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PERFORMANCE FLIGHT TESTS OF THE B-26F-1-MA AIRPLANE, AAF NO. 42-96231

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PERFORMANCE FLIGHT TESTS OF THE B-26F-1-MA AIRPLANE, AAF NO. 42-96231

I Introduction

Flight tests were conducted on B-26F-1-MA airplane, AAF No. 42-96231, at Wright Field for the purpose of checking performance of the latest type production model and to check Technical Order range and take-off data at the request of the Technical Data Laboratory. (Ref. T.O. #AN 01-[illegible]-1 dated 15 February 1944).

The airplane was flown by Captain Ralph C. Hoewing and Captain Fred C. Bretcher of the Bomber Flight Test Branch with Mr. W. A. Burrell of the Flight Test Engineering Branch, Flight Section, as engineer and observer.

This airplane is a twin engine, high wing, medium bomber of all metal construction manufactured by the Glenn L. Martin Company of Baltimore, Maryland. Known as the "Marauder", it carries a normal crew of five on combat missions and the bomb load is carried in the forward bomb bay which occupies the center section of the fuselage. The landing gear is of the tricycle type and retracts cleanly into the nose and the engine nacelles during flight.

The power plant consists of two (2) Pratt and Whitney R-2800-43 eighteen cylinder, twin row, air cooled, radial engines rated at 1920 horsepower per engine for take-off. The engines are equipped with Stromberg injection type PT-16G1 carburetors, parts list #392351-16 and Curtiss Electric constant speed, full feathering, four- laded propellers, blade design No. 63821306, with a blade angle setting of 16 degrees to 46 degrees measured at the 54 inch radius station and fitted with 19-1/2 inch cuffs for better distribution of cooling air at cruising power and for ground operation.

A.F. = 93.
h/t = .083
D = 13'8"

The angle of incidence of the wing on the B-26F series has been increased by 3-1/2 degrees over all previous B-26 airplanes.

II Summary

The controllability of the airplane was good throughout the normal speed range. The trim tabs were ample to correct for all changes in trim and balance. The airplane had excellent taxiing and ground handling characteristics. Power off stalling speed was approximately 110 MPH indicated airspeed with the landing gear and flaps down. The airplane had no single engine ceiling at normal rated power for gross loads over 31,000 pounds. Excellent visibility was afforded for approach and landing and the landing speed was lower than on previous B-26 models although the flair did not appear to be as good. Emergency escape for the bombardier would be difficult but was satisfactory for the rest of the crew members.

The principal airplane performance corrected to a standard weight at altitude (take-off gross weight, 35,170 pounds less the weight of fuel used in take-off and climb to the altitude) was as follows:

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High Speed at Sea Level (military power)	283 MPH
High Speed in low blower at 3000 feet (critical altitude for military power)	287.5 MPH
Rate of Climb at Sea Level (normal rated power)	790 ft/min.
Service Ceiling (two engines) at normal rated power	19,800 ft.
Take-off over 50 ft. obstacle at 35,100 pounds using 1/2 flaps (20°)	2310 ft.

III Condition of the Aircraft Relative to Tests

A. Airplane performance was obtained at three different gross weights using 130 grade fuel.

Speed vs. Altitude at both normal rated and military power, normal rated power climbs, performance take-off tests, cruising power calibrations and miscellaneous drag item configurations at 10,000 feet density altitude were obtained at a take-off gross weight of 35,170 pounds, c.g. at 18.13% MAC, wheels up, and 17.49% MAC, wheels down.

Normal rated power climbs, performance take-off tests and cruising power calibrations at 10,000 ft. were also conducted at a take-off gross weight of 37,250 pounds, c.g. at 18.92% MAC, wheels up.

Cruising power calibrations at 10,000 feet were also obtained at a take-off gross weight of 33,085 pounds, c.g. at 17.22% MAC, wheels up and 16.56% MAC, gear down.

All level flight speed vs. altitude data was corrected to a standard weight at altitude, which was the take-off gross weight less the weight of fuel used to take-off and climb to the altitude.

B. Armament consisted of one flexible .50 caliber nose gun in the center of the plexiglass nose section, lashed in place and depressed 20° and pointing approximately 20° to the right; two .50 caliber flexible waist guns in stowed position, four .50 caliber fixed package guns installed under the radio operator's and navigator's compartment and enclosed in separate faired envelopes and pointed forward; two .50 caliber tail guns in a type M-6 gun mount pointed rearward and elevated approximately 40° and an electrically operated upper gun turret with two .50 caliber guns pointed rearward and level. The muzzles and barrels of all external guns were wrapped with masking tape. An external section of half inch armor plate, 39 inches by 51 inches was bolted to the left side of the fuselage slightly forward of the pilot's position.

C. The airplane was flown in the bare metal, unpainted condition typical of the present production models. A type LP-21A radio loop housing was installed on the under side of the fuselage beneath the navigator's compartment. Radio masts and all antennae were in place.

D. Except for a single flight the airplane was equipped with the standard top panel (Parts list #R-312211-SH1) on the engine cowl with the large carburetor airscoops protruding on the panel and faired into the

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cowling. For one flight this top section was replaced by a lighter, more streamlined panel (Parts List AR-263170) with smaller airscoops, made possible by the elimination of the air intake filters. This was done to determine the relative drag of the two types of cowling.

E. This airplane was not equipped with de-icer boots although the regular production models are supposed to be so equipped.

F. The airplane was flown with the landing gear retracted, wing flaps neutral and carburetor cold unless otherwise specified. Engine cowl flaps, oil cooler shutters and mixture as noted.

IV Flight Characteristics

A. Taxiing and Ground Handling

The subject airplane had excellent taxiing and ground handling characteristics. Vision was good, both over the nose and to either side. Directional control was easily maintained with either throttles or brakes. The oleos functioned satisfactorily on soft and rough runways.

B. Take-off

The initial acceleration was good but the ground roll was fairly long; the take-off speed was approximately 95 to 100 MPH indicated airspeed. The initial climb was flat since a minimum indicated airspeed of 135 MPH should be reached as quickly as possible; this was considered the critical single engine speed although the airplane would not maintain altitude with the landing gear extended. For this reason it is advisable to retract the gear as soon as the airplane is airborne. The rudder becomes effective at about 70 MPH, IAS.

The shortest ground roll could be obtained with the wing flaps one-half down. However, with a lightly loaded ship or with long runways it would be advisable to use no wing flap since the minimum single engine flying speed would be obtained at a faster rate with the reduced drag. In the event of engine failure on take-off it would be inadvisable to attempt to continue flight if the airplane was loaded to more than 31,000 pounds gross weight.

C. Stability

The airplane was found to possess static and dynamic stability both longitudinall and directionally with lateral neutral stability at a gross weight of approximately 32,000 pounds and the c.g. approximately 18% MAC.

Tests were conducted to determine the maximum rearward c.g. at which longitudinal stability could be maintained without assistance on the controls.

At rated power in the level flight configuration at 31,750 pounds, the airplane was stable at a c.g. back to 26.5% MAC.

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At 2100 RPM and 31" Hg. manifold pressure in the landing configuration (wheels and flaps down) at 32,500 pounds the airplane was stable at a c.g. back to 23%.

At 2400 RPM and 35" Hg. manifold pressure in the take-off configuration (wheels down and wing flaps 1/2 down) at 33,500 pounds the airplane was stable at a c.g. back to 25% MAC.

The maximum recommended rearward c.g. limit at 32,500 pounds gross weight is 23% MAC.

D. Trim and Balance

All normal changes in trim and balance could be easily corrected for with the adjustable trim tabs. When the landing gear and wing flaps were lowered, the elevator trim tab had to be rolled backward ten degrees. Operation of the bomb bay doors or the upper gun turret made no noticeable change in trim or balance.

E. Controllability

All controls were effective, and controllability good, from the maximum allowable indicated airspeed in a dive (353 MPH) down to the stall although the elevator forces became rather heavy above 270 MPH indicated airspeed. The ailerons were satisfactory for this type of ship but forces appeared to be heavier than on previous B-26 series airplanes. Aileron "snatch" was apparent in "power-on" stalls. A slight elevator "walk" was noticeable below 155 MPH indicated airspeed when making climbs at normal rated power.

F. Maneuverability

The maneuverability was considered good for this type of ship. The rate of climb was poor at the gross weight tested and the rate of roll very good although the radius of turn was normal to large.

G. Stalling Characteristics

Stalls were run at approximate gross weight of 33,500 pounds. The power off stalls were abrupt with the nose falling straight through. Warning of the approaching stall was given by a slight buffeting of the tail approximately 5 MPH above the stall. In the clean configuration and power off the airplane stalled at about 126 MPH. With the landing gear extended and the wing flaps down the indicated stalling speed was 109 MPH.

At a power setting of approximately 880 brake horsepower per engine the airplane stalled clean at 110 MPH, IAS and with the landing gear extended and wing flaps full down the stall came at 90 MPH, IAS. Slight buffeting was apparent below 130 MPH, IAS. In the former configuration the nose fell straight through but in the latter condition the left wing dropped quickly and a severe aileron "snatch" developed which required considerable force to overcome.

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Full power stalls were not attempted because of the spin producing tendencies which characterized the low power stalls.

H. Diving Characteristics

The airplane exhibited satisfactory diving characteristics although as the indicated airspeed went up considerable forward elevator trim was required. There was no evidence of excessive engine cooling in long power off dives.

I. Operation on a Reduced Number of Engines

The best single engine flying speed was found to be approximately 156 MPH, IAS although it was possible to maintain control down to 135 MPH, IAS and the airplane could be readily trimmed for that speed down to this point. The airplane would not maintain altitude on one engine at rated power at any gross weight over 31,000 pounds.

J. High Altitude

No flights were made at high altitude because this airplane was a low to medium altitude bomber with a limited ceiling due to the heavy weight at which it was flown.

K. Approach and Landing

Landing approaches were made at an indicated airspeed of 140 to 150 MPH with wheels and flaps down and the gliding speed was reduced to 120 to 125 MPH with power. The wheels touched the runway at approximately 100 to 105 MPH, IAS. Visibility was excellent, both in approach and landing.

L. Night Flying

No night flights were made.

M. Noise and Vibration Level at Crew Stations

The noise level was considered normal at all crew stations below 2450 RPM but above this RPM the noise level increased proportionally with RPM. At rated RPM for military power (2700) the noise level was so high as to be considered objectionable.

N. Pilot Report on Vision and Cockpit Layout

In general, the vision was very good on this airplane. It was considered excellent for taxiing, take-off, climb, level flight, approach and landing with no noticeable distortion. However, at no time were the wing tips visible from the pilot's compartment.

Forward vision was very poor in rainy weather. Although the ship was equipped with a clear vision panel it was located to the side which made it impossible to see straight ahead. This condition would make bad weather landings extremely hazardous.

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The cockpit layout was considered exceptionally good. All controls and levers were well located and in easy reach of the pilot and nearly equally so for the co-pilot. The engine instruments were well placed and plainly visible to both the pilot and co-pilot. However, the flight instruments were poorly arranged; the altimeter, airspeed, and turn and bank instruments were all partially obscured by the pilot's control column and wheel.

C. Crew Report on Individual Stations

1. Bombardier's Compartment

In order to enter and leave the bombardier's compartment it was necessary for the co-pilot to turn his rudder pedals aside and slide his seat back to make way for the bombardier. Since no emergency exit was provided in the nose a hasty exit by the latter crew member would be impossible. To allow the occupant of the nose compartment to escape would require that the pilot be without the assistance of the co-pilot at a time when such assistance was most urgently needed. This would be a serious mental hazard for a combat crew. The compartment itself appeared to be barely adequate for its intended use.

2. Radio and Navigator's Compartment

This compartment was roomy and entirely adequate with the single exception that no astrodome was provided for celestial navigation. Parachute exit could be conveniently made through the forward bomb bay if the bomb bay doors could be opened in time. Also if the nose wheel could be quickly extended, exit can be made through the nose wheel well hatch. In the event of "ditching" (water landing) all personnel would make their escape through the navigator's compartment upper escape hatch and this also would apply to emergency landings made with the landing gear retracted. Escape in landings of this nature could also be made through the cockpit upper escape hatch.

3. Upper Turret and Waist Gunner's Compartment

The turret gunner's position appeared to be entirely adequate although it was difficult to enter or leave in a hurry. The waist gunners could fire only to the sides and the down wind, rearward position. It was necessary to first remove the plexiglass center panel after which the remainder of the window frame could be rolled upward on a specially provided track until it locked in the stowed position. Parachute exit could be made through the open waist gunner's windows but whenever possible it would be advisable to go forward for exit through the bomb bay. However, this method would be difficult with parachute on because the doorway to the rear bomb bay was partially obstructed by the upper power turret. In event of a forced landing at sea the gunner personnel would have to go forward to the navigator's compartment.

4. Tail Gunner's Position

The tail gunner's position appeared to be satisfactory although

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the visibility was good only to the rearward with the side vision partially obstructed. Emergency exit from the tail compartment would be the same as for the waist gunners. However, for emergency exit on the ground a special hatch was provided on the right side of the fuselage slightly forward of the aft bulkhead of the waist compartment. The latch cable would have to be pulled and the panel kicked out to make the opening available.

P. Emergency Systems

1. Landing Gear System

In case of engine hydraulic failure the landing gear handle should be moved to the down position and the gear pumped down with the handle located on the right side of the control pedestal until both the nose wheel and the main gear are down and locked. A minimum of three and one half gallons of hydraulic fluid would be required and the emergency lines would have to be intact and free from damage. In case insufficient pressure was available by this means, provision was made for mechanical operation as follows:

The nose wheel gear should be extended first. With the landing gear handle in the "down" position a hole should be gouged in the floor between the pilot's seat tracks and the plunger pried closed on the load and fire valve, thus unlocking the gear. Since the gear must move forward against the slipstream proper maneuvering of the aircraft would be required to lock the gear in place. Next, the main gear up lock pins should be removed by turning the screw block mechanism, with the ratchet lock on the handle in the "on" position, in a clockwise direction. This mechanism was located just aft of the forward bomb bay door. The force of the slipstream would then lock the gear down.

2. Wing Flap System

With the flap control valve in the desired position and all other hydraulic valves in the neutral position the wing flaps could be pumped to the desired position with the hand pump after which the control lever should be returned to the neutral position.

The flaps could also be lowered mechanically by the use of a special crank inserted in a hole above and forward of the opening between the bomb bay and the waist compartment. The crank would be turned counter-clockwise until the flaps were in their desired position.

3. Brake System

With the brake pedals depressed the use of the hand pump should build up sufficient pressure to stop the airplane. Should this fail the emergency air brake handle should be pulled.

4. Bomb Bay Doors

The doors could be operated with the emergency hydraulic hand pump and a compressed air system was also provided.

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5. Vacuum

A vacuum selector valve was located just aft of and slightly below the command radio.

6. Fuel System

In the event that the electric pump was inoperative the fuel could be transferred by means of a hand pump located just aft of the forward entrance to the bomb bay.

7. Electrical System

An auxiliary power plant was provided as a supplement to the engine driven generators and battery and in case of complete failure of the main system would provide sufficient amperage for a normal landing.

Q. General Functioning

This aircraft was obtained for flight testing with approximately ten hours of operating time on the engines. Practically no trouble was encountered with the aircraft or the power plant with the exception of the carburetors.

The airplane was equipped with torquemeters, fuel flowmeters, and metering suction gages so that any change in carburetion was readily apparent. Both carburetors were removed from the airplane and checked for limits by the Carburetor Unit of the Power Plant Laboratory previous to the initial flight tests. The carburetors were then reinstalled and three flights were made during which carburetion appeared to be satisfactory. On the next flight, however, the left carburetor began running considerably richer. At approximately 17,000 feet at 2700 RPM and wide open throttle the left engine was using approximately 220 pounds of fuel per hour more than the right engine and the torque brake horsepower was nearly 275 horsepower less than that of the right engine. The same condition existed at normal rated power although the spread in fuel flow and horsepower was not as great. After landing, this carburetor was removed and sent to the Power Plant Laboratory for a recheck of the limits where it was found that the richness of the mixture had increased considerably at high fuel flows. The carburetor was replaced by a new carburetor drawn from stock and limit checked by the Power Plant Laboratory before installation. No further trouble was given except for the sticking of the regulator poppet valve which prevented starting of the engine on two occasions. This valve had to be unstuck by hand before the engine could be started. It would be impossible for this sticking to occur in flight with the engine running since the valve would be held open by the pressure between the two diaphragms.

V Shipboard Tests

Not applicable to this aircraft.

VI Performance Data

A. Airspeed Calibration (See fig. 1)

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B. Speed vs. altitude is given below for normal rated power; engines operating at 2400 RPM; mixture auto rich; cowl flaps flush; and oil cooler shutters open 10 degrees (wide open is approximately 33 degrees).

Altitude	Average torque meter BHP/Engine	Average Man. Press. " Hg.	True Speed MPH	Blower	Throttle	Gross Weight lbs.
0	1390	39.5	244	Low	Part	35120
5000	1440	39.5	261	Low	Part	34910
*8500	1485	39.5	273	Low	Wide	34770
10000	1410	37.4	270.5	Low	Wide	34700
**12100	1300	35.5	266	Low	Wide	34580
**12100	1300	40.2	266	High	Part	34580
15000	1315	40.2	275.5	High	Part	34390
***16100	1325	40.2	279	High	Wide	34300
20000	1145	33.6	258	High	Wide	33800

* Low blower critical altitude for 2400 RPM and 39.5" Hg.

** Optimum altitude for blower shift.

*** High blower critical altitude for 2400 RPM and 40.2" Hg.

NOTE: Original data corrected for instrument error is given in Table I, Page 16.

C. Speed vs. altitude for military power is tabulated below. Engine operating at 2700 RPM, mixture auto rich, cowl flaps flush and oil cooler shutters open 13 degrees.

Altitude	Average torque meter BHP/Engine	Average Man. Press. " Hg.	True Speed MPH	Blower	Throttle	Gross Weight lbs.
0	1905	51.5	283	Low	Part	35120
*3000	1980	51.5	287.5	Low	Wide	34990
5000	1870	48.2	285	Low	Wide	34910
10000	1580	40.0	278.5	Low	Wide	34700
*13700	1380	34.2	271	Low	Wide	34480
*13700	1380	43.2	271	High	Part	34480
15000	1385	43.2	275.5	High	Part	34390
***16000	1398	43.2	278.5	High	Wide	34310
20000	1190	36.2	257	High	Wide	33800

* Low blower critical altitude for 2700 RPM and 51.5" Hg.

** Optimum altitude for blower shift.

*** High blower critical altitude for 2700 RPM and 43.2" Hg.

NOTE: Original data corrected for instrument error is given in Table I, Page 17.

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D. Rate of climb vs. altitude at normal rated power is tabulated below. Propellers set for 2400 RPM, mixture auto rich, engine cowl flaps wide open and oil cooler shutters wide open.

1. Gross weight at take-off = 35170 pounds.

Altitude	Average torque meter BHP/Engine	Average Manifold Pressure "Hg.	Blower	Throttle	True Speed MPH	R/C ft/min.	Time to climb min.	Gross Weight lbs.
0	1375	39.5	Low	Part	158	790	0	35170
5000	1425	39.5	Low	Part	168	800	6.3	34920
*7000	1450	39.5	Low	Wide	173	800	8.8	34840
10000	1310	35.5	Low	Wide	178	560	13.2	34700
**10900	1275	34.5	Low	Wide	180	490	14.9	34650
**10900	1275	40.2	High	Part	180	490	14.9	34650
***14700	1310	40.2	High	Wide	190	510	22.5	34402
15000	1295	39.7	High	Wide	191	485	23.1	34380
S/C19800	1095	33.0	High	Wide	201	100	42.9	33850
A/C21000	1045	31.4	High	Wide	—	0	--	--

* Critical altitude for 2400 RPM and 39.5" Hg. in low blower.

** Optimum altitude for blower shift.

*** Critical altitude for 2400 RPM and 40.2" Hg. in high blower.

NOTE: Original data corrected for instrument error is given in Table II, Page 18.

2. Gross weight at take-off = 37250 pounds.

Altitude	Average torque meter BHP/Engine	Average Manifold Pressure " Hg.	Blower	Throttle	True Speed MPH	R/C ft/min.	Time to climb min.	Gross Weight lbs.
0	1375	39.5	Low	Part	161	600	0	37250
5000	1425	39.5	Low	Part	171.5	630	8.1	36960
*7000	1450	39.5	Low	Wide	176	640	11.3	36850
10000	1310	35.5	Low	Wide	181.5	390	17.2	36680
**10900	1275	34.5	Low	Wide	183	310	19.8	36590
**10900	1275	40.2	High	Part	183	310	19.8	36590
***14700	1310	40.2	High	Wide	194.5	370	30.8	36240
15000	1295	39.7	High	Wide	195	350	31.6	36210
S/C17700	1180	35.7	High	Wide	202	100	45.2	35820
A/C18700	1140	34.5	High	Wide	--	0	--	--

* Critical Altitude for 2400 RPM and 39.5" Hg. in low blower.
** Optimum altitude for blower shift.
*** Critical altitude for 2400 RPM and 40.2" Hg. in high blower.

NOTE: Original Data corrected for instrument error is given in Table II, Page 19.

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E. Cruising Power Calibration and Range Survey in Low Blower. Standard configuration with package guns installed, cowl flaps flush and oil cooler shutters closed.

1. Power required curves at 10000 feet for 31500 pounds, 33500 pounds and 35000 pounds gross weights are shown on Figure No. 4.

2. Cruising survey showing air miles per gallon vs. airspeed is shown on Figures No. 5 and No. 6 with all data corrected to N.A.C.A. Standard Day.

3. See Figure No. 11 for fuel flow data at variable engine RPM's.

4. Original Power Required and Fuel Flow Data corrected only for instrument error and speed are given in Table III, page 21.

F. Miscellaneous Tests

1. A power calibration was run at 10000 feet with a smaller, streamlined top panel installed on the engine cowlings in place of the standard panel. This streamlined panel, made possible by the elimination of the air filters in the carburetor air scoops, resulted in an increase in airplane speed of 6 MPH at 1580 torquemeter brake horsepower per engine (2700 RPM). At 1410 torquemeter brake horsepower per engine (2400 RPM) the gain in speed was only 3.5 MPH and no difference was apparent between the two panels below 1150 BHP per engine.

2. Drag calibrations conducted at a take-off gross weight of 35170 pounds in low blower, engine cowl flaps flush unless otherwise indicated, oil cooler shutters as noted.

(a) Fuselage package guns and ammunition belts removed; oil cooler shutters as noted; standard engine cowling. Run at 9625 ft. pressure altitude and +0.5°C free air.

Average RPM	Average test Man Press "Hg.	Automatic Mixture Setting	Average test. Torquemeter BHP/Engine	True Speed MPH	Oil Cooler Shutters	Total Fuel Flow GPH	Estimated Gross Weight lbs.
2710	40.2	Rich	1554	280	10°	388	34420
2410	37.7	Rich	1391	274	10°	308	34295
2010	32.0	Lean	996	229	0°	194	34205
1805	28.9	Lean	763	178.5	0°	114	34125

NOTE: For comparisons, see curves shown on Figure 2.

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(b) Bomb bay doors open; oil cooler shutters open 10°. Run at 9350 ft. pressure altitude and +3.0°C free air temperature.

Average RPM	Average test Man Press " Hg.	Automatic Mixture Setting	Average test Torquemeter BHP/Engine	True Speed MPH	Total Fuel Flow GPH	Estimated Gross Weight lbs.
2410	37.3	Rich	1377	241.5	300	33610
2410	34.0	Rich	1188	226	226	33320
2115	31.0	Lean	1004	206	162	33545

NOTE: For comparisons see curves shown on Fig. 9.

(c) Landing gear extended; oil cooler shutters open 10° and wing flaps neutral. Run at 9010 feet pressure altitude and 5.5°C free air temperature.

Average RPM	Average test Man Press " Hg.	Automatic Mixture Setting	Average test Torquemeter BHP/Engine	True Speed MPH	Estimated Gross Weight lbs.
2410	37.5	Rich	1322	193.5	31785
2410	34.9	Rich	1249	187.5	31705
2410	32.9	Rich	1167	177.5	31610
2410	29.0	Rich	1081	167.5	31540

(d) Wing flap calibration; landing gear retracted and oil cooler shutters open 10°. Pressure altitude 9010 ft. and 4.5°C free air temperature.

Wing Flap	Average RPM	Average test Man Press " Hg.	Automatic Mixture Setting	Average test Torquemeter BHP/Engine	True Speed MPH	Estimated Gross Weight lbs.
0°	1900	32.0	Lean	917	215	33740
5°	1900	32.0	Lean	907	210	33585
10°	1900	32.0	Lean	903	201	33255
15°	1900	32.0	Lean	905	186	33335
0°	1800	30.4	Lean	817	194.5	33620
5°	1800	30.4	Lean	820	191.5	33185
10°	1800	30.4	Lean	815	174	33150
15°	1800	30.4	Lean	807	164.5	33040

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(e) Engine cowl flap calibration and waist gun window deflector plate calibration with oil cooler shutters open 10°; mixture automatic rich at 2410 RPM and automatic lean at 2005 RPM. Run at 9350 feet pressure altitude and +3.0°C free air temperature.

Engine Cowl Flaps	Deflector Plate Position	Ave. RPM	Ave Test Man Press " Hg.	Automatic Mixture Setting	Test BHP/ Engine	True Speed MPH	Observed Cylinder Head temp, °C	Est. Gross wt. lbs.
Closed	Closed	2410	37.9	Rich	1401	274	212	33105
Flush	Closed	2410	37.9	Rich	1408	274.5	210	32950
14° Open	Closed	2410	37.9	Rich	1415	270	190	32700
28° Open	Closed	2410	37.9	Rich	1415	266	186	32570
41°(Wide) (Open)	Closed	2410	37.9	Rich	1409	260	184	32380
41°(Wide) (Open)	4-1/4" Exit Gap	2410	37.9	Rich	1408	255	--	32100
41°(Wide) (Open)	6"Exit(Wide) Gap (Open)	2410	37.9	Rich	1401	248	--	32130
Flush	Closed	2005	28.7	Lean	841	208	214	32125
21° Open	Closed	2005	28.7	Lean	842	201	200	32085
41°(Wide) (Open)	Closed	2005	28.7	Lean	847	189.5	198	31900

3. Drag calibration on oil cooler shutter position; engine cowl flaps flush; mixture auto rich.

Pressure Altitude ft.	Free Air °C	Oil Cooler Shutter Position	Average RPM	Average Man Press "Hg.	Test BHP/ Engine	True Speed MPH	Estimated Gross Weight lbs.
7125	+ 2	Closed	2410	39.5	1471	275.5	31240
7125	+ 2	13° Open	2410	39.5	1473	272	31810
7125	+ 2	25° Open	2410	39.5	1471	270	31640
7125	+ 2	32°(Wide) (Open)	2410	39.5	1471	266	31440
8120	+10	32°(Wide) (Open)	2160	28	884	201	32750
8120	+10	13° Open	2160	28	883	207.5	32710
8120	+10	Closed	2160	28	855	209	32640

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4. Carburetor heat check at 2100 feet pressure altitude at 2110 RPM, mixture auto lean.

Carburetor Heat	Manifold Pressure	Test BHP/Eng	Carburetor Air Temp °C	Free Air Temp. °C
Cold	32.5	982	+30.5	+21.0
Hot	31.5	888	* 80+	+21.0

*Off scale. Instrument only calibrated to +80°C.

G. Stalling speeds at 6100 feet; oil cooler shutters 10° open.

Stall No.	Wing Flaps	Landing Gear	Cowl Flaps	RPM	Man Press " Hg.	Test BHP per Engine	IAS corr. for instr. error MPH	Gross Weight lbs.
1	Up	Up	Flush	2210	--	Idling	126	33600
2	Up	Down	Flush	2210	--	Idling	125	33560
3	Down	Down	Flush	2210	--	Idling	109	33510
4	Up	Up	Flush	2210	25	885	110	33480
5	Up	Down	Flush	2210	25	883	110	33460
6	Down	Down	Flush	2210	25	873	90	33440

H. Performance with Reduced Number of Engines.

Single engine trials were conducted on this airplane with the dead engine propeller feathered, cowl flaps flush, oil cooler shutters closed and throttle wide open; live engine operating at normal rated power (2400 RPM and 39.5" Hg.) in low blower with engine cowl flaps wide open, oil cooler shutters wide open.

With the left engine operating and the right engine propeller feathered the airplane failed to maintain level flight at any altitude at a test gross weight of 32000 pounds. The approximate rate of descent was 155 ft. per minute at 7000 feet. (critical altitude for normal rated power).

With the right engine operating and the left engine propeller feathered the airplane was still unable to maintain level flight at any altitude and the rate of descent was approximately 155 ft. per minute at 7000 feet at a test gross weight of 31200 pounds. The best single engine speed was found to be 156 MPH indicated airspeed.

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I. Take-off Tests

All take-off tests were made from a dry concrete runway; wing flaps one half down (20°); oil cooler shutters one half open (15°); propellers set for 2700 RPM; throttles adjusted to 51.5" Hg. manifold pressure with mixture automatic rich. All performance reduced to standard sea level and zero wind conditions.

Type of Take-Off	Gross Weight lbs.	Ground Roll ft.	Air Dist. ft.	Total Distance over 50' obstacle ft.	IAS, MPH at TO	IAS, MPH at 50' obst.	TRUE SPEED MPH at TO	TRUE SPEED MPH at 50' obst.	Torque BHP per Eng.	Eng. cowl flaps
Normal	35100	1845	815	2660	90	101	105.5	109.5	1960	Closed
Minimum Safe	35100	1715	755	2470	92	[illegible]	101.5	105.5	1830	Closed
Absolute Minimum	35100	1595	715	2310	89	98	98.5	103.5	1915	1/4 open
Normal	37200	2190	1275	3465	103	110	104.5	116.5	1835	Flush
Minimum Safe	37000	2075	1010	3085	98	104	102	110.5	--	Flush

Uncorrected observed data for these tests are shown on Figures 12, 13, 14, 15, and 16. Pictures of the absolute minimum take-off trial at 35,100 pounds gross weight are shown on Figure 14a, page 53.

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TABLE I. B-26F Level Flight test data corrected for instrument errors. Altitude and Free Air Temperature also corrected for speed error. Configuration: Landing gear retracted; wing flaps neutral; cowl flaps flush; mixture auto rich; oil cooler shutters as noted. NOTE: Pressure altitude and free air temperature also corrected for speed error. Torque BHP = Torque Pressure (#/sq.in.) x RPM x 0.00213.

Run No.	Indicated Airspeed MPH	Pressure Altitude	Free Air Temp. °C	Left torque press psi	Right torque press psi	Left RPM	Right RPM	Ave. man. press. "Hg.	Ave. carb. air temp. °C	Oil cooler shutters	Throttle	Blower	Left fuel flow #/hr.	Right fuel flow #/hr.	Gross weight lbs.
1	241.5	2105	+ 9.0	277	271.3	2405	2430	39.4	20.0	13°	P	L	930	954	34675
2	237	2105	+ 9.0	264.7	258.5	2405	2415	37.4	20.5	13°	P	L	855	875	34475
3	230	2105	+ 9.0	247.5	242.0	2405	2413	35.4	21.0	13°	P	L	751	786	34140
4	221	2105	+ 9.0	229.6	224.0	2405	2410	33.5	20.0	13°	P	L	662	693	33990
5	244.5	4125	+ 5.0	283.3	277.0	2410	2410	39.5	18.0	13°	P	L	935	983	32620
6	240	5125	- 1.0	287.4	283	2405	2410	39.5	11.0	13°	P	L	950	1003	34220
7	242.5	7125	+ 2.0	291.6	284	2405	2410	39.5	12.5	13°	P	L	1011	1023	31810
8	235	9545	+ 0.5	281.2	271.3	2405	2410	37.8	12.0	0°	W	L	940	993	34660
9	238	9145	- 7.0	292.7	285.5	2405	2410	40.0	4.5	26°	W	L	970	983	33005
10	223	9145	- 7.0	251.4	248	2405	2410	40.0	6.0	26°	P	H	870	895	32135
11	234	9345	+ 3.0	279.6	270.4	2405	2410	37.9	13.5	13°	W	L	900	945	32950
12	224	11115	- 3.5	263.2	254.7	2395	2405	35.4	8.5	0°	W	L	810	811	34350
13	221.5	11115	- 3.5	252.4	244.0	2410	2420	40.0	9.5	13°	P	H	895	915	33735
14	215	13135	- 8.5	239.6	232.0	2405	2410	37.4	5.0	13°	P	H	945	945	32615
15	220	13135	- 8.5	255.4	245.0	2405	2410	40.0	7.5	13°	P	H	850	860	32785
16	216	13135	- 8.5	244.5	236.0	2405	2410	38.1	4.0	13°	W	L	765	781	32135
17	215	15130	-11.0	252.9	247.0	2405	2410	40.0	2.5	13°	P	H	970	1000	34080
18	218.5	15130	-11.0	259.3	251.9	2405	2410	40.0	5.0	13°	P	H	980	993	32605
19	215	15130	-13.0	244.5	237.0	2405	2410	37.9	4.0	13°	P	H	905	950	32335
20	206.5	15130	-13.0	227.6	221.0	2400	2405	35.9	3.5	13°	P	H	805	836	32115
21	201.5	15130	-13.0	216.5	209.2	2400	2405	34.0	3.0	13°	P	H	720	760	31990
22	211.5	17115	-14.5	249.5	241.0	2410	2405	38.3	2.0	13°	W	H	910	924	32815
23	196	19105	-20.0	229.6	222.0	2405	2405	35.0	-4.5	13°	W	H	810	826	33750
24	184.5	19105	-20.0	211.5	203.4	2415	2420	33.0	-5.0	13°	P	H	751	755	33650
25	178.5	19105	-20.0	197.5	190.8	2415	2420	31.0	-5.0	13°	P	H	665	673	33540
26	271	2110	+ 9.0	341.6	328.4	2715	2705	51.3	23.0	13°	P	L	1511	1645	33620
27	261.5	2110	+ 9.0	311.5	301.0	2695	2701	46.8	22.0	13°	P	L	1330	1422	33250

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TABLE I (cont'd.)

Run No.	Indicated Airspeed MPH	Pressure Altitude	Free Air Temp. °C	Left torque press. psi	Right torque press. psi	Left RPM	Right RPM	Ave. man. press. "Hg.	Ave. carb. air temp. °C	Oil cooler shutters	Throttle	Blower	Left fuel flow #/hr.	Right fuel flow #/hr.	Gross Weight lbs.
28	270	4125	+ 5.0	340.5	329.4	2705	2706	49.8	19.0	13°	W	L	1403	1499	32275
29	259.5	5125	- 1.0	329.1	324.4	2715	2711	47.8	11.0	26°	W	L	1379	1480	33925
30	253.5	7125	- 6.0	314.4	307.8	2715	2711	44.8	6.0	26°	W	L	1323	1383	33355
31	243.5	9145	- 7.0	290.6	283.8	2715	2711	41.9	5.0	26°	W	L	1201	1281	32715
32	275.5	9145	- 7.0	243.5	237	2715	2711	42.9	5.5	26°	P	H	1006	1024	32360
33	232	11115	- 3.5	262.2	253.9	2725	2721	38.2	9.5	13°	W	L	1043	1111	34140
34	221	11115	- 3.5	237.6	230.0	2715	2711	42.9	9.5	13°	P	H	1079	1140	33510
35	222	13135	- 8.5	240.6	233	2715	2711	42.9	5.5	13°	P	H	1125	1165	32340
36	217.5	15130	-12.0	241.5	232	2715	2711	42.9	2.5	13°	P	H	1153	1205	33870
37	221	15130	-13.0	242.6	234	2715	2711	42.9	6.0	13°	P	H	1134	1190	31720
38	211	17115	-14.5	232.5	223.0	2710	2706	41.0	1.5	13°	W	H	1042	1092	32965
39	194.5	19105	-20.0	213.5	207.3	2725	2716	37.6	-4.0	13°	W	H	—	—	33375
40	186.5	19105	-20.0	198.5	190.8	2710	2706	34.9	-4.5	13°	P	H	910	925	33255
41	215	13130	- 0.5	236.6	229	2700	2686	34.95	12.5	13°	W	L	925	973	34060
42	225.5	11090	3.5	252.4	246.0	2710	2696	37.4	16.0	13°	W	L	1025	1072	33760
43	234.5	9140	+ 7.0	269.1	261.2	2700	2696	40.55	21.0	13°	W	L	1104	1150	33475

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TABLE II. B-26F Climb Performance test data corrected for instrument errors. Altitude and Free Air Temperature also corrected for speed error. Configuration: Landing gear retracted; wing flaps neutral; cowl flaps wide open; oil cooler shutters wide open; mixture auto rich.
Torque BHP = Torque Pressure (#/sq.in.) x RPM x 0.00213.
NOTE: Pressure altitude and free air temperature also corrected for speed error.

IAS, MPH	Pressure Altitude ft.	Free air temp. °C	Time, min.	Left torque press, psi	Right torque press, psi	Left RPM	Right RPM	Throttle	Blower	Ave. man. press "Hg.	Ave. carb. air temp. °C	Fuel flow left #/hr.	Fuel flow right #/hr.
Climb No. 1 - Gross weight at take-off = 35,170 pounds.													
155	2077	5.0	1.98	277.0	271.4	2405	2410	P	L	39.4	17.0	979	1003
155	3088	4.5	3.20	275.0	273.2	2405	2410	P	L	39.4	15.0	969	1008
155	4092	2.5	4.45	285.3	275	2405	2405	P	L	39.4	12.0	969	1003
155	5092	1.5	5.67	285.3	277	2400	2415	P	L	39.4	10.0	974	1008
155	6092	0.5	6.74	284.2	275	2400	2415	P	L	39.4	14.0	983	1023
155	7091	- 1.0	8.03	286.6	278.0	2400	2415	P	L	39.4	--	959	993
154	8119	- 3.0	9.38	278.1	269.5	2395	2415	W	L	37.9	13.0	910	943
153	9110	- 4.0	10.97	267.1	260.3	2395	2415	W	L	36.7	11.0	865	899
152	10110	- 5.5	12.74	258.3	252.0	2395	2400	W	L	35.1	10.0	849	873
152	11090	- 7.5	14.69	252.4	246.0	2400	2415	P	H	40	6.5	940	958
152	12092	- 9.0	16.76	249.5	244.0	2400	2410	P	H	40	5.5	979	983
152	13112	-10.5	18.88	254.4	246.0	2405	2415	P	H	40	4.5	939	943
152	14113	-12.0	20.74	255.4	247.0	2405	2410	P	H	40	2.5	959	968
151	15104	-13.5	23.01	254.4	247.0	2400	2405	W	H	39.2	0.5	910	938
150.5	16105	-15.0	25.88	245.6	239	2395	2405	W	H	37.8	-0.5	870	894
150.0	17095	-17.0	29.00	236.6	231	2400	2405	W	H	36.4	-3.5	820	855
Climb No. 2 - Gross weight at take-off = 35,170 pounds.													
155	2077	5.0	1.98	279.2	271.3	2405	2410	P	L	39.4	17.0	944	968
155	3088	4.5	3.32	281.2	276	2405	2410	P	L	39.4	15.0	965	973
155	4092	2.5	4.57	284.3	275	2405	2410	P	L	39.4	12.0	965	973
155	5092	1.5	5.88	285.3	278	2410	2415	P	L	39.4	10.0	965	984
155	6092	0.5	6.98	285.3	278	2415	2420	P	L	39.4	14.0	984	1003
155	7091	- 1.0	8.18	285.3	276	2415	2415	P	L	39.4	--	974	993
154	8119	- 3.0	9.59	277	268.5	2405	2405	W	L	37.9	13.0	935	953
153	9110	- 4.0	10.95	267.1	260.3	2400	2405	W	L	36.6	11.0	890	904

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TABLE II (cont'd.)

	IAS, MPH	Pressure Altitude ft.	Free air temp. °C	Time min.	Left torque press, psi	Right torque press, psi	Left RPM	Right RPM	Throttle	Blower	Ave. man. press. "Hg.	Ave. carb. air temp. °C	Fuel flow left #/hr.	Fuel flow right #/hr.
Climb No. 2	(cont'd.)													
	152	10110	- 5.5	12.65	257.3	252.0	2400	2405	W	L	35.2	10.0	860	875
	152	11090	- 7.5	14.73	252.4	245	2405	2410	P	H	40.0	6.5	920	944
	152	12092	- 9.0	16.96	255.4	245	2405	2420	P	H	40.0	5.5	930	949
	152	13112	-10.5	18.97	252.4	246	2410	2415	P	H	40.0	4.5	954	964
	152	14113	-12.0	20.98	256.3	247	2410	2420	P	H	40.0	2.5	950	953
	151	15104	-13.5	23.19	255.3	247	2405	2410	W	H	39.4	0.5	870	894
	150.5	16105	-15.0	25.47	246.5	236	2400	2405	W	H	37.9	-0.5	820	854
	150.0	17095	-17.0	28.77	236.6	231	2400	2410	W	H	36.4	-3.5	820	854
	149	18096	-19.5	33.04	227.5	222	2405	2410	W	H	35.0	-6.0	800	821
Climb No. 3 - Gross weight at take-off = 37,250 pounds.														
	156	2077	14.5	2.68	267.1	264.0	2405	2410	P	L	39.4	24.0	920	954
	156	3088	13.5	4.64	272	264	2405	2410	P	L	39.4	22.0	940	904
	158	4092	11.0	6.47	272	264	2405	2420	P	L	39.4	20.0	950	983
	158	5092	9.5	8.23	272	264	2410	2420	P	L	39.4	16.0	930	973
	158	6092	8.0	9.93	277	266.5	2410	2430	P	L	39.4	15.0	940	983
	158	7091	5.0	11.67	282.2	273.2	2405	2425	P	L	39.4	13.0	970	1013
	157	8119	3.5	13.34	280.1	271.3	2405	2410	P	L	37.9	14.0	920	963
	156	9110	1.5	15.42	274	264	2405	2410	P	L	36.6	10.0	890	933
	155	10110	0.5	17.70	262.2	254.8	2405	2410	W	L	35.1	9.0	955	885
	155	11090	0.5	20.73	257.3	250.0	2405	2410	P	H	40.1	10.0	930	969
	155	12092	- 2.5	23.63	252.4	245.0	2405	2410	P	H	40.1	9.0	930	973
	155	13112	- 3.5	26.96	253.4	246.0	2405	2410	P	H	40.1	7.0	950	963
	155	14113	- 4.5	29.80	252.4	245	2405	2410	P	H	40.1	5.0	950	983
	154	15104	- 8.5	33.15	252.4	245	2405	2410	W	H	39.2	3.0	893	924
	153.5	16105	-10.5	37.34	244.5	238	2405	2410	W	H	37.8	0.0	884	914
Climb No. 4 - Gross weight at take-off = 37,250 pounds.														
	159	2077	16.5	-6.69	266.2	255.7	2405	2410	P	L	37.0	11.0	900	923
	159	3088	14.0	-3.58	271	262.1	2405	2410	P	L	--	9.0	925	948
	157	4092	11.5	-1.67	272	263	2405	2410	P	L	39.4	7.0	920	943
	157	5092	9.5	0.53	276	265.7	2405	2410	P	L	39.4	5.0	920	953

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TABLE II (cont'd.)

IAS, MPH	Pressure Altitude Ft.	Free air temp. °C	Time Min.	Left torque press. psi	Right torque press. psi	Left RPM	Right RPM	Throttle	Blower	Ave. man. press. "Hg.	Ave. carb. air temp. °C	Fuel flow Left #/hr.	Fuel flow Right #/hr.
Climb No. 4 (cont'd.)													
157	6992	6.0	2.24	276.2	254.9	2105	2110	F	L	38.0	16.0	890	923
156	7991	6.0	4.26	282.2	273.2	2105	2110	F	L	39.4	14.5	900	943
153	8119	4.0	6.16	273	264.8	2105	2110	F	L	37.9	13.0	880	918
157	9110	4.0	8.60	261.2	253.7	2105	2110	F	L	36.4	13.0	820	864
155	10110	2.0	11.92	254.4	248	2105	2110	F	L	--	11.5	800	854
155	11090	1.5	15.17	246.5	237	2105	2110	F	L	40.2	11.0	925	953
155	12082	0	19.845	247.5	241	2105	2110	F	L	40.2	9.5	890	934
155	13112	- 1.5	26.07	251.4	244	2102	2110	F	L	40.2	8.5	920	953
155	14113	- 3.0	27.15	249.5	241	2105	2110	F	L	40.2	7.5	910	943
154.5	15104	- 4.5	31.96	249.5	241	2105	2110	F	L	38.9	5.5	860	909
154.5	16105	- 6.5	37.01	240.6	234	2105	2110	F	L	37.7	4.0	810	874

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TABLE III. B-26F Cruising power test data corrected for instrument errors. Altitude and Free Air Temperature also corrected for speed error. Configuration: Landing gear retracted; wing flaps neutral; cowl flaps flush; oil cooler shutters closed; mixture as noted. NOTE: Pressure altitude and free air temperature also corrected for speed error.

Pressure Altitude ft.	Free air Temp. °C	Den. Alt	Throttle Position	Average RPM	Average manifold pressure in. Hg.	Auto mix setting	Ave. carb. air temp. °C	Average torque HP	Fuel flow per engine lbs/hr.	Indicated Airspeed MPH	True Airspeed MPH	Estimated (Gross wt. lbs.
10845	-14	9970	Part	2160	32	A.R.	--	1137	660	210.7	245.4	32250
10845	-14		Part	2110	31	A.R.	--	1062	550	206.5	240.2	32190
10845	-14		W.O.	2005	31.8	A.L.	- 1.5	1057	492	205	239.1	32080
10845	-14		W.O.	1905	30.4	A.L.	- 2	922	429	193.5	225	32010
10845	-14		Part	1905	27.8	A.L.	--	832	398	181.5	211.4	31930
10845	-14		Part	1905	25.8	A.L.	--	739	355	157.8	184.1	31830
10845	-14		W.O.	1800	29.2	A.L.	--	818	383	175.4	204.6	31750
10845	-14		Part	1805	26.8	A.L.	- 1.5	721	352	160.9	187.7	31690
10845	-14		Part	1805	24.8	A.L.	--	652	318	--	--	31570
10845	-14		Part	1805	29.8	A.L.	--	838	382	147.4	171.8	31400
10845	-14		W.O.	1705	27.8	A.L.	--	773	343	160.9	187.7	31305
10845	-14		Part	1705	26.8	A.L.	- 0.5	678	328	146.9	171.2	31180
10845	-14		Part	1905	27.8	A.L.	--	817	368	181.5	211.5	31040
10245	- 7	10060	W.O.	2105	36.9	A.R.	6	1401	915	232	270.6	31400
10245	- 7		W.O.	2005	36	A.R.	6	1334	815	227.5	265.1	31290
10245	- 7		W.O.	2010	34.9	A.R.	6	1259	722	224	261.1	31190
10245	- 7		W.O.	2160	34.3	A.R.	6	1215	673	220.5	256.8	33980
10245	- 7		Part	2165	33	A.L.	8.5	1157	580	214.9	251.2	33830
10245	- 7		W.O.	1905	31	A.L.	7	921	408	186	216.8	33635
10245	- 7		Part	1915	29.4	A.L.	5.5	875	395	181.5	211.5	33490
10245	- 7		Part	1915	27.9	A.L.	--	815	378	172.3	200.8	33270
10245	- 7		Part	1910	25.9	A.L.	5.5	720	330	145.9	170.2	33130
10245	- 7		W.O.	1805	29.5	A.L.	5	807	358	170.9	199.5	33040
10245	- 7		Part	1800	28.8	A.L.	5.5	780	393	161.9	188.9	32970
10245	- 7		W.O.	1750	28.8	A.L.	4.5	747	333	151.8	177	32770
10245	- 7		Part	2110	30.9	A.L.	5.0	1027	466	204	237.2	32700

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TABLE III (cont'd.)

Pressure Altitude Ft.	Free air temp. °C		Throttle position	Ave. R.P.M.	Average manifold pressure "Hg.	Auto mix setting	Ave. carb. air temp. °C	Average torque HP	Fuel Flow per engine lbs/hr.	Indicated Airspeed MPH	True Airspeed MPH	Estimated Gross wt. lbs.
10325	- 6.5	10,200	W.O.	1905	30.9	A.L.	--	919	418	186.2	217.3	33730
10325	- 6.5		Part	1905	28.8	A.L.	--	842	390	175.4	204.4	33605
10325	- 6.5		W.O.	1705	28	A.L.	--	718	352	151.9	177	33530
9810	+ 0.5	9980	W.O.	2305	38.4	A.R.	11.5	1336	817	231	270	31490
9465	+ 0.5	9980	W.O.	2408	37.9	A.R.	13	1388	910	231.5	270	35585
9465	+ 0.5		W.O.	2311	36.7	A.R.	13	1334	916	225	262.2	35465
9465	+ 0.5		Part	2210	33.0	A.R.	14	1119	857	211.8	246.1	35265
9465	+ 0.5		Part	2160	32.0	A.R.	14	1088	583	201.5	234.1	35125
9465	+ 0.5		Part	2110	31.0	A.R.	13	1017	518	198.4	230.7	35020
9465	+ 0.5		W.O.	2110	32.0	A.L.	12	1002	510	193.5	225	34880
9465	+ 0.5		W.O.	2110	31.6	A.L.	14	908	411	181.5	211	34750
9465	+ 0.5		W.O.	1905	28.9	A.L.	12	816	378	166.1	194.3	34630
9465	+ 0.5		Part	1905								

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VII Curves

Fig. 1, page 24, Airspeed Calibration
Fig. 2, page 25, Speed vs. Altitude
Fig. 3, page 26, Climb vs. Altitude
Fig. 4, page 27, Power Required at 10,000 feet
Fig. 5, page 28, Cruising Survey at 10,000 feet at 33,500 and 35,000 pounds
Fig. 6, page 29, Cruising Survey at 10,000 feet at 31,500 pounds
Fig. 7, page 30, Oil Cooler Shutter Drag Calibration
Fig. 8, page 31, Cowl Flap Drag Calibration
Fig. 9, page 32, Wing Flap Drag Calibration
Fig. 10, page 33, Effect of Cowl Flap Position on Rate of Climb
Fig. 11, page 34, Fuel Flow Data
Fig. 12, page 35, Normal Take-Off at 35,100 pounds
Fig. 13, page 36, Recommended Minimum Safe Take-Off at 35,100 pounds
Fig. 14, page 37, Absolute Minimum Safe Take-Off at 35,100 pounds
Fig. 15, page 38, Normal Take-Off at 37,200 pounds
Fig. 16, page 39, Recommended Minimum Safe Take-Off at 37,200 pounds

All data reduced to N.A.C.A. Standard Day.

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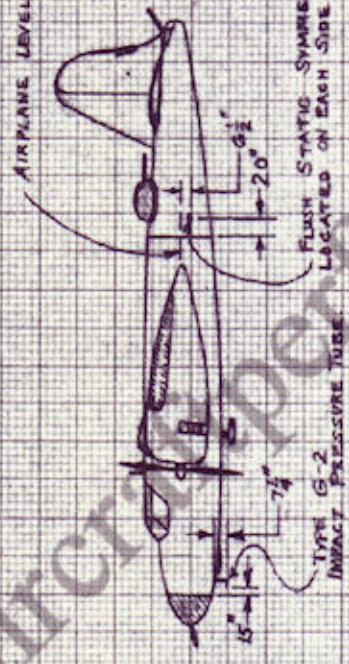

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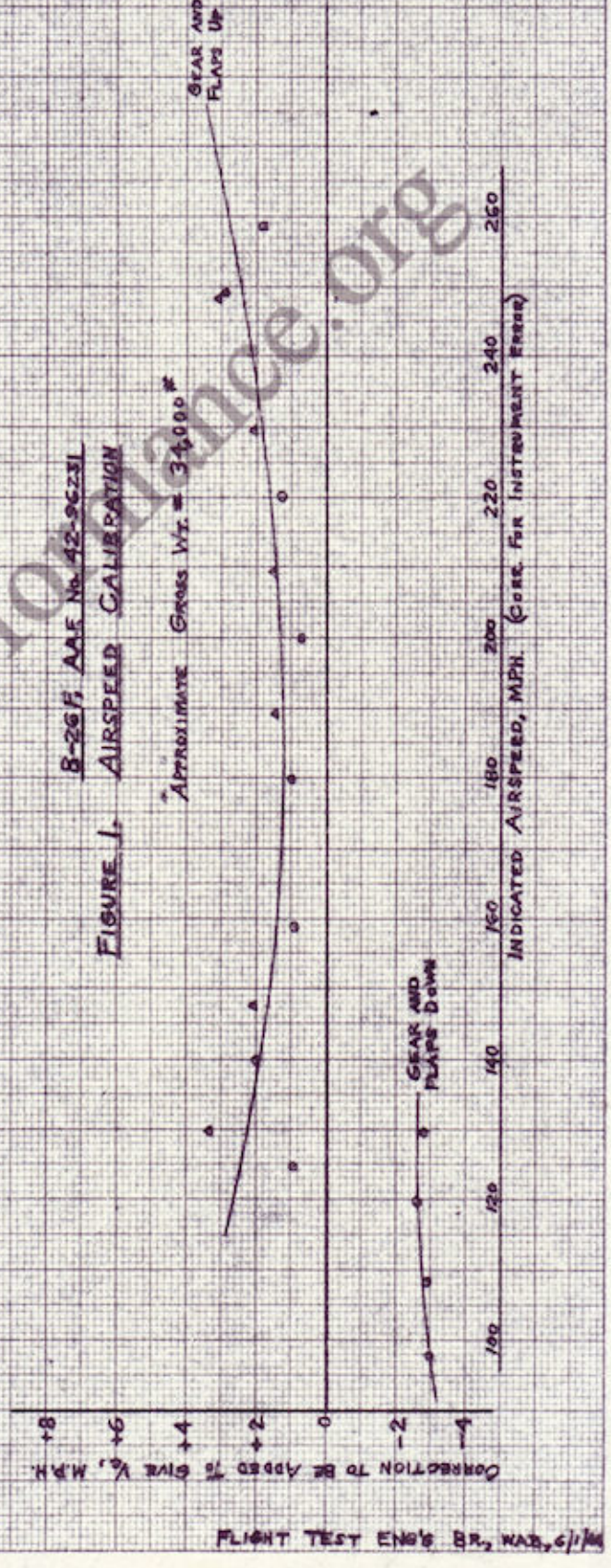
FIGURE 1. AIRSPEED CALIBRATION



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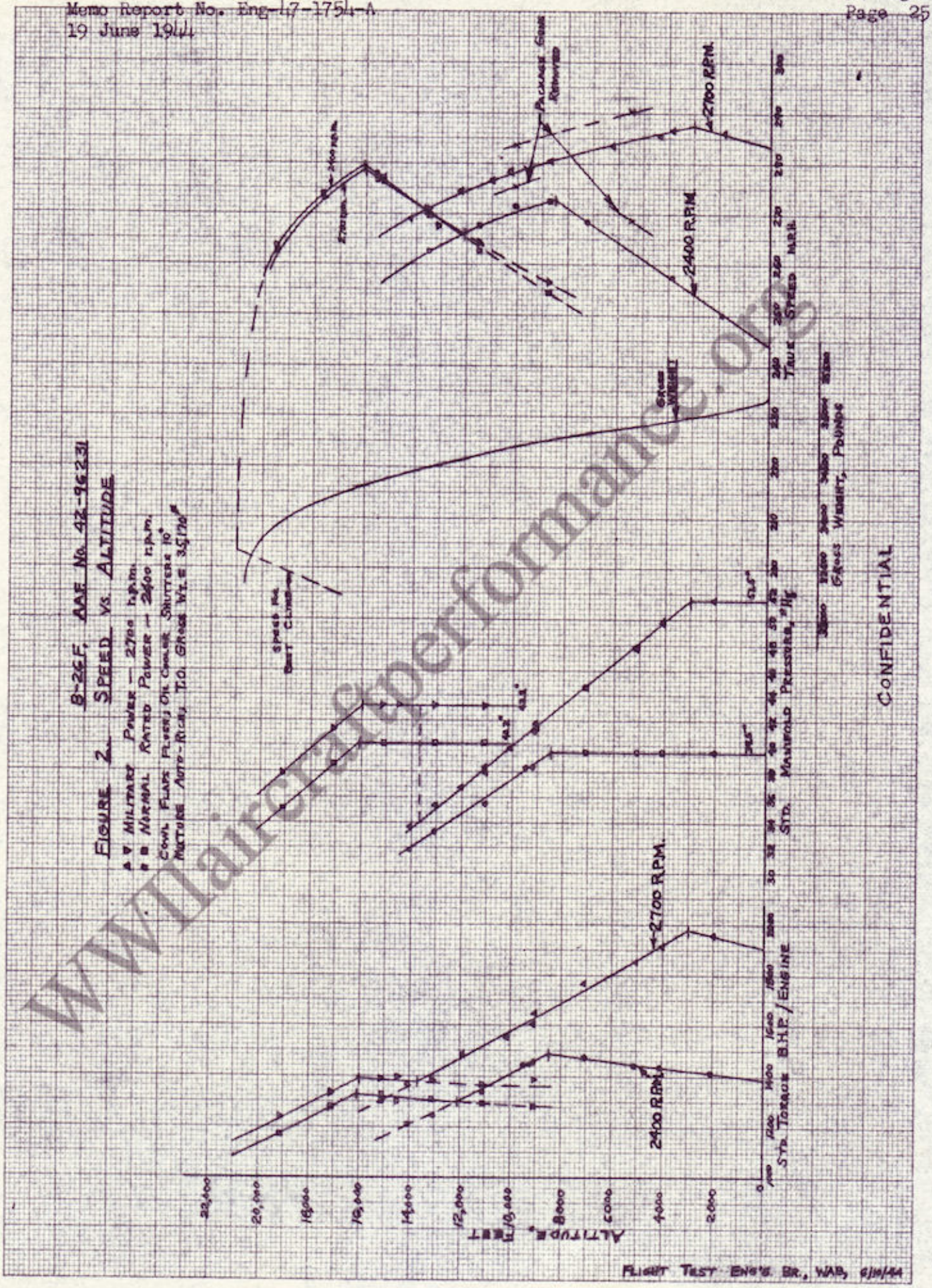

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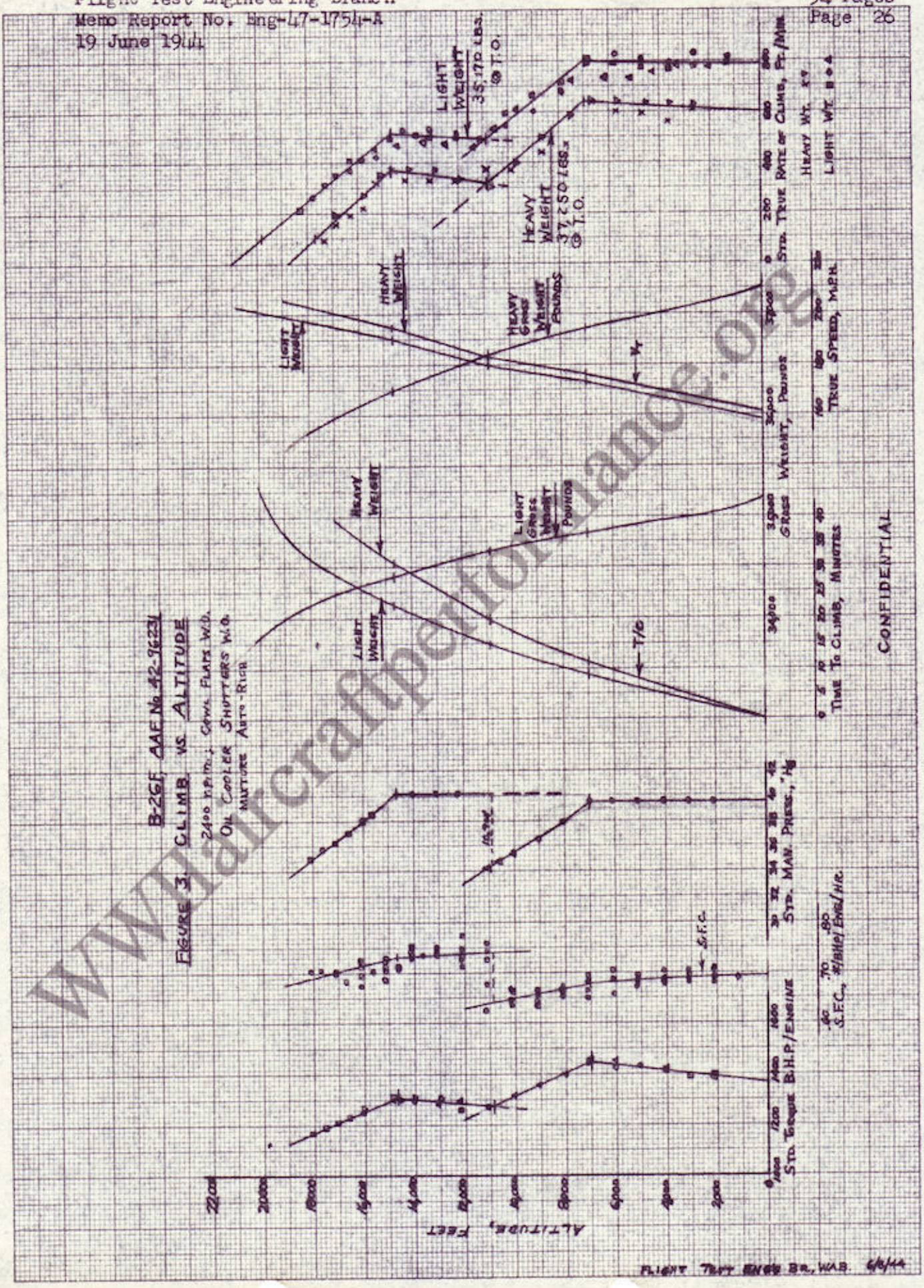

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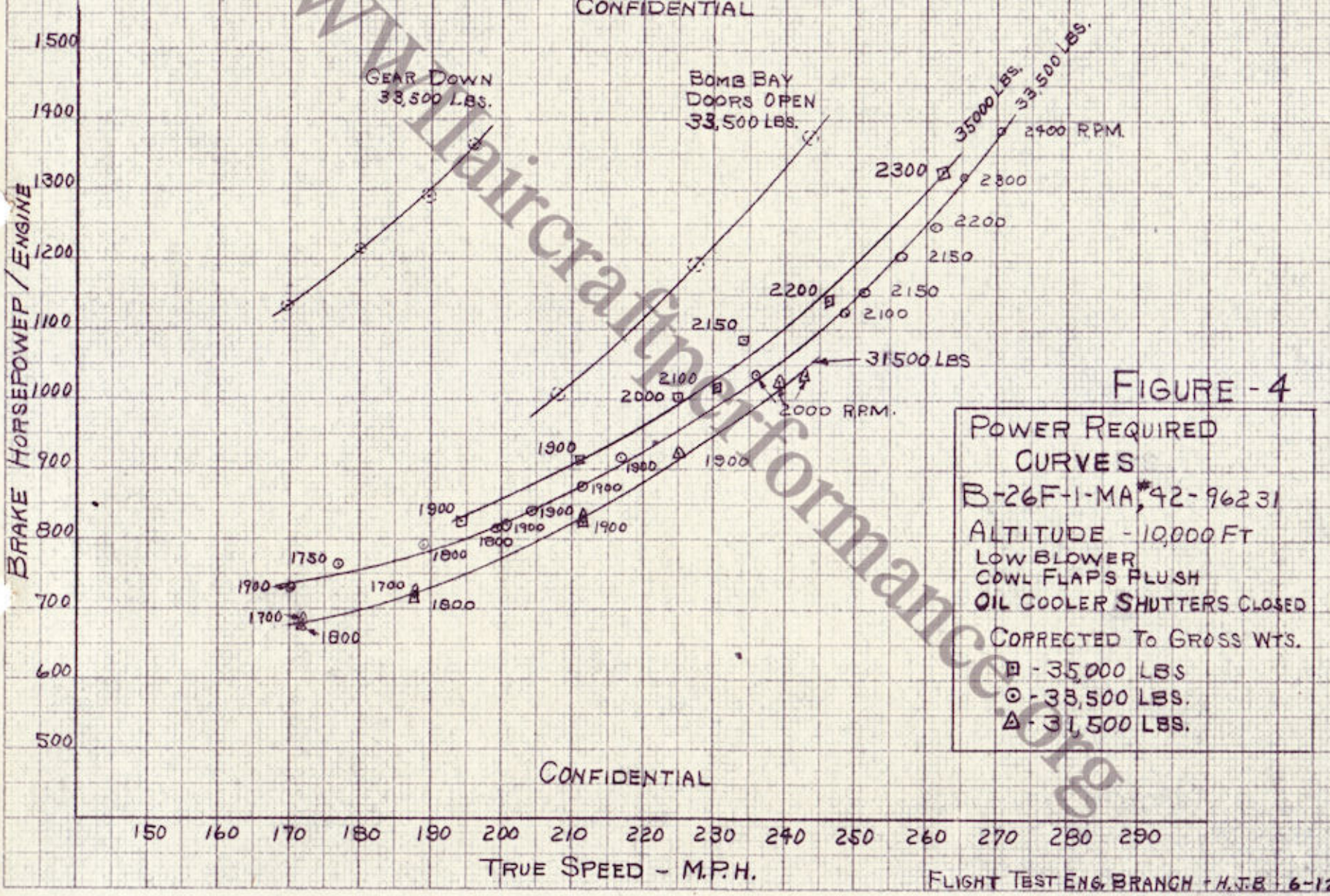

FIGURE - 4

POWER REQUIRED CURVES
B-26F-1-MA, 42-96231
ALTITUDE - 10,000 FT
LOW BLOWER
COWL FLAPS PLUSH
OIL COOLER SHUTTERS CLOSED
CORRECTED TO GROSS WTS.
□ - 35,000 LBS
⊙ - 38,500 LBS.
△ - 31,500 LBS.

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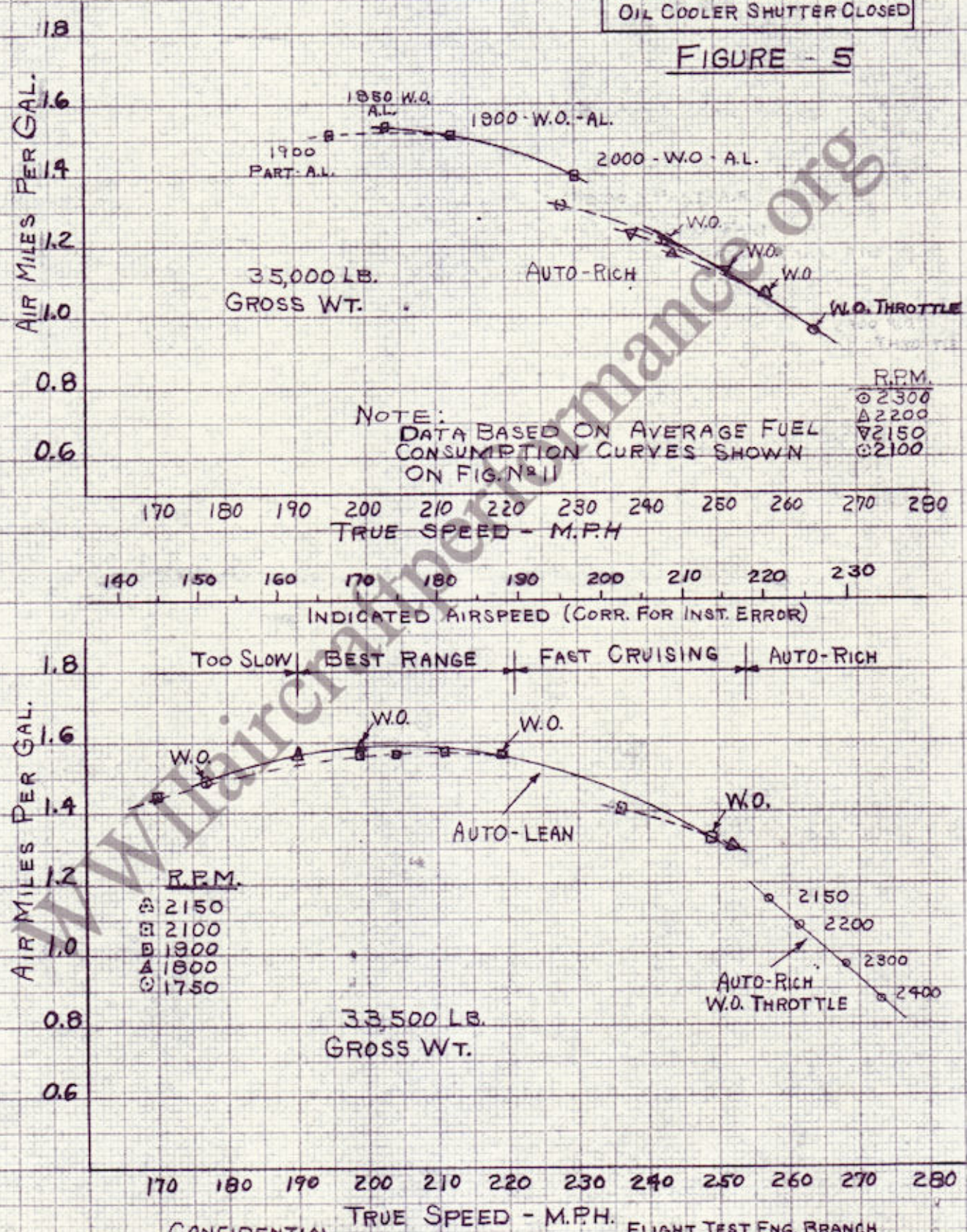
CRUISING SURVEY
B-26F1-MA, #42-96231
ALTITUDE - 10,000 FT.
LOW BLOWER
COWL FLAPS FLUSH
OIL COOLER SHUTTER CLOSED

FIGURE - 5



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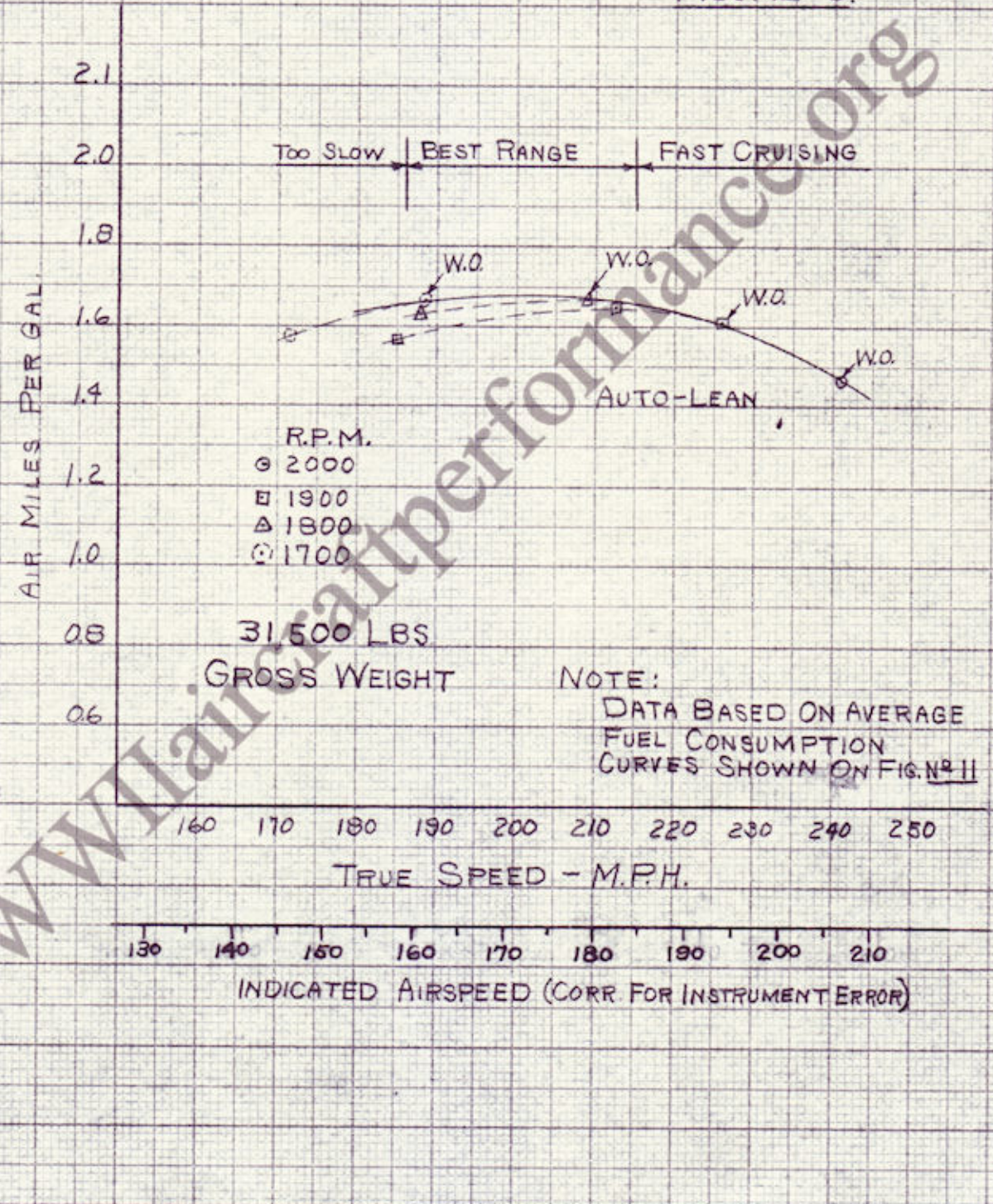
CRUISING SURVEY
B-26F-1-MA, #42-96231
ALTITUDE - 10,000 FT
LOW BLOWER
COWL FLAPS FLUSH
OIL COOLER SHUTTER CLOSED

FIGURE 6.



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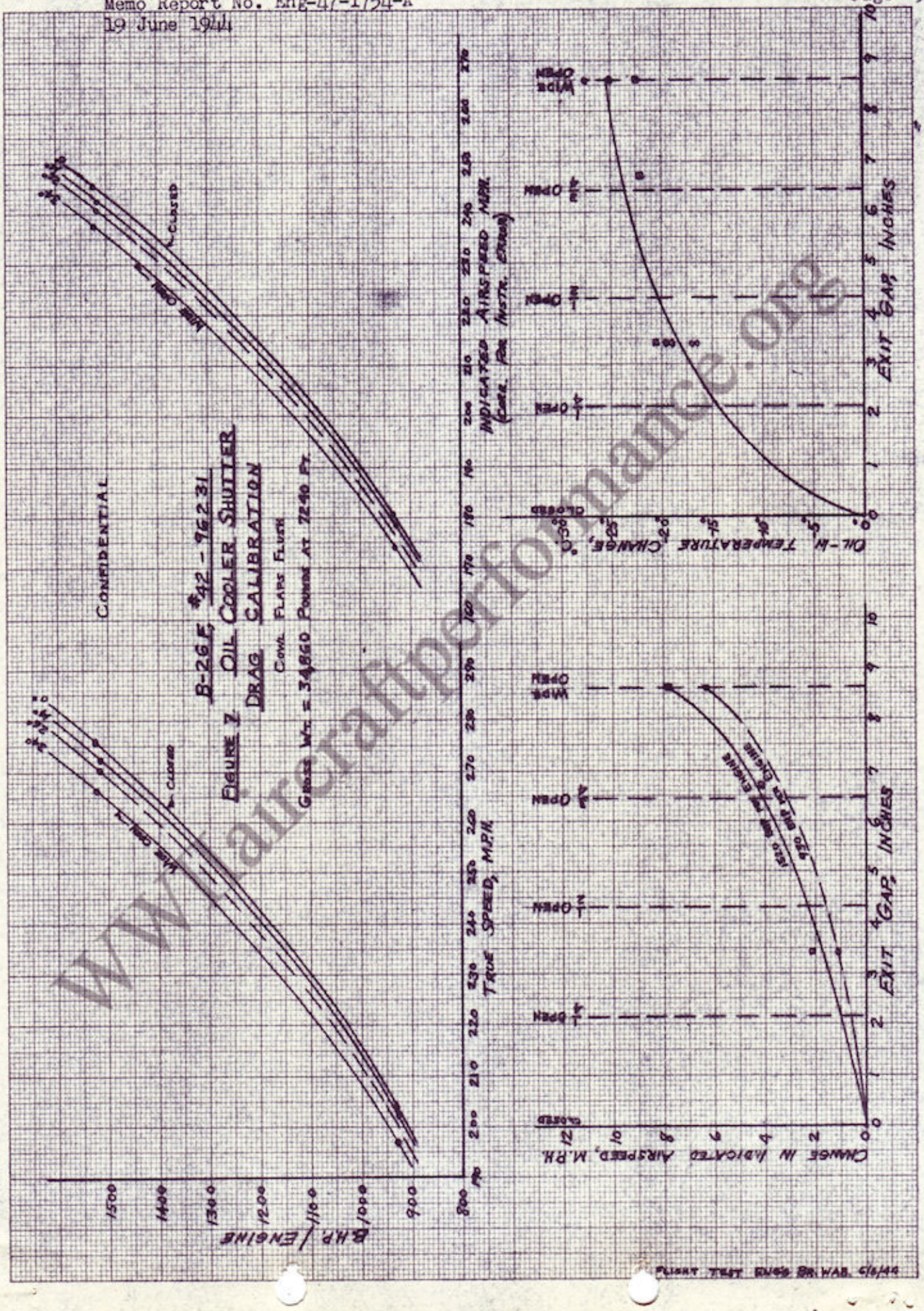

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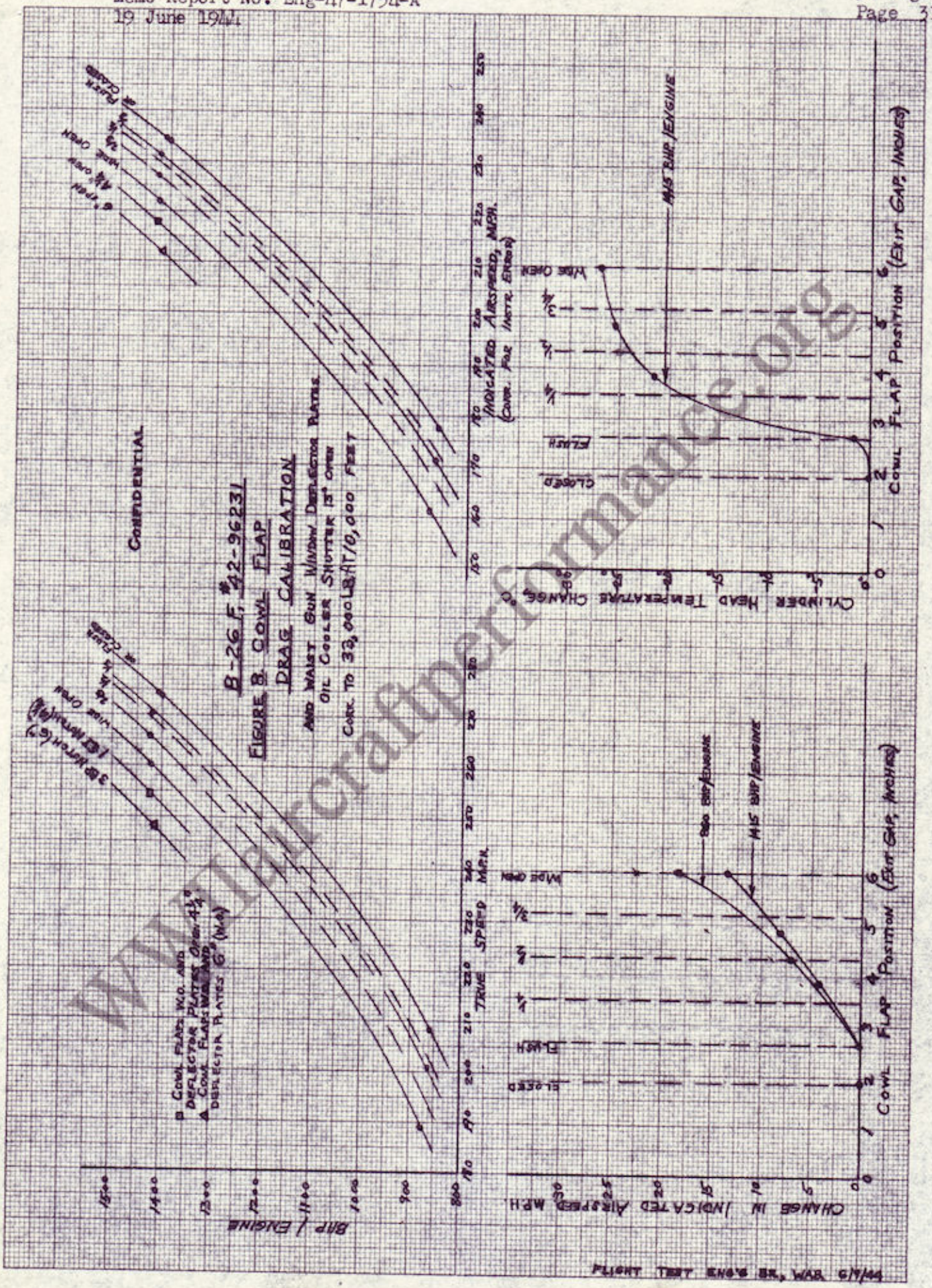

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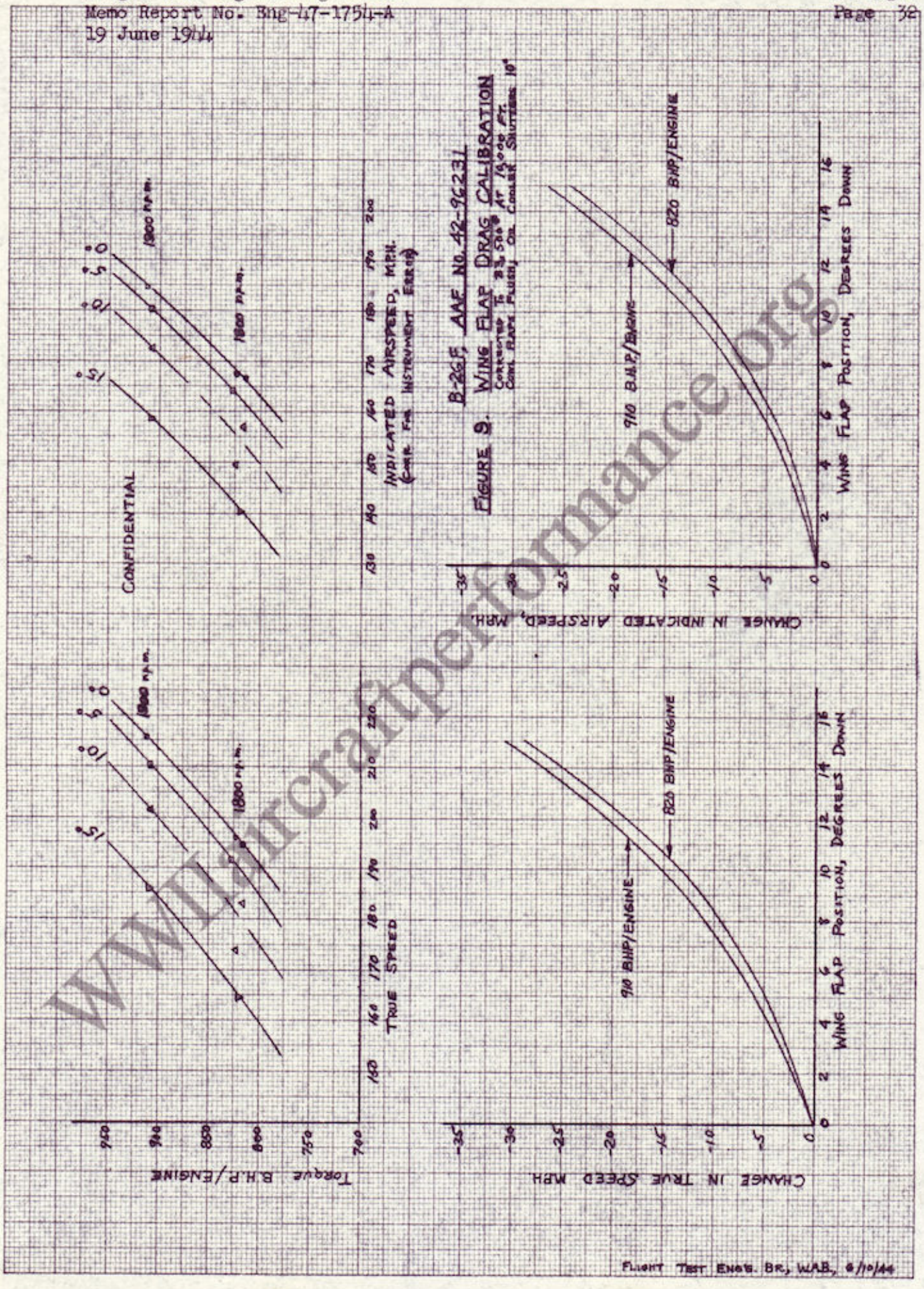

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B-26F, #42-96231

FIGURE 10. COWL FLAP POSITION EFFECT ON RATE OF CLIMB

GROSS WT. 32,000 #; 1318 BHP/ENGINE @ 9850 FEET
INDICATED AIRSPEED 155 MPH; 2400 R.P.M.
OIL COOLER SHUTTERS WIDE OPEN

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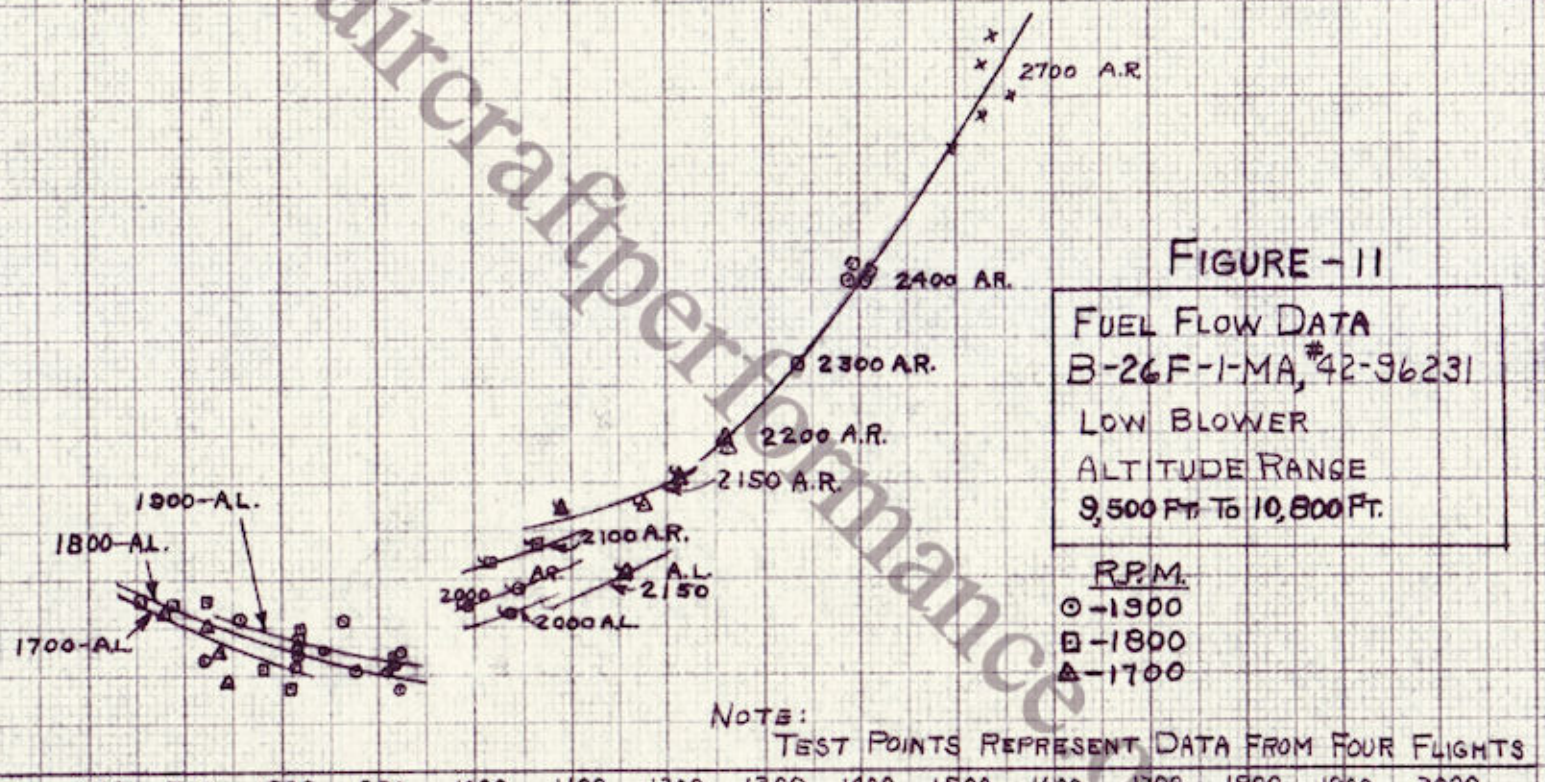

FIGURE - 11

FUEL FLOW DATA
B-26F-1-MA, #42-96231
LOW BLOWER
ALTITUDE RANGE
9,500 FT. TO 10,800 FT.

R.P.M.
⊙ - 1900
□ - 1800
△ - 1700

NOTE:
TEST POINTS REPRESENT DATA FROM FOUR FLIGHTS

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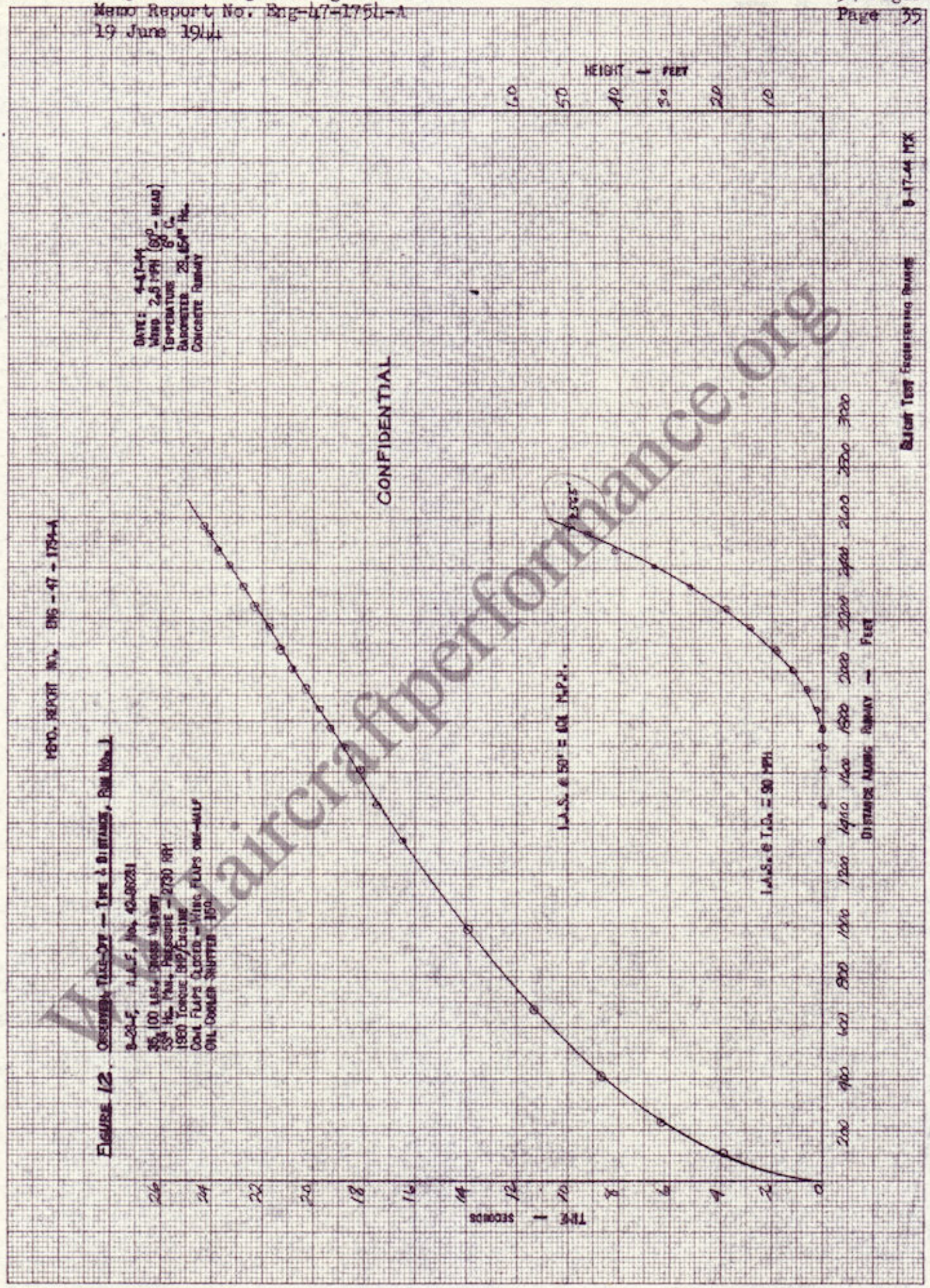

FIGURE 12. OBSERVED TAKE-OFF — TIME & DISTANCE, RUN No. 1

B-24-E, A.A.F. No. 42-8221
35,100 LBS. GROSS WEIGHT
33" Hg. MAN. PRESSURE — 2730 RPM
1980 Torque HP/Engine
Cowl Flaps Closed — Wing Flaps One-Half
Oil Cooler Shutter 150.

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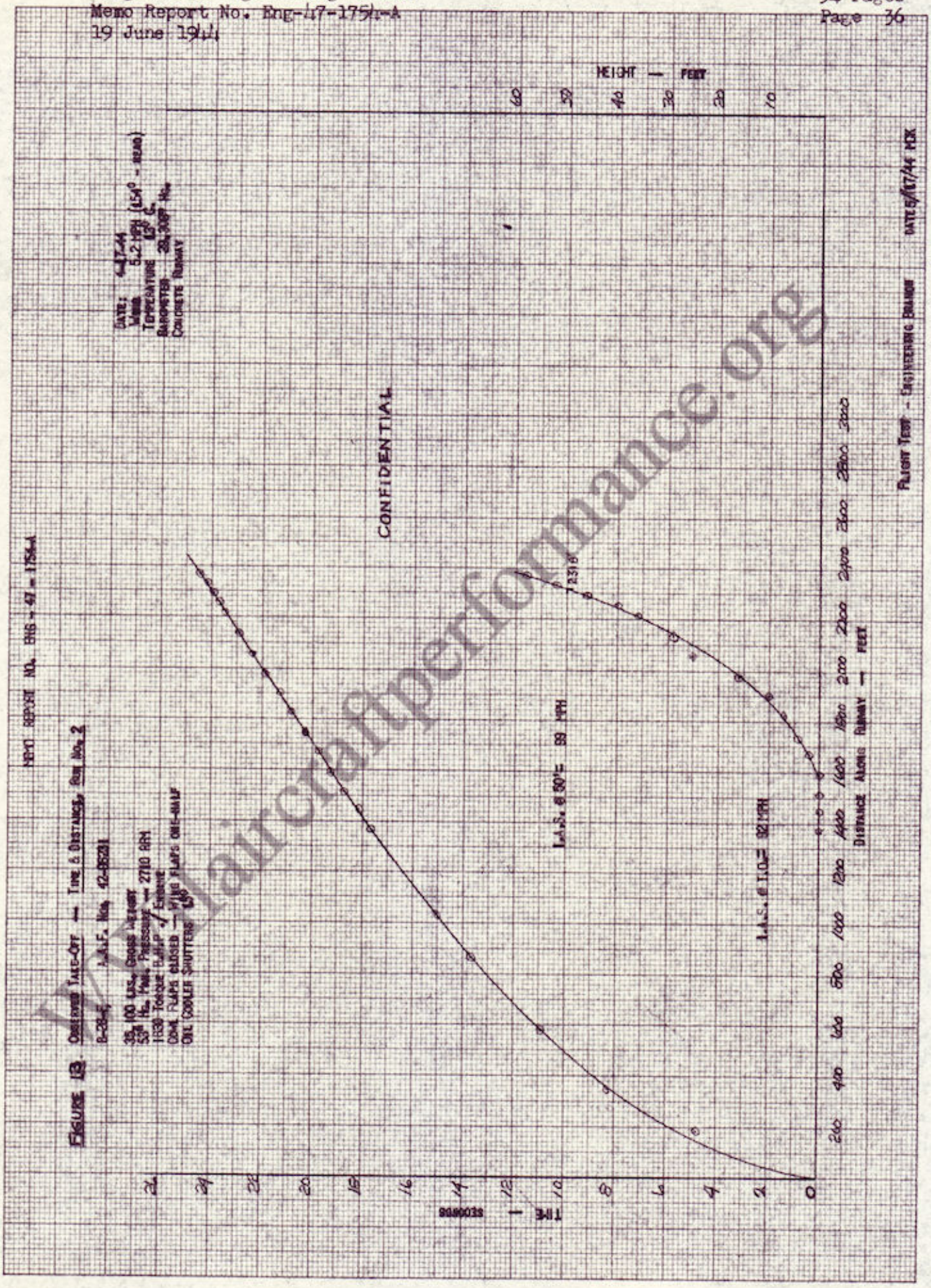

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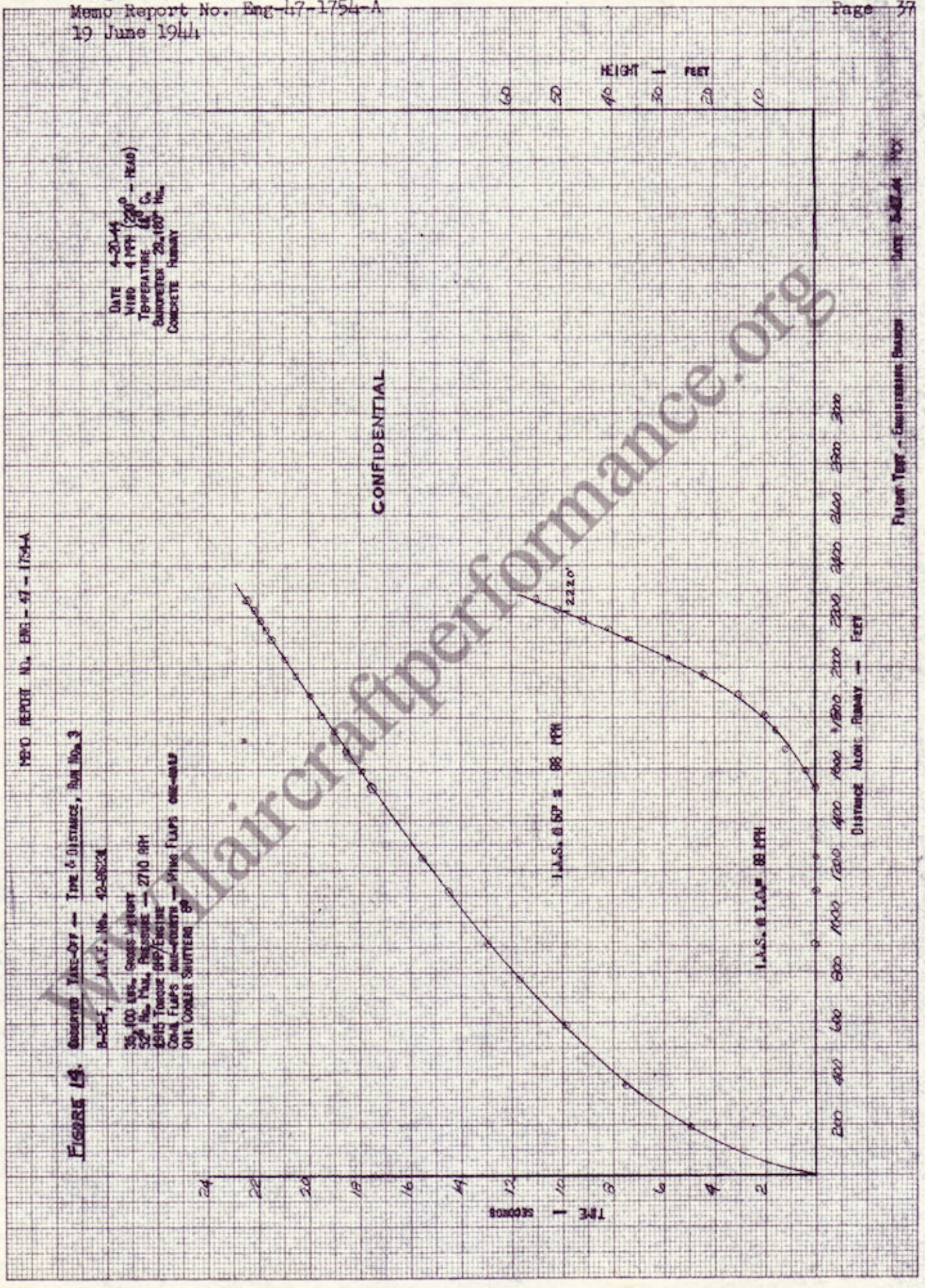

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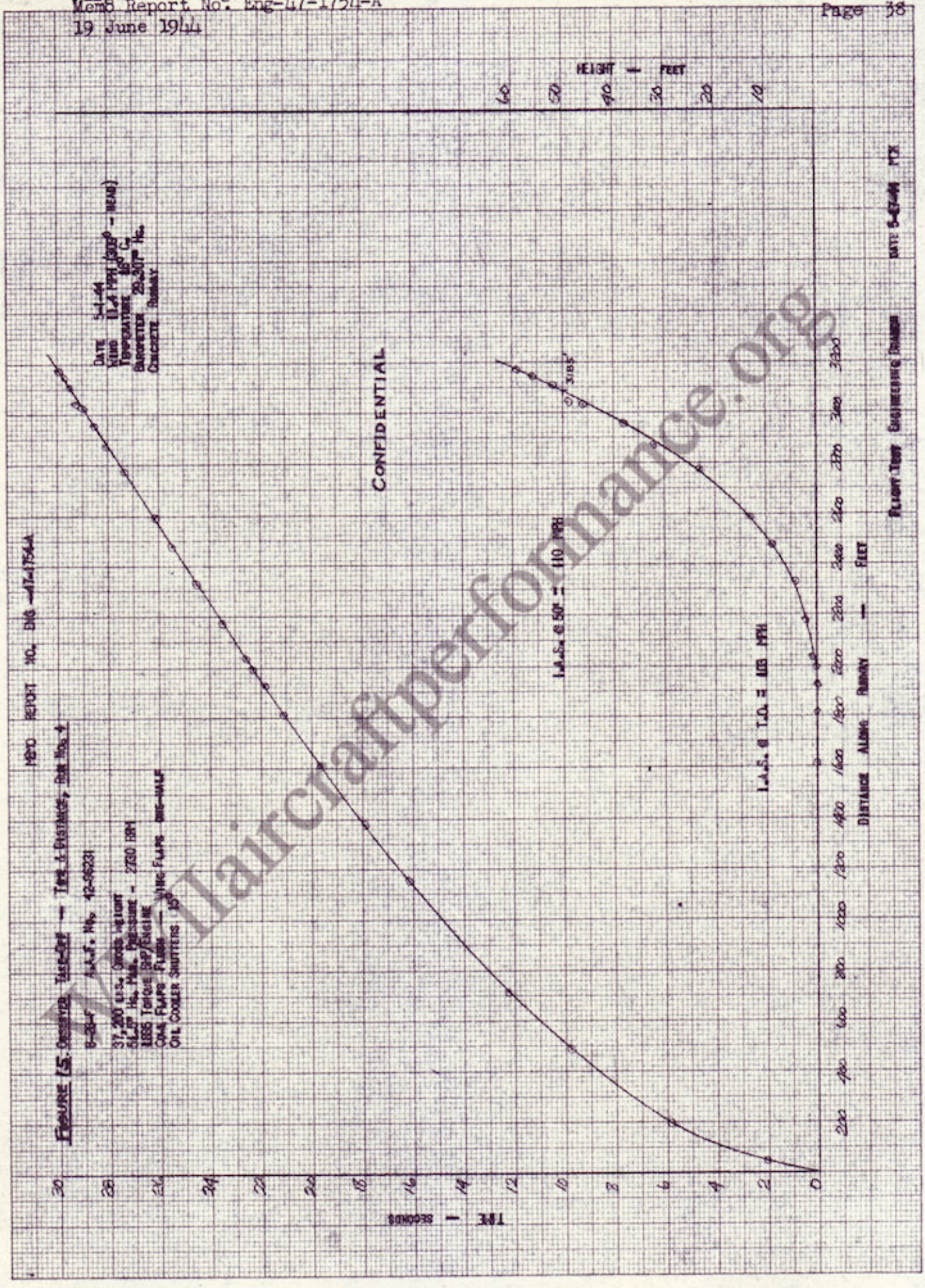

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FIGURE 16. OBSERVED TAKE-OFF — TIME & DISTANCE, RUN NO. 5

B-25-F, A.A.F. No. 43-36236

37,000 LBS. GROSS WEIGHT
52" MS. MANI. PRESSURE + 2730 RPM
COWL FLAPS FLUSH — WING FLAPS ONE-HALF
OIL COOLER SHUTTERS 15°

DATE 5-6-44
WIND 10.5 MPH (80° - HEAD)
TEMPERATURE 8°
BAROMETER 29.09" HG.
CONCRETE RUNWAY

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I.A.S. @ 50' = 104 MPH

I.A.S. @ T.O. = 98 MPH

3082'

TIME — SECONDS

HEIGHT — FEET

DISTANCE ALONG RUNWAY — FEET

FLIGHT TEST ENGINEERING BRANCH DATE 5-17-44 MCK

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VIII Conclusions

The results of the take-off tests showed that the T.O.'s were very conservative in their statements of the distances required to take off and clear a 50 ft. obstacle and that the values as given in the T.O.'s should be easily duplicated by regular service pilots. The increased angle of incidence of the wing on this aircraft very appreciably reduces the take-off distance of the B-26F airplane compared to the older series models. The best take-off distance obtained on the B-26F was only approximately 45 feet longer in total distance over the 50 ft. obstacle than was required on former tests run on a B-26 airplane (Memo Report Serial No. Eng-51-B-846-29) despite the fact that the latter was 5900 pounds lighter. However, it should be noted that no wing flaps were used on the B-26C and that 20° flaps were used on the B-26F. It is concluded that the B-26F-1-MA airplane has a very satisfactory take-off distance for this type of airplane when heavily loaded.

In comparing range data, the T.O. range tables show from 3 to 5 percent less range in auto lean than was obtained on these flight tests. The T.O. tables were also on the conservative side for the auto rich mixture operation particularly through the lower engine R.P.M's. The long range cruise charts put out by the headquarters of the Air Transport Command on this type airplane agree favorably with the data in this report.

The level flight speed vs. power data showed that above 15,000 feet in high blower the airplane was slightly faster at normal rated power (2400 RPM) than it was at military power (2700 RPM) although the torque meter brake horsepower per engine was 60 to 70 horsepower higher at the latter rating. This would seem to indicate an appreciable loss in propeller efficiency with altitude at 2700 RPM. It is concluded that no advantage is derived from the use of the military power rating above 15,000 feet.

An increase of 11 MPH in high speed at 2700 R.P.M at 10,000 feet can be obtained by the removal of the fuselage package guns and the installation of the streamlined top panel engine cowling in place of the standard panel. A corresponding increase of 8.9 MPH is obtained at 2400 R.P.M. At cruising powers the removal of the package guns increases the speed of the airplane by 4 MPH while the installation of the streamlined top panel makes no apparent difference in speed.

IX Recommendations

1. It is recommended that the military power rating (2700 R.P.M) be discontinued in high blower above an altitude of 15,000 feet.

2. It is recommended that the airplane be equipped with windshield wipers.

3. It is recommended that a port be provided under the pilot's seat for access to the load and fire valve (used for emergency lowering of the nose gear).

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4. It is recommended that decals for locating the main gear emergency lowering system be placed in a more conspicuous position.

X General Dimensions and Photographs

A. General Dimensions

Span	71 feet 0 inches
Length	58 feet 2 inches
Height	21 feet 6 inches
Wing Area	658 ~~619.1~~ square feet
Aileron Area	44.7 square feet
Wing Flap Area	71.82 square feet

B. Photographs

1. Package guns on

a. Front view, #139027, page 42
b. Three quarter front view, #139028, page 43
c. Side view, #139029, page 44
d. Three quarter rear view, flaps up, #139030, page 45
e. Three quarter rear view, flaps down, #139031, page 46
f. Three quarter front view showing streamlined top panel installation on left engine cowling, #148075, page 47
g. Close up of streamlined top panel installation on left engine cowling, bomb bay doors open wide, #148077, page 48
h. Close up of waist gun window deflector plates in wide open position, #148078, page 49

2. Package guns removed

a. Front view, #142433, page 50
b. Three quarter front view, #142434, page 51
c. Close up of right side of fuselage, #142435, page 52

3. Maximum Performance Take-off, Fig. 1a, page 53

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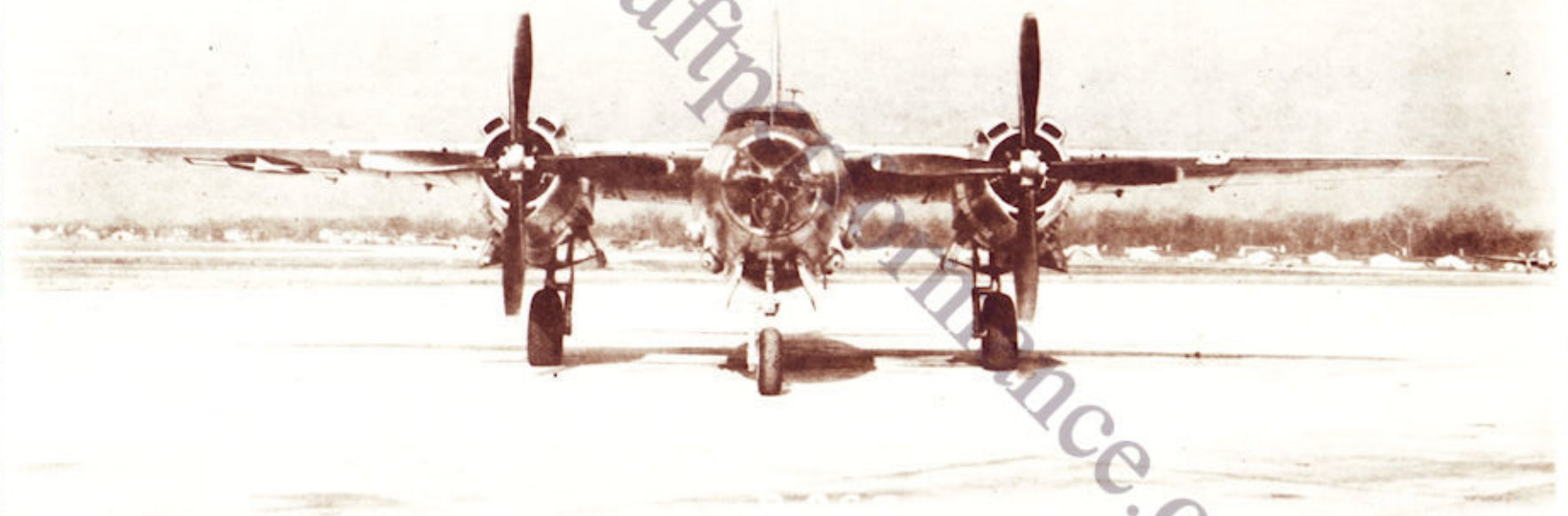

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1-a. Front View - Package Guns On - B-26F-1-MA, 42-96231

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1-b. Three-Quarter Front View - Package Guns On - B-26F-1-MA, 42-96231

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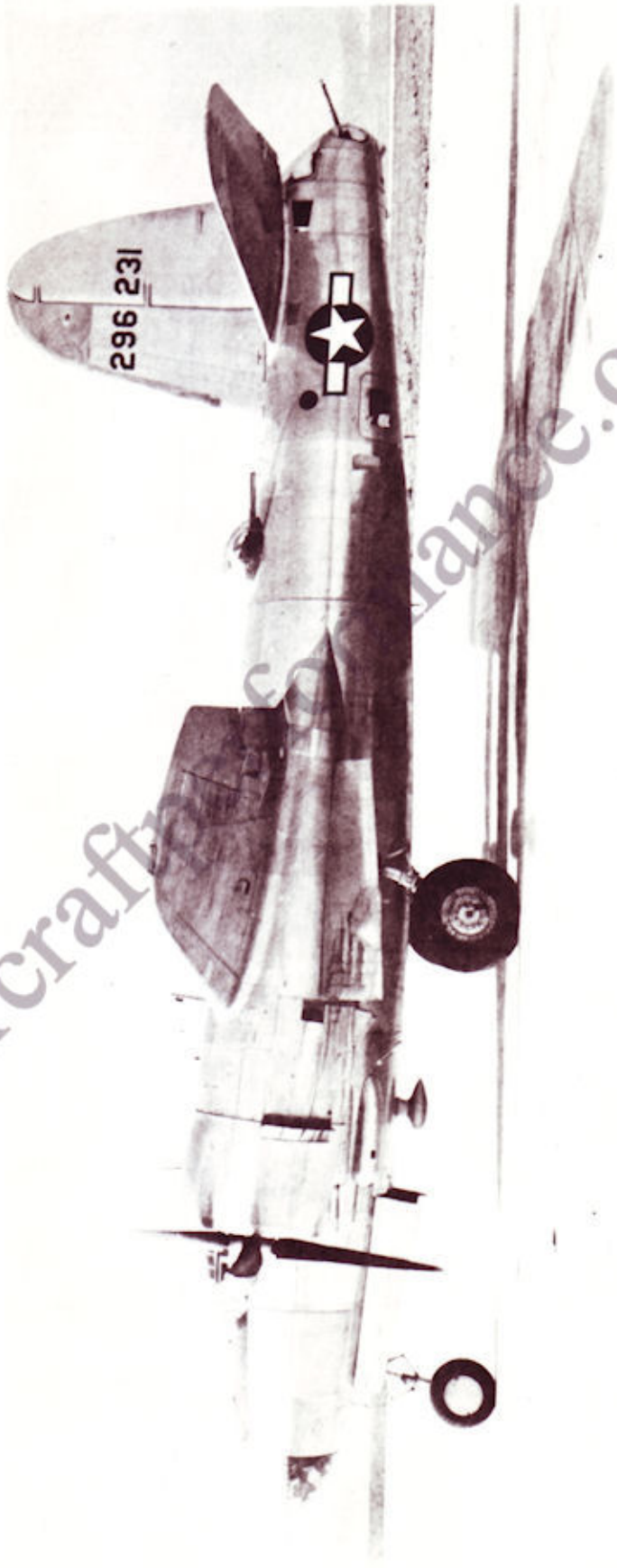

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1-c. Side View - Package Guns On - B-26F-1-MA, 42-96231.

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1-d. Three-Quarter Rear View - Package Guns On - B-26F-1-MA, 42-96231.

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1-e. Three-Quarter Rear View - Flaps Down - Package Guns On - B-26F-1-MA, 42-96231.

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1-f. 3/4 Front View showing streamline top panel on left engine cowling - Package Guns Installed.

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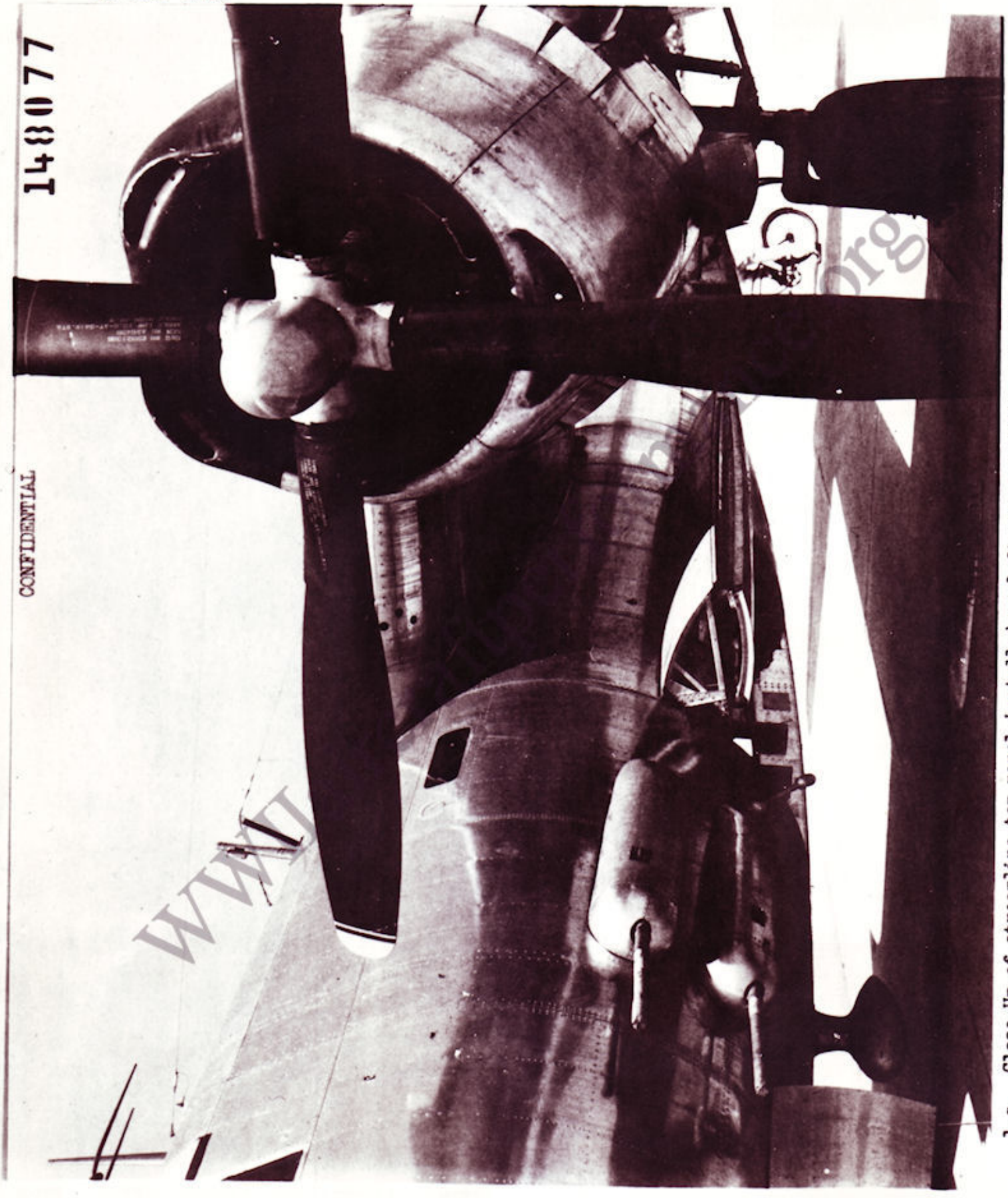

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1-g. Close-Up of streamline top panel installed on left engine cowling and wide open bomb-bay.

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1-h. Close-Up of waist gun window deflector plates in wide open position - Package Guns On.

148078

142433

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2-a. Front View - Package guns removed - B-26F-1-MA, 42-96231

142434

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2-b. Three-Quarter Front View - Package Guns Removed - B-26F-1-MA, 42-96231

2-c. Close-up of right side of fuselage - Package Guns Removed - B-26F-1-MA, 42-96231 .

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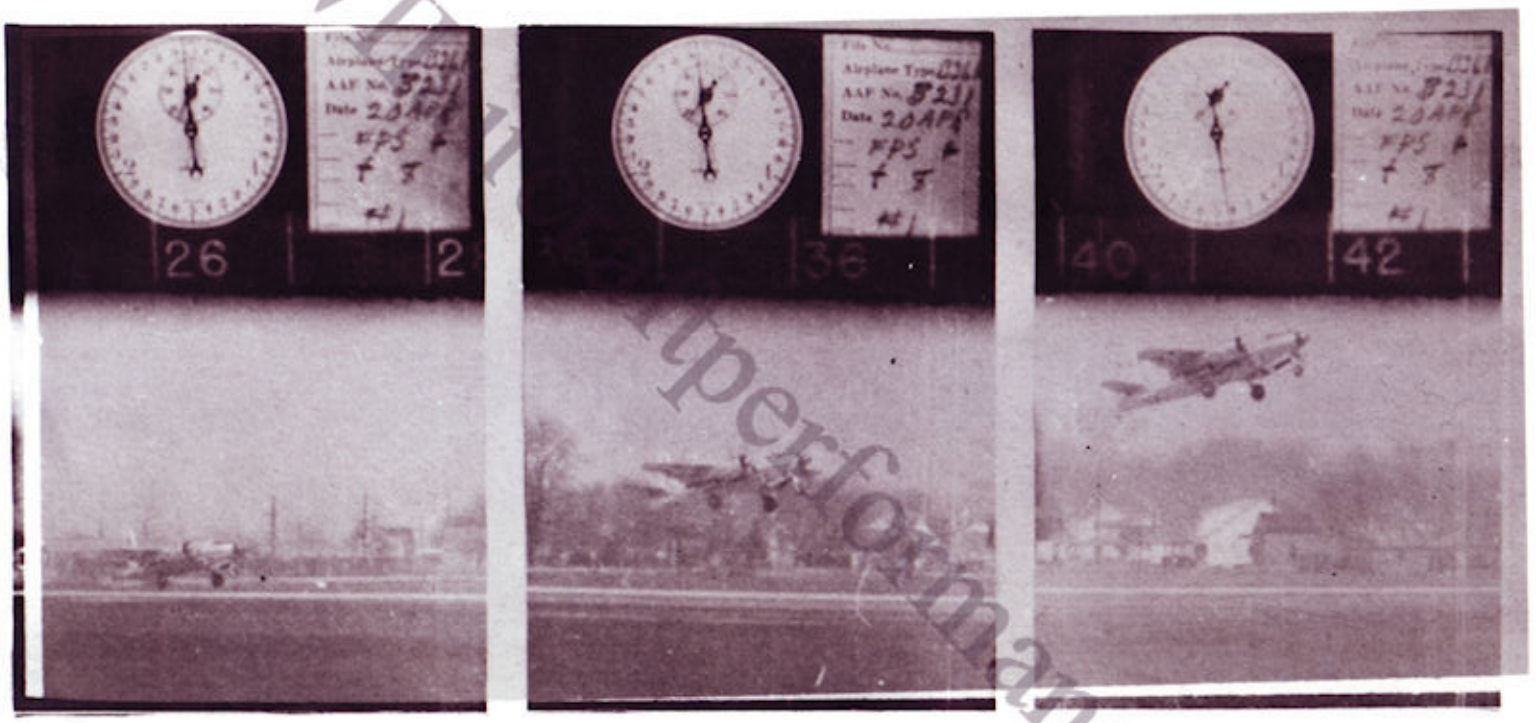

Take-off | 25 ft. Height | 50 ft. Height

Fig. 11a
B-26F-1-MA Airplane, AAF No. 42-96231
Maximum performance take-off
as recorded by the photographic
method. Gross wt. = 35,100 lbs.
Indicated Airspeed at T.O. = 89 MPH
Indicated Airspeed at 50' = 98 MPH

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