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CIVIL AERONAUTICS MANUAL 42

U. S. Department of Commerce — Civil Aeronautics Administration

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Supplement No. 6 — April 1, 1956

SUBJECT: Revisions to Civil Aeronautics Manual 42 dated August 1954

The purpose of this supplement is to convert performance limitations data applicable to large aircraft from miles per hour to knots in accordance with section 42.22a(d) of the Civil Air Regulations.

Remove and destroy the following pages:	Insert in lieu thereof the following pages:
51 through 74	51 through 74
83 through 92	83 through 92

John F. Curlick

For WILLIAM B. DAVIS,
Director,
Office of Aviation Safety.

Attachments

378933—56——1

point 50 feet directly above the intersection of the obstruction clearance line and the runway. For the purpose of this section it shall be assumed that the take-off weight of the airplane is reduced by the weight of the fuel and oil expected to be consumed in flight to the field of intended destination.

"(a) It shall be assumed that the aircraft is landed on the most favorable runway and direction without regard to wind.

"(b) It shall be assumed, considering every probable wind velocity and direction, that the aircraft is landed on the most suitable runway, taking due account of the ground handling characteristics of the airplane and allowing for the effect on the landing path and roll of not more than 50 percent of the favorable wind component.

"(c) If the airport of intended destination will not permit full compliance with paragraph (b) of this section, the aircraft may be taken off if an alternate airport is designated which permits compliance with section 42.78."

42.77–1 *Landing distance limitations; airport of destination (CAA policies which apply to section 42.77).*

(a) Section 42.77 establishes two major considerations in determining the permissible landing weight at the airport of destination. The first is that the aircraft weight will be such on arrival that it can be landed within 60 percent of the effective landing length of the most favorable (normally the longest) runway in still air. This maximum weight for an airport/aircraft configuration, once established, remains constant and cannot be exceeded, regardless of wind conditions.

(b) The second is that consideration be given to the maximum weight that will be permitted due to the necessity of using another runway because of the probable wind condition, ground handling characteristics of the aircraft, landing aids, etc. This consideration may result in a lower gross weight than permitted in paragraph (a) of this section, in which case, dispatch must be based on this lesser weight.

(c) The probable wind referred to in paragraph (b) of this section, is the wind forecasted to exist at the time of arrival.

(d) If the forecast conditions are such that consideration of the requirements in section 42.77 (b) would preclude a landing at the intended destination, the aircraft may be dispatched if an alternate airport is designated which permits compliance with section 42.78.

(e) (1) If a flight has been properly dispatched, but arrives at the destination with a weight higher than anticipated due to unexpected wind conditions or fuel consumption, section 42.77 (b) should not be construed as prohibiting a landing at the overweight condition, provided the crosswind and/or tailwind operating limitations are not exceeded. (2) If conditions are such that the crosswind and/or tailwind limitations will be exceeded, the flight must proceed to its alternate, if one has been named to meet the requirements of section 42.77 (b). However, if an alternate was not provided, and upon arrival the wind conditions were such that the crosswind and/or tailwind limitations would be exceeded, the pilot should exercise the authority granted him in section section 42.51 (d).

(f) For application of the wind components as allowed in section 42.77 (b), refer to section 42.72–1 (f).

"42.78 *Landing distance limitations; alternate airports.* No airport shall be designated as an alternate airport in a flight plan unless the aircraft at the weight at takeoff can comply with the requirements of paragraphs (a) and (b) of section 42.77 at such airport: *Provided,* That the aircraft can be brought to rest within 70 percent of the effective length of the runway.

"42.80 *Operating limitations for aircraft not certificated in the transport category.* In operating any passenger-carrying, large, nontransport category airplane after January 1, 1950, the provisions of sections 42.81 through 42.83 shall be complied with. Prior to that date, such aircraft shall be operated in accordance with such operating limitations as the Administrator determines will provide a safe relation between the performance of the aircraft and the airports to be used and the areas to be traversed. Performance data published by the Administrator for each such nontransport category type aircraft shall be used in determining compliance with this part."

42.80–1 *Performance data on Curtiss model*

C46 aircraft certificated for maximum weights of 45,000 pounds to 48,000 pounds (CAA rules which apply to section 42.80). The following performance limitations data, applicable to the Curtiss model C46 aircraft shall be used in determining compliance with section 42.80. These data are presented in tables 1 through 3 and figures 1 through 3.

TABLE 1.—*Takeoff limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12). (Distance to accelerate to 93 knots TIAS, and stop, with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds			
	39,000	42,000	45,000	[1] 48,000
	Distance in feet			
S. L.	4,110	4,295	4,570	4,950
1,000	4,250	4,450	4,725	5,130
2,000	4,400	4,600	4,880	5,300
3,000	4,650	4,890	5,190	5,680
4,000	4,910	5,170	5,500	6,050
5,000	5,165	5,450	5,810	6,430
6,000	5,420	5,730	6,120	6,805
7,000	5,685	6,000	6,440	7,180
8,000	5,940	6,280	6,750	7,550

[1] For use with Curtiss model C46 airplanes when approved for this weight.

(b) Actual length of runway required when "effective length", considering obstacles, is not determined (distance to accelerate to 93 knots TIAS, and stop divided by the factor 0.85.)

Standard altitude in feet	Airplane weight in pounds			
	39,000	42,000	45,000	[1] 48,000
	Distance in feet			
S. L.	4,835	5,050	5,375	5,825
1,000	5,000	5,235	5,555	6,035
2,000	5,175	5,410	5,740	6,235
3,000	5,470	5,750	6,105	6,680
4,000	5,775	6,080	6,470	7,120
5,000	6,075	6,410	6,830	7,565
6,000	6,375	6,740	7,200	8,005
7,000	6,690	7,060	7,575	8,445
8,000	6,990	7,390	7,940	8,880

[1] For use with Curtiss model C46 airplanes when approved for this weight.

TABLE 2.—*En route limitations*

(a) Curtiss model C–46 certificated for maximum weight of 45,000 pounds (based on a climb speed of 113 knots (TIAS)).

Weight (pounds)	Terrain clearance [1] (feet)	Blower setting
45,000	6,450	Low.
44,000	7,000	Do.
43,000	7,550	Do.
42,200	8,000	High.
41,000	9,600	Do.
40,000	11,000	Do.
39,000	12,300	Do.

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.

(b) Curtiss model C–46 certificated for maximum weight of 48,000 pounds or with engine installation approved for 2,550 revolutions per minute (1,700 brake horsepower). Maximum continuous power in low blower [1] (based on a climb speed of 113 knots (TIAS)).

Weight (pounds)	Terrain clearance [2] (feet)	Blower setting
48,000	5,850	Low.
47,000	6,300	Do.
46,000	6,700	Do.
45,000	7,200	Do.
44,500	7,450	Do.
44,250	8,000	High.
44,000	8,550	Do.
43,000	10,800	Do.
42,000	12,500	Do.
41,000	13,000	Do.

[1] Engine installations having P & W. R–2800–27, –43, –51, –71, –75, –79 engines can be approved for 1,700 brake horsepower in low blower. See engine specification chap. 19. p. 30.02 revised Oct. 10, 1949

[2] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42 82.

TABLE 3.—*Landing limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient. (1) Curtiss model C–46 certificated for maximum weight of 45,000 pounds.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	40,000	V_{50}	42,000	V_{50}	44,000	V_{50}	45,000	V_{50}
	Distance in feet							
S. L.	3,700	86.0	3,855	88.0	4,030	90.5	4,110	91.0
1,000	3,800	86.0	3,960	88.0	4,140	90.5	4,220	91.0
2,000	3,900	86.0	4,070	88.0	4,250	90.5	4,335	91.0
3,000	4,050	86.0	4,180	88.0	4,360	90.5	4,450	91.0
4,000	4,110	86.0	4,290	88.0	4,475	90.5	4,565	91.0
5,000	4,215	86.0	4,400	88.0	4,595	90.5	4,680	91.0
6,000	4,330	86.0	4,515	88.0	4,710	90.5	4,800	91.0
7,000	4,430	86.0	4,635	88.0	4,845	90.5	4,930	91.0
8,000	4,550	86.0	4,755	88.0	4,970	90.5	5,060	91.0

[1] Steady approach speed through 50 foot-height-knots TIAS denoted by symbol V_{50}.

(2) Curtiss model C–46 certificated for maximum weight of 48,000 pounds.[1]

Standard altitude in feet	Airplane weight in pounds and approach speeds [2] in knots							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	48,000	V_{50}
	Distance in feet							
S. L.	2,890	80.5	3,000	82.0	3,110	84.5	3,215	86.0
1,000	2,960	80.5	3,070	82.0	3,180	84.5	3,285	86.0
2,000	3,035	80.5	3,145	82.0	3,250	84.5	3,360	86.0
3,000	3,110	80.5	3,215	82.0	3,330	84.5	3,430	86.0
4,000	3,185	80.5	3,300	82.0	3,410	84.5	3,520	86.0
5,000	3,260	80.5	3,370	82.0	3,495	84.5	3,615	86.0
6,000	3,330	80.5	3,460	82.0	3,580	84.5	3,700	86.0
7,000	3,415	80.5	3,545	82.0	3,670	84.5	3,800	86.0
8,000	3,500	80.5	3,635	82.0	3,765	84.5	3,900	86.0

[1] For use with Curtiss model C–46 aircraft when approved for this weight.
[2] Steady approach speed through 50 foot-height-knots TIAS denoted by symbol V_{50}.

(Continued on page 54)

TABLE 3 —*Landing limitations*—Continued

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.11(a) (12).

(1) Curtiss model C–46 certificated for maximum weight of 45,000 pounds.[1]

Standard altitude in feet	Airplane weight in pounds and approach speeds[2] in knots							
	40, 000	V_{50}	42, 000	V_{50}	44, 000	V_{50}	45, 000	V_{50}
	Distance in feet							
S. L.	4, 710	86. 0	4, 910	88. 0	5, 130	90. 5	5, 230	91. 0
1,000	4, 835	86. 0	5, 050	88. 0	5, 270	90. 5	5, 370	91. 0
2,000	4, 965	86. 0	5, 180	88. 0	5, 410	90. 5	5, 520	91. 0
3,000	5, 155	86. 0	5, 320	88. 0	5, 550	90. 5	5, 665	91. 0
4,000	5, 230	86. 0	5, 560	88. 0	5, 695	90. 5	5, 810	91. 0
5,000	5, 365	86. 0	5, 600	88. 0	5, 850	90. 5	5, 955	91. 0
6,000	5, 510	86. 0	5, 745	88. 0	5, 995	90. 5	6, 110	91. 0
7,000	5, 640	86. 0	5, 900	88. 0	6, 165	90. 5	6, 275	91. 0
8,000	5, 790	86. 0	6, 050	88. 0	6, 325	90. 5	6, 550	91. 0

[1] Steady approach speed through 50 foot-height-knots TIAS denoted by symbol V_{50}.
[2] For use with Curtiss model C–46 aircraft when approved for this weight.

(2) Curtiss C–46 certificated for maximum weight of 48,000 pounds.[1]

Standard altitude in feet	Airplane weight in pounds and approach speeds[2] in knots							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	48,000	V_{50}
	Distance in feet							
S. L.	3, 680	80. 5	3, 820	82. 0	3, 960	84. 5	4, 090	86. 0
1,000	3, 765	80. 5	3, 905	82. 0	4, 045	84. 5	4, 180	86. 0
2,000	3, 860	80. 5	4, 000	82. 0	4, 135	84. 5	4, 275	86. 0
3,000	3, 960	80. 5	4, 090	82. 0	4, 240	84. 5	4, 365	86. 0
4,000	4, 055	80. 5	4, 200	82. 0	4, 340	84. 5	4, 480	86. 0
5,000	4, 150	80. 5	4, 290	82. 0	4, 450	84. 5	4, 600	86. 0
6,000	4, 240	80. 5	4, 405	82. 0	4, 555	84. 5	4, 710	86. 0
7,000	4, 345	80. 5	4, 510	82. 0	4, 670	84. 5	4, 835	86. 0
8,000	4, 455	80. 5	4, 625	82. 0	4, 790	84. 5	4, 965	86. 0

[1] For use with Curtiss model C–46 aircraft when approved for this weight.
[2] Steady approach speed through 50 foot-height-knots TIAS denoted by symbol V_{50}.

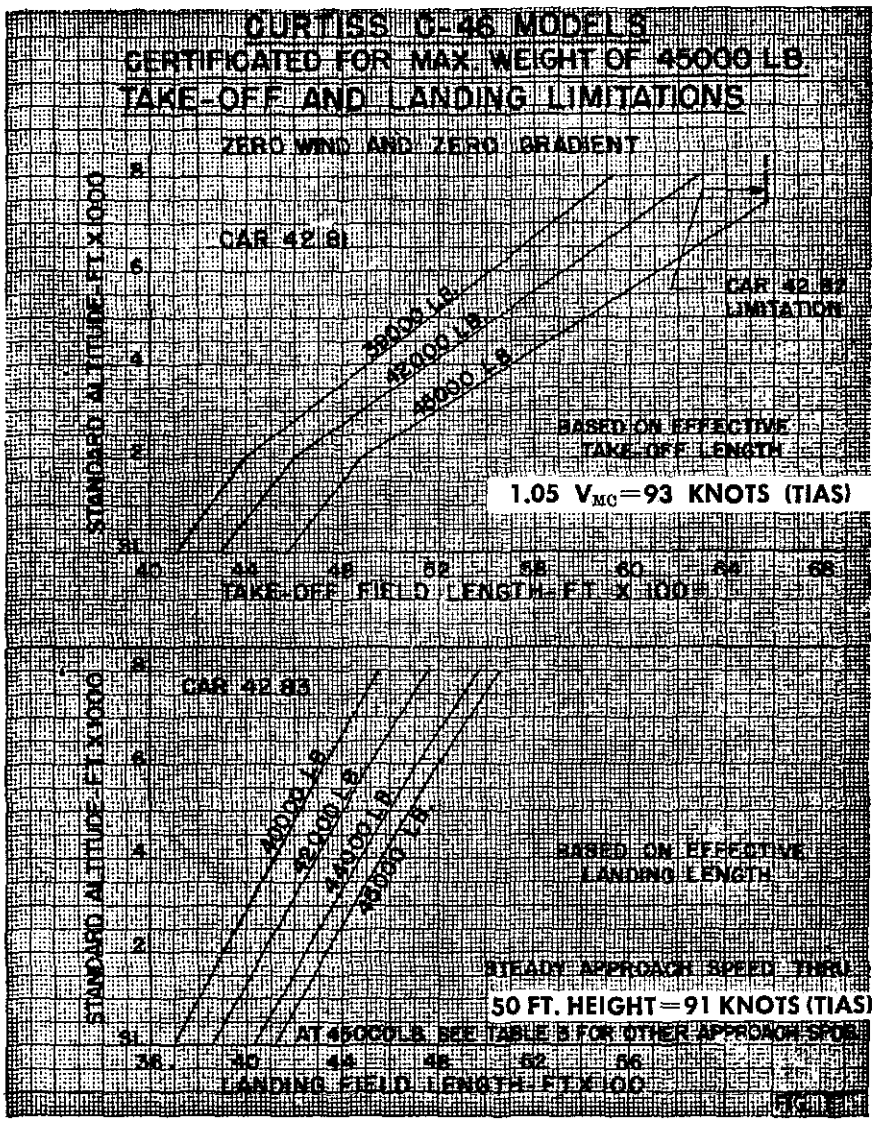
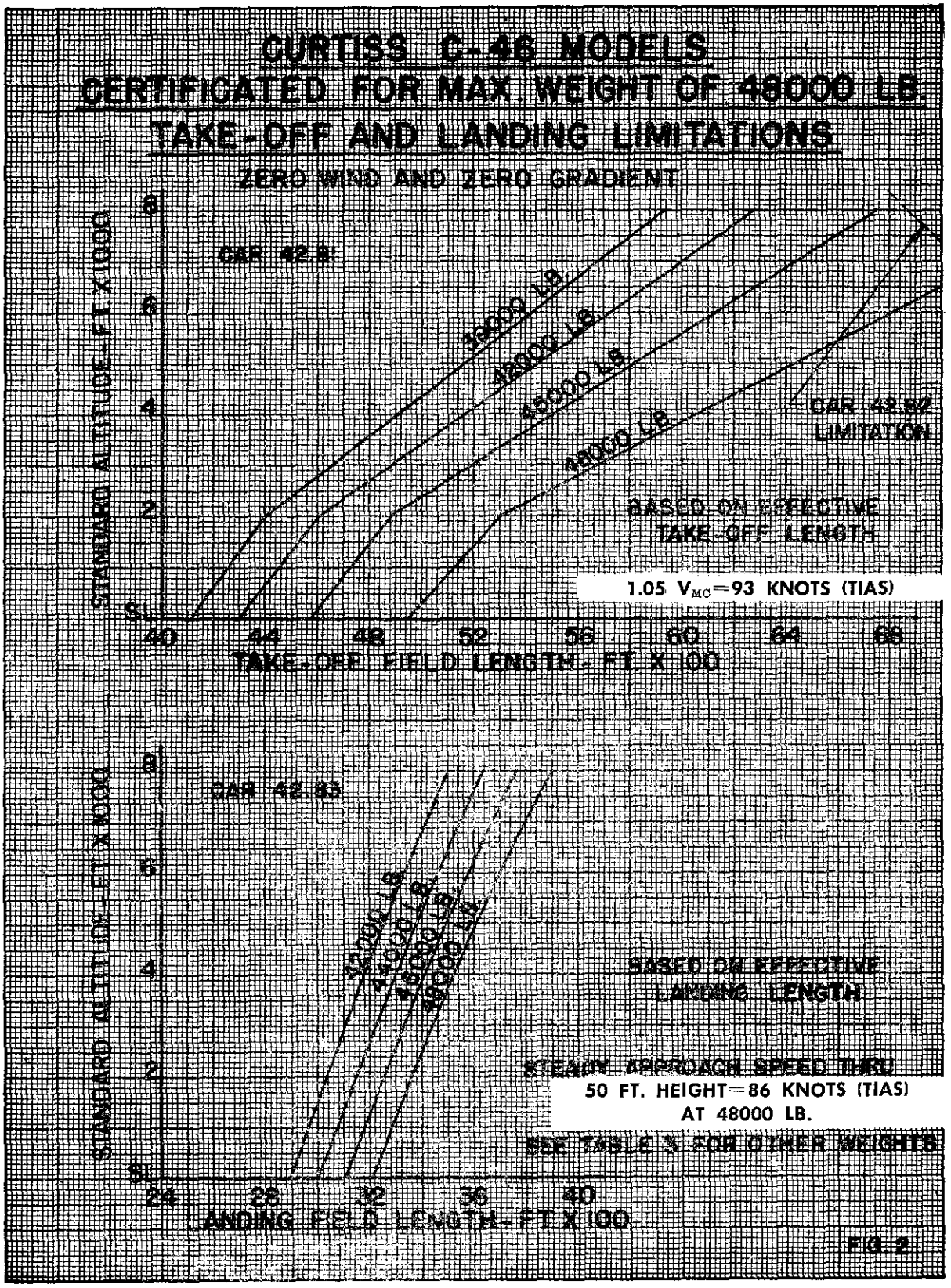
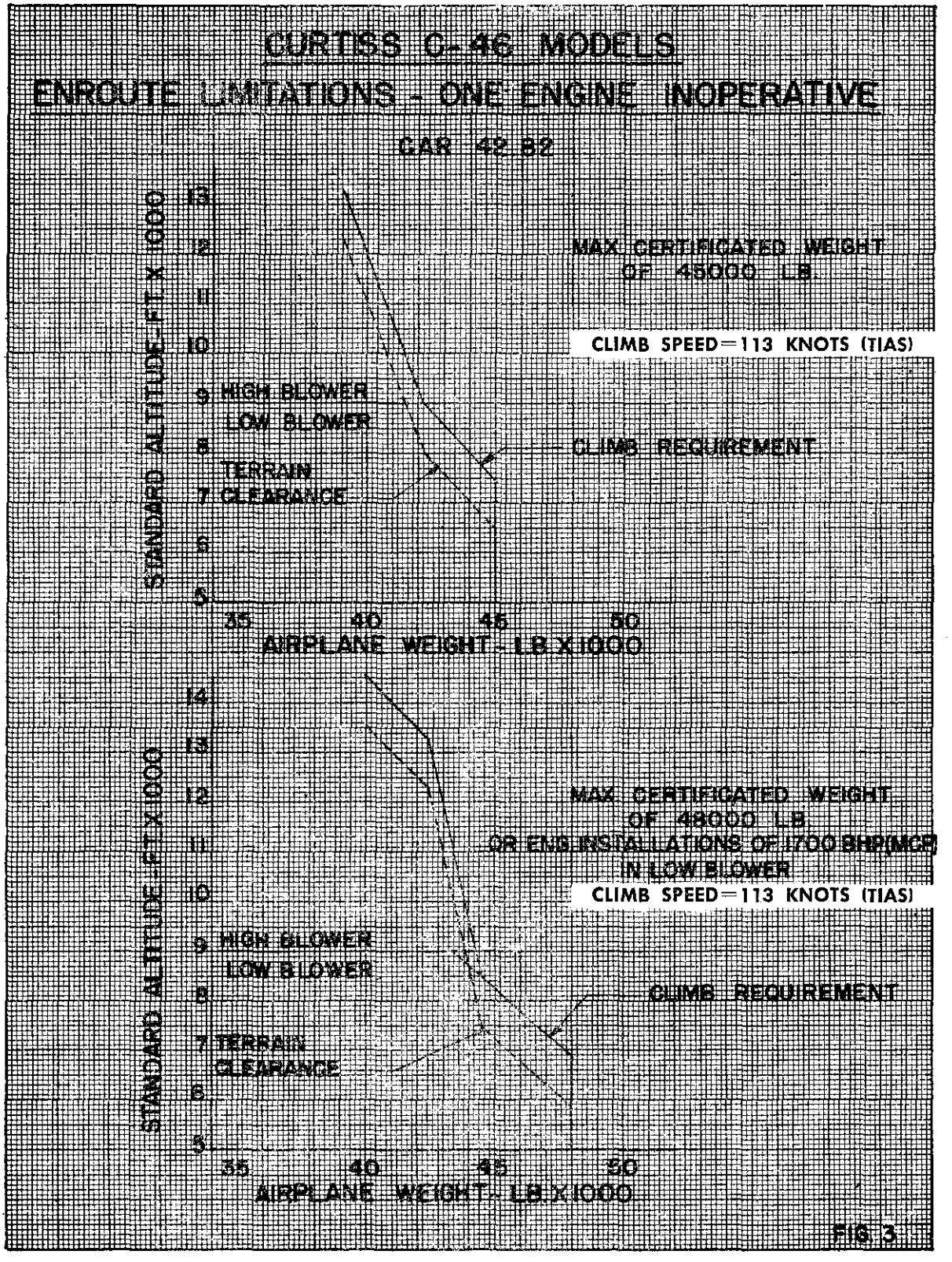


FIG. 41

(Rev. 4/1/56)


CURTISS C-46 MODELS
CERTIFICATED FOR MAX. WEIGHT OF 48000 LB.
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.8:
STANDARD ALTITUDE - FT. X 1000
8
6
4
2
SL.
40
44
48
52
56
60
64
68
TAKE-OFF FIELD LENGTH - FT. X 100
44000 LB.
48000 LB.
CAR 42.82 LIMITATION
BASED ON EFFECTIVE TAKE-OFF LENGTH
1.05 V_{MC} = 93 KNOTS (TIAS)
CAR 42.83
BASED ON EFFECTIVE LANDING LENGTH
STEADY APPROACH SPEED THRU 50 FT. HEIGHT = 86 KNOTS (TIAS) AT 48000 LB.
SEE TABLE 3 FOR OTHER WEIGHTS
24
28
32
36
40
LANDING FIELD LENGTH - FT. X 100
FIG 2

(Rev. 4/1/56)


CURTISS C-46 MODELS
ENROUTE LIMITATIONS - ONE ENGINE INOPERATIVE
CAR 42.82
STANDARD ALTITUDE-FT. X 1000
13
12
11
10
9
8
7
6
5
HIGH BLOWER
LOW BLOWER
TERRAIN
CLEARANCE
MAX CERTIFICATED WEIGHT OF 45000 LB.
CLIMB SPEED=113 KNOTS (TIAS)
CLIMB REQUIREMENT
35
40
45
50
AIRPLANE WEIGHT - LB. X 1000
14
13
12
11
10
9
8
7
6
5
HIGH BLOWER
LOW BLOWER
TERRAIN
CLEARANCE
MAX CERTIFICATED WEIGHT OF 48000 LB.
OR EMB INSTALLATIONS OF 1700 BHP(MCP) IN LOW BLOWER
CLIMB SPEED=113 KNOTS (TIAS)
CLIMB REQUIREMENT
35
40
45
50
AIRPLANE WEIGHT - LB. X 1000
FIG 3

(Rev. 4/1/56)

42.80–2 *Performance data on Douglas DC–3 aircraft (CAA rules which apply to section 42.80).* The following performance limitations data, applicable to all Douglas DC–3 aircraft with various engine models, shall be used in determining compliance with section 42.80. These data are presented in tables 1 through 4 and figures 1 through 3.

DOUGLAS DC–3 G102, AND C–47's, R4D's WITH COMPARABLE HORSEPOWER ENGINES

TABLE 1.—*Takeoff limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with sec. 42.1 (a) (12). (Distance to accelerate to 80 knots TIAS, and stop with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds			
	22,000	23,000	24,000	25,200
	Distance in feet			
S. L.	3,325	3,395	3,460	3,545
1,000	3,425	3,495	3,560	3,645
2,000	3,610	3,685	3,760	3,840
3,000	3,800	3,880	3,960	4,050
4,000	3,990	4,080	4,170	4,270
5,000	4,200	4,290	4,390	4,500
6,000	4,415	4,520	4,630	4,760
7,000	4,650	4,770	4,895	5,050
8,000	4,900	5,040	5,190	(1)

[1] Limited by sec. 42.82.

(b) Actual length of runway required when "effective length," considering obstacles, is not determined. (Distance to accelerate to 80 knots TIAS, and stop, divided by factor 0.85.)

Standard altitude in feet	Airplane weight in pounds			
	22,000	23,000	24,000	25,200
	Distance in feet			
S. L.	3,910	3,990	4,070	4,170
1,000	4,030	4,110	4,185	4,285
2,000	4,245	4,335	4,420	4,515
3,000	4,470	4,565	4,655	4,765
4,000	4,690	4,800	4,905	5,020
5,000	4,940	5,045	5,160	5,290
6,000	5,190	5,315	5,445	5,600
7,000	5,470	5,610	5,755	5,940
8,000	5,760	5,925	6,105	(1)

[1] Limited by sec. 42.82.

DOUGLAS DC–3 G202A, S1C3G AND C47's, R4D's WITH COMPARABLE HORSEPOWER ENGINES

TABLE 2.—*Takeoff limitations*

(a) "Effective length" of runway required where effective length is determined in accordance with section 42.1 (a) (12). (Distance to accelerate to 80 knots TIAS, and stop, with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds					
	22,000	23,000	24,000	25,000	[1]26,000	[1]26,900
	Distance in feet					
S. L.	3,125	3,195	3,260	3,330	3,385	3,450
1,000	3,255	3,320	3,395	3,470	3,525	3,595
2,000	3,390	3,460	3,540	3,610	3,685	3,750
3,000	3,525	3,610	3,690	3,775	3,850	3,920
4,000	3,680	3,775	3,860	3,950	4,035	4,110
5,000	3,855	3,960	4,060	4,150	4,255	4,315
6,000	4,060	4,170	4,280	4,385	4,490	4,575
7,000	4,300	4,415	4,530	4,640	4,750	4,845
8,000	4,600	4,700	4,810	4,925	5,055	5,150

[1] Cargo operation only but not required under sec. 42.80.

(b) Actual length of runway required where "effective length," considering obstacles, is not determined. (Distance to accelerate to 80 knots TIAS, and stop, divided by factor 0.85.)

Standard altitude in feet	Airplane weight in pounds					
	22,000	23,000	24,000	25,000	[1]26,000	[1]26,900
	Distance in feet					
S. L.	3,675	3,755	3,835	3,915	3,980	4,055
1,000	3,830	3,905	3,990	4,080	4,145	4,230
2,000	3,985	4,070	4,165	4,245	4,335	4,410
3,000	4,145	4,245	4,340	4,440	4,530	4,610
4,000	4,330	4,440	4,540	4,645	4,745	4,835
5,000	4,535	4,655	4,775	4,880	5,005	5,075
6,000	4,775	4,905	5,035	5,155	5,280	5,380
7,000	5,055	5,190	5,325	5,455	5,585	5,700
8,000	5,410	5,525	5,655	5,790	5,945	6,055

[1] Cargo operation only but not required under sec. 42.80.

DOUGLAS DC–3, G102, G202A, S1C3G, C–47's, R4D's WITH COMPARABLE HORSEPOWER ENGINES

TABLE 3.—*En route limitations*

Weight in pounds	Terrain clearance [1] in feet and climb speed in knots TIAS					
	G102	V_c	G202A	V_c	S1C3G	V_c
25,200	6,400	95.5	7,500	95.0	10,600	92.5
24,000	7,550	94.0	8,700	93.5	12,100	90.0
23,000	8,500	92.0	9,750	91.0	13,450	88.0
22,000	9,500	90.5	10,750	89.5	14,750	86.5
21,000	10,500	89.0	11,750	87.5	16,100	85.5

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.

DOUGLAS DC–3 G102, G202A S1C3G, AND C47's, R4D's WITH COMPARABLE HORSEPOWER ENGINES

TABLE 4—*Landing limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

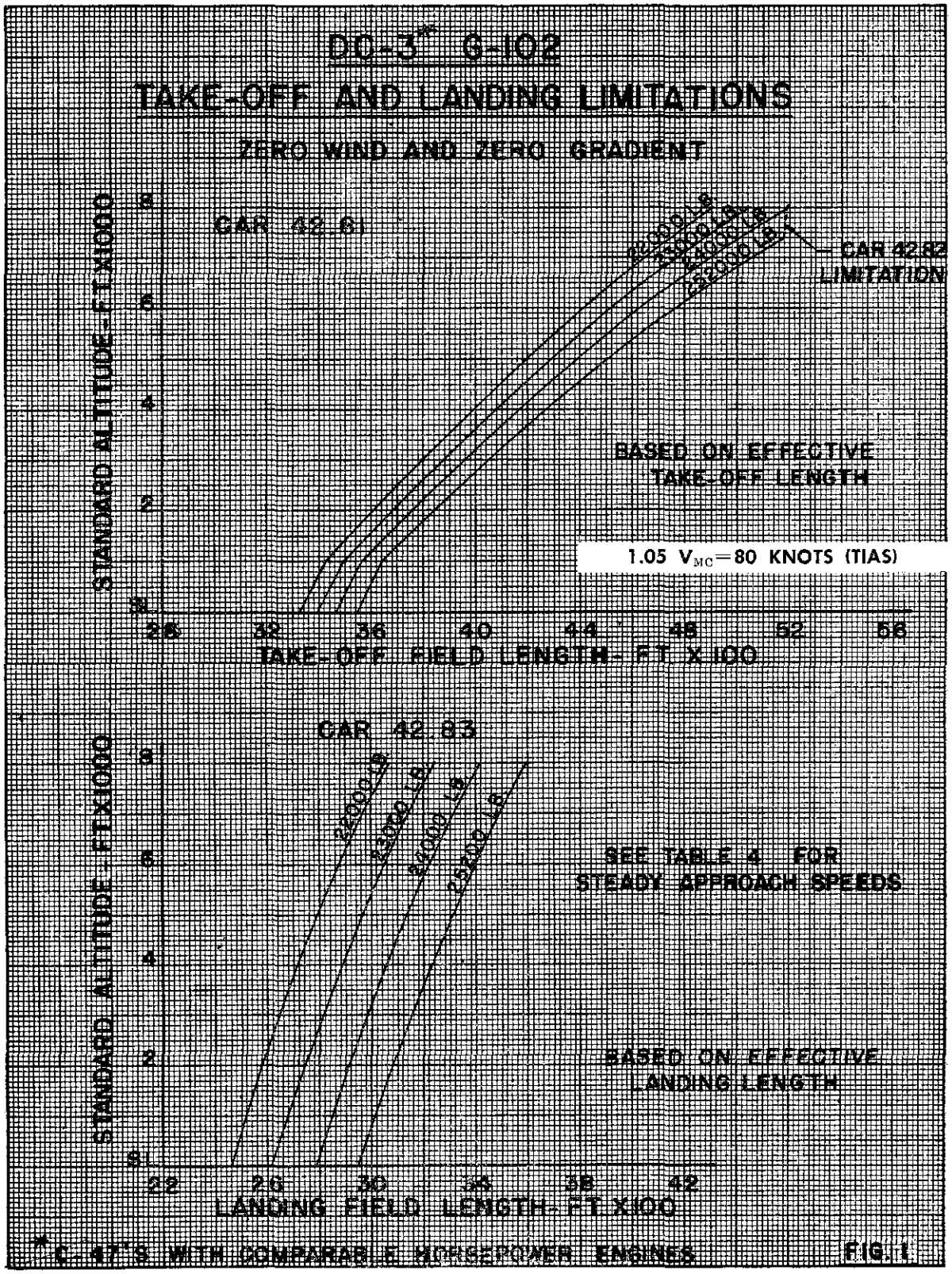
Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	22,000	V_{50}	23,000	V_{50}	24,000	V_{50}	25,200	V_{50}
	Distance in feet							
S. L.	2,460	74.5	2,620	76.5	2,790	78.0	2,950	80.0
1,000	2,520	74.5	2,680	76.5	2,850	78.0	3,015	80.0
2,000	2,580	74.5	2,745	76.5	2,915	78.0	3,080	80.0
3,000	2,645	74.5	2,815	76.5	2,980	78.0	3,155	80.0
4,000	2,710	74.5	2,885	76.5	3,060	78.0	3,230	80.0
5,000	2,790	74.5	2,965	76.5	3,135	78.0	3,310	80.0
6,000	2,870	74.5	3,050	76.5	3,220	78.0	3,400	80.0
7,000	2,965	74.5	3,140	76.5	3,315	78.0	3,490	80.0
8,000	3,045	74.5	3,240	76.5	3,420	78.0	3,595	80.0

[1] Steady approach speed through 50 feet height-knots TIAS denoted by symbol V_{50}.

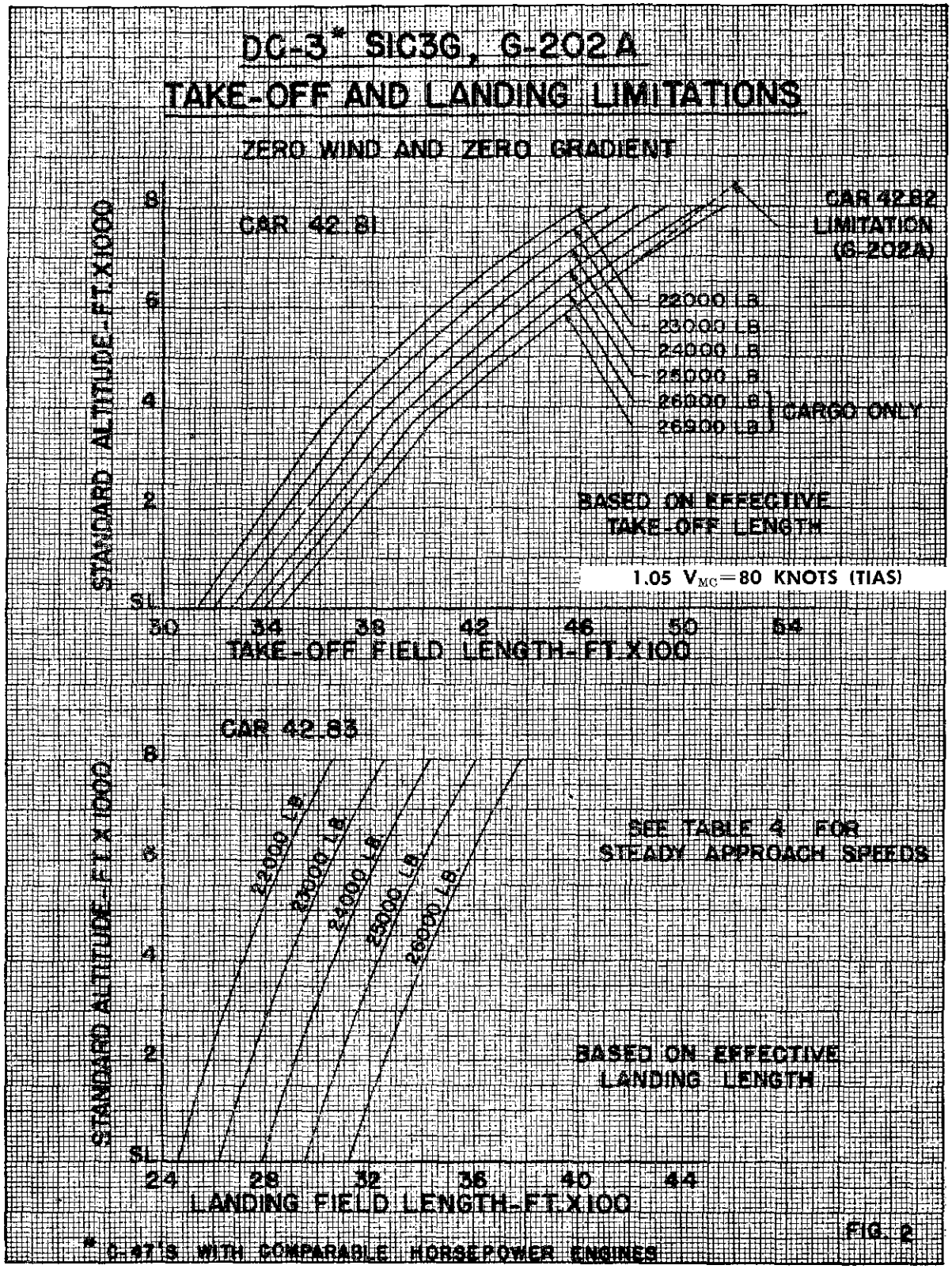
(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	22,000	V_{50}	23,000	V_{50}	24,000	V_{50}	25,000	V_{50}
	Distance in feet							
S. L.	3,125	74.5	3,325	76.5	3,545	78.0	3,745	80.0
1,000	3,200	74.5	3,390	76.5	3,620	78.0	3,830	80.0
2,000	3,275	74.5	3,485	76.5	3,700	78.0	3,910	80.0
3,000	3,360	74.5	3,575	76.5	3,785	78.0	4,005	80.0
4,000	3,440	74.5	3,665	76.5	3,885	78.0	4,100	80.0
5,000	3,545	74.5	3,765	76.5	3,980	78.0	4,205	80.0
6,000	3,645	74.5	3,875	76.5	4,090	78.0	4,320	80.0
7,000	3,765	74.5	3,990	76.5	4,210	78.0	4,430	80.0
8,000	3,865	74.5	4,115	76.5	4,345	78.0	4,565	80.0

[1] Steady approach speed through 50 feet height-knots TIAS denoted by symbol V_{50}.


DC-3* C-I02
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.61
CAR 42.82 LIMITATION
BASED ON EFFECTIVE TAKE-OFF LENGTH
1.05 V_{MC} = 80 KNOTS (TIAS)
STANDARD ALTITUDE - FT X 1000
TAKE-OFF FIELD LENGTH - FT X 100
CAR 42.83
SEE TABLE 4 FOR STEADY APPROACH SPEEDS
BASED ON EFFECTIVE LANDING LENGTH
LANDING FIELD LENGTH - FT X 100
*C-47'S WITH COMPARABLE HORSEPOWER ENGINES
FIG. 1

(Rev. 4/1/56)


DC-3* SIC3G, G-202A
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.81
CAR 42.82 LIMITATION (G-202A)
22000 LB
23000 LB
24000 LB
25000 LB
26000 LB
26900 LB
CARGO ONLY
BASED ON EFFECTIVE TAKE-OFF LENGTH
1.05 V_{MC}=80 KNOTS (TIAS)
STANDARD ALTITUDE-FT.X1000
SL 2 4 6 8
30 34 38 42 46 50 54
TAKE-OFF FIELD LENGTH-FT.X100
CAR 42.83
22000 LB
23000 LB
24000 LB
25000 LB
26000 LB
SEE TABLE 4 FOR STEADY APPROACH SPEEDS
BASED ON EFFECTIVE LANDING LENGTH
STANDARD ALTITUDE-FT.X1000
SL 2 4 6 8
24 28 32 36 40 44
LANDING FIELD LENGTH-FT.X100
* C-47'S WITH COMPARABLE HORSEPOWER ENGINES
FIG. 2

(Rev. 4/1/56)

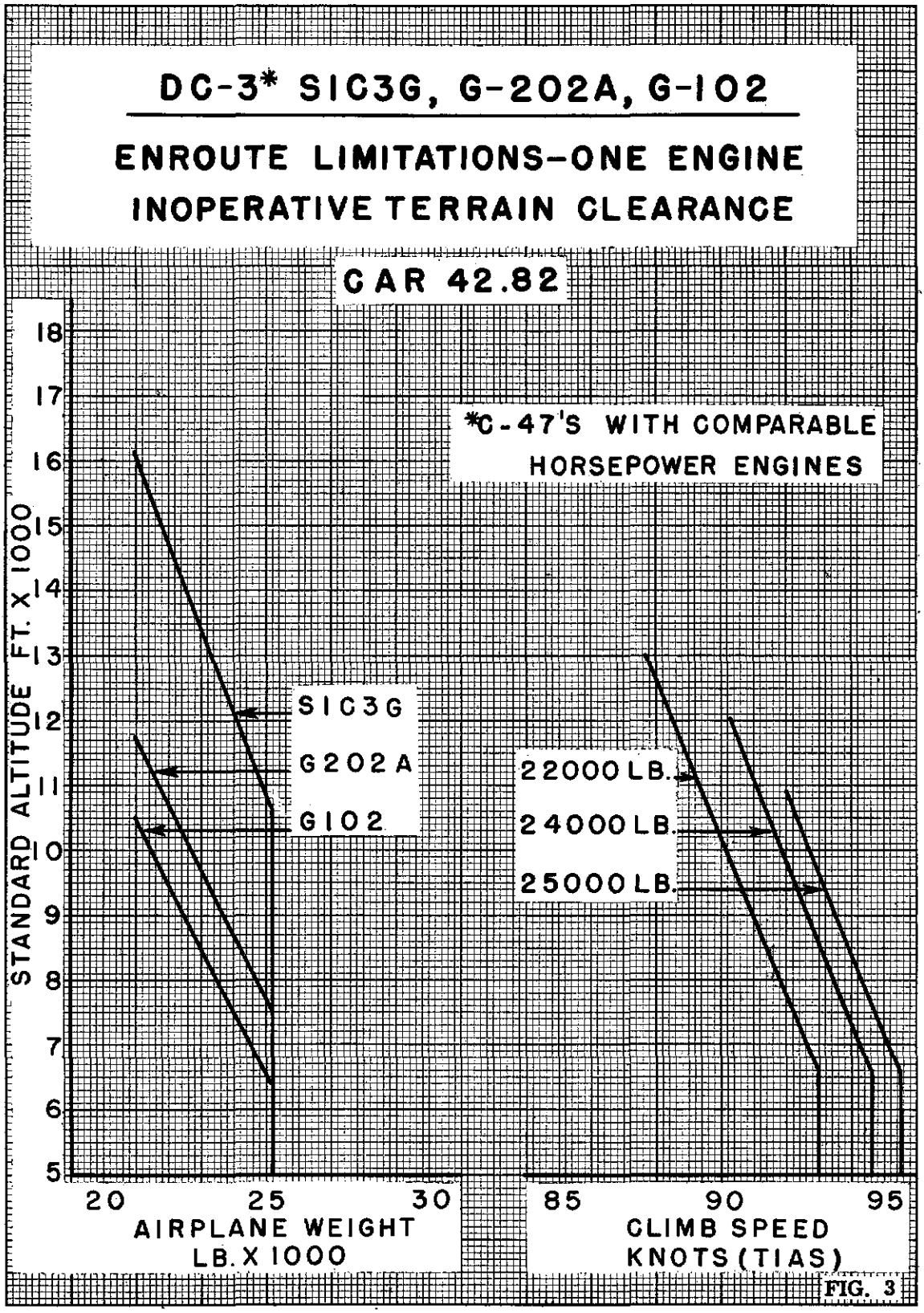


FIG. 3

(Rev. 4/1/56)

42.80–3 *Performance data on Lockheed 18 G202A aircraft (CAA rules which apply to section 42.80).* The following performance limitations data, applicable to Lockheed 18 G202A aircraft shall be used in determining compliance with section 42.80. These data are presented in tables 1 through 3 and figures 1 and 2.

TABLE 1.—*Takeoff limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12). (Distance to accelerate to 99.5 knots TIAS, and stop, with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds		
	17,500	18,000	18,500
	Distance in feet		
S. L.	5,470	5,670	5,830
1,000	5,725	5,925	6,100
2,000	5,980	6,185	6,380
3,000	6,250	6,460	6,670
4,000	6,520	6,740	6,950
5,000	6,800	7,030	7,250
6,000	7,100	7,330	7,570
7,000	7,405	7,650	7,890
8,000	7,750	8,000	8,240

(b) Actual length of runway required when "effective length," considering obstacles, is not determined. (Distance to accelerate to 99.5 knots TIAS, and stop, divided by the factor 0.85.)

Standard altitude in feet	Airplane weight in pounds		
	17,500	18,000	18,500
	Distance in feet		
S. L.	6,430	6,665	6,855
1,000	6,730	6,965	7,175
2,000	7,030	7,275	7,500
3,000	7,350	7,595	7,845
4,000	7,665	7,925	8,175
5,000	7,995	8,265	8,525
6,000	8,350	8,620	8,900
7,000	8,760	8,995	9,280
8,000	9,115	9,410	9,690

TABLE 2.—*En route limitations*

Weight in pounds	Terrain clearance [1] in feet and climb speed in knots TIAS	
	Feet	Knots
18,500	9,800	104.5
18,000	10,600	103.0
17,500	11,350	102.0
17,000	12,150	101.0
16,500	12,900	100.0
16,000	13,700	99.0

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.

TABLE 3.—*Landing limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

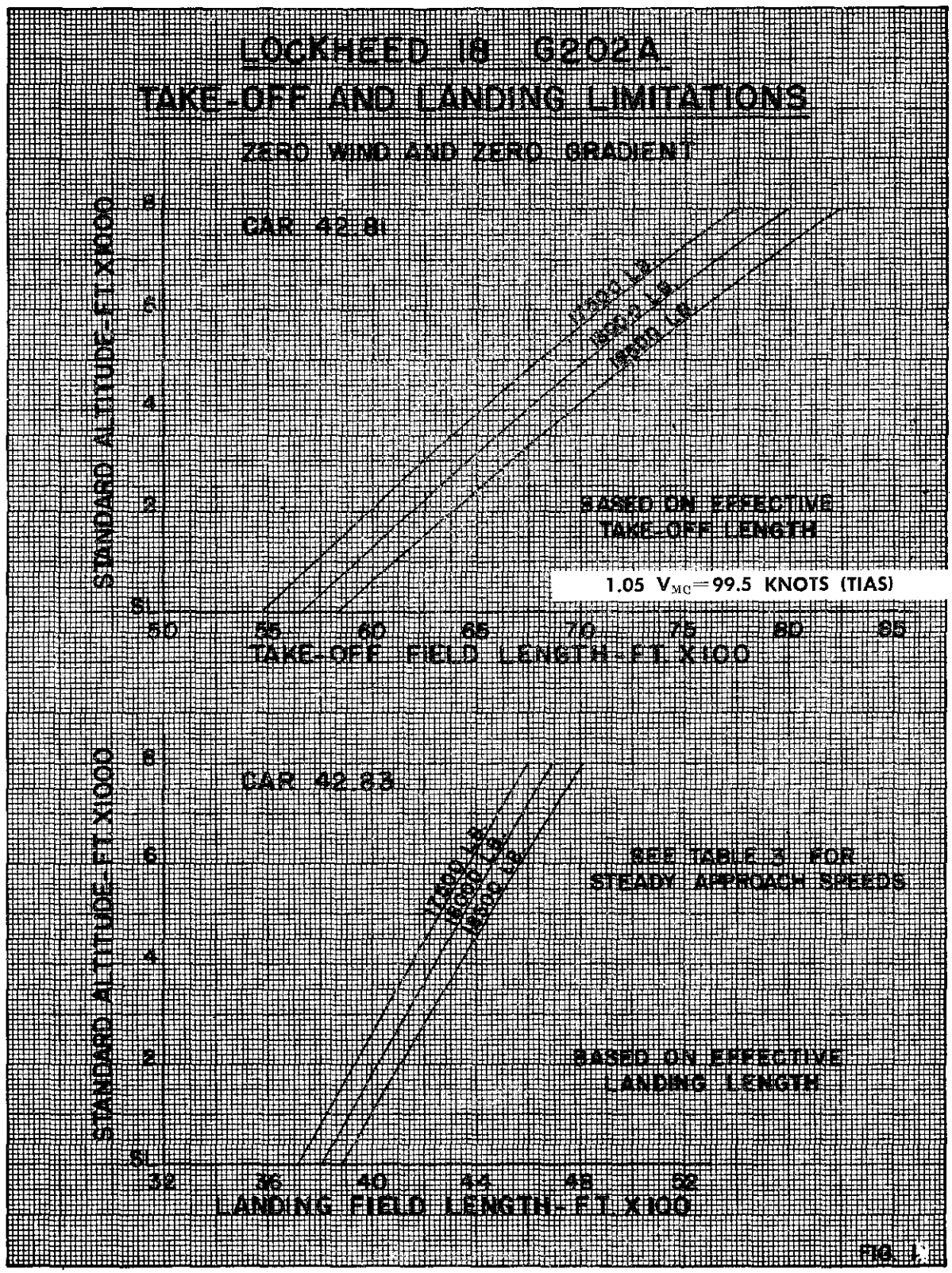
Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots					
	17,500	V_{50}	18,000	V_{50}	18,500	V_{50}
	Distance in feet					
S. L.	3,715	83.0	3,810	84.0	3,885	86.0
1,000	3,825	83.0	3,910	84.0	3,995	86.0
2,000	3,930	83.0	4,020	84.0	4,105	86.0
3,000	4,040	83.0	4,130	84.0	4,220	86.0
4,000	4,150	83.0	4,240	84.0	4,335	86.0
5,000	4,240	83.0	4,350	84.0	4,450	86.0
6,000	4,370	83.0	4,460	84.0	4,570	86.0
7,000	4,480	83.0	4,575	84.0	4,690	86.0
8,000	4,595	83.0	4,690	84.0	4,810	86.0

[1] Steady approach speed through 50-foot height knots TIAS denoted by symbol V_{50}.

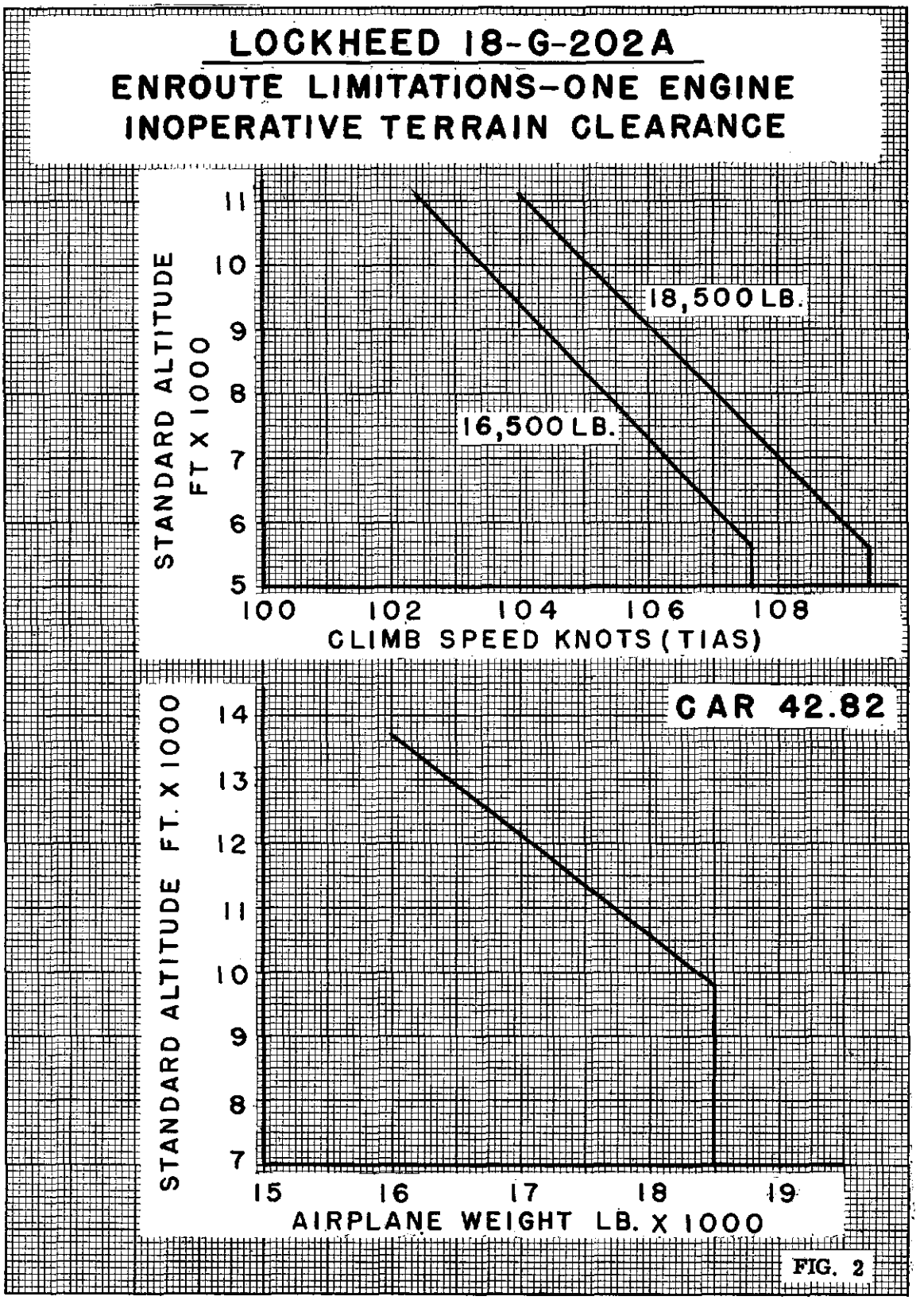
(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots					
	17,500	V_{50}	18,000	V_{50}	18,500	V_{50}
	Distance in feet					
S. L.	4,720	83.0	4,840	84.0	4,935	86.0
1,000	4,860	83.0	4,965	84.0	5,075	86.0
2,000	4,990	83.0	5,105	84.0	5,215	86.0
3,000	5,130	83.0	5,245	84.0	5,360	86.0
4,000	5,270	83.0	5,385	84.0	5,505	86.0
5,000	5,385	83.0	5,525	84.0	5,650	86.0
6,000	5,550	83.0	5,665	84.0	5,805	86.0
7,000	5,690	83.0	5,810	84.0	5,955	86.0
8,000	5,835	83.0	5,955	84.0	6,110	86.0

[1] Steady approach speed through 50-foot height knots TIAS denoted by symbol V_{50}.


LOCKHEED 18 G202A
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.81
STANDARD ALTITUDE-FT X1000
8
6
4
2
SL
50
55
60
65
70
75
80
85
TAKE-OFF FIELD LENGTH-FT X100
BASED ON EFFECTIVE TAKE-OFF LENGTH
1.05 V_{MC}=99.5 KNOTS (TIAS)
CAR 42.83
STANDARD ALTITUDE-FT X1000
8
6
4
2
SL
32
36
40
44
48
52
LANDING FIELD LENGTH-FT X100
SEE TABLE 3 FOR STEADY APPROACH SPEEDS
BASED ON EFFECTIVE LANDING LENGTH
FIG. 1

(Rev. 4/1/56)


LOCKHEED 18-G-202A
ENROUTE LIMITATIONS-ONE ENGINE
INOPERATIVE TERRAIN CLEARANCE
STANDARD ALTITUDE FT X 1000
11
10
9
8
7
6
5
18,500 LB.
16,500 LB.
100
102
104
106
108
CLIMB SPEED KNOTS (TIAS)
CAR 42.82
STANDARD ALTITUDE FT. X 1000
14
13
12
11
10
9
8
7
15
16
17
18
19
AIRPLANE WEIGHT LB. X 1000
FIG. 2

(Rev. 4/1/56)

42.80–4 *Convair Model 28–5ACF and PBY–5A landplane aircraft (CAA rules which apply to sec. 42.80).* The following performance limitations data, applicable to Convair Model 28–5ACF and PBY–5A landplane aircraft shall be used in determining compliance with section 42.80. These data are presented in tables 1 through 4 and figures 1 and 2.

TABLE 1.—*Takeoff limitations*

[(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12). (Distance to accelerate to 82.5 knots TIAS (28–5ACF), 79 knots TIAS (PBY–5A), and stop, with zero wind and zero gradient.)]

Standard altitude in feet	Airplane weight in pounds					
	23,000	24,000	25,000	26,000	[1]27,000	[2]28,000
	Distance in feet					
S. L.	3,240	3,400	3,565	3,725	3,880	4,050
1,000	3,370	3,540	3,720	3,885	4,055	4,225
2,000	3,500	3,680	3,875	4,045	4,230	4,400
3,000	3,635	3,830	4,025	4,200	4,400	4,580
4,000	3,860	4,070	4,280	4,485	4,700	4,900
5,000	4,095	4,315	4,540	4,770	5,000	5,215
6,000	4,330	4,565	4,810	5,060	5,305	5,545
7,000	4,580	4,830	5,090	5,360	5,610	5,880
8,000	4,830	5,095	5,380	5,660	5,940	6,240

[1] Maximum weight for PBY–5A landplane.
[2] Maximum weight for 28–5ACF.

[(b) Actual length of runway required when "effective length," considering obstacles, is not determined. (Distance to accelerate to 82.5 knots TIAS (28–5ACF), 79½ knots TIAS (PBY–5A), and stop, divided by the factor 0.85.)]

Standard altitude in feet	Airplane weight in pounds					
	23,000	24,000	25,000	26,000	[1]27,000	[2]28,000
	Distance in feet					
S. L.	3,810	4,000	4,190	4,380	4,560	4,760
1,000	3,965	4,165	4,375	4,570	4,770	4,970
2,000	4,115	4,330	4,557	4,755	4,975	5,175
3,000	4,275	4,505	4,735	4,940	5,175	5,385
4,000	4,540	4,785	5,035	5,275	5,525	5,760
5,000	4,815	5,075	5,340	5,610	5,880	6,130
6,000	5,090	5,370	5,655	5,950	6,240	6,520
7,000	5,385	5,680	5,985	6,305	6,600	6,915
8,000	5,680	5,990	6,325	6,655	6,985	7,340

[1] Maximum weight for PBY–5A landplane.
[2] Maximum weight for 28–5ACF.

TABLE 2.—*En route limitations*

Weight in pounds	Terrain clearance [1] in feet and climb speed in knots TIAS			
	Model PBY–5A		Model 28–5ACF	
	Feet	Knots	Feet	Knots
28,000			7,500	90.5
27,500			8,000	89.5
27,000	7,200	81.0	8,500	88.5
26,500	7,700	80.5	9,050	87.5
26,000	8,200	79.5	9,600	87.0
25,500	8,700	78.5	10,100	86.0
25,000	9,200	77.5	10,650	84.5
24,500	9,700	76.5	11,150	84.0
24,000	10,200	75.5	11,700	82.5

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.

(Rev. 4/1/56)

TABLE 3.—*Landing limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots TIAS					
	23,000	V_{50}	24,000	V_{50}	25,000	V_{50}
	Distance in feet					
S. L.	3,420	74.5	3,570	76.5	3,690	78.0
1,000	3,515	74.5	3,665	76.5	3,800	78.0
2,000	3,605	74.5	3,765	76.5	3,900	78.0
3,000	3,700	74.5	3,860	76.5	4,010	78.0
4,000	3,790	74.5	3,955	76.5	4,110	78.0
5,000	3,885	74.5	4,055	76.5	4,215	78.0
6,000	3,975	74.5	4,150	76.5	4,320	78.0
7,000	4,070	74.5	4,245	76.5	4,425	78.0
8,000	4,160	74.5	4,340	76.5	4,525	78.0

[1] Steady approach speed through 50 feet height in knots. TIAS denoted by symbol V_{50}.

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots TIAS					
	23,000	V_{50}	24,000	V_{50}	25,000	V_{50}
	Distance in feet					
S. L.	4,350	74.5	4,544	76.5	4,696	78.0
1,000	4,475	74.5	4,664	76.5	4,836	78.0
2,000	4,588	74.5	4,792	76.5	4,964	78.0
3,000	4,709	74.5	4,913	76.5	5,104	78.0
4,000	4,824	74.5	5,034	76.5	5,231	78.0
5,000	4,944	74.5	5,161	76.5	5,364	78.0
6,000	5,059	24.5	5,282	76.5	5,498	78.0
7,000	5,180	74.5	5,403	76.5	5,632	78.0
8,000	5,294	74.5	5,524	76.5	5,759	78.0

[1] Steady approach speed through 50 feet height in knots. TIAS denoted by symbol V_{50}.

TABLE 4.—*Landing limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

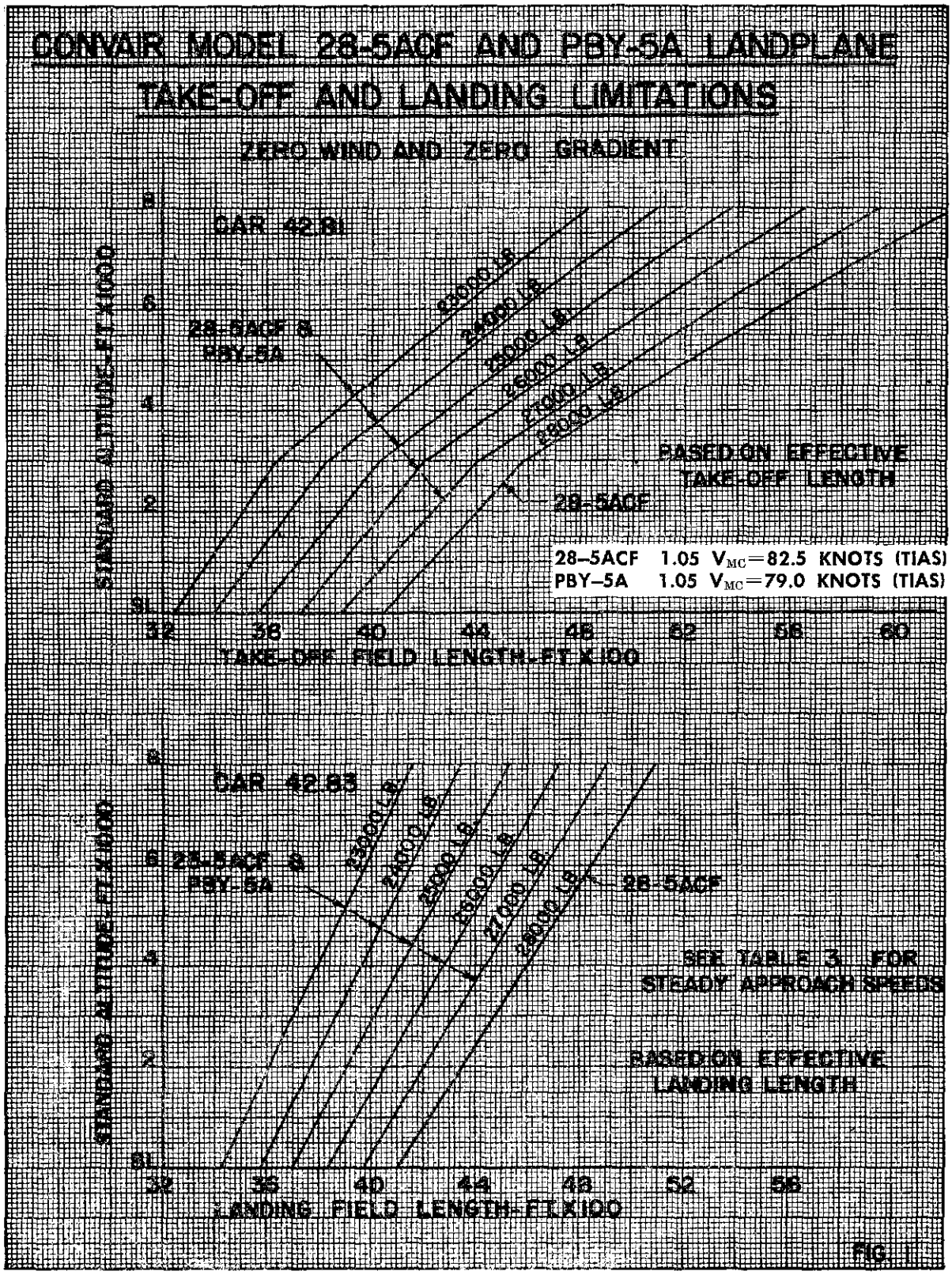
Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots TIAS					
	26,000	V_{50}	[2]27,000	V_{50}	[3]28,000	V_{50}
	Distance in feet					
S. L.	3,830	80.0	3,965	81.0	4,100	82.5
1,000	3,940	80.0	4,080	81.0	4,220	82.5
2,000	4,050	80.0	4,200	81.0	4,345	82.5
3,000	4,160	80.0	4,315	81.0	4,470	82.5
4,000	4,275	80.0	4,430	81.0	4,595	82.5
5,000	4,385	80.5	4,550	81.0	4,720	82.5
6,000	4,495	80.0	4,665	81.0	4,840	82.5
7,000	4,610	80.0	4,785	81.0	4,970	82.5
8,000	4,720	80.0	4,900	81.0	5,090	82.5

[1] Steady approach speed through 50 feet height in knots. TIAS denoted by symbol V_{50}.
[2] Maximum weight for PBY-5A landplane.
[3] Maximum weight for 28-5ACF.

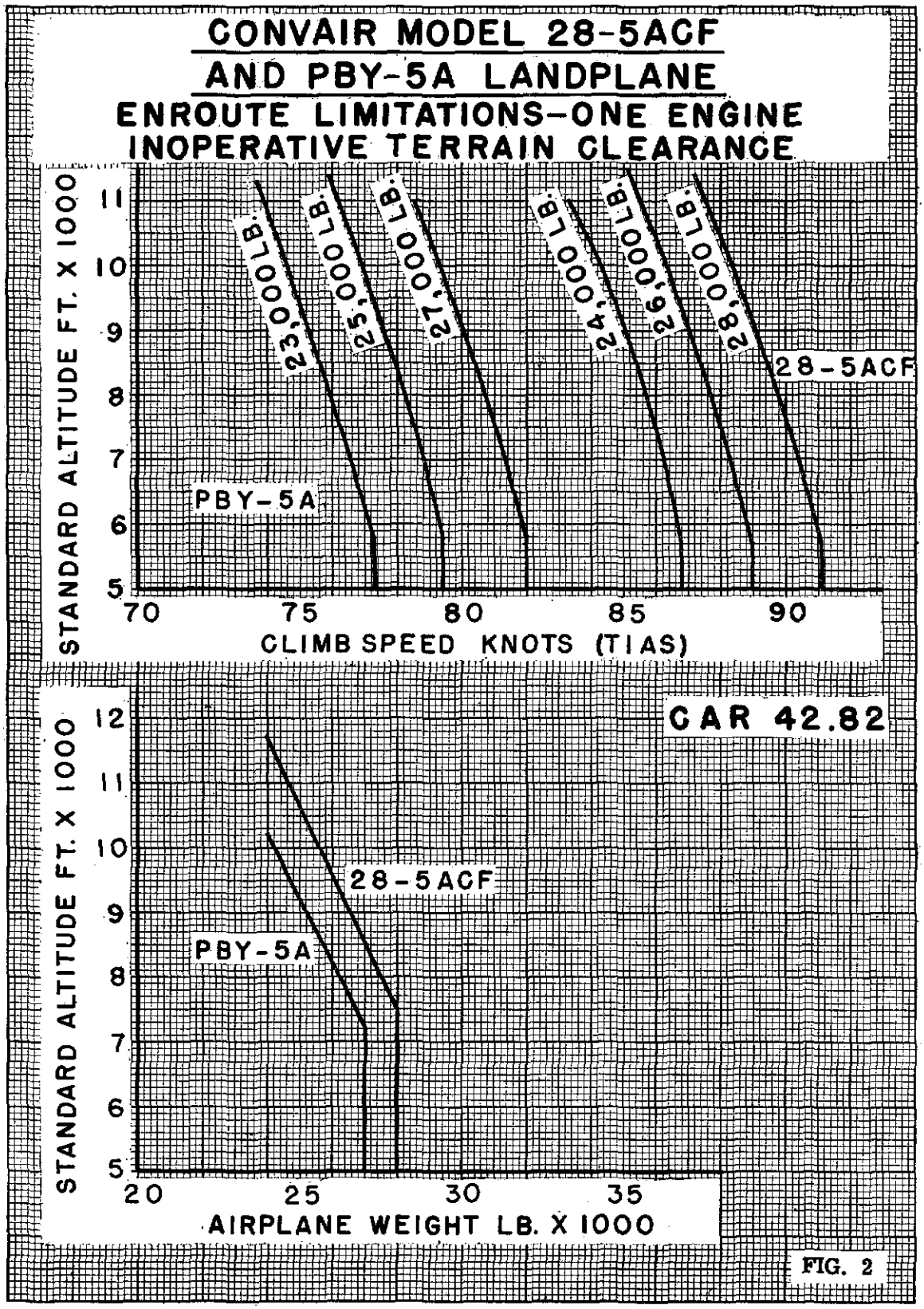
(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots TIAS					
	26,000	V_{50}	[2]27,000	V_{50}	[3]28,000	V_{50}
	Distance in feet					
S. L.	4,874	80.0	5,046	81.0	5,218	82.5
1,000	5,014	80.0	5,193	81.0	5,371	82.5
2,000	5,154	80.0	5,345	81.0	5,530	82.5
3,000	5,294	80.0	5,492	81.0	5,689	82.5
4,000	5,441	80.0	5,638	81.0	5,848	82.5
5,000	5,581	80.0	5,791	81.0	6,007	82.5
6,000	5,721	80.0	5,937	81.0	6,160	82.5
7,000	5,867	80.0	6,090	81.0	6,325	82.5
8,000	6,007	80.0	6,236	81.0	6,478	82.5

[1] Steady approach speed through 50 feet height in knots. TIAS denoted by symbol V_{50}.
[2] Maximum weight for PBY-5A landplane.
[3] Maximum weight for 28-5ACF.


CONVAIR MODEL 28-5ACF AND PBY-5A LANDPLANE
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.81
28-5ACF & PBY-5A
28-5ACF
BASED ON EFFECTIVE TAKE-OFF LENGTH
28-5ACF 1.05 V_{MC}=82.5 KNOTS (TIAS)
PBY-5A 1.05 V_{MC}=79.0 KNOTS (TIAS)
STANDARD ALTITUDE-FT X 1000
SL
32 36 40 44 48 52 56 60
TAKE-OFF FIELD LENGTH-FT X 100
CAR 42.83
28-5ACF & PBY-5A
28-5ACF
SEE TABLE 3 FOR STEADY APPROACH SPEEDS
BASED ON EFFECTIVE LANDING LENGTH
LANDING FIELD LENGTH-FT X 100
FIG.

(Rev. 4/1/56)


CONVAIR MODEL 28-5ACF
AND PBY-5A LANDPLANE
ENROUTE LIMITATIONS-ONE ENGINE
INOPERATIVE TERRAIN CLEARANCE
STANDARD ALTITUDE FT. X 1000
11
10
9
8
7
6
5
23,000 LB.
25,000 LB.
27,000 LB.
24,000 LB.
26,000 LB.
28,000 LB.
28-5ACF
PBY-5A
70
75
80
85
90
CLIMB SPEED KNOTS (TIAS)
CAR 42.82
STANDARD ALTITUDE FT. X 1000
12
11
10
9
8
7
6
5
28-5ACF
PBY-5A
20
25
30
35
AIRPLANE WEIGHT LB. X 1000
FIG. 2

(Rev. 4/1/56)

42.80–5 *Performance data on Douglas B–18, RB–18A (R1820–53) aircraft (CAA rules which apply to section 42.80).* The following performance limitations data, applicable to the Douglas B–18, RB–18A aircraft shall be used in determining compliance with section 42.80. These data are presented in tables 1 through 3 and figures 1 and 2. As indicated by the en route limitation data for the Douglas model B–18 (table 2), operation is restricted to impractical operating weights. Therefore takeoff and landing limitations are not presented for this model.

TABLE 1.—*Takeoff limitations*

MODEL RB–18A

(a) "Effective length" of runway required when effective length is determined in accordance with 42.1 (a) (12). (Distance to accelerate to 81.5 knots TIAS, and stop, with zero wind and zero gradient.)

Standard altitude in feet	Airplane weight in pounds			
	19,000	20,000	21,000	21,300
	Distance in feet			
S. L.	3,605	3,695	3,790	3,820
1,000	3,710	3,815	3,920	3,950
2,000	3,835	3,945	4,045	4,085
2,500	3,890	4,000	4,110	4,150
3,000	4,015	4,130	4,230	4,275
4,000	4,240	4,355	4,475	4,525
5,000	4,475	4,595	4,720	----
6,000	4,710	4,835	----	----
7,000	4,935	5,065	[1]	[1]
8,000	5,170	5,300	----	----

[1] Limited by sec. 42.82

(b) Actual length of runway required when "effective length", considering obstacles, is not determined. (Distance to accelerate to 81.5 knots TIAS, and stop, divided by the factor 0.85.)

Standard altitude in feet	Airplane weight in pounds			
	19,000	20,000	21,000	21,300
	Distance in feet			
S. L.	4,250	4,350	4,460	4,495
1,000	4,360	4,490	4,610	4,650
2,000	4,510	4,645	4,755	4,800
2,500	4,575	4,705	4,840	4,880
3,000	4,730	4,855	4,980	5,025
4,000	4,990	5,125	5,260	5,325
5,000	5,260	5,400	5,550	----
6,000	5,550	5,680	----	----
7,000	5,800	5,960	[1]	[1]
8,000	6,080	6,240	----	----

[1] Limited by sec. 42.82.

DOUGLAS B–18, RB18A (R–1820–53)

TABLE 2.—*En route limitations*

MODEL B–18

Weight in pounds:	*Terrain clearance [1] in feet*
13,500	4,100
13,000	4,600

Section 42.82 limitation critical for all practical operating weights.

MODEL RB–18A

Weight in pounds	Terrain clearance [1] in feet and climb speed in knots TIAS			
	Low blower		High blower	
	Feet	Knots	Feet	Knots
21,000	4,270	86.0	----	----
20,600	----	----	4,600	85.0
20,500	----	----	5,900	84.5
20,200	----	----	8,800	83.5
20,000	----	----	8,950	83.5
19,500	----	----	9,400	82.5

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.

TABLE 3.—*Landing limitations*

MODEL RB-18A

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

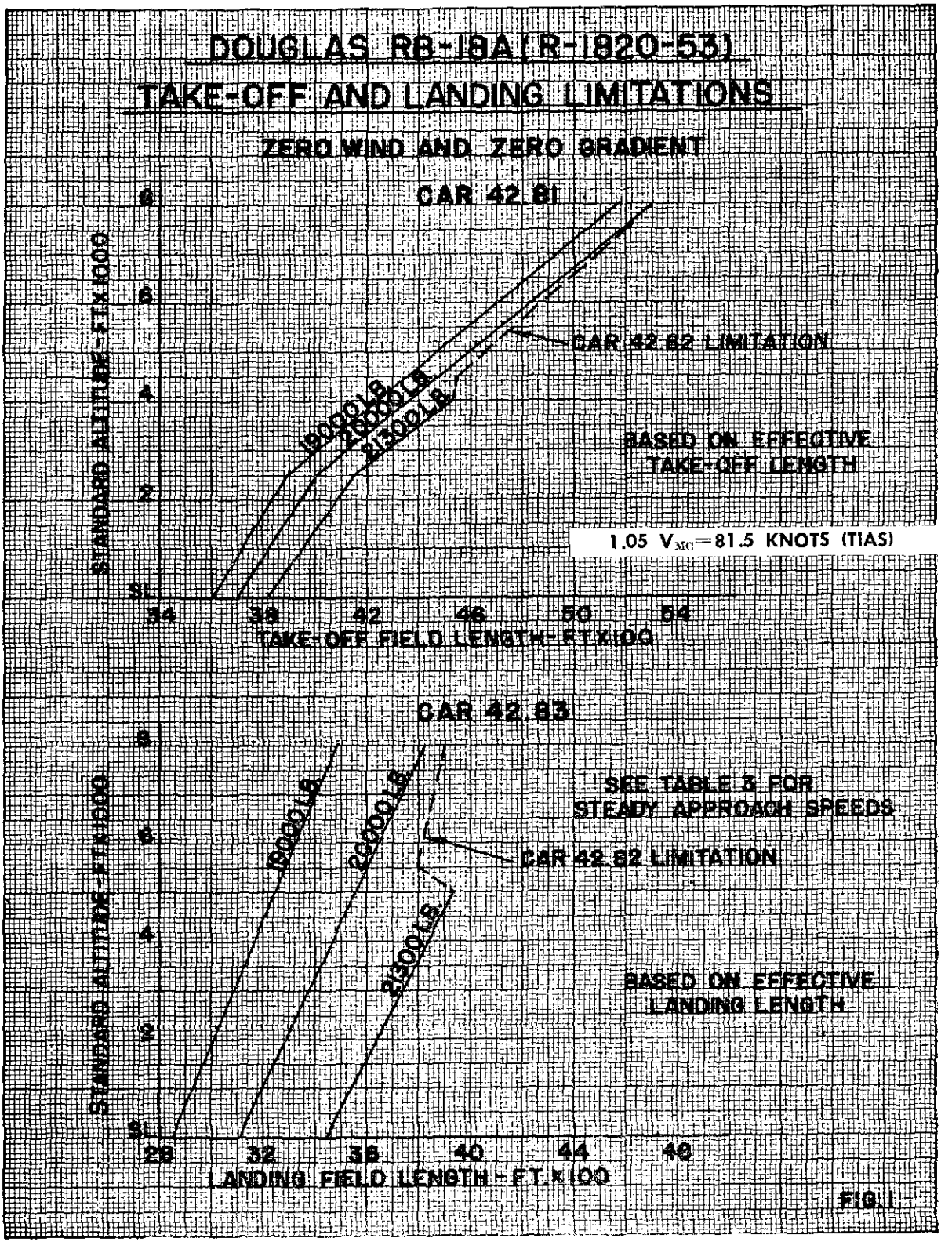
Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	19,000	V_{50}	20,000	V_{50}	21,000	V_{50}	21,300	V_{50}
	Distance in feet							
S. L.	2,850	74.5	3,110	77.0	3,370	78.5	3,445	79.0
1,000	2,930	74.5	3,200	77.0	3,470	78.5	3,545	79.0
2,000	3,010	74.5	3,290	77.0	3,565	78.5	3,640	79.0
3,000	3,085	74.5	3,380	77.0	3,660	78.5	3,740	79.0
4,000	3,165	74.5	3,470	77.0	3,755	78.5	3,835	79.0
5,000	3,245	74.5	3,560	77.0	3,850	78.5	3,935	79.0
6,000	3,325	74.5	3,650	77.0	---	---	---	---
7,000	3,405	74.5	3,735	77.0	[2]	[2]	[2]	[2]
8,000	3,485	74.5	3,825	77.0	---	---	---	---

[1] Steady approach speed through 50 feet height knots TIAS denoted by symbol V_{50}.
[2] Limited by sec. 42.82.

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	19,000	V_{50}	20,000	V_{50}	21,000	V_{50}	21,300	V_{50}
	Distance in feet							
S. L.	3,630	74.5	3,960	77.0	4,290	78.5	4,390	79.0
1,000	3,730	74.5	4,070	77.0	4,410	78.5	4,510	79.0
2,000	3,835	74.5	4,190	77.0	4,540	78.5	4,630	79.0
3,000	3,925	74.5	4,300	77.0	4,655	78.5	4,760	79.0
4,000	4,025	74.5	4,415	77.0	4,775	78.5	4,880	79.0
5,000	4,130	74.5	4,535	77.0	4,900	78.5	5,005	79.0
6,000	4,230	74.5	4,645	77.0	---	---	---	---
7,000	4,340	74.5	4,750	77.0	---	[2]	[2]	---
8,000	4,440	74.5	4,865	77.0	---	---	---	---

[1] Steady approach speed through 50 feet height knots TIAS denoted by symbol V_{50}.
[2] Limited by sec. 42.82.


DOUGLAS R8-18A (R-1820-53)
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.81
STANDARD ALTITUDE - FT.X1000
8
6
4
2
SL
34
38
42
46
50
54
TAKE-OFF FIELD LENGTH - FT.X100
CAR 42.82 LIMITATION
BASED ON EFFECTIVE TAKE-OFF LENGTH
1.05 V_{MC}=81.5 KNOTS (TIAS)
CAR 42.83
STANDARD ALTITUDE - FT.X1000
8
6
4
2
SL
28
32
36
40
44
48
LANDING FIELD LENGTH - FT.X100
SEE TABLE 3 FOR STEADY APPROACH SPEEDS
CAR 42.82 LIMITATION
BASED ON EFFECTIVE LANDING LENGTH
FIG. I

(Rev. 4/1/56)

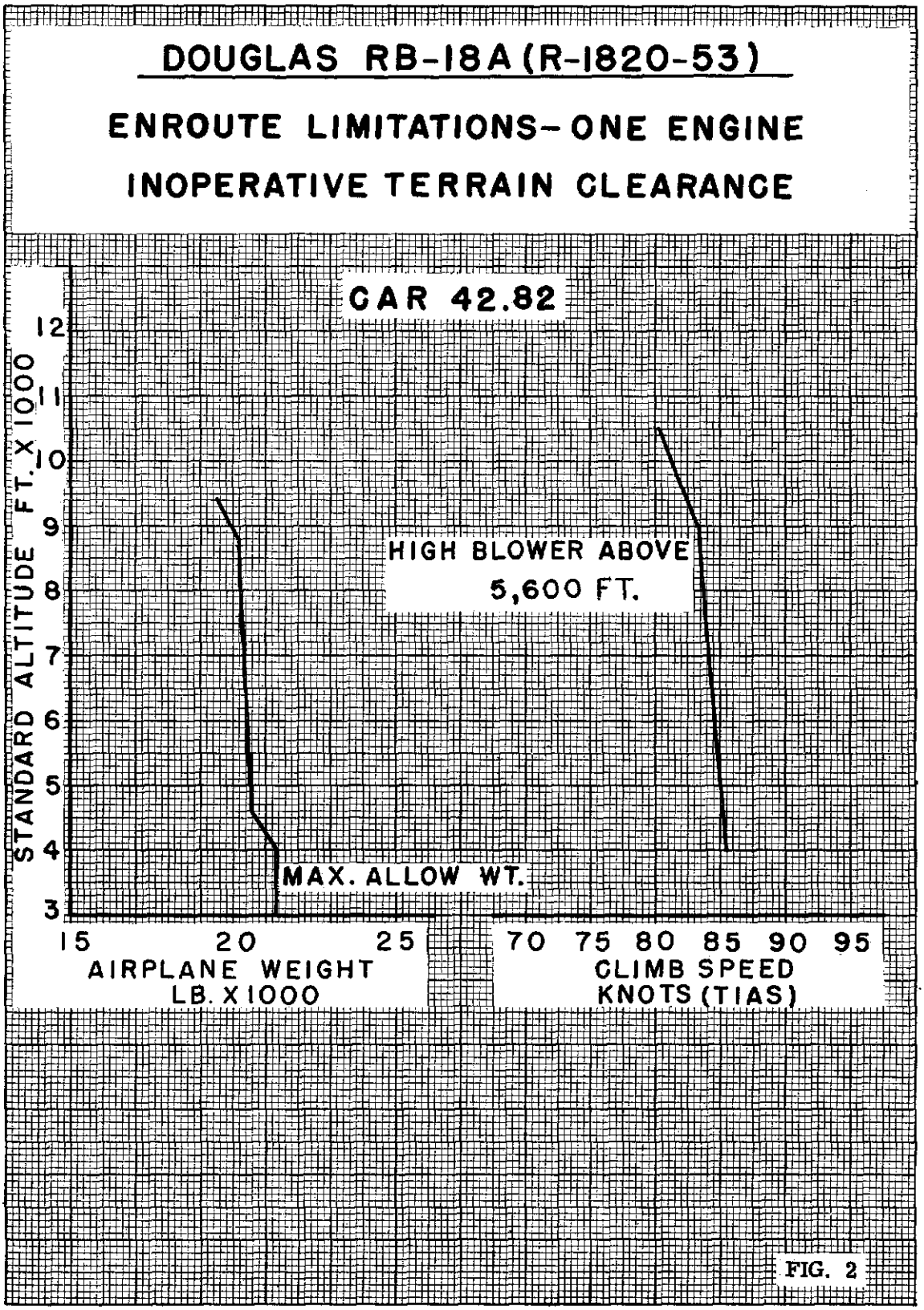


FIG. 2

(Rev. 4/1/56)

42.80–7 *Performance data on Boeing S–307 aircraft (CAA rules which apply to section 42.80).* The following performance limitations data, applicable to Boeing S–307 aircraft, shall be used in determining compliance with section 42.80. These data are presented in tables 1 through 3 and Figures 1 and 2.

TABLE 1.—*Takeoff limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) (distance to accelerate to 1.15 V_{s_1}=1.15 (85.4) $\sqrt{\text{Wgt.}/50{,}000}$ knots TIAS and stop, with zero wind and zero gradient).

Standard altitude in feet	Airplane weight in pounds and critical engine failure speeds in knots TIAS		
	46,000 V_1=94.0	48,000 V_1=96.5	50,000 V_1=98.0
	Distance in feet		
S. L.	3, 730	4, 010	4, 260
1,000	3, 900	4, 190	4, 460
2,000	4, 120	4, 430	4, 720
3,000	4, 350	4, 680	4, 990
4,000	4, 600	4, 950	5, 280
5,000	4, 860	5, 250	5, 600
6,000	5, 140	5, 550	5, 940
7,000	5, 460	5, 910	6, 320
8,000	5, 820	6, 330	6, 770

(b) Actual length of runway required when "effective length," considering obstacles, is not determined (distance to accelerate to 1.15 (85.4) $\sqrt{\text{Wgt.}/50{,}000}$ knots TIAS, and stop, divided by the factor 0.85).

Standard altitude in feet	Airplane weight in pounds and critical engine failure speed (V_1) in knots TIAS		
	46,000 V_1=94.0	48,000 V_1=96.5	50,000 V_1=98.0
	Distance in feet		
S. L.	4, 390	4, 720	5, 010
1,000	4, 590	4, 930	5, 245
2,000	4, 845	5, 210	5, 555
3,000	5, 120	5, 505	5, 870
4,000	5, 410	5, 825	6, 210
5,000	5, 720	6, 175	6, 590
6,000	6, 045	6, 530	6, 990
7,000	6, 425	6, 955	7, 435
8,000	6, 845	7, 445	7, 965

TABLE 2.—*En route limitations*

Weight in pounds	Terrain clearance [1] in feet and climb speed in knots TIAS		Weight in pounds	Terrain clearance [1] in feet and climb speed in knots TIAS	
	Feet	knots		Feet	knots
40,000	17,000	89.5	46,000	13,750	99.0
41,000	16,400	91.0	47,000	13,200	100.5
42,000	15,900	93.0	48,000	12,700	101.5
43,000	15,350	94.0	49,000	12,150	103.0
44,000	14,800	96.0	50,000	11,650	104.0
45,000	14,300	97.5			

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.

TABLE 3.—*Landing limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

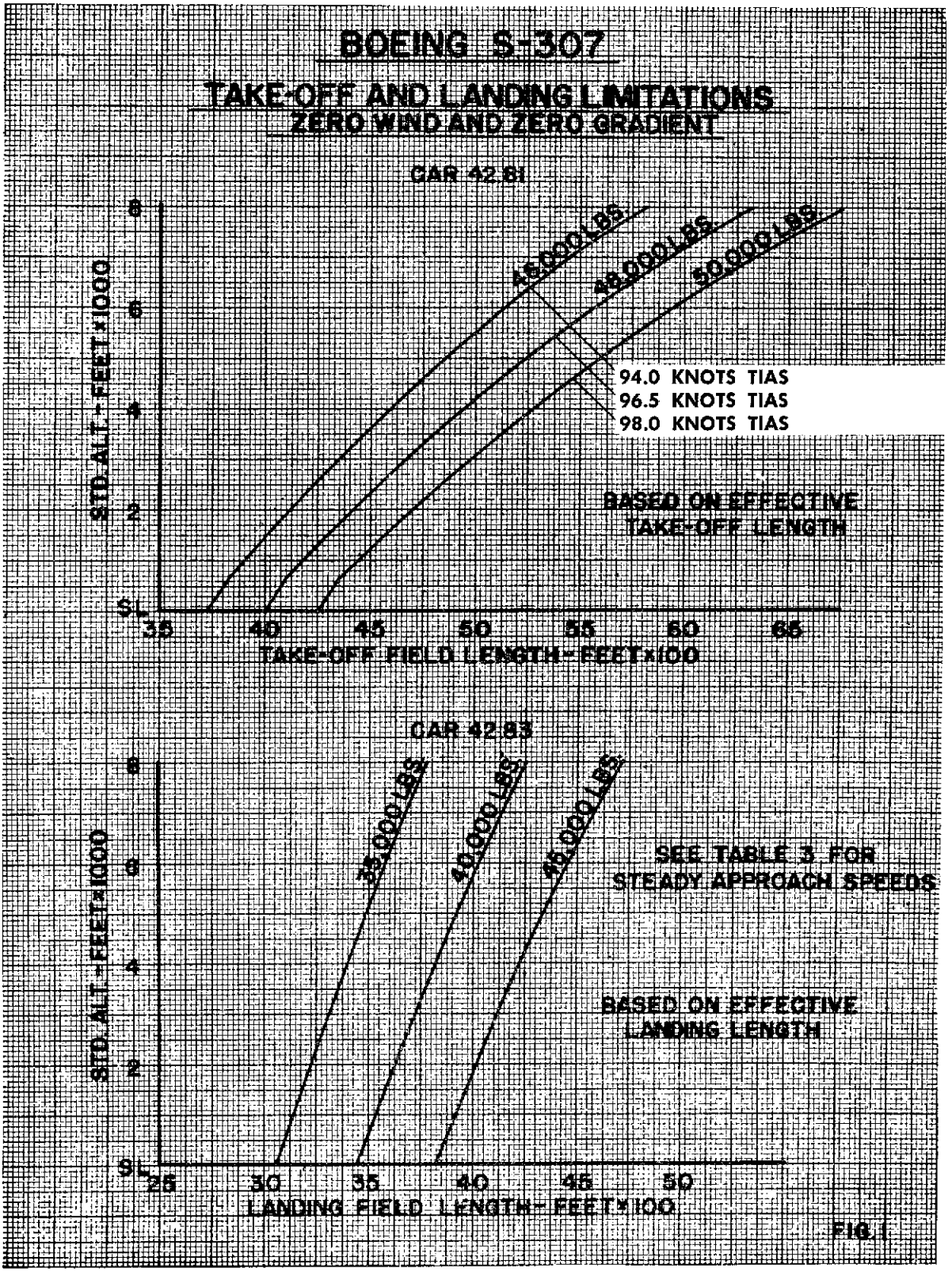
Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots TIAS					
	35,000	V_{50}	40,000	V_{50}	45,000	V_{50}
	Distance in feet					
S. L.	3,065	81.0	3,445	86.5	3,815	91.0
1,000	3,145	81.0	3,540	86.5	3,915	91.0
2,000	3,225	81.0	3,630	86.5	4,015	91.0
3,000	3,310	81.0	3,725	86.5	4,120	91.0
4,000	3,390	81.0	3,820	86.5	4,225	91.0
5,000	3,480	81.0	3,925	86.5	4,340	91.0
6,000	3,575	81.0	4,035	86.5	4,460	91.0
7,000	3,670	81.0	4,140	86.5	4,580	91.0
8,000	3,770	81.0	4,260	86.5	4,715	91.0

[1] Steady approach speed through 50-foot height knots TIAS denoted by symbol V_{50}.

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots TIAS					
	35,000	V_{50}	40,000	V_{50}	45,000	V_{50}
	Distance in feet					
S. L.	3,890	81.0	4,375	86.5	4,845	91.0
1,000	3,995	81.0	4,495	86.5	4,970	91.0
2,000	4,095	81.0	4,610	86.5	5,100	91.0
3,000	4,205	81.0	4,730	86.5	5,230	91.0
4,000	4,305	81.0	4,850	86.5	5,365	91.0
5,000	4,420	81.0	4,985	86.5	5,510	91.0
6,000	4,540	81.0	5,125	86.5	5,665	91.0
7,000	4,660	81.0	5,260	86.5	5,815	91.0
8,000	4,790	81.0	5,410	86.5	5,990	91.0

[1] Steady approach speed through 50-foot height knots TIAS denoted by symbol V_{50}.


BOEING S-307
TAKE-OFF AND LANDING LIMITATIONS
ZERO WIND AND ZERO GRADIENT
CAR 42.81
STD. ALT. - FEET x 1000
SL
2
4
6
8
48,000 LBS
48,000 LBS
39,999 LBS
94.0 KNOTS TIAS
96.5 KNOTS TIAS
98.0 KNOTS TIAS
BASED ON EFFECTIVE TAKE-OFF LENGTH
35
40
45
50
55
60
65
TAKE-OFF FIELD LENGTH - FEET x 100
CAR 42.83
STD. ALT. - FEET x 1000
SL
2
4
6
8
45,000 LBS
40,000 LBS
35,000 LBS
SEE TABLE 3 FOR STEADY APPROACH SPEEDS
BASED ON EFFECTIVE LANDING LENGTH
25
30
35
40
45
50
LANDING FIELD LENGTH - FEET x 100
FIG. 1

(Rev. 4/1/56)

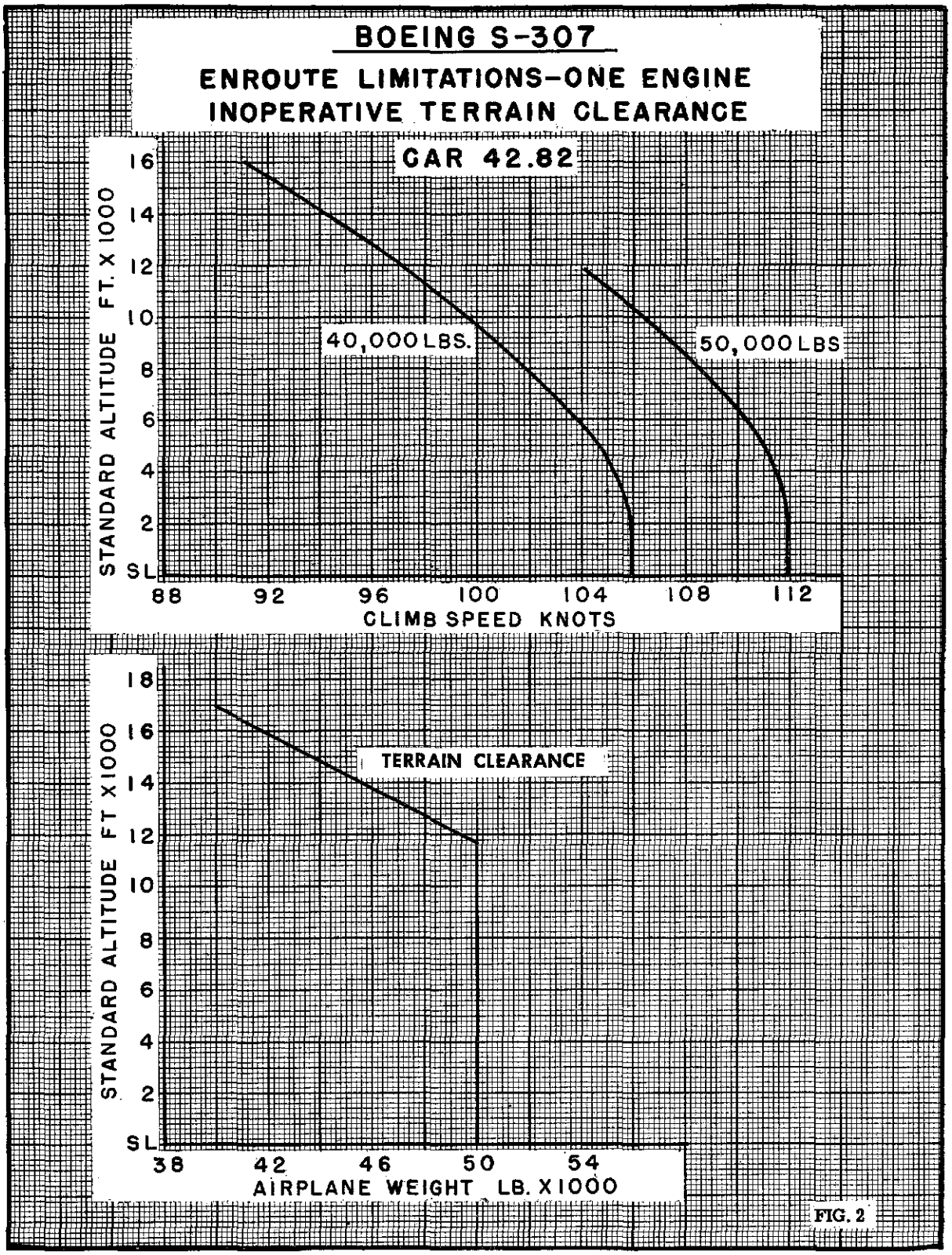


FIG. 2

(Rev. 4/1/56)

42.80–8 *Performance data—operations from sod runway surfaces (CAA rules which apply to section 42.80.)*

(a) *General.* The performance limitation data and information contained herein, are adopted to provide a comparable level of safety between operations utilizing sod surfaced runways and those utilizing paved surfaced runways. There are, of course, numerous types of runway surfaces which are neither paved nor sod. Obviously, it is not feasible at this time to categorize all of the runway surfaces and to establish specific correction factors for operations from them. Therefore, all runways which are not paved shall be regarded as sod runways, and the limitations data herein shall be applied to such runways, except in those individual cases where the Administrator finds that a particular runway surface is such as to justify the use of a specific correction factor.

(b) *Takeoff limitation data.* In computing the maximum allowable takeoff weights for operations from sod runways, the takeoff weight tables contained in sections 42.80–1, 42.80–2, 42.80–3, 42.80–4, 42.80–5 or 42.80–7 shall be used in the following manner:

(1) Where the effective length of a sod runway has been established, the maximum allowable takeoff weight shall be the *lesser* gross weight as determined by application of the effective length to the appropriate takeoff table (a) and by application of the actual runway length to the corresponding takeoff table (b). Takeoff table (a) is used to determine the maximum allowable gross weight which will permit the aircraft to take off within the effective runway length, while table (b) is used to determine the maximum allowable gross weight which will permit the particular aircraft to be accelerated and brought to a full stop within the actual length of available runway.

(2) Where the effective length of a sod runway has not been established, the maximum allowable takeoff weight shall be determined by application of the actual runway length to the appropriate takeoff table (b). Tables (b) incorporate a correction factor (approximately 17.6 percent for an assumed obstruction height and/or a reduced coefficient of friction.

(c) *Landing limitations data.* In computing the maximum allowable landing weights for operations from sod runways, the landing weight tables contained in this section shall be used in the following manner:

(1) Where the effective length of a sod runway has been established, the maximum allowable landing weight shall be determined by application of the effective length to the appropriate landing weight table (a).

(2) Where the effective length of a sod runway has not been established, the maximum allowable landing weight shall be determined by application of the actual runway length to the appropriate landing weight table (b).

DOUGLAS DC–3 G102, C202A, S1C3G, AND C47's, R4D's WITH COMPARABLE HORSEPOWER ENGINES

TABLE 4.—*Landing limitations (sod runway surfaces)*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	22,000	V_{50}	23,000	V_{50}	24,000	V_{50}	25,200	V_{50}
	Distance in feet							
S. L.	2,830	74.5	3,015	76.5	3,210	78.0	3,390	80.0
1,000	2,900	74.5	3,080	76.5	3,275	78.0	3,465	80.0
2,000	2,965	74.5	3,155	76.5	3,350	78.0	3,540	80.0
3,000	3,040	74.5	3,235	76.5	3,425	78.0	3,630	80.0
4,000	3,115	74.5	3,320	76.5	3,520	78.0	3,715	80.0
5,000	3,210	74.5	3,410	76.5	3,605	78.0	3,805	80.0
6,000	3,300	74.5	3,505	76.5	3,705	78.0	3,910	80.0
7,000	3,410	74.5	3,610	76.5	3,810	78.0	4,015	80.0
8,000	3,500	74.5	3,725	76.5	3,935	78.0	4,135	80.0

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.

(Continued on page 88)

TABLE 4.—*Landing limitations (sod runway surfaces)*—Continued

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] knots							
	22,000	V_{50}	23,000	V_{50}	24,000	V_{50}	25,000	V_{50}
	Distance in feet							
S. L	3,595	74.5	3,825	76.5	4,075	78.0	4,305	80.0
1,000	3,680	74.5	3,900	76.5	4,165	78.0	4,405	80.0
2,000	3,765	74.5	4,010	76.5	4,255	78.0	4,495	80.0
3,000	3,865	74.5	4,110	76.5	4,355	78.0	4,605	80.0
4,000	3,955	74.5	4,215	76.5	4,470	78.0	4,715	80.0
5,000	4,075	74.5	4,330	76.5	4,575	78.0	4,835	80.0
6,000	4,190	74.5	4,455	76.5	4,705	78.0	4,970	80.0
7,000	4,330	74.5	4,590	76.5	4,840	78.0	5,095	80.0
8,000	4,445	74.5	4,730	76.5	4,995	78.0	5,250	80.0

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.

LOCKHEED 18 G202A AIRCRAFT

TABLE 3.—*Landing limitations (sod runway surfaces)*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots					
	17,500	V_{50}	18,000	V_{50}	18,500	V_{50}
	Distance in feet					
S. L	4,270	83.5	4,380	84.0	4,470	86.0
1,000	4,400	83.5	4,495	84.0	4,595	86.0
2,000	4,520	83.5	4,625	84.0	4,720	86.0
3,000	4,645	83.5	4,750	84.0	4,855	86.0
4,000	4,770	83.5	4,875	84.0	4,985	86.0
5,000	4,875	83.5	5,000	84.0	5,115	86.0
6,000	5,025	83.5	5,130	84.0	5,255	86.0
7,000	5,150	83.5	5,260	84.0	5,395	86.0
8,000	5,285	83.5	5,395	84.0	5,530	86.0

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots					
	17,500	V_{50}	18,000	V_{50}	18,500	V_{50}
	Distance in feet					
S. L	5,430	83.5	5,565	84.0	5,675	86.0
1,000	5,590	83.5	5,710	84.0	5,835	86.0
2,000	5,740	83.5	5,870	84.0	5,995	86.0
3,000	5,900	83.5	6,030	84.0	6,165	86.0
4,000	6,060	83.5	6,195	84.0	6,330	86.0
5,000	6,195	83.5	6,355	84.0	6,495	86.0
6,000	6,380	83.5	6,515	84.0	6,675	86.0
7,000	6,545	83.5	6,680	84.0	6,850	86.0
8,000	6,710	83.5	6,850	84.0	7,025	86.0

[1] Steady approach speed through 50 eet height—knots TIAS denoted by symbol V_{50}.

CURTIS MODEL C-46 AIRCRAFT

TABLE 3.—*Landing limitations (sod runway surfaces)*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (b) (12) with zero wind and zero gradient.

(1) Curtiss model C–46 certificated for maximum weight of 45,000 pounds.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	40,000	V_{50}	42,000	V_{50}	44,000	V_{50}	45,000	V_{50}
	Distance in feet							
S. L.	4, 255	86. 0	4, 435	88. 0	4, 635	90. 5	4, 725	91. 0
1,000	4, 370	86. 0	4, 555	88. 0	4, 760	90. 5	4, 855	91. 0
2,000	4, 485	86. 0	4, 680	88. 0	4, 890	90. 5	4, 985	91. 0
3,000	4, 660	86. 0	4, 805	88. 0	5, 015	90. 5	5, 120	91. 0
4,000	4, 730	86. 0	4, 935	88. 0	5, 145	90. 5	5, 250	91. 0
5,000	4, 845	86. 0	5, 060	88. 0	5, 285	90. 5	5, 380	91. 0
6,000	4, 980	86. 0	5, 190	88. 0	5, 415	90. 5	5, 520	91. 0
7,000	5, 095	86. 0	5, 330	88. 0	5, 570	90. 5	5, 670	91. 0
8,000	5, 235	86. 0	5, 470	88. 0	5, 715	90. 5	5, 820	91. 0

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.

(2) Curtiss model C–46 certificated for maximum weight of 48,000 pounds.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	48,000	V_{50}
	Distance in feet							
S. L.	3, 325	80. 5	3, 450	82. 0	3, 575	84. 5	3, 695	86. 0
1,000	3, 405	80. 5	3, 530	82. 0	3, 655	84. 5	3, 780	86. 0
2,000	3, 490	80. 5	3, 615	82. 0	3, 740	84. 5	3, 865	86. 0
3,000	3, 575	80. 5	3, 695	82. 0	3, 830	84. 5	3, 945	86. 0
4,000	3, 675	80. 5	3, 795	82. 0	3, 920	84. 5	4, 050	86. 0
5,000	3, 750	80. 5	3, 875	82. 0	4, 020	84. 5	4, 155	86. 0
6,000	3, 830	80. 5	3, 980	82. 0	4, 115	84. 5	4, 255	86. 0
7,000	3, 925	80. 5	4, 075	82. 0	4, 220	84. 5	4, 370	86. 0
8,000	4, 025	80. 5	4, 180	82. 0	4, 330	84. 5	4, 485	86. 0

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 41.1 (a) (12).

(1) Curtiss model C–46 certificated for maximum weight of 45,000 pounds.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	40,000	V_{50}	42,000	V_{50}	44,000	V_{50}	45,000	V_{50}
	Distance in feet							
S. L.	5, 415	86. 0	5, 645	88. 0	5, 900	90. 5	6, 015	91. 0
1,000	5, 560	86. 0	5, 795	88. 0	6, 060	90. 5	6, 175	91. 0
2,000	5, 710	86. 0	5, 955	88. 0	6, 220	90. 5	6, 350	91. 0
3,000	5, 930	86. 0	6, 120	88. 0	6, 385	90. 5	6, 515	91. 0
4,000	6, 015	86. 0	6, 280	88. 0	6, 550	90. 5	6, 680	91. 0
5,000	6, 170	86. 0	6, 440	88. 0	6, 730	90. 5	6, 850	91. 0
6,000	6, 335	86. 0	6, 605	88. 0	6, 895	90. 5	7, 025	91. 0
7,000	6, 485	86. 0	6, 785	88. 0	7, 090	90. 5	7, 215	91. 0
8,000	6, 650	86. 0	6, 960	88. 0	7, 275	90. 5	7, 405	91. 0

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.

(Continued on page 90)

378933—56——3

TABLE 3.—*Landing limitations (sod runway surfaces)*—Continued

(2) Curtiss C–46 certificated maximum weight of 48,000 pounds.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	48,000	V_{50}
	Distance in feet							
S. L.	4, 230	80. 5	4, 395	82. 0	4, 555	84. 5	4, 705	86. 0
1,000	4, 330	80. 5	4, 490	82. 0	4, 650	84. 5	4, 805	86. 0
2,000	4, 440	80. 5	4, 600	82. 0	4, 755	84. 5	4, 915	86. 0
3,000	4, 555	80. 5	4, 705	82. 0	4, 875	84. 5	5, 020	86. 0
4,000	4, 665	80. 5	4, 830	82. 0	4, 990	84. 5	5, 150	86. 0
5,000	4, 775	80. 5	4, 935	82. 0	5, 120	84. 5	5, 290	86. 0
6,000	4, 875	80. 5	5, 065	82. 0	5, 240	84. 5	5, 415	86. 0
7,000	4, 995	80. 5	5, 185	82. 0	5, 370	84. 5	5, 560	86. 0
8,000	5, 125	80. 5	5, 320	82. 0	5, 510	84. 5	5, 710	86. 0

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.

CONVAIR MODEL 28–5ACF AND PBY–5A

TABLE 3.—*Landing limitations (sod runway surfaces)*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots					
	23,000	V_{50}	24,000	V_{50}	25,000	V_{50}
	Distance in feet					
S. L.	3, 935	74. 5	4, 105	76. 5	4, 245	78. 0
1,000	4, 040	74. 5	4, 215	76. 5	4, 370	78. 0
2,000	4, 145	74. 5	4, 330	76. 5	4, 485	78. 0
3,000	4, 255	74. 5	4, 370	76. 5	4, 610	78. 0
4,000	4, 360	74. 5	4, 585	76. 5	4, 725	78. 0
5,000	4, 470	74. 5	4, 665	76. 5	4, 845	78. 0
6,000	4, 570	74. 5	4, 775	76. 5	4, 970	78. 0
7,000	4, 680	74. 5	4, 880	76. 5	5, 090	78. 0
8,000	4, 785	74. 5	4, 990	76. 5	5, 205	78. 0

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots					
	23,000	V_{50}	24,000	V_{50}	25,000	V_{50}
	Distance in feet					
S. L.	5, 005	74. 5	5, 225	76. 5	5, 400	78. 0
1,000	5, 145	74. 5	5, 365	76. 5	5, 560	78. 0
2,000	5, 275	74. 5	5, 510	76. 5	5, 710	78. 0
3,000	5, 415	74. 5	5, 650	76. 5	5, 870	78. 0
4,000	5, 550	74. 5	5, 790	76. 5	6, 015	78. 0
5,000	5, 685	74. 5	5, 935	76. 5	6, 170	78. 0
6,000	5, 820	74. 5	6, 075	76. 5	6, 325	78. 0
7,000	5, 955	74. 5	6, 215	76. 5	6, 475	78. 0
8,000	6, 090	74. 5	6, 355	76. 5	6, 625	78. 0

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.

CONVAIR MODEL 28–5ACF AND PBY–5A

TABLE 4.—*Landing limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots					
	26,000	V_{50}	[2] 27,000	V_{50}	[3] 28,000	V_{50}
	Distance in feet					
S. L.	4,405	80.0	4,560	81.0	4,715	82.5
1,000	4,530	80.0	4,690	81.0	4,855	82.5
2,000	4,660	80.0	4,830	81.0	4,995	82.5
3,000	4,785	80.0	4,960	81.0	5,140	82.5
4,000	4,915	80.0	5,095	81.0	5,285	82.5
5,000	5,045	80.0	5,235	81.0	5,430	82.5
6,000	5,170	80.0	5,365	81.0	5,565	82.5
7,000	5,300	80.0	5,505	81.0	5,715	82.5
8,000	5,430	80.0	5,635	81.0	5,855	82.5

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.
[2] Maximum weight for PBY–5A landplane.
[3] Maximum weight for 28–5ACF.

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots					
	26,000	V_{50}	[2] 27,000	V_{50}	[3] 28,000	V_{50}
	Distance in feet					
S. L.	5,605	80.0	5,805	81.0	6,000	82.5
1,000	5,765	80.0	5,970	81.0	6,175	82.5
2,000	5,925	80.0	6,145	81.0	6,360	82.5
3,000	6,090	80.0	6,315	81.0	6,540	82.5
4,000	6,255	80.0	6,485	81.0	6,725	82.5
5,000	6,420	80.0	6,660	81.0	6,910	82.5
6,000	6,580	80.0	6,830	81.0	7,085	82.5
7,000	6,745	80.0	7,005	81.0	7,275	82.5
8,000	6,910	80.0	7,170	81.0	7,450	82.5

[1] Steady approach speed through 50 feet height— knots TIAS denoted by symbol V_{50}.
[2] Maximum weight for PBY–5A landplane.
[3] Maximum weight for 28–5ACF.

DOUGLAS, RB–18A AIRCRAFT

TABLE 3.—*Landing limitations (sod runway surfaces)*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	19,000	V_{50}	20,000	V_{50}	21,000	V_{50}	21,300	V_{50}
	Distance in feet							
S. L.	3,280	74.5	3,575	77.0	3,875	78.5	3,960	79.0
1,000	3,370	74.5	3,680	77.0	3,990	78.5	4,075	79.0
2,000	3,460	74.5	3,785	77.0	4,100	78.5	4,185	79.0
3,000	3,550	74.5	3,885	77.0	4,210	78.5	4,300	79.0
4,000	3,640	74.5	3,990	77.0	4,320	78.5	4,410	79.0
5,000	3,730	74.5	4,095	77.0	4,430	78.5	4,525	79.0
6,000	3,825	74.5	4,200	77.0				
7,000	3,915	74.5	4,295	77.0	[2]	[2]	[2]	[2]
8,000	4,010	74.5	4,400	77.0				

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.
[2] Limited by CAR 42.82.

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	19,000	V_{50}	20,000	V_{50}	21,000	V_{50}	21,300	V_{50}
	Distance in feet							
S. L	4,175	74.5	4,555	77.0	4,935	78.5	5,050	79.0
1,000	4,290	74.5	4,680	77.0	5,070	78.5	5,185	79.0
2,000	4,410	74.5	4,820	77.0	5,220	78.5	5,325	79.0
3,000	4,515	74.5	4,945	77.0	5,355	78.5	5,475	79.0
4,000	4,630	74.5	5,075	77.0	5,490	78.5	5,610	79.0
5,000	4,750	74.5	5,215	77.0	5,635	78.5	5,755	79.0
6,000	4,865	74.5	5,340	77.0				
7,000	4,990	74.5	5,465	77.0	[2]	[2]	[2]	[2]
8,000	5,105	74.5	5,590	77.0				

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.
[2] Limited by CAR 42.82.

Boeing Model S-307 Aircraft

Table 3.—*Landing limitations (sod runway surfaces)*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots					
	35,000	V_{50}	40,000	V_{50}	45,000	V_{50}
	Distance in feet					
S. L	3,525	81.0	3,960	86.5	4,385	91.0
1,000	3,615	81.0	4,070	86.5	4,500	91.0
2,000	3,710	81.0	4,175	86.5	4,615	91.0
3,000	3,805	81.0	4,285	86.5	4,740	91.0
4,000	3,900	81.0	4,395	86.5	4,860	91.0
5,000	4,000	81.0	4,515	86.5	4,990	91.0
6,000	4,110	81.0	4,640	86.5	5,130	91.0
7,000	4,220	81.0	4,760	86.5	5,265	91.0
8,000	4,335	81.0	4,900	86.5	5,420	91.0

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots					
	35,000	V_{50}	40,000	V_{50}	45,000	V_{50}
	Distance in feet					
S. L	4,475	81.0	5,040	86.5	5,570	91.0
1,000	4,595	81.0	5,170	86.5	5,715	91.0
2,000	4,710	81.0	5,300	86.5	5,865	91.0
3,000	4,835	81.0	5,440	86.5	6,015	91.0
4,000	4,950	81.0	5,580	86.5	6,170	91.0
5,000	5,085	81.0	5,735	86.5	6,335	91.0
6,000	5,220	81.0	5,895	86.5	6,515	91.0
7,000	5,360	81.0	6,050	86.5	6,685	91.0
8,000	5,510	81.0	6,220	86.5	6,890	91.0

[1] Steady approach speed through 50 feet height—knots TIAS denoted by symbol V_{50}.