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ACCOUNTING CLASSIFICATION 9 July 1965 From: Belew, Cleveland	TYPE OF MESSAGE <input type="checkbox"/> SINGLE <input type="checkbox"/> BOOK <input type="checkbox"/> MULTI-ADDRESS
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SECURITY CLASSIFICATION IX. 4
STANDARD FORM 14 REV. MARCH 15, 1957 GSA REGULATION 2-IX-203.04 14-303
<b>TELEGRAPHIC MESSAGE</b>
OFFICIAL BUSINESS U. S. GOVERNMENT

saturn history  
 7/9/65  
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MR. S. G. KILLER, DIRECTOR, APOLLO PROGRAM  
WASHINGTON, D.C., CODE 13A

MR. G. H. KING, WASH WASHINGTON, D. C., CODE 112

MR. P. BOYERS, NASA ENGINE PROJECT OFFICE, EAA, INC.  
1631 CAROL AVE, CAROL PARK, CALIFORNIA

MR. R. GORRISON, NASA ENGINE TECHNIC OFFICE  
HEBELS CENTER TEST STAGE, BOX 6035  
HOWARD AIR FORCE BASE, CALIFORNIA

UNRECORDED. IN DEFIN REFER TO I-E-F-41

Copies to:  
 Don Brown,  
 Saturn History DOCUMENT  
 University of Alabama Research Institute  
 History of Science & Technology Group  
 Date \_\_\_\_\_  
 Doc No. \_\_\_\_\_  
 I-DIR

SUBJECT: APOLLO PROGRAM FLASH REPORT, S-10 STAGE F-1 ENGINE

BEGINNING OF TEXT

THIS IS AN APOLLO FLASH REPORT AND IS FOR THE PERSONAL ATTENTION OF THE ALCOR PROGRAM DIRECTOR.

PART I

PROBLEM

THIS REPORT PRESENTS AN ASSESSMENT OF THE PROBLEM REPORTED IN  
 I-3-F-40 CONCERNING RING-TO-LAND SEPARATIONS OF THE F-1 ENGINE THRUST  
CHAMBER INJECTOR  
CHAMBER INJECTOR.

UNCLASSIFIED  
 By Authority of 524-6

BACKGROUND  
 mtd w/ Redyne + MSFC in relp 2071 lower held  
 A MEETING WITH ROCKWELL AND NRC REPRESENTATIVES WAS HELD ON  
 July 7, 1965, TO ADDRESS THE NEED FOR AND IMPACT OF REPLACING  
 injectors in eng. for S-10-1 + S-10-2 w/ gold plated design.  
 INJECTORS IN ENGINES FOR S-10-1 AND S-10-2 WITH GOLD PLATED DESIGN.  
 The injector ring brass separation history was reviewed by  
 THE INJECTOR RING BRASS SEPARATION HISTORY WAS REVIEWED BY

Dr. Radolph,  
 I-V-DIR

Mr. Urick,  
 I-V-SIC

Mr. Woldner,  
 I-V-DIR

Mr. Glino,  
 I-V-DIR

Mr. Hainberg,  
 I-V-DIR

Mr. Grau,  
 I-V-DIR

Mr. Myers,  
 I-V-DIR

Dr. Kranck,  
 I-IB/V-CE

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ROCKETDYNE. THIRTEEN R&D INJECTORS HAVE BEEN FABRICATED WITH ONE MESSAGE TO BE TRANSMITTED (Use double spacing and all capital letters)

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BRAZING TECHNIQUE UTILIZING GOLD PLATING ON THE COPPER RINGS BUT  
 NINE HAVE BEEN TESTED. FIVE OF THESE ARE OF THE EXACT PLATING  
 THICKNESS AND BRAZE GAP TO BE USED ON THE GOLD PLATED QUAL I (FRT)  
 TYPE INJECTOR. THESE INJECTORS HAVE COMPLETED 117 THRUST CHAMBER  
 HOT FIRING TESTS FOR A TOTAL OF 1041 SECONDS INCLUDING 81 BOMB TESTS.  
 NO BRAZE JOINT SEPARATIONS OCCURRED. IN CONTRAST NONE OF 34 R&D  
 INJECTORS USING NICKEL PLATED RINGS SURVIVED REPEATED BOMB TESTS  
 WITHOUT EVENTUAL RING-TO-LAND SEPARATION. ROCKETDYNE PRESENTED A  
 GOLD PLATED QUAL I (FRT) INJECTOR DELIVERY SCHEDULE WHICH WILL  
 SUPPORT ON SCHEDULE DELIVERY OF ENGINES FOR S-IC-3 AND WILL ALLOW  
 RETROFIT OF INJECTORS ON ENGINES IN S-IC-1 and S-IC-2 WITHOUT  
 SCHEDULE IMPACT. RETROFIT WILL, HOWEVER, REQUIRE OUT-OF-SEQUENCE  
 WORKAROUND OPERATIONS WITH THE ATTENDANT DIFFICULTIES IMPOSED ON AN  
 ALREADY TIGHT SCHEDULE. ENGINES RETROFITTED WITH NEW INJECTORS FOR  
 USE IN SA-501 AND SA-502 WILL NOT REQUIRE HOT FIRE RECALIBRATION.  
 THE NEXT GOLD PLATED QUAL I (FRT) INJECTOR PRODUCED WILL BE  
 SHIPPED TO KSCC IN JULY FOR ENGINE TESTING TO GAIN ADDITIONAL  
 CONFIDENCE IN THE NEW INJECTOR. PRESENT PLANNING IS BASED ON THE  
 ASSUMPTION THAT THE GOLD PLATED INJECTOR WILL BE RETROFITTED INTO

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THE ENGINES FOR G-10-1 and G-10-2 DURING ENGINE TESTING OR DURING  
 STATIC TEST OPERATIONS. THE ORDER OF INSTALLATION WILL BE PAGED UPON  
 ARRIVAL THESE RESULTS AT 1400. IF ADDITIONAL TEST TIME IS DESIRED  
 WITH ENGINES IN G-10-1 ENGINES COULD BE CHANGED AT THE STATIC  
 TEST STAND WITH NO SIGNIFICANT IMPACT ON THE TESTING VEHICLE  
 SCHEDULE.

SIGNED BY LELAND F. BELEW, ENGINE PROGRAM MANAGER

CP-4

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NAME AND TITLE OF ORIGINATOR (Type)	ORIGINATOR'S TEL. NO.
John H. ...	076-6038
I certify that this message is official business, is not personal, and is in the interest of the Government.	
Original signed by Leland F. Belew (Signature)	

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