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LOCKHEED MARTIN 

Service News



A SERVICE PUBLICATION OF LOCKHEED MARTIN AIR MOBILITY SUPPORT

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AIR MOBILITY SUPPORT

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RESTRICTION NOTICE

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It's HOC Time Again!

The 15th annual Hercules Operators Conference (HOC) is rapidly approaching. This year's conference, like so many in the past, will be held at the Marriott Northwest in Atlanta, Georgia from 27-31 October 2003. Tri-Chairman for the conference are: Major Kevin Lemke of the Canadian Forces, representing International Operators; Ray Waldbusser of the USN Fleet Support Team, representing Domestic Operators, and Geoff Bateman of Lockheed Martin Aeronautics Company.

Prior to the conference, on-line registration may be completed by accessing <https://www.lmsupport.com> through the Air Mobility Support portal. Hotel accommodations need to be reserved by 10 October to obtain the special conference rate of \$112.

On-site registration for this year's conference begins at 1700 hours on 26 October, and attendance is expected to exceed 300 participants representing more than 40 operators, from at least 35 countries, and over 40 vendors and suppliers.

The HOC, which began in 1982 with 48 attendees representing 15 operators from 10 countries, provides a forum for all Hercules operators to come together and share common concerns and successes with Lockheed Martin appointed Hercules Service Centers, vendors, suppliers and Lockheed Martin.

The conference agenda for this year's event will be a similar format from previous events: four days of operator, vendor and Lockheed Martin presentations; four working groups including Corrosion Control, Structural Integrity, Propulsion & Mechanical Systems, and Avionics; scheduled side meetings between Lockheed Martin and the operators; and ad hoc meetings. This year's conference will be capped with a Lockheed Martin Hercules production line tour and powered-up C-130J tour on the final conference day, 31 October.



IS YOUR DOCUMENTATION CURRENT?

The importance of maintaining current documentation to operate and perform maintenance on the C-130 aircraft is sometimes overshadowed by other requirements that seem more urgent, such as purchasing spare parts or incorporating aircraft modifications. But current documentation is essential to operational safety and aircraft maintainability. Without current documentation, the risk of failed missions and/or excessive maintenance down-time can increase substantially.

The layout of these manuals varies depending on whether the operator is a commercial entity, US military or for-

Typical documentation for operating, maintaining and inspecting the aircraft include:

- **Flight/Operating Manual and Checklist** (FM 382C-XX, FM 382T-XX, OM 382G-XX, TO-1C-130B-1, FM 130B-1)
- **Maintenance Manuals** (TM 382C-2 Series, TO-1C-130B-2 Series, TO-1C-130H-2 Series, TM 130B-2 Series, SMP 581)
- **Wiring Diagram Manual** (TM 382C-2-12, TO-1C-130B-2-13, TO-1C-130H-2-13, TM 130B-2-13, SMP 582)
- **Supplemental Manual** (TM 382C-XX, TM 382T-XX, SMP-XXX)
- **Illustrated Parts Breakdown/Catalog** (SMP-XXXX, TM 130B-4)
- **Inspection Program** (SMP 515C-XX)

foreign military, and if the aircraft was purchased through foreign military sales or foreign direct sales. Most operators have a dedicated flight/operating manual, illustrated parts breakdown catalog and inspection program which apply only to their aircraft. The supplemental manual is also a dedicated manual for non-commercial operators that covers differences between the operator's configuration and the baseline/USAF maintenance and wiring diagram manuals. A combination of the supplemental manual and baseline/USAF maintenance and wiring diagram manuals is used along with selected customized manuals where applicable. Some operators have their own customized set of manuals rather than a supplemental manual. Commercial operators use the commercial maintenance and wiring diagram manuals which contain all operator-specific and customer-peculiar equipment.

The manuals listed above are complemented with Off-the-Shelf (OTS) manuals. The following is a typical list of OTS manuals:

- Structure Repair Manual
- Airplane Flight Manual (Commercial)
- Performance Manual (Military)
- Loading Manual



Some operators are leading the way on digitizing their Flight and Maintenance Manuals

(Continued on page 4)

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The baseline and commercial maintenance and wiring diagram manuals are also OTS manuals.

MAINTAINING THE DOCUMENTATION

The manuals should be maintained just like the aircraft. As obsolete equipment is replaced with modern equipment or changes are made to the aircraft to accommodate operator's missions, the manuals should be updated to reflect these changes. Supplements may be used for the short term, but over time the manuals may become unusable because of the excessive number of supplements or supplements supplementing each other. In addition to maintaining aircraft configuration in the manuals, general updates must be incorporated to reflect the latest available data. These general updates include latest part numbers in the illustrated parts breakdown, new or revised inspections into the inspection schedule, new maintenance instructions in the maintenance manuals, and of course changes for the flight manual. Operators with many aircraft versions and extensive modifications face significant maintenance and operational difficulties unless their manuals are kept up-to-date. The method used in updating these manuals should be more than an add-on to the manuals; the changes should be fully integrated into all the applicable manuals (various maintenance and operational instructions). If the changes are not fully integrated, follow-on changes become difficult or nearly impossible to incorporate.

REVISION SERVICE PROGRAMS

Revision Service Programs provide the operator of the C-130 aircraft an avenue to update and maintain manuals to the latest baseline configuration and/or aircraft configuration. The program is flexible and versatile enough to meet every operator's needs. Operators may purchase a simple revision service to keep all documentation up-to-date, or they may elect to develop a full set of customized/digitized manuals on a linked CD-ROM. Following are typical examples of Revision Service Programs:



LM Aero Flight Operations Analyst updating a Flight Manual

- **Simple Revision Service-** Some operators purchase this service to ensure their customized documentation reflects the latest changes in the fleet. This service may also include a revision service or update to the baseline manuals and OTS manuals. This service does not include modifications performed on the aircraft.
- **Simple Revision Service with Aircraft Modifications-** This service is the same as above but includes minor modifications performed on the aircraft.
- **Modifications-** Under this revision service, an aircraft and documentation review are performed at the operator's facility. This revision service usually includes major rework of existing manuals or development of new manuals to cover the modifications.
- **Revision Service Conversion to Electronic Media-**The conversion is usually worked in conjunction with incorporating major modifications incorporated on the aircraft. This service spans the development of a single customized/digitized manual to a complete set of manuals on a linked CD-ROM. The level of detail in these manuals may be determined by the operator to suit all operational needs. These manuals are also made available to the operator through a secure web site for quick updates and transfer of data.

The types of new manuals developed or changes made under the revision service program depend on the operator's needs and requirements. The following are some examples of manuals developed or changes made under a typical revision service:

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- **Elimination of the Supplemental Manual**—The most common request is the elimination or reduction of the Supplemental Manual. This manual was provided with delivery of the aircraft to cover operator-peculiar maintenance data that differs from the Baseline TM or TO Maintenance Manual Set. Early versions of the Supplemental Manual also included supplemental data for the USAF flight manual. Most data contained in the Supplemental Manual is associated with the avionics systems. Therefore, developing a new customized Communication/Navigation maintenance manual and a new customized Wiring Diagram manual eliminates most of the data contained in the supplemental manual. Some operators choose to develop other customized maintenance manuals to meet their needs, further reducing the amount of supplemental data. In many cases the best option is to completely eliminate the supplemental manual by developing a complete set of customized manuals.

Several operators are digitizing their manuals' libraries making their manuals accessible anywhere in the world through the world wide web.

- **Major Avionics Upgrades**—New manuals are usually developed to support major avionics upgrades performed on the aircraft. When a major avionics upgrade is performed, most of the existing avionic coverage in the Communication/Navigation maintenance manual becomes obsolete. Therefore, creating a new manual is the best option even if some of the coverage in the old manual is still applicable, because the old data would be incorporated into the new stand-alone manual. In addition, the wiring in the aircraft is usually heavily modified to support the new avionics. A new Wiring Diagram manual is developed to integrate the new avionics wiring into the existing aircraft wiring diagrams. A new Instruments manual and Electrical System manual may also be developed depending on the changes made to the pitot-static system and electrical system. If the operator is using the baseline TM 382C-2 Series maintenance manuals or the USAF TO-1C-130B/H-2 series maintenance manuals, the newly developed manuals would replace the respective baseline or USAF manuals. If the operator already has customized manuals, those manuals would be updated to include the upgrade. The operator-peculiar manuals such as the flight manual and illustrated parts breakdown would also need updating to reflect the new configuration.
- **Customizing and Digitizing** the TM 382C-2 Series Manuals or USAF TO-1C-130B/H-2 Series manuals—Several operators are leading the way on making their manuals accessible anywhere in the world. Their manuals are loaded on a local base server and a secure web site which provides them immediate access when needed, where needed. These manuals can be provided to the user on CD-ROM and via a secure web site. This manual set is fully customized to the user's configuration and digitized with hyperlinks for quick navigation through the manuals.

There are constant initiatives to improve the versatility of manuals such as expanding and refining the linking ability on a linked CD-ROM. Such expanded linking capability might include links between related wiring diagrams; item numbers to part numbers; removal and installation procedures to associated illustrations in the illustrated parts breakdown; and troubleshooting to the respective wiring diagram.

Regardless how aircraft manuals are updated, it is important to remember: Without current documentation, the risk of failed missions and/or excessive maintenance down-time can increase substantially.

DIGITAL DISCREPANCY REPORTING ENTERS MODIFICATIONS AND MAINTENANCE

The digital world is entering C-130 modifications and maintenance. Lockheed Martin has implemented a hand-held wireless device used to pinpoint and electronically write Discrepancy Reports (DR), research the correct manual on-line for the discrepancy code, and transfer the data instantaneously to the reporting system for review by the customer. What used to take more than six hours, now takes 20 minutes. The new technology will be used to support the upgrade of the US Air Force's Combat Search & Rescue (CSAR) aircraft.

Lockheed Martin's Air Mobility Support companies have been selected by the US Air Force in a competitive bid to upgrade ten C-130 Hercules to a CSAR configuration. The multi-year project entails the simultaneous integration of nearly 40 time compliance technical order changes to prepare the C-130Es for their special missions. The electronic, hand-held, wireless DR devices have been in use on C-9 and P-3 aircraft at Lockheed Martin Air Logistics Center, Greenville and will be key in quickly and efficiently identifying potential Over & Above work to assure meeting program schedule and budget.



“The palm-sized DR writer faultlessly identifies a discrepancy, writes the DR electronically on-site, and transmits it wirelessly to the Maintenance Reporting system, saving time and labor.”

The hand-held DR is a palm-sized machine that is carried on-site by an inspector. The DR displays C-130 configurations that allow an inspector to quickly “drill-down” into the exact spot of a found potential discrepancy, pull up maintenance manuals for the correct code, fill out the Discrepancy Report on-line, enter the Work Unit Code. The DR data is also immediately and automatically loaded into the data system and put into the queue for the customer’s review.

With the new reporting device, it is not unusual now for Work Center personnel to be reviewing the spot of the discovered item before the inspector has even completed that section of aircraft inspection. The electronic device has logic and ensures the inspector enters all of the needed data. With his employee number from the bar code on his badge, the work instruction is scanned or log book item entered; the



“The DR device allows an inspector to ‘drill-down’ to the exact spot of the discrepancy.”

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Work Center is identified and details of how the discrepancy was found is entered for corrective action.

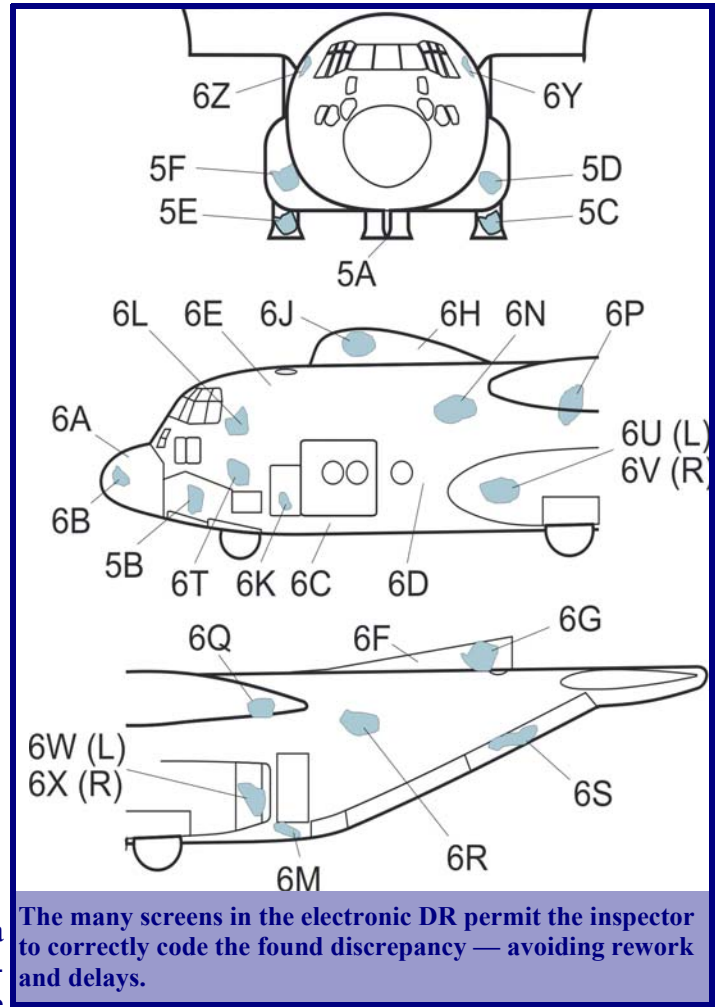
The electronic system avoids the time needed for an in-

“...an average of 80% less time is needed to get the DR written and into the system.”

spector to write the discrepancy on a note pad, proceed to his office to research maintenance manuals for the discrepancy code, transfer his information to a DR by writing it on a paper form then giving it to an employee to enter manually into the company maintenance reporting system. From that point, it would be shown to the customer representative for review and resolution. What used to take as much as six days on average to ‘turn’ a DR, now takes just over one day. That efficiency directly translates into time and money saved for the customer. An average of 80% less time is needed to get the DR written and into the system.

The inspector marks the exact spot on the aircraft where a discrepancy is noted with a “stick-on” dot with the inspector’s personal info and the DR number. That spot ties the electronic DR on the actual aircraft to the review by the Work Center and customer representative.

The digital world is making our lives much more efficient and shortening the time for communications. All programs using the new DR system will enjoy reduced schedule risk and greater efficiency with this new, proven technology.



Operator's Corner In This Issue:

**WE WANT YOUR UNIT OR COMPANY
LOGO AND PHOTOS HERE!**

We would like to publicize your military unit or company. Please submit a short descriptive paragraph and photos so we can highlight your organization in our upcoming editions. Send all submittals to:

fritz.a.weise@lmco.com

PROTECTING YOUR C-130 HERCULES ASSET FROM CORROSION

BY BOB EDINGER AND BOB CAMERON, LOCKHEED MARTIN AERONAUTICS SERVICES

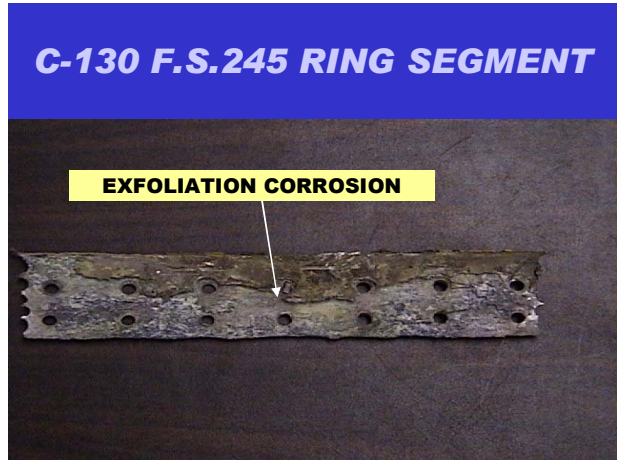
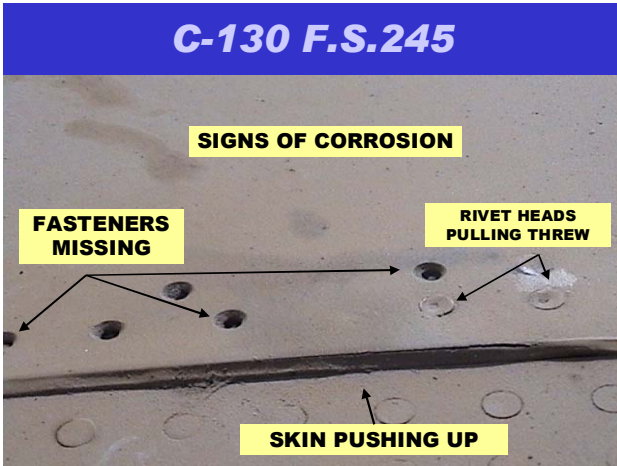
The venerable C-130 Hercules continues in service decades longer than anyone originally planned. It takes constant attention and maintenance plus system- and safety-of-flight upgrades, modifications, and even some tender loving care to keep that Hercules asset mission ready and safe during its long service life. When care is given, the Herc responds with reliable performance. Corrosion is one subtle problem that can secretly rob the Herc of useful life. It takes attention and commitment to ensure that the many facets of corrosion are identified and remedied.

The *Hercules Service News* dated Oct-Dec 1988 presented a lengthy article titled UNDERSTANDING CORROSION describing the technical aspects behind the corrosion process. For those readers interested in fully understanding the mechanics of the corrosion process, the electromotive series, the corrosion cell, and anodes and cathodes, we recommend you visit the Library Section of the <https://www.lmsupport.com> website and review the 1988 article (Volume 15, Number 4). This article will focus on the more practical aspects of identifying and fighting corrosion in order to protect your Herc.

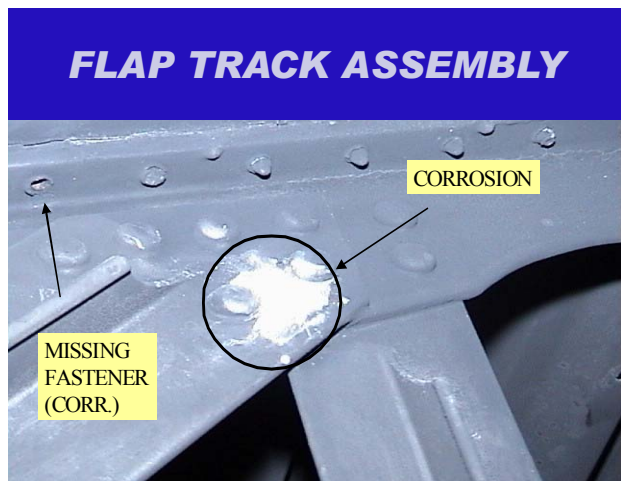
To start: If you do not have maintenance personnel writing up a continual stream of corrosion “gripes,” you have problems! If your maintenance personnel inspect an aircraft, but don’t know what to look for or do not understand what they are really seeing, the service life of your Hercules is literally being eaten away. A good maintenance program involves the searching out and correcting of corrosive effects. Left unchecked, corrosion will ultimately cause structural failure.

Training: The following photos are taken from operating Hercules and are offered as examples of types of corrosion effects maintenance personnel and flight crew personnel should be looking for and writing up for corrective action.





Path Forward: Review your C-130 fleet for the signs of corrosion and train your personnel to identify and correct corrosion. Check your Maintenance Manuals for what is required in the way of facilities, washing, equipment, and tools required to prevent and control corrosion. Formalize the corrosion prevention and control program, and select a leader of the program who is motivated and trained to protect the important C-130 asset. Expect and correct corrosion write-ups. The Template on page 10 offers an outline of the key parts of a good Corrosion Program, but it will take commitment, time, resources, and motivated personnel to make it happen. Your C-130 aircraft, and your crews that fly the Here, make a strong corrosion prevention program a wise investment.



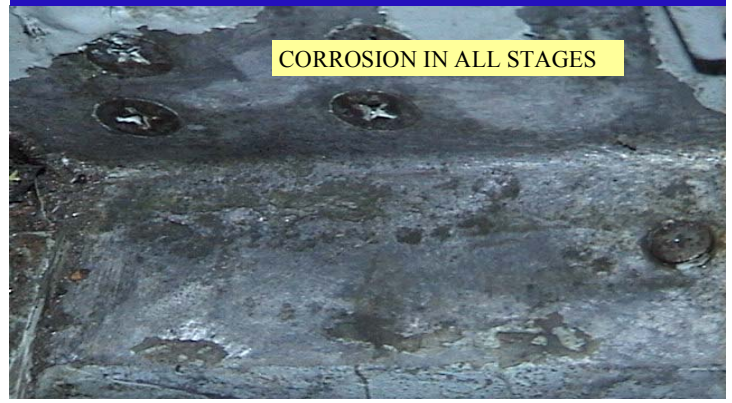
AFT CENTER PRESSURE PNL

SEVERE CORROSION



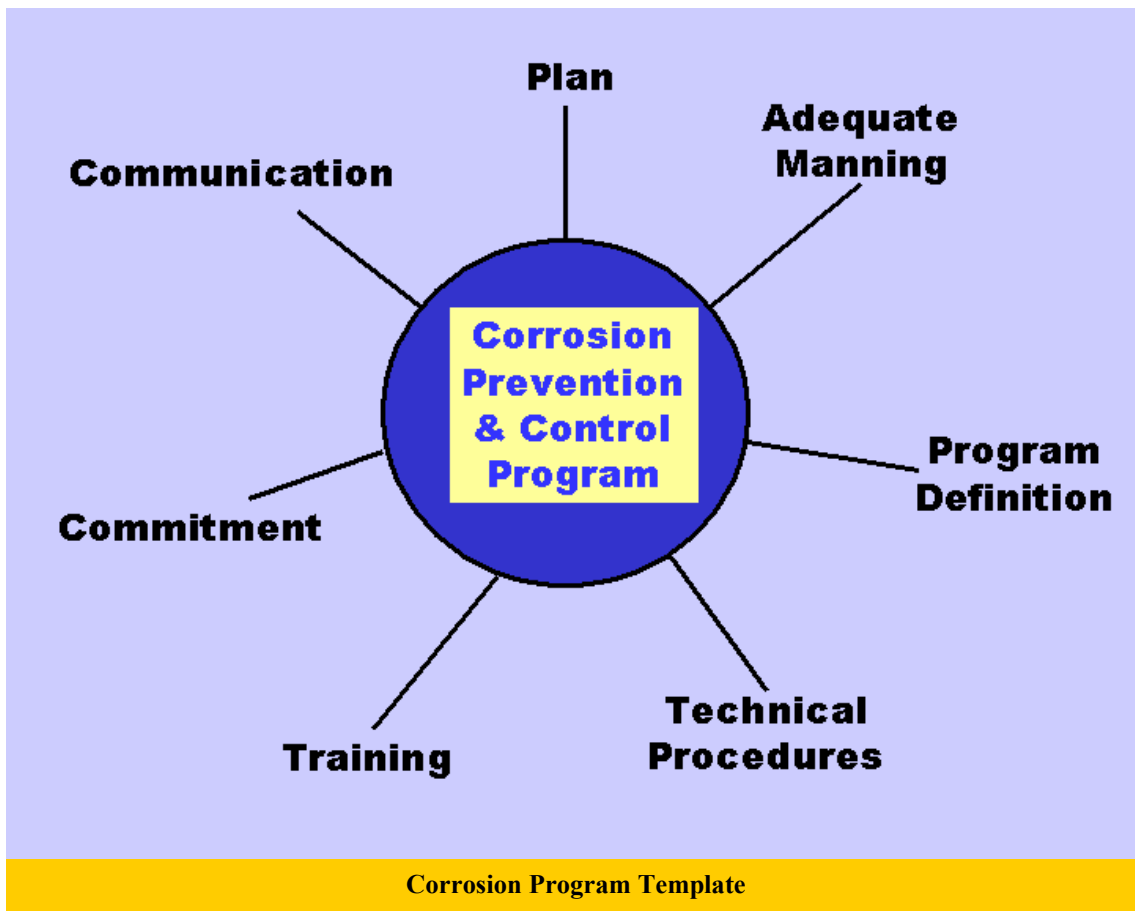
RIH SLOPING LONGERON

CORROSION IN ALL STAGES



Look Ahead: Lockheed Martin Air Mobility Support (AMS) is in the process of reviewing and updating the SMP 515-C Scheduled Maintenance Program using Reliability-Centered Maintenance analysis performed in accordance with guidelines established by Airline / Manufacture MAINTENANCE PROGRAM DEVELOPMENT DOCUMENT MSG-3. Using the analysis and based on the in-service experience of our operators, specific Corrosion Prevention and Control Program tasks will subsequently warrant inclusion in SMP 515-C. AMS will conduct a Maintenance Working Group at the 2003 Hercules Operators Conference to receive inputs to provide the most practical and efficient Maintenance and Corrosion Control Programs for the C-130. Finally, the article "PREVENTING CORROSION" in Service News Jan-Mar 1990, Vol 17, No.1 will be updated for the next Service News.

Unfortunately, corrosion lessons need to be learned over and over. There are too many Hercules aircraft permanently grounded due solely to inattention to corrosion.



INCREASING THE LIFE OF LANDING LIGHT BULBS

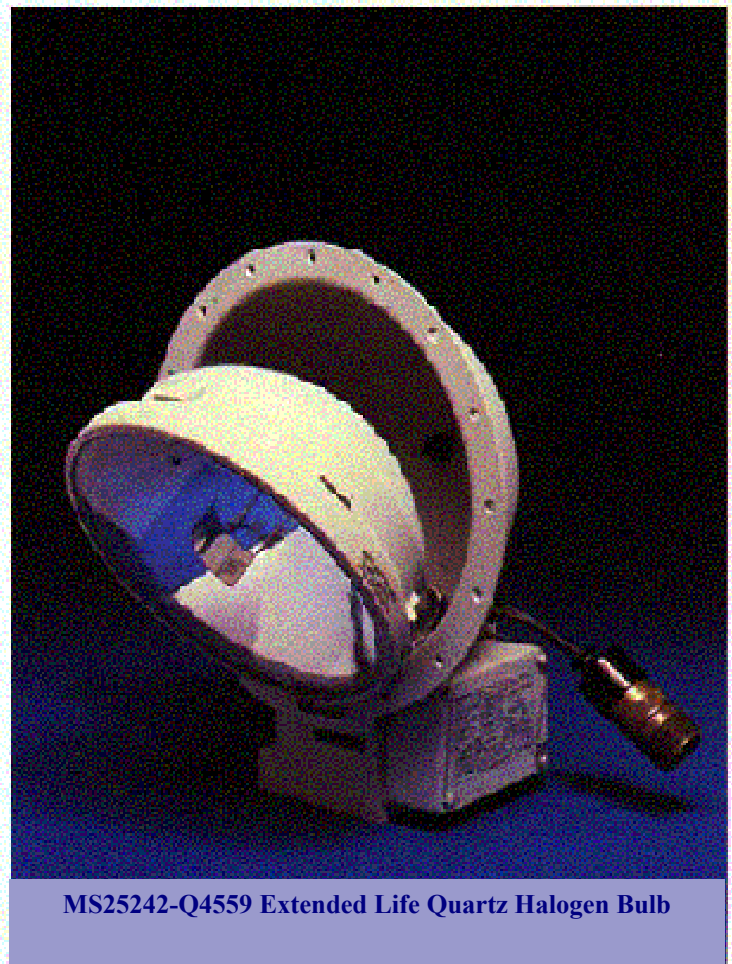
Most landing lights on the C-130B-H aircraft use a standard single-mode light. Late model C-130Hs are equipped with the Dual Mode light which houses a normal white light and infrared light. Users of the earlier version standard lights frequently complain of short bulb life with the standard landing light bulb, P/N MS25242-4559, having an average life of 25 hours. Standards Engineering reports P/N MS25242-Q4559, a quartz halogen bulb, has a 100 hour life and is an acceptable replacement for the former.

A 25-hour average lifespan can be extended to 100 hours.

The landing light bulb's life is dependent primarily on the length of time it is operated, and whether it is operated with or without airflow cooling. Many operators require the use of landing lights in high traffic areas, such as traffic patterns or below altitudes of 10,000 feet in terminal control areas, to increase visibility for safety purposes. This can increase the time of operation appreciably beyond that for which the lights were originally intended, operation on final approach and landing.

Landing light bulb life will be further reduced if the lights are not turned off after landing due to the reduced air flow over the lights causing overheat of the bulb filaments. Some improvement in operating hours can be expected if the lights are turned off immediately after touchdown.

To reduce the frequency of landing bulb replacement, give the quartz halogen bulb a try and immediately realize a 4X improvement in bulb longevity!



MS25242-Q4559 Extended Life Quartz Halogen Bulb

MARK OF QUALITY: THE NEW C-130 PARTS ASSURANCE PROGRAM

The Lockheed Martin-built C-130 Hercules is demonstrating a new source of strength — holograms. In response to customers' need for assurance that the spare parts they purchase are made by reputable manufacturers, Lockheed Martin has implemented a program that certifies high-quality manufacturers. Qualified manufacturers of Hercules parts have their products identified with a sequentially numbered hologram.

“The program is in its infancy, but it appears it will be widely accepted throughout the world,” says Paul Siano, sales manager for Airborne Technologies Inc., the first of nine licensees to have received Lockheed Martin certification since the program began in May 2003. “End users will have the comfort of knowing they’re purchasing parts from a reputable source and that Lockheed Martin and the licensee will stand behind them.”



Original Hologram on Certified Parts today.

Lockheed Martin is the Original Equipment Manufacturer (OEM) but manufactures only very few Hercules spare parts. The vast majority of replacement spare parts are marked with a Lockheed Martin part number as well as a cage code identifying Lockheed Martin as the OEM. Unfortunately, prior to the certification program, the markings misled some customers to think Lockheed Martin had been

involved with the part's production. Other customers incorrectly assumed the Lockheed Martin part number markings indicated the manufacturer had followed appropriate drawings, used correct materials and had followed Lockheed Martin process and quality specifications.

“Really, customers had no way of knowing if the part manufacturer even had the inherent capability to make the part,” says Cole Blumer, Lockheed Martin's program manager for the Certified Parts Program. “As a result, there were a lot of poor quality or substandard parts making their way into the marketplace, and customers couldn't use them after they were purchased.”

Today, customers can look for the Lockheed Martin hologram.

“Bad parts are unsafe and they're costly,” Blumer says. “As the OEM, Lockheed Martin has the desire to support its products from cradle to grave. Today, aircraft customers can purchase parts with more assurance than they've ever had before.”



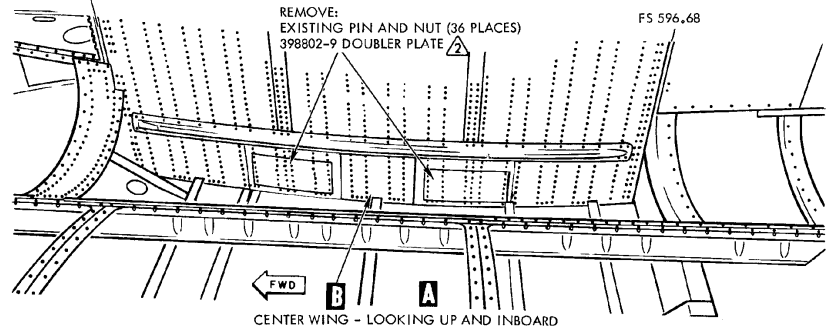
This Lockheed Martin initiative begins with the C-130 and will expand to other Lockheed Martin aircraft in the future. The Certified Parts Program will provide the same level of oversight and assurance for other Lockheed Martin aircraft and will expand to certify repair facilities to ensure that repairs are done correctly and to the OEM standard to ensure long product life and highest quality.

A new hologram has been developed and will be used for all future spares and repairs for Lockheed Martin aircraft. The hologram is the buyers' assurance that the part or repair is correct, using current data and processes.

SERVICE BULLETIN UPDATES

SB82-557- REMOVAL OF DOUBLERS FROM CENTER WING LOWER SURFACE, CWS62 TO CWS68

This revision was issued to add inspection procedures to the lower surface area at CWS 62 to CWS 68 and provide more emphasis to remove the doublers permanently.



SB82-762- INSTALLATION OF THE ATS-100-497 HONEYWELL STARTER

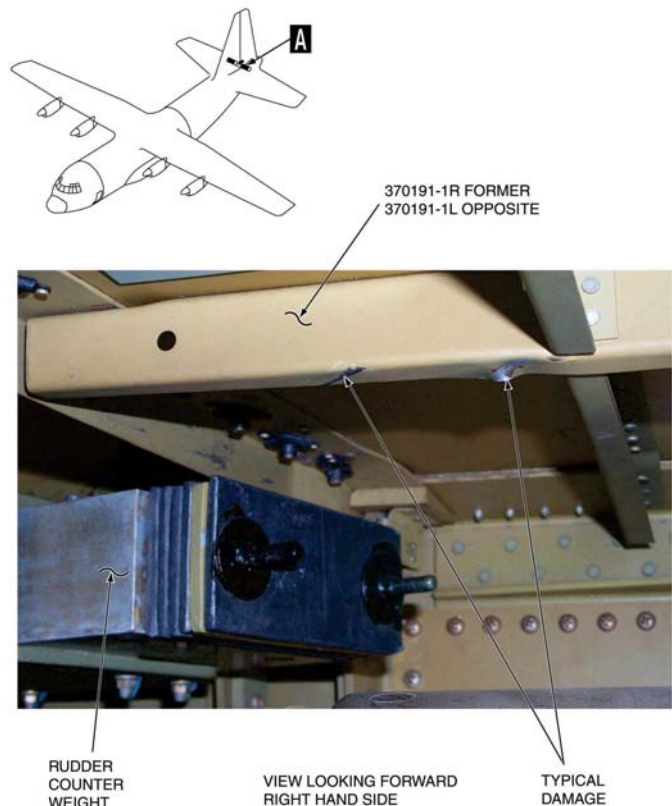
Hercules operators can elect to purchase and install the ATS100-497 Honeywell starter as the preferred spare. This Service Bulletin provides ATS100-497 Honeywell starter installation procedures. Operators of FAA certificated Hercules aircraft are directed to contact Honeywell for details on FAA approval and applicability to their aircraft.

SB82-761/382-76-15 REV.I - INSPECTION OF T-56 ENGINE THROTTLE CONTROL ARMS

This revision was issued to add 501D22 engine reference to paragraph 1B and to change the lower tube assembly part number from 363872-2 to 363878-1 in paragraph 3. This Service Bulletin provides instructions for inspecting upper and lower T56 engine control arms. This Service Bulletin also provides replacement procedures if inspection reveals throttle control arms manufactured from low carbon steel.

SB82-763 - INSPECTION OF HORIZONTAL STABILIZER FORMERS P/N 370191-1L AT FS1106.95 BL18

The rudder counterweight bolts and the adjacent structure are inspected for signs of interference and the amount of clearance or interference is measured. Repair procedures are provided for aircraft with interference or with unacceptable clearance between rudder counterweight bolts and adjacent structure.



SERVICE BULLETIN UPDATES (CONTINUED)

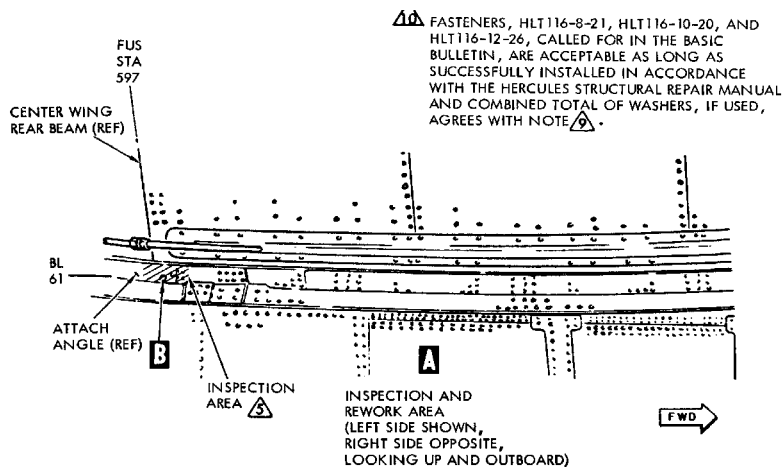
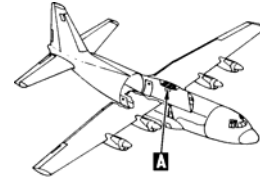
SB82-481 REV.III – REPLACEMENT OF CERTAIN WING-TO-FUSELAGE ATTACHMENTS

This revision was issued to include a recurring inspection requirement. The recurring inspections are not due until the total wing exceeds 10,000 Flight Hours. This includes aircraft that have had the service bulletin complied with during production. The recurring inspection times are as follows:

3,600 Flight Hours

 for SMP 515C, Card Number SP-138.

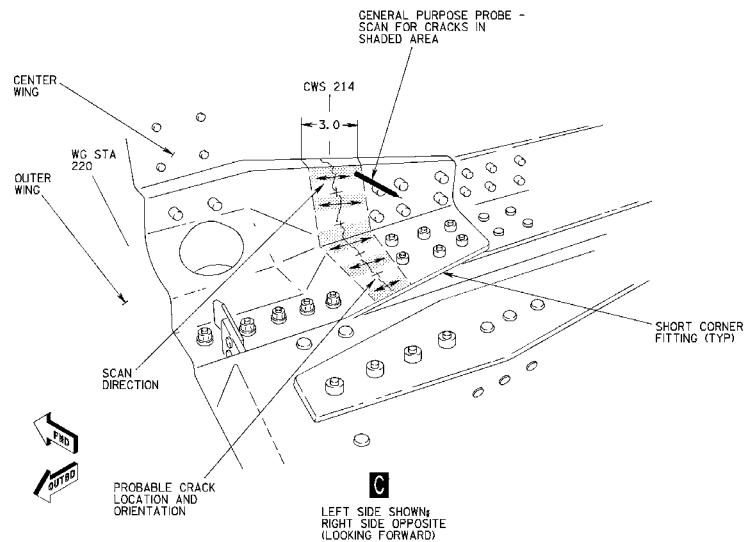
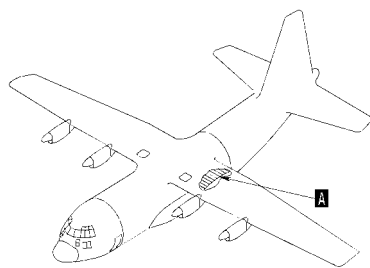
7,200 Flight Hours

 for SMP 515C, Card Number SP-141.


82-481-001-1-

SB82-766/382-57-79 - EDDY CURRENT INSPECTION OF CENTER WING LOWER FORWARD CORNER FITTING

This service bulletin was issued to perform a surface scan eddy current inspection of the center wing lower forward corner fittings left-hand and right-hand CWS 212 to CWS 216.





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