APPROVED AEROPLANE FLIGHT MANUAL

FOR THE PIPER MODEL

PA-28-180

PREPARED IN ACCORDANCE WITH BRITISH CIVIL AIRWORTHINESS REQUIREMENTS

(Applicable to Aircraft S/N 28-3150 to 28-7205318)

Rev. 2 3

1 May 1973

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REGISTRATION PARTICULARS

Nationality and Registration Marks: G-AZYF

Constructors Serial Number: 28-5227 28 - 5227.

Designed and Constructed by: PIPER AIRCRAFT CORPORATION
Vero Beach, Florida
U.S.A.

F.A.A. Certificate of
Airworthiness for export:

This airplane shall be operated in accordance with the limitations given in Section III and any additional limitations contained in a supplement in Section VII.

This replacement Flight Manual supersedes any previous Flight Manual issued for this aircraft.

"This is the flight manual which forms part of
Certificate of Airworthiness Number 4645."

C O N T E N T S PAGE

SECTION I

INTRODUCTORY

THE DOCUMENT REFERENCE NUMBER OF THIS

FLIGHT MANUAL IS VB-545

This Flight Manual applies only to the aircraft having the constructors serial number shown on page 1. It is the responsibility of the pilot to be familiar with the contents of the manual including all amendments at the time of flight.

The current amendment state of this copy is given on the record sheets on pages 5 and 6. Amendments are of two kinds;

a) F.A.A. approved revisions (page 5)

b) C.A.A. approved revisions (page 6)

Amendments to the text will be indicated by a marginal vertical line together with the amendment number, except that when a considerable change has taken place or a completely new page has been issued the revision, together with the amendment number, will be denoted at the foot of the page. Changes to the weight and loading data (Section VI) are not associated with an amendment number.

A list of the approved supplements which have been embodied in Section VII of this copy is recorded on page 4. Supplements are published either by the manufacturer, or by an organization producing a modification to the aircraft, and approved by the Civil Aviation Authority.

RECORD OF SUPPLEMENTS

The following list of supplements have been approved by the Secretary of the Civil Aviation Authority and embodied in this Manual.

SUPPLEMENT NUMBER	NAME OF CONSTRUCTOR	SUPPLEMENT TITLE	DATE OF APPROVAL			DATE OF EMBODIMENT			AUTHORIZED SIGNATURE OF EMBODIMENT
			DAY	MO.	YR.	DAY	MO.	YR.	

PREPARED	PIPER AIRCRAFT CORP.	REPORT: VB-545
CHECKED	DEVELOPMENT CENTER, VERO BEACH, FLA.	MODEL: PA-28-180
APPROVED		PAGE 5

UNITED STATES F.A.A.
AMENDMENT RECORD SHEET

REVISION NO.	DATE OF REVISION			REVISED BY	APPROVAL DATE (CAA)			REVISION TITLE	PAGES AFFECTED
	DAY	MO.	YR.		DAY	MO.	YR.		
1	20	2	74	JMS	1	4	74	Editing of Write-up	7,12 13,19,23, 33,37
								Revised Oil Pressure limitation	14
								Pitot Head Sketch	27.
								Revised Airspeeds	17,19,28,31, 33
								Added T.O. Graph	32
	[DOA SO-1 APPROVED]								
2	11	11	75		8	1	76	Changed Applicability per CAA letter of 27 Oct. 1975	Title & 27
[FAA DOA SO-1 APPROVED]									
3	25	2	77	RKK	14	4	77	Changed Effectivity	Title
								Clarified Drawing	27

PREPARED	PIPER AIRCRAFT CORP.	REPORT: VB-545
CHECKED	DEVELOPMENT CENTER, VERO BEACH, FLA.	MODEL: PA-28-180
APPROVED		PAGE 6

C.A.A. AMENDMENT RECORD SHEET

REVISION NO.	DATE OF REVISION			REVISED BY	APPROVAL DATE (CAA)			REVISION TITLE	PAGES AFFECTED
	DAY	MO.	YR.		DAY	MO.	YR.		
Flight Sheet 1 of 2 inside 2	24	7	78	[illegible]	20	1	78	Pressure head info.	To face Page 27

SECTION II

DESCRIPTION

AEROPLANE PARTICULARS

Rev. 1

CLASS

Aeroplane (Landplane)	Low Wing Monoplane

ENGINE

Number	One
Manufacturer	Lycoming
Type	O-360-A3A or O-360-A4A

PROPELLER

Manufacturer	Sensenich
Type (A/C S/N 28-671 to 28-1760A)	M76EMM or M76EM8
(A/C S/N 28-1571, 28-1573, 78-1761 & On)	M76EMMS or M76EM8S5
Diameter	76 Inches
Pitch	60 Inches

LEADING DIMENSIONS

Figure II-1 on page 8 is a three view general arrangement drawing, and associated dimensions are shown below.

Span	30 ft. 0 inches
Length	23 ft. 5 inches
Height	7 ft. 3 inches

WING

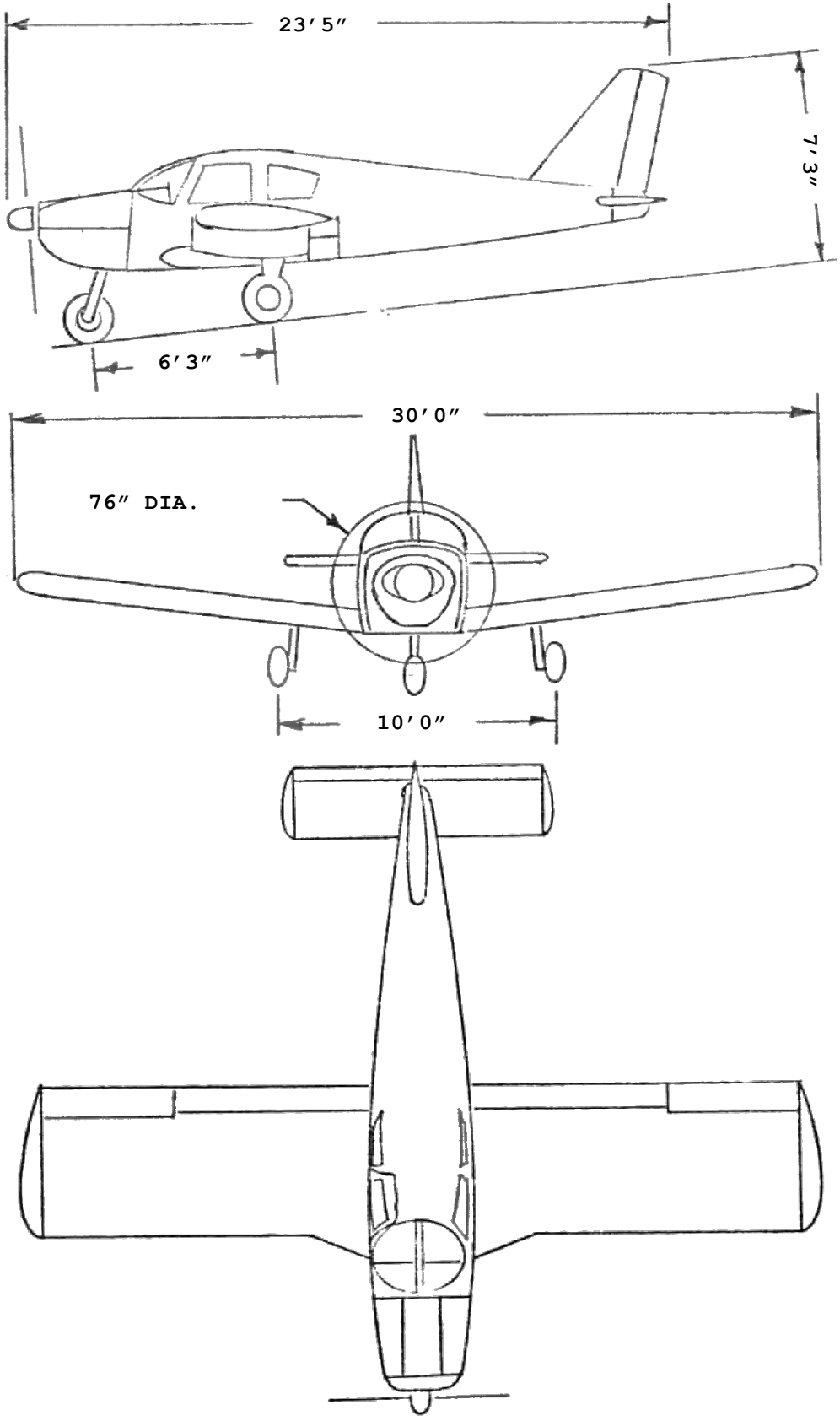
Area	160.0 sq. ft.
Mean Chord	5.3 ft.
Aspect Ratio	5.7
Aileron Area (total)	10.6 sq. ft.
Flap Area (total)	14.6 sq. ft.
Flap Positions	0° Take-Off
	10°
	25°
	40° Landing

TAIL UNIT

Tailplane Area	24.4 sq. ft.
Fin Area	7.5sq. ft.
Rudder Area	4.1 sq. ft.

MISCELLANEOUS

Under Carriage Track	10 ft. 0 inches
Wheel Base 6 ft. 3 inches	6 ft. 3 inches



GENERAL ARRANGEMENT DRAWING FIG. II-1

D E F I N I T I O N S

The following terms are used in various sections of this manual:

AIR TEMPERATURE: The temperature of the free air near to, but not influenced by, the aeroplane. This temperature may be a reported, forecast, or, when permitted by the Air Navigations Regulations, a declared temperature derived in accordance with an approved system.

ALTITUDE: The altitude shown on the charts is pressure altitude which is the expression of atmospheric pressure in terms of altitude above mean sea level according to the interrelation of these factors in International Standard Atmosphere (I.S.A.). This may be obtained by setting the sub-scale of an accurate pressure type altimeter at 1,013 millibars (29.92 inches or 760 millimeters of mercury).

I.S.A.: International Standard Atmosphere, which is the interrelationship of air temperature and pressure as shown in Figure II-2.

HEIGHT: The vertical distance between the lowest part of the aeroplane and the relevant datum.

WEIGHT: The total weight of the aeroplane, including fuel, oil, equipment, crew and payload.

I.A.S.: Indicated Air Speed, which is the reading obtained from an instrument having no calibration error. Because the permitted tolerances are small the Air Speed Indicator Reading (A.S.I.R.) may be taken as equal to I.A.S.

C.A.S.: Calibrated Air Speed, which is A.S.I.R. corrected for position and instrument error.

T.A.S.: True Air Speed, which is the C.A.S. corrected for altitude and temperature.

TAKE-OFF-SAFETY SPEED: The minimum speed at which, following sudden and complete failure of the engine in the take-off configuration, adequate control exists to establish a glide at a safe margin above the stall.

V_{NO}: Normal Operating Limit - Maximum cruising speed.

MANEUVERING SPEED: Maximum speed for full application of primary flight controls.

HARD RUNWAY: A surface such as concrete or tarmac.

GRADIENT OF CLIMB: The ratio, in the same units and expressed as a percentage, of:

$$\frac{\text{Change in Height}}{\text{Horizontal Distance Travelled}}$$

The gradients of climb shown on the charts are true gradients, i.e., they are derived from true (not pressure) rates of climb.

GROSS PERFORMANCE: The average performance which a fleet of aeroplanes can be expected to achieve if satisfactorily maintained and flown in accordance with the associated techniques described in the manual.

NET PERFORMANCE: Net performance is the "gross" performance, diminished by the amounts specified in British Civil Airworthiness Requirements to allow for various contingencies which cannot be directly accounted for operationally, e.g., the need to manoeuver, unavoidable variations in piloting technique, temporary below-average performance, etc. It is extremely improbable that the net performance will not be achieved in operation, provided the aeroplane is flown in accordance with the recommended techniques.

STANDARD ATMOSPHERES

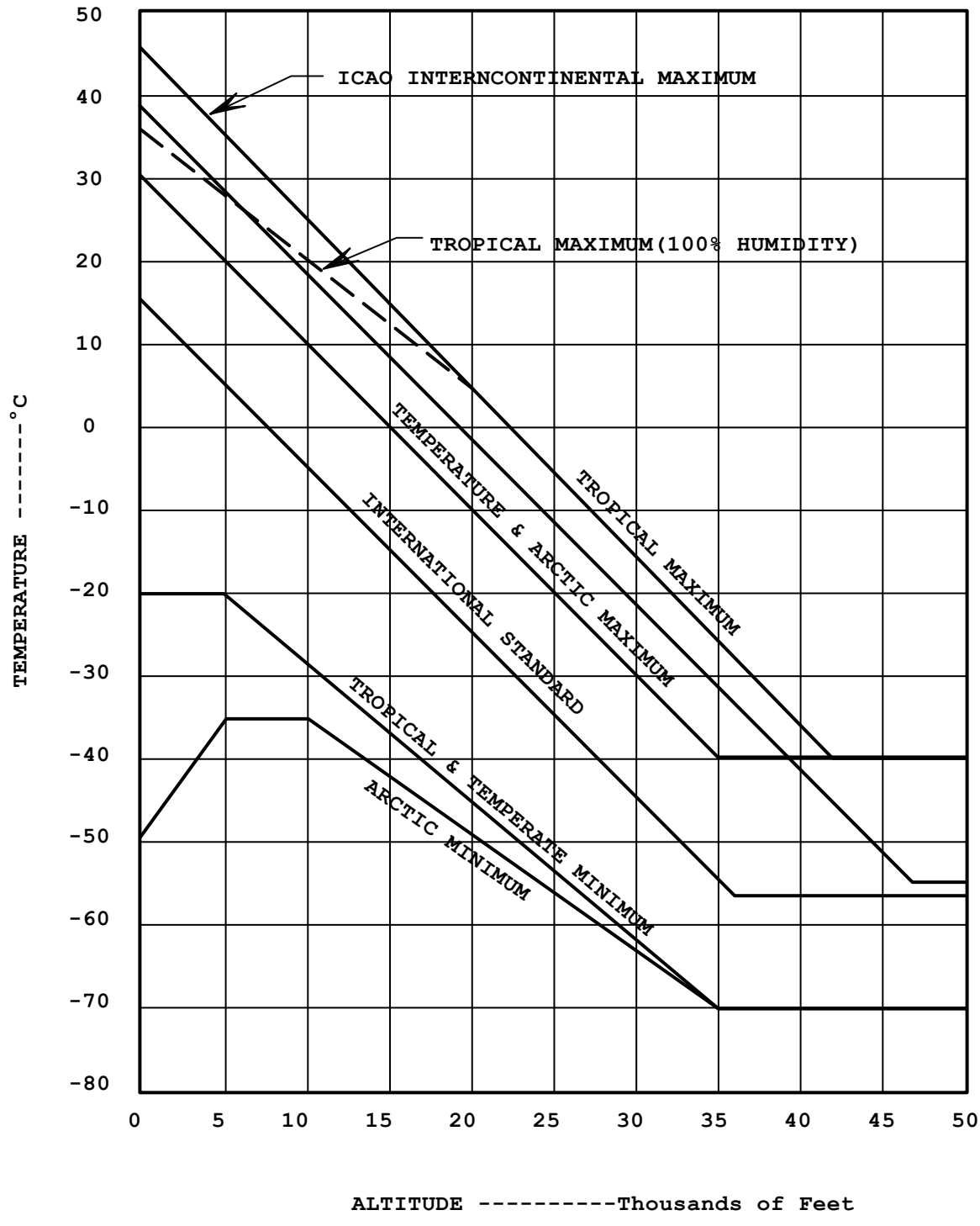


FIG. II-2

SECTION III

L I M I T A T I O N S

THE AEROPLANE MUST BE OPERATED SO THAT THE LIMITATIONS AND INSTRUCTIONS IN THIS SECTION ARE OBSERVED.

CATEGORY:

Aircraft of this typeare eligible for certification in the General Purpose Category. However, this aeroplane may be restricted to particular use or to some other category, and this will be stated in the Certificate of Airworthiness.

Rev. 1

MANOEUVERS:

The following aerobatic manoeuvers are permitted, provided the aeroplane is loaded within the approved weight and centre-of-gravity limits up to a gross weight of 1950 lbs.
Spins, steep turns, lazy eights, and chandelles.

All aerobatic manoeuvers, including spins are prohibited above a gross weight of 1950 lbs.

Inverted manoeuvers are prohibited.

FLIGHT LOAD FACTORS:

The structure has been designed to withstand positive accelerations of 4.4 g flaps up and 2.0 g flaps down and negative acceleration of 1.76 g flaps up without permanent deformation up to a gross weight of 1950 lbs.

The structure has been designed to withstand positive accelerations of 3.8 g flaps up and 2.0 g flaps down up to a gross weight of 2400 lbs. without permanent deformation.

A I R S P E E D L I M I T A T I O N S

NEVER EXCEED SPEED *

The never exceed speed is 176 MPH I.A.S. (153 knots).

NORMAL OPERATING LIMIT SPEED *

During normal cruising flight the aeroplane should not be flown at a speed greater than 143 MPH I.A.S. (124 knots). The aeroplane shall only be flown at speeds between the normal operating limit speed and the never exceed speed at the discretion of the pilot, having due regard to the prevailing and atmospheric conditions.

MANOEUVERING SPEED

Manoeuvres involving an approach to the stall or full application of aileron or rudder control shall not be undertaken at a speed greater than 131 MPH I.A.S. (114 knots).

NOTE :

Although the aeroplane is strong enough for steady application of full rudder at this speed, a violently checked manoeuvre might over-stress it. For example, any violent yaw must not be checked with sudden application of opposite rudder.

WING FLAPS EXTENDED SPEED *

Rev. 1

The wing flaps shall hot be extended when the aeroplane is flying at a speed greater than 116 MPH I.A.S. (101 knots).

AIRSPEED INDICATOR COLOUR MARKINGS

Rev. 1

Flaps Up:	Normal Operating Range	67 to 140 MPH (Green Arc)
	Caution Range	140 to 171 MPH (Yellow Arc)
	Never Exceed Speed	171 MPH (Red Radial Line)
Flaps Extended:	Normal Operating Range	57 to 115 MPH (White Arc)
	Never Exceed Speed	115 MPH

These speeds are C.A.S., that is I.A.S., corrected for position error.

POWERPLANT LIMITATIONS

The following are the limitations for the installed Lycoming 0-360-A3A or 0-360-A4A Engine with the Sensenich 76 inch diameter, 60 inch pitch M76EMM, M76EM8, M76EM8S5 propeller.

FUEL:

The minimum grade of fuel approved for use of this engine is 91/96 octane, D. Eng. R.D. 2485 with a maximum limit of 5.5 MLS. TEL/Imperial Gallon.

OIL:

The oil approved for the use of this engine is to specification D.ENG. R.D. 2472 B/O and the latest issue of Lycoming Service Instruction 1014.

OIL TEMPERATURE: *

Normal	60°F to 245°F	(Green Arc)
Maximum	245°F	(Red Line)

Minimum Oil Temperature for take-off is established when oil pressure remains steady as the engine is accelerated.

OIL PRESSURE: *

Rev. 1

Normal Operating range	60 to 90 psi	(Green Arc)
Maximum	90 psi	(Red Line)
Minimum	25 psi	(Red Line)
Caution Range	25 to 60 psi	(Yellow Arc)

FUEL PRESSURE: *

Normal operating range	1/2 to 6 psi	(Green Arc)
Maximum	6 psi	(Red Line)
Minimum	1/2 psi	(Red Line)

Electric fuel pump must be on for both take-off and landing.

ENGINE SPEED LIMITATIONS: *

The maximum permissible rotational speed for all conditions of flight is 2700 RPM (Red Line). The normal Operating range is 500 to 2700 RPM (Green Arc).

USE OF MIXTURE CONTROL:

The mixture control is used to maintain best power weak mixture for cruising at or below 75% power. To avoid rough running in climb due to over-richness, mixture may be weakened for smooth engine operation above 5000 feet.

W E I G H T A N D L O A D I N G

WEIGHT:

The maximum permissible take-off and landing weight is 2400 lbs. This is the maximum weight and lower weights may in particular circumstances be advised or enforced by operational performance considerations.

CENTRE OF GRAVITY:

The load is to be distributed so that the centre-of-gravity for approved aerobatic manoeuvres lies always between:

A forward limit of

84.0 ins. aft of datum at 1650 lbs. with straight line variation between points given
85.8 ins. aft of datum at 1950 lbs.

and an aft limit of 86.5 ins. aft of datum at all weights. Baggage and aft passengers are also prohibited.

For non-aerobatic operation, the centre-of-gravity limits are:

84.0 ins. aft of datum at 1650 lbs. with straight line variation
85.9 ins. aft of datum at 1975 lbs.(1) between points given
92.1 ins. aft of datum at 2400 lbs (1)
87.0 ins. aft of datum at 2150 lbs.(2)
91.0 ins. aft of datum at 2400 lbs.(2)

and an aft limit of 94.5 ins. aft of datum at 2400 lbs. and 95.9 ins. aft of datum at 2200 lbs., or less.

C.G. DATUM:

The C.G. Datum is defined as 78.4 ins. ahead of wing leading edge outboard of the intersection of straight and tapered sections.

BAGGAGE: *

The maximum weight of baggage is the baggage compartment must not exceed 125 lbs. The maximum allowable baggage is 200 lbs. for serial numbers 28-1761 and on.

G-AZYF 28-5227

(1) Aircraft Serial No.'s 671 thru 5859, inclusive.

(2) Aircraft Serial No.'s 7105001 and higher.

M I S C E L L A N E O U S L I M I T A T I O N S

MINIMUM CREW:

The minimum crew is one pilot.

NUMBER OF OCCUPANTS:

The number of persons carried must not in any circumstances exceed four, nor exceed the number of seats installed. Children under the age of three, carried in the arms of passengers, are excluded from this count.

FLIGHT BY NIGHT:

Night flying is permitted when the required equipment is installed, and when allowed by the Air Navigation Legislation.

FLIGHT IN ICING CONDITIONS:

The aeroplane is not approved for flight in icing conditions.

CLIMATIC CONDITIONS:

The operating suitability of the aeroplane has been established for temperatures up to the range defined by the I.C.A.O. Tropical Maximum Atmosphere (I.S.A. + 30°C). This temperature range is shown on Figure II-2

No minimum temperature range has yet been established.

AUTOCONTROL II AUTOPILOT: *

(When installed)
The Autocontrol II must be off during take-off and landing.

PLACARDS:

Items marked * must either be placarded in the cockpit or the appropriate instruments colour marked.

SECTION IV

HANDLING

MAXIMUM CROSSWIND COMPONENT:

The maximum crosswind component in which the aeroplane has been demonstrated to be safe for take-off and landing is 17 knots at a tower height of 33 feet.

HANDLING ON ROUGH GROUND :

The aeroplane has been de onstrated to be safe when operating from rough grass surfaces.

TAKE-OFF TECHNIQUE :

With flaps retracted and the engine at full throttle, liftoff should be initiated at the take-off safety speed of 76 MPH I.A.S. (66 knots). This speed should be maintained until all obstacles have been cleared.

Rev. 1

EN ROUTE PERFORMANCE :

The en route performance in Section V for climb and glide is based on 81 MPH I.A.S. (70 knots).

ROUGH AIR SPEED :

131 MPH I.A.S. (114 knots) with flaps retracted is recommended for flight in extreme turbulence.

STALLING :

There is no aerodynamic stall warning. A stall warning light is installed on the instrument panel to provide warning at a uniform 5 to 10 MPH speed increment above the stall in all configurations. Recovery from the stall is normal in all configurations. The variation of power off stalling speed with weight is shown in Figure IV-1.

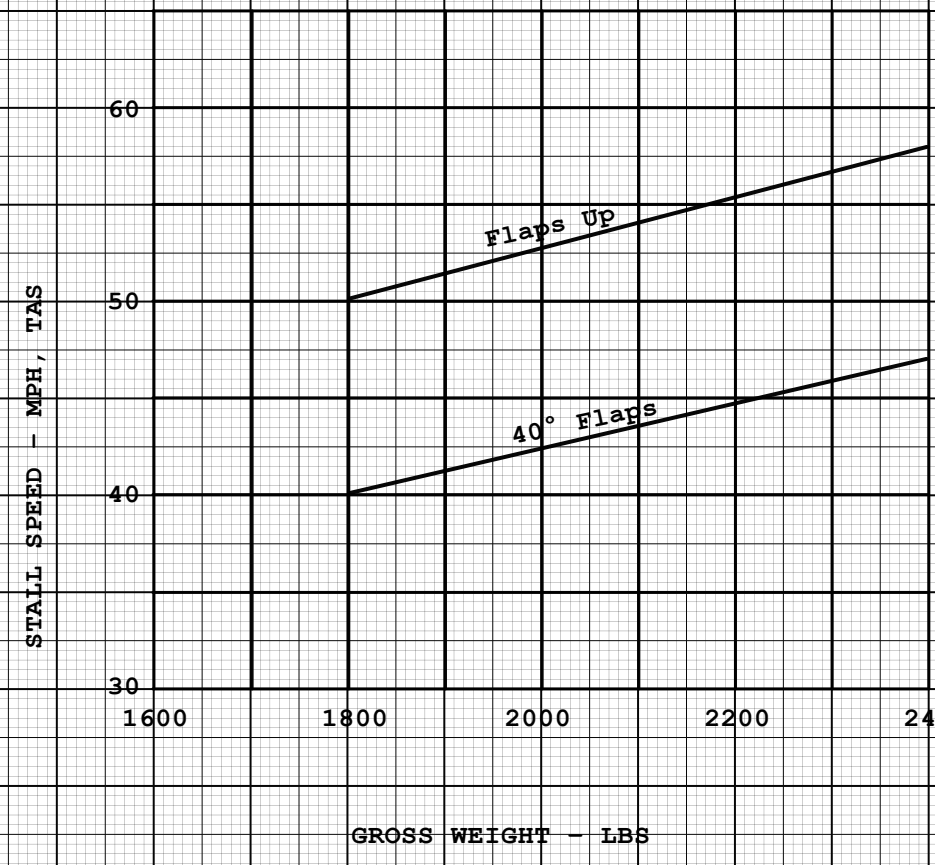
NOTE :

The stall warning system is inoperative with the master switch off.

F I G U R E I V - 1

S T A L L S P E E D P O W E R O F F

Valid only for pitot-static mast P/N 99057-4, if the original equipment pitot-static mast is replaced, contact Piper Aircraft for applicable Airplane Flight Manual.



BALKED LANDING :

In the event of a balked landing, apply full throttle, allow the speed to increase to 76 MPH I.A.S., (66 knots), then raise the flaps to 0° setting gradually. Carburetor heat off, unless icing exists.

Rev. 1

FUEL SYSTEM :

The fuel is contained in two 25 U.S. Gallon (20.8 Imperial Gallons) main tanks. Either tank may be used in any condition or configuration of flight, including take-off and landing.

Fuel is supplied to the engine by an engine driven fuel pump which may be augmented by an electric fuel pump. The electric fuel pump should be used on take-off and landing or in case of failure of the engine driven pump.

OPERATION OF PIPER AUTOCONTROL II AUTOPILOT

(When Installed)

LIMITATIONS :

The Autocontrol II must be disengaged during take-off and landing.

OPERATION:

The Roll Engage Knob turns on Autocontrol II and engages its servo with the aileron controls when it is pushed in. If this knob resists full travel, rock the control wheel slightly to allow the gear to mesh. When this knob is pulled fully aft, it turns off Autocontrol II and completely disconnects it from the control system.

The Turn Trim Knob must be centered when the Roll Engage Knob is pushed in. When the Heading Lock is out, a full 90° right or left rotation of the Turn Trim Knob will give a turn with a bank of up to 25°. When the Heading Lock is in, the Turn Trim Knob acts as a trim control to provide minor corrections of the directional Gyro Heading.

The Heading Lock Button serves to connect the directional Gyro into the circuit and have it control the aircraft, or to cut it out of the circuit. This is a "Push-In, Push-Out" Button; When it is first pushed in, it will remain in, connecting the directional Gyro into the circuit. The next time it is pushed, it will release and pop out, exposing a white groove on its shank and disconnecting the directional Gyro.

If a Zero Heading Directional Gyro is installed, set it to 0° heading before pushing the Heading Lock Button "in". The Autocontrol II will then hold this heading. Turns up to 180° may be made by resetting the Gyro.

If a Course Selector Directional Gyro is installed, set the directional Gyro with the magnetic compass and the Course Selector Dial to the desired heading. Turns may be made by resetting the Course Selector Dial.

The angle of bank during turns with the Directional Gyro may be increased or decreased by the use of the Turn Trim Knob.

EMERGENCY PROCEDURES:

The Autocontrol II may be overpowered by the pilot at any time by a force of 16 lbs. on the control wheel. In the event any component of the Auto-control II fails during flight, the system may be completely disengaged by pulling out the Roll Engage Knob. If the Directional Gyro should fail and precess excessively, the Heading Lock Button should be pushed to the "Out" position and the heading of the Aircraft controlled with the Turn Trim Knob.

OPERATION OF PIPER AUTOCONTROL III AUTOPILOT

(When Installed)

LIMITATIONS

Automatic Pilot must be off during take-off and landing.

OPERATION

The Autocontrol II Console contains the ON/OFF switch, the Bank Command knob, and the Heading Lock switch. The Directional Gyro incorporates the course Selector "bug" which supplies the heading information to the autopilot.

Before engaging the autopilot the airplane should be trimmed for hands-off level flight with the skid/slip ball of the turn and bank centered and the directional gyro set to agree with the magnetic heading.

Set the Course Selector "bug" on the directional gyro to the desired heading. Depress the Heading Lock switch to the ON position then depress the ON/OFF switch to the ON position. If the heading of the A/C is other than that selected the A/C will immediately roll into a bank in the direction of the "bug". The bank angle will be no more than 18 to 20 degrees. Subsequent heading changes are now made by setting the Course Selector "bug" to the desired heading.

With the Heading Lock ON the Bank Command knob is inoperative. In order to employ this function the Heading Lock must be OFF. Banks up to 18 to 20 degrees can be directed by the full movement of the knob.

EMERGENCY PROCEDURES

The Autocontrol III may be overpowered by the pilot at any time by a force of 12 to 15 pounds on the control wheel. In the event of any component malfunction the autopilot is disengaged by turning OFF the ON/OFF switch.

ELECTRIC PITCH TRIM INSTALLATION ONLY (When Installed)

The following emergency information applies in case of electric pitch trim malfunction.

a. In case of malfunction, disengage electric pitch trim by pulling out circuit breaker on instrument panel or by pushing pitch trim switch on the instrument to OFF position.

b. In emergency, electric pitch trim may be overpowered using manual pitch trim.

c. In cruise configuration, malfunction results in 10° pitch change and 30 ft. altitude variation.

SECTION V - PERFORMANCE

Use of the data in this section is only mandatory when required by the Air Navigation Order or Regulations; otherwise its use, although most desirable on the grounds of safety, is at the discretion of the Pilot in command of the aeroplane.

CONDITION OF AEROPLANE:

The information in this section relates to a standard Piper PA-28-180 Aeroplane, as shown on figure II-1, powered by a Lycoming 0-360-A3A or 0-360-A4A engine fitted with a Sensenich 76 inch DIA, 60 inch pitch M76EMM or M76EM8 propeller for serial numbers 28-671 to 28-1760A or a Sensenich 76 inch DIA, 60 inch pitch M76EMMS or M76EM8S5 for serial numbers 28-1571, 28-1573, 28-1761 and on.

COMPLIANCE WITH THE AIR NAVIGATION ORDER AND GENERAL REGULATIONS:

(1) This aeroplane is classified in performance group D.

(2) For compliance with the regulations governing flight over water, the true air speed is 125 MPH.

VALIDITY OF PERFORMANCE INFORMATION:

The performance information is not valid if:

Rev. 1 (a) The total loaded weight exceeds the relevant maximum take-off and landing weight appropriate to the altitude and temperature, see Page 29.

(b) The aeroplane is flown when the outside air temperature exceeds the appropriate maximum temperature for which operational suitability has been established. (See Page 16.)

(c) Readings from the charts are obtained by extrapolation (i.e.,using values of parameters outside the ranges given on the charts) except as and when specifically permitted. At temperatures below the lowest range scheduled the performance shall be assumed to be not better than that appropriate to the lowest temperature scheduled.

(d) A propeller of a type differing from that stated above is fitted.

(e) External modifications causing a significant increase in the aerodynamic drag are incorporated.

NET DATA :

The majority of the performance information scheduled (for example, the take-off distance required) is "net data". This means that some margin has been included in the charts for the loss of performance due to various factors for which it is difficult to make an allowance operationally, such as small and unavoidable variations from the correct airspeed, and variations from the average airframe drag and engine powers, etc. Where necessary a note in the text indicates those charts or portions of charts which are "net data".

CONVERSION CHARTS :

Charts to convert wind velocity into wind component, °C and altitude into I.S.A., and °F to °C are given in Figures V-1 and V-2, Arrowed example lines illustrate their use.

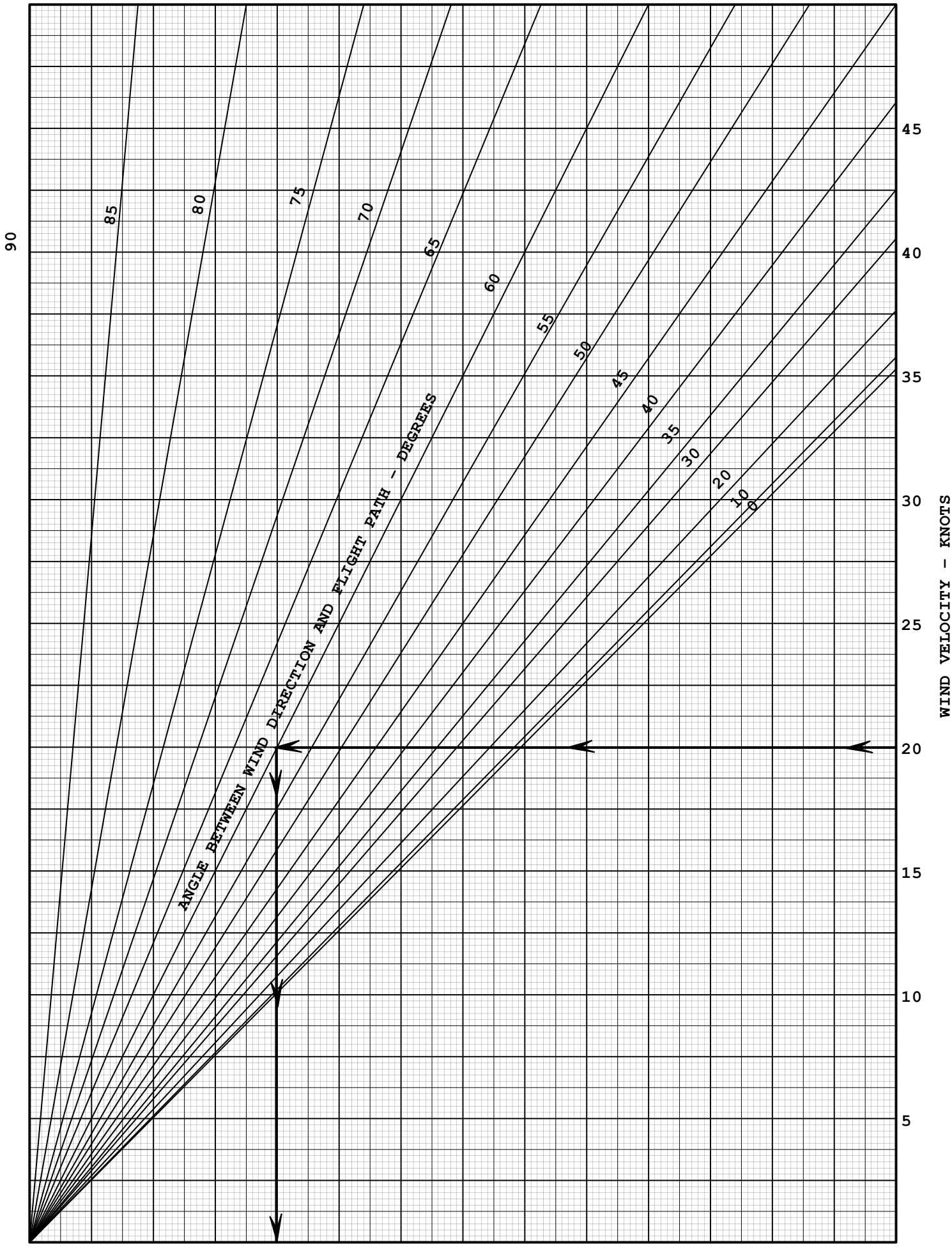

90
85
80
75
70
65
60
55
50
45
40
35
30
20
10
0
ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH - DEGREES
45
40
35
30
25
20
15
10
5
WIND VELOCITY - KNOTS
0
5
10
15
20
25
30
35
WIND COMPONENT PARALLEL TO FLIGHT PATH - KNOTS

FIGURE V-1

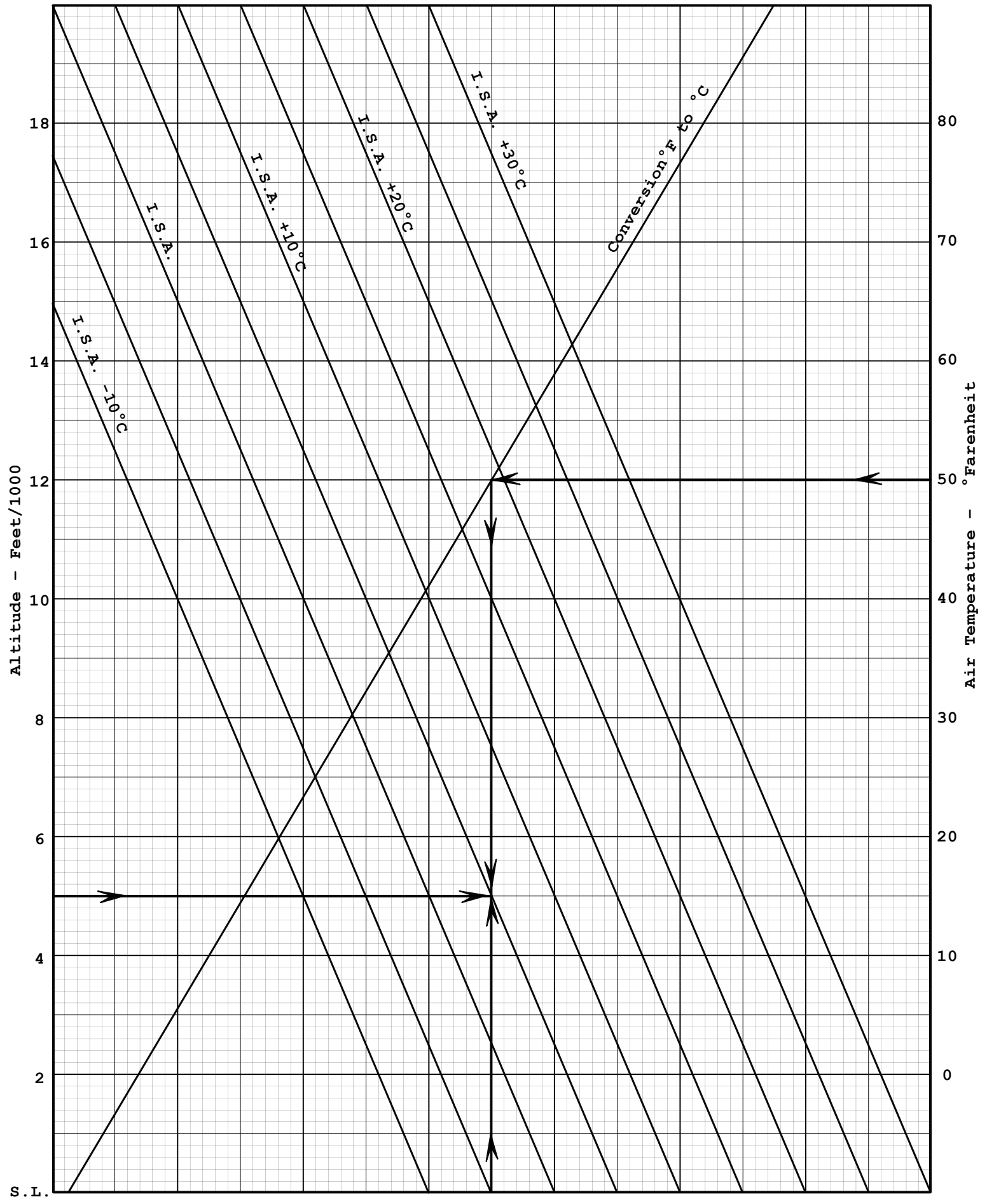

I.S.A. -10°C
I.S.A.
I.S.A. +10°C
I.S.A. +20°C
I.S.A. +30°C
Conversion °F to °C
Altitude - Feet/1000
Air Temperature - °Farenheit
S.L.
2
4
6
8
10
12
14
16
18
0
10
20
30
40
50
60
70
80
-20
-10
0
10
20
30
40
Air Temperature - °C

FIGURE V-2

CIVIL AVIATION AUTHORITY

CAA Change Sheet no. 1 issue 2 to the Piper PA28-180 FAA approved aeroplane Flight Manual Piper Report no. VB-545.

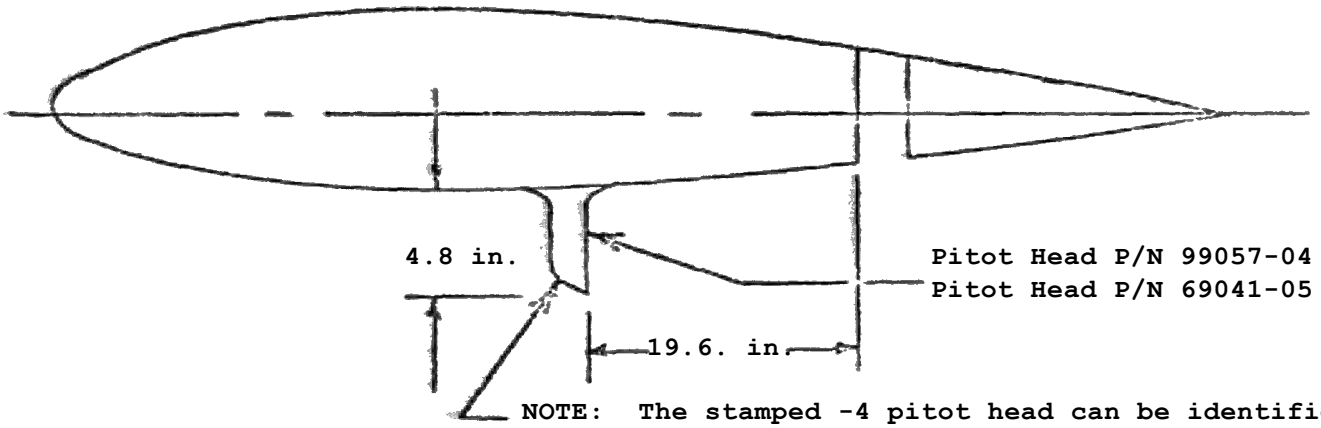
Piper	Constructor's	Registration
PA28-180	Serial No. 28-5227	Marks G-AZYF

PRESSURE HEAD PART NO.99057-04 (UNHEATED)
PRESSURE HEAD PART NO.69041-05 (HEATED)

The information in this Change Sheet supersedes the information on page 27 of the Flight Manual when a pitot or pressure head part no. 99057-04 or part no. 6 9041-05 is fitted to the aeroplane.

The position error corrections to be applied to the I.A.S. to obtain E.A.S. are shown in Figure V-3. Corrections are based on a weight of 2400 lb and the variation of the correction at other weights is small and may be ignored.

The static error correction applicable to the altimeter is less than 50 feet in all conditions.



NOTE: The stamped -4 pitot head can be identified by the 0.56 inch radius leading edge.

Left Wing, Station 107.4
The pitot head is parallel to centerline of airplane.
A static vent is located in the bottom of the pitot head.

To be inserted in Flight Manual VB-545 to face page 27 when Piper revision no.3 is embodied.

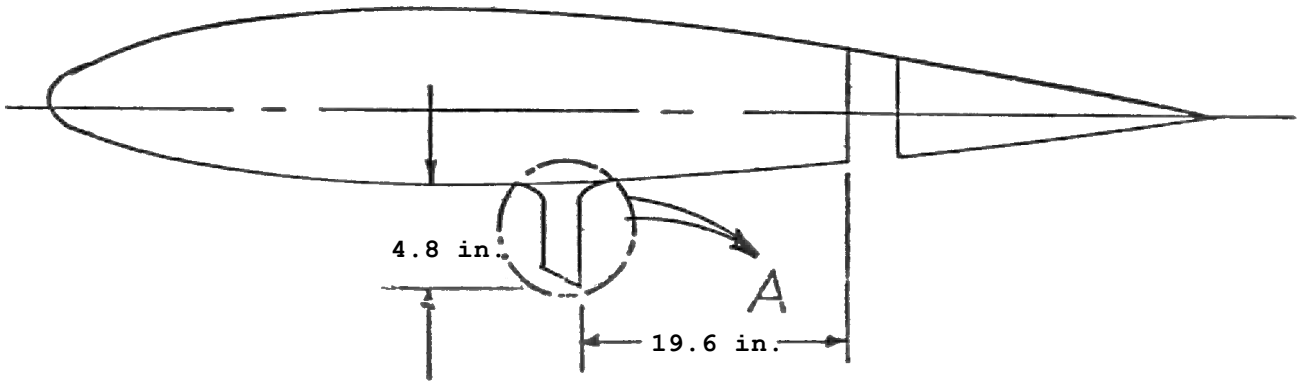
POSITION ERROR CORRECTIONS

The position error corrections to be applied to the I.A.S. to obtain E.A.S. are shown in Figure V-3. Corrections are based on a weight of 2400 lb. and the variation of the correction at other weights is small.

The static error correction applicable to the altimeter is less than 50 feet in all conditions.

Rev. 3

Rev. 1



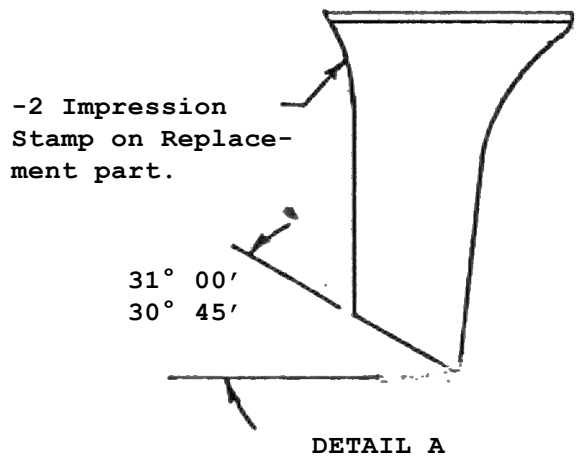
Rev. 2

Left Wing, Station 107.4

The pitot head is parallel to centerline of airplane.

A static vent is located in the bottom of the pitot head.

Rev. 3



DETAIL A

NOTE: If other than -2 mast is installed contact Piper Aircraft for proper AFM.

Rev. 1

FIGURE V-3
POSITION ERROR
CORRECTION TO INDICATED AIRSPEED
PITOT HEAD P/N 99057-4

NOTE: If original pitot-static mast is replaced, contact Piper Aircraft for applicable Airplane Flight Manual.

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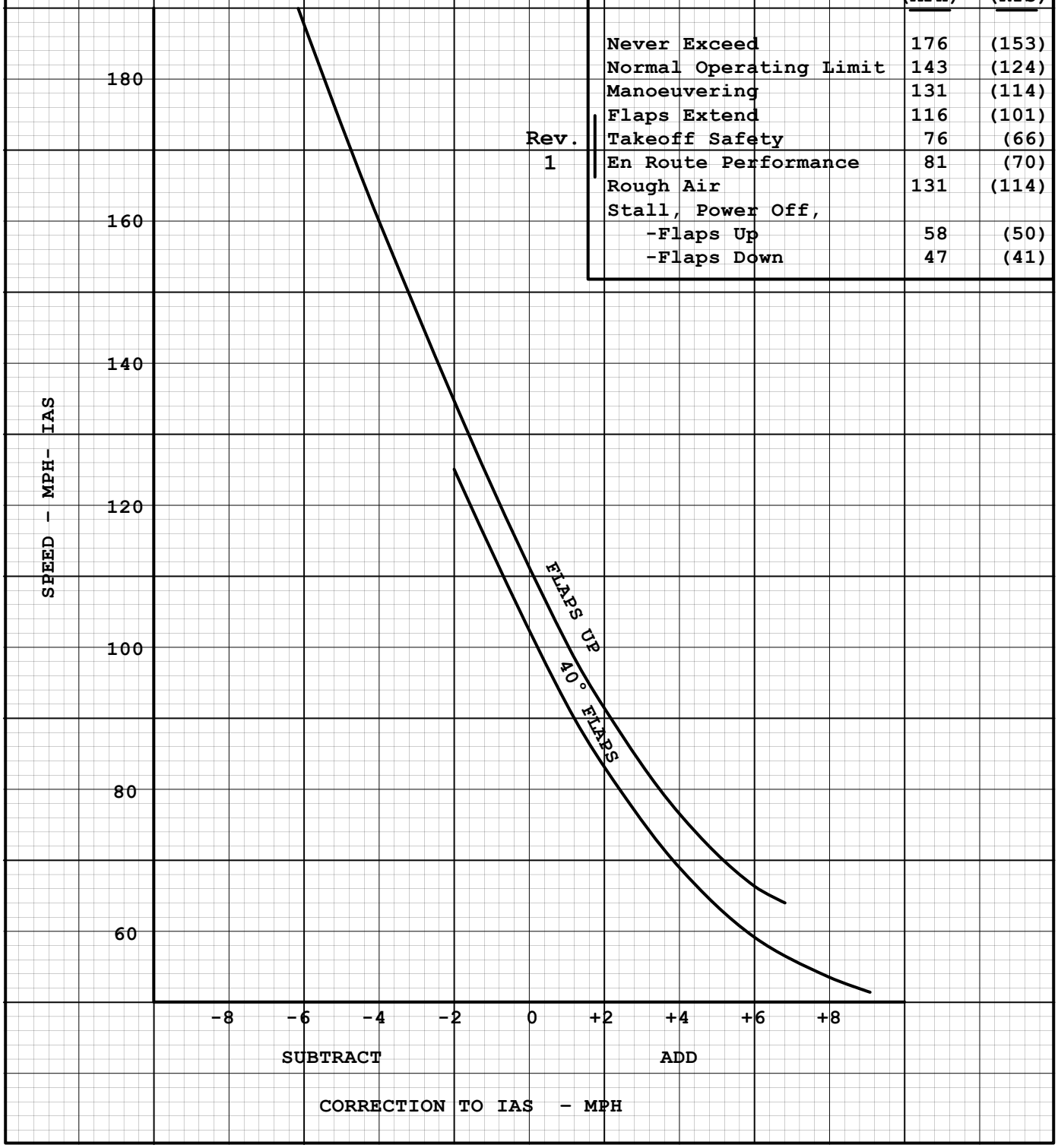
AIRSPEED LIMITATIONS

	IAS (MPH)	IAS (KTS)
Never Exceed	176	(153)
Normal Operating Limit	143	(124)
Manoeuvering	131	(114)
Flaps Extend	116	(101)
Takeoff Safety	76	(66)
En Route Performance	81	(70)
Rough Air	131	(114)
Stall, Power Off,		
-Flaps Up	58	(50)
-Flaps Down	47	(41)



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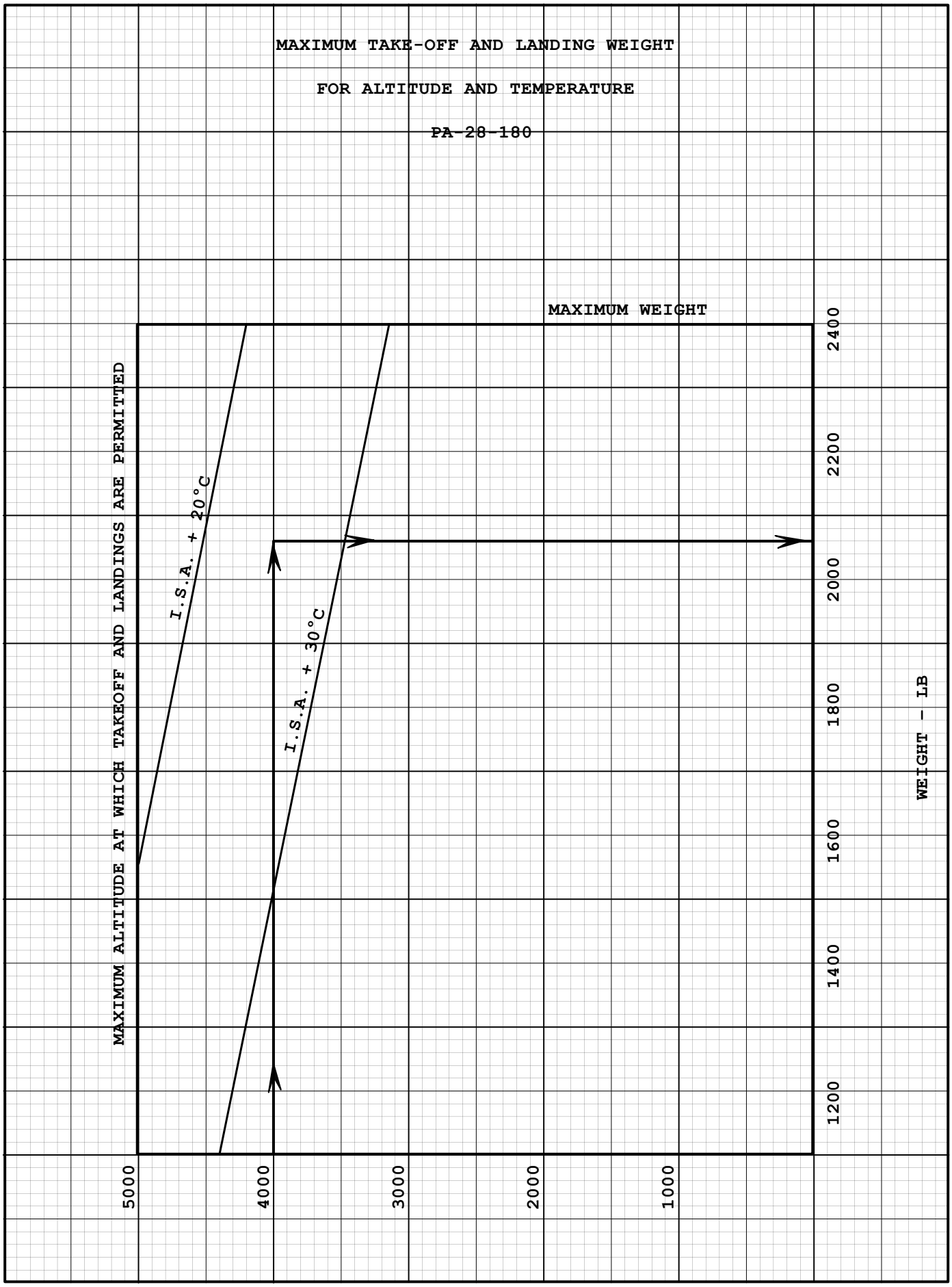
MAXIMUM TAKE-OFF AND LANDING WEIGHT FOR ALTITUDE AND TEMPERATURE

The maximum permissible take-off and landing weight for varying altitudes and temperatures is shown in Figure V-4.

The example given by the arrowed dashed line shows that for an aerodrome at an altitude of 4000 feet at 32°C (I.S.A + 25°C) the maximum permissible take-off weight is 2060 lb.

NOTE:

At a particular aerodrome the actual weight may have to be limited by other operational considerations (such as take-off distance) becoming critical.


MAXIMUM TAKE-OFF AND LANDING WEIGHT
FOR ALTITUDE AND TEMPERATURE
PA-28-180
MAXIMUM WEIGHT
I.S.A. + 20°C
I.S.A. + 30°C
MAXIMUM ALTITUDE AT WHICH TAKEOFF AND LANDINGS ARE PERMITTED
5000
4000
3000
2000
1000
2400
2200
2000
1800
1600
1400
1200
WEIGHT - LB
AERODROME ALTITUDE - FEET

TAKE-OFF RUN AND TAKE-OFF DISTANCE REQUIRED

The take-off distance required from rest to the 50 ft. height point is shown in Figure V-5 for varying air temperatures, aerodrome altitudes, weights, reported wind components, and uniform runway slopes.

ASSOCIATED CONDITIONS:

Engine — Full throttle

Wing Flaps — Retracted

Technique — Lift-off should be initiated at the take-off safety speed of 76 MPH I.A.S. (66 knots). This speed should be maintained until all obstacles have been cleared.

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Runway — Dry Tarmac runway (See Note 2).

The example given by the arrowed dashed line shows that with an air temperature of 25°C (I.S.A. + 11°C) at an aerodrome altitude of 500 ft., and a weight of 1800 lb., with a reported headwind component of 10 knots and a uniform uphill runway slope of 1%, the take-off distance required is 1700 feet.

NOTES:

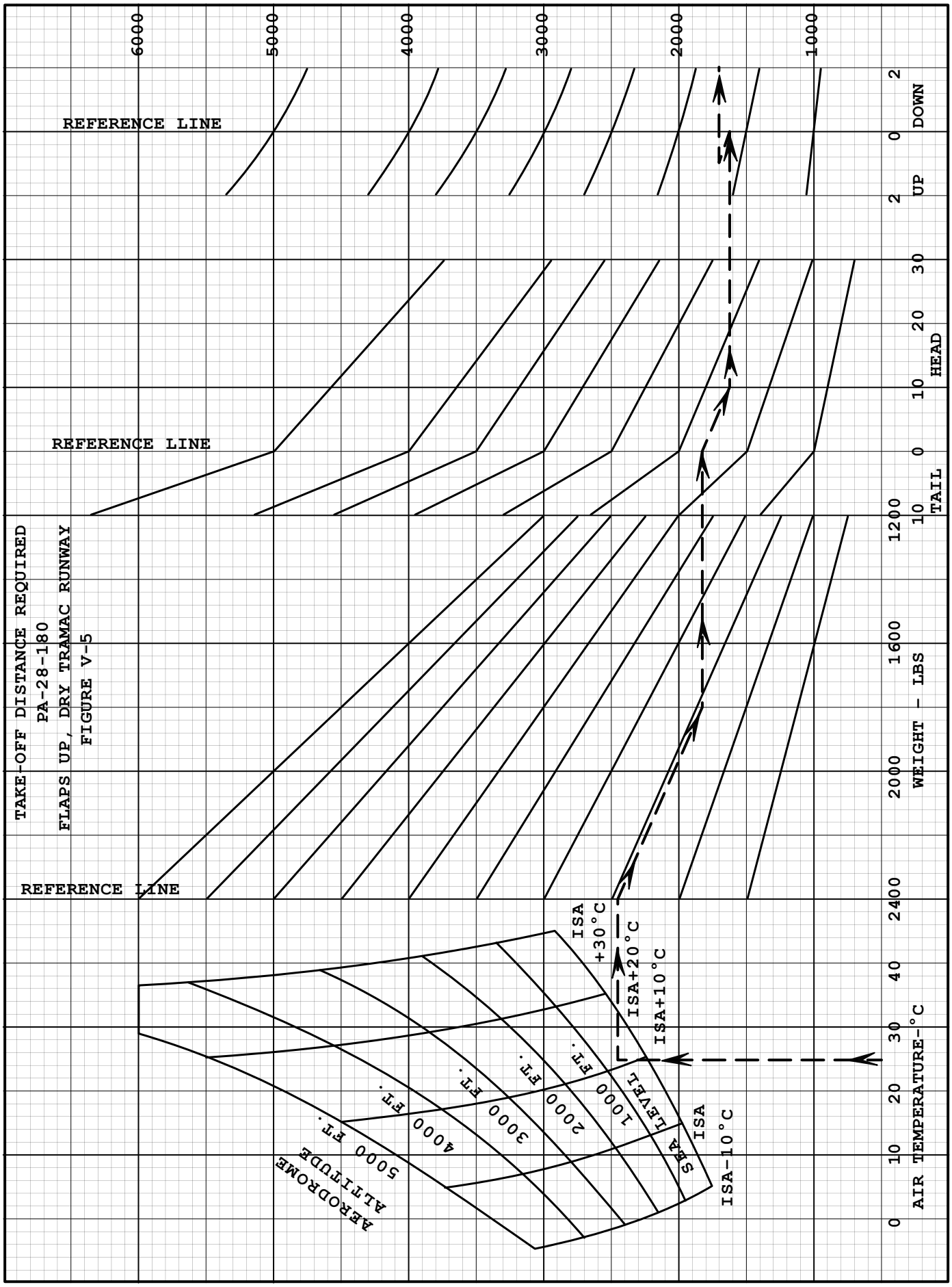
(1) The take-off run will not exceed, and must be taken as, 64% of the take-off distance required.

The measured take-off distance has been factored by 1.25, to obtain the scheduled take-off distance required, and the measured take-off run by 1.15.

(2) For operation from a short, dry grass runway, the distances for a dry tarmac runway should be increased by 6.5%

(3) The wind correction grids are factored so that 50% of headwinds and 150% of tailwinds areobtained. Reported winds may therfore be used directly in the grids.

TAKE-OFF DISTANCE - FEET



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NET TAKE-OFF FLIGHT PATH

NET GRADIENT OF CLIMB:

The net gradient of climb between 50 ft. height and 1000 ft. height is shown in Figure V-6 for varying air temperatures, aerodrome altitudes, weights, and reported wind components.

ASSOCIATED CONDITIONS:

Engine	Full throttle
Wing Flaps	Retracted
Airspeed	76 MPH I.A.S. (66 knots)

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The example given by the arrowed dashed lines shows that with an air temperature of 21°C (I.S.A. + 10°c) at an aerodrome altitude of 2000 ft. and a weight of 1800 lb. with a reported headwind component of 15 knots the net gradient of climb is 7.3%.

NOTES:

(1) The data given in Figure V-5 has been derived from gross performance reduced by a margin of 2.0% gradient.

(2) The wind correction grids are factored so that 50% of head-winds and 150% of tailwinds are obtained. Reported winds may therefore be used directly in the grids.

RADIUS OF A STEADY TURN:

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The radius of a steady "Rate One" turn (180°/minute) may be taken as 2510 ft. (for the maximum ambient conditions of 5000 ft. and I.S.A. + 30°c).

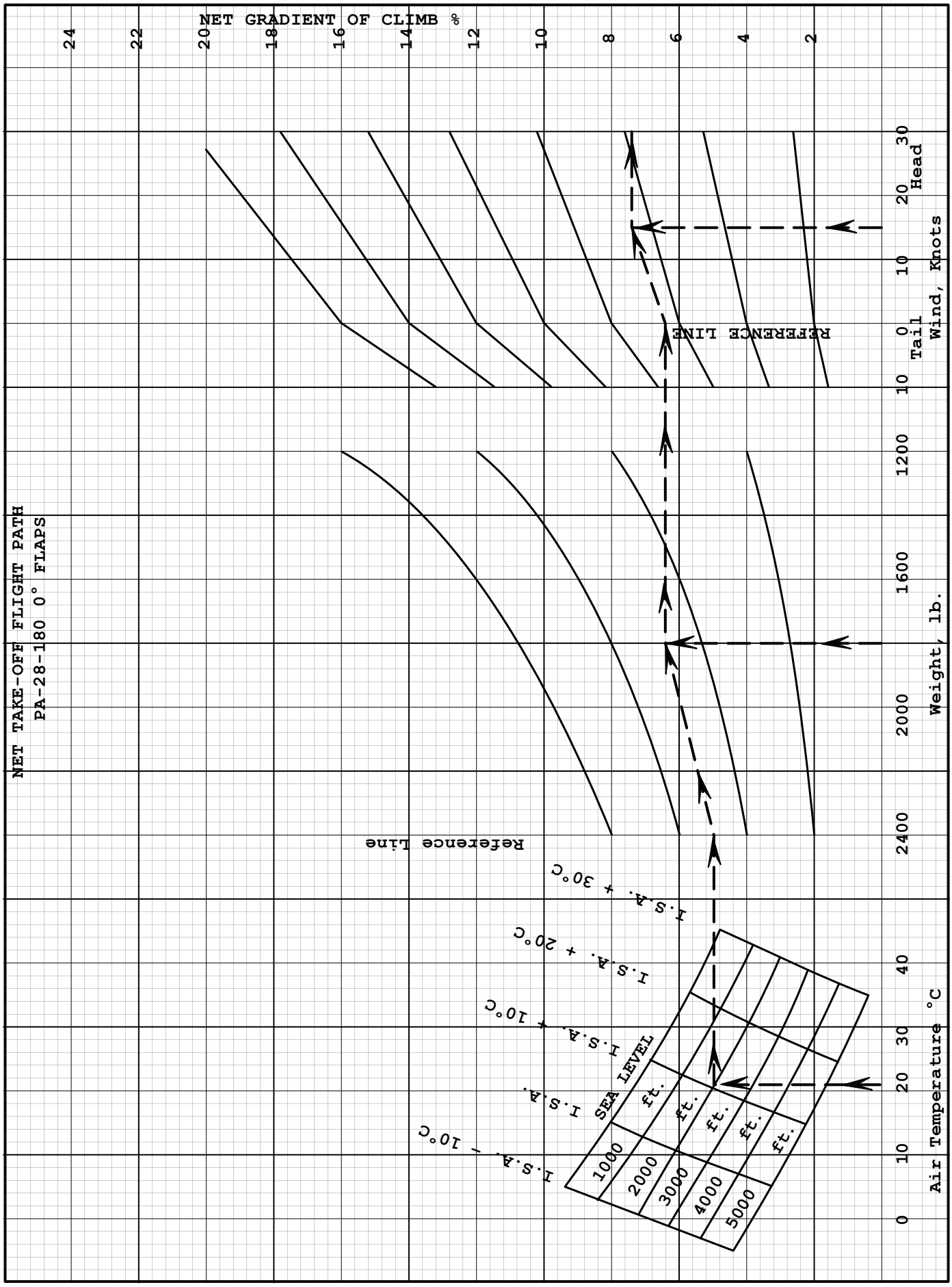


FIGURE V-6
NET TAKE-OFF FLIGHT PATH
PA-28-180 0° FLAPS

EN ROUTE PERFORMANCE

EN ROUTE PERFORMANCE CEILING AND GROSS RATE OF CLIMB

The performance ceiling may be obtained from Figure V-7 for varying weights, altitudes, and air temperatures. The chart may also be used to determine the gross pressure rates of climb.

ASSOCIATED CONDITIONS:

Engine	Full throttle
King Flaps	Retracted
Air Speed	81 MPH I.A.S. 70 knots)

The example A given by the arrowed dash lines shows that for a weight of 1700 lb. in an atmosphere of I.S.A. + 10°C the performance ceiling is 10,800 feet.

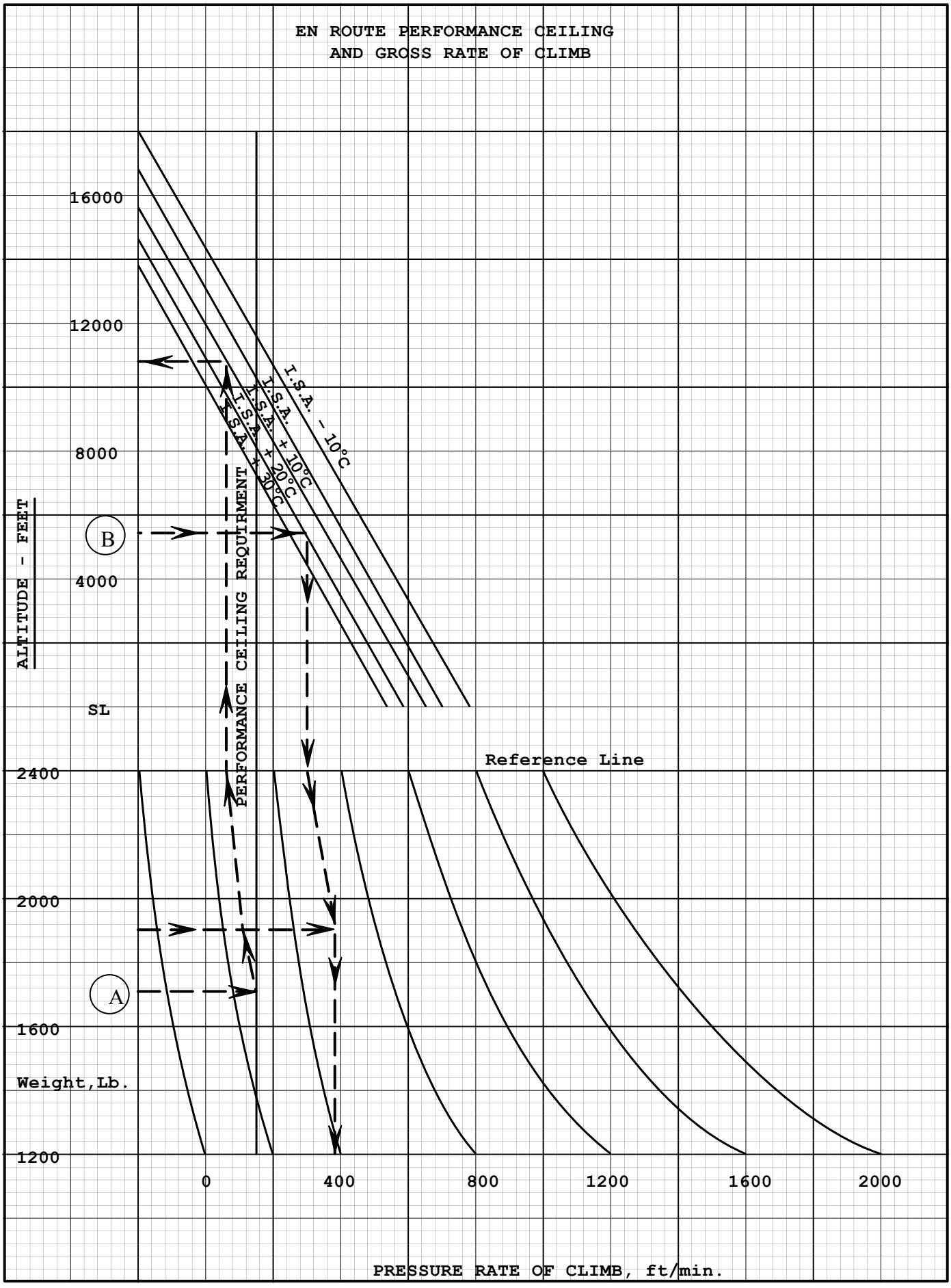
The example B shows that at an altitude of 5400 feet in an atmosphere of I.S.A. + 20°C at a weight of 1900 lb., the gross pressure rate of climb is 380 ft./min.

NOTE:

The performance ceiling is the maximum altitude which may be assumed when establishing compliance with the operating regulations dealing with en route flight. It does not prohibit flying at a higher altitude (although at some altitudes the operating regulations may require oxygen to be carried) but it is unlikely that the performance ceiling will be achieved unless full throttle and the air speed quoted are used towards the end of the climb.

GLIDE:

With the engine inoperative and flaps fully retracted and 81 MPH I.A.S. (70 knots), the aeroplane has a net glide of 1.66 nautical miles per 1,000 feet of altitude loss, or a loss of 602 feet per nautical mile traveled. This net glide is 1% gradient steeper than the gross glide.


EN ROUTE PERFORMANCE CEILING
AND GROSS RATE OF CLIMB
16000
12000
8000
4000
SL
2400
2000
1600
1200
ALTITUDE - FEET
Weight,Lb.
I.S.A. - 10°C.
I.S.A.
I.S.A. + 10°C.
I.S.A. + 20°C.
I.S.A. + 30°C.
PERFORMANCE CEILING REQUIRMENT
Reference Line
B
A
0
400
800
1200
1600
2000
PRESSURE RATE OF CLIMB, ft/min.

LANDING DISTANCE REQUIRED

The landing distance required is shown in Figure v-8 for varying air temperatures, aerodrome altitudes, weights, forecast wine components and uniform runway slopes.

ASSOCIATED CONDITIONS:

Engine	Idling
Wing Flaps	40°(fully extended)
Technique	Approach speed 1.3 VSO. This is 63 knots I.A.S. (72 MPH) at 2400 lb. decreasing linearly to 52 knots I.A.S. (60 MPH) at 1800 lb. Maximum wheel braking is applied immediately after touchdown.
Runway	Dry Tarmac runway

The example given by the arrowed dotted lines shows that at an altitude of 500 feet at a temperature of 20°C (I.S.A. + 6°C) at a weight of 1800 lb. with a forecast headwind component of 10 knots and with a uphill runway slope of 1.0% the landing distance required is 1190 feet.

NOTE:

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(1) The landing distance required includes the Air Navigation (General) Regulation field length factor 100/70. This means that distances obtained from Figure V-8 may be equated directly to the landing distance available.

(2) For operations from dry grass runways with freshly cut grass and firm subsoil, the distances for a dry tarmac should be increased by 8%.

(3) The wind grids are factored so that 50% of headwinds and 150% of tailwinds are obtained. Reported winds may therefore be used directly in the grids.

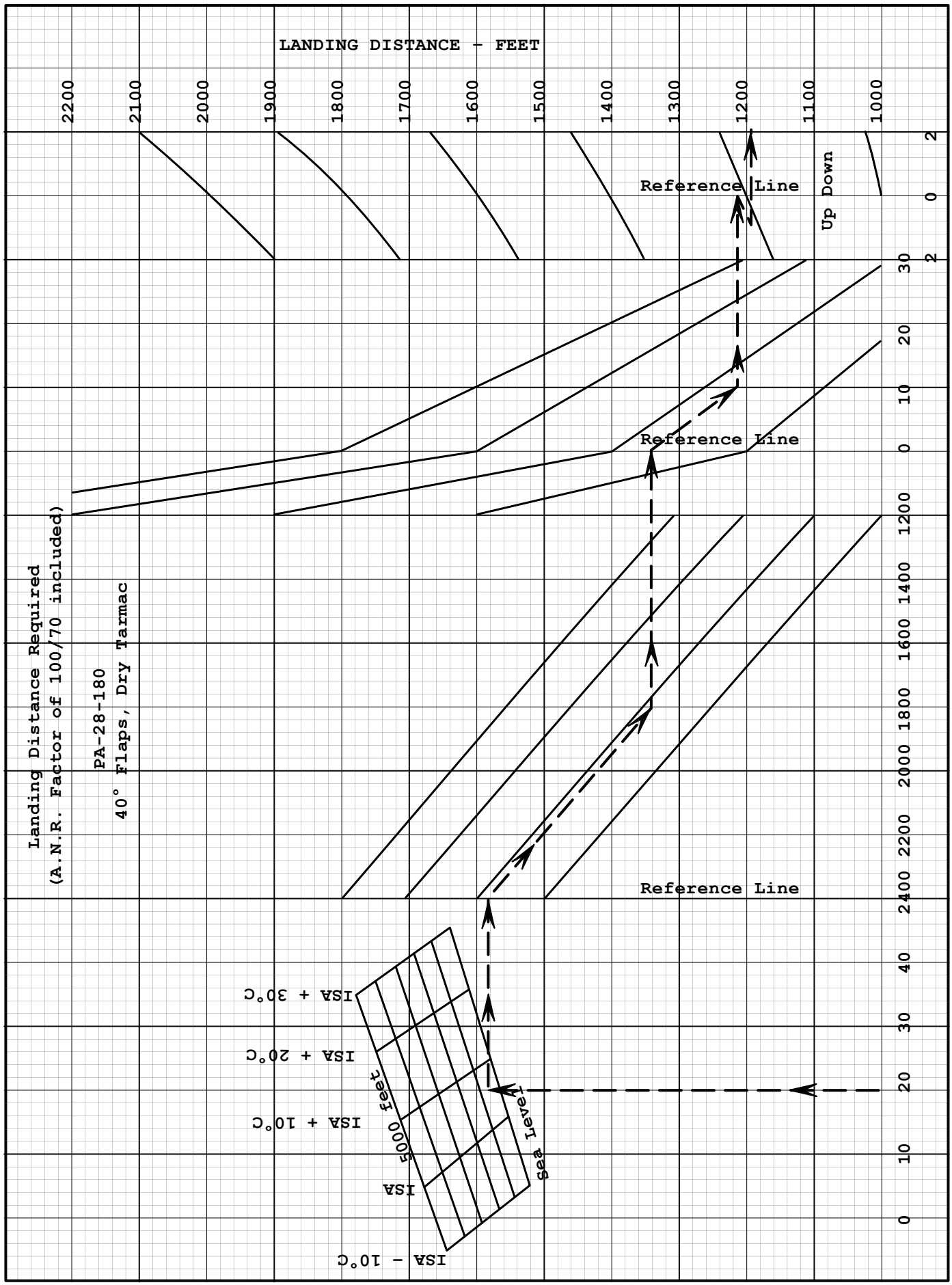
LANDING DISTANCE – FEET
2200
2100
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
Reference Line
Up Down
2 0 2
Runway Slope %
Head
Tail
Wind, knots
30 20 10 0 10
Reference Line
1200 1400 1600 1800 2000 2200 2400
Weight, Lb.
Reference Line
ISA + 30°C
ISA + 20°C
ISA + 10°C
ISA
ISA – 10°C
5000 feet
Sea Level
0 10 20 30 40
Air Temperature °C
Landing Distance Required
(A.N.R. Factor of 100/70 included)
PA-28-180
40° Flaps, Dry Tarmac

FIGURE V-8

S E C T I O N V I

WEIGHT AND LOADING DATA

The weight and centre of gravity schedule shall be inserted to follow this page.

This section is not subject to the approval of the Civil Aviation Authority.

S E C T I O N V I I

SUPPLEMENTS

INTRODUCTION:

This section contains supplements covering items affected by installations designed by the manufacturer of the aeroplane or by other organizations, but which do not normally form part of the basic specification of the aeroplane.