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FLIGHT TEST REPORT GUIDE

Introduction and Instructions

Special Appendix to CAM 3 has been prepared as a guide to aid the applicant in making complete type certification flight test and in preparing a flight test report. The report format is very similar to that used for years by FAA flight test inspectors when conducting official type inspection flight tests and in preparing their reports. The report guide can also be used to assure that the minimum required critical flight characteristics, performance, and pilot operation aspects are considered during a type certification program.

To assist in locating easily and in referring to applicable requirements, there is included a CAR/CAM cross-reference index. In addition, opposite each item in the margin of the report guide is shown the applicable reference CAR/CAM 3 section together with any subsequent amendment number (in parenthesis). The report is arranged in logical sequence of item investigation for the collection of flight data.

The report may be duplicated by an applicant. Only those portions and questions applicable to the model involved or to the alteration of a certificated model, need be included in the final report. Care should be taken that basic information is supplied in each instance and that any inapplicable items and questions are struck out. Whenever it is necessary or desirable to include extra information for a particular item, a notation should be entered "See remarks" or "See attachment_____."

Note that an underlined answer (yes or no) to a question means that the model does not comply with the reference applicable requirement. In preparing a report, be sure to either circle the right answer or strike out the wrong answer(s). If the model has features adding equivalent airworthiness to the requirement, this should be explained under "REMARKS" per paragraph 3 above.

The report guide has been revised to include amendment 3-7 to the Civil Air Regulations. Comments and proposals from industry and FAA regions have also been incorporated werever applicable. Page numbers have been added to the CAR/CAM cross-reference to facilitate the use of the guide. The amendment numbers that were found in the margins of the previous report guide have been deleted in this revision.

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FEDERAL AVIATION AGENCY

Certification Data Summary

Date_____

Make_____ Model_____

Applicant_____

Specification or Data Sheet No. & Date_____

TC if New Model_____ STC if Alteration_____

If Alteration, state nature, reason, and by whom made_____

Type Inspection Authorization No. & Date_____

Other Authorization_____

Certification Basis_____

Serial No. Tested_____ Serial Nos. Eligible_____

Certification Data Forwarded to Washington_____

Certification Data Available in Responsible Region_____

Responsible Region_____ Approved By_____

SECTION O. ADMINISTRATIVE INFORMATION

A. Administrative Data:

1. Airplane(s) Tested: Model No._____
Serial No._____ Registration No._____

2. When were flight tests conducted?_____ To_____

3. Where were flight tests conducted?_____

4. Has applicant:

3.65 a. Submitted a Report on Calibration of Instruments and correction of test results to standard atmospheric conditions..... Yes No

3.16 b. Submitted a report of his flight tests (Attach report)..... Yes No

3.62 c. Provided a pilot with a valid and appropriate pilot certificate to make the flight tests? (State which certificate_____) Yes No

3.64 d. Provided satisfactory emergency egress on the test airplane, such as door rip hinges, for use of the crew wearing parachutes? Yes No

3.63 5. Was the applicant's test pilot unable or unwilling to conduct any of the required official flight tests or, were items of non-compliance found which might render additional test data meaningless or which were of a nature to make further testing unduly hazardous?..... No Yes

If yes, were official flight tests discontinued and a formal notice of discontinuance issued? (Attach copy).....NA Yes No

6. If a partial type test, do attachments (page) describe nature of alteration?..... Yes No

If no, describe below:

_____

_____

_____

_____

_____

_____

SECTION 0. ADMINISTRATIVE INFORMATION:

A. Administrative Data: (continued)

7. Were changes made to the airplane during type test? (If "yes", give details)..... Yes No

_____

_____

_____

_____

3.10 8. Are all CAR/CAM provisions met?..... Yes No

If "no" were they compensated for by factors which provide an equivalent level of safety?..... Yes No

(Describe all such compensating factors under remarks)

3.10 9. Were any regulatory or policy difficulties encountered during the type tests?..... Yes No

(If "yes", briefly state their nature under remarks and reference the separate communication which transmitted these difficulties with a recommended solution.)

3.750 10. Type(s) of operation:

a. Is the intended type(s) of operation to be:

(1) Transportation (Air Taxi, Business, Personal)?..... Yes No

(2) Work operations (Aerial Application, Surveying Patrol, Prospecting, Mapping, Conservation) other (Specify)?..... Yes No

(3) Day operations?..... Yes No

(4) Night operations?..... Yes No

(5) IFR operations?..... Yes No

b. Was any feature or characteristic of the airplane found which renders it unsafe for the category in which it is to be certificated and for the type of operation intended? No Yes

SECTION O. ADMINISTRATIVE INFORMATION:

A. Administrative Data: (continued)

3.750
3.651
3.655

11. Are all of the required equipment items provided for the intended type of operation and are they installed satisfactorily?..... Yes No

(List below all the equipment items installed, tested and found to comply, that were in excess of the minimum (day-VFR) requirements.)

_____

_____

_____

_____

_____

_____

_____

_____

3.11(a)
3.12

12. State below the date of the amended CAR 3 and the amendments, if any, which are applicable:

CAR 3 amended to_____

Amendments: No_____Date_____

_____Date_____

_____Date_____

3.16(b)
3.16-1

13. If airplane type is over 6,000 pounds, has the TCB decided upon the program, as required, for additional service tests?..... NA Yes No

(A copy of this accelerated service test report is to be forwarded to each TIR holder)

14. Has a copy of SECTION O. and SECTION I. of this report form been forwarded to all regions and Washington?..... Yes No

SECTION O. ADMINISTRATIVE INFORMATION

A. Administrative Data: (continued)

15. Flight Test Log:

Date	Time of Takeoff / Landing	Test Description	Remarks	Elapsed Time Hrs.	Elapsed Time Min.

Total Flight Test Time_____

SECTION O. ADMINISTRATIVE INFORMATION:

A. Administrative Data: (continued)

16. List results of special tests specified in the Type Inspection Authorization.

SECTION O. ADMINISTRATIVE INFORMATION

B. Reference Data:

SECTION I. CERTIFICATION INFORMATION:

A. Type of Operation Limitations:

3.20 1. Category: (check appropriate space(s))

Normal	( )	Landplane	( )
Utility	( )	Seaplane	( )
Acrobatic	( )		

47.21
49.30
3.750 2. Equipment: Items installed and found satisfactory for:
(check appropriate space(s))

General Operations (CAR 43)		Air Taxi Operations (CAR 47)	
VFR (Day)	( )	VFR (Day)	( )
VFR (Night)	( )	VFR (Night)	( )
IFR	( )	IFR (Day)	( )
WEATHER	( )	IFR (Night)	( )

3.74 B. Maximum Certificated Weights:

Category	Takeoff	Landing
Normal	_____ lbs.	_____ lbs.
Utility	_____ lbs.	_____ lbs.
Acrobatic	_____ lbs.	_____ lbs.

3.71 C. C.G. Limits: (To be [illegible]

SECTION I. CERTIFICATION INFORMATION: (continued)

D. Operating Limitations and Information:

1. Airspeeds: (M.P.H.)

3.739 (a) Never Exceed Speed (V_{ne}).....___CAS

3.740 (b) Maximum Structural Cruising Speed (V_{nc}):.....___CAS

3.741 3.771(c) (c) Maximum Rough Air or Maneuvering Speed (V_p):.....___CAS

3.742(a) (d) Maximum Speed, Flaps Extended (V_{fe}):.....___CAS

3.742(b) (e) Maximum Speed, Intermediate Flaps, Flaps Extended:__°.___CAS

3.771(a) (f) Maximum Speed, Landing Gear Extended:.....___CAS

3.778(a) (g) Maximum Speed for Lowering of Landing Gear:.....___CAS

3.743 (h) Minimum Controllability Speed (Multiengine V_{mc}):.....___CAS

3.111 3.771(b) (i) Demonstrated Crosswind Speed:.....___CAS

* (j) Recommended Climb Speed:.....___CAS

* (k) Best Angle-of-Climb Speed:.....___CAS

* (l) Engine-Inoperative-Climb Speed:.....___CAS

* (m) Approach Speed(s):.....___CAS

* Airplanes weighing more than 6000 pounds.

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

1. Controls: (continued)

3.338 3.338-1 3.339	e. Are flap controls:		
	(1) Such that the flap(s) will not move from any position required for performance compliance unless further adjusted or by an automatic load limiting device?.....	Yes	No
	(2) Provided with an indicator or other means to indicate the flap extended, retracted, and any other position required for performance compliance?.....	Yes	No
	(3) Such that the rate of movement in response to the pilot's control, or automatic device, results in unsatisfactory flight or performance characteristics?.	No	Yes
	(4) Such that flaps are mechanically interconnected?.....	Yes	No
	(a) If "no", has airplane safe flight characteristics with flaps retracted on one side and extended on other?.....	Yes	No
3.384(c)	(5) Located centrally or to the right of the pedestal centerline or of the powerplant throttle control centerline and sufficiently displaced from the landing gear control to avoid confusion?.....	Yes	No
3.341	f. Is a control surface lock system installed?.....	Yes	No
	If "yes", answer the following:		
	(1) When in "locked" position, does it provide an unmistakable warning to the pilot?.....	Yes	No
	(2) Are means provided to preclude possibility of the lock becoming engaged in flight?.....	Yes	No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

1. Controls: (continued)

g. Powerplant Controls:

3.384(b) (1) In multiengine airplanes, are identical controls for the several engines so located as to prevent any misleading impression as to the pertinent engine?.... NA Yes No

3.627 (2) Will controls maintain any set position without further attention and without creeping due to control loads or vibration?..... Yes No

3.627 (3) Have controls adequate strength and rigidity under operating loads?..... Yes No

3.628 (4) Throttle Controls:

(a) Does each throttle afford a positive and immediately responsive means of controlling the engine?..... Yes No

(b) Are controls so grouped to permit separate and also simultaneous control of all engines?.. NA Yes No

(c) Does a forward motion open the throttle?..... Yes No

3.629 (5) Ignition Switches:

(a) Can all ignition switches on multiengine airplanes be quickly shut off?..... NA Yes No

(b) If a master control is provided, are means provided to prevent inadvertent operation?.... NA Yes No

3.630 (6) Mixture Controls:

Is separate and also simultaneous control of all engines considered satisfactory?..... Yes No

3.631 (7) Propeller Speed and Pitch Controls:

(a) Are controls grouped to permit control of all propellers both separately and together?..... Yes No

(b) Do controls permit ready synchronization of all propellers?..... NA Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations: (continued)

3.386 c. Crashworthiness provisions:

(1) Does it appear that all occupants, making proper use of belts or harnesses will, with reasonable probability, escape serious injury from penetrating or relatively solid objects (structural features which can be lethal in a crash), including a wheels-up landing, in the event of a minor crash?..... Yes No

3.386(c) (2) For airplanes, other than in which the possibility of a turnover is remote, is there reasonable protection of the occupants in a complete turnover?..... NA Yes No

3.387(d) d. Exits:

Are exits provided for A Category that will permit all occupants with parachutes to bail out quickly at normal flight speeds?..... NA Yes No

3.390(a) e. Seats:

(1) If crew seats are adjustable, are adjustments easily made, intermediate positions secure, not subject to displacement during takeoff and landing operations, and operate satisfactorily?..... NA Yes No

3.390(b) (2) Are all seats in the A Category capable of accommodating passengers wearing parachutes unless placarded otherwise? Yes No

3.755(a) f. Operational Placards and Markings:

(1) Are the following operational placards displayed in a conspicuous place, clear, and not subject to misinterpretation:

3.755(b)
3.755-1
3.770 (a) Category placard which states the basis of all markings and placards with reference, if required, to AFM information on other categories, and includes the following statement?..... Yes No

"This airplane must be operated as a_____ or_____category airplane in compliance with the operating limitations stated in the form of placards, markings, and manuals".

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations:

f. Operational Placards and Markings:

(1) Are the following operational placards....(continued)

3.769	(b) Prohibited or approved flight maneuvers placard?.....		Yes	No
3.755-2(b)	(c) Flaps operational settings placard, if dangerous characteristics result from an improper setting?..	NA	Yes	No
3.124(c)(4)	(d) Spin recovery procedure placard?.....	NA	Yes	No
	(For acrobatic category, and utility category when demonstrated to meet acrobatic category requirements)			
3.771	(e) Airspeed Placards			
	_____Maximum speed with landing gear extended?....		Yes	No
	_____Minimum control speed?.....		Yes	No
	_____Design maneuvering speed?.....		Yes	No
	_____Demonstrated crosswind velocity?.....		Yes	No
3.771(b)	_____Recommended climb speed?.....	NA	Yes	No
	_____Best angle-of-climb speed?.....	NA	Yes	No
	_____Engine-inoperative-climb speed?.....	NA	Yes	No
	_____Approach speeds?.....	NA	Yes	No
3.766 3.755-1(a)(6)	(f) Weight and Loading Placards (baggage, cargo, seats, cabin, removable ballast, Normal Category Operations vs Utility Category).....	NA	Yes	No
3.768	(g) Emergency Exit Placards (placard and controls to be colored red, placard to be adjacent to control and to clearly indicate it as an emergency exit and its method of operation)?.....	NA	Yes	No
3.755(a)	(h) Additional Placards (having a direct bearing on safe operation and required by the type's unusual design, operating, or handling characteristics).....	NA	Yes	No

If additional placards are required, list below:

_____

_____

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations:

f. Operational Placards and Markings: (continued)

3.756 (2) Are the following instrument markings clear and easily visible to the pilot?

3.757(a) (a) Airspeed indicator

3.757-1

V_{ne}	– Red radial line.....		Yes	No
Caution Range	– Yellow arc (from V_{ne} to V_{no}).....		Yes	No
Normal Range	– Green arc (from V_{no} to V_{s1}).....		Yes	No
Flap Range	– White arc (from V_f to V_{s_o}).....		Yes	No

3.757(b) (b) Variable V_{ne} and V_{no} speed limitations, if applicable.. NA Yes No

3.759 (c) Powerplant Instruments

3.759-1

Maximum safe limit	– Red radial line.....		Yes	No
Minimum safe limit	– Red radial line.....		Yes	No
Normal operating range	– Green arc.....		Yes	No
Takeoff range	– Yellow arc.....		Yes	No
Precautionary range	– Yellow arc.....		Yes	No
RPM range(s), if any, to be avoided	– Red arc.....	NA	Yes	No

3.755(a) (d) Additional Instrument Markings..... NA Yes No

(Having a direct bearing on safe operation and required by the type's unusual design, operating, or handling characteristics.)

If additional markings are required, list below:

_____

3.765(b) (3) Accessory and Auxiliary Controls

Are all emergency controls colored red and clearly marked as to their method of operation?..... NA Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations: (continued)

g. Operating Limitations and Information for Crew

3.777 (1) Airplane Flight Manual

An AFM is required for airplanes with maximum certificated weight over 6000 lbs.

Is maximum certificated airplane weight over 6000 lbs.? (_____lbs.) Yes No

If "yes", answer the following:

(a) Is an Airplane Flight Manual provided?..... Yes No

(b) Does it contain only required material, or, is there a distinct separate section confined to the required material?..... NA Yes No

(c) Is the FAA approved portion so marked and identified that no one can easily err in distinguishing approved from unapproved information?..... NA Yes No

(d) If more than one page, is a cover provided with the title "Airplane Flight Manual"?..... NA Yes No

(e) Does each page bear the notation "FAA approved" and date of issuance?..... NA Yes No

(f) Is the material bound in a semi-permanent manner so that pages will not be easily lost, but so that revised pages can be inserted?..... NA Yes No

(g) If airplane has tentative approval only, does the following statement appear on the inside of the front covering page?..... NA Yes No

"The certificate of airworthiness issued to the aircraft described hereon, subject to the final issuance of a covering type certificate, is based upon tentative approval of aircraft of this model. Upon issuance of a covering type certificate it may become necessary to make certain modifications or adjustments to the subject aircraft in order that the certificate of airworthiness may remain effective."

	- Removable ballast amount(s), location, and any cautionary information, such as adverse effects on spins?..... NA	Yes	No
3.72			
3.76	- Satisfactory loading combinations? NA	Yes	No
3.778(d)	Load Distribution - C.G. limits?.....	Yes	No
	- Useful load composition, including weight of fuel and oil with full tanks?.....	Yes	No
	- Useful load?.....	Yes	No
	- Weight Empty (including a list of items of equipment installed and their locations) and its C.G. location?.....	Yes	No
3.73 3.778(c)	Weight - Maximum certification weight?.....	Yes	No
3.778(b)	Powerplant - An outline and explanation of all powerplant limitations?.....	Yes	No
	- Correct powerplant instrument markings?...	Yes	No
	- Significance of limitations and of color?..	Yes	No
	- Maximum safe speed to lower gear?.....	Yes	No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:
2. Crew Accommodations: (continued)

g. Operating Limitations and Information for Crew

3.777 (1) Airplane Flight Manual

An AFM is required for airplanes with maximum certificated weight over 6000 lbs.

Is maximum certificated airplane weight over 6000 lbs.? Yes No
(_____ lbs.)

If "yes", answer the following:

(a) Is an Airplane Flight Manual provided?..... Yes No

(b) Does it contain only required material, or, is there a distinct separate section confined to the required material?..... NA Yes No

(c) Is the FAA approved portion so marked and identified

654382 O - 62 - 4

3.765(b)	(3) Accessory and Auxiliary Controls			
	Are all emergency controls colored red and clearly marked as to their method of operation?.....	NA	Yes	No

---

If additional markings are required, list below:

(Having a direct bearing on safe operation and required by the type's unusual design, operating, or handling characteristics.)

3.755(a)	(d) Additional Instrument Markings.....	NA	Yes	No
	RPM range(s), if any, to be avoided – Red arc.....	NA	Yes	No
	Precautionary range – Yellow arc.....		Yes	No
	Takeoff range – Yellow arc.....		Yes	No
	Normal operating range – Green arc.....		Yes	No
	Minimum safe limit – Red radial line.....		Yes	No
	Maximum safe limit – Red radial line.....		Yes	No
3.759 3.759-1	(c) Powerplant Instruments			

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations:

g. Operating Limitations and Information for Crew:

(2) Required information: Is the following information provided?

(a) Operating Limitations: (continued)

3.778(e)	Maneuvers – All authorized maneuvers (with appropriate entry speeds) by category?.....	NA	Yes	No
	– All unauthorized maneuvers?.....	NA	Yes	No
	– Statement re "characteristically incapable of spinning"?.....	NA	Yes	No
3.778(f)	Flight Load Factor – Positive limit load factors in terms of acceleration which structure can stand?.....		Yes	No
3.778(g)	Flight Crew – Minimum number and functions of each, if more than one person required to operate plane safely?.....	NA	Yes	No
3.778(h)	Types of Operation – Day or night, VFR, IFR and			

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations:

g. Operating Limitations and Information for Crew:

(2) Required information: Is the following information provided?

(b) Operating Procedures: (continued)

EMERGENCY PROCEDURES (Preferably located in a separate section or on red colored pages for quick reference)

- Recommended procedures for coping with different types of emergency or critical situations, such as:

(1) A go-around with an engine out..... NA Yes No

(2) A landing gear malfunction..... NA Yes No

(3) Engine malfunction (on a multiengine airplane) NA Yes No

(4) Carburetor icing..... NA Yes No

(5) Impact/external icing..... NA Yes No

(6) Turbulent air (IFR/VFR) speed and control configuration..... Yes No

(7) Obstacle clearance speed and configuration (from short fields and during precautionary landings). Yes No

(8) Fire..... NA Yes No

(9) Electrical failures (including impact on navigational devices)..... NA Yes No

(10) Hydraulic failures..... NA Yes No

*(11) Other pertinent information peculiar to the airplane's operating characteristics and necessary to safe operation..... NA Yes No

* Includes such items as unusable fuel quantity; effects of various configurations on flight characteristics, performance, and handling (gear and flaps down, propeller not feathered and windmilling; cowl flaps open; stall warning variations; effect on an electrical stall warning indicator when master switch is turned off, etc.)

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations:

g. Operating Limitations and Information for Crew:

(2) Required information: Is the following information provided? (continued)

3.780	(c) Performance Information			
3.755-2(a)	(1) Stalling speed at maximum weight, gear/flaps down, M.C. power.....	NA	Yes	No
	(2) Stalling speed at maximum weight, gear/flaps up, M.C. power.....	NA	Yes	No
3.120(e)	(3) Loss of altitude and pitch below level flight during stall recovery.....	NA	Yes	No
	(4) Climb at M.C. power in takeoff configuration...	NA	Yes	No
	(5) Climb at M.C. power (all engines) climb configuration.....		Yes	No
	(6) Climb at takeoff power in landing configuration (for go-around).....	NA	Yes	No
	(7) Climb - engine out - enroute configuration...	NA	Yes	No
	(8) Climb/sink - engine out - landing/approach configuration.....	NA	Yes	No
	(9) Landing distance and speed from 50 feet.....		Yes	No
3.122 .780(b)	(10) Variation of stalling speed with angle of bank up to 60° (maximum weight, gear/flaps up).....		Yes	No
	(11) Items required for airplanes with a maximum certificated weight over 6000 lbs.			
	(a) Takeoff distance and speed to clear 50 feet		Yes	No
.780-2 .780-3	(b) Variation (calculated) of takeoff distance, landing distance and rates of climb from effects of altitude and temperature.....		Yes	No
.780(d)	(12) The best climb/minimum descent speed for multiengine airplanes with one engine inoperative?.....	NA	Yes	No

REMARKS

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

B. Fire Protection:

3.388-2 1. Built-in Fire Extinguishing Systems:

a. Is a built-in fire extinguishing system installed?..... Yes No

If "yes", answer the following:

3.335 (1) Is it properly identified, or marked for method of operation and does it operate satisfactorily?..... Yes No

(2) Can a hazardous amount of fire extinguishing agent enter the pilot or passenger compartment in flight or on the ground (as a leak or when operated)?..... No Yes

b. Is a fire detection system installed?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant

1. Engine:

a. Engine Name and Model _____
T. C. No. _____

b. Carburetor Name and Model _____

c. Engine Gear Ratio _____

d. Operation:

3.15(a) (1) Is the engine(s) new or in such condition that it apparently is developing its power rating(s)?..... Yes **No**

3.411(b) (2) Are vibration characteristics of engine installation apparently normal at all operating speeds on the ground and in flight?..... Yes No

If "no", indicate rough spots _____ to _____ R.P.M. to be avoided.

3.662 (3) Does the engine(s) shake instruments excessively, such as to cause the accuracy of the instruments to be inadequate, or to cause damage to them?..... No **Yes**

3.429 (4) Does the engine(s) accelerate promptly upon quickly opening throttle after glide for landing?..... Yes **No**

3.429 (5) Is there any uneven engine operation during takeoff which might indicate that fuel system will not feed properly in bumpy takeoff?..... No **Yes**

ECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

1. Engine:

d. Operation: (continued)

(6) Do the following items show signs of excessive vibration and/or distortion from engine movement, air loads, or accelerated flight conditions?

.625 (a) Cowling..... No Yes

.550 (b) Fuel Lines..... No Yes

.570 (c) Oil Lines..... No Yes

.671 (d) Instrument Lines..... No Yes

.616 (e) Manifolds..... No Yes

.627 (f) Powerplant Controls..... No Yes

(g) _____..... No Yes

(h) _____..... No Yes

.429 (7) Engine idling speed on ground_____R.P.M.:

Is idling speed such that engine will continue to function during all maneuvers encountered in official flight tests?..... Yes No

.627 (8) Any undesirable characteristics noted in engine control operation, or arrangement?..... No Yes

2. Propeller:

a. Blades:

(1) Make and Model_____

(2) T. C. No._____

(3) Number of Blades_____.(4) Diameter_____

(5) Material_____.(6) Activity Factor_____

(7) Thickness ratio at 3/4 radius_____

		Low	High	Feathered	Reversed	Station Inches
		Degrees				
	(a) Two Position	____°	____°			____
	(b) Constant Speed	____°	____°			____
	(c) Feathering	____°	____°	____°		____
	(d) Reversible	____°	____°	____°	____°	____
	(e) Auto. Varying	____°	____°			____

d. Propeller Governor Model _____

e. Propeller Deicing Model _____

f. Operation:

3.417 (1) Does operation of the propeller(s) appear smooth at all operating speeds on ground and in flight?..... Yes No

(If "no", indicate rough spots _____ to _____ R.P.M. to be avoided)

_____

_____

_____

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

1. Engine:

d. Operation: (continued)

(6) Do the following items show signs of excessive vibration and/or distortion from engine movement, air loads, or accelerated flight conditions?

3.625	(a) Cowling.....	No	Yes	
3.550	(b) Fuel Lines.....	No	Yes	
3.570	(c) Oil Lines.....	No	Yes	
3.671	(d) Instrument Lines.....	No	Yes	
3.616	(e) Manifolds.....	No	Yes	
3.627	(f) Powerplant Controls.....	No	Yes	
	(g) _____.....	No	Yes	
	(h) _____.....	No	Yes	

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

2. Propeller:

f. Operation: (continued)

3.419
3.419-1

(2) If fixed pitch, ground adjustable, or automatically varying: NA

3.85-5

(a) Is it desired that prop permit T.O. r.p.m. at best angle of climb speed in balked landing configuration?..... Yes No

If "yes" are engine cooling requirements set at this speed?..... Yes No

If "no", is the propeller pitch such that the engine maximum permissible T.O. r.p.m. is not exceeded at T.O. power during takeoff and initial climb at best rate of climb speed?..... Yes No

R.P.M._____ I.A.S._____ M.P.H.
(C.A.S._____ M.P.H.)

(b) What is full throttle static r.p.m. (on ground)?

_____ apparently normal at all operating speeds on the ground and in flight?..... Yes No

If "no", indicate rough spots _____ to _____ R.P.M. to be avoided.

3.662 (3) Does the engine(s) shake instruments excessively, such as to cause the accuracy of the instruments to be inadequate, or to cause damage to them?..... Yes No

3.429 (4) Does the engine(s) accelerate promptly upon quickly opening throttle after glide for landing?..... Yes No

3.429 (5) Is there any uneven engine operation during takeoff which might indicate that fuel system will not feed properly in bumpy takeoff?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

2. Propeller:

f. Operations:

(4) If constant speed: (continued)

3.419-1(b) (c) Is the airplane to be operated with and without ADI (anti-detonation injection)?..... Yes No

If "yes", were the above tests made at the lower pitch setting of the wet and dry ratings?..... Yes No

(5) If feathering: NA

3.577 (a) Is feathering dependent on engine oil supply?... Yes No
3.637(b)

If "yes", in event of failure of any portion of the lubrication system other than the tank itself, may feathering be satisfactorily accomplished?..... NA Yes No

(b) At takeoff climb speed, what is time required to:

1. Feather from windmilling at _____ RPM; _____ seconds

2. Unfeather until propeller reaches 1000 RPM; _____ seconds

3.416(c) (3-5) (c) Can each propeller be unfeathered individually in flight?..... Yes No

(6) If reversible: NA

3.631 (a) Are these controls so grouped to permit control of the propellers separately and/or together?.. Yes No

3.627 (b) Are these controls provided with means to prevent inadvertent operation?..... Yes No

(c) At landing, what is time required to reverse the propeller from idling in low pitch to M.C. R.P.M. in negative thrust _____ seconds?..

(d) Does putting throttle back increase deceleration thrust?..... Yes No

(If "no", explain procedure used):

REMARKS

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

2. Propeller:

f. Operations: (continued)

3.411(b) (7) Deicing system:

Is deicing provided for each propeller?.....NA Yes No

If yes, State type_____

(If fluid, conduct the following test; at cruising speed, and starting with a full tank of deicing fluid, put on maximum flow to all propellers for a 15 minute timed period, and answer the following:

(a) Is distribution to each propeller and operation in flight satisfactory?..... Yes No

(b) What is amount of fluid used?_____gallons per engine.

3.637(a) (c) Can hazardous quantities of any flammable deicer fluid flow to the engine compartment? NA Yes No

3.637(d) (d) Are provisions made to guard against inadvertent operation of the shutoff means?... NA Yes No

3.637(d) (e) Is it possible for crew to reopen the shutoff means after it has been closed?..... NA Yes No

3. Fuel System:

a. Arrangement:

3.430 (1) Is it possible for any one fuel pump to draw fuel from more than one tank at the same time?..... NA No Yes

3.430 (2) In gravity feed system, can any engine be supplied with fuel from more than one tank at a time in such a way that tanks feed unequally?..... NA No Yes

3.439 (3) When tank outlets are interconnected, is it possible for fuel to flow between tanks in quantities sufficient to cause an overflow of fuel from the tank vent when the tanks are full and the airplane is operated in various critical attitudes?.... NA No Yes

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

3. Fuel System:

a. Arrangement: (continued)

3.633	(4) Fuel Shutoff Valves			
3.551(a)	(a) Are means provided to permit the flight personnel to shutoff rapidly the flow of fuel to any engine individually in flight?.....	Yes	No	
3.551(b)	(b) Can the flight personnel reopen the valves rapidly in flight after they have been closed?.	Yes	No	
3.637(d) 3.551(b)	(c) Are fuel shutoff valves guarded against inadvertent operation?.....	Yes	No	
3.637(a)	(d) Does closing the fuel shutoff valve for any engine make any of the fuel supply unavailable to the remaining engines?.....	NA	No	Yes

b. Fuel Tank Details:

3.446	(1) During normal operation, is there any noticeable syphoning or spilling of fuel?.....		No	Yes
3.446	(2) Are vents terminated at points where the discharge of fuel from the outlet will cause fumes to enter personnel compartments?.....		No	Yes
3.447-A	(3) In acrobatic type airplanes, is there excessive loss of fuel during acrobatic maneuvers-including short periods of inverted flight, or any syphoning from a vent when normal flight has been resumed?.....	NA	No	Yes

c. Fuel Quantity Indicators:

3.672 3.672-1	(1) Are suitable means provided to indicate to the flight personnel the quantity of fuel in gallons or pounds in each tank during flight?.....		Yes	No
	(2) Are exposed sight gages so installed and guarded as to preclude the possibility of breakage and damage?.	NA	Yes	No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

3. Fuel System:

c. Fuel Quantity Indicators: (continued)

3.672	(3) Are there any small auxiliary tanks that do not have quantity indicators?.....		Yes	No
	If "yes", does the relative size of the tanks, rate of fuel transfer, and operating instructions guard against overflow and assure that the crew will receive prompt warning if fuel transfer is not being achieved as intended?.....		Yes	No
3.673	(4) When a fuel flowmeter indicator is installed, does the bypass operate satisfactorily in the event of malfunctioning?.....	NA	Yes	No

d. Emergency Fuel Pump and Installation:

3.449	(1) Are emergency pumps easily available for immediate use?.....	NA	Yes	No
3.435	(2) Is excessive effort required in hand-emergency pumps for continued operation at the rate of 60 complete cycles (120 single strokes) per minute?	NA	No	Yes
3.449(b)	(3) Does the emergency and normal pump operate continuously?.....		Yes	No
	If "yes", are means provided to indicate to the crew when either pump is malfunctioning?.....		Yes	No

4. Lubrication System:

3.568(b)-A 3.575(b)-A	a. Is there hazardous loss of oil during acrobatic maneuvers, including short periods of inverted flight?.....	NA	No	Yes
3.637	b. Oil Shutoff Means			
	(1) Are means provided to permit the flight personnel to shutoff the flow of oil to any engine individually in flight?.....	NA	Yes	No
	(2) Can the flight personnel reopen the valves in flight after they have been closed?.....	NA	Yes	No
	(3) Are these oil shutoff means reasonably protected from inadvertent operation?.....	NA	Yes	No

ECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant: (continued)

5. Cooling System: (For air or liquid cooled engines)

.627 a. Are all cowling flaps and shutters, and their actuating mechanism sufficiently rigid and positively operable?.... Yes No

.627 b. Do cowling flap and shutter controls maintain any necessary position without constant attention by flight personnel and not tend to creep due to control loads and/or vibration?..... Yes No

6. Induction System:

.605(b) a. Using the alternate air intake system, is there any excessive loss of power above the power lost due to the increase in temperature of the air?..... NA No Yes

.607 b. Is induction air preheater provided?..... Yes No

(1) If a preheater is used in combination with fluid deicing system, is flow available to all engines simultaneously?..... NA Yes No

(2) Is the cockpit control sufficiently strong and so arranged that it will not "spring" or otherwise fail to function in the event of ice formation when in the "cold" position?..... Yes No

(3) Does the induction air heat control maintain any necessary position without constant attention by the flight personnel and not tend to creep due to control loads and/or vibration?..... Yes No

7. Exhaust System:

.615(b) a. Are exhaust gases discharged at such a location that they will not cause a glare to seriously affect pilot visibility at night?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION: (continued)

D. Electrical System:

	1. Fuses, Circuit Breakers and Switches.....Installed?...	Yes	No
3.691	a. Are protective devices in circuits essential to safety in flight so located and identified that fuses may be replaced or circuit breakers reset readily in flight?.....	Yes	No
3.695	b. Are switches so installed as to be readily accessible to the appropriate crew members?.....	Yes	No
3.695	c. Are switches adequately labeled as to operation and circuit controlled?.....	Yes	No
	2. Lights:		
	a. Instrument Lights.....Installed?..	Yes	No
3.697	(1) Are instrument lights installed in such a manner that direct rays are shielded from the pilot's eyes?.....	Yes	No
3.697	(2) Are direct rays reflected from the windshield or other surface into the pilot's eyes?.....	No	Yes
3.696	(3) Is sufficient illumination provided so that all instruments, switches, placards, etc., are easily readable and discernible?.....	Yes	No
	b. Landing Lights.....Installed?..	Yes	No
3.699	(1) Are landing lights installed such that no dangerous glare is visible to the pilot?.....	Yes	No
	(2) Do they sufficiently light the runway?.....	Yes	No
	(3) Is the glow, reflection or halation from the landing lights in the pilot's compartment considered objectionable?.....	No	Yes

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SECTION II. EQUIPMENT AND FLIGHT OPERATION:

D. Electrical System:

2. Lights: (continued)

3.705 c. Rotating (anticollision) Light System.....Installed?... Yes No

(1) Is light so located that emitted light is not detrimental to crew's vision or result in adverse effects on control of the airplane?..... Yes No

(2) Is light so located that it does not detract from the conspicuity of the position lights?..... Yes No

3.652 d. All Lights:

(1) Are all light switches so installed as to be readily accessible to the appropriate crew members?..... Yes No

3.652 (2) Are switches adequately labeled as to operation and the light controlled?..... Yes No

(3) Does the operation of the switches appear adequate for service use?..... Yes No

3.652 3. Are there any unsatisfactory features in connection with the
3.681 electrical system operation, any hazards in itself, in methods of operation, or in effects on other parts?..... No Yes

REMARKS

SECTION II. EQUIPMENT AND FLIGHT OPERATION: (continued)

E. Equipment and Operatonal Features:

1. Flight Control Installations:

a. Automatic Pilot System.....Installed?.... Yes No

Make and Model _____

	Servo Unit Model No.	Gear Train Model No.	Capstan Sizes
Rudder	_____	_____	_____
Elevator	_____	_____	_____
Aileron	_____	_____	_____
Trim	_____	_____	_____

3.667(a) (1) Can the automatic pilot system be quickly and positively disengaged by the human pilot(s) to prevent it from interfering with his control of the airplane?..... Yes No

(a) If "no", can the autopilot be sufficiently over-powered by one human pilot to enable him to control the airplane?..... Yes No

(2) Is the system dependent upon pilot "overpowering" to maintain flight control in the event of a malfunction?..... Yes No

If "yes", answer the following:

(a) Does the system have any features subject to malfunction which are located between the over-powering component and the unit's attachment to a flight control?..... Yes No

If "yes", is there a mechanical disconnect device that satisfactorily disengages the complete system from the flight controls?..... Yes No

4b.612-4 (b) Is it possible to overpower servo forces plus resultant airloads in all configurations of flight demonstrated, including maximum speed for which approval is sought, without exceeding the following control forces measured at the pilot's controls; pitch - 50 lbs., roll - 30 lbs., yaw-150 lbs?..... Yes No

ECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:
1. Flight Control Installations:
a. Automatic Pilot System: (continued)

.667(d)	(3) Is an emergency disengagement device provided?.....	Yes	No
	If "yes" answer the following:		
	(a) Is it located on the pilot's (and copilot's) control wheels to the side away from the throttles?.....	Yes	No
	(b) Does it operate satisfactorily?.....	Yes	No
.667(b)	(4) Is automatic syhchronization provided for each control system involved?.....	Yes	No
	(a) If "no", are satisfactory means provided to indicate readily to the pilot the alignment of the actuating device in relation to the control system it operates?.....	Yes	No
.667(c)	(5) Are all manually operated controls for the system's operation readily accessible to the pilot?.....	Yes	No
	Also to the copilot if a copilot is required?... NA	Yes	No
.335	(6) Is each control clearly marked to indicate its method of operation?.....	Yes	No
.667(d)	(7) Have positive means been provided to prevent the engagement of the system before the automatic pilot is ready for operation, or when any gyroscopic components are caged or inoperative?.....	Yes	No
	(a) If "no", have positive means been provided to indicate to the pilot when the automatic pilot is ready and when any controllable gyroscopic components are inoperable?.....	Yes	No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System: (continued)

(8) List the servo stall forces used during the tests below:

Stall Force at Servo (in-lbs) at "Capstan" or "Connection to the control system." (State which)

	Minimum	Maximum
Rudder	_____	_____
Aileron	_____	_____
Elevator	_____	_____
Trim	_____	_____

4b.612-4(h) (If an envelope of forces has been used, the tests to determine the adequacy of the automatic pilot to control the aircraft will be accomplished at the minimum servo stall force settings, and tests to determine that the aircraft will not be endangered from severe loads or dangerous deviations in the flight path will be conducted at the maximum servo stall force settings)

3.667(d) (9) Flight Tests

With the aircraft loaded at the most critical GW and c.g. for the condition to be tested, can the aircraft be smoothly maneuvered to the fullest extent appropriate to the type of automatic pilot and airplane, including the use of altitude control and coordinated turn control when installed, without inadvertently placing loads beyond an envelope of 0 to + 2 "G" or encountering dangerous deviations from the flight path?..... Yes No

Conditions at which tests were made: GW_____lbs.; C.G._____% MAC

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:
1. Flight Control Installations:
a. Automatic Pilot System:
(9) Flight Tests (continued)

(a) When an oscillatory condition is induced in the airplane controls through a single malfunction:

Can it produce loads hazardous to the airplane with a minimum delay of 3 seconds after detecting the malfunction and prior to the pilot taking corrective action?..... NA No Yes

When used in conjunction with an instrument landing aid, can it produce dangerous deviation from the flight path or any degree of loss of control within a minimum delay of one second after detecting the malfunction and prior to pilot taking corrective action?

(See following test data.)

	Cruising Flight 75% METO Power Flaps Up_____ Gear Up_____ Cruising Altitude_____ Ft. Engines: "HG_____ RPM_____ BHP_____ Weight_____. C.G._____ % MAC			ILS Approach 1.4 V_{so} Approach Flaps_____° Landing Gear Down_____ Engines: "HG_____ RPM_____ BHP_____ Weight_____. C.G._____ % MAC		
Test Data	Aileron	Rudder	Elevator	Aileron	Rudder	Elevator
Period of Resulting Oscillation						
Maximum Angle of Bank, Yaw, or Pitch						
Time Before Corrective Action Is Taken						
Maximum Altitude						
Minimum Altitude						
Maximum Maneuver Acceleration						
Minimum Maneuver Acceleration						

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System:

(9) Flight Tests (continued)

(b) In any of the tests below, when corrective action is taken with a minimum delay of 3 seconds after the pilot detects the signal or combination of signals of the malfunction, does the simulated failure and/or subsequent corrective action (1) create loads beyond an envelope of 0 to 2G, (2) speeds beyond V_{ne}, or (3) dangerous deviations from the flight path?..... No Yes

Test #1 Climb - 75% MCP, Flaps & Gear Up.

Test #2 Cruise - 75% MCP, Flaps & Gear Up.

Test #3 Descend - Maximum permissible auto-pilot speed, Flaps & Gear Up. (Attach test data)

Test #4 Multiengine aircraft with critical engine inoperative, propeller in minimum drag position - MCP on operative engine(s), Flaps & Gear Up.

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:
1. Flight Control Installations:
a. Automatic Pilot System:
(9) Flight Tests (continued)

3.667(d)
(4b.612-4(c))

(c) Does the autopilot system include an approach coupler?..... Yes No

If "yes", in any of the tests below, when corrective action is taken with a minimum delay of one second after pilot detects the signal or combination of signals of the malfunction, does the simulated failure or subsequent corrective action produce (1) hazardous flight path, or (2) any degree of loss of control?..... No Yes

Test #5 ILS Approach at $1.4V_{S1}$, flaps in approach position, gear down, all engines operating.

Test #6 ILS Approach with configuration and speed for and with critical engine inoperative.

Test #7 ILS Approach at $1.4V_{S1}$, flaps in approach position gear down and a simulated critical engine failure during the approcah. (Attach test data)

3.667(d)
(4b.612-4(c))

(d) If no approach coupler is incorporated in the system, will autopilot satisfactorily meet tests and conditions of Tests #4, 5 and 6 above where manual control is used?..... NA Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System: (continued)

(10) Test Data:

Test #_____ Flight phase being tested:_____
(Climb, cruise, descent, approach)

Configuration: Flap Position_____ Gear Position_____

Power: Engine(s)_____ In. Hg._____ R.P.M.

Weight:_____ lbs._____ % MAC

Signal	Trim Speed I.A.S. M.P.H.	Max. or Min. Speed I.A.S. M.P.H.	Initial Altitude Feet	Min. or Max. Alt. Feet	Max. Angle Bank, Pitch or Yaw	Time Before Recovery Initiated	Acceleration		Time to Recover Seconds	Control Force		
							Man.	Rec.		Rud.	Elev.	Ail.
Hard Left Aileron												
Hard Right Aileron												
Hard Left Rudder												
Hard Right Rudder												
Hard Up Elevator												
Hard Down Elevator												
Hard Down Ele. Hard Left Rud. Hard Left Ail.												
Hard Up Ele. Hard Left Rud. Hard Left Ail.												

ECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System: (continued)

(11) Test Results

.667 At the critical weight and c.g. for the phase of flight condition tested, answer the following:

(a) Can the autopilot satisfactorily control the airplane in all maneuvers appropriate to the type of autopilot installed?..... Yes No

(b) Does each control satisfactorily perform its intended function?..... Yes No

(c) When used in conjunction with an ILS aid, can smooth transition be made from cruising or descent through approach to a landing configuration?.. NA Yes No

(d) When used in conjunction with an ILS aid, does an engine failure cause deviations from the flight path greater than 3°/sec.?..... NA No Yes

(e) When used in conjunction with an ILS aid, has pilot a visual means of knowing when the autopilot is uncoupled from the ILS aid?..... NA Yes No

(f) With an ILS aid coupler, is automatic pilot capable of conducting an approach with airplane trimmed for critical engine inoperative flight?..... NA Yes No

(g) If an automatic trim system is incorporated, can its failure create a hazard to automatic or manual flight?..... NA No Yes

(h) Is the autopilot system subject to adverse reactions from spurious signals from:

- Variation in the power source..... No Yes

- Induced signals from other systems?..... No Yes

- Feedback signals from other equipment, operating on same autopilot power source?..... No Yes

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System: (continued)

3.667
(4b.612-4(b))

(12) Airplane Flight Manual Information

Is the following information included in the AFM?... NA Yes No

(a) Operations Limitations Section -

- Autopilot airspeed limitations (specify)_____

_____

- Other operating limitations, if any, such as "approach localizer at angle of 45° or less" (specify)_____

_____

_____

(b) Operating Procedures Section

- Normal operating Information (specify)_____

_____

_____

_____

(c) Emergency Operating Procedures Section

- Altitude lost in following flight phase conditions:

Cruise_____ft.

ILS Approach_____ft. (with ILS coupler)

ILS Approach_____ft. (w/o ILS coupler)

ILS Approach_____ft. (Engine out w/coupler)

ILS Approach_____ft. (Engine out w/o coupler)

- Other emergency procedures information (specify)

ECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System: (continued)

(13) Are any cockpit placards required and installed in addition to those provided at each control (ref. item(6) above)?..... Yes No

If "yes", are these included in the AFM?.....NA Yes No

(Specify each such one below)

_____

_____

_____

_____

REMARKS

tate method of inducing oscillatory condition: (See Section II E. 1. a. (9))

_____

_____

_____

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SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations: (continued)

b. Gyroscopic Indicators

Are one or more gyroscopic instruments installed?..... Yes No

If "yes", answer the following:

3.668 (1) Is energy for actuating all gyroscopic instruments from a reliable source with capacity sufficient to maintain required accuracy at all speeds above the best rate of climb speed?..... Yes No

3.668 (2) Is the installation subject to malfunctioning due to rain, oil, and other detrimental elements?..... No Yes

3.668 (3) Is a satisfactory means provided to indicate to the pilot the adequacy of the power being supplied to the instruments?..... Yes No

3.668(a) (4) If multiengine airplane, answer the following: NA

(a) Are two independent sources of energy supplied?... Yes No

3.668(a) (b) Is a means provided to indicate the adequacy of the power being supplied by each source?..... Yes No

3.668(a) (c) Is a suitable means installed to select either power source for the proper functioning of the instruments should failure of one source occur?.... Yes No

(Specify whether manual or automatic_____)

3.668(b) (d) Are the installation and power systems such that failure of one instrument or of either energy supply will not interfere with the proper supply of energy to the remaining instruments or from the other source?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations: (continued)

3.661(b) c. Instrument Locations and Arrangements:

(1) If a multiengine airplane, are identical powerplant instruments so located as to prevent confusion as to the engine to which each relates?..... NA Yes No

3.665 (2) Static Air Vent System

Are the airspeed indicator, altimeter and any other instruments which are provided with static air case connections influenced by airplane speed, the opening and closing of windows, airflow variation, moisture, or other foreign matter which seriously affects their accuracy?..... No Yes

3.666 (3) Magnetic Direction Indicator

Does the deviation in level flight exceed 10° on any heading?..... No Yes

3.669 (4) Flight Director Instrument

Is a flight director (zero reader, etc.) installed?.... No Yes

If "yes" is:

(a) Its installation and operation free from adverse effects on the performance and accuracy of the required instruments?..... Yes No

(b) A means provided for disconnecting the flight director instrument from the required instruments or their installations?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

2. Deicers:

3.712 a. Are pneumatic deicers installed?..... Yes No

(1) If "yes", are positive means provided for the deflation of all the boots?..... Yes No

3.10 (2) Are stall characteristics satisfactory with all deicers in operation?..... Yes No

(3) List deicer installations:

_____

3. Flares:

a. Are flares installed?..... Yes No

3.714 (1) If "yes", are release controls so installed that the probability of accidental discharge is reduced to a minimum?..... Yes No

3.714 (2) Are release controls operated easily by pilot or copilot?..... Yes No

3.714 (3) Was a ground test for operation of flares considered adequate?..... Yes No

If "no", is the release of flares satisfactory in flight?..... Yes No

3.762 (4) Are flare controls plainly marked as to function and method of operation?..... Yes No

3.718 4. Emergency Flotation and Signaling Equipment:

a. Signaling device:

Is very pistol or equivalent device easily accessible, function satisfactorily, and free from hazard in operation? NA Yes No

3.711 b. Rafts and Life Preservers:
3.717

Is each raft and life preserver readily available to the crew and passengers, and plainly marked as to method of operation? NA Yes No

ECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

5. Radio Equipment:

Is radio equipment installed?..... Yes No

If "yes":

.721 a. Is radio equipment and installation free from hazards in themselves, in method of operation, and in effects on components?..... Yes No

.652 b. Does the installed radio equipment:

(1) function properly?..... Yes No

(2) adequately perform the functions for which it is to be used?..... Yes No

.652 c. Is the radio equipment adequately labeled as to identification and function?..... Yes No

REMARKS

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

3.725 6. Engine Driven Accessories for Multiengine Airplanes:

a. Are engine driven accessories essential to the safe operation of the airplane so distributed among two or more engines that the failure of any one engine will not impair the safe operation of the airplane by malfunctioning of these accessories during the type(s) of operations intended?..... NA Yes No

7. Landing Gear:

3.145 a. Nose (or tail) wheel:

Does wheel unit function satisfactorily during ground operations and not require an exceptional degree of pilot skill or alertness (for a private pilot) to maintain directional control?..... Yes No

(Is nose (or tail) wheel steerable?..... Yes No)

(Can nose (or tail) wheel be locked?..... Yes No)

3.356 b. Gear is:.....Retractable Fixed

If gear is retractable, answer following:

(1) Does the positive means provided for the purpose of maintaining the wheels in the extended position operate satisfactorily?..... Yes No

3.356 (2) Can the landing gear, wheel well doors, and retracting mechanism in the extended position withstand the flight loads during retraction at $1.6V_{s1}$ flaps retracted, or at maximum gear extension speed, whichever is greater?..... Yes No

(Indicate speed of test_____M.P.H. I.A.S._____C.A.S.)

3.356 3.356-1 (3) At speed of $1.6V_{s1}$ (Flaps retracted) or at maximum speed with gear extended, whichever is greater, is the operation of the landing gear retracting mechanism and the doors satisfactory for the extension and the retraction of the gear, including degree of yawed flight expectable in this configuration?..... Yes No

3.359 3.765(a) (4) Does the indicator satisfactorily show the pilot at all times when the wheels are secured in either extreme position?..... Yes No

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SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

7. Landing Gear:

b. If gear is retractible, (continued)

3.359 3.359-2 3.359-1(a)	(5) For landplane, is an aural or equally effective device installed which shall function continuously after the throttle is closed until the gear is down and locked?..	Yes	No
3.357	(6) Is gear manually operated?.....	Yes	No
	If "no", specify type of means used_____, and answer the following:		
3.357	(a) Is an auxiliary means provided for extending the landing gear?.....	Yes	No
3.765(b)	(b) Is this control colored red and clearly marked as to method of operation?.....	Yes	No
3.358	(c) Is the operation of this auxiliary means satisfactory?.....	Yes	No

c. Brakes:

3.335 3.384	(1) Is operation of brake control system satisfactory?.....	Yes	No
3.363	(2) Are brakes adequate to prevent the airplane from rolling on a paved runway while applying takeoff power to the critical engine?.....	Yes	No
3.363	(3) Are brakes of sufficient capacity to provide adequate speed control during taxiing without the use of excessive pedal or hand forces?.....	Yes	No
3.335 3.384	d. Parking Brakes Installed?.....	Yes	No
	If "yes", answer the following:		
	(1) Is lock positive and operation satisfactory for ground starting of engine(s)?.....	Yes	No
	(2) Is arrangement such that inadvertent locking during flight unlikely?.....	Yes	No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

8. Control System Operation:

a. During any of the flight testing of this airplane, has it been necessary to change the travels of any of the control surfaces or tabs?..... No Yes

If "yes", list the item and the change in travel in degrees:

_____ _____

_____ _____

_____ _____

_____ _____

3.328 b. If an adjustable stabilizer is used, do stabilizer stops limit travel to a range permitting safe flight and landing? NA Yes No

3.347 c. Are any bungee devices used in any control system?..... No Yes

(1) If "yes", what are the control systems? _____

_____

_____

(2) Is rubber cord used for this purpose?..... No Yes

(3) Has the reliability of spring devices or other suitable device been established by tests simulating service conditions?..... Yes No

(a) If "no", has it been demonstrated that the failure of the spring or device will not cause flutter or unsafe flight characteristics?..... Yes No

_____

_____

_____

_____

_____

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

8. Control System Operation: (continued)

3.335 d. Do flight controls have a boost system or systems installed?.. No Yes

(1) If "yes", list the system and the type of boost operation:

_____ _____

_____ _____

_____ _____

(2) Has it been demonstrated that the airplane may be flown and landed safely in the event of failure of the boost system?..... Yes No

(a) If "no", is an adequate and reliable emergency boost control system provided which is completely independent of the primary boost system and which has been demonstrated to permit the airplane to be flown and landed safely?..... Yes No

REMARKS

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

9. Fuel Jettisoning System:

3.242 a. Is the maximum takeoff weight greater than 105% of the maximum landing weight?..... No Yes

(If "yes", is provision made for the jettisoning of fuel)?. Yes No

b. If a fuel jettisoning system is provided, complete preliminary tests using nonflammable colored fluid consisting of_____

_____.

c. Information:

(1) Which tanks use the same chutes?_____

_____

(2) Which tanks are symmetrically disposed about the center-line of the fuselage?_____

_____

(3) Give location of each dump chute _____

_____

d. Test results (with nonflammable fluid)

3.242 (4b.437(b)) (1) Does dumped fluid come in contact with any portion of airplane?..... No Yes

3.242 (4b.437(b)) (2) Does dumped fluid or fumes enter any portion of the airplane?..... No Yes

3.242 (4b.437(b)) (3) Is control of airplane adversely affected by dumping process?..... No Yes

3.242 (4b.437(d)) (4) Does dump valve operating mechanism permit closing valves?..... Yes No

3.242 (4b.437(d)) (5) Is there any evidence of leakage of valve after closing?. No Yes

3.335 (6) Is mechanism considered adequate?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

9. Fuel Jettisoning System:

d. Test results (with nonflammable fluid) (continued)

3.384 (4b.475) (7) Are fuel jettisoning controls conveniently located to operating personnel, provided with guards to prevent inadvertent operation, and located apart from any fire extinguishing controls?..... Yes No

3.384 (8) Are controls identified and clearly marked as to method of operation?..... Yes No

(If answer to any of these questions is underscored, describe fully under "Remarks".)

REMARKS

e. If preliminary tests are satisfactory, complete following tests using gasoline (Octane rating_____):

SECTION II.E.9.f.

Fuel Jettisoning Flight Test Data: (airplane at maximum T.O. Weight) Fluid used_____ T.O. Weight_____

C.G._____ Flap Position_____ Landing Gear Position_____ Cowl Flap Position_____

Tank No.	Location of Tank Equipped for Dumping	Tank Capacity Gallons	AT START OF DUMPING						AT END OF DUMPING					
			I.A.S. M.P.H.	Pressure Altitude	O.A.T. °F	Engines R.P.M.	Engines M.P.	Gallons in Tank	I.A.S. M.P.H.	Pressure Altitude	O.A.T. °F	*Fluid Left in Tank	Fluid Dumped	Time for Dumping
(1) Power Off Glide (Engines Idling) - Speed at $1.4V_{S1}$														
1														
2														
3														
4														
(2) Climb At One Engine Inoperative Vy Speed, Critical Engine Inoperative, Propeller In Minimum Drag Position On Remaining Engine(s)														
1														
2														
3														
4														
(3) Level Flight - Speed of $1.4V_{S1}$ - Test For This Condition Only If Tests (1) & (2) Indicate It May Be Critical.														
1														
2														
3														
4														

* Fluid remaining in tank must not be more than 20% of dumpable tank capacity.

ECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

9. Fuel Jettisoning System: (continued)

.242 (4b.437a)

g. What is the time to jettison fuel from maximum takeoff weight to maximum landing weight?_____ minutes.

(1) Is this time greater than 10 minutes?..... No Yes

(2) If "yes", is the average rate of jettisoning fuel per minute not less than 1% of the maximum takeoff weight?.. Yes No

.242 (4b.437a)

h. Is it demonstrated that flap extension does not adversely affect fuel jettisoning?..... Yes No

(1) If "no", is a placard provided adjacent to the dumping control to warn flight personnel against dumping fuel while the flaps are extended?..... Yes No

(2) Is a notation to this effect also included in the airplane operating manual?..... Yes No

.242 (4b.437)

i. During above tests:

(1) Does dumped fuel come in contact with any portion of airplane?..... No Yes

(2) Does dumped fuel or fumes enter any portion of the airplane?..... No Yes

(3) Is control of airplane adversely affected by dumping process?..... No Yes

(4) Is there any evidence of leakage of valve after closing? No Yes

.242 (4b.437c)

j. Is it possible to jettison fuel in the tanks used for take-off and landing below the level providing 45 minutes flight at 75% M.C. power?..... No Yes

(1) If "yes", is an auxiliary control provided which is independent of the main jettisoning control to do this? Yes No

(If answer to any of these questions is underscored, describe fully under "Remarks".)

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

10. Pressurization of Cockpit and Cabin:

a. Is pressurization provided for cockpit and/or cabin? (Circle which)?..... Yes No

b. If "yes", what are the following operational limits:

(1) Maximum pressure differential that can be maintained?_____p.s.i.

(2) Maximum pressure altitude for which the aircraft is approved?_____feet.

(3) Considering items (a) and (b), what is the internal pressure altitude that can be maintained at the maximum operating altitude?_____feet.

3.395(a) c. Are two pressure relief valves installed, at least one of which is the normal regulating valve?..... Yes No

3.395(a) d. Is the positive pressure differential automatically limited to a predetermined value during the maximum flow from the pressure source?..... Yes No

3.395(a) e. Is there an appreciable rise in pressure when one relief valve is inoperable?..... No Yes

3.395(b) f. Are reverse pressure differential relief valves installed that will automatically prevent a negative differential that would damage the structure?..... Yes No

3.395(c) g. Is a means provided by which the pressure differential can be rapidly equalized?..... Yes No

3.395(d) h. Is a regulator installed to control the intake and/or exhaust airflow so that the required internal pressure and airflow rates can be maintained?..... Yes No

This control is automatic_____, manual_____.

3.395(e) i. Are instruments provided to show the pilot the pressure differential, the absolute cabin pressure, and the rate of change of the absolute pressure?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

10. Pressurization of Cockpit and Cabin: (continued)

3.395(f) j. Is a warning system provided for the pilot to show when the safe or preset limits on pressure differential and on absolute internal pressure are exceeded?..... Yes No

3.395(g) k. Is structure designed for pressure differentials up to the maximum relief valve setting in combination with landing loads?..... Yes No

If "no", is a warning placard provided for the pilot?..... Yes No

3.396(b)(2) l. Do all parts of the pressurization system function properly under all possible conditions of pressure, temperature, and moisture up to the maximum altitude selected for certification?..... Yes No

3.396(b)(3) m. Do the pressure supply, pressure and flow regulators, indicators, and warning signals in steady and stepped climbs and descents at rates corresponding with the maximum attainable without exceeding the operating limitations of the airplane up to the maximum altitude selected for certification operate satisfactorily?..... Yes No

3.396(b)(4) n. Do all doors and emergency exits operate properly after being subjected to the flight tests in "m" above?..... Yes No

o. Are provisions made to keep the windshield adequately clear of ice and fog at all intended operating altitudes?. Yes No

p. Are adequate controls and equipment provided for the satisfactory maintenance of the above?..... Yes No

3.10 11. Noise Survey of Cockpit:

a. Does it appear that there is sufficient sound insulation in the cockpit so that the operating personnel would not be unduly affected as to interfere with the safe operation of the airplane?..... Yes No

If an instrument is available, what is the maximum decible reading?_____

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

12. Time of Operation of Flaps and Landing Gear:

3.338 a. Time of operation of flaps: (With throttles closed, gear up, speed (at V_f)_____M.P.H. I.A.S.)

(1) What is time to lower flaps from retracted to landing position?_____seconds.

(2) What is time to lower flaps from retracted to landing position by emergency means?_____seconds.

(3) What is time to raise flaps from landing position to fully retracted position?_____seconds.

(4) What is time to raise flaps from landing position to fully retracted position by emergency means?_____ seconds.

3.358 b. Time of operation of landing gear: (At any desired power, flaps retracted, speed (at 1.6 V_{s1})_____M.P.H. I.A.S.)

(1) What is time required to extend and lock landing gear from retracted position?_____seconds.

(2) What is time required to retract landing gear?_____ seconds.

3.357 (3) What is the time required to extend and lock the landing gear by emergency means?_____seconds.

(4) What is time required to retract the landing gear by emergency means?_____seconds.

13. Auxiliary Powerplant:

3.652 a. Are auxiliary powerplant units installed?..... Yes No

(1) If "yes", is the starting and the operation satisfactory?..... Yes No

_____

_____

_____

SECTION II. EQUIPMENT AND FLIGHT OPERATION: (continued)

F. Flutter and Vibration:

1. Test at V_d (to be investigated in increments of progressively higher speeds).

a. Test Information and Data:

(1) Are deicers installed?..... Yes No

If "yes" (See II E.2.a.)

(2) Service propeller installed. (See II C.2.)

(Should be propeller having both largest diameter and highest static R.P.M. to be noted in aircraft specifications)

(3) Maximum takeoff Wt._____lbs. at most rearward

C.G._____% MAC Ref.: Page_____App._____.

(4) Is airplane trimmed for level flight at M.C. power or at full throttle?..... Yes No

3.419(b) (5) Is V_d obtained (with power optional but not exceeding 110% M.C. R.P.M.) using service propeller?..... Yes No

(High pitch may be used for controllable propeller)

If "no", what propeller was used to permit V_d?

Make and Model_____

_____

(6) Maximum reading:

** Airspeed_____M.P.H. I.A.S.,_____M.P.H. C.A.S.

Engine_____R.P.M.

Manifold Pressure_____in. Hg.

* Acceleration_____G's.

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

F. Flutter and Vibration:

1. Test at V_d (continued)

3.159 b. During test were any of the following encountered:

3.311

(1) Excessive tail buffeting?..... No Yes

(2) Excessive vibration?..... No Yes

(3) Flutter?..... No Yes

(4) Airfoil divergence?..... No Yes

(5) Control reversal?..... No Yes

2. Test at V_{ne} for power off R.P.M. in glide with service props.

3.419(b) (Required only if service prop not used in obtaining V_d for above)

%V_{ne}	I.A.S. (M.P.H.)	C.A.S. (M.P.H.)	R.P.M.	*Maximum Acceleration
70				
80				
90				
100				

* Should not exceed maximum value on TIA.

Did service propeller cause engine R.P.M. to exceed 110% M.C. R.P.M. with power off at V_{ne}?.....NA No Yes

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

F. Flutter and Vibration: (continued)

3. Test at Vf (flaps extended, landing position):

a. Test Information and Data:

(1) Maximum landing weight_____lbs. at most rearward C.G._____% MAC Ref.: Page_____App._____.

(2) Maximum readings:

** Airspeed_____M.P.H. I.A.S.,_____M.P.H. C.A.S.

Engine_____ R.P.M.

* Acceleration_____G's

Manifold Pressure_____in. Hg.

3.159 b. During test were any of the following encountered:

3.311

(1) Excessive buffeting?..... No Yes

(2) Excessive vibration?..... No Yes

(3) Flutter?..... No Yes

(4) Airfoil divergence?..... No Yes

(5) Control reversal?..... No Yes

3.347 4. Spring Devices in Control Systems

a. If there are spring devices in the control systems and section II E.8.c.(3) is answered in the negative, were items F. 1 and 3 investigated with the spring disconnected and inactive?..... NA Yes No

(If "yes", were flutter and vibration characteristics satisfactory?)..... Yes No

* Should not exceed maximum value on TIA.

** If other than design value, explain under "REMARKS".

_____

_____

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

F. Flutter and Vibration: (continued)

3.117 5. Dynamic Stability (Short Period Oscillation)

3.118

3.118(a)(4) a. *** Is any short period oscillation (about any axis) occurring between stalling speed (V_S) and maximum permissible speed (V_{ne}) heavily damped with the primary controls:

(1) Free..... NA Yes No

(If answer is "yes", or "no", describe under "REMARKS")

* Should not exceed maximum value stated on pertinent TIA.

** If other than design value, explain reason under "REMARKS".

*** The test for this characteristic is to excite the individual control by a short sharp disturbance.

REMARKS

REMARKS

SECTION III. POWERPLANT OPERATION

A. Fuel System:

3.437(b) 1. Unusable Fuel Supply:
3.437(a)

The Unusable Fuel Supply Is The Quantity Remaining In The Tank After First Evidence of Malfunctioning of Engine

	Condition		Tank #1 Gallons	Tank #2 Gallons	Tank #3 Gallons	Tank #4 Gallons	Tank #5 Gallons
		Indicate amount of fuel in Tank at Start of Each Test (Should be as Low as Practical)					
Note the critical unusable fuel and order of the conditions in being critical	1	Level Flight at M.C. power or at V_c, whichever is less including sideslips and skids of greatest severity likely to be encountered in normal service or turbulent air.					
	2	Climb at M.C. power at calculated best angle of climb at minimum weight including sideslips and skids of greatest severity likely to be encountered in normal service or turbulent air.					
	3	Transition to best rate of climb by rapid application of power following a power-off glide at 1.3 V_{so} including sideslips and skids of greatest severity likely to be encountered in normal service or turbulent air.					

3.437(a) a. Is it desired that all the tanks feed the engine(s) in all conditions listed above?..... Yes No

(If "no", is each tank placarded against use in the conditions of flight not investigated?)..... Yes No

3.440 b. Is the unusable fuel supply in any tank greater than 5% of the tank capacity or 1 gallon?..... No Yes

(If "yes", is a placard and a suitable notation included in the airplane flight manual to indicate to the flight personnel that the fuel remaining in the tank when the indicator reads zero cannot be used safely in flight?).. Yes No

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SECTION III. POWERPLANT OPERATION:

A. Fuel System: (continued)

2. Operation:

3.437(f) a. Is there any malfunctioning during takeoff and climb for one minute at the calculated attitude of best angle of climb at takeoff power and minimum weight using quantity of fuel in each tank that does not exceed the unusable fuel plus 0.03 gallons for each M.C. horsepower?..... No Yes

3.437(c) b. For "Utility Category Airplanes," is there any malfunctioning during the execution of all approved maneuvers included in the approved operating limitations? (The fuel in each tank shall not exceed the unusable fuel plus 0.03 gallons for each M. C. power)..... NA No Yes

3.437(d) c. For "Acrobatic Category Airplanes," is there any malfunctioning during the execution of all approved maneuvers included in the airplane flight manual. (The fuel in each tank shall not exceed the unusable fuel plus 0.03 gallons for M.C. power)..... NA No Yes

3.438 d. Does airplane have a suction lift fuel or other system conducive to vapor formation?..... Yes No

If "yes", did any vapor lock occur when using fuel at a temperature of 110°F under the critical operating conditions? No Yes

3.437(e) e. Time to regain power: (more than one supply source involved). NA

(1) From level flight at M.C. power run dry on each tank, turn on another tank containing ample fuel:

(a) Is time to regain power acceptable?..... Yes No

(Not more than 10 seconds for single engine, 20 seconds for multiengine).

Tank Number Run Dry	Tank Number Turned On	TIME TO REGAIN POWER	
		Using Auxiliary Pump	Without Auxiliary Pump

SECTION III. POWERPLANT OPERATION: (continued)

B. Carburetor Air Heat Rise:

3.606 1. Test Data:

Airplane weight at takeoff (optional)_____lbs., optional C.G._____% MAC and be flown in level flight at cruising mixture setting in air free of visible moisture. Ref.: Page_____Appendix_____

NOTE: May be flown at only one altitude if O.A.T. of 30°F is Available	MINIMUM ALTITUDE						INTER-MEDIATE ALTITUDE						MAXIMUM ALTITUDE (75% MC Power or Full Throttle)					
	Full Throttle or MC Power*		90% IAS of Column #1		80% IAS of Column #1		Full Throttle or MC Power*		90% IAS of Column #1		80% IAS of Column #1		Full Throttle or MC Power*		90% IAS of Column #1		80% IAS of Column #1	
Carburetor Air Heat Control Position																		
Pressure Altitude(ft.)																		
O.A.T. (°F)																		
C.A.T. (°F)																		
Heat Rise																		
I.A.S. (M.P.H.)																		
R.P.M.																		
M.P. (In. Hg.)																		
Indicated B.H.P.																		
Pressure Correction Factor**																		
Std. Temperature for Pressure Altitude(°F)																		
Temperature Correction Factor																		
Actual B.H.P.																		
% Rated B.H.P.																		
Throttle Position																		

*Supercharged Engines Only. **For Sea Level Engines

SECTION III. POWERPLANT OPERATION:

B. Carburetor Air Heat Rises: (continued)

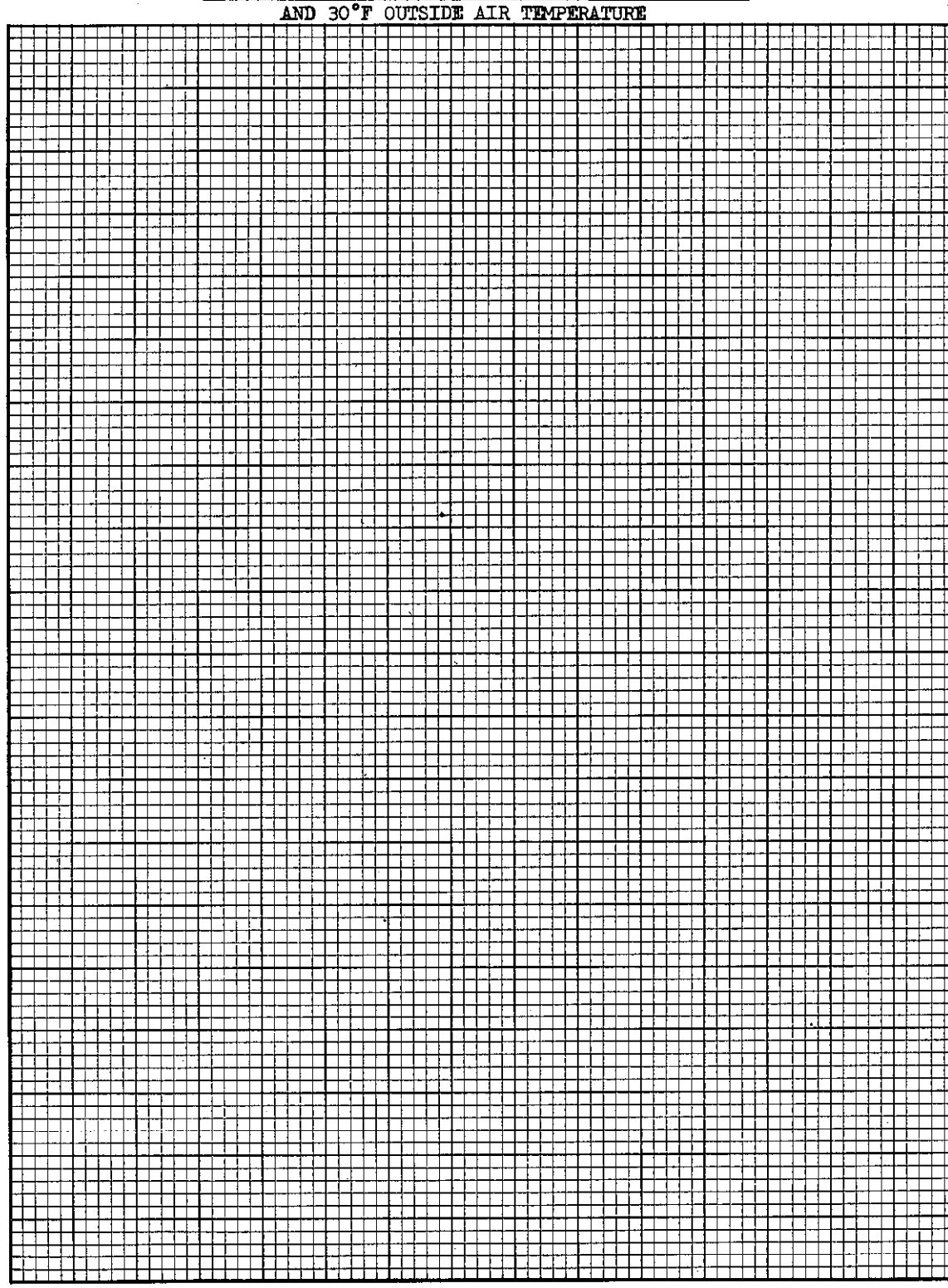
2. Test Results (corrected to correct power and outside air temperature)

	Type Engine (& Carb.)	Required Heat Rise At 30°F O.A.T.	Actual Heat Rise At 30°F O.A.T.	Requirements Met
3.606(a)	Sea level (Venturi)	90°F at 75% M.C. power		NA Yes No
3.606(d)	Single engine Sea level (non ice prone)	Sheltered alternate air source with preheat at least that of engine cylinder downstream air, or equivalent.		NA Yes No
3.606(e)	Multiengine Sea level (non ice prone)	90°F at 75% M.C. power		NA Yes No
3.606(b)	Altitude (Venturi)	120°F at 75% M.C. power		NA Yes No
	Altitude (non ice prone)	100°F at 60% M.C. power or 40°F with fluid deicing system		NA Yes No

3. For multiengine airplanes, were above results obtained from the critical engine (least carburetor air heat rise)?..... NA Yes No

CARBURETOR AIR HEAT RISE AT _____% RATED B.H.P.
AND 30°F OUTSIDE AIR TEMPERATURE

B.H.P. _____% M.C. POWER



OUTSIDE AIR TEMPERATURE °F

CARBURETOR AIR HEAT RISE °F

SECTION III. POWERPLANT OPERATION: (continued)

3.581 C. Cooling:

1. Climb Conditions (in air free of visible moisture):

3.582 a. Takeoff weight (max.)_____

C.G. (optional)_____% MAC Ref.: Page_____

Appendix_____

b. Fuel Grade_____(minimum approved for engine)

c. Mixture Setting_____(should be same as used in normal operations)

d. Engine Power:

(1) _____R.P.M.

(2) Manifold Pressure_____in. Hg.

e. Propeller Model (See II C.2.a.)

f. Cowl Flap Position_____(should be same as used in establishing M.C. power climb)

g. Has engine more than one stage blower?..... No Yes

(If "yes", are cooling tests performed and submitted for each blower stage?)..... Yes No

h. If a multiengine airplane, is inoperative propeller in minimum drag condition?..... NA Yes No

Also complete the following:

Which engine is inoperative?_____

Hottest cylinder head on which engine?_____

Hottest cylinder barrel on which engine?_____

SECTION III. POWERPLANT OPERATION:

C. Cooling:

1. Climb Conditions (in air free of visible moisture): (continued)

3.583-1 i. Is "winterization" equipment installed?..... Yes No

If "yes", answer the following:

(1) What is applicant's selected maximum temperature_____°F

(2) Is this value used in lieu of the 100°F hot day in correction of test data to maximum anticipated temperatures?..... Yes No

(3) Does the AFM clearly indicate that the winterization equipment must be removed whenever the temperature reaches the limit for which approved?..... Yes No

(4) Is the cockpit placarded similarly (with item (3) information)?..... Yes No

(5) Is airplane equipped with an outside air temperature gage or with a cylinder/barrel/oil gage (whichever is critical)?..... Yes No

3.586 (3-2) j. Cooling test procedure requirements (strike out nonapplicable sections):

(1) For Sea Level Engines, Single Engine Airplane:

After stabilizing engine temperatures in flight with engines operating at not less than 75% MCP, start at lowest practicable altitude and climb for one minute at takeoff power; continue climb at full throttle until at least 5 minutes after the occurrence of the highest temperature recorded:

Is climb conducted at a speed greater than best R/C speed?..... No Yes

(a) If "yes", is the slope of the flight path at the cooling speed equal to or greater than the minimum required angle of climb?..... Yes No

(b) If "yes", is a cylinder head temperature indicator provided?..... Yes No

SECTION III. POWERPLANT OPERATION:

C. Cooling:

1. Climb Conditions (in air free of visible moisture)

j. Cooling test procedure requirements (strike out nonapplicable sections): (continued)

(2) For Supercharged Engines, Single Engine Airplane:

After stabilizing engine temperature in flight with engine operating at not less than 75% MCP, tests for each blower stage should start at 1,000 feet below the actual engine critical altitude of each stage and continue at least 5 minutes after the occurrence of the highest temperature recorded:

Is climb conducted at a speed greater than best R/C speed?..... No Yes

(a) If "yes", is the slope of the flight path at the cooling speed equal to or greater than the minimum required angle of climb?..... Yes No

(b) If "yes", is a cylinder head temperature indicator provided?..... Yes No

3.587(a) (3) For multiengine airplanes that meet the minimum one engine inoperative climb performance:

With the airplane in the configuration that was used in establishing the critical engine inoperative climb performance, the operating engine(s) at M.C. power or at full throttle (above the critical altitude), and after the temperatures are stabilized in flight with engines operating at not less than 75% MCP the climbs, for each blower stage, shall be started at the lower of the two following altitudes, and continued for 5 minutes after the first occurrence of the highest temperature:

1,000 feet below the actual engine critical altitude of the lowest practicable altitude (when applicable);

1,000 feet below the altitude at which the single-engine inoperative rate of climb is 0.02 V_{SO} 2.

Is climb conducted at a speed not over the speed used in establishing the one engine inoperative climb performance?..... Yes No

If "yes", is a cylinder head temperature indicator provided?..... Yes No

SECTION III. POWERPLANT OPERATION:

C. Cooling:

1. Climb Conditions: (in air free of visible moisture)

j. Cooling test procedure requirements (strike out nonapplicable sections):

3.587(a) (3) For multiengine airplanes that meet the minimum one engine inoperative climb performance: (continued)

(a) If speed exceeds the best rate of climb speed with one engine inoperative, is a cylinder head temperature indicator provided for each engine?.... NA Yes No

(For high blower cooling, the minimum altitude for start of climb need not be lower than the lowest approved altitude for high blower operation.)

3.587(b) (4) For multiengine airplanes that cannot meet the minimum
3.587-1 one engine inoperative: (for airplanes having positive climb)

After stabilizing temperature in flight with engines operating at not less than 75% M.C. power, the climb shall be commenced at as near sea level as practicable for low blower and shall be conducted at the best rate of climb speed.

(5) For multiengine airplanes that cannot meet the minimum one engine inoperative: (for airplanes with zero climb or a rate of sink)

While stabilizing temperature in level flight at the lowest practical altitude above the ground with engines operating at not less than 75% M.C. power, use M.C. power on test engine and sufficient power on remaining engine(s) to maintain level flight at the speed for minimum rate of descent. When temperature is thus stabilized reduce power on remaining engine(s), maintain speed for minimum rate of descent, and record test data.

Is climb or descent conducted at best one-engine inoperative rate of climb or minimum rate of descent speed?.. Yes No

(For high blower cooling, the altitudes for conducting these tests should be that approved for high blower operation.)

ECTION III. POWERPLANT OPERATION:

C. Cooling:

1. Climb Conditions (in air free of visible moisture): (continued)

k. Climb Test Data:

Time (Minutes)	Pressure Altitude (Ft.)	Observed Temperature °F				Operating Engine(s)___			Speed of Test M.P.H.	
		O.A.T.	Head No.___	Barrel No.___	Oil	M.P. in. Hg.	R.P.M.	C.A.T. °F	I.A.S.	C.A.S.

SECTION III. POWERPLANT OPERATION:

C. Cooling:

1. Climb Conditions (in air free of visible moisture): (continued)

3.583 1. Climb Test Results:
3.584
3.585

		(1) Cylinder Head No._____	(2) Barrel or Base No._____	(3) Oil Inlet
(a)	Maximum Observed Temperature (°F)			
(b)	True Observed Temperature (°F)			
(c)	Pressure Altitude (Ft.)			
(d)	Observed O.A.T. (°F)			
(e)	True O.A.T. (°F)			
(f)	Corrected Temperature (°F)	*	**	***
(g)	Maximum Permissible Temperature (°F)			
(h)	Is Temperature Satisfactory?	Yes No	Yes No	Yes No

* Corrected Head Temperature = (1)(b)_____ + 100 − 0.0036 x (1)(c)_____ − (1)(e)_____ = _____.

** Corrected Barrel Temperature = (2)(b)_____ + 0.7 $\sqrt{100}$ − 0.0036 x (2)(c)_____ − (2)(e)_____ $\sqrt{}$ = _____.

*** Corrected Oil Inlet Temperature = (3)(b)_____ + 100 − 0.0036 x (3)(c)_____ − (3)(e) _____ = _____.

Are all calibration curves attached?..... Yes No

ECTION III. POWERPLANT OPERATION:

C. Cooling: (continued)

.582-1 2. Water Taxiing Conditions: (applicable to flying boats only)

a. Takeoff Weight (maximum)_____C.G._____% MAC

Ref.: Page_____Appendix_____

b. Fuel Octane No.:_____(minimum approved for engine.)

c. Mixture Setting_____(normal setting for power used).

d. Cowl Flap Position_____(may be best setting for cooling).

e. If multiengine, complete the following:

Hottest cylinder head is on which engine?_____

Hottest cylinder barrel is on which engine?_____

Highest oil inlet temperature is on which engine?_____

f. Test procedure and data

After stabilizing cylinder and oil inlet temperature, taxi downwind for 10 minutes at 5 M.P.H. above the step speed, and record data below:

Time (Minutes)	Pressure Altitude (Ft.)	Observed Temperature °F				Operating Engine(s)			Speed of Test M.P.H.	
		O.A.T.	Head No.___	Barrel No.___	Oil	M.P. in. Hg.	R.P.M.	C.A.T. °F	I.A.S.	C.A.S.

SECTION III. POWERPLANT OPERATION:

C. Cooling:

2. Water Taxiing Conditions: (applicable to flying boats only) (continued)

3.583 g. Water Taxiing Test Results:

3.584

3.585

	(1) Cylinder Head No._____	(2) Barrel or Base No._____	(3) Oil Inlet
(a) Maximum Observed Temperature (°F)			
(b) True Observed Temperature (°F)			
(c) Pressure Altitude (Ft.)			
(d) Observed O.A.T. (°F)			
(e) True O.A.T. (°F)			
(f) Corrected Temperature (°F)	*	**	***
(g) Maximum Permissible Temperature (°F)			
(h) Is Temperature Satisfactory?	Yes No	Yes No	Yes No

* Corrected Head Temperature = (1)(b)_____ + 100 − 0.0036 x (1)(c)_____ − (1)(e)_____ = _____.

** Corrected Barrel Temperature = (2)(b)_____ + 0.7 $\sqrt{}$ 100 − 0.0036 x (2)(c) _____ − (2)(e)_____ $\sqrt{}$ = _____.

*** Corrected Oil Inlet Temperature = (3)(b)_____ + 100 − 0.0036 x (3)(c) _____ − (3)(e)_____ = _____.

h. Are all calibration curves attached?..... Yes No

SECTION III. POWERPLANT OPERATION: (continued)

D. Test For Carbon Monoxide:

1. Airplane may be at any convenient weight and C.G. position.

2. Using a "CO" indicator reading instrument, record the values for the following tests:

3.615
3.393

	CLIMB M.C. Power or Full Throttle Speed 1.4 V_{s1} Mixture Full Rich		CRUISE 75% M.C. Power Mixture_____		GLIDE Engine(s) throttled Speed 1.4V_{s1} Flaps Up	
	Windows and/or Vents					
	Partly open	Closed	Partly open	Closed	Partly open	Closed
a. Maximum Reading (Cockpit):						
(1) Along Windows and/or Vents						
(2) Along Floor						
(3) Front of Instrument Panel						
(4) Front of Pilots Face						
b. Maximum Reading (Cabin):						
(1) Front						
(2) Center						
(3) Rear						

3.388

	AUXILIARY POWER UNIT Installed? No Yes		HEATERS Installed? No Yes		OTHERS	
c. With Tester Directly in Front of Unit While Unit is Operating						

3. Does any of the above readings exceed 0.005 of 1 per cent?..... No Yes

SECTION IV. PERFORMANCE

A. Airspeed Calibration:

1. Over Speed Course

a. Weight _____ lbs. (Max. T.O. Weight)

3.663

C.G. _____ % MAC (Intermediate) Ref.: Pages _____ Appendix ____

b. Course Distance _____ Ft. (At least two miles)

c. Pressure Altitude _____ Ft. (Altimeter set to 29.92")

d. Are at least 5 complete runs conducted for each flap position?... Yes No

(Landing gear should be extended when flaps are extended).

Flap Position (Degrees)	Gear Position (Up or Down)	OBSERVED DATA				Ground Speed * (M.P.H.)	Average Ground Speed (M.P.H.)	Factor **	Calibrated Air Speed (M.P.H.)	Average I.A.S. (M.P.H.)	ERROR (M.P.H.)		
		Time (Seconds)	I.A.S. (M.P.H.)	Pressure Altitude (Ft.)	O.A.T. (°F)						Airspeed Installation	Instrument	Position

* Course Speed (M.P.H.) = $\frac{0.6818 \times \text{Course Distance (Ft.)}}{\text{Time (Seconds)}}$

** Factor = $\sqrt{\frac{\rho}{\rho_0}} = 4.16 \sqrt{\frac{\text{Observed Pressure (In. Hg.)}}{460 + \text{Observed Temperature } °F}}$ (Or read from chart)

SECTION IV. PERFORMANCE:

A. Airspeed Calibration:

2. Airspeed Boom or Trailing Bomb:

3.663 a. Weight_____lbs. (Max. T.O. Weight);

C.G._____% MAC (Intermediate) Ref.: Pages_____Appendix____

b. Boom or Bomb Data:

(1) Length of Cable_____Ft. (At least one wingspan)

(2) Is boom or bomb balanced for lag?..... Yes No

(3) Boom or bomb Serial No._____Boom or bomb Airspeed Instrument No._____

3.65 (4) Has this combination been calibrated within the past six months?..... Yes No

(5) Is calibration attached?..... Yes No

Reference_____.

(6) If no, where is calibration curve filed?_____

_____

c. Are at least 5 runs conducted for each flap setting?..... Yes No

(Landing gear should be extended when flaps are extended).

d. Is at least one run conducted in level flight at 75% M.C. power?. Yes No

_____

_____

_____

_____

_____

_____

_____

SECTION IV. PERFORMANCE:

A. Airspeed Calibration:
2. Airspeed Boom or Trailing Bomb: (continued)

e. Test Data

Flap Position (Degrees)	Gear Position (Up or Down)	OBSERVED DATA			Bomb Correction (M.P.H.)	Calibrated Airspeed (M.P.H.)	ERROR (M.P.H.)		
		Airplane I.A.S. (M.P.H.)	Bomb I.A.S. (M.P.H.)	Flight Attitude (Level or Diving) *			Airspeed Installation	Instrument	Position

* Level flight data desired at all speeds where practicable.

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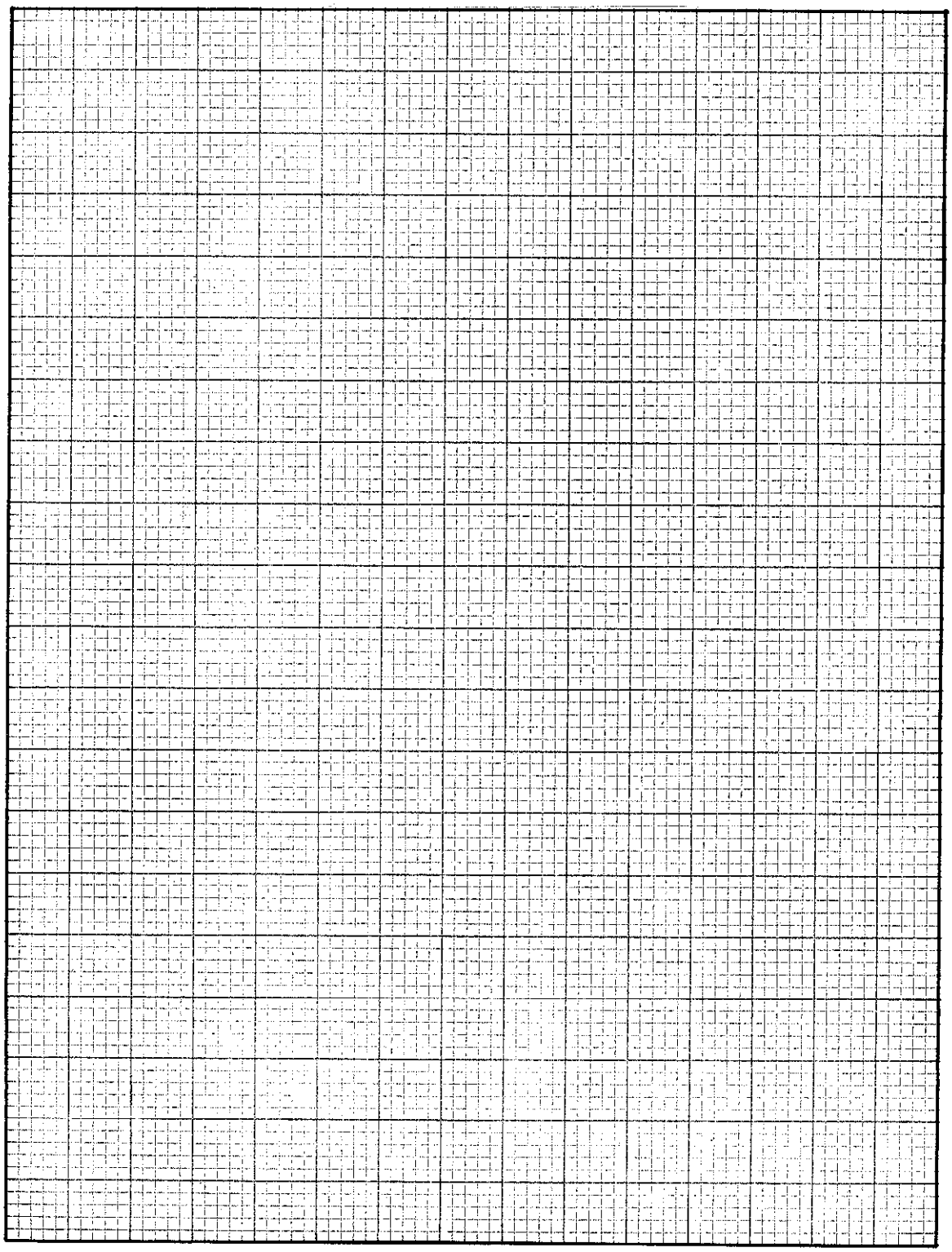
AIRSPEED INSTALLATION CALIBRATION CURVE



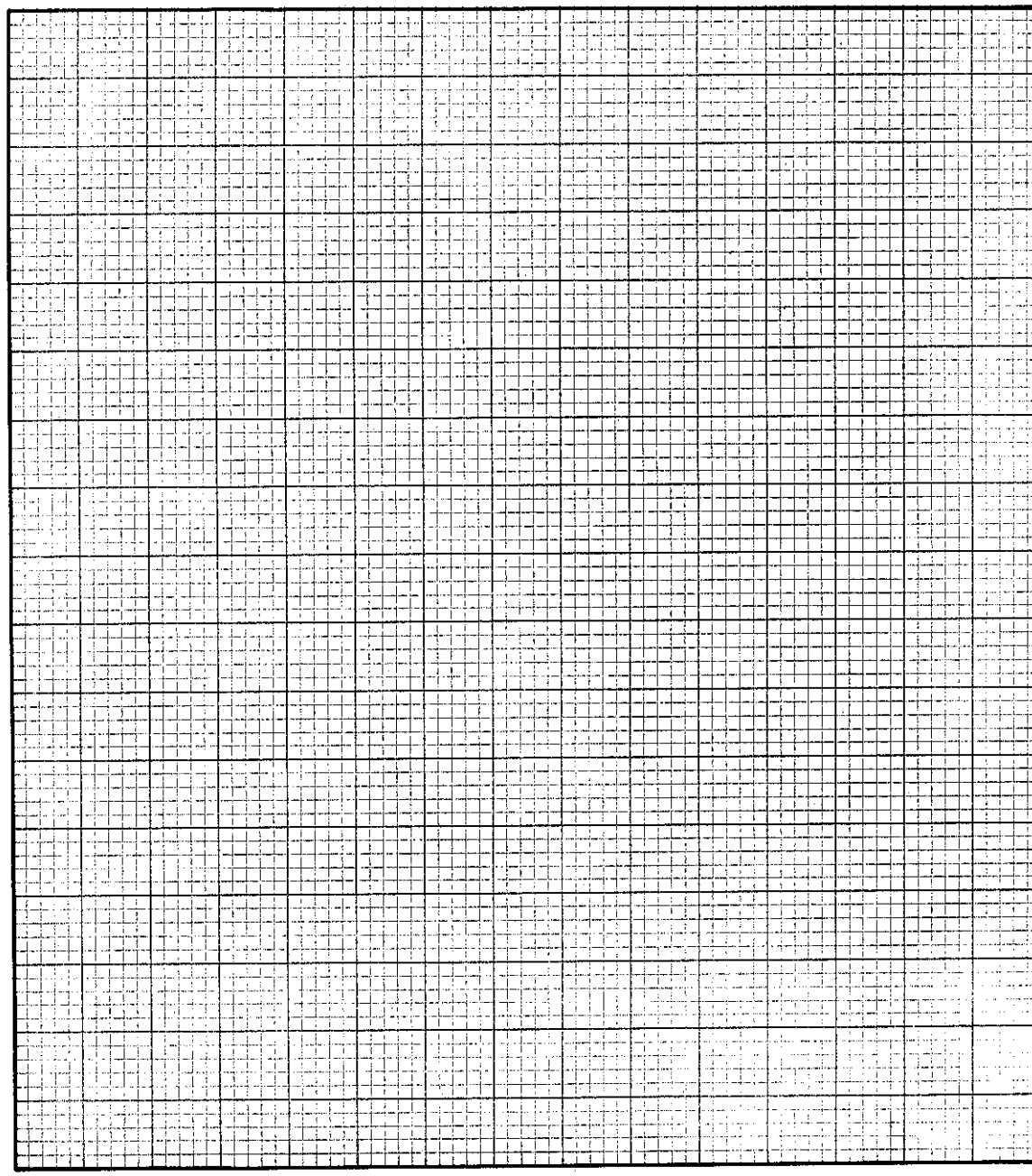
INDICATOR READING (M.P.H.)

AIRSPEED CALIBRATION CURVE
POSITION ERROR ONLY

(Difference between "airplane airspeed instrument" calibration and the "airplane airspeed installation" calibration).

Is airplane airspeed instrument calibration attached?.....Yes No

Reference _____



SECTION IV. PERFORMANCE:

A. Airspeed Calibration: (continued)

3.663 3. With flaps and gear up, and throughout range from V_c (_____

_____M.P.H., C.A.S.) to 1.3 V_{s1} (_____M.P.H., C.A.S.),

is the installational error greater than plus or minus 3% of the C.A.S. or 5 M.P.H. (Whichever is greater)?..... No Yes

3.663 4. With flaps and gear down, and at 1.3 V_{s1} (_____M.P.H., C.A.S.) is the installational error greater than plus or minus 3% of the C.A.S. or 5 M.P.H. (Whichever is greater?)..... No Yes

B. Airflow Variation

3.665 Are the airspeed indicator, altimeter and any other instruments which are provided with static air case connections influenced by the airplane attitude, opening and closing of windows or any condition of airflow variation such that their accuracy is seriously affected. (Give details below)..... No Yes

REMARKS

SECTION IV. PERFORMANCE: (continued)

3.82 C. Determination of Stalling Speed (V_{so}):
3.120

1. General Data:

a. Were deicers installed? (See II E.2)..... No Yes

3.82-1 b. Are engines idling with throttles closed and not more than zero thrust?..... Yes No

c. Are propeller pitch controls in position normally used for takeoff?..... Yes No

d. Are cowl flaps closed?..... NA Yes No

e. Is landing gear extended?..... Yes No

f. Is airplane trimmed to straight flight at a ± 3 M.P.H. or 3% of 1.5 V_{s1} or minimum trim speed, whichever is greater?. Yes No

SECTION IV. PERFORMANCE:

C. Determination of Stalling Speed (V_{so}): (continued)

2. At Most Forward Center of Gravity Position:

a. Weight _____ lbs. (Max. T.O. Weight); C.G. _____ % MAC (Most Forward); Ref.: Page _____ Appendix _____

Wing Flap Angle	Time	Weight At Test W_1 Lbs.	Trim Speed M.P.H. C.A.S.	Prop. Pitch Low or Deg.	Engine R.P.M.	I.A.S. Where One MPH/Sec. Is First Obtained	Test Airspeed At Stall V_1 - M.P.H. I.A.S.	Test Airspeed At Stall V_1 - M.P.H. C.A.S.	$\sqrt{\frac{W}{W_1}}$	$V_{so} = V_1\sqrt{\frac{W}{W_1}}$ M.P.H. C.A.S.
Landing Flap ____°										
Intermediate Flap ____°										
Intermediate Flap ____°										
Intermediate Flap ____°										
No Flap ____°										

b. Is airplane unstallable?..... No Yes

If "yes", what is the minimum steady flight speed at which the airplane is controllable? _____ C.A.S. M.P.H.

SECTION IV. PERFORMANCE:

C. Determination of Stalling Speed (V_{SO}): (continued)

3. At Most Rearward Center of Gravity Position:

a. Weight_____ Lbs. (Max. T.O. Weight); C.G._____% MAC (Most Rearward); Ref.: Page_____Appendix _____

Wing Flap Angle	Time	Weight At Test W_1 Lbs.	Trim Speed M.P.H. C.A.S.	Prop. Pitch Low or Deg.	Engine R.P.M.	I.A.S. Where One MPH/Sec. Is First Obtained	Test Airspeed At Stall V_1 - M.P.H. I.A.S.	Test Airspeed At Stall V_1 - M.P.H. C.A.S.	$\sqrt{\frac{W}{W_1}}$	$V_{SO} = V_1\sqrt{\frac{W}{W_1}}$ M.P.H. C.A.S.
Landing Flap ____°										
Intermediate Flap ____°										
Intermediate Flap ____°										
Intermediate Flap ____°										
No Flap ____°										

b. Is airplane unstallable?..... No Yes

If "yes", what is the minimum steady flight speed at which the airplane is controllable?_____ M.P.H. C.A.S.

3.83 4. For single engine airplanes, does V_{SO} at maximum takeoff weight and with landing flap exceed 70 M.P.H. C.A.S.? ..... NA No **Yes**

ECTION IV. PERFORMANCE: (continued)

D. Determination of Critical Inoperative Engine:
.85(b)

.85a(b) 1. At Takeoff

a. Weight_____lbs. (any convenient weight);

C.G._____% MAC; Ref.: Page_____

Appendix_____

b. Propeller (See II C.2.)

c. Were deicers installed?..... No Yes

If "yes" (See II E.2.)

d. Mixture setting_____(should be same as in cooling test)

e. Cowl flap setting_____(should be same as in cooling test)

f. Time of takeoff_____

2. Observed Flight Test Data:

a. Is the landing gear retracted?.....Fixed Yes No

b. Is the inoperative propeller in the minimum drag position. Yes No

(1) What is this position?_____

c. Are the remaining engines operating at M.C. power?..... Yes No

SECTION IV. PERFORMANCE:

D. Determination of Critical Inoperative Engine:

2. Observed Flight Test Data: (continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(9)	(10)	(11)**
* Inoperative Engine		Time	Pressure Altitude Feet	Pressure Altitude at 1/2 Minute	O.A.T. °F	C.A.T. °F	Operating Eng. M.P. in.Hg.	Operating Eng. R.P.M.	Approx. Best R/C Speed I.A.S.	C.A.S.	Wt. & Obs. R/C
RPM	a										Wt.
	b										
	c										R/C
	d										
	e										
	f										
RPM	a										Wt.
	b										
	c										R/C
	d										
	e										
	f										
RPM	a										Wt.
	b										
	c										R/C
	d										
	e										
	f										
RPM	a										Wt.
	b										
	c										R/C
	d										
	e										
	f										

* Indicate inoperative engine by Left Outboard (LO), Left Inboard (LI), Right Inboard (RI), Right Outboard (RO); also R.P.M. of inoperative propeller. (After stabilizing airplane, conduct above tests at approximately identical altitudes. Altitude readings should be made at one minute intervals for five minutes)

** Observed rate of climb = $\frac{(4)f - (4)a}{(3)f - (3)a}$

e. Which inoperative engine is critical? _____

SECTION IV. PERFORMANCE:

3.85 E. Climbs:

1. General Data:

a. Were deicers installed? (If "yes" (See II.E.2.)) ..... No Yes

b. Propeller (See II.C.2.)

c. Mixture setting_____(Should be same as in cooling test)

3.85(a) 2. Normal Climb (all engines operating): (Desired, but not required for airplane 6,000 lbs. or less)

a. Is landing gear retracted?.....Fixed Yes No

3.85-2 b. Are wing flaps in T.O. position?..... NA Yes No

(1) What is flap position?_____degrees.

c. Are engines operating at not more than M.C. power?..... Yes No

d. Weight_____lbs. (Max. T.O. Weight)

C.G._____% MAC Ref.: Page_____Appendix_____

e. Cowl flap setting_____(Should be same as in cooling test)

f. Results (from chart on next page)

g. What is observed R/C at sea level?_____Ft./Min.

*h. What is corrected R/C at sea level?_____Ft./Min.

i. What is actual angle of climb (expressed as a ratio)?_____

_____

j. Is steady R/C at sea level greater than 300 Ft./Min.?..... Yes No

k. Is steady angle of climb greater than 1:12 for landplanes or 1:15 for seaplanes?..... Yes No

l. Are data for inclusion in the operating limitations submitted to indicate variations in climb for a variation in altitude from S.L. to 7000 feet and air temperature from 0°F to 100°F? (Seaplanes need not show temperatures below 30°F at altitudes above 1000 feet)..... Yes No

(1) Is this graph also attached to this TIR?..... Yes No

*See Page 101.

SECTION IV. PERFORMANCE:

3.85 E. Climbs:

2. Normal Climb (all engines operating): (Desired, but not required for airplane 6,000 lbs. or less) (continued)

	Time	Pressure Altitude (Feet)		O.A.T. °F	C.A.T. °F	I.A.S. M.P.H.	Engine R.P.M.	M.P. in. Hg.	Weight lbs.
		Ea. Min.	Ea. 1/2 Min.						
Climb #1									
Climb #2									
Climb #3									
Climb #4									
Climb #5									
HS*									

* Record high speed run in level flight at intermediate altitude

(Use additional data sheets in appendix when required)

* (from page 100)

Corrected R/C = R/Cobs. Tamb./Tstd. at test day true airspeed.

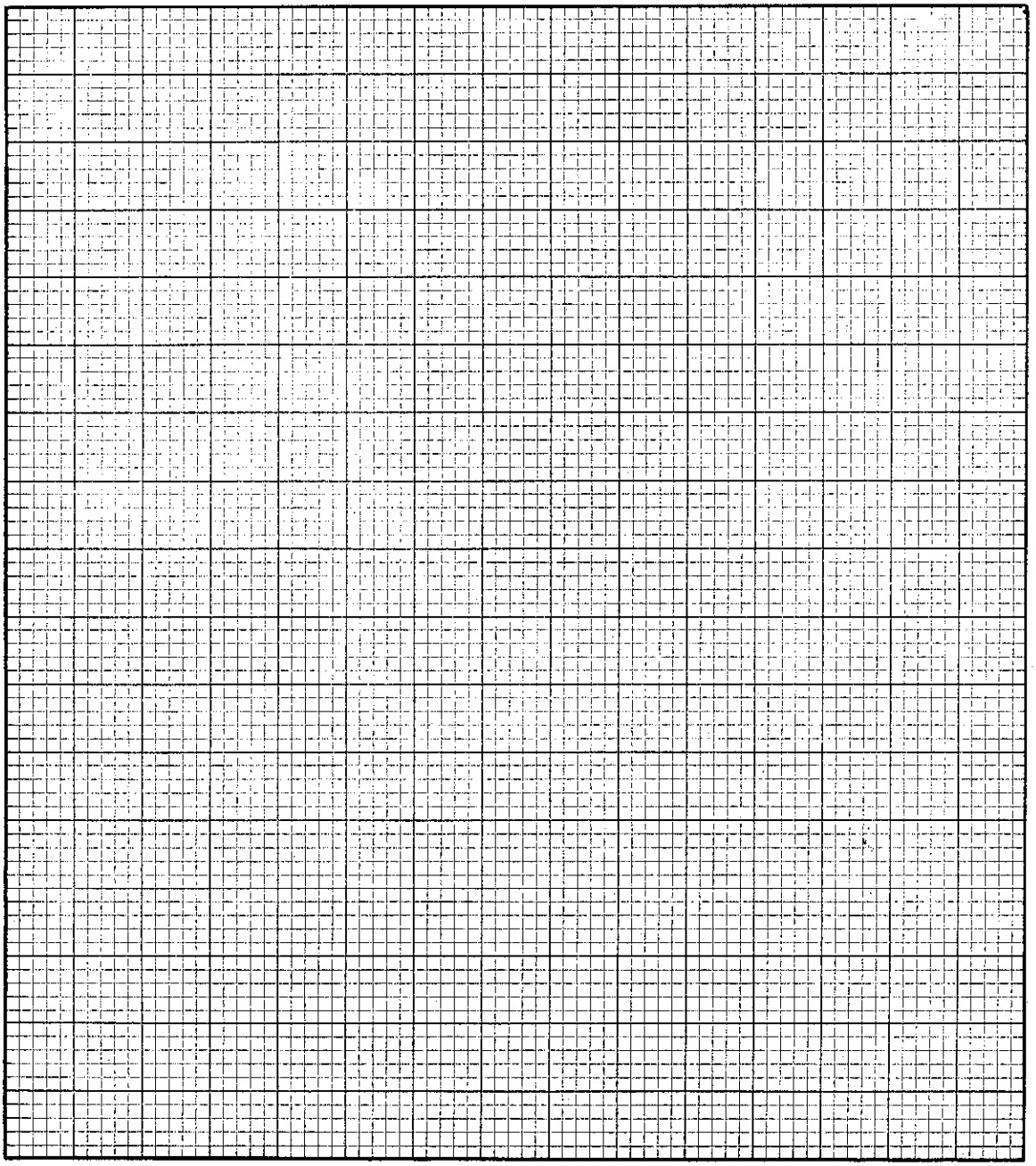
Corrected R/C = R/Cobs. $\sqrt{Tstd/Tamb.}$ at standard day true airspeed. (final value to be used)

CURVES FOR DETERMINING THE BEST RATE OF CLIMB AND SPEED
NORMAL CLIMB - ALL ENGINES OPERATING

.85(a) Landing Gear Position_____ Weight_____lbs.

Wing Flap Position_____ Cowl Flap Position_____

Power_____



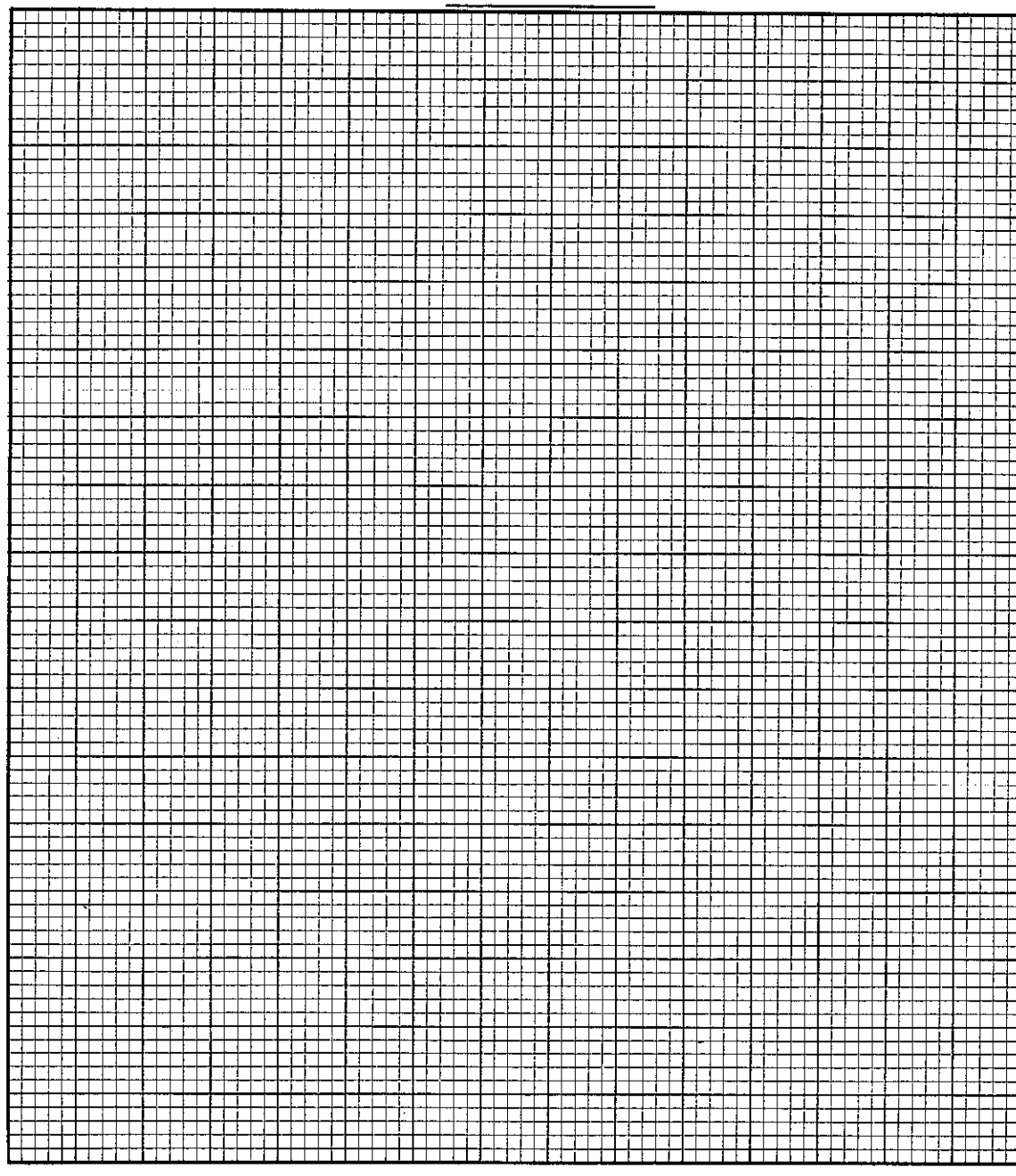
CALIBRATED AIRSPEED (M.P.H.)

NORMAL CLIMB PERFORMANCE - ALL ENGINES OPERATING

3.85(a) Landing Gear Position_____ Weight_____lbs.

Wing Flap Position_____ Cowl Flap Position_____

Power_____



DENSITY ALTITUDE (feet)

BEST RATE OF CLIMB (ft/min)

BEST R/C SPEED M.P.H. C.A.S.

ECTION IV. PERFORMANCE:

E. Climbs: (continued)

3.85(b) 3. Critical Engine Inoperative Climb:

3.85a(b) a. Is landing gear retracted?.....Fixed Yes No

b. Are wing flaps in the most favorable position for climb? NA Yes No

(1) What is flap position?_____degrees

c. Which is the inoperative engine?_____

(1) Is the inoperative propeller in the minimum drag position?..... Yes No

(a) What is this position?_____

d. Are remaining engines operating at not more than M.C. power? Yes No

e. Weight_____lbs. (Max. T.O. Weight);

C.G._____% MAC; Ref.: Page_____Appendix_____

f. Cowl flap setting_____(must be same as in cooling test)

g. (Use chart on next page)

h. What is observed R/C at 5000 Ft.?_____Ft./Min.

i. What is corrected R/C at 5000 Ft.?_____Ft./Min.

3.85((At 5000 Ft. required R/C is 0.02 V_{so}^2 = _____Ft./Min.)
(V_{so}, critical value from item IV, C. with landing flap)

j. If maximum T.O. Weight is over 6000 lbs., is critical engine inoperative climb at 5000 ft. satisfactory?..... NA Yes No

3.83 k. If V_{so} exceeds 70 M.P.H., is the critical engine inoperative climb at 5000 ft. satisfactory?..... NA Yes No

3.780(c) l. Are data for inclusion in the operating limitations submitted to indicate variation in climb for a variation in altitude from S.L. to 8000 ft. and a temperature range of 60°F below the standard temperature to 40°F above the standard at the altitude involved?..... NA Yes No

(1) Is this graph also attached to this TIR?..... NA Yes No

SECTION IV. PERFORMANCE:

E. Climbs:

3.85(b) 3. Critical Engine Inoperative Climb: (continued)

	Time	Pressure Altitude (Feet)		O.A.T. °F	C.A.T. °F	I.A.S. M.P.H.	Engine R.P.M.	M.P. in. Hg.	Dead Engine		Weight & Obs. R/C
		Ea.Min.	Ea. 1/2 Min.						R.P.M.	Pitch	
Climb #1											
Climb #2											
Climb #3											
Climb #4											
Climb #5											
HS *											

* Record high speed run in level flight at intermediate altitude

(Use additional data sheets in appendix when required)

ECTION IV. PERFORMANCE:

E. Climbs:

3. Critical Engine Inoperative Climb: (continued)

7.31 m. If airplane is to be eligible for air taxi operations, is information attached (format indicated below) which gives the maximum authorized weight for the corresponding terrain elevations which will still permit, in the event of a critical inoperative engine and with the airplane in its most favorable en route configuration, a minimum terrain clearance of at least 1000 ft. and a minimum of 50 ft./minute climb?.... NA Yes No

PERFORMANCE - Inoperative propeller in minimum drag position, flaps and gear up.

Model	Maximum Authorized Weight (lbs.)	Climb Speed (MPH - CAS)	Highest Terrain (ft.) (To permit minimum of 1,000 ft. clearance and 50 ft./min. rate of climb)

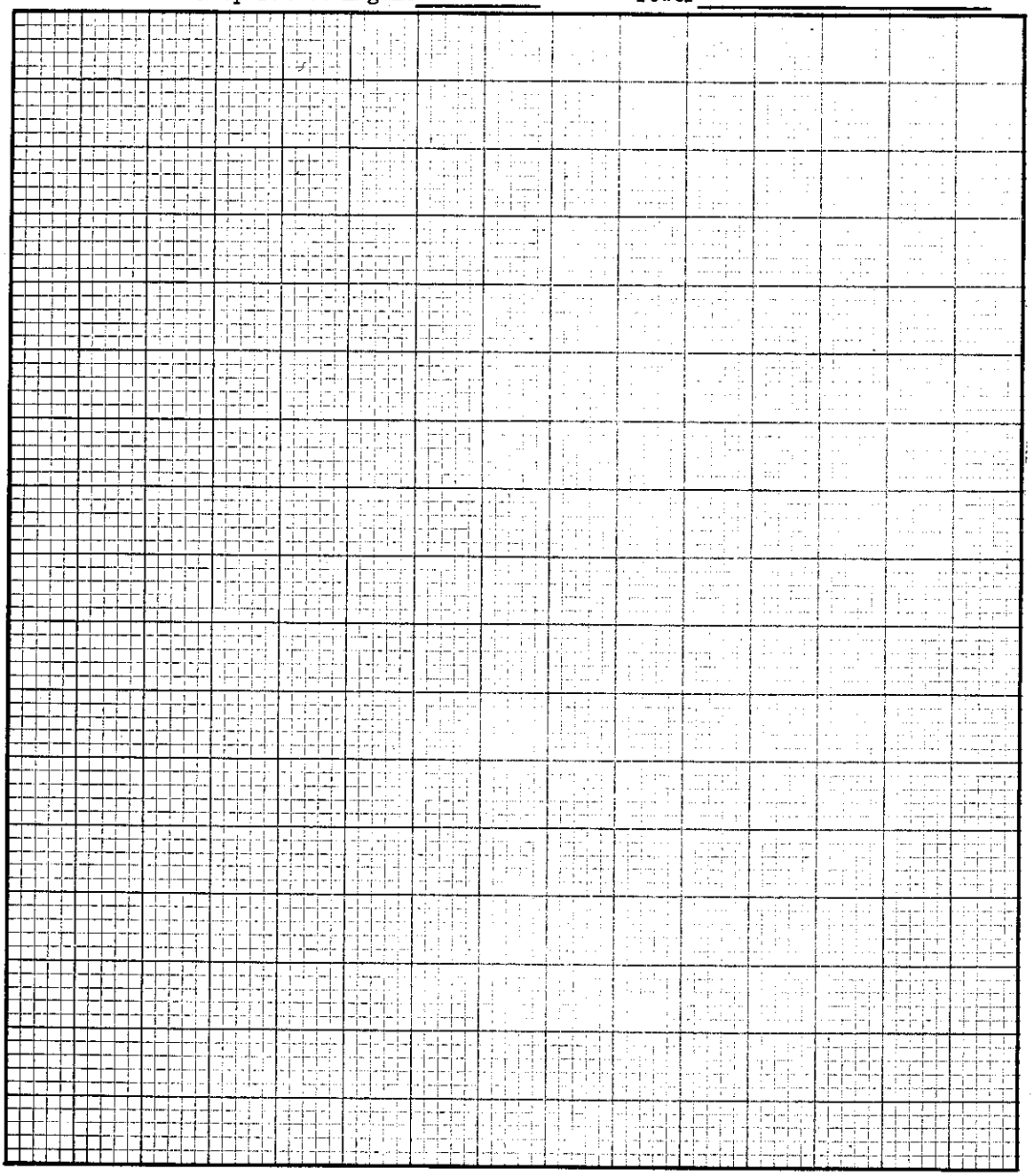
CURVES FOR DETERMINING THE BEST RATE OF CLIMB AND SPEED

CRITICAL ENGINE INOPERATIVE

3.85(b) Landing Gear Position_____ Weight_____lbs._

Wing Flap Position_____ Cowl Flap Position_____

Critical Inoperative Engine_____ Power_____



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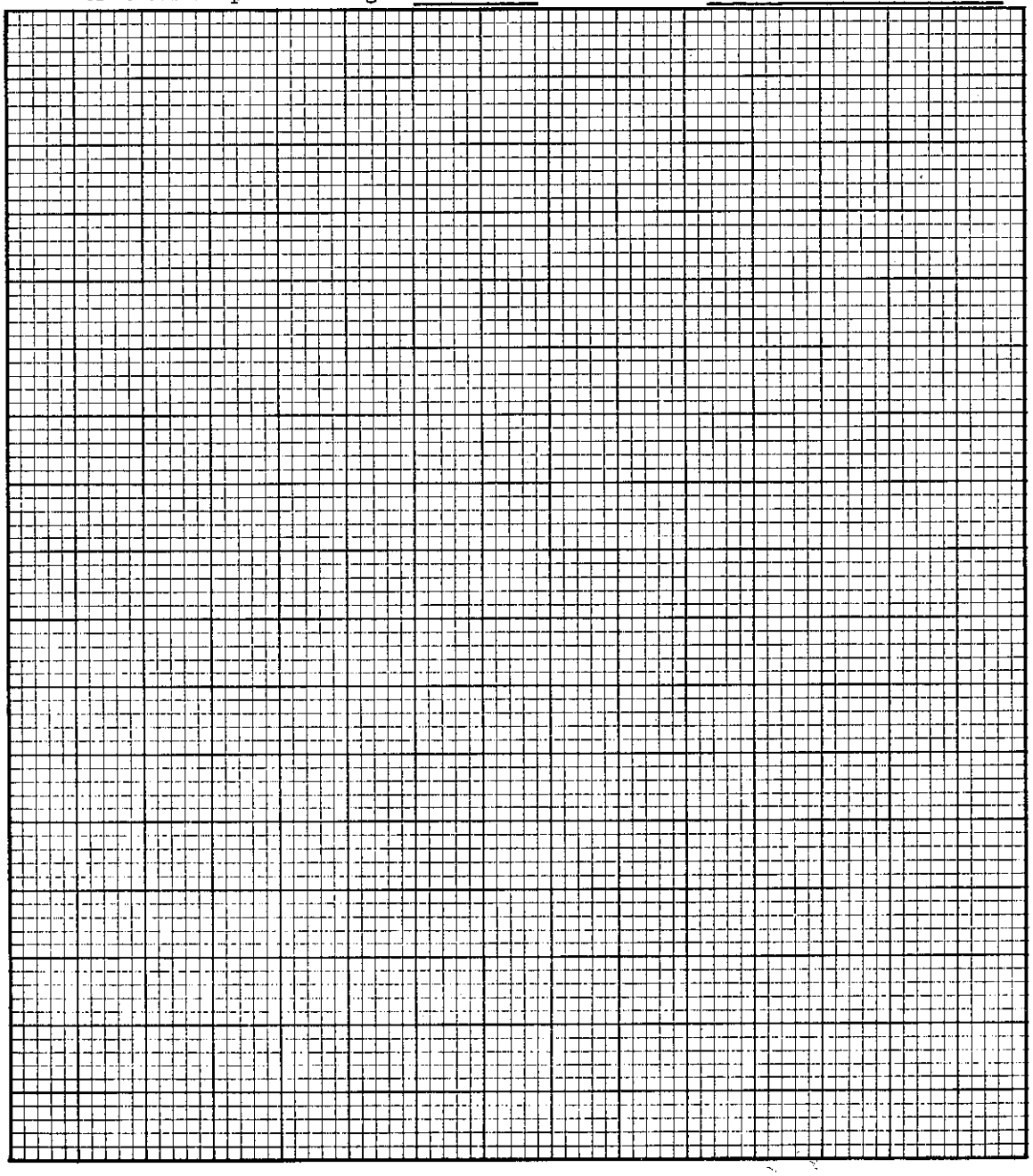
CLIMB PERFORMANCE - CRITICAL ENGINE INOPERATIVE

Landing Gear Position_____ Weight_____lbs.

Wing Flap Position_____ Cowl Flap Position_____

Critical Inoperative Engine_____ Power_____



DENSITY ALTITUDE (feet)

BEST RATE OF CLIMB
(ft/min)

BEST R/C SPEED
M.P.H. C.A.S.

SECTION IV. PERFORMANCE:

E. Climbs: (continued)

3.85(c) 4. Balked Landing Climb

3.85a(c)

a. Is landing gear extended?..... Yes No

b. Are wing flaps in the landing position?..... NA Yes No

(1) If "yes", what is extension in degrees?_____

3.85-3 (2) If "no", may retraction of the wing flaps be made in 2 seconds or less, with safety, without loss of altitude and without requiring sudden changes of angles of attack or exceptional skill on the part of a private pilot?..... Yes No

c. Is takeoff power used on all engines?..... Yes No

3.85-4 d. Is maximum landing weight used?..... Yes No

e. Cowl flap setting_____(should be position normally used for takeoff)

f. Weight_____lbs;

C.G._____% MAC; Ref.: Page_____Appendix_____

g. Results (from chart on next page)

3.85(c) h. For airplanes or more than 6000 lbs. T.O. weight: NA

(1) Is steady angle of climb (at sea level) greater than 1:30?..... Yes No

(2) What is actual angle of climb ratio?_____

3.85a(c) i. For airplanes of 6000 lbs. or less: NA

(1) Is steady rate of climb at sea level at least 5 V_{SO} or 200 feet per minute, whichever is greater? (5 V_{SO}____) Yes No

(2) What is actual rate of climb?_____

SECTION IV. PERFORMANCE:

E. Climbs:

4. Balked Landing Climb: (continued)

	Time	Pressure Altitude (Feet)		O.A.T. °F	C.A.T. °F	I.A.S. M.P.H.	Engine R.P.M.	M.P. in. Hg.	Weight
		Ea. Min.	Ea. 1/2 Min.						
Climb #1									
Climb #2									
Climb #3									
Climb #4									
Climb #5									
HS *									

* Record high speed run in level flight at intermediate altitude
(Use additional data sheets in appendix when required)

V max. _____ I.A.S. _____ C.A.S.

V min. _____ I.A.S. _____ C.A.S.

CURVES FOR DETERMINING THE BEST RATE OF CLIMB AND SPEED

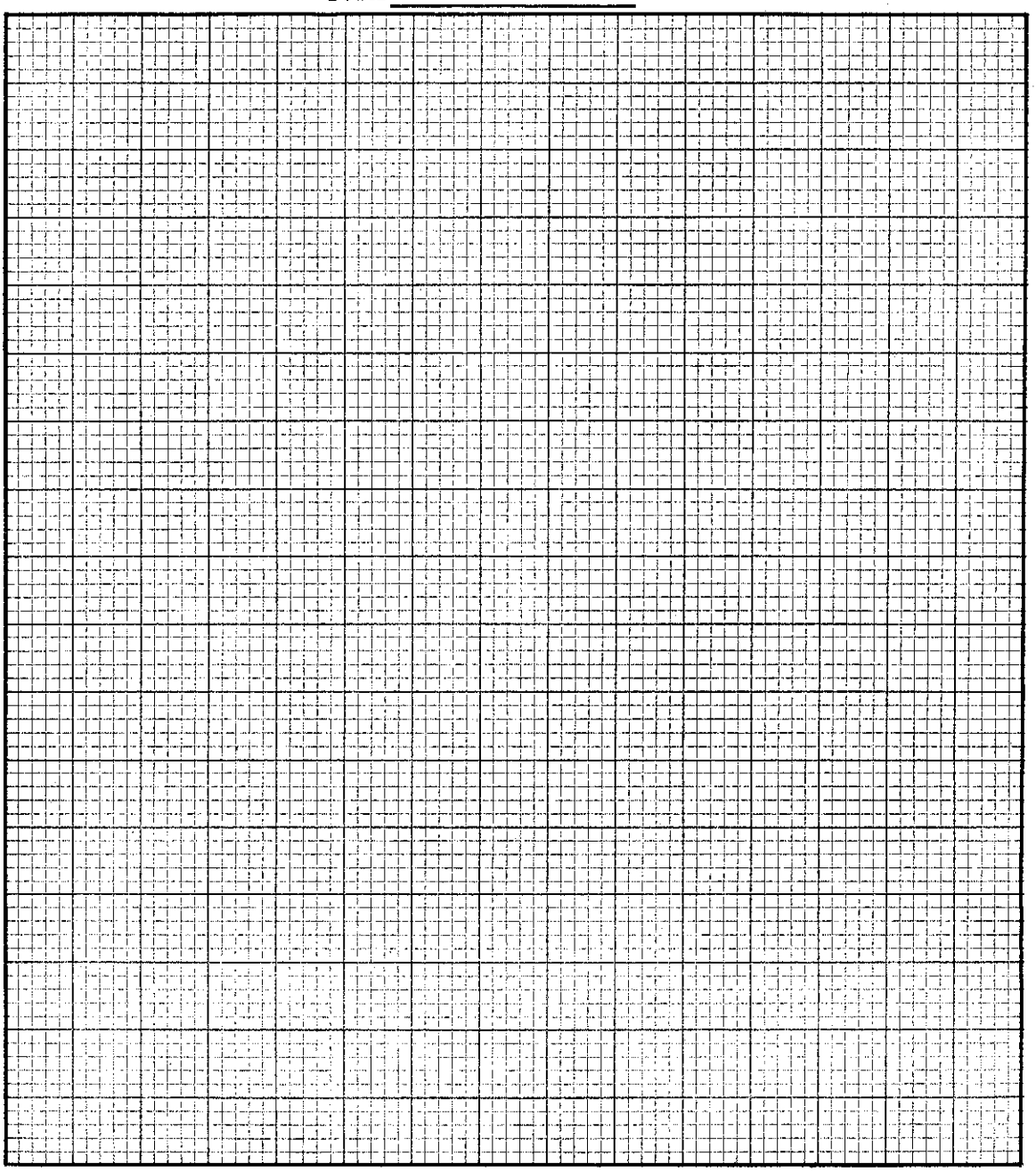
BALKED LANDING CLIMB

3.85(c) Landing Gear Position_____ Weight_____lbs.

3.85a(c)

Wing Flap Position_____ Cowl Flap Position_____

Power_____



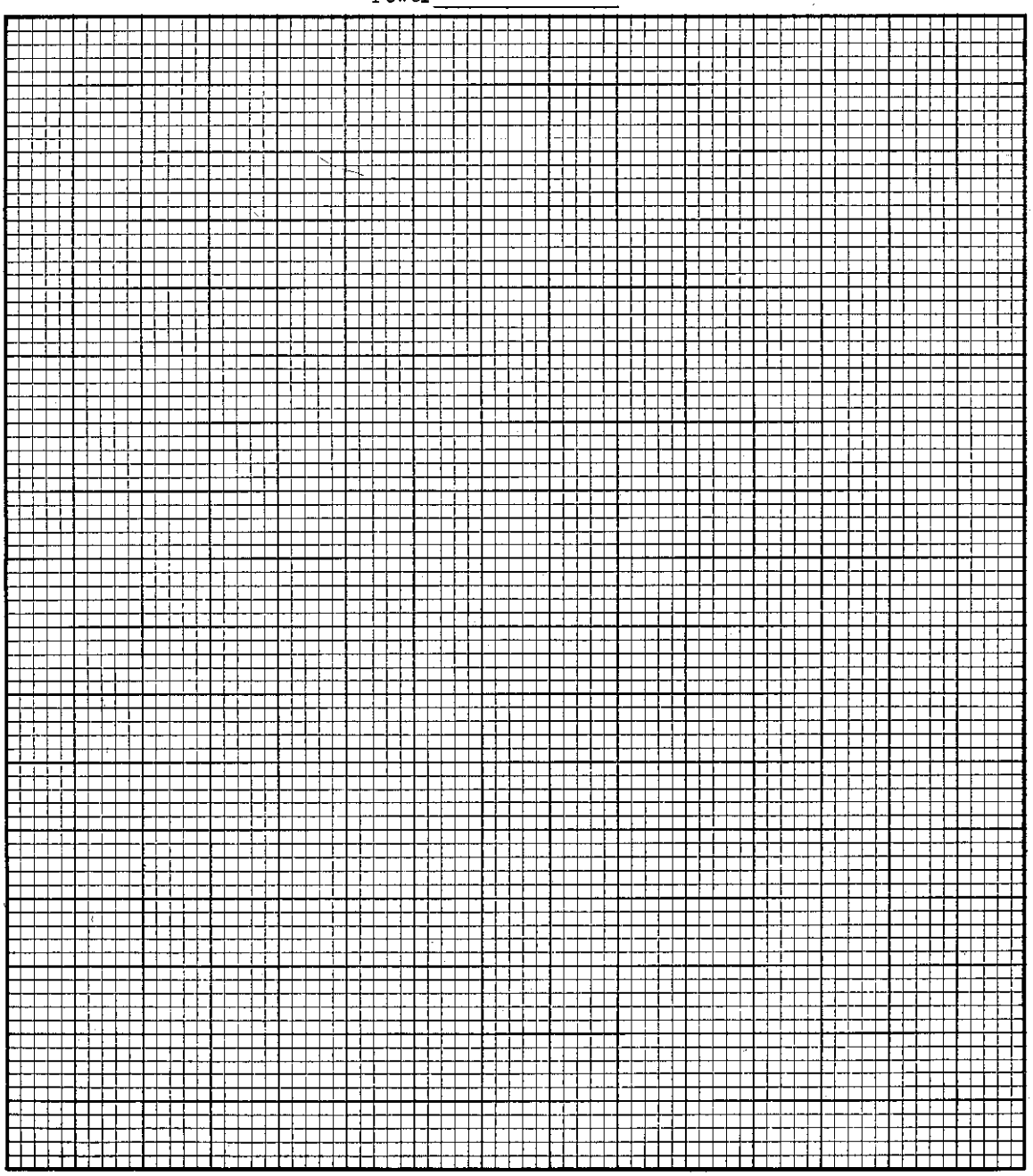
CLIMB PERFORMANCE - BALKED LANDING CLIMB

3.85(c)
3.85a(c)

Landing Gear Position_____ Weight_____lbs.

Wing Flap Position_____ Cowl Flap Position_____

Power_____



BEST RATE OF CLIMB
(ft/min)

BEST R/C SPEED
M.P.H. C.A.S.

SECTION IV. PERFORMANCE:

E. Climbs: (continued)

5. Takeoff Climb

3.85a(a) a. Is climb test conducted with gear extended?..... Yes No

b. Are wing flaps in takeoff position?..... NA Yes No

(1) If "yes", what is flap position?_____degrees

c. Weight_____lbs. (Max. takeoff weight)

Critical C.G._____% MAC (Most forward generally critical)

d. Are engine(s) operated within approved limitations?..... Yes No

(Use takeoff power if practicable)

e. Cowl flap setting_____(same as used for cooling tests)

f. Results (from chart on next page)

3.85a(a) g. Does airplane have a maximum certificated takeoff weight of 6000 lbs. or less?..... Yes No

(1) If "yes", is steady rate of climb at sea level 10 V_{sl} or 300 feet per minute, whichever is greater?..... Yes No

(2) What is actual rate of climb?_____Ft./Min.

SECTION IV. PERFORMANCE:

E. Climbs:

5. Takeoff Climb: (continued)

	Time	Pressure Altitude (Feet)		O.A.T. °F	C.A.T. °F	I.A.S. M.P.H. **	Engine R.P.M.	M.P. in. Hg.	Weight
		Ea. Min.	Ea. 1/2 Min.						
Climb #1									
Climb #2									
Climb #3									
Climb #4									
Climb #5									
HS *									

* Record high speed run in level flight at intermediate altitude

** Speeds should bracket 1.3 V_{s1}

V max._____I.A.S._____C.A.S.

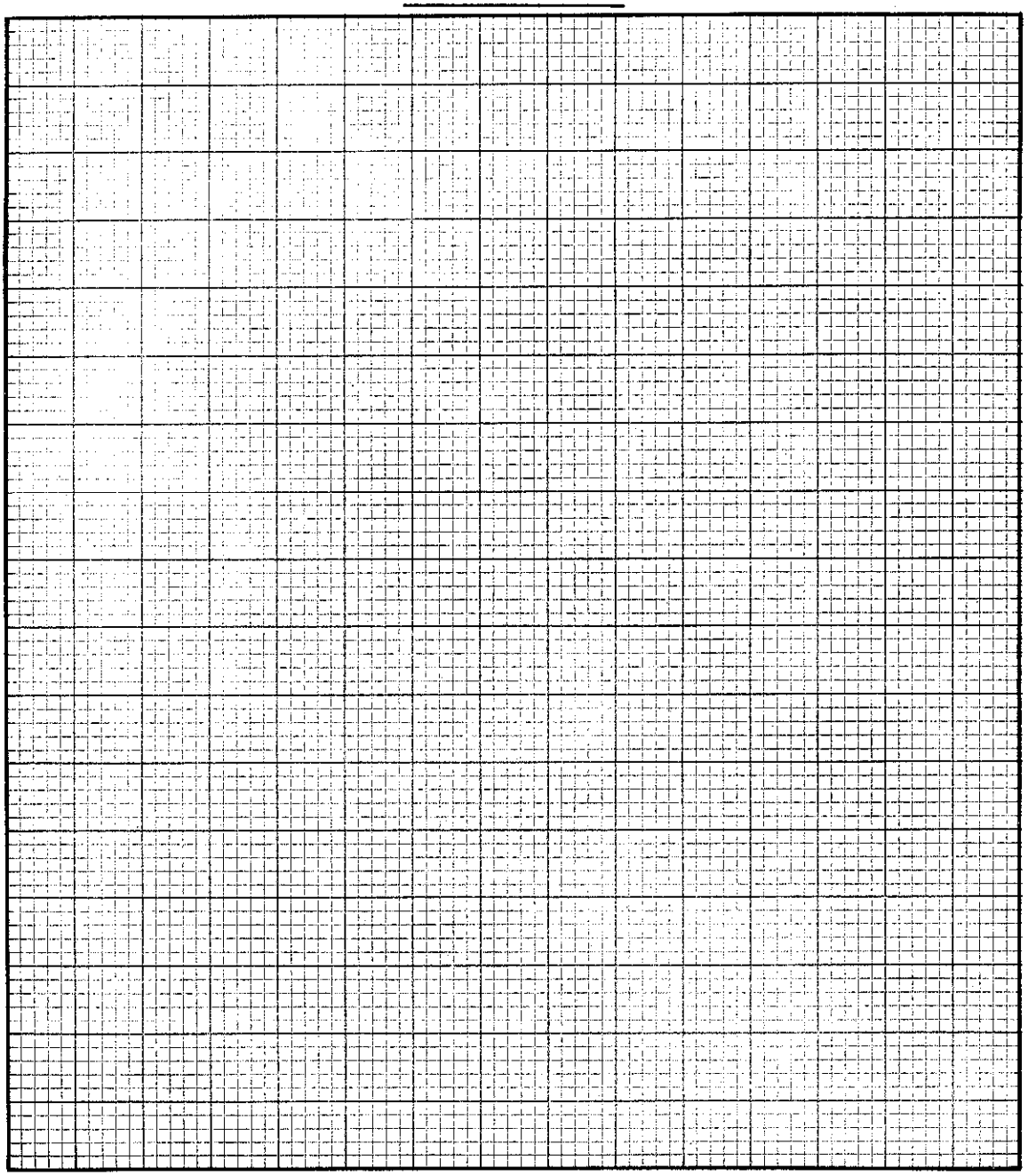
V min._____I.A.S._____C.A.S.

CURVES FOR DETERMINING THE BEST RATE OF CLIMB AND SPEED
TAKEOFF CLIMB

3.84 Landing Gear Position_____ Weight_____lbs.
3.85a(a)

Wing Flap Position_____ Cowl Flap Position_____

Power_____



CORRECTED RATE OF CLIMB (ft/min)

CALIBRATED AIRSPEED (M.P.H.)

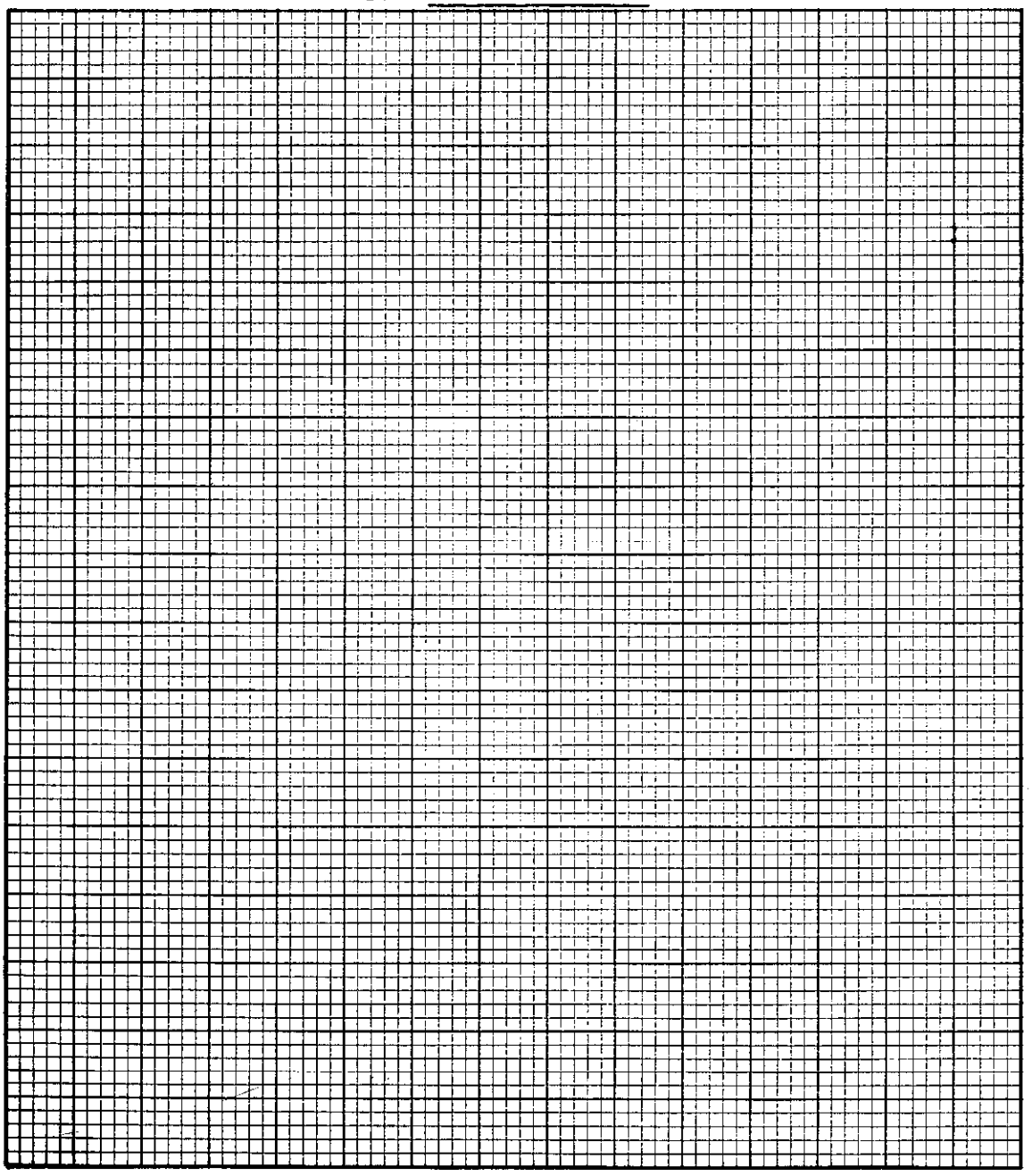
CLIMB PERFORMANCE - TAKEOFF CLIMB

.84
.85a(a)

Landing Gear Position_____ Weight_____lbs.

Wing Flap Position_____ Cowl Flap Position_____

Power_____



BEST RATE OF CLIMB
(ft/min)

BEST R/C SPEED
M.P.H. C.A.S.

SECTION IV. PERFORMANCE: (continued)

F. Takeoff

1. Piece Method (Distance to takeoff and climb over a 50 ft. obstacle by piece method applicable to airplanes having a maximum certificated takeoff weight greater than 6000 lbs.)

a. Ground Run

3.84 (1) Were deicers installed? (If "yes" (See II.E.2.)) ..... Yes No

3.84-1 (2) Weight _____ lbs.; C.G. _____ % MAC
3.84-2 (Most unfavorable combination of Weight and C.G. location); (Most forward generally critical, unless inspector believes otherwise); Ref.: Page _____ Appendix _____.

(3) Propeller: (See II.C.2.)
(Should be the one having both the smallest diameter and lowest static R.P.M. for recommendation in the aircraft specification)

(4) Mixture setting _____ (should be position normally used for take-off)

(5) Cowl flap setting _____ (should be position normally used for take-off)

(6) Are engines operating within approved limitations? ..... Yes No
(T.O. power to be used if available)

R.P.M. _____. Manifold Pressure _____ in.Hg.

(7) Is wing flap in takeoff position? ..... Yes No

(8) Is gear retraction started prior to attaining speed of 1.3 V_{S1}? ..... Yes No

(If "yes", is retraction begun earlier than in normal takeoffs?) ..... No Yes

(9) Is gear retraction completed prior to attainment of 1.3 V_{S1}? ..... Yes No

SECTION IV. PERFORMANCE:

F. Takeoff:

1. Piece Method:

a. Ground Run: (continued)

(10) Surface conditions at the takeoff area

(a) Land

(i) Paved (ii) Hard Turf (iii) Long Grass (iv) Cinder (v) Wet

(b) Water

Height of waves (trough to crest)_____inches

(11) Data for ground takeoff (photographic equipment to be used)

At Least 3 Runs At Or Bracketing 1.3 V_{s1}		1st Run	2nd Run	3rd Run
(a) Engine R.P.M.				
(b) Manifold Pressure	(in.Hg.)			
(c) Carburetor Air Temperature	(°F)			
(d) Outside Air Temperature	(°F)			
(e) Pressure Altitude (Set 29.92)	(Ft.)			
(f) Density Altitude	(Ft.)			
(g) Wind Velocity At_____Ft. Above Surface	(M.P.H.)			
(h) Wind Direction With Respect To Runway (0° = Head Wind, 180° = Tail Wind)				
(i) Wind Component Along Runway	(M.P.H.)			
(j) Wind Component Across Runway	(M.P.H.)			
(k) Indicated Air Speed At T.O.	(M.P.H.)			
(l) C.A.S. At Takeoff	(M.P.H.)			
(m) Actual Weight	(Lbs.)			
(n) Measured Ground Run To Accelerate To Speed Of 1.3 V_{s1}	(Ft.)			
(o) Corrected Ground Run (St. Cond.)	(Ft.)			
(p) Ave. Corrected Ground Run	(Ft.)			

NOTE: Standard starting point for seaplanes may be assumed to be at point at which 3 m.p.h. is attained.

3.84(c) (12) Are above T.O. runs made in such a manner that their reproduction shall not require an exceptional degree of skill or exceptionally favorable condition?..... Yes No

SECTION IV. PERFORMANCE:

F. Takeoff:

1. Piece Method: (continued)

b. Air Run What is distance to gain height of 50 feet?_____ _____Ft. (Obtain from IV,E,5)

(1) Is this obtained at speed not less than 1.3 V_{S1}?..... Yes No

What speed?_____M.P.H. - C.A.S.

(2) If "no", is a speed of at least V_X plus 5 used?..... Yes No

(a) What speed?_____M.P.H. - C.A.S.

(b) Is airplane at this speed demonstrated to be safe under all conditions including turbulence and complete engine failure?..... Yes No

(If multiengine, must be at least V_{mc}).

c. Total Run (Corrected to standard and sea level conditions)

(1) What is total run distance to takeoff and gain 50 feet at sea level standard conditions?_____Ft.

(2) Are data for inclusion in the operating limitations submitted to indicate the variations in the total run for a change in altitude from S.L. to 7000 feet and in temperature from 0° to 100°F?..... Yes No

Is this graph also attached to this TIR?..... Yes No

2. Continuous Method (Distance to takeoff and climb over a 50 ft. obstacle by continuous run method). (Applicable to airplanes which have a maximum certificated takeoff weight greater than 6000 lbs.)

3.84 a. Were deicers installed? (If "yes" (See II.E,2)..... Yes No

3.84-1 b. Weight_____lbs; C.G._____% MAC (Most unfavorable combination of weight and C.G. location) (Most forward generally critical, unless inspector believed otherwise)

c. Propeller (See II.C,2)
(Should be the one having both the smallest diameter and lowest static r.p.m. for recommendation in the aircraft specification)

ECTION IV. PERFORMANCE:

F. Takeoff:

2. Continuous Method (continued)

.84 d. Mixture setting_____(should be position normally
.84-1 used for takeoff)
.84-2

e. Cowl flap setting_____(should be position normally used for takeoff)

f. Are engine(s) operating within approved limitations?..... Yes No
(T.O. power to be used if available)

R.P.M._____ Manifold Pressure_____in.Hg.

g. What is wing flap position?_____ _____Degrees
(T.O. Flap)

h. At the takeoff area

(1) Surface Conditions - Land

(a) Paved (b) Hard Turf (c) Long Grass (d) Cinder (e) Wet

(2) Surface Conditions - Water

(a) Height of waves (Trough to crest)_____inches

SECTION IV. PERFORMANCE:

F. Takeoff:

2. Continuous Method: (continued)

i. Data for ground takeoff and climb to 50 ft. (Photographic equipment to be used)

At Least 3 Runs At Or Bracketing 1.3 V_{s1} At 50 Ft. Level *		1st Run	2nd Run	3rd Run
(1) Engine R.P.M.				
(2) Manifold Pressure	(in. Hg.)			
(3) Carburetor Air Temperature	(°F)			
(4) Outside Air Temperature	(°F)			
(5) Pressure Altitude (Set at 29.92)	(Ft.)			
(6) Density Altitude	(Ft.)			
(7) Wind Velocity at _____Ft. Above Surface	(M.P.H.)			
(8) Wind Direction With Respect to Runway (0° Head Wind, 180° Tail Wind)				
(9) Wind Component Along Runway	(M.P.H.)			
(10) Wind Component Across Runway	(M.P.H.)			
(11) I.A.S. at T.O.	(M.P.H.)			
(12) C.A.S. at Takeoff	(M.P.H.)			
(13) Actual Weight	(Lbs.)			
(14) Measured Ground Run	(Ft.)			
(15) Corrected Ground Run (S.L.Std.Cond.)	(Ft.)			
(16) Measured Air Run to 50 Ft.	(Ft.)			
(17) I.A.S. at 50 Ft.	(M.P.H.)			
(18) C.A.S. at 50 Ft.	(M.P.H.)			
(19) Corrected Air Run at 50 Ft. at 1.3 V_{s1}, Standard Conditions	(Ft.)			
(20) Total Corrected Run	(Ft.)			
(21) Average Corrected Run	(Ft.)			

* Speed at 50 ft. level may be used which is not less than V_x plus 5 m.p.h.

NOTE: Starting point for seaplanes may be assumed to be at point at which 3 m.p.h. attained.

j. Is speed of V_x plus 5 m.p.h. or greater at 50 ft. used?..... No Yes

(1) If "yes", insert appropriate values in table above.

(2) Is airplane demonstrated at speed used (Must be greater than V_{mc}) to be safe under all conditions including turbulence and complete engine failure?..... Yes No

SECTION IV. PERFORMANCE:

F. Takeoff:

2. Continuous Method: (continued)

k. Are above runs made in such a manner that their reproduction shall not require an exceptional degree of skill or exceptionally favorable condition?..... Yes No

l. Are data for inclusion in the operating limitations submitted to indicate the variations in the total run for a change in altitude from S.L. to 7000 ft. and in temperature from 0°F to 100°F?..... Yes No

Is this graph also attached to this TIR?..... Yes No

G. Landing (Distance to a complete stop from a height of 50 ft.)*

1. Airplanes with maximum certificated weight greater than 6000 lbs.

a. General Data

3.86(a) (1) Were deicers installed? (If "yes", (See II.E.2)..... Yes No

(2) Is maximum T.O. weight used?..... Yes No

(3) Weight_____lbs.; C.G._____% MAC (Most unfavorable combination of Weight and C.G. position) Ref.: Page_____ Appendix_____(Most forward generally critical, unless inspector believes otherwise)

(4) Cowl flap setting_____(should be set for landing)

(5) Are engines throttled, propellers in low pitch?..... Yes No

(6) Is wing flap in landing position?..... Yes No

What is flap position?_____degrees

(7) Is landing gear extended?..... Yes No

(8) Surface conditions at the landing area

(a) Land

(i) Paved (ii) Hard Turf (iii) Long Grass (iv) Cinder

(v) Wet

(b) Water

Height of waves (Trough to crest)_____inches

SECTION IV. PERFORMANCE:

G. Landing:

1. Airplanes with maximum certificated weight greater than 6000 lbs. (continued)

b. Landing Data (Photographic equipment to be used)

(1) Observed and Corrected Test Data

At Least 3 Runs At Or Above 1.3 V_{so}, C.A.S. In Steady Glide Approach Before Reaching 50 Ft.		1st Run	2nd Run	3rd Run
(a) Outside Air Temperature	(°F)			
(b) Pressure Altitude (Set at 29.92)	(Ft.)			
(c) Density Altitude	(Ft.)			
(d) Wind Velocity At _____ Ft. Above Surface	(M.P.H.)			
(e) Wind Direction With Respect To Runway (0° Head Wind, 180° Tail Wind)				
(f) Wind Component Along Runway	(M.P.H.)			
(g) Wind Component Across Runway During Approach Glide at 50 Ft. Altitude	(M.P.H.)			
(h) Engine R.P.M.				
(i) Manifold Pressure	(in.Hg.)			
(j) I.A.S.	(M.P.H.)			
(k) C.A.S. (Should be at or above 1.3 V_{so}	(M.P.H.)			
(l) Is airplane trimmed? (Yes or No) At Contact				
(m) I.A.S.	(M.P.H.)			
(n) C.A.S.	(M.P.H.)			
(o) Altitude of Airplane				
(p) Actual Weight	(Lbs.)			
Landing Distance				
*(q) Measured Distance From 50 Ft. to Stop	(Ft.)			
(r) Corrected Distance (Std.Cond.& S.L.)	(Ft.)			
(s) Average Corrected Landing Distance	(ft.)			

* (Complete stop for seaplanes, amphibian, etc. may be interpreted at a speed of 3 m.p.h.)

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ECTION IV. PERFORMANCE:

G. Landing:

1. Airplanes with maximum certificated weight greater than 6000 lbs. (continued)

c. Landing Test Results

(1) Are above landing runs made in such a manner that their reproduction shall not require an exceptional degree of skill or exceptionally favorable conditions?..... Yes No

(2) Are landings made such that there was no excessive vertical acceleration, tendency to bounce, nose over, ground loop, porpoise or water loop?..... Yes No

(3) Is landing gear arrangement nosewheel or tailwheel?_____

(a) Were above landings made in level on tail down altitude?_____

(b) If nosewheel, and landings were made in level altitude, can flared landings be made tail down with most forward c.g.?..... NA Yes No

(c) If tailwheel, and landings were made in level altitude, can landing be made tail down at most forward c.g.?..... NA Yes No

(4) Are data for inclusion in the AFM submitted to indicate the variations in the landing run for a change in altitude from S.L. to 7000 ft. and in temperature from 0°F to 100°F?..... Yes No

Are these data also attached to this TIR?..... Yes No

.86-1 (5) Were landing distances established with use of reversible thrust propellers?..... NA No Yes

2. Landing Tests - Applicable to Airplanes Having A Maximum Certificated Weight Of 6000 Lbs. Or Less.

.87 Was it demonstrated that the airplane can be safely landed and brought to a stop without requiring an exceptional degree of piloting skill (by private pilot), and without excessive vertical acceleration tendency to bounce, nose over, groundloop, porpoise or water loop?..... Yes No

SECTION V. HANDLING QUALITIES

A. Ground Handling

To be determined at most adverse authorized Weight and C.G. position for each test conducted:

3.145 1. Is there any unusual ground looping tendency?..... No Yes

Is this demonstrated during power-off landings at normal landing speed during which brakes or engine power are not used to maintain a straight path?..... Yes No

3.145 2. Is directional control during taxiing and takeoff satisfactory? Yes No

3.145 3. Is there any uncontrollable looping tendency during taxiing, takeoff, or landing in 90° crosswinds up to a wind intensity of 0.2 V_{so} _____ M.P.H.?..... No Yes

a. Is airplane tested in 90° crosswind greater than 0.2 V_{so}?.. Yes No

(1) If "yes", what is this wind value_____M.P.H.

(2) Are characteristics satisfactory at this value?..... Yes No

(3) Is this the highest 90° crosswind intensity which is recommended for this airplane?..... Yes No

3.144 4. Is there any uncontrollable tendency to nose over in any operating condition reasonably expected for the type, including rebound during landing or takeoff?..... No Yes

3.144 5. Do wheel brakes operate smoothly and exhibit no undue tendency to induce nosing over?..... Yes No

3.146 6. Does shock absorbing mechanism appear to be adequate to prevent damage to any part of the airplane when operated on the roughest ground which may reasonably be expected in normal operation (specify type of surface used for test)..... Yes No

_____

_____

_____

3.351 7. Is shock absorbing mechanism, under the above conditions, such that "bottoming" or other possible damage to structure will not occur?..... Yes No

SECTION V. HANDLING QUALITIES: (continued)

B. Water Handling

To be determined at maximum takeoff weight and with most unfavorable authorized C.G. position for each test conducted:

3.147 1. Does the spray during taxiing, takeoff and landing at any time:

a. dangerously obscure the vision of the pilots?..... No Yes

b. produce damage to the propeller or other parts of the airplane?..... No Yes

3.144 2. Is there any dangerous or uncontrollable porpoising at any speed or condition at which the airplane is normally operated? No Yes

3.145(c) 3. Can airplane be held on a straight course during takeoff run with takeoff power on all engines?..... Yes No

3.106 4. Can airplane be safely controlled in the event of failure of any engine at any point in the takeoff run and in taxiing?... Yes No

3.145 5. Can airplane be maneuvered and sailed safely under all expected conditions?..... Yes No

3.145 3.335 6. If water rudders are provided, do they perform satisfactorily?..... NA Yes No

3.145 7. Is airplane satisfactorily controllable during taxiing, takeoff, or landing in 90° crosswinds up to a wind intensity of 0.2 V_{so} _____ M.P.H.?..... Yes No

a. Is airplane tested in 90° crosswind greater than 0.2 V_{so}? Yes No

If "yes", answer the following:

(1) What is this wind value _____ M.P.H.

(2) Are characteristics satisfactory at this value?.... Yes No

(3) Is this the highest 90° crosswind intensity which is recommended for this airplane?..... Yes No

b. Estimate maximum wind velocity in which satisfactory 360° turns can be executed at or below hump speed _____ M.P.H.

c. Estimate the wave height (trough to crest) of the roughest water upon which the airplane has been operated _____ _____ inches.

SECTION V. HANDLING QUALITIES: (continued)

C. Ski Handling

To be determined at the most adverse authorized Weights and C.G. positions for each test condition:

3.144 3.145	1. Are takeoff characteristics satisfactory?.....	Yes	No
3.144 3.145	2. Are landing characteristics satisfactory?.....	Yes	No
3.144 3.145	3. Can airplane be satisfactorily maneuvered on the ground?.....	Yes	No
3.106 3.780-3	4. Are the airplane's flight characteristics satisfactory with the skis installed?.....	Yes	No
3.335	5. Are brakes provided?.....	Yes	No
	(If "yes", are these considered satisfactory?).....	Yes	No
3.145	6. Is there any uncontrollable looping tendency during taxiing, takeoff, or landing in 90° crosswinds up to a wind intensity of 0.2 V_{SO} _____ M.P.H.?.....	No	Yes
	a. Is airplane tested in 90° crosswind greater than 0.2 V_{SO}?..	Yes	No
	(1) If "yes", what is this wind value _____ M.P.H.		
	(2) Are characteristics satisfactory at this value?.....	Yes	No
	(3) Is this the highest 90° crosswind intensity which is recommended for this airplane?.....	Yes	No

ECTION V. HANDLING QUALITIES: (continued)

D. Takeoff Characteristics

.84a 1. Determination of Elevator Effectiveness (Applicable to airplanes having a maximum certificated weight of 6000 lbs. or less)

.84(a),(b) a. Is takeoff power used?..... Yes No

b. Is loading at most unfavorable weight?..... Yes No

c. Is loading at most unfavorable C.G.?..... Yes No

d. Is exceptional piloting skill required to make safe take-off?..... No Yes

e. Airplane is of tailwheel type or nosewheel type (Circle which)

(1) If tailwheel type, is elevator control at $0.8V_{s1}$ sufficient to hold airplane on runway until a safe takeoff speed is attained?..... Yes No

(2) If nosewheel type, is elevator control at $0.85\ V_{s1}$ sufficient to raise nosewheel clear of takeoff surface? Yes No

REMARKS

SECTION V. HANDLING QUALITIES: (continued)

E. Flight Characteristics (If flight characteristics are affected by altitude they should be investigated at the most adverse normally expected operating altitude.)

1. Most Forward C.G. Condition at Maximum T.O. Weight

a. Weight _____ lbs.; C.G. _____ % MAC; Ref.: Page _____ Appendix _____

b. Propeller* (See II.C.2.)

c. Were deicers installed? (If "yes" (See II.E.2)) ..... Yes No

3.112(a)(2)

d. Tests for Trim

Configuration	Observed Data	Trim Speed	Longitudinal Trim
(1) Climbs - M.C. Power M.C. Power ( ) Gear Retracted ( ) Flap Retracted ( )	Hp _____ Ft. R.P.M. _____ M.P. _____ in.Hg. O.A.T. _____ °F	Speed between V_x & $1.4V_{s1}$ _____ MPH - IAS _____ MPH - CAS Trim Tab Indicator Position _____	Trimmed Tail Heavy Nose Heavy
(2) Climb - M.C. Power M.C. Power ( ) Gear Retracted ( ) Takeoff Flaps _____ °	Hp _____ Ft. R.P.M. _____ M.P. _____ O.A.T. _____ °F	Speed between V_x & $1.4V_{s1}$ _____ MPH - IAS _____ MPH - CAS Trim Tab Indicator Position _____	Trimmed Tail Heavy Nose Heavy
(3) Power Approach ** Power to maintain 3° angle of descent. Gear Extended ( ) Flap Retracted ( )	Hp _____ Ft. R.P.M. _____ M.P. _____ in.Hg. O.A.T. _____ °F	$1.5V_{s1}$ _____ MPH - IAS _____ MPH - CAS Trim Tab Indicator Position _____ Minimum Trim Speed _____ MPH - IAS _____ MPH - CAS	Trimmed Tail Heavy Nose Heavy
Gear Extended ( ) Flap Extended ( )	Hp _____ Ft. R.P.M. _____ M.P. _____ in.Hg. O.A.T. _____ °F	$1.5V_{s1}$ _____ MPH - IAS _____ MPH - IAS Trim Tab Indicator Position _____ Minimum Trim Speed _____ MPH - IAS _____ MPH - CAS	Trimmed Tail Heavy Nose Heavy
Gear Extended ( ) Flap Extended ( ) Fwd. C.G. regardless of weight	Hp _____ Ft. R.P.M. _____ M.P. _____ in.Hg. O.A.T. _____ °F	$1.5V_{s1}$ _____ MPH - IAS _____ MPH - CAS Trim Tab Indicator Position _____ Minimum Trim Speed _____ MPH - IAS _____ MPH - CAS	Trimmed Tail Heavy Nose Heavy

** Item VEld(3) to be conducted also at forward c.g regardless of weight.

ECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

e. Test for Static Longitudinal Stability:

.115(a) .114(b)	In configuration of item VEld(3), conduct the static longitudinal stability test with trim at 1.5V_{s1}	Ref. Data Sheet #_____ Stable slope required between 1.1 V_{s1} and 1.8V_{s1}, Stick force must not exceed 40 pounds between those speed limits. Free return speed (friction band) Must be within ± 10% (+_____M.P.H. - I.A.S) (-_____M.P.H. - I.A.S) (+_____% V trim) (-_____% V trim) Stable ( ) Unstable ( )

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:
1. Most Forward C.G. Condition - At Maximum T.O. Weight: (continued)

3.109(b) f. Special Longitudinal Control Tests:

Configuration (gear extended each case)	Information		Does it require a change in the trim control or the exertion of more control force than can be readily applied with one hand for a short period to	Force + Push* - Pull*
	Observed Data	Trim Speed $1.5V_{S1}$ or Min Trim Speed		
(1) Glide Throttle Closed ( ) Gear Extended ( ) Flaps Retracted ( )	HP____Ft. OAT____°F RPM____ In.Hg.___	____MPH-IAS ____MPH-CAS	extend the flaps as rapidly as possible to landing position ____° while maintaining approx. 1.4 x instantaneous stall speed? No Yes	
(2) Glide Throttle Closed ( ) Gear Extended ( ) Landing Flaps ____°	HP____Ft. OAT____°F RPM____ In.Hg.___	____MPH-IAS ____MPH-CAS	retract the flaps as rapidly as possible, while maintaining app approx. 1.4 x instantaneous stall speed? No Yes	
(3) Climb M.C. Power ( ) Gear Extended ( ) Landing Flaps____°	HP____Ft. OAT____°F RPM____ In.Hg.___	____MPH-IAS ____MPH-CAS	retract the flaps as rapidly as possible, while maintaining approx. 1.4 x instantaneous stall speed? No Yes	
(4) Glide Throttle Closed ( ) Gear Extended ( ) Flaps Retracted ( )	HP____Ft. OAT____°F RPM____ In.Hg.___	____MPH-IAS ____MPH-CAS	Apply T.O. power quickly while maintaining the same speed? No Yes	
(5) Glide Throttle Closed ( ) Gear Extended ( ) Landing Flaps____°	HP____Ft. OAT____°F RPM____ In.Hg.___	____MPH-IAS ____MPH-CAS	Apply T.O. power quickly while maintaining the same speed? No Yes	
(6) Glide Throttle Closed ( ) Gear Extended ( ) Landing Flaps ( )	HP____Ft. OAT____°F RPM____ In.Hg.___	____MPH-IAS ____MPH-CAS	Obtain and maintain speed at $1.1V_{S1}$? (____MPH - IAS____MPH - CAS) No Yes	
(7) Glide Throttle Closed ( ) Gear Extended ( ) Landing Flaps____°	HP____Ft. OAT____°F RPM____ In.Hg.___	____MPH-IAS ____MPH-CAS	obtain and maintain speed at the lower of $1.7V_{S1}$ or V_f? (____MPH - IAS____MPH - CAS) No Yes	

* Use + or - to indicate a push or pull force

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition - At Maximum T.O. Weight:

f. Special Longitudinal Control Tests (continued)

3.109(d) (8) Is it possible to maintain a speed of not more than $1.5V_{s1}$ with a pilot control force of not more than 10 pounds during a power-off glide with landing gear and wing flaps extended with the most forward center of gravity position approved at maximum weight?..... Yes No

and with the most forward center of gravity position approved regardless of weight?..... Yes No

3.109(e) (9) Is it possible, without the use of the primary means of longitudinal control, to control the descent of the airplane with the use of all other normal flight and power controls to a zero rate of descent and to an attitude suitable for a controlled landing without requiring exceptional strength skill or alertness on the part of the pilot, or without exceeding the operational and the structural limitations of the airplane?..... Yes No

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight: (continued)

3.109(c) g. Controllability test for flap retraction with simultaneous application of M.C. power at speed of 1.1 V_{S1}

Configuration	Information	Result
Steady level flight, power sufficient for speed of 1.1 V_{S1} ( )	Hp_____ Ft.	Is exceptional piloting skill (for a private pilot) required to maintain essentially level flight?
	Power Before Test R.P.M.____ In.Hg.____	
Gear Extended ( )	Power After Test R.P.M.____ In.Hg.____	No Yes
Landing Flap_____°		

h. General Controllability

3.106 (1) Is the airplane satisfactorily controllable and maneuverable about all three axis during takeoff, climb, level flight, dive and landing (with and without power)? Yes No

(2) Is it possible to make a smooth transition from one flight condition to another, including turns and slips, without requiring an exceptional degree of pilot skill, alertness, or strength (by a private pilot) and without danger of exceeding the limit load factor under all conditions of operation probable for the type?..... Yes No

(3) Are the control values both for temporary and prolonged application (strength of pilots limits) exceeded in any operation?..... No Yes

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight: (continued)

3.120 i. Power Off Stall Characteristics

3.120-1

3.120-2 (1) Conditions

(a) Hp_____Ft.

(b) OAT_____°F

(c) Engines idling in low pitch_____RPM_____in.Hg.

		Gear Retracted Flaps Retracted	Gear Extended Landing Flaps ____°
(2) Trim 1.5V_{s1} or minimum trim speed	MPH-IAS		
(3) Trim 1.5 V_{s1} or minimum trim speed	MPH-CAS		
(4) Prior to stall, is speed reduced at rate not greater than 1 MPH/SEC.?		Yes No	Yes No
(5) Speed at which 1 MPH/SEC. first obtained	MPH-IAS		
(6) Stall speed	MPH-IAS		
(7) Stall speed	MPH-CAS		
(8) Is stall limited by control stop?		No Yes	No Yes
(9) Maximum roll	(degrees)		
(10) Maximum yaw	(degrees)		
(11) Maximum pitch below level	(degrees)		
(12) Altitude lost*	(feet)		
(13) Maximum IAS during recovery	(MPH)		
(14) Maximum CAS during recovery	(MPH)		
(15) Maximum acceleration during recovery	(G)		

(16) Controllability

	Good	Fair	Poor	Unsatisfactory
(a) Longitudinal:	_____	_____	_____	_____
(b) Lateral:	_____	_____	_____	_____
(c) Directional:	_____	_____	_____	_____

3.120-1(b) * Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

3.120-1(c) If power is used during recovery, it should not be applied at a speed below 1.2V_{s1}.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

i. Power Off Stall Characteristics: (continued)

(17) For airplanes with independently controlled bank and yaw control, is it possible to produce and to correct roll and yaw by unreversed use of aileron and rudder controls up to time airplane pitches?..... NA Yes No

(18) For two control airplanes, is it possible to produce and to correct roll by unreversed use of the rolling control without producing excessive yaw up to time airplane pitches? NA Yes No

(19) Is buffeting violent at the stall?..... No Yes

(If "yes", describe under "REMARKS")

(20) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?..... Yes No

(Describe nature and extent of warning under "REMARKS")

(21) During recovery:

(a) Is it possible to prevent more than 15° roll or yaw by normal control use?..... Yes No

(b) If loss of altitude is over 100 ft., is this information in the AFM, on a placard, or listing?..... NA Yes No

(c) If pitch is over 30° below level, is this information in the AFM, on a placard, or listing?..... NA Yes No

(22) Is buffeting at any speed above the stall severe enough to interfere with the satisfactory control of the airplane or cause structural damage or excessive fatigue to the crew?. No Yes

REMARKS -

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight: (continued)

3.120 j. Power On Stall Characteristics

3.120-1

3.120-2 (1) Conditions

(a) Hp_____Ft. (b) OAT_____°F

(c) Engines at_____in.Hg. _____RPM

Power setting for airplanes over 6000 lbs. should not be less than that required to show compliance with normal climb requirements (CAR 3.85(a)), or with 90% M.C. power for airplanes 6000 lbs. or less.

		Gear Retracted Flaps Retracted	Gear Extended Landing Flaps °
(2) Trim 1.5V_{S1} or minimum trim speed	MPH-IAS		
(3) Trim 1.5V_{S1} or minimum trim speed	MPH-CAS		
(4) Prior to stall is speed reduced at rate not greater than 1 MPH/SEC.?		Yes No	Yes No
(5) Speed at which 1 MPH/SEC. first obtained	MPH-IAS		
(6) Stall speed	MPH-IAS		
(7) Stall speed	MPH-CAS		
(8) Is stall limited by control stop?		No Yes	No Yes
(9) Maximum roll	(degrees)		
(10) Maximum yaw	(degrees)		
(11) Maximum pitch below level	(degrees)		
(12) Altitude lost *	(feet)		
(13) Maximum IAS during recovery	(MPH)		
(14) Maximum CAS during recovery	(MPH)		
(15) Maximum acceleration during recovery	(G)		

(16) Controllability	Good	Fair	Poor	Unsatisfactory
(a) Longitudinal:				
(b) Lateral:				
(c) Directional:				

3.120-1(b) * Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

j. Power On Stall Characteristics: (continued)

(17) For airplanes with independently controlled bank and yaw controls, is it possible to produce and to correct roll and yaw by unreversed use of aileron and rudder controls up to time airplane pitches?..... NA Yes No

(18) For two control airplanes, is it possible to produce and to correct roll by unreversed use of the rolling control without producing excessive yaw up to the time airplane pitches?..... NA Yes No

(19) Is buffeting violent at the stall?..... No Yes

(If "yes", describe under "REMARKS")

(20) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?..... Yes No

(Describe nature and extent of warning under "REMARKS")

(21) During recovery:

(a) Is it possible to prevent more than 15° roll or yaw by normal control use?..... Yes No

(b) If loss of altitude is over 100 ft., is this information in the AFM, on a placard, or listing?... NA Yes No

(c) If pitch is over 30° below level, is this information in the AFM, on a placard, or listing?..... NA Yes No

(22) Is buffeting at any speed above the stall severe enough to interfere with the satisfactory control of the airplane or cause structural damage or excessive fatigue to the crew?..... No Yes

REMARKS -

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight: (continued)

3.121

3.121-1 k. Stall Characteristics From Excessive Climb Attitude *

(1) Conditions

(a) Hp_____Ft. (b) OAT_____°F

3.121-1(b) (c) Engines at_____in.Hg. _____RPM

(Power used, if any, to achieve the desired excessive climb or nose high attitude)

		Gear Retracted Flaps Retracted		Gear Extended Landing Flaps °	
		Power On	Power Off	Power On	Power Off
(2) Trim 1.5V_{S1} or minimum trim speed	(MPH-IAS)				
(3) Trim 1.5V_{S1} or minimum trim speed	(MPH-CAS)				
(4) Approx. rate of approach (last 20 mph) (Should be as high as practicable)	(MPH/Sec.)				
(5) Approx. climb (attitude horizontal) (Should be as high as practicable)	(Degrees)				
(6) Stall speed	(MPH-IAS)				
(7) Stall speed	(MPH-CAS)				
(8) Maximum roll	(Degrees)				
(9) Maximum yaw	(Degrees)				
(10) Maximum pitch below level	(Degrees)				
(11) Altitude lost **	(Feet)				
(12) Maximum IAS during recovery	(MPH)				
(13) Maximum CAS during recovery	(MPH)				
(14) Maximum acceleration during recovery	(G)				

(15) Controllability	Good	Fair	Poor	Unsatisfactory
(a) Longitudinal:				
(b) Lateral:				
(c) Directional:				

* See Section VE3a(9) for one engine inoperative power on stalls

** Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

k. Stall Characteristics From Excessive Climb Attitude: (continued)

(16) Is buffeting violent at the stall?..... No Yes

(17) Are the recovery speeds greater than V_{ne}?..... No Yes

(18) Are the recovery maximum accelerations greater than the limit positive maneuvering load factor for which the airplane was designed?..... No Yes

(19) Describe stall warning and buffeting: _____

REMARKS

654382 O - 62 - 11

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight: (continued)

3.122 1. Power On Coordinated 30° Banked Turn Stall

(1) Conditions

(a) Hp_____Ft. (b) OAT_____°F

(c) Engine at_____in.Hg. _____RPM

(Setting should be that for 75% M.C. power)

(d) Landing gear retracted ( )

(e) Flaps retracted ( )

	Direction of Turn			
	Right		Left	
(2) Is a steady curvilinear level coordinated flight condition in a 30° bank established?.....	Yes	No	Yes	No
(a) Speed (MPH-IAS)				
(b) Speed (MPH-CAS)				
(3) While maintaining 30° bank, is airplane stalled by steadily tightening the turn with the elevator control?.....	Yes	No	Yes	No
(a) If "no", is stall limited by elevator control stop?.....	Yes	No	Yes	No
(4) Stall speed (MPH-IAS)				
(5) Stall speed (MPH-CAS)				
(6) Maximum roll (Degrees)				
(7) Maximum yaw (Degrees)				
(8) Maximum pitch below level (Degrees)				
(9) Altitude lost * (Feet)				
(10) Maximum IAS during recovery (MPH)				
(11) Maximum CAS during recovery (MPH)				
(12) Maximum acceleration during recovery (G)				

3.120-1(b) * Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

1. Power On Coordinated 30° Banked Turn Stall: (continued)

	Good	Fair	Poor	Unsatisfactory
(13) Controllability				
(a) Longitudinal:	_____	_____	_____	_____
(b) Lateral:	_____	_____	_____	_____
(c) Directional:	_____	_____	_____	_____

(14) Is recovery to level flight made by normal use of controls?..... Yes No

(15) During recovery to normal level flight

(a) Is there an excessive loss of altitude?..... No Yes

(b) Does airplane have uncontrollable rolling characteristics?..... No Yes

(c) Does airplane have uncontrollable spinning tendencies?..... No Yes

(16) Is buffeting at any speed above the stall severe enough to interfere with the satisfactory control of the airplane, or cause structural damage or excessive fatigue to the crew?..... No Yes

(17) Is buffeting violent at the stall?..... No Yes

(18) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?..... Yes No

(Describe nature and extent of warning under "REMARKS")

_____

_____

_____

_____

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition - At Maximum T.O. Weight: (continued)

m. Spins (All single-engine airplanes)

(1) Airplane to be certificated in category: N U A

3.124(b) (2) Category U - is airplane to comply with the spin requirements of category: N A Not Applicable

3.124(a) (3) Category N

(Normal spin tests (recovery with normal control application))

(a) Configuration (flaps and gear)	Up ( )		Down ( )		Up ( )		Down ( )	
(b) Trim speed (MPH-IAS)	.9 V_h ( )		1.3 V_{so} ( )					
(c) Spin entry effected by normal methods (If "no", describe under "REMARKS")	Yes	No	Yes	No	Yes	No	Yes	No
(d) Spin maintained 1 turn by full elevator and rudder in pro spin position, ailerons neutral? (If "no", describe under "REMARKS")	Yes	No	Yes	No	Yes	No	Yes	No
(e) Test data:								
Direction of spin	L	R	L	R	L	R	L	R
No. turns spinning	1	1	1	1	1	1	1	1
No. turns recovering								
Maximum recovery speed (MPH-IAS)								
Recovery acceleration (Max. G)								
(f) Any excessive back pressures?	No	Yes	No	Yes	No	Yes	No	Yes
(g) Recovery effected within one additional turn?	Yes	No	Yes	No	Yes	No	Yes	No
*(h) Recovery speed exceed placard limit?	No	Yes	No	Yes	No	Yes	No	Yes
*(i) Recovery acceleration exceed limit positive maneuvering load factor?	No	Yes	No	Yes	No	Yes	No	Yes

* In the flaps and gear down configuration, flaps may be retracted during recovery.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

m. Spins (All single-engined airplanes) (Continued)

3.124(c) (4) Category A

Normal spin tests (recovery with normal control application)

(a) Configuration (flaps and gear)							Up ( )		Down ( )	
(b) Trim Speed (MPH-IAS)							.9V_h ( )		1.3V_{so} ( )	
(c) Spin entry effected by normal methods?..... (If "no", describe under "REMARKS")							Yes	No	Yes	No
(d) Spin maintained by full elevator and rudder in pro spin position, ailerons neutral?..... (If "no", describe under "REMARKS")							Yes	No	Yes	No
(e) Test data:										
Direction of spin	L	R	L	R	L	R	L	R	L	R
No. turns spinning	1	1	2	2	4	4	6	6	1	1
No. turns recovering										
Recovery speed (Max. IAS)										
Recovery acceleration (Max. G)										
Is there any back pressure? (If "yes", describe under "REMARKS")							Yes	No	Yes	No
(f) Is recovery effected within 1 1/2 additional turns in all instances?.....							Yes	No	Yes	No
*(g) Does recovery speed exceed placard limit?.....							No	Yes	No	Yes
*(i) (h) Does recovery acceleration exceed limit positive maneuvering load factor?.....							No	Yes	No	Yes
(i) Is airplane capable of spinning at this loading?.....							Yes	No	Yes	No

* In the flaps and gear down position, flaps may be retracted during recovery, provided a placard is installed prohibiting intentional spins with flaps extended.

REMARKS

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics: (continued)

3.106 2. Most Rearward C.G. Condition at Maximum T.O. Weight

a. Weight_____lbs.; C.G._____% MAC; Ref.: Page_____Appendix____

b. Propeller (See II.C,2)

c. Were deicers installed? (If "yes", (See II.E,2)..... Yes No

3.115 d. Static Stability and Controllability:

3.112-1

Configuration	Static Longitudinal Stability	Controllability		
		Long.	Lat.	Direct.
(1) Climb Hp____Ft., OAT____°F 75% M.C. Power ( ) RPM____M.P.____in.Hg. Gear & flaps retracted ( ) Trim to 1.4V_{s1} ____MPH-IAS ____MPH-CAS	Ref. Data Sheet #_____ Stable slope required between 1.2V_{s1} to 1.6V_{s1} Free return speed (friction band) (+____% V trim)(+____MPH-IAS) (-____% V trim)(-____MPH-IAS) Stable ( ) Unstable ( )	Good Fair Poor Unsat.	Good Fair Poor Unsat.	Good Fair Poor Unsat.
(2) Cruise Hp____Ft., OAT____°F Power to Maintain V_g ( ) RPM____M.P.____in.Hg. Gear extended ( ) Flaps retracted ( ) Trim to level flight speed ____MPH-IAS ____MPH-CAS	Ref. Data Sheet #_____ Stable slope required between 1.3V_{s1} to level flight trim speed or up to speed where stick force is 40 lbs. Free return speed (friction band) (+____% V trim)(+____MPH-IAS) (-____% V trim)(-____MPH-IAS) Stable ( ) Unstable ( )	Good Fair Poor Unsat.	Good Fair Poor Unsat.	Good Fair Poor Unsat.
(3) Cruise Hp____Ft., OAT____°F 75% M.C. Power ( ) RPM____M.P.____in.Hg. Gear & flaps retracted ( ) Trim to level flight speed ____MPH-IAS ____MPH-CAS	Ref. Data Sheet #_____ Stable slope required between 1.3V_{s1} to V_{ne} or up to speed where stick force is 40 lbs. Free return speed (friction band) (+____% V trim)(+____MPH-IAS) (-____% V trim)(-____MPH-IAS) Stable ( ) Unstable ( )	Good Fair Poor Unsat.	Good Fair Poor Unsat.	Good Fair Poor Unsat.
(4) Approach Hp____Ft., OAT____°F Power for 3° angle of descent RPM____M.P.____in.Hg. ( ) Gear extended ( ) Landing flaps____° Trim: 1.5V_{s1} (6000# or less) 1.4V_{s1} (more than 6000#) ____MPH -IAS____MPH-CAS	Ref. Data Sheet #_____ Stable slope required between 1.1V_{s1} to 1.8V_{s1} stick force must not exceed 40 lbs. between these speed limits. Free return speed (friction band) (+____% V trim)(+____MPH-IAS) (-____% V trim)(-____MPH-IAS) Stable ( ) Unstable ( )	Good Fair Poor Unsat.	Good Fair Poor Unsat.	Good Fair Poor Unsat.

(5) Are friction band, stable slope and no reversal of stick force requirements met?..... Yes No

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

Static Longitudinal Stability

Airplane_____ Flight No._____ Date_____

Weight_____ C.G. at_____% MAC

Altitude_____Ft. Flap Position_____° Gear Up ( ) Down ( )

Required Trim = _____V_{sl} = _____CAS V_{sl}_____MPH-CAS

Required Stable Slope = _____V_{sl} to _____ [_____CAS to _____CAS]

RPM_____ Manifold pressure_____in.Hg. BHP_____(____% Rated)

Tests Speeds	IAS (MPH)	CAS (MPH)	Stick force (lbs.) (+ For pull, - for push)				
Minimum steady speed for unstalled flight							Airspeed decreased by steady pull in increasing increments
Minimum required for stable slope							
Intermediate							
Intermediate							
Intermediate							
Intermediate							
Intermediate							
Intermediate							
Free return speed							Friction Band
Trim speed							
Free return speed							
Intermediate							Airspeed increased by steady push in increasing increments.
Intermediate							
Intermediate							
Intermediate							
Intermediate							
Intermediate							
Maximum required for stable slope							
Maximum permissible speed							

NOTE: Maximum speed is not required if stick force exceeds 40 pounds.

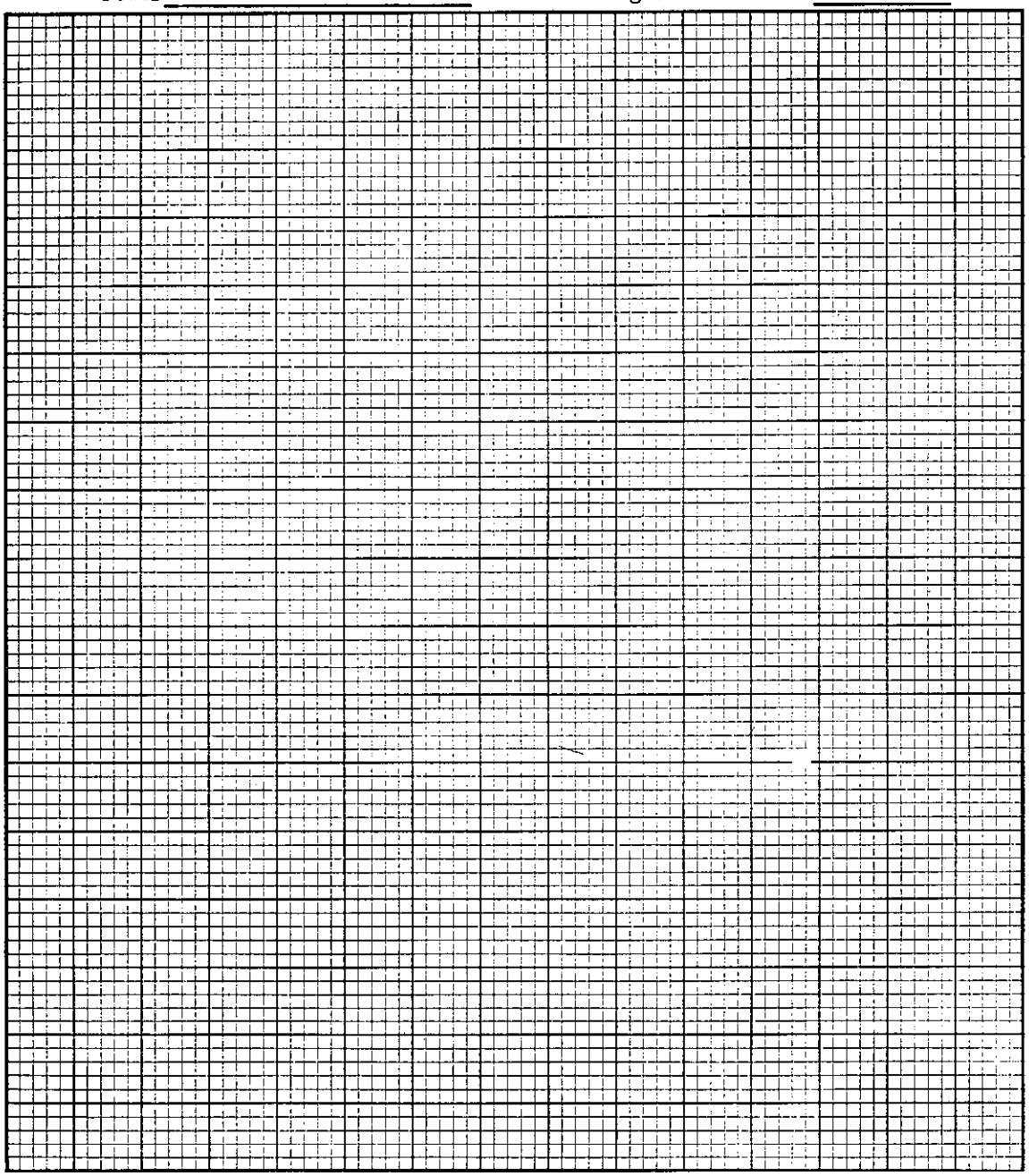
STATIC LONGITUDINAL STABILITY

3.115 Airplane _____

Weight _____ lbs. Altitude _____ ft.

C.G. _____ % M.A.C. Wing Flap Position _____

Power _____ Landing Gear Position _____



STICK FORCE (POUNDS)

CALIBRATED AIRSPEED (M.P.H.)

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.112 e. Trim – Longtudinal

Configurations	Information: Observed Data	Information: Trim Speed	Trim Longitudinal
(1) Climb M.C. Power ( ) Gear retracted ( ) Flap retracted ( )	Hp_____Ft. RPM_____ M.P._____in.Hg. OAT_____°F	Climb with M.C.Power at a speed between V_x & 1.4V_{s1} _____MPH-IAS _____MPH-CAS	Trimmed Tail Heavy Nose Heavy
(2) Climb M.C. Power ( ) Gear retracted ( ) Takeoff flaps_____°	Hp_____Ft. RPM_____ M.P._____in.Hg. OAT_____°F	Climb with M.C.Power at a speed between V_x & 1.4V_{s1} _____MPH-IAS _____MPH-CAS	Trimmed Tail Heavy Nose Heavy
(3) Level flight Sufficient power for trim speed ( ) Gear retracted ( ) Flap retracted ( )	Hp_____Ft. RPM_____ M.P._____in.Hg. OAT_____°F	Level flight at power sufficient for the higher of V_x or 1.4V_{s1} speeds (indicate by circle which speed used) _____MPH-IAS _____MPH-CAS	Trimmed Tail Heavy Nose Heavy
(4) Level flight Sufficient power for trim speed ( ) Gear retracted ( ) Flap retracted ( )	Hp_____Ft. RPM_____ M.P._____in.Hg. OAT_____°F	Level flight at 0.9V_h _____MPH-IAS _____MPH-CAS	Trimmed Tail Heavy Nose Heavy
Trim – Lateral and Directional			
(5) Level flight Sufficient power for trim speed ( ) Gear retracted ( )	HP_____Ft. RPM_____ M.P._____in.Hg. OAT_____°F	Level flight at lower of 0.9V_h or V_c (circle which)	Is lateral and directional trim satisfactory? Yes No If "no", explain under "REMARKS"

3.109(c) f. Controllability Test For Full Flap Retraction With Simultaneous Application Of M.C.Power At Speed Of 1.1V_{s1}

Configuration	Information	Result	Force
Steady level flight Power sufficient for speed of 1.1V_{s1} ( ) Gear extended ( ) Landing flaps_____°	Hp_____ft. Before test (RPM_____) (M.P._____In.Hg.) After test (RPM_____) (M.P._____In.Hg.) OAT_____°F	Is exceptional piloting skill (for private pilot required to maintain essentially level flight. No Yes	

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.109 g. Longitudinal Control Tests

Configuration (gear extended each case)	Information: Observed Data	Information: Trim Speed	Does it require a change in the trim control or the exertion of more control force than can be readily applied with one hand for a short period to.....
(1) Glide Throttles closed ( ) Gear extended ( ) Flaps retracted ( )	Hp____Ft. OAT____°F RPM_____ In.Hg.___	1.5V_{s1} or minimum trim speed _____MPH - IAS _____MPH - CAS	extend the flaps as rapidly as possible to landing position _____° while maintaining approx. 1.4 times instantaneous stall speed? No Yes
(2) Glide Throttles closed ( ) Gear extended ( ) Landing flaps____°	Hp____Ft. OAT____°F RPM_____ In.Hg.___	1.5V_{s1} or minimum trim speed _____MPH - IAS _____MPH - CAS	retract the flaps as rapidly as possible, while maintaining approx. 1.4 times instantaneous stall speed? No Yes
(3) Climb M.C. Power ( ) Gear extended ( ) Landing flaps____°	Hp____Ft. OAT____°F RPM_____ In.Hg.___	1.5V_{s1} or minimum trim speed _____MPH - IAS _____MPH - CAS	retract the flaps as rapidly as possible, while maintaining approx. 1.4 times instantaneous stall speed? No Yes
(4) Glide Throttles closed ( ) Gear extended ( ) Flaps retracted ( )	Hp____Ft OAT____°F RPM_____ In.Hg.___	1.5V_{s1} or minimum trim speed _____MPH - IAS _____MPH - CAS	apply T.O. power quickly while maintaining the same speed? No Yes
(5) Glide Throttles closed ( ) Gear extended ( ) Landing flaps____°	Hp____Ft. OAT____°F RPM_____ In.Hg.___	1.5V_{s1} or minimum trim speed _____MPH - IAS _____MPH - CAS	apply T.O. power quickly while maintaining the same speed? No Yes
(6) Glide Throttles closed ( ) Gear extended ( ) Landing flaps____°	Hp____Ft. OAT____°F RPM_____ In.Hg.___	1.5V_{s1} or minimum trim speed _____MPH - IAS _____MPH - CAS	obtain and maintain speed at 1.1V_{s1}? (____MPH-IAS _____MPH-CAS) No Yes
(7) Glide Throttles closed ( ) Gear extended ( ) Landing flaps____°	Hp____Ft. OAT____°F RPM_____ In.Hg.____	1.5V_{s1} or minimum trim speed _____MPH - IAS _____MPH - CAS	obtain and maintain speed at the lower of 1.7V_{s1} or V_f No Yes

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

g. Longitudinal Control Tests: (continued)

3.109(a) (8) Test to Determine Longitudinal Control Between V_x and V_{s1} in Pitching Nose Downward for Prompt Acceleration to Speed of V_x

All engines	M.C. Power ( )	M.C. Power ( )	Power Off ( )	Power Off ( )
Flap position	Landing ____°	Retracted ( )	Landing ____°	Retracted ( )
Landing gear	Extended ( )	Retracted ( )	Extended ( )	Retracted ( )
Trim speed MPH-IAS ____ MPH-CAS ____	V_x	V_x	1.5V_{s1} or min. trim speed	1.5V_{s1} or min. trim speed
Pressure altitude (Ft.)				
Outside air temp. (°F)				
Engine RPM				
Manifold pressure (in.Hg.)				
Lowest speed from which pitch is satisfactory? MPH-IAS ____ MPH-CAS ____				
Is this speed V_{s1} or lower?	Yes No	Yes No	Yes No	Yes No
Alt. lost to regain speed V_x (Ft.)				
Is longitudinal control satisfactory?	Yes No	Yes No	Yes No	Yes No

REMARKS

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.118-2

3.118(a) h. Directional and Lateral Stability (3 control airplanes)

Configuration, Power, Trim and Data	Kind Stab.	Test Results for Trim Speeds Between 1.2V_{s1} to Maximum Permissible
Configuration and Power Gear Up ( ) Flaps Up ( ) Trim at several speeds (MPH) from 1.2V_{s1} to V_{ne} 1.2V_{s1} _____ IAS _____ CAS _____ IAS _____ CAS _____ IAS _____ CAS _____ IAS _____ CAS V_{ne} _____ IAS _____ CAS Observed Data HP _____ Ft., OAT _____ °F M.P. _____ in.Hg., RPM _____ M.P. _____ in.Hg., RPM _____	MCP Directional	Is tendency positive to recover from a skid with rudder free?... Yes <u>No</u> Does control force increase steadily with deflection?..... Yes <u>No</u> What is the rudder pedal force at maximum deflection? Right _____ lbs. Left _____ lbs. What bank angle is required to hold a constant heading? _____ °
	75% MCP Lateral	Is the tendency to raise the low wing in a side slip: (1) Positive at V_{ne}?..... Yes <u>No</u> (2) Negative at 1.2V_{s1}?..... No <u>Yes</u> (a) If positive, record time required to recover from a _____ ° bank. Right _____ Sec. Left _____ Sec. Does control force increase steadily with deflection?..... Yes <u>No</u>
	Dynamic 75% MCP	Are any short period oscillations occuring between stall and V_{ne} heavily damped with the primary controls: (1) Lateral (a) Free?..... Yes <u>No</u> (b) Fixed?..... Yes <u>No</u> (2) Directional (a) Free?..... Yes <u>No</u> (b) Fixed?..... Yes <u>No</u>

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3.118-2 2. Most Rearward C.G. Condition at Maximum T.O. Weight:

3.118(a) h. Directional and Lateral Stability (3 control airplanes): (continued)

Configuration, Power, Trim and Data	Kind Stab.	Test Results for Trim Speeds Between $1.2V_{s1}$ to Maximum Permissible		
Configuration and Power Gear extended ( ) Flaps in takeoff position_____° ( ) Several speeds from $1.2V_{s1}$_____IAS _____CAS to V_f or maximum gear speed (circle which) $1.2V_{s1}$_____IAS_____CAS _____IAS_____CAS _____IAS_____CAS _____IAS_____CAS V_f or gear____IAS_____CAS Observed Data Hp_____Ft., OAT_____°F M.P._____in.Hg., RPM_____ M.P._____in.Hg., RPM_____	MCP Directional	Is tendency positive to recover from a skid with rudder free?..	Yes	No
		Does control force increase steadily with deflection?.....	Yes	No
		What is the rudder pedal force at maximum deflection? Right_____lbs. Left_____lbs.		
		What bank angle is required to hold a constant heading?_____°		
	75% MCP Lateral	Is the tendency to raise the low wing in a side slip:		
		(1) Positive at V_f or gear?..	Yes	No
		(2) Negative at $1.2V_{s1}$?.....	No	Yes
		(a) If positive, record time required to recover from a _____° bank. Right_____Sec. Left_____Sec.		
		Does control force increase steadily with deflection?.....	Yes	No
	75% MCP Dynamic	Are any short period oscillations occuring between stall and V_f or gear heavily damped with the primary controls:		
		(1) Lateral		
		(a) Free?.....	Yes	No
		(b) Fixed?.....	Yes	No
		(2) Directional		
		(a) Free?.....	Yes	No
		(b) Fixed?.....	Yes	No

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

3.118(a) h. Directional and Lateral Stability (3 control airplanes): (continued)

3.118-2

Configuration, Power, Trim and Data	Kind Stab.	Test Results for Trim Speeds Between 1.2V_{s1} to Maximum Permissible
Configuration and Power Throttles Closed ( ) Gear Up ( ) Flaps Up ( ) Trim at several speeds (MPH) from 1.2V_{s1} to V_{ne} 1.2V_{s1} _____ IAS _____ CAS _____ IAS _____ CAS _____ IAS _____ CAS _____ IAS _____ CAS V_{ne} _____ IAS _____ CAS Observed Data HP _____ Ft., OAT _____ °F M.P. _____ in.Hg., RPM _____	Directional	Is tendency positive to recover from a skid with rudder free?.. Yes No Does control force increase steadily with deflection?..... Yes No What is the rudder pedal force at maximum deflection? Right _____ lbs. Left _____ lbs. What bank angle is required to hold a constant heading? _____ °
	Lateral	Is the tendency to raise the low wing in a side slip: (1) Positive at V_{ne}?..... Yes No (2) Negative at 1.2V_{s1}?..... No Yes (a) If positive, record time required to recover from a _____ ° bank. Right _____ Sec. Left _____ Sec. Does control force increase steadily with deflection?..... Yes No
	Dynamic	Are any short period oscillations occuring between stall and V_{ne} heavily damped with the primary controls: (1) Lateral (a) Free?..... Yes No (b) Fixed?..... Yes No (2) Directional (a) Free?..... Yes No (b) Fixed?..... Yes No

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

3.118(a) h. Directional and Lateral Stability (3 control airplanes): (continued)

3.118-2

Configuration, Power, Trim and Data	Kind Stab.	Test Results for Trim Speeds Between $1.2V_{s1}$ to Maximum Permissible
Configuration and Power Throttles Closed ( ) Gear Extended ( ) Flaps in takeoff position____° ( ) Several speeds from $1.2V_{s1}$_____IAS _____CAS to V_f or maximum gear speed (circle which) $1.2V_{s1}$_____IAS_____CAS _____IAS_____CAS _____IAS_____CAS _____IAS_____CAS V_f or gear _____IAS_____CAS Observed Data Hp_____Ft., OAT_____°F M.P._____in.Hg., RPM_____	Directional	Is tendency positive to recover from a skid with rudder free?.. Yes **No** Does control force increase steadily with deflection?..... Yes **No** What is the rudder pedal force at maximum deflection? Right_____lbs. Left_____lbs. What bank angle is required to hold a constant heading?_____°
	Lateral	Is the tendency to raise the low wing in a side slip: (1) Positive at V_f or gear?.. Yes **No** (2) Negative at $1.2V_{s1}$?..... No **Yes** (a) If positive, record time required to recover from a _____° bank. Right_____Sec. Left_____Sec. Does control force increase steadily with deflection?..... Yes **No**
	Dynamic	Are any short period oscillations occuring between stall and V_f or gear heavily damped with the primary controls: (1) Lateral (a) Free?..... Yes **No** (b) Fixed?..... Yes **No** (2) Directional (a) Free?..... Yes **No** (b) Fixed?..... Yes **No**

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.118

i. Test for Rudder Lock (3 control airplanes)

(1) Power setting	50% M.C. Power	Power Off	50% M.C. Power	Power Off
(2) Landing gear position	Retracted	Retracted	Extended	Extended
(3) Flap position	Retracted	Retracted	Ldg. °	Ldg. °
(4) Speed (MPH-IAS)				
(5) Speed (MPH-CAS) (See item "11" below for speeds)				
(6) Pressure altitude (Feet)				
(7) Outside air temperature (°F)				
(8) RPM				
(9) Manifold pressure (in.Hg.)				
(10) In straight steady sideslips: (a) Do the aileron and rudder control movements and forces increase steadily as the angle of sideslip is increased?	Yes No	Yes No	Yes No	Yes No
(b) Is rate of increase of control movements and forces satisfactory up to the extreme angles of sideslip considered appropriate to the type?.....	Yes No	Yes No	Yes No	Yes No
(c) Is the limit at maximum angles of sideslip obtained by control force of 150 lbs. or maximum rudder travel?....	_____	_____	_____	_____
(d) Do the rudder pedal forces reverse?...	No Yes	No Yes	No Yes	No Yes
(e) Does sufficient bank accompany sideslipping to indicate adequately any departure from steady, unyawed flight?.....	Yes No	Yes No	Yes No	Yes No

(11) Speeds for item (5) above:

For all aircraft: $1.2V_{S1}$ at all gear and flap positions

3.117 j. "Formerly called for longitudinal short period oscillation" investigation. Omitted since item already covered by item II F 5 under flutter investigation.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.118(b) k. Directional Stability (2 control airplane)

Is the directional stability adequate by demonstrating that the airplane can be rapidly rolled from a 45° bank to a 45° bank in the opposite direction without exhibiting dangerous skidding characteristics with the airplane in the configuration of (flaps and landing gear up), (landing flaps and landing gear down), (power off and 75% M.C. power) and over a range of speeds considered appropriate for the airplane?..... Yes No

3.118(b) l. Lateral Stability (2 control airplane)

(1) Are flaps and landing gear retracted?..... NA Yes No

(2) Is airplane trimmed for level flight at

(a) The lower of 0.9 of high speed in level flight or V_c? Yes No

Which is lower_____, and what are speed values_____MPH-IAS _____MPH-CAS

(3) Is lateral stability adequate by demonstrating that the airplane will not assume a dangerous attitude or speed when all the controls are abandoned for a period of two minutes when in the above configuration?..... Yes No

3.118(b) m. Dynamic Stability (2 control airplane)

Is any short period oscillation between stalling speed and the maximum permissible speed heavily damped with primary controls:

(1) Free?..... Yes No

(2) Fixed?..... Yes No

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ECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

.106 n. General Controllability

(1) Is the airplane satisfactorily controllable and maneuverable about all three axes during takeoff, climb, level flight, dive and landing (with and without power)?..... Yes No

(2) Is it possible to make a smooth transition from one flight condition to another, including turns and slips, without requiring an exceptional degree of skill, alertness, or strength on the part of the pilot (private) and without danger of exceeding the limit load factor under all conditions of operating probable for the type?..... Yes No

(3) Are the control values both for temporary and prolonged application (strength of pilots limits) as listed in CAR 3.106 exceeded in any operation?..... No Yes

o. Acrobatic Controllability (Applicable to Categories U and A only)

.108-A (1) It is demonstrated that the following acrobatic maneuvers
.107-U are performed readily and safely?..... NA Yes No
.778(e)(2),(3)

Maneuvers	Maximum Safe Entry Speeds (M.P.H.)
(a) Stalls (except whip stalls) (accelerated or high speed stalls)	_____IAS _____CAS
(b) Steep turns (over 60° bank)	_____IAS _____CAS
(c) Spin (except when placarding against same)	_____IAS _____CAS
(d) Lazy eights	_____IAS _____CAS
(e) Chandelle	_____IAS _____CAS
(f) _____	_____IAS _____CAS
(g) _____	_____IAS _____CAS

(2) Are the above maneuvers listed with recommended entry speeds in the Airplane Flight Manual?..... Yes No

* (These items to be investigated for Utility Category, and are minimum required for Acrobatic Category).

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.120 p. Power Off Stall Characteristics

3.120-1

3.120-2 (1) Conditions

($_a$) Hp_____Ft. (b) OAT_____°F

(c) Engines idling in low pitch_____RPM_____in.Hg.

		Gear Retracted Flaps Retracted	Gear Extended Landing Flaps °
(2) Trim 1.5V_{S1} or minimum trim speed	(MPH-IAS)		
(3) Trim 1.5V_{S1} or minimum trim speed	(MPH-CAS)		
(4) Prior to stall, is speed reduced at rate not greater than 1 MPH/SEC.?.....		Yes No	Yes No
(5) Speed at which 1 MPH/SEC. first obtained	(MPH-IAS)		
(6) Stall speed	(MPH-IAS)		
(7) Stall speed	(MPH-CAS)		
(8) Is stall limited by control stop?.....		No Yes	No Yes
(9) Maximum roll	(degrees)		
(10) Maximum yaw	(degrees)		
(11) Maximum pitch below level	(degrees)		
(12) Altitude lost *	(feet)		
(13) Maximum IAS during recovery	(MPH)		
(14) Maximum CAS during recovery	(MPH)		
(15) Maximum acceleration during recovery	(G)		

(16) Controllability

	Good	Fair	Poor	Unsatisfactory
(a) Longitudinal:				
(b) Lateral:				
(c) Directional:				

* Difference in altitude as measured on sensetive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

ECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

p. Power Off Stall Characteristics: (continued)

(17) For airplanes with independently controlled bank and yaw control, is it possible to produce and to correct roll and yaw by unreversed use of aileron and rudder controls up to time airplane pitches?..... NA Yes No

(18) For 2 control airplanes, is it possible to produce and to correct roll by unreversed use of the rolling control without producing excessive yaw up to time airplane pitches?..... NA Yes No

(19) Is buffeting violent at the stall?..... No Yes

(If "yes", describe under "REMARKS")

(20) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?..... Yes No

(Describe nature and extent of warning under "REMARKS")

(21) During recovery:

(a) Is it possible to prevent more than 15° roll or yaw by normal control use?..... Yes No

(b) If loss of altitude is over 100 feet, is this information in the AFM, on a placard, or listing?.... NA Yes No

(c) If pitch is over 30° below level, is this information in the AFM, on a placard, or listing?..... NA Yes No

.159 (22) Is buffeting at any speed above the stall severe enough to interfere with the satisfactory control of the airplane or cause structural damage or excessive fatigue to the crew?..... No Yes

REMARKS

		Flaps Retracted	Landing Flaps °
(2) Trim 1.5V_{S1} or minimum trim speed	(MPH-IAS)		
(3) Trim 1.5V_{S1} or minimum trim speed	(MPH-CAS)		
(4) Prior to stall is speed reduced at rate not greater than 1 MPH per second?		Yes No	Yes No
(5) Speed at which 1 MPH/SEC. first obtained	(MPH-IAS)		
(6) Stall speed	(MPH-IAS)		
(7) Stall speed	(MPH-CAS)		
(8) Is stall limited by control stop?		No Yes	No Yes
(9) Maximum roll	(degrees)		
(10) Maximum yaw	(degrees)		
(11) Maximum pitch below level	(degrees)		
(12) Altitude lost *	(feet)		
(13) Maximum IAS during recovery	(MPH)		
(14) Maximum CAS during recovery	(MPH)		
(15) Maximum acceleration during recovery	(G)		

(16) Controllability — Good _____ Fair _____ Poor _____ Unsatisfactory _____

(a) Longitudinal: _____ _____ _____ _____

(b) Lateral: _____ _____ _____ _____

(c) Directional: _____ _____ _____ _____

* Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

p. Power Off Stall Characteristics: (continued)

(17) For airplanes with independently controlled bank and yaw control, is it possible to produce and to correct roll and yaw by unreversed use of aileron and rudder controls up to time airplane pitches? ..... NA Yes No

(18) For 2 control airplanes, is it possible to produce and to correct roll by unreversed use of the rolling control without producing excessive yaw up to time airplane pitches? ..... NA Yes No

(19) Is buffeting violent at the stall? ..... No Yes

(If "yes", describe under "REMARKS")

(20) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs? ..... Yes No

(3) Trim 1.5V_{s1} or minimum trim speed	(MPH-CAS)			
(4) Prior to stall, is speed reduced at rate not greater than 1 MPH/SEC.?.....		Yes	No	Yes No
(5) Speed at which 1 MPH/SEC. first obtained	(MPH-IAS)			
(6) Stall speed	(MPH-IAS)			
(7) Stall speed	(MPH-CAS)			
(8) Is stall limited by control stop?.....		No	Yes	No Yes
(9) Maximum roll	(degrees)			
(10) Maximum yaw	(degrees)			
(11) Maximum pitch below level	(degrees)			
(12) Altitude lost *	(feet)			
(13) Maximum IAS during recovery	(MPH)			
(14) Maximum CAS during recovery	(MPH)			
(15) Maximum acceleration during recovery	(G)			

(16) Controllability

	Good	Fair	Poor	Unsatisfactory
(a) Longitudinal:				
(b) Lateral:				
(c) Directional:				

* Difference in altitude as measured on sensetive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

q. Power On Stall Characteristics: (continued)

(17) For airplanes with independently controlled bank and yaw control, is it possible to produce and to correct roll and yaw by unreversed use of aileron and rudder controls up to time airplane pitches?..... NA Yes No

(18) For 2 control airplanes, is it possible to produce and to correct roll by unreversed use of the rolling control without producing excessive yaw up to time airplane pitches?..... NA Yes No

(19) Is buffeting violent at the stall?..... No Yes

(If "yes", describe under "REMARKS")

(20) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?..... Yes No

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.121 r. Stall Characteristics From Excessive Climb Attitude *

3.121-1

(1) Conditions

(a) Hp_____Ft.

(b) OAT_____°F

(c) Engines at _____in.Hg._____RPM

Power used, if any, to achieve the critical "excessive climb or nose high attitude".

		Gear Retracted Flaps Retracted		Gear Extended Landing Flaps °	
		Power On	Power Off	Power On	Power Off
(2) Trim speed approximately $1.5V_{S1}$	(MPH-IAS)				
(3) Trim speed approximately $1.5V_{S1}$	(MPH-CAS)				
(4) Approx. climb attitude to horizontal (Should be as high as practicable)	(degrees)				
(5) Rate of approach (last 20 mph) (Should be as high as practicable)	(MPH/SEC)				
(6) Stall speed	(MPH-IAS)				
(7) Stall speed	(MPH-CAS)				
(8) Maximum roll	(degrees)				
(9) Maximum yaw	(degrees)				
(10) Maximum pitch below level	(degrees)				
(11) Altitude lost **	(feet)				
(12) Maximum IAS during recovery	(MPH)				
(13) Maximum CAS during recovery	(MPH)				
(14) Maximum acceleration during recovery	(G)				

* See Section VE3a(9) for one engine inoperative power on stalls

** Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

r. Stall Characteristics From Excessive Climb Attitude: (continued)

(15) Controllability	Good	Fair	Poor	Unsatisfactory
(a) Longitudinal:	_____	_____	_____	_____
(b) Lateral:	_____	_____	_____	_____
(c) Directional:	_____	_____	_____	_____

(16) Is buffeting violent at the stall?..... No Yes

(17) Are the recovery speeds greater than V_{ne}?..... No Yes

(18) Are the recovery maximum accelerations greater than the limit positive maneuvering load factor for which the airplane was designed?..... No Yes

(19) Describe stall warning and buffeting:_____

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.122 s. Power On Coordinated 30° Banked Turn Stall, Left And Right

(1) Conditions

(a) Hp_____Ft.

(b) OAT_____°F

(c) Engine at_____in.Hg._____RPM

Setting should be that for 75% M.C. power

(d) Landing gear retracted ( )

(e) Flaps retracted ( )

		Left	Right
(2) Is a steady curvilinear level coordinated flight condition in a 30° bank established?.....		Yes No	Yes No
(a) Speed	(MPH-IAS)		
(b) Speed	(MPH-CAS)		
(3) While maintaining 30° bank, is airplane stalled by steadily tightening the turn with the elevator control?.....		Yes No	Yes No
(a) If "no", is stall limited by elevator control stop?.....		Yes No	Yes No
(4) Stall speed	(MPH-IAS)		
(5) Stall speed	(MPH-CAS)		
(6) Maximum roll	(degrees)		
(7) Maximum yaw	(degrees)		
(8) Maximum pitch below level	(degrees)		
(9) Altitude lost *	(feet)		
(10) Maximum IAS during recovery	(MPH)		
(11) Maximum CAS during recovery	(MPH)		
(12) Maximum acceleration during recovery	(G)		

* Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

3.122 s. Power On Coordinated 30° Banked Turn Stall, Left And Right: (continued)

(13) Controllability

	Good	Fair	Poor	Unsatisfactory
(a) Longitudinal:	_____	_____	_____	_____
(b) Lateral:	_____	_____	_____	_____
(c) Directional:	_____	_____	_____	_____

(14) Is recovery to level flight made by normal use of controls?..... Yes No

(15) During recovery to normal level flight:

(a) Is there an excessive loss of altitude?..... No Yes

(b) Does airplane have uncontrollable rolling characteristics?..... No Yes

3.159 (c) Does airplane have uncontrollable spinning tendencies?..... No Yes

(16) Is buffeting at any speed above the stall severe enough to interfere with the satisfactory control of the airplane, or cuase structural damage or excessive fatigue to the crew?..... No Yes

(17) Is buffeting violent at the stall?..... No Yes

3.120 (18) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?..... Yes No

(Describe nature and extent of warning under "REMARKS")

_____

_____

_____

_____

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

t. Spins

3.124(b) (1) Airplane to be certificated in which category? N U A

(2) Category U - Is airplane to comply with the spin requirements of category: Normal ( ) Acrobatic ( ) Not Applicable ( )

3.124(a) (3) Category N - (All single-engine airplanes)

Normal spin tests (recovery with normal control application)

(a) Configuration (flaps & gear)	Up ( )		Down ( )		Up ( )		Down ( )	
(b) Trim speed (MPH-IAS)	.9V_h ( )		1.3V_{so} ( )					
(c) Spin entry effected by normal methods..... (If "no", describe under "REMARKS")	Yes	No	Yes	No	Yes	No	Yes	No
(d) Spin maintained 1 turn by full elevator and rudder in pro spin position, ailerons neutral?	Yes	No	Yes	No	Yes	No	Yes	No
(e) Test data: Direction of spin	L	R	L	R	L	R	L	R
No. turns spinning	1	1	1	1	1	1	1	1
No. turns recovering								
Maximum recovery speed (MPH-IAS)								
Recovery acceleration (Max. G)								
(f) Any excessive back pressures?.....								
(g) Recovery effected within one additional turn?	Yes	No	Yes	No	Yes	No	Yes	No
(h) Recovery speed exceed placard limit?......	No	Yes	No	Yes	No	Yes	No	Yes
(i) Recovery acceleration exceed limit positive maneuvering load factor?......	No	Yes	No	Yes	No	Yes	No	Yes

* In the flaps and gear down configuration, flaps may be retracted during recovery.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins

3.124(a) (3) Category N (continued)

Uncontrollable spin tests (power on, or abnormal use of controls for entry into, maintenance of, or recovery from a spin)

(a) Configuration (flaps & gear)	Up ( )		Down ( )		Up ( )		Down ( )	
(b) Trim speed (MPH-IAS)	$.9V_h$ ( )		$1.3V_{so}$ ( )					
(c) Spin entry affected by abnormal control or power use?..... (If "yes", describe under "REMARKS")	Yes	No	Yes	No	Yes	No	Yes	No
(d) Can spin be maintained the desired number of turns with power off by any possible use of the controls?..... (If "yes", describe under "REMARKS")	Yes	No	Yes	No	Yes	No	Yes	No
(e) Test data:								
Direction of spin	L	R	L	R	L	R	L	R
No. of turns spinning	-	-	-	-				
No. of turns recovering								
Maximum recovery speed (MPH-IAS)								
Maximum recovery acceleration (G)								
(f) Spin recovery require abnormal control use or more than one additional turn when normal control recovery procedure used?....	No	Yes	No	Yes	No	Yes	No	Yes
(g) Any back pressures?.....	No	Yes	No	Yes	No	Yes	No	Yes
(h) Recovery speed exceed placard limits?......	No	Yes	No	Yes	No	Yes	No	Yes
(i) Recovery acceleration exceed limit positive maneuvering load factor?......	No	Yes	No	Yes	No	Yes	No	Yes

* In the flaps and gear down position, flaps may be retracted during recovery

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins: (continued)

(4) Categories N - U

3.124(d)

(a) Does applicant desire airplane to be designated "characteristically" incapable of spinning?..... Yes No

(If "yes", perform the following:)

(1) Is airplane capable of being spun in any configuration and from non-acrobatic maneuver; i.e., power on or off, flaps and gear up or down?..... No Yes

(If "yes", describe fully under "REMARKS")

(2) With airplane modified as indicated below, is airplane capable of being spun in any configuration and from any non-acrobatic maneuver; i.e., power on or off, flaps and gear up or down?..... No Yes

(If reply is "yes", describe fully under "REMARKS")

Is gross weight 5% in excess of T.O. weight? (_____lbs.) Yes No

Is center of gravity at least 3% aft of the rearmost position for which approval is desired(_____% MAC)? Yes No

What is reference page _____appendix _____ for above.

Is elevator up travel 4° in excess of the normal elevator travel stop limit?..... Yes No

(What is this up range_____degrees)?

Is rudder travel in each direction increased by 7° over that limited by the normal rudder travel stop?..... Yes No

(What is this new rudder range_____ degrees)?

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins

(4) Categories N - U: (continued)

(b) Placards (Categories N and U only)

(1) Category N - Is the airplane placarded against spins?..... Yes No

(2) Category U - If the airplane has been demonstrated to meet Category A spin requirements, is a placard placed in the cockpit setting forth the use of controls required for recovery from spinning maneuvers?..... NA Yes No

REMARKS

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins: (continued)

3.124(c) (5) Category A

3.124-2

Normal spins (recovery with normal control application)

(a) Configuration (flaps and gear)							Up ( )		Down ( )	
(b) Trim speed (MPH-IAS)							.9V_h ( )		1.3V_{so} ( )	
(c) Is spin entry effected by normal methods? (If "no", describe under "REMARKS")							Yes No		Yes No	
(d) Is spin maintained by full elevator and rudder in pro spin position, ailerons neutral? (If "no", describe under "REMARKS")							Yes No		Yes No	
(e) Test data:										
Direction of spin	L	R	L	R	L	R	L	R	L	R
No. turns spinning	1	1	2	2	4	4	4	6	1	1
No. turns recovering										
Recovery speed (Max. IAS)										
Recovery acceleration (Max. G)										
(f) Any back pressure? (If "yes", describe)							Yes	No	Yes	No
(g) Is recovery effected within 1 1/2 additional turns in all instances?							Yes	No	Yes	No
(h) Does recovery speed exceed placard limit?*							No	Yes	No	Yes
(i) Does recovery acceleration exceed limit positive maneuvering load factor?*							No	Yes	No	Yes
(j) Is airplane capable of spinning?							Yes	No	Yes	No

* In the flaps and gear down position, flaps may be retracted during recovery, provided a placard is installed prohibiting intentional spins with flaps extended.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins:

3.124(c) (5) Category A (continued)

3.124-2

Uncontrollable spin tests (power on or abnormal use of controls for entry into, maintenance of, or recovery from a spin.)

(a) Configuration (flaps and gear)							Up ( )		Down ( )	
(b) Trim speed (MPH-IAS)							.9V_h ( )		1.3V_{so} ( )	
(c) Is spin entry effected by abnormal control or power use? (If "yes", describe under "REMARKS")							Yes	No	Yes	No
(d) Can spin be maintained with power off by abnormal control position (elevator full forward, or aileron off neutral)? (If "yes", describe under "REMARKS")							Yes	No	Yes	No
(e) Test data:										
Direction of spin	L	R	L	R	L	R	L	R	L	R
No. turns spinning	1	1	2	2	4	4	6	6	1	1
No. turns recovering										
Recovery speed (Max. IAS)										
Recovery acceleration (Max. G)										
(f) Does spin recovery require abnormal control use or more than 1 1/2 additional turns when normal control recovery procedure is used?							No	Yes	No	Yes
(g) Any back pressures?							No	Yes	No	Yes
*(h) Does recovery speed exceed placard limits?							No	Yes	No	Yes
*(i) Does recover acceleration exceed limit positive maneuvering load factor?							No	Yes	No	Yes

* In the flaps and gear down condition, flaps may be retracted during recovery, if necessary, to avoid exceeding V_f or acceleration limits.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins:

(5) Category A (continued)

Placard (Category A only)

(a) Is a placard placed in the cockpit setting forth the use of controls required for recovery from spinning maneuvers?..... Yes No

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SECTION V. HANDLING QUALITIES:

E. Flight Characteristics: (continued)

3. Multiengine Flight Characteristics With Critical Engine Inoperative

a. Most Rearward C.G. Condition at Maximum T.O. Weight

(1) Weight_____lbs.; C.G._____% MAC; Ref.: Page____Appendix_____

(2) Propeller (See II.C,2)

(3) Were deicers installed?..... Yes No

(If "yes" (See II.E,2)

3.112 (4) * Trim - Critical Engine Inoperative and flaps retracted

Configuration	Information		Trim	
	Observed Data	Trim Speed	Longitudinal	Directional
Climb Critical inoperative engine Left ( ) Right ( )	Hp_____Ft. OAT_____°F	Climb with M.C. Power on operating engines	Trimmed	Trimmed
Gear retracted ( )	Bank_____° 5° Max.	(Between V_y & 1.4V_{S1} speeds)	Elevator Tab Position___.	Rudder Tab Position___.
Is inoperative propeller in least drag position? Yes No	RPM_____ In.Hg._____	_____MPH-IAS	Tail Heavy	Yaws Left
Operating engine(s) at M.C. Power	RPM_____ In.Hg._____	_____MPH-CAS	Nose Heavy	Yaws Right

* (Parts of Sections 3 (5) and (6) may be performed with this test providing configurations are similar.)

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3. Multiengine Flight Characteristics With Critical Engine Inoperative:

a. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.110(a) (5) Lateral Control

	Up	Down
(a) Landing gear position	Up	Down
(b) Wing flaps (most favorable climb position) (°)	____ °	____ °
(c) Critical inoperative engine?	Left, Right	Left, Right
Is inoperative propeller in minimum drag position?	Yes No	Yes No
If windmilling, what is RPM? (RPM)		
(d) Are other engine(s) operating at M.C. power	Yes No	Yes No
RPM		
Manifold pressure (in.Hg.)		
(e) Is trim speed in climb at Vy or $1.4V_{S1}$?	Yes No	Yes No
State which ____.		
MPH-IAS		
MPH-CAS		
(f) Pressure altitude of test (Ft.)		
(g) Outside air temperature (°F)		
(h) Can 15° banked turns be made to left?	Yes No	Yes No
(i) Can 15° banked turns be made to right?	Yes No	Yes No
(j) Do control forces increase proportionately with deflection?	Yes No	Yes No
(k) What is maximum force at maximum deflection? Rudder		
Aileron		

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3. Multiengine Flight Characteristics With Critical Engine Inoperative:

a. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.110(b) (6) Directional Control

15° Change in Heading With and Against Inoperative Engine		
(a) Landing gear position	Retracted	Extended
(b) Wing flaps (most favorable climb position) (degrees)		
(c) Critical inoperative engine?	Left, Right	Left, Right
State minimum drag position of inoperative propeller		
If rotating, what is RPM?		
(d) Are other engines operating at M.C. power?	Yes No	Yes No
RPM		
Manifold pressure (in.Hg.)		
(e) Is trim speed in climb at or below Vy or 1.4Vs1?	Yes No	Yes No
(MPH-IAS)		
(MPH-CAS)		
(f) Pressure altitude (ft.)		
(g) Outside air temperature (°F)		
(h) During test, are wings level laterally within 5°?	Yes No	Yes No
(i) Are any dangerous characteristics encountered when heading is suddenly altered 15° to left, or to heading where rudder force is 150 lbs. ? (If heading is limited by rudder force, describe details and state heading in "REMARKS")	Yes No	Yes No
(j) Are any dangerous characteristics encountered when heading is suddenly altered 15° to right, or to heading where rudder force is 150 lbs. ? (If heading is limited by rudder force, describe details and state heading in "REMARKS")	Yes No	Yes No
(lbs.)		
(degrees)		

NOTE: Gear down is usually most critical for nose wheel planes and gear up for tail wheel planes. If inspector is uncertain, conduct test in both positions.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3. Multiengine Flight Characteristics With Critical Engine Inoperative:

a. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.111
3.106 (7) Minimum Control speed

(a) Is landing gear retracted?	Yes No	Yes No
(b) Wing flap in take-off position (degrees)		
(c) Which is critical inoperative Engine? (throttle closed)	Left, Right	Left, Right
(1) RPM of inoperative engine? (RPM)		
(d) Are other engines operating at T.O. or maximum available power?	Yes No	Yes No
(1) RPM		
(2) Manifold pressure (in.Hg.)		
(e) Pressure altitude of test (Ft.)		
(f) Outside air temperature (°F)		
(g) What is the minimum control speed such that (MPH-IAS) (MPH-CAS)		
(1) Recovery of control to straight flight at this speed is effected without change of power?	Yes No	Yes No
(2) Bank does not exceed 5°?	Yes No	Yes No
(3) Rudder force (_____lbs.) did not exceed 150 lbs.?	Yes No	Yes No
(4) No dangerous attitudes or uncontrollable tendencies encountered?	Yes No	Yes No
(5) No exceptional pilot skill strength or alertness required (of a private pilot) to prevent a change of heading in excess of 20° before recovery is complete?	Yes No	Yes No
(h) Does the minimum controllability speed exceed $1.2V_{S1}$?	No Yes	No Yes

3.106
3.111 (8) Transition Controllability

If the rudder force exceeds 20 lbs. for maintaining straight flight at V_{mc} in the configuration for item (7) above, answer the following:

Can straight flight control be maintained (by a private pilot) until the airplane has been placed in its "clean" configuration and attained its best R/C speed (single engine inoperative)? Yes No

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3. Multiengine Flight Characteristics With Critical Engine Inoperative:

a. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.123 (9) Power On Stall - Critical Engine Inoperative

(a) Is landing gear retracted?	Yes No	Yes No
(b) Are wing flaps retracted?	Yes No	Yes No
(c) Which is critical inoperative engine? (throttle closed)	Left, Right	Left, Right
(1) RPM of inoperative engine?		
(d) Are other engines operating at 75% M.C. power?	Yes No	Yes No
(1) If "no", is power used that at which the use of maximum control travel just holds the wings laterally level in approaching the stall?	Yes No	Yes No
(2) What is RPM?		
(3) What is manifold pressure? (in.Hg.)		
(e) Pressure altitude of test (Ft.)		
(f) Outside air temperature (°F)		
(g) Trim speed at $1.5V_{S1}$ (MPH-IAS)		
(h) Trim speed at $1.5V_{S1}$ (MPH-CAS)		
(i) Maximum roll (degrees)		
(j) Maximum yaw (degrees)		
(k) Maximum pitch below level (degrees)		
*(l) Altitude lost (Ft.)		
(m) Maximum IAS during recovery (MPH)		
(n) Maximum CAS during recovery (MPH)		
(o) Maximum acceleration during recovery (G)		
(p) Was there any undue spinning tendency?	No Yes	No Yes
(q) Was recovery made without applying power to inoperative engine?	Yes No	Yes No
(r) Were operating engines throttled back during the recovery from the stall?	No Yes	No Yes

(s) Controllability	Good	Fair	Poor	Unsatisfactory
(1) Longitudinal:				
(2) Lateral:				
(3) Directional:				

* Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3. Multiengine Flight Characteristics With Critical Engine Inoperative:

a. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

(10) Directional Trim, Airplane With Four Or More Engines, Two Critical Engines Out

(a) Is landing gear retracted?		Yes No
(b) Are wing flaps retracted?		Yes No
(c) Maximum weight (at which level flight speed range is 10 MPH or more(lbs.)		
(d) Rearmost C.G. (Ref. Page Appendix)	(% MAC)	
(e) Pressure altitude	(Ft.)	
(f) Outside air temperature	(°F)	
(g) Operating engines at M.C. power		
Manifold pressure	(in.Hg.)	
Rev. per minute	(RPM)	
Brake horsepower	(BHP)	
(h) Which two engines are inoperative?		
(i) Are inoperative propellers feathered?		Yes No
(j) If "no", inoperative propellers are windmilling at RPM		
(k) Maximum level flight speed	(MPH-IAS)	
	(MPH-CAS)	
(l) Can airplane be trimmed at a speed 10 MPH (CAS) less than the maximum level flight CAS		Yes No
(m) If "no", what is rudder force necessary for straight flight?	(Lbs.)	

REMARKS

ADDITIONAL SAWTOOTH DATA SHEET # _____

REFERENCE SECTION _____

1. General Information

a. Landing gear position _____
b. Flap position _____
c. Which engine is inoperative? _____
d. Power on operating engines (M.C.P. - T.O.) _____
e. Weight _____ lbs.; C.G. _____ % MAC; Reference Page _____, Appendix _____
f. Power on stall speed _____ MPH-IAS, _____ MPH-CAS
g. Mixture setting _____
h. Cowl flap setting _____
i. Time of takeoff _____

2. Observed Flight Test Data

	Time	Pressure Altitude (Feet)		O.A.T. °F	C.A.T. °F	I.A.S. M.P.H.	Engine R.P.M.	M.P. In. Hg.	Dead Engine		Weight & Obs. R/C
		Ea. Min.	Ea.1/2 Min.						R.P.M.	Pitch	
Climb # 1											
Climb # 2											
Climb # 3											
Climb # 4											
Climb # 5											
HS *											

* Record high speed run in level flight at intermediate altitude.

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