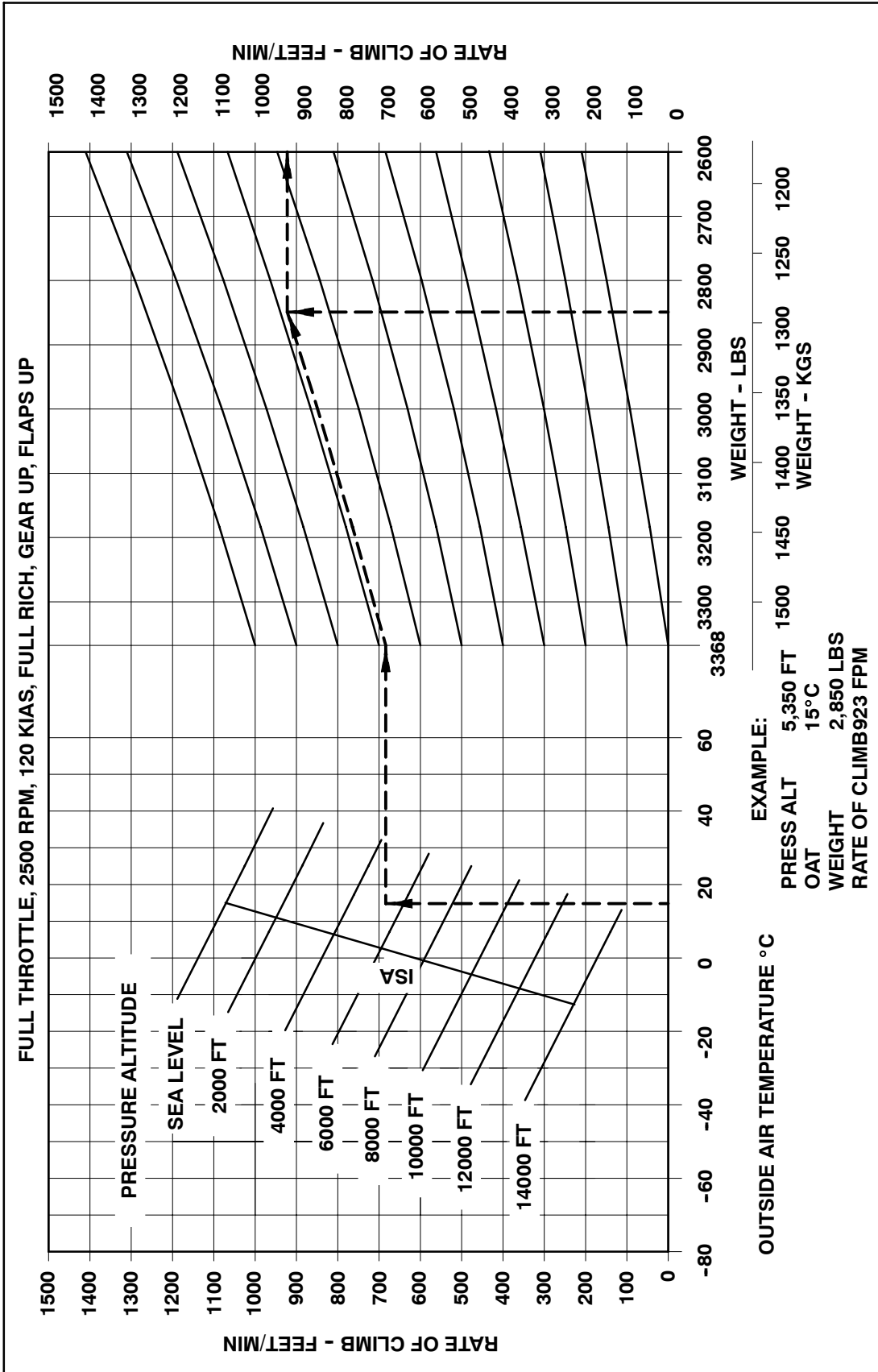
TAKEOFF DISTANCE - HARD SURFACE (NORMAL)
CHART 2 OF 2



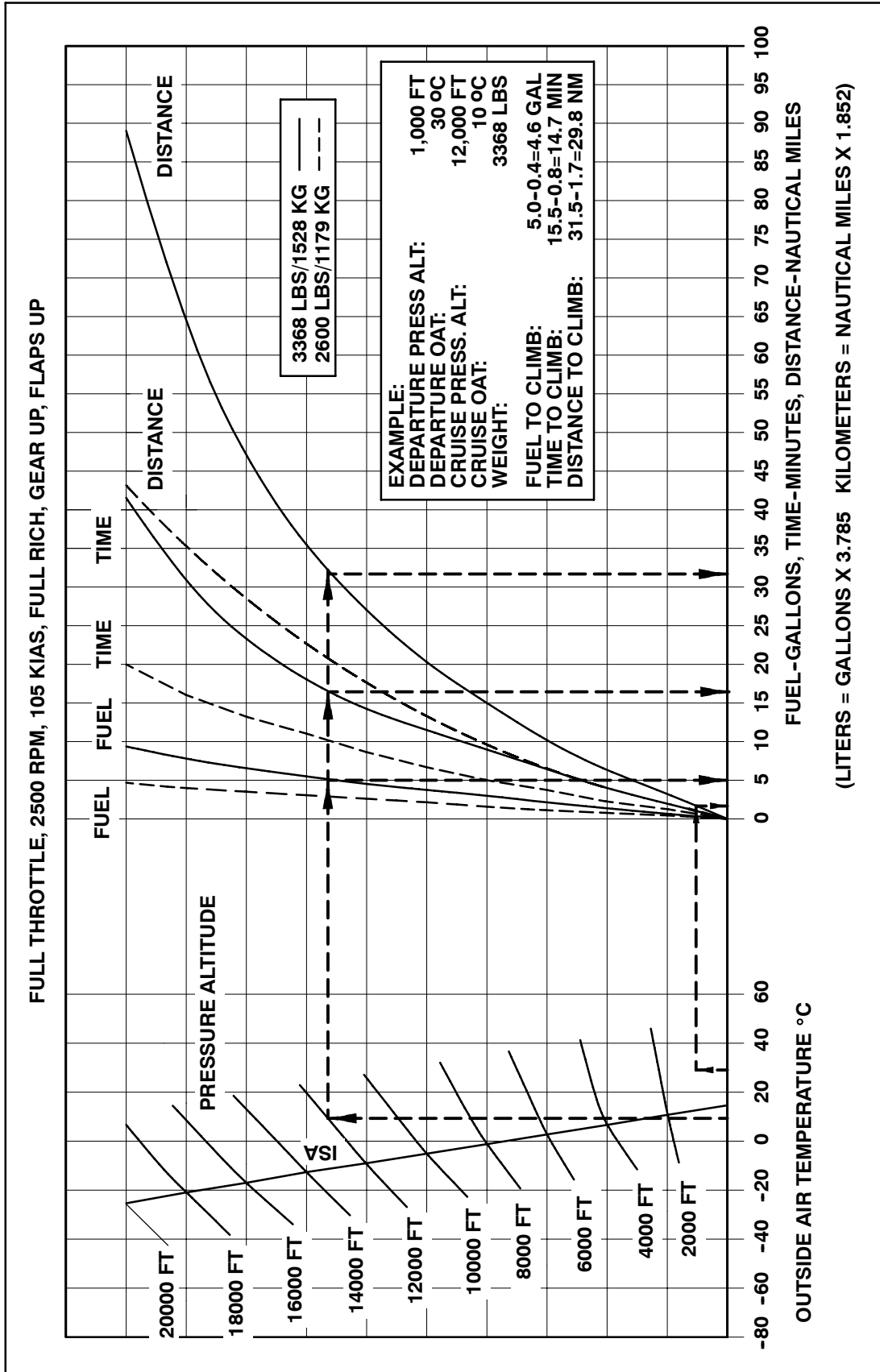
MAXIMUM RATE OF CLIMB
(HARTZELL THREE BLADE PROPELLER)



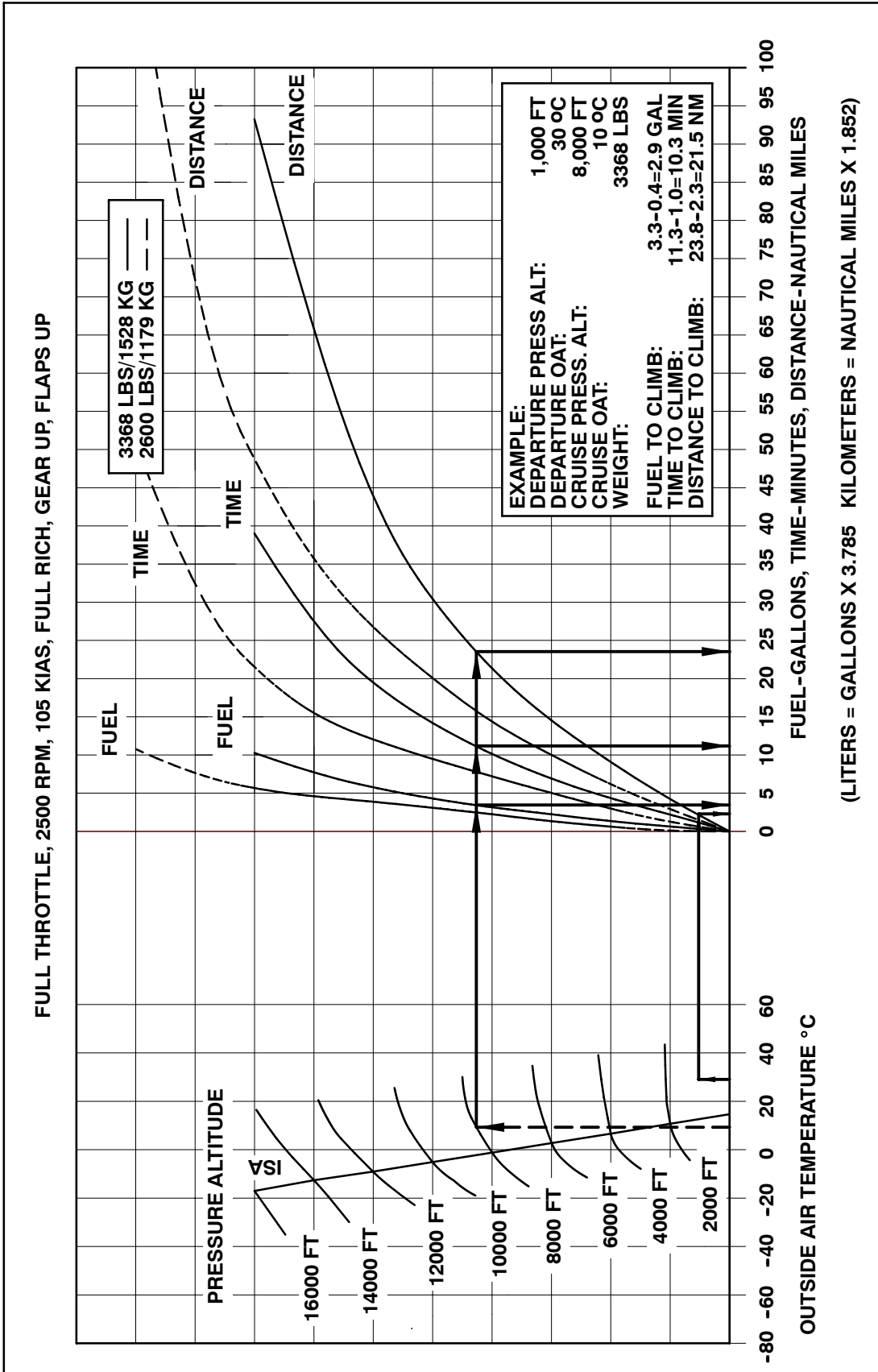
CRUISE RATE OF CLIMB



TIME-FUEL-DISTANCE TO CLIMB - MAX CLIMB



TIME-FUEL-DISTANCE TO CLIMB - CRUISE CLIMB



M20R OVATION 2 GX - CRUISE POWER SETTINGS & FUEL FLOWS - BEST POWER
CRUISE

M20R CRUISE POWER SETTINGS AND FUEL FLOWS BEST POWER 500 F RICH OF PEAK															
EXAMPLE: CRUISE ALT. 8,000 FT OAT 9°C (SEE NOTE) POWER SETTING DESIRED 75%															
RPM/MP 2500/22.3 FUEL FLOW 16.0	RPM		MAX. RECOM- MENDED	75% POWER			65% POWER			55% POWER			45% POWER		
	FUEL FLOW	BEST POWER		2400	2500	2300	2400	2500	2300	2400	2500	2300	2400	2500	
PRESSURE ALTITUDE (FEET)	17.8	17.9	16.0	15.9	16.0	13.9	14.0	14.1	11.9	12.0	12.1	10.1	10.2		
STD. DAY	STD. TEMP	MANIFOLD PRESSURE - INCHES OF MERCURY													
S.L.	15°C 59°F	27.0	26.2	25.5	24.5	23.2	22.9	21.9	20.8	20.5	19.4	18.3	17.2	16.4	
2,000	11°C 52°F	26.5	25.7	25.0	24.0	22.8	22.5	21.6	20.5	20.1	19.0	17.9	16.8	16.0	
4,000	7°C 45°F		25.2	24.4	23.4	22.5	22.1	21.3	20.2	19.7	18.7	17.6	16.3	15.7	
6,000	3°C 38°F			23.8	23.0	22.2	21.6	20.8	19.7	19.3	18.3	17.3	16.0	15.4	
8,000	-1°C 31°F					21.9	21.1	20.3	19.2	18.9	17.9	16.9	15.7	15.1	
10,000	-5°C 23°F						20.7	19.8	18.7	18.5	17.6	16.6	15.4	14.8	
12,000	-9°C 16°F							19.2	18.4	18.1	17.2	16.3	15.1	14.5	
14,000	-13°C 9°F									17.7	16.9	16.0	14.8	14.3	
16,000	-17°C 2°F											15.7	14.6	14.1	
18,000	-21°C -5°F												14.8	13.9	
20,000	-25°C -12°F													14.1	13.7

NOTE: ADD 0.4" MP FOR EACH 10 DEGREES C (18 DEGREES F) OAT ABOVE STANDARD DAY TEMPERATURE. SUBTRACT 0.4" MP FOR EACH 10 DEGREES C (18 DEGREES F) BELOW STANDARD DAY TEMPERATURE. IF OAT ABOVE STANDARD PRECLUDES OBTAINING THE DESIRED MP, USE NEXT HIGHER RPM/MP WITH APPROPRIATE TEMPERATURE CORRECTION TO MP.



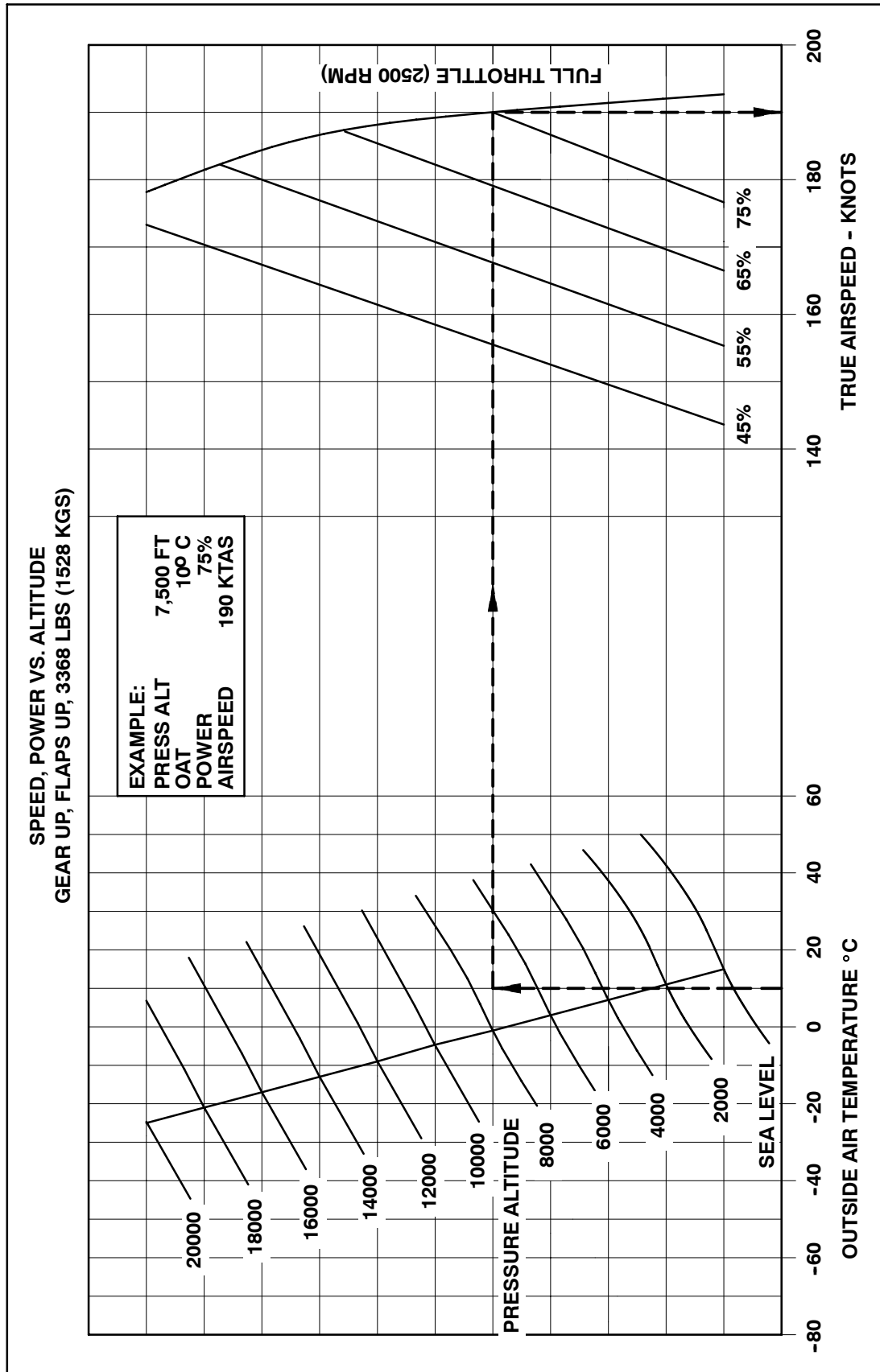
M20R OVATION 2 GX - CRUISE POWER SETTINGS & FUEL FLOWS - ECONOMY CRUISE

M20R CRUISE POWER SETTINGS AND FUEL FLOWS BEST ECONOMY 50 OF LEAN OF PEAK															
EXAMPLE: CRUISE ALT. 8,000 FT OAT 9°C (SEE NOTE) POWER SETTING DESIRED 65%															
RPM/MP FUEL FLOW 12.2	RPM	MAX. RECOM- MENDED		75% POWER			65% POWER			55% POWER			45% POWER		
		2400	2500	2300	2400	2500	2300	2400	2500	2300	2400	2500	2300	2400	2500
PRESSURE ALTITUDE (FEET)	FUEL FLOW BEST POWER	16.3	16.4	14.3	14.4	14.5	12.2	12.3	12.4	10.2	10.3	10.4	8.2	8.3	8.4
STD. DAY	STD. TEMP	MANIFOLD PRESSURE - INCHES OF MERCURY													
S.L.	15°C 59°F	28.2	27.4	26.7	25.7	24.4	24.1	23.1	22.0	21.7	20.6	19.5	19.2	18.4	17.6
2,000	11°C 52°F		26.9	26.2	25.2	24.0	23.7	22.8	21.7	21.3	20.2	19.1	18.7	18.0	17.2
4,000	7°C 45°F			25.6	24.6	23.7	23.3	22.5	21.4	20.9	19.9	18.8	18.1	17.5	16.9
6,000	3°C 38°F					23.4	22.8	22.0	20.9	20.5	19.5	18.5	17.8	17.2	16.6
8,000	-1°C 31°F						22.3	21.5	20.4	20.1	19.1	18.1	17.5	16.9	16.3
10,000	-5°C 23°F							21.0	19.9	19.7	18.8	17.8	17.1	16.6	16.0
12,000	-9°C 16°F									19.3	18.4	17.5	16.8	16.3	15.7
14,000	-13°C 9°F											17.2	16.5	16.0	15.5
16,000	-17°C 2°F												16.2	15.8	15.3
18,000	-21°C -5°F													15.6	15.1
20,000	-25°C -12°F														14.9

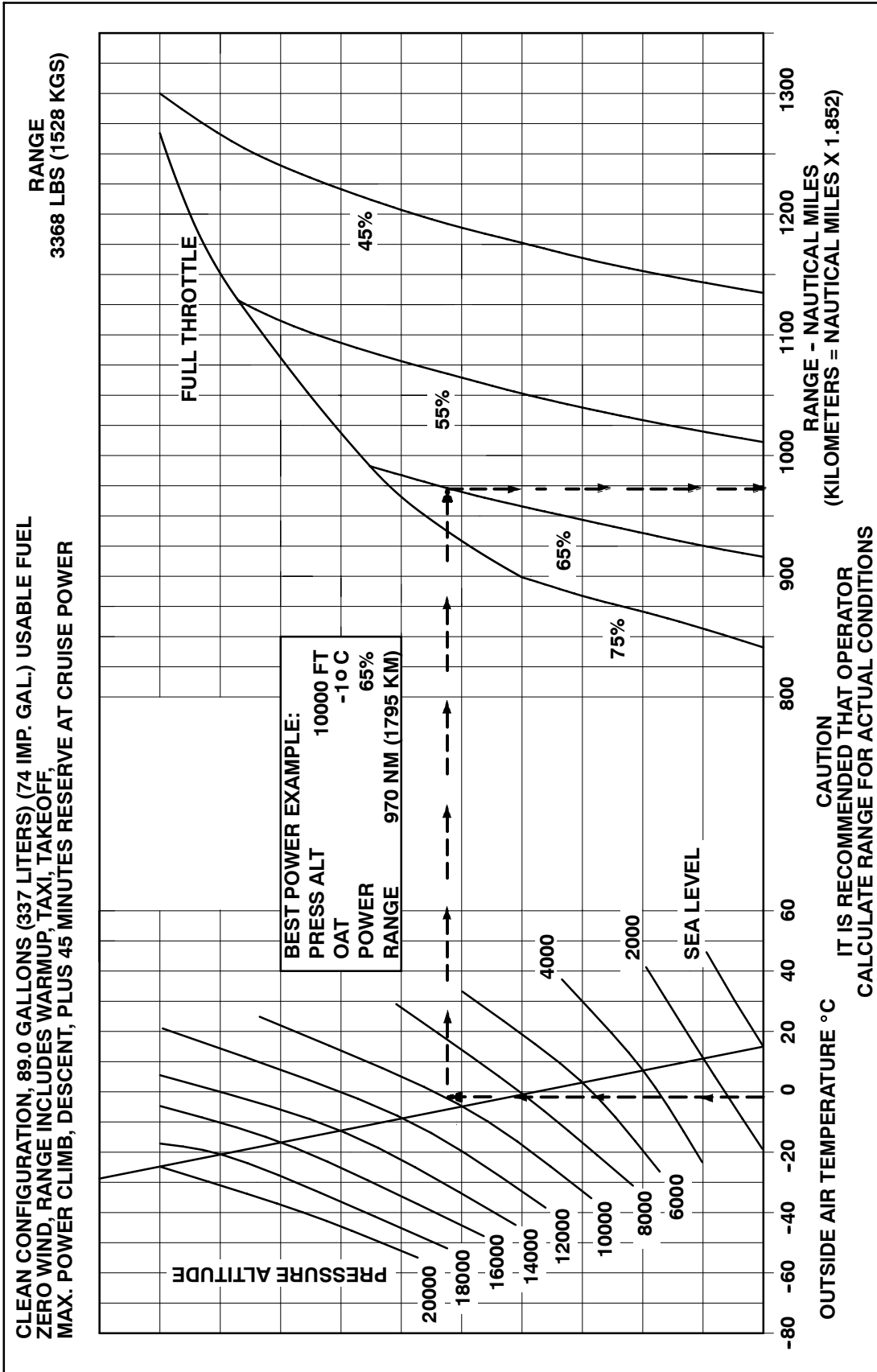
NOTE: ADD 0.4" MP FOR EACH 10 DEGREES C (18 DEGREES F) OAT ABOVE STANDARD DAY TEMPERATURE. SUBTRACT 0.4" MP FOR EACH 10 DEGREES C (18 DEGREES F) BELOW STANDARD DAY TEMPERATURE. IF OAT ABOVE STANDARD PRECLUDES OBTAINING THE DESIRED MP, USE NEXT HIGHER RPM/MP WITH APPROPRIATE TEMPERATURE CORRECTION TO MP.



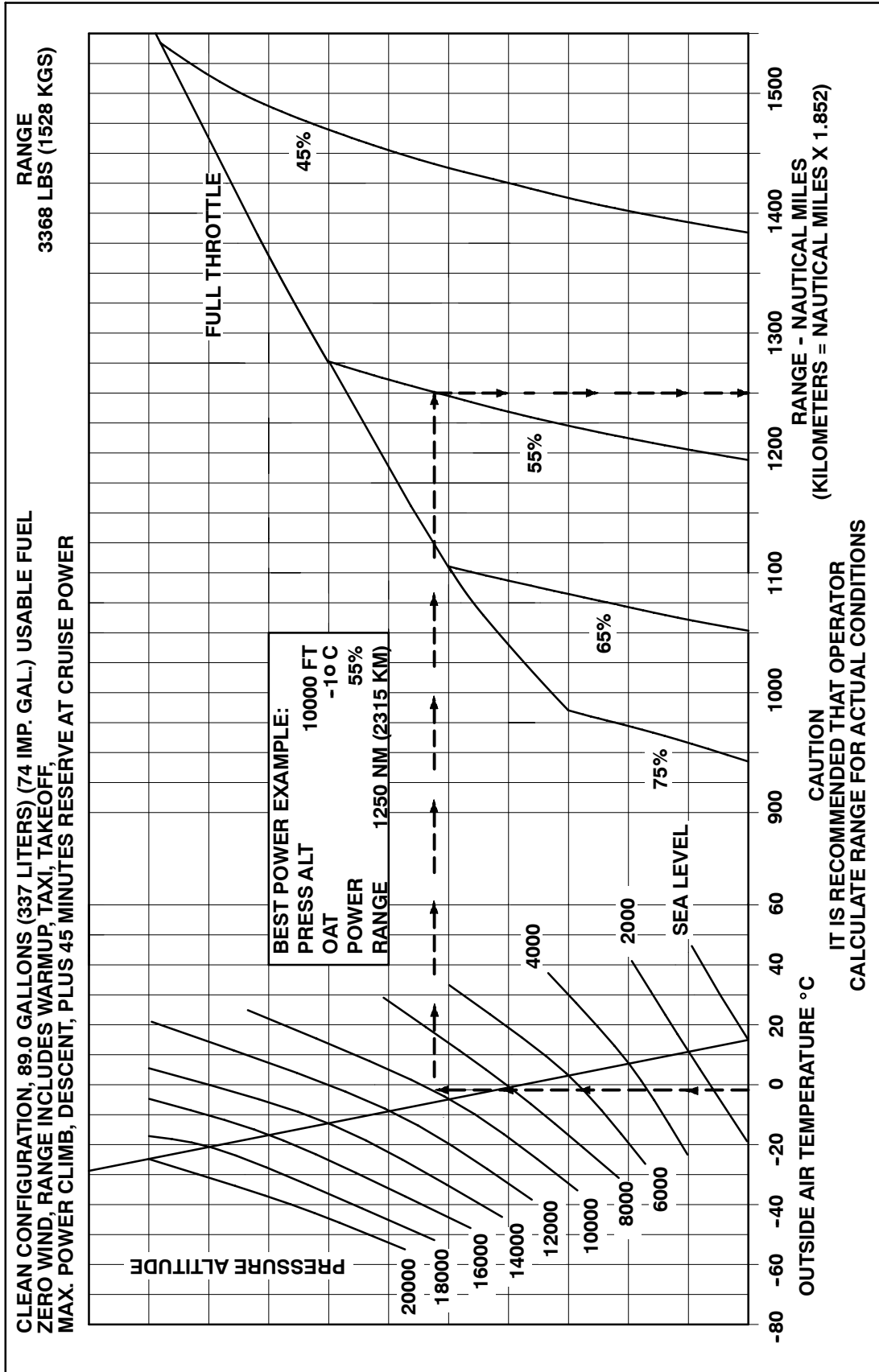
M20R OVATION 2 GX - SPEED POWER VS ALTITUDE



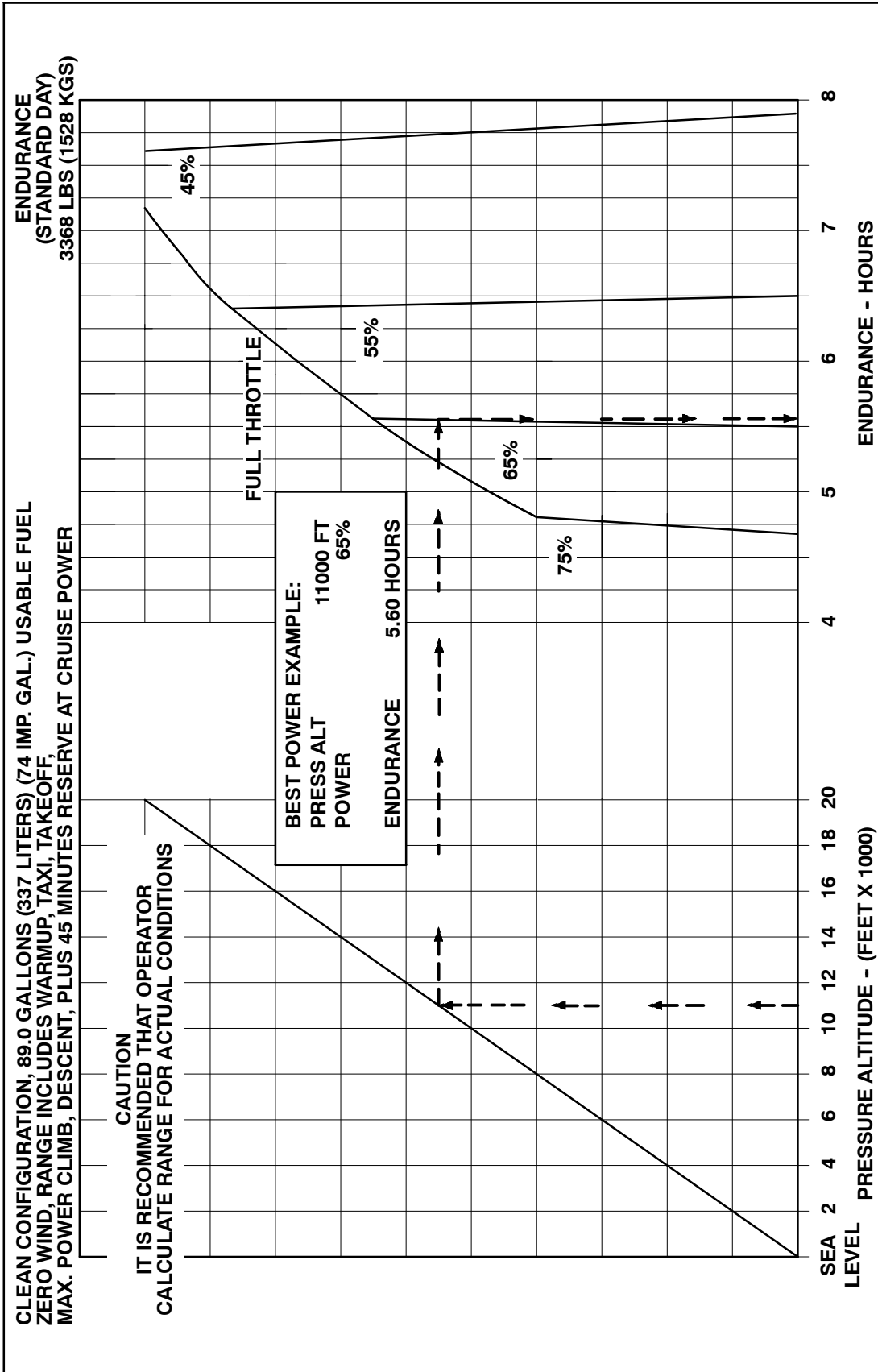
RANGE - BEST POWER



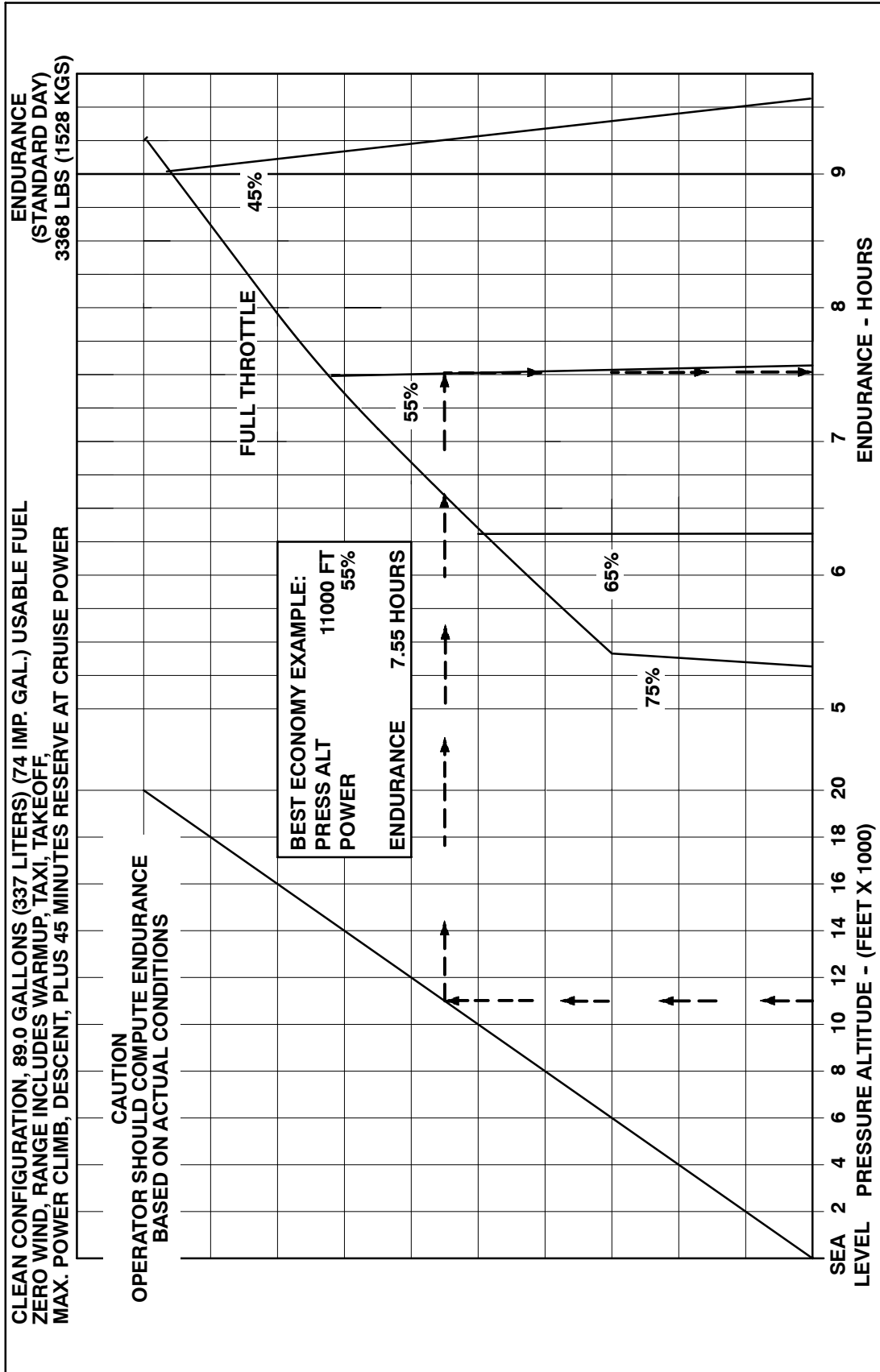
RANGE - BEST ECONOMY



ENDURANCE - BEST POWER



ENDURANCE - BEST ECONOMY

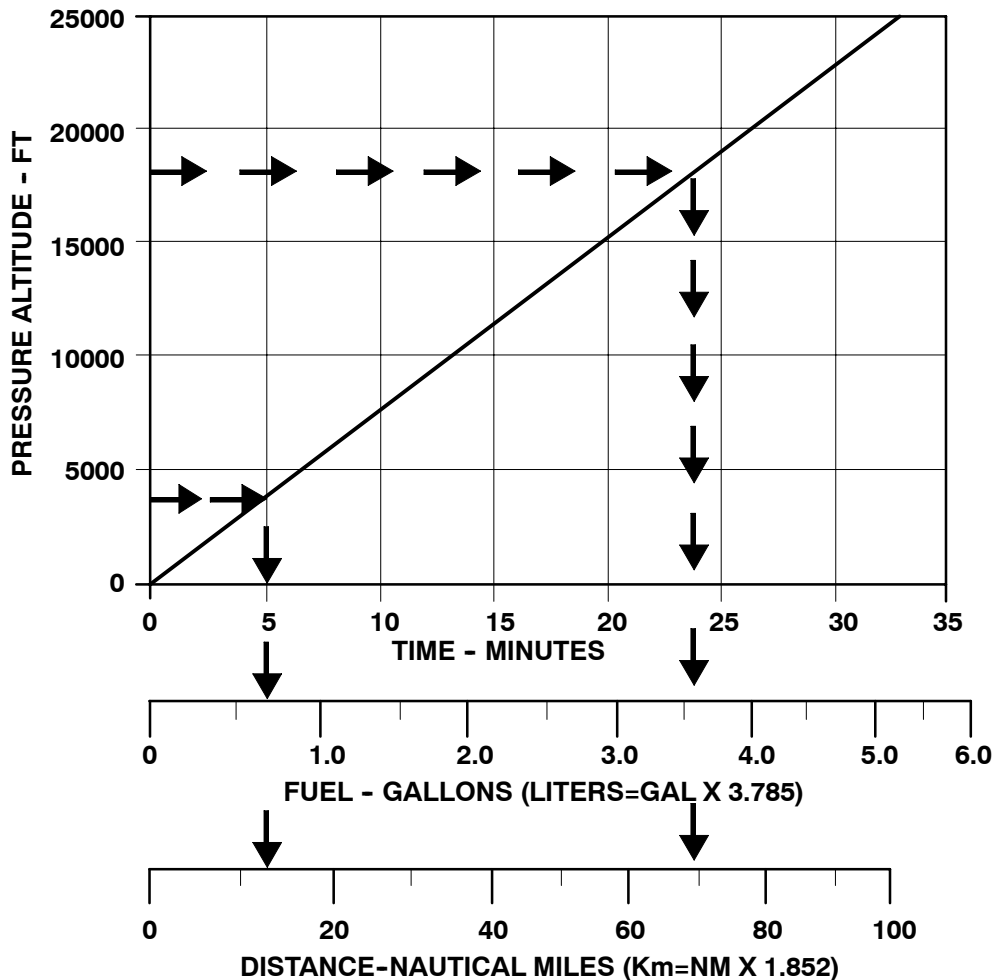


TIME-FUEL-DISTANCE TO DESCEND

150 KIAS DESCENT SPEED

ASSOCIATED CONDITIONS:
POWER 2000 RPM/MAP AS REQ'D. TO MAINTAIN 750 FPM RATE OF DESCENT
LANDING GEAR: UP
MIXTURE: LEAN TO BLUE ARC OR ENRICHEN FOR SMOOTHNESS

EXAMPLE:
INITIAL PRESSURE ALT: 18000
FINAL PRESSURE ALT: 4000
TIME TO DESCEND: 24.0-5.0=19 MINUTES
FUEL TO DESCEND: 3.6-0.7=2.9 GALLONS
DISTANCE TO DESCEND: 69.0-13.0=56.0 NAUTICAL MILES



LANDING DISTANCE - NORMAL
CHART 1 OF 2

LANDING DISTANCE
(USE WITH CHART ON FOLLOWING PAGE)

LANDING WEIGHT LBS (KGS)	APPROACH SPEED KIAS
3200 (1452)	75
2900 (1315)	71
2600 (1175)	68

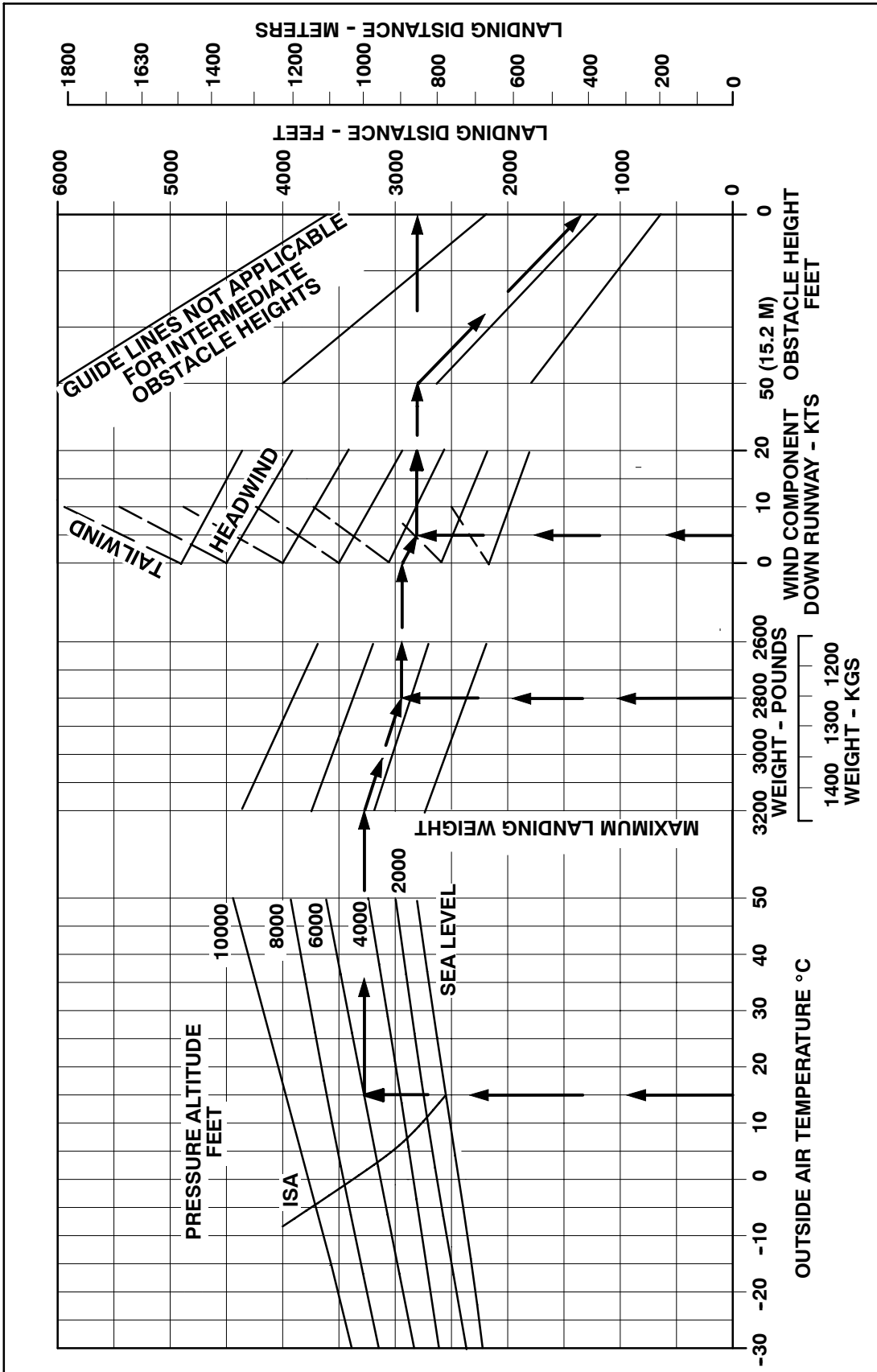
ASSOCIATED CONDITIONS:
POWER: IDLE LANDING GEAR: DOWN WING FLAPS: FULL DOWN (33°) BRAKING: MAXIMUM

EXAMPLE:
OAT: 150 C PRESSURE ALTITUDE: 6000 FT WEIGHT: 2800 LBS (1270 KGS) HEADWIND COMPONENT: 5 KTS GROUND ROLL: 1350 FT (411 M) TOTAL LANDING DISTANCE: 2800 FT (853 M) ((50 FT (15.2 M) OBSTACLE))

NOTE:
10 MAXIMUM DEMONSTRATED CROSSWIND IS 13 KNOTS.



LANDING DISTANCE - NORMAL
CHART 2 OF 2



BLANK

