

AD 633632

PROPELLER, INTEGRAL GEARBOX
MODEL 73EGH1
AND
PROPELLER, VARIABLE CAMBER
MODEL VC86260
FLIGHT TEST REPORT

BUREAU OF NAVAL WEAPONS CONTRACTS
NOW 64-0635-di
NOW 65-0533-d

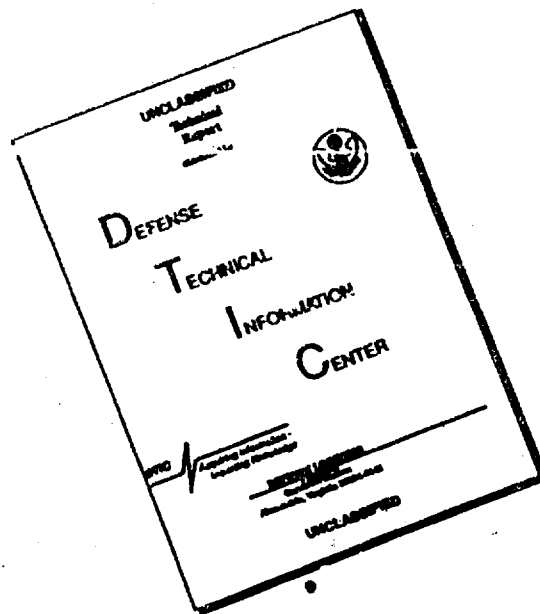
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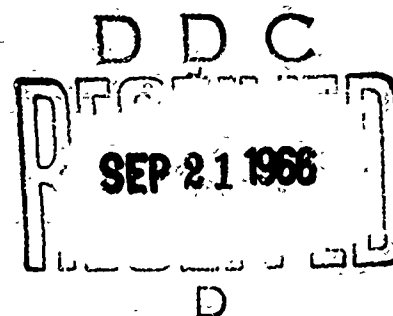


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ABSTRACT

This report describes the preparations for, and the 50 hour flight tests of, the 73EGB1 Integral Gearbox Propeller and the VC86260 Variable Camber Propeller conducted under Bureau of Naval Weapons Contracts NOW 64-0635-d1 and NOW 65-0533-d.

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SUMMARY

A 50 hour flight test was conducted on both the 73EGB1 and VC86260 propellers. These tests were conducted on the United Aircraft Corporation B-17C test bed aircraft which was removed from long time storage and reconditioned. A 73EGB1 gearbox was modified to a shaft configuration for use in the VC86260 propeller flight test. Development tests and a 50 hour engine PFRT were conducted on this gearbox. Both test propellers and gearboxes were assembled primarily from hardware used in development testing programs on the 73EGB1 and VC86260 propellers. In general, both propellers performed satisfactorily during their respective tests.

INTRODUCTION

The 73EGB1 propeller was developed under Navy Contract NOW 60-0556-d to the point where it was considered capable of passing a 50 hour PFRT engine test. A 50 hour PFRT engine test was then successfully conducted under Navy Contract NOW 64-0642-d.

The VC86260 propeller was developed under Navy Contract NOW 62-0649-d. Development of this propeller included a 50 hour engine PFRT and a whirl stand PFRT.

Late in 1964, Hamilton Standard received Bureau of Naval Weapons Contract NOW 64-0635-d1 to conduct the preparatory phase of the flight test and in mid-1965 Bureau of Naval Weapons Contract NOW 65-0533-d was received to conduct the flight test of the 73EGB1 and VC86260 propellers.

OBJECT

This test program was conducted to evaluate the performance and endurance capabilities of the 73EGB1 and VC86260 propellers during 50 hour flight tests.

CONCLUSION

It is concluded that the 73EGB1 and VC86260 propellers demonstrated satisfactory performance and endurance characteristics during the flight test program.

RECOMMENDATION

None.

PREPARATORY PHASE

The preparations for the flight test were conducted under Bureau of Naval Weapons Contract NOW 64-0635-di. This phase consisted of two major areas of effort.

Aircraft

The aircraft used as the flying test bed was a Boeing B-17G modified to accept a fuselage nose mount nacelle. Figure 1, Appendix A is a photograph of the airplane at the start of modification for this test. When reactivated for this test, the aircraft had been in storage for two years and had not flown for five years.

The airframe provides a four point mounting adapter for the test nacelle as shown in Figure 2, Appendix A. This photograph also shows the firewall and the exhaust duct for the T64-GE-1 engine used during this test program.

The nacelle structure designed and fabricated for this test consisted of a two-section tubular steel frame. Figure 3, Appendix A is a photograph of the frame, with a gearbox mock-up installed, on an assembly jig. The frame supported the engine, gearbox-propeller, paneling, air inlet duct, oil tank, engine and propeller input systems, and instrumentation.

The air inlet duct designed and manufactured for the installation was subjected to an engine test to insure that the circumferential distortion of the air across the engine compressor face was within the limits set forth by the engine manufacturer. This test revealed the duct to be satisfactory for use on the test installation. Figures 4 and 5, Appendix A show the air inlet duct installed in the test house for evaluation.

The test installation was operated from a control station in the bomb bay area of the aircraft. This station is shown in Figure 6, Appendix A.

Data was recorded by oscillograph, Figure 7, Appendix A, and on a photo panel, Figure 8, Appendix A.

Figure 9, Appendix A, is a photograph of the left side of the test installation, Figure 10, Appendix A, is a photograph of the test installation from underneath, and Figures 11 and 12, Appendix A are photographs of the right side of the test installation. All photo's are of the test installation for the 73EQB1 propeller.

Aircraft - (continued):

In addition, to the manufacture and installation of the test nacelle, it was necessary to recondition the aircraft for relicensing. This included the depreserving of the aircraft, refabricating of the control surfaces, and the procurement and installation of new radio equipment to conform to the new FAA requirements. The aircraft was licensed for day VFR by the FAA. Figure 13, Appendix A is a photograph of the aircraft with the 73EGB1 propeller, ready for flight, and Figure 14, Appendix A is a photograph of the VC86260 propeller installation ready for flight.

SK56029 Speed Reduction Gearbox

The SK56029 Speed Reduction Gearbox is the same gearbox used in the 73EGB1 Integral Gearbox Propeller, modified to a shaft type configuration. Figures 15 and 16, Appendix A are photographs of the gearbox in an assembly stand. The unit is designed to accommodate a T-64 engine of 3180 HP military rating at 15,600 rpm. Maximum input speed and torque for the gearbox are 17,000 rpm and 1200 ft-lb. The gear reduction ratio is 12.08:1.

To modify the 73EGB1 gearbox to the SK56029 configuration, the following changes are necessary:

1. Replacement of the propeller tail shaft with a propeller mounting shaft in accordance with AND 10152-60A.
2. Replacement of the propeller control with a transfer bearing to provide the gearbox lubricating oil.
3. Addition of a control torque retainer.

The configuration of the SK56029 gearbox used for this test is defined by Model Specification No. 5067. This unit, S/N GB 104, consisted mainly of parts used during the static structural testing of the 73EGB1 propeller. New parts were incorporated to obtain the shaft type configuration or where dictated by normal test procedure. A VC86260 Variable Camber Propeller was used to load the gearbox, and a T64-GE-1 engine was used as the power source.

A short development test was run on the SK56029/VC86260 configuration to determine their compatibility, and to evaluate the functional and structural suitability of the gearbox to perform the 50 hour PFRT. This test was conducted in the Hamilton Standard "E" engine test cell and consisted of 37 hours, 25 minutes of running. Operation was checked in both steady state and transient conditions. No problems were encountered during this test, and the gearbox was considered to be satisfactory for subjection to the 50 hour PFRT.

SK56029 Speed Reduction Gearbox (continued):

The 50 hour PFRT engine test of the SK56029 gearbox was conducted in accordance with paragraph 4.5.2 of MIL-P-26366A. The test was run in the Hamilton Standard "E" engine test cell. The test cell incorporates a horizontal intake with a variable cone orifice and a vertical exhaust. Control apparatus and test instrumentation were housed in a room overlooking the test cell. Figure 17, Appendix A is a photograph of the test cell with gearbox/propeller installed and Figure 18, Appendix A is a photograph of the control room. Two levers mounted on a quadrant in the control room were used to control engine and propeller operation. One lever, the condition lever, was used to set propeller governing speed and to provide a manual feather signal to the propeller control. The second lever, the power lever, was used to control engine power through input to the fuel control and also, through an electric switch located on the quadrant and a solenoid located on the test stand, to provide a reversing signal to the propeller control. A switch located on the propeller control panel provided electrical feather and unfeather signals to the propeller control.

Instrumentation used to monitor the required engine, gearbox, and propeller parameters is tabulated in Figure 22, Appendix A.

Prior to initiating the test, the gearbox was completely disassembled and laid out for inspection by Hamilton Standard Engineering and by Hamilton Standard and Government Quality Control. At that time all indications of abnormal wear were noted on the pre-test inspection record and any necessary part replacements were made. The gearbox was then assembled per Hamilton Standard Specification HS 1455.

Testing, as specified by paragraph 4.5.2 of MIL-P-26366A, consisted of propeller performance tests prior to and following endurance running, and endurance testing consisting of 50 one-hour flight cycles. Plan of Test 128PT-89 describes in detail the test procedure used for the 50-hour PFRT. This Plan of Test and log sheets covering the test are contained in Appendix B.

Following the testing, the gearbox was again disassembled and laid out for inspection. All conditions of abnormal wear not noted on the pre-test inspection record were then noted on the post-test inspection record. Copies of both pre-test and post-test inspection records are contained in Appendix B.

Gearbox operation throughout the test was excellent. There were no instances of chip detector shutdowns or abnormal vibration indications.

Propeller operation during the test was satisfactory, with no unusual incidents occurring.

Post-test examination of the gearbox revealed the detail parts to be in good condition.

It was concluded that the SK56029 gearbox had demonstrated satisfactory endurance characteristics during the test, and was qualified for flight testing.

DESCRIPTION OF TEST

The flight phase of the program was conducted under Bureau of Naval Weapons Contract NOW 65-0533-d. This phase was conducted in two parts.

The first part was a 50-hour flight test of the 73EGB1 Integral Gearbox Propeller. This test was conducted primarily to evaluate the air-worthiness of the gearbox. The second part was a 50-hour flight test of the VC86260 Variable Camber Propeller installed on a modified 73EGB1 gearbox.

73EGB1 Propeller

The 73EGB1 propeller is an integrated unit consisting of hub, control, and speed reduction gearbox. The hub is similar to the Hamilton Standard 63E60 propeller hub, but with the rear barrel half modified to provide a tailshaft for assembly with the gearbox and the fluid transfer system modified to accommodate oil flow to the hub from the rear mounted control. The control, mounted at the aft end of the gearbox, is functionally similar to the 53C51 propeller control now in service on the AO-1 aircraft. The main feature which distinguishes the 73EGB1 from previous Hamilton Standard propellers is the integrated gearbox. This unit is designed to accommodate a T64 engine of 3180 HP military rating at 15,600 rpm. Maximum input speed and torque for the gearbox are 17,000 rpm and 1200 ft-lb. Gear reduction ratio is 12.08:1. Complete descriptions of the 73EGB1 propeller may be found in the Hamilton Standard Model Specification No. 3704B, the Hamilton Standard 73EGB1 Propeller Development Report No. HSER 2789, and the Hamilton Standard 73EGB1 50-hour PFRT Report No. HSER 3407.

The configuration of the 73EGB1 propeller used for this test was essentially the same as that used for the 50-hour PFRT. Minor modifications were made to incorporate a 63E60 spinner and an instrumentation flight ring. This unit consisted mainly of parts used during development testing.

VC86260 Propeller

The VC86260 propeller consists of a hub and a control. The hub differs from other Hamilton Standard hydromatic propellers in that it has a tandem, or two-stage arrangement of blades with a means for varying the blade angle schedule between the forward and rear blades. This arrangement permits the forward and rear blades to act as one to achieve the effect of a high camber blade for take-off and, by differential pitch change, to revert to a low camber staggered biplane arrangement for cruise. The control is essentially the same as the 63E60 propeller control with minor modifications to make it compatible with the propeller.

VC86260 Propeller (continued):

This unit is designed to accommodate a T64 engine with a 2765 HP take-off rating at 1160 rpm. A complete description of the VC86260 propeller may be found in the Hamilton Standard Model Specification No. 5006A.

The configuration of the VC86260 propeller and SK56029 gearbox used for this test were essentially the same as that used for their respective 50-hour PFRT's. Minor modifications were made to incorporate an instrumentation flight ring. This unit consisted mainly of parts used during development testing.

Test Method

The testing was conducted on the nose mounted nacelle of the modified B-17G aircraft. The test installation was controlled from a panel in the aircraft bomb bay area. Instrumentation used to monitor the required propeller and engine parameters is tabulated in Figure 23. Oscillograph recording equipment was employed where necessary for determining propeller performance versus time and to record blade stresses during the vibration stress survey portions of the testing. A photo panel was used to continuously record critical installation parameters.

Prior to and at the conclusion of testing, the propellers were completely disassembled and laid out for Hamilton Standard Engineering inspection. Assembly of the test units was then conducted in accordance with their respective specifications. A brief engine check out of each unit was then performed prior to installation on the aircraft.

Testing of each propeller consisted of ground and flight vibration surveys, ground and flight performance tests, operation under unusual attitudes, taxi tests, and endurance cycles. Plans of Test No's. 128PT-90 and 128PT-91 describe in detail the test procedures used for the 73EGB1 propeller, and Plans of Test No's. 128PT-93 and 128PT-94 describe in detail the test procedures used for the VC86260 propeller.

Test Chronology

A chronological order of test is presented in Figure 24 Appendix A for the 73EGB1 propeller and in Figure 25 Appendix A for the VC86260 propeller.

DISCUSSION

General

Testing was conducted in accordance with the plans of test within the limits of aircraft and test engine capabilities. Maximum airspeed was established as that speed which could be maintained with the aircraft engines at maximum cruise power and the test engine at idle power. This airspeed varied from 240 mph indicated at 5000 feet to 165 mph indicated at 30000 feet. Maximum attitudes attainable were 45° about the roll axis, 25° about the pitch axis, and zero "g". Attempts to run a negative "g" condition were discontinued when oil pressure was lost on all engines during this maneuver.

Ambient temperatures observed during the test ranged from + 24°F to +54°F on the ground and +45°F to -46°F during flight.

Engine power was altitude limited. Take-off power could be obtained up to approximately 11,000 feet, and at 30,000 feet 60% normal rated power was the maximum attainable.

During both the 73EGB1 and VC86260 portion of the test, the aircraft was flown for a short period of time with the reciprocating engines shut down. Figure 19 Appendix A is a photograph of the aircraft in flight with the 73EGB1 propeller, and Figure 20 Appendix A is a photograph of the aircraft in flight with the VC86260 propeller. Figure 21 Appendix A is a photograph of the aircraft in flight with the VC86260 propeller feathered.

73EGB1 Integral Gearbox Propeller

Vibration Stress Survey

The propeller stress survey indicated that both bending and shear blade stresses were well within acceptable limits over the envelope of test conditions. A summary of the vibration stress levels is presented in Figure 26 Appendix A. These findings confirmed data obtained previously by Hamilton Standard on similar blade/hub configurations. The 73EGB1/6903-14 propeller was concluded to be satisfactory, from a blade vibratory stress standpoint, for continuous operation on the aircraft at the specified flight test conditions.

Nacelle Temperature Survey

The nacelle temperature survey, conducted in accordance with 128PT-90, revealed that temperatures in the engine, propeller-gearbox, and nacelle area were well within the limits set forth by both the engine manufacturer and Hamilton Standard over the range of test conditions. A tabulation of the measured temperatures is presented in Figure 27 Appendix A.

DISCUSSION (continued):Propeller Performance

The propeller exhibited satisfactory performance throughout the test. No problem areas were encountered over the range of altitude, airspeed, temperature, and attitude flown. Steady state governing was good during all phases of the test. Propeller response to power and/or condition lever transients was also good during the program. A tabulation of pitch change rates and blade angle changes for various altitudes, airspeeds, power, and propeller speeds is shown in Figures 28 and 29 Appendix A.

Electrical feathering and unfeathering operation was marginal during the early portion of the test. Various changes were made to the oil system without significant improvement in auxiliary pump operation. These changes included revision of the plumbing between the oil tank and the gearbox to disassociate the auxiliary pump inlet line from the propeller control oil line, and changes to the oil tank vent line to provide a slight pressure head on the tank. The pump was then replaced with a new one, and electrical feathering and unfeathering was excellent for the remainder of the test. A tabulation of both electrical and mechanical feathering and unfeathering times for various altitudes and airspeeds is presented in Figure 30 Appendix A.

Propeller reversing operation was satisfactory during the taxi tests. A tabulation of reversing times from various powers at varying speeds is presented in Figure 31 Appendix A.

Attitude Checks

Gearbox/propeller operation was evaluated to the design limits of the unit as limited by the aircraft. Operation of the unit was satisfactory over the range of attainable attitudes. Propeller governing was unaffected by changes in attitude. Gearbox oil outlet temperatures were monitored closely during this check. A tabulation of temperature rise versus attitude is shown in Figure 32 Appendix A.

Flight Cycles

The propeller/gearbox was subjected to a total of 18 one-hour flight cycles. Each cycle consisted of a 15 minute climb, 30 minutes of level flight, and a 15 minute descent. This cycle was designed to approximate the conditions the unit would be subjected to in service. During these cycles, the oil inlet temperature to the gearbox was varied from 100°F to 215°F. No problems were encountered during this portion of the test.

Propeller Endurance

During the test three incidents of propeller malfunction occurred.

As discussed in a previous section of this report, electrical feathering and unfeathering action was marginal until the auxiliary pump was replaced. The original pump had been used during the development test of the propeller,

DISCUSSION (continued):

and had accumulated an unknown amount of time. It is felt that the feathering/unfeathering problem was a result of a partially worn out pump.

During ground run 6, the propeller brake was badly damaged by being partially actuated while the ground run was in progress. This was a result of a slight pressure trapped in the brake actuation system. The actuation system was reworked to provide a more positive means of venting to preclude this situation and no further problems were experienced with the brake.

During ground run 14, oil was found leaking from the propeller in the blade to barrel seal area. The propeller was disassembled on the aircraft for examination. It was found that the teflon strip cemented to the blade shank, for the blade packing to ride on, was loose. This problem was a result of improper preparation of the blade for assembly of the teflon strip. The blades were repaired, by installing new teflon strips, and reinstalled in the propeller. No further incidents of leakage occurred for the remainder of the test. Post test inspection of the hardware did not reveal any evidence of abnormal wear or distress in any areas of the propeller or gearbox.

VC86260 Variable Camber PropellerVibration Stress Survey

The propeller stress survey indicated that both bending and shear blade stresses were acceptable for all conditions tested. The summary data from the survey is presented in Figures 38 through 61 Appendix A. Figures 38 through 51 Appendix A show the data obtained during static ground running. The stress levels are well within limits for all conditions tested. It will be noted that the midblade stresses tend to increase momentarily at a frequency of two times propeller speed (2P) during reverse transients. (Reference Figures 44, 45, 50, and 51 Appendix A). This increase occurs because as the rpm decreases momentarily during the reverse cycle the propeller speed approaches or passes through the resonant speed for the 2P first flatwise mode of the blade.

The high propeller vibration noted at idle power in ground run 9 is felt to be a result of the propeller being at the 2P resonant speed with a high crosswind component. This would tend to excite the aircraft, and test installation mounting structure with a whirl excitation at a frequency of 3P. This could result in an appreciable motion of the engine and airframe particularly if the excitation frequency were close to a resonant frequency of the power plant and/or airframe. There are no measured or analytical data available to confirm that such a relationship between excitation and resonance frequencies existed on this installation, however the fact that increasing propeller speed would stop the vibration tends to substantiate this theory.

DISCUSSION (continued):

Data obtained during taxi tests are presented in Figures 52 through 55 Appendix A. These runs cover reverse-unreverse transients from forward powers ranging from idle to take-off. Again the stress levels are acceptable.

Data obtained during steady-state flight conditions are presented in Figures 56 and 57 Appendix A. It will be noted that these stress levels are extremely low which would be expected for an installation of this sort where the propeller is essentially isolated in an airstream and the thrust line inclination is small.

Figures 58 through 61 Appendix A present data obtained during yaw maneuvers at various indicated airspeeds. This data must be evaluated on a qualitative basis since a precise means for measuring yaw angle was not available. While the stress levels are low it is readily apparent that the rear blades are much less sensitive to 2P excitation due to angular inflow than are the front blades. This condition was indicated by some very limited data obtained in early wind tunnel model tests but the reason for this loading split and its relation to blade angle and/or airspeed are not now completely understood.

The VC86260/2FD14A3-6 & 2FE14A3-6 was concluded to be satisfactory from a blade vibratory stress standpoint for continuous operation on the aircraft at the specified flight conditions.

Nacelle Temperature Survey

The nacelle temperature survey, conducted in accordance with 128PT-93, revealed that temperatures in the engine, propeller, gearbox, and nacelle area were well within the limits set forth by both the engine manufacturer and Hamilton Standard over the complete range of test conditions. A tabulation of the measured temperatures is presented in Figure 33 Appendix A.

Propeller Performance

The propeller exhibited satisfactory performance throughout the test. With two exceptions, no problem areas were encountered over the range of altitude, airspeed, temperature, and attitude flown. Steady state governing was acceptable during all phases of the test. A tendency for the propeller to increase speed as the airspeed or altitude increased was noted. Propeller response to condition lever transients was satisfactory during the program. Propeller response to power lever transients was satisfactory except that transients from idle to take-off power would result in a higher than desired overspeed of approximately 150 rpm. A tabulation of pitch change rates and blade angle changes for various altitudes, airspeeds, powers, and propeller rpm's is shown in Figures 34 and 35 Appendix A.

Both the rpm increase problem and the overspeed problem were felt to be the result of a higher than desired hysteresis band in the propeller governing system. During the development running of the SK56029 gearbox, it was found that the hysteresis band of the VC86260 propeller was approximately

DISCUSSION (continued):

+ 30 propeller rpm wide. From a set speed, it was possible to change propeller speed up to 30 rpm before the propeller blade angle would change to correct the offspeed. This is analogous to the increase in propeller rpm with increases in aircraft speed or altitude, since a change in blade angle is necessary to keep rpm constant if airspeed or altitude change and the only input to the propeller, for this blade angle change, is an rpm offspeed signal. Since the VC86260 propeller was not particularly sensitive to small rpm offspeed signals, the rpm change with altitude and airspeed was large enough to be easily noted. The excessive rpm overshoot on idle to take-off power lever transients was also a result of this governing system hysteresis. Examination of the oscillograph records taken during these power lever transients showed that blade angle did not start to increase until the propeller was in a slight overspeed condition. When the blade angle did start to increase, the pitch change rate was quite rapid as can be seen in Figure 35 Appendix A. However, because of the amount of blade angle change necessary during this transient, the overspeed reached approximately 150 rpm before the blades had increased pitch sufficiently to absorb the engine power. This overspeed was well within the structural limits of the propeller.

Feathering and unfeathering operation was good throughout the program. A tabulation of both electrical and mechanical feathering and unfeathering times for various altitudes and airspeeds is presented in Figure 36 Appendix A.

Propeller reversing operation was satisfactory during the taxi tests. A tabulation of reversing times from various powers at varying speeds is presented in Figure 37 Appendix A.

Attitude Checks

Propeller operation was evaluated at various attitudes to the design limits of the assembly, as limited by the aircraft. Operation of the unit was satisfactory over the range of attainable attitudes. Propeller governing was unaffected by changes in attitude about the roll and yaw axes. Rotation about the pitch axis did result in changes in propeller speed as discussed under propeller performance.

Flight Cycles

The propeller was subjected to a total of 33 one-hour flight cycles. Each cycle consisted of a 15 minute climb, 30 minutes of level flight, and a 15 minute descent. During these cycles, the oil inlet temperature to the gearbox was varied from 100 F to 215 F. No problems were encountered during this portion of the test.

Propeller Endurance

During the test there was one incident which required propeller disassembly and hardware replacement. This incident occurred during ground run 5 when the propeller would not increase pitch without the use of the auxiliary

DISCUSSION (continued):

pump. Disassembly of the propeller control revealed the steel rotating sleeve had "picked up" on the babbitt lined rotating sleeve allowing high pitch pressure to drain directly to the pressurized sump. Investigation revealed that the rotating sleeve did not include a change which should have been incorporated to improve its pressure balance. The rotating sleeve was reworked to this change, and with a new stationary sleeve assembled in the control. No further problems were experienced with the propeller or control.

Post test inspection of the hardware did not reveal any evidence of abnormal wear or distress in any areas of the propeller or gearbox.

APPENDIX A

AIRCRAFT AT START OF MODIFICATION

(Negative No. X15587)

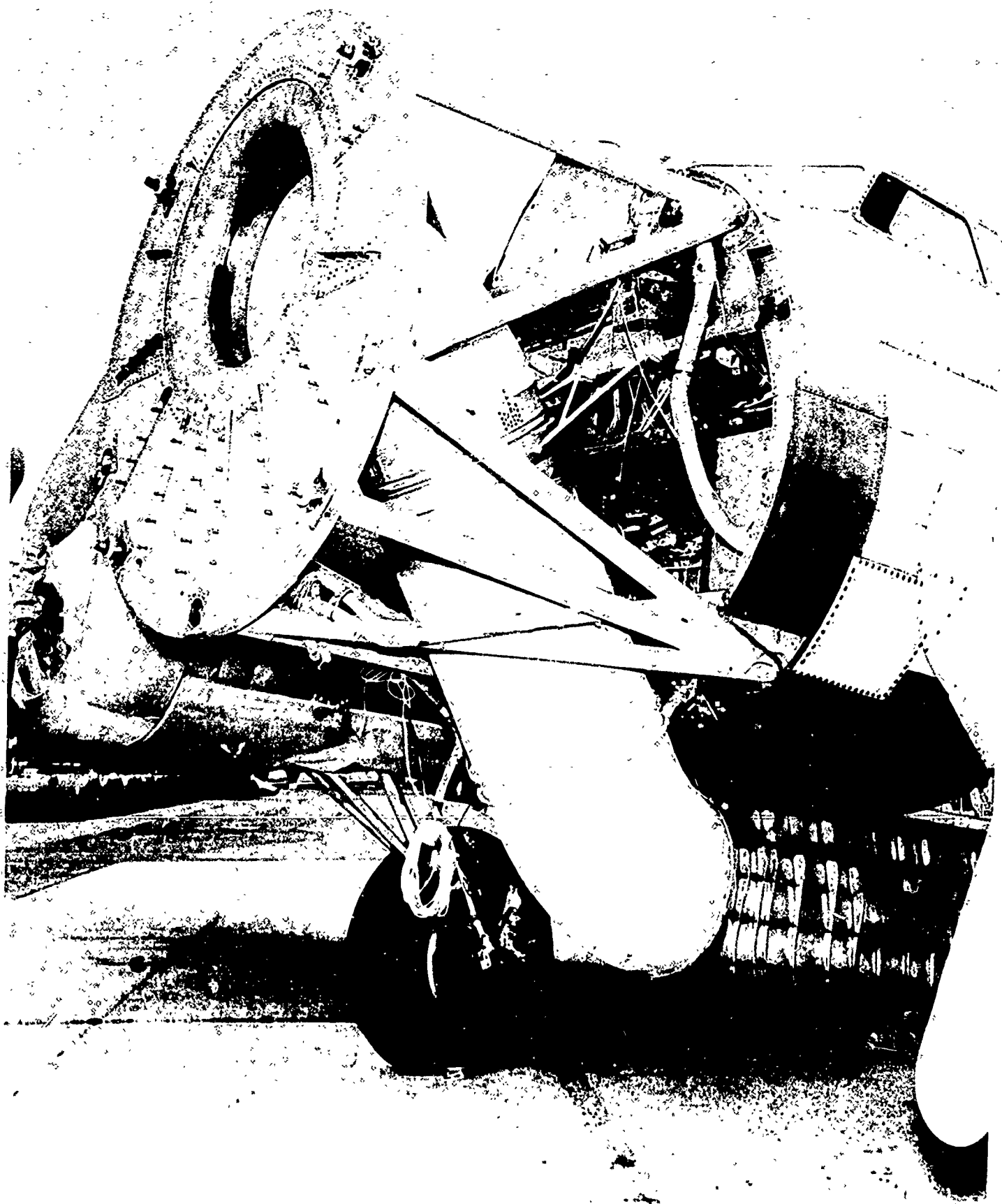
FIGURE 1



AIRCRAFT MOUNT FOR TEST NACELLE

(Negative No. X15586)

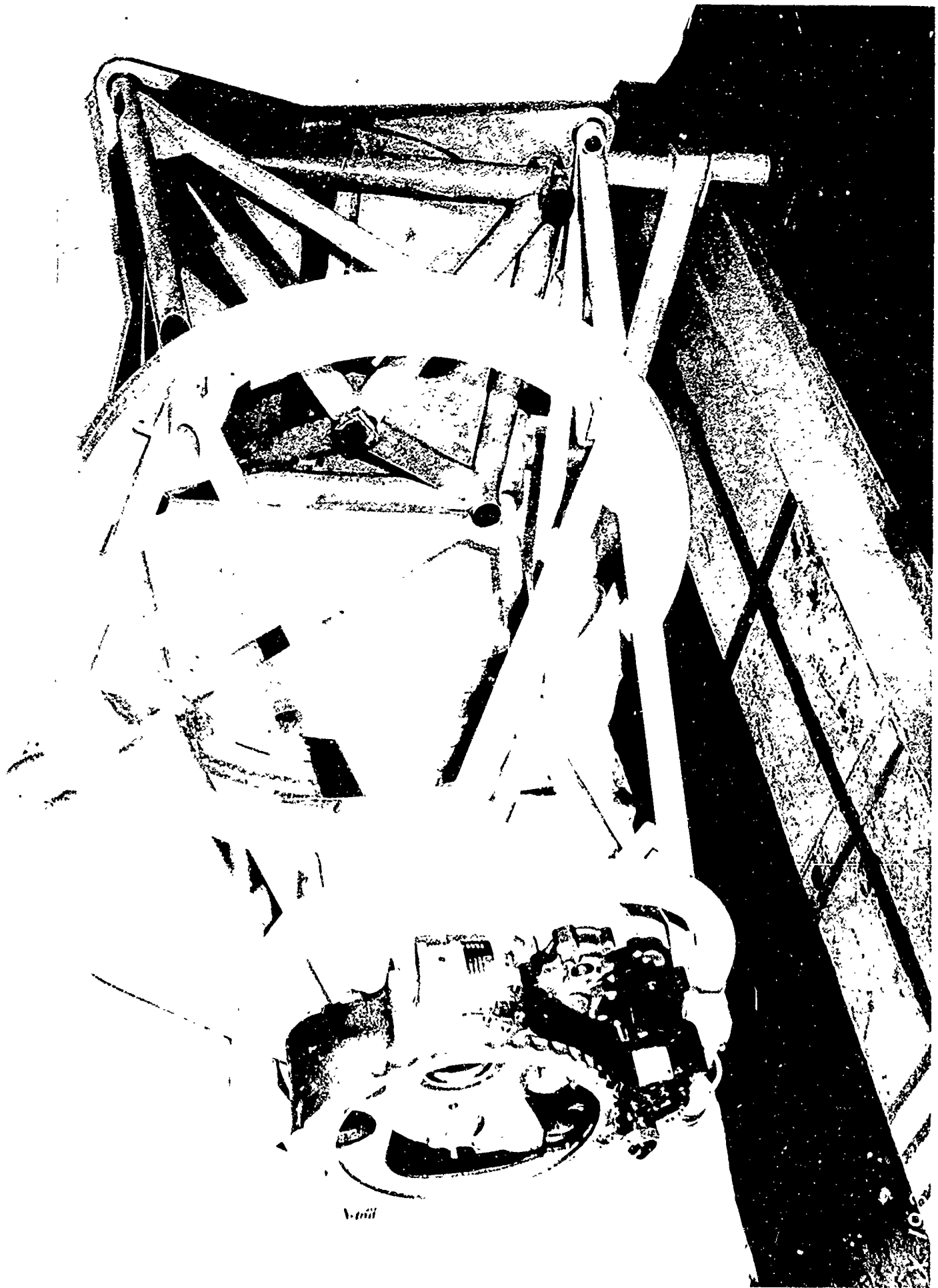
FIGURE 2



TEST NACELLE STRUCTURE ON ASSEMBLY JIG

(Negative No. X19369)

FIGURE 3



Atoll

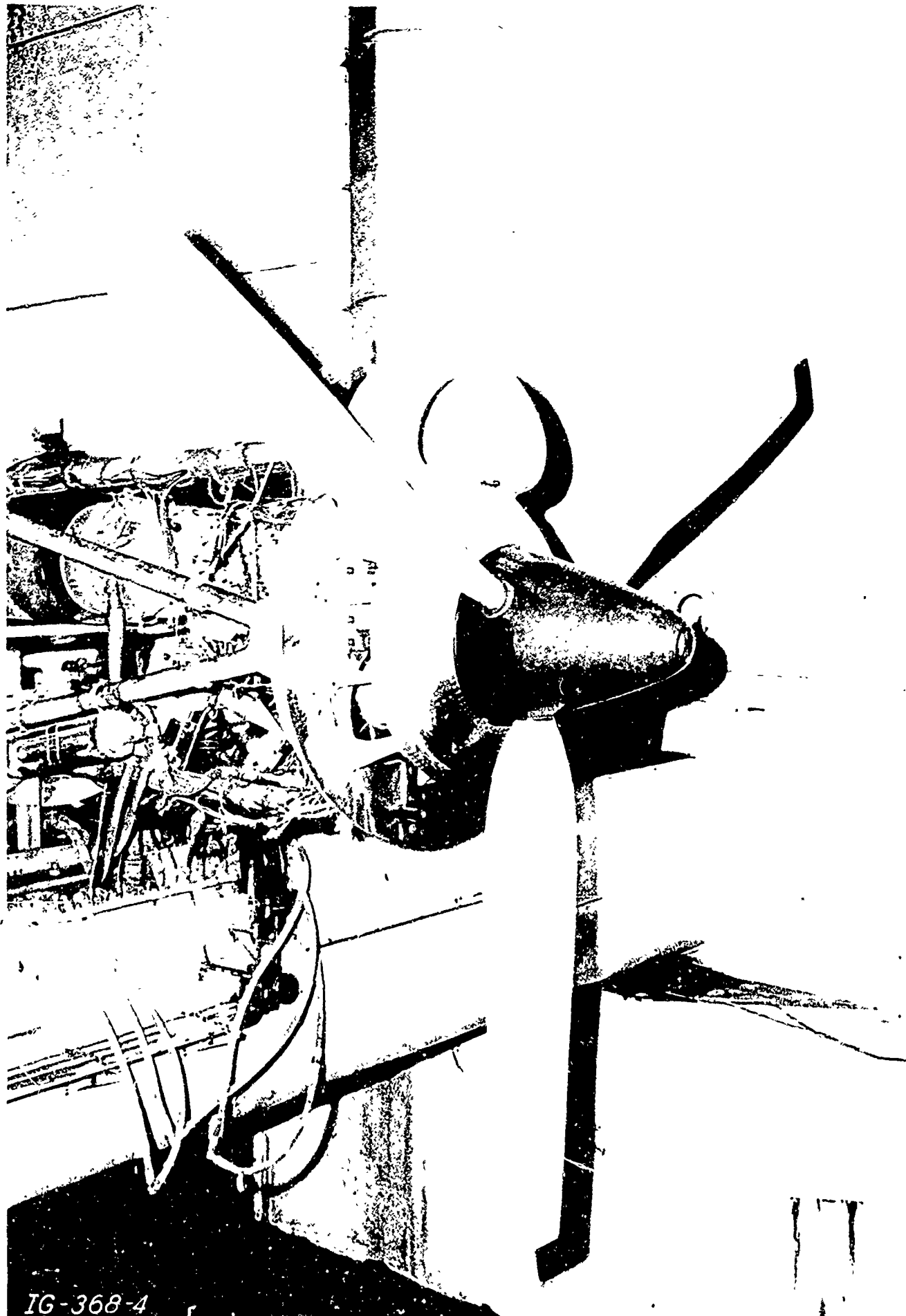
10/10

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73EGB1 PROPELLER MOUNTED IN "E" TEST CELL
FOR INLET DUCT TEST

(Negative No. IG368)

FIGURE 4

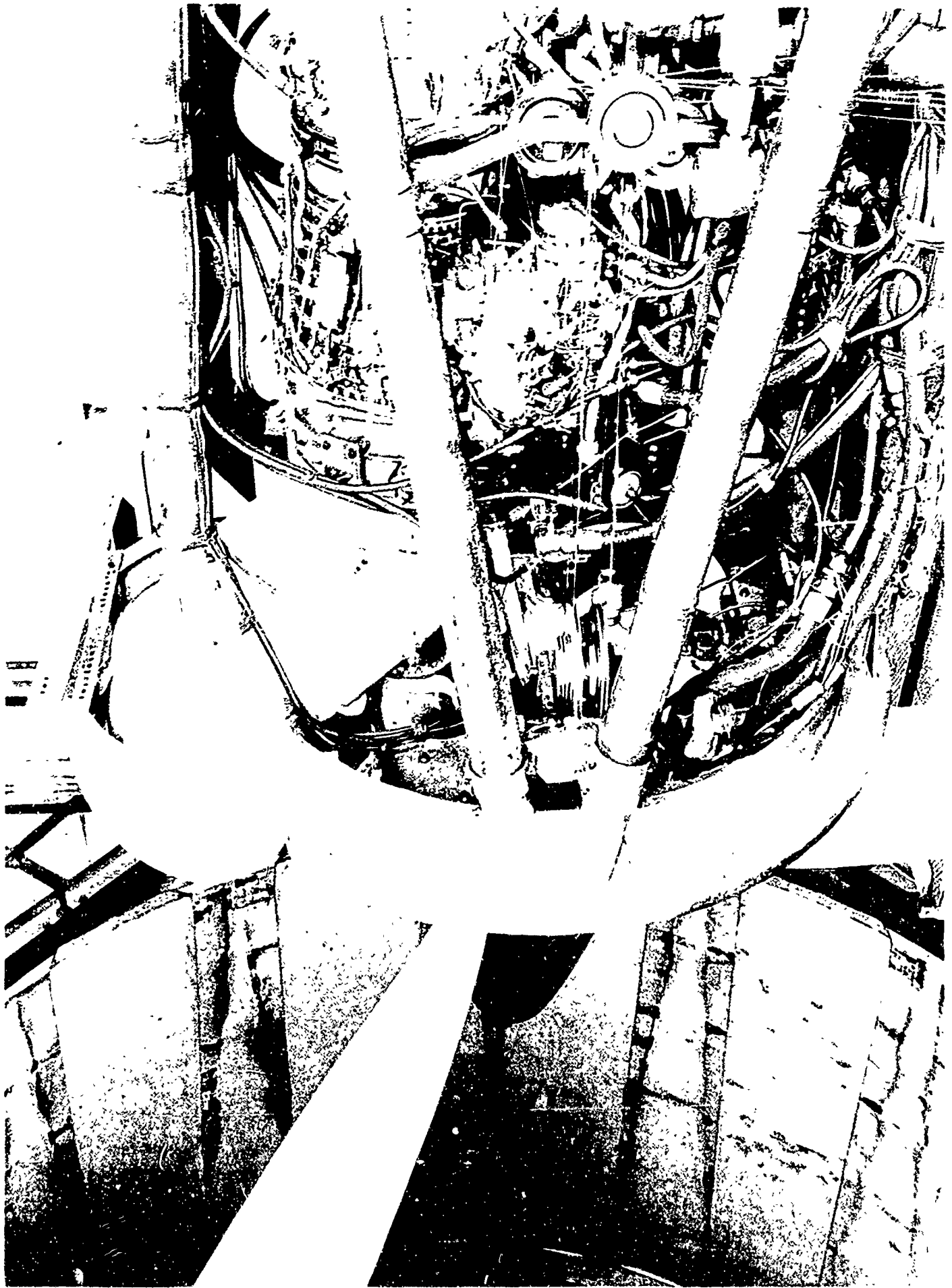


IG-368-4

INLET DUCT MOUNTED ON ENGINE

(Negative No. 025540)

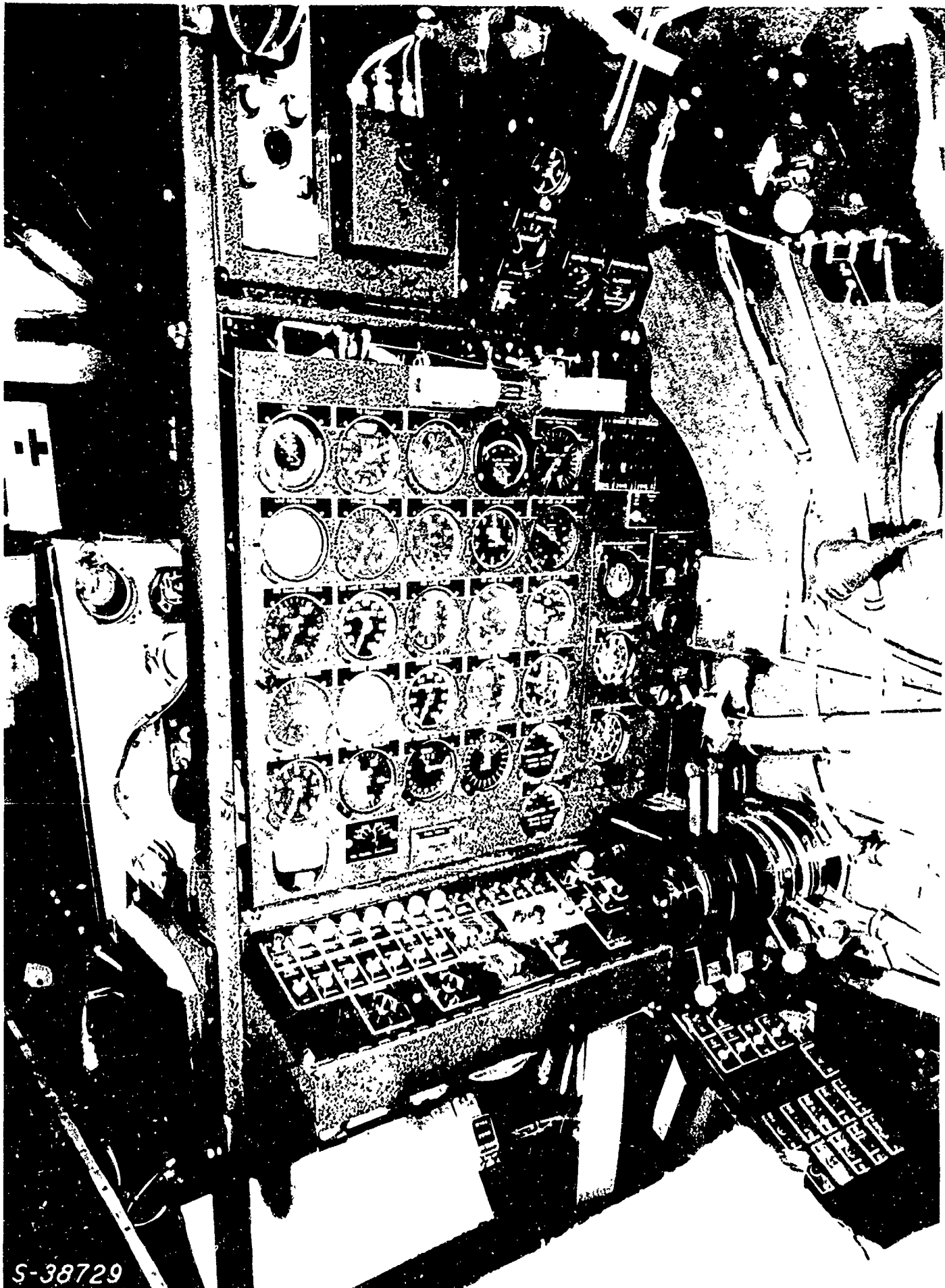
FIGURE 5



TEST INSTALLATION OPERATORS PANEL

(Negative No. 538729)

FIGURE 6



OSCILLOGRAPH RECORDING EQUIPMENT

(Negative No. S38735)

FIGURE 7

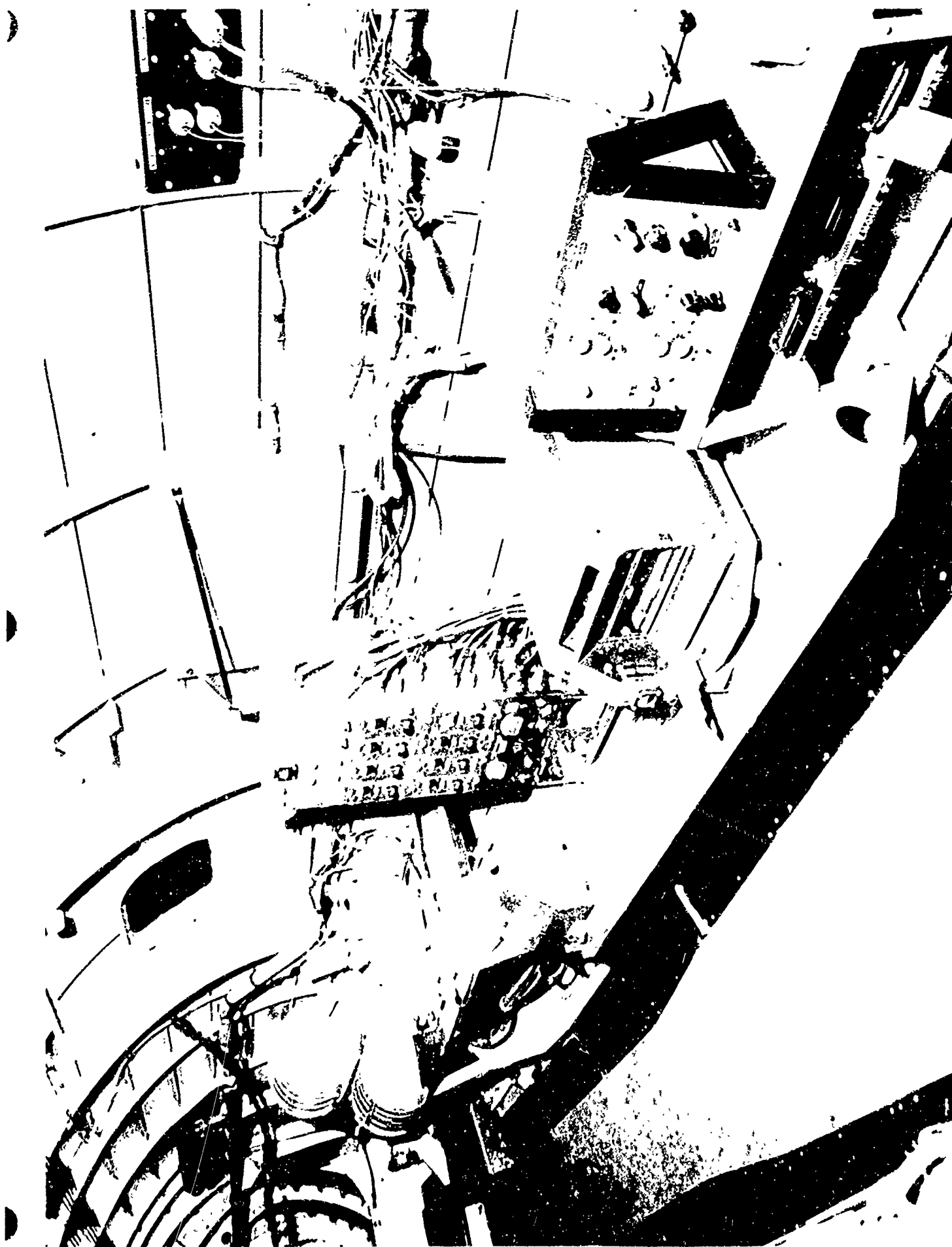
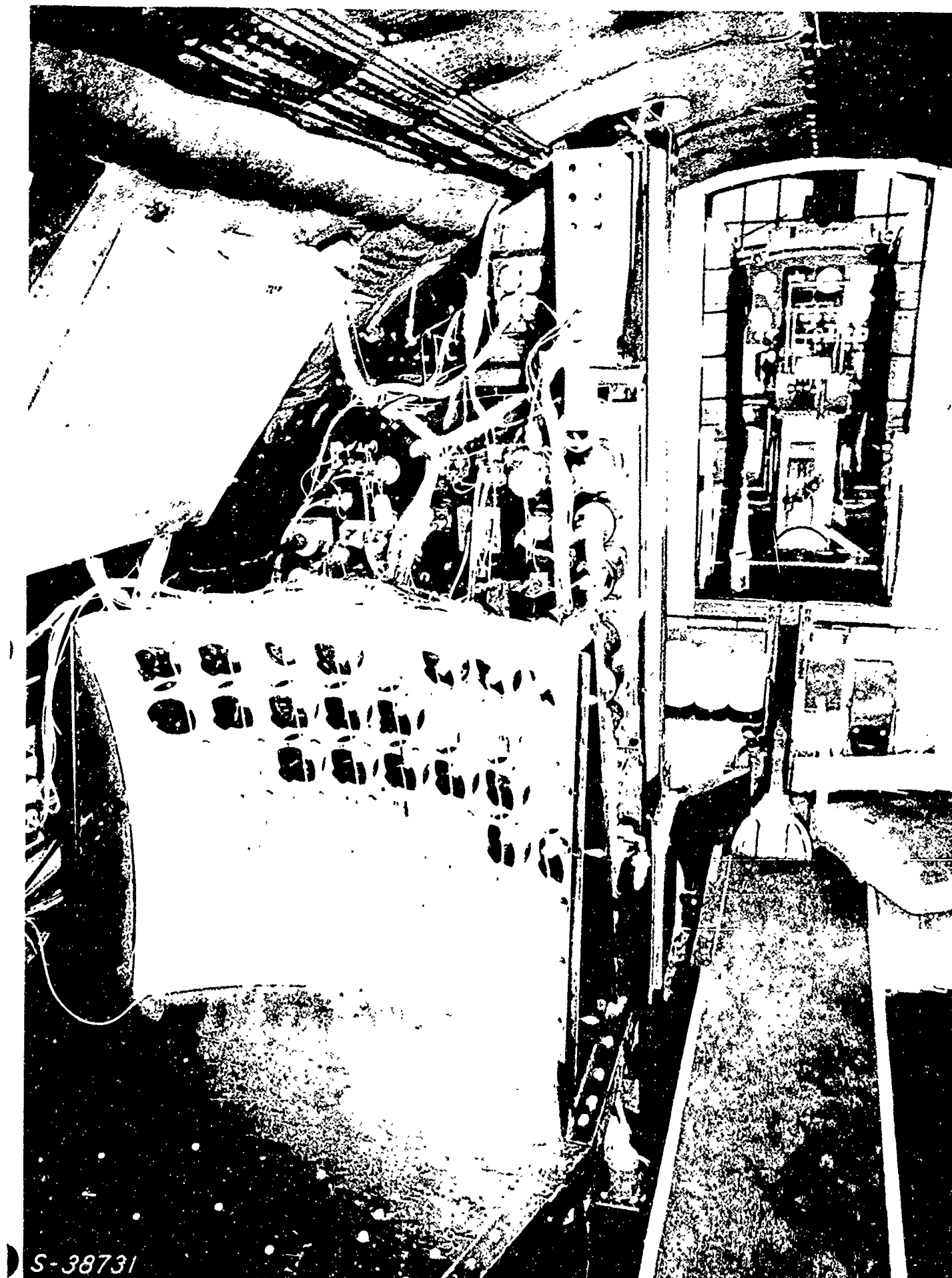


PHOTO PANEL

(Negative No. S38731)

FIGURE 8



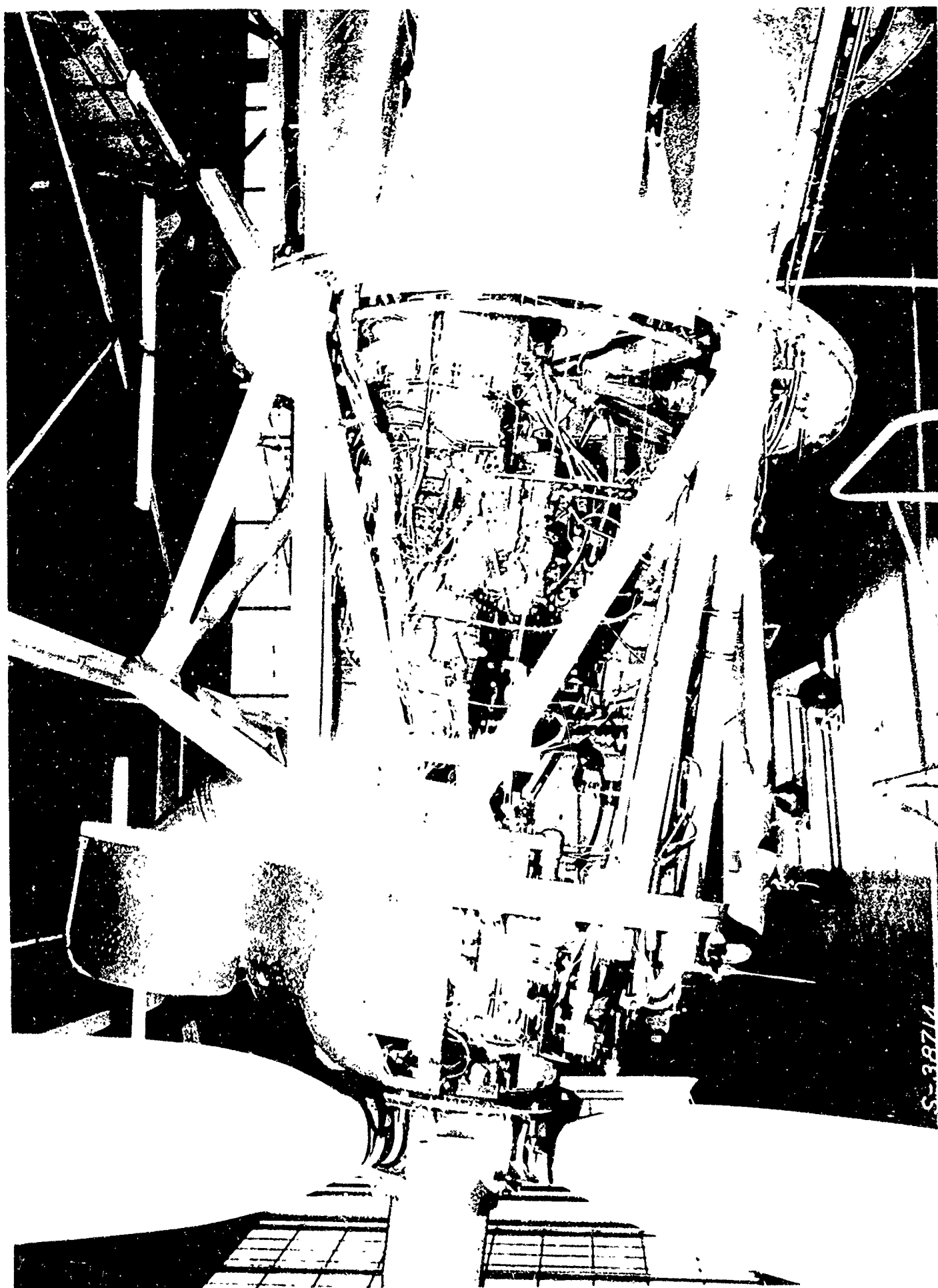
S-38731

TEST NACELLE, LEFT SIDE

73EOB1 INSTALLATION

(Negative No. S38714)

FIGURE 9

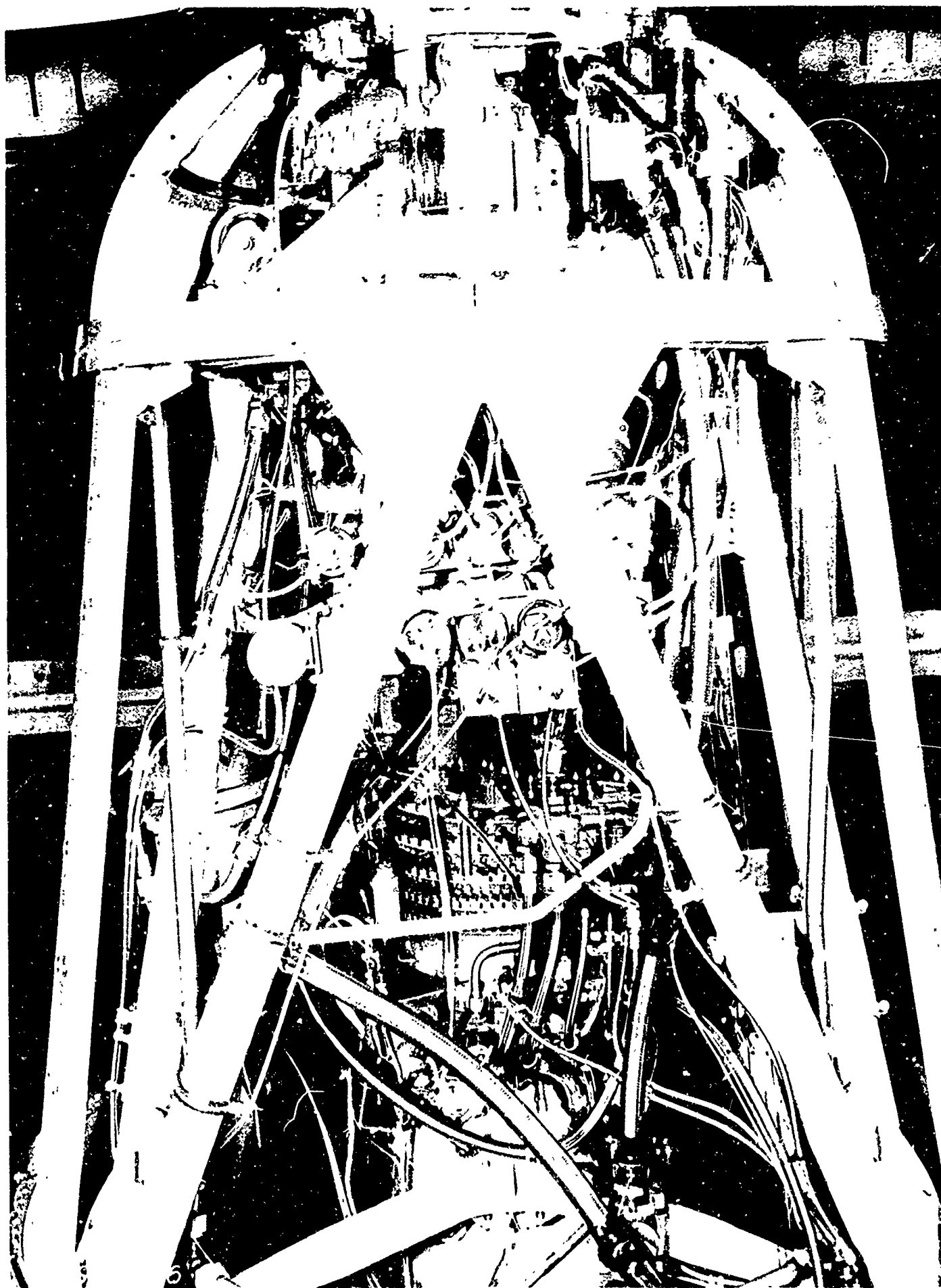


TEST NACELLE, BOTTOM VIEW

73EGB1 INSTALLATION

(Negative No. S38726)

FIGURE 10

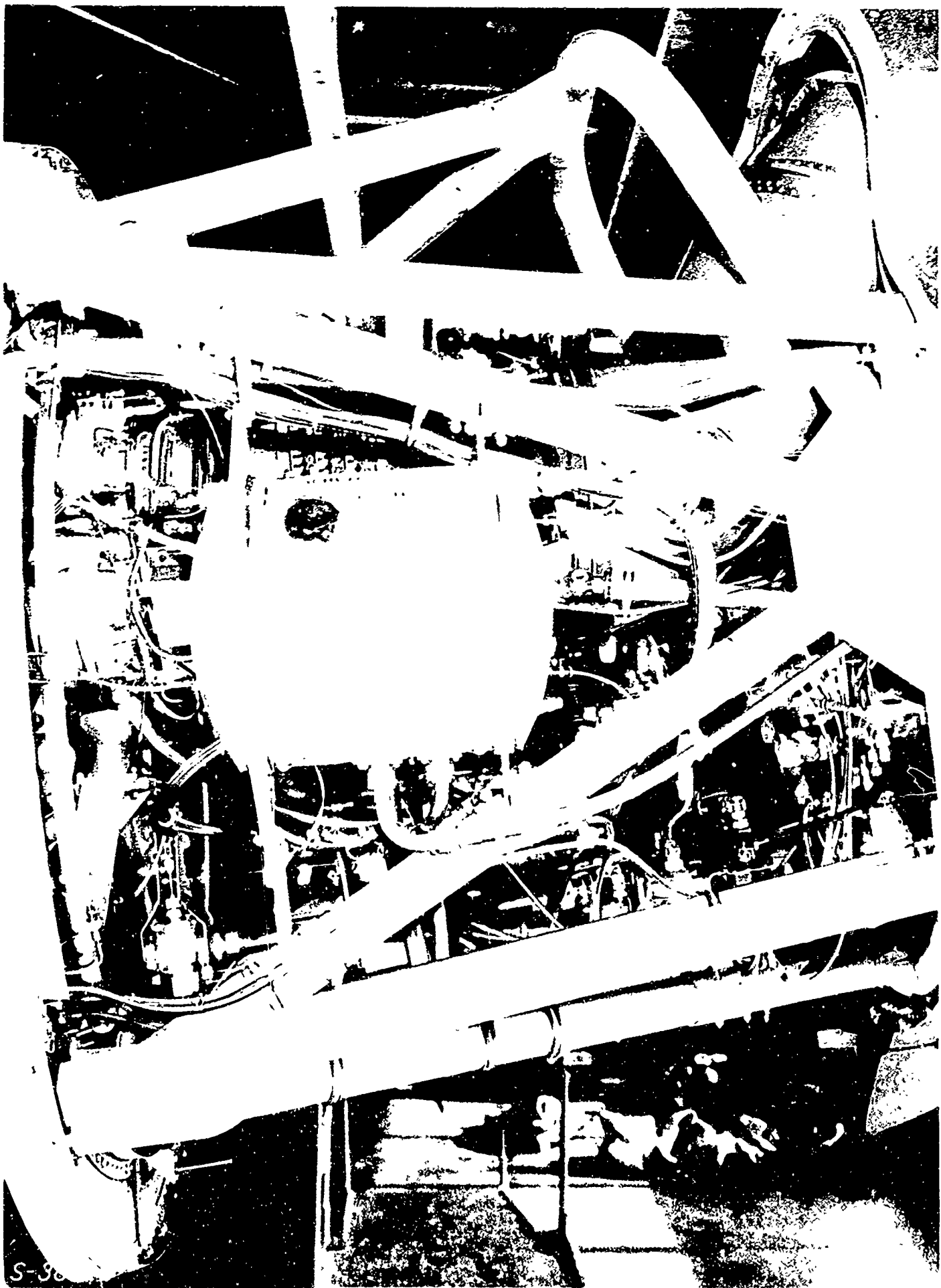


TEST NACELLE, RIGHT SIDE

73EGB1 INSTALLATION

(Negative No. S38716)

FIGURE 11

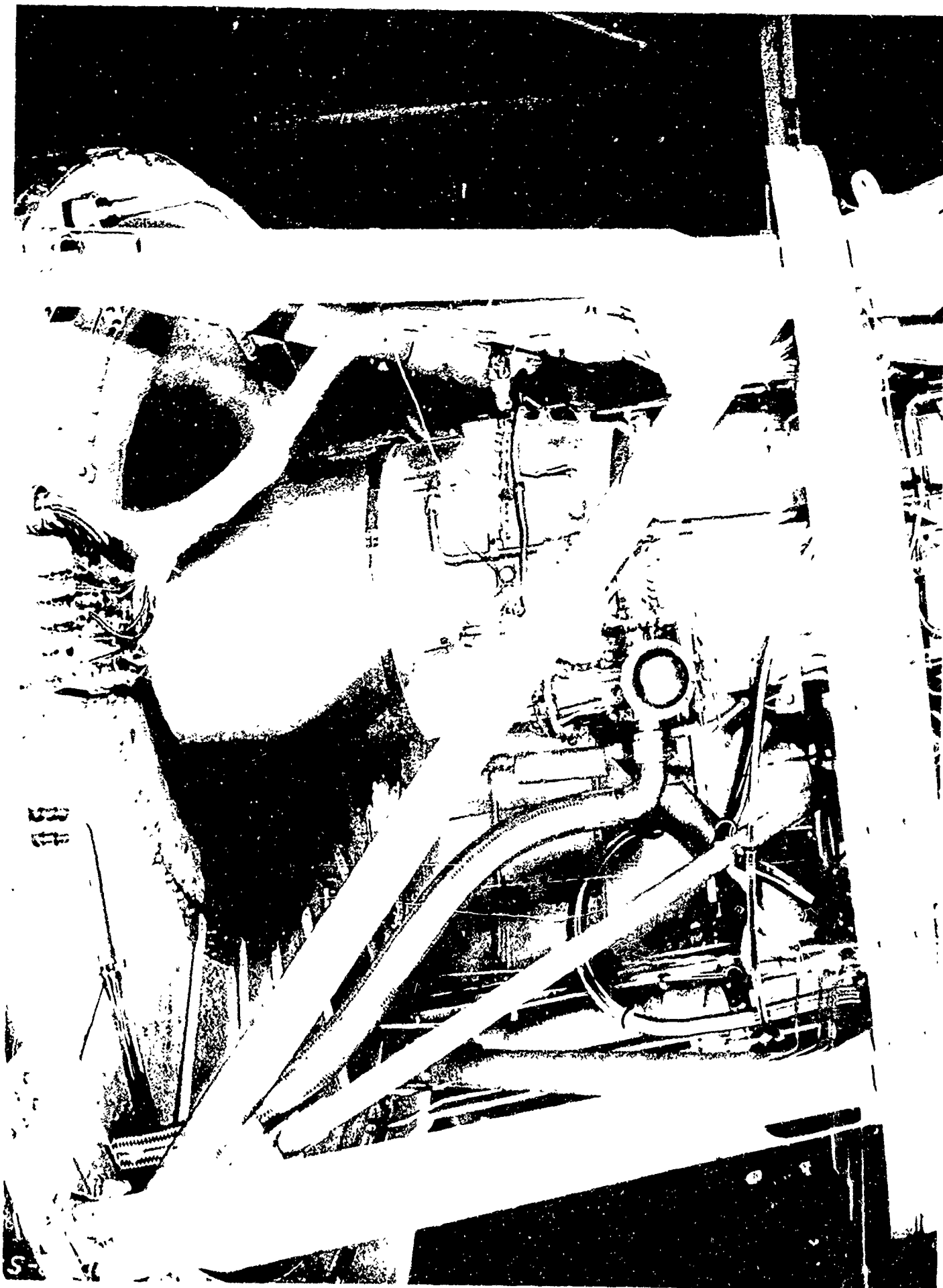


TEST NACELLE, RIGHT SIDE

73EQB1 INSTALLATION

(Negative No. S38718)

FIGURE 12



AIRCRAFT AT COMPLETION OF MODIFICATION

73EGB1 INSTALLATION

(Negative No. S38264)

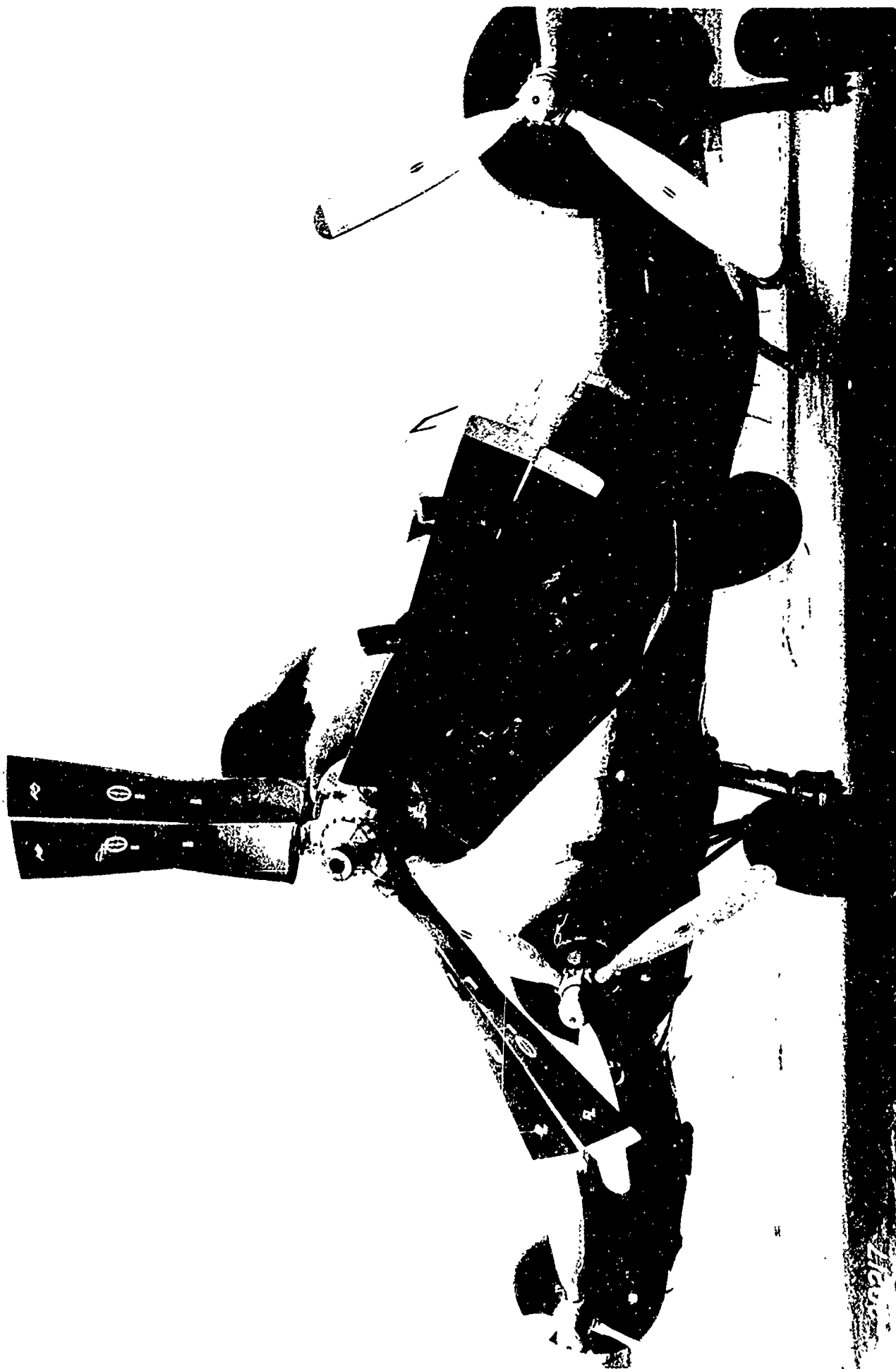
FIGURE 13



VC86260 INSTALLATION

(Negative No. G29217)

FIGURE 14

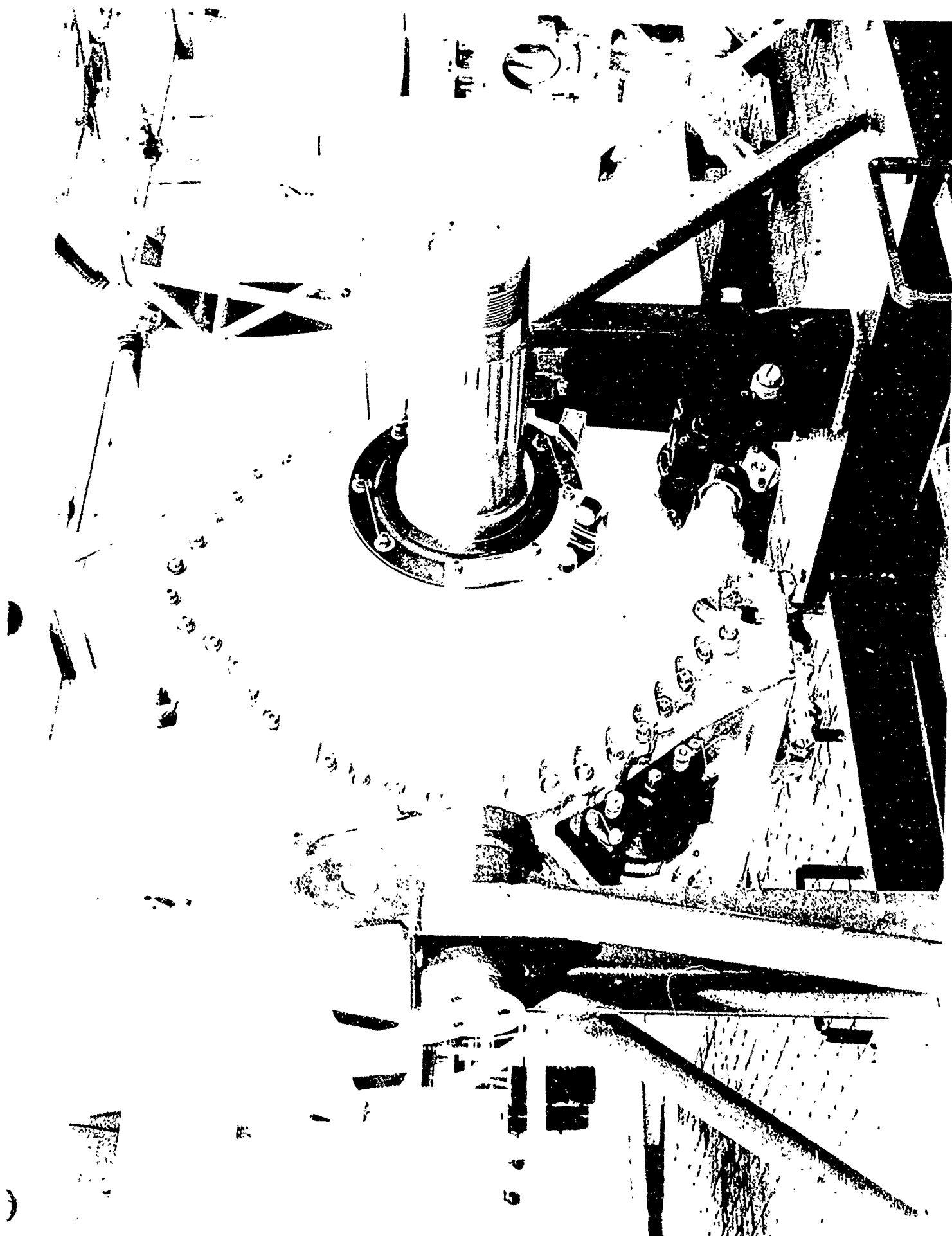


SK56029 SPEED REDUCTION GEARBOX

FRONT VIEW

(Negative No. G27168)

FIGURE 15

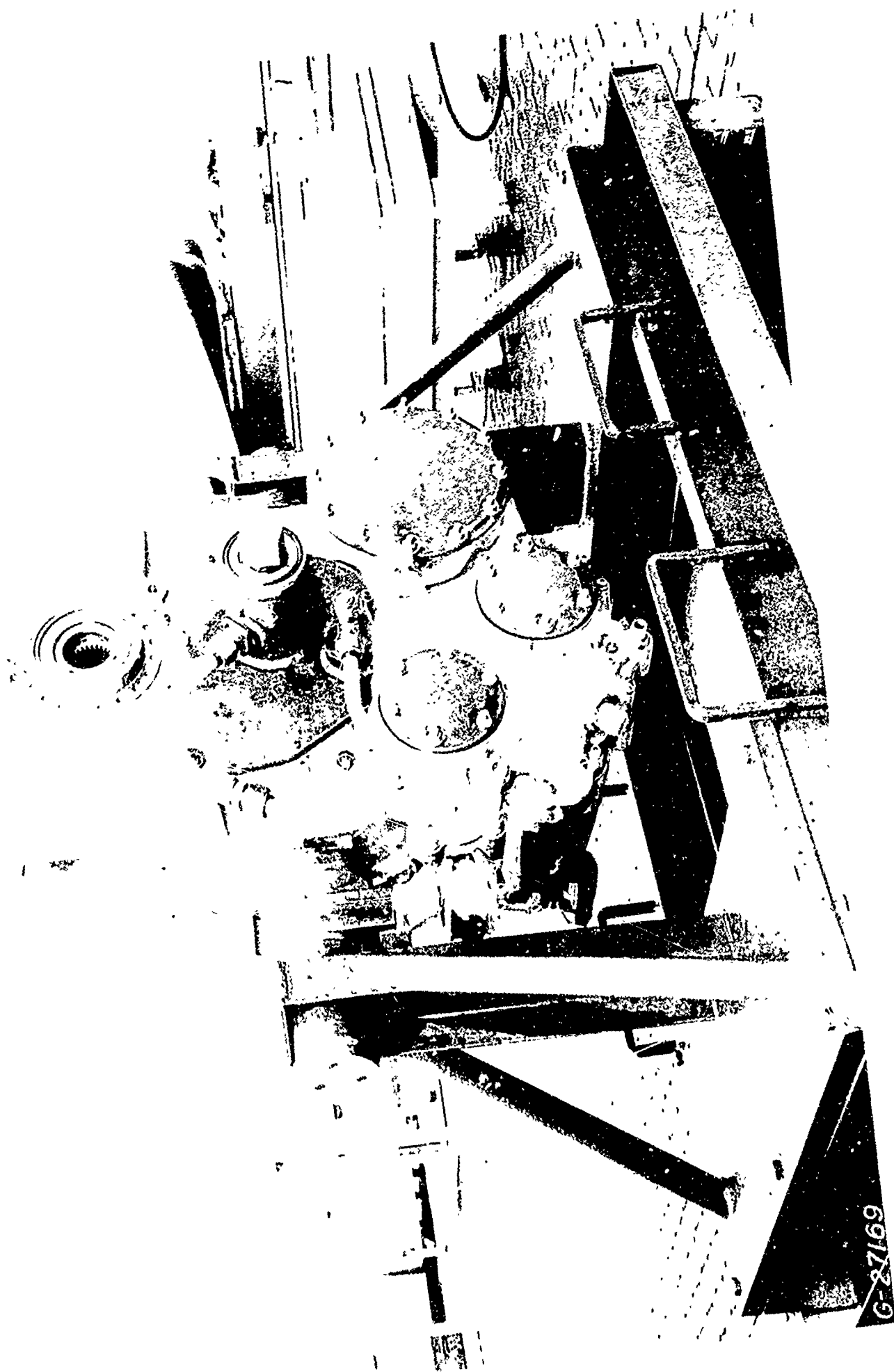


SK56029 SPEED REDUCTION GEARBOX

REAR VIEW

(Negative No. G27169)

FIGURE 16



SK56029 SPEED REDUCTION GEARBOX AND
VC86260 PROPELLER MOUNTED IN "E" TEST CELL

(Negative No. VC127-4)

FIGURE 17

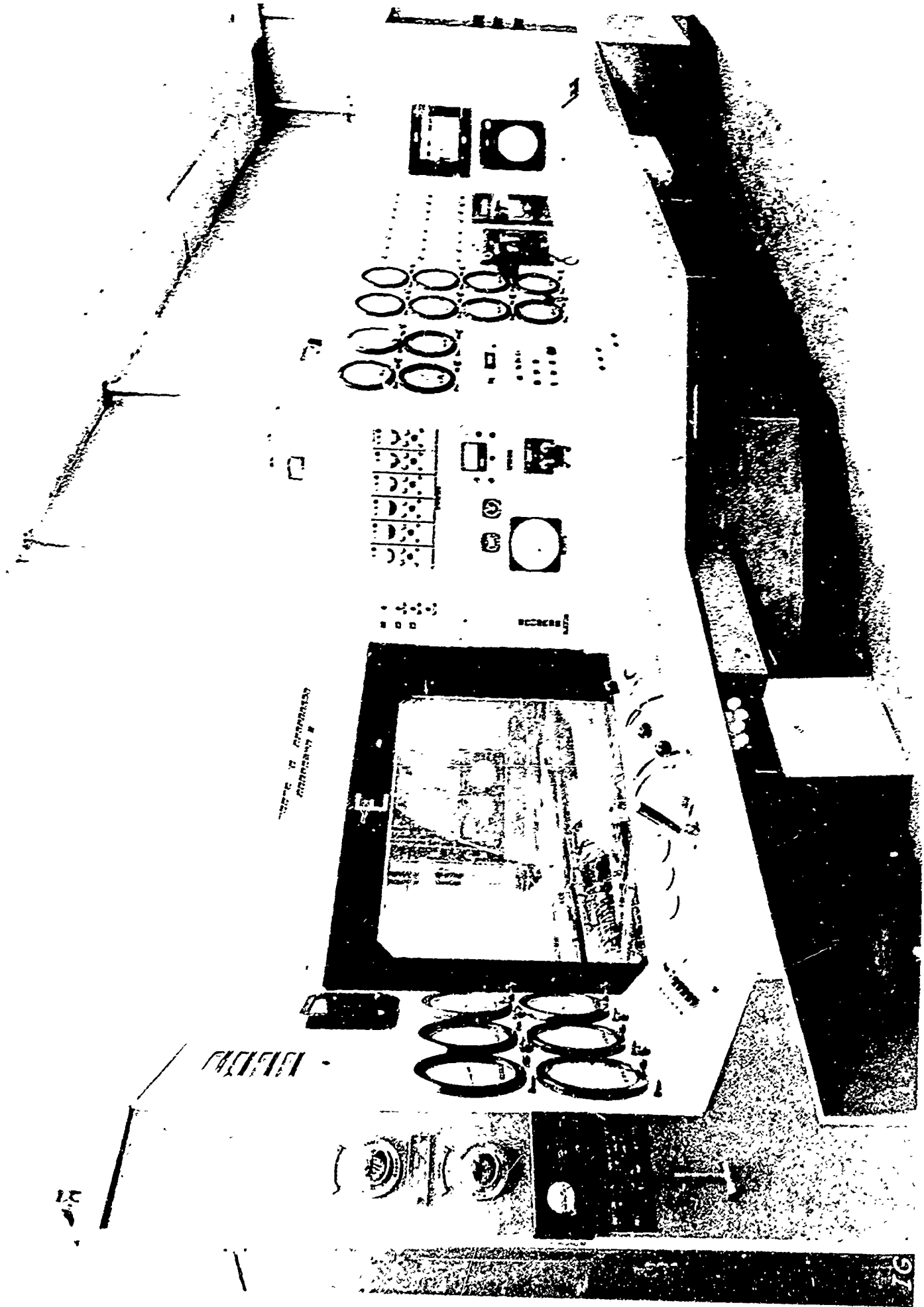


VC-127-4

"E" TEST CELL CONTROL ROOM

(Negative No. IG-82-4)

FIGURE 18



73EGP1 PROPELLER INSTALLATION IN FLIGHT

(Negative No. 928778)

FIGURE 19



VC86260 PROPELLER INSTALLATION IN FLIGHT

(Negative No. C994)

FIGURE 20

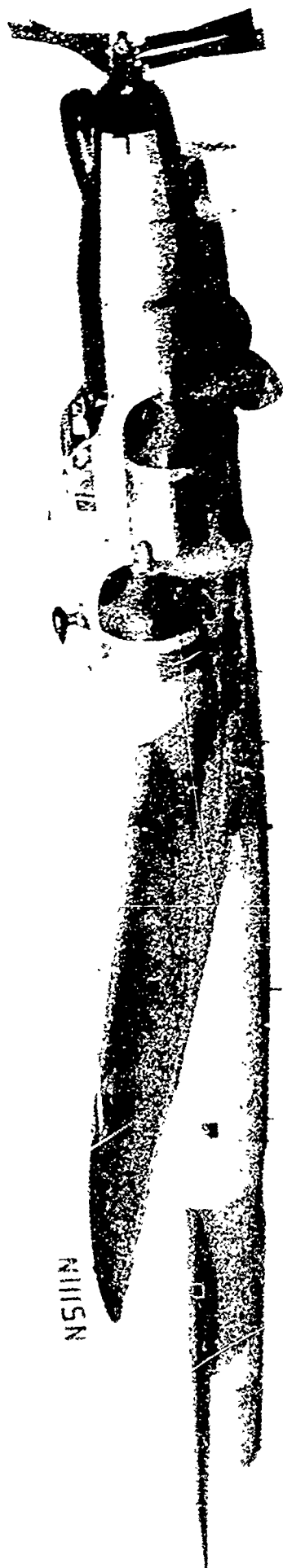


VC86260 PROPELLER INSTALLATION IN FLIGHT

TEST PROPELLER FEATHERED

(Negative No. C993)

FIGURE 21



PERT 50 HOUR ENGINE TEST INSTRUMENTATION

<u>PROPELLER PARAMETER</u>	<u>TRANSDUCER</u>	<u>READOUT</u>	<u>MEASUREMENT ACCURACY</u>
Speed	Tachometer	Eput Meter and Sanborn Recorder	$\pm 0.1\%$
Blade Angle	Potentiometer	Gage and Sanborn Recorder	$\pm 1\%$
Condition Lever	Potentiometer	Gage and Sanborn Recorder	$\pm 1\%$
High Pitch Pressure	Press. Transducer	Press. Gage and Sanborn Recorder	$\pm 1\%$
Low Pitch Pressure	Press. Transducer	Press. Gage and Sanborn Recorder	$\pm 1\%$
Pitchlock Pressure	Press. Transducer	Press. Gage and Sanborn Recorder	$\pm 1\%$
<u>GEARBOX PARAMETER</u>			
Vibration	MB Pickup	EPR Meter	$\pm 10\%$
Oil Inlet Temperature	Thermocouple	Bristol Recorder	$\pm 3\%$
Scavenge Outlet Pressure	Press. Gage	Press. Gage	$\pm 0.5\%$
<u>ENGINE PARAMETER</u>			
Power Turbine Speed	Tachometer	Eput Meter	$\pm 0.1\%$
Gas Generator Speed	Tachometer	Eput Meter and Sanborn Recorder	$\pm 0.1\%$
Torque	Phase Detector	Gage	$\pm 1\%$
Fuel Flow	Potter Element	Gage and Eput Meter	$\pm 1\%$
Turbine Inlet Temperature	Thermocouple	Howell Gage	$\pm 0.2\%$
Power Lever Position	Potentiometer	Gage and Sanborn Recorder	$\pm 1\%$
Ambient Temperature	Thermocouple	Bristol Recorder	$\pm 3\%$
Barometric Pressure	Barometer	Barometer	$\pm 0.1\%$

FIGURE 22

50 HOUR FLIGHT TEST INSTRUMENTATION

<u>PROPELLER PARAMETER</u>	<u>TRANSDUCER</u>	<u>READOUT</u>	<u>MEASUREMENT ACCURACY</u>
Condition Lever	Potentiometer	Oscillograph and gages (2)	$\pm 1\%$
Blade Angle	Potentiometer	Oscillograph and gages (2)	$\pm 1\%$
High Pitch Pressure	Pressure Transducer	Oscillograph and pressure gages (2)	$\pm 1\%$
Low Pitch Pressure	Pressure Transducer	Oscillograph and pressure gages (2)	$\pm 1\%$
Pitch Lock Pressure	Pressure Transducer	Oscillograph and pressure gages (2)	$\pm 1\%$
Control Temperature	Thermocouple	Gages (2)	$\pm 3\%$
Speed	Tachometer	Gage	$\pm 0.1\%$
<u>GEARBOX PARAMETER</u>			
Vibration	MB Pickup	EPR Meter	$\pm 10\%$
Lube Inlet Temp.	Thermocouple	Gages (2)	$\pm 3\%$
Scavenge Outlet Temp.	Thermocouple	Gages (2)	$\pm 3\%$
Skin Temp.	Thermocouple	Gage	$\pm 3\%$
Lube Pressure	Pressure Transducer	Gages (2)	$\pm 1\%$
Scavenge Outlet Pressure	Pressure Transducer	Gage	$\pm 1\%$
Lube Pump Inlet Pressure	Pressure Transducer	Gage	$\pm 1\%$
Vent Pressure	Pressure Transducer	Gage	$\pm 1\%$
Lube Flow	Potter Element	Gage	$\pm 1\%$
Brake Pressure	Pressure Transducer	Gage	$\pm 1\%$
<u>ENGINE PARAMETER</u>			
Power Turbine Speed	Tachometer	Oscillograph and Gages (2)	$\pm 0.1\%$
Gas Generator Speed	Tachometer	Oscillograph and Gages (2)	$\pm 0.1\%$
Torque	Phase Detector	Gage	$\pm 1\%$

FIGURE 23

50 HOUR FLIGHT TEST INSTRUMENTATION (continued)

<u>ENGINE</u>	<u>PARAMETER</u>	<u>TRANSDUCER</u>	<u>READOUT</u>	<u>MEASUREMENT ACCURACY</u>
Fuel Flow		Potter Element	Oscillograph and gage	$\pm 1\%$
Fuel Inlet Pressure		Pressure Transducer	Gage	$\pm 1\%$
Fuel Control Pressure		Pressure Transducer	Gage	$\pm 1\%$
Lube Pressure		Pressure Transducer	Gage	$\pm 1\%$
Lube Temperature		Thermocouple	Gage	$\pm 3\%$
Turbine Inlet Temperature		Thermocouple	Gage	$\pm 3\%$
Power Lever		Potentiometer	Oscillograph and gage	$\pm 1\%$
Vibration		CEC Pickup	EPR Meter	$\pm 10\%$
Strut Pad Temp.		Thermocouple	Gage	$\pm 3\%$
Accessory Gearbox Temp.		Thermocouple	Gage	$\pm 3\%$
Compressor Rear Frame Temp.		Thermocouple	Gage	$\pm 3\%$
Burner Case Temp.		Thermocouple	Gage	$\pm 3\%$
Turbine Casing-Front, Temp.		Thermocouple	Gage	$\pm 3\%$
Turbine Casing-Rear, Temp.		Thermocouple	Gage	$\pm 3\%$
Rear Mount Temp.		Thermocouple	Gage	$\pm 3\%$
<u>GENERAL PARAMETER.</u>				
Nacelle Firewall Beam Temp.		Thermocouple	Gage	$\pm 3\%$
Altitude			Gages (2)	$\pm 1\%$
Airspeed			Gages (2)	$\pm 1\%$
Air Temp.		Thermocouple	Gages (2)	$\pm 3\%$

TEST CHRONOLOGY - 73EGEL PROPELLER

Date	Run	Time	Total		Remarks
			Ground Time	Flight Time	
10-25-65	G1	:15	:15		Leak and operational check. Torque readout inoperative and oil leak in control area.
10-28-65	G2	:30	:45		Leak and operational check. Torque readout still inoperative. Traced oil leak to pressure instrumentation in control cover.
11-1-65	G3	:30	1:15		Leak and operational check. Torque readout ok. Oil leak in control area corrected, but there is another leak.
11-2-65	G4	:20	1:35		Leak check. Traced oil leak to engine accessory drive gearbox.
11-8-65	G5	1:00	2:35		Leak check. No leaks with new engine accessory drive gearbox. Aircraft ok for flight.
11-9-65	F1	0		1:15	Aircraft operational check.
11-10-65	G6	:20	2:55		Started headwind stress survey per 128PT-91. Smoke observed coming from test nacelle, but no cause could be found. Aux pump operation marginal. It tends to lose its prime.
11-11-65	G7	1:50	4:45		Completed headwind stress survey per 128PT-91.
11-15-65	G8	:20	5:05		Check of revised oil system to provide separate line for aux pump. Operation ok.
11-16-65	G9	1:55	7:00		Ran steady state and transient checks per 128PT-90. Operation ok. Immediately prior to shutdown, sparks were noted coming from test nacelle. Brake was found to be partially actuated and had burned up. Aux pump operation is still marginal.
11-17-65	G10	:20	7:20		System check after installation of new brake.
11-17-65	F2	:25	:25	2:20	Checked unfeather operation, air starting, and feathering operation. All ok.

FIGURE 24

TEST CHRONOLOGY - 73EGBL PROPELLER

Date	Run	Time	Total Ground Time	Total Flight Time	Total Aircraft Time	Remarks
11-18-65	G11	1:30	8:50			Started rerun of steady state and transient checks run in G9. Power lever, fuel flow, and gas generator speed did not record in G9.
11-19-65	F3	1:25		1:50	4:15	Checked steady state and transient operation at 5000 feet and 185 mph.
11-22-65	G12	1:25	10:15			Completed rerun of transients started in G11.
11-23-65	F4	2:25		4:15	7:15	Checked steady state and transient operation at 10,000 feet and 185 mph.
11-24-65	F5	1:50		6:05	9:20	Checked steady state and transient operation at 20,000 feet and 185 mph.
11-26-65	F6	1:35		7:40	11:35	Checked steady state and transient operation at 30,000 feet and 185 mph per 128PT-90. Aux pump operation poor.
11-29-65	F7	1:45		9:25	13:45	Ran steady states and transients at 5000 feet and 240 mph per 128PT-90. Aux pump operation still poor.
11-29-65	F8	1:50		11:15	16:05	Ran steady states and transients at 5,000 feet and 140 mph per 128PT-90.
12-1-65	F9	0		11:15	17:35	Aborted start attempt when propeller cycled on secondary electrical low pitch stop. Investigation on ground revealed metal machining chips in operators panel which probably shorted out prop electrical system.
12-2-65	G13	:15	10:30			Checked out prop operation. Everything normal.
12-2-65	F10	:55		12:10	18:50	Ran stress survey at 5,000 and 10,000 feet per 128PT-91. Prop operation normal.
12-6-65	F11	1:00		13:10	20:15	Repeated transients at 5,000 feet, 150 and 240 mph per 128PT-90. Records taken during F7 and F8 did not show condition lever movement.

TEST CHRONOLOGY - 73EGBL PROPELLER

3

Date	Run	Time	Total Ground Time	Total		Remarks
				Total Flight Time	Aircraft Time	
12-7-65	FL2	1:10		14:20	21:40	Ran steady state and transients at 10,000 feet and 150 mph per 128PT-90.
12-8-65	GL4	2:20	10:50			Check of blade angle readout on oscillograph. Data taken during FL1 and FL2 had poor blade angle trace. During run, oil noted leaking from prop in blade area.
12-15-65	GL5	2:25	11:15			Leak check of prop after reinstalling blades and check of blade angle readout after cleaning flight ring.
12-22-65	FL3	1:55		16:15	24:35	Reran all steady states and transients at 5000 feet and 150 mph per 128PT-90.
12-28-65	FL4	2:05		18:20	26:55	Reran all steady states and transients at 5,000 feet and 240 mph, and steady states at 10,000 feet and 150 mph per 128PT-90. New aux pump installed prior to flight. Operation excellent.
12-28-65	FL5	1:50		20:10	29:05	Ran transients at 10,000 feet and 150 mph, and steady states at 10,000 feet and 240 mph per 128PT-90.
12-29-65	FL6	1:50		22:00	31:15	Ran transients at 10,000 feet and 240 mph per 128PT-90. Climb made to 20,000 feet for further testing, but #3 engine failed.
1-4-66	FL7	1:00		23:00	32:45	Ran steady states and transients at 20,000 feet and 150 mph per 128PT-90.
1-5-66	FL8	1:50		24:50	34:45	Ran steady states and transients at 20,000 feet and 210 mph and started attitude testing per 128PT-90. Aborted test after failure of #1 and #3 engines.
1-11-66	GL6	1:20	12:35			Ran crosswind stress survey per 128PT-91.
1-13-66	FL9	2:20		25:10	35:15	No data taken. #1 engine feathered on climb out.
1-25-66	F20	1:35		26:45	37:30	Ran stress survey at 20,000 feet per 128PT-91.

TEST CHRONOLOGY - 73EG81 PROPELLER

Date	Run	Time	Total Ground Time	Total Flight Time	Total Aircraft Time	Remarks
1-25-66	G17	:20	12:55			Ran stress survey during taxi runs per 128PT-91. Limited to speeds of 20 and 40 mph due to aircraft brake problem
1-26-66	F21	1:35		28:20	39:35	Ran remainder of attitude tests started in F18 and one flight cycle per 128PT-90.
1-27-66	F22	4:50		33:10	44:35	Ran four flight cycles per 128PT-90.
1-28-66	F23	0		33:10	47:15	All attempts to light engine results in hot starts.
2-1-66	F24	2:30		35:40	50:25	Ran one flight cycle per 128PT-90 and had inflight pictures taken.
2-4-66	G18	1:00	13:55			Ran taxi tests per 128PT-90.
2-4-66	F25	2:20		38:00	53:05	Ran two flight cycles per 128PT-90.
2-7-66	F26	4:20		42:20	57:35	Ran three flight cycles per 128PT-90. Checked propeller performance.
2-8-66	F27	4:25		46:45	62:15	Ran four flight cycles per 128PT-90.
2-9-66	F28	3:30		50:15	66:00	Ran three flight cycles per 128PT-90. Total flight cycles, 18.

TEST CHRONOLOGY - VC86260 PROPELLER

Date	Run	Time	Total Ground Time	Total Flight Time	Total Aircraft Time	Remarks
3-2-66	G1	:15	:15			Leak and operational check. Fuel control set low and minor oil leak in scavenge line.
3-3-66	G2	1:45	2:00			Ran headwind stress survey per 128PT-94. Fuel control still not set right.
3-7-66	G3	:20	2:20			Fuel control checkout. Operation still poor.
3-11-66	G4	:10	2:30			Fuel control checkout ok.
3-15-66	G5	:35	3:05			Started steady state and transients per 128PT-93. Experienced control transfer bearing seizure.
3-21-66	G6	:40	3:45			Leak and operational check after reinstalling control ok.
3-22-66	G7	1:40	5:25			Ran steady state and transient operation, and nacelle temperature survey per 128PT-93. Installation ok for flight.
3-23-66	F1	1:00		1:00	67:20	Checked unfeathering, feathering, and air start operation. All ok.
3-25-66	G8	:10	5:35			Checkout of oscillograph set up for stress survey records.
3-25-66	F2	1:10		2:10	68:45	Ran part of stress survey at 5,000 feet per 128PT-94.
3-28-66	G9	:35	6:10			Started crosswind stress survey per 128PT-94. Discontinued test due to high prop vibrations. Wind 18 mph, gusts to 25 mph.
3-29-66	G10	:50	7:00			Completed crosswind stress survey started in G9. No recurrence of vibration noted in G9. Wind 10-12 mph.
3-30-66	F3	1:00		3:10	60:00	Completed stress survey at 5,000 feet per 128PT-94.

FIGURE 25

TEST CHRONOLOGY - VC86260 PROPELLER

Date	Run	Time	Total		Remarks
			Ground Time	Flight Time	
3-31-66	GL1	:05	7:05		Check oscillograph operation after cleaning flight ring
3-31-66	F4	2:05		5:15	Completed flight stress survey per 128PT-94.
4-1-66	GL2	:40	7:45		Started stress survey during taxi tests per 128PT-94. Aborted due to strain gage failure.
4-4-66	GL3	1:15	9:00		Continued stress survey during taxi test. Aborted by aircraft tail wheel problems.
4-5-66	GL4	:45	9:45		Completed stress survey during taxi test.
4-7-66	GL5	:50	10:35		Check oscillograph operation after switch to prop parameters.
4-11-66	F5	2:20		7:35	Ran all steady state and transients at 6500 feet, 150 and 230 mph and nacelle temperature survey per 128PT-93 Run made at 6500 feet instead of 5,000 feet due to cloud
4-11-66	F6	1:30		9:05	Ran all steady states and transients at 10,000 feet, 150 and 230 mph.
4-14-66	F7	2:45		11:50	Ran all steady state and transients at 20,000 feet, 150 and 210 mph, all attitude checks, and all steady state and transient operation at 30,000 feet, 150 and 180 mph per 128PT-93.
4-14-66	F8	1:15		13:05	Performance check of installation.
4-15-66	F9	3:20		16:25	Ran three flight cycles per 128PT-93.
4-18-66	F10	4:15		20:40	Ran four flight cycles per 128PT-93.
4-19-66	F11	4:00		24:40	Ran four flight cycles per 128PT-93.
4-21-66	GL6	:10	10:45		High speed motion pictures of blade movement.

FIGURE 25

TEST CHRONOLOGY - VC86260 PROPELLER

Date	Run	Time	Total Ground Time	Total Flight Time	Total Aircraft Time	Remarks
4-22-66	F12	:45		25:25	94:15	Flight for inflight pictures.
4-25-66	F13	2:10		27:35	96:35	Ran two flight cycles per 128PT-93.
4-26-66	F14	4:15		31:50	101:15	Ran four flight cycles per 128PT-93.
5-2-66	F15	4:55		36:45	106:15	Ran four flight cycles per 128PT-93.
5-3-66	F16	4:05		40:40	110:40	Ran four flight cycles per 128PT-93.
5-4-66	F17	5:15		46:05	116:10	Ran five flight cycles per 128PT-93.
5-5-66	F18	3:10		49:15	119:30	Ran three flight cycles per 123PT-93. Total flight cycles, 33.
5-6-66	F19	1:05		50:20	120:40	Ran a post test calibration.
5-10-66	G17	:50	11:35			Ran taxi tests per 128PT-93.

FIGURE 25

73EGBL/6903-11 PROPELLER STRESS SUMMARY

CONDITION	ALT.	PRPM	IAS(MPH)	+ STRESS PSI				
				20" F.T.	20"F.T.-Shear	50" F.I.	LR	90° FLE
G.I. F.I. 60% 75% 80% 90%	20,000' ↓	1130 ↓	180 ↓	600 " " " " "	200 " " " " "	650 650 1150 1250 1550 1500	500 " " " " "	400 " " " " " 900 " "
80% 60% F.I. G.I.	20,000' ↓	1130 ↓	230 225 215 200	600 " " " "	200 " " " "	500 " " "	800 " " "	600 " " "
Str. Flt. 20° Bank-Right " " " Left " " " Right " " " Left " " " "G" -G 25° Nose Dn, 10° Right " " " Left Nose Up 10° Right " " " Left	20,000' ↓			1650 1900 1900 1900 500 500 1600 1000 1000 1000	700 " " " " 200 300 700 400 600 500	5600 5150 5000 4700 1800 2200 4300 3750 3400 3200	3500 3400 3000 3100 1700 2000 2900 2400 2400 2300	5000 4700 4900 4200 1800 2000 4000 3400 3400 2700
Transient, PL 60% Normal " " " 80% " " " Normal " " " Take-Off	10,000' ↓	700-1250-700 800-1250-800 900-1250-900 1050-1250-1050	200 ↓	800 " " " "	200 " " " "	1000 " " " "	600 " " 500	600 " " " 500
Trans. Normal-T.O.-Normal " F.I.-T.O.-F.I. " Normal-T.O.-Normal " F.I.-T.O.-F.I.	10,000' ↓	Cond. Lever Set 1130 Cond. Lever Set 1250	200 ↓	800 " " " "	200 " " " "	1000 " " " "	500 " " " "	500 " " " "
" F.I.-T.O.-F.I. " T.O.-G.I.-T.O.	10,000' ↓	Move Cond. L. & P.L. F.I.= 1130, T.O.= 1250	200 "	800 "	200 "	1100 "	500 "	950 "

FIGURE 26

TABULATION-73EGB1 PROPELLER NACELLE TEMPERATURE SURVEY

Altitude and Airspeed Power Setting	Ground		5000' 200mph	
	Flight Idle	Take-off	Flight Idle	Take-off
Thermocouple Location				
<u>Engine</u>				
Strut Mount Pad	94°F	80°F	34°F	34°F
Accessory Gear Box	152	148	82	82
Compressor Rear Frame	332	554	374	486
Burner Case	292	424	208	298
Turbine Case Front	438	566	406	508
Turbine Case Rear	658	640	476	478
Rear Mount	106	86	46	44
<u>Nacelle</u>				
Firewall Beam	162	126	46	50
<u>Propeller-Gearbox</u>				
Control	182	220	188	190
Gearbox Skin	168	180	132	132
Lube in	172	198	148	158
Lube out	178	220	166	180
Ambient	48	48	19	19

FIGURE 27

TABULATION

Power Setting		60% NORMAL			NORMAL	
Condition						
Lever Movement		1000 rpm-1250 rpm-1000 rpm			700 rpm-1250 rpm-1000 rpm	
Altitude & Airspeed	Decrease	Increase	Blade	Decrease	Increase	Blade
	Pitch Rate (Degrees/Sec)	Pitch Rate (Degrees/Sec)	Angle Change (Degrees)	Pitch Rate (Degrees/Sec)	Pitch Rate (Degrees/Sec)	Angle Change (Degrees)
Ground	5	8.5	16.5-15-16.5	5		16.5-15-16.5
5000' and 150 mph	5	12.5	25.5-19-25.5	4.5		25.5-19-25.5
5000' and 240 mph	5	13	28-20-28	7		28-20-28
10000' and 150 mph	5.5	11.5	29-20-29	6		29-20-29
10000' and 240 mph	6	13	36-28-36	5		36-28-36
20000' and 150 mph	4.5	11	34.5-27-34.5	4		34.5-27-34.5
20000' and 205 mph	4.5	10	44-37-44	3.5		44-37-44
30000' and 185 mph	5.5	12.5	40-32-40	3.5		40-32-40

Power Setting		NORMAL				MAL
Condition						
Lever Movement		1000 rpm-1250 rpm-1000 rpm			900 rpm-1250 rpm-1000 rpm	1000 rpm
<u>Altitude & Airspeed</u>						
Ground	6	15.5	22.5-15-22.5	5		22.5-15-22.5
5000' and 150 mph	5.5	11	29.5-22-29.5	4.5		29.5-22-29.5
5000' and 240 mph	5	13	33-23-33	6		33-23-33
10000' and 150 mph	5	12	35-24-35	5.5		35-24-35
10000' and 240 mph	4.5	12.5	38-30-38	4.5		38-30-38

A

TABULATION-

TABULATION-73ECB1 PROPELLER CONDITION LEVER TRANSIENTS

NORMAL									80% NORM.
700 rpm-1250 rpm			700 rpm-1250 rpm-700 rpm			1000 rpm-1250 rpm-1000 rpm			
Pitch Rate (Degrees/Sec)	Incr Pitch (Deg.)	Blade Angle Change (Degrees)	Decrease Pitch Rate (Degrees/Sec)	Increase Pitch Rate (Degree/Sec)	Blade Angle Change (Degrees)	Decrease Pitch Rate (Degrees/Sec)	Increase Pitch Rate (Degree/Sec)	Blade Angle Change (Degrees)	
5		16.5-15-16.5	5	11.5	33.5-15-33.5	5	12	19.5-15-19.5	
4.5		25.5-19-25.5	4.5	11.	39.5-19-39.5	5	14	27.5-19-27.5	
7		28-20-28	7	14	43-20-43	5.5	16.5	30-20-30	
5		29-20-29	6	13	45-20-45	4.5	15.5	31-23.5-31	
5		36-28-36	5	11	48-27-48	6	12.5	37.5-28.5-37.5	
4		34.5-27-34.5	4	10.5	49-27-49	4	16	36-28.5-36	
3.5		44-37-44	3.5	11	57.5-37-57.5	4.5	12	46-38-46	
3.5		40-32-40	3.5	11.	54-32-54				

MAL									TAKE-OFF
900 rpm-1250 rpm			900 rpm-1250 rpm-900 rpm			1100 rpm-1250 rpm-1100 rpm			
Pitch Rate (Degrees/Sec)	Incr Pitch (Deg.)	Blade Angle Change (Degrees)	Decrease Pitch Rate (Degrees/Sec)	Increase Pitch Rate (Degree/Sec)	Blade Angle Change (Degrees)	Decrease Pitch Rate (Degrees/Sec)	Increase Pitch Rate (Degree/Sec)	Blade Angle Change (Degrees)	
5		22.5-15-22.5	5	15.5	27-15-27	5.5	16	21-16-21	
4.5		29.5-22-29.5	4.5	11.5	33.5-21.5-33.5	6	12.5	27.5-23-27.5	
5		33-23-33	6	15	37-24-37	4	10	30-26-30	
5.5		35-24-35	5.5	13	39-24-39	6	13.5	31-25-31	
4.5		38-30-38	4.5	12	42.5-30-42.5	4.5	11	36-32-36	

FIGURE 28

80% NORMAL

1000 rpm-1250 rpm-1000 rpm

800 rpm-1250 rpm-800 rpm

	Decrease Pitch Rate (Degrees/Sec)	Increase Pitch Rate (Degree/Sec)	Blade Angle Change (Degrees)	Decrease Pitch Rate (Degree/Sec)	Increase Pitch Rate (Degree/Sec)	Blade Angle Change (Degrees)
s)						
-33.5	5	12	19.5-15-19.5	4.5	15	30.5-15-30.5
-39.5	5	14	27.5-19-27.5	4.5	12	36-20-36
3	5.5	16.5	30-20-30	5	16	38-21-38
5	4.5	15.5	31-23.5-31	5	14.5	42.5-24-42.5
8	6	12.5	37.5-28.5-37.5	4	12.5	45-29-45
7	4	16	36-28.5-36	4	11.5	46-29-46
-57.5	4.5	12	46-38-46	4	11.5	54-38-54

TAKE-OFF

1100 rpm-1250 rpm-1100 rpm

1050 rpm-1250 rpm-1050 rpm

7	5.5	16	21-16-21	5.5	15	23.5-16-23.5
5-33.5	6	12.5	27.5-23-27.5	4.5	12	29.5-23-29.5
7	4	10	30-26-30	5.5	11	33-25-33
9	6	13.5	31-25-31	6.5	15	32.5-26-32.5
42.5	4.5	11	36-32-36	4	13	40-33-40

Propeller rpm
Setting

1130

Power Lever
Movement

Flight Idle-Normal-Flight Idle

Flight Idle-Take-off-Fl...

Altitude &
Airspeed

Increase
Pitch Rate
(Degrees/Sec)

Decrease
Pitch Rate
(Degrees/Sec)

Blade
Angle
Change
(Degrees)

Increase
Pitch Rate
(Degrees/Sec)

Decrease
Pitch Rate
(Degrees/Sec)

Ground	2.5	3	15-17-15	6	5.5
5000' and 150 mph	10.5	5	17-23.5-17	10	5
5000' and 240 mph	4	5	19-26-19	3.5	5
10000' and 150 mph	6	5.5	17-29-17	6	6
10000' and 240 mph	4	6	26-33.5-26	3.5	4.5
20000' and 150 mph	2.5	4	22.5-32.5-22.5		
20000' and 205 mph	2	3	34.5-41.5-34.5		
30000' and 185 mph	1	2	29.5-36.5-29.5		

TABULATION - 73EGB1 PROPELLER POWER LEVER TRANSIENTS

POW

1130

e-Normal-Flight Idle		Flight Idle-Take-off-Flight Idle			Flight Idle-Normal-Flight		
Decrease Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)	Increase Pitch Rate (Degrees/Sec)	Decrease Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)	Increase Pitch Rate (Degrees/Sec)	Decrease Pitch Rate (Degrees/Sec)	
3	15-17-15	6	5.5	15-19-15	0	0	
5	17-23.5-17	10	5	16.5-23-16.5	9.5	4.5	15.5
5	19-26-19	3.5	5	20-28-20	4	4.5	
5.5	17-29-17	6	6	17.5-31-17.5	4	6	37.5
6	26-33.5-26	3.5	4.5	27.5-36-27.5	3	5	27.5
4	22.5-32.5-22.5				2	5.5	
3	34.5-41.5-34.5				2	4	
2	29.5-36.5-29.5				4	4.5	

F I G U R E 29

E

POWER LEVER TRANSIENTS

1250

	Flight Idle-Normal-Flight Idle			Flight Idle-Take-off-Flight Idle		
	Increase Pitch Rate (Degrees/Sec)	Decrease Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)	Increase Pitch Rate (Degrees/Sec)	Decrease Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)
	0	0	15-15-15	2	3	15-16-15
15.5	9.5	4.5	17-21-17	10	5.5	17-24-17
	4	4.5	15-25-15	4.5	5	15-28-15
22.5	4	6	17-25-17	3	3.5	21.5-27.5-21.5
27.5	3	5	24-30.5-24	3.5	5.5	24.5-32-24.5
	2	5.5	19.5-27.5-19.5			
	2	4	31-37.5-31			
	4	4.5	27.5-33-27.5			

TABULATION-73EG81 PROPELLER FEATHER TIMES

Altitude and Airspeed	Electrical Feather(Secs)	Mechanical Feather(Secs)	Unfeather (Secs)
5000' and 150 mph	6.0	10.0	13
5000' and 240 mph	4.1	4.6	13
10000' and 150 mph	5.9	6.1	12
10000' and 240 mph	N O D A T A		
20000' and 150 mph	3.6	7.4	12
20000' and 205 mph	5.4	6.5	12
30000' and 185 mph	N O D A T A		

FIGURE 30

TABULATION-73EGB1 PROPELLER REVERSING TIME

<u>Taxi Speed (mph)</u>	<u>Power Reverse Initiated From</u>	<u>Time to Reverse (Sec)</u>
20	Flight Idle	1.9
20	Normal	1.4
20	Take-off	1.4
40	Flight Idle	1.9
40	Normal	1.6
40	Take-off	1.4
60	Flight Idle	1.8
60	Normal	1.5
60	Take-off	1.7

FIGURE 31

TABULATION-73EGBI PROPELLER ATTITUDE CHECKS

Attitude	Time at Attitude	Scavenge Outlet Temperature Change (°F)
20° left about roll axis	5 mins	+8
20° right about roll axis	5 mins	+2
45° left about roll axis	30 secs	0
45° right about roll axis	30 secs	0
25° down about pitch axis with 10° left about roll axis	2 min	-3
25° down about pitch axis with 10° right about roll axis	2 min	-3
25° up about pitch axis with 10° left about roll axis	2 min	+5
25° up about pitch axis with 10° right about roll axis	2 min	+14
zero "g"	30 sec	0

FIGURE 32

TABULATION-VC86260 PROPELLER NACELLE TEMPERATURE SURVEY

Altitude & Airspeed Power Setting	Ground		5000' 200 mph	
	Flight Idle	Take-off	Flight Idle	Take-off
<u>Thermocouple Location</u>				
<u>Engine</u>				
Strut Mount Pad	58	64	32	34
Accessory Gear Box	136	162	184	190
Compressor Rear Frame	324	598	346	512
Burner Case	278	554	216	322
Turbine Case Front	396	626	374	530
Turbine Case Rear	534	736	418	522
Rear Mount	90	146	40	40
<u>Nacelle</u>				
Firewall Beam	104	152	30	38
<u>Propeller-Gearbox</u>				
Control	86	180	104	106
Gearbox Skin	128	230	104	112
Lube in	138	230	142	166
Lube out	138	266	152	182
Ambient	42	42	16	16

FIGURE 33

TABULATION-VCE

Power Setting		60% NORMAL			60% NORMAL		
Condition		1000 rpm-1160 rpm-1000 rpm			850 rpm-1160 rpm-1000 rpm		
Lever Movement							
Altitude & Airspeed		Decrease	Increase	Blade	Decrease	Increase	Blade
		Pitch Rate (Degrees/Sec)	Pitch Rate (Degrees/Sec)	Angle Change (Degrees)	Pitch Rate (Degrees/Sec)	Pitch Rate (Degrees/Sec)	Angle Change (Degrees)
Ground					2.5	6.1	
6500' and 150 mph		5	13.5	33-21-33	4	15.5.5	33-21
6500' and 230 mph		4	11	41-35.5-41	4	12	41-35
10000' and 150 mph		4.5	14.5	34.5-23.5-34.5	5	14.5.5	34.5-
10000' and 230 mph		3.5	10.5	42-37.5-42	3	13 .5	42-37
20000' and 150 mph		4.5	14.5	41.5-34.5-41.5	4.5	15.5.5	41.5-
20000' and 220 mph		3.5	10.5	46-41-46	4	16.5.5	46-41
30000' and 150 mph		3	12	46.5-42-46.5	3	13.5	46.5-
30000' and 165 mph		3	11	48-43.5-48	5	14	48-43

Power Setting		NORMAL			NORMAL		
Condition		1000 rpm-1160 rpm-1000 rpm			900 rpm-1160 rpm-1000 rpm		
Lever Movement							
Altitude & Airspeed							
Ground		2.5	8.5	17.5-13-17.5	3	10 1.5	17.5-
6500' and 150 mph		3.5	14.5	39.5-30-39.5	3	14 .5	39.5-
6500' and 230 mph		3	14.5	44-38-44	3.5	12 1.5	44-38
10000' and 150 mph		3	15	39.5-32-39.5	2.5	13.5	39.5-
10000' and 230 mph		2.5	16.5	46-40.5-46	2	12.5.5	46-40

TABULATION-VC8626C PROPELLER CONDITION LEVER TRANSIENTS

60% NORMAL				80%			
-1000 rpm		850 rpm-1160 rpm-850 rpm		1000 rpm-1160 rpm-1000 rpm			
Rate s/Sec)	Blade Angle Change (Degrees)	Decrease Pitch Rate (Degrees/Sec)	Increase Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)	Decrease Pitch Rate (Degrees/Sec)	Increase Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)
5	33-21-33	2.5	6.5	18-12-18	5	4.5	15-12-15
5	41-35.5-41	4	15.5	40-21-40	4	15.5	36-24.5-
5	34.5-23.5-34.5	4	12	46-36-46	5	9.5	42-37-42
5	42-37.5-42	5	14.5	41-23.5-41	4	15.5	37-28-37
5	41.5-34.5-41.5	3	13	47-37-47	4	11.5	43-38.5-
5	46-41-46	4.5	15.5	49.5-35-49.5	4.5	16	45.5-38-
5	46.5-42-46.5	4	16.5	51.5-41-51.5	4	13	47.5-42.
	48-43.5-48	3	13.5	54-42-54			
		5	14	54.5-44-54.5			

NORMAL				TAKE-			
-1000 rpm		900 rpm-1160 rpm-900 rpm		1100 rpm-1160 rpm-1100 rpm			
5	17.5-13-17.5	3	10	24-13-24	1.5	5	16-13-16
5	39.5-30-39.5	3	14	44.5-31-44.5	2.5	10.5	37-33.5-
5	44-38-44	3.5	12	47-38-47	3.5	14.5	42-40-42
5	39.5-32-39.5	2.5	13.5	45-32-45	3	11	37-35-37
5	46-40.5-46	2	12.5	49-41-49	2.5	18.5	44-42-44

F I G U R E 34

B

80% NORMAL

1000 rpm-1160 rpm-1000 rpm			850 rpm-1160 rpm-850 rpm		
Decrease Pitch Rate (Degrees/Sec)	Increase Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)	Decrease Pitch Rate (Degrees/Sec)	Increase Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)
5	4.5	15-12-15	2.5	8	23-12-23
4	15.5	36-24.5-36	3.5	16	44-26.5-44
5	9.5	42-37-42	4	12.5	46.5-37-46.5
4	15.5	37-28-37	4	13.5	47-28.5-47
4	11.5	43-38.5-43	2	11	48.5-39-48.5
4.5	16	45.5-38-45.5	3	16	54.5-38.5-54.5
4.5	13	47.5-42.5-47.5	3	15.5	54-43-54
54.5					

TAKE-OFF

1100 rpm-1160 rpm-1100 rpm			1050 rpm-1160 rpm-1050 rpm		
1.5	5	16-13-16	3	9.5	18-12-18
2.5	10.5	37-33.5-37	3	13.5	40-34-40
3.5	14.5	42-40-42	4	11	43.5-39-43.5
3	11	37-35-37	2.5	11.5	41-35-41
2.5	18.5	44-42-44	2	12.5	45.5-42-45.5

R E 34

Propeller rpm
Setting

1015

Power Lever
Movement

Flight Idle-Normal-Flight Idle

Flight Idle-Take-off-I

Altitude & Airspeed	Increase Pitch Rate (Degrees/Sec)	Decrease Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)	Increase Pitch Rate (Degrees/Sec)	Decrease Pitch Rate (Degrees/Sec)
------------------------	---	---	---------------------------------------	---	---

Ground	4.5	2	12-15-12	7	3
6500' and 150 mph	18	6	12-38.5-12	19	5
6500' and 230 mph	6	3.5	34.5-42.5-34.5	5.5	3
10000' and 150 mph	18.5	5	12-38.5-12	17	4
10000' and 230 mph	4.5	4	34.5-44-34.5	4.5	3.5
20000' and 150 mph	6	4.5	24.5-44.5-24.5		
20000' and 220 mph	2	3.5	39.5-47-39.5		
30000' and 150 mph	5	3	37-45-37		
30000' and 165 mph	4.5	2	40.5-46.5-40.5		

TABULATION - VC86260 PROPELLER POWER LEVER TRANSIENTS

1015

Normal-Flight Idle		Flight Idle-Take-off-Flight Idle			Flight Idle-Normal-Flight	
Decrease Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)	Increase Pitch Rate (Degrees/Sec)	Decrease Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)	Increase Pitch Rate (Degrees/Sec)	Decrease Pitch Rate (Degrees/Sec)
2	12-15-12	7	3	12-20-12	0	0
6	12-38.5-12	19	5	12-40.5-12	28.5	6
3.5	34.5-42.5-34.5	5.5	3	37.5-43-37.5	2.5	4
5	12-38.5-12	17	4	12-41.5-12	31.5	5.5
4	34.5-44-34.5	4.5	3.5	37.5-46-37.5	4	4.5
4.5	24.5-44.5-24.5				19	7.5
3.5	39.5-47-39.5				2.5	4
3	37-45-37				6	4
2	40.5-46.5-40.5				5	3.5

F I G U R E 35

POWER LEVER TRANSIENTS

1160

1-Flight se Rate es/Sec)	Flight Idle-Normal-Flight Idle			Flight Idle-Take-off-Flight Idle		
	Increase Pitch Rate (Degrees/Sec)	Decrease Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)	Increase Pitch Rate (Degrees/Sec)	Decrease Pitch Rate (Degrees/Sec)	Blade Angle Change (Degrees)
	0	0	12-12-12	6.5	5	12-13-12
	28.5	6	12-31-12	26	5	12-32-12
.5	2.5	4	37-39.5-37	3	4	38-41-38
.5	31.5	5.5	12-32.5-12	28.5	6.5	12-35-12
.5	.5	4.5	32-40-32	4	4.5	33-41.5-33
.5	19	7.5	12-38-12			
	2.5	4	36-42.5-36			
	6	4	30-40-30			
.5	5	3.5	36.5-42-36.5			

I R E 35

C

TABULATION-VC86260 PROPELLER FEATHER TIMES

Altitude and Airspeed	Electrical Feather(Sec)	Mechanical Feather(Sec)	Unfeather (Sec)
Ground	3.5	-	9.6
6500' and 150 mph	4.6	25.2	16.4
6500' and 230 mph	3.2	13.2	7.4
10000' and 150 mph	4.0	20	13
10000' and 230 mph	4.0	19	12
20000' and 150 mph	4.0	12	16
20000' and 220 mph	3.0	11	11
30000' and 150 mph	5.0	11	12
30000' and 165 mph	4.0	10	8

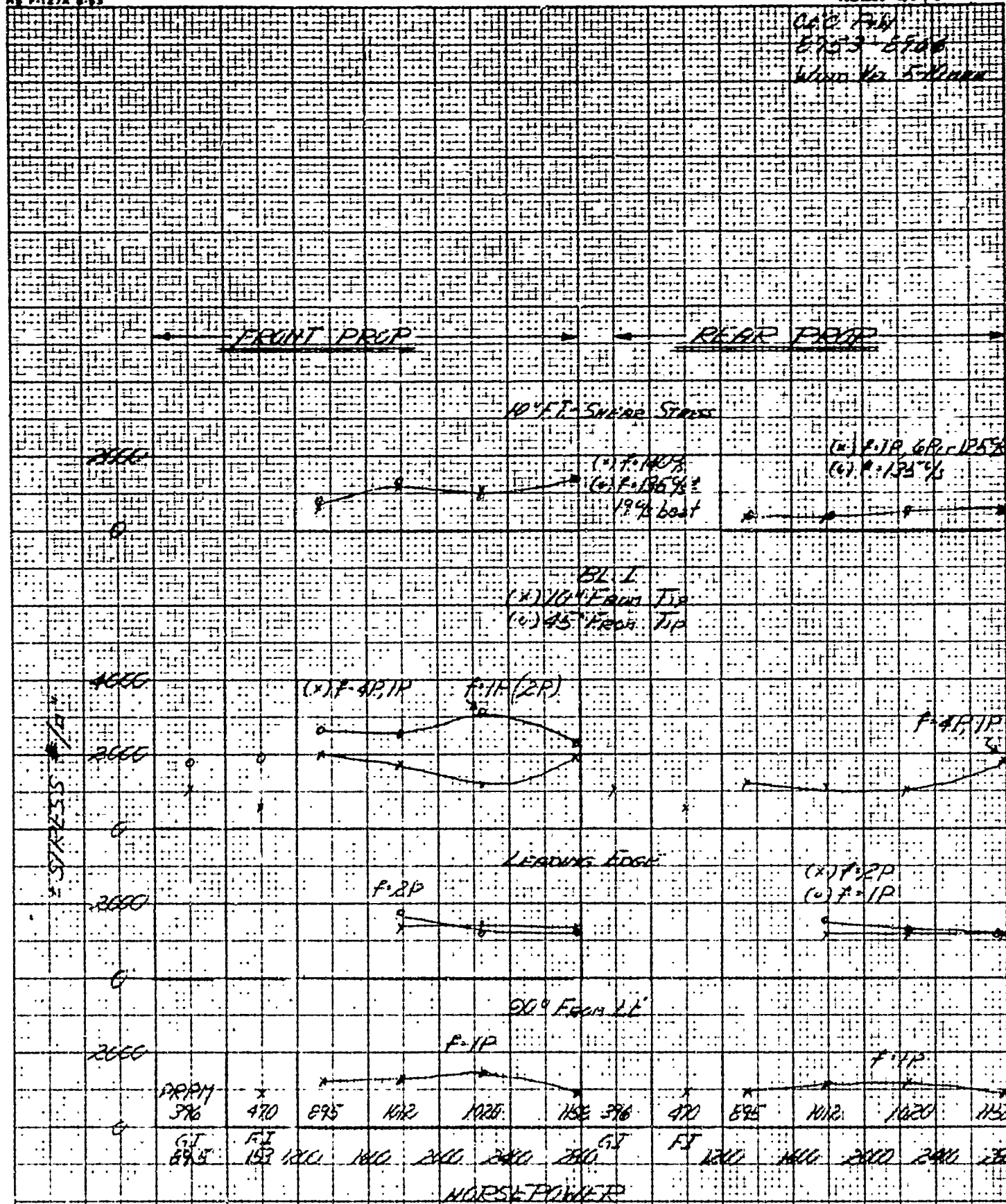
FIGURE 36

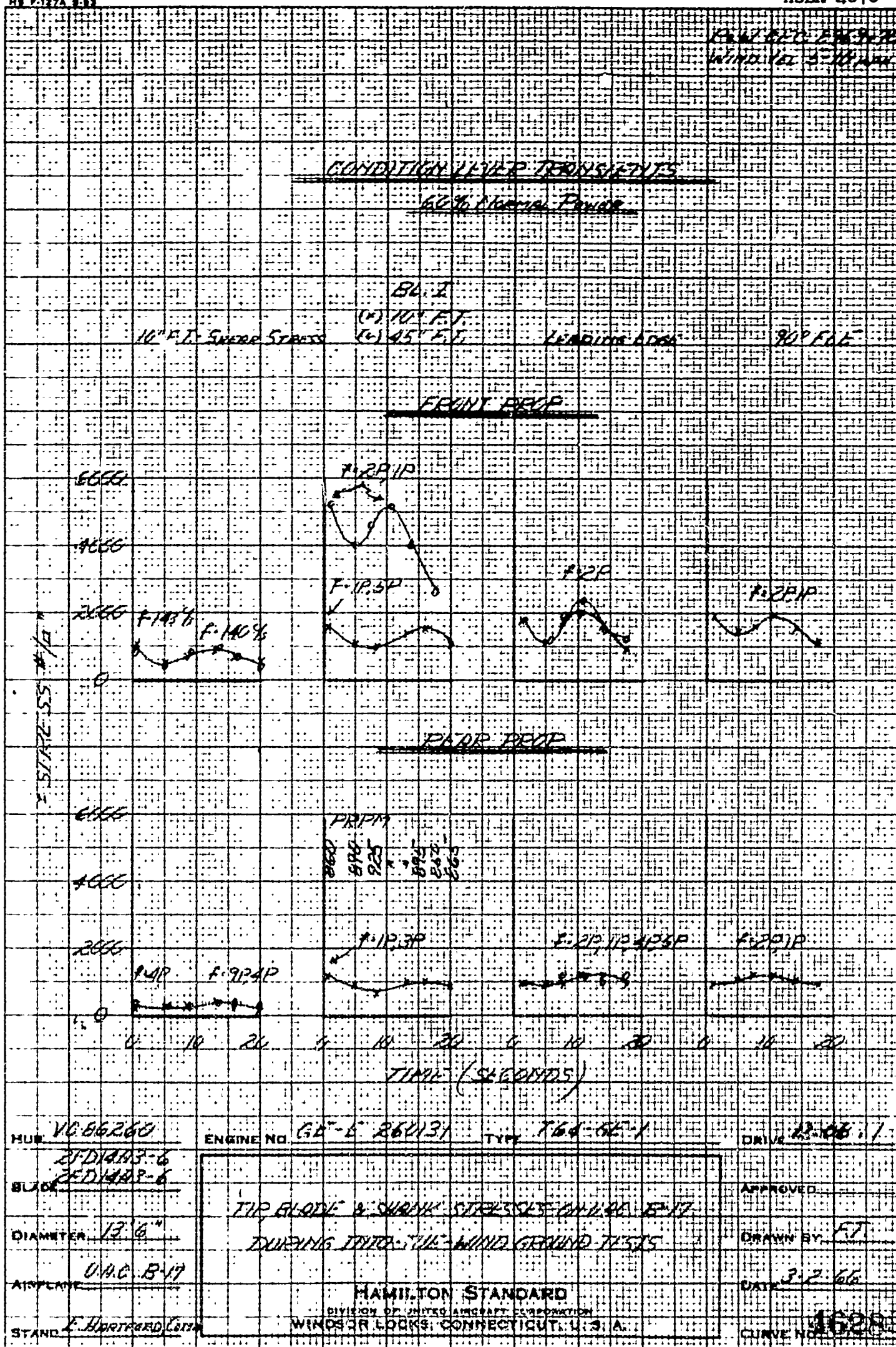
TABULATION-VC86260 PROPELLER REVERSING TIMES

Taxi Speed (mph)	Power Reverse Initiated From	Blade Angle Reverse Initiated From	Time to Reverse (Sec)
20	Flight Idle	12.5°	1.5
20	Normal	19°	1.45
20	Take-off	12.5°	1.3
40	Flight Idle	12.5°	1.55
40	Normal	18.5°	1.45
40	Take-off	13.5°	1.3
60	Flight Idle	12°	1.45
60	Normal	17°	1.55
60	Take-off	15°	1.40

FIGURE 37

0.62 FPA
8953-8900
WIND NO. 5-10000





Rev. 12-22
Wind Vel. 5.16 m.p.h.

CONDITION LEVER TRANSIENTS

100% Normal Power

BL I

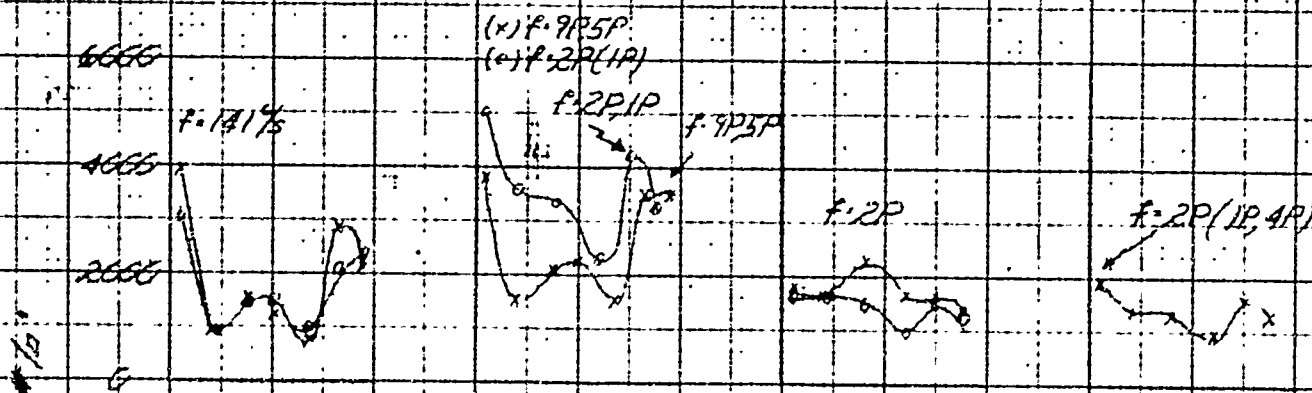
10" F.T. - SHEAR STRESS

(*) 10" F.T.
(o) 45" F.T.

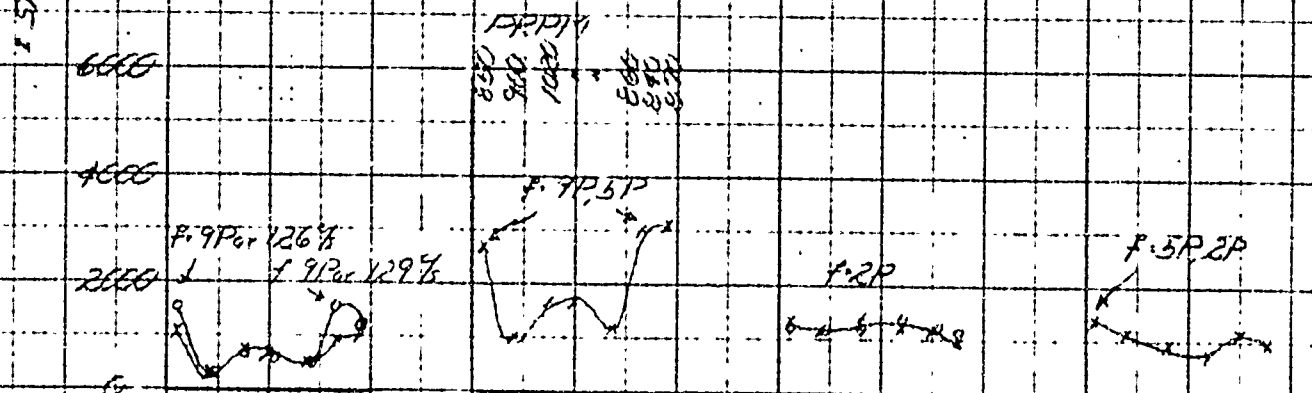
LEADING EDGE

90° T.F.

FRONT PROP



RIGHT PROP



NUM. <u>1066260</u>	ENGINE NO. <u>GE-E-260131</u>	TYPE <u>T64-GE-1</u>	DRIVE <u>12.06:1</u>
BLADE <u>2FD1A93-6</u>	TIP BLADE & SHANK STRESSES ON IARC B-17 DURING INTO-THE-WIND GROUND TESTS. HAMILTON STANDARD DIVISION OF UNITED AIRCRAFT CORPORATION WINDSOR LOCKS, CONNECTICUT, U. S. A.		APPROVED _____
DIAMETER <u>13' 6"</u>			DRAWN BY <u>F.T.</u>
AIRPLANE <u>UAC B-17</u>			DATE <u>7-2-66</u>
STAND. <u>C. HARTFORD, Conn.</u>			CURVE NO. <u>4624</u>

FIGURE 1

CONDITIONAL FEVER TRANSFERENCE

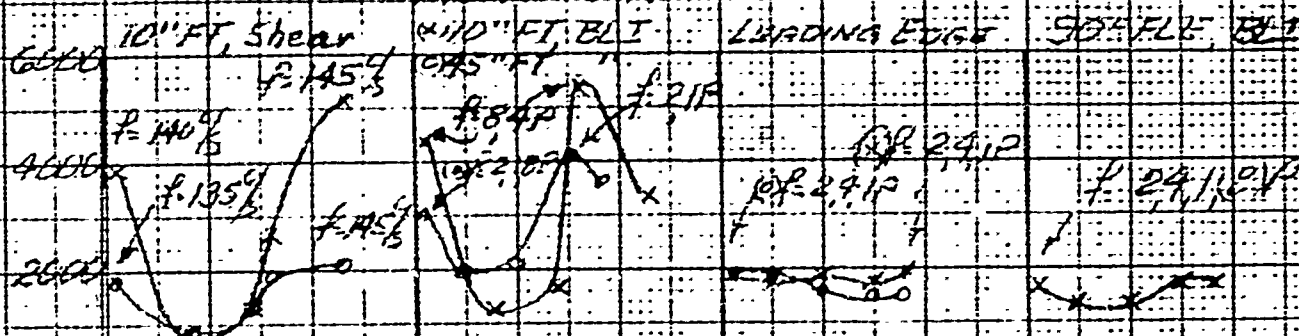
ENC. 500
5973-54
NE 3/4 1/4 - 56
10 mps

NORMAL FORM

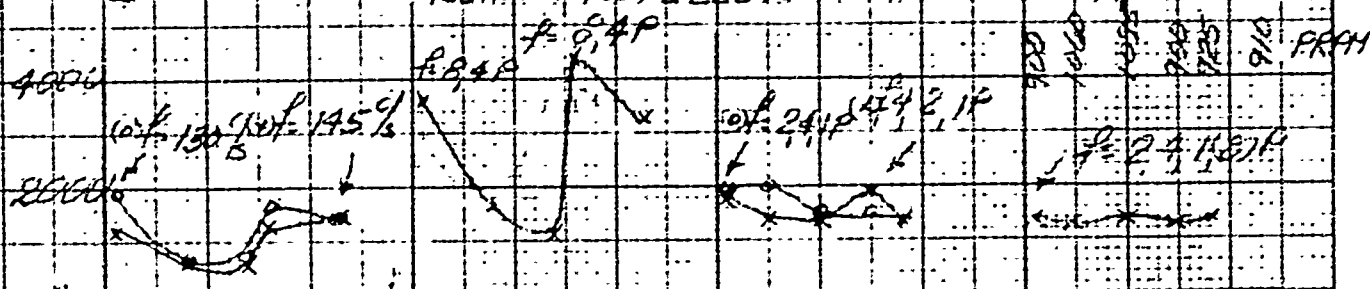
FRONT PROFILE

LIVING ETHER

504 F2 251

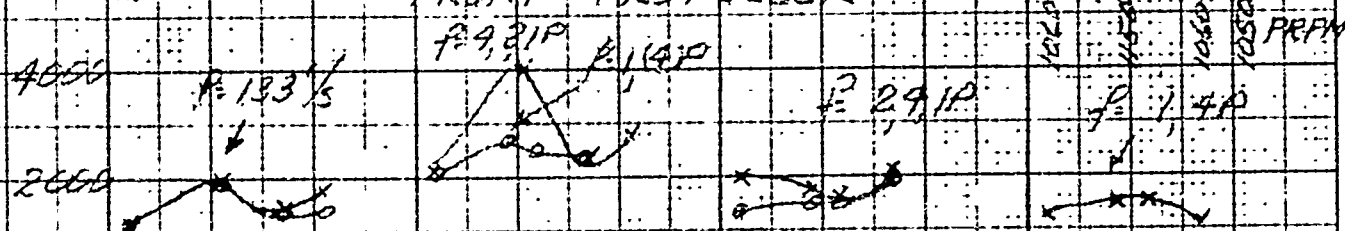


REAR PROPELLER

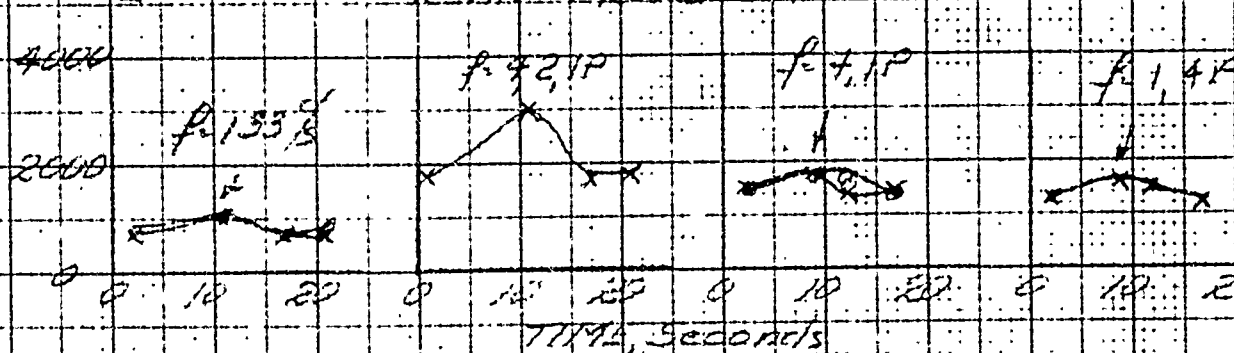


TANK OFF COVER

FRONT PROPELLER



PLAP PROFILE



HUS
 2F01493-0
 2F01493-0
 BLADE

ENGINE NO. G6-L-260131 TYPE T64-G5-1

DRIVE 32.05.11

TIP, BLADE AND SHAFT STRESSES
ON LFC B-17 DURING WIND-
TUNNEL WIND GROUND TEST

AFRICANA

DIAMETER 13'6"
UAC B-17

DRAWN BY 575

AIRPLANE
PLAIN EXP. HANGER
E. HARTFORD, CONN
STAND.

HAMILTON STANDARD
DIVISION OF UNITED AIRCRAFT CORPORATION
WINDSOR LOCKS, CONNECTICUT, U. S. A.

3-2-6

CURVE NO. 3000

CAC F.W.
8979 & 5981

Headwind = 5-10 mph

ROTARY WHEEL TRANSLIENT

FEEL TO 4 FT

10" FT. Shear

510" FT. RLT

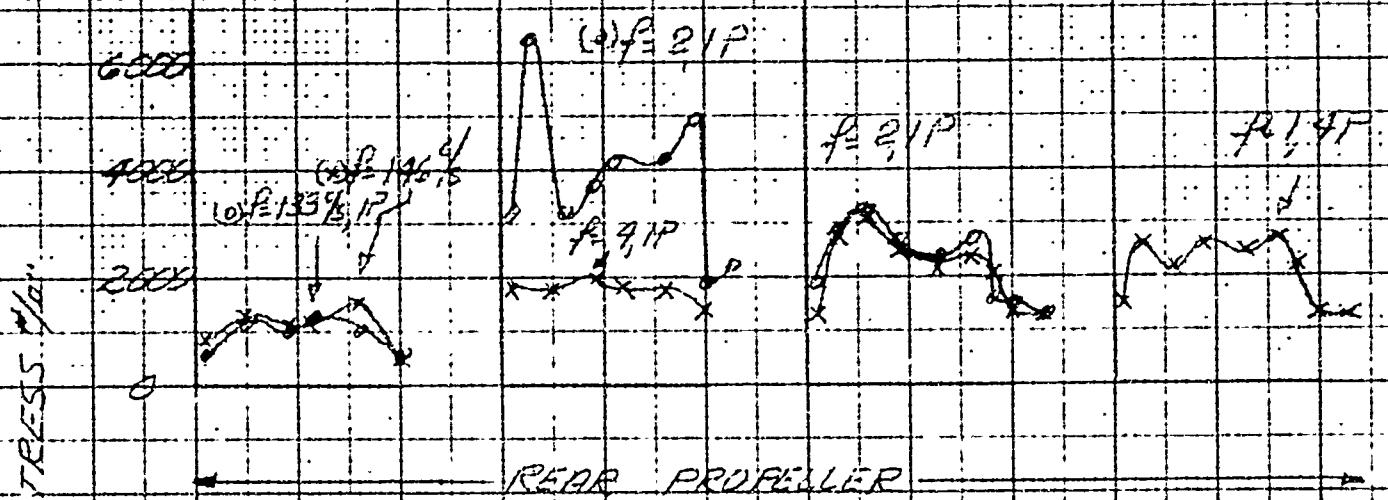
LEADING EDGE

90° FLE BLT

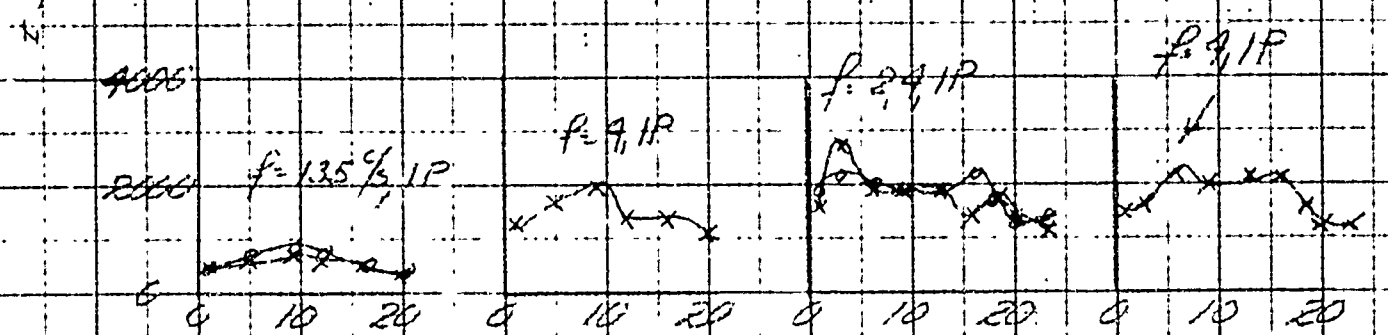
(1) 45" FT. "

FRONT PROPELLER

(1) P. 2P



REAR PROPELLER



TIME, Seconds

ENGINE NO. GE 260131 TYPE T-64-GE-1 DRIVE 12.06:1

VB 260
2FE 193-6
2FE 193-6

BLADE 13'6"

DIAMETER WAC B-17

AIRPLANE F.W. EXP. HANDED
E. HANDED, G.A.
STAND

TIP BLADE AND SHANK STRESSES
ON WAC B-17 DURING INITIAL
THE - INNER GROUND TEST

HAMILTON STANDARD
DIVISION OF UNITED AIRCRAFT CORPORATION
WINDSOR LOCKS, CONNECTICUT, U. S. A.

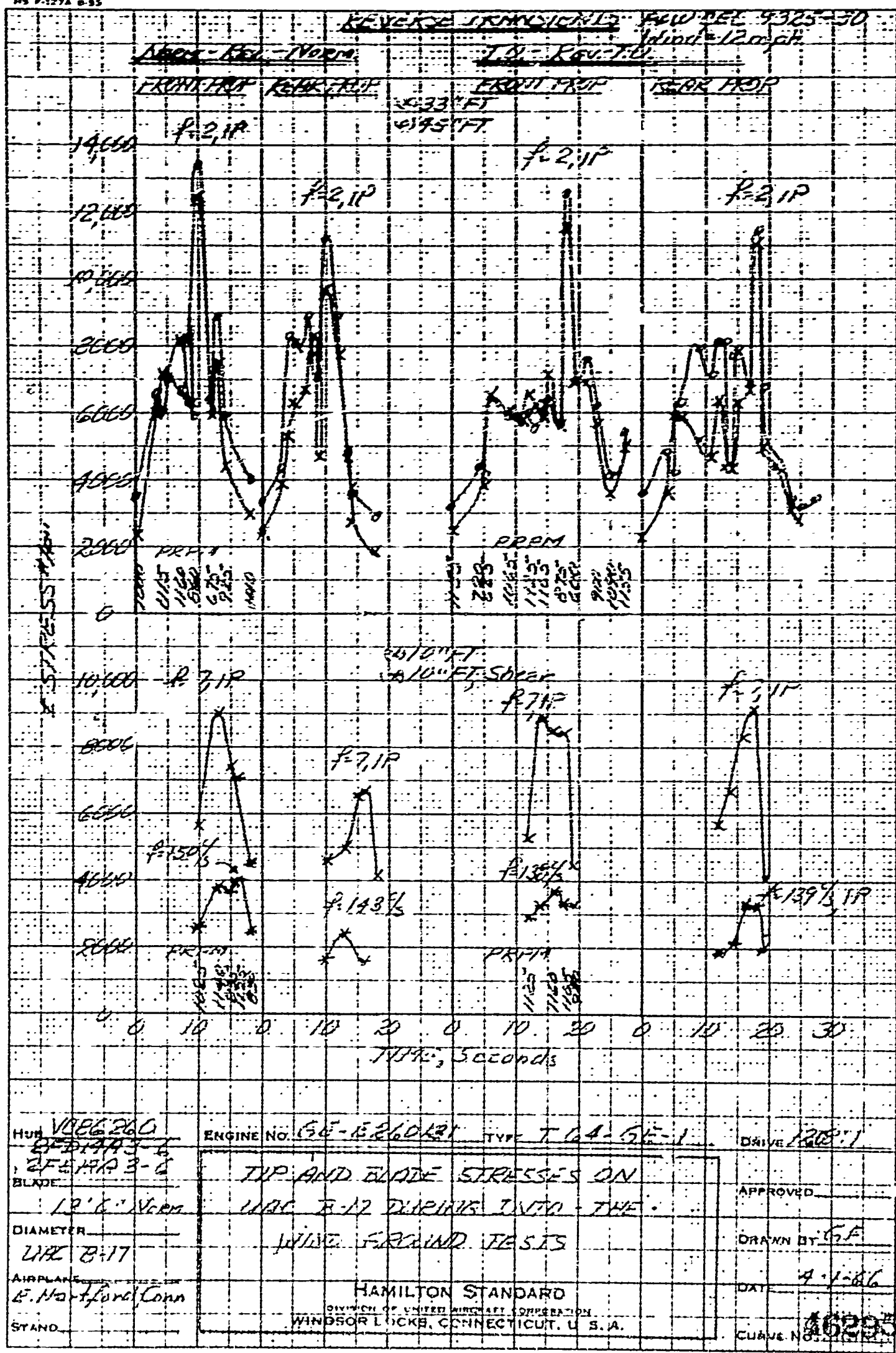
APPROVED

DRAWN BY G.P.

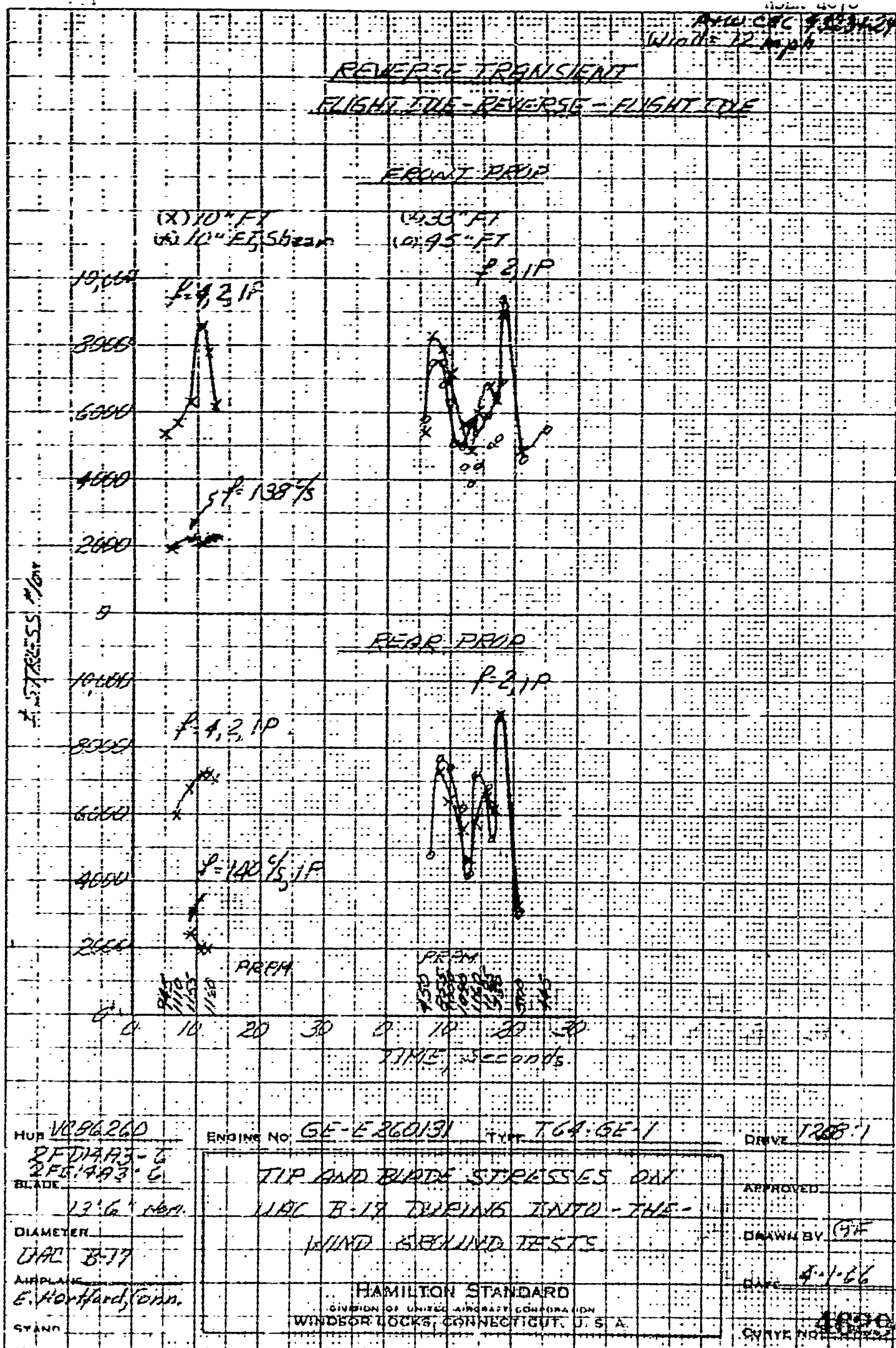
DATE 3-2-66

CURVE NO. 4620

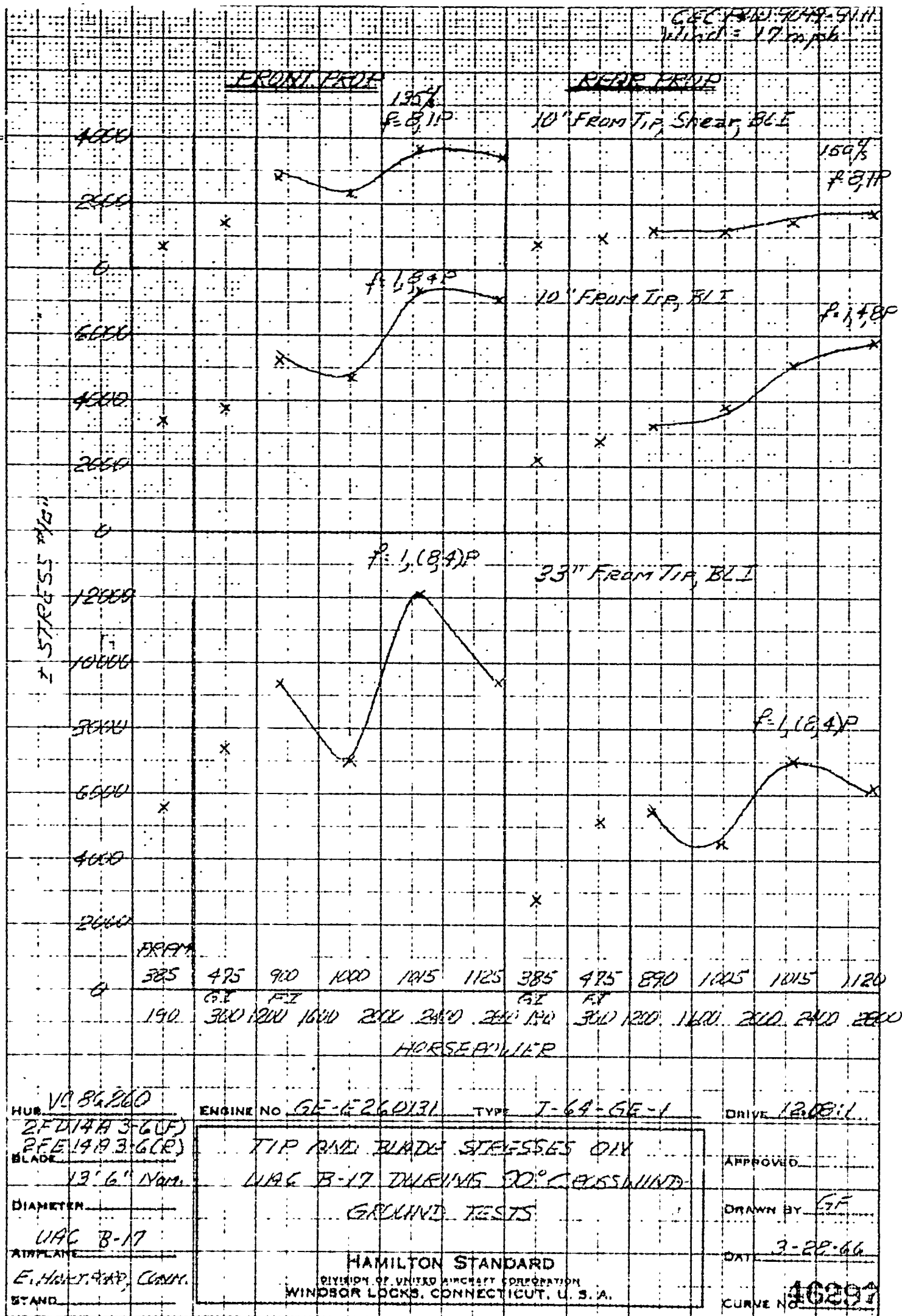
1/2" IN X 10 TO THE 1/2 INCH 359-11
 1/2" IN X 10 TO THE 1/2 INCH 359-11



FIGURE



FIGURE



FIGURE

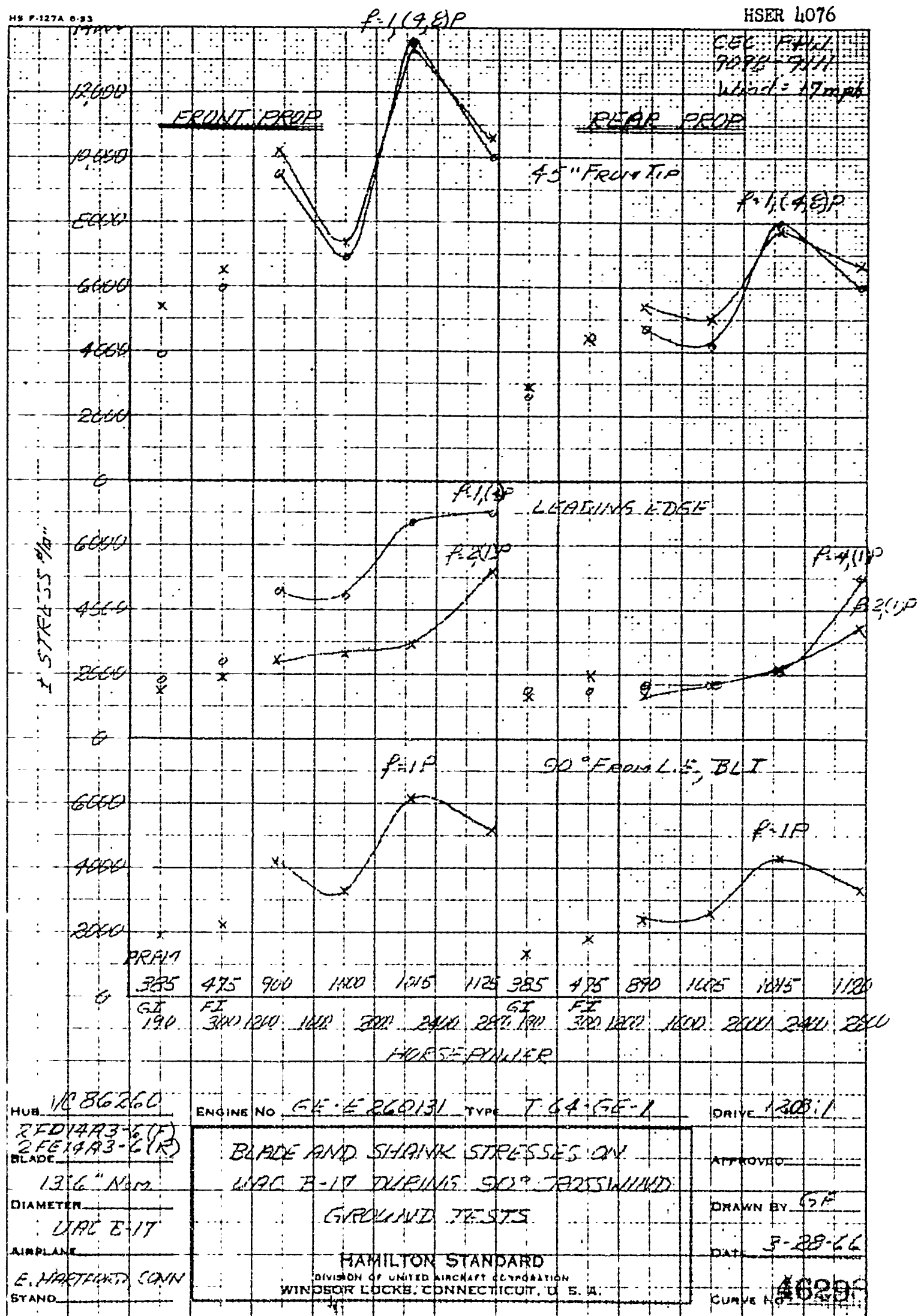
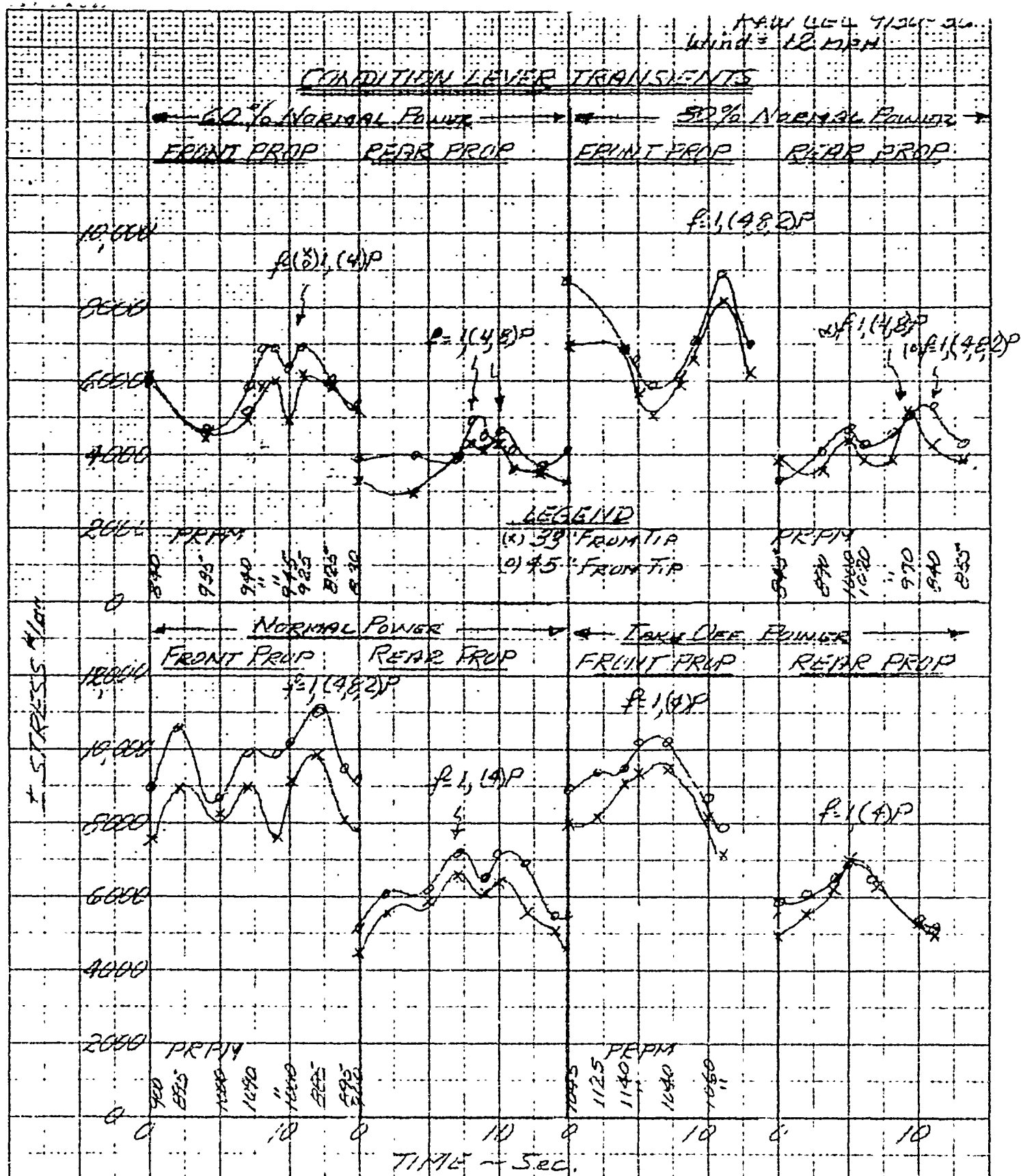


FIGURE 7



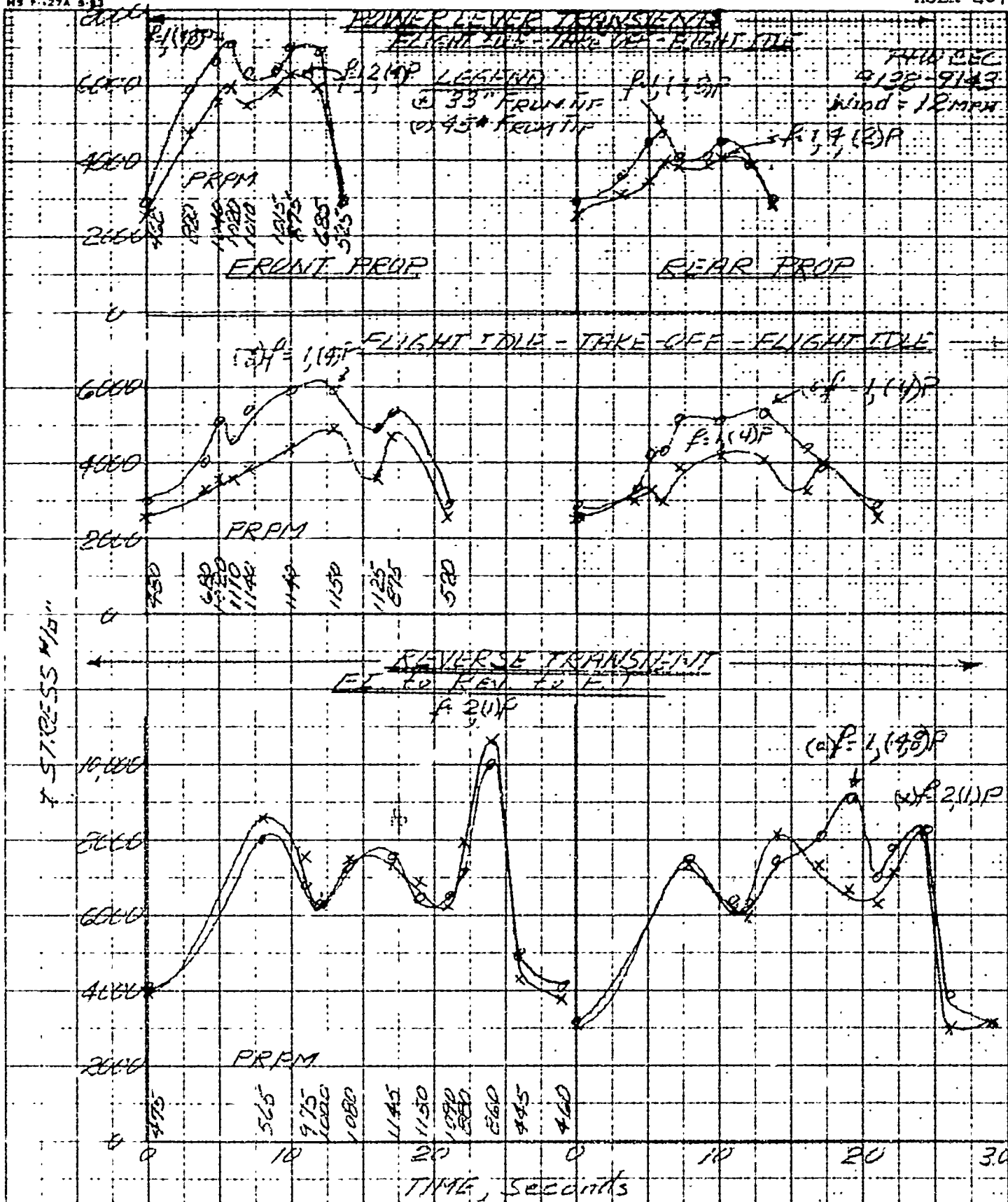
HUB VCE6260
2FD14A3-1 (F)
2FE14A3-6 (R)
BLADE
13'6" (Nom.)
DIAMETER
UNC B-17
AIRPLANE
E. HARTMAN CO. INC.
STAND

ENGINE NO. GE-E260131 TYPE T64-GE-1
DRIVE 1200:1
APPROVED
DRAWN BY GF
DATE 3-29-66
CURVE NO. 46200

BLADE STRESSES ON U.N.C. B-17
DURING 30" CROSSWIND GROUND
TESTS.

HAMILTON STANDARD
DIVISION OF UNITED AIRCRAFT CORPORATION
WINDSOR LOCKS, CONNECTICUT, U. S. A.

MS P-27A 5-53



HUB 1086260

ENGINE NO. 65-6260131

TYPE 764 GE-1

DRIVE 1X208:1

2FE1493-6(F)

2FE1493-6(R)

BLADE 12' 6" (AEM)

DIAMETER

WAC B-17

AIRPLANE

E. HARTFORD (CONV)

STAND

BLADE STRESSES ON WAC B-17

WINDING 30° CROSSWIND

GROUND TESTS

HAMILTON STANDARD

DIVISION OF UNITED AIRCRAFT CORPORATION
WINDSOR LOCKS, CONNECTICUT, U. S. A.

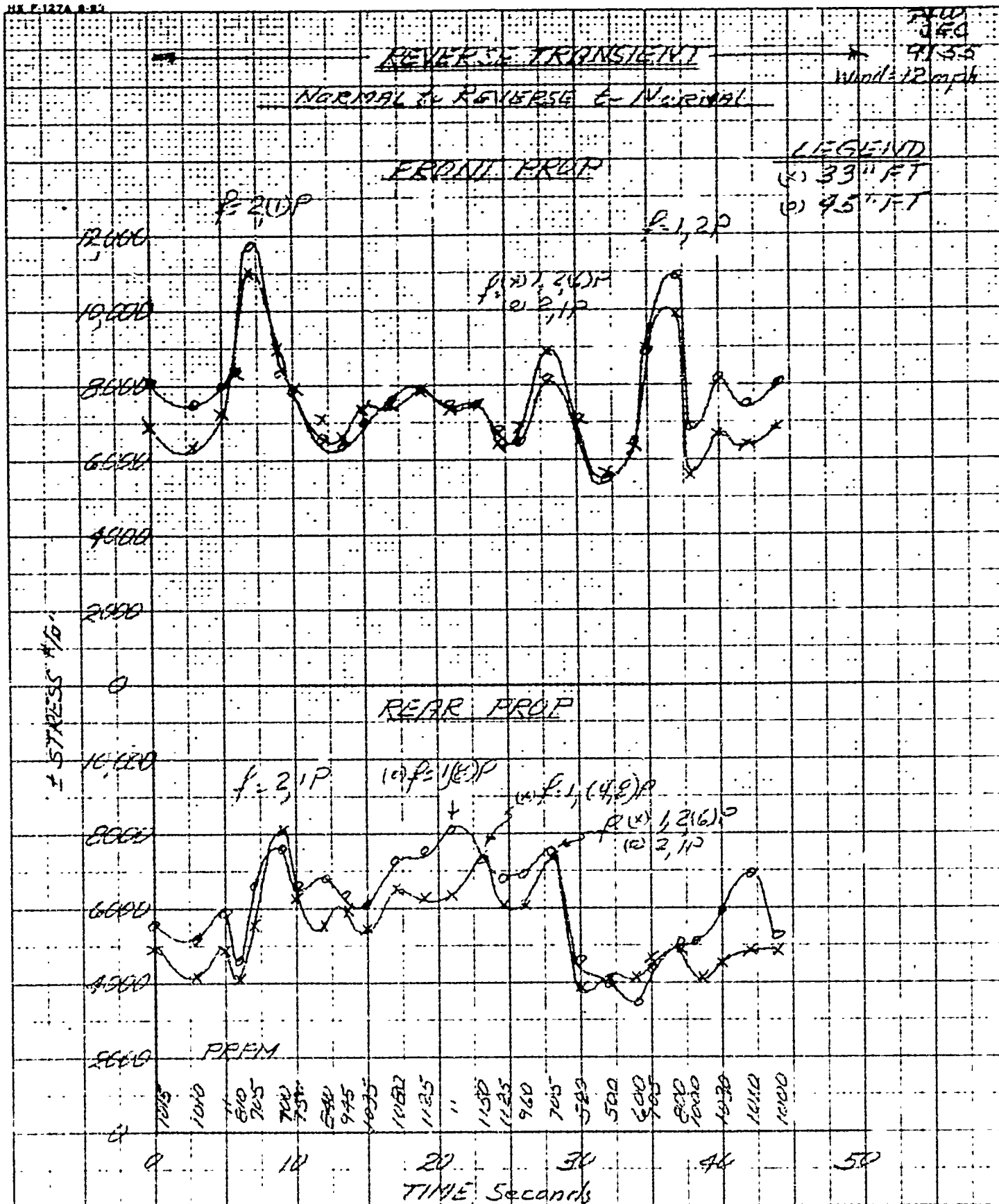
APPROVED

DRAWN BY GF

DATE 3-29-66

CURVE NO.

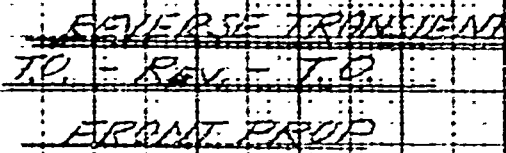
HS F-127A 8-54



HUB VC 86260
2FD1493-2 (F)
2FE493-2 (R)
BLADE 13' 6" (NORM)
DIAMETER
UAC B-17
AIRPLANE
E. HARTFORD, CONN.
STAND

ENGINE NO. GE-6260121 TYPE T-64-GE-1
BLADE STRESSES ON UAC B-17
DURING 50° PRESSURE WIND GROUND
TESTS
HAMILTON STANDARD
DIVISION OF UNITED AIRCRAFT CORPORATION
WINDSOR LOCKS, CONNECTICUT, U. S. A.

DRIVE 120R11
APPROVED
DRAWN BY GF
DATE 3-29-66
CURVE NO. 46004



ALL REC

9/3/3

Wind: 12 mph

LEGEND

1x1.33" FT

(5) 1, (4) 2

[illegible]

10) 45" r/j

[illegible]

PEAR. PROP.

P-2, 1P

6(x)/4P

$$f_1(x) = f_2(x) = f_3(x) = \dots$$

PRAM

1719c, Seconds

NUM. VC 96.260

ENGINE No. GE-E20131

TYPE F-64-5E-1

DRIVE 120511

21-2743-6 (F)

2 FEB 14 1963 (R)
BLADE

12'6" (Nem)

DIAMETER.

495. E. 17

AIRPLANE

E. HARPER, CANN

STAND.

BEAD STRESSES ON WFC = 5.17

DEKRAAF ET AL. CROSS-INKED GELATIN

72573

HAMILTON STANDARD									
-------------------	--	--	--	--	--	--	--	--	--

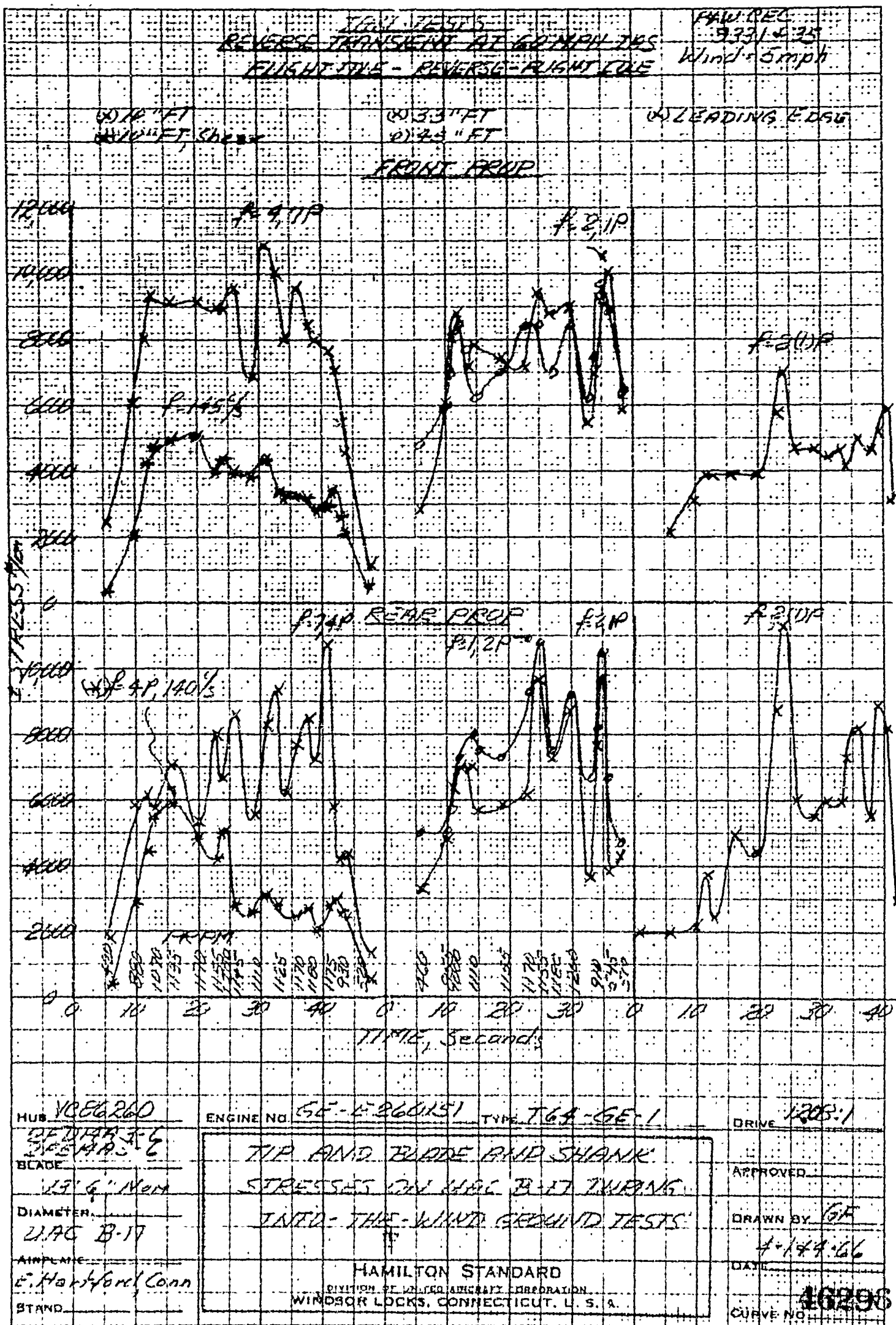
DIVISION OF UNITED AIRCRAFT CORPORATION
WINDSOR LOCKS, CONNECTICUT, U. S. A.

APPROVED

DRAWN BY

DATA

CURVE NO. 5

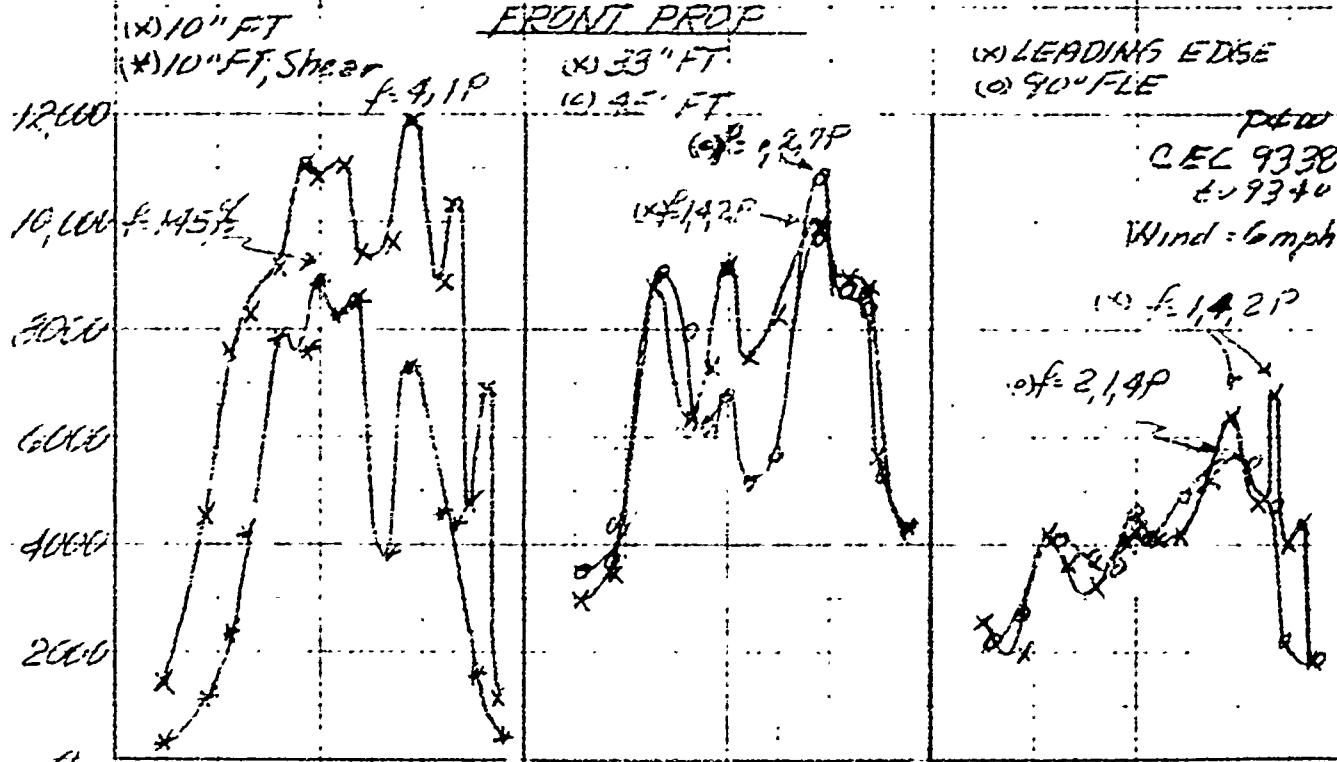


FIGURE

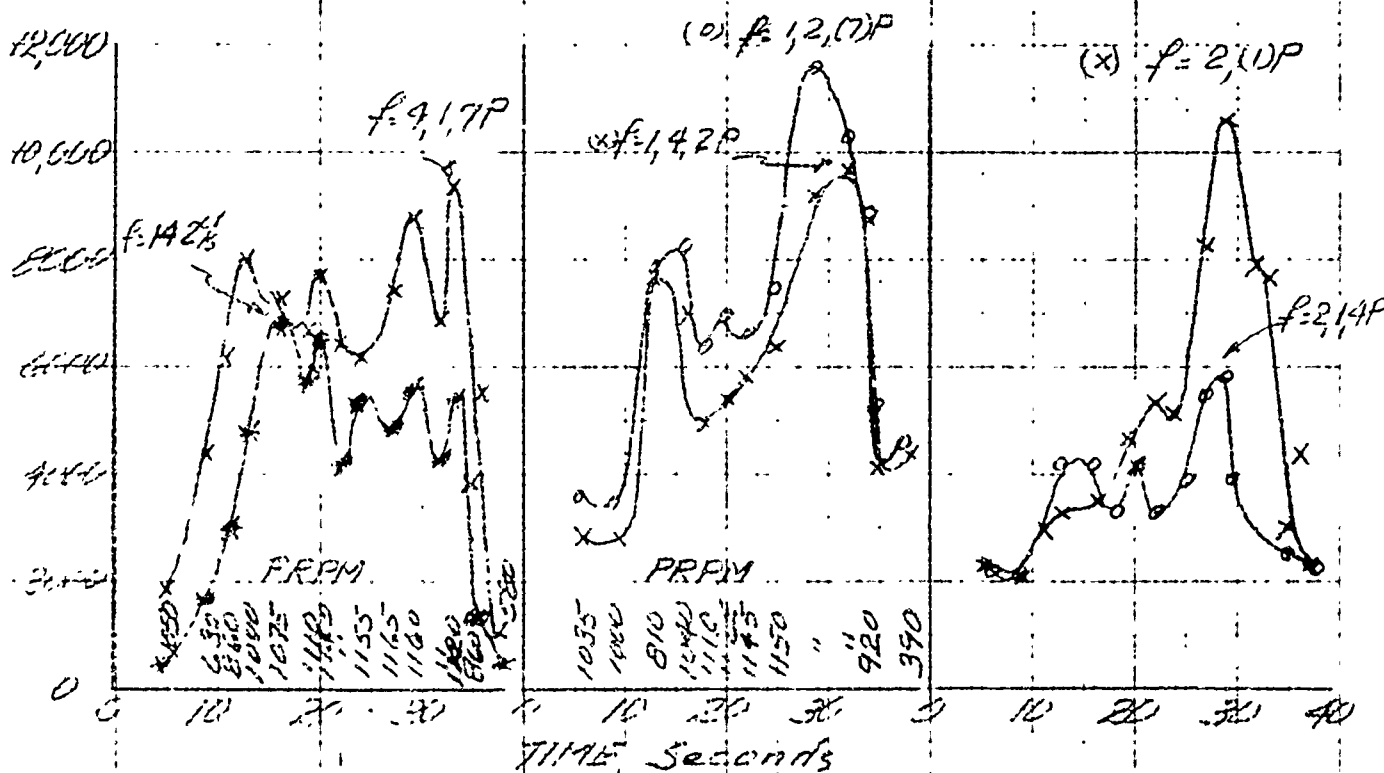
TAXI TESTS - REVERSE TRANS. AT COMH IAS

NORMAL - REVERSE - NORMAL

FRONT PROP



REAR PROP



HUB 100E 200
2FD143-6
2FEH43-6
BLADE

ENGINE NO. GE 5260131 TYPE T64-GE-1

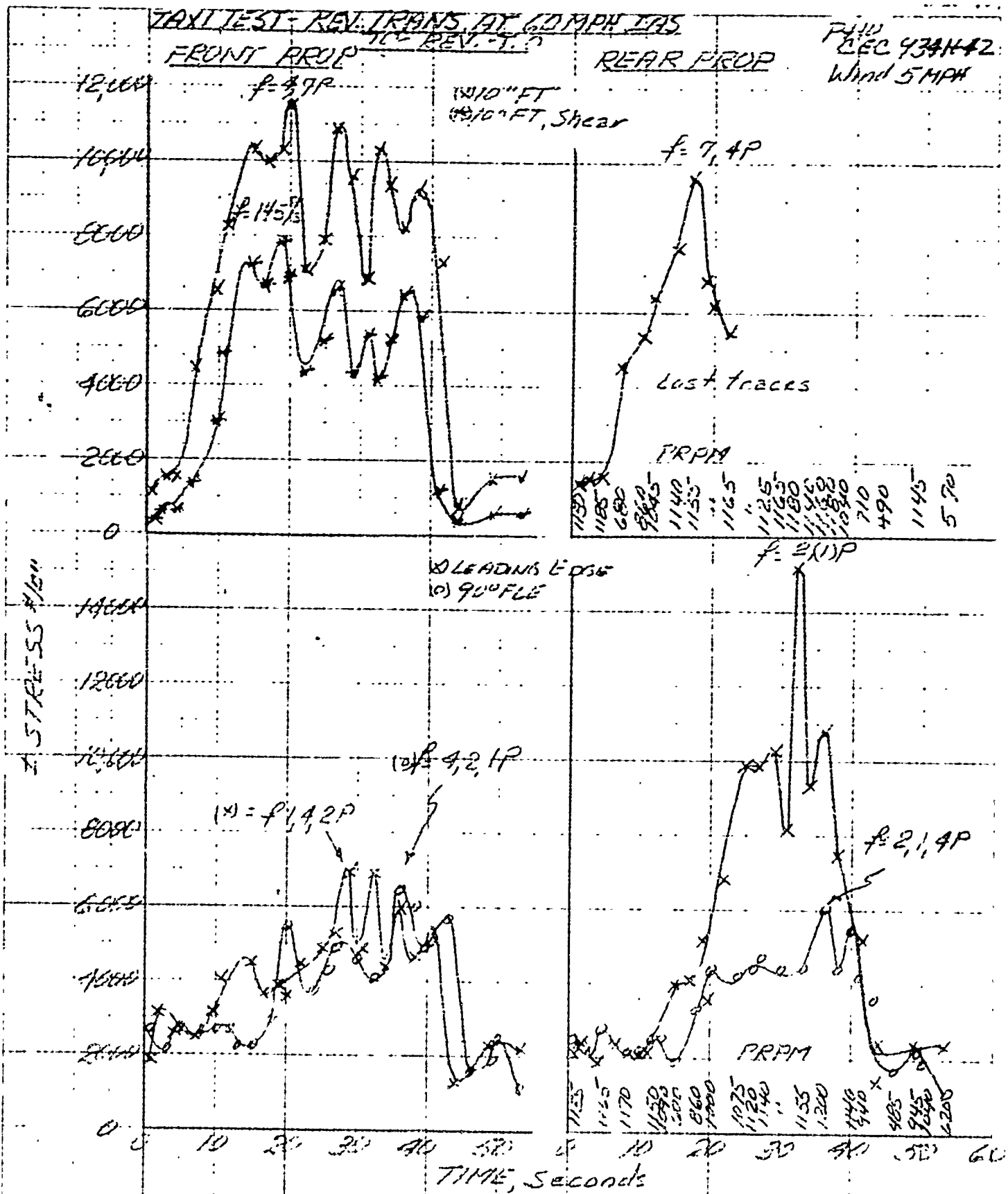
DRIVE 1200:1

13'6" Nom.
DIAMETER
UHC B-17
AIRPLANE
E. Hartford, Conn
STAND

TIF, ROOT AND SHANK STRESSES
ON UHC B-17 TURBINE 90" RE
CROSSWIND GROUND TESTS

HAMILTON STANDARD
DIVISION OF UNITED AIRCRAFT CORPORATION
WINDSOR LOCKS, CONNECTICUT, U. S. A.

APPROVED
DRAWN BY GF
DATE 4-5-66
CURVE NO 46305



HUB V. 57 250
 2FDPA 3-1/2
 2FEPA 3-1/2
 BLADE
 13' 6" diam.
 DIAMETER
 UAC-B-17
 AIRPLANE
 E. Hartford, Conn
 STAND

ENGINE NO. GE-E260131 TYPE T64-GE-1

TIP & SPANK STRESSES ON
 UAC B-17 USING 50" K.B.
 CASE IN WIND GROUND TEST
 HAMILTON STANDARD
 DIVISION OF UNITED AIRCRAFT CORPORATION
 WINDSOR LOCKS, CONNECTICUT, U S A.

DRIVE 1200:1
 APPROVED
 DRAWN BY SF
 DATE 4-5-56
 CURVE NO. 46305

FAW 924142
Wind 5 MPH

TAXI TEST

REV. TRANS AT 60 MPH LOS

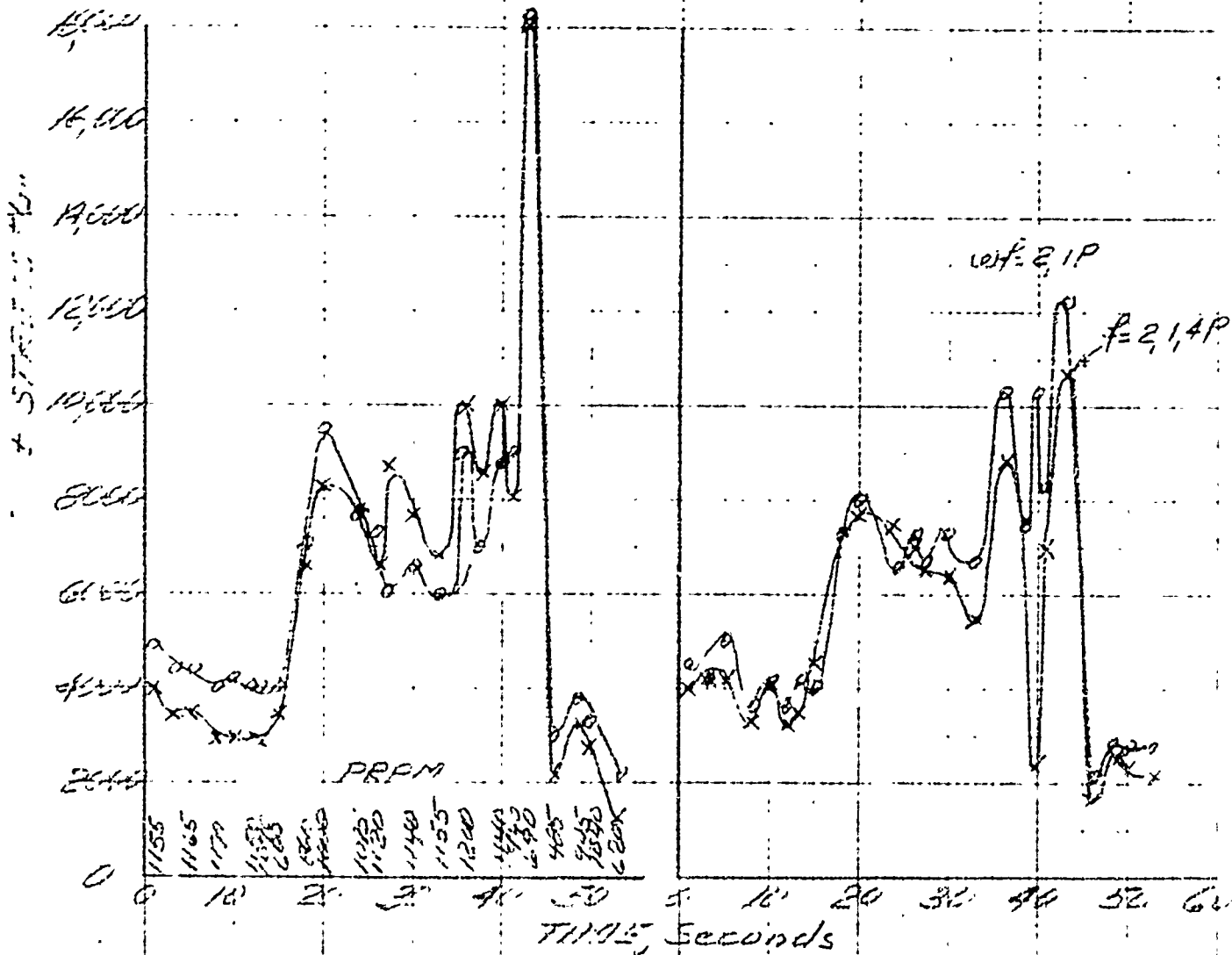
I.D. - REV. - T.O.

FRONT PROP

REAR PROP

(*) 33" FT
(O) 45" FT

(*) F=2,1P



HUB VCER260
EF11A95-6
EF11A95-6
BLADE
13'6" Nom.
DIAMETER
1190 B-17
AIRPLANE
E. HARTFORD
STAND CONIN

ENGINE NO. 66-E 260131 TYPE T64 GE-1

DRIVE REAR

REAL STRESSES IN LINE
B-17 DURING TAKE OFF
CROSSWIND GROUND TEST

HAMILTON STANDARD
DIVISION OF UNITED AIRCRAFT CORPORATION
WINDSOR LOCKS, CONNECTICUT, U S A

APPROVED

DRAWN BY

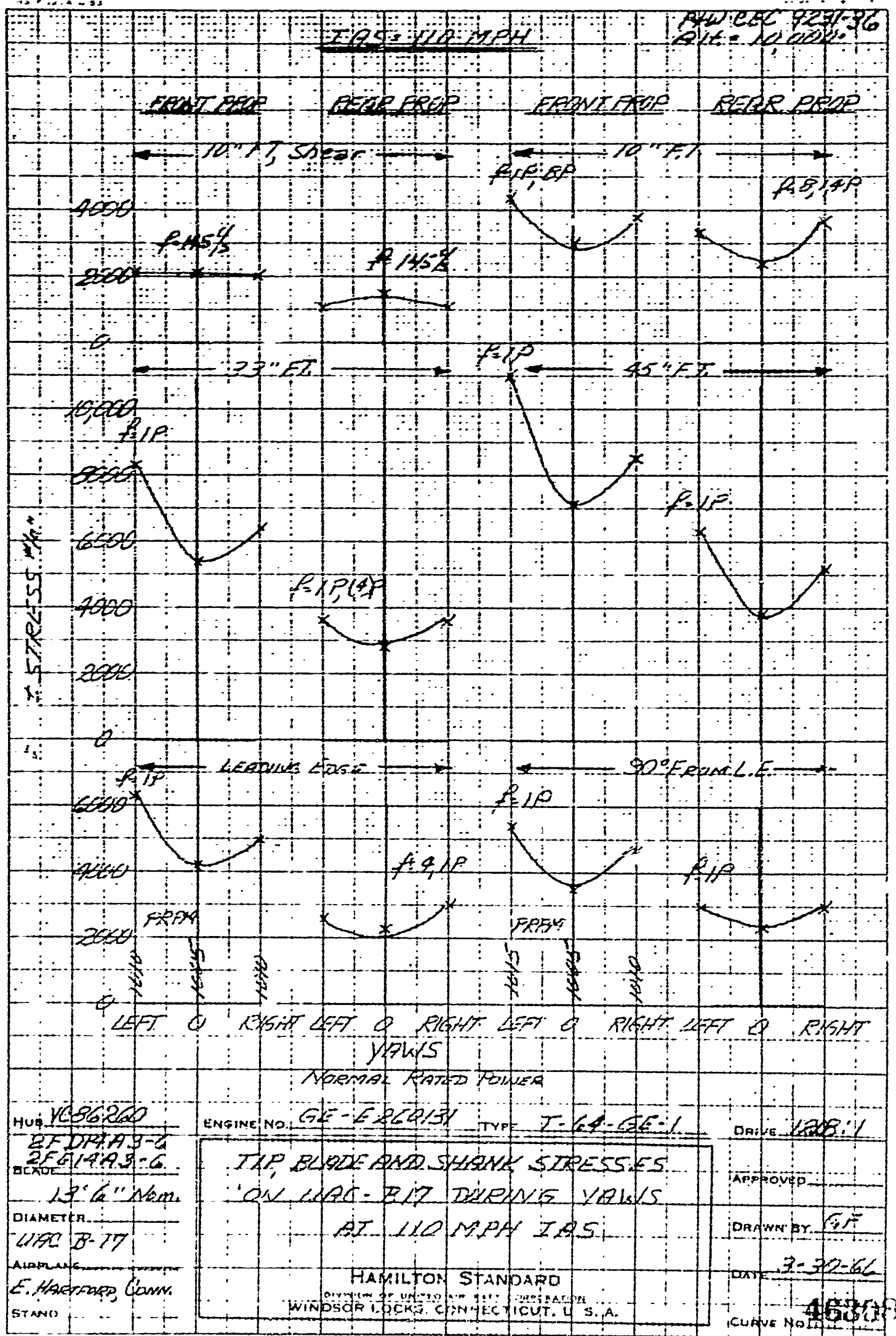
DATE 7-5-66

CURVE NO

4630

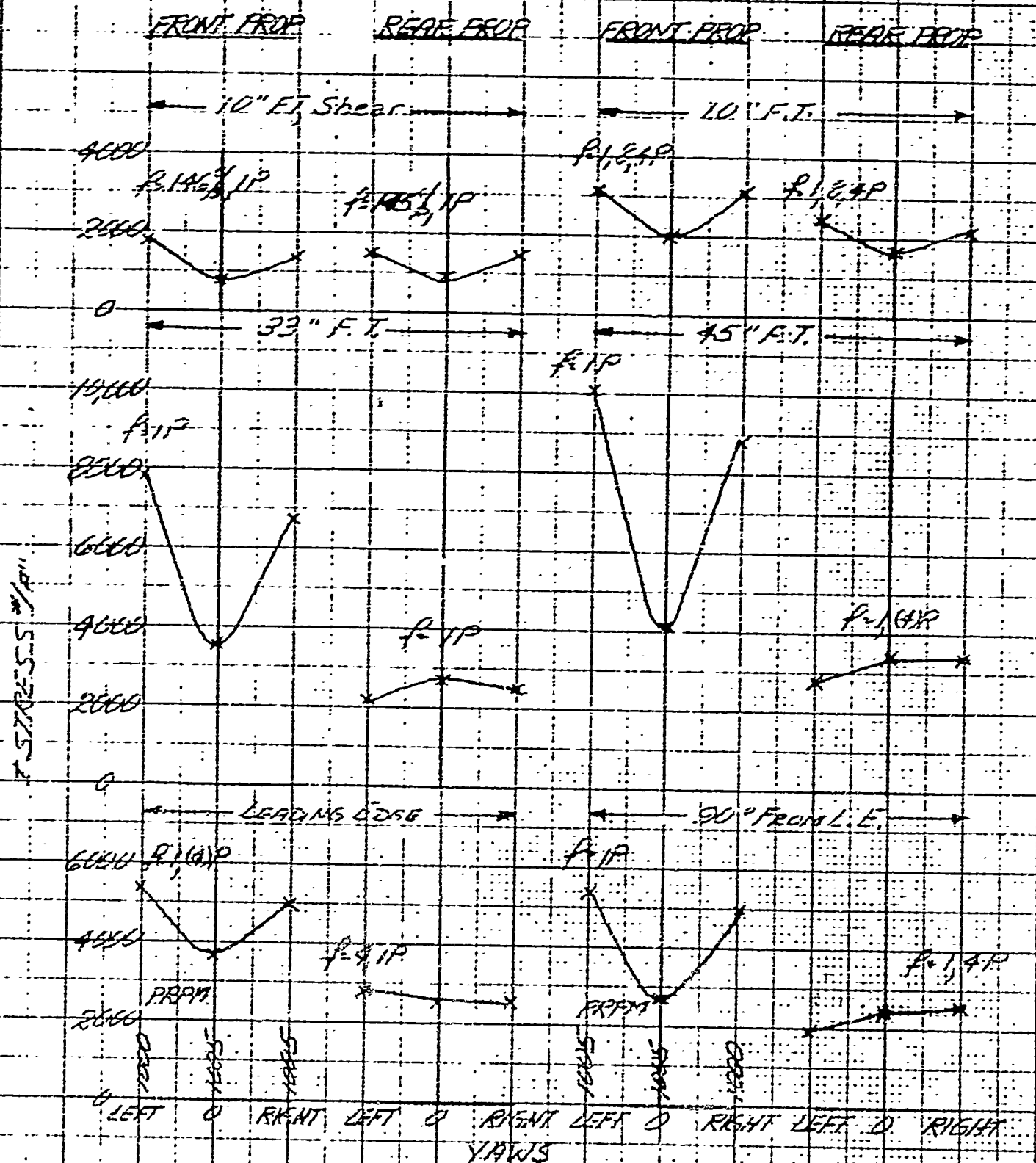
[illegible]





IAS = 160 MPH

FAW C/L 7X37-40
RAH = 10.000



HUB V1086280

ENGINE NO. GE-E 262131 TYPE T-34-GE-1

DRIVE 100%

2FD143-6

2FE1443-6

BLADE

13' 6" NCM

DIAMETER

UAC B-17

AIRPLANE

E. HARTFORD, CONN.

STAND

TIP, BLADE AND SPARK STRESSES
ON UAC B-17 DURING YAW'S
AT 160 MPH IAS,

HAMILTON STANDARD
DIVISION OF UNITED AIRCRAFT CORPORATION
WINDSOR LOCKS, CONNECTICUT, U. S. A.

APPROVED

DATE

DRAWN BY

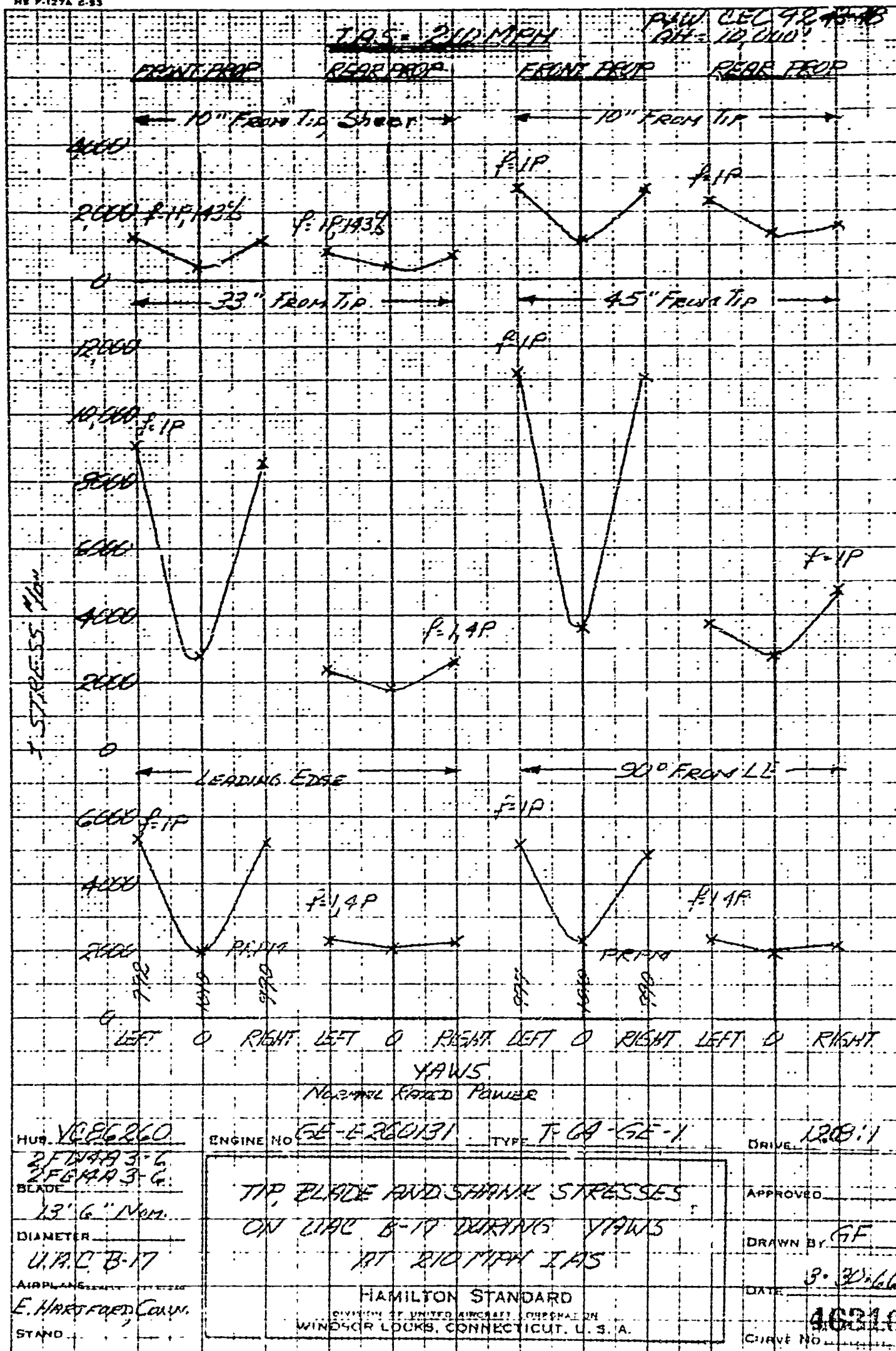
DATE

DATE

DATE

DATE

46300

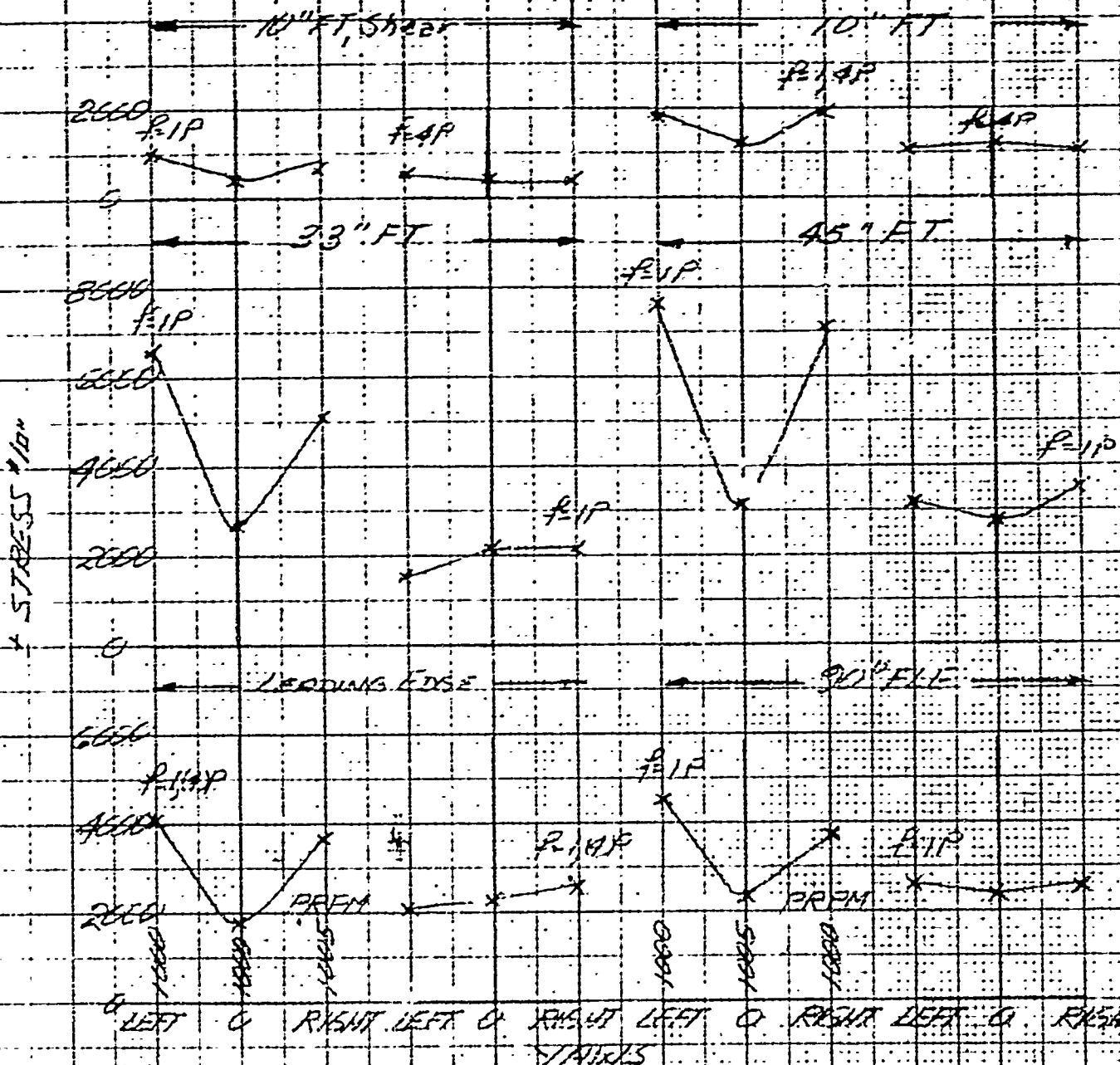


359.11 10 X 10 TO THE 1/2 INCH

RAW DEC 9249-34
RIT 10,000

TAS = 245 MPH

FRONT PROP REAR PROP FRONTER REARER



NORMAL RATED POWER

HUB VCEG 260	ENGINE NO. GE-E 260131	TYPE T-64 GE-1	DRIVE 120811
BLADE 2F1443-6 2F1443-6 13'6" NOM	TIP BLADE AND SPARK STRESSES ON UAC B-17 DURING YAWS AT 245 MPH TAS		APPROVED
DIAMETER UAC B-17	HAMILTON STANDARD DIVISION OF UNITED AIRCRAFT CORPORATION WINDSOR LOCKS, CONNECTICUT, U. S. A.		DRAWN BY GF
AIRPLANE E HARTFORD CONN			DATE 3-30-66
STAND			CURVE NO. 4681

APPENDIX B

PLAN OF TEST

JOB: 50 Hour PFRT of SK56029 Gearbox

PLAN PREPARED BY: D. K. Leishman

PROJECT & ORDER: 102-A05 -100A

APPROVED BY: _____

INSTRUCTION: _____

TEST ENGINEER: D. K. Leishman

TIME PERIOD: 8-30-65

TO 10-30-65

1. WHAT IS ITEM BEING TESTED?
2. WHY IS TEST BEING RUN? WHAT WILL RESULTS SHOW OR BE USED FOR?
3. DESCRIBE TEST SET UP INCLUDING INSTRUMENTATION. ATTACH SKETCH OF INSTALLATION.
4. ITEMIZE RUNS TO BE MADE GIVING LENGTH OF EACH AND READINGS TO BE TAKEN.
5. SPECIAL INSTRUCTIONS. SAFETY PRECAUTIONS FOR OPERATORS AND HANDLING EQUIPMENT. OBSERVATIONS BY SIGHT, FEEL, OR HEARING. LIST POINTS OF OBSERVATION WHICH MIGHT CONTRIBUTE TO ANALYSIS OF (A) PERFORMANCE OF UNITS, (B) INCIPIENT TROUBLE BEFORE IT OCCURS, AND (C) CAUSE OF FAILURE.
6. HOW WILL DATA BE USED OR FINALLY PRESENTED? GIVE SAMPLE PLOT, CURVE, OR TABULATION AS IT WILL BE FINALLY PRESENTED.

NUMBER ENTRY AS LISTED ABOVE AND DESCRIBE BELOW

1,	Test Item
1.1	The item being tested is the SK56029 speed reduction gearbox as defined by Model Specification 5067 (Ref. MIL-P-26366A Par. 4.5.2.4).
1.2	The same test gearbox shall be used for the entire 50 hour test (Ref. MIL-P-26366A Par. 4.5.2.1.2).
2.0	Object of Test
2.1	The object of the test is to fulfill the PFRT 50-hour engine test requirements of contract NOW 64-0635-di in accordance with Par. 4.5.2 of MIL-P-26366A and to demonstrate satisfactory gearbox operation and durability.
3.0	Test Installation and Instrumentation
3.1	The gearbox shall be mounted on a T64-GE-6 engine in "E" propeller test house at Hamilton Standard. A VC86260-5 propeller will be mounted on the gearbox. (Ref. MIL-P-26366A Par. 4.5.2.1.1.1).
3.2	The instrumentation shall be as necessary to monitor the parameters defined in Table I.
3.2.1	During the flight cycle portion of the test, the Sanborn Recorders shall be operated at a paper speed of 1MM/second and during the steady state and transient checks the paper speed shall be 2.5 MM/second and 10 MM/second respectively. (Ref. MIL-P-26366A Par. 4.5.2.7.1 and 4.5.2.7.2.

- 3.3 Prior to the test, the gearbox oil system shall be drained and filled with new MIL-L-7808 oil. The amount required to completely fill the system shall be recorded.
- 3.3.1 The oil inlet temperature to the gearbox shall be $215 \pm 10^{\circ}\text{F}$.
- 3.3.2 The back pressure on the scavenge pump shall be 30 ± 1 psig at maximum propeller speed (1160).
- 3.3.3 Since the gearbox and engine use a common oil supply, some additional oil will be required during the test to make up oil consumed by the engine. The addition of this oil shall not be considered a "deviation from normal operation" as defined by 4.5.2.10 of MIL-P-26366A.
- 3.3.4 The propeller shall be serviced with MIL-H-6083B Type I hydraulic fluid. The engine shall be started, and the propeller operated in the governing range (1015-1160 rpm) for 15 minutes. During this period, the propeller shall be exercised with movements of both the power and condition levers. Fifteen reversals from 900 rpm shall be made. The engine shall then be shutdown, the oil level in the control checked, and if necessary, oil added.

If oil is added, repeat this procedure.

- 3.4 The engine propeller control linkages shall be checked prior to the initiation of actual testing. Power and condition levers shall be checked for correct rigging and to insure full range of travel. The established relationships between the control linkages shall be recorded. Only external means shall be used for any required adjustments. A normal checkout of the electrical system shall be made before testing. (Ref. MIL-P-26366A Par. 4.5.2.5).

4.0 Test Runs

- 4.1 Test scope. The test shall consist of steady state and transient performance checks, and fifty (50) one-hour flight cycles.
- 4.2 Response. Steady state and transient operation shall be checked in accordance with 4.2.1 and 4.2.2 prior to and following the cyclic portion of the test.
- 4.2.1 Steady state operation. After all external adjustments have been made to obtain the require operational performance, a calibration shall be conducted to obtain the steady-state data as specified in 3.2 for the following series of power lever settings. (Ref. Table II) (Ref. MIL-P-26366A Par 4.5.2.7.1)
- (1) Reverse
 - (2) Ground Idle
 - (3) Flight Idle
 - (4) 60% Normal
 - (5) 80% Normal
 - (6) Normal
 - (7) Take-off

4.2.2 Transient operation, after completion of the steady state check, data will be recorded automatically as specified in 3.2 for the following series of transients. All lever movements shall be made in one second or less with time allowed for stabilization of propeller speed at each new condition. (Ref. Table II) (Ref. MIL-P-26366A Par. 4.5.2.7.2).

- (1) Flight idle to 60% normal to flight idle
- (2) Flight idle to 80% normal to flight idle
- (3) Flight idle to normal to flight idle.
- (4) Flight idle to take-off to flight idle
- (5) Flight idle to take-off to ground idle
- (6) Flight idle to take-off to reverse
- (7) Flight idle to reverse
- (8) Ground idle to flight idle
- (9) Take-off to 60% normal to take-off
- (10) Take-off to 80% normal to take-off
- (11) Take-off to ground idle to take-off
- (12) Take-off to reverse to take-off
- (13) Flight idle to 60% normal to flight idle
- (14) Flight idle to 80% normal to flight idle
- (15) Ground idle to flight idle to take-off to ground idle
- (16) Ground idle to flight idle to take-off to reverse
- (17) Flight idle to reverse to take-off

Note: In (15) and (16) a maximum of 5 seconds shall be used in going from ground idle through flight idle to take-off holding take-off power for 3 second before moving to the next power setting.

4.2.3 Miscellaneous checks. After completion of the transient operation following the cyclic portion of the test, the following miscellaneous checks shall be made. (Ref. MIL-P-26366A Par. 4.5.2.7.3)

- (1) Feather shutdown from flight idle power accomplished with the condition lever.
- (2) Feather shutdown from normal power accomplished with the feather button. Fuel shall be shut off simultaneously.
- (3) Static feathering and unfeathering after shutdown.
- (4) With the propeller in the static condition, reduce the voltage to the propeller to 17 volts. Then feather, unfeather, reverse, and unreverse the propeller.
- (5) Increase the voltage to the propeller to 29 volts, then feather, unfeather, reverse, and unreverse the propeller.
- (6) With the propeller operating at 60% normal power set the condition lever for 1160 rpm. Record propeller rpm and blade angle. Using the power lever, reverse the propeller. Repeat the foregoing procedure three times. (Check LPS operation.)

4.3 Cyclic test. Following the response tests, the gearbox shall be subjected to 50 successive one-hour flight cycles as defined by curve P29722 and Table II.. (Ref. MIL-P-26366A Par 4.5.2.8)

- 4.3.1 After the first, third, and sixth hour of operation and after every tenth hour thereafter, the gearbox shall be subjected to an external visual examination for signs of part distress or other irregular functioning. (Ref. MIL-P-26366A Par 4.5.2.8)
- 4.3.2 The log shall be maintained on a half hour basis throughout this test. In addition the required data shall be recorded at each operating condition during the first and fifth flight cycles and each fifth flight cycle of operation thereafter.
- 4.3.3 Should any of the following deviations from normal operation occur, the cognizant engineer shall be notified and the Government representative shall determine whether accrued creditable hours shall be disallowed.
- (1) Failure of any component adversely affecting gearbox performance or integrity
 - (2) Detection of any failure or excessive wear of any component during teardown inspection.
- 5.0 Special Instructions
- 5.1 Pre-test inspection. Prior to initiation of testing the disassembled gearbox shall be made available for both Government and HSD engineering inspection. At this time a record shall be made of any wear or part deviation. The gearbox shall be assembled per HS 1455.
- 5.2 Post-test inspection. At the completion of testing per 4.2, 4.3, and 4.4 the gearbox again will be completely disassembled for inspection. Parts will be examined for wear and compared with pre-test examination records. Photographs will be made of any unusual wear. (Ref. MIL-P-26366A Par. 4.5.2.9).
- 5.3 The following limits will be observed during the test.
- | | |
|--------------------------------|---------------|
| (1) Turbine inlet temperatures | 1160°F |
| (2) Input torque | 1200 ft. lbs. |
| (3) Propeller speed | 1160 rpm |
- 6.0 Data Presentation
- 6.1 The final data from this test will be included in the final report covering the VC86260 flight test program.

TABLE I

<u>Measurement</u>	<u>Limit</u>
<u>Gearbox</u>	
Lube oil inlet temperature	225°F max.
Lube oil outlet temperature	350°F max.
Lube oil pressure	30-80 psig
Lube oil flow	20-60 gpm
Lube oil inlet pressure	5 psia min.
Scavenge discharge pressure	30 psig max.
Vibration (6)	100 mils max. below 100 cps 20 mils max. below 70 cps 4 mils max. above 70 cps
Vent pressure	0-1 in of Hg
Brake actuation pressure	1600 psig max.
<u>Engine</u>	
Power turbine speed	17,000 rpm max.
*Gas generator speed	18,500 rpm max.
Torque	1200 ft-lbs. max.
Vibration (4)	4 mils max. steady state 8 mils max. peaking
Lube oil inlet pressure	5 psia min.
Scavenge discharge pressure	30 psig max.
Lube oil pressure	15 psig min.
Lube oil inlet temperature	225°F max.
Lube oil outlet temperature	310°F max.
Fuel flow	

Plan of Test 128PT-89

Table I (Continued)

<u>Measurement</u>	<u>Limit</u>
Fuel inlet pressure	50 psig max.
Fuel manifold pressure	
Turbine vent pressure	
Diffuser vent pressure	
Compressor inlet pressure	
Compressor discharge pressure	
Turbine inlet temperature	1160°F max.
Compressor inlet temperature	
<u>Propeller</u>	
*Front blade angle	-21° to +83°
*Speed	1200 rpm max.
*Condition lever	0-160°
*Power lever	0-170°
*High pitch pressure	1300 psig max.
*Low pitch pressure	800 psig max.
*Pitchlock pressure	300 psig max.
Control temperature	250°F max.

Parameters noted by* are to be recorded on Sanborn recorders.

TABLE IITest Conditions

<u>Condition</u>	<u>Power (HP)</u>	<u>Propeller Speed Setting (rpm)</u>	<u>Input Torque (ft-lb)</u>
Take-off	2765	1160	1036
Military	2570	1160	963
Normal	2245	1015	961
90% Normal	2020	1015	865
80% Normal	1796	1015	769
75% Normal	1684	1015	721
60% Normal	1347	1015	577
Flight Idle	300 (max)	---	---
Ground Idle	190 (max)	---	---
Reverse	2530	1160	---

Plan of Test 128PT-89

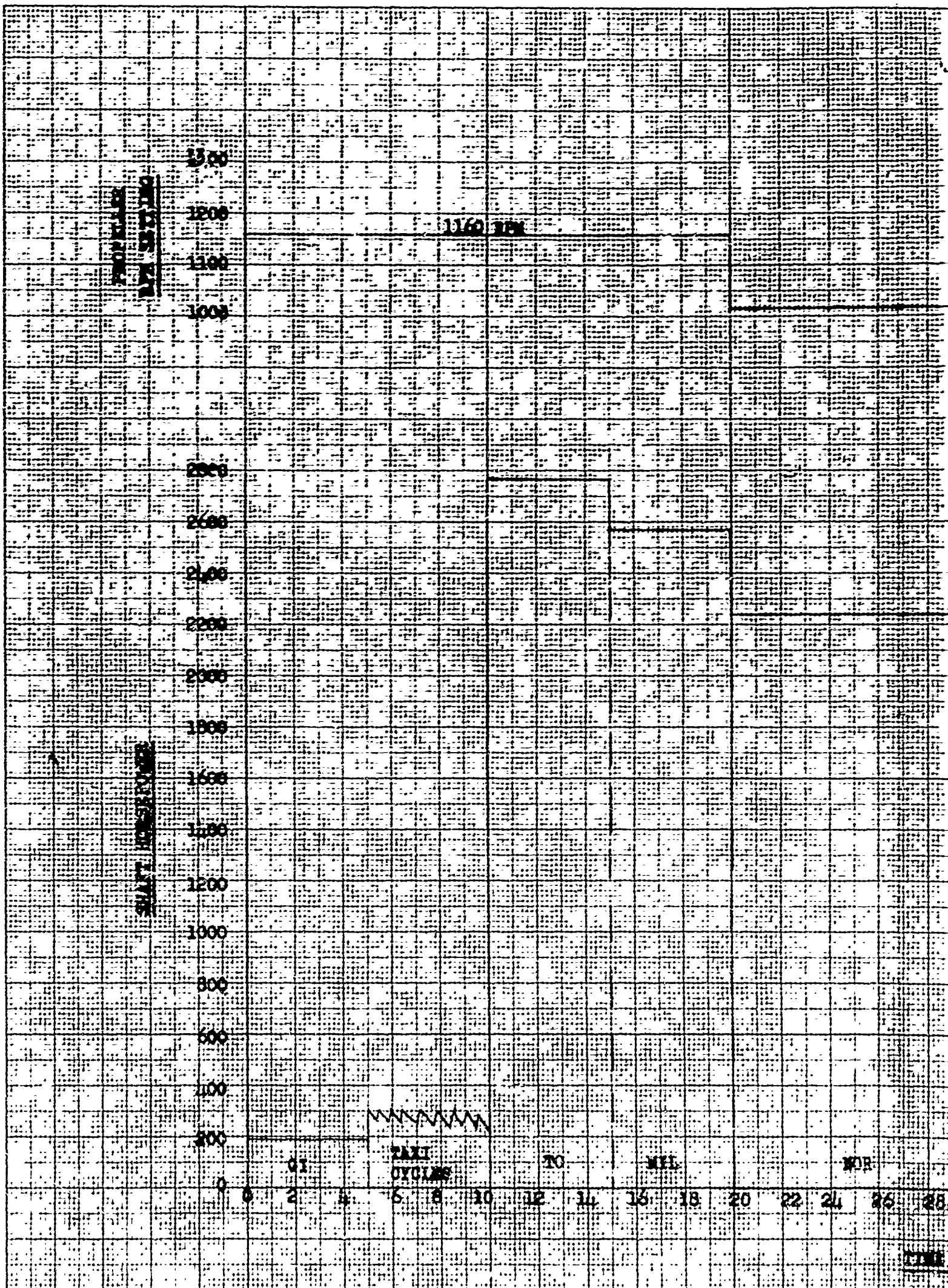
TABLE III

PARTS LIST DEVIATION

<u>Parts List</u>	<u>Quantity</u>	<u>Part Replaced</u>	<u>Substitute Part</u>	<u>Reason</u>
SK 56029	1	583726 Pinion	128X421	Identical except for instrumentation rework

EUGENE DIETZGEN CO.
MADE IN U. S. A.

A-3 3400 M DIETZGEN GRAPH PAPER
MILLIMETER



A

1160 RPM

1015 RPM

ONE HOUR TEST FLIGHT CYCLE

TAXI CYCLE

GI TO REV TO FI TO GI

REPEAT 10 TIMES IN 5

MINUTES ALTERNATELY

FAST AND SLOW

D. E. LAMAR CURVE NO.

TYPE T. 225

125722

90% NORMAL

75% NORMAL

FLIGHT
IDLE

REVERSE

TAXI
CYCLES

30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60

MINUTES

4.0 TEST RUNS

4.1 Test scope. The test shall consist of a vibration stress survey, a nacelle temperature survey, propeller steady state and transient performance checks, propeller attitude operation checks, and flight cycles.

4.2 Vibration stress survey.

4.2.1 Reference - Plan of Test 128PT-01.

4.3 Nacelle temperature survey. (Repeat on ground and at 5000', IAS 200 mph.) The temperatures at the points noted in Table II shall be measured at the following power settings. The setting shall be maintained until the temperatures stabilize. (Ref. Table III)

1. Flight Idle
2. Take-off

4.4 Control Response. (Repeat on ground and at 5000', 10,000', 20,000', and 30,000' with IAS of 150 mph and max attainable.) Steady state and transient operation shall be checked in accordance with 4.4.1, 4.4.2, 4.4.3, and 4.4.4. as limited by engine power.

4.4.1 Steady state operation. A calibration shall be made to obtain steady state data as specified in 3.2 for the following series of power settings. (Ref. Table III)

1. Ground Idle
2. Flight Idle
3. 60% Normal
4. 80% Normal
5. Normal
6. Take-off

4.4.2 Condition lever transients. After completion of the steady state check, data will be recorded as specified in 3.2 for the following series of transients. (Ref. Table III) All condition lever movements shall be made in one second or less, with a pause to allow conditions to stabilize between burst and chop.

1. Set power at 60% normal
 - a. 1000 rpm to 1250 rpm to 1000 rpm
 - b. 900 rpm to 1250 rpm to 900 rpm
 - c. 800 rpm to 1250 rpm to 800 rpm
 - d. 700 rpm to 1250 rpm to 700 rpm
2. Set power at 80% normal
 - a. 1000 rpm to 1250 rpm to 1000 rpm
 - b. 900 rpm to 1250 rpm to 900 rpm
 - c. 800 rpm to 1250 rpm to 800 rpm

3. Set power at normal

- a. 1000 rpm to 1250 rpm to 1000 rpm
- b. 900 rpm to 1250 rpm to 900 rpm

4. Set power at take-off

- a. 1100 rpm to 1250 rpm to 1100 rpm
- b. 1050 rpm to 1250 rpm to 1050 rpm

4.4.3 Power lever transients. After completion of the condition lever transients data will be recorded as specified in 3.2 for the following series of transients. (Ref. Table III). All lever movements shall be made in one second or less, with a pause to allow conditions to stabilize between burst and chop.

1. Set condition lever at 1130 rpm

- a. 80% normal to normal to 80% normal
- b. 60% normal to normal to 60% normal
- c. Flight idle to normal to flight idle
- d. Normal to take-off to normal
- e. 80% normal to take-off to 80% normal
- f. 60% normal to take-off to 60% normal
- g. Flight idle to take-off to flight idle

2. Set condition lever at 1250 rpm and repeat the power lever movements of 1.

4.4.4 Transient operation. After completion of the power lever transients, data will be recorded as specified in 3.2 for the following series of transients. (Ref. Table III)

1. Flight idle to 60% normal to flight idle
2. Flight idle to 80% normal to flight idle
3. Flight idle to normal to flight idle
4. Flight idle to take-off to flight idle
5. Take-off to 80% normal to take-off
6. Take-off to 60% normal to take-off
7. Take-off to ground idle to take-off

4.5 Feathering and unfeathering checks. Check electrical and mechanical feathering and unfeathering operation at ground idle power of the test engine, at altitudes of 5000', 10,000', 20,000', and 30,000' with IAS of 150 and max attainable.

4.6 Taxi Tests

4.6.1 Make reverse transients at forward velocities of 20, 40, and 60 mph IAS from the following test engine powers.

1. Flight idle
2. Normal
3. Take-off

4.7 Attitude checks.

- 4.7.1 With the test propeller operating at 80% of normal power, altitude of 20,000' and max attainable airspeed, check gearbox operation with the aircraft in level flight inclined 20° to each side for a period of five minutes.
- 4.7.2 With the test propeller operating at 90% normal power, altitude of 20,000' and max attainable airspeed, check gearbox operation with the aircraft in level flight inclined up to 45° to each side for a period of 30 seconds.
- 4.7.3 With the test propeller operating at 60% normal power, altitude of 20,000', check gearbox operation with the aircraft in as steep a nose-down attitude (45° max) as possible inclined 10° to each side for as long as possible.
- 4.7.4 With the test propeller operating at take-off power, altitude of 5000', check gearbox operation with the aircraft in the steepest possible nose-up attitude inclined 10° to each side for as long as possible.
- 4.7.5 With the test propeller operating at normal power, altitude of 20,000', check gearbox operation with the aircraft being flown in a manner to exert a force of negative one "g" for a period of up to sixty seconds.
- 4.7.6 With the test propeller operating at normal power, altitude of 20,000', check gearbox operation with the aircraft being flown in a manner to exert a zero "g" condition for a period of up to thirty seconds.
- 4.8 Flight cycles. The time necessary to accumulate a total of 50 hours of test will be made up of one-hour flight cycles as defined by Table III and Curve 1. Each cycle will be started at an altitude of 1000'. Half of the cycles will be run with an oil inlet temperature to the test engine and gearbox of 200-225°F, and the remainder with an inlet temperature as cold as possible.

5.0 SPECIAL INSTRUCTIONS

- 5.1 The oil used for the propeller, gearbox, and engine shall be MIL-L-7808.
- 5.2 The maximum input torque to the gearbox shall be 1135 ft-lbs.
- 5.3 The maximum steady state propeller speed shall be 1250 rpm.
- 5.4 The maximum allowable turbine inlet temperature shall be 1180°F.
- 5.5 Brake actuation pressure shall be 1600 psig maximum.
- 5.6 If safety of flight considerations indicate that #2 and #3 propellers should not be feathered in flight, avoid continuous operation of #2 and #3 engines between 1200 and 1600 rpm and between 2300 and 2600 rpm if #5 propeller is operating above flight idle power.
- 5.7 Avoid ground running on #5 propeller between 900 and 1050 rpm at gear box input torques above 960 ft-lbs.

TABLE I

<u>Parameter</u>	<u>Range</u>	<u>Visual</u>	<u>Automatic Recording</u>
Aircraft attitude		x	
Blade Angle	-21° to +73°	x	x
Control temperature	0 to 300°F	x	
High pitch pressure	0 to 1500 psi	x	x
Low pitch pressure	0 to 1000 psi	x	x
Pitchlock pressure	0 to 1500 psi	x	x
Gearbox vent pressure	0 to 5 psi	x	
Gearbox lube pump inlet pressure	-25" to +25 psi	x	
Gearbox scavenge pressure	0 to 30 psi	x	
Gearbox lube pressure	0 to 150 psi	x	
Gearbox lube flow	0 to 75 cpm	x	
Gearbox lube in temperature	0 to 225°F	x	
Gearbox lube out temperature	0 to 275°F	x	
Gearbox vibration (6)	0 to 20 mils	x	
Brake pressure	0 to 1600 psi	x	
Power turbine rpm	0 to 17000 rpm	x	x
Gas generator rpm	0 to 19000 rpm	x	
Torque	0 to 1200 ft-lbs.	x	
Fuel Flow	0 to 1500 gph	x	x
Turbine inlet temperature	0 to 1160°F	x	
Engine oil temperature	0 to 250°F	x	
Engine oil pressure	0 to 100 psi	x	
Engine vibration (4)	0 to 5 mils	x	
Power lever	0 to 125°	x	x
Condition lever	0 to 110°	x	x
Outside Air temperature		x	
Aircraft weight		x	

TABLE II

Nacelle Temperature Survey

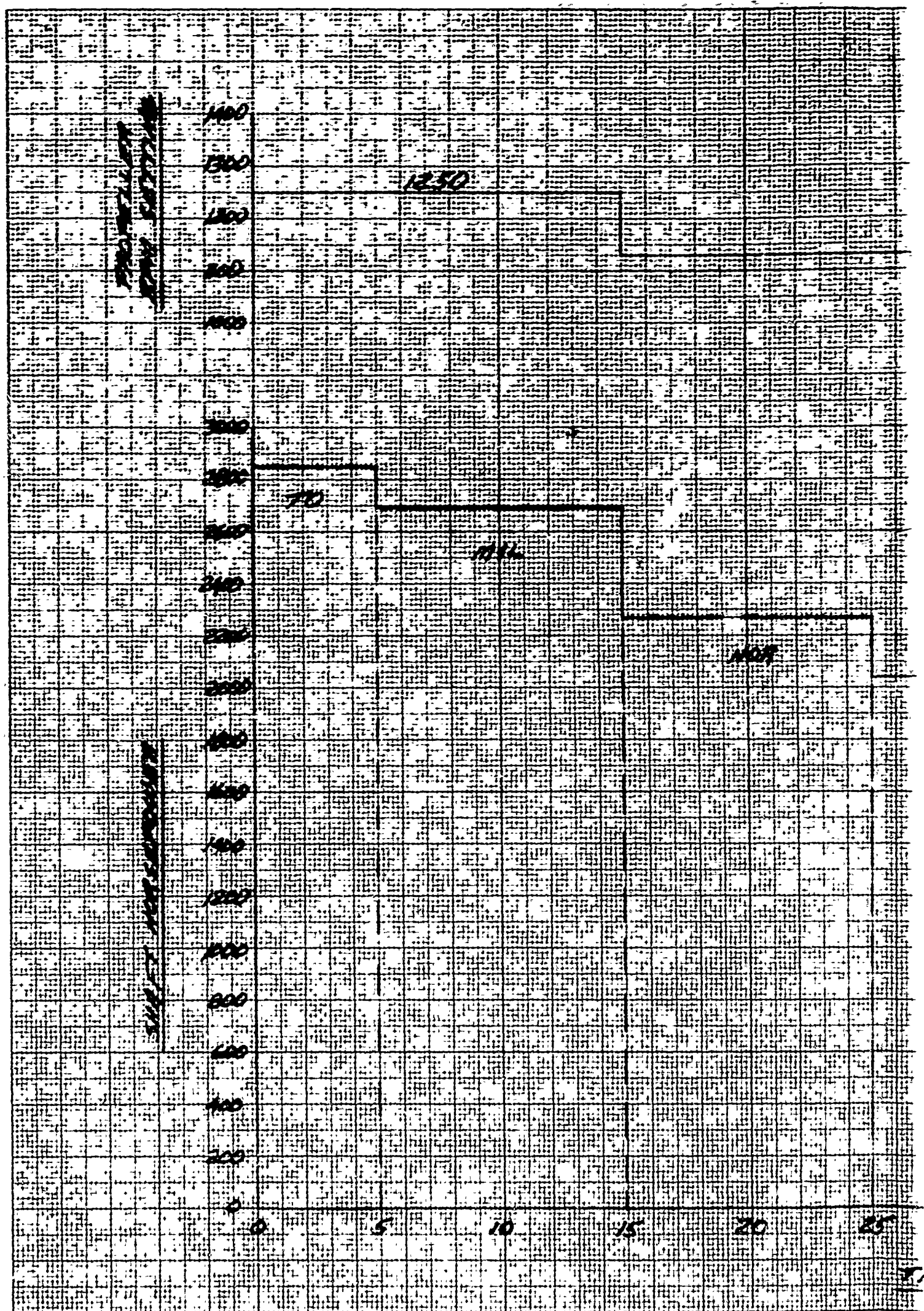
All temperatures are washer type T/C's.

<u>Location</u>	<u>Range</u>
Engine:	
Strut mount pad top	0-300°F
Accy. case bolt circle	0-300°F
Exner case top	0-1000°F
Turbine casing forward top	0-1000°F
Turbine casing aft top	0-1000°F
Lord mount	0-300°F
Nacelle:	
Firewall beam	0-300°F
Propeller-Gearbox:	
Control	0-300°F
Gearbox Rear	0-300°F
Lube oil in	0-300°F
Lube oil out	0-300°F

TABLE III

Test Conditions

<u>Condition</u>	<u>Nominal Power (hp)</u>	<u>Propeller Speed Setting (rpm)</u>	<u>Input Torque (ft-lbs)</u>
Take-off	2850	1250	991
Military	2690	1250	935
Normal	2270	1130	877
90% normal	2045	1130	790
80% normal	1816	1130	702
75% normal	1700	1130	656
60% normal	1360	1130	534
Flight idle	300 max.	---	---
Ground idle	190 max.	---	---



A

1250

1130

MYL

NOR

20% NOR

25% NOR

5

10

15

20

25

30

35

40

TIME - MINUTES

1130

CURVE R

ONE HOUR FLIGHT CYCLE

0-15 MIN CLIMB

16-45 MIN LEVEL FLIGHT

46-60 MIN DESCENT

START CLIMB AT 1000 FT

LEVEL FLIGHT AT 10000-15000 FT

% NOA

25% NOA

FI

MINUTES

C

PLAN OF TEST

JOB: Vibration Survey of 73ECB1 Propeller PLAN PREPARED BY: S. Parsons
 PROJECT & ORDER: 104-ACG-100A APPROVED BY: S. Parsons
 INSTRUCTION: _____ TEST ENGINEER: D.K. Leishman
 TIME PERIOD: November 1965 TO January 1966

1. WHAT IS ITEM BEING TESTED
2. WHY IS TEST BEING RUN? WHAT WILL RESULTS SHOW OR BE USED FOR?
3. DESCRIBE TEST SET UP INCLUDING INSTRUMENTATION. ATTACH SKETCH OF INSTALLATION.
4. ITEMIZE RUNS TO BE MADE GIVING LENGTH OF EACH AND READINGS TO BE TAKEN.
5. SPECIAL INSTRUCTIONS: SAFETY PRECAUTIONS FOR OPERATORS AND HANDLING EQUIPMENT. OBSERVATIONS BY SIGHT, FEEL, OR HEARING. LIST POINTS OF OBSERVATION WHICH MIGHT CONTRIBUTE TO ANALYSIS OF (A) PERFORMANCE OF UNITS, (B) INCIPIENT TROUBLE BEFORE IT OCCURS, AND (C) CAUSE OF FAILURE.
6. HOW WILL DATA BE USED OR FINALLY PRESENTED? GIVE SAMPLE PLOT, CURVE, OR TABULATION AS IT WILL BE FINALLY PRESENTED.

NUMBER ENTRY AS LISTED ABOVE AND DESCRIBE BELOW

1.0	TEST ITEM		
1.1	Aircraft: UAC Experimental B-17		
	Engine: Fuselage nose mounted T-64-GE-1		
	Propeller: 73ECB1/6903-14/SK 50067		
	Gear Ratio: 12.08 to 1		
3.0	TEST INSTALLATION AND INSTRUMENTATION		
3.1	Strain Gage Hook-up:		
	<u>Trace</u>	<u>Location</u>	<u>Blade No.</u>
	1	20" from tip	1
	2	20" from tip, Vee	1
	3	50" from tip	1
	4	Shank, L.E.	1
	5	Shank, 90° F.L.E.	1
	6	Shank, 135° F.L.E.	1
	7	50" from tip	2
	8	Shank, L.E.	2
	9	1P Phase pip	
	10	Aircraft Vert. c.g. acc. (n_z)	
	11	Timing code	
	12		

4.0 OPERATING CONDITIONS

4.1 Steady State. (In accordance with Items 4.3, 4.4.1 and 4.7 of Plan of Test 128PT-90.)

Power Setting	G.I.	F.I.	60%	75%	80%	90%	100%	W11	W.O.
Horsepower	190	300	1360	1700	1816	2045	2270	2690	2850
Prop RPM	---	---	1130	1130	1130	1130	1130	1250	1250
Engine torque, ft-lbs	---	---	526	656	702	790	877	935	991

Wind Velocities or Indicated Airspeeds, mph

Ground-Headwind	0-25	0-25	0-25		0-25		0-25		0-25
Ground-Crosswind	15-25	15-25	15-25		15-25		15-25		15-25
Flight-S.L. to 5000'	200, max	200, max	200, max	200	200, max	200	200, max	150	150, 200
Flight-10,000'	200, max	200, max	200, max	200	200, max	200	200, max	150	200, max
Flight-20,000'	200, max	200, max	200, max	200	200, 250, max	200	200, max	150	200, max
Flight-30,000'	200, max	200, max	200, max	200	200, max	200	200, max	150	200, max

4.2 Transients

4.2.1 During ground running in 0-25 mph headwind and 15-25 mph crosswind, and in flight at 20,000' at 200 mph IAS, record the following transients as given in Plan of Test 128PT-90:

- Item 4.4.2, Transients 1d, 2c, 3b, 4b.
- Item 4.4.3, Transients 1d, 1f, 2d, 2g.
- Item 4.4.4, Transients 4, 7

4.2.2 At 150 mph IAS and 10,000', record an air start and feathering.

4.3 Attitude Checks

4.3.1 Record the following conditions as given in Plan of Test 128PT-90:

- Item 4.7.1 (This can be a continuous 1.064 g turn).
- Item 4.7.2 (This can be a continuous 1.41 g turn).
- Item 4.7.3 Note pitch angle.
- Item 4.7.4 Note pitch angle.
- Item 4.7.5 Use 200 mph IAS.
- Item 4.7.6 Use 200 mph IAS.

These last two items can be combined into a roller coaster run from 1g to 2g to -1g to 1g.

4.4 Taxi Tests

4.4.1 Record data for conditions as given in Plan of Test 128PT-90, Item 4.6.

TEST NO. 128PT-93

HAMILTON STANDARD

PAGE 1 OF 4PLAN OF TESTJOB: 50-Hour Flight Test of VC86260 PropellerPLAN PREPARED BY: D. K. LeishmanPROJECT & ORDER: 104-AGO-100AAPPROVED BY: [Signature]

INSTRUCTION: _____

TEST ENGINEER: D. K. LeishmanTIME PERIOD: February 1966 TO July 1966

1. WHAT IS ITEM BEING TESTED?
2. WHY IS TEST BEING RUN? WHAT WILL RESULTS SHOW OR BE USED FOR?
3. DESCRIBE TEST SET UP INCLUDING INSTRUMENTATION. ATTACH SKETCH OF INSTALLATION.
4. ITEMIZE RUNS TO BE MADE GIVING LENGTH OF EACH AND READINGS TO BE TAKEN.
5. SPECIAL INSTRUCTIONS. SAFETY PRECAUTIONS FOR OPERATORS AND HANDLING EQUIPMENT. OBSERVATIONS BY SIGHT, FEEL, OR HEARING. LIST POINTS OF OBSERVATION WHICH MIGHT CONTRIBUTE TO ANALYSIS OF (A) PERFORMANCE OF UNITS, (B) IMMINENT TROUBLE BEFORE IT OCCURS, AND (C) CAUSE OF FAILURE.
6. HOW WILL DATA BE USED OR FINALLY PRESENTED? GIVE SAMPLE PLOT, CURVE, OR TABULATION AS IT WILL BE FINALLY PRESENTED.

NUMBER ENTRY AS LISTED ABOVE AND DESCRIBE BELOW

1.0	TEST ITEM
1.1	The item being tested is the VC86260-5 Variable Camber Propeller.
2.0	OBJECT OF TEST
2.1	The object of this test is to evaluate the airworthiness of the propeller.
3.0	TEST INSTALLATION AND INSTRUMENTATION
3.1	The propeller shall be mounted in the nose nacelle (Reference L-8852) of the UAC B-17 aircraft. A T64-GE-1 engine (with an SK56029 Speed Reduction Gearbox) shall be used as the power source.
3.2	The instrumentation shall be as necessary to monitor the parameters defined in Table I.
3.2.1	The instrumentation and techniques used for the vibration stress survey shall be as specified in Plan of Test 128PT-94.
3.2.2	During the flight cycle portion of the test, the oscillograph shall be operated at a speed of .46 in/sec, and during the steady state and transient checks the speed shall be 4.8 in/sec.

4.0 TEST RUNS

4.1 Test scope. The test shall consist of a vibration stress survey, a nacelle temperature survey, propeller steady state and transient performance checks, propeller attitude operation checks, propeller performance test, and flight cycles.

4.2 Vibration stress survey.

4.2.1 Reference - Plan of Test 128PT-94.

4.3 Nacelle temperature survey. (Repeat on ground and at 5000', IAS 200 mph.) The temperatures at the points noted in Table II shall be measured at the following power settings. The setting shall be maintained until the temperatures stabilize. (Reference Table III.)

1. Flight Idle
2. Take-off

4.4 Control Response. (Repeat on ground and at 5000', 10,000', 20,000', and 30,000' with IAS of 150 mph and max attainable.) Steady state and transient operation shall be checked in accordance with 4.4.1, 4.4.2, 4.4.3, and 4.4.4. as limited by engine power.

4.4.1 Steady state operation. A calibration shall be made to obtain steady state data as specified in 3.2 for the following series of power settings. (Reference Table III.)

1. Ground Idle
2. Flight Idle
3. 60% Normal
4. 80% Normal
5. Normal
6. Take-off

4.4.2 Condition lever transients. After completion of the steady state check, data will be recorded as specified in 3.2 for the following series of transients. (Reference Table III.) All condition lever movements shall be made in one second or less, with a pause to allow conditions to stabilize between burst and chop.

1. Set power at 60% normal

- a. 1000 rpm to 1160 rpm to 1000 rpm
- b. 900 rpm to 1160 rpm to 900 rpm
- c. 850 rpm to 1160 rpm to 850 rpm

2. Set power at 80% normal

- a. 1000 rpm 1160 rpm to 1000 rpm
- b. 900 rpm to 1160 rpm to 900 rpm
- c. 850 rpm to 1160 rpm to 850 rpm

3. Set power at normal

- a. 1000 rpm to 1160 rpm to 1000 rpm
- b. 900 rpm to 1160 rpm to 900 rpm

4. Set power at take-off

- a. 1100 rpm to 1160 rpm to 1100 rpm
- b. 1050 rpm to 1160 rpm to 1050 rpm

4.4.3 Power lever transients. After completion of the condition lever transients, data will be recorded as specified in 3.2 for the following series of transients. (Reference Table III.) All lever movements shall be made in one second or less, with a pause to allow conditions to stabilize between burst and chop.

1. Set condition lever at 1015 rpm

- a. 80% normal to normal to 80% normal
- b. 60% normal to normal to 60% normal
- c. Flight idle to normal to flight idle
- d. Normal to take-off to normal
- e. 80% normal to take-off to 80% normal
- f. 60% normal to take-off to 60% normal
- g. Flight idle to take-off to flight idle

2. Set condition lever at 1160 rpm and repeat the power lever movements of 1.

4.4.4 Transient operation. After completion of the power lever transients, data will be recorded as specified in 3.2 for the following series of transients. (Reference Table III.)

- 1. Take-off to 80% normal to take-off
- 2. Take-off to 60% normal to take-off
- 3. Take-off to ground idle to take-off

4.5 Feathering and unfeathering checks. Check electrical and mechanical feathering and unfeathering operation at ground idle power of the test engine, at altitudes of 5000', 10,000', 20,000', and 30,000' with IAS of 150 and max attainable.

4.6 Taxi Tests

4.6.1 Make reverse transients at forward velocities of 0, 20, 40 and 60 mph IAS from the following test engine powers.

- 1. Flight idle
- 2. Normal
- 3. Take-off

Plan of Test
128PT-93

4.7 Attitude checks.

- 4.7.1 With the test propeller operating at 80% of normal power, altitude of 20,000' and max attainable airspeed, check gearbox operation with the aircraft in level flight inclined 20° to each side for a period of five minutes.
- 4.7.2 With the test propeller operating at 80% normal power, altitude of 20,000' and max attainable airspeed, check gearbox operation with the aircraft in level flight inclined up to 45° to each side for a period of 30 seconds.
- 4.7.3 With the test propeller operating at 60% normal power, altitude of 20,000' check gearbox operation with the aircraft in as steep a nose-down attitude (45° max) as possible inclined 10° to each side for as long as possible.
- 4.7.4 With the test propeller operating at take-off power, altitude of 5000', check gearbox operation with the aircraft in the steepest possible nose-up attitude inclined 10° to each side for as long as possible.
- 4.7.5 With the test propeller operating at normal power, altitude of 20,000', check gearbox operation with the aircraft being flown in a manner to exert a zero "g" condition for a period of up to 30 seconds..
- 4.8 Flight cycles. The time necessary to accumulate a total of 50 hours of test will be made up of one-hour flight cycles as defined by Table III and Curve 1. Each cycle will be started at an altitude of 1000'. Half of the cycles will be run with an oil inlet temperature to the test engine and gearbox of 200-225°F, and the remainder with an inlet temperature as cold as possible.
- 5.0 SPECIAL INSTRUCTIONS
- 5.1 The oil used for the propeller shall be MIL-H-6083, and for the engine shall be MIL-L-7808.
- 5.2 The maximum input torque to the gearbox shall be 1135 ft-lbs.
- 5.3 The maximum steady state propeller speed shall be 1160 rpm.
- 5.4 The maximum allowable turbine inlet temperature shall be 1180°F.
- 5.5 Brake actuation pressure shall be 1600 psig maximum.
- 5.6 If safety of flight considerations indicate that #2 and #3 propellers should not be feathered in flight, avoid continuous operation of #2 and #3 engines between 1200 and 1600 rpm and between 2300 and 2600 rpm if #5 propeller is operating above flight idle power.

Plan of Test
28PT-93

.7 Attitude checks.

- .7.1 With the test propeller operating at 80% of normal power, altitude of 20,000' and max attainable airspeed, check gearbox operation with the aircraft in level flight inclined 20° to each side for a period of five minutes.
- .7.2 With the test propeller operating at 80% normal power, altitude of 20,000' and max attainable airspeed, check gearbox operation with the aircraft in level flight inclined up to 45° to each side for a period of 30 seconds.
- .7.3 With the test propeller operating at 60% normal power, altitude of 20,000' check gearbox operation with the aircraft in as steep a nose-down attitude (45° max) as possible inclined 10° to each side for as long as possible.
- .7.4 With the test propeller operating at take-off power, altitude of 5000', check gearbox operation with the aircraft in the steepest possible nose-up attitude inclined 10° to each side for as long as possible.
- .7.5 With the test propeller operating at normal power, altitude of 20,000', check gearbox operation with the aircraft being flown in a manner to exert a zero "g" condition for a period of up to 30 seconds.
- .8 Flight cycles. The time necessary to accumulate a total of 50 hours of test will be made up of one-hour flight cycles as defined by Table III and Curve 1. Each cycle will be started at an altitude of 1000'. Half of the cycles will be run with an oil inlet temperature to the test engine and gearbox of 200-225°F, and the remainder with an inlet temperature as cold as possible.
- 0 SPECIAL INSTRUCTIONS
 - 1 The oil used for the propeller shall be MIL-H-6083, and for the engine shall be MIL-L-7808.
 - 2 The maximum input torque to the gearbox shall be 1135 ft-lbs.
 - 3 The maximum steady state propeller speed shall be 1160 rpm.
 - 4 The maximum allowable turbine inlet temperature shall be 1180°F.
 - 5 Brake actuation pressure shall be 1600 psig maximum.
 - 6 If safety of flight considerations indicate that #2 and #3 propellers should not be feathered in flight, avoid continuous operation of #2 and #3 engines between 1200 and 1600 rpm and between 2300 and 2600 rpm if #5 propeller is operating above flight idle power.

TABLE I

<u>Parameter</u>	<u>Range</u>	<u>Visual</u>	<u>Automatic Recording</u>
Aircraft attitude		x	
Blade Angle (Front)	-210 to +530	x	x
Control temperature	0 to 3000F	x	
High pitch pressure	0 to 1300 psi	x	x
Low pitch pressure	0 to 800 psi	x	x
Pitchlock pressure	0 to 300 psi	x	x
Gearbox vent pressure	0 to 5 psi	x	
Gearbox lube pump inlet pressure	-25" to +25 psi	x	
Gearbox scavenge pressure	0 to 30 psi	x	
Gearbox lube pressure	0 to 150 psi	x	
Gearbox lube flow	0 to 75 gpm	x	
Gearbox lube in temperature	0 to 2250F	x	
Gearbox lube out temperature	0 to 2750F	x	
Gearbox vibration (3)	0 to 20 mils	x	
Brake pressure	0 to 1600 psi	x	
Power turbine rpm	0 to 17000 rpm	x	x
Gas generator rpm	0 to 19000 rpm	x	
Torque	0 to 1200 ft-lbs.	x	
Fuel Flow	0 to 1500 pph	x	x
Turbine inlet temperature	0 to 11800F	x	
Engine oil temperature	0 to 2500F	x	
Engine oil pressure	0 to 100 psi	x	
Engine vibration (4)	0 to 5 mils	x	
Power lever	0 to 1250	x	x
Condition lever	0 to 1600	x	x
Outside air temperature		x	
Aircraft weight		x	

TABLE II

Nacelle Temperature Survey

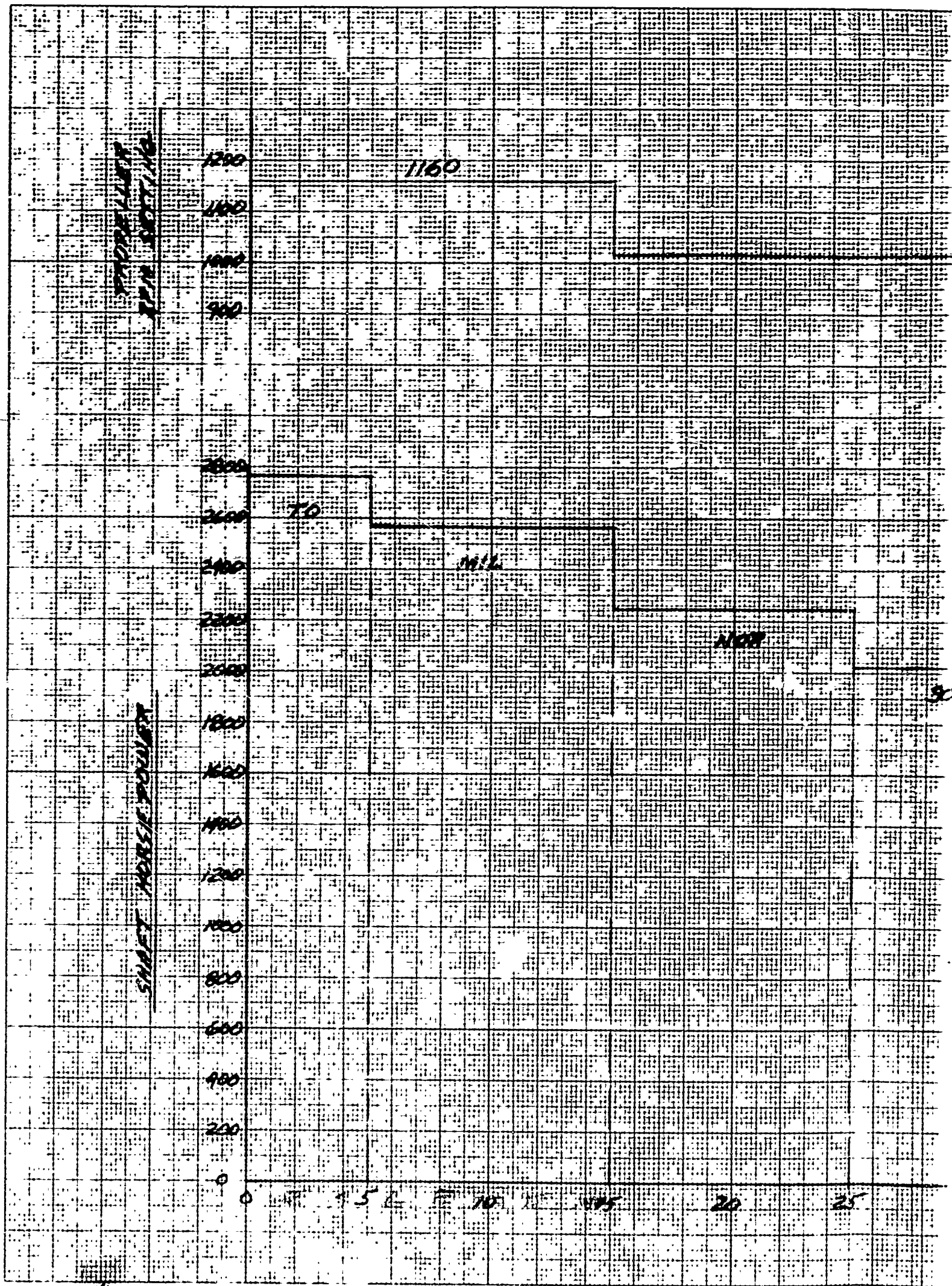
All temperatures are washer type T/C's

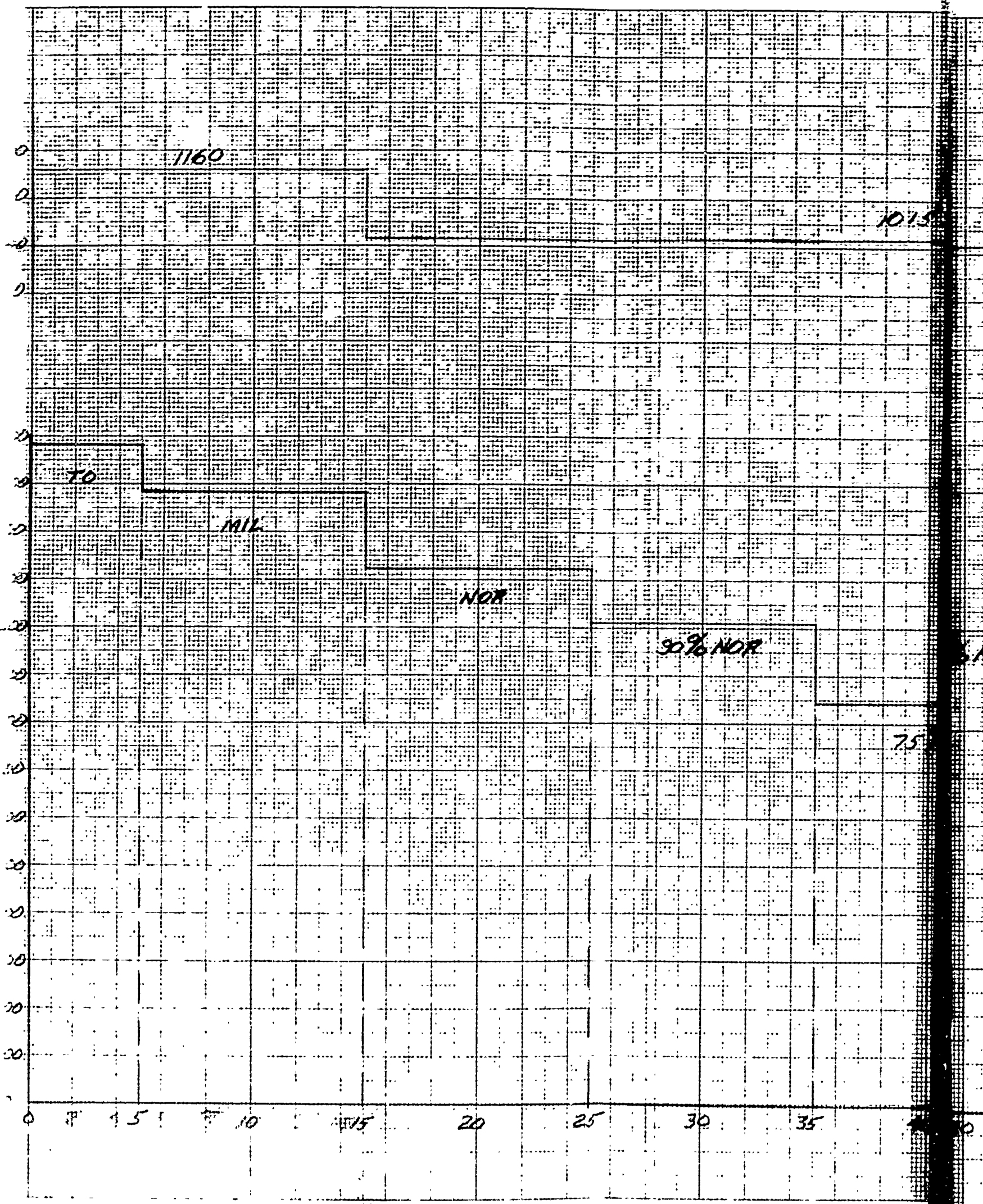
<u>Location</u>	<u>Range</u>
Engine:	
Strut mount pad top	0-300°F
Accy. case bolt circle	0-300°F
Burner case top	0-1000°F
Turbine casing forward top	0-1000°F
Turbine casing aft top	0-1000°F
Lord mount	0-300°F
Nacelle:	
Firewall beam	-300°F
Propeller-Gearbox:	
Control	0-300°F
Gearbox Rear	0-300°F
Lube oil in	0-300°F
Lube oil out	0-300°F

TABLE III

Test Conditions

<u>Condition</u>	<u>Nominal Power (hp)</u>	<u>Propeller Speed Setting (rpm)</u>	<u>Input Torque (ft-lbs)</u>
Take-off	2765	1160	1036
Military	2570	1160	963
Normal	2245	1015	961
90% Normal	2020	1015	865
80% Normal	1796	1015	769
75% Normal	1684	1015	721
60% Normal	1347	1015	577
Flight idle	300 max.	---	---
Ground idle	190 max.	---	---
Reverse	2530	1160	947





1015

CURVE A

ONE HOUR FLIGHT CYCLE

0-15 MIN

CLIMB

15-45 MIN

LEVEL FLIGHT

45-60 MIN

DESCENT

START CLIMB AT 1000 FT

LEVEL FLIGHT AT 1000-15000 FT

6 NOR

75% NOR

F.I

35

40

45

50

55

60

C

PLAN OF TESTJOB: Vibration Survey of VC86260 PropellerPLAN PREPARED BY: H. E. DeablerPROJECT & ORDER: 104-B01-100AAPPROVED BY: H. E. DeablerINSTRUCTION: Vibration Test Program No. 1326

TEST ENGINEER: _____

TIME PERIOD: February, 1966TO July, 1966

1. WHAT IS ITEM BEING TESTED?
2. WHY IS TEST BEING RUN? WHAT WILL RESULTS SHOW OR BE USED FOR?
3. DESCRIBE TEST SET UP INCLUDING INSTRUMENTATION. ATTACH SKETCH OF INSTALLATION.
4. ITEMIZE RUNS TO BE MADE GIVING LENGTH OF EACH AND READINGS TO BE TAKEN.
5. SPECIAL INSTRUCTIONS: SAFETY PRECAUTIONS FOR OPERATORS AND HANDLING EQUIPMENT. OBSERVATIONS BY SIGHT, FEEL, OR HEARING. LIST POINTS OF OBSERVATION WHICH MIGHT CONTRIBUTE TO ANALYSIS OF (A) PERFORMANCE OF UNITS, (B) INCIPIENT TROUBLE BEFORE IT OCCURS, AND (C) CAUSE OF FAILURE.
6. HOW WILL DATA BE USED OR FINALLY PRESENTED? GIVE SAMPLE PLOT, CURVE, OR TABULATION AS IT WILL BE FINALLY PRESENTED.

NUMBER ENTRY AS LISTED ABOVE AND DESCRIBE BELOW

1. VC 86260/2FD14A3-6, 2FE14A3-6 Propeller.				
3. VC 86260 propeller on fuselage nose mounted T-64-GE-1 in UAC Experimental B-17 aircraft.				
3.1 Strain gage hookups:				
	Ground		Flight	
Channel	"A" Diode Pos. "B"		"A" Diode Pos. "B"	
1	45"-1F	10"V-1F	10"-1F	L.E. - 1F
2	45"-1R	10"V-1R	33"-1F	L.E/ - 1R
3	10"-1F	10"-1F	45"-1F	L.E. -2F
4	10"-1R	10"-1R	90°-1F	L.E. - 2R
5	L.E.-1F	10"V-2F	10"-1R	10"V-1F
6	L.E.-1R	10"V-2R	33"-1R	10"V-1R
7	L.E.-2F		45"-1R	
8	L.E.-2R		90°-1R	
9	90° -1F		45"-2F	
10	90° -1R		45"-2R	
11	1P Speed/Phase Pulse		1P Speed/Phase Pulse	
	Aircraft C. G. Vertical acceleration			

Test No. 128PT-94

GROUND TEST CONDITIONS

Conditions without reference numbers to POT 128PT-93 are additions.
Refer to Table III, attached, for power conditions.

4. Ref. POT 128PT-93 Headwind and Crosswind from 90° R. B.

4.4.1 Steady state operation

1. Ground Idle
2. Flight Idle
3. 60% Normal
4. 80% Normal
5. Normal
6. Take-off

4.4.2 Condition lever transients, 1 second or less

1. Set power at 60% normal
c. 850 rpm to 1160 rpm to 850 rpm
2. Set power at 80% normal
c. 850 rpm to 1160 rpm to 850 rpm
3. Set power at normal
b. 900 rpm to 1160 rpm to 900 rpm
4. Set power at take-off
b. 1050 rpm to 1160 rpm to 1050 rpm

4.4.3 Power lever transients, 1 second or less

1. Set condition lever at 1015 rpm
g. Flight idle to take-off to flight idle
2. Set condition lever at 1160 rpm
g. Flight idle to take-off to flight idle

4.6.1 Reverse Transients

1. Flight idle to reverse to flight idle
2. Normal to reverse to normal
3. Take-off to reverse to take-off

Record during a normal start

4.6.1 Taxi tests-reverse transients at forward velocities of 20, 40, and 60 mph IAS

1. Flight idle to reverse to flight idle
2. Normal to reverse to normal
3. Take-off to reverse to take-off

FLIGHT TEST CONDITIONS

4. Ref. POT 128FT-93

- 4.7.3 With the test propeller operating at 60% normal power, altitude of 20,000 ft., check gearbox operation with the aircraft in as steep a nose-down attitude (45° max.) as possible, 10° of roll to each side for as long as possible. Record stresses after condition is set.
- 4.7.4 With the test propeller operating at take-off power, altitude of 5,000 ft., check gearbox operation with the aircraft in the steepest possible nose-up attitude, 10° of roll to each side for as long as possible. Record stresses after condition is set.
- 4.7.5 With the test propeller operating at normal power, altitude of 20,000 ft., check gearbox operation with the aircraft being flown in a manner to exert a zero "g" condition for a period of up to 30 seconds. Record stresses after condition is set.
- 4.8 Flight cycles (as defined in Table III, attached) altitude 5,000 ft. Record stresses at each cycle condition: Take-off, Military, Normal, 90% Normal, 80% Normal, 75% Normal, 60% Normal, Flight Idle, Ground Idle.

Variable airspeed and yaw runs-normal rated power.

1. From minimum IAS to maximum IAS in 50 mph increments. Record stresses at zero, maximum left yaw and maximum right yaw at each airspeed. Altitude 10,000 ft.

Variable power runs - normal rated RPM

1. At minimum airspeed vary power from Flight Idle to NRP in 5 increments. Altitude 10,000 ft.

- 4.4.1 Steady state operation. 5,000 and 30,000 ft. altitude as limited by engine power.

1. Ground idle
2. Flight idle
3. 60% Normal
4. 80% Normal
5. Normal
6. Take-off

- 4.4.2 Condition lever transients, 1 second or less. 5,000 and 30,000 ft. altitude
 1. Set power at 60% normal
 - c. 850 rpm to 1160 rpm to 850 rpm
 2. Set power at 80% normal
 - c. 850 rpm to 1160 rpm to 850 rpm
 3. Set power at normal
 - b. 900 rpm to 1160 rpm to 900 rpm
 4. Set power at take-off
 - b. 1050 rpm to 1160 rpm to 1050 rpm
- 4.4.3 Power lever transients, 1 second or less. 5,000 and 30,000 ft. altitude.
 1. Set condition lever at 1015 rpm
 - g. Flight idle to take-off to flight idle
 2. Set condition lever at 1160 rpm
 - g. Flight idle to take-off to flight idle
- 4.4.4 Transient operation, after completion of power lever transients. 5,000 and 30,000 ft. altitude.
 3. Take-off to ground idle to take-off. (as defined in Table III, attached)
- 4.5 Feather and unfeather. 5,000 ft. altitude. Operation at ground idle power. At 150 mph IAS and maximum attainable IAS.

TABLE III

TEST CONDITIONS

<u>Condition</u>	<u>Nominal Power hp</u>	<u>Propeller Speed Setting rpm</u>	<u>Input Torque (ft-lbs)</u>
Take-off	2765	1160	1036
Military	2570	1160	963
Normal	2245	1015	961
90% Normal	2020	1015	865
80% Normal	1796	1015	769
75% Normal	1684	1015	721
60% Normal	1347	1015	577
Flight Idle	300 max.	-	-
Ground Idle	190 max.	-	-
Reverse	2530	1160	947

EXPERIMENTAL INSPECTION REPORT

COPIES:

1. Engineer (white) *H. H. H.*
2. Government (green) *H. H. H.*
()USAF ()NAVY ()C.A.
3. Exp. Ass'y. (yellow) *J. H. H.*
(sign to verify inspection)

Pre-1 TEST
 XERO INKUNESOX
 GEAR BOX Assembly
 Parts List SK 56029
 Experimental No. GB
 Ass'y Record No. 1
 Insp. Date 8 Sept. 65

Test No. _____
 Sheet No. _____
 Test Date _____
 No. of Pages _____
 Page No. _____
 (designate by 3A, 3B, etc.)

Part No.	Part Name	Quan.	Mt.	Condition of Part	Recommendation or Disposition
SK 56029	GEAR -Box	1		Note: Original assembly of this Gear Box has been listed as SK 49741 and SN. GB 164. work has been catlog'd as Development Tests. visual, Magnaflux, and Zyglo inspection; all were found to be acceptable for further use above P.O.T.	All details per the
				Those details that are different than original parts list will be stamped in on the new parts list (N). Those parts that are original, will be shown (U). Those parts that have been reworked are listed (R). All "O" rings, AN parts, standard hardware, will be replaced as new at assembly. Any questionable details are listed below, ~~etc~~	
574600	Housing - Assy	1		Paint removed on outer areas	(Touch up)
SK56002	Shaft - Post	1		O.D. has stains and light scratches	(clean up) OK
ETG 2740-6	Shaft -	1		Discoloration from seal and Rust at the under cut area adj. to threaded end.	(clean up) OK
574785	Valve -housing	1		Outer surface has heavy scratches	(clean up) OK
ETG 2740-3	Nut	1		Slots marred at assembly and disassembly.	(clean up) OK
574705	Nuts	2		Light scratches.	(OK as is)
574614	Retainer	1		Light stains	(OK as is) OK
574609	Plate - Ret.	1		Screw head impressions (4 places)	(OK as is) OK
574538	Retainer	1		O.D. area # annodize removed various places	(clean up) OK to use
128X-L21x	Pinion-Gear	1		Bearing Dia's. ~~in~~ scratched (see Table III)	(clean up)
Co Insp. John Lichatz 9 Sept 1965 OK to Insp. S. Frank DCASO 9/10/65					

Co Insp. Jankulichatz 9 Sept 1965

OK to copy. S. Frank
9/10/65 DCHSC

HAMILTON STANDARD

EXPERIMENTAL INSPECTION REPORT

COPIES:

1. Engineer (white) *E. J. DeLina*
2. Government (green) *W. J. DeLina*
3. Exp. An'y. (green) *W. J. DeLina*
(sign to verify inspection)

TEST

After *TEST*

Parts List *56029*

Experimental No. *56029*

An'y Record No. *56029*

Insp. Date *20 October 55*

Test No. _____

Sheet No. _____

Test Date _____

No. of Pages _____

Page No. *1*

(designate by 3A, 3B, etc.)

(732081) 50 Hour P.F.R.T. TEST Per P.O.T. # 128 PT. 50

Part No.	Part Name	Quan.	Mt.	Condition of Part	Recommendation or Disposition
SE 56029	GEAR BOX	1		Above P.O.T. has been completed in test cell at E.S. and returned for disassembly. Upon a visual, Magnaflex, and Tyglo inspection, all details show no indications or discrepancies beyond some normal assembly and wear indications, which are listed below:	
577882	Front Main Hsg.	1		Detail Bag lines have evidence of Bag Installation & Removal in test cell. OK	
574000	Main-Rear Hsg.	1		Same as above & lines have stains. OK	
SKS6004	Gil-Shaft Trans.	1		Large O.D. has nicks - either side of groove. (light stain)	
SKS6003	Ret-Mat-Ret.	1		Both ends nicked and scratched. OK	
ETG 2740-6	In-line shaft	1		Heat discoloration axial and also at opposite end. (clean up)	
583666	Fluid Trans Tube	1		Heavily scored - O.D. has spalling. (light stain)	
577789	Plug	1		Minor O.D. has slight spalling. OK	
574616	Input Gear	1		Big - Pressure patterns on one end. OK	
574678	Output Gear	1		Flattened areas on O.D. OK	
574550	Large Main Gear	1		Big - Gear has pressure scored marks. OK	
574523	Big Nut	1		Flats heavily scored - slight pressure patterns on face. OK	
574804	Big Ret. Nut	1		Flats marked - both pressure patterns. OK	
(583726)					
28421 X	Pinion Gear	1		Big pressure score marks on (2) ends. OK	
574137	Pinions	1		Slight Burnishing on O.D. - I.D. OK	
574785	Valve Hsg.	1		I.D. has heavy polishing effects. O.D. has slight scratches thru hard coat. OK	
574565	Planet Support	1		Various surfaces nicked - Big dia's score (light stain)	
574538	Retainer	1		O.D. nicked & scored thru annealing (hand up grinding)	
574582	Input Gear - Alternator	1		Heat score pattern at both ends of shaft. OK	
SKS6002	Input shaft	1		Stain & Rust on tail shaft. (clean up)	

START PLAN OF
TEST
128-PT-89 APR 4.2
LOG OF 732081 GEAR BOX
HAMILTON STANDARD
T-77.5-12/57
A

PROP. ASS'Y. NO. N220586 HUB DESIGN NO. VC86260 BLADE DESIGN NO. _____ FUEL CONT. _____

[illegible]

Witness imp. Pasneck 10/1/65 - W

A

T OF SK 56029 GEARBOX SN 104 VC 86260-5 Prop 36

WORK ORDER NO. 102-A05-100A ENGINE YT-64 SERIES 1 NO. 2 SE

CONSTANT 5252 SPECIAL PARTS

HUB DESIGN NO. VC 86260 BLADE DESIGN NO. FUEL CONTROL NO. FUEL PUMP NO. PRESS. VALVE PUN

FM	TEMP.		POWER							FUEL		ENGINE PRESSURES						ENGINE O-RING			
	MAX. T.L.T. OF	T.L.T. OF	COMP. INLET OF	GAS Turbine RPM	POWER Turbine RPM	PROP RPM	TORQ. PSI	BLADE X	P L A	COND. LEVER	FLOW LBS/HR.	MAN-FOLD PSI	PSIG SUPPLY	DIFF VENT	COMP. DISCH	COMP. INLET	TURB VENT	FRONT COMP. VENT	TEMP	MAIN PSI	COMP DISCH
			13				1.025 X									12.0			118		
DRAINED Engine lube system AND Filled with clean MIL-L-7808 oil.																					
ENG. STAND. 400 cycles ON, 115 volts Power ON INSTRUMENTATION C.I																					
830	1000	62	13253	5562	351	40		31			260	13			30	28				42	30
To check Rigging - U input lever																					
866	1024	62	13225	5510	438	27										2.7					
864 Rigging Problem																					
851	1028	64	13220	5277	443	34		31			260	14			29	2.6			166	42	29
	1120	63	116976	12268	1017	777		63			739	400	12		123	223			212	55	23
	1010	66	13464	5531	457	38		31			260	13			30	30			205	35	30
CHECK oil - BLEED Buffer Piston - Added 3 ozs of oil																					
940	1004	66	13344	5478	453	35	2	31	89		260	14			30	2.9			197	31	30
	924	66	139066	444	507	63	2	33	92		255	13.5			36.5	3.6			208	37	36.5
Added 3 ozs. oil BLEED Buffer Piston																					
874	1000	66	13302	7357	449	29	2	31	92		255	14			27.5	2.8			203	35	27.5
STOP FOR STATIC RUNNING PAR. 4.2.3.3 through PAR. 4.2.3.5																					
869	1040	66	13288	5377	448	28	2	31	95		255	14			29	2.7			203	34	29
846	990	66	13119	5267	437	26	2	31	86		250	14			28	2.6			172	36	28
START FLIGHT CYCLE #1																					
	1158	67	17177	14123	1165	105	2	68	85	1292	430	13			129	2.8			203	51	129
	1160	68	17205	1407	1169	129	2	69	85	1302	425	12.5			131	2.5			182	51	131
854 TO REPAIR THERMOCOUPLE (G/B on in) TO CHECK PROP PRESSURES																					
854	1036	67	13238	5340	442	32	2	31	35	239	260	14			28.5	2.7			178	38	28.5
Re-STARTING FLIGHT CYCLE #1. PAR. 4.3																					

Witness map Sasmuk 10/1/65 - witness - RYF Owens DCA50, WH - Owens

B

Prop 26260-5 Prop S/N 14220566 DATE 10-1-65 SHEET NO. 1
 NO. 2 SERIES 1 NO. 220108 ENGINEER D. Leishman OPERATOR T. Purzucki
 HELPERS E. Jarvis P. Gendron
 PRESS. VALVE PUMP NO. PRESS. VALVE NO. BLEED GOV. NO. BLEED CONTROL NO. COORD. NO.

ENGINE PRESSURES										ENGINE OIL				GEAR BOX				PROP. PRESS				VIB. METERS			
FRONT COMP. VENT	IN #18 TEMP	MAIN PSI	COMP. DISCH	COMP. INLET	TURB VENT	FRONT COMP. VENT	IN #18 TEMP	MAIN PSI	MAIN FSI IN OUT	LUBE PSI	SCAV PSI IN OUT	LUBE TEST OF IN OUT	RAM LUBE FLOW VENT	CON-TROL IN	HI PITCH	LO PITCH	Pitch Lock	Engine	G/B 1	G/B 3	G/B 5	G/B 2	G/B 4	G/B 6	
	186	42	30	-28			186	42	14.7	9	3	10	23.6	20	-	-	-	13.6	0	1.2	1.0	1.0	0	0	
	166	36		-2.7			166	36					21.8		-	-	-								
	186	42	29	-2.6			186	42	16.5		1.2	16.6	23.4					withers							
	212	55	23	-22.3			212	55	13.5		2.0	14.9	23.2	0	12	18	110	225	17.3	3.0	0	0			
	205	25	30	30	-	-	205	25	16.5	52		216	52.4	0	8	170	100	220	18.4	0	2.0	.8			
	225	35	30	30	-	-	225	35	1.7	9	30	207	24.1	0	12	10	110	220	10.7	1.0	0	0			
	197	31	30	2.9	-	-	197	36	16		1.1	197	23.5	0					14.9	0	1.0	.5			
	208	37	36.5	3.6	-	-	208	37.5	14.4		1.1	211	26.5	0					12.8	1.5	0	0			
	231	37.5					231	37.5	17	11.2	15.9	194	26.5	0	11.5	15	110	220	17.6	0	2.5	.3			
	203	35	2.8				203	35	16		1.1	204							12.2	12	115	222			
	223	35	1.5				223	35	1.5	8	12.5	186	23.2	0	12.5	10	112	220	15.4	0	1	1.4			
	4.2	3.5	4.4	PAR	4.2	3.5													15.6	0	1	1.6			
	203	34	2.9	2.7	-	-	203	34.5	16		1.1	204							12.1	1	0	0			
	222	34	1.5				222	34.5	1.5	7.5	12.5	186	23.1	0	12.5	14	114	221	15.4	0	1	1.4			
	172	36	28	2.6	-	-	172	36.7	16.5		1.1	218	22.9	0					12.2	12	112	222			
	193	36	1.5				193	36	1.5	8	12.6	163	22.9	0	12.5	12	112	222	16.3	0	.6	1.1			
	203	57	129	24.8	-	-	203	57	12.5		1.1	213	59.4	0					15.2	2.5	0	0			
	262	57	2.9				262	57	6.6		3.0	232	59.4	0	8	270	100	220	17.6	0	2	.5			
	182	57	131	25	-	-	182	56	12.5		1.1		59	0					16.9	0	1.1	1.9			
	255	57	2.9				255	56	2.9	61	29.5		59	0	8.1	290	75	220	15.9	0	1.1	1.9			
	178	34	15.7				178	34	15.7		1.1	173							15.9	0	1.1	1.9			
	200	23	1.5				200	23	1.5	8.5	10	139	23.1	0	12.5	12	112	221	15.2	2.5	0	0			

Also, WH - minus DCA50, WH - 10-1-65

FUEL METER READING

C E2Dorling 10-11-65

TEST OF 50 NR. PFRT OF SK 56029 GEAR BOX SN 1021 VC 52267-5 (P)
STAND E- House WORK ORDER NO. 122-A05-100A ENGINE VT-6H SERI
REDUCTION 12.08:1 CONSTANT .5252 SPECIAL PARTS
PROP. ASS'Y. NO. 1220566 HUB DESIGN NO. VC80260 BLADE DESIGN NO. FUEL CONTROL NO. FUEL PUMP

TIME				ATM	TEMP.			POWER							FUEL			ENGINE			
A.M. P.M.	TOTAL TEST	TOTAL ENGINE	TOTAL PROP.	TRUNK BAR.	MAX. T.L.T. °F	T.L.T. °F	COMP. INLET °F #3	GAS Producer RPM	POWER Turbine RPM	PROP RPM	TORQ. PSI	BLADE X	P L A	COND. LEVER	FLOW LBS / HR.	MANI- FOLD PSI	FUEL SUPPLY	DIFF VENT	COMP. DISCH	C U	
2225	41 ²⁵	43 ³⁵	41 ³⁵					1036	6713238	5340	442	32	2	31	35	239	260	141	—	28.5	
MAKING TAXI CYCLES.																					
2230								1158	68	17139	14017	1163	700	2	67	85	1278	420	13	—	129
2235								1160	67	19167	14055	1164	735	3	68	85	1304	425	13	—	132
2240								1160	65	17172	12526	1438	835	10.5	58	69	1311	425	12	—	132.2
2250								1160	64	17188	12516	1038	845	11	68	69	1324	430	12	—	133.5
2300								1065	63	16735	11809	971	721	11.5	60	67	1127	390	12	—	119
2310								922	61	13770	5400	447	68	10	33	67	228	250	13	—	36
1 MINUTE REVERSAL.																					
2315								RUNNING TAXI CYCLES.													
2320								COMPLETE CYCLE #1 STARTING CYCLE #1													
2330	42 ⁴⁰	44 ⁴⁵	42 ⁴⁰					1160	63	17090	14032	1185	730	2	67	85	1300	425	13	—	131
00 ³⁰	43 ³⁰	45 ³⁵	43 ³⁰					1058	61	16630	11642	938	721	12	59	67	1099	39	12	—	118
COMPLETED FLIGHT CYCLE #2.																					
Witness																					

DAILY H.P. READING @ T.O.

Witness me Los Angeles 10/1/65.

2500-5 PROP SIN 11220566

DATE 10-1-65. SHEET NO. 2

SERIES 1 NO. 220108 ENGINEER D. LEISMAN OPERATOR P. GENDRON
HELPERS P. A. RENTHOLD

NO. FUEL PUMP NO. PRESS. VALVE NO. BLEED GOV. NO. BLEED CONTROL NO. COORD. NO.

FUEL		ENGINE PRESSURES					ENGINE OIL			GEAR BOX				PROP. PRESS				VIB. METERS				
IANI-FOLD PSI	PSI SUPPLY	DIFF VENT	COMP. DISCH	COMP. INLET	TURB VENT	FRONT COMP. VENT	TEMP PSI	MAIN PSI	MAIN PSI IN OUT	LUBE PSI	SCAV PSI IN OUT	LUBE TEST OF IN OUT	OPM LUBE FLOW VENT	CON-TROL IN	HI PITCH	LO PITCH	Pitch Lock	Engage	G/B 1 2	G/B 3 4	G/B 5 6	
260	141	—	28.5	2.7	—	—	178	36	15.7	8.5	1.1	173	23.1	0	12.5	12	112	22	1.8	0	1.0	1.9
							200	36	1.5	10	1.1	139	0					4.2	2.6	0	0	
120	13	—	129	24.5	—	—	204	56	12.5	66	1.1	205	59.8	0	7.5	230	105	220	1.8	0	2.5	5
							263	56	2.4	66	1.1	205	0					1.2	1.8	0	0	
135	13	—	132	25.1	—	—	213	56	12.5	66	1.1	212	59.3	0	7.5	210	105	220	1.9	0	1.8	5
							271	56	2.4	66	1.1	212	0					1.2	1.5	0	0	
135	12	—	132.2	25.3	—	—	215	56	12	53	1.1	213	53.7	0	8	170	105	220	1.6	0	3.3	9
							273	56	2.8	53	1.1	213	0					1.2	1.4	0	0	
130	12	—	133.5	25.5	—	—	214	56.5	12.5	53	1.1	214	53.8	0	8	210	105	220	1.7	0	3.5	1.1
							213	56.5	2.8	53	1.1	214	0					1.5	1.9	0	0	
190	12	—	119	21.7	—	—	114	54	13	418	1.1	113	508	0	8.5	35	125	220	1.6	0	1.9	1.5
							170	54	2.6	418	1.1	113	0					1.2	1.9	0	0	
150	13	—	36	3.8	—	—	212	36.2	16	8	1.1	210	23.4	0	11.9	17	109	220	2.3	0	5	1.8
							237	36.2	1.7	8	1.1	210	0					4.15	.9	0	0	
104	13	—	131	24.8	—	—	210	56.5	12	66	1.1	209	59.6	0	7.8	180	115	220	1.7	0	2.3	5
							266	56.5	2.9	66	1.1	209	0					1.2	1.2	0	0	
39	12	—	118	21.3	—	—	213	53	13	42	1.1	213	48.9	0	8.6	18	125	220	1.9	0	2	1
							267	53	2.6	42	1.1	213	0					1.3	2.5	0	0	
Witness																						
R. P. ... DCASO, W. L.																						
10-11-65																						

Witness

R. P. Ramey, DCASO, W. L.
10/1/65

S. J. Deering
10-1-65

FUEL METER READING

TEST OF 50 HR. PERT OF SK56029 GEARBOX S/N 104 VC 86260-5 PROP S
 STAND E-HOUSE WORK ORDER NO. 102-A05-100A ENGINE YT64 SERIES 1
 REDUCTION 12:08:1 CONSTANT 5252 SPECIAL PARTS
 PROP. ASS'Y. NO. N220566 HUB DESIGN NO. VC86260 BLADE DESIGN NO. FUEL CONTROL NO. FUEL PUMP NO.

	TIME				ATM	TEMP.			POWER							FUEL			ENGINE PRESSURES				
	A.M. P.M.	TOTAL TEST	TOTAL ENGINE	TOTAL PROP.		TRUE BAR	MAX. T.L.T. °F	T.L.T. °F	COMP. INLET °F #3	GAS Producer RPM	POWER Turbine RPM	PROP RPM	1025 X TORQ. PSI	BLADE X	P L A	COND. LEVER	FLOW LBS / HR.	MANI- FOLD PSI	SUPPLY	DIFF VENT	COMP. DISCH	COMP. INLET H2O	TURB VENT
LOG OF TEST GEAR BOX		30 43	25 115	30 43	29.54																		
	START																						
	0925					850	826	40	13719	6464	539	103	+6	35	160	328	260	13		42	-4.6		
	0945																						
	0950																						
	0955					1156	43		17006	13908	1151	855	8	67.5	147	1387	440	12		142.5	-27.5		
	1015					1120	43		16852	12279	1016	875	16	62.5	125	1359	440	12		134	-25.7		
	1045	50 44	45 116	50 44																			
	1055					1160	44		17062	13562	1122	865	11	66	160	1396	450	13		140	-27.3		
	STOP	45 25	117 20	45 25																			
HAMILTON STANDARD	1120																						
	8500																						
	1125	45 25	117 20	45 25																			
	1140					1052	42		16556	12249	1012	721	12	58.5	120	1156	400	13		122.5	-3.6		
	1200	46 25	118 20	46 25																			
	1210					1160	42		17057	13432	1127	855	11	66	157	1396	450	13		140	-4.1		
	1245					1066	43		16551	12222	1020	725	13	58.5	122	1157	400	13		123	-3.6		
	1305	47 10	119 25	47 10																			
	1315					1160	49		16997	13602	1176	805	8	66	152	1362	440	13		138	-4.0		
	1345					1060	43		16565	12323	1019	725	12	58.5	128	1156	400	12		122.5	-3.6		
STOP	48 25	119 25	48 25																				
1400																							
START																							
1425	Start Flight cycle #7				822	986	43		13161	5361	441	40	3	31	-	29.4	260	13		30	-7		
1555					1160	43		17031	14069	1166	910	7	66	152	1377	450	13		138	-4.1			
1640	Start Flight cycle #8																						
1645	49 25	121 10	49 25		1160	47		16961	14060	1162	789	4	64	85	134.9	440	13		136	-25.4			
1720	49 55	121 50	49 55		1010	44		16350	10245	889	721	13.5	54	68	1061	385	13		116	-20.5			
1740	50 20	122 20	50 20																				
1750					1155	45		16996	13923	1160	800	4	65	85	1380	450	13		138	-26.3			

DAILY H.P. READING @ T.O.

E. J. Dooling 10-11-65

C 86260-5 PROP S/N 11220566 DATE 10-4-65 SHEET NO. 13
 SERIES 1 NO. 260108 ENGINEER D. LEISHMAN OPERATOR R. PORZYCKI
 HELPERS F. JARVIS M. STAMBAUGH

FUEL PUMP NO. PRESS. VALVE NO. BLEED GOV. NO. BLEED CONTROL NO. COORD. NO.

FL	ENGINE PRESSURES					ENGINE OIL			GEAR BOX					PROP. PRESS				VIB. METERS							
	DIFF SUPPLY	COMP. DISCH	COMP. INLET	TURB VENT	FRO. IT COMP. VENT	#18 TEMP °F	MAIN PSI	MAIN PSI IN OUT	LUBE PSI	SCAV PSI IN OUT	LUBE TEST # OF IN IN ROUT %	QPM LUBE FLOW	VENT	CON-TROL IN	HI PITCH	LO PITCH	Pitch Lock	Engine 112 319	G/B 1 2	G/B 3 4	G/B 5 6				
TAND.	400 CYCLES ONLY					115 VOITS			POWER ON					ADDED				16 025 MIL-H 60				838 TO 100			
013		42	4.6			104		15		.8	94								17.8	0	1.5	2.1			
						140	62	1.6	18	14	89	27.8	0	11	10	115	220	52.1	3.0	0	0				
ended taxi cycles																									
012		142.5	27.5			192		12.5		.8	196								17.8	0	2.2	1.0			
						255	58	2.8	67	30	215	59.6	0	8	320	85	220	17.0	2.9	0	0				
012		134	25.7			200		12.5		.8	197								17.6	0	2.8	.5			
						257	55	2.5	52	27	217	53.1	0	8	100	125	220	17.2	2.0	0	0				
MADE 3HR INSP OF GEAR BOX AS PER PGT* 128PT-89 PAR. 4.3.1 GEAR BOX OK																									
013		140	27.3			201		12		.8	205								16.1	0	2.7	1.2			
						260	56	2.8	63	29	221	58.1	0	8	20	185	220	16.2	2.2	0	0				
CONDITIAION																									
013		122.5	3.6			205		13.5		.8	203								21.6	0	.7	.2			
						255	55	2.5	52	29	211	55.8	0	8	210	100	220	12.3	.3	0	0				
013		140	4.1			201		12		.8	200								19.7	0	1.2	.2			
						267	57	2.7	63	29	210	57.8	0	7.5	25	135	220	19.2	.4	0	0				
013		123	3.6			198		12		.8	207								19.7	0	1.6	.2			
						256		2.3	52	27.5	215	52.6	0	8	130	115	220	19.2	.4	0	.0				
						128																			
						205		13.5		.8	204								15.7	0	2.5	.4			
013		138	4.0			251	58	2.5	66	30	217	59.9	0	7	280	100	220	13.2	1.2	0	0				
012		122.5	3.6			204		13		.8	200								17.7	0	2.3	.6			
						255	53	2.6	53	27	211	53.3	0	8	85	130	220	17.2	1	0	0				
S PER PGT 128PT-89 PAR 4.3.1 GEAR BOX OK																									
013		30	-.7			-		15	9	1.2	-								15.6	0	.1	.5			
						-	40	1.5	42	10	-	32.2	0	12	10	115	220	4.2	.1	0	0				
013		138	4.1			208		12.5		1.2	210								15.7	.05	2.5	0			
						264	57	3	68	30	227	59.7	0	7	180	115	220	11.8	.05	0	0				
013		136	25.8			195		12		2.5	206								18.7	.05	.5	.05			
						260	58	3	67	30	226	59.5	0	7	330	95	220	13.2	.05	0	0				
013		116	20.5			196		12.5		6	206								19.9	.1	.1	.05			
						152	53	2.5	39	23	208	46.4	0	9	25	130	220	19.2	.1	0	0				
#9																									
13		138	26.3			208		12		2.8	207								15.9	.05	.2	.05			
						263	58	3	68	29.5	225	59.2	0	7.5	270	100	220	11.2	.05	0	0				

1-65 7-11-65 2-11-65 10-11-65 14-11-65 18-11-65 22-11-65 26-11-65 30-11-65 4-12-65 8-12-65 12-12-65 16-12-65 20-12-65 24-12-65 28-12-65 31-12-65 3-1-66 7-1-66 11-1-66 15-1-66 19-1-66 23-1-66 27-1-66 30-1-66 3-2-66 7-2-66 11-2-66 15-2-66 19-2-66 23-2-66 27-2-66 30-2-66 3-3-66 7-3-66 11-3-66 15-3-66 19-3-66 23-3-66 27-3-66 30-3-66 3-4-66 7-4-66 11-4-66 15-4-66 19-4-66 23-4-66 27-4-66 30-4-66 3-5-66 7-5-66 11-5-66 15-5-66 19-5-66 23-5-66 27-5-66 30-5-66 3-6-66 7-6-66 11-6-66 15-6-66 19-6-66 23-6-66 27-6-66 30-6-66 3-7-66 7-7-66 11-7-66 15-7-66 19-7-66 23-7-66 27-7-66 30-7-66 3-8-66 7-8-66 11-8-66 15-8-66 19-8-66 23-8-66 27-8-66 30-8-66 3-9-66 7-9-66 11-9-66 15-9-66 19-9-66 23-9-66 27-9-66 30-9-66 3-10-66 7-10-66 11-10-66 15-10-66 19-10-66 23-10-66 27-10-66 30-10-66 3-11-66 7-11-66 11-11-66 15-11-66 19-11-66 23-11-66 27-11-66 30-11-66 3-12-66 7-12-66 11-12-66 15-12-66 19-12-66 23-12-66 27-12-66 30-12-66 3-1-67 7-1-67 11-1-67 15-1-67 19-1-67 23-1-67 27-1-67 30-1-67 3-2-67 7-2-67 11-2-67 15-2-67 19-2-67 23-2-67 27-2-67 30-2-67 3-3-67 7-3-67 11-3-67 15-3-67 19-3-67 23-3-67 27-3-67 30-3-67 3-4-67 7-4-67 11-4-67 15-4-67 19-4-67 23-4-67 27-4-67 30-4-67 3-5-67 7-5-67 11-5-67 15-5-67 19-5-67 23-5-67 27-5-67 30-5-67 3-6-67 7-6-67 11-6-67 15-6-67 19-6-67 23-6-67 27-6-67 30-6-67 3-7-67 7-7-67 11-7-67 15-7-67 19-7-67 23-7-67 27-7-67 30-7-67 3-8-67 7-8-67 11-8-67 15-8-67 19-8-67 23-8-67 27-8-67 30-8-67 3-9-67 7-9-67 11-9-67 15-9-67 19-9-67 23-9-67 27-9-67 30-9-67 3-10-67 7-10-67 11-10-67 15-10-67 19-10-67 23-10-67 27-10-67 30-10-67 3-11-67 7-11-67 11-11-67 15-11-67 19-11-67 23-11-67 27-11-67 30-11-67 3-12-67 7-12-67 11-12-67 15-12-67 19-12-67 23-12-67 27-12-67 30-12-67 3-1-68 7-1-68 11-1-68 15-1-68 19-1-68 23-1-68 27-1-68 30-1-68 3-2-68 7-2-68 11-2-68 15-2-68 19-2-68 23-2-68 27-2-68 30-2-68 3-3-68 7-3-68 11-3-68 15-3-68 19-3-68 23-3-68 27-3-68 30-3-68 3-4-68 7-4-68 11-4-68 15-4-68 19-4-68 23-4-68 27-4-68 30-4-68 3-5-68 7-5-68 11-5-68 15-5-68 19-5-68 23-5-68 27-5-68 30-5-68 3-6-68 7-6-68 11-6-68 15-6-68 19-6-68 23-6-68 27-6-68 30-6-68 3-7-68 7-7-68 11-7-68 15-7-68 19-7-68 23-7-68 27-7-68 30-7-68 3-8-68 7-8-68 11-8-68 15-8-68 19-8-68 23-8-68 27-8-68 30-8-68 3-9-68 7-9-68 11-9-68 15-9-68 19-9-68 23-9-68 27-9-68 30-9-68 3-10-68 7-10-68 11-10-68 15-10-68 19-10-68 23-10-68 27-10-68 30-10-68 3-11-68 7-11-68 11-11-68 15-11-68 19-11-68 23-11-68 27-11-68 30-11-68 3-12-68 7-12-68 11-12-68 15-12-68 19-12-68 23-12-68 27-12-68 30-12-68 3-1-69 7-1-69 11-1-69 15-1-69 19-1-69 23-1-69 27-1-69 30-1-69 3-2-69 7-2-69 11-2-69 15-2-69 19-2-69 23-2-69 27-2-69 30-2-69 3-3-69 7-3-69 11-3-69 15-3-69 19-3-69 23-3-69 27-3-69 30-3-69 3-4-69 7-4-69 11-4-69 15-4-69 19-4-69 23-4-69 27-4-69 30-4-69 3-5-69 7-5-69 11-5-69 15-5-69 19-5-69 23-5-69 27-5-69 30-5-69 3-6-69 7-6-69 11-6-69 15-6-69 19-6-69 23-6-69 27-6-69 30-6-69 3-7-69 7-7-69 11-7-69 15-7-69 19-7-69 23-7-69 27-7-69 30-7-69 3-8-69 7-8-69 11-8-69 15-8-69 19-8-69 23-8-69 27-8-69 30-8-69 3-9-69 7-9-69 11-9-69 15-9-69 19-9-69 23-9-69 27-9-69 30-9-69 3-10-69 7-10-69 11-10-69 15-10-69 19-10-69 23-10-69 27-10-69 30-10-69 3-11-69 7-11-69 11-11-69 15-11-69 19-11-69 23-11-69 27-11-69 30-11-69 3-12-69 7-12-69 11-12-69 15-12-69 19-12-69 23-12-69 27-12-69 30-12-69 3-1-70 7-1-70 11-1-70 15-1-70 19-1-70 23-1-70 27-1-70 30-1-70 3-2-70 7-2-70 11-2-70 15-2-70 19-2-70 23-2-70 27-2-70 30-2-70 3-3-70 7-3-70 11-3-70 15-3-70 19-3-70 23-3-70 27-3-70 30-3-70 3-4-70 7-4-70 11-4-70 15-4-70 19-4-70 23-4-70 27-4-70 30-4-70 3-5-70 7-5-70 11-5-70 15-5-70 19-5-70 23-5-70 27-5-70 30-5-70 3-6-70 7-6-70 11-6-70 15-6-70 19-6-70 23-6-70 27-6-70 30-6-70 3-7-70 7-7-70 11-7-70 15-7-70 19-7-70 23-7-70 27-7-70 30-7-70 3-8-70 7-8-70 11-8-70 15-8-70 19-8-70 23-8-70 27-8-70 30-8-70 3-9-70 7-9-70 11-9-70 15-9-70 19-9-70 23-9-70 27-9-70 30-9-70 3-10-70 7-10-70 11-10-70 15-10-70 19-10-70 23-10-70 27-10-70 30-10-70 3-11-70 7-11-70 11-11-70 15-11-70 19-11-70 23-11-70 27-11-70 30-11-70 3-12-70 7-12-70 11-12-70 15-12-70 19-12-70 23-12-70 27-12-70 30-12-70 3-1-71 7-1-71 11-1-71 15-1-71 19-1-71 23-1-71 27-1-71 30-1-71 3-2-71 7-2-71 11-2-71 15-2-71 19-2-71 23-2-71 27-2-71 30-2-71 3-3-71 7-3-71 11-3-71 15-3-71 19-3-71 23-3-71 27-3-71 30-3-71 3-4-71 7-4-71 11-4-71 15-4-71 19-4-71 23-4-71 27-4-71 30-4-71 3-5-71 7-5-71 11-5-71 15-5-71 19-5-71 23-5-71 27-5-71 30-5-71 3-6-71 7-6-71 11-6-71 15-6-71 19-6-71 23-6-71 27-6-71 30-6-71 3-7-71 7-7-71 11-7-71 15-7-71 19-7-71 23-7-71 27-7-71 30-7-71 3-8-71 7-8-71 11-8-71 15-8-71 19-8-71 23-8-71 27-8-71 30-8-71 3-9-71 7-9-71 11-9-71 15-9-71 19-9-71 23-9-71 27-9-71 30-9-71 3-10-71 7-10-71 11-10-71 15-10-71 19-10-71 23-10-71 27-10-71 30-10-71 3-11-71 7-11-71 11-11-71 15-11-71 19-11-71 23-11-71 27-11-71 30-11-71 3-12-71 7-12-71 11-12-71 15-12-71 19-12-71 23-12-71 27-12-71 30-12-71 3-1-72 7-1-72 11-1-72 15-1-72 19-1-72 23-1-72 27-1-72 30-1-72 3-2-72 7-2-72 11-2-72 15-2-72 19-2-72 23-2-72 27-2-72 30-2-72 3-3-72 7-3-72 11-3-72 15-3-72 19-3-72 23-3-72 27-3-72 30-3-72 3-4-72 7-4-72 11-4-72 15-4-72 19-4-72 23-4-72 27-4-72 30-4-72 3-5-72 7-5-72 11-5-72 15-5-72 19-5-72 23-5-72 27-5-72 30-5-72 3-6-72 7-6-72 11-6-72 15-6-72 19-6-72 23-6-72 27-6-72 30-6-72 3-7-72 7-7-72 11-7-72 15-7-72 19-7-72 23-7-72 27-7-72 30-7-72 3-8-72 7-8-72 11-8-72 15-8-72 19-8-72 23-8-72 27-8-72 30-8-72 3-9-72 7-9-72 11-9-72 15-9-72 19-9-72 23-9-72 27-9-72 30-9-72 3-10-72 7-10-72 11-10-72 15-10-72 19-10-72 23-10-72 27-10-72 30-10-72 3-11-72 7-11-72 11-11-72 15-11-72 19-11-72 23-11-72 27-11-72 30-11-72 3-12-72 7-12-72 11-12-72 15-12-72 19-12-72 23-12-72 27-12-72 30-12-72 3-1-73 7-1-73 11-1-73 15-1-73 19-1-73 23-1-73 27-1-73 30-1-73 3-2-73 7-2-73 11-2-73 15-2-73 19-2-73 23-2-73 27-2-73 30-2-73 3-3-73 7-3-73 11-3-73 15-3-73 19-3-73 23-3-73 27-3-73 30-3-73 3-4-73 7-4-73 11-4-73 15-4-73 19-4-73 23-4-73 27-4-73 30-4-73 3-5-73 7-5-73 11-5-73 15-5-73 19-5-73 23-5-73 27-5-73 30-5-73 3-6-73 7-6-73 11-6-73 15-6-73 19-6-73 23-6-73 27-6-73 30-6-73 3-7-73 7-7-73 11-7-73 15-7-73 19-7-73 23-7-73 27-7-73 30-7-73 3-8-73 7-8-73 11-8-73 15-8-73 19-8-73 23-8-73 27-8-73 30-8-73 3-9-73 7-9-73 11-9-73 15-9-73 19-9-73 23-9-73 27-9-73 30-9-73 3-10-73 7-10-73 11-10-73 15-10-73 19-10-73 23-10-73 27-10-73 30-10-73 3-11-73 7-11-73 11-11-73 15-11-73 19-11-73 23-11-73 27-11-73 30-11-73 3-12-73 7-12-73 11-12-73 15-12-73 19-12-73 23-12-73 27-12-73 30-12-73 3-1-74 7-1-74 11-1-74 15-1-74 19-1-74 23-1-74 27-1-74 30-1-74 3-2-74 7-2-74 11-2-74 15-2-74 19-2-74 23-2-74 27-2-74 30-2-74 3-3-74 7-3-74 11-3-74 15-3-74 19-3-74 23-3-74 27-3-74 30-3-74 3-4-74 7-4-74 11-4-74 15-4-74 19-4-74 23-4-74 27-4-74 30-4-74 3-5-74 7-5-74 11-5-74 15-5-74 19-5-74 23-5-74 27-5-74 30-5-74 3-6-74 7-6-74 11-6-74 15-6-74 19-6-74 23-6-74 27-6-74 30-6-74 3-7-74 7-7-74 11-7-74 15-7-74 19-7-74 23-7-74 27-7-74 30-7-74 3-8-74 7-8-74 11-8-74 15-8-74 19-8-74 23-8-74 27-8-74 30-8-74 3-9-74

TEST OF 50 HR. PART OF SH56029 GEARBOX S/N104 VC862A2-5 PE
 STAND E HOUSE WORK ORDER NO. 102-A05-100A ENGINE YT6A SE
 REDUCTION 12:08:1 CONSTANT 5252 SPECIAL PARTS
 PROP. ASS'Y. NO. N220566 HUB DESIGN NO. VC8620 BLADE DESIGN NO. FUEL CONTROL NO. FUEL PUMP

	TIME			ATM	TEMP.			POWER							FUEL			ENGINE	
	AME. P.M.	TOTAL TEST	TOTAL ENGINE		MAX. T.L.T. °F	T.L.T. °F	COMP. INLET °F #3	GAS PRODUCER RPM	POWER TURBINE RPM	PROP RPM	1.025 X TORQ. PSI	BLADE X	P L A	COND. LEVER	FLOW LBS / HR.	MANI-FOLD PSI	SUPPLY	DIFF VENT	COMP DISCH
4481	18:30	1400	1400			1008	42	16319	11251	900	721	125	54	67	1065	380	13		117
4502	18:40	51	122			End cycle #9 Start cycle #10													
4545	18:50					1056	43	16926	14022	1160	820	4	64	85	138.5	440	13		139
4545	19:20					1084	41	16318	10825	897	725	3	54	67	106.5	390	13		112
4545	19:30	51	125			Lunch. Repaired 0.1 in 6/10 Taper angle													
4551	21:25					784	958	38	12877	5166	427	40	2	31	85	25.1	250	14	28
4551	21:30					continued last 10 min of Flight Cycle #90.													
45670	21:40	52	123			944	40	13413	5087	421	57	8	32	85	30.6	260	13		32
45716	21:45					Running Taxi cycles.													
45760	21:50					1160	40	16961	13991	1160	835	5	64	86	139.6	450	13		140
45815	21:55					1160	40	17027	14650	1161	848	6	66	86	142.9	450	13		143
45891	22:00					1150	38	17024	12285	1016	965	13	65	67	140.2	440	13		142
45969	22:10					1094	38	16664	11243	923	865	13	59	67	146.2	420	13		131
46082	22:20					1004	38	16262	10966	908	721	13	53	67	106.6	390	13		117
46182	22:30					828	37	13659	5385	462	107	12	34	67	28.3	260	13		40
46277	22:40	53	124			Completed One One Minute Reversal													
46277	22:50					Completed cycle #11 started cycle #12													
46625	23:00					1160	39	16857	13920	1160	828	5	62	86	138.1	440	13		138
46875	23:40	54	125			1000	37	16273	10812	903	725	13	54	67	106.6	390	13		117
46986	23:50					Completed cycle #12 started cycle #13													
4747	24:00	55	126			1160	38	16878	13965	1160	830	4	63	85	138.6	450	13		140
4747	24:10					1002	36	16245	10990	910	721	12	53	67	106.8	390	13		117
4747	24:20					Stop. Completed #13 cycle.													

DAILY H.P. READING @ T.O.

Witness insp 10/4/65 Jossim.

ST. Dorelous
10-11-65

Witness

240-5 Prop S/N N 220 566

DATE 10-4-65 SHEET NO. 4

SERIES 1

NO. 260108

ENGINEER D. LEISHMAN OPERATOR Gendron

HELPERS Schneider

FUEL PUMP NO.

PRESS. VALVE NO.

BLEED GOV. NO.

BLEED CONTROL NO.

COORD. NO.

SUPPLY	ENGINE PRESSURES					ENGINE OIL			GEAR BOX					PROP. PRESS				VIB. METERS				
	DIFF VENT	COMP. DISCH	COMP. INLET H ₂ O	TURB VENT	FRONT COMP. VENT	#18 TEMP °F	MAIN PSI	MAIN PSI IN OUT	LUBE PSI	SCAV PSI IN OUT	LUBE TEST OF IN 15 OUT 76	QPM FLOW	VENT	CON- TROL IN	HI PITCH	LO PITCH	Pitch Lock	Englac 1 2 3 4 6	G/B 1 2 3 4 5			
13		117	20.5			206 254	53	12.5 2.6	39	5.8 23	206 207	47	0	9	25	125	230	141 1323	.1 .1	.1 0	0	0
13		139	26.6			186 260	58	12 3	68	2.4 30	205 227	59.5	0	8	300	110	230	151.8 1422	.15 .15	.2 0	.15 0	
13		117	20.5			195 250	53	14.5 2.6	38	5.8 23	— 208	47.2	0	9	25	130	230	161.9 1723	.1 .1	.1 0	.15 0	
14		28	2.6			159 174	44	16 1.5	8	12 8	154 127	22.7	0	12	15	120	230	2141 12	.2 .7	.1 0	.14 0	
13		32	3.0			206 220	40	14 1.5	7	8.5 9	204 180	22.1	0	12	20	140	230	16.4 1622	.2 .3	.2 0	.6 0	
13		140	26.6			204 260	67	12 3	67	2.7 30	20 227	58.4	0	7.5	320	110	230	11 13	.4 .3	.2 0	.4 0	
13		143	27.6			205 258	69	12 3	67	2.5 29.5	203 225	58.3	0	7	310	105	230	12.5 1435	.4 .3	.2 0	.4 0	
13		142	27.5			198 258	64	12 2.4	51	4 26	207 217	52.7	0	7	130	120	230	15.2 1225	.4 .5	.6 0	.3 0	
13		131	24.5			206 254	66	12 2.8	48	4.5 2.5	205 210	50.7	0	8	30	130	230	12.2 1223	.5 .5	.4 0	.2 0	
13		117	20.8			205 250	62	14.5 2.7	40	5.2 23.5	205 206	47.4	0	8	20	130	230	12.8 123	.5 .5	.5 0	.2 0	
13		40	4			200 234	45	13 1.8	8	13.5 10	205 195	23.3	0	12	20	120	230	12.3 1212	.2 .5	.1 0	.11 0	
3		138	26.3			208 256	67	12 3	67	2.5 29	208 224	58.3	0	8	220	110	230	13.8 1321	.3 .3	.2 0	.2 0	
3		117	20.8			111 249	63	12.5 2.6	40	5.5 23.5	207 207	47.1	0	9	20	130	230	16.8 1723	.2 .6	.6 0	.2 0	
3		140	26.4			204 258	67	12 3	68	3 29	207 222	58.5	0	8	350	110	230	16.8 1322	.3 .4	.2 0	.4 0	
3		117	20.7			207 249	62	14.5 2.7	40	5.5 23.5	205 205	47.5	0	9	20	130	230	16.1 1723	.6 .3	.5 0	.3 0	

Witness - R. P. ... DCAAO, W.L. 10/4/65

FUEL METER READING

TEST OF 50 HR. PFT OF SK56029 GEARBOX S/N 104 VC86260-5 PROP S/N N220
 STAND E House WORK ORDER NO. 102-A05-100A ENGINE YT64 SERIES
 REDUCTION 12:28:1 CONSTANT 5252 SPECIAL PARTS
 PROP. ASS'Y. NO. N220566 HUB DESIGN NO. VC86260 BLADE DESIGN NO. FUEL CONTROL NO. FUEL PUMP NO.

TIME	A.M. P.M.	TOTAL TEST	TOTAL ENGINE	TOTAL PROP.	ATM	TEMP.			POWER					FUEL			ENGINE PRESSURES								
						MAX. T.L.T. °F	T.L.T. °F	COMP. INLET °F	GAS PRODUCER RPM	POWER TURBINE RPM	PROP RPM	1.025 X TORQ. PSI	BLADE P L A	COND. LEVER	FLOW LBS / HR.	MANIFOLD PSI	SUPPLY VENT	DIFF DISCH	COMP. INLET	TURB VENT					
0800		17 ¹⁵	126 ²⁰	55 ²⁰																					
COMPLETED DAILY INSPECTION OF ENGINE - STAND 400 CYCLES ON 115 VOLT																									
REPLACED AUX MOTOR REFILLED PROP WITH OIL MIL-H-6083B																									
START.																									
1425		CYCLE #14				812	964	41	1284	5131	427	40	3	31	-	330	260	14	29	-1.7					
1435						1160	43	17043	14065	1166	830	8	66	147	1391	450	13	139.8	-4.1						
1505						1064	42	16574	12299	1015	730	14 ^{NO}	58	124	1163	400	13	123	-3.9						
1525		18 ¹⁵	128 ⁵⁰	56 ²⁰		COMPLETED CYCLE #14 START CYCLE #15															Withstand				
STOP																									
1540		18 ³⁰	128 ⁰⁵	56 ¹⁵		SHUT DOWN FOR DEMONSTRATION FOR NEW ENG.																			
START																									
1555		18 ³⁰	128 ⁰⁵	56 ¹⁵		830	970	42	13175	5398	447	40	5	31	148	339	260	14	30	-6	-				
							1156 ⁴²																		
1610						1108	43	17034	14111	1152	810	7	66	156	1382	450	13	138.5	-4.2	-					
48381		1640				1020	43	16362	10986	907	721	13	54	70	107.8	390	13	117	20.7	-					
48600		1700	19 ³⁵	129 ¹⁰	57 ²⁰	COMPLETED CYCLE #15, START CYCLE #16																			
48601		1700				960	45	13255	5019	418	56	9	31	86	35	260	13.5	31	3	-					
48670		1705				RUNNING TAXI CYCLES																			
48692		1710				1158	45	16927	16731	1126	795	4	63	86	136.9	440	13	136	25.6	-					
48785		1715				1160	45	15157	14065	1164	830	4	65	85	136.2	450	13	140	26.6	-					
48806		1720				1160	43	14420	12401	1015	961	13	66	68	141.9	455	13	142	27.5	-					
48896		1730				1108	42	13128	11982	985	870	13	60	68	128.3	425	13	132	24.5	-					
49011		1740				1016	42	16344	10918	905	725	13	54	68	107.4	390	13	117	20.7	-					
49102		1750				842	42	8437	5309	447	108	13	34	68	35.1	260	13	39	39	-					
49143		1754				ONE 1 MINUTE REVERSAL																			
49158		1755				RUNNING 10 TAXI CYCLES.																			
STOP																									
1800		20 ⁰⁵	130 ¹⁰	58 ²⁰		NAVY MADE VISUAL INSP. OF PROP & GEAR BOX WITH																			
START																									
49200		1830	20 ³⁵	130 ¹⁰	58 ²⁰	814	953	41	13138	5380	446	41	2	31	85	35	250	14	30	2.9	-				
		1835				START FLIGHT CYCLE #17.																			
49368		1845	20 ³⁰	130 ¹⁰	58 ²⁰	1054	44	16740	12608	1165	795	3	62	85	136.5	430	13	137	25.8	-					

50
DAILY H.P. READING & T.O.

* NOTE: TOTAL TEST TIME BROUGHT FORWARD ON 50 HR PFT TEST. FROM PAGE #, IN THIS COLUMN

Witness insp 10/5/65 J. S. Tucker

5 PROP S/N N220566 DATE 10-5-65 SHEET NO. 45
 SERIES 1 NO. 300108 ENGINEER D LEISHMAN OPERATOR R PRZYCKI
 HELPERS M STAMBAUGH
 FUEL PUMP NO. PRESS. VALVE NO. BLEED GOV. NO. BLEED CONTROL NO. COORD. NO.

SUPPLY	ENGINE PRESSURES					ENGINE OIL			GEAR BOX					PROP. PRESS				VIB. METERS			
	DIFF VENT	COMP. DISCH	COMP. INLET	TURB VENT	FRONT COMP. VENT	TEMP °F	MAIN PSI	MAIN PSI IN OUT	LUBE PSI	SCAV PSI IN OUT	LUBE TEST OF IN/5 OUT/6	RPM LUBE FLOW VENT	CON-TROL IN	HI PITCH	LO PITCH	Pitch Lock	Engine 1/2	G/B 1	G/B 3	G/B 5	
			1420			19											314	2	4	6	
CYCLES ON 115 VOLTS ADDED 16023 OF OIL MIL-H-46838 TO PROP																					
H-46838																					
14		29	-1.7			225	46	11.8		15	215	22.5	0	11	20	120	220	17.2	.3	.3	1.3
						136		16		1.5	198						7.23	.7	0	0	
13		139.5	-4.1			203	65	12.5		34	216	59.3	0	7	350	100	220	16.8	.3	.6	.4
						254		12.5		3.7	209						17.7	.4	.4	2	
13		123	-3.9			254	64	2.8	51	26	214	52.9	0	8	110	125	220	17.2	.3	0	0
Witnessed E. J. Dowling 9-5-65																					
Witnessed E. J. Dowling 10-10-65																					
14	-	30	-6	-	-	201	33	14.5		12	200	23.5	0	12	20	120	220	13.4	.1	.1	.5
						211		1.5	8	8	171						30.1	.2	0	0	
13	-	138.5	-4.2	-	-	210	56	2.9	66	29	225	59.8	0	7	130	125	220	14.7	.5	.7	.3
						263		2.9		6.5	195						11.8	.4	0	0	
13	-	117	20.7	-	-	200	52	4.3		2.3	205	47.3	0	9	20	130	220	18.8	.4	0	.2
						260		2.6	40								14.22	.5	0	0	
							35	13.5													
								1.6													
35	-	31	3	-	-	205	35	13.5		11.5	200	22	0	12	18	115	220	17.4	.1	.2	.6
						228		1.6	7	2.5	195						31.21	.3	0	0	
3	-	136	25.6	-	-	205	57	11.5		3	205	59.3	0	7.5	110	136	220	17.1	.3	.25	.2
						268		2.9	67	29	215						11.2	.3	0	0	
13	-	140	26.6	-	-	201	57	11.5		2.6	205	59.2	0	7.5	265	110	230	17.7	.3	.8	.4
						263		2.9	67	29	225						11.21	.3	0	0	
3	-	142	27.5	-	-	205	57	11.5		4.1	200	53.1	0	8	128	125	220	16.7	.4	.6	.3
						260		2.8	51	25.2	215						11.5	.4	0	0	
								12		4.3	205						17.7	.5	.5	.2	
3	-	132	24.5	-	-	208	55	2.8	48	25	210	51.1	0	8.5	32	132	220	17.23	.6	0	0
						260											17.23	.6	0	0	
3	-	117	20.7	-	-	209	53	2.5	40	5.6	205	47.3	0	9	25	130	227	17.18	.4	.5	.3
						253		2.5		22.5	206						7.33	.3	0	0	
3	-	39	39	-	-	203	37	1.3	8	11.5	205	23	0	12	20	120	227	18.12	.2	.2	1.0
						232		1.7		9.5	182						14.15	.5	0	0	
Gear Box returned 8/10/65																					
4	-	30	2.9	-	-	205	40	1.5	7.5	12.5	200	23.1	0	12	20	115	230	14.7	.1	.1	1.3
						214				8	170						31.4	.7	0	0	
							66	12		3		59.7	0	7.5	275	105	230				
								2.9	68	29											
3	-	137	25.8	-	-	200	66	12		3	210	59.7	0	7.5	275	105	230	16.7	.3	.9	.3
						258		2.9	68	2.9	226						10.20	.2	0	0	

6260-5 PROP S/N N220566 DATE 10-5-65 SHEET NO. 6
 SERIES 1 NO. 260108 ENGINEER D. LEISHMAN OPERATOR T. GENDRON
 HELPERS P.A. BERTRAND

FUEL PUMP NO. _____ PRESS. VALVE NO. _____ BLEED GOV. NO. _____ BLEED CONTROL NO. _____ COORD. NO. _____

L	ENGINE PRESSURES					ENGINE OIL			GEAR BOX					PROP. PRESS				YIB. METERS		
	DIFF SUPPLY VENT	COMP. DISCH	COMP. INLET	TURB VENT	FRONT COMP. VENT	TEMP #18	MAIN PSI	MAIN PSI IN OUT	LUBE PSI	SCAV PSI IN OUT	LUBE TEST OF IN OUT	RPM	LUBE FLOW VENT	CON-TROL IN	HI PITCH	LO PITCH	Pitch Lock	G/B 1	G/B 3	G/B 5
513	—	117	20.5	—	—	207	62	12 2.5	40	5.5 204	2.5 205	471	0	8.5	25	—	220	161	.4	.3
ACTION of Low Pitch Press Gauge Complete Cycle #17.																				
513.5	—	30	2.8	—	—	202	34	6.5 1.4	8	12.7 198	8 160	23.1	0	12.5	20	112	230	111.7	.2	.3
						209												111.7	.4	0
513	—	138	26.0	—	—	207	56	12.5 2.8	68	3.1 201	2.9 225	59.4	0	7.5	290	110	228	111.8	.3	.9
013	—	117	20.5	—	—	207	52	12.5 2.5	39	8.8 206	2.3 206	466	0	9	22	—	228	111.7	.3	.4
						261												111.7	.3	0
Had Sashbury Cal. - Bent pointer on Low Pitch Press gage - had gage recal.																				
014	—	21.5	2.7	—	—	200	41	14 8.5	8.7	12.1 190	8.7 150	22.3	0	12.5	15	110	230	111.7	.4	.4
						207												111.7	.7	0
POP. O.K.																				

E.H. Dooling
 10-11-65

FUEL METER READING

TEST OF 50 Hr. PFRT OF SK56029 GEARBOX S/N 104 VC 86260-S PROP S
 STAND E HOUSE WORK ORDER NO. 102 AOS 100 A ENGINE VT 64 S
 REDUCTION 12.08:1 CONSTANT .5252 SPECIAL PARTS _____
 PROP. ASS'Y. NO. V220566 HUB DESIGN NO. VC 86260 BLADE DESIGN NO. _____ FUEL CONTROL NO. _____ FUEL PUMP _____

TIME				ATM	TEMP.			POWER							FUEL			ENGI	
A.M. P.M.	TOTAL TEST	TOTAL ENGINE	TOTAL PROP.	TRUE BAR	MAX. T.T.T. °F	T.T.T. °F	COMP. INLET °F	GAS Producer RPM	POWER Turbine RPM	PROP RPM	1.025 X TORQ. PSI	BLADE P L A	COND. LEVER	FLOW LBS/ HR.	MAN- FOLD PSI	SUPPLY PSIG	DIFF VENT	CON DISK	
					Completed daily			INSPECTION OF ENGINE + STAND.							4				
0748	0855	START cycle #19	19		796	960	36	12815	5124	427	48	+5	31	60	312	260	14	20	
0838	0910				1154	38		17012	14078	1165	868	+9	66	156	1436	450	13	144	
51028	0930				1048	38		16457	12369	1023	725	11	56	124	1157	400	13	123	
51230	0945	START cycle #20	20	51333	1154	40		16976	14032	1160	832	+9	64.5	150	1397	450	13	141	
51745	1045	135 45			1050	40		16478	12259	1017	723	10	56	118	1152	400	13	125	
	1050	24 50 13 45	63 50		COMPLETED F.I. cycle, FRONT G.I.B. chip detector shut down														
51923	1115				1178	1000	64	13216	4668	385	47	✓	31	✓	316	260	14	29	
52044	1125	START cycle #21	21																
52193	1140				1154	46		17027	13238	1092	872	12	65	160	1383	450	13	138	
52219	1150				1158	44		17032	12255	1019	935	12	65.5	118	1382	430	13	138	
52372	1200				1130	48		16876	12335	1018	870	14	63	124	1310	420	13	134	
52473	1210				1068	48		16591	12232	1015	730	10	58	118	1156	400	13	122	
52642	1225	START cycle #22	22		1			17020	14062	111				1350					
52815	1245				1160	49		17020	14063	1161	780	5	64.5	160	1358	440	13	136.5	
53918	1310				1072	48		16591	12451	1030	715	10	58	155	1159	400	13	123	
* 53871	1335	START cycle #23	23		1148	49		16897	13902	1160	746	5	63	160	1308	410	13	134.5	
	1410				1078	49		16685	12278	1020	736	9	60	118	1174	400	13	123	
	1425	START cycle #24	24		Witnessed														
53838	1445				1160	51		17044	14135	1160	777	✓	66	✓	1361	440	13	136.5	
54175	1510				1080	51		16689	12224	1012	732	✓	59	✓	1169	400	13	122	
54469	1540	START cycle #25	25		1156	54		17037	14012	1159	755	+5	66	160	1321	420	13	133	
54783	1610	45 7.8 45	68 45		1090	54		16731	12237	1015	740	12	60	121	1180	400	13	123	
	1625	28 45 7.8 45	69 00		START cycle #26														
	1630	30 00 14 00			NOTE: Engine time + Prop Time FROM BEGINNING OF LOG B														

DAILY H.P. READING @ T.O.

- * Change paper in Bristol nan out.
- * number stamping on Bristol after changing paper

S PROP S/N N 280566

DATE 10-6-65 SHEET NO. 7

SERIES 1

NO. 260108

ENGINEER D. LEISHMAN

OPERATOR T. FURZYCKI

HELPERS F. JARVIS

FUEL PUMP NO.

PRESS. VALVE NO.

BLEED GOV. NO.

BLEED CONTROL NO.

COORD. NO.

ENGINE PRESSURES										ENGINE OIL			GEAR BOX				PROP. PRESS				VIB. METERS				
D	SUPPLY	DIFF VENT	COMP. DISCH	COMP. INLET H2O	TURB VENT	FRONT COMP. VENT	18	MAIN PSI	MAIN PSI IN OUT	LUBE PSI	SCAV PSI IN OUT	LUBE TEST # OF IN 15 OUT 1/4	QPM LUBE FLOW	VENT	CON-TROL IN	HI PITCH	LO PITCH	Pitch Lock	Engine 1 2 3 4	G/B	G/B	G/B			
							TEMP °F #19													1	2	3	5	6	
STAND. 400 cycles DU. 115 volts PO. OPER. ON. ADDED 25 OZS. MIL-H 685 TO PROP																									
14			29	-27			127	46	1.4	9.5	11.6	121	222	0	12	20	115	225	1.5	.5	.7	2.6			
							161		13		2.4	158							2.0	1.0	2.0	1.5			
13			144	-27.8			224	74	3.1	73	30	178	61.8	0	8	250	105	225	1.2	0	0				
							208		12		4.1	208							19.8	1.2	1.7	.7			
13			123.5	-22.5			254	64	2.6	52	27	216	53.1	0	8	190	110	225	1.4	0	0				
							212		12		2.7	212							15.8	1.0	2.9	1.0			
13			141.5	-26.6			262	66	2.7	60	30	226	59.0	0	8	260	215	225	1.0	0	0				
							211		12		4.3	211							16.9	1.2	1.8	.5			
13			123	-27.1			256	62	2.6	51	27	216	52.7	0	8	200	145	220	1.2	.9	0	0			
FOR SHUT DOWN CHECKED CHIP DETECTOR. FOUND O.K.																									
14			29	-26			194		16.5		12.7	176							17.5	.4	1.0	1.7			
							196	34	13	6	7	160	20.6	0	12	10	110	220	1.1	0	0				
13			138.5	-26.4			211		12.5		3.7	212							17.9	1.0	2.2	.9			
							266	55	2.6	59	29	225	56.6	0	7	30	130	220	1.2	0	0				
							212		12.5		4.4	212							18.1	1.3	2.0	.8			
13			138.5	-26.5			268	55	2.5	51	27	221	53.2	0	8	170	115	220	1.2	0	0				
							211		13.0		4.5	211							18.8	1.5	2.0	.8			
13			134	-25.0			265	54	2.6	50	28	221	53.1	0	8	105	135	220	1.2	0	0				
							211		13.0		4.7	211							18.1	1.5	1.8	.6			
13			122.5	-22.2			264	52	2.5	51	28	220	52.8	0	8	110	125	225	1.2	0	0				
13			136.5	-25.5			215		12.5		2.8	215							19.7	.9	2.2	.6			
							269	55	2.8	66	30	235	59.5	0	7	170	105	225	1.5	.8	0	0			
							220		13		4.3	212							19.8	1.3	1.8	.5			
13			123	-27.1			261	53	2.7	52	27	215	53.5	0	8	240	95	225	1.7	1.4	0	0			
									13		3								17.7	1.0	2.8	.7			
13			134.5	-24.4				55	2.7	66	29		59.3	0	8	75	130	225	1.0	.8	0	0			
							212		13		4.4	212							20.8	1.4	2.6	.8			
13			123	-22.5			262	53	2.6	51	27	220	52.9	0	8	200	85	220	1.2	1.7	0	0			
Witnessed [Signature] 10-6-65																									
							216		12.5		2.8	216							18.7	1.4	1.5	.8			
13			136.5	-25.5			270	55	2.8	66	30	236	59.7	0	7	250	95	220	1.0	1.2	0	0			
							212		13		4.4	212							20.8	1.5	1.5	.5			
13			122	-22.1			262	53	2.8	50	27	220	52.6	0	8	60	125	225	1.2	0	0				
							215		12.5		2.7	215							17.8	1.8	2.3	.7			
13			133	-24.8			270	55	2.8	65.5	30	234	59.2	0	7	110	125	225	1.2	1.1	0	0			
							212		13		4.3	212							19.7	1.2	2.2	.6			
13			123	-22.5			264	53	2.6	50	28	221	52.6	0	8	290	90	220	1.5	1.3	0	0			
FLOG BOOKS ARE CORRECTED ON THIS SHEET																									

F LOG. BOOKS ARE CORRECTED ON THIS SHEET

in 9 paper

ED Dowling
10-11-65

FUEL METER READING 98852

TEST OF 50 HP. PFRT OF SK 56029 Gear Box S/N 104 VC 86260-5
 STAND E House WORK ORDER NO. 102 AOS 100A ENGINE VT 64 SERIES
 REDUCTION 12.08:1 CONSTANT .5252 SPECIAL PARTS
 PROP. ASS'Y. NO. N220566 HUB DESIGN NO. VC86260 BLADE DESIGN NO. FUEL CONTROL NO. FUEL PUMP NO.

	TIME				ATM	TEMP.			POWER						FUEL			ENGINE PRESSU.				
	A.M. P.M.	29 ⁰⁰ TOTAL TEST	18.55 TOTAL ENGINE	69 ⁰⁰ TOTAL PROP.		MAX. T.L.T. °F	T.L.T. °F	COMP. INLET °F	GAS Producer RPM	POWER Turbine RPM	PROP RPM	1025 X TORQ. PSI	BLADE X	P L A	COND. LEVER	FLOW LBS / HR.	MANI- FOLD PSI	SUPPLY PSI	DIFF VENT	COMP. DISCH	COMP. INLET H ₂ O	
55034		1635					1159	54	16930	14033	1162	730	1	64	86	130.6	425	13	—	131	24.3	
55275		1705					1048	52	1659	11106	920	725	12	56	61	109.3	395	13	—	117	20.8	
STOP		1725	30 ⁰⁰	140 ⁵⁵	70 ⁰⁰				MADE VISUAL INSPECTION OF GEAR BOX - CHECKS													
		1735	30 ⁰⁰	140 ⁵⁵	70 ⁰⁰				START CYCLE #27.													
5575		1736					1002	52	16282	5433	450	42	2	31	86	34.1	260	14	—	30	2.8	
5556		1745					1156	52	16980	14046	1164	745	2	64	86	132.4	430	13	—	132	24.7	
55850		1815					1044	50	16486	11206	930	721	12	56	67	109.8	390	13	—	117	20.7	
		1835	32 ⁰⁰	142 ⁵⁵	71 ⁰⁰				COMPLETE CYCLE #27, START CYCLE #28.													
6155		1845					1158	50	16939	13968	1156	756	3	64	86	132.4	420	13	—	133	24.6	
56509		1920					1042	48	16480	11217	930	722	12	56	67	110.1	395	13	—	118	21.	
		1935	33 ⁰⁰	142 ⁵⁵	72 ⁰⁰				COMPLETE CYCLE #28, START CYCLE #29.													
56750		1945					1158	50	16977	14110	1166	765	2	64	86	133.8	440	13	—	134	25.0	
57085		2015					1042	48	16903	11240	930	721	12	57	67	110.1	390	13	—	118	21.0	
		2035	34 ⁰⁰	144 ⁵⁵	73 ⁰⁰		97		COMPLETE CYCLE #29, START CYCLE #30													
57265		2035					970	48	13332	4974	412	58	10	32	85	335	260	13	—	31	3.1	
57318		2040					Running TAXI cycles															
57360		2045					1156	50	16967	13960	1157	770	3	64	85	134.6	425	13	—	134	25	
57418		2050					1160	48	16999	14029	1161	785	3	65	85	134.9	440	13	—	136	25.4	
57461		2055					1160	48	17042	12241	1165	915	12	65	67	136.2	445	13	—	137	25.8	
57560		2105					1130	46	16858	11963	989	865	12	62	67	130.0	425	13	—	132	24.6	
57665		2115					1036	47	16332	11050	913	721	12	55	67	108.5	390	13	—	117	20.5	
57752		2125					852	45	13790	5405	448	115	12	35	67	360	260	13	—	40	4.1	
57780		2129					ONE MINUTE REVERSAL															
		2130					Running TAXI Cycles.															
		2135	35 ⁰⁰	145 ⁵⁵	74 ⁰⁰				COMPLETE CYCLE #30, START CYCLE #31.													

DAILY H.P. READING @ T.O.

Witness insp 10/6/65 Loomis

60-5 PROP 5/1 220566

DATE 10-6-65 SHEET NO. 8

SERIES 1 NO. E260108 ENGINEER D. LEISHMAN OPERATOR P. GENDRON
HELPERS P. A. BERTRAND

PUMP NO. PRESS. VALVE NO. BLEED GOV. NO. BLEED CONTROL NO. COORD. NO.

ENGINE PRESSURES				ENGINE OIL			GEAR BOX				PROP. PRESS				VIB. METERS						
COMP. DISCH	COMP. INLET	TURB VENT	FRONT COMP. VENT	#18 TEMP #19	MAIN PSI	MAIN PSI IN OUT	LUBE PSI	SCAV PSI IN OUT	LUBE TEST # OF IN. OUT/6	QPM LUBE FLOW	VENT	CON-TROL IN	HI PITCH	LO PITCH	Pitch Lock	Engine 1 2	G/B 1 2	G/B 3 4	G/B 5 6		
131	24.3	—	—	210 264	56	12.5 2.8	6.7	3.1 29.5	210 227	59.8	0	8	190	107	228	13.4	1.8	.9	.3	.7	.3
117	20.8	—	—	212 261	52	12.5 2.4	40	5.3 24.5	212 215	47.7	0	8.7	28	125	225	11.9	1.7	1.0	.5	.7	.3
Checked out A.M.K. Complete Cycle #26																					
30	2.8	—	—	205 221	36	15 1.4	8	12.5 8.8	203 185	23.4	0	12.5	18	110	225	13.3	1.1	.4	.1	.7	.7
132	24.7	—	—	208 263	56	12 2.8	68	3.2 29.9	209 225	59.6	0	7.8	295	105	228	13.1	1.7	.3	.1	.2	.0
117	20.7	—	—	212 260	52	12.5 2.4	41	5.3 24	210 215	48.2	0	8.5	25	127	215	11.9	1.4	.4	.5	.3	.0
133	24.6	—	—	209 262	56	12.5 2.7	67	3.4 30	209 225	59.6	0	8	115	110	226	13.1	1.7	.3	.1	.3	.0
118	21	—	—	211 260	53	12.5 2.5	41	5.2 24.5	211 216	48.3	0	8.5	28	130	226	11.7	1.4	.4	.6	.3	.0
#29																					
34	25.0	—	—	208 263	56	12 2.8	68	3.1 29.5	209 226	59.8	0	8	250	115	229	13.1	1.7	.3	.8	.2	.0
18	21.0	—	—	210 260	52	13 2.5	43	5.2 24.5	210 214	48.5	0	8.5	30	125	225	11.9	1.5	.5	.4	.3	.0
#30																					
31	3.1	—	—	209 261	34	1.5 1.5	65	11.8 9	209 195	217	0	5	20	110	225	14.5	1.1	.5	.2	1.0	.0
34	25	—	—	208 262	55	12 2.8	65.5	2.75 30	208 225	59.5	0	7.5	210	105	230	12.8	1.3	.3	.8	.3	.0
36	25.4	—	—	214 262	55	12 2.8	65	2.5 29.5	214 232	59.0	0	7	310	100	225	12.9	1.3	.3	1.3	.3	.0
37	25.8	—	—	214 262	56	12.5 2.6	50	4 26	214 216	52.5	0	8	110	125	220	16.8	1.4	.4	.6	.2	.0
32	24.6	—	—	212 265	55	12 2.6	48	4.3 26	212 220	51.5	0	8.5	45	125	220	16.9	1.4	.4	.6	.3	.0
7	20.5	—	—	212 266	52	12.8 2.5	40	5.3 24	214 214	47.6	0	8.5	30	125	210	17.6	1.6	.5	.5	.2	.0
10	4.1	—	—	210 284	38	14.5 1.6	8.5	11.3 10.2	207 193	23.4	0	11.5	20	125	225	17.3	1.2	.7	.2	1.1	.0
#31 10-11-65																					

FUEL METER READING

TEST OF 50 HR PERT. OF SK 56029 Gear Box S/N 10A VC 86260-5
 STAND. E House WORK ORDER NO. 102-A05-100A ENGINE YT 6A
 REDUCTION 12:08:1 CONSTANT 5252 SPECIAL PARTS
 PROP. ASS'Y. NO. N220561 HUB DESIGN NO. VC 86260 BLADE DESIGN NO. FUEL CONTROL NO. FUEL PUM

	TIME				ATM	TEMP.			POWER						FUEL			ENGINE				
	A.M. P.M.	TOTAL TEST	TOTAL ENGINE	TOTAL PROP.		MAX. T.T.T. °F	T.T.T. °F	COMP. INLET °F	GAS Producer RPM	POWER Turbine RPM	PROP RPM	1025 X TORQ. PSI	BLADE X	P L A	COND. LEVER	FLOW LBS / HR.	MAN- FOLD PSI	SUPPLY PSI	DIFF VENT	COMP. DISCH		
2135		35 ⁵⁵	148 ⁵⁵	74 ⁵⁵																		
57961		2145					1160	47	11912	14016	1163	760	2	63	86	1333	440	13		134		
58258		2215					1024	44	11377	10968	910	721	12	54	66	1082	395	13		117		
		2235	35 ⁵⁵	148 ⁵⁵	75 ⁵⁵		Complete cycles #31, Start cycle #32															
58565		2245					1160	46	11980	14014	1161	795	3	65	85	1363	440	13		136		
58856		2315					1010	42	11341	10884	905	721	12	54	67	1072	390	13		117		
59050		2335	38 ⁵⁵	148 ⁵⁵	76 ⁵⁵		End cycle #32, Start cycle #33															
59160		2345					1156	42	11684	113953	1155	800	4	62	86	1353	430	13		136		
59450		0015					1020	40	116341	11118	918	721	12	54	67	1087	390	13		117		
		0035	38 ⁵⁵	148 ⁵⁵	77 ⁵⁵		Complete cycle #33. End of shift															
			38 ⁵⁵	148 ⁵⁵	77 ⁵⁵																	

Witnessed 1/9/63 Samuel

HAMILTON STANDARD

T-77.5 1/63

DAILY H.P. READING @ T.O.