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7.0 PAVEMENT DATA

7.1 General Information

A brief description of the pavement charts that follow will help in their use for airport planning. Each airplane configuration is depicted with a minimum range of four loads imposed on the main landing gear to aid in interpolation between the discrete values shown. All curves for any single chart represent data based on rated loads and tire pressures considered normal and acceptable by current aircraft tire manufacturers' standards. Tire pressures, where specifically designated on tables and charts, are at values obtained under loaded conditions as certified for commercial use.

Section 7.2 presents basic data on the landing-gear footprint configuration, maximum design taxi loads, and tire sizes and pressures. The tire pressures shown in this section and in subsequent sections are given for optimum flotation at the condition of maximum design taxi weight.

Maximum pavement loads for certain critical conditions at the tire-ground interface are shown in Section 7.3.

Pavement requirements for commercial airplanes are customarily derived from the static analysis of loads imposed on the main landing gear struts. The charts in Section 7.4 are provided in order to determine these loads throughout the stability limits of the airplane at rest on the pavement. These main landing gear loads are used to enter the pavement design charts, interpolating load values where necessary.

The flexible-pavement design curves (sec. 7.5) are based on procedures set forth in Instruction Report No. S-77-1, "Procedures for Development of CBR Design Curves," dated June 1977, and as modified according to the methods described in FAA Advisory Circular 150/5320-6C, "Airport Pavement Design and Evaluation," dated December 7, 1978. Instruction Report No. S-77-1 was prepared by the U.S. Army Corps of Engineers Waterways Experiment Station, Soils and Pavements Laboratory, Vicksburg, Mississippi. The line showing 10,000 coverages is used to calculate Aircraft Classification Number (ACN).

The following procedure is used to develop the curves shown in Section 7.5:

1. Having established the scale for pavement thickness at the bottom and the scale for CBR at the top, an arbitrary line is drawn representing 6,000 annual departures.
2. Values of the aircraft gross weight are then plotted.
3. Additional annual departure lines are then drawn based on the load lines of the aircraft gross weights already established.
4. An additional line representing 10,000 coverages (used to calculate the flexible-pavement Aircraft Classification Number) is also placed.

All Load Classification Number (LCN) curves (Sections 7.6 and 7.8) have been developed from a computer program based on data provided in International Civil Aviation Organization (ICAO) document 7920-AN/865/2, Aerodrome manual, Part 2, "Aerodrome Physical Characteristics," 2nd edition, 1965. LCN values are shown directly for parameters of weight on main landing gear, tire pressure, and radius of relative stiffness (ℓ) for rigid pavement or pavement thickness or depth factor (h) for flexible pavement.

Rigid-pavement design curves (Section 7.7) have been prepared with the Westergaard equation in general accordance with the procedures outlined in the Design of Concrete Airport Pavement (1955 edition) by Robert G. Packard, published by the Portland Cement Association, 5420 Old Orchard Road, Skokie, Illinois 60076. These curves are modified to the format described in the Portland Cement Association publication XP6705-2, Computer Program for Airport Pavement Design (Program PDILB), 1968, by Robert G. Packard.

The following procedure is used to develop the rigid-pavement design curves shown in Section 7.7:

1. Having established the scale for pavement thickness to the left and the scale for allowable working stress to the right, an arbitrary load line is drawn representing the main-landing-gear maximum weight to be shown.
2. Values of the subgrade modulus (k) are then plotted.
3. Additional load lines for the incremental values of weight on the main landing gear are drawn on the basis of the curve for $k = 300$, already established.

The rigid-pavement design curves (Section 7.9) have been developed based on methods used in the FAA Advisory Circular AC 150/5320-6C, 7 December 1978. The following procedure is used to develop the curves shown in Section 7.9:

1. Having established the scale for pavement flexural strength on the left and a temporary scale for pavement thickness on the right, an arbitrary load line is drawn representing the main-landing-gear maximum weight to be shown at 5,000 coverages.
2. Values of the subgrade modulus (k) are then plotted.
3. Additional load lines for the incremental values of weight are then drawn on the basis of the subgrade modulus curves already established.
4. The permanent scale for the rigid-pavement thickness is then placed. Lines for other than 5,000 coverages are established based on the aircraft pass-to-coverage ratio.

The ACN/PCN system (Section 7.10) as referenced in Amendment 35 to ICAO Annex 14, "Aerodromes", 7th Edition, June 1976, provides a standardized international airplane/pavement rating system replacing the various S, T, TT, LCN, AUW, ISWL, etc., rating systems used throughout the world. ACN is the Aircraft Classification Number and PCN is the Pavement Classification Number. An aircraft having an ACN equal to or less than the PCN can operate on the pavement subject to any limitation on the tire pressure. Numerically, the ACN is two times the derived single-wheel load expressed in thousands of kilograms, where the derived single wheel load is defined as the load on a single tire inflated to 180 psi (1.25 MPa) that would have the same pavement requirements as the aircraft. Computationally, the ACN/PCN system uses the PCA program PDILB for rigid pavements and S-77-1 for flexible pavements to calculate ACN values. The method of pavement evaluation is left up to the airport with the results of their evaluation presented as follows:

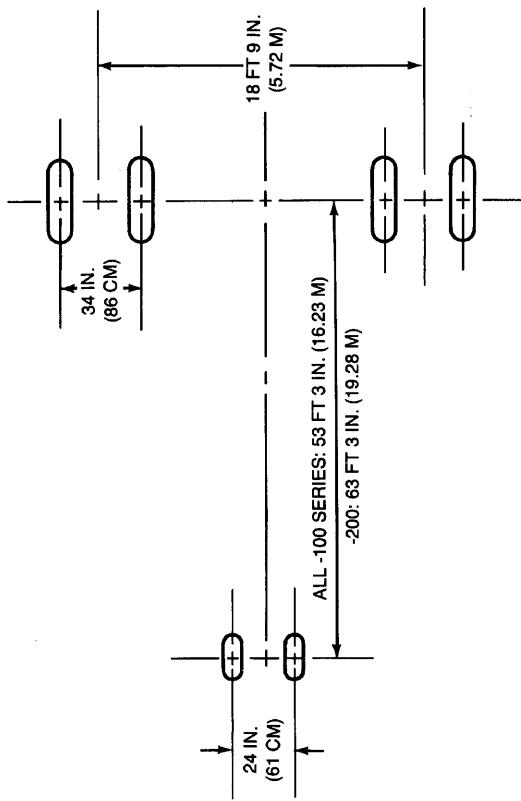
PCN	PAVEMENT TYPE	SUBGRADE CATEGORY	TIRE-PRESSURE CATEGORY	EVALUATION METHOD
	R — Rigid	A — High	W — No Limit	T — Technical
	F — Flexible	B — Medium	X — To 217 psi (1.5 MPa)	U — Using aircraft
		C — Low	Y — To 145 psi (10 MPa)	
		D — Ultra Low	Z — To 73 psi (0.5 MPa)	

Sections 7.10.1 to 7.10.3 show the aircraft ACN values for flexible pavements. The four subgrade categories are:

- Code A — High Strength — CBR 15
- Code B — Medium Strength — CBR 10
- Code C — Low Strength — CBR 6
- Code D — Ultra Low Strength — CBR 3

Sections 7.10.4 to 7.10.6 show the aircraft ACN values for rigid pavements. The four subgrade categories are:

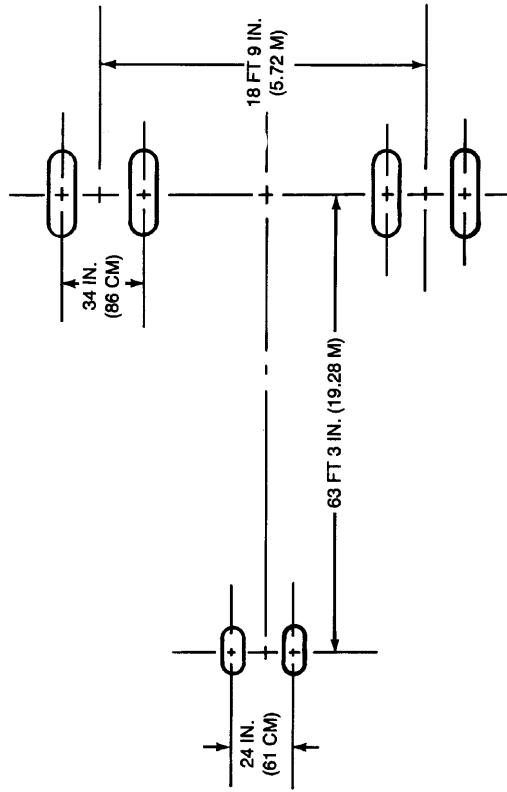
- Code A — High Strength, $k = 550 \text{ pci (150 MN/m}^3\text{)}$
- Code B — Medium Strength, $k = 300 \text{ pci (80 MN/m}^3\text{)}$
- Code C — Low Strength, $k = 150 \text{ pci (40 MN/m}^3\text{)}$
- Code D — Ultra Low Strength, $k = 75 \text{ pci (20 MN/m}^3\text{)}$



727 MODEL					
	-100	-100/C	-100/C	-200	-200
MAXIMUM DESIGN TAXI WEIGHT	LB (KG)	153,000 (69,400)	161,000 (73,000)	170,000 (77,100)	170,000 (77,100)
PERCENT OF WEIGHT ON MAIN GEAR					
SEE SECTION 7.4					
NOSE GEAR TIRE SIZE					
32x11.5 TYPE VIII					
NOSE GEAR TIRE PRESSURE (LOADED)	PSI (KG/CM ²)	100 (7.03)	100 (7.03)	100 (7.03)	100 (7.03)
MAIN GEAR TIRE SIZE		49x17, 26PR TYPE VII	49x17, 26PR TYPE VII*	49x17, 28PR TYPE VII**	49x17, 28PR TYPE VII**
MAIN GEAR TIRE PRESSURE (LOADED)	PSI (KG/CM ²)	158 (11.11)	158 (11.11)	165 (11.60)	167 (11.74)

*OPTIONAL 50x20, 24PR
**OPTIONAL 50x20, 26PR

7.2.1 LANDING GEAR FOOTPRINT MODELS 727-100, -100C, and -200



ADV 727 MODEL							
	-200	-200	-200	-200	-200	-200	-200
MAXIMUM DESIGN TAXI WEIGHT	LB (KG)	176,000 (79,800)	179,400 (81,400)	183,000 (83,000)	185,200 (84,000)	191,000 (86,800)	195,500 (88,700)
PERCENT OF WEIGHT ON MAIN GEAR							
NOSE GEAR TIRE SIZE							
NOSE GEAR TIRE PRESSURE (LOADED)	PSI (KG/CM ²)	100 (7.03)	100 (7.03)	100 (7.03)	100 (7.03)	100 (7.03)	100 (7.03)
MAIN GEAR TIRE SIZE		49x17 28 PR	50x21 30 PR	50x21 30 PR	50x21 30 PR*	50x21 30 PR**	50x21 30 PR*
MAIN GEAR TIRE PRESSURE (LOADED)	PSI (KG/CM ²)	169 (11.88)	148 (10.41)	148 (10.41)	154 (10.83)	167 (11.74)	167 (11.74)

SEE SECTION 7.4

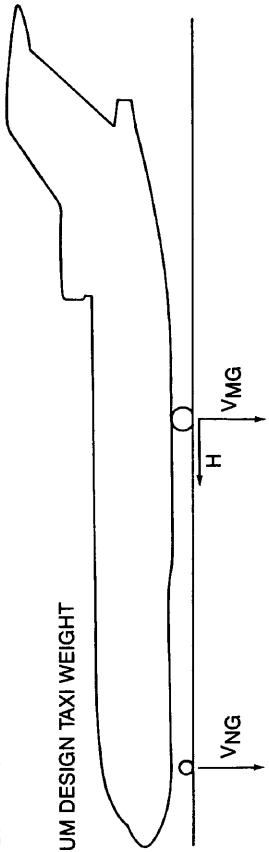
32x11.5 TYPE VIII

*OPTIONAL 49x17, 30 PR
**OPTIONAL 50x20, 30 PR

7.2.2 LANDING GEAR FOOTPRINT MODELS ADVANCED 727-200 AND -200F

V_{NG} = MAXIMUM VERTICAL NOSEGEAR GROUND LOAD AT MOST FORWARD CG
 V_{MG} = MAXIMUM VERTICAL MAINGEAR GROUND LOAD AT MOST AFT CG
 H = MAXIMUM HORIZONTAL GROUND LOAD FROM BRAKING

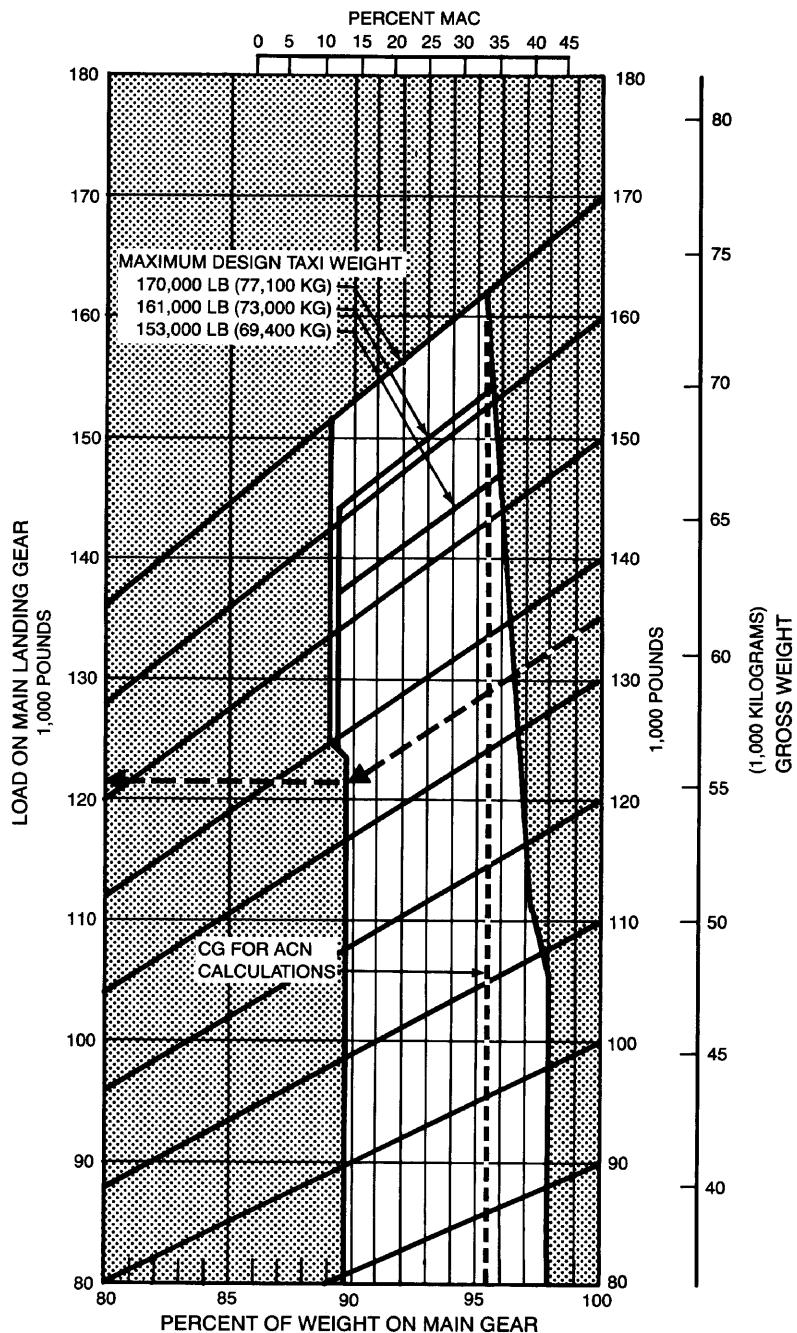
NOTE:
ALL LOADS CALCULATED USING AIRPLANE MAXIMUM DESIGN TAXI WEIGHT



MODEL	MAXIMUM DESIGN TAXI WEIGHT			V_{NG}			V_{MG} PER STRUT (4)			H PER STRUT (4)		
	LB	KG	LB	KG	LB	KG	MAXIMUM LOAD OCCURRING AT STATIC AFT CG	AT STEADY BRAKING 10 FT/SEC ² DECELERATION	AT INSTANTANEOUS BRAKING (COEFF OF FRICTION = 0.8)	LB	KG	
-100	153,000	69,400	16,300	7,400	24,000	10,900	73,200	33,200	23,800	10,800	58,600	26,600
-100C	161,000	73,000	17,100	7,800	25,300	11,500	77,000	34,900	25,000	11,300	61,600	27,900
-100JC	170,000	77,100	18,600	8,400	27,200	12,300	81,000	36,700	26,400	12,000	64,800	29,400
-200	170,000	77,100	16,500	7,500	23,700	10,800	82,400	37,400	26,400	12,000	65,900	29,900
-200	173,000	78,500	17,100	7,800	24,300	11,000	83,900	38,100	26,900	12,200	67,100	30,400
-200	176,000	79,800	17,400	7,900	24,900	11,300	85,300	38,700	27,300	12,400	68,200	30,900
-200	179,400	81,400	17,600	8,000	25,300	11,500	86,600	39,300	27,900	12,600	69,300	31,400
-200	183,000	83,000	17,850	8,100	25,600	11,600	87,800	39,800	28,400	12,900	70,200	31,900
-200	186,200	84,000	18,100	8,200	26,000	11,800	88,900	40,300	28,800	13,000	71,200	32,300
-200	191,000	86,600	18,500	8,400	26,600	12,100	91,100	41,300	29,700	13,500	72,900	33,100
-200	195,500	88,700	18,900	8,600	27,200	12,300	92,800	42,100	30,400	13,800	74,300	33,700
-200	197,700	89,700	18,200	8,300	27,100	12,300	92,800	42,100	30,700	13,900	74,200	33,700
-200F	204,000	92,500	20,700	9,400	29,400	13,300	96,100	43,600	31,700	14,400	76,900	34,900
-200	210,000	95,200	19,900	9,000	28,800	13,100	97,600	44,300	32,600	14,800	78,100	35,400

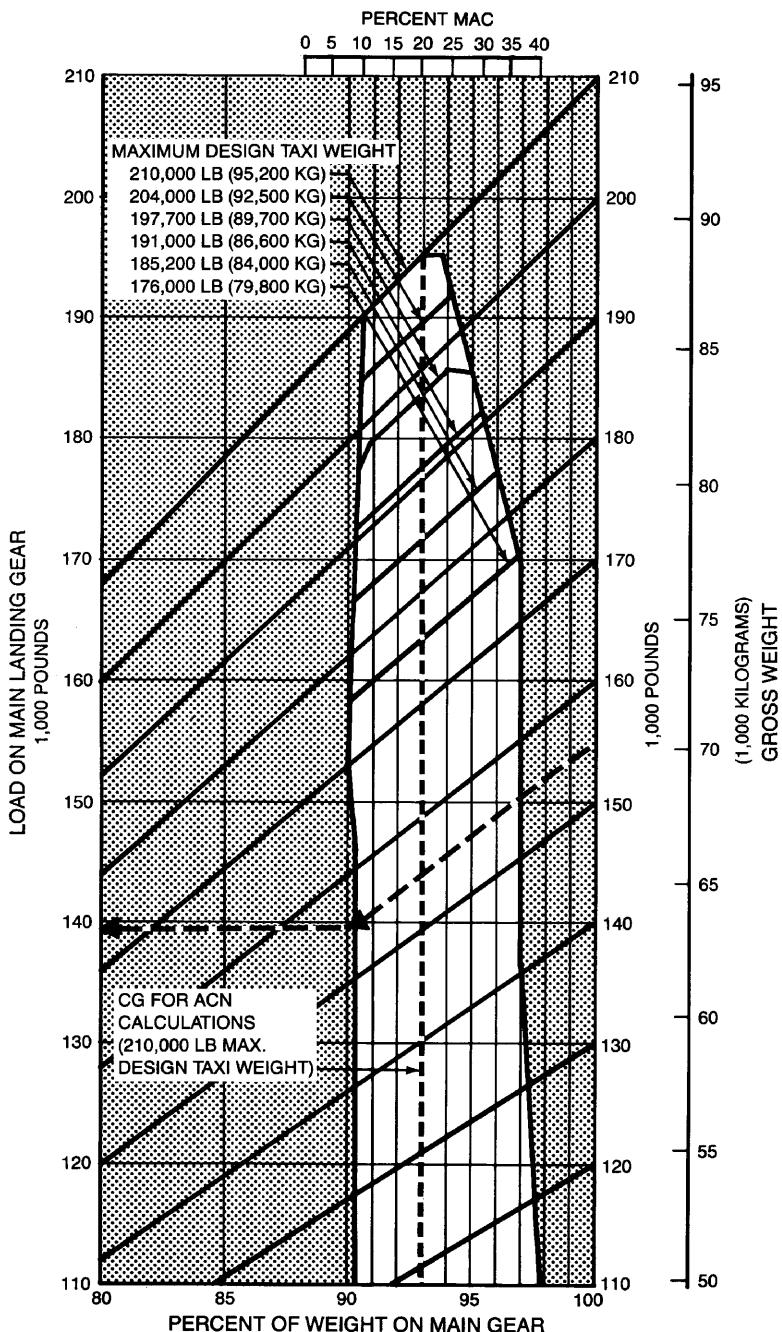
7.3 MAXIMUM PAVEMENT LOADS MODEL 727

NOTE: UNSHADED AREA REPRESENTS OPERATIONAL LIMITS



7.4.1 LANDING GEAR LOADING ON PAVEMENT MODELS 727-100, -100C

NOTE: UNSHADED AREA REPRESENTS OPERATIONAL LIMITS



7.4.2 LANDING GEAR LOADING ON PAVEMENT MODEL 727-200, -200F

7.5 Flexible-Pavement Requirements: U.S. Army Corps of Engineers Method (S-77-1)

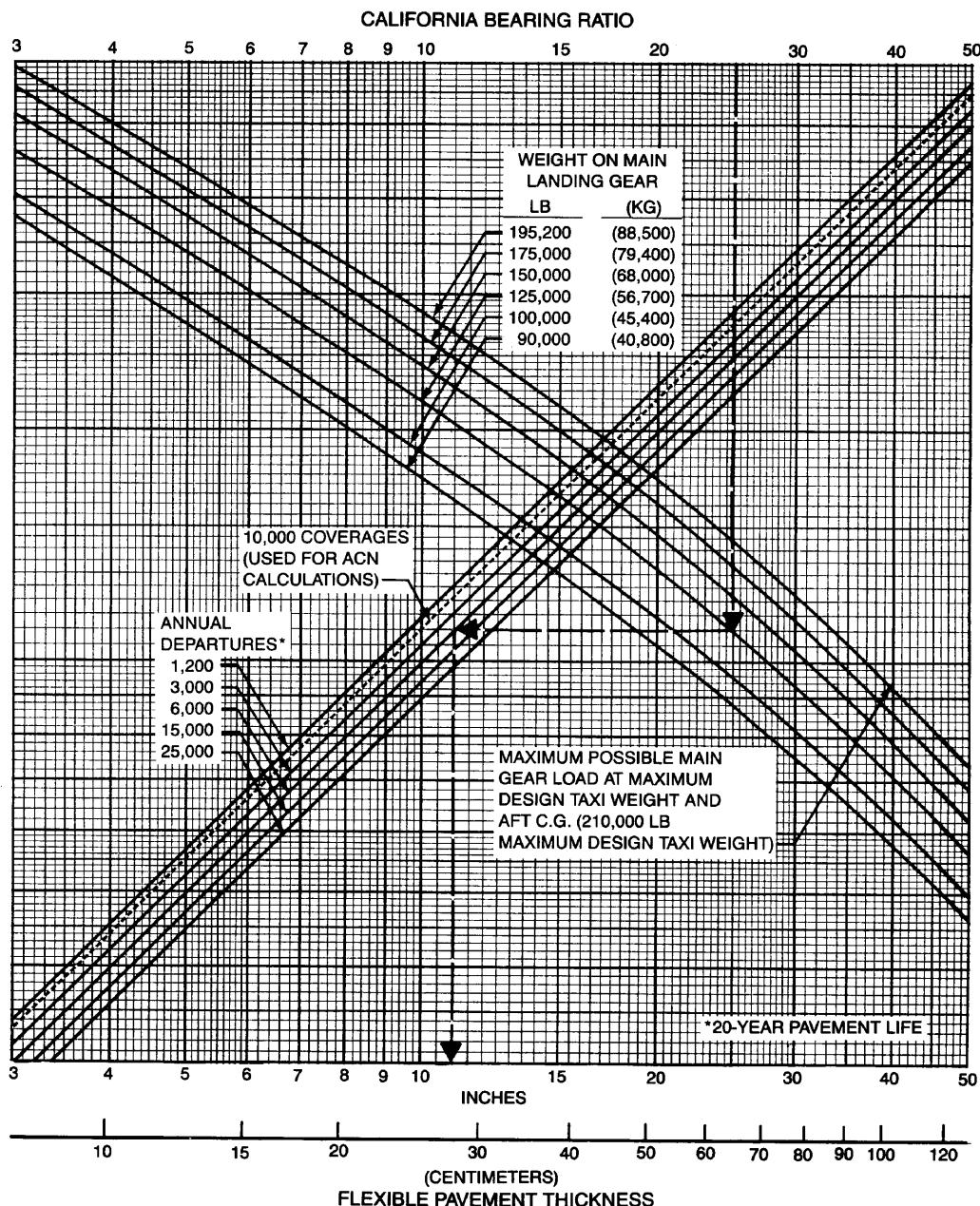
The following flexible-pavement design chart presents the data of six incremental main-gear weights at a constant pressure of 167 psi.

In the example shown on the next page, for a CBR of 25 and an annual departure level of 6,000, the required flexible-pavement thickness for an airplane with a main gear loading of 125,000 lb is 11.0 in.

The line showing 10,000 coverages is used for ACN calculations (see Section 7.10).

The FAA design method uses a similar procedure using total airplane weight instead of weight on main landing gear. The equivalent main gear loads for a given airplane weight can be calculated from Section 7.4.

NOTES: • APPLICABLE TO ALL TIRES
 • PRESSURE CONSTANT AT 167 PSI (11.74 KG/CM²)



7.5.1 FLEXIBLE PAVEMENT REQUIREMENTS—U.S. ARMY CORPS OF ENGINEERS DESIGN METHOD (S-77-1) AND F.A.A. DESIGN METHOD MODEL 727

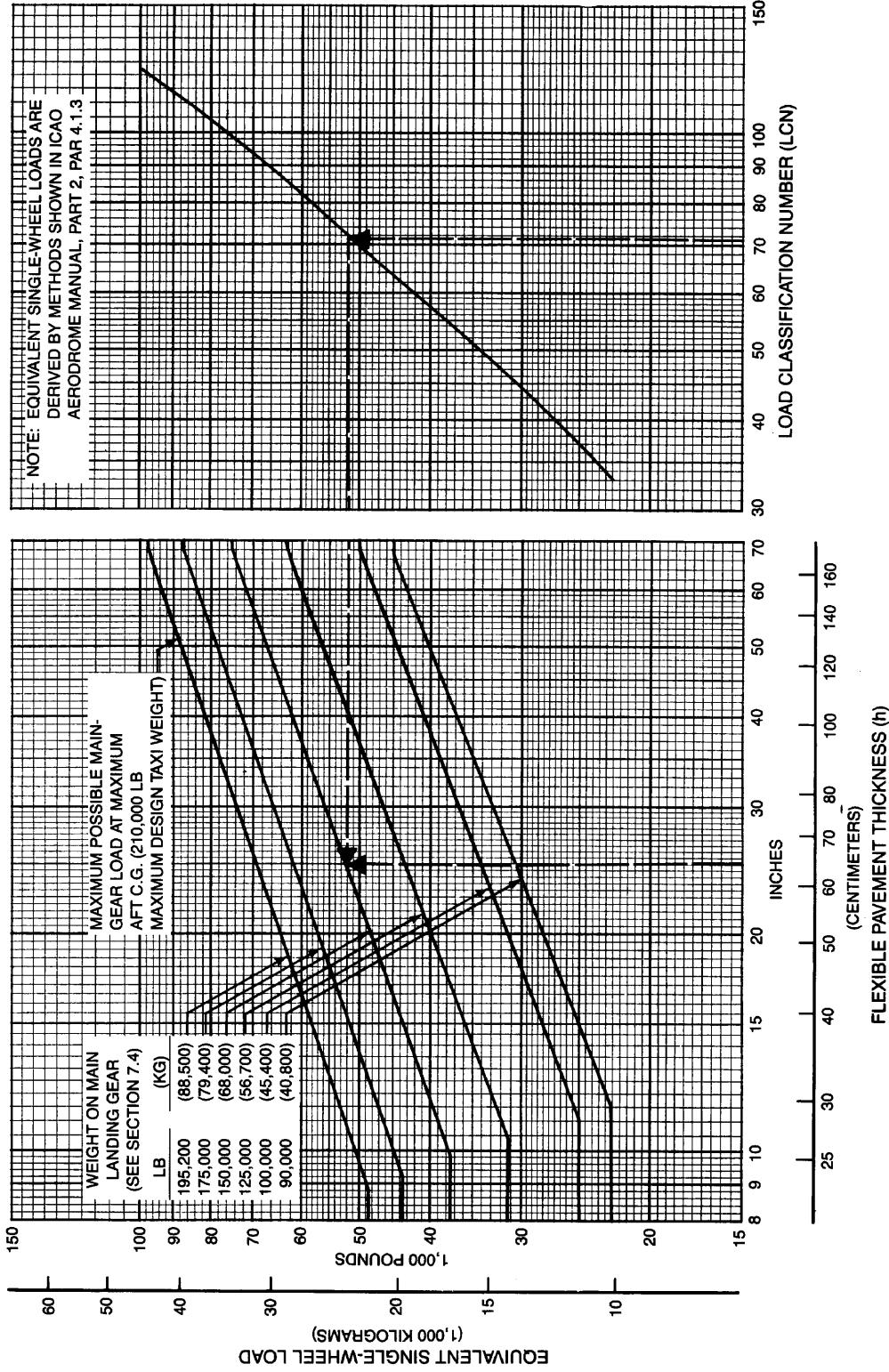
7.6 Flexible-Pavement Requirements: LCN Conversion

To determine the airplane weight that can be accommodated on a particular flexible pavement, both the LCN and the thickness (h) of the pavement must be known.

In the example shown on the next page, flexible-pavement thickness (h) is shown at 25 in. with an LCN of 71. For these conditions, the apparent maximum allowable weight permissible on the main landing gear is 150,000 lb.

Note: Provided that the resultant airplane LCN is not more than 10% above the published pavement LCN, the bearing strength of the pavement can be sufficient for unlimited use by the aircraft. The figure of 10% has been chosen as representing the lowest degree of variation in LCN that is significant (reference: ICAO Aerodrome Manual, Part 2, "Aerodrome Physical Characteristics," Chapter 4, Paragraph 4.1.5.7v, 2nd Edition, dated 1965).

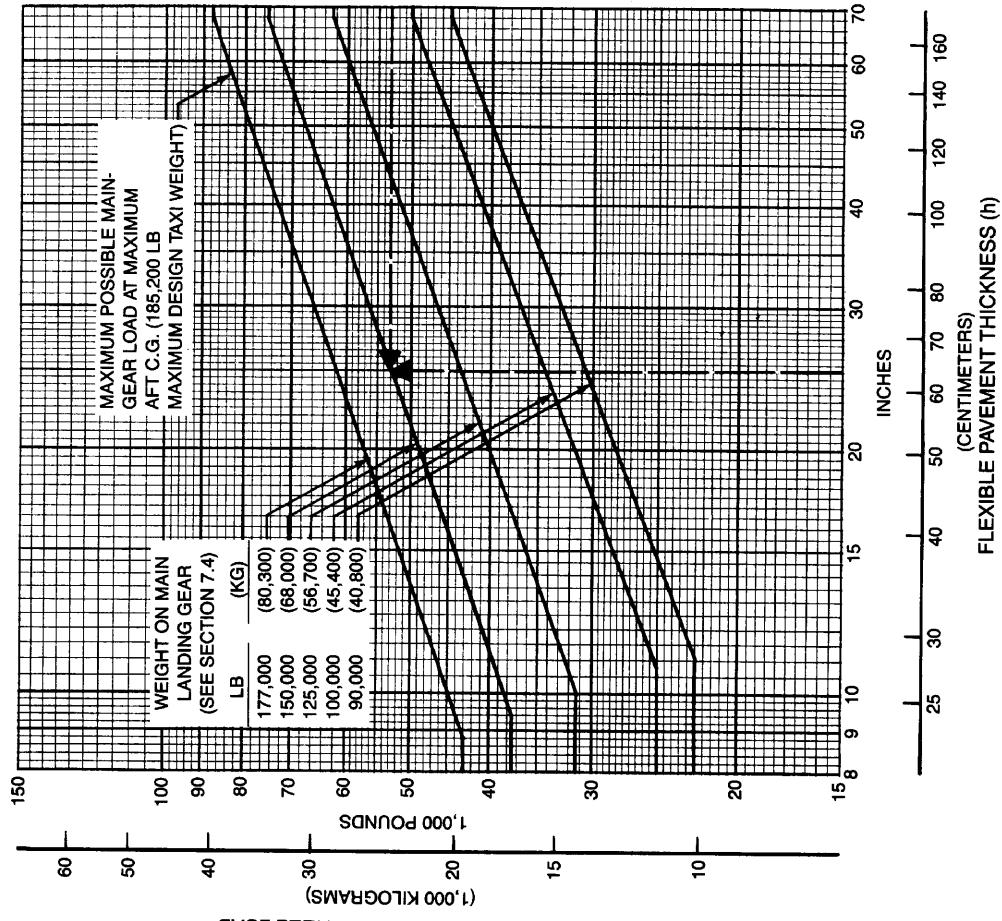
NOTES: • TIRES—49x17 26 PR; 49x17 28 PR; 50x21 30 PR
 • PRESSURE CONSTANT AT 167 PSI ($11.74 \text{ KG}/\text{CM}^2$)



7.6.1 FLEXIBLE PAVEMENT REQUIREMENTS—LCN CONVERSION

MODELS 727-100, -100C, -200 AT 153,000 TO 179,400 LB (69,400 TO 81,400 KG) MTW AND
 727-200 AT 191,000 TO 210,000 LB (86,600 TO 95,200 KG) MTW

NOTES: • TIRES—50x21 30 PR
 • PRESSURE CONSTANT AT 148 PSI (10.41 KG/CM²)



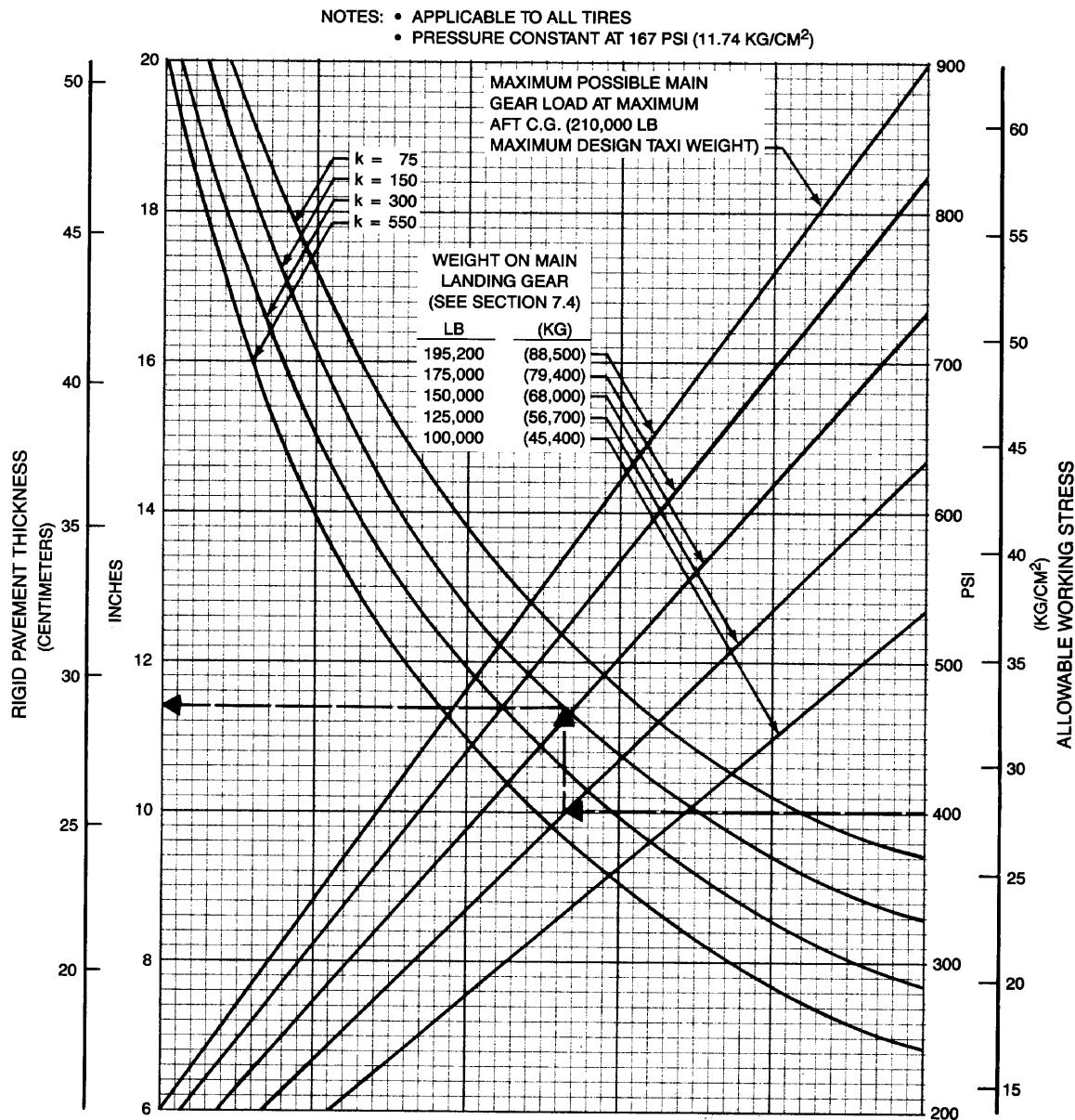
7.6.2 FLEXIBLE PAVEMENT REQUIREMENTS—LCN CONVERSION MODEL 727-200 AT 183,000 TO 185,200 LB (83,000 TO 84,000 KG) MTW

7.7 Rigid-Pavement Requirements: Portland Cement Association Design Method

Rigid-pavement requirements are based on the Portland Cement Association computerized version of the methods of "Design of Concrete Airport Pavement" (Portland Cement Association, 1955) as described in XP6705-2, "Computer Program for Airport Pavement Design," by Robert G. Packard, Portland Cement Association 1968.

The following rigid-pavement design chart presents the data of five incremental main-gear weights at a constant pressure of 167 psi.

In the example shown on the next page, for an allowable working stress of 400 psi, a main gear load of 125,000 lb, and a subgrade strength k of 150, the required rigid-pavement thickness is 11.4 in.



NOTE: THE VALUES OBTAINED BY USING THE MAXIMUM LOAD REFERENCE LINE AND ANY VALUE OF k ARE EXACT. FOR LOADS LESS THAN MAXIMUM, THE CURVES ARE EXACT FOR $k = 300$ BUT DEVIATE SLIGHTLY FOR OTHER VALUES OF k .

REFERENCE: "DESIGN OF CONCRETE AIRPORT PAVEMENT" AND "COMPUTER PROGRAM FOR AIRPORT PAVEMENT DESIGN—PROGRAM PDILB," PORTLAND CEMENT ASSOCIATION.

7.7.1 RIGID-PAVEMENT REQUIREMENTS—PORTLAND CEMENT ASSOCIATION DESIGN METHOD MODEL 727

7.8 Rigid-Pavement Requirements: LCN Conversion

To determine the airplane weight that can be accommodated on a particular rigid pavement, both the LCN of the pavement and the radius of relative stiffness (\mathcal{Q}) of the pavement must be known.

In the example shown in Figure 7.8.2 the rigid-pavement radius of relative stiffness is shown at 40 with an LCN of 66. For these conditions, the apparent maximum allowable weight permissible on the main landing gear is 125,000 lb.

Note: Provided that the resultant airplane LCN is not more than 10% above the published pavement LCN, the bearing strength of the pavement can be considered sufficient for unlimited use by the airplane. The figure of 10% has been chosen as representing the lowest degree of variation of LCN that is significant (reference: ICAO Aerodrome Manual, Part 2, "Aerodrome Physical Characteristics," Chapter 4, Paragraph 4.1.5.7v, 2nd Edition dated 1965).

RADIUS OF RELATIVE STIFFNESS (ℓ)
VALUES IN INCHES

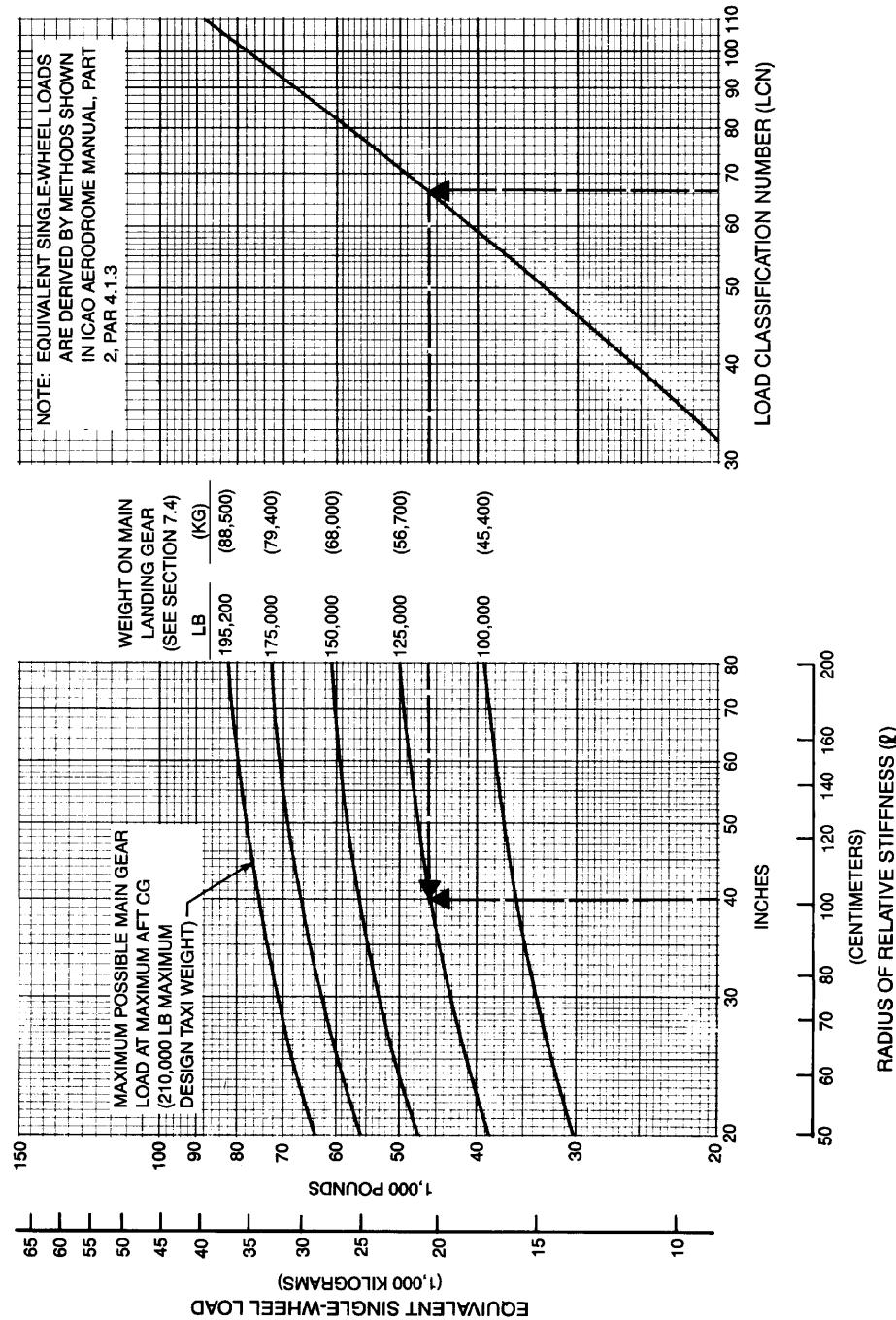
$$\ell = \sqrt[4]{\frac{Ed^3}{12(1-\mu^2)k}} = 24.1652 \sqrt[4]{\frac{d^3}{k}}$$

WHERE: E = YOUNG'S MODULUS = 4×10^6 PSI
 k = SUBGRADE MODULUS, LB/IN.³
 d = RIGID-PAVEMENT THICKNESS, IN.
 μ = POISSON'S RATIO = 0.15

d (IN.)	k = 75	k = 100	k = 150	k = 200	k = 250	k = 300	k = 350	k = 400	k = 500	k = 550
6.0	31.48	29.30	26.47	24.63	23.30	22.26	21.42	20.72	19.59	19.13
6.5	33.43	31.11	28.11	26.16	24.74	23.64	22.74	22.00	20.80	20.31
7.0	35.34	32.89	29.72	27.65	26.15	24.99	24.04	23.25	21.99	21.47
7.5	37.22	34.63	31.29	29.12	27.54	26.32	25.32	24.49	23.16	22.61
8.0	39.06	36.35	32.85	30.57	28.91	27.62	26.58	25.70	24.31	23.74
8.5	40.88	38.04	34.37	31.99	30.25	28.91	27.81	26.90	25.44	24.84
9.0	42.67	39.71	35.88	33.39	31.58	30.17	29.03	28.08	26.55	25.93
9.5	44.43	41.35	37.36	34.77	32.89	31.42	30.23	29.24	27.65	27.00
10.0	46.18	42.97	38.83	36.14	34.17	32.65	31.42	30.39	28.74	28.06
10.5	47.90	44.57	40.28	37.48	35.45	33.87	32.59	31.52	29.81	29.11
11.0	49.60	46.16	41.71	38.81	36.71	35.07	33.75	32.64	30.87	30.14
11.5	51.28	47.72	43.12	40.13	37.95	36.26	34.89	33.74	31.91	31.16
12.0	52.94	49.27	44.52	41.43	39.18	37.44	36.02	34.84	32.95	32.17
12.5	54.59	50.80	45.90	42.72	40.40	38.60	37.14	35.92	33.97	33.17
13.0	56.22	52.32	47.27	43.99	41.61	39.75	38.25	36.99	34.99	34.16
13.5	57.83	53.82	48.63	45.26	42.80	40.89	39.35	38.06	35.99	35.14
14.0	59.43	55.31	49.98	46.51	43.98	42.02	40.44	39.11	36.99	36.12
14.5	61.02	56.78	51.31	47.75	45.16	43.15	41.51	40.15	37.97	37.08
15.0	62.59	58.25	52.63	48.98	46.32	44.26	42.58	41.19	38.95	38.03
15.5	64.15	59.70	53.94	50.20	47.47	45.36	43.64	42.21	39.92	38.98
16.0	65.69	61.13	55.24	51.41	48.62	46.45	44.70	43.23	40.88	39.92
16.5	67.23	62.56	56.53	52.61	49.75	47.54	45.74	44.24	41.84	40.85
17.0	68.75	63.98	57.81	53.80	50.88	48.61	46.77	45.24	42.78	41.78
17.5	70.26	65.38	59.48	54.98	52.00	49.68	47.80	46.23	43.72	42.70
18.0	71.76	66.78	60.35	56.16	53.11	50.74	48.82	47.22	44.66	43.61
19.0	74.73	69.54	62.84	58.48	55.31	52.84	50.84	49.17	46.51	45.41
20.0	77.66	72.27	65.30	60.77	57.47	54.92	52.84	51.10	48.33	47.19
21.0	80.55	74.97	67.74	63.04	59.62	56.96	54.81	53.01	50.13	48.95
22.0	83.41	77.63	70.14	65.28	61.73	58.98	56.75	54.89	51.91	50.69
23.0	86.24	80.26	72.52	67.49	63.83	60.98	58.68	56.75	53.67	52.41
24.0	89.04	82.86	74.87	69.68	65.90	62.96	60.58	58.59	55.41	54.11
25.0	91.81	85.44	77.20	71.84	67.95	64.92	62.46	60.41	57.14	55.79

7.8.1 RADIUS OF RELATIVE STIFFNESS (REFERENCE: PORTLAND CEMENT ASSOCIATION)

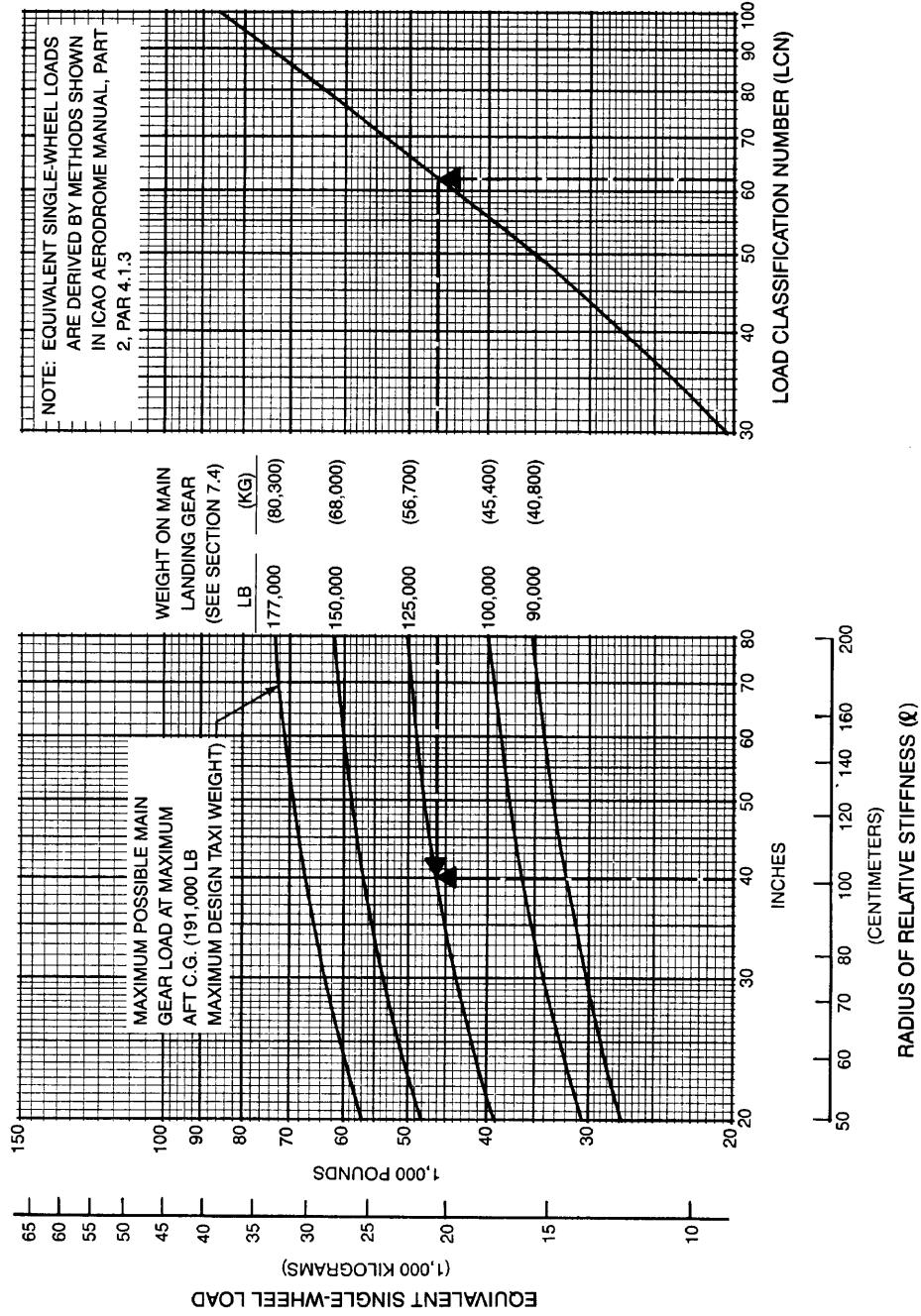
NOTES: • TIRES—49x17 26 PR; 49x17 28 PR; 50x21 30 PR
 • PRESSURE CONSTANT AT 167 PSI (11.74 KG/CM²)



7.8.2 RIGID PAVEMENT REQUIREMENTS—LCN CONVERSION

MODELS 727-100, -100C, -200 AT 153,000 TO 179,400 LB (69,400 TO 81,400 KG) MTW AND
 727-200 AT 191,000 TO 210,000 LB (86,600 TO 95,200 KG) MTW

NOTES: • TIRES - 50x21 30 PR • PRESSURE CONSTANT AT 148 PSI (10.41 KG/CM²)

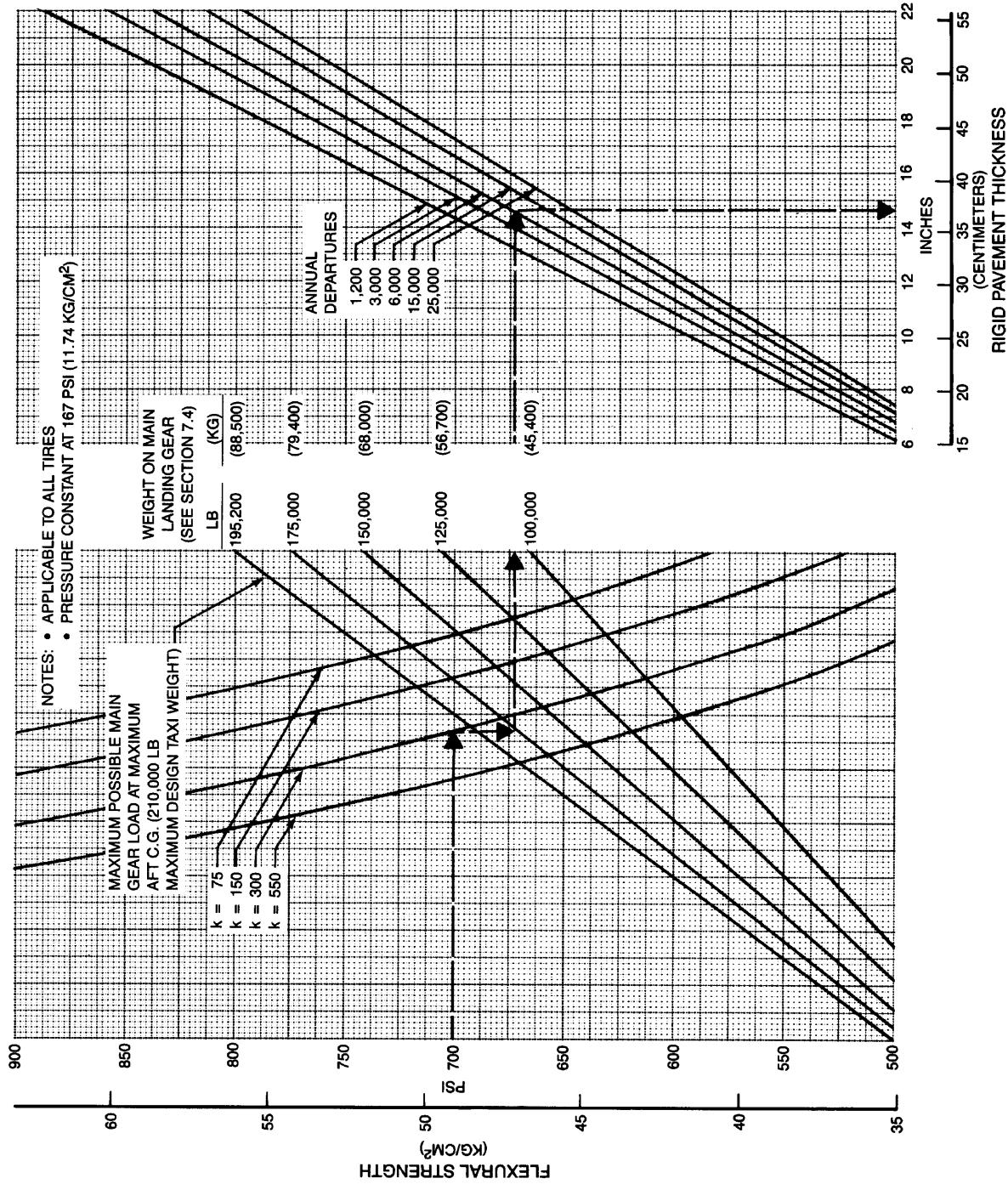


7.8.3 RIGID PAVEMENT REQUIREMENTS—LCN CONVERSION MODEL 727-200 AT 183,000 TO 185,200 LB (83,000 TO 84,000 KG) MTW

7.9 Rigid-Pavement Requirements: FAA Design Method

The following rigid-pavement design charts present the data of five incremental main-gear weights at a constant pressure of 167 psi.

In the example shown on the next page, the pavement flexural strength is shown at 700 psi, the subgrade strength is shown at $k = 300$, and the annual departure level is 6,000. For these conditions, the required rigid-pavement thickness for an airplane with a main gear load of 175,000 lb is 14.6 in.



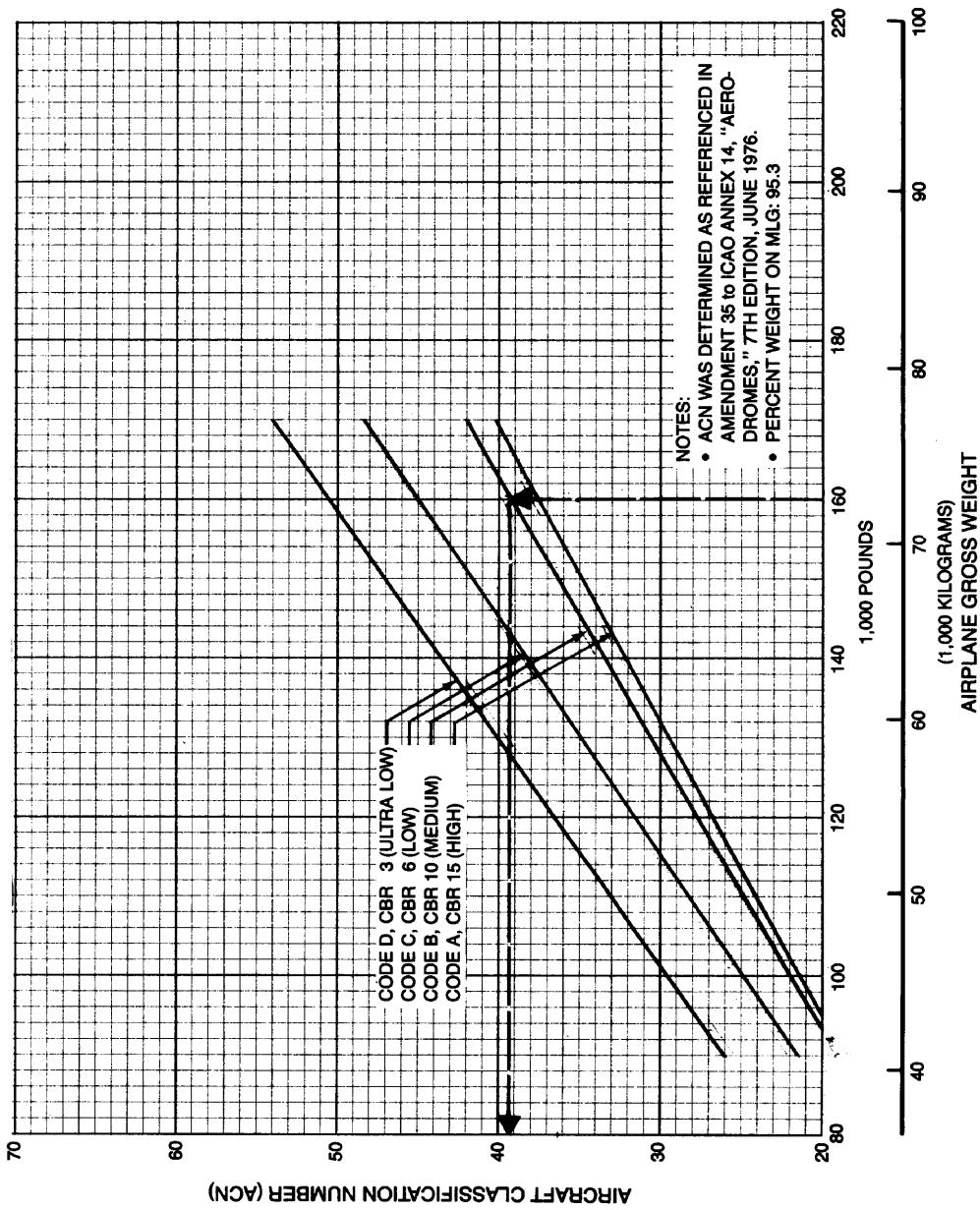
7.9.1 RIGID PAVEMENT REQUIREMENTS—FAA METHOD MODEL 727

7.10 ACN/PCN Reporting System: Flexible and Rigid Pavements

To determine the ACN of an aircraft on flexible or rigid pavement, both the aircraft gross weight and the subgrade strength category must be known. In the chart on 7.10.1, for example, for an aircraft gross weight of 160,000 lb and medium subgrade strength, the ACN for flexible pavement is 39. Referring to 7.10.3 for the same gross weight and subgrade strength, the ACN for rigid pavement is 42.

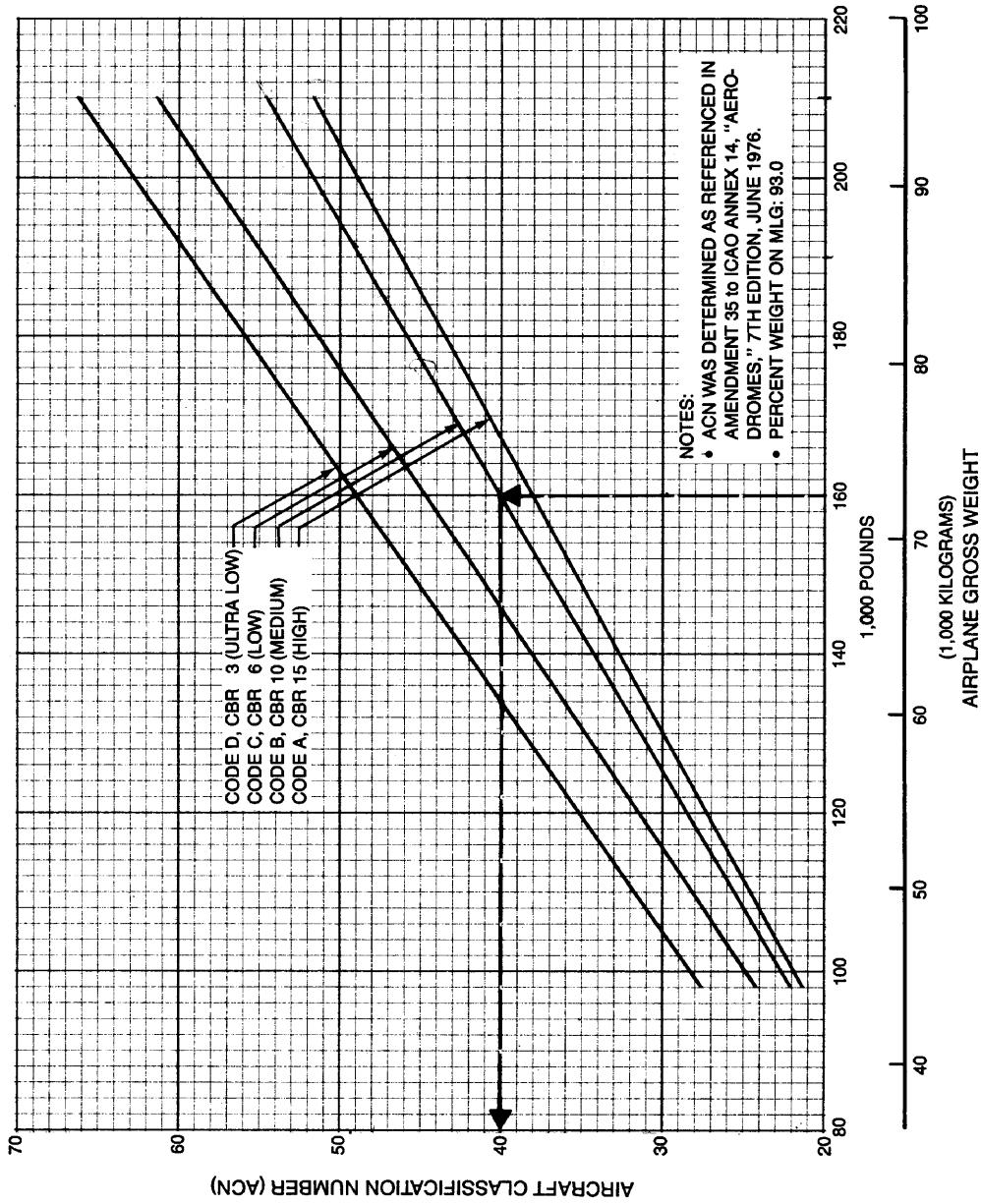
Note: An aircraft with an ACN equal to or less than the reported PCN can operate on the pavement subject to any limitations on the tire pressure. (Ref.: Amendment 35 to ICAO Annex 14 Aerodromes, 7th Edition, June 1976).

NOTES: • TIRES—49x17 26 PR; 49x17 28 PR
 • PRESSURE CONSTANT AT 148 PSI (10.41 KG/CM²)



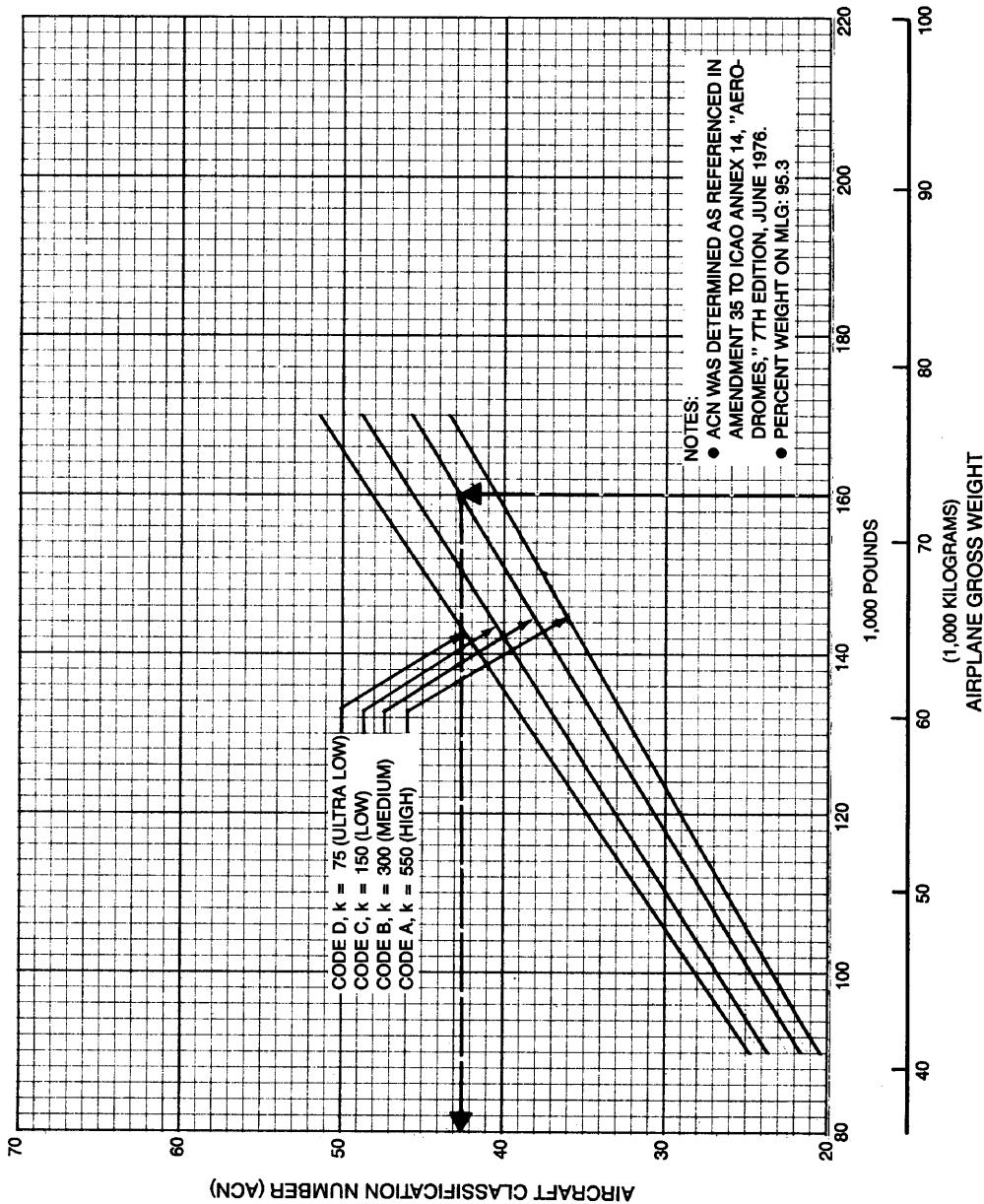
7.10.1 AIRCRAFT CLASSIFICATION NUMBER—FLEXIBLE PAVEMENT—49x17 TIRES MODEL 727

NOTES: • TIRES—50x21 30 PR
• PRESSURE CONSTANT AT 167 PSI (11.74 KG/CM²)



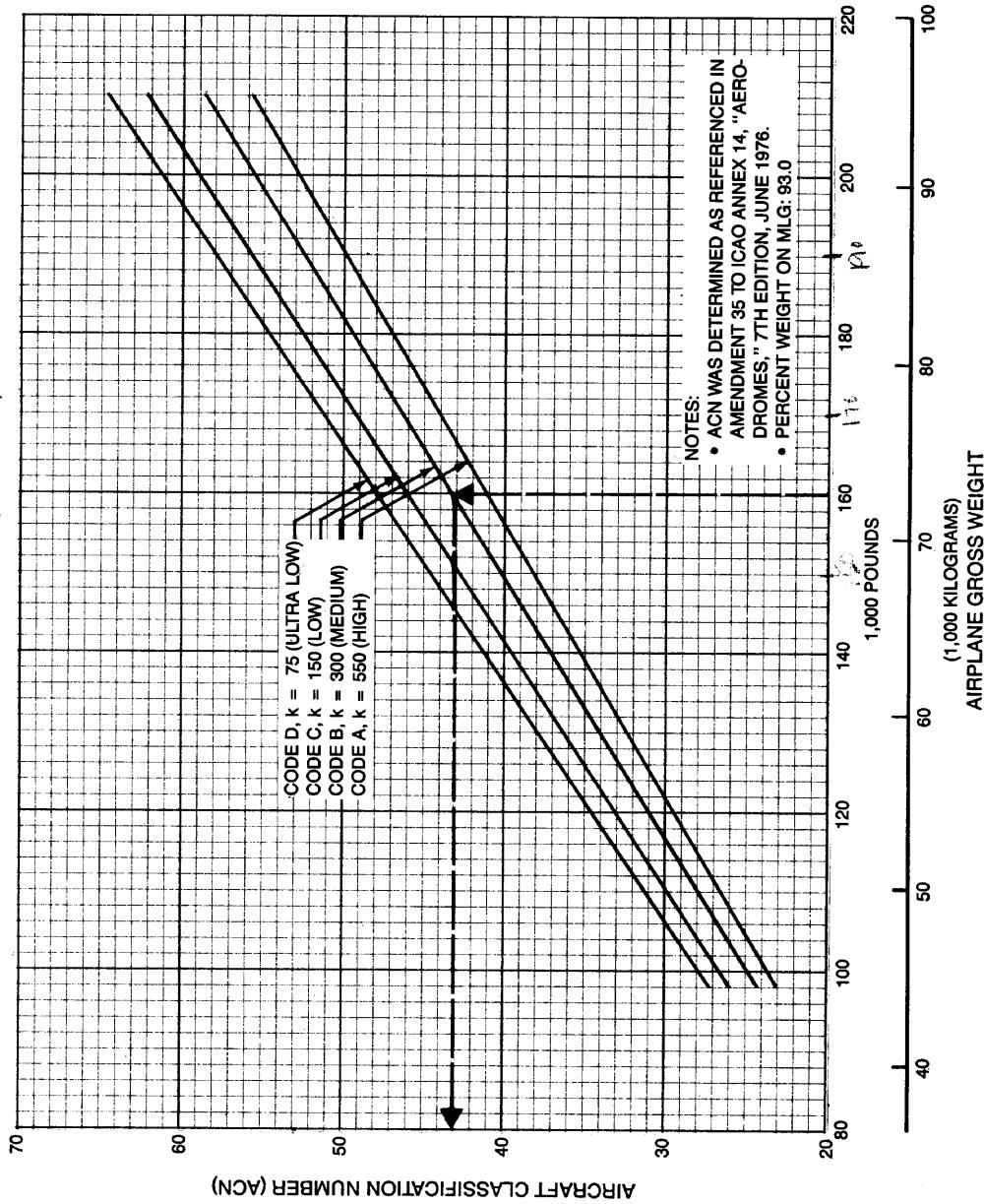
7.10.2 AIRCRAFT CLASSIFICATION NUMBER—FLEXIBLE PAVEMENT—50x21 TIRES MODEL 727

NOTES: • TIRES—49x17 26 PR; 49x17 28 PR
 • PRESSURE CONSTANT AT 148 PSI (10.41 KG/CM²)



7.10.3 AIRCRAFT CLASSIFICATION NUMBER—RIGID PAVEMENT—49x17 TIRES MODEL 727

NOTES: • TIRES — 50x21 30PR
• PRESSURE CONSTANT AT 167 PSI (11.74 KG/CM²)



7.10.4 AIRCRAFT CLASSIFICATION NUMBER—RIGID PAVEMENT—50x21 TIRES MODEL 727

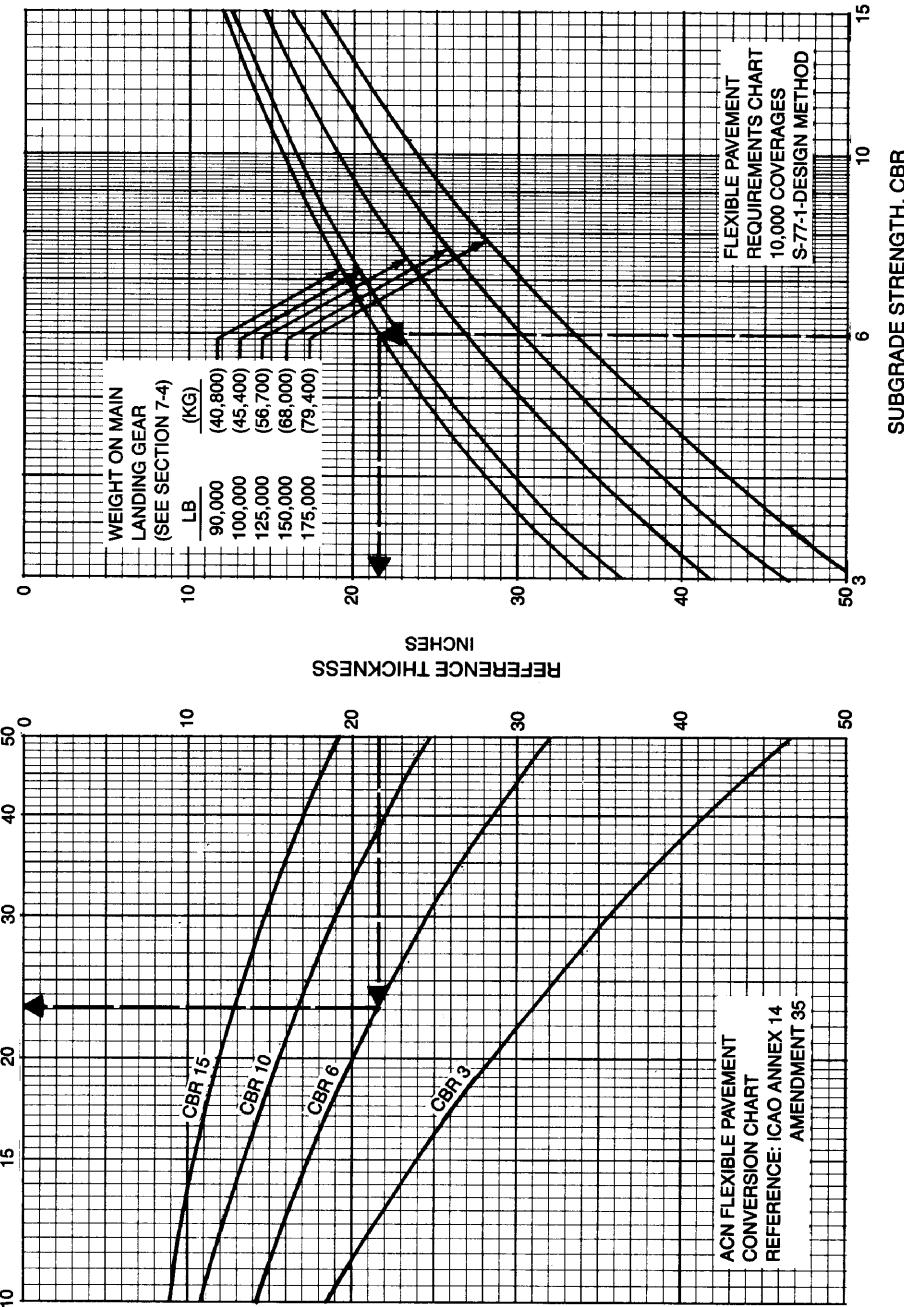
7.10.5 Development of ACN Charts

The ACN charts for flexible and rigid pavements were developed by methods referenced in Amendment 35 to ICAO Annex 14. The procedures used to develop these charts are also described below.

The following procedure is used to develop the flexible-pavement ACN charts:

1. Determine the percentage of weight on the main gear to be used in steps 2, 3, and 4 below. It is the maximum aft center of gravity position that yields the critical loading on the critical gear (see Section 7.4). This center of gravity position is used to determine the main-gear loads at all gross weights of the model being considered.
2. Establish a flexible-pavement requirements chart using the S-77-1 design method, such as shown on the right-hand side of the chart (7.10.6). Use standard subgrade strengths of CBR 3, 6, 10, and 15 at 10,000 coverages. This chart provides the same thickness values as those of section 7.5, but is presented here in a different format.
3. Determine reference thickness values from the pavement requirements chart of step 2 for each standard subgrade strength and gear loading.
4. Enter the reference thickness values into the ACN flexible-pavement conversion chart shown on the left-hand side of the chart to determine ACN. This chart was developed using the S-77-1 design method with a single tire inflated to 180 psi (1.25 MPa) pressure and 10,000 coverages. The ACN is two times the derived single-wheel load expressed in thousands of kilograms. These values of ACN are then plotted as a function of aircraft gross weight, as shown on 7.10.1 and 7.10.2.

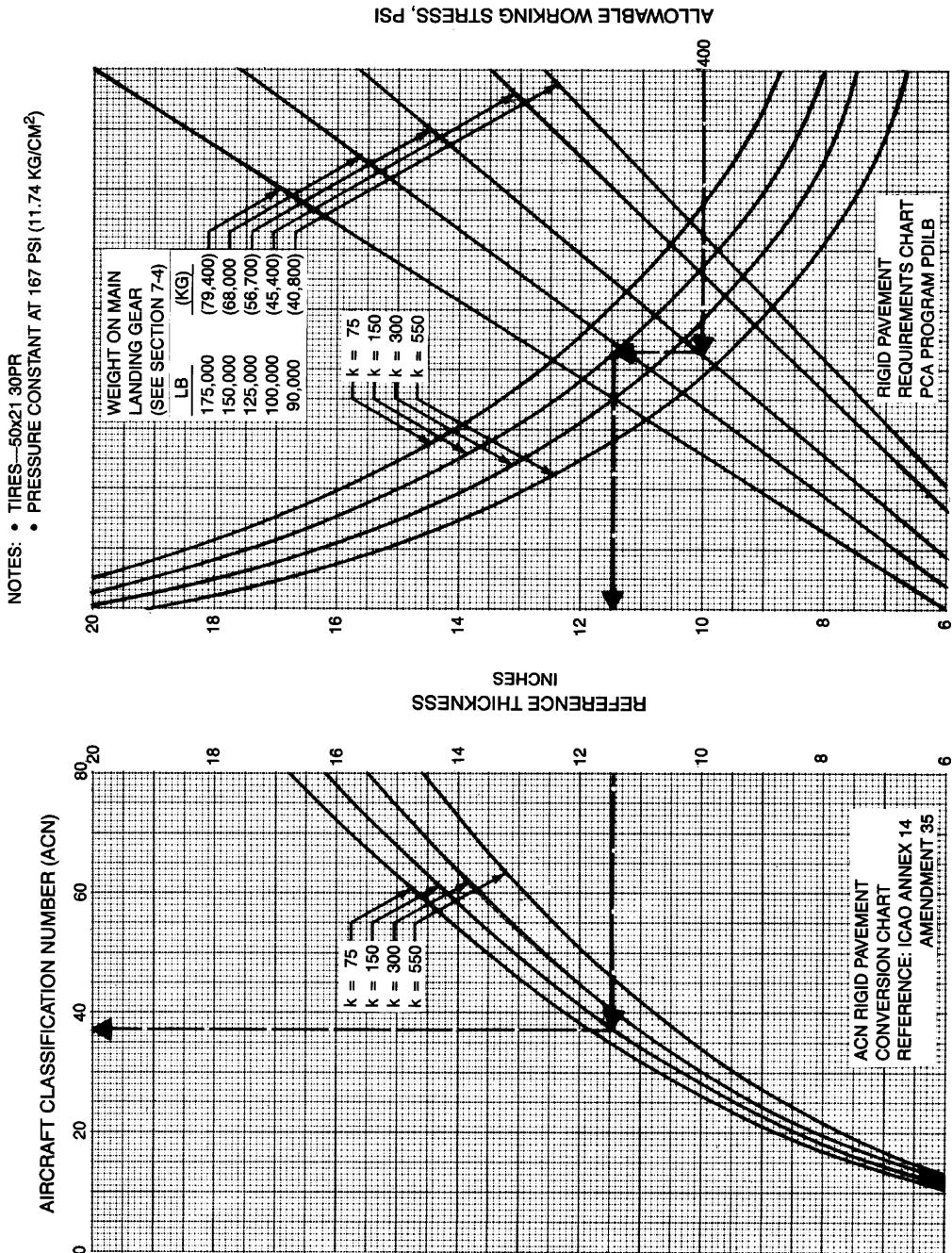
NOTES: • TIRES—50X21 30 PR
 • PRESSURE CONSTANT AT 167 PSI (11.74 KG/CM²)



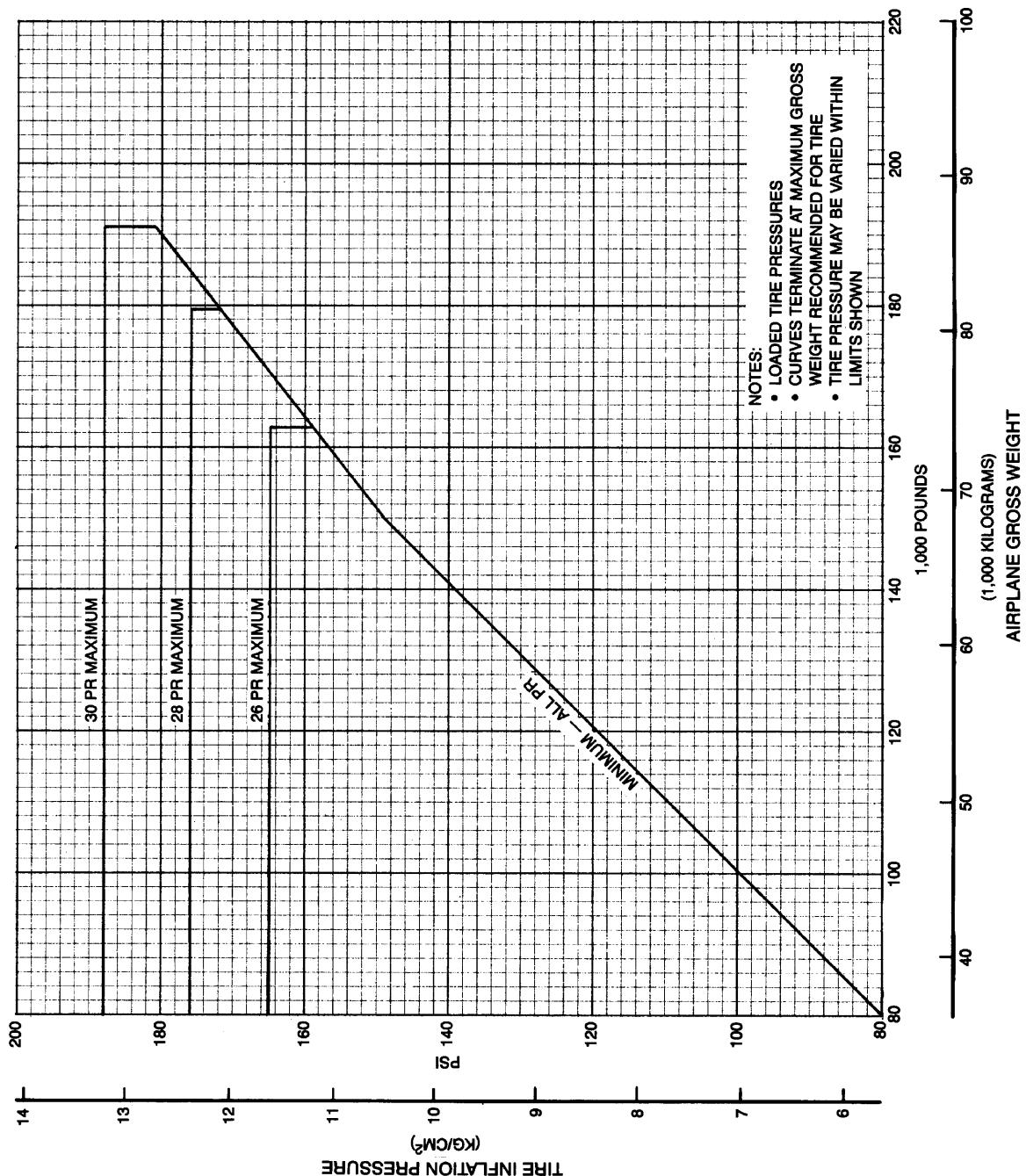
7.10.6 DEVELOPMENT OF AIRCRAFT CLASSIFICATION NUMBER (ACN), FLEXIBLE PAVEMENT MODEL 727

The following procedure is used to develop the rigid-pavement ACN charts:

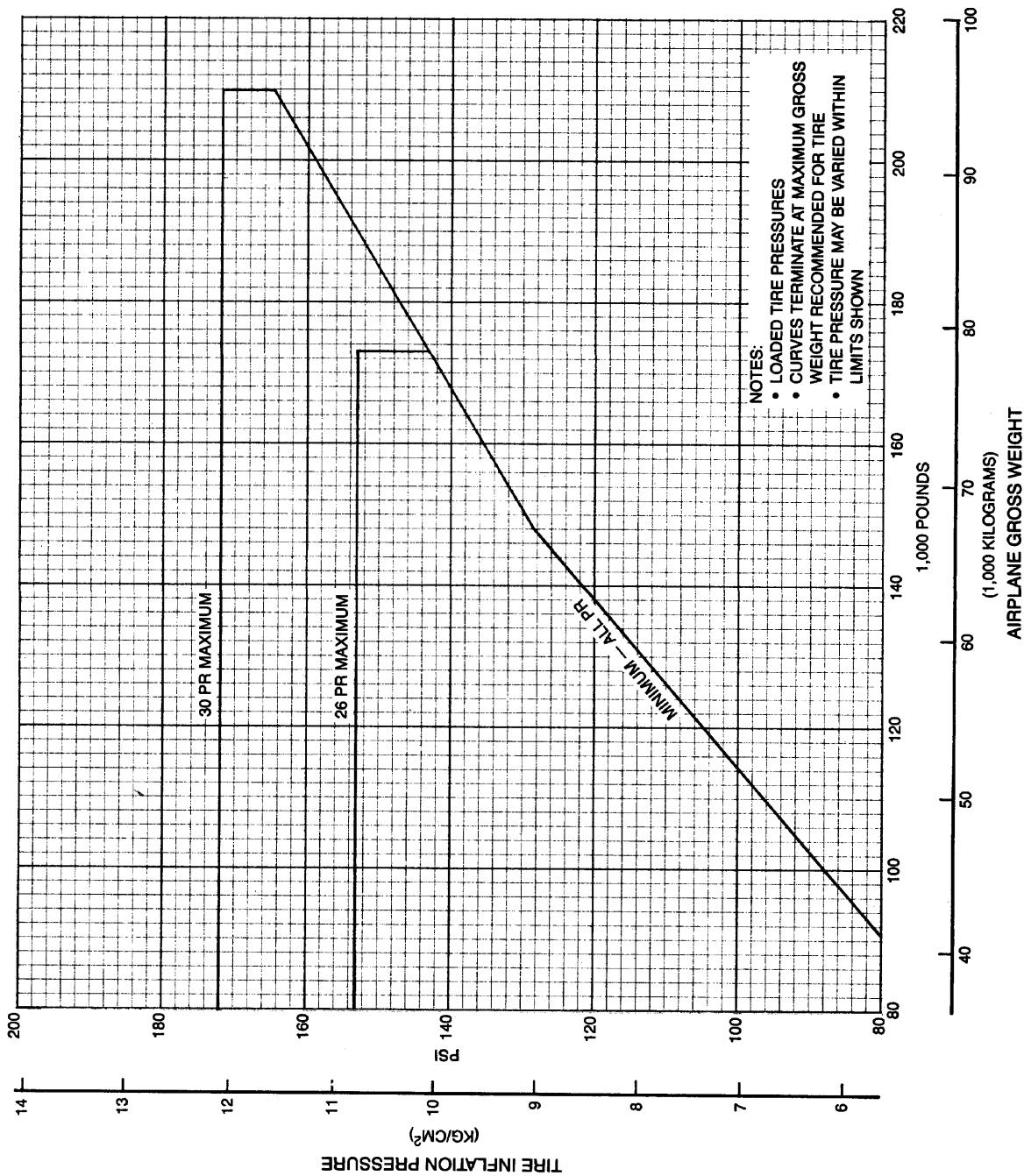
1. Determine the percentage of weight on the main gear to be used in steps, 2, 3 and 4 below. It is the maximum aft center of gravity position that yields the critical loading on the critical gear (see Section 7.4). This center of gravity position is used to determine main-gear loads at all gross weights of the model being considered.
2. Establish a rigid-pavement requirements chart using the PCA computer program PDILB, such as shown on the right-hand side of the chart (7.10.7). Use standard subgrade strengths of $k = 75, 150, 300$, and 550 pci — nominal values for $K = 20, 40, 80$, and 150 MN/m^3 , respectively. This chart provides the same thickness values of those in Section 7.7.
3. Determine reference thickness values from the pavement requirements chart of step 2 for each standard subgrade strength and gear loading at 400 psi working stress (nominal value for 2.75 MPa working stress).
4. Enter the reference thickness values into the ACN rigid-pavement conversion chart shown on the left-hand side of the chart to determine ACN. This chart was developed using the PCA Computer program PDILB with a single tire inflated to 180 psi (1.25 MPa) pressure and a working stress of 400 psi. The ACN is two times the derived single-wheel load expressed in thousands of kilograms. These values of ACN are then plotted as a function for aircraft gross weight, as shown on 7.10.3 and 7.10.4.



7.10.7 DEVELOPMENT OF AIRCRAFT CLASSIFICATION NUMBER (ACN), RIGID PAVEMENT MODEL 727



7.11.1 TIRE INFLATION CHART (VARIABLE PRESSURE)—49x17 TIRES MODEL 727



**7.11.2 TIRE INFLATION CHART (VARIABLE PRESSURE)—50x21 TIRES
MODEL 727**