

SERVICE NEWS

A SERVICE PUBLICATION OF LOCKHEED-GEORGIA COMPANY, A DIVISION OF LOCKHEED CORPORATION



MAIN LANDING GEAR RUB



**A SERVICE PUBLICATION OF
LOCKHEED-GEORGIA COMPANY
A DIVISION OF
LOCKHEED CORPORATION**

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Vol. 13, No. 1, January - March 1986

CONTENTS

- 2 **Focal Point**
Howard Burnette
General Manager, Field Service
- 3 **MLG Rub**
A Step-by-Step Approach to Solving
MLG Contact Problems
- 7 **Brake Piston Insulator Inspection**
Guidelines
- 8 **Controlling T-56 Engine Starting Tem-**
perature
Proper Adjustment of the TD Null
Orifice Valve Is a Key Factor
- 9 **Starter Control Valve Adjustment**
Increasing the Rise Rate Protects Starter
Components
- 12 **Index by Subject, 1974-1985**
Vol. 1, No. 1 -Vol. 12, No. 4

Cover: AS winter tightens its grip in the Northern Hemisphere, the all-weather capabilities of the tough, versatile Hercules aircraft become a vital factor in keeping schedules in tact and supply lines open.

Editor's note: The cover notes in Vol. 12, No. 4 state that over 1800 Hercules aircraft have been built. That figure included both the units delivered and those Under contract at the time. As of mid-December 1985, a total of 1765 Hercules aircraft had been delivered.

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Focal Point

Field Service- Dedicated to Serve You

The first operational Hercules aircraft was delivered in December 1956 to Ardmore, Oklahoma. Almost 1800 Hercules airlifters and over 17 million flying hours later, the Lockheed-Georgia Company continues with a strong commitment to provide the support necessary for every operator to achieve maximum utilization of their aircraft and associated equipment.

Having been associated with Lockheed for over thirty years and in my present position, I am keenly aware of the Lockheed **commitment and dedication** to support its products. We have a Field Service organization designed to provide technical assistance to **every customer**, world-wide, through on-site service representatives, regional service representatives, and at the factory.

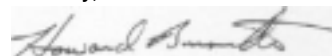
The **long** history, **outstanding accomplishments**, and remarkable record of the Hercules is not only a tribute to the aircraft, but a tribute to the personnel of the many operators of the aircraft throughout the world.

We like to think that our Field Service **Representatives played an important and** vital role in making these achievements possible. We are proud of the unique contribution Lockheed-Georgia Field Service Representatives have made to this record of success. A tradition of service born with the delivery of that first Hercules lives today through the personal dedication of these specialists to the success of the aircraft and the operators who fly them.

Field Service Representatives are Lockheed career professionals who are willing to serve in support of our products anywhere the aircraft operates and take pride in the operational effectiveness of the customers they serve. These representatives provide a key and vital link in a vast communication network between operators and the factory. Their reports of customer operations, successes and problems, are read by all Lockheed organizations and top management. Information from these reports is not only used to address immediate problems but serves to enhance future aircraft performance through improved maintenance and inspection procedures and manufacturing techniques.

Lockheed-Georgia Field Service is dedicated to serve you, the Hercules operator, whether on the flight line, in your shops, in the classroom, or back in Georgia at our factory. Below, I have identified the key Hercules service management people for your information and use. **Let us hear from you.**

Sincerely,



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PRODUCT SUPPORT

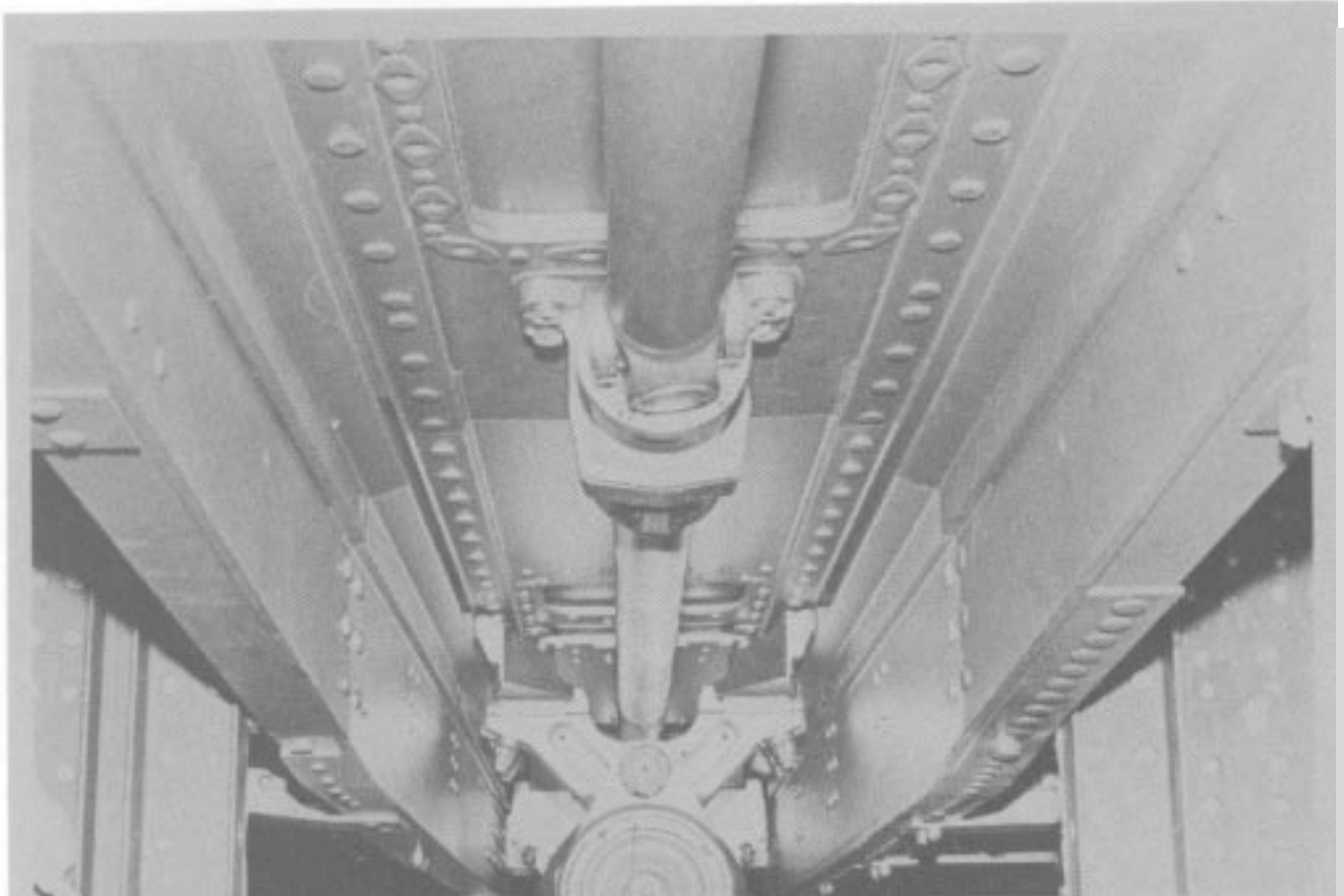
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by **Charles W. Callan**
Aircraft Design Engineer, Senior

Operators of Hercules aircraft may on some occasions find evidence that there has been contact between the main landing gear torque strut and the vertical beams, or between the main gear piston and shelf bracket. This contact could be the result of any or a combination of the following causes:

- Shoe misadjustment
- Shoe or track wear
- Tire unbalance

The nature of the indications of landing gear rub are helpful in determining the extent of corrective action necessary to deal with the problem. For example, an airplane with suspected gear rub where only scratched or chipped paint is observed is considered flyable until adjustments can be made to provide more clearance. Do not, however, continue to operate the airplane for more than 100 flight hours without taking action to relieve the rub. An airplane that shows evidence of rubbing in

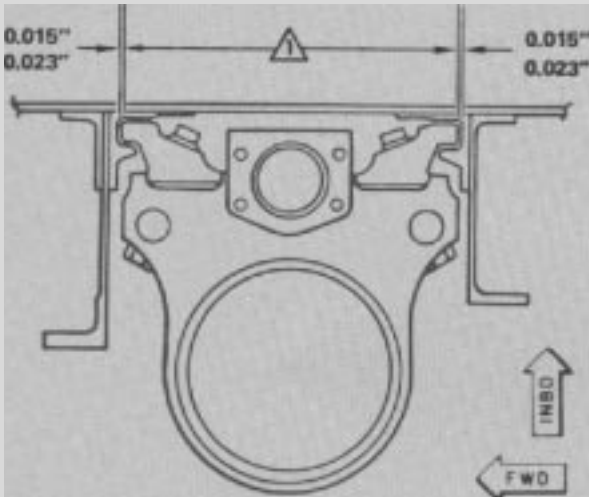
which metal-to-metal contact is taking place, causing gouging or scratching of the surfaces, is not considered flyable. Immediate corrective action is mandatory.

The following steps can be taken to correct the rubbing condition:

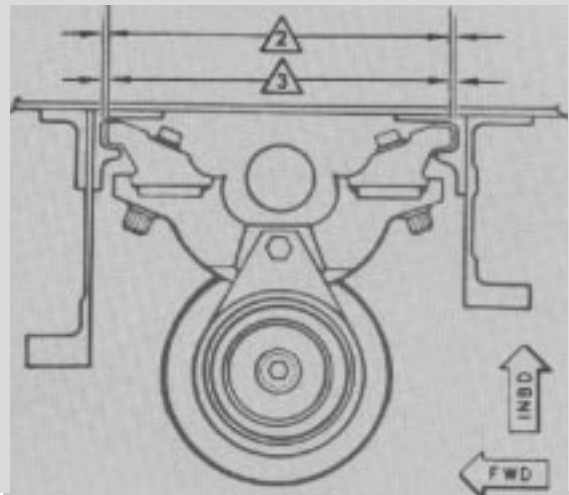
1. Check the lower shoe gap between the inboard face of the shoe and the face of the track. The gap should be 0.002 to 0.007 inch, measured with the airplane on jacks.
2. Check the lower shoe fore and aft clearances to ensure that they are not excessive. Adjust if required (see Figure 1).
3. Check the adjustment of the upper shoes for proper clearance and make sure that the tops of both shoes are within 0.06 inch of being an equal distance above the swivel bracket.
4. Check the upper shoe outboard facings (see Figure

INITIAL GAPSETTING: 0.015" to 0.023"

TOTAL MINIMUM GAPSETTING: 0.010" to 0.020"
TOTAL INITIAL GAP SETTING: 0.030" to 0.040"

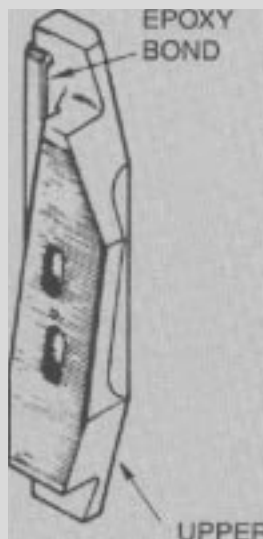


LOWER TRACK SHOES



UPPER TRACK SHOES

Figure 1. Track shoes — fore and aft clearances.



**UPPER TRACK SHOE
PIN 331 7794**

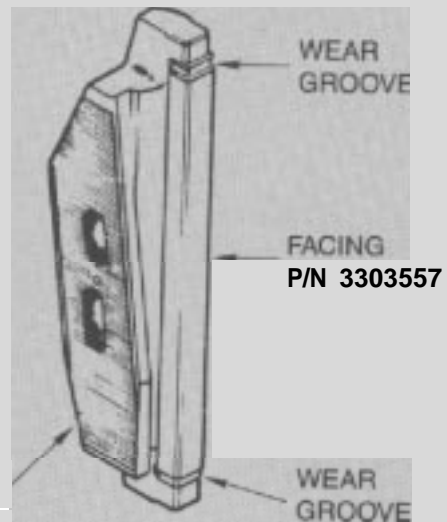


Figure 2. Upper track shoe assemblies.

2) for excessive wear according to the instructions in the appropriate maintenance manual, and replace if necessary.

5. Check for unbalanced wheel and tire assemblies and correct if necessary.

If a main landing gear strut has a rubbing condition that cannot be corrected by the above measures, check to see whether the aircraft has the thick (0.130 inch) serrated plates (P/N 372602-11, and -1R) installed between the upper shoes and the swivel bracket (see Figure 3).

If the thick serrated plates are present on the aircraft in question, the rubbing condition can be relieved by substituting the thin (0.065 to 0.070 inch) serrated plates (P/N 372602-3 and -4). The use of the thinner serrated plates shifts the position of the main landing gear piston/axle slightly outboard, thereby increasing the clearance in the contact area.

The thinner plates are interchangeable with the thick plates and may be substituted if increased clearance is desired.

Note that plates should be replaced in pairs, and that a combination of thick and thin plates on one swivel bracket is not acceptable. If the P/N 372602-3 and -4

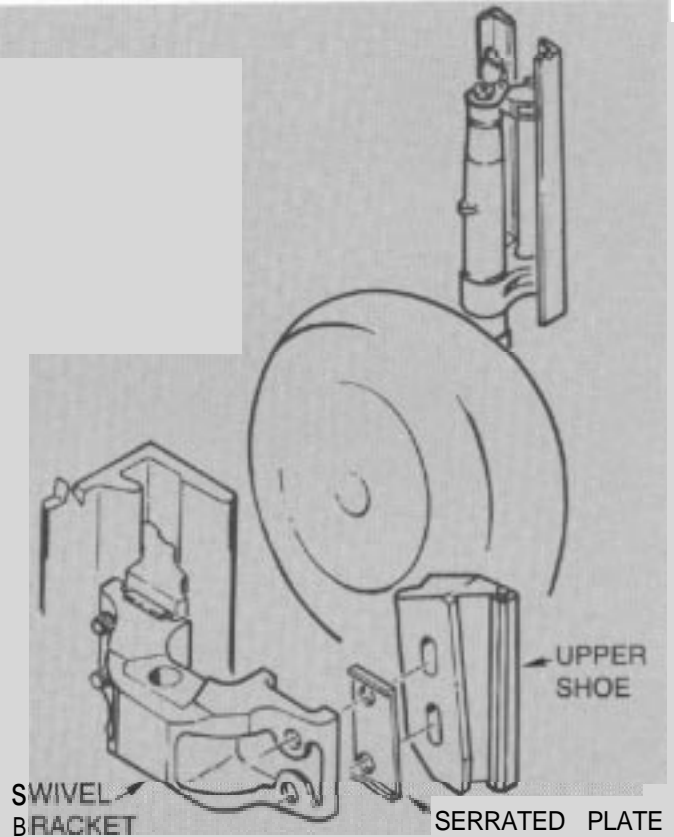


Figure 3. Upper track shoe installation.

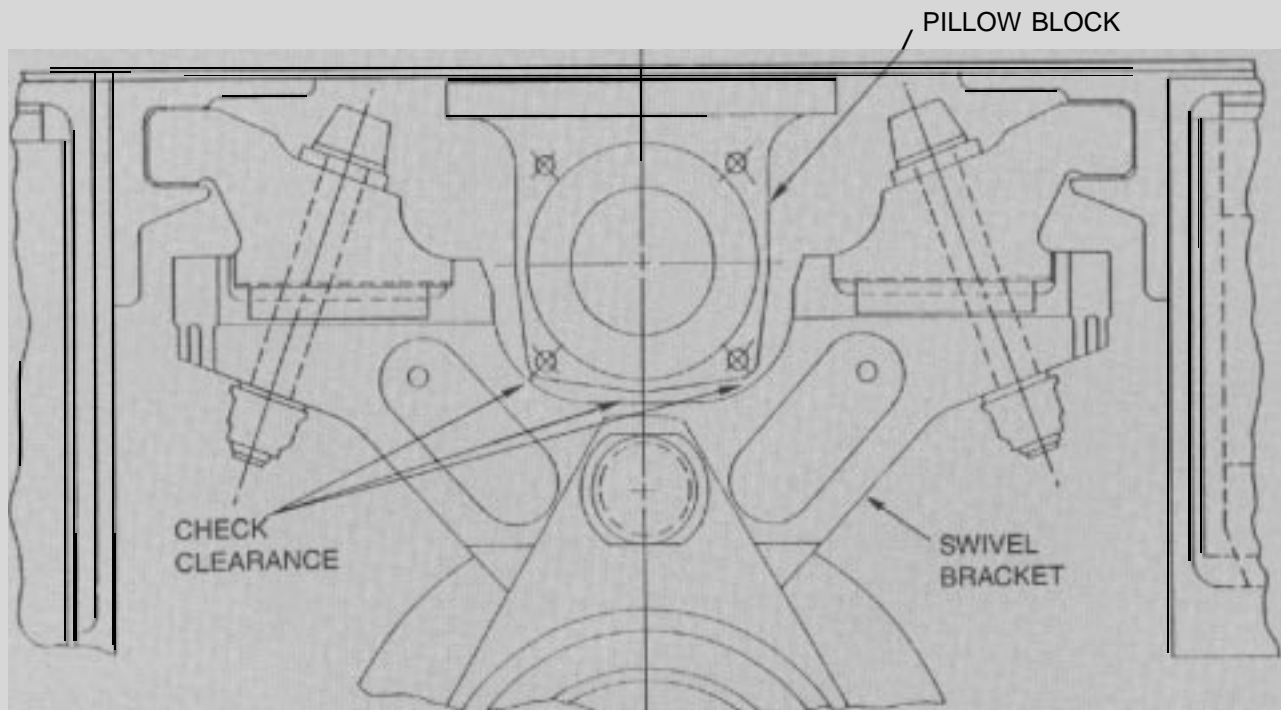


Figure 4. Clearance check between swivel bracket and pillow block.

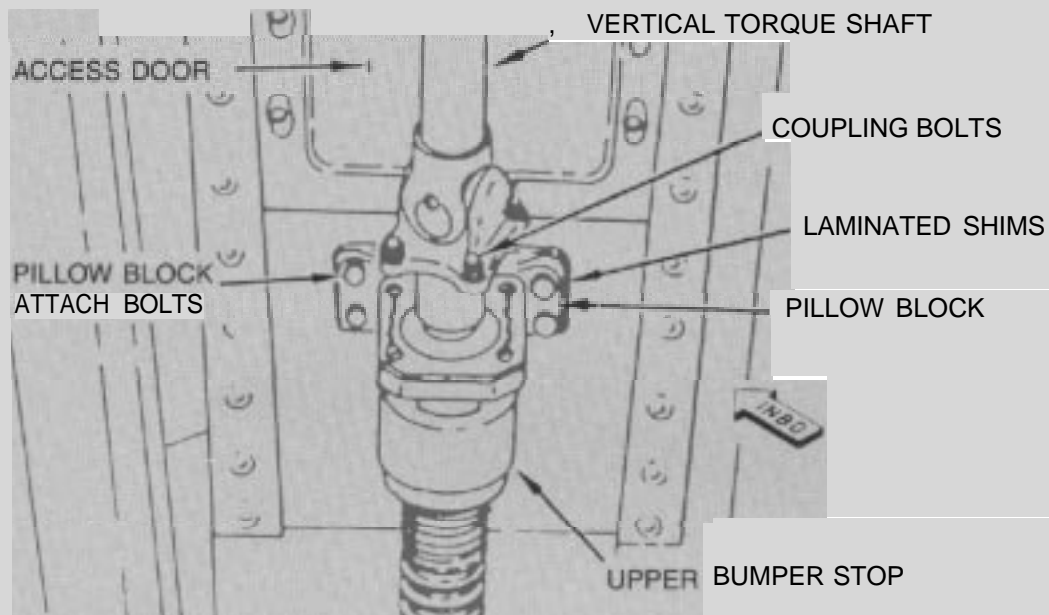


Figure 3. Pillow block installation.

thin serrated plates are not readily available, the -IL and -IR thick plates can be modified to the thinner -3 and -4 configuration by machining the inside of the channel section web to 0.065 to 0.070 inch in thickness. Then replating the reworked area with cadmium.

When thin serrated plates are substituted, care must be taken to ensure that there is adequate **clearance** between the swivel bracket and the ball screw pillow block (see Figure 4). It will be necessary to verify that this clearance exists during functional extension and retraction operations on the ground. The clearance should be no less than 0.015 inch. If the clearance is less than this, the laminated shims (P/N 373556-1) between the pillow block and the side panel may be reduced in thickness until the required clearance is obtained (see Figure 5). If there is only a single point of contact, an additional option may be considered for obtaining the required clearance. That option is to remove up to 0.020 inch of the pillow block edge material at the point where the interference is taking place.



BRAKE PISTON INSULATOR INSPECTION GUIDELINES

There have been a number of reports of Goodyear multi-disc brakes being removed because of crushed or broken insulators. Here is a little background information on the problem, and some guidelines for inspection and acceptance or rejection of brake piston insulators.

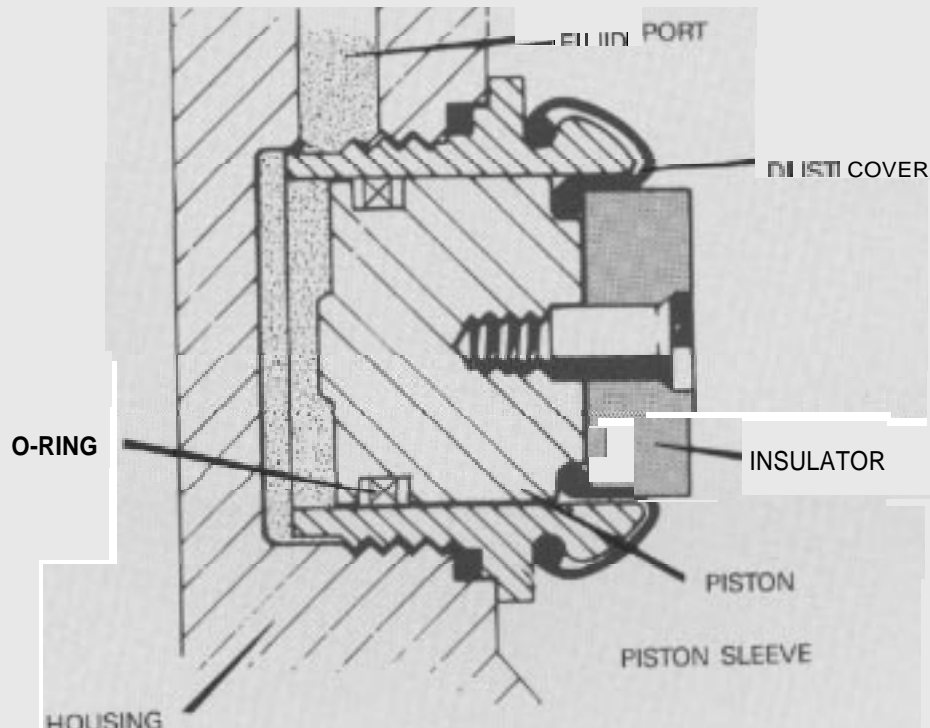
Originally there was no specific requirement for compression strength or load testing of brake piston insulators. After the problem of broken and crushed insulators was reported, the parts were tested by Raymark and Abex, the two vendors concerned. The tests revealed that the Raymark parts crushed at 9,000-13,000 pounds, while the Abex parts failed at 20,000-25,000 pounds.

In December 1983, a minimum acceptable crush load requirement of 18,000 pounds was included in the speci-

fication. Goodyear also added a requirement that the vendors stamp a letter H and the supplier identification on same face of the insulator as the part number. Any insulator so marked will be good part.

For inspection of used insulators, parts that are of inadequate strength usually delaminate and are therefore easy to identify. Any insulator that is starting to delaminate should be replaced. Also check visually for blisters, nicks, and cracks. Surface cracks are acceptable; but cracks that extend into the screw hole are cause for rejection. The height of the insulator is also important in determining if a part may be reinstalled for another run. Brake piston insulators less than 0.669 inches high should not be continued in service.

SERVICE NEWS



MULTI-DISC ASSEMBLY

CONTROLLING T-56 ENGINE

STARTING TEMPERATURE

Occasionally we note excessive turbine inlet temperature (TIT) during engine start, and our usual reaction is to check temperature datum (TD) amplifier calibration. However, improper calibration or malfunction of the TD amplifier is not the cause of excessive TIT during engine start. If the propeller blade angle is properly adjusted and the starter is supplied with an adequate supply of air, then the cause of high TIT is almost invariably excessive fuel flow. In any event, the TD amplifier cannot prevent excessive TIT; it can only reduce fuel flow after the overtemp occurs by driving the TD valve to a “take” position.

Proper operation of the TD system will prevent serious damage to the engine turbine, but repeated overtemps (TIT in excess of 830°C) during start are somewhat life-limiting for the engine. Therefore, in daily operation, the engine hydromechanical system should control fuel flow so that an overtemp will occur only if induced by an abnormal condition such as excessive blade angle, low bleed air pressure, high ambient air temperature, etc.

Proper fuel flow during start and acceleration is a function of the fuel control metering system output that is fine-tuned by manual adjustment of the TD valve null orifice. If the TIT consistently exceeds 820°C and then

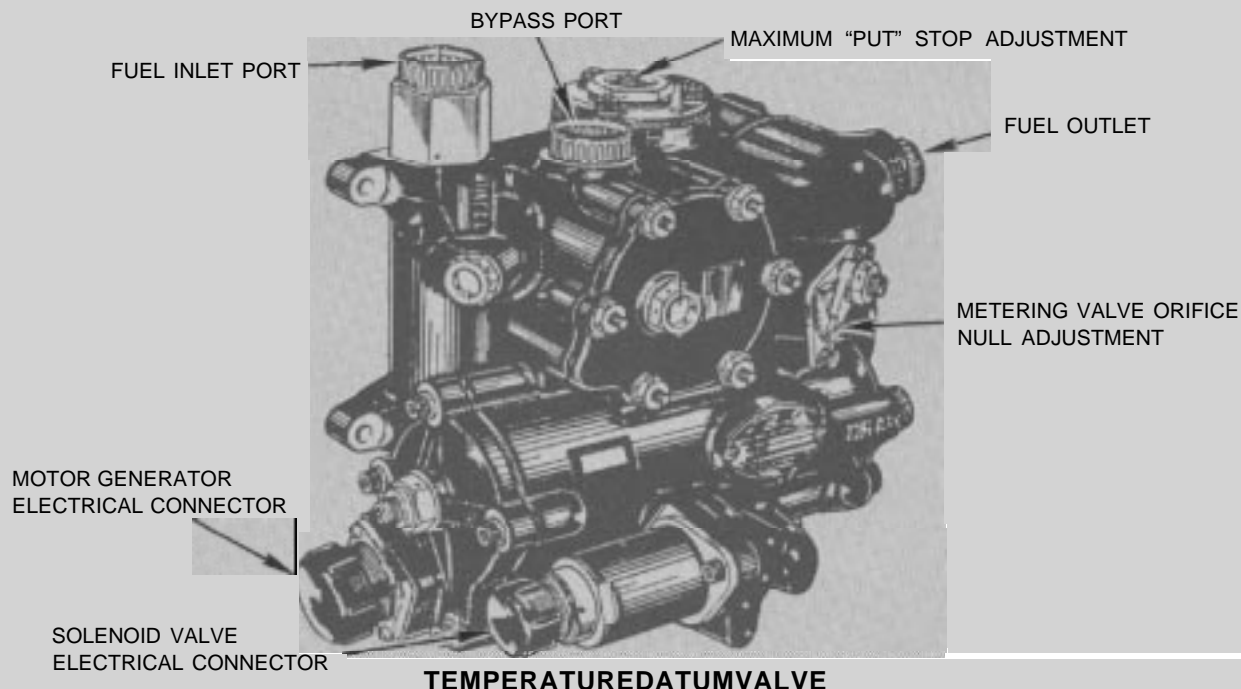
is reduced by the TD amplifier start limit function, the TD valve null orifice definitely needs to be adjusted toward the decrease fuel flow direction. Conversely, if TIT during start is less than 780°C, the null orifice requires an increase adjustment in order for the engine to accelerate properly.

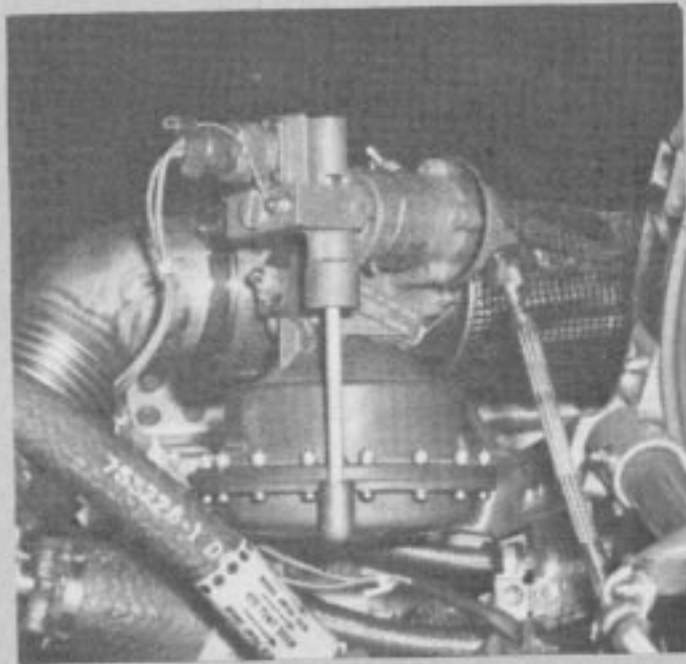
The “Null Engine Start” check will determine if the engine hydromechanical fuel schedule is properly adjusted. This check establishes that a safe engine start could be accomplished in the event of a TD system failure at a remote location where there is no maintenance capability.

Please remember these points when diagnosing and correcting an excessive TIT discrepancy that occurs during engine start and acceleration:

1. The TD valve null orifice adjustment is provided for the sole purpose of matching the hydromechanical fuel system output to the engine fuel requirements during start and acceleration.
2. The TD valve null orifice adjustment should never be used to compensate for rich or lean conditions during normal operation.

SERVICE NEWS





STARTER CONTROL VALVE ADJUSTMENT

Increasing the Rise Rate Protects Starter Components

Later model Bendix starters (P/N 36E84-18QD or -18QF, for example) are equipped with a stronger clutch return spring. The stronger spring may, under certain circumstances, allow the starter to spool up to a higher RPM before the starter engages. This higher engagement RPM may cause a significant increase in the wear rate on the clutch and coupling teeth, thereby reducing the service life of these components. Bendix Service Bulletin No. 124A has been issued to establish the procedure to elevate the rise rate of the 38E73 starter control valves in order to make them compatible with the stronger return springs. Starter control valves which have been adjusted in compliance with the service bulletin may be identified by the letter "A" following the serial number on their name plate.

Note that the increased rise rate called for in the service bulletin will have no adverse effects on earlier configuration Bendix, AiResearch or Hamilton Standard starters currently being used on C-130 or L-100 aircraft.

The starter control valves that Bendix Service Bulletin No. 124A applies to are as follows:

Allied/Bendix Fluid Power Division Starter Control Valve models:

38E73 - 4A S/N 1538 and earlier

38373 - 5A S/N 201 and earlier

38E73 - 7A S/N 802 and earlier

Some starter control valves have been previously adjusted at the factory and do not have the "A" stamped after the serial number on the nameplate. If this is the case, the adjustment stem will already be extended 1/2 inch from the face of the rise rate control housing and will not require further adjustment (see Figure 1). For this reason, be sure to check this dimension before any adjustment is made to the unit.

Adjustment Procedure

1. First, locate the rise rate control valve housing on the starter valve. It is located between the 2-pin solenoid connector and the servo-to-regulator tube (see **Figure 2**). The rise rate control adjusting stem (No. 10-32 thread) is situated above the large regulator backup screw plug. Both the adjusting stem and its locknut are covered with orange torque seal.
2. Scrape off the majority of the torque seal on the adjustment stem and lock nut, while exercising caution not to damage the adjustment screw threads.
3. Use a stiff non-metallic brush and the acetone solvent (or equivalent) to remove the torque seal remaining in the adjustment stem threads. It is important that the adjustment screw threads be properly cleaned without damaging them in the process. Binding may occur between the locknut and adjusting screw if the threads are not properly cleaned or are damaged.
4. Place a suitable blade-type screwdriver into the adjustment screw stem slot to hold it stationary while using a 1/4-inch wrench to unscrew (counterclockwise direction) the locknut only as required to loosen the assembly (about 1/2 turn).
5. Remove the wrench from the locknut and use the screwdriver to unscrew the adjustment stem four (4) complete turns (counterclockwise direction). Be very careful NOT to unscrew the adjustment stem more than four (4) turns since doing so may cause the stem to fall out. With this accomplished, hold the stem stationary with the screwdriver and carefully tighten the locknut (clockwise direction) as required to hold the stem in place.
6. Apply new torque seal to the threads of the stem.
7. Add the letter "A" after the serial number on the name plate on starter control valves which have been adjusted in this manner.

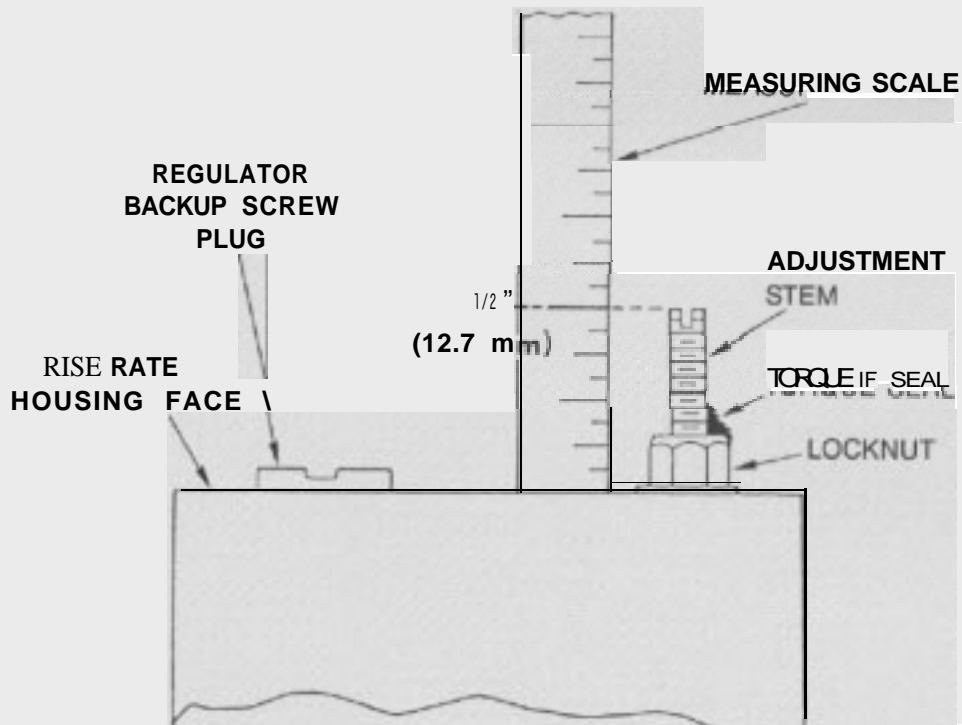


Figure 1. Adjustment stem measurement.

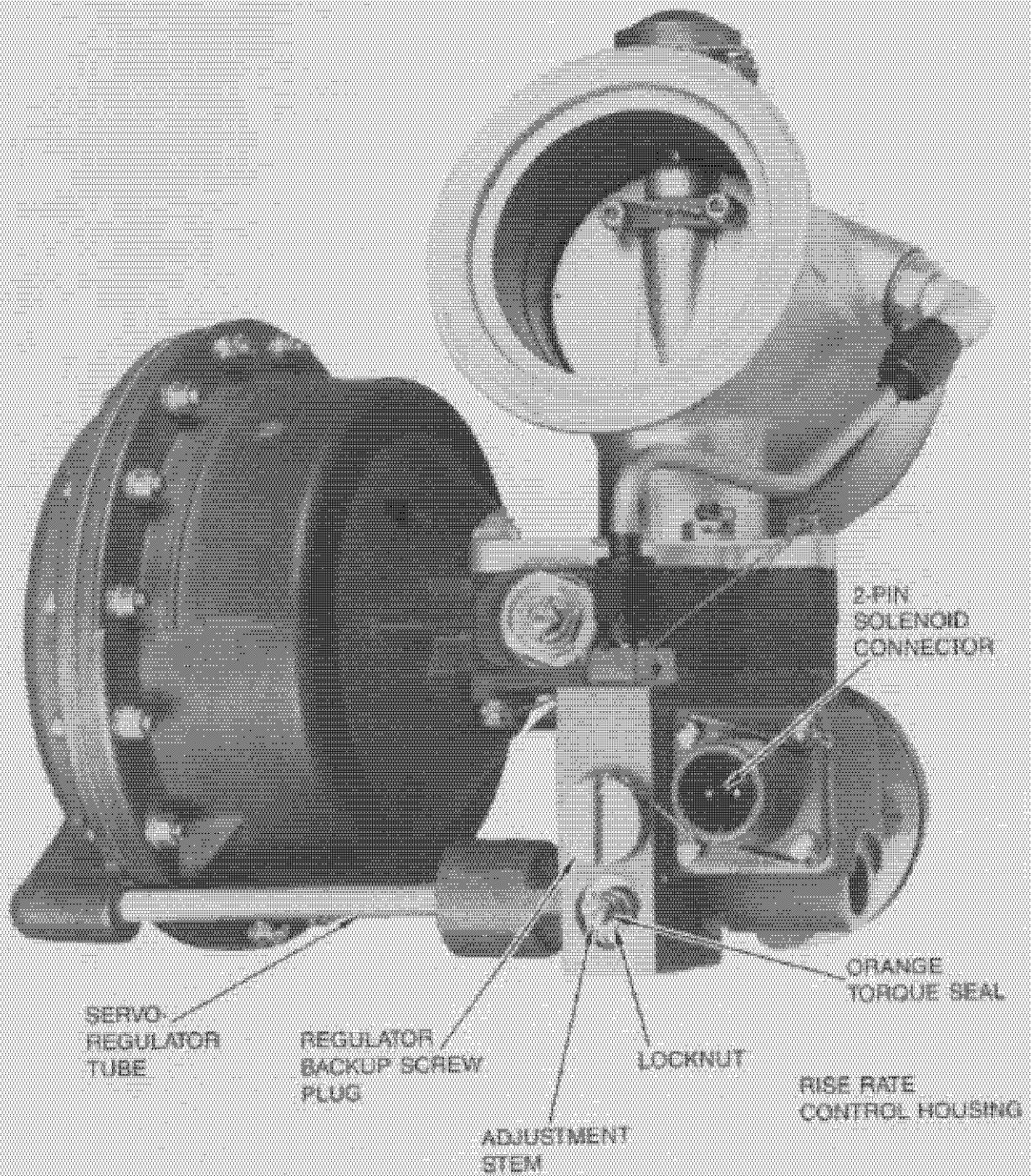


Figure 2. Rise rate control adjustment.

SERVICE NEWS

AIRFRAME

INDEX

ELECTRICAL AND AVIONICS

INDEX

ENGINES AND PROPELLERS

INDEX

FUEL SYSTEM

INDEX

HYDRAULICS

**SUBJECT
HEADINGS**

LANDING GEAR

INDEX

OPERATIONS

INDEX

**PNEUMATICS AND
ENVIRONMENTAL**

INDEX

**TOOLS AND GROUND
SUPPORT EQUIPMENT**

INDEX

MISCELLANEOUS

INDEX by SUBJECT

VOL.1, NO.1 through VOL.12, NO.4

1974-1985

AIRFRAME

	Issue	Page
ADJUSTING LANDING LIGHTS	VOL. 8, NO. 3 JUL-SEP '81	11
AFT CARGO DOOR UPLOCK BINDING	VOL. 8, NO. 3 JUL-SEP '81	8
AIRFRAME A Brief Discussion of C-130H and L-100-30 Airframe Features	VOL. 6, NO. 4 OCT-DEC '79	7
THE AN/ART-31 RADIO COMPARTMENT DOOR Making It Secure	VOL. 8, NO. 4 OCT-DEC '81	10
ANOTHER GREASE-GREAT IMPROVEMENT Use of ML-G-81 322 Avoids Paint Damage	VOL. 7, NO. 3 JUL-SEP '80	19
CARGO FLOOR SHORING Protecting the Floor From Damage	VOL. 6, NO. 2 APR-JUN '79	18
CARGO RAMP RIGGING	VOL. 4, NO. 1 JUL-SEP '79	3
CARGO RAMP RIGGING CHECKS Making Sure the Cargo Ramp Is Properly Rigged	VOL. 12, NO. 1 JAN-MAR '85	3
CLIP-LOCKING TURNBUCKLES	VOL. 12, NO. 4 OCT-DEC '85	6
CONTROLLING RUDDER THRUST BEARING WEAR	VOL. 10, NO. 3	3
CREW DOOR RIGGING	VOL. 6, NO. 3 JUL-SEP '83	3
CREW ENTRANCE DOOR CABLE Adding a Support Cable to the Crew Entrance Door	VOL. 4, NO. 3 JUL-SEP '77	17
DELAMINATION OF WHEEL WELL DOORS	VOL. 2, NO. 4 OCT-DEC '75	15
DIMENSIONS C-130H and L-100-30 External Dimensions	VOL. 6, NO. 4 OCT-DEC '79	6

AIRFRAME (contd)

	Issue	Page
FACT SHEET Basic Data on the C-130H and L-100-30 at a Glance	VOL. 6, NO. 4 OCT-DEC '79	6
FLIGHT CONTROL CABLE TENSION REGULATORS Description and Operation of Cable Tension Regulators	VOL. 3, NO. 3 JUL-SEP '76	14
THE HERCULES AIRCRAFT: A STUDY IN EVOLVING MATERIALS AND PROCESSES TECHNOLOGY	VOL.8, NO. 3 JUL-SEP '81	3
HERCULES CREW ENTRANCE DOOR OPEN WARNING SWITCH ADJUSTMENT	VOL. 2, NO. 1 JAN-MAR '75	13
INFLIGHT VACUUM CLEANER SYSTEM Pressurization Powers an Ingenious Cleaner	VOL.12, NO. 4 OCT-DEC '85	12
KEEP A TIGHT SHIP Care and Handling of Pressurization Seals	VOL. 6, NO. 2 APR-JUN '79	3
KEEPING THE FRONT BEAM CLEAN Preventing Corrosion in the Leading Edge Area	VOL. 10, NO. 4 OCT-DEC '83	11
LIFE RAFT VENT VALVE POSITIONING	VOL. 10, NO. 2 APR-JUN '83	10
LIFE RAFTS	VOL. 6, NO. 1 APR-JUN '83	3
NOSEJACKPADNUTPLATES Part Numbers	VOL. 7, NO. 1 JAN-MAR '80	13
NUTS, BOLTS, AND SCREWS	VOL. 2, NO. 3 JUL-SEP '75	3
PRECIPITATION STATIC DISSIPATION Causes and Solutions for Precipitation Static	VOL. 4, NO. 3 JUL-SEP '77	20

AIRFRAME (contd)

	Issue	Page
A QUICK FIX FOR A HANGING DOOR A Simple Remedy for Cargo Door Inflight Operation Problems	VOL. 12, NO. 2 APR-JUN '85	13
RAMP ACTUATOR DAMAGE Reversing a Bolt Can Prevent It	VOL. 8, NO. 1 JAN-MAR '81	14
SCOVILL FASTENERS How They Work, and How to Use Them	VOL. 7, NO. 2 APR-JUN '80	15
STATIC GROUND ASSEMBLIES Deleted From Landing Gear	VOL. 4, NO. 3 JUL-SEP '77	21
TORQ-SET SCREWS AND TOOLS Torq-Set Fasteners and Tools Described and Illustrated	VOL. 3, NO. 4 OCT-DEC '76	11
UPPER COWLING HINGE LUBRICATION Installing Grease Fittings to Lubricate Engine Cowling Hinge Pins	VOL. 4, NO. 4 OCT-DEC '77	15
UPPER NACELLE AND WING DRY BAY PLUMBING Keeping the Drain Lines Clear	VOL. 7, NO. 1 JAN-MAR '80	4
WARPED CREW DOORS	VOL. 6, NO. 3 JUL-SEP '79	14

ELECTRICAL AND AVIONICS

	Issue	Page
ACVOLTAGEREGULATORS Matching of Generator and Voltage Regulator	VOL. 4, NO. 4 OCT-DEC '77	16
APO-122 RADAR Basic Description and Operation	VOL. 4, NO. 4 OCT-DEC '77	3
THE BENDIX PPI-1P WEATHERVISION RADAR INDICATOR Description and Operation	VOL. 7, NO. 1 JAN-MAR '80	6
BOOST PUMP ELECTRICAL CONNECTOR for the Hydraulic Suction Boost Pump	VOL. 4, NO. 4 OCT-DEC '77	18
CHECKING AND ADJUSTING B-1235 HARTMAN CONTACTORS	VOL. 11, No. 1 JAN-MAR '84	3
CIRCUIT BREAKERS How They Protect Your Airplane	VOL. 8, NO. 4 OCT-DEC '81	12

ELECTRICAL AND AVIONICS (contd)

	Issue	Page
ELECTRICAL SYSTEM An Introduction to C-130H and L-100-30 Electrical Systems	VOL. 6, NO. 4 OCT-DEC '79	22
THE HANDLING OF GYROS Protecting Gyros During Shipment	VOL. 6, NO. 4 JAN-MAR '79	14
HERCULES WIRE IDENTIFICATION Including a Cross-Reference Chat-t	VOL. I, NO. 2 APR-JUN '74	9
HF ANTENNA WIRE BREAKAGE Preventing Corrosion Keeps Antennas on the Job	VOL. 10, NO. 3 JUL-SEP '83	14
NEW ICE DETECTORS Description, Operation, and Maintenance of Solid-State Units	VOL. 8, NO. 1 JAN-MAR '81	17
NICAD (NICKEL-CADMIUM) BATTERIES Don't Leave "Well Enough" Alone	VOL. 1, NO. 4 OCT-DEC '74	10
PROTECTING UHF AND VHF ANTENNAS A Simple Way to Prevent Erosion Damage	VOL. 10, NO. 2 APR-JUN '63	15
TERMINAL LUGS: STACKING THEM SAFELY Making Safe Connections When Securing Terminal Lugs	VOL. 10, NO. 4 OCT-DEC '83	6
TROUBLESHOOTING APQ-122 RADAR	VOL. 5, NO. 2 APR-JUN '78	3

ENGINES AND PROPELLERS

	Issue	Page
CRACKED PROPELLER DOME SHELL	VOL. 3, NO. 2 APR-JUN '76	14
THE EXTERNAL SCAVENGE OIL FILTER Checklist for Oil Venting and Differential Pressure Symtoms	VOL. 2, NO. 2 APR-JUN '75	7
A GUIDE TO PROPELLER BLADE CARE	VOL. 9, NO. 1 JAN-MAR '82	3
HERCULES ENGINE TACHOMETER SYSTEM	VOL. I, NO. 1 JAN-MAR '74	8
HERCULES POWER PLANT RIGGING	VOL. 5, NO. 1 JAN-MAR '78	3
HERCULES PROPELLER CONTROL OIL LEVEL CHECK Using the Atmospheric Sump	VOL. I, NO. 2 APR-JUN '74	3

ENGINES AND PROPELLERS (cont'd)

ENGINES AND PROPELLERS (cont)

	Issue	Page
HINTS FOR MAINTAINING THERMOCOUPLES	VOL. 9, NO. 3 JUGSEP '82	6
HOW TO RELEASE A LOCKED PROPELLER BRAKE Proven Techniques to Release a Balky Prop Brake	VOL. 12, NO. 4 OCT-DEC '85	8
MORE ABOUT RIG PINS Additional Data on Power Plant Rigging	VOL. 5, NO. 2 APR-JUN '76	35
OIL PRESSURE TRANSMITTER VENT LINE ON JETSTAR ENGINES	VOL. 4, NO. 1 JAN-MAR '77	22
POWER PLANT, PROPELLERS, AND THE APU on the C-130H and L-160-30	VOL. 6, NO. 4 OCT-OEC '79	12
PRESERVATION OF T-56 ENGINES	VOL.2, NO. 4 OCT-DEC '75	9
PROPELLER VALVE HOUSING INSTALLATION	VOL. 2, NO. 2 APR-JUN '75	19
SECONDARY FUEL PUMP PRESSURE LIGHT FLICKER What Causes It and How to Correct It	VOL. 8, NO. 4 OCT-DEC '61	16
SOLID-STATE OIL TEMPERATURE CONTROL THERMOSTATS Oil Cooling System Operation Reflects Thermostat Changes	VOL. 10, NO. 3 APR-JUN '83	10
SOLID-STATE OIL QUANTITY TRANSMITTERS How They Work. and How to Interpret the Indications	VOL. 12, NO. 2 APR-JUN '85	8
STARTING FOR A LONGER ENGINE LIFE Understanding Engine Starting Events	VOL. 2, NO. 2 APR-JUN '75	3
THERMOCOUPLES AND TIT Turbine Inlet Temperature Indicating System Operation	VOL. 9, NO. 3 JUL-SEP '82	3
TROUBLESHOOTING RPM FLUCTUATION Finding the Causes of Prop Induced RPM Fluctuation	VOL. a. NO. 2 APR-JUN 'EI	3
TROUBLESHOOTING ENGINE START PROBLEMS	VOL. 4, NO. 1 JAN-MAR '77	23
TURBINE TEMPERATURE TROUBLESHOOTING Detecting Abnormal Temperature Condifions	VOL. I, NO. 4 OCT-DEC '74	3

	Issue	Page
USING THE TACH GENERATOR TEST FOR AN AUTO-TAC	VOL. 4, NO. 3 JUL-SEP '77	17
WHERE DID THE OIL GO? Troubleshooting Engine Oil Losses	VOL. 2, NO. 3 JUL-SEP '75	14

FUELSYSTEM

	Issue	Page
CHEMICAL CONTROL OF FUEL TANK INFESTATION	VOL. 10, NO. 3 JUL-SEP '83	8
CONTROLLING MICROBIAL GROWTH in Aircraft Fuel Tanks	VOL. 2, NO. 2 APR-JUN '75	10
FUELSYSTEM An introduction to C-130H and L-100-30 Fuel Systems	VOL. 6, NO. 4 OCT-DEC '79	9
HERCULES FUEL QUANTITY INDICATING SYSTEM	vOL. 1, NO. 3 JUL-SEP '74	2
HERCULES FUEL VENT SYSTEM Keep Obstructions Out	VOL. 1, NO. 1 JAN-MAR '74	14
LEAKY FASTENERS A Guide to Fuel Tank Fastener Leak Repair	VOL. 4, NO. 2 APR-JUN '77	3
LOCATING LEAKS in Auxiliary Fuel Tanks by Color	VOL. 2, NO. 2 APR-JUN '75	14
MAINTENANCE OF INTEGRAL FUEL TANKS	VOL. 9, NO. 4 OCT-DEC '82	3
MATERIALS FOR FUEL TANK MAINTENANCE A Helpful List of Materials, Stock Numbers, and Vendors	VOL. 8, NO. 2 APR-JUN '81	11
NEW FUEL QUANTITY TANK PROBES	vOL. 4, NO. 1 JAN-MAR '77	22
OVERBOARD FUEL VENTING The Chief Causes of Inadvertent Fuel Venting	VOL. 7, NO. 2 APR-JUN '80	3
RECLAIMING FUEL COMPENSATOR UNITS Some Units Damaged by Moisture Can Be Restored	VOL. 5, NO. 3 JUL-SEP '78	14
REPAIR OF RUBBER COVERING ON INFLIGHT REFUELING HOSES	VOL. 4, NO. 2 APR-JUN '77	15
SOLDERING FUEL QUANTITY INDICATING SYSTEM CONNECTORS	VOL. 8, NO. 2 APR-JUN '81	18

FUEL SYSTEM (contd)

	Issue	Page
UPPER REFUELING TUBE INSTALLATION A Special Tool Can Simplify the Procedure	VOL. 8, NO. 2 APR-JUN '81	16

HYDRAULICS

	Issue	Page
AFT CARGO DOOR ACTUATOR MODIFICATION	VOL. 10, NO. 2 APR-JUN '83	9
DON'T SLAM THE DOOR	VOL. 4, NO. 1 JAN-MAR '77	17
ENGINE-DRIVEN HYDRAULIC PUMPS: A BRIEF HISTORY	VOL. 10, NO. 2 APR-JUN '83	3
FLARELESS FITTINGS	VOL. 1, NO. 1 JAN-MAR '74	3
HERCULES FLAP SYSTEM A Brief Description of the Hercules Flap System	VOL. 4, NO. 1 JAN-MAR '77	18
HEACULESFLAPSYSTEM A Review of the Major Components and System Operation	VOL. 12, NO. 3 JUL-SEP '85	16
HOW TO BLEED A HERCULES HYDRAULIC PUMP — AND KEEP IT CLEAN	VOL. 1, NO. 2 APR-JUN '74	11
HYDRAULIC FLUID INTER- CHANGE BETWEEN SYSTEMS Accumulator Trouble Can Cause Fluid Interchange	VOL. 3, NO. 3 JUL-SEP '76	16
HYDRAULIC FLUID TRANSFER An Update on Fluid Transfer Between Systems	VOL. 9, NO. 2 APR-JUN '82	11
HYDRAULIC PRESSURE DROP Hydraulic Pressure Changes During Flight Control and Landing Gear Movements	VOL. 6, NO. 3 JUL-SEP '79	15
THE HYDRAULIC SYSTEMS An Introduction to the C-130H and L-100-30 Hydraulic Systems	VOL. 6, NO. 4 OCT-DEC '79	19
INTERCONNECT VALVE POSITIONING PROCEDURE	VOL. 2, NO. 4 OCT-DEC '75	10
MEET THE "H" FITTING A New Approach to Hydraulic Fitting Repair	VOL. 10, NO. 1 JAN-MAR '83	13

HYDRAULICS (contd)

	Issue	Page
NEW CHECK VALVE for Hercules Hydraulic Pump Pressure Lines	VOL. 4, NO. 2 APR-JUN '77	15
NEW FILTER ELEMENTS for Hercules Hydraulic Systems	VOL. 2, NO. 1 JAN-MAR '75	14
NEW HYDRAULIC PUMP Limits Temperature	VOL. 2, NO. 3 JUL-SEP '75	12
O-RINGS An Updated Compilation of O-Ring Data	VOL. 11, NO. 3 JUL-SEP '84	3
OPENING THE HERCULES RAMP Using the Auxiliary System Hand Pump	VOL. 1, NO. 4 OCT-DEC '74	6
PREFORMED PACKINGS	VOL. 3, NO. 1 JAN-MAR '76	3
PRESSURE INDICATOR LAG	VOL. 2, NO. 4 OCT-DEC '75	12
SEALS FOR HERCULESPUROLATOR HYDRAULIC FILTERS A Chart Listing the Seals Required to Service Hydraulic Filters	VOL. 3, NO. 3 JUL-SEP '76	13
SERVICING HERCULES HYDRAULIC FILTERS	VOL. 3, NO. 1 JAN-MAR '76	15
TWO DIFFERENT HERCULES ENGINE DRIVEN HYDRAULIC PUMPS	VOL. 1, NO. 3 JUL-SEP '74	15
VERY HIGH PRESSURE HYDRAULICS — ITS HERE Systems With 8000 PSI, Non- flammable Fluid Begin Tests	VOL. 12, NO. 3 JUL-SEP '85	14

LANDING GEAR

	Issue	Page
AIRCRAFT WHEEL INSPECTION Inspection of Critical Areas	VOL. 5, NO. 1 JAN-MAR '78	23
HERCULES HIGH-ENERGY BRAKES Single-Disk Versus Multi-Disk	VOL. 2, NO. 1 JAN-MAR '75	10
HERCULES MLG BALLSGREW LUBE Side Lubrication Fitting Modified	VOL. 4, NO. 4 OCT-DEC '77	17
HOT BRAKES Causes of Overheated Brake8	VOL. 4, ND. 3 JUL-SEP '77	18
JETSTAR NOSE STEERING SYSTEM	VOL. 1, NO. 1 JAN-MAR '74	8

LANDING GEAR (contd)

	Issue	Page
KEEPING THE PRESSURE ON Continuously Applied Gear Up Pressure: Here's Why	VOL. 10, NO. 1 JAN-MAR '83	6
KEEPUP THE PRESSURE IN JETSTAR TIRES Precautions and Recommendations for Inflating JetStar Tires	VOL. 3, NO. 2 APR-JUN '76	15
LOST LOCKING SCREW Means MLG Trouble	VOL. 6, NO. 1 JAN-MAR '79	13
MAIN LANDING GEAR FRICTION WASHER SPLASH GUARD	VOL. 12, NO. 3 JUL-SEP '85	22
MARK II ANTISKID Description, Operation, and Troubleshooting	VOL. 6, NO. 1 JAN-MAR '81	3
MLG BRAKE APPLICATION AFTER LOSS OF HYDRAULIC PRESSURE	VOL. 11, NO. 2 APR-JUN '84	7
MLG MANUAL GEARBOX Techniques for Proper Operation of the Manual Gearbox	VOL. 7, NO. 3 JUL-SEP '80	10
MLG TRACKSHOE CLEARANCES A New Tool Simplifies Adjustments	VOL. 6, NO. 1 JAN-MAR '79	10
MLG UPPER SHOE ASSEMBLY MODIFICATIONS Design Changes Give Shoe Facings Longer Life.	VOL. 5, NO. 3 JUL-SEP '79	16
NEW ALLOY for JetStar Landing Gear Shock Struts	VOL. 2, NO. 1 JAN-MAR '75	12
NEW PIN AND BUSHING FOR MLG SHELF BRACKET	VOL. 11, NO. 2 APR-JUN '84	11
NOSE LANDING GEAR SHIMMY The Causes of NLG Shimmy, and How to Correct Them	VOL. 12, NO. 4 OCT-DEC '85	3
NOSE LANDING GEAR SWITCH ADJUSTMENTS	VOL. 5, NO. 3 JUL-SEP '78	13
NOSE WHEEL SHIMMY and What to Do About It	VOL. 3, NO. 1 JAN-MAR '78	18
SAFETY WIRE FOR HERCULES MLG TORQUE TUBE YOKE ASSEMBLY	VOL. 3, NO. 4 OCT-DEC '76	15
SHOCK STRUT SERVICING	VOL. 7, NO. 3 JUL-SEP '80	13
STEEL CYLINDERS FOR THE JETSTAR MLG ACTUATORS YOU Can Install These Preferred Spares	VOL. 1, NO. 2 APR-JUN '74	12

LANDING GEAR (contd)

	Issue	Page
THINNER SERRATED PLATES for Hercules Main Landing Gear	VOL. 4, NO. 3 JUL-SEP '77	21
TIPS FOR MLG INSPECTION, MAINTENANCE, AND EMERGENCY ACTION	VOL. 9, NO. 3 JUL-SEP '82	13
TIRES Operation, Maintenance, and Handling Tips	VOL. 4, NO. a JUL-SEP '77	a
TORQUE STRUT BOLT Preferred Spare Now Available	VOL. 7, No. 2 APR-JUN '80	19
UPPER BUMPER STOP REPAIR PROCEDURE Storing Jammed Ring Spring Assemblies to Service	VOL. 10, NO. 2 APR-JUN '83	12

OPERATIONS

	Issue	Page
DESERT OPERATIONS Protecting Your Aircraft in an Arid Environment	VOL. 8, NO. 4 OCT-DEC '81	11
FLIGHT LINE OBSTACLE COURSE Caution During Taxiing or Towing	VOL. 2, NO. 1 JAN-MAR '75	3
HERCULES FLIGHT TRAINING CENTER The Best in Hercules Aircrew Training	VOL. 12, NO. 2 APR-JUN '85	3
HERCULES GROUND HANDLING Tips on Towing, Parking, Mooring, and Jacking the Hercules	VOL. 3, NO. 3 JUL-SEP '76	3
HERCULES TOWBAR SHEAR BOLTS An Explanation of Shear Bolt Function	VOL. 4, NO. 3 JUL-SEP '77	22
HOW TO MOVE AN INCOMPLETE HERCULES	VOL. 2, NO. 1 JAN-MAR '75	4
KC-130R FLIGHT SIMULATOR A Brief Description	VOL. 4, NO. 4 OCT-DEC '77	9

**PNEUMATICS
AND ENVIRONMENTAL**

	Issue	Page
A/C TEMPERATURE CONTROL SYSTEM CHECKOUT	VOL. 5, NO. 4 OCT-DEC '78	11

**PNEUMATICS
AND ENVIRONMENTAL (contd)**

	Issue	Page
THE AIR TURBINE MOTOR Description, Operation, and Troubleshooting	VOL. 7, NO. 4 OCT-DEC '60	11
BENDIX STARTERS Description, and Hints on Installation and Operation	VOL. 5, NO. 4 OCT-DEC '76	3
FIRST AID FOR THE HERCULESTEMPERATURE CONTROL SYSTEM	VOL. 3, NO. 3 JUL-SEP '76	23
THE FORGOTTEN SCREENS Cleaning Screens in the Air Conditioning System	VOL. 2, NO. 4 OCT-DEC '75	14
HERCULES AIR CONDITIONING A Basic Description of the Hercules Air Conditioning System	VOL. 3, NO. 2 APR-JUN '76	2
HERCULES LIQUID OXYGENSYSTEM Major Components, Servicing, and Safety Tips	VOL. 5, NO. 3 JUL-SEP '78	3
HERCULES NEW AIR CONDITIONING UNITS Changes to the Hercules Air Conditioning System	VOL. 3, NO. 3 JUL-SEP '76	18
HERKY'S NEW APU Operation and Description of the New APU for the Hercules	VOL. 3, NO. 4 OCT-DEC '76	3
HOW JETSTARS KEEP THEIR COOL	VOL. 1, NO. 3 JUL-SEP '74	20
HOW THE 186th FCS LICKED A TURBINE PROBLEM	VOL. 1, NO. 3 JUL-SEP '74	20
NEW HEATEXCHANGERSFOR THE HERCULES AIRCRAFT Improved Heat Exchangers Lower Maintenance Costs	VOL. 10, NO. 4 OCT-DEC '63	3
OXYGEN SAFETY	VOL. 1, NO. 1 JAN-MAR '74	10
PNEUMATIC SYSTEMS An Introduction to the C-130H and L-100-30 Pneumatic Systems	VOL. 6, NO. 4 OCT-DEC '79	15
POLYTETRAFLUOROETHYLENE (TEFLON) Lining for Oxygen Servicing Hoses	VOL. 2, NO. 1 JAN-MAR '75	9
SOLID-STATE COMPONENTS For Hercules Air Conditioning Systems	VOL. 5, NO. 3 JUL-SEP '76	12

**PNEUMATICS
AND ENVIRONMENTAL (contd)**

	Issue	Page
SPARE NUTS FOR V-BAND COUPLINGS Size and Part Number Designations for V-Band Coupling Nuts	VOL. 4, NO. 4 OCT-DEC '77	18
STARTER OIL LEAK DETECTION A Special Dye Helps Pinpoint Leak Sources	VOL. 9, NO. 2 APR-JUN '82	10
STARTER SERVICING	VOL. 3, NO. 4 OCT-DEC '76	11
TROUBLESHOOTING AIR CONDITIONING SYSTEM TEMPERATURECONTROLSSENSORS	VOL. 12 NO. 4 OCT-DEC '85	11
TROUBLESHOOTING PRESSURIZATION PROBLEMS	VOL. 8, NO. 4 OCT-DEC '81	3

**TOOLS AND
GROUND SUPPORT EQUIPMENT**

	Issue	Page
APU HOIST ASSEMBLY MODIFICATION	VOL. 11, NO. 1 JAN-MAR '84	14
ENGINE PERFORMANCE CALCULATOR KIT A Better Way to Check Engine Performance	VOL. 12, NO. 2 APR-JUN '85	7
A FLEXIBLE FIBER-OPTIC BORESCOPE	VOL. 6, NO. 4 OCT-DEC '81	11
A HANDY NOSE LANDING GEAR RIGGING TOOL	VOL. 6, NO. 1 JAN-MAR '79	9
IMPROVING THE GENERAL PURPOSE SLING ASSEMBLY	VOL. 11, NO. 2 APR-JUN '84	13
INSTALLATION TOOL-WING LEADING EDGE HINGE PIN	VOL. 4, NO. 2 APR-JUN '77	14
LOCKHEED INTRODUCES AVWASH A Clean Aircraft in Less Time, at Lower cost	VOL. 12, NO. 2 APR-JUN '85	11
MLG TRACK SHOE SHOP AID A Helpful Tool For Track Shoe Maintenance	VOL. 7, NO. 4 OCT-DEC '80	16
NEW FCS-105/C-12 SIMULATION TEST SET	VOL. 11, NO. 2 APR-JUN '84	9
NEW LOCKHEED-DESIGNED SYNCHROPHASERTESTSETS	VOL. 12, NO. 3 JUL-SEP '85	15

**TOOLS AND
GROUND SUPPORT EQUIPMENT**

	issue	Page
PROP REMOVAL AND INSTALLATION AID A Modified Stand Can Speed the Work	VOL. 10, NO. 4 DCT-DEC '83	15
A QUICK WAY TO DRAIN HERCULES AUX TANKS	VOL.1,NO.2 APR-JUN '74	6
SMP-515-E, ILLUSTRATED TOOL AND EQUIPMENT MANUAL A Catalog of Special Tools and Support Equipment	VOL 11, NO. 4 OCT-DEC '84	14
TESTING THE GTF-6 TEST SET Making Sure It's Safe to Use	VOL. 8, NO. 1 JAN-MAR '81	16
TOOLS FOR PANELOCS	VOL. 7, NO. APR-JUN '80	17
TROOP SEAT INSTALLATION TOOL New Tool Facilitates Installation	VOL. 8, NO. JAN-MAR '8'	18
TURNBUCKLE TOOLS	VOL.I,NO.4 GCT-DEC '74	5
WASHING THE HERCULES A Clean Airplane Lasts Longer	VOL. 2, ND. 4 OCT-DEC '75	3

WINDSHIELD WIPER ALIGNMENT VOL. 1, NO. 4
OCT-DEC '74 9

MISCELLANEOUS

	Issue	Page
THE AMAZING HERCULES Airlifter for Today and Tomorrow	VOL. 5, NO. 2 APR-JUN '78	23
ARRS Aerospace Rescue and Recovery Service	VOL6,NO.2 APR-JUN '79	1 4
AUSTRALIA CELEBRATES 25 YEARS WITH THE C-130	VOL. 11, NO. 1 JAN-MAR '84	17
C-130 DERIVATIVES (1982) A Listing of C-130 Derivatives in Chart Form	VOL. 9, NO. 3 JUL-SEP '82	7
C-130 TECHNICAL PUBLICATIONS A Key Part of Your Hercules Program	VOL. 7, NO. 3 JUL-SEP '80	3
C-130Hs FOR JAPAN	VOL. 11, NO. 2 APR-JUN '84	15
A DISTINGUISHED PAST Milestone in 25 Years of Hercules Aircraft Production	VOL. 6, NO. 3 JUL-SEP '79	19

MISCELLANEOUS (contd)

	Issue	Page
EMERGENCY SERVICES Full Service Product Support	VOL. 6, NO. 2 APR-JUN '79	22
FIRE ON THE FLIGHT DECK! A Maintenance "Solution" Falls Victim to Murphy's Law	VOL. 10, NO. 1 JAN-MAR '83	3
FIRST FLIGHT OF MODIFIED JETSTAR	VOL. 2, NO. 2 APR-JUN '75	23
HTTB-THE HIGH TECHNOLOGY TEST BED Lockheed's Unique, Flying Laboratory Enters Service	VOL. 12, NO. 3 JUL-SEP '85	3
AN INTRODUCTION TO NON-DESTRUCTIVE EVALUATION	VOL. II, NO. 2 APR-JUN '84	3
JETSTAR II Advance Data on New Configuration	VOL. 2, NO. 2 APR-JUN '75	20
LIQUID PENETRANT EVALUATION A Quick and Reliable NDE Technique	VOL. 11, NO. 4 OCT-DEC '84	3
LOCKHEED AIRCRAFT SERIAL NUMBERS Identifies Production Sequence Only	VOL. 2, NO. 2 APR-JUN '75	19
LUBRICANTS FOR HERCULES AIRCRAFT A Helpful List of Lubricants and Distributors	VOL. 9, NO. 2 APR-JUN '82	3
MEETTHEHERCULES The Advanced C-130H and the L-100-30	VOL. 6, NO. 4 OCT-DEC '79	3
NEW AIRCRAFT STATUS DESIGNATIONS	VOL. 5, NO. 2 APR-JUN '78	35
A PROMISING FUTURE New Derivatives for the 1980s and Beyond	VOL. 6, NO. 3 JUL-SEP '79	22
THE STANDARDIZED LOGISTICS MANAGEMENT SYSTEM A Better Way to Maintain High Technology Products	VOL.I,NO.2 APR-JUN '74	7

**SERVICE
NEWS**

AIRFRAME

INDEX

ELECTRICAL AND AVIONICS

INDEX

ENGINES AND PROPELLERS

INDEX

FUEL SYSTEM

INDEX

HYDRAULICS

**INDEX
1974-1985**

LANDING GEAR

INDEX

OPERATIONS

INDEX


**PNEUMATICS AND
ENVIRONMENTAL**

INDEX

**TOOLS AND GROUND
SUPPORT EQUIPMENT**

INDEX

MISCELLANEOUS

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