

# AIRPLANE FLIGHT MANUAL SUPPLEMENT

FM1067

## FOR THE CESSNA MODEL 414A MODIFIED IN ACCORDANCE WITH STC'S SA4943SW AND SA4546SW

*Installation of RAM Winglets and Series III/IV Engines*

SERIAL NO: 414A-0641

REGISTRATION NO: N78DG

*This supplement is FAA approved and must be attached to the FAA-approved Airplane Flight Manual when the aircraft has been modified in accordance with STC SA 4943SW and STC SA 4546SW. The information contained in this document supplements or supersedes the Airplane Flight Manual only in those areas listed herein. For limitations, procedures, and performance not contained in this supplement, consult the Airplane Flight Manual.*

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Special Certification Office  
Federal Aviation Administration  
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## LOG OF REVISIONS

Rev.	Pages Affected	Description	Approval Date
—	—	Original Submittal	October 2, 1990
A	2,3,4,6,7,8,10,19.	Increased Zero Fuel Weight per STC SA4943SW revision no. 7. Added fuel flow limits for takeoff and MCP operations.	<b>FEB 16 1994</b>

FAA APPROVED

**FEB 16 1994**

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**NOTE:**

For information not contained in this supplement, see the Airplane Flight Manual or the Information Manual for the Cessna Model 414A.

# SECTION 1 GENERAL

## ENGINES

Teledyne Continental Motors TSIO-520-NB modified per STC SE4327SW

## PROPELLERS

Hartzell PHC-C3YF-2UF/FC7663D-2Q        -or-  
Hartzell PHC-C3YF-2UF/FC7663DB-2Q       -or-  
McCaughey 3AF32C93/82NC -6.0 to -7.0     -or-  
McCaughey 3AF32C505/82NEA -6.0 to -7.0

## MAXIMUM CERTIFICATED WEIGHTS

Maximum Ramp Weight:        7087 pounds  
Maximum Takeoff Weight:     7087 pounds  
Maximum Zero Fuel Weight:   6515 pounds  
Maximum Landing Weight:     6750 pounds

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## SECTION 2 LIMITATIONS

### AIRSPEED LIMITATIONS TABLE

SPEED	KIAS	KCAS	REMARKS	
Maneuvering Speed $V_A$ (knots)	151	146	Do not make abrupt control movements above this speed.	
Max. Flap Extended Speed $V_{FE}$ (knots)	15° 45°	171 145	175 145	Do not exceed this speed with the given flap setting.
Max. Gear Operating Speed $V_{LO}$ (knots)	178	175	Do not extend or retract landing gear above this speed.	
Max. Gear Extended Speed $V_{LE}$ (knots)	178	175	Do not exceed this speed with landing gear extended.	
Air Minimum Control Speed $V_{MCA}$ (knots)	80	79	This is the minimum flight speed at which the airplane is directionally controllable with one engine inoperative and with a 5° bank towards the operative engine.	
One Engine Inoperative Best Rate of Climb Speed $V_{YSE}$ (knots)	112	108	This speed delivers the greatest gain in altitude in the shortest possible time with one engine inoperative at sea level, standard day conditions, and 7087 pounds weight.	
Never Exceed Speed $V_{NE}$ (knots)	230	232	Do not exceed this speed in any operation.	
Max. Structural Cruising Speed $V_{NO}$ (knots)	201	200	Do not exceed this speed except in smooth air and then only with caution.	

### AIRSPEED INDICATOR TABLE

MARKING	KIAS VALUE OR RANGE	SIGNIFICANCE
Red Radial	80	Air minimum control speed.
White Arc	77 to 140	Operating speed range with 45° wing flaps. Lower limit is maximum weight stalling speed in landing configuration. Upper limit is maximum speed permissible with wing flaps extended 45°.
Green Arc	79 to 201	Normal operating range. Lower limit is maximum weight stalling speed with flaps and landing gear retracted. Upper limit is maximum structural cruising speed.
Blue Radial	112	One engine inoperative best rate-of-climb speed at sea level standard day conditions and 7087 pounds weight.
Yellow Arc	201 to 230	Caution range. Operations must be conducted with caution and only in smooth air.
Red Radial	230	Maximum speed for all operations.

**ENGINE LIMITATIONS**

Number of Engines: 2  
 Engine Manufacturer: Teledyne Continental Motors  
 Engine Model Number: TSIO-520-NB modified per STC SE4327SW  
 Engine Operating Limits for Takeoff and Maximum Continuous Power Operations

**RAM SERIES III ENGINE**

Manifold Pressure (In.Hg)	Engine Speed (rpm)	Fuel Flow (pph)	Power Output (hp)	Altitude Limit (feet)
40.0	2700	205	325	sea level
40.0	2700	205	325	13,000
38.0	2700	187	310	20,000
25.0	2700	125	200	30,000

**RAM SERIES IV ENGINE**

(TSIO-520-NB with RAM Camshaft, p/n 1058-3)

Manifold Pressure (In.Hg)	Engine Speed (rpm)	Fuel Flow (pph)	Power Output (hp)	Altitude Limit (feet)
41.0	2700	210	325	sea level
41.0	2700	210	325	13,000
39.0	2700	195	310	20,000
25.0	2700	125	200	30,000

**PROPELLER LIMITATIONS**

Hartzell PHC-C3YF-2UF/FC7663D-2Q

- and -

Hartzell PHC-C3YF-2UF/FC7663DB-2Q

Diameter: Maximum 76.0 inches  
 Minimum 76.0 inches  
 Pitch: Low  $14.0^{\circ} \pm 0.5^{\circ}$   
 Feather  $84^{\circ}$

McCauley 3AF32C93/82NC -6.0 to -7.0

- and -

McCauley 3AF32C505/82NEA -6.0 to -7.0

Diameter: Maximum 76.0 inches  
 Minimum 75.0 inches  
 Pitch: Low  $14.9^{\circ} \pm 0.2^{\circ}$   
 Feather  $81.2^{\circ} \pm 0.3^{\circ}$

**Operating Limits**

McCauley 3AF32C93/82NC only

2700 rpm (all models)

Avoid continuous operation at or above 36 In. Hg manifold pressure between 2300 and 2600 rpm.

**ENGINE INSTRUMENT MARKINGS**

Definition of Limit	Minimum Operating Limit	Normal Operating Range	Preferred Operating Range	Caution Range	Maximum Operating Limit
Marking Description	Red Radial	Green Arc	Wide Green Arc	Yellow Arc	Red Radial
Manifold Pressure Gage	--	17.0 - 35.0 In. Hg	--	--	40.0 In.Hg (Series III) 41.0 In.Hg (Series IV)
Cylinder Head Temp Gage	--	200° F - 320° F 400° F - 460° F	320° F - 400° F	--	460° F
Oil Pressure Gage	10 psi	30 - 60 psi	--	--	100 psi
Oil Temp Gage	75° F	75° F - 140° F 190° F - 240° F	140° F - 190° F	--	240° F
Tachometer	--	2100 - 2700 rpm	--	--	2700 rpm
Exhaust Gas Temp. Gage	--	1300°F - 1550°F	--	1550°F-1650°F	1650°F

### WEIGHT LIMITS

Maximum Ramp Weight:	7087 pounds
Maximum Takeoff Weight:	7087 pounds
Maximum Landing Weight:	6750 pounds
Maximum Zero Fuel Weight:	6515 pounds

### CENTER OF GRAVITY LIMITS

Aft Limit -	159.04 inches aft of reference datum at 7087 pounds and 160.04 inches aft of reference datum at 6750 pounds, or less, with straight line variation between these points.
Forward Limit -	152.2 inches aft of reference datum at 7087 pounds and 147.82 inches aft of reference datum at 5800 pounds, or less, with straight line variation between these points. (see Section 6 for Weight & Center of Gravity Envelope)

### MANEUVER LIMITS

This is a normal category airplane. Acrobatic maneuvers, including spins, are prohibited.

### FLIGHT LOAD FACTOR LIMITS

At design Takeoff Weight of 7087 pounds:

- |                                      |                  |
|--------------------------------------|------------------|
| a. Landing gear up, wing flaps 0°    | +3.53g to -1.44g |
| b. Landing gear down, wing flaps 45° | +2.0g to 0.0g    |

### REQUIRED PLACARDS

On Left Forward Side Panel:

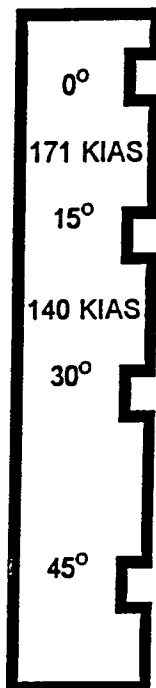
a. OPERATIONAL LIMITS

AIR MINIMUM CONTROL SPEED  
 MAXIMUM GEAR OPERATING SPEED  
 MAXIMUM GEAR EXTENDED SPEED  
 MAXIMUM FLAP EXTENDED SPEED 15° FLAPS  
 MAXIMUM FLAP EXTENDED SPEED 45° FLAPS  
 MAXIMUM MANEUVERING SPEED

80 KIAS
178 KIAS
178 KIAS
171 KIAS
140 KIAS
151 KIAS

On the Flap Handle Console these airspeeds replace the previously listed airspeeds.

b. FLAPS LIMITATIONS



On the instrument panel just below or near the electronic digital fuel flowmeter:

c. ENGINE FUEL FLOW LIMITS (Airplanes with electronic digital fuel flowmeter only)

Airplanes with RAM Series III Engines

<b>T.O. AND M.C.P. FUEL FLOW</b>	<b>35.0-33.5gph / 205-195pph</b>
FOR ADDITIONAL INFORMATION SEE RAM ENGINE OP LIMIT TABLE: TSIO-620-NB; SERIES III	

Airplanes with RAM Series IV Engines

<b>T.O. AND M.C.P. FUEL FLOW</b>	<b>35.9-34.2gph / 210-200pph</b>
FOR ADDITIONAL INFORMATION SEE RAM ENGINE OP LIMIT TABLE: TSIO-620-NB; SERIES IV	



On the instrument panel in plain view:

d. TURBO LIMITATIONS

Airplanes with RAM  
Series III Engines

Turbo Limitations	
ALT <u>X 1000</u>	MAX <u>M. P.</u>
13.0	40.0
20.0	38.0
22.0	35.2
24.0	32.3
26.0	29.8
28.0	27.4
30.0	25.0

Airplanes with RAM  
Series IV Engines

Turbo Limitations	
ALT <u>X 1000</u>	MAX <u>M. P.</u>
13.0	41.0
20.0	39.0
22.0	35.2
24.0	32.3
26.0	29.8
28.0	27.4
30.0	25.0

Airplanes equipped with McCauley Model 3AF32C93/82NC Propellers ONLY

AVOID CONTINUOUS OPERATION  
AT OR ABOVE 36.0 IN. HG MANIFOLD  
PRESSURE BETWEEN 2300 AND  
2600 RPM

Near Op Limits placard or on instrument panel in plain view.

e. ICING LIMITATION

WARNING: With Visible Ice Accumulation  
on the Aircraft DO NOT EXCEED 185 KIAS

On the Trim Console this placard replaces the existing Cessna placard.



## SECTION 3 EMERGENCY PROCEDURES

### ENGINE INOPERATIVE PROCEDURES

Maximum continuous power setting for rate-of-climb - single engine:

325 HP - 2700 RPM - 41 in. Hg. - 210 pph - S.L. to 13,000 feet. Above 13,000 feet see Turbo Limitations.

## SECTION 4 NORMAL PROCEDURES

### STARTING HOT ENGINES:

1. PROPELLERS - CLEAR
2. THROTTLES - FULL OPEN
3. MIXTURES - IDLE CUT-OFF
4. AUX FUEL PUMPS - ON HIGH (for 30-90 seconds) THEN OFF
5. THROTTLES - SET
6. MIXTURES - FULL OPEN
7. PRIME - FOR 1-SECOND ONLY
8. MAGNETO - SWITCHES ON
9. ENGINES - START
10. AUX FUEL PUMPS - LOW
11. ENG INSTRUMENTS - CHECK

### EXHAUST GAS TEMPERATURE GAGE OPERATION:

Refer to System Manufacturer's Instructions for proper operation.

### DIGITAL FUEL FLOWMETER OPERATIONS:

Refer to System Manufacturer's Instructions for proper operation.

## SECTION 5 PERFORMANCE

### AIRSPEED CALIBRATION NORMAL STATIC SOURCE

- NOTE:**
1. Indicated airspeed assumes zero instrument error.
  2. The following calibrations are not valid in the prestall buffet.
  3. The following calibrations are valid for the pilot's and copilot's airspeed indicators when the standard or optional dual static system is installed.

GEAR UP FLAPS 0°		GEAR DOWN FLAPS 15°		GEAR DOWN FLAPS 45°	
KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
70	70	70	64	70	66
80	79	80	75	80	77
90	88	90	85	90	88
-	-	-	-	94*	93*
100	97	100	97	100	100
110	106	110	108	110	110
120	115	120	118	120	122
140	135	130	130	130	133
160	155	140	140	140	145
180	177	150	151	145	150
200	199	160	162	-	-
220	221	170	174	-	-
230	232	179	183	-	-
237	239	-	-	-	-

\* Recommended minimum all engines approach speed at 6750 pounds with 45° flaps.

## STALL SPEEDS

**CONDITIONS:**  
Throttles - IDLE

**NOTE:**  
Max. altitude loss during a stall is 300 feet.

WEIGHT	CONFIGURATION		ANGLE OF BANK							
			0°		20°		40°		60°	
	Flaps	Gear	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
7087 pounds	0°	Up	79	78	81	80	91	89	114	110
	15°	Down	82	77	84	79	93	88	112	109
	45°	Down	77	74	79	76	87	85	105	105
6750 pounds	0°	Up	78	77	80	79	90	88	112	109
	15°	Down	80	75	82	77	90	86	109	106
	45°	Down	75	72	77	74	84	82	102	102
6200 pounds	0°	Up	73	73	76	75	84	83	107	103
	15°	Down	78	72	79	74	87	82	105	102
	45°	Down	73	69	75	71	82	79	98	98
5700 pounds	0°	Up	70	70	72	72	81	80	102	99
	15°	Down	74	69	77	71	84	79	101	98
	45°	Down	70	66	73	68	78	75	94	93
5200 pounds	0°	Up	67	67	69	69	78	77	98	95
	15°	Down	72	66	73	68	80	75	97	93
	45°	Down	67	63	69	65	76	72	91	89

# NORMAL TAKEOFF DISTANCE

CONDITIONS:  
1. 2700 RPM AND 41.0 INCHES Hg. MANIFOLD PRESSURE BEFORE BRAKE RELEASE.  
2. MIXTURES - 32.0PH MIN. FUEL FLOW.  
3. WING FLAPS - UP.  
4. COML FLAPS - OPEN.  
5. LEVEL, HARD SURFACE, DRY RUNWAY.

NOTE:  
1. IF FULL POWER IS APPLIED WITHOUT BRAKES SET, DISTANCES APPLY FROM POINT WHERE FULL POWER IS APPLIED.  
2. DECREASE DISTANCE 7% FOR EACH 10 KNOTS HEADWIND.  
3. INCREASE DISTANCE 5% FOR EACH 2 KNOTS TAILWIND.

WEIGHT POUNDS	TAKEOFF TO 50' FOOT OBSTACLE SPEED KIAS	PRESSURE ALTITUDE - FEET	-30°C (-1°F)		-10°C (14°F)		0°C (32°F)		10°C (50°F)		20°C (68°F)		30°C (86°F)		40°C (104°F)	
			GROUND ROLL FEET	TOTAL DISTANCE TO CLEAR 50 FEET	GROUND ROLL FEET	TOTAL DISTANCE TO CLEAR 50 FEET	GROUND ROLL FEET	TOTAL DISTANCE TO CLEAR 50 FEET	GROUND ROLL FEET	TOTAL DISTANCE TO CLEAR 50 FEET	GROUND ROLL FEET	TOTAL DISTANCE TO CLEAR 50 FEET	GROUND ROLL FEET	TOTAL DISTANCE TO CLEAR 50 FEET	GROUND ROLL FEET	TOTAL DISTANCE TO CLEAR 50 FEET
7000	101	SEA LEVEL	1618	1977	1741	2123	1889	2279	2001	2440	2138	2607	2278	2778	2423	2953
		1000	1771	2167	1908	2328	2049	2497	2181	2673	2340	2826	2499	3043	2681	3237
		2000	1924	2349	2070	2528	2223	2714	2360	2853	2542	3104	2709	3308	2881	3578
		3000	2108	2576	2299	2772	2488	2978	2585	3186	2786	3403	2958	3627	3157	3858
		4000	2292	2802	2487	3016	2684	3237	2815	3406	3028	3702	3249	3851	3433	4197
8700	98	SEA LEVEL	1488	1798	1634	1971	1647	2008	1763	2150	1883	2297	2007	2448	2135	2603
		1000	1650	2089	1824	2277	1928	2391	1975	2355	2061	2416	2187	2616	2337	2892
		2000	1835	2289	1988	2472	2087	2584	2178	2560	2259	2584	2307	2814	2533	3100
		3000	2019	2488	2174	2672	2285	2777	2368	2807	2459	2762	2466	3001	2782	3399
		4000	2203	2687	2369	2871	2498	2970	2559	3053	2647	2927	2648	3199	2924	3697
5700	90	SEA LEVEL	1120	1437	1308	1536	1295	1648	1309	1765	1481	1828	1578	2010	1879	2138
		1000	1238	1699	1434	1628	1417	1803	1512	1934	1621	1896	1727	2202	1977	2342
		2000	1422	1899	1571	1828	1599	2006	1687	2102	1761	2036	1876	2293	1996	2545
		3000	1606	2097	1748	2066	1834	2133	1964	2305	1929	2452	2036	2624	2187	2791
		4000	1791	2296	1924	2296	2012	2374	2154	2544	2097	2679	2235	2853	2378	2994

# ACCELERATE STOP DISTANCE

**CONDITIONS :**

1. 2700 RPM AND 41.0 INCHES Hg. MANIFOLD PRESSURE BEFORE BRAKE RELEASE.
2. MIXTURES - 32.5 GPH MIN. FUEL FLOW.
3. WING FLAPS - UP
4. COWL FLAPS - OPEN.
5. LEVEL, HARD SURFACE, DRY RUNWAY.
6. ENGINE FAILURE AT ENGINE FAILURE SPEED.
7. IDLE POWER AND MAXIMUM EFFECTIVE BRAKING AFTER ENGINE FAILURE.

**NOTE:**

1. IF FULL POWER IS APPLIED WITHOUT BRAKES SET, DISTANCES APPLY FROM POINT WHERE FULL POWER IS APPLIED.
2. DECREASE DISTANCE 3% FOR EACH 4 KNOTS HEADWIND.
3. INCREASE DISTANCE 5% FOR EACH 2 KNOTS TAILWIND.

WEIGHT POUNDS	ENGINE FAILURE SPEED - KIAS	PRESSURE ALTITUDE - FEET	TOTAL DISTANCE - FEET						
			-20°C	-10°C	0°C	-10°C	+20°C	+30°C	+40°C
			-4°F	+14°F	+32°F	+50°F	+68°F	+86°F	+104°F
7087	101	SEA LEVEL	3539	3770	4011	4326	4610	4904	5229
		1000	3707	3948	4263	4536	4830	5145	5502
		2000	3885	4190	4463	4757	5072	5408	5775
		3000	4074	4389	4683	4988	5324	5681	6080
		4000	4326	4610	4914	5240	5597	5975	6395
		5000	4536	4841	5166	5513	5891	6290	6741
		6000	4767	5082	5429	5796	6195	6636	7109
		7000	5010	5345	5712	6101	6531	6993	7497
		8000	5280	5630	6017	6437	6880	7362	7928
		9000	5545	5922	6342	6783	7266	7791	8379
10,000	5840	6250	6689	7161	7676	8243	8873		
6750	98	SEA LEVEL	3370	3590	3820	4120	4390	4670	4980
		1000	3530	3760	4060	4320	4600	4900	5240
		2000	3700	3990	4250	4530	4830	5150	5500
		3000	3880	4180	4480	4750	5070	5410	5790
		4000	4120	4390	4680	4990	5330	5690	6090
		5000	4320	4610	4920	5250	5610	5990	6420
		6000	4540	4840	5170	5520	5900	6320	6770
		7000	4770	5090	5440	5810	6220	6660	7140
		8000	5010	5360	5730	6130	6560	7030	7550
		9000	5280	5640	6040	6460	6920	7420	7980
10,000	5560	5950	6370	6820	7310	7850	8450		
6200	94	SEA LEVEL	2780	2960	3150	3340	3560	3780	4090
		1000	2910	3100	3300	3510	3730	4030	4290
		2000	3050	3250	3460	3680	3970	4230	4510
		3000	3200	3410	3630	3910	4170	4440	4740
		4000	3360	3580	3850	4110	4380	4670	4990
		5000	3530	3800	4050	4310	4600	4910	5250
		6000	3740	3990	4250	4540	4840	5170	5530
		7000	3930	4190	4470	4770	5100	5450	5840
		8000	4130	4410	4710	5030	5370	5750	6160
		9000	4350	4640	4960	5300	5670	6070	6510
10,000	4580	4890	5230	5590	5990	6410	6880		
5700	90	SEA LEVEL	2300	2450	2600	2760	2930	3120	3310
		1000	2410	2560	2720	2890	3080	3270	3480
		2000	2530	2690	2860	3040	3230	3430	3710
		3000	2650	2820	3000	3190	3390	3600	3890
		4000	2780	2960	3150	3350	3610	3840	4100
		5000	2920	3110	3310	3560	3790	4040	4310
		6000	3060	3260	3510	3740	3980	4250	4540
		7000	3220	3460	3690	3930	4190	4480	4780
		8000	3410	3640	3880	4140	4420	4720	5050
		9000	3590	3830	4090	4360	4660	4980	5330
10,000	3780	4030	4310	4600	4920	5260	5630		

# ACCELERATE GO DISTANCE

**CONDITIONS:**

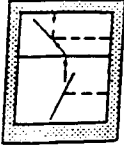
1. 2700 RPM AND 41.0 INCHES HG. MANIFOLD PRESSURE BEFORE BRAKE RELEASE.
2. MIXTURE - 32.5 GPM MINIMUM FUEL FLOW.
3. WING FLAPS - UP.
4. COWL FLAPS - OPEN
5. LEVEL, HARD SURFACE, DRY RUNWAY.
6. ENGINE FAILURE AT ENGINE FAILURE SPEED.
7. LANDING GEAR UP ON TRANSIT AND PROPELLER FEATHERED DURING CLIMB.
8. MAINTAIN ENGINE FAILURE SPEED UNTIL CLEAR OF OBSTACLE. 1

**NOTE:**

1. IF FULL POWER IS APPLIED WITHOUT BRAKES SET, DISTANCES APPLY FROM POINT WHERE FULL POWER IS APPLIED.
2. DECREASE DISTANCE 6% FOR EACH 10 KNOTS HEADWIND.
3. INCREASE DISTANCE 2% FOR EACH KNOT OF TAILWIND.
4. DISTANCE IN BOXES REPRESENT RATES OF CLIMB LESS THAN 60 FT./MIN..

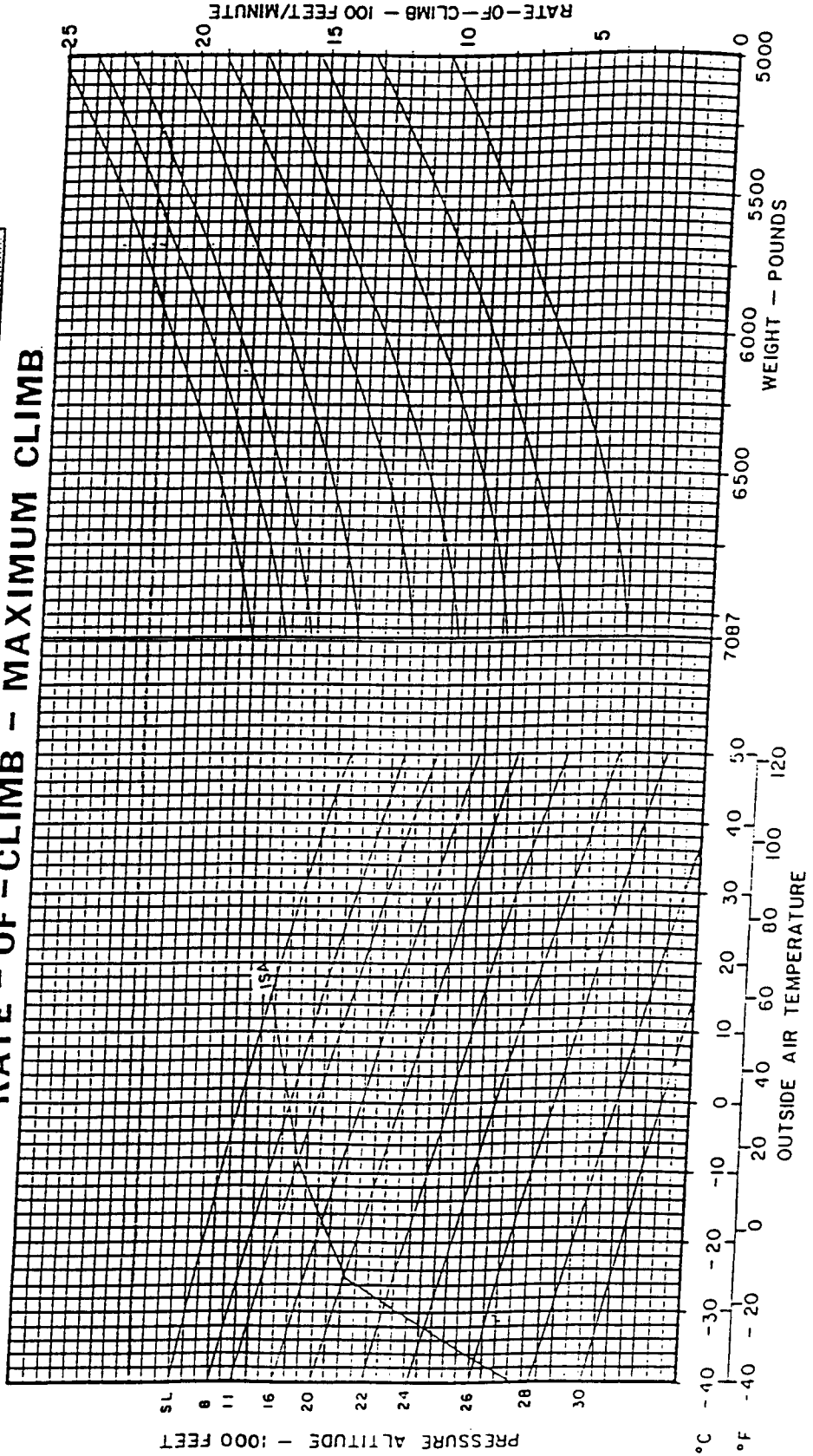
WEIGHT - POUNDS	ENGINE FAILURE - SPEED - KIAS	PRESSURE ALTITUDE -	TOTAL DISTANCE TO CLEAR 50-FOOT OBSTACLE - FEET						
			-20°C -4°F	-10°C +14°F	0°C +32°F	+10°C +50°F	+20°C +68°F	+30°C +86°F	+40°C +104°F
7087	101	SEA LEVEL	2720	3014	3360	3780	4368	5072	6090
		1000	2867	3182	3560	4074	4652	5450	6647
		2000	3024	3371	3822	4326	4977	5891	7319
		3000	3203	3612	4053	4610	5345	6395	8159
		4000	3434	3833	4316	4925	5754	6993	9219
		5000	3633	4064	4599	5282	6227	7707	10,668
		6000	3843	4316	4904	5681	6773	8600	12,779
		7000	4085	4599	5250	6132	7424	9744	16,275
		8000	4347	4914	5649	6647	8211	11,309	-----
		9000	4631	5261	6090	7256	9188	13,640	-----
		10,000	4946	5650	6594	7980	10,469	17,619	-----
6750	98	SEA LEVEL	2590	2870	3200	3600	4160	4830	5800
		1000	2730	3030	3390	3880	4430	5190	6330
		2000	2880	3210	3640	4120	4740	5610	6970
		3000	3050	3440	3860	4390	5090	6090	7770
		4000	3270	3650	4110	4690	5480	6660	8780
		5000	3460	3870	4380	5030	5930	7340	10,160
		6000	3660	4110	4670	5410	6450	8190	12,170
		7000	3890	4380	5000	5840	7070	9280	15,500
		8000	4140	4680	5380	6330	7820	10,770	-----
		9000	4410	5010	5800	6910	8750	12,990	-----
		10,000	4710	5380	6280	7600	9970	16,780	-----
6200	94	SEA LEVEL	2070	2270	2500	2770	3080	3470	4010
		1000	2180	2390	2640	2930	3270	3740	4280
		2000	2290	2520	2790	3090	3510	3970	4570
		3000	2420	2660	2940	3320	3730	4240	4910
		4000	2550	2810	3160	3520	3960	4520	5290
		5000	2690	3010	3340	3740	4220	4850	5720
		6000	2880	3190	3540	3970	4510	5210	6220
		7000	3040	3370	3760	4230	4830	5260	6810
		8000	3220	3580	4000	4520	5180	6100	7520
		9000	3420	3810	4270	4840	5590	6650	8410
		10,000	3630	4060	4560	5200	6050	7300	9560
5700	90	SEA LEVEL	1690	1840	2010	2200	2430	2690	2990
		1000	1770	1930	2110	2320	2560	2840	3170
		2000	1860	2030	2230	2450	2700	3000	3420
		3000	1960	2140	2350	2580	2860	3230	3630
		4000	2060	2260	2480	2730	3070	3420	3860
		5000	2170	2380	2620	2930	3250	3630	4110
		6000	2290	2500	2800	3100	3440	3870	4400
		7000	2420	2690	2960	3280	3660	4120	4710
		8000	2580	2840	3140	3480	3900	4400	5060
		9000	2730	3010	3330	3710	4160	4720	5460
		10,000	2900	3200	3540	3930	4440	5070	5910

- CONDITIONS:
1. 2700 RPM AND 410 INCHES Hg.
  2. MIXTURE - 32.5 GPH MINIMUM FUEL FLOW.
  3. LANDING GEAR - UP.
  4. WING FLAPS - UP.
  5. COWL FLAPS - OPEN.
- \* ABOVE 13,000 FT. USE PLACARDED MANIFOLD PRESSURE



ALTITUDE - FEET	CLIMB SPEED - KIAS
SL	112
20,000	111
30,000	108

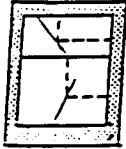
## RATE - OF - CLIMB - MAXIMUM CLIMB



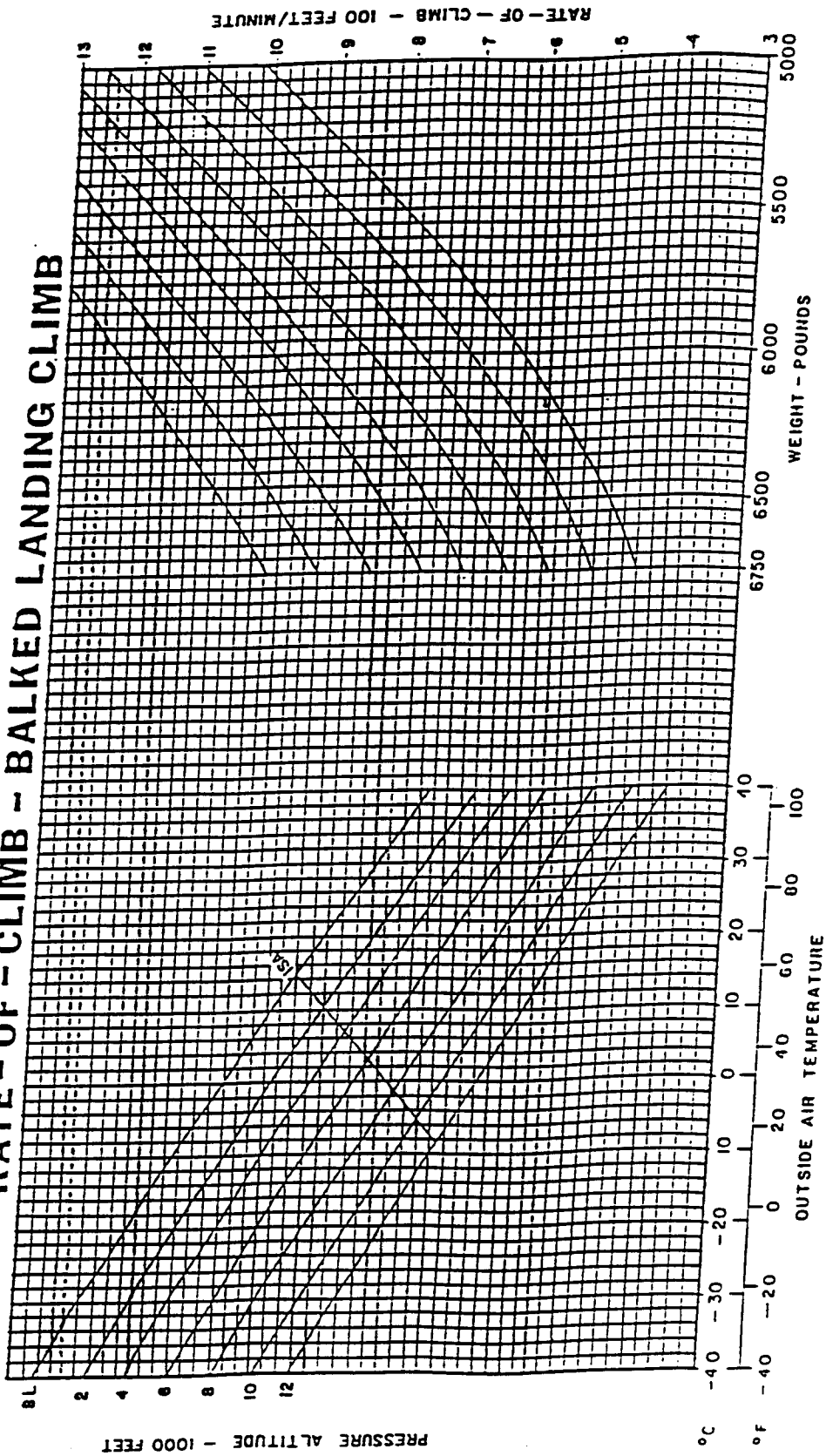


CONDITIONS:

1. 2700 AND 41.0 INCHES Hg.
2. MIXTURE — 32.5 GPH MIN. FUEL FLOW
3. LANDING GEAR — DOWN
4. WING FLAPS — 45°
5. COWL FLAPS — OPEN
6. CLIMB SPEED — 84 KIAS



**RATE-OF-CLIMB - BALKED LANDING CLIMB**



NOTE:

CONDITIONS:

1. 2700 RPM AND 40 INCHES Hg.
2. MIXTURE - 32.5 GPH. MINIMUM FUEL FLOW.
3. LANDING GEAR - UP
4. WING FLAPS - UP
5. INOPERATIVE PROPELLER - FEATHERED
6. WINGS BANKED 5° TOWARDS OPERATIVE ENGINE WITH APPROXIMATELY 1/2 BALL SLIP INDICATED ON THE TURN AND BANK INDICATOR.

\* ABOVE 13,000 FEET, USE PLACARD MANIFOLD PRESSURE AND CLIMB FUEL FLOW.

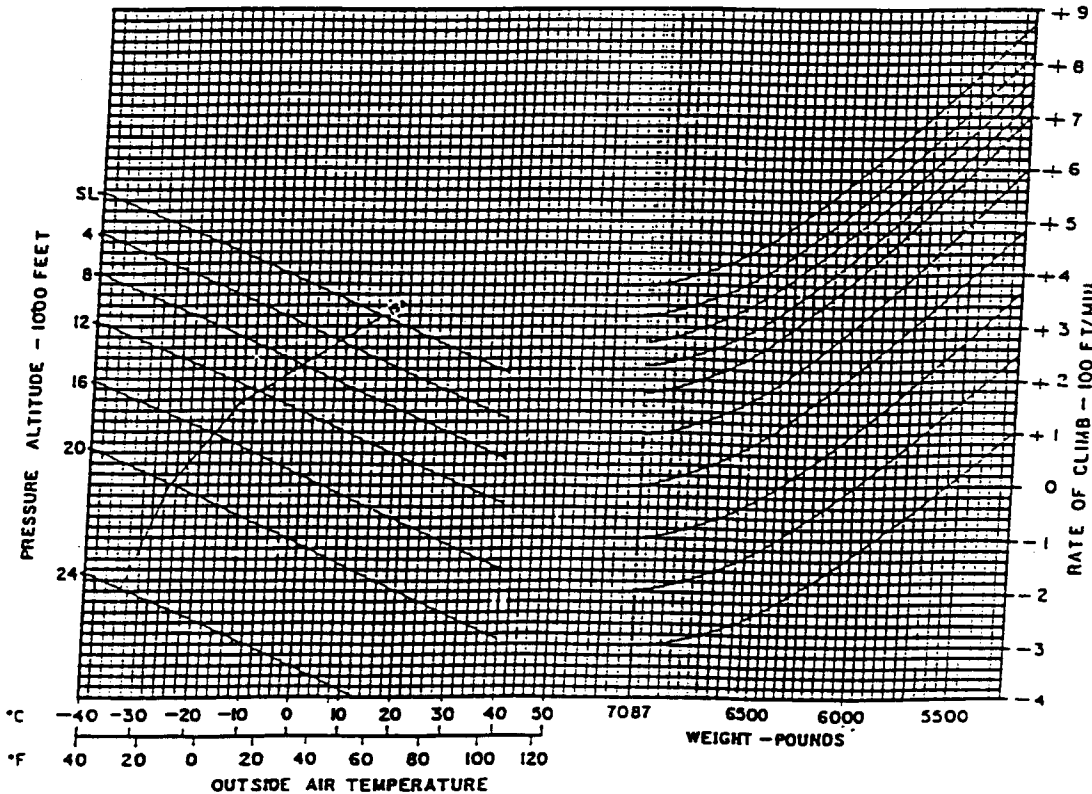
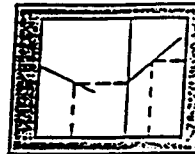
APPROXIMATE EFFECT OF CONFIGURATION ON SINGLE-ENGINE RATE-OF-CLIMB

SUBTRACT VALUES LISTED BELOW FROM VALUE OBTAINED IN THE GRAPH. EFFECTS FOR A COMBINATION OF GEAR, FLAP OR WINDMILLING PROPELLER MAY BE OBTAINED BY ADDING THE EFFECTS FOR EACH.

INOPERATIVE ENGINE	
WINDMILLING	400 Ft./Min.
GEAR DOWN	350 Ft./Min.
FLAPS DOWN 15°	200 Ft./Min.
FLAPS DOWN 45°	800 Ft./Min.

RATE-OF-CLIMB - ONE ENGINE INOPERATIVE

WEIGHT POUNDS	CLIMB SPEED - KIAS		
	SEA LEVEL	10,000	20,000
7087	112	109	107
6250	105	103	101
5750	102	101	100



# WEIGHT AND MOMENT TABLES

