PITTS AVIATION ENTERPRISES, INC.

AIRPLANE FLIGHT MANUAL

MODEL S-2A AIRPLANE

Pitts S-2A

FAA APPROVED: John F. Vogel

CHIEF, ENGINEERING AND
MANUFACTURING BRANCH,
SOUTHERN REGION,
FEDERAL AVIATION AGENCY

DATE: 11, June, 1971

LOG OF REVISIONS

REVISION LETTER	PAGES AFFECTED	DESCRIPTION OF CHANGE	APPROVAL AND DATE
A	8 of 9	add radio opt.	John F. Vogel Chief, Engineering and Manufacturing Branch Southern Region, FAA Date 1 December 1971
B	i, 1 of 9	Alternate equip. noted	Acting Chief Engineering and Manufacturing Branch Southern Region, FAA Date: April 3, 1974
C	i, 2 of 9	correct oil temp limits	John F. Vogel Chief, Engineering and Manufacturing Branch Southern Region, FAA Date: December 9, 1975
D	i, 1 of 9	Engine designation change	Acting Chief, Engineering and Manufacturing Branch Southern Region, FAA Date: October 29,1976
E	i, 2 of 9, 9 of 9	adds placard for RPM Limitations	Acting Chief, Eng. and Mfg. Branch Rocky Mountain Region, FAA August 31, 1978
F	i, 1 of 9	Engine designation change	Acting Chief, Eng. and Mfg. Branch Rocky Mountain Region, FAA November 29, 1979
G	i, 1 of 9, 2 of 9	adds information for normal operating power	Acting Chief, Eng. and Mfg. Branch Rocky Mountain Region, FAA January 20, 1980
H	i, 9 of 9	adds additional spin placard	Acting Chief, Eng. and Mfg. Branch Rocky Mountain Region, FAA October 25, 1980

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SECTION I OPERATING LIMITATIONS

A. Airspeeds:

	CAS
Normal operating range (green arc) from stall speed:	58 MPH 50 Knots
To maximum normal operating speed:	154 MPH 134 Knots
Caution range (yellow arc) from maximum normal operating speed:	154 MPH 134 Knots
To never exceed speed:	203 MPH 176 Knots
Never exceed speed (red radial)	203 MPH 176 Knots

FOR ACROBATIC MANEUVER ENTRY SPEEDS SEE PLACARDS SECTION

B. Powerplant Limits:

For Lycoming IO-360-A1A engine as modified by STC No. SE469SO and Hartzell HC-C2YK-4/C7666A-2, or HC-C2YK-4AF/FC7666A-2 propeller. Propeller min. diameter is 72 in. Propeller max. diameter is 74 in.
or
For Lycoming AEIO-360-A1A engine or AEIO-360-A1E and Hartzell HC-C2YK-4AF/FC7666A-2 propeller. Propeller min. diameter is 72 in. Propeller max. diameter is 74.

Propeller Pitch Settings: (Measured at 30 in. sta.)	High Pitch:	$24^{o} + \frac{1}{2}^{o}$
	Low Pitch:	$13\frac{1}{2}^{o}$
Engine Rated Power:		200 HP at 2700 RPM
Normal Operating Power:		150 HP at 2400 RPM
Minimum Fuel Grade:		100 Octane
Oil Pressure:		
Minimum (red radial)		25 PSI
Caution Range (yellow arc)	from	25 PSI
	to	60 PSI
Normal Range (green arc)	from	60 PSI
	to	90 PSI

F.A.A. APPROVED: June 11, 1971
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SECTION I OPERATING LIMITATIONS

B. Powerplant Limits (cont'd)

Oil Pressure (cont'd)

Caution range (yellow arc)	from	90 PSI
	to	100 PSI
Maximum (red radial)		100 PSI

Oil Temperature:

Maximum (red radial)		245 Deg. F 118 Deg. C
Normal range (green arc)	from	100 Deg. F 38 Deg. C
	to	245 Deg. F 118 Deg. C

Fuel Pressure:

Minimum		0 PSI
Normal range (green arc)	from	0 PSI
	to	12 PSI
Maximum (red radial)		12 PSI

Tachometer:

Recommended idle		650 RPM
Normal range (green arcs)	from	500 RPM
	to	2000 RPM
and	from	2350 RPM
	to	2400 RPM
Avoid continuous operation (red arc)	from	2000 RPM
	to	2350 RPM

Avoid continuous operation (red arc) above 2600 RPM in aerobatic flight

Do not exceed (red radial) 2700 RPM

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SECTION I OPERATING LIMITATIONS

C. Weights

Maximum gross weight (Acrobatic category)		1500 LBS.
Maximum gross weight (Normal category)		1575 LBS.
Design empty weight, dry, no fuel, no oil		1007 LBS.
Design empty weight dry center of gravity is at fuselage station:	FS	87.89

NOTE: Reference station, FS 0.00 is located 97.81 inches forward of leading edge of lower wing.

Maximum oil	2 U.S. gals.	15 LBS.
Fuel tank capacity	24 U.S. gals.	144 LBS.
Crew of two plus parachutes		(ACTUAL WT.)
Baggage, maximum		20 LBS.
Design useful load (Acrobatic category)		493 LBS.
Design useful load (Normal category)		568 LBS.

NOTE: NO ACROBATIC MANEUVERS WITH BAGGAGE.

Usable fuel, normal flight	23 U.S. gals.	138 LBS.

(See Section V, "Weight and Balance", Model S-2A Airplane, for allowable weight and center of gravity combinations and detail loading instructions.)

Weight and Center of Gravity Limits: (Acrobatic category)

Most forward limit:
FS 92.35 (16.3% mac) at 1350 lbs. or less;

Most forward at maximum gross weight:
FS 95.58 (24.7% mac) at 1500 lbs.;

Most rearward at maximum gross weight:
FS 96.50 (27.0% mac) at 1500 lbs.;

Most rearward limit:
FS 97.12 (28.7%) at 1440 lbs. or less; with straight line variation between points given.

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SECTION I OPERATING LIMITATIONS

C. Weights (cont'd)

Weight and Center of Gravity Limits: (Normal category)

Most forward limit:
FS 92.35 (16.3% mac) at 1350 lbs. or less;

Most forward at maximum gross weight:
FS 94.5 (21.8% mac) at 1575 lbs.;

Most rearward at maximum gross weight:
FS 96.13 (24.4% mac) at 1575 lbs.;

Most rearward:
FS 97.50 (29.6% mac) at 1472 lbs. or less; with straight line variation between points given.

D. Flight Load Factors: (Acrobatic category)

Positive flight, limit	+ 6.0 G.
Negative flight, limit	— 3.0 G.

Maneuvers and entry speeds:
See Section IV, "Placards".

E. Flight Load Factors: (Normal category)

Positive flight, limit	+ 3.80 G.
Negative flight, limit	— 1.52 G.

F. Flight Limitations:

This airplane must be operated as a day VFR airplane only. Flight into known icing conditions is prohibited.

G. Usable Fuel:

Of the 24 U.S. gallon fuel tank capacity, 23 gallons are usable during all normal flight conditions. Unusable fuel, normal flight: 1 U.S. Gal.

NOTE: Do not perform low altitude acrobatics with less than 1/4 tank of fuel on board.

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SECTION II OPERATING PROCEDURES

A. NORMAL PROCEDURES

a. Starting Engine

1. Alternate Air:	OFF
2. Propeller governor control:	HIGH RPM
3. Fuel Selector:	ON
4. Throttle:	OPEN 1/4 FULL
5. Mixture:	FULL RICH
6. Boost Pump:	ON,
until positive fuel pressure is noted, then:	OFF
7. Mixture:	IDLE CUT-OFF
8. Crank Engine with Starter	
9. When Engine fires, move mixture control slowly and smoothly to:	FULL RICH

b. Ground Running and Warm-Up:

To prevent overheating, follow these procedures:

1. Head airplane into wind	
2. Mixture	FULL RICH
3. Propeller governor control	HIGH RPM
4. Warm up at approx.	1000-1200 RPM
Avoid prolonged idling and do not exceed	2200 RPM

NOTE: Hot idle oil press. 25 PSI min.

c. Take-Off:

1. Warm-up as above	
2. Oil pressure:	GREEN ARC
3. Oil temperature:	GREEN ARC
4. Mixture control:	FULL RICH
5. Elevator trim:	NEUTRAL
6. Flight controls:	FREE
7. Set throttle to 1700 RPM and move propeller governor control through full range and return to:	HIGH RPM
8. Magneto check: with propeller set at high RPM, set throttle to produce:	2200 RPM

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SECTION II OPERATING PROCEDURES

A. NORMAL PROCEDURES (cont'd)

c. Take-Off: (cont'd)

9. Switch magnetos from both to one and note drop-off, return to both until engine regains speed and switch to other magneto and note drop-off, then return to both.

Normal drop-off is:	100 RPM
Maximum drop-off is:	175 RPM
Difference in drop-off between Magnetos is:	50 RPM

10. Throttle: FULL OPEN

d. Landing:

1. Mixture control: FULL RICH
2. Propeller control: HIGH RPM

e. Engine Shut-Down:

1. Throttle: CLOSED
2. Mixture control: IDLE CUT-OFF
3. Master switch: OFF
4. Ignition switch: OFF

B. EMERGENCY PROCEDURES

a. In-Flight Engine Restart:

1. Pull mixture control to: IDLE CUT-OFF
2. Establish glide at: 100 MPH IAS
3. Fuel selector: ON
4. Master switch: ON
5. Throttle: OPEN 1/4 FULL
6. Engage starter to start propeller windmilling, if it is not turning.
7. Advance mixture control to: FULL RICH

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SECTION II OPERATING PROCEDURES

B. EMERGENCY PROCEDURES (cont'd)

b. Freezing of Pitot-Static Head:

In the event of icing of the static orifices on the pitot-static head, an alternate source of static pressure is provided.

To open the alternate static air pressure source, turn the indicated valve on the left-hand side of the rear instrument panel counter-clockwise to full open.

c. Best Glide Speed, Engine-out, is: 97 MPH IAS

d. NOTE: Stall warning inoperative with master switch off.

SECTION III PERFORMANCE INFORMATION

A. Altitude loss during power-off stalls: 200 FT.

B. Power-off stalling speed versus bank-angle, at 1575 lbs. gross weight and forward gross C.G.:
Normal Category.

BANK ANGLE	STALLING SPEED
0°	61 MPH CAS
30°	66 MPH CAS
45°	73 MPH CAS
60°	86 MPH CAS

Power-off stalling speed versus bank-angle, at 1500 lbs. gross weight and forward gross C.G.:
Acrobatic Category.

BANK ANGLE	STALLING SPEED
0°	58 MPH CAS
30°	62 MPH CAS
45°	69 MPH CAS
60°	82 MPH CAS

C. Demonstrated flight-time, inverted is: 3 minutes

D. Demonstrated cross-wind velocity is: 20 MPH

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SECTION IV PLACARDS

The following placards are installed in the airplane:

1. Adjacent to fuel selector valve handle in both cockpits:
   "Fuel Select"
   "23 gals. usable"
   "ON" ; "OFF"

2. Adjacent to airspeed indicator: "Design maneuver speed 154 MPH": "Demonstrated crosswind velocity 20 MPH".

3. On inside of baggage compartment door: "No acrobatics with baggage", "Max. baggage 20 lbs."

4. Adjacent to fuel filler neck: "Fuel 100/130 Octane. 23 gals. usable".

5. On left hand side of rear instrument panel adjacent to alternate static source valve: "Open for alternate static  ".

6. On fairing stringer on L.H. side of rear cockpit adjacent to mixture control: "Pull for lean mixture".

7. On fairing stringer on R.H. side of rear cockpit adjacent to engine alternate inlet air control: "Pull for alternate air".

8. On elevator trim control quadrant: "Nose Up", "Neutral", "Nose Down".

9. On throttle quadrant: "Open", "Throttle", "Closed".

10. On both instrument panels: "No Smoking".

11. On front instrument panel: "Solo Rear Seat Only".

12. On junction box in rear panel adjacent to the appropriate switches:
    "Boost Pump Switch", "ON", "OFF".
    "Alternator Field Switch", "ON", "OFF".
    "Master Switch", "ON", "OFF".

13. On junction box in rear cockpit adjacent to appropriate circuit breakers:
    "Alternator",
    "Alternator Field",
    "Boost Pump",
    "Stall Warning",
    "Radio", (if installed).

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SECTION IV PLACARDS (cont'd)

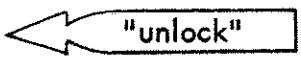
14. On left hand side of rear cockpit coaming in clear view of pilot:

This airplane must be operated as a normal or an acrobatic category airplane in compliance with the operating limitations stated in the form of placards markings and manuals. All markings and placards on this airplane apply to its operation as an Acrobatic Category Airplane. For Normal Category operations refer to the Approved Airplane Flight Manual. Operations limited to day VFR conditions. Flight into known icing conditions prohibited.

APPROVED MANEUVERS AND RECOMMENDED ENTRY SPEEDS:(MPH)

	INSIDE		OUTSIDE	
MANEUVER	MAX.	MIN.	MAX.	MIN.
LOOP (UP)	180	130	180	130
LOOP(DOWN)	100	70	100	70
SLOW ROLL	180	100	180	100
BARREL ROLL	180	130	180	130
SNAP ROLL	140	90	110	90
HAMMERHEAD	180	130	180	130
LAZY EIGHT	180	140	180	140
CHANDELLE	180	140	180	140
STALLS AND SPINS	(SLOW DECELERATION)			

For spin recovery put ailerons neutral, apply full opposite rudder briskly and then apply nose down elevator. Use power off for all spin recoveries.

15. Adjacent to propeller governor control, in both cockpits: "Push for High RPM", and 

16. "No acrobatic maneuvers (including spins) are approved for normal category operations". (Immediately aft of placard number 14.)

17. On right side of instrument panel adjacent to tachometer "Avoid continuous operation between 2000 and 2350 RPM. Above 2600 RPM in aerobatic flight."

18. "For flat spins use aileron with the spin for recovery" (Immediately aft of placard number 14 and below placard 16.)

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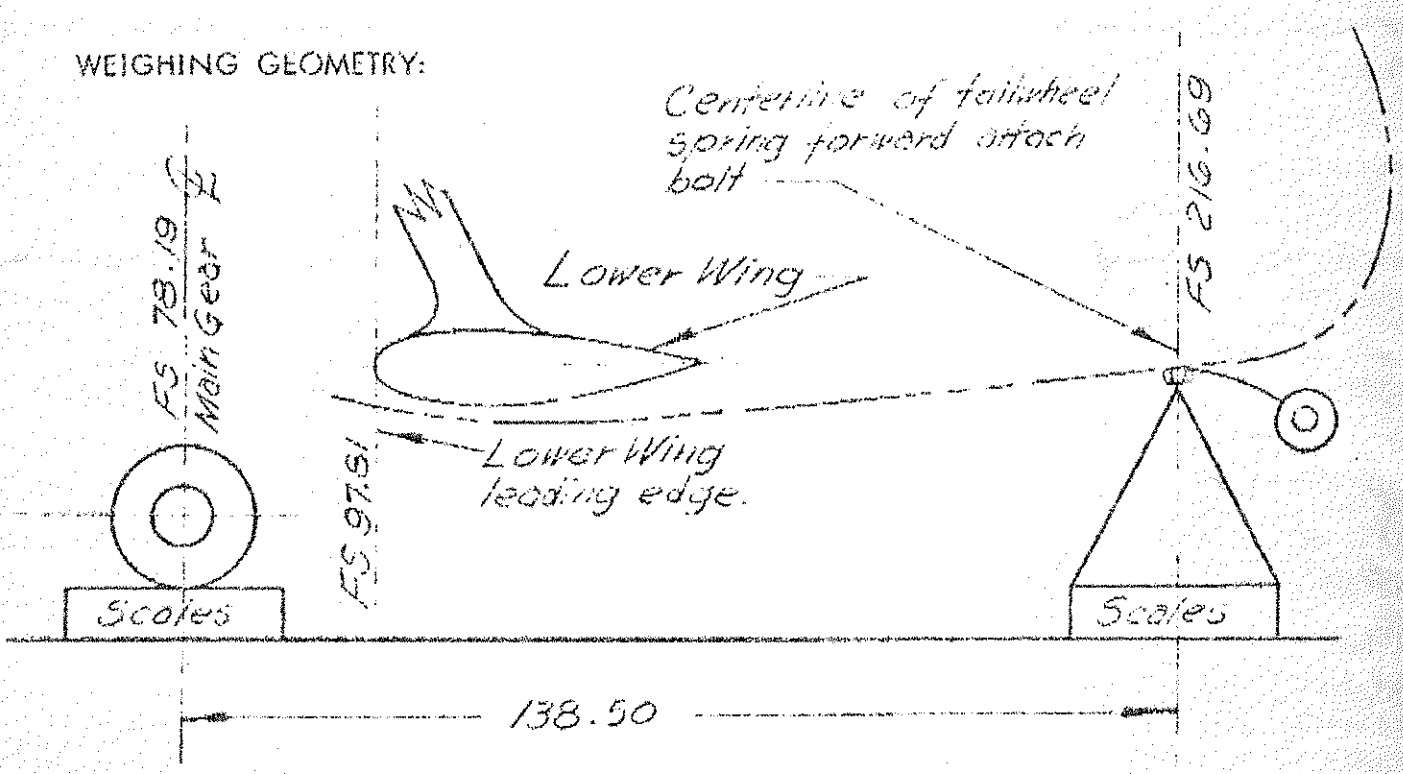
SECTION V WEIGHT AND BALANCE

Airplane Serial Number: 2243

WEIGHING GEOMETRY:



Datum is 97.81 inches forward of lower wing leading edge.

Weighing performed with airplane level.

Level airplane on upper longerons at rear cockpit.

A. Empty Weight As Weighed:

SCALE	READING	TARE	NET
Left Main	481.0 lb.	- .5 lb.	480.5 lb.
Right Main	489.5 lb.	- .5 lb.	489.0 lb.
Tail	103.5 lb.	- 34.0 lb.	69.5 lb.
	Empty weight as weighed is total		1039.0 lb.

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SECTION V WEIGHT AND BALANCE

Airplane Serial Number: 2248

A. Empty Weight As Weighed (cont'd)

$\bar{X}$ C.G. As Weighed:

$\bar{x}$ c.g. = $\frac{\text{(left main net + right main net) } 78.19 + \text{(tail net) } 216.69;}{\text{total net}}$

$\bar{x}$ c.g. = $\frac{(480.5 + 489)\ 78.19 + (\quad 69.5 \quad)\ 216.69;}{(\quad 1039.0 \quad)}$

$\bar{x}$ c.g. = (90865) / (1039.0);

$\bar{x}$ c.g. = 87.45 inches aft of datum, as weighed.

Standard Zero-Fuel Weight And Moment:

As-weighed weight, net, (page 3) = 1039.0 lb.

As-weighed moment = (as-weighed weight) ($\bar{x}$ c.g.)
= (1039.0) (87.45)
= 90865 in-lb.

The as-weighed weight and moment above includes the following items:

1. Radio (optional): YES [X] NO [ ]

Weight, lb.	Arm, in.	Moment, in-lb.
7.0	120.00	840

2. Engine oil:

Weight, lb.	Arm, in.	Moment, in-lb.
(0 gal.) ( )	54.81	( )

NOTE: Full oil is as follows:

2 gal. 15 lb.	54.81	822 in-lb.

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SECTION V WEIGHT AND BALANCE

Airplane Serial Number: 2248

A. Standard Zero-Fuel Weight And Moment(cont'd)

3. Fuel:

Weight, lb.	Arm, in.	Moment, in-lb.
(0gal.) ( )	80.81	( )

The following zero-fuel weight is for Pitts Model S-2A Airplane Serial No. 2248, with two gallons of oil, zero fuel, (with) ~~(without)~~ radio, no pilots, no baggage:

	WEIGHT, LB.	MOMENT, IN-LB.
As-weighed	1039.0	90865
Oil Correction	15.0	822
Fuel Correction		
Other Correction (1) Ballast	1.5	333
Standard, Zero-fuel	1055.5	92020

(1) : Other Correction:
Ballast installed at FS. 221.69 to put aircraft at Allowable empty weight Center of Gravity.

Equipped Weight Empty:

The equipped weight empty of the airplane is the standard zero-fuel weight of the above, plus one gallon, (six lbs.) of normal unusable fuel, and includes 8 quarts oil.

	WEIGHT, LB.	MOMENT, IN-LB.
Standard Zero-Fuel	(1055.5)	(92020)
Normal Unusable Fuel	6.0	485
Equipped Weight Empty	1061.5	92505

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SECTION V WEIGHT AND BALANCE

Airplane Serial Number: 2248

A. Allowable Weight and Center of Gravity:

The allowable weight and center of gravity envelope to which the Model S-2A is FAA Type Certificated in the ACROBATIC CATEGORY is defined by the following points:

	Weight, Lb.	Arm, F.S.	Moment	% MAC
At Most Forward C.G.:	1350	92.35	124673	16.3
At Most Forward and Max. Gross C.G.:	1500	95.58	143370	24.7
At Most Rearward and Max. Gross C.G.:	1500	96.50	144750	27.0
At Most Rearward C.G.:	1440	97.12	139853	28.7

The allowable weight and center of gravity envelope to which the Model S-2A is FAA Type Certificated in the NORMAL CATEGORY is defined by the following points:

	Weight, Lb.	Arm, F.S.	Moment	% MAC
At Most Forward C.G.:	1350	92.35	124673	16.3
At Most Forward and Max. Gross C.G.:	1575	94.50	148838	21.8
At Most Rearward and Max. Gross C.G.:	1575	96.13	151405	26.1
At Most Rearward C.G.:	1472	97.50	143520	29.6

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SECTION V WEIGHT AND BALANCE

The following section of this manual has been provided for your convenience in determining the weight and center of gravity of the airplane for various loading configurations.

CAUTION

1. The envelope of Page 17 has been thoroughly investigated by Pitts Aviation, and by the Federal Aviation Agency, and the S-2A airplane has been found to comply with all flight and structural requirements of FAR 23, Acrobatic Category, within this envelope. Operation at weights or centers of gravity not within the envelope is legally prohibited, and may be dangerous.

2. Do not perform acrobatics with baggage.

3. Do not perform acrobatics with less than 1/4 tank of fuel on board.

For your convenience, several loading points for various configurations have been computed and plotted on the envelope of Page 17. These points are for example, and are based on an airplane dry empty weight of 1007 pounds, and a moment of 88505 in.-lb. which is typical; however, THE OWNER IS CAUTIONED TO BASE ACTUAL WEIGHT/C.G. CALCULATIONS FOR HIS AIRPLANE ON THE EQUIPPED WEIGHT EMPTY SHOWN AT THE BOTTOM OF PAGE 5.

TO DETERMINE YOUR WEIGHT AND C.G.:

1. Begin with the equipped weight empty of your airplane, shown at the bottom of Page 5. Record the weight and the moment.

2. From the plot on Page 16, (weight and moment due to pilots), locate the weights and moments corresponding to the actual weights of the pilots on board, including parachutes, if they are worn.

3. From the plot on Page 16, (weight and moment due to baggage), locate the weight and moment corresponding to the weight of baggage in the baggage compartment aft of the rear cockpit.

NOTE: No acrobatics with baggage.

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SECTION V WEIGHT AND BALANCE

TO DETERMINE YOUR WEIGHT AND C.G.: (cont'd)

4. Add these weight and moments as shown:

	WEIGHT, LB	MOMENT, IN-LB
Equipped Weight Empty	1061.5	92505
Forward Pilot		
Aft Pilot		
Baggage		
Total		

5. Locate the total weight and moment point found in step 4. on the plot of Page 17. This point on the weight/C.G. envelope represents the airplane and its contents with zero usable fuel. Note that this point must not lie aft of the rear C.G. limit of the envelope of Page 17 .

6. To the weight obtained in step 4. above, (zero usable fuel), add the weight of the maximum usable fuel: 23 gals. times 6 lb/gal., or 138 pounds. Draw a line through the zero usable fuel point of step 5. above, parallel to the fuel-burnoff lines of the weight/C.G. envelope, extending the line upward to the left, to the weight corresponding to airplane and contents plus maximum usable fuel. This point must also be within the design weight and C.G. envelope of Page 17 . The two points obtained in steps 5. and 6. above, represent the configuration of the airplane at take-off with full fuel and at landing with zero usable fuel.

The above procedure is illustrated by the examples shown here:

Example #1.

CONFIGURATION:
140 lb. pilot + 20 lb. parachute in aft seat; no baggage.

Step 1: From bottom of Page 5 of 17 , equipped weight empty = 1028 lbs., and the corresponding moment is 89812 in-lb.

Step 2: From plot of Page 16 of 17 , for pilot plus chute of 160 lbs. in aft seat, read moment = 21850 in-lb.

Step 3: Weight and moment from baggage: NONE.

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SECTION V WEIGHT AND BALANCE

TO DETERMINE YOUR WEIGHT AND C.G.: (cont'd)

Example # 1. (cont'd)

Step 4: Add the results of steps 1 thru 3:

	WEIGHT	MOMENT
Equipped, Empty	1028	89812
Pilot, Aft	160	21850
Baggage	0	0
Airplane and contents, zero usable fuel:	1188	111662

Step 5: Locate the point of step 4, (1188 lb. and 111662 in-lb.), on the chart of Page 17 of 17 . Note that it is within the design envelope at Fuselage Station 93.99. (this point is labeled 1-E.)

Step 6: Weight and moment from fuel: (from plot, Page 15 of 17 :

	WEIGHT	MOMENT
Fuel (23 gal)	138	11152
Plus (step 5)	1188	111662
Total, with full fuel:	1326	122814

Locate this point on the chart of Page 17 of 17 , and label it 1-F. Since this point, (at fuselage station 92.62), is within the design envelope, the airplane is satisfactorily loaded for this example.

Example #2.

CONFIGURATION:
220 lb. aft pilot + 20 lb. parachute in aft seat; no baggage.

Step 1. From bottom of Page 5 of 17, equipped weight empty equal 1028 lb. and the corresponding moment is 89812 in-lb.

Step 2. From plot of Page 16 of 17 , for pilot plus chute of 240 lb. in aft seat, read moment equals 32780 in-lb.

Step 3. Weight and moment from baggage: NONE

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SECTION V WEIGHT AND BALANCE

TO DETERMINE YOUR WEIGHT AND C.G.: (cont'd)

Example #2. (cont'd)

Step 4. Add the results of steps 1 thru 3:

	WEIGHT	MOMENT
Equipped, Empty	1028	89812
Pilot, Aft	240	32780
Baggage	0	0
Airplane and contents, zero usable fuel:	1268	122592

Step 5. Locate the point of step 4, (1268 lb. and 122592 in-lb), on the chart of Page 17 of 17 . (This point is labeled 2-E. Note that it is inside the design envelope at FS 96.68)

Step 6. Weight and moment from fuel: (from plot, Page 15 of 17).

	WEIGHT	MOMENT
Fuel (23 gal)	138	11152
Plus (step 5)	1268	122592
Total, with full fuel:	1406	133744

Locate this point on the chart of Page 17 of 17 , and label it 2-F. Note that it is within the design envelope.

Example #3.

CONFIGURATION:
180 lb. pilot plus 20 lb. parachute in aft seat; 140 lb. pilot plus 20 lb. parachute in front seat, no baggage.

Step 1. From bottom of Page 5 of 17 , equipped weight empty equals 1028 lb., and the corresponding moment is 89812 in-lb.

Step 2. From plot of Page 16 of 17 , for pilot plus chute of 200 lb. in aft seat read moment equals 17380 in-lb.

Step 3. Weight and moment from baggage: NONE

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SECTION V WEIGHT AND BALANCE

TO DETERMINE YOUR WEIGHT AND C.G.: (cont'd)

Example #3. (cont'd)

Step 4. Add the results of steps 1 thru 3:

	WEIGHT	MOMENT
Equipped, Empty	1028	89812
Fwd. Pilot	160	17380
Aft Pilot	200	27320
Baggage	0	0
Airplane and contents, zero usable fuel:	1388	134512

Step 5. Locate the point of step 4, (1388 lb and 134512 in-lb), on the chart of Page 17 of 17 . This point is labeled 3-E. Note that it is inside the design envelope.

Step 6. Weight and Moment from Fuel: (from plot, page 15 of 17).

	WEIGHT	MOMENT
Fuel (23 gal)	138	11152
Plus (step 5)	1388	134512
Total, with full fuel:	1526	145664

Locate this point on the chart of Page 17 of 17 , and label it 3-F. Note that it is outside the acrobatic design envelope.

Step 7. This step is necessary because if the airplane were loaded to maximum usable fuel it would be outside the acrobatic design envelope, at point 3-F. Locate point 3-N along the fuel burnoff line where it crosses the acrobatic forward C.G. limit. Note the total weight at 3-F is 1526 lbs., or 26 lbs. heavier than at 3-N, 1500 lbs. From the plot of Page 15 , read 26 lbs. of fuel equals 4.4 gallons, or 3/16 tank. You must therefore plan your flight so as to fly in Normal Category (no acrobatic maneuvers) until you have between 7/8 and 3/4 tank of fuel on board, after which you may operate in Acrobatic Category.

PITTS AVIATION ENTERPRISES, INC.
AIRPLANE FLIGHT MANUAL
MODEL S-2A AIRPLANE

SECTION V WEIGHT AND BALANCE

B. STANDARD AND OPTIONAL EQUIPMENT LIST

The Pitts Model S-2A airplane empty weight includes the following items of installed equipment.

The following equipment was installed in this airplane as delivered from the factory and is included in the empty weight.

CHECK ITEMS INSTALLED

(X) 1. AIRSPEED INDICATOR (rear panel only)
(PER TSO-C2(b) or equiv.)
Weight .75 lb. @ FS 124.5

(X) 2. ALTIMETER (rear panel only)
(PER TSO C10(b) or equiv.)
Weight 1.00 lb. @ FS 124.5

(X) 3. COMPASS (1) (rear panel only)
(AIRPATH P/N C-2300) Weight .50 lb. @ FS 124.5

(X) 4. BRAKE MASTER CYLINDERS (2)
(Scott P/N 4408)
(or Cleveland Model 10-19) Weight 1.00 lb. @ FS 102.0

5. 12 V. BATTERY
( ) a)AN 3153-1A Weight 30.0 lb. @ FS 154.8
( ) b)Rebat S-25 with
Pitts fiberglass box P/N 2-1008
Weight 30.0 lb. @ FS 154.8
( ) c)GEL/CELL GC-6200 (2)
6V 20A Installed IAW
Pitts Drwg. Weight 20.0 lb @ FS 154.8
(X) d)GEL/CELL U-128
12V 28A Installed IAW Weight 23.0 lb @ FS 154.8
Pitts Drwg. 7602

(X) 6. STARTER SOLENOID
Filko P/N SW-97 or Echlin ST-81
Weight .75 lb. @ FS 150.8

7. ENGINE
( ) a)Lycoming IO-360-A1A Weight 324.0 lb. @ FS 51.50
Serials 2001 thru 2085
( ) b)Lycoming AEIO-360-A1A Weight 329.0 lb. @ FS 51.50
Serials 2086 thru 2205
(X) c)Lycoming AEIO-360-A1E Weight 332.0 lb. @ FS 51.50
Serials 2206 and up

(X) 8. PROPELLER
~~Hartzell HC-C2YK-4/C7666A-2 or~~
~~Hartzell HC-C2YK-4AF/FC7666A-2~~
HARTZELL HC-C2YK-4CF/FC7666A-2 Weight 58.0 lb. @ FS 35.00

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AIRPLANE FLIGHT MANUAL
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SECTION V WEIGHT AND BALANCE

B. STANDARD AND OPTIONAL EQUIPMENT LIST (cont'd)

9.

( ) a) AF B-7 GAUGE
(rear panel only)
Oil Temperature, Oil Pressure, Fuel Pressure
Weight 2.80 lb. @ FS 124.5

(X) b) OIL PRESS/OIL TEMP GAUGE
U.S. Gauge P/N 092738
Weight 1.40 lb. @ FS 124.5

(X) c) MANIFOLD PRESS/FUEL PRESSURE
Edo-Aire P/N IU 028-055-14
Weight 1.40 lb. @ FS 124.5

(X) 10. TACHOMETER (rear panel only)
AC Division of GM
P/N RT7
Weight .75 lb. @ FS 124.5

(X) 11. AUXILIARY BOOST PUMP
Weldon Mfg. Co. P/N B-8100-C
or C-8100-C or C-8100-E
Weight 3.25 lb. @ FS 71.0

(X) 12. MAIN GEAR WHEELS (2)
Cleveland P/N 40-78 or P/N 40-78B (PER TSO-C26(a): 500x5
Weight 8.00 lb. @ FS 78.2

(X) 13. MAIN GEAR BRAKES (2)
Cleveland P/N 30-9
Weight 3.0 lb. @ FS 78.2

(X) 14. MAIN GEAR TIRES (2)
5.00 x 5, 6 ply rating, type III, Tube Type
Weight 14.0 lb. @ FS 78.2

(X) 15. TAILWHEEL UNIT
Maule SFS-1-4
Weight 9.5 lb. @ FS 230.0

(X) 16. STALL WARNING INDICATOR UNIT
Safe-Flight No. 146
Weight 2 oz. @ FS 98.81

PITTS AVIATION ENTERPRISES, INC.
AIRPLANE FLIGHT MANUAL
MODEL S-2A AIRPLANE

SECTION V WEIGHT AND BALANCE

B. STANDARD AND OPTIONAL EQUIPMENT LIST (cont'd)

(X)	17.	STALL WARNING HORN (rear panel only) Safe-Flight Model "R"	Weight	4	oz. @ FS	124.5
( )	18.	MANIFOLD PRESSURE GAUGE (rear panel only) AN 5770-1	Weight	.50	lb. @ FS	124.5
	19.	CRASH LOCATOR BEACON				
( )		a)EB-2BCD, Dayton Aircraft Products				
( )		b)LEFT-1005-P, Larago Electronics				
(X)		c)EBC-102A, Emergency Beacon Corp.	Weight	3.0	lb. @ FS	155.0
(X)	20.	PROPELLER SPINNER Hartzell P/N 836-60	Weight	4.5	lb. @ FS	34.16
	21.	RADIO (aft side of front seat)				
~~(X)~~		a)Genave Alpha 200 B	Weight	5.0	lb. @ FS	120.0
( )		b)Narco Escort 110	Weight	5.0	lb. @ FS	120.0
(X)		c)KING KX145	Weight	5.2	lb. @ FS	120.0
	22.	ACCELEROMETER				
~~(X)~~		a)Front Panel (AN 5745-2 or equiv.)	Weight	1.0	lb. @ FS	97.5
(X)		b)Rear Panel (AN 5745-2 or equiv.)	Weight	1.0	lb. @ FS	124.5
(X)	23.	AIRSPEED INDICATOR (Fwd. Panel) PER TSO C2b or equiv.)	Weight	.75	lb. @ FS	97.5
(X)	24.	ALTIMETER (fwd. Panel) PER TSO C10b or equiv.)	Weight	1.0	lb. @ FS	97.5
	25.	INTERCOM				
(X)		a)PER Pitts drwg. 2-218	Weight	(Neglig.)	lb. @ FS	122.6
( )		b)SIGTRONICS	Weight		lb. @ FS	
(X)	26.	TACHOMETER (Fwd. Panel) A.C. Division of G.M. P/N RT7	Weight	.75	lb. @ FS	97.5
( )	27.	COMPASS (fwd. panel) Airpath P/N C-2300	Weight	.50	lb. @ FS	97.5

PITTS AVIATION ENTERPRISES, INC.
AIRPLANE FLIGHT MANUAL
MODEL S-2A AIRPLANE

SECTION V WEIGHT AND BALANCE

B. STANDARD AND OPTIONAL EQUIPMENT LIST (cont'd)

"OPTIONAL EQUIPMENT"

(X) 28. MANIFOLD PRESSURE GAUGE (fwd. panel)
AN5770-1 or EDOAire P/NIU028-005-14
Weight .50 lb. @ FS 97.5

( ) 29. CANOPY (optional), AFT COCKPIT
(Drwg. No. 2-1007) Weight 9.0 lb. @ FS 137.0

( ) 30. RUDDER PEDAL EXTENSIONS (rear cockpit only)
(Drwg. No. Pitts 2-1006) Weight 0.3 lb. @ FS 102.0

( ) 31. FIBERGLASS BATTERY BOX
(Pitts Drwg. No. 2-1008) (see note)
Weight (Neglig.) lb. @ FS 154.8

(X) 32. SWITCH INSTL-THROTTLE HANDLE
(Pitts Drwg. No. 2-1009) Weight (Neglig.) lb. @ FS 122.6

(X) 33. ALUMINUM MAIN GEAR LEG FAIRINGS
(Pitts Drwg. No. 2-2303) Weight (Neglig.) lb. @ FS 78.2

( ) 34. FRONT COCKPIT COVER
(Pitts Drwg. No. 2-1005) Weight (Neglig.) lb. @ FS 111.0

(X) 35. TWO PLACE CANOPY
(Pitts Drwg. No. 2-8000) Weight 12.5 lb. @ FS 125.0

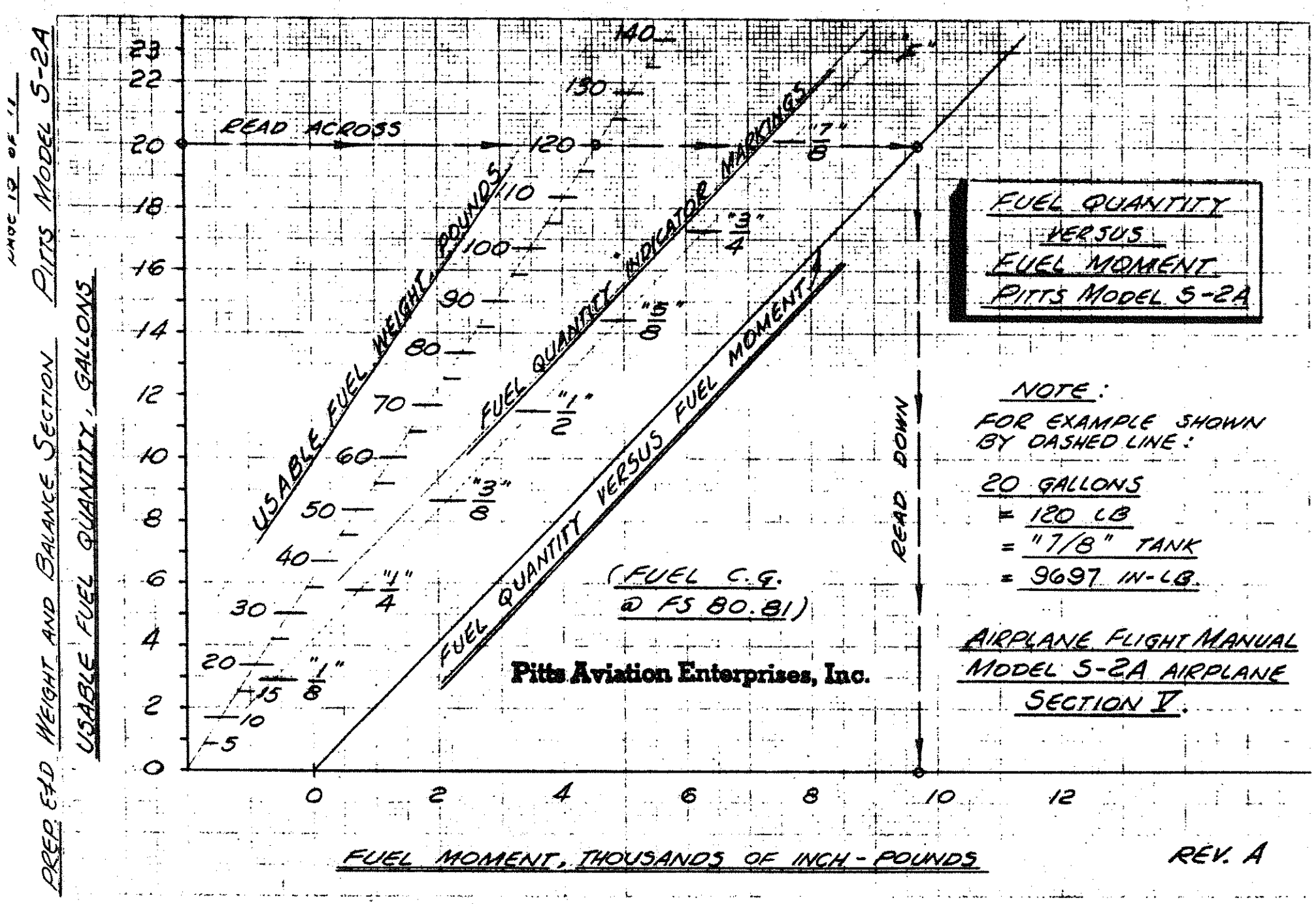
NOTE: The following batteries are eligible for use with the 2-1008 fiberglass battery box.

REBAT	S-25
EXIDE	AC-25
WILLARD	W-25

These batteries are 12 volt, 25 amper-hours, and when installed per 2-1008 there is no significant weight or moment change from the AN3153-1A installation.

PREP. E4D WEIGHT AND BALANCE SECTION PITTS MODEL S-2A

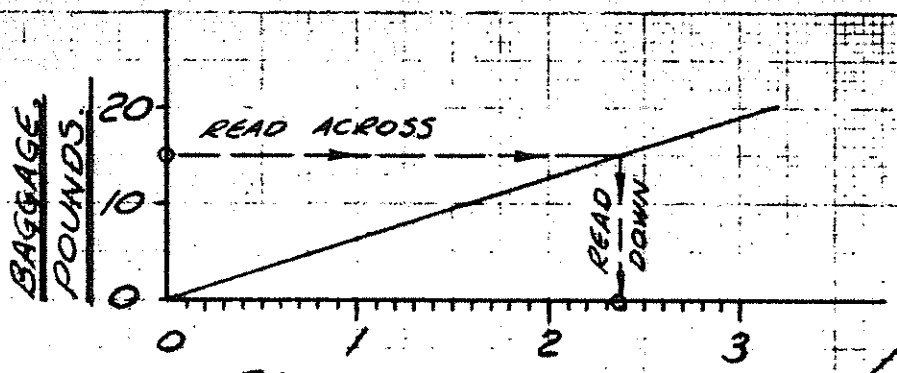
USABLE FUEL QUANTITY - GALLONS



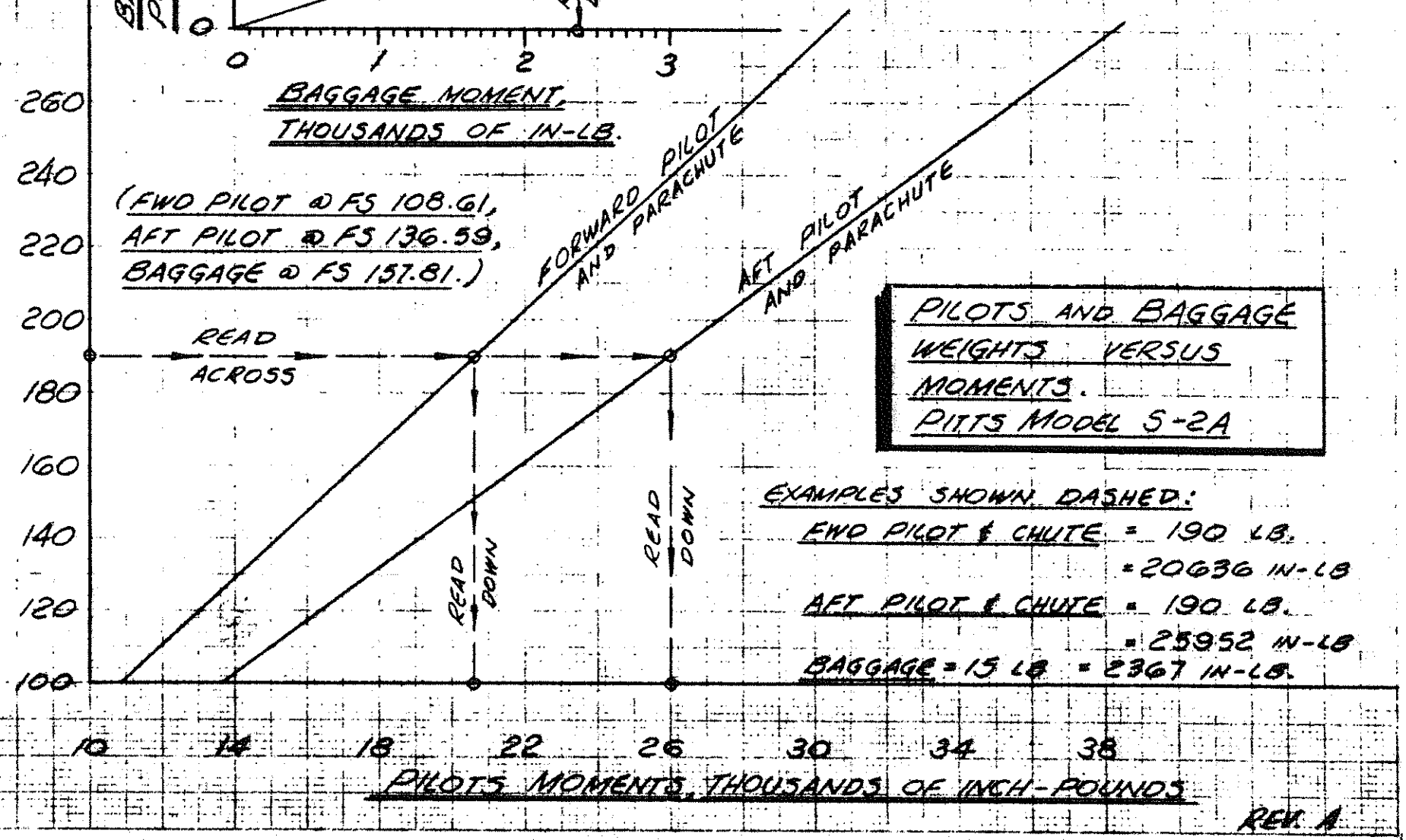
PREP. F/D WEIGHT AND BALANCE SECTION PITTS MODEL S-2A

PILOTS WEIGHT WITH PARACHUTE, LBS.

AIRPLANE FLIGHT MANUAL
MODEL S-2A AIRPLANE
Pitts Aviation Enterprises, Inc.
SECTION V



(FWD PILOT @ FS 108.61,
AFT PILOT @ FS 136.59,
BAGGAGE @ FS 157.81.)



PILOTS AND BAGGAGE WEIGHTS VERSUS MOMENTS.
PITTS MODEL S-2A

EXAMPLES SHOWN DASHED:

FWD PILOT & CHUTE = 190 LB.
= 20636 IN-LB

AFT PILOT & CHUTE = 190 LB.
= 25952 IN-LB

BAGGAGE = 15 LB = 2367 IN-LB.

REV. A