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# Component Maintenance Manual with Illustrated Parts List

# Ram Air Modulation Linear Electromechanical Actuator

| Part Number | CAGE |
|---|---|
| 541674-1-1 | 70210 |
| 541674-3 | 70210 |
| 541674-4 | 70210 |
| 541674-5 | 70210 |
| 541674-6 | 70210 |

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# TRANSMITTAL INFORMATION

TO HOLDERS OF RAM AIR MODULATION LINEAR ELECTROMECHANICAL ACTUATOR CMM ATA NO. 21-20-36 ISSUED FOR USE IN SUPPORT OF THE FOLLOWING:

Table TI-1 shows the applicable components.

**Table TI-1. Applicable Components**

| Component PN | Nomenclature |
|---|---|
| 541674-1-1 | Ram Air Modulation Linear Electromechanical Actuator |
| 541674-3 | |
| 541674-4 | |
| 541674-5 | |
| 541674-6 | |

**Revision History**

Table TI-2 shows the revision history of this CMM.

**Table TI-2. Revision History**

| Revision Number | Revision Date |
|---|---|
| 0 | 1 Feb 1993 |
| 1 | 20 Nov 1994 |
| 2 | 2 Apr 1996 |
| 3 | 31 Aug 1996 |
| 4 | 15 Sep 1997 |
| 5 | 15 Dec 2001 |
| 6 | 30 Mar 2002 |
| 7 | 30 Oct 2004 |
| 8 | 31 Oct 2006 |
| 9 | 23 Feb 2012 |
| 10 | 25 Feb 2013 |
| 11 | 2 Dec 2014 |
| 12 | 17 Feb 2016 |
| 13 | 10 Jul 2018 |
| 14 | 14 Nov 2018 |
| 15 | 29 Mar 2019 |
| 16 | 18 Nov 2019 |
| 17 | 12 May 2022 |

**Table TI-2. Revision History (Cont)**

| Revision Number | Revision Date |
|---|---|
| 18 | 8 Aug 2023 |
| 19 | 28 Nov 2023 |

This revision is a full replacement. All changed pages have a new date, as identified in the List of Effective Pages. Revision bars identify the changed data. A revision bar adjacent to the Fig./Item column identifies changes in the Detailed Parts List. See Transmittal information for history of revisions to this CMM.

Remove and discard all pages of the manual and replace them with the attached pages. Write the revision number, revision date, and replacement date on the Record of Revisions page.

Revision bars mark the technical data that changed in this revision; those changes are described in the Table of Highlights. Editorial changes are not marked with a revision bar.

The table of highlights tells users what has changed as a result of the revision. The table consists of three columns.

The Task/Page column identifies the blocks of changed information, such as a task, subtask, graphic, or parts list, and the page on which that block starts. The block of information often includes the MTOSS code. Revision marks, when provided, identify the location of the change within the block.

The Description of Change column tells about the change or changes within each block. The description of change is often preceded by a paragraph or figure reference that applies to the block of information.

The Effectivity column tells the user the part number(s) to which the block of information applies. The default value for this column is "All." "All" means that the block applies to all parts.

**Table of Highlights**

| Task/Page | Description of Change | Effectivity |
|---|---|---|
| TRANSMITTAL INFORMATION | Global Change: Changed the content and format to agree with the Honeywell processes in effect at the time of the release of this revision. | All |
| TRANSMITTAL INFORMATION | Global Change: The editorial changes and data that were moved or reformatted are not identified with revision bars. | All |
| Subtask 21-20-36-99C-013-A01 (Page 6001) | Paragraph 1.B. Step (4). Table 6002. Deleted row for PN “446-21-7038/X-530” and added row for PN “446-22-1002, X-530”. | All |
| Subtask 21-20-36-300-004-A01 (Page 6005) | Paragraph 2.D. Step (5). Changed step. | All |
| Subtask 21-20-36-940-001-A01 (Page 9002) | Paragraph 1.B. Step (4). Table 9002. Deleted row for PN “446-21-7038/X-530” and added row for PN “446-22-1002, X-530”. | All |
| Detailed Parts List IPL Figure 1 | Added “REPLACED BY ITEM 35A” note for Item 35. | All |

**Table of Highlights (Cont)**

| Task/Page | Description of Change | Effectivity |
|---|---|---|
| Detailed Parts List<br>IPL Figure 1 | Added Item 35A. | All |

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# RECORD OF REVISIONS

For each revision, write the revision number, revision date, date put in the manual, and your initials in the applicable column.

**NOTE:** Refer to the Revision History in the TRANSMITTAL INFORMATION section for revision data.

| Revision Number | Revision Date | Date Put in Manual | By | | Revision Number | Revision Date | Date Put in Manual | By |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
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# RECORD OF TEMPORARY REVISIONS

Instructions on each page of a temporary revision tell you where to put the pages in your manual. Remove the temporary revision pages only when discard instructions are given. For each temporary revision, put the applicable data in the record columns on this page.

Definition of Status column: A TR may be active, incorporated, or deleted. “Active” is entered by the holder of the manual. “Incorporated” means a TR has been incorporated into the manual and includes the revision number of the manual when the TR was incorporated. “Deleted” means a TR has been replaced by another TR, a TR number will not be issued, or a TR has been deleted.

| Temporary Revision Number | Status | Page Number | Issue Date | Date Put in Manual | By | Date Removed from Manual | By |
|---|---|---|---|---|---|---|---|
| 21-1 | INC Rev 2 | | | | | | |
| 21-2 | INC Rev 5 | | | | | | |
| 21-3 | INC Rev 7 | | | | | | |
| 21-4 | Deleted | | | | | | |
| 21-5 | INC Rev 7 | | | | | | |
| 21-6 | INC Rev 9 | | | | | | |
| 21-7 | INC Rev 9 | | | | | | |
| 21-8 | INC Rev 9 | | | | | | |
| 21-9 | INC Rev 11 | | | | | | |
| 21-10 | INC Rev 12 | | | | | | |
| 21-11 | INC Rev 12 | | | | | | |
| 21-12 | INC Rev 12 | | | | | | |
| 21-13 | INC Rev 13 | | | | | | |
| 21-14 | INC Rev 14 | | | | | | |
| 21-15 | INC Rev 14 | | | | | | |
| 21-16 | INC Rev 15 | | | | | | |

Blank Page

# SERVICE BULLETIN LIST

Refer to Table INTRO-7 for other applicable service information documents not listed in the Service Bulletin List.

| Service Bulletin/ Revision Number | Title | Modification | Date Put in Manual |
|---|---|---|---|
| 21-2110 | Conversion of 541674-3 Series 1 to 541674-3 Series 2 (Replacement of motor and gearshaft shim washers and adjustment of limit switches relative to the mechanical stop). | | 1 Feb 1993 |
| 21-2120 | Conversion of 541674-5 Series 1 and 541674-5 Series 2 to 541674-6 Series 1 (Replacement of AC motor 46339-2 with AC motor 46366-1). | | 1 Feb 1993 |
| 21-2126, Rev 1 | Conversion of 541674-3 Series 1 Actuator to 541674-5 Series 1 Actuator, and 541674-3 Series 2 Actuator to 541674-5 Series 2 Actuator. | | 8 Aug 2023 |
| 21-2130 | Conversion of 541674-3 Series 2 to 541674-4 Series 1 (Replacement of AC motor 46339-2 with AC motor 46366-1). | | 1 Feb 1993 |
| 21-2565, Rev 1 | Replace the Alternating Current (AC) Motor. | | 8 Aug 2023 |
| 21-2664 | Conversion of 541674-4 Series 2 to 541674-4 Series 3 (Reworking the housing assembly, replacement of the switch assemblies, switch arms with cams, addition of pin retaining plate, and rerouting the switch wire leads). | | 2 Apr 1996 |
| 21-2756 | Air Conditioning-Ram Air Modulation Linear Electromechanical Actuator-Change the M2 Cam and the DPDT Switches. | | 23 Feb 2012 |

Blank Page

# LIST OF EFFECTIVE PAGES


| Subheading and Page | Date |
|---|---|
| Title | |
| T-1 | 28 Nov 2023 |
| T-2 | 28 Nov 2023 |
| T-3 | 28 Nov 2023 |
| T-4 | 28 Nov 2023 |
| T-5 | 28 Nov 2023 |
| T-6 | 28 Nov 2023 |
| Transmittal Information | |
| TI-1 | 28 Nov 2023 |
| TI-2 | 28 Nov 2023 |
| TI-3 | 28 Nov 2023 |
| TI-4 | 28 Nov 2023 |
| Record of Revisions | |
| RR-1 | 28 Nov 2023 |
| RR-2 | 28 Nov 2023 |
| Record of Temporary Revisions | |
| RTR-1 | 28 Nov 2023 |
| RTR-2 | 28 Nov 2023 |
| Service Bulletin List | |
| SBL-1 | 28 Nov 2023 |
| SBL-2 | 28 Nov 2023 |
| List of Effective Pages | |
| LEP-1 | 28 Nov 2023 |
| LEP-2 | 28 Nov 2023 |
| LEP-3 | 28 Nov 2023 |
| LEP-4 | 28 Nov 2023 |
| Table of Contents | |
| TC-1 | 28 Nov 2023 |
| TC-2 | 28 Nov 2023 |
| TC-3 | 28 Nov 2023 |
| TC-4 | 28 Nov 2023 |
| TC-5 | 28 Nov 2023 |
| TC-6 | 28 Nov 2023 |
| TC-7 | 28 Nov 2023 |
| TC-8 | 28 Nov 2023 |
| TC-9 | 28 Nov 2023 |
| TC-10 | 28 Nov 2023 |
| Introduction | |
| INTRO-1 | 28 Nov 2023 |
| INTRO-2 | 28 Nov 2023 |
| INTRO-3 | 28 Nov 2023 |
| INTRO-4 | 28 Nov 2023 |
| INTRO-5 | 28 Nov 2023 |
| INTRO-6 | 28 Nov 2023 |
| INTRO-7 | 28 Nov 2023 |
| INTRO-8 | 28 Nov 2023 |
| INTRO-9 | 28 Nov 2023 |
| INTRO-10 | 28 Nov 2023 |
| INTRO-11 | 28 Nov 2023 |
| INTRO-12 | 28 Nov 2023 |
| INTRO-13 | 28 Nov 2023 |
| INTRO-14 | 28 Nov 2023 |
| INTRO-15 | 28 Nov 2023 |
| INTRO-16 | 28 Nov 2023 |
| INTRO-17 | 28 Nov 2023 |
| INTRO-18 | 28 Nov 2023 |
| INTRO-19 | 28 Nov 2023 |
| INTRO-20 | 28 Nov 2023 |
| Description and Operation | |
| 1 | 28 Nov 2023 |
| 2 | 28 Nov 2023 |
| 3 | 28 Nov 2023 |
| 4 | 28 Nov 2023 |
| 5 | 28 Nov 2023 |
| 6 | 28 Nov 2023 |
| Testing and Fault Isolation | |
| 1001 | 28 Nov 2023 |
| 1002 | 28 Nov 2023 |
| 1003 | 28 Nov 2023 |
| 1004 | 28 Nov 2023 |
| 1005 | 28 Nov 2023 |
| 1006 | 28 Nov 2023 |
| 1007 | 28 Nov 2023 |
| 1008 | 28 Nov 2023 |
| 1009 | 28 Nov 2023 |
| 1010 | 28 Nov 2023 |
| Schematic and Wiring Diagrams | |
| 2001 | 28 Nov 2023 |
| 2002 | 28 Nov 2023 |
| 2003 | 28 Nov 2023 |
| 2004 | 28 Nov 2023 |
| 2005 | 28 Nov 2023 |


* Indicates a changed or added page.
F Indicates a foldout page.

## LIST OF EFFECTIVE PAGES (Cont)

| Subheading and Page | | Date |
|---|---|---|
| 2006 | | 28 Nov 2023 |
| 2007 | | 28 Nov 2023 |
| 2008 | | 28 Nov 2023 |
| Disassembly | | |
| 3001 | | 28 Nov 2023 |
| 3002 | | 28 Nov 2023 |
| 3003 | | 28 Nov 2023 |
| 3004 | | 28 Nov 2023 |
| 3005 | | 28 Nov 2023 |
| 3006 | | 28 Nov 2023 |
| Cleaning | | |
| 4001 | | 28 Nov 2023 |
| 4002 | | 28 Nov 2023 |
| 4003 | | 28 Nov 2023 |
| 4004 | | 28 Nov 2023 |
| Inspection/Check | | |
| 5001 | | 28 Nov 2023 |
| 5002 | | 28 Nov 2023 |
| 5003 | | 28 Nov 2023 |
| 5004 | | 28 Nov 2023 |
| 5005 | | 28 Nov 2023 |
| 5006 | | 28 Nov 2023 |
| 5007 | | 28 Nov 2023 |
| 5008 | | 28 Nov 2023 |
| Repair | | |
| 6001 | * | 28 Nov 2023 |
| 6002 | | 28 Nov 2023 |
| 6003 | | 28 Nov 2023 |
| 6004 | | 28 Nov 2023 |
| 6005 | * | 28 Nov 2023 |
| 6006 | | 28 Nov 2023 |
| 6007 | | 28 Nov 2023 |
| 6008 | | 28 Nov 2023 |
| Assembly | | |
| 7001 | | 28 Nov 2023 |
| 7002 | | 28 Nov 2023 |
| 7003 | | 28 Nov 2023 |
| 7004 | | 28 Nov 2023 |
| 7005 | | 28 Nov 2023 |
| 7006 | | 28 Nov 2023 |
| 7007 | | 28 Nov 2023 |
| 7008 | | 28 Nov 2023 |
| 7009 | | 28 Nov 2023 |
| 7010 | | 28 Nov 2023 |
| 7011 | | 28 Nov 2023 |
| 7012 | | 28 Nov 2023 |
| 7013 | | 28 Nov 2023 |
| 7014 | | 28 Nov 2023 |
| 7015 | | 28 Nov 2023 |
| 7016 | | 28 Nov 2023 |
| 7017 | | 28 Nov 2023 |
| 7018 | | 28 Nov 2023 |
| 7019 | | 28 Nov 2023 |
| 7020 | | 28 Nov 2023 |
| 7021 | | 28 Nov 2023 |
| 7022 | | 28 Nov 2023 |
| 7023 | | 28 Nov 2023 |
| 7024 | | 28 Nov 2023 |
| Fits and Clearances | | |
| 8001 | | 28 Nov 2023 |
| 8002 | | 28 Nov 2023 |
| 8003 | | 28 Nov 2023 |
| 8004 | | 28 Nov 2023 |
| Special Tools, Fixtures, Equipment and Consumables | | |
| 9001 | | 28 Nov 2023 |
| 9002 | * | 28 Nov 2023 |
| 9003 | | 28 Nov 2023 |
| 9004 | | 28 Nov 2023 |
| Special Procedures | | |
| 11001 | | 28 Nov 2023 |
| 11002 | | 28 Nov 2023 |
| Removal | | |
| 12001 | | 28 Nov 2023 |
| 12002 | | 28 Nov 2023 |
| Installation | | |
| 13001 | | 28 Nov 2023 |
| 13002 | | 28 Nov 2023 |
| Servicing | | |
| 14001 | | 28 Nov 2023 |
| 14002 | | 28 Nov 2023 |

* Indicates a changed or added page.
F Indicates a foldout page.

## LIST OF EFFECTIVE PAGES (Cont)


| Subheading and Page | | Date |
|---|---|---|
| Storage (Including Transportation) | | |
| 15001 | | 28 Nov 2023 |
| 15002 | | 28 Nov 2023 |
| 15003 | | 28 Nov 2023 |
| 15004 | | 28 Nov 2023 |
| Rework (Service Bulletin Accomplishment Procedures) | | |
| 16001 | | 28 Nov 2023 |
| 16002 | | 28 Nov 2023 |
| Illustrated Parts List | | |
| 10001 | | 28 Nov 2023 |
| 10002 | | 28 Nov 2023 |
| 10003 | | 28 Nov 2023 |
| 10004 | | 28 Nov 2023 |
| 10005 | | 28 Nov 2023 |
| 10006 | | 28 Nov 2023 |
| 10007 | | 28 Nov 2023 |
| 10008 | | 28 Nov 2023 |
| 10009 | | 28 Nov 2023 |
| 10010 | | 28 Nov 2023 |
| 10011 | | 28 Nov 2023 |
| 10012 | | 28 Nov 2023 |
| 10013 | | 28 Nov 2023 |
| 10014 | | 28 Nov 2023 |
| 10015 | | 28 Nov 2023 |
| 10016 | | 28 Nov 2023 |
| 10017 | | 28 Nov 2023 |
| 10018 | | 28 Nov 2023 |
| 10019 | | 28 Nov 2023 |
| 10020 | | 28 Nov 2023 |
| 10021 | | 28 Nov 2023 |
| 10022 | | 28 Nov 2023 |
| 10023 | * | 28 Nov 2023 |
| 10024 | | 28 Nov 2023 |
| 10025 | | 28 Nov 2023 |
| 10026 | | 28 Nov 2023 |
| 10027 | | 28 Nov 2023 |
| 10028 | | 28 Nov 2023 |
| 10029 | | 28 Nov 2023 |
| 10030 | | 28 Nov 2023 |
| 10031 | | 28 Nov 2023 |
| 10032 | | 28 Nov 2023 |
| 10033 | | 28 Nov 2023 |
| 10034 | | 28 Nov 2023 |


* Indicates a changed or added page.
F Indicates a foldout page.

Blank Page

# TABLE OF CONTENTS
## LIST OF SECTIONS


| Title | Page |
|---|---|
| **INTRODUCTION** | **INTRO-1** |
| 1. How to Use This Manual (TASK 21-20-36-99F-801-A01) | INTRO-1 |
| A. General (Subtask 21-20-36-99F-001-A01) | INTRO-1 |
| B. Observance of Manual Instructions (Subtask 21-20-36-99F-002-A01) | INTRO-2 |
| C. Symbols (Subtask 21-20-36-99F-003-A01) | INTRO-2 |
| D. Units of Measure (Subtask 21-20-36-99F-004-A01) | INTRO-6 |
| E. Page Number Block Explanation (Subtask 21-20-36-99F-005-A01) | INTRO-6 |
| F. Illustration (Subtask 21-20-36-99F-006-A01) | INTRO-6 |
| G. Application of Maintenance Task Oriented Support System (MTOSS) (Subtask 21-20-36-99F-007-A01) | INTRO-7 |
| 2. Customer Support (TASK 21-20-36-99F-802-A01) | INTRO-16 |
| A. Honeywell Aerospace Online Technical Publications Website (Subtask 21-20-36-99F-008-A01) | INTRO-16 |
| B. Honeywell Aerospace Contact Team (Subtask 21-20-36-99F-009-A01) | INTRO-17 |
| 3. References (TASK 21-20-36-99F-803-A01) | INTRO-17 |
| A. Honeywell/Vendor Publications (Subtask 21-20-36-99F-010-A01) | INTRO-17 |
| B. Other Publications (Subtask 21-20-36-99F-011-A01) | INTRO-17 |
| 4. Acronyms and Abbreviations (TASK 21-20-36-99F-804-A01) | INTRO-18 |
| A. General (Subtask 21-20-36-99F-012-A01) | INTRO-18 |
| 5. Process Verification (TASK 21-20-36-99F-805-A01) | INTRO-19 |
| A. Verification Data (Subtask 21-20-36-99F-013-A01) | INTRO-19 |
| 6. Software History (TASK 21-20-36-99F-806-A01) | INTRO-19 |
| A. Software Data (Subtask 21-20-36-99F-014-A01) | INTRO-19 |
| 7. History of Changes (TASK 21-20-36-99F-807-A01) | INTRO-19 |
| A. Modification/Configuration History (Subtask 21-20-36-99F-015-A01) | INTRO-19 |
| B. Change History for Parts List (Subtask 21-20-36-99F-016-A01) | INTRO-19 |
| 8. Service Information Documents (TASK 21-20-36-99F-808-A01) | INTRO-20 |
| A. Applicable Service Information Documents (Subtask 21-20-36-99F-017-A01) | INTRO-20 |
| **DESCRIPTION AND OPERATION** | **1** |
| 1. Description (TASK 21-20-36-870-801-A01) | 1 |
| A. General (Subtask 21-20-36-870-001-A01) | 1 |
| B. Applicable Publications (Subtask 21-20-36-99C-001-A01) | 5 |

## TABLE OF CONTENTS (Cont)
## LIST OF SECTIONS (Cont)


| Title | Page |
|---|---|
| C. Ram Air Modulation Linear Electromechanical Actuator (Subtask 21-20-36-870-002-A01) | 5 |
| 2. Operation (TASK 21-20-36-870-802-A01) | 5 |
| A. Ram Air Modulation Linear Electromechanical Actuator (Subtask 21-20-36-870-003-A01) | 5 |
| **TESTING AND FAULT ISOLATION** | **1001** |
| 1. Planning Data (TASK 21-20-36-99C-801-A01) | 1001 |
| A. Reason for the Job (Subtask 21-20-36-99C-002-A01) | 1001 |
| B. Job Setup Data (Subtask 21-20-36-99C-003-A01) | 1001 |
| 2. Procedure (TASK 21-20-36-810-801-A01) | 1002 |
| A. Job Setup (Subtask 21-20-36-810-001-A01) | 1002 |
| B. Testing the Bonding Resistance (Subtask 21-20-36-810-002-A01) | 1002 |
| C. Rated Load Requirement and No-Load Requirement Test Setup (Subtask 21-20-36-810-003-A01) | 1004 |
| D. Testing at Rated Load Conditions (Subtask 21-20-36-810-004-A01) | 1006 |
| E. Testing at Maximum Load Conditions (Subtask 21-20-36-810-005-A01) | 1006 |
| F. Testing Mechanical Stroke at No Load Conditions (Subtask 21-20-36-810-006-A01) | 1006 |
| G. Testing Electrical Stroke Calibration at No Load Conditions (Subtask 21-20-36-810-007-A01) | 1007 |
| H. Testing M1 Limit Switch Actuation at No Load Conditions (Subtask 21-20-36-810-008-A01) | 1008 |
| I. Testing M2 Limit Switch Actuation at No Load Conditions (Subtask 21-20-36-810-009-A01) | 1008 |
| J. Testing M1 and M2 Switch Overtravel at No Load Conditions (Subtask 21-20-36-810-010-A01) | 1009 |
| K. Test Stroke with Capacitor Installed (Subtask 21-20-36-810-011-A01) | 1009 |
| L. Fault Isolation of Ram Air Modulation Linear Electromechanical Actuator (Subtask 21-20-36-810-012-A01) | 1009 |
| M. Job Close-up (Subtask 21-20-36-810-013-A01) | 1010 |
| **SCHEMATIC AND WIRING DIAGRAMS** | **2001** |
| 1. Planning Data (TASK 21-20-36-99C-802-A01) | 2001 |
| A. Reason for the Job (Subtask 21-20-36-99C-004-A01) | 2001 |
| B. Job Setup Data (Subtask 21-20-36-99C-005-A01) | 2001 |
| 2. Schematic and Wiring Diagrams (TASK 21-20-36-878-801-A01) | 2001 |

## TABLE OF CONTENTS (Cont)
## LIST OF SECTIONS (Cont)


| Title | Page |
|---|---|
| A. Schematic Diagrams (Subtask 21-20-36-878-001-A01) | 2001 |
| B. Wiring Diagram (Subtask 21-20-36-878-002-A01) | 2004 |
| **DISASSEMBLY** | **3001** |
| 1. Planning Data (TASK 21-20-36-99C-803-A01) | 3001 |
| A. Reason for the Job (Subtask 21-20-36-99C-006-A01) | 3001 |
| B. Job Setup Data (Subtask 21-20-36-99C-007-A01) | 3001 |
| 2. Procedure (TASK 21-20-36-000-801-A01) | 3002 |
| A. Job Setup (Subtask 21-20-36-000-001-A01) | 3002 |
| B. General Disassembly Procedures (Subtask 21-20-36-000-002-A01) | 3002 |
| C. Disassembly of the Ram Air Modulation Linear Electromechanical Actuator (Subtask 21-20-36-000-003-A01) | 3003 |
| D. Job Close-up (Subtask 21-20-36-000-004-A01) | 3006 |
| **CLEANING** | **4001** |
| 1. Planning Data (TASK 21-20-36-99C-804-A01) | 4001 |
| A. Reason for the Job (Subtask 21-20-36-99C-008-A01) | 4001 |
| B. Job Setup Data (Subtask 21-20-36-99C-009-A01) | 4001 |
| 2. Procedure (TASK 21-20-36-100-801-A01) | 4002 |
| A. Job Setup (Subtask 21-20-36-100-001-A01) | 4002 |
| B. External Parts (Subtask 21-20-36-100-002-A01) | 4002 |
| C. Electrical Parts (Subtask 21-20-36-100-003-A01) | 4002 |
| D. Metal Mechanical Parts (Subtask 21-20-36-100-004-A01) | 4003 |
| E. Job Close-up (Subtask 21-20-36-100-005-A01) | 4003 |
| **INSPECTION/CHECK** | **5001** |
| 1. Planning Data (TASK 21-20-36-99C-805-A01) | 5001 |
| A. Reason for the Job (Subtask 21-20-36-99C-010-A01) | 5001 |
| B. Job Setup Data (Subtask 21-20-36-99C-011-A01) | 5001 |
| 2. Procedure (TASK 21-20-36-210-801-A01) | 5002 |
| A. Job Setup (Subtask 21-20-36-210-001-A01) | 5002 |
| B. General Inspection/Check of the Ram Air Modulation Linear Electromechanical Actuator (Subtask 21-20-36-210-002-A01) | 5002 |
| C. Magnetic Particle Inspection/Check of the Ram Air Modulation Linear Electromechanical Actuator (Subtask 21-20-36-210-003-A01) | 5003 |

## TABLE OF CONTENTS (Cont)
## LIST OF SECTIONS (Cont)


| Title | Page |
|---|---|
| D. Penetrant Inspection/Check of the Ram Air Modulation Linear Electromechanical Actuator (Subtask 21-20-36-210-004-A01) | 5003 |
| E. Detailed Inspection/Check of the Ram Air Modulation Linear Electromechanical Actuator (Subtask 21-20-36-210-005-A01) | 5004 |
| F. Job Close-up (Subtask 21-20-36-210-006-A01) | 5007 |
| **REPAIR** | **6001** |
| 1. Planning Data (TASK 21-20-36-99C-806-A01) | 6001 |
| A. Reason for the Job (Subtask 21-20-36-99C-012-A01) | 6001 |
| B. Job Setup Data (Subtask 21-20-36-99C-013-A01) | 6001 |
| 2. Procedure (TASK 21-20-36-300-801-A01) | 6002 |
| A. Job Setup (Subtask 21-20-36-300-001-A01) | 6002 |
| B. References for Repair (Subtask 21-20-36-300-002-A01) | 6002 |
| C. General Repair Instructions (Subtask 21-20-36-300-003-A01) | 6003 |
| D. Repair of Exterior Paint (Subtask 21-20-36-300-004-A01) | 6003 |
| E. Replacement of Identification Plate (Subtask 21-20-36-300-005-A01) | 6005 |
| F. Replacement of Wiring Diagram Plate (Subtask 21-20-36-300-006-A01) | 6005 |
| G. Replacement of Follow-up Cams and Pins (Subtask 21-20-36-300-007-A01) | 6006 |
| H. Replacement of Loose or Damaged Bearing (Subtask 21-20-36-300-008-A01) | 6006 |
| I. Repair of Dry-Film Lubricant (Subtask 21-20-36-300-009-A01) | 6007 |
| J. Replacement of Loose or Damaged Spacer (Subtask 21-20-36-300-010-A01) | 6007 |
| K. Replacement of Loose or Damaged Bushing (Subtask 21-20-36-300-011-A01) | 6007 |
| L. Job Close-up (Subtask 31-61-79-300-012-A01) | 6008 |
| **ASSEMBLY** | **7001** |
| 1. Planning Data (TASK 21-20-36-99C-807-A01) | 7001 |
| A. Reason for the Job (Subtask 21-20-36-99C-014-A01) | 7001 |
| B. Job Setup Data (Subtask 21-20-36-99C-015-A01) | 7001 |
| 2. Procedure (TASK 21-20-36-400-801-A01) | 7003 |
| A. Job Setup (Subtask 21-20-36-400-001-A01) | 7003 |
| B. General Assembly Procedures (Subtask 21-20-36-400-002-A01) | 7003 |
| C. Assembly of the Gear Housing Extension, Switch Operating Arms, Switch Cams, Pins, Screws, Follow-up Cams, Pin Retaining Plates, Switch Gearshaft, and Switch Operating Cam Guide (Subtask 21-20-36-400-003-A01) | 7004 |
| D. Installation of the Ram Air Modulation Linear Electromechanical Actuator Switch Assemblies (Subtask 21-20-36-400-004-A01) | 7007 |

## TABLE OF CONTENTS (Cont)
## LIST OF SECTIONS (Cont)


| Title | Page |
|---|---|
| E. Installation of the Jackscrew Assembly and Gear Assembly (Subtask 21-20-36-400-005-A01) | 7008 |
| F. Setting the Mechanical Stroke (Subtask 21-20-36-400-006-A01) | 7011 |
| G. Installation of Stop in the Ram Air Modulation Linear Electromechanical Actuator Nut Assembly (Subtask 21-20-36-400-007-A01) | 7011 |
| H. Installation of the Ram Air Modulation Linear Electromechanical Actuator End Fittings (Subtask 21-20-36-400-008-A01) | 7012 |
| I. Installation of the AC Motor (Subtask 21-20-36-400-009-A01) | 7013 |
| J. Assembly of the Wiring (Subtask 21-20-36-400-010-A01) | 7013 |
| K. Calibration of the Ram Air Modulation Linear Electromechanical Actuator Switch Assemblies and DPDT Switches (Subtask 21-20-36-400-011-A01) | 7021 |
| L. Installation of the Machined Housing (Subtask 21-20-36-400-012-A01) | 7024 |
| M. Job Close-up (Subtask 21-20-36-400-013-A01) | 7024 |
| **FITS AND CLEARANCES** | **8001** |
| 1. Planning Data (TASK 21-20-36-99C-808-A01) | 8001 |
| A. Reason for the Job (Subtask 21-20-36-99C-016-A01) | 8001 |
| B. Job Setup Data (Subtask 21-20-36-99C-017-A01) | 8001 |
| 2. Fits and Clearances (TASK 21-20-36-220-801-A01) | 8001 |
| A. Fits and Clearances of the Ram Air Modulation Linear Electromechanical Actuator (Subtask 21-20-36-220-001-A01) | 8001 |
| B. Torque Values (Subtask 21-20-36-220-002-A01) | 8002 |
| C. Specified Torque Values (Subtask 21-20-36-220-003-A01) | 8003 |
| **SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES** | **9001** |
| 1. Planning Data (TASK 21-20-36-99C-809-A01) | 9001 |
| A. Reason for the Job (Subtask 21-20-36-99C-018-A01) | 9001 |
| B. Job Setup Data (Subtask 21-20-36-940-001-A01) | 9001 |
| **SPECIAL PROCEDURES** | **11001** |
| 1. Not Applicable | 11001 |
| **REMOVAL** | **12001** |
| 1. Not Applicable | 12001 |
| **INSTALLATION** | **13001** |
| 1. Not Applicable | 13001 |
| **SERVICING** | **14001** |
| 1. Not Applicable | 14001 |

## TABLE OF CONTENTS (Cont)
## LIST OF SECTIONS (Cont)


| Title | Page |
|---|---|
| **STORAGE (INCLUDING TRANSPORTATION)** | **15001** |
| 1. Planning Data (TASK 21-20-36-99C-810-A01) | 15001 |
| A. Reason for the Job (Subtask 21-20-36-99C-019-A01) | 15001 |
| B. Job Setup Data (Subtask 21-20-36-99C-020-A01) | 15001 |
| 2. Procedure (TASK 21-20-36-550-801-A01) | 15002 |
| A. Job Setup (Subtask 21-20-36-550-001-A01) | 15002 |
| B. Preservation (Subtask 21-20-36-550-002-A01) | 15002 |
| C. Packing (Subtask 21-20-36-550-003-A01) | 15002 |
| D. Storage (Subtask 21-20-36-550-004-A01) | 15002 |
| E. Transportation (Subtask 21-20-36-550-005-A01) | 15002 |
| F. Job Close-up (Subtask 21-20-36-550-006-A01) | 15003 |
| **REWORK (SERVICE BULLETIN ACCOMPLISHMENT PROCEDURES)** | **16001** |
| 1. Not Applicable | 16001 |
| **ILLUSTRATED PARTS LIST** | **10001** |
| 1. Description (TASK 21-20-36-99C-811-A01) | 10001 |
| A. General (Subtask 21-20-36-99C-021-A01) | 10001 |
| B. Job Setup Data (Subtask 21-20-36-99C-022-A01) | 10001 |
| 2. Contents of the IPL (TASK 21-20-36-99C-812-A01) | 10001 |
| A. Vendor Code List (Subtask 21-20-36-99C-023-A01) | 10001 |
| B. Equipment Designator Index (Subtask 21-20-36-99C-024-A01) | 10001 |
| C. Numerical Index (Subtask 21-20-36-99C-025-A01) | 10001 |
| D. Detailed Parts List (Subtask 21-20-36-99C-026-A01) | 10001 |
| 3. Vendor Code List | 10009 |
| 4. Detailed Parts List | 10010 |

## TABLE OF CONTENTS (Cont)

## LIST OF FIGURES


| Figure | Description | Page |
|---|---|---|
| INTRO-1 | Geometric Tolerance Symbols | INTRO-3 |
| INTRO-2 | Weld Symbols | INTRO-5 |
| INTRO-3 | MTOSS Code Positions | INTRO-8 |
| 1 | Ram Air Modulation Linear Electromechanical Actuator | 4 |
| 1001 | Bonding Resistance Test Points | 1003 |
| 1002 | Ram Air Modulation Linear Electromechanical Actuator Test Setup | 1005 |
| 2001 | Ram Air Modulation Linear Electromechanical Actuator Schematic Diagram | 2003 |
| 2002 | Ram Air Modulation Linear Electromechanical Actuator Wiring Diagram | 2005 |
| 2003 | Ram Air Modulation Linear Electromechanical Actuator Wiring Diagram | 2007 |
| 5001 | Housing Assembly Check | 5006 |
| 6001 | Paint Mask Areas | 6004 |
| 7001 | Assembly Requirements | 7006 |
| 7002 | Jackscrew and Gear Assembly Lacing Tape Placement | 7010 |
| 7003 | Wiring Harness Lacing Tape Placement | 7016 |
| 7004 | Connector Harness Lacing Tape Placement | 7018 |
| 7005 | Connector Assembly Requirements | 7020 |
| 10001 | DPL Example | 10006 |
| 10002 | Nomenclature Indentures | 10008 |

**IPL Figure**

| | | |
|---|---|---|
| 1 | Ram Air Modulation Linear Electromechanical Actuator | 10017 |

## TABLE OF CONTENTS (Cont)
## LIST OF TABLES


| Table | Description | Page |
|---|---|---|
| INTRO-1 | Equipment Identification List | INTRO-1 |
| INTRO-2 | Page Number Blocks | INTRO-6 |
| INTRO-3 | MTOSS Function Code Definitions | INTRO-8 |
| INTRO-4 | Applicable Publication List | INTRO-17 |
| INTRO-5 | List of Acronyms and Abbreviations | INTRO-18 |
| INTRO-6 | Verification Data | INTRO-19 |
| INTRO-7 | Applicable Service Information | INTRO-20 |
| 1 | Leading Particulars | 1 |
| 1001 | Special Tools, Fixtures, and Equipment | 1001 |
| 1002 | Consumables | 1002 |
| 1003 | Ram Air Modulation Linear Electromechanical Actuator Stroke Requirements | 1008 |
| 1004 | Fault Isolation | 1009 |
| 2001 | Special Tools, Fixtures, and Equipment | 2001 |
| 2002 | Consumables | 2001 |
| 2003 | Schematic Diagrams | 2002 |
| 2004 | Revision Reference Sheet for Figure 2001 | 2002 |
| 2005 | Wiring Diagrams | 2004 |
| 2006 | Wiring Data (For Actuators With PN 26-804 Switches) | 2006 |
| 2007 | Wiring Data (For Actuators With PN 26-830070 or 2748045-1 Switches) | 2008 |
| 3001 | Special Tools, Fixtures, and Equipment | 3001 |
| 3002 | Consumables | 3001 |
| 4001 | Special Tools, Fixtures, and Equipment | 4001 |
| 4002 | Consumables | 4001 |
| 5001 | Special Tools, Fixtures, and Equipment | 5001 |
| 5002 | Consumables | 5001 |
| 5003 | Check Requirements | 5005 |
| 6001 | Special Tools, Fixtures, and Equipment | 6001 |
| 6002 | Consumables | 6001 |
| 7001 | Special Tools, Fixtures, and Equipment | 7001 |
| 7002 | Consumables | 7001 |
| 8001 | Fits and Clearances | 8001 |
| 8002 | Thread Size and Torque Data | 8002 |

## TABLE OF CONTENTS (Cont)

## LIST OF TABLES (Cont)


| Table | Description | Page |
|---|---|---|
| 8003 | Final Torque Data | 8003 |
| 8004 | Specified Torque | 8003 |
| 9001 | Special Tools, Fixtures, and Equipment | 9001 |
| 9002 | Consumable Materials | 9002 |
| 15001 | Special Tools, Fixtures, and Equipment | 15001 |
| 15002 | Consumables | 15001 |

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# INTRODUCTION

**1.** **How to Use This Manual** (TASK 21-20-36-99F-801-A01)

**A.** **General** (Subtask 21-20-36-99F-001-A01)

(1) This publication gives maintenance instructions for the equipment shown on the Title page.

(2) Refer to Table INTRO-1 for equipment identification data.

(a) The configuration of the equipment is shown by the part number, dash number, series number, and change number stamped on the identification plate. Compare this data with the data shown in Table INTRO-1.

(b) A part number, a service bulletin number (Pre SB, Post SB), or an effectivity code symbol identifies the special procedures or illustrations necessary for each configuration. The procedures and illustrations not identified are applicable to all the configurations of the equipment.

(c) The effectivity coding system identifies the differences between unit configurations.

1 Modifications to the basic unit make it necessary to re-identify the unit. For example: PN 123456-1 becomes PN 123456-2.

2 Each different part number and dash number has its own effectivity code.

3 In the text, if no effectivity codes or part numbers are shown, then the procedures are applicable to all the configurations of the unit.

4 In the text, if one or more effectivity codes or part numbers are shown, then the procedures are applicable only to the related configuration of the unit.

**Table INTRO-1. Equipment Identification List**

| PN | Series Number | Effectivity Code Symbol | Description | Service Bulletin Number |
|---|---|---|---|---|
| 541674-1-1 | | A | Original configuration. | - |
| 541674-3 | 1 | B | Incorporates new actuator drive nut assembly. | - |
| 541674-3 | 2 | C | Incorporates new motor and gearshift shim washers and changed adjustment of limit switches relative to the mechanical stop. | 21-2110 |
| 541674-4 | 1 | D | Incorporates new AC motor. | 21-2130 |
| 541674-4 | 2 | E | Incorporates new AC motor. | 21-2565 |
| 541674-4 | 3 | J | Incorporates new switch assemblies. | 21-2664 |
| 541674-4 | 4 | K | Incorporates new switches and cams. | 21-2756 |
| 541674-5 | 1 | F | Changed adjustment of the electrical travel. | 21-2126 |
| 541674-5 | 2 | G | Changed adjustment of the electrical travel. | 21-2126 |
| 541674-6 | 1 | H | Incorporates new AC motor. | 21-2120 |

(3) Standard maintenance procedures that technicians must know are not given in this manual.

(4) This publication is written in agreement with the ATA specification.

(5) Refer to the Special Tools, Fixtures, and Equipment and Consumables tables in each section before the start of maintenance or repair procedures.

(6) An explanation on how to use the ILLUSTRATED PARTS LIST is given in the Introduction to that section.

(7) Honeywell recommends that you do the tests in TESTING AND FAULT ISOLATION before you disassemble the unit. These tests can show the condition of the unit or most possible cause of a malfunction. If a malfunction occurs, repair as necessary.

(8) Warnings, cautions, and notes in this manual give the data that follows:

- A WARNING gives a condition or tells personnel what part of an operation or maintenance procedure, which if not obeyed, can cause injury or death.
- A CAUTION gives a condition or tells personnel what part of an operation or maintenance procedure, which if not obeyed, can cause damage to the equipment.
- A NOTE gives data, not commands. The NOTE helps personnel when they do the related instruction.

(9) Warnings and cautions go before the applicable paragraph or step. Notes follow the applicable paragraph or step.

**B. Observance of Manual Instructions** (Subtask 21-20-36-99F-002-A01)

(1) Make sure that you carefully obey all safety, quality, operation, and shop procedures for the unit.

(2) All personnel who operate equipment and do maintenance specified in this manual must know and obey the safety precautions.

**C. Symbols** (Subtask 21-20-36-99F-003-A01)

(1) The symbols and special characters are in agreement with IEEE Publication 260 and IEC Publication 27. Special characters in text are spelled out.

(2) The signal mnemonics, unit control designators, and test designators are shown in capital letters.

(3) The signal names followed by an “*” show an active low signal.

(4) Some figures in this manual incorporate standard geometric characteristic symbols. Refer to Figure INTRO-1 for the geometric characteristic symbols.

**CHARACTERISTIC SYMBOLS**

| | |
|---|---|
| FLATNESS | PERPENDICULARITY |
| STRAIGHTNESS | PARALLELISM |
| CIRCULARITY | ANGULARITY |
| CYLINDRICITY | CIRCULAR RUN OUT |
| PROFILE OF A SURFACE | POSITION |
| PROFILE OF A LINE | SYMMETRY |
| CONCENTRICITY | |

**MODIFYING SYMBOLS**

- (M) MAXIMUM MATERIAL CONDITION (MMC)
- (S) REGARDLESS OF FEATURE SIZE (RFS)
- (P) PROJECTED TOLERANCE ZONE

**OTHER SYMBOLS**

- Ø DIAMETER
- NEGATIVE NOTATION

**FEATURE CONTROL FRAME**

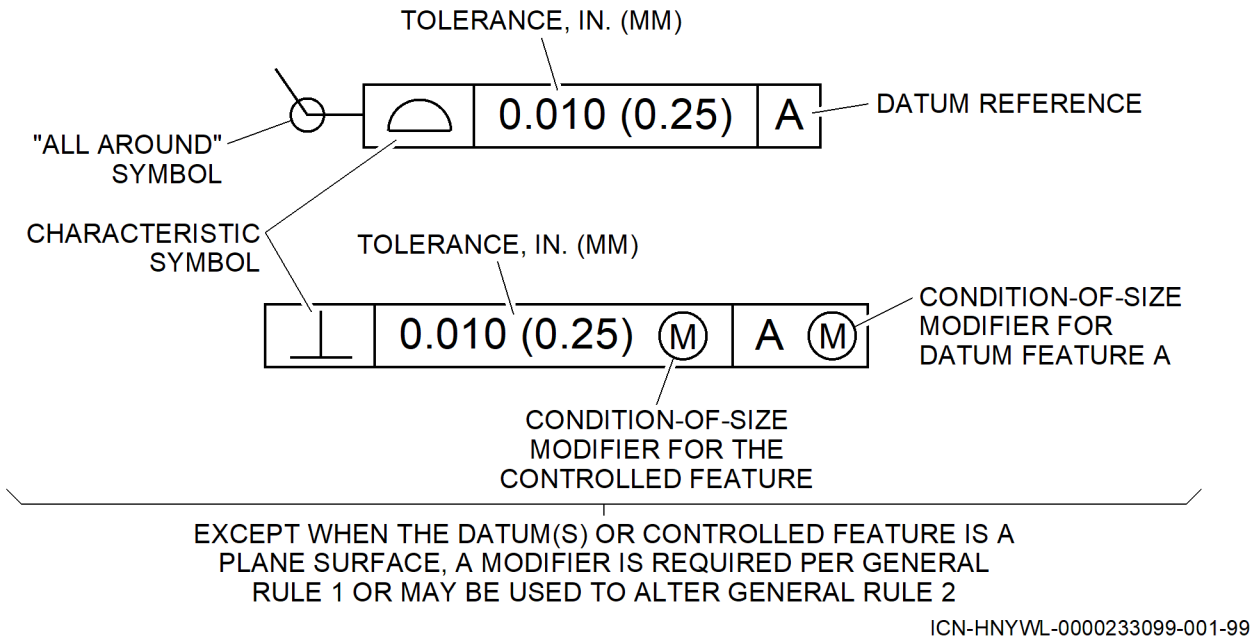


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**Figure INTRO-1. (Sheet 1 of 2) Geometric Tolerance Symbols**

**GENERAL RULES**

1. POSITION (⌖) TOLERANCES AND THEIR RELATED DATUMS APPLY AT MMC OR RFS AS SPECIFIED IN THE FEATURE CONTROL FRAME.
2. EXCEPT FOR POSITION (⌖), ALL TOLERANCES AND THEIR RELATED DATUMS APPLY RFS UNLESS OTHERWISE SPECIFIED.
3. ALL GEOMETRIC TOLERANCES ARE SPECIFIED AS TOTAL VALUES (TOTAL DIAMETER, TOTAL THICKNESS, TOTAL WIDTH, OR TOTAL ON RADIUS).
4. WHEN TWO DATUM FEATURES ARE REFERENCED IN HYPHENATED FORM, [A-B], A SINGLE DATUM IS ESTABLISHED BY THE TWO FEATURES.
5. WHEN TWO OR THREE DATUMS ARE REFERENCED IN SUCCEEDING FRAMES, [A][B][C], THE ORDER OF PRECEDENCE IS LEFT TO RIGHT.

**SAMPLE INTERPRETATIONS**

[-A-] THIS IS DATUM FEATURE A WHICH IS USED TO CREATE DATUM A IN THE PROCESSING EQUIPMENT.

[▱][0.010 (0.25)] THIS SURFACE MUST BE FLAT WITHIN 0.010 IN. (0.25 MM) TOTAL (MEETING EITHER SYSTEM WILL ACCEPT THE PART).

[//][0.010 (0.25)][B] / [-C-] THIS IS DATUM FEATURE C AND, RFS MUST BE PARALLEL TO DATUM B, RFS, WITHIN 0.010 IN. (0.25 MM) TOTAL.

[↗][0.0005 (0.013)][A-B] EACH CIRCULAR ELEMENT OF THIS FEATURE, RFS, MUST NOT RUN OUT MORE THAN 0.0005 IN. (0.013 MM) FIM, WITH RESPECT TO THE DATUM ESTABLISHED BY FEATURES A AND B, BOTH RFS.

[⌖][Ø 0.010 (0.25) Ⓜ][A][B Ⓜ][C Ⓜ] THE AXIS OF THIS FEATURE, WHEN THIS FEATURE IS AT MMC, MUST BE LOCATED WITHIN 0.010 IN. (0.25 MM) DIAMETER OF THE TRUE (BASIC) LOCATION ESTABLISHED IN RELATION TO THE PRIMARY SURFACE DATUM A, SECONDARY DATUM B AT MMC, AND TERTIARY DATUM C AT MMC.

[⊥][Ø 0.010 (0.25) Ⓜ][A] / [0.500 (12.7) Ⓟ] THE AXIS OF THIS FEATURE, WHEN THIS FEATURE IS AT MMC, MUST BE PERPENDICULAR TO DATUM A, RFS, WITHIN A 0.010 IN. (0.25 MM) DIAMETER TOLERANCE ZONE PROJECTED 0.500 IN. (12.7 MM) ABOVE THE SURFACE.

[∠][▱] THE ANGULAR ORIENTATION OF THIS FEATURE NEED NOT BE CONTROLLED WITH RESPECT TO ANY OTHER FEATURE.

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**Figure INTRO-1. (Sheet 2 of 2) Geometric Tolerance Symbols**

(5) Some figures in this manual incorporate standard weld symbols. Refer to Figure INTRO-2 for the weld symbols.

**BASIC WELD SYMBOLS AND THEIR LOCATION SIGNIFICANCE**

| LOCATION SIGNIFICANCE | FILLET | PLUG OR SLOT | SPOT OR PROJECTION | SEAM | BACK OR BACKING | SURFACING | FLANGE | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | EDGE | CORNER |
| ARROW SIDE | | | | | GROOVE WELD SYMBOL | NOT USED | | |
| OTHER SIDE | | | | | GROOVE WELD SYMBOL | NOT USED | | |
| BOTH SIDES | | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED |
| NO ARROW SIDE OR OTHER SIDE SIGNIFICANCE | NOT USED | NOT USED | | | NOT USED | | NOT USED | NOT USED |

**BASIC WELD SYMBOLS AND THEIR LOCATION SIGNIFICANCE**

| LOCATION SIGNIFICANCE | GROOVE (FLASH OR UPSET) | | | | | | |
|---|---|---|---|---|---|---|---|
| | SQUARE | V | BEVEL | U | J | FLARE V | FLARE BEVEL |
| ARROW SIDE | | | | | | | |
| OTHER SIDE | | | | | | | |
| BOTH SIDES | | | | | | | |
| NO ARROW SIDE OR OTHER SIDE SIGNIFICANCE | NOT USED EXCEPT FOR FLASH OR UPSET WELDS | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED |

**SUPPLEMENTARY SYMBOLS**

| WELD ALL AROUND | FIELD WELD | MELT-THRU | CONTOUR | | |
|---|---|---|---|---|---|
| | | | FLUSH | CONVEX | CONCAVE |
| | | | | | |

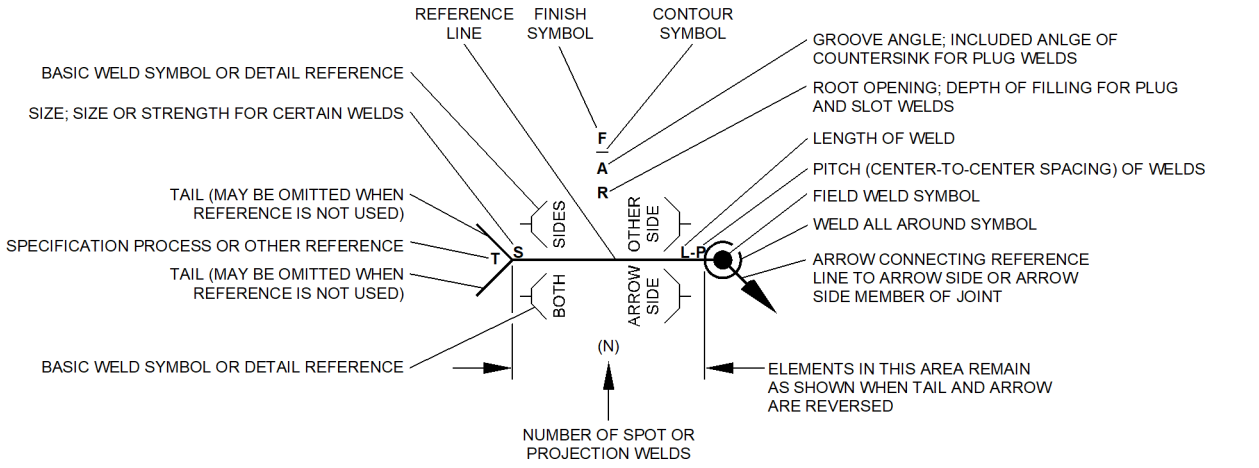


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**Figure INTRO-2. Weld Symbols**

**D.** **Units of Measure** (Subtask 21-20-36-99F-004-A01)

(1) Measurements, weights, temperatures, dimensions, and other values are expressed in the USMS followed by the appropriate SI metric units in parentheses. Some standard tools or parts such as drills, taps, bolts, nuts, etc. do not have an equivalent.

**E.** **Page Number Block Explanation** (Subtask 21-20-36-99F-005-A01)

(1) The data in this manual is divided into sections. A standard page number block system is used. Page number blocks are shown in Table INTRO-2.

**Table INTRO-2. Page Number Blocks**

| Section | Page Number Block |
|---|---|
| Description and Operation | 1 thru 999 |
| Testing and Fault Isolation | 1001 thru 1999 |
| Schematic and Wiring Diagrams | 2001 thru 2999 |
| Disassembly | 3001 thru 3999 |
| Cleaning | 4001 thru 4999 |
| Inspection/Check | 5001 thru 5999 |
| Repair | 6001 thru 6999 |
| Assembly | 7001 thru 7999 |
| Fits and Clearances | 8001 thru 8999 |
| Special Tools, Fixtures, Equipment and Consumables | 9001 thru 9999 |
| Illustrated Parts List | 10001 thru 10999 [1] |
| Special Procedures | 11001 thru 11999 |
| Removal | 12001 thru 12999 |
| Installation | 13001 thru 13999 |
| Servicing | 14001 thru 14999 |
| Storage (Including Transportation) | 15001 thru 15999 |
| Rework (Service Bulletin Accomplishment Procedures) | 16001 thru 16999 |

**NOTE :**

**1** The IPL is the last page number block in the document.

**F.** **Illustration** (Subtask 21-20-36-99F-006-A01)

(1) Some of the exploded view illustrations shown in the ILLUSTRATED PARTS LIST section are also referenced in the DISASSEMBLY, CLEANING, INSPECTION/CHECK, REPAIR, ASSEMBLY, and/or FITS AND CLEARANCES sections of this manual.

(2) Illustrations that support the individual items are shown by the item nomenclature, and in parenthesis, the item number followed by the basic figure number, i.e. washer (90, IPL Figure 1). Item numbers refer to the same IPL figure until a different IPL figure is specified.

(3) Supplemental illustrations use a suffix number to the basic figure number. For example, if Figure 5001-5 is used, it signifies that it is an illustration of the item identified by index number 5 in Figure 5001.

(4) If a code symbol (Code _____), part number, or Service Bulletin Number (Pre SB _____ or Post SB _____) is before the illustration title, it is applicable to a specific unit.

(5) Illustrations with no specific designation are applicable to all units.

**G. Application of Maintenance Task Oriented Support System (MTOSS)** (Subtask 21-20-36-99F-007-A01)

(1) In accordance with the ATA Specification 2200, this publication uses a Maintenance Task Numbering System which make the maintenance procedures in this manual compatible with an automated shop environment.

(2) The system uses standard and unique number combinations to identify maintenance tasks and subtasks.

(3) The MTOSS structure is the logical approach to organizing maintenance tasks and subtasks. The MTOSS numbering system includes the ATA Chapter-Section-Subject number as well as a function code and unique identifiers. The purpose of incorporating the MTOSS numbering system is to provide a means for the automated sorting, retrieval, and management of digitized data.

(4) Section and Sub-section Numbering System

(a) All procedures in this publication have TASK and SUBTASK numbers at key data retrieval points. The numbers provide the following:

- Identification of the hardware (part or parts) primary to the TASK
- Identification of the maintenance function applied to the part or parts
- A unique identifier for a set of instructions (known as TASK or SUBTASK)
- Identification of alternate methods and configuration differences that change the procedure applied to the TASK
- Identification of airline changes to a TASK or SUBTASK.

(5) Components of Task and Subtask Number

(a) The numbering system is an expansion of the ATA three-element numbering system. The number has seven elements. The first five elements are necessary for each TASK or SUBTASK. The sixth and seventh elements are applied only when necessary. Refer to Figure INTRO-3.

(b) Elements 1, 2, and 3 identify the ATA Chapter-Section-Subject number of the pageblock.

(c) Element 4 defines the maintenance function being performed. This element is a three position element. The third position is zero filled when further definition is not required. If required, the manufacturer will use the numbers 1 thru 9 or letters A thru Z, excluding the letters I and O. Refer to Table INTRO-3.

(d) Element 5 provides a unique identification for each TASK or SUBTASK number which is similarly numbered through the first four elements.

- TASKS are numbered from 801 thru 999
- SUBTASKS are numbered from 001 thru 800.

(e) Element 6 is a three position alphanumeric element used for identification of differences in configurations, methods or techniques, variations of standard practice applications, etc.

(f) Element 7 provides coding of those tasks or subtasks that have been changed by the customer (e.g., those tasks or subtasks accomplished by an outside repair source).

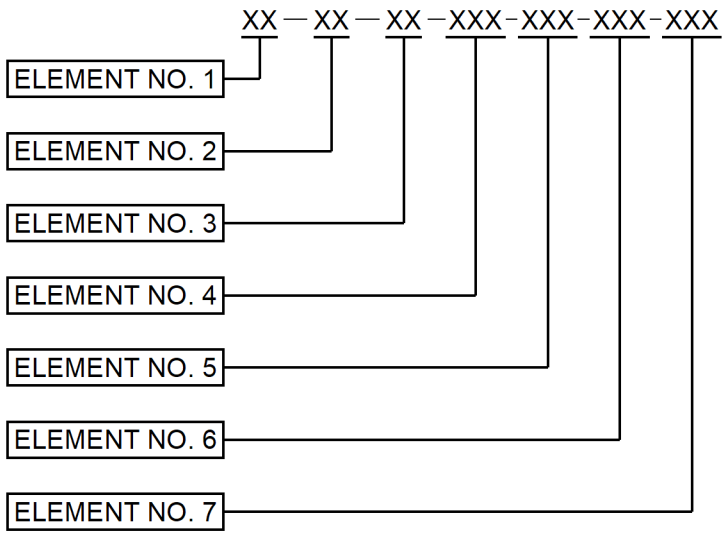


**Figure INTRO-3. MTOSS Code Positions**

**Table INTRO-3. MTOSS Function Code Definitions**

| Code | Function | Definition |
|---|---|---|
| 000 | REMOVAL AND DISASSEMBLY | |
| 010 | Removal | Removal of the engine/component from a workstand, transport dolly, test stand, etc., or aircraft. |
| 020 | Remove Modular Sections | This is the first echelon of disassembly which consists of sectionalization of the unit/engine into primary modular sections. Modular sections are identified by the third element of the ATA number when removed from the unit/engine. |
| 030 | Disassemble Modular Sections | This is the second echelon of disassembly which consists of disassembly of the modular sections into subassemblies after removal from the unit/ engine. Modular section designations appear in the second element of the ATA number for this echelon of disassembly. |

**Table INTRO-3. MTOSS Function Code Definitions (Cont)**

| Code | Function | Definition |
|---|---|---|
| 040 | Disassemble Subassemblies | This is the third echelon of engine disassembly which consists of disassembly of subassemblies to the piece part level. The subassemblies are identified by the third element of the ATA number. |
| 050 | Remove Accessory/Power Plant Components | This consists of removing individual accessory/ power plant components from either installed or uninstalled engines. |
| 060 | Disassemble Accessory | This involves disassembly of accessories/ components into subassemblies. |
| 070 | Disassemble Accessory Subassembly | This involves disassembly of accessories/ components subassemblies into piece parts. |
| 080 | Remove Test Equipment | This consists of removing equipment and instrumentation after accessory/component test. |
| 090 | Disassemble Support Equipment | This consists of disassembly of support equipment required to maintain said support equipment. |
| | | |
| 100 | CLEANING | |
| 110 | Chemical | Removal of surface deposits from a part by use of a chemical cleaning agent. After being dissolved, the deposit is washed or rinsed away after a soaking period. Also includes chemical power flushing. |
| 120 | Abrasive | Removal of surface deposits from a part by wet or dry particle impingement. |
| 130 | Ultrasonic | Removal of surface deposits and entrapped material by use of high frequency sound waves to produce cavitation at the surface of the part. Cleaning is performed in a liquid bath that transmits the sound energy and keeps the removed material in suspension. |
| 140 | Mechanical | Removal of surface deposits from a part by use of a brush, felt bob, sandpaper, or other hand or mechanical action. |
| 150 | Unassigned | |
| 160 | Miscellaneous | Removal of deposits from parts with compressed air, miscellaneous hand cleaning, and various combinations of cleaning procedures. |

**Table INTRO-3. MTOSS Function Code Definitions (Cont)**

| Code | Function | Definition |
|---|---|---|
| 170 | Foam/Water Wash | Removal or post emulsified fluorescent penetrant via an agitated water wash, automatic spray rinse, or an aqueous remover aerated to produce a foam. |
| 180 | Testing of Solutions | Test used to assist in identifying certain materials by electro-mechanically determining the presence or absence of known constituents. |
| 190 | Unassigned | |
| | | |
| 200 | INSPECTION | |
| 210 | Check | A thorough visual examination of components, accessories, subsystems, and piece parts to detect structural failure, deterioration or damage: and to determine the need for corrective action. For example: exterior surfaces, electronic circuit cards, gears, control systems, linkages, accessories, components, tubing, wiring and connections, safety wiring, fasteners, clamps, etc., are inspected to verify proper condition and acceptability for continued service. |
| 220 | Visual/Dimensional | A comparison of the dimensions and material conditions of parts, subassemblies, and assemblies with the specifications contained in technical manuals and/or blueprints, to detect deviations from established standard and limits and determine the acceptability for continued service, repair, or need to discard the item. A visual/dimensional function code is also required to verify that proper corrective maintenance has been accomplished. Although some of these tasks may not require measurements, a complete spectrum of tasks/sub tasks requires a variety of measuring equipment to determine runout, concentricity, flatness, parallelism, hardness, thickness, clarity, dimensions, etc. |
| 230 | Penetrant | Fluorescent penetrant inspection to detect surface cracks. |
| 240 | Magnetic | Magnetic particle inspection to detect surface cracks in magnetic materials. |

**Table INTRO-3. MTOSS Function Code Definitions (Cont)**

| Code | Function | Definition |
|---|---|---|
| 250 | Eddy Current | Inspection for subsurface cracks, porosity, inclusions, or other nonhomogeneous material structure by use of high frequency electromagnetic wave equipment. Parts are scanned and compared to similar parts or test specimens having known material defects. |
| 260 | X-Ray | Inspection for subsurface cracks, porosity, inclusions, or other nonhomogeneous material structure by use of x-ray techniques. |
| 270 | Ultrasonic | Inspection for subsurface cracks, porosity, inclusions, or other nonhomogeneous material structure by use of contact pulse echo ultrasonic techniques. |
| 280 | Special | Any special inspection to determine the integrity of a part for continued operation In-Service or qualitative analysis. |
| 290 | Unassigned | |
| | | |
| 300 | REPAIR | |
| 310 | Welding and Brazing | The joining of pieces by welding (fusion, resistance, spot, electron beam, plasma arc), brazing (furnace, torch, induction), or soldering. This category includes hard facing. |
| 320 | Machining | The process of obtaining a desired shape or finish by grinding, turning, boring, reaming, broaching, milling, drilling, lapping, honing, sizing, polishing, buffing, cutting, forming, stamping, blanking, etc. |
| 330 | Stripping and Plating | Removing or applying a metallic coating on a surface by mechanical, chemical, or electrical means. Plating of chromium, cadmium, tin, etc., to build up the size of a part or provide surface protection. Includes masking or waxing prior to the process. |
| 340 | Plasma and Flame Spraying | The application of a protective coating to a part by feeding a powder into an ionized gas stream. Flame spraying uses a fuel oxygen flame to melt and propel metal onto parts to build up the size or provide surface protection. |

**Table INTRO-3. MTOSS Function Code Definitions (Cont)**

| Code | Function | Definition |
|---|---|---|
| 350 | Miscellaneous Repairs | Repairing parts by hand (cutting, drilling, polishing, grinding, lapping, riveting, blending, routing, fitting, burring, planishing, sanding, sawing, recambering, drilling, tapping, heating, chilling) and including miscellaneous disassembly and assembly required. |
| 360 | Bonding and Molding/Sealing | Joining and curing of parts with an adhesive or fusible material (including silicone, fiberglass, glues). |
| 370 | Heat Treating | Controlled heating and cooling of a material to obtain the desired physical property (includes annealing, tempering, quenching, stress relieving, solution heat treat, etc.). |
| 380 | Surface Treating | Treating the surface of a part by painting, varnishing, aluminizing, Teflon coating, zinc chromate priming, tumble finishing, shot peening, etc. Baking and masking processes are included. |
| 390 | Machine Riveting and Flaring | Joining of parts by riveting and flaring the rivet. |
| | | |
| 400 | INSTALLATION AND ASSEMBLY | |
| 410 | Install | Installation of the unit/engine onto a workstand, transport dolly, test stand, or aircraft. |
| 420 | Install Modular Sections | The third echelon of assembly consisting of assembly of the modular assemblies into a complete unit/engine assembly. The modular sections are identified by the third element of the ATA number. |
| 430 | Assemble Modular Sections | The second echelon of assembly consisting of assembling subassemblies into modular sections. The modular section is identified by the second element of the ATA number. |
| 440 | Assemble Subassemblies | The first echelon of assembly consisting of assembling piece parts into subassemblies. The subassemblies are identified by the third element of the ATA number. |
| 450 | Install/Close Items Removed/Opened for Access | Installation or closing of access plates, closing of ports, installation of components, tubing or any item which was removed or opened in order to provide access to perform the task. |
| 460 | Assemble Accessory | Assemble accessory components. |
| 470 | Assemble Accessory Subassembly | Assembly of accessory subassembly components. |

**Table INTRO-3. MTOSS Function Code Definitions (Cont)**

| Code | Function | Definition |
|---|---|---|
| 480 | Install Test Equipment | Install equipment and instrumentation required for accessory component test. |
| 490 | Assemble Support Equipment | Any assembly required to maintain support equipment. |
| | | |
| 500 | MATERIAL HANDLING | |
| 510 | Shipping | The movement of any part, subassembly, assembly, or component from the time it is packaged until it reaches its destination. |
| 520 | Receiving | The receipt activity for any incoming part, subassembly, assembly, or component. |
| 530 | Packing | Installing parts, subassemblies, assemblies, or components into shipping containers. |
| 540 | Unpacking | Removing parts, subassemblies, assemblies, or components from shipping containers. |
| 550 | Storage | Safekeeping of parts, subassemblies, assemblies, or components until required for use. |
| 560 | Marshaling/Positioning | Marshaling is collection of parts, subassemblies, and accessories prior to release for assembly. Positioning is movement from one fixed state to another. |
| 570 | Engine Ferry/Pod Maintenance | Necessary preparations before and after transporting an engine by aircraft ferry method. |
| 580 | Unassigned | |
| 590 | Unassigned | |
| | | |
| 600 | SERVICING/PRESERVING/LUBRICATING | |
| 610 | Servicing | Action required to sustain a unit or system in proper operating status including priming with applicable fluids prior to use. |
| 620 | Preserving | Preparation of a unit, part, assembly, etc., for safekeeping from decomposition or deterioration. Includes preparation for storage (applying a preservative layer, desiccants, etc.). |
| 630 | Depreserving | Removing preservatives, desiccants, etc., from a unit, part, assembly, etc., prior to installation or operation. |

**Table INTRO-3. MTOSS Function Code Definitions (Cont)**

| Code | Function | Definition |
|---|---|---|
| 640 | Lubricating | Applying oil, grease, dry film, or silicon lubricants on moving parts to reduce friction or cool the item. |
| 650 | Unassigned | |
| 660 | Unassigned | |
| 670 | Unassigned | |
| 680 | Unassigned | |
| 690 | Unassigned | |
| | | |
| 700 | TESTING/CHECKING | |
| 710 | Oil Flow | Measuring the flow of oil through components or compartments under specific conditions. |
| 720 | Air Flow | Measuring the flow of air through components or compartments under specific conditions. |
| 730 | Fuel Flow | Function checks and flow measurements through the part or system being tested. |
| 740 | Water Flow | Function checks and flow measurements through the part or system being tested. |
| 750 | Electrical/Return to Service | Functional tests (manual or ATE) of the system or component as well as measurement of electrical or electronic parameters designed to determine whether the item can be returned to service. May include fault isolation procedures for components that require close correlation between test results and fault indications. |
| 760 | Engine | Operation of an engine to establish systems function or operation under specific conditions to measure performance. |
| 770 | Accessory/Bite | Testing of an accessory to ensure proper operation or function. |
| 780 | Pressure Check | Testing to establish the ability of a normally pressurized component or system to operate properly. |
| 790 | Leak Check | Determine the ability of a component or system to operate without leaking. |
| | | |
| 800 | MISCELLANEOUS | |

**Table INTRO-3. MTOSS Function Code Definitions (Cont)**

| Code | Function | Definition |
|---|---|---|
| 810 | Fault Isolation | Operation of an engine at constant thrust level or identical Engine Pressure Ratio (EPR) to locate the prime suspect deficient system: operating an improperly functioning system or component to locate the cause; or performing a series of checks to isolate a failed part or component. |
| 820 | Adjusting/Aligning/Calibrating | Making a physical correction to ensure proper placement or operation of a system or component. |
| 830 | Rigging | Hooking-up, arranging, or adjusting a component or accessory linkage for proper operation. |
| 840 | Service Bulletin Incorporation | Performing the work specified in the service bulletin. Provides for identification of modification tasks at the task level with subtasks recognizing any functional changes (chemical, visual/ dimensional, cleaning, machining, etc.) necessary to incorporate the service bulletin. |
| 850 | Part Number Change/Re-identification | Change of part number, application of part number by transfer, engrave repair number, etc. |
| 860 | Unassigned | |
| 870 | Description and Operation | Electrical and mechanical description of the unit or component. Includes leading particulars, descriptions, limitations, specifications, and theory of operation. |
| 878 | Schematic and Wiring Diagrams | Schematic diagrams, wiring diagrams, interconnect diagrams and wire lists. |
| 880 | Approved Vendor Processes | Includes processes that may be proprietary and controlled by a particular manufacturer, or by nonproprietary and approved for application by conforming vendors. |
| 890 | Airline Maintenance Program (Customer Use) | |
| 900 | Unassigned | |
| 910 | Special Equipment Maintenance | Identification of tasks to maintain special support equipment. |
| 920 | Standard Equipment Maintenance | Identification of tasks to maintain standard support equipment. |
| 930 | Tool Fabrication | Includes fabricating any tool for which procedures to use are included in the manual. |

**Table INTRO-3. MTOSS Function Code Definitions (Cont)**

| Code | Function | Definition |
|---|---|---|
| 940 | Special Tools, Equip, and Consumables Listing | Listing of all special tools, standard equipment, special equipment, and consumables required to perform maintenance on the unit or component. |
| 94A | Consumables | |
| 94B | Special Tools/Non Std Tools | |
| 94C | Fixtures/Test Equipment | |
| 94D | Standard Tools | |
| 950 | Illustrated Parts List (Detailed Parts List) | Section of IPL/IPC that contains parts description and identification in top-down break down sequence. |
| 960 | Illustrated Parts List (Equipment Designation Index) | Section of IPL/IPC that contains equipment designators cross-referenced to detailed parts list. |
| 970 | Illustrated Parts List (Numerical Index) | Section of IPL/IPC that contains an alphanumeric listing of all parts in the unit cross-referenced to the detailed parts list. |
| 980 | Illustrated Parts List (Alternate Vendor Index) | Optional section of IPL/IPC that contains an alphanumeric listing of all parts in the unit that have more than one vendor source. |
| 990 | Illustrations, Tables, Front Matter, Etc. | |
| 99A | Tables | |
| 99B | Illustrations | |
| 99C | Front Matter Pageblock (TASK Level MTOSS) Front Matter Task (Collection of Subtask MTOSS) | |
| 99D | Access | |
| 99E | References | |
| 99F | General/Introduction | |

**2.** **Customer Support** (TASK 21-20-36-99F-802-A01)

**A.** **Honeywell Aerospace Online Technical Publications Website** (Subtask 21-20-36-99F-008-A01)

(1) Go to the Honeywell Online Technical Publications Website at ( https://aerospace.honeywell.com).

- To download or see publications online
- To order a publication
- To tell Honeywell of a possible data error in a publication.

**B. Honeywell Aerospace Contact Team** (Subtask 21-20-36-99F-009-A01)

(1) If you do not have access to the Honeywell Technical Publications Website, or if you need to speak to personnel about non-Technical Publication matters, the Honeywell Aerospace Contact Team gives 24/7 customer service to Air Transport & Regional, Business & General Aviation, and Defense & Space customers around the globe.

- Telephone: 800-601-3099 (Toll Free U.S.A./Canada)
- Telephone: 602-365-3099 (International).

**3. References** (TASK 21-20-36-99F-803-A01)

**A. Honeywell/Vendor Publications** (Subtask 21-20-36-99F-010-A01)

(1) The publication title, part number, publication number, and type of publications applicable to the unit are shown in Table INTRO-4.

**Table INTRO-4. Applicable Publication List**

| Item No. (IPL Figure 1) | PN | Nomenclature | Publication No. |
|---|---|---|---|
| 405 | 46339-1-1 | Alternating current motor | 21-20-9 |
| 405A (1) | 46339-2 | | |
| 405B (1) | 46366-1 | | 21-20-54 (2) |
| 405C (1) | 46366-2 | | |
| 405D (1) | | | |

**NOTES:**

(1) ITEM NOT ILLUSTRATED.

(2) Alternating Current Motor Publication No. 21-20-54 replaced Publication No. 21-20-13.

(2) Honeywell publications related to the content of this manual are shown in the list that follows:

- ATA No. 20-00-02/70-00-01, SPM, Aircraft Application General.

**B. Other Publications** (Subtask 21-20-36-99F-011-A01)

(1) These publications are standard references. Check for latest version of publication.

- The United States GPO Style Manual (available at http://www.gpo.gov/fdsys/pkg/GPOSTYLEMANUAL- 2008/content-detail.html)
- IEEE Std 260.1, Standard Letter Symbols for Units of Measurement (available from the American National Standards Institute at http://www.ansi.org)
- ASME Y14.38, Abbreviations for Use on Drawings and Related Documents (available from the American National Standards Institute at http://www.ansi.org)
- ASME Y14.5, Dimensioning and Tolerancing (available from the American National Standards Institute at http://www.ansi.org)

- ANSI/IEEE Std 91, Graphic Symbols for Logic Functions (available from the American National Standards Institute at http://www.ansi.org)
- CAGE codes and manufacturer's addresses are available at https://cage.dla.mil.

**4.** **Acronyms and Abbreviations** (TASK 21-20-36-99F-804-A01)

**A.** **General** (Subtask 21-20-36-99F-012-A01)

(1) The abbreviations are used in agreement with ASME Y14.38.

(2) Acronyms and non-standard abbreviations used in this publication are as follows:

**Table INTRO-5. List of Acronyms and Abbreviations**

| Term | Full Term |
|---|---|
| AC | Alternating Current |
| AN | Army - Navy |
| ASME | American Society of Mechanical Engineers |
| ATA | Air Transport Association |
| AWG | American Wire Gage |
| CAGE | Commercial and Government Entity |
| CMM | Component Maintenance Manual |
| CRES | Corrosion Resistant Steel |
| DC | Direct Current |
| DPL | Detailed Parts List |
| EDI | Equipment Designator Index |
| EIA | Electronic Industries Association |
| FAA | Federal Aviation Administration |
| GPO | Government Publishing Office |
| ID | Inside Diameter |
| IEC | International Electrotechnical Commission |
| IEEE | Institute of Electrical and Electronics Engineers |
| IPC | Illustrated Parts Catalog |
| IPL | Illustrated Parts List |
| LRU | Line Replaceable Unit |
| MS | Miltary Standard |
| MTOSS | Maintenance Task Oriented Support System |
| NAS | National Aerospace Standards |
| NHA | Next Higher Assembly |
| Nm | Newton Meter |
| No. | number |

**Table INTRO-5. List of Acronyms and Abbreviations (Cont)**

| Term | Full Term |
|---|---|
| PN | part number |
| Pub | Publication |
| RAM | Random Access Memory |
| SB | service bulletin |
| SI | International System of Units |
| USMS | United States Measurement System |
| VAC | Volts Alternating Current |
| VDC | Volts Direct Current |
| in | Inches |
| lb | Pound |

**5.** **Process Verification** (TASK 21-20-36-99F-805-A01)

**A.** **Verification Data** (Subtask 21-20-36-99F-013-A01)

(1) Honeywell does a verification of these technical instructions by performance or by simulation of the necessary procedures. Performance shows that the procedures were checked by the use of the manual. Simulation shows that the applicable personnel looked at the procedure in the manual and that the procedure is technically correct. The dates of verification for this manual are given in Table INTRO-6.

**Table INTRO-6. Verification Data**

| Section | Method | Date |
|---|---|---|
| Testing and Fault Isolation | Performance | 16 Jun 2004 |
| Disassembly | Performance | 16 Jun 2004 |
| Assembly | Performance | 16 Jun 2004 |
| Engineering Technical Review | N/A | 10 Jul 2018 |

**6.** **Software History** (TASK 21-20-36-99F-806-A01)

**A.** **Software Data** (Subtask 21-20-36-99F-014-A01)

(1) Not applicable.

**7.** **History of Changes** (TASK 21-20-36-99F-807-A01)

**A.** **Modification/Configuration History** (Subtask 21-20-36-99F-015-A01)

(1) Not applicable.

**B.** **Change History for Parts List** (Subtask 21-20-36-99F-016-A01)

(1) Not applicable.

**8.** **Service Information Documents** (TASK 21-20-36-99F-808-A01)

**A.** **Applicable Service Information Documents** (Subtask 21-20-36-99F-017-A01)

(1) Refer to Table INTRO-7 for other applicable service information documents not listed in the Service Bulletin List.

**Table INTRO-7. Applicable Service Information**

| Document Type | Document Number/ Revision Number | Title | Date Put In Manual |
|---|---|---|---|
| Not applicable | Not applicable | Not applicable | Not applicable |

# DESCRIPTION AND OPERATION

1. **Description** (TASK 21-20-36-870-801-A01)

   A. **General** (Subtask 21-20-36-870-001-A01)

      (1) This section contains a description of the ram air modulation linear electromechanical actuator.

      (2) Refer to Table 1 for the leading particulars.

**Table 1. Leading Particulars**

| Characteristic | Specification |
|---|---|
| Operating voltage | 115 VAC, 400 Hz, single-phase |
| Operating current (at rated load) | 0.8 amp (maximum) |
| Ambient operating temperature range | -65 to 160°F (-53.9 to 71.1°C) |
| Operating load | |
| Rated load | 160 pounds (72.57 kg) |
| Maximum load | 200 pounds (90.72 kg) |
| Performance requirements | |
| Actuator PN 541674-1-1 | |
| Duty cycle | 1 minute on, 2 minutes off |
| Travel time (at rated load) | 16.5 seconds (maximum) |
| Extend limit switch setting(1) | 11.13 to 11.19 inches (282.70 to 284.23 mm) |
| Retract limit switch setting(1) | 8.30 to 8.39 inches (210.82 to 213.11 mm) |
| M1 switch setting(2) | 0.70 to 0.785 inches (17.780 to 19.939 mm) |
| M2 Switch Setting(2) | 0.815 to 0.90 inches (20.701 to 22.860 mm) |
| Mechanical travel(1) | 2.89 inches (73.406 mm) (minimum) |
| Electrical travel(1) | 2.80 to 2.83 inches (71.12 to 71.88 mm) from extend limit switch setting |
| Retracted mechanical stop | 0.03 inch (0.762 mm) (minimum) from retract limit switch setting |
| Extended mechanical stop | 0.01 to 0.03 inches (0.254 to 0.762 mm) from extend limit switch setting |
| Actuator PN 541674-3 | |
| Duty cycle | 1 minute on, 2 minutes off |
| Travel time (at rated load) | 15 seconds (maximum) |
| Extend limit switch setting(1) | 10.83 to 10.89 inches (275.08 to 276.61 mm) |
| Retract limit switch setting(2) | 8.30 to 8.39 inches (210.82 to 213.11 mm) |

**Table 1. Leading Particulars (Cont)**

| Characteristic | Specification |
|---|---|
| M1 switch setting(1) | 0.70 to 0.785 inches (17.780 to 19.939 mm) |
| M2 switch setting(2) | 0.815 to 0.90 inches (20.701 to 22.860 mm) |
| Mechanical travel(1) | 2.59 inches (65.79 mm) (minimum) |
| Electrical travel(1) | 2.50 to 2.53 inches (63.500 to 64.262 mm) from extend limit switch setting |
| Retracted mechanical stop | 0.03 inch (0.762 mm) (minimum) from retract limit switch setting |
| Extended mechanical stop | 0.03 inch (0.762 mm) (minimum) from extend limit switch setting |
| Actuator PN 541674-4 | |
| Duty cycle | Continuous stall |
| Travel time (at rated load) | 15 seconds (maximum) |
| Extend limit switch setting(1) | 10.83 to 10.89 inches (275.08 to 276.61 mm) |
| Retract limit switch setting(1) | 8.30 to 8.39 inches (210.82 to 213.11 mm) |
| M1 switch setting(2) | 0.70 to 0.785 inches (17.780 to 19.939 mm) |
| M2 switch setting(2) | 0.815 to 0.90 inches (20.701 to 22.860 mm) |
| Mechanical travel(1) | 2.59 inches (65.79 mm) (minimum) |
| Electrical travel(1) | 2.50 to 2.53 inches (63.500 to 64.262 mm) from extend limit switch setting |
| Retracted mechanical stop | 0.03 inch (0.762 mm) (minimum) from retract limit switch setting |
| Extended mechanical stop | 0.03 inch (0.762 mm) (minimum) from extend limit switch setting |
| Actuator PN 541674-5 | |
| Duty cycle | 1 minute on, 2 minutes off |
| Travel time (at rated load) | 12.7 seconds (maximum) |
| Extend limit switch setting(1) | 10.46 to 10.52 inches (265.68 to 267.21 mm) |
| Retract limit switch setting(1) | 8.30 to 8.39 inches (210.82 to 213.11 mm) |
| M1 switch setting(2) | 0.70 to 0.785 inches (17.780 to 19.939 mm) |
| M2 switch setting(2) | 0.815 to 0.90 inches (20.701 to 22.860 mm) |
| Mechanical travel(1) | 2.59 inches (65.79 mm) (minimum) |
| Electrical travel(1) | 2.13 to 2.16 inches (54.10 to 54.86 mm) from extend limit switch setting |

**Table 1. Leading Particulars (Cont)**

| Characteristic | Specification |
|---|---|
| Retracted mechanical stop | 0.03 inch (0.762 mm) (minimum) from retract limit switch setting |
| Extended mechanical stop | 0.40 inch (10.16 mm) (minimum) from extend limit switch setting |
| Actuator PN 541674-6 | |
| Duty cycle | Continuous stall |
| Travel time (at rated load) | 12.7 seconds (maximum) |
| Extend limit switch setting(1) | 10.46 to 10.52 inches (265.68 to 267.21 mm) |
| Retract limit switch setting(1) | 8.30 to 8.39 inches (210.82 to 213.11 mm) |
| M1 switch setting(2) | 0.70 to 0.785 inches (17.780 to 19.939 mm) |
| M2 switch setting(2) | 0.815 to 0.90 inches (20.701 to 22.860 mm) |
| Mechanical travel(1) | 2.59 inches (65.79 mm) (minimum) |
| Electrical travel(1) | 2.13 to 2.16 inches (54.10 to 54.86 mm) from extend limit switch setting |
| Retracted mechanical stop | 0.03 inch (0.762 mm) (minimum) from retract limit switch setting |
| Extended mechanical stop | 0.40 inch (10.16 mm) (minimum) from extend limit switch setting |
| Electrical connections | |
| Pin 1 | Retract limit switch |
| Pin 2 thru 5 | M1 switch |
| Pin 6 thru 9 | M2 switch |
| Pin 10 | Extend limit switch |
| Pin 11 | Motor common |
| Pin 12 | Not used |
| Weight: | 2.6 pounds (1.18 kg) (approx) |

**NOTES:**

(1) Measured from centerline of each mounting eye.

(2) Measured from retract limit switch setting.

(3) Refer to Figure 1 for ram air modulation linear electromechanical actuator.

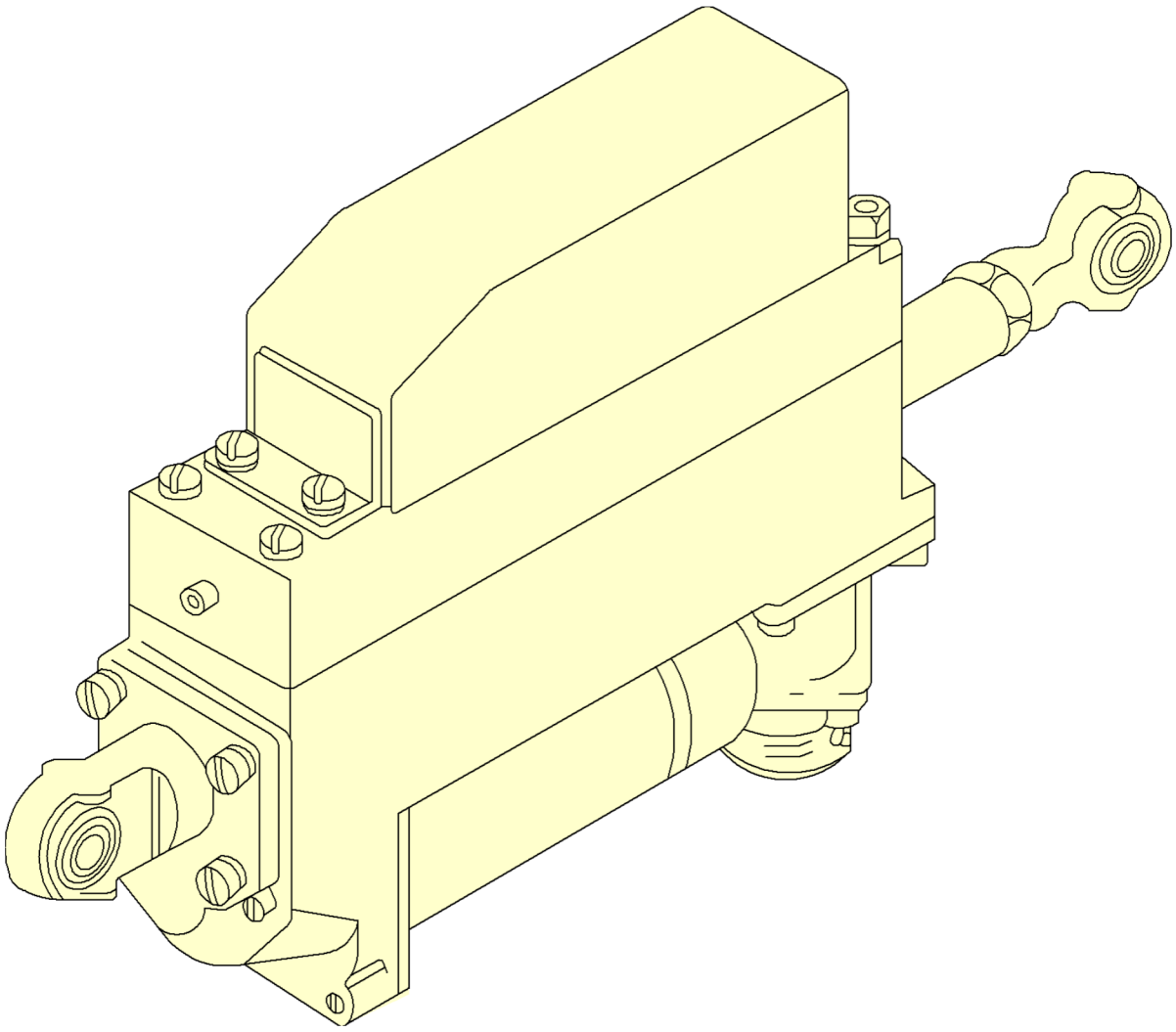

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**Figure 1. Ram Air Modulation Linear Electromechanical Actuator**

**B.** **Applicable Publications** (Subtask 21-20-36-99C-001-A01)

(1) The list that follows identifies Honeywell publications that are related to this section:

- Not Applicable.

**C.** **Ram Air Modulation Linear Electromechanical Actuator** (Subtask 21-20-36-870-002-A01)

(1) The ram air modulation linear electromechanical actuator has a motor, a gear train, a capacitor-filter assembly, a nut assembly, two end fittings, four internal switches with associated cams housed in a switch, and gear housing. Refer to Figure 1.

**2.** **Operation** (TASK 21-20-36-870-802-A01)

**A.** **Ram Air Modulation Linear Electromechanical Actuator** (Subtask 21-20-36-870-003-A01)

(1) The ram air modulation linear electromechanical actuator operates an aircraft component by converting electrical energy into controlled, reversible linear movement.

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# TESTING AND FAULT ISOLATION

1. **Planning Data** (TASK 21-20-36-99C-801-A01)

   A. **Reason for the Job** (Subtask 21-20-36-99C-002-A01)

      (1) Use the test procedures in this section to test and isolate faults.

      (2) The function of the test procedures is to find if there is a failure in the operation of the LRU.

   B. **Job Setup Data** (Subtask 21-20-36-99C-003-A01)

      (1) You can use equivalent alternatives for the special tools, fixtures, equipment, and consumable materials unless specified differently. The user must find equivalent alternatives.

      (2) Refer to Table 1001 for the special tools, fixtures, and equipment in this section.

      (3) CAGE codes and manufacturer's addresses are available at https://cage.dla.mil.

**Table 1001. Special Tools, Fixtures, and Equipment**

| Number | Description | Source |
|---|---|---|
| 2025587-1 | Linear actuator interface test box<br>(Mates to 834380-3, -4 and actuator connector per MS24266R12B12SN) | CAGE: 06848 |
| 834380-3 | Linear actuator test stand | CAGE: 06848 |
| 834380-4 | Linear actuator test stand | CAGE: 06848 |
| 4300B | Bonding resistance meter | CAGE: 53504 |
| 5250SL-3-11 | AC power supply | CAGE: 25965 |
| 8840A | Digital multimeter | CAGE: 89536 |
| Model S-10 | Timer | CAGE: 56631 |
| Weston Model 433/2916007 | AC ammeter | CAGE: 32590 |

**NOTE :** 834380-3, -4 linear actuator test stand replaces both 912986-2-1 actuator load test set and 257916-1 electrical power test set.

**WARNING: BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

(4) Refer to Table 1002 for the consumable materials in this section.

**Table 1002. Consumables**

| Number | Description | Source |
|---|---|---|
| NASM33540 | Lockwire | Commercially available |

(5) The list that follows identifies Honeywell publications that are related to this section:

- Not applicable.

**2.** **Procedure** (TASK 21-20-36-810-801-A01)

**A.** **Job Setup** (Subtask 21-20-36-810-001-A01)

**WARNING:** **BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

CAUTION: DO NOT HIT OR LET THE LRU FALL DURING THESE PROCEDURES. THE LRU CONTAINS AN ASSEMBLY THAT CAN BE DAMAGED FROM INCORRECT USE.

CAUTION: DO THESE PROCEDURES IN A CLEAN ENVIRONMENT TO PREVENT DAMAGE TO THE MECHANICAL COMPONENTS.

(1) Obey the precautions.

CAUTION: TO PREVENT DAMAGE TO THE RAM AIR MODULATION LINEAR ELECTROMECHANICAL ACTUATOR, DO NOT OPERATE THE RAM AIR MODULATION LINEAR ELECTROMECHANICAL ACTUATOR BEYOND THE DUTY CYCLE SPECIFIED IN TABLE 1.

(2) Do the tests at laboratory ambient conditions unless specified differently in the test descriptions.

(3) The tests must be done in the following sequence:

(a) Bonding resistance test.

(b) No load requirements tests.

(c) Rated load requirements tests.

**B.** **Testing the Bonding Resistance** (Subtask 21-20-36-810-002-A01)

(1) Refer to Figure 1001 for the bonding resistance test.

(2) Use a 4300B bonding resistance meter to measure the bonding resistance. Make sure to penetrate the paint at all test points.

(3) Measure the bonding resistance between the ground tab test point, TP1, and the motor test point, TP2. The resistance must not be more than 0.016 ohm.

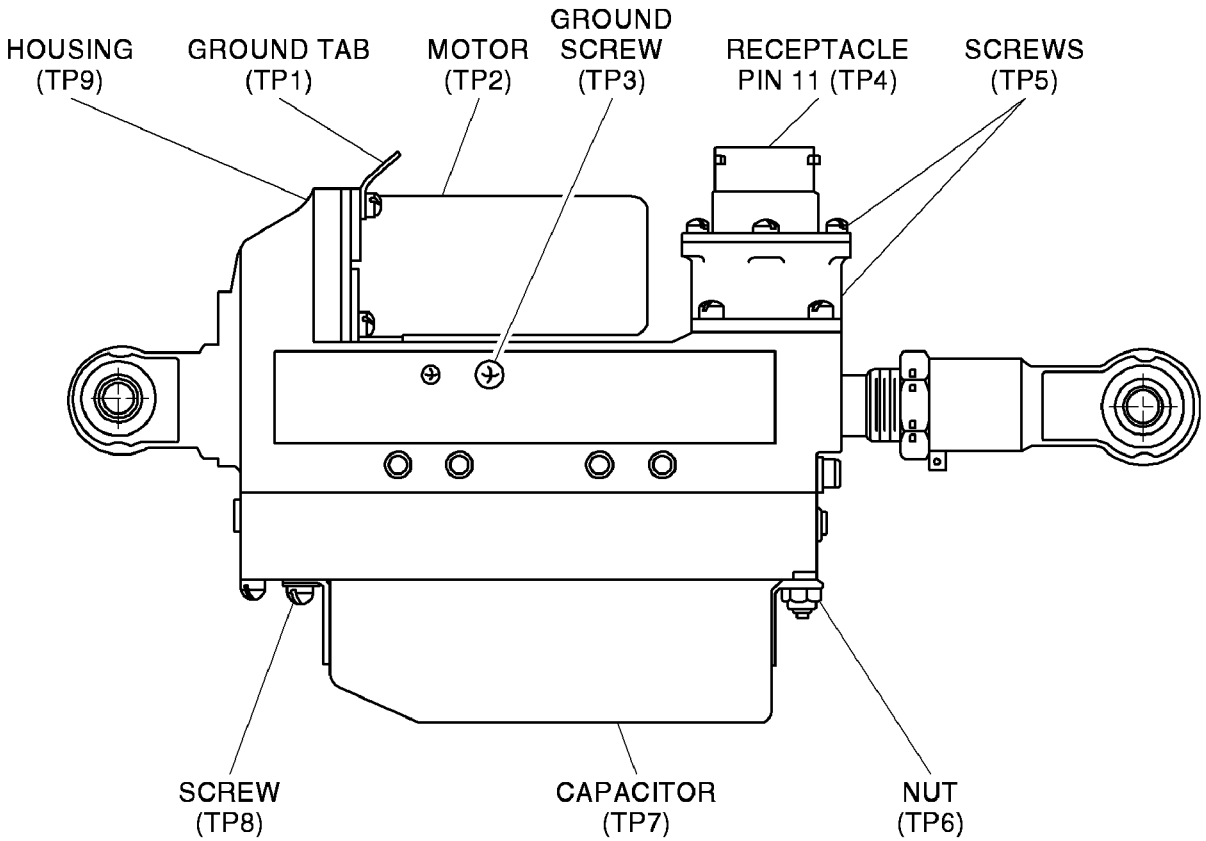


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**Figure 1001. Bonding Resistance Test Points**

(4) Measure the bonding resistance between the ground tab test point, TP1, and each separate test point, TP3, TP4 (receptacle Pin 11), TP5, TP6, TP7, TP8 and TP9. The resistance must not be more than 0.016 ohm for each test point.

**C. Rated Load Requirement and No-Load Requirement Test Setup** (Subtask 21-20-36-810-003-A01)

CAUTION: END FITTINGS MUST BE RESTRAINED DURING OPERATION TO PREVENT DAMAGE TO THE ANTI-ROTATION DEVICE.

(1) Install the ram air modulation linear electromechanical actuator in the 834380-3 linear actuator test stand or 834380-4 linear actuator test stand. Refer to Figure 1002. Make sure the actuator end fittings (289, 335) are restrained from rotating. Refer to Figure 2001 for the ram air modulation linear electromechanical actuator schematic diagram.

(2) Use 2025587-1 linear actuator interface test box to connect the ram air modulation linear electromechanical actuator electrical connector to the 834380-3 linear actuator test stand or 834380-4 linear actuator test stand per MS24266R12B12SN.

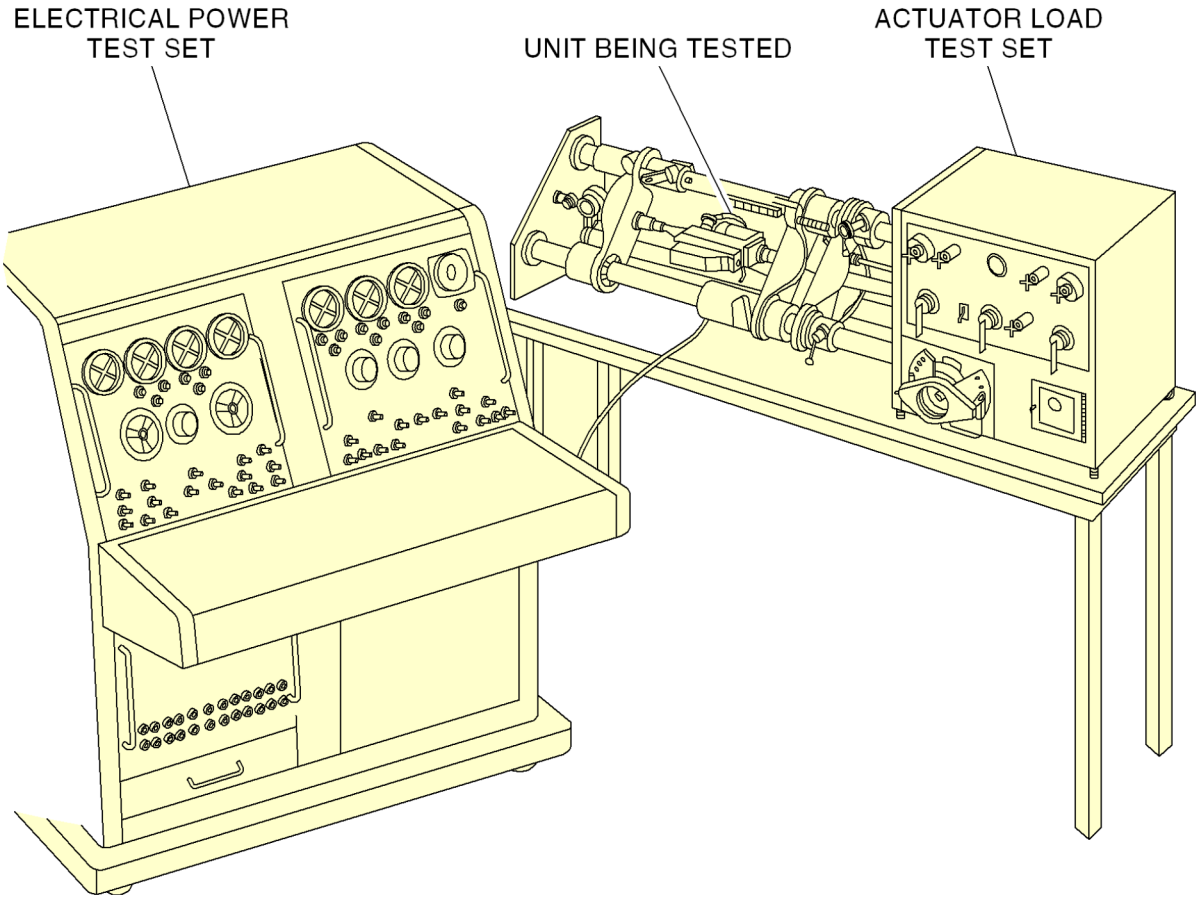


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**Figure 1002. Ram Air Modulation Linear Electromechanical Actuator Test Setup**

**D. Testing at Rated Load Conditions** (Subtask 21-20-36-810-004-A01)

(1) Refer to Paragraph 2.C for the test setup.

(2) Operate the ram air modulation linear electromechanical actuator at 114.5 to 115.5 VAC for one complete cycle with a rated opposing, tension, or compression load of 160 to 170 pounds (72.57 to 77.11 kg).

(3) (541674-1-1) Stroke length must be 2.80 to 2.83 inches (71.120 to 71.882 mm). Stroke time must be 8.0 to 15.0 seconds.

**NOTE:** The minimum stroke length does not include overcoast.

(4) (541674-3 and -4) Stroke length must be 2.50 to 2.53 inches (63.500 to 64.262 mm). Stroke time must be 8.0 to 15.0 seconds.

**NOTE:** The minimum stroke length does not include overcoast.

(5) (541674-5 and -6) Stroke length must be 2.13 to 2.16 inches (54.102 to 54.864 mm). Stroke time must be 6.8 to 12.7 seconds.

**NOTE:** The minimum stroke length does not include overcoast.

(6) Current must not be more than 0.80 amp.

(7) Make a record of the stroke time, stroke length, and maximum current.

**E. Testing at Maximum Load Conditions** (Subtask 21-20-36-810-005-A01)

(1) Refer to Paragraph 2.C for the test setup.

(2) Operate the ram air modulation linear electromechanical actuator at 114.5 to 115.5 VAC for one complete cycle with a rated opposing, tension, or compression load of 200 to 210 pounds (90. 7185 to 95.2544 kg).

(3) Make sure the ram air modulation linear electromechanical actuator will operate one full cycle.

(4) Do the operation at rated load conditions test again to make sure there has been no degradation due to the operation at maximum load conditions test. Refer to Paragraph 2.D.

**F. Testing Mechanical Stroke at No Load Conditions** (Subtask 21-20-36-810-006-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Make sure the actuator end fitting assembly (335) is centered approximately on the threads of the nut assembly (380) and has ±0.25 inch (6.35 mm) of adjustment. Make a record on the applicable data sheet.

(3) Disable or bypass the extend and retract limit switches.

**NOTE:** The switches can be disabled by maximizing the separation of the switches using the two adjusting screws. Bypass can be done by removing the capacitor filter assembly (25) and connecting the facility power panel to the A (retract) and B (extend) terminals on the capacitor filter assembly (25).

(4) With no load applied to the ram air modulation linear electromechanical actuator, apply approximately 45 VAC in short pulses to prevent over travel, so the ram air modulation linear electromechanical actuator returns to the retract position mechanical stop.

(5) Zero the dial indicator.

(6) With no load applied to the ram air modulation linear electromechanical actuator, apply approximately 45 VAC in short pulses to prevent over travel, so the ram air modulation linear electromechanical actuator goes to the extend position mechanical stop.

(7) If the dial indicator reading is less than 2.590 inches (65.786 mm) or more than 2.625 inches (66.675 mm), the ram air modulation linear electromechanical actuator must be disassembled and reassembled. Make a record of the actual mechanical stroke on the applicable data sheet.

(8) With the ram air modulation linear electromechanical actuator at the mechanical extend, set the actuator end fitting assembly (335) at 10.900 to 10.920 inches (276.86 to 277.368 mm). Use the nut (345) to secure the actuator end fitting assembly (335). Secure the nut (345) and washer (340) in final assembly using NASM33540 lockwire. Make a record on the applicable data sheet.

(9) Adjust the extend limit switch by turning the adjustment screw at least five turns counterclockwise.

(10) Retract the ram air modulation linear electromechanical actuator approximately 1.0 inch (25.4 mm).

(11) Pulse the ram air modulation linear electromechanical actuator towards the extend direction until the switch opens. The ram air modulation linear electromechanical actuator will stop.

(12) Set the extend switch at the following dimension. Make a record on the applicable data sheet.

- (541674-1-1) 11.130 to 11.190 inches (282.702 to 284.226 mm)
- (541674-3 and -4) 10.830 to 10.890 inches (275.082 to 276.606 mm)
- (541674-5 and -6) 10.460 to 10.520 inches (265.684 to 267.208 mm).

(13) Subtract the ram air modulation linear electromechanical actuator extend switch setting from the mechanical extend setting as previously recorded on the data sheet. The difference must be as follows:

- (541674-1-1) 0.210 to 0.290 inches (5.334 to 7.366 mm)
- (541674-3 and -4) 0.030 to 0.050 inches (0.762 to 1.27 mm)
- (541674-5 and -6) 0.40 to 0.50 inches (10.16 to 12.7 mm).

**G. Testing Electrical Stroke Calibration at No Load Conditions** (Subtask 21-20-36-810-007-A01)

(1) Adjust the retract limit switch by turning the adjustment screw at least five turns clockwise.

(2) Retract the ram air modulation linear electromechanical actuator to the electrical travel requirements shown in Table 1003. Adjust the switch in or out until the switch opens at this distance when the ram air modulation linear electromechanical actuator is slowly pulsed into the switch.

**Table 1003. Ram Air Modulation Linear Electromechanical Actuator Stroke Requirements**

| Actuator PN | Retracted Length Inches (mm) | Extended Length Inches (mm) | Electrical Travel Inches (mm) |
|---|---|---|---|
| 541674-1-1 | 8.30 to 8.39<br>(210.820 to 213.106) | 11.13 to 11.19<br>(282.702 to 284.226) | 2.80 to 2.83<br>(71.120 to 71.882) |
| 541674-3 Series 1<br>541674-3 Series 2<br>541674-4 Series 1<br>541674-4 Series 2<br>541674-4 Series 3<br>541674-4 Series 4 | 8.30 to 8.39<br>(210.820 to 213.106) | 10.83 to 10.89<br>(275.082 to 276.606) | 2.50 to 2.53<br>(63.500 to 64.262) |
| 541674-5 Series 1<br>541674-5 Series 2<br>541674-6 Series 1 | 8.30 to 8.39<br>(210.820 to 213.106) | 10.46 to 10.52<br>(265.684 to 267.208) | 2.13 to 2.16<br>(54.102 to 54.864) |

**H. Testing M1 Limit Switch Actuation at No Load Conditions** (Subtask 21-20-36-810-008-A01)

(1) While you operate the ram air modulation linear electromechanical actuator from the full electrical retract 0.000 inch (0 mm) position to somewhere between 0.700 to 0.785 inches (17.780 to 19.939 mm), pulse AC volts slowly into the M1 switch.

(2) Use a 8840A digital multimeter to do a check for continuity between connector Pins 2 and 3, and between Pins 5 and 10.

(3) There must be continuity until Pins 2 and 3 switch to open (discontinuity). Make a record of the actual point of discontinuity of Pins 2 and 3.

(4) (541674-4 and -6) At the point of switch transfer, Pins 3 and 4 must have continuity before Pins 5 and 10 have discontinuity or transfer at the same time.

(5) Pins 3 and 4 must stay closed (continuity) and Pins 5 and 10 must stay open (discontinuity) during travel from a position that is less than the 0.785 inch (19.939 mm) from the 0.000 inch (0 mm) position to the full extend position.

**I. Testing M2 Limit Switch Actuation at No Load Conditions** (Subtask 21-20-36-810-009-A01)

(1) Intermittently operate the ram air modulation linear electromechanical actuator from the full electrical extend position toward the retract position, to somewhere between 0.815 to 0.900 inches (20.701 to 22.860 mm) stroke (from the 0.000 inch (0 mm) position).

(2) (54167 4-4 and -6) At the point of switch transfer, connector Pins 7 and 8 must have continuity before Pins 1 and 6 have discontinuity or transfer at the same time.

(3) Pins 7 and 8 must have continuity {close) and Pins 1 and 6 must have discontinuity (open) at a position of more than a 0.815 inch (20.701 mm) stroke during travel from the 0.000 inch (0 mm) position to full retract.

**J. Testing M1 and M2 Switch Overtravel at No Load Conditions** (Subtask 21-20-36-810-010-A01)

(1) Operate the ram air modulation linear electromechanical actuator full on from full retract into the M1 switch. Make sure that M2 does not trip. Pins 7 and 8 must have continuity.

(2) Operate the ram air modulation linear electromechanical actuator full on from full extend into the M2 switch. Make sure that M1 does not trip. Pins 3 and 4 must have continuity.

**K. Test Stroke with Capacitor Installed** (Subtask 21-20-36-810-011-A01)

(1) With no load on the actuator and capacitor-filter (25) installed on to the unit, run the actuator until full stroke and then run to full retract two times to make sure that the capacitor does not short out against the housing.

**L. Fault Isolation of Ram Air Modulation Linear Electromechanical Actuator** (Subtask 21-20-36-810-012-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Do fault isolation (diagnostics) on the ram air modulation linear electromechanical actuator, 541674, as a part of the test procedure.

(3) Refer to Table 1004 for fault isolation information.

**Table 1004. Fault Isolation**

| Trouble | Probable Cause | Correction |
|---|---|---|
| Ram air modulation linear electromechanical actuator does not operate. | Loose connection or open circuit in electrical system | Tighten connections and repair or replace wiring. |
| | Actuator wired incorrectly | Correct wiring. |
| | Motor damaged | Replace damaged motor. Refer to DISASSEMBLY and ASSEMBLY. |
| | Switch assembly damaged | Replace switch assembly. Refer to DISASSEMBLY and ASSEMBLY. |
| | Gear train does not move freely | Correct the gear tolerances. Refer to ASSEMBLY. |
| | Sleeving/wiring is chafed. | Replace wiring and sleeving. Refer to ASSEMBLY. |
| Ram air modulation linear electromechanical actuator fails to meet linear stroke requirements. | Cams installed incorrectly | Reinstall cams and readjust actuator. Refer to DISASSEMBLY and ASSEMBLY. |
| | Limit switches incorrectly set | Reset limit switch and readjust actuator. Refer to DISASSEMBLY and ASSEMBLY. |
| Ram air modulation linear electromechanical actuator does not extend or retract to the necessary length. | Switch assembly adjustment incorrect | Adjust the switch assembly. Refer to ASSEMBLY. |
| | Gear train does not move freely | Correct the gear tolerances. Refer to ASSEMBLY. |

**Table 1004. Fault Isolation (Cont)**

| Trouble | Probable Cause | Correction |
|---|---|---|
| Ram air modulation linear electromechanical actuator does not shut off. | Switch assembly installed incorrectly | Disassemble the actuator and install switch assembly correctly. Refer to DISASSEMBLY and ASSEMBLY. |
| | Switch assembly damaged | Replace damaged switch. Recalibrate switch. Refer to ASSEMBLY. |
| | Broken follow-up nut (370) | Disassemble actuator and replace follow-up nut. Refer to DISASSEMBLY and ASSEMBLY. |
| Ram air modulation linear electromechanical actuator is more than the maximum travel time with correspondingly high current. | Motor damaged | Replace motor. Refer to ASSEMBLY. |
| | Gears do not move freely | Disassemble and replace damaged parts. Refer to ASSEMBLY. |
| | Bent jackscrew assembly or nut assembly | Disassemble and replace damaged parts. Refer to DISASSEMBLY and ASSEMBLY. |
| Ram air modulation linear electromechanical actuator will not operate under rated-load conditions. | Gear train does not move freely | Disassemble and repair. Refer to ASSEMBLY. |
| | Shaft endplay incorrect | Adjust end play. Refer to ASSEMBLY. |
| Continuity between the connector Pins 2 and 3, 5 and 10, or 3 and 4 do not agree with the test requirements. | Intermediate switch M1 out of adjustment or damaged | Readjust or replace switch. Refer to ASSEMBLY. |
| | Switch operating arm (105) or switch cam (107, 107A) out of adjustment or damaged | Readjust or replace switch. Refer to ASSEMBLY. |
| Continuity between the connector Pins 8 and 9, 1 and 6, or 7 and 8 do not agree with the test requirements. | Intermediate switch M1 out of adjustment or damaged | Readjust or replace switch. Refer to ASSEMBLY. |
| | Switch operating arm ( 100) or switch cam (107, 107B) out of adjustment or damaged | Readjust or replace switch. Refer to ASSEMBLY. |

**M. Job Close-up** (Subtask 21-20-36-810-013-A01)

(1) Remove all tools, equipment, used parts, and materials from the work area.

# SCHEMATIC AND WIRING DIAGRAMS

**1.** **Planning Data** (TASK 21-20-36-99C-802-A01)

**A.** **Reason for the Job** (Subtask 21-20-36-99C-004-A01)

(1) This section gives schematic and wiring diagrams for the LRU.

(2) Use these diagrams as an aid to fault isolate the LRU.

**B.** **Job Setup Data** (Subtask 21-20-36-99C-005-A01)

(1) You can use equivalent alternatives for the special tools, fixtures, equipment, and consumable materials unless specified differently. The user must find equivalent alternatives.

(2) Refer to Table 2001 for the special tools, fixtures, and equipment in this section.

(3) CAGE codes and manufacturer's addresses are available at https://cage.dla.mil.

**Table 2001. Special Tools, Fixtures, and Equipment**

| Number | Description | Source |
|---|---|---|
| Not applicable | Not applicable | Not applicable |

**WARNING:** **BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

(4) Refer to Table 2002 for the consumable materials in this section.

**Table 2002. Consumables**

| Number | Description | Source |
|---|---|---|
| Not applicable | Not applicable | Not applicable |

(5) The list that follows identifies Honeywell publications that are related to this section:

- Not applicable.

**2.** **Schematic and Wiring Diagrams** (TASK 21-20-36-878-801-A01)

**A.** **Schematic Diagrams** (Subtask 21-20-36-878-001-A01)

(1) The schematic diagrams for the ram air modulation linear electromechanical actuator are given in Figure 2001.

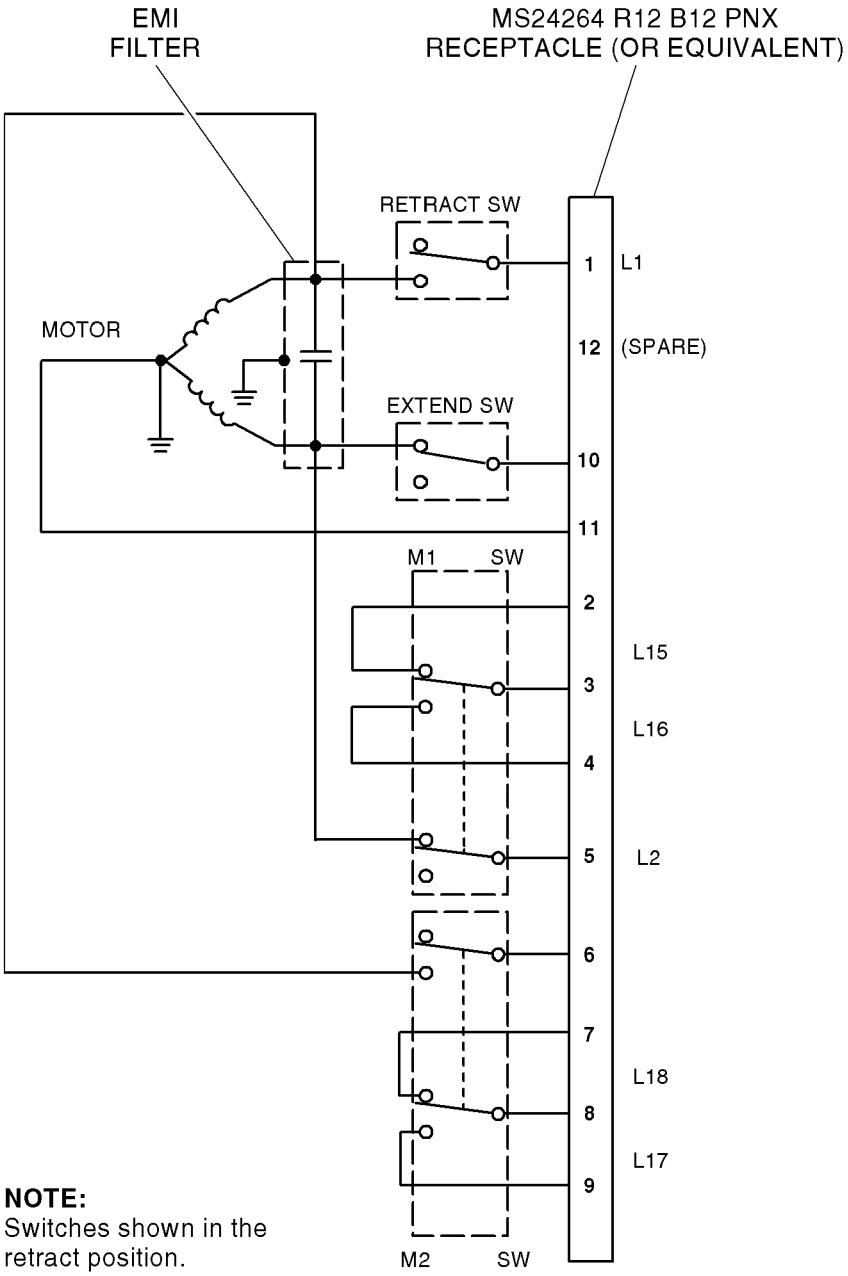
(2) Table 2003 shows the schematic diagrams in this section.

**Table 2003. Schematic Diagrams**

| Nomenclature | Figure Number |
|---|---|
| Ram Air Modulation Linear Electromechanical Actuator Schematic Diagram | Figure 2001 |

**Table 2004. Revision Reference Sheet for Figure 2001**

| Sheet Number/Grid Location | Revision Description | Effectivity |
|---|---|---|
| | | |




ICN-70210-0000283151-002-01

**Figure 2001. Ram Air Modulation Linear Electromechanical Actuator Schematic Diagram**

**B. Wiring Diagram** (Subtask 21-20-36-878-002-A01)

(1) The wiring diagrams for the ram air modulation linear electromechanical actuator are given in Figure 2002 and Figure 2003.

(2) Table 2005 shows the wiring diagrams in this section.

**Table 2005. Wiring Diagrams**

| Nomenclature | PN | Figure Number |
|---|---|---|
| Ram Air Modulation Linear Electromechanical Actuator Wiring Diagram | 26-804 | Figure 2002 |
| | 26-830070 or 2748045-1 | Figure 2003 |

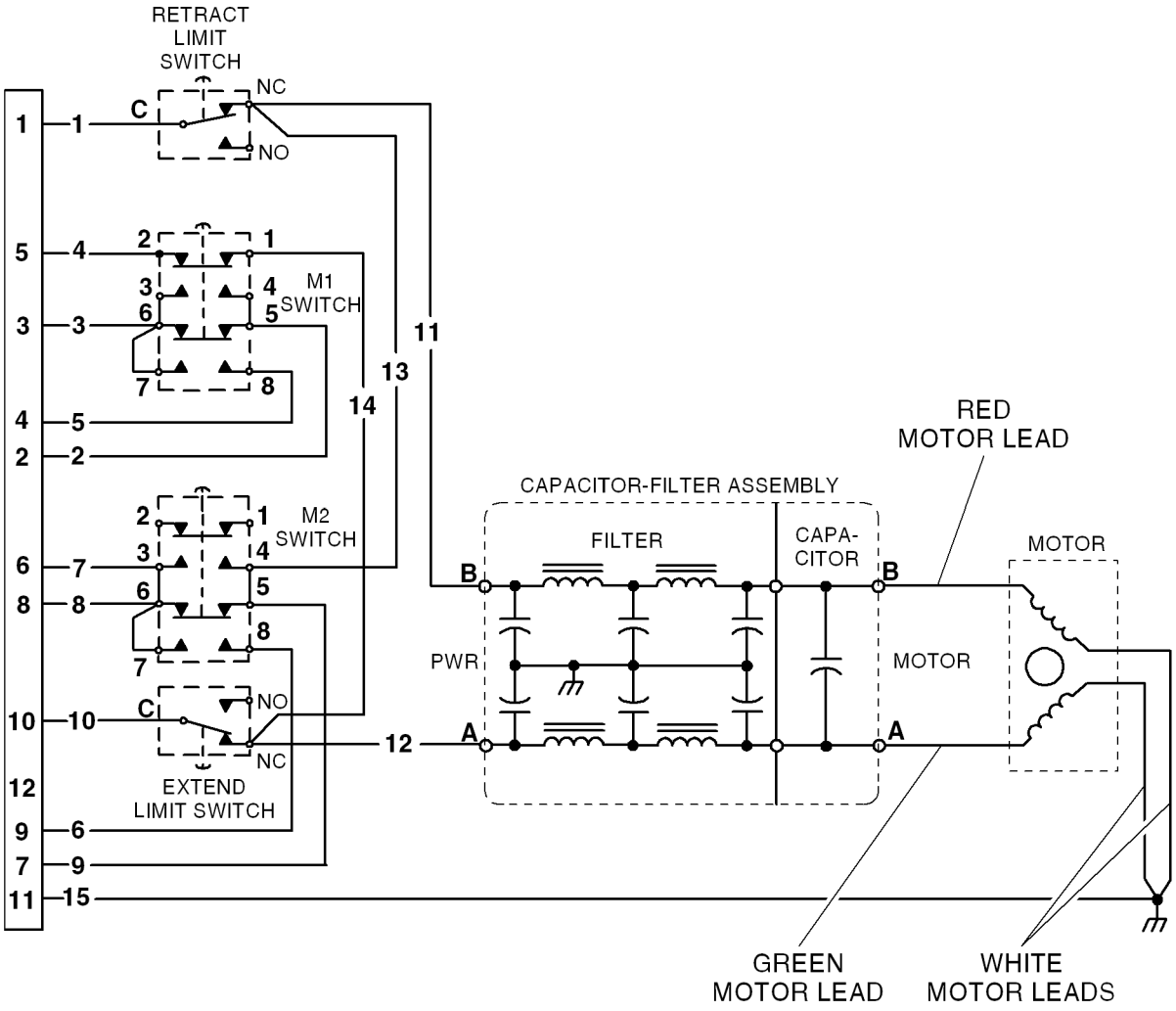
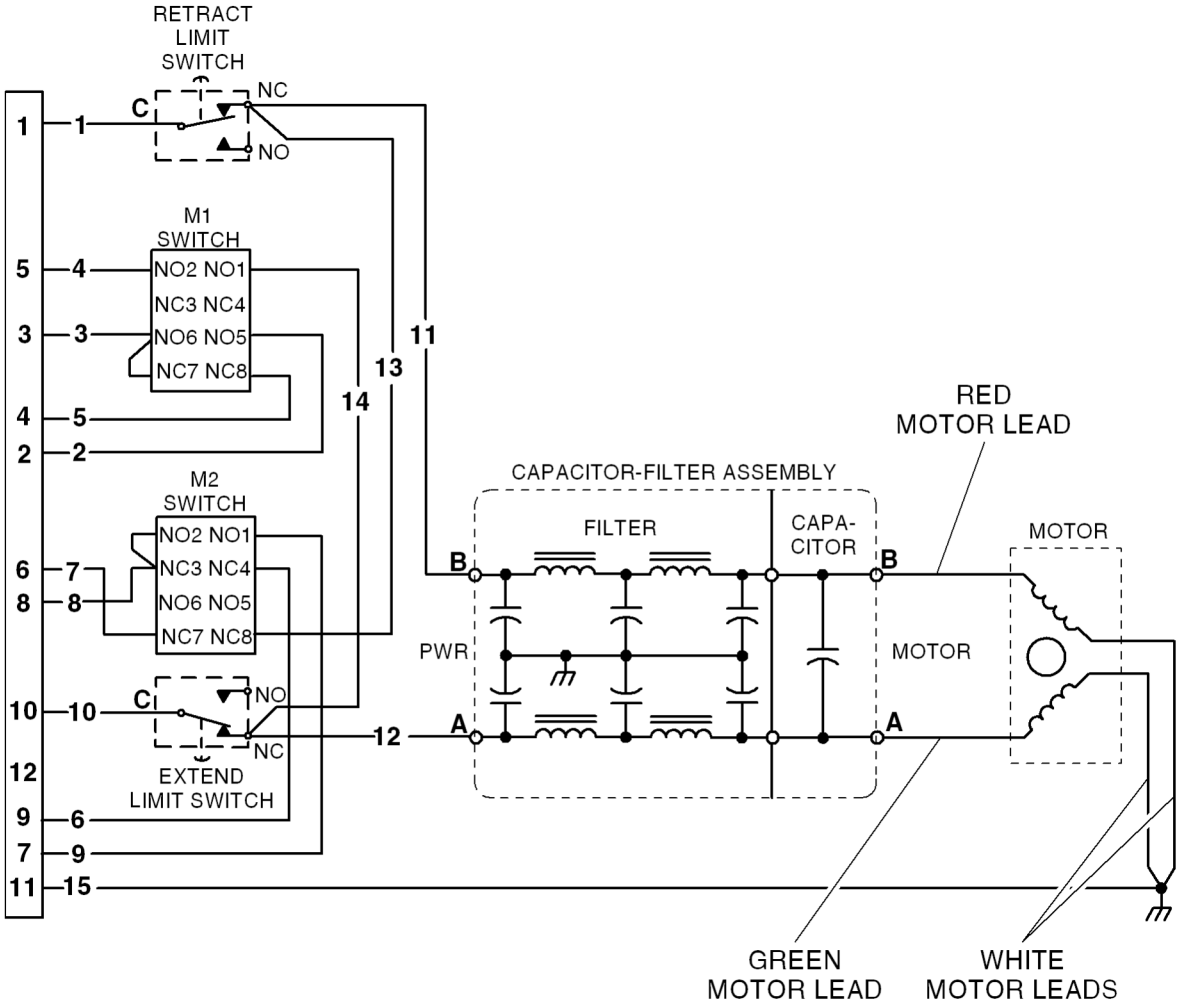



**Figure 2002. Ram Air Modulation Linear Electromechanical Actuator Wiring Diagram**

**Table 2006. Wiring Data (For Actuators With PN 26-804 Switches)**

| Lead | Color | Size (AWG) | Length Inch (mm) |
|---|---|---|---|
| 1 | Brown | 22 | 5.25 (133.35) |
| 2 | Blue | 22 | 3.625 (92.075) |
| 3 | Orange | 22 | 6 (152.4) |
| 4 | Green | 22 | 3.625 (92.075) |
| 5 | Yellow | 22 | 6 (152.4) |
| 6 | White/Black | 22 | 4.625 (117.475) |
| 7 | Red | 22 | 4.625 (117.475) |
| 8 | Gray | 22 | 4.5 (114.30) |
| 9 | Purple | 22 | 3.625 (92.075) |
| 10 | Black | 22 | 3 (76.2) |
| 11 | Red | 22 | 4.625 (117.475) |
| 12 | Green | 22 | 3.625 (92.075) |
| 13 | Red | 22 | 5.625 (142.875) |
| 14 | Green | 22 | 4.625 (117.475) |
| 15 | White | 22 | 4.5 (114.30) |

**NOTE :** Wire conforms with MIL SPEC MIL-W-16878 (NAVY), Type EE.




ICN-70210-0000283154-001-01

**Figure 2003. Ram Air Modulation Linear Electromechanical Actuator Wiring Diagram**

**Table 2007. Wiring Data (For Actuators With PN 26-830070 or 2748045-1 Switches)**

| Lead | Color | Size (AWG) | Length Inch (mm) |
|---|---|---|---|
| 1 | Brown | 22 | 5.25 (133.35) |
| 2 | Blue | 22 | 3.625 (92.075) |
| 3 | Orange | 22 | 6 (152.4) |
| 4 | Green | 22 | 3.625 (92.075) |
| 5 | Yellow | 22 | 6 (152.4) |
| 6 | White/Black | 22 | 4.625 (117.475) |
| 7 | Red | 22 | 4.625 (117.475) |
| 8 | Gray | 22 | 4.5 (114.30) |
| 9 | Purple | 22 | 3.625 (92.075) |
| 10 | Black | 22 | 3 (76.2) |
| 11 | Red | 22 | 4.625 (117.475) |
| 12 | Green | 22 | 3.625 (92.075) |
| 13 | Red | 22 | 5.625 (142.875) |
| 14 | Green | 22 | 4.625 (117.475) |
| 15 | White | 22 | 4.5 (114.30) |

**NOTE :** Wire conforms with MIL SPEC MIL-W-16878 (NAVY), Type EE.

# DISASSEMBLY

1. **Planning Data** (TASK 21-20-36-99C-803-A01)

   **A. Reason for the Job** (Subtask 21-20-36-99C-006-A01)

   (1) Use these procedures to remove parts from the LRU to do the cleaning, checks, and repair. Do only those procedures of disassembly that are necessary to remove the defective parts.

   **B. Job Setup Data** (Subtask 21-20-36-99C-007-A01)

   (1) You can use equivalent alternatives for the special tools, fixtures, equipment, and consumable materials unless specified differently. The user must find equivalent alternatives.

   (2) Refer to Table 3001 for the special tools, fixtures, and equipment in this section.

   (3) CAGE codes and manufacturer's addresses are available at https://cage.dla.mil.

**Table 3001. Special Tools, Fixtures, and Equipment**

| Number | Description | Source |
|---|---|---|
| | Soldering iron | Commercially available |

**WARNING: BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

(4) Refer to Table 3002 for the consumable materials in this section.

**Table 3002. Consumables**

| Number | Description | Source |
|---|---|---|
| Not applicable | Not applicable | Not applicable |

(5) The list that follows identifies Honeywell publications that are related to this section:

- Not applicable.

**2.** **Procedure** (TASK 21-20-36-000-801-A01)

**A.** **Job Setup** (Subtask 21-20-36-000-001-A01)

**WARNING:** **BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

CAUTION: DO NOT HIT OR LET THE LRU FALL DURING THESE PROCEDURES. THE LRU CONTAINS AN ASSEMBLY THAT CAN BE DAMAGED FROM INCORRECT USE.

CAUTION: DO THESE PROCEDURES IN A CLEAN ENVIRONMENT TO PREVENT DAMAGE TO THE MECHANICAL COMPONENTS.

(1) Obey the precautions.

(2) The item numbers shown in the DPL are the same as the item numbers on the exploded view illustration(s). To find a part number, find the part on the illustration and note the item number. Find the item number in the parts list and read the correct part number. Item numbers refer to the same figure until a different figure is specified.

(3) Before disassembly, use TESTING AND FAULT ISOLATION to examine the condition of the unit or to find the malfunction. Do this to prevent disassembly that is not necessary.

(4) If applicable, as an aid for assembly, tag the items that are disconnected to show where the connections were made.

(5) Include data for special conditions of a connection such as the polarity and the position of the items.

(6) If applicable, identify the tie points for the wire assembly to prevent damage to the wire insulation during assembly.

**B.** **General Disassembly Procedures** (Subtask 21-20-36-000-002-A01)

CAUTION: BE CAREFUL TO PREVENT DAMAGE TO PARTS THAT CAN BE USED AGAIN.

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Disassemble in a dry, bright, clean room.

**NOTE:** Refer to TESTING AND FAULT ISOLATION to find the condition of the ram air modulation linear electromechanical actuator and the level of disassembly necessary to repair the ram air modulation linear electromechanical actuator.

(3) Remove all protective caps, plugs, and closures before disassembly of the ram air modulation linear electromechanical actuator.

(4) It is not necessary to remove the wire leads from the capacitor filter assembly (25), connector (185A), switches (165), switch assemblies (230, 235), or motor (405) leads unless replacement of these components is necessary after check.

(5) Do not disassemble staked, welded, riveted, soldered, swaged, or press fit assemblies, or remove plates, passage hole plugs, or threaded inserts unless replacement or repair of these parts is necessary.

(6) Make a record of the quantities and thickness of the shims and washers. This will help when you assemble the ram air modulation linear electromechanical actuator.

(7) Make a record of the method and location of any lockwire before it is removed. This will help when you assemble the ram air modulation linear electromechanical actuator.

**C. Disassembly of the Ram Air Modulation Linear Electromechanical Actuator** (Subtask 21-20-36-000-003-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

**NOTE:** Only disassemble to the level necessary to repair the ram air modulation linear electromechanical actuator.

(2) Do not remove the identification plate (10D) or screws (15) unless necessary after check. Refer to REPAIR for replacement of the identification plate (10D).

(3) Do not remove the wiring diagram plate (20) unless necessary after check.

**WARNING: USE EYE PROTECTION WHEN YOU CUT THE LOCKWIRE. WHEN YOU CUT THE LOCKWIRE, PIECES THAT BREAK OFF CAN HIT YOUR EYES AND CAUSE INJURY.**

CAUTION: DO NOT USE LOCKWIRE AGAIN AFTER REMOVAL. USED LOCKWIRE CAN BREAK IF YOU APPLY TOO MUCH FORCE TO IT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

(4) Remove the lockwire from the screws (30, 60).

**WARNING: USE CORRECT PROTECTION. WELDING, CUTTING, BRAZING OR SOLDERING OPERATIONS CAUSE HEAT, METAL FUMES, SLAG, RADIATION AND LOOSE PARTICLES. THESE OPERATIONS MUST BE DONE ONLY BY QUALIFIED PERSONNEL.**

(5) Remove screws (30), nuts (35) and washers (40). Use a soldering iron to unsolder and remove the wire leads from the capacitor-filter assembly (25). Remove the capacitor-filter assembly (25).

(6) Remove the screws (50, 60) and washers (55, 65). Lift the machined housing extension (160) and protector (45).

**WARNING: USE EYE PROTECTION WHEN YOU CUT THE LOCKWIRE. WHEN YOU CUT THE LOCKWIRE, PIECES THAT BREAK OFF CAN HIT YOUR EYES AND CAUSE INJURY.**

CAUTION: DO NOT USE LOCKWIRE AGAIN AFTER REMOVAL. USED LOCKWIRE CAN BREAK IF YOU APPLY TOO MUCH FORCE TO IT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

(7) Remove the lockwire from the screws (170).

(8) Remove the screws (170), washers (175), lockplates (180), switches (165), and if applicable, insulators (182).

**WARNING:** **USE CORRECT PROTECTION. WELDING, CUTTING, BRAZING OR SOLDERING OPERATIONS CAUSE HEAT, METAL FUMES, SLAG, RADIATION AND LOOSE PARTICLES. THESE OPERATIONS MUST BE DONE ONLY BY QUALIFIED PERSONNEL.**

(9) Use a soldering iron to unsolder wires from the switches (165).

(10) Remove the ring (125) from the guide (145).

(11) Remove the guide (145) and washers (130, 135, 140) from the machined housing extension (160).

(12) Remove the ring (70) from the gearshaft (120).

(13) Remove the gearshaft (120) and washers (80, 85, 90) from the machined housing extension (160).

(14) Do not remove the bearing (75) unless necessary.

(15) Remove the follow-up cams (115) from the gearshaft (120).

(16) (541674-1-1, -3, -4 Series 1 and Series 2, -5 and -6) Do not remove the switch arms (100, 105) or pins (110) from the follow-up cams (115) unless necessary after check.

(17) (541674-4 Series 3) Do not remove the switch cams (107), plates (97), or pins (110) from the follow-up cams (115) unless necessary after check.

(18) (541674-4 Series 4) Do not remove the switch cams (107A, 107B), plates (97), or pins (110) from the follow-up cams (115) unless necessary after check.

(19) Do not remove the rivet (146) from the machined housing extension (160).

(20) Do not remove the actuator plain bearing (150) from the machined housing extension (160) unless necessary after check.

**WARNING:** **USE EYE PROTECTION WHEN YOU CUT THE LOCKWIRE. WHEN YOU CUT THE LOCKWIRE, PIECES THAT BREAK OFF CAN HIT YOUR EYES AND CAUSE INJURY.**

CAUTION: DO NOT USE LOCKWIRE AGAIN AFTER REMOVAL. USED LOCKWIRE CAN BREAK IF YOU APPLY TOO MUCH FORCE TO IT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

(21) Remove the lockwire from the screws (190).

(22) Remove the screws (190) and washers (195). Pull the connector (185A) out sufficiently to remove wires from connector. Remove the connector (185A).

**WARNING:** **USE EYE PROTECTION WHEN YOU CUT THE LOCKWIRE. WHEN YOU CUT THE LOCKWIRE, PIECES THAT BREAK OFF CAN HIT YOUR EYES AND CAUSE INJURY.**

CAUTION: DO NOT USE LOCKWIRE AGAIN AFTER REMOVAL. USED LOCKWIRE CAN BREAK IF YOU APPLY TOO MUCH FORCE TO IT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

(23) Remove the lockwire from the screws (205).

(24) Remove the screws (205), washers (210), and adapter (200).

(25) Remove the clips (215, 220) from the switch assemblies (230, 235).

**WARNING: USE EYE PROTECTION WHEN YOU CUT THE LOCKWIRE. WHEN YOU CUT THE LOCKWIRE, PIECES THAT BREAK OFF CAN HIT YOUR EYES AND CAUSE INJURY.**

CAUTION: DO NOT USE LOCKWIRE AGAIN AFTER REMOVAL. USED LOCKWIRE CAN BREAK IF YOU APPLY TOO MUCH FORCE TO IT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

(26) Remove the lockwire from the switch adjusting screws (260, 265).

(27) Remove the pins (225) from the switch adjusting screws (260, 265).

(28) Loosen the switch adjusting screws (260, 265) out of the machined housing (465) until the switch assemblies (230, 235) can be removed.

(29) Remove the washers (240) and shim washers (245, 250, 253) from the switch adjusting screws (260, 265).

(30) Remove the switch adjusting screws (260, 265) from the machined housing (465) with the washers (255). Remove the washers (255) from the switch adjusting screws (260, 265).

**WARNING: USE EYE PROTECTION WHEN YOU CUT THE LOCKWIRE. WHEN YOU CUT THE LOCKWIRE, PIECES THAT BREAK OFF CAN HIT YOUR EYES AND CAUSE INJURY.**

CAUTION: DO NOT USE LOCKWIRE AGAIN AFTER REMOVAL. USED LOCKWIRE CAN BREAK IF YOU APPLY TOO MUCH FORCE TO IT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

(31) Remove the lockwire from the screws (280).

(32) Remove the screws (280) and washers (285) to remove the fitting (289). Do not remove the bearing (287) from the fitting (289) unless necessary after check.

(33) Remove the washers (420, 425, 430).

(34) Remove the pin (290) from the nut (295) and jackscrew assembly (375).

(35) Remove the nut (295) from the jackscrew assembly (375).

**WARNING: USE EYE PROTECTION WHEN YOU CUT THE LOCKWIRE. WHEN YOU CUT THE LOCKWIRE, PIECES THAT BREAK OFF CAN HIT YOUR EYES AND CAUSE INJURY.**

CAUTION: DO NOT USE LOCKWIRE AGAIN AFTER REMOVAL. USED LOCKWIRE CAN BREAK IF YOU APPLY TOO MUCH FORCE TO IT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

(36) Remove the lockwire from the nut (345) and washer (340).

(37) Turn the nut (345) on the nut assembly (380) toward the machined housing (465) until the washer (340) can be removed from the fitting (335).

(38) Remove the fitting (335), washer (340), and nut (345). Do not remove the bearing (330) from the fitting unless necessary after check.

(39) Push out the pins (350).

(40) Turn the jackscrew assembly (375) toward the extend position to disengage the gear (360). Remove the gear (360).

(41) Remove the key (365) from the keyway of the jackscrew assembly (375).

(42) Continue to turn the jackscrew assembly (375) to remove the nut (370) and to push out the stop (355).

(43) Remove the jackscrew assembly (375) from the nut assembly (380).

CAUTION: THE WIRING DIAGRAM PLATE CAN BE DAMAGED. THE SCREWS (310, 325) ARE COUNTERSUNK BEHIND THE WIRING DIAGRAM PLATE. DO NOT PRESS ON THE SCREWS (310, 325) FROM THE INSIDE OF THE HOUSING UNLESS THE WIRING DIAGRAM PLATE IS REMOVED. DO NOT REMOVE THE SCREWS (310, 325) UNLESS THE WIRING DIAGRAM PLATE IS REMOVED.

(44) Remove the nut (320A) and clip (315).

(45) Remove the nut (305A) to remove the terminals (300A) from the machined housing (465). Do not remove the crimped terminals (300A) from the motor leads or the white lead from the connector to the housing.

**WARNING: USE EYE PROTECTION WHEN YOU CUT THE LOCKWIRE. WHEN YOU CUT THE LOCKWIRE, PIECES THAT BREAK OFF CAN HIT YOUR EYES AND CAUSE INJURY.**

CAUTION: DO NOT USE LOCKWIRE AGAIN AFTER REMOVAL. USED LOCKWIRE CAN BREAK IF YOU APPLY TOO MUCH FORCE TO IT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

(46) Remove the lockwire from the screws (385, 390).

(47) Remove the clamps (400), grounding terminal (395), and screws (385, 390) to remove the motor (405).

(48) Remove the plate (415) from the machined housing (465). Do not remove the spacer (410) from the plate (415) unless necessary after check.

(49) Do not remove the screws (445) from the machined housing (465).

**NOTE:** The screws fill holes in the housing. They do not attach parts.

(50) Do not remove the bushing (460) or bearings (435, 450) from the machined housing (465) unless necessary after check.

**D. Job Close-up** (Subtask 21-20-36-000-004-A01)

(1) Remove all tools, equipment, used parts, and materials from the work area.

# CLEANING

**1.** **Planning Data** (TASK 21-20-36-99C-804-A01)

**A.** **Reason for the Job** (Subtask 21-20-36-99C-008-A01)

(1) Use these procedures to remove dust, dirt, and unwanted oil and grease. Be careful not to cause damage to the parts when you do these procedures.

**B.** **Job Setup Data** (Subtask 21-20-36-99C-009-A01)

(1) You can use equivalent alternatives for the special tools, fixtures, equipment, and consumable materials unless specified differently. The user must find equivalent alternatives.

(2) Refer to Table 4001 for the special tools, fixtures, and equipment in this section.

(3) CAGE codes and manufacturer's addresses are available at https://cage.dla.mil.

**Table 4001. Special Tools, Fixtures, and Equipment**

| Number | Description | Source |
|---|---|---|
| | Soft-bristle brush | Commercially available |
| | Source of compressed air | Commercially available |
| | Wire brush | Commercially available |

**WARNING:** **BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

(4) Refer to Table 4002 for the consumable materials in this section.

**Table 4002. Consumables**

| Number | Description | Source |
|---|---|---|
| | Lint-free cloth | Commercially available |
| MIL-PRF-680 | Solvent | Commercially available |

(5) The list that follows identifies Honeywell publications that are related to this section:

- Not applicable.

**2.** **Procedure** (TASK 21-20-36-100-801-A01)

**A.** **Job Setup** (Subtask 21-20-36-100-001-A01)

**WARNING: BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

CAUTION: DO NOT HIT OR LET THE LRU FALL DURING THESE PROCEDURES. THE LRU CONTAINS AN ASSEMBLY THAT CAN BE DAMAGED FROM INCORRECT USE.

CAUTION: DO THESE PROCEDURES IN A CLEAN ENVIRONMENT TO PREVENT DAMAGE TO THE MECHANICAL COMPONENTS.

CAUTION: BEFORE YOU USE ISOPROPYL ALCOHOL, DO A TEST TO MAKE SURE THAT IT DOES NOT CAUSE DAMAGE TO THE PAINTED SURFACES.

CAUTION: DO NOT LET THE ISOPROPYL ALCOHOL TOUCH THE CONNECTOR BODY. IT CAN CAUSE DAMAGE TO THE PARTS. USE ISOPROPYL ALCOHOL CAREFULLY WHEN YOU CLEAN FLUX FROM THE SOLDER CONNECTIONS.

(1) Obey the precautions.

(2) Do the procedures in a clean location.

(3) When you use pressurized air to clean assemblies and parts, do not use more air pressure than is necessary.

(4) After you clean the assemblies and parts, supply protection from moisture, dust, and other contamination until you do a visual check and assemble the component.

(5) Refer to ATA No. 20-00-03,(Pub No. A09-1100-004), Standard Repair Procedures for Honeywell Avionics Equipment Instruction Manual for more cleaning procedures. Use the standard repair procedures and approved local shop procedures.

**B.** **External Parts** (Subtask 21-20-36-100-002-A01)

**WARNING: CLEAN PARTS IN AN AREA WITH GOOD AIR CIRCULATION AND GOOD LIGHT. MAKE SURE THAT SAFETY AND FIRE EQUIPMENT IS AVAILABLE.**

(1) Clean painted parts, but do not remove the paint if it is still serviceable.

(2) Use a soft-bristle brush to remove carbon and combustion deposits.

(3) Use a wire brush to remove loose scale and light surface corrosion.

**C.** **Electrical Parts** (Subtask 21-20-36-100-003-A01)

**WARNING: USE CORRECT PROTECTION IN AN AREA WITH A GOOD FLOW OF AIR. SOLVENT CAN CAUSE SKIN, EYE, AND RESPIRATORY DAMAGE. DO NOT USE NEAR AN OPEN FLAME.**

(1) Clean all electrical parts and wiring with a lint-free cloth moist with MIL-PRF-680 solvent.

(2) Wipe electrical parts with a lint-free cloth moist with clean water.

**WARNING:** **USE THE CORRECT PROTECTION. COMPRESSED AIR WILL CAUSE LOOSE PARTICLES THAT CAN GET IN YOUR EYES. THE AIRSTREAM CAN CAUSE CUTS. DO NOT POINT THE AIRSTREAM TOWARD YOURSELF OR OTHER PERSONS.**

(3) Use a source of compressed air set at 20 PSIG (138 kPa) (maximum) to dry the cleaned parts fully.

**D.** **Metal Mechanical Parts** (Subtask 21-20-36-100-004-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

**WARNING:** **USE CORRECT PROTECTION IN AN AREA WITH A GOOD FLOW OF AIR. SOLVENT CAN CAUSE SKIN, EYE, AND RESPIRATORY DAMAGE. DO NOT USE NEAR AN OPEN FLAME.**

(2) Wash all nonelectrical parts, not to include the bearings (287, 330, 435, 450), in MIL-PRF-680 solvent and dry them fully.

(3) Use water to wash remaining solvent from the cleaned parts. Rinse the parts fully with clean water.

**WARNING:** **USE THE CORRECT PROTECTION. COMPRESSED AIR WILL CAUSE LOOSE PARTICLES THAT CAN GET IN YOUR EYES. THE AIRSTREAM CAN CAUSE CUTS. DO NOT POINT THE AIRSTREAM TOWARD YOURSELF OR OTHER PERSONS.**

(4) Use a source of compressed air set at 20 PSIG (138 kPa) (maximum) to dry the cleaned parts fully.

**E.** **Job Close-up** (Subtask 21-20-36-100-005-A01)

(1) Remove all tools, equipment, used parts, and materials from the work area.

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# INSPECTION/CHECK

1. **Planning Data** (TASK 21-20-36-99C-805-A01)

   A. **Reason for the Job** (Subtask 21-20-36-99C-010-A01)

      (1) Use these procedures to find damage or worn parts and parts that show signs of near failure.

   B. **Job Setup Data** (Subtask 21-20-36-99C-011-A01)

      (1) You can use equivalent alternatives for the special tools, fixtures, equipment, and consumable materials unless specified differently. The user must find equivalent alternatives.

      (2) Refer to Table 5001 for the special tools, fixtures, and equipment in this section.

      (3) CAGE codes and manufacturer's addresses are available at https://cage.dla.mil.

**Table 5001. Special Tools, Fixtures, and Equipment**

| Number | Description | Source |
|---|---|---|
| | Fluorescent penetrant unit | Commercially available |
| | Magnifying glass | Commercially available |
| Model D990R | Magnetizing unit | CAGE: 37676 |
| Model SB2824T | Demagnetizing unit | CAGE: 37676 |

**WARNING: BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

(4) Refer to Table 5002 for the consumable materials in this section.

**Table 5002. Consumables**

| Number | Description | Source |
|---|---|---|
| | Penetrant oil | Commercially available |
| A-A-55827 | Chromic acid (Chromium trioxide) | Commercially available |
| Magnaglo Carrier II | Magnetic base oil | CAGE: 37676 |
| Magnaglo Dry Concentrate No. 14A | Magnetic particles compound | CAGE: 37676 |

(5) The list that follows identifies Honeywell publications that are related to this section:

- Not applicable.

**2.** **Procedure** (TASK 21-20-36-210-801-A01)

**A.** **Job Setup** (Subtask 21-20-36-210-001-A01)

**WARNING:** **BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

CAUTION: DO NOT HIT OR LET THE LRU FALL DURING THESE PROCEDURES. THE LRU CONTAINS AN ASSEMBLY THAT CAN BE DAMAGED FROM INCORRECT USE.

CAUTION: DO THESE PROCEDURES IN A CLEAN ENVIRONMENT TO PREVENT DAMAGE TO THE MECHANICAL COMPONENTS.

CAUTION: BEFORE YOU USE ISOPROPYL ALCOHOL, DO A TEST TO MAKE SURE THAT IT DOES NOT CAUSE DAMAGE TO THE PAINTED SURFACES.

CAUTION: DO NOT LET THE ISOPROPYL ALCOHOL TOUCH THE CONNECTOR BODY. IT CAN CAUSE DAMAGE TO THE PARTS. USE ISOPROPYL ALCOHOL CAREFULLY WHEN YOU CLEAN FLUX FROM THE SOLDER CONNECTIONS.

(1) Obey the precautions.

(2) Repair or replace all damaged or worn parts. This prevents possible failures of the equipment.

**B.** **General Inspection/Check of the Ram Air Modulation Linear Electromechanical Actuator** (Subtask 21-20-36-210-002-A01)

**NOTE:** Heat discoloration of metal surfaces is permitted unless the discoloration was caused by an overheat condition.

(1) Examine the parts in a clean area where there is sufficient light. Use a magnifying glass where necessary.

(2) Examine all parts for nicks, cracks, corrosion, scoring, and dents.

(3) Examine threaded parts for worn or crossed threads. Discard the parts if they have damaged threads.

(4) Examine riveted parts for security of attachment.

(5) Examine all painted surfaces for cracked, chipped, or peeling paint.

(6) Examine all electrical parts for corrosion, pitting, and loose terminals. Examine all sleeving and wiring for frayed, cracked, deteriorated insulation, or wear.

(7) Examine all gear teeth, worm gears, and splines for damage and signs of wear.

**C. Magnetic Particle Inspection/Check of the Ram Air Modulation Linear Electromechanical Actuator** (Subtask 21-20-36-210-003-A01)

**NOTE:** It is not necessary to do a magnetic particle examination on plated or painted surfaces, unless you find signs of wear or physical damage.

**WARNING: USE THE CORRECT PROTECTION IN AN AREA WITH A GOOD FLOW OF AIR. OIL USED DURING THIS CHECK CAN CAUSE SKIN, EYE AND RESPIRATORY DAMAGE. THE ELECTRICAL CURRENT IS DANGEROUS AND CAN BURN THE SKIN.**

(1) Use the wet continuous DC method with the Model D990R magnetizing unit, Magnaglo Carrier II magnetic base oil, and Magnaglo Dry Concentrate No. 14A magnetic particles compound. Refer to ASTM E1444.

**NOTE:** During magnetic particle examination, acid etch only when necessary.

(2) If necessary, remove paint or dry film lubricant from the surface of the part.

**WARNING: USE THE CORRECT PROTECTION. THIS CHEMICAL/SOLUTION CAN CAUSE SKIN, EYE AND LUNG DAMAGE. FOLLOW THE MANUFACTURER'S INSTRUCTIONS FOR EACH CHEMICAL.**

**WARNING: USE THE CORRECT PROTECTION. HEATED PARTS CAN CAUSE BURNS.**

(3) To remove dry film lubricant, use a 10 percent solution, by weight, of A-A-55827 chromic acid and water at a temperature of 180°F (82.22°C) until all traces of the dry film lubricant are removed.

(4) Remove all rust, scale, burrs, dirt, grease, or other contamination from the part.

(5) Magnetize the part in the longitudinal direction.

(6) Examine the part.

(7) Magnetize the part in the circumferential direction.

(8) Examine the part.

(9) The part must not have any cracks, tears, corrosion, pits, or galling.

(10) Use Model SB2824T demagnetizing unit to demagnetize the part to a maximum of 3 Gauss.

**WARNING: USE THE CORRECT PROTECTION. OIL USED DURING THIS CHECK CAN CAUSE SKIN, EYE AND LUNG DAMAGE. THE ELECTRICAL CURRENT IS DANGEROUS AND CAN BURN THE SKIN.**

(11) Fully remove all Magnaglo Carrier II magnetic base oil from the part.

(12) If necessary, refer to REPAIR to apply paint or dry-film lubricant to the part.

**D. Penetrant Inspection/Check of the Ram Air Modulation Linear Electromechanical Actuator** (Subtask 21-20-36-210-004-A01)

**NOTE:** It is not necessary to do a penetrant inspection on plated or painted surfaces, unless you find signs of wear or physical damage. Refer to ASTM E1417.

(1) Remove paint from the surface.

(2) Remove all rust, scale, burrs, dirt, grease, and other contamination. Make sure the part is dry. Refer to CLEANING.

**WARNING: USE THE CORRECT PERSONAL PROTECTION. OIL CAN HAVE AN ADDITIVE CALLED TRICRESYL PHOSPHATE IN IT. THIS CHEMICAL IS AN ASPHYXIANT. IT IS POISONOUS AND CAN BE ABSORBED THROUGH THE SKIN.**

(3) Refer to the manufacturer's instructions to use the fluorescent penetrant unit and penetrant oil.

**WARNING: USE THE CORRECT PERSONAL PROTECTION. OIL CAN HAVE AN ADDITIVE CALLED TRICRESYL PHOSPHATE IN IT. THIS CHEMICAL IS AN ASPHYXIANT. IT IS POISONOUS AND CAN BE ABSORBED THROUGH THE SKIN.**

(4) When completed, remove penetrant oil. Refer to CLEANING.

(5) Apply paint, if necessary. Refer to REPAIR.

**E. Detailed Inspection/Check of the Ram Air Modulation Linear Electromechanical Actuator** (Subtask 21-20-36-210-005-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Examine the identification plate (10D) and wiring diagram plate (20) for legibility and for correct attachment. Refer to REPAIR if replacement is necessary.

(3) Examine the outside of the capacitor-filter assembly (25) for leakage of the potting material. Examine the terminals for correct attachment and corrosion. Do a functional test for requirements specified in Table 5003.

(4) Make sure pins (110) are tight in the follow-up cams (115). Refer to REPAIR if necessary.

(5) Examine the gearshaft (120), gear (360), and gear assembly (440) for chipped, nicked, or worn teeth.

(6) Do a dimensional check and a magnetic particle examination of the gearshaft (120). Refer to Paragraph 2.C. and Table 5003 for requirements.

(7) Make sure the bearing (150) is tight in the machined housing extension (160). Refer to REPAIR if necessary.

(8) Examine the switches (165) and switch assemblies (230, 235) for the condition of the case and terminals.

(9) Do a functional test of the switches (165) and switch assemblies (230, 235). Refer to Table 5003 for requirements.

(10) Examine the bearings (287, 330, 435, 450). The bearings must not be rusted, discolored, or fractured, and must turn smoothly without roughness or binding.

(11) Examine the jackscrew assembly (375) for chipped, nicked, or worn teeth. Manually turn the jackscrew assembly in the nut assembly (380) to examine the jackscrew assembly for freedom of travel. The nut must travel through the jackscrew assembly smoothly, from extend to retract position, with no sign of binding.

(12) Do a penetrant examination of the jackscrew assembly (375). Refer to Table 5003 and Paragraph 2.D.

(13) Examine the dry-film lubricant on the follow-up nut (370). Examine the jackscrew assembly (375) and gear assembly (440) for scratches or scoring that show base metal. Make sure that no more than 20 percent of the base metal is visible. Refer to REPAIR if necessary.

(14) Examine the nut assembly (380) for dents and cracks.

(15) Make sure the bore in the bushing (460) is not scored. Make sure the bushing is not loose in the machined housing (465).

**Table 5003. Check Requirements**

| Component (IPL Figure 1) | Type of Check | Check | Requirements |
|---|---|---|---|
| Capacitor-filter assembly (25) | Functional | Insulation resistance | At 68 to 86°F (20 to 30°C) apply 100 VDC minimum between terminals, resistance must be 1,000 megohms minimum. |
| Screws (95) | Visual | Installation | Inspect the lockwire on four screws (95) used to secure switch cam (107) and follow-up cam (115). Install per NASM33540. |
| Switches (165), switch assemblies (230, 235) | Functional | Continuity | Use a multimeter, operate switch, circuit must open and close. Refer to Figure 6001 or Figure 2002 for the wiring diagram. |
| Gearshaft (120) | Dimensional | Wear of bearing journals that have bearings (75, 150) | Refer to FITS AND CLEARANCES. |
| | Magnetic particle | Cracks | ASTM E1444. |
| Jackscrew assembly (375) | Dimensional | Wear of bearing journal that has bearing (450) | Refer to FITS AND CLEARANCES. |
| | Penetrant examination | Cracks | ASTM E1417. |
| Gear assembly (440) | Dimensional | Wear of bearing journal that has bearing (435) | Refer to FITS AND CLEARANCES. |
| | Magnetic particle | Cracks | ASTM E1444. |
| Housing assembly (455) | Visual | Wear/groove in housing track at movable rod end side. Refer to Figure 5001. | Replace if wear is present. |

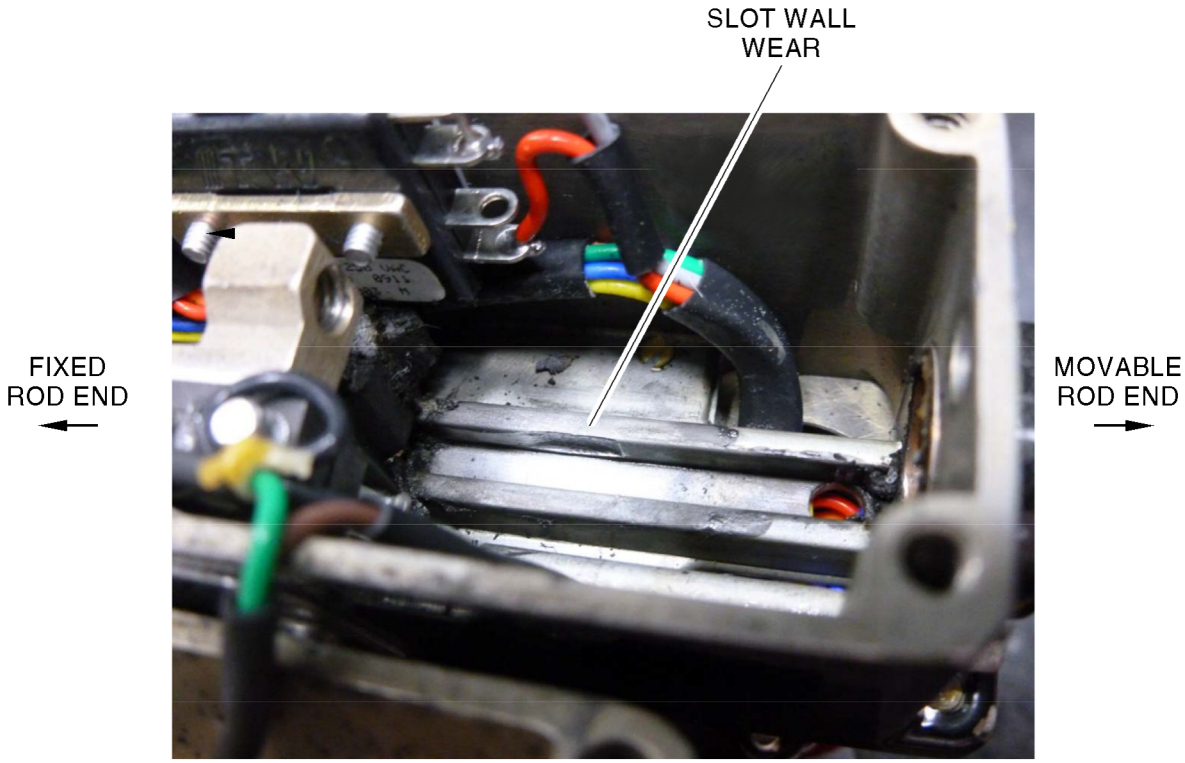


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**Figure 5001. Housing Assembly Check**

**F.** **Job Close-up** (Subtask 21-20-36-210-006-A01)

(1) Remove all tools, equipment, used parts, and materials from the work area.

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# REPAIR

1. **Planning Data** (TASK 21-20-36-99C-806-A01)

   **A. Reason for the Job** (Subtask 21-20-36-99C-012-A01)

   (1) Use these procedures for the LRU to replace defective parts and replace or repair defective subassemblies.

   (2) Do only those procedures of DISASSEMBLY that are necessary to make repairs. When new parts are necessary, refer to the ILLUSTRATED PARTS LIST for the correct part numbers and quantities.

   **B. Job Setup Data** (Subtask 21-20-36-99C-013-A01)

   (1) You can use equivalent alternatives for the special tools, fixtures, equipment, and consumable materials unless specified differently. The user must find equivalent alternatives.

   (2) Refer to Table 6001 for the special tools, fixtures, and equipment in this section.

   (3) CAGE codes and manufacturer's addresses are available at https://cage.dla.mil.

**Table 6001. Special Tools, Fixtures, and Equipment**

| Number | Description | Source |
|---|---|---|
| | Hot air gun | Commercially available |
| | Oven | Commercially available |

**WARNING: BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

(4) Refer to Table 6002 for the consumable materials in this section.

**Table 6002. Consumables**

| Number | Description | Source |
|---|---|---|
| | Lint-free cloth | Commercially available |
| 44GN11 | Primer paint | CAGE: 33461 |
| 446-22-1002, X-530 | High solids epoxy enamel (Black BAC-701) | CAGE: 91342 |
| ANSI B74.18 | Abrasive paper | Commercially available |
| ANSI B74.18 | Aluminum-oxide abrasive paper | Commercially available |
| ANSI B74.18 | Crocus cloth | Commercially available |
| ANSI B74.18 | Silicon-carbide abrasive paper | Commercially available |

**Table 6002. Consumables (Cont)**

| Number | Description | Source |
|---|---|---|
| AS5272, Type I | Dry-film lubricant | Commercially available |
| Desoclean 45 | Solvent | CAGE: 83574 |
| NASM33540 | Lockwire | Commercially available |
| Sn60 | Solder (EIA J-STD-006) | Commercially available |

(5) The list that follows identifies Honeywell publications that are related to this section:

- Not applicable.

**2.** **Procedure** (TASK 21-20-36-300-801-A01)

**A.** **Job Setup** (Subtask 21-20-36-300-001-A01)

**WARNING: BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

CAUTION: DO NOT HIT OR LET THE LRU FALL DURING THESE PROCEDURES. THE LRU CONTAINS AN ASSEMBLY THAT CAN BE DAMAGED FROM INCORRECT USE.

CAUTION: DO THESE PROCEDURES IN A CLEAN ENVIRONMENT TO PREVENT DAMAGE TO THE MECHANICAL COMPONENTS.

(1) Obey the precautions.

(2) Do all repair procedures in a dry, well-lighted area that is free from dust.

(3) Replace all damaged parts that cannot be repaired.

**B.** **References for Repair** (Subtask 21-20-36-300-002-A01)

(1) These references show where to find repair data that is located in other sections of this manual and in other manuals. The data in other sections of this manual is necessary for repair of the ram air modulation linear electromechanical actuator and its primary subassemblies. The data in other manuals gives procedures that are not included in this manual.

(2) Refer to SCHEMATIC AND WIRING DIAGRAMS for reference drawings for the Ram air modulation linear electromechanical actuator and its primary subassemblies. The drawings give data about:

- Consumable materials
- Component layout
- Component termination
- Schematic diagrams.

(3) Refer to FITS AND CLEARANCES for:

- Component clearance
- Maximum component height
- Maximum lead length
- Torque limits.

(4) Refer to ILLUSTRATED PARTS LIST for:

- Figure and item numbers
- Subassembly and component locations
- Correct part numbers
- Correct quantities.

**C. General Repair Instructions** (Subtask 21-20-36-300-003-A01)

**WARNING: DO NOT USE CROCUS CLOTH TO POLISH ALUMINUM PARTS. CROCUS CLOTH CONTAINS AN OXIDE OF IRON WHICH CAUSES ALUMINUM TO QUICKLY CORRODE.**

(1) Remove small scratches, burrs, and corrosion from steel parts with ANSI B74.18 crocus cloth.

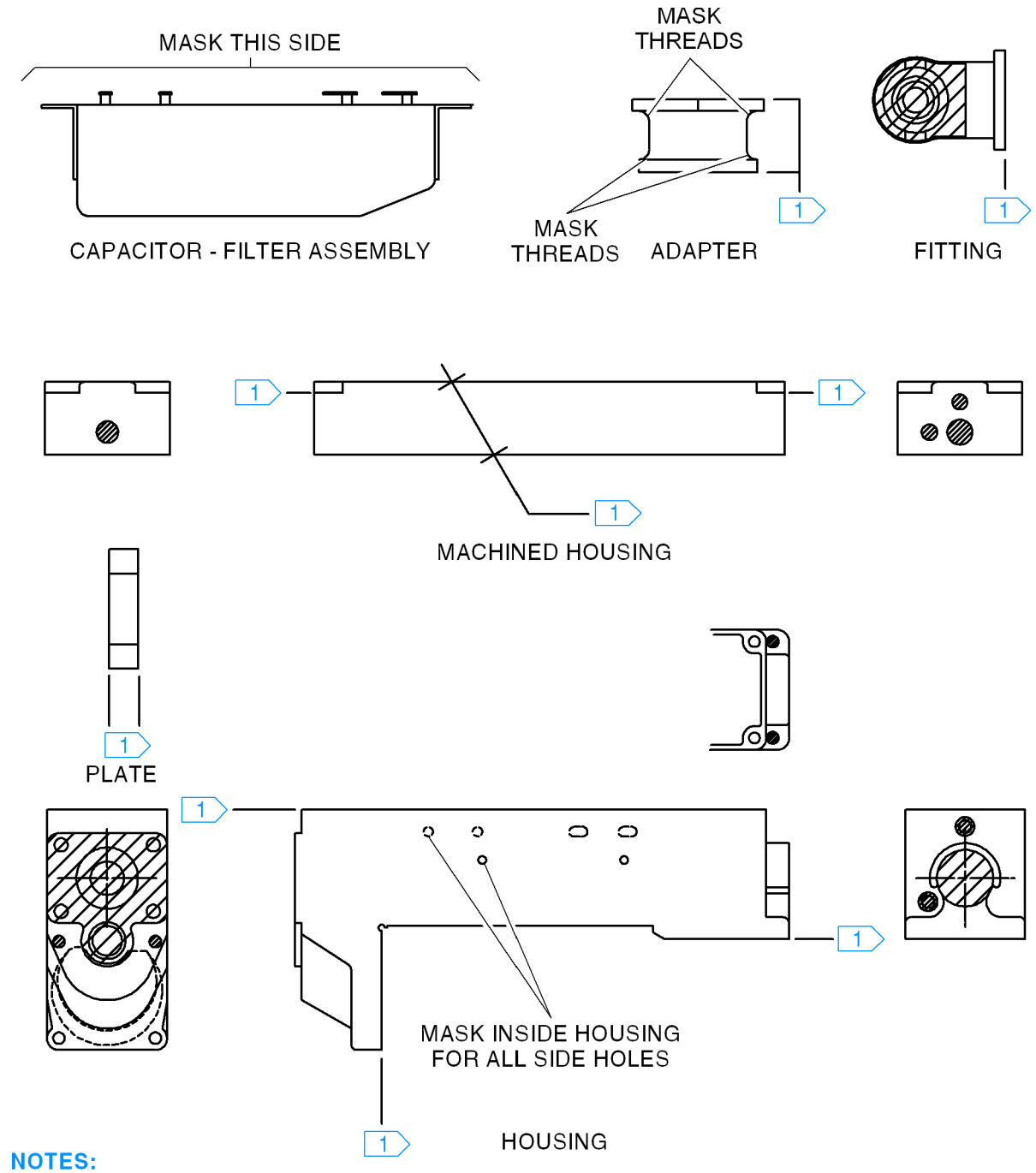
(2) Use fine ANSI B74.18 aluminum-oxide abrasive paper or ANSI B74.18 silicon carbide abrasive cloth remove minor nicks, burrs, scratches, and adherent corrosion from aluminum parts.

**WARNING: USE CORRECT PROTECTION. WELDING, CUTTING, BRAZING OR SOLDERING OPERATIONS CAUSE HEAT, METAL FUMES, SLAG, RADIATION AND LOOSE PARTICLES. THESE OPERATIONS MUST BE DONE ONLY BY QUALIFIED PERSONNEL.**

(3) Do all necessary soldering with Sn60 solder.

**D. Repair of Exterior Paint** (Subtask 21-20-36-300-004-A01)

(1) Protect against sanding particles and paint overspray by masking or capping all areas not being painted. Refer to Figure 6001.




**NOTES:**

1 Mask all cross hatched and surface marked areas.

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**Figure 6001. Paint Mask Areas**

(2) Lightly sand the paint around the damaged area with ANSI B74.18 abrasive paper.

**WARNING: USE CORRECT PROTECTION IN AN AREA THAT HAS A GOOD FLOW OF AIR. SOLVENT CAN CAUSE SKIN, EYE AND LUNG DAMAGE. DO NOT USE NEAR AN OPEN FLAME.**

(3) Wipe the sanded area with a clean lint-free cloth moist with Desoclean 45 solvent. Wipe with a dry, lint-free cloth before the solvent dries.

**WARNING: PRIMER IS FLAMMABLE AND TOXIC TO EYES, SKIN AND RESPIRATORY TRACT. SKIN AND EYE PROTECTION REQUIRED. AVOID REPEATED OR PROLONGED CONTACT. USE ONLY IN WELL-VENTILATED AREAS. KEEP AWAY FROM OPEN FLAMES OR OTHER SOURCES OF IGNITION.**

**WARNING: USE THE CORRECT PROTECTION. HEATED PARTS CAN CAUSE BURNS.**

CAUTION: DO NOT GET PRIMER OVERSPRAY ON THE INTERNAL SURFACES OR PARTS.

(4) Apply one layer of 44GN11 primer paint. Allow to dry at room temperature for 40 minutes minimum.

**WARNING: PAINT IS FLAMMABLE AND TOXIC TO EYES, SKIN, AND RESPIRATORY TRACT. SKIN AND EYE PROTECTION REQUIRED. AVOID REPEATED OR PROLONGED CONTACT. USE ONLY IN WELL VENTILATED AREAS. KEEP AWAY FROM OPEN FLAMES OR OTHER SOURCES OF IGNITION.**

**WARNING: USE THE CORRECT PROTECTION. HEATED PARTS CAN CAUSE BURNS.**

CAUTION: DO NOT GET PAINT OVERSPRAY ON THE INTERNAL SURFACES OR PARTS.

(5) Apply one layer of 446-22-1002, X-530 high solids epoxy enamel to the primed areas. Dry the paint for 15 minutes at room temperature, then cure in an oven for 3 hours at 150°F (65.6°C), or cure 10 hours at room temperature.

**E. Replacement of Identification Plate** (Subtask 21-20-36-300-005-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Remove the screws (15) and existing identification plate (10D) from the machined housing (465).

(3) Copy all serial number data to the new identification plate (10D).

(4) Use the screws (15) to attach the new identification plate (10D) to the machined housing (465).

**F. Replacement of Wiring Diagram Plate** (Subtask 21-20-36-300-006-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

**WARNING: USE THE CORRECT PROTECTION IN AN AREA WITH A GOOD FLOW OF AIR. SEALANT CAN CAUSE SKIN, EYE, AND LUNG DAMAGE. DO NOT USE NEAR AN OPEN FLAME.**

(2) Apply Desoclean 45 solvent around the edges of the damaged wiring diagram plate (20), or use a hot air gun, to soften the adhesive backing.

(3) When the adhesive backing becomes soft, scrape or pull the old wiring diagram plate (20) from the machined housing (465).

**WARNING:** **USE THE CORRECT PROTECTION IN AN AREA WITH A GOOD FLOW OF AIR. SEALANT CAN CAUSE SKIN, EYE, AND LUNG DAMAGE. DO NOT USE NEAR AN OPEN FLAME.**

(4) Use a clean lint-free cloth soaked, but not dripping, with Desoclean 45 solvent to clean the housing surface. Wipe the area with a dry lint-free cloth before the solvent dries.

(5) Remove the paper from the back of the replacement wiring diagram plate (20).

**WARNING:** **USE THE CORRECT PROTECTION IN AN AREA WITH A GOOD FLOW OF AIR. SEALANT CAN CAUSE SKIN, EYE, AND LUNG DAMAGE. DO NOT USE NEAR AN OPEN FLAME.**

(6) Wipe the adhesive side of the replacement wiring diagram plate (20) with a clean lint-free cloth dampened with the Desoclean 45 solvent.

(7) Put the wiring diagram plate (20) firmly in position on the machined housing (465).

**G. Replacement of Follow-up Cams and Pins** (Subtask 21-20-36-300-007-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) (541674-1-1, -3, -4 Series 1 and 2, -5, -6) Remove screws (95) and switch arm (100, 105).

(3) (541674-4 Series 3) Remove screws (95), plate (97), and switch cam (107).

(4) (541674-4 Series 4) Remove screws (95), plate (97), and switch cam (107A, 107B).

(5) Remove a loose or damaged pin (110) from the follow-up cam (115), or remove the pin (110) from a damaged follow-up cam (115).

(6) Install a pin (110) in the follow-up cam (115). Make sure the pin is 0.070 to 0.090 inches (1.778 to 2.286 mm) above the surface of the follow-up cam (115).

(7) (541674-1-1, -3, -4 Series 1 and 2, -5, -6) Install the switch arm (100, 105) on the follow-up cam (115), over the pin (110).

(8) (541674-1-1, -3, -4 Series 1 and 2, -5, -6) Use the screws (95) to secure the switch arm (100, 105) to the follow-up cam (115).

(9) (541674-4 Series 3) Install the switch cam (107) on the follow-up cam (115), over the pin (110).

(10) (541674-4 Series 3) Use the screws (95) to secure the plate (97) and switch cam (107) to the follow-up cam (115).

(11) (541674-4 Series 4) Install the switch cam (107A, 107B) on the follow-up cam (115), over the pin (110).

(12) (541674-4 Series 4) Use the screws (95) to secure the plate (97) and switch cam (107A, 107B) to the follow-up cam (115). Make sure there is no gap between the switch cam (107A, 107B) and the follow-up cam (115).

(13) Secure the screws (95) using NASM33540 lockwire.

**H. Replacement of Loose or Damaged Bearing** (Subtask 21-20-36-300-008-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Remove the actuator plain bearing (150) from the machined housing extension (160).

(3) Measure the ID of the hole in the machined housing extension (160) from where the actuator plain bearing (150) was removed. The ID must be 0.2185 to 0.2190 inches (5.5499 to 5.5626 mm). If the ID hole is more than 0.2190 inch (5.5626 mm), replace the gear housing extension (147).

(4) Press in a new actuator plain bearing (150) so the top of the bearing is 0.570 to 0.580 inches (14.478 to 14.732 mm) from the opposite wall.

(5) Make sure the actuator plain bearing (150) bore is 0.1560 to 0.1565 inches (3.9624 to 3.9751 mm) diameter.

**I. Repair of Dry-Film Lubricant** (Subtask 21-20-36-300-009-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) If dry-film lubricant on nut (370), jackscrew assembly (375), or gear assembly (440) is scratched or scored to the base metal, or if more than 20 percent of base metal shows, refinish parts with dry-film lubricant. Dry-film lubricant thickness must not be more than 0.001 inch (0.0254 mm).

(3) Use AS5272, Type I dry-film lubricant on nut (370). Use AS5272, Type I dry-film lubricant on jackscrew assembly (375). Use AS5272, Type I dry-film lubricant on gear assembly (440).

**J. Replacement of Loose or Damaged Spacer** (Subtask 21-20-36-300-010-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Make a record of the gear case side of the motor mounting plate (415). This is the side with the plain spacer (410) above the surface.

(3) Remove the plain spacer (410).

(4) Press the new plain spacer (410) into the motor mounting plate (415). Make sure the plain spacer is 0.060 to 0.070 inches (1.524 to 1.778 mm) above the surface of the motor mounting plate on the gear case side.

**K. Replacement of Loose or Damaged Bushing** (Subtask 21-20-36-300-011-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

**WARNING: USE THE CORRECT PERSONAL PROTECTION. PROCEDURES THAT NEED GRIND/MACHINE WORK WILL CAUSE LOOSE PARTICLES THAT CAN GET IN YOUR EYES.**

(2) Machine out the bushing (460).

(3) Make sure the machined housing (465) is clean. Refer to CLEANING.

(4) Measure the bore in the machined housing (465) where the new bushing will be inserted. It must be 0.575 to 0.576 inches (14.605 to 14.6304 mm) diameter. Replace the machined housing if the bore is more than specified.

(5) Press in a new bushing (460) until it is flush with the machined housing outside surface.

(6) Ream the bushing (460) to a 0.4920 to 0.4925 inches (12.4968 to 12.5095 mm) inside diameter.

(7) Make sure the bushing (460) and machined housing (465) are clean. Refer to CLEANING.

**L.** **Job Close-up** (Subtask 31-61-79-300-012-A01)

(1) Remove all tools, equipment, used parts, and materials from the work area.

# ASSEMBLY

1. **Planning Data** (TASK 21-20-36-99C-807-A01)

   A. **Reason for the Job** (Subtask 21-20-36-99C-014-A01)

      (1) Use these procedures to assemble the LRU. Do only those procedures that are applicable to the disassembly done.

   B. **Job Setup Data** (Subtask 21-20-36-99C-015-A01)

      (1) You can use equivalent alternatives for the special tools, fixtures, equipment, and consumable materials unless specified differently. The user must find equivalent alternatives.

      (2) Refer to Table 7001 for the special tools, fixtures, and equipment in this section.

      (3) CAGE codes and manufacturer's addresses are available at https://cage.dla.mil.

**Table 7001. Special Tools, Fixtures, and Equipment**

| Number | Description | Source |
|---|---|---|
| | Calipers | Commercially available |
| | Soldering iron | Commercially available |
| 2025587-1 | Linear actuator interface test box<br>(Mates to 834380-3, -4 and actuator connector per MS24266R12B12SN) | CAGE: 06848 |
| 834380-3 | Linear actuator test stand | CAGE: 06848 |
| 834380-4 | Linear actuator test stand | CAGE: 06848 |

**WARNING: BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

(4) Refer to Table 7002 for the consumable materials in this section.

**Table 7002. Consumables**

| Number | Description | Source |
|---|---|---|
| A-A-883 | Masking tape (SAE-AMS-T-21595) | Commercially available |
| AA52080-C-5 | Lacing tape | Commercially available |
| Desoclean 45 | Solvent | CAGE: 83574 |
| FA1076 | Adhesive | CAGE: 79833 |
| M39029/31-627 | Electrical pins | CAGE: 96906 |
| MIL-PRF-23827, Type II | Grease | Commercially available |

**Table 7002. Consumables (Cont)**

| Number | Description | Source |
|---|---|---|
| MIL-PRF-7808 | Oil | Commercially available |
| MIL-V-173, Notice 1 | Varnish | Commercially available |
| MS20995C020 | Lockwire | Commercially available |
| NASM20995 | Lockwire | Commercially available |
| NASM33540 | Lockwire | Commercially available |
| S8935F0S30 | Wire leads (black) | CAGE: 06848 |
| S8935F1S52 | Wire leads (brown) | CAGE: 06848 |
| S8935F2S45 | Wire leads (red) | CAGE: 06848 |
| S8935F2S55 | Wire leads (red) | CAGE: 06848 |
| S8935F3S60 | Wire leads (orange) | CAGE: 06848 |
| S8935F4S35 | Wire leads (yellow) | CAGE: 06848 |
| S8935F5S35 | Wire leads (green) | CAGE: 06848 |
| S8935F5S45 | Wire leads (green) | CAGE: 06848 |
| S8935F5S60 | Wire leads (green) | CAGE: 06848 |
| S8935F7S35 | Wire leads (blue) | CAGE: 06848 |
| S8935F7S45 | Wire leads (violet) | CAGE: 06848 |
| S8935F8S44 | Wire leads (grey) | CAGE: 06848 |
| S8935F90S35 | Wire leads (white/black) | CAGE: 06848 |
| S8935F9S44 | Wire leads (white) | CAGE: 06848 |
| S9352-10-0-400 | Sleeving | CAGE: 06848 |
| S9352-14-0-800 | Sleeving | CAGE: 06848 |
| S9352-14-0 | Sleeving | CAGE: 06848 |
| Sn60 | Solder (EIA J-STD-006) | Commercially available |
| Stabond C-lll | Adhesive | CAGE: 25670 |
| TT-P-1757, Type I, Class C, Color Y or T | Zinc chromate primer | Commercially available |

(5) The list that follows identifies Honeywell publications that are related to this section:

- Not applicable.

**2.** **Procedure** (TASK 21-20-36-400-801-A01)

**A.** **Job Setup** (Subtask 21-20-36-400-001-A01)

**WARNING:** **BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

CAUTION: DO NOT HIT OR LET THE LRU FALL DURING THESE PROCEDURES. THE LRU CONTAINS AN ASSEMBLY THAT CAN BE DAMAGED FROM INCORRECT USE.

CAUTION: DO THESE PROCEDURES IN A CLEAN ENVIRONMENT TO PREVENT DAMAGE TO THE MECHANICAL COMPONENTS.

CAUTION: BEFORE YOU USE ISOPROPYL ALCOHOL, DO A TEST TO MAKE SURE THAT IT DOES NOT CAUSE DAMAGE TO THE PAINTED SURFACES.

CAUTION: DO NOT LET THE ISOPROPYL ALCOHOL TOUCH THE CONNECTOR BODY. IT CAN CAUSE DAMAGE TO THE PARTS. USE ISOPROPYL ALCOHOL CAREFULLY WHEN YOU CLEAN FLUX FROM THE SOLDER CONNECTIONS.

(1) Obey the precautions.

(2) The item numbers shown in the DPL are the same as the item numbers on the exploded view illustration(s). To find a part number, find the part on the illustration and note the item number. Find the item number in the parts list and read the correct part number. Item numbers refer to the same figure until a different figure is specified.

(3) If applicable, refer to the data written during disassembly for the location of the tie points and where to connect the components and wires.

**B.** **General Assembly Procedures** (Subtask 21-20-36-400-002-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Replace all parts that do not meet INSPECTION/CHECK requirements or cannot be repaired.

(3) Do all assembly procedures in a dry, well-lighted area that is free from dust.

(4) Torque values shown do not include frictional torque by self-locking devices or rundown resistance. Frictional torque values must be added to the specified torque.

**WARNING:** **PRIMER IS FLAMMABLE AND TOXIC TO EYES, SKIN AND RESPIRATORY TRACT. SKIN AND EYE PROTECTION REQUIRED. AVOID REPEATED OR PROLONGED CONTACT. USE ONLY IN WELL-VENTILATED AREAS. KEEP AWAY FROM OPEN FLAMES OR OTHER SOURCES OF IGNITION.**

(5) Apply a layer of TT-P-1757, Type I, Class C, Color Y or T zinc chromate primer to the threads of screws. Install the screws while the primer is moist.

**WARNING:** **USE CORRECT PROTECTION IN AN AREA WITH A GOOD FLOW OF AIR. SOLVENT CAN CAUSE SKIN, EYE, AND RESPIRATORY DAMAGE. DO NOT USE NEAR AN OPEN FLAME.**

(6) Make sure the mating surfaces of the machined housing (465), motor (405), grounding terminal strip (395), terminal (300A), machined housing extension (160), and capacitor-filter assembly (25) are clean for a good electrical bond between components. Use Desoclean 45 solvent to make sure the parts are clean.

(7) Refer to Figure 2002, Table 2006, Figure 2003, and Table 2007 for a wiring diagram of the ram air modulation linear electromechanical actuator.

**C. Assembly of the Gear Housing Extension, Switch Operating Arms, Switch Cams, Pins, Screws, Follow-up Cams, Pin Retaining Plates, Switch Gearshaft, and Switch Operating Cam Guide** (Subtask 21-20-36-400-003-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) If necessary, refer to REPAIR to install the bushing (460).

(3) Do not apply MIL-PRF-23827, Type II grease to the gearshaft (120) threads or guide (145) where the cams move.

(4) Install the guide (145) through the hole in the machined housing extension (160).

(5) Use washers (130, 135, 140) as necessary for a 0.000 to 0.005 inch (0.000 to 0.127 mm) guide endplay. Install washers on the end of the guide (145) which is nearest the gears.

(6) Install the ring (125) on the end of the guide (145) which is opposite the washer (130, 135, 140) installation.

(7) (541674-1-1, -3, -4 Series 1 and 2, -5, -6) Mount the assembled arms (100, 105), pins (110), screws (95), and cams (115) on the gearshaft (120). Torque the screws (95) to 1.2 to 2.2 in-lb (0.13 to 0.25 Nm) and secure with MS20995C020 lockwire. Refer to NASM33540. Keep Dimension F. Refer to Figure 7001.

(8) (541674-4 Series 3) Mount the assembled arms (107, IPL Figure 1), plates (97), pins (110), screws (95), and cams (115) on the gearshaft (120). Torque the screws (95) to 1.2 to 2.2 in-lb (0.13 to 0.25 Nm) and secure with MS20995C020 lockwire. Refer to NASM33540. Keep Dimension F. Refer to Figure 7001.

(9) (541674-4 Series 4) Mount the assembled arms (107A, 107B, IPL Figure 1), plates (97), pins (110), screws (95), and cams (115) on the gearshaft (120). Torque the screws (95) to 1.2 to 2.2 in-lb (0.13 to 0.25 Nm) and secure with MS20995C020 lockwire. Refer to NASM33540. Keep Dimension G. Refer to Figure 7001.

(10) Make sure the cams (115, IPL Figure 1) are square to the gearshaft (120). The cams can drag on the guide (145) if they are not installed correctly.

**WARNING:** **USE THE CORRECT PERSONAL PROTECTION. OIL CAN HAVE AN ADDITIVE CALLED TRICRESYL PHOSPHATE IN IT. THIS CHEMICAL IS AN ASPHYXIANT; IT IS POISONOUS AND CAN BE ABSORBED THROUGH THE SKIN.**

(11) Apply a light layer of MIL-PRF-7808 oil to the actuator plain bearing (150) in the machined housing extension (160) and to the bearing (75) that will go in the machined housing extension (160) after the gearshaft (120) is installed.

(12) Install the gearshaft (120) in the machined housing extension (160).

(13) Install the bearing (75) in the machined housing extension (160) on the gearshaft (120).

(14) Use the washers (80, 85, 90) as necessary to get a 0.000 to 0.003 inch (0.000 to 0.076 mm) gearshaft (120) endplay.

(15) When the gearshaft (120) endplay is correct, secure the bearing (75) in the machined housing extension (160) with the ring (70).

(16) Make sure the gearshaft (120) rotates without binding.

(17) Install the rivet (146) in the machined housing extension (160) if it has been removed.

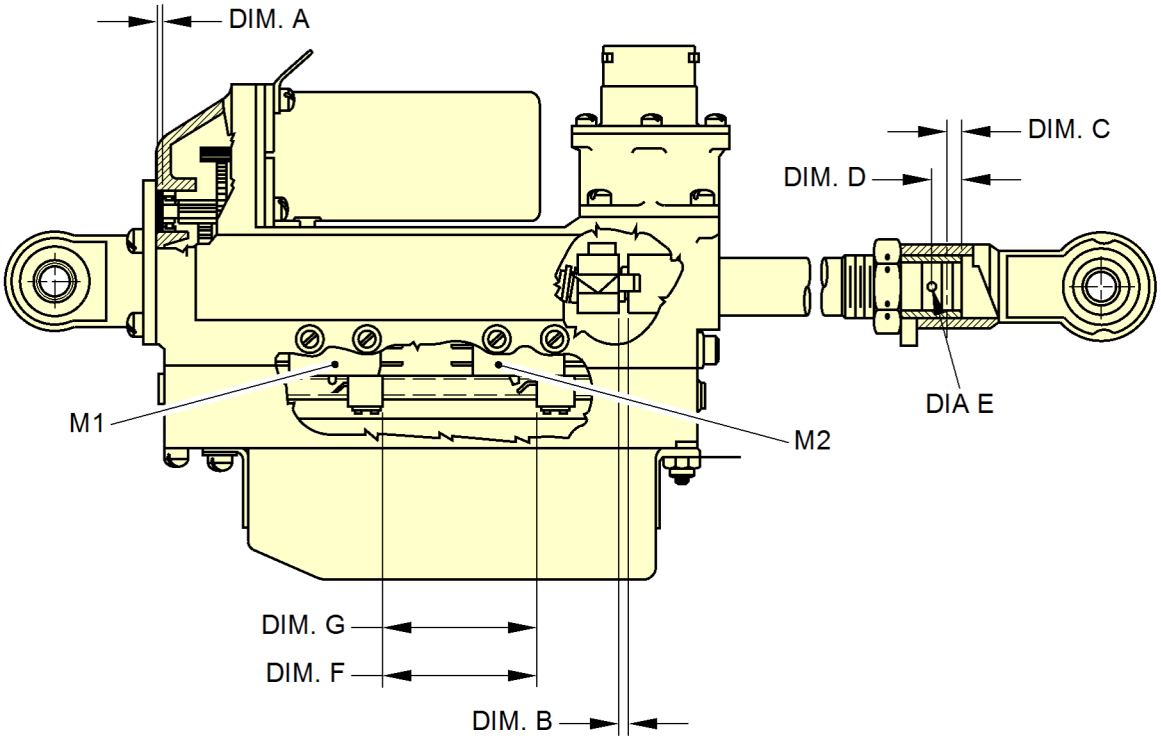


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**Figure 7001. Assembly Requirements**

**Dimensional Limits for Figure 7001**

| Reference | Limits Inches (mm) | Reference | Limits Inches (mm) |
|---|---|---|---|
| DIM. A | 0.002 TO 0.006 (0.0508 TO 0.1524) | DIA E | 0.0937 TO 0.0941 (2.37998 TO 2.39014) |
| DIM. B | 0.075 (1.905) MAXIMUM | DIM. F (EFFECT CODES A,B,C,D,E,F,G,H,J) | 1.12 (28.448) APPROX |
| DIM. C | 0.12 TO 0.14 (3.048 TO 3.556) | DIM. G (EFFECT CODE K) | 1.22 (30.988) APPROX |
| DIM. D | 0.26 TO 0.28 (6.604 TO 7.112) | | |

**D. Installation of the Ram Air Modulation Linear Electromechanical Actuator Switch Assemblies** (Subtask 21-20-36-400-004-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Install a washer (255) on the screw (265).

(3) Install the screw (265) in the machined housing (465) with the washer (255).

(4) Find the amount of shim washers (245, 250, 253) plus one washer (240) necessary to get a maximum of 0.005 inch (0.127 mm) screw endplay when the washers are installed on the screw, between the machined housing (465) and the pin (225). Temporarily install a pin (225) to check the endplay. Hold the endplay as close to 0.000 inch (0 mm) as possible without binding the screw (265).

(5) Remove the temporary pin (225).

(6) Loosen the screw (265) out of the machined housing (465) approximately halfway. Add the shim washers (245, 250, 253) next to the machined housing (465). Install a washer (240).

(7) Install the switch assemblies (230, 235) on the screw (265).

(8) Put the end of the screw (265) in the hole in the opposite end of the machined housing (465).

(9) Install a new pin (225) in the screw (265).

(10) Install a washer (255) on the other screw (260).

(11) Install the screw (260) in the machined housing (465) with the washer (255).

(12) Find the amount of shim washers (245, 250, 253) plus one washer (240) necessary to get a maximum of 0.005 inch (0.127 mm) screw endplay when the washers are installed on the screw, between the machined housing (465) and the pin (225). Temporarily install a pin (225) to check the endplay. Hold the endplay as close to 0.000 inch (0 mm) as possible without binding the screw.

(13) Loosen the screw (260) out of the machined housing (465) to be able to install the shim washers (245, 250, 253) next to the machined housing (465). Install a washer (240).

(14) Put the screw (260) through the switch assembly (235).

(15) (541674-4 Series 2, 3, 4) Install a piece of S9352-10-0-400 sleeving approximately 1.0 inch (25.4 mm) in length on the screw (260) threads so it will be between the switch assemblies (235).

(16) Put the screw (260) through the second switch assembly (230).

(17) Put the end of the screw (260) in the hole in the opposite end of the machined housing (465).

(18) Do not install a new pin (225) in the screw (260) at this time.

(19) Install the clips (215, 220) on the switch assemblies (230, 235).

**E. Installation of the Jackscrew Assembly and Gear Assembly** (Subtask 21-20-36-400-005-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

**WARNING: USE THE CORRECT PERSONAL PROTECTION. OIL CAN HAVE AN ADDITIVE CALLED TRICRESYL PHOSPHATE IN IT. THIS CHEMICAL IS AN ASPHYXIANT; IT IS POISONOUS AND CAN BE ABSORBED THROUGH THE SKIN.**

(2) Apply a layer of MIL-PRF-7808 oil on the jackscrew assembly (375). Remove extra oil if necessary.

(3) Apply a light layer of MIL-PRF-23827, Type II grease to the follow up nut (370) and the slot in the bottom of the machined housing (465).

(4) Partially install the jackscrew assembly (375) in the nut assembly (380).

(5) Put the jackscrew assembly (375) and nut assembly (380) in the machined housing (465).

**NOTE:** Position the slot in the nut assembly (380) so that it faces the opposite direction of the connector (185A).

(6) Apply a light layer of MIL-PRF-23827, Type II grease to the gear assembly (440).

(7) Install the bearing (435) on the gear assembly (440) shaft next to the large gear.

(8) Install the gear assembly (440) in the machined housing (465) with the pinion gear through the bearing recess in the cap end of the machined housing (465). Install the bearing (435) end of the gear assembly (440) in the machined housing (465). Install another bearing (435) on the pinion end of the gear assembly (440) through the machined housing (465).

(9) Temporarily install the spacer (430) and washer (420, 425). Use a piece of A-A-883 masking tape to keep the spacer and washer in place.

(10) Install the follow up nut (370) so it is aligned with the slots in the machined housing (465) and nut assembly (380).

(11) Thread the jackscrew assembly (375) through follow up nut (370) trying to keep a maximum gap of 0.075 inch (1.905 mm). Refer to Dimension B in Figure 7001.

**NOTE:** A minimum gap of 0.010 inch (0.254 mm) is preferred so that the ram air modulation linear electromechanical actuator moves freely.

(12) Install bearing (450, IPL Figure 1) in the machined housing (465).

(13) Apply a light layer of MIL-PRF-23827, Type II grease to the gear (360).

(14) Put the key (365) in the jackscrew assembly (375) keyway.

(15) Put the gear (360) in the machined housing (465) next to the bearing (450). Make sure the gear teeth are away from the bearing.

(16) Insert the jackscrew assembly (375) through the gear (360) and bearing (450). Align the keyway slot in the gear with the key (365). Install the gear (360) over the key until the gear touches the jackscrew assembly worm gear.

(17) Install the nut (295) on the jackscrew assembly (375). Align a slot in the nut with the hole in the jackscrew assembly (375).

(18) Install the pin (290) through the follow up nut (370) and jackscrew assembly (375).

(19) Make sure the pin (290) is centered in the follow up nut (370). Center punch stake the pin in the follow up nut with a 0.005 inch (0.127 mm) maximum protrusion around the stop to hold it in place.

(20) Apply AA52080-C-5 lacing tape as shown in Figure 7002. Secure lacing tape knots with MIL-V-173, Notice 1 varnish.

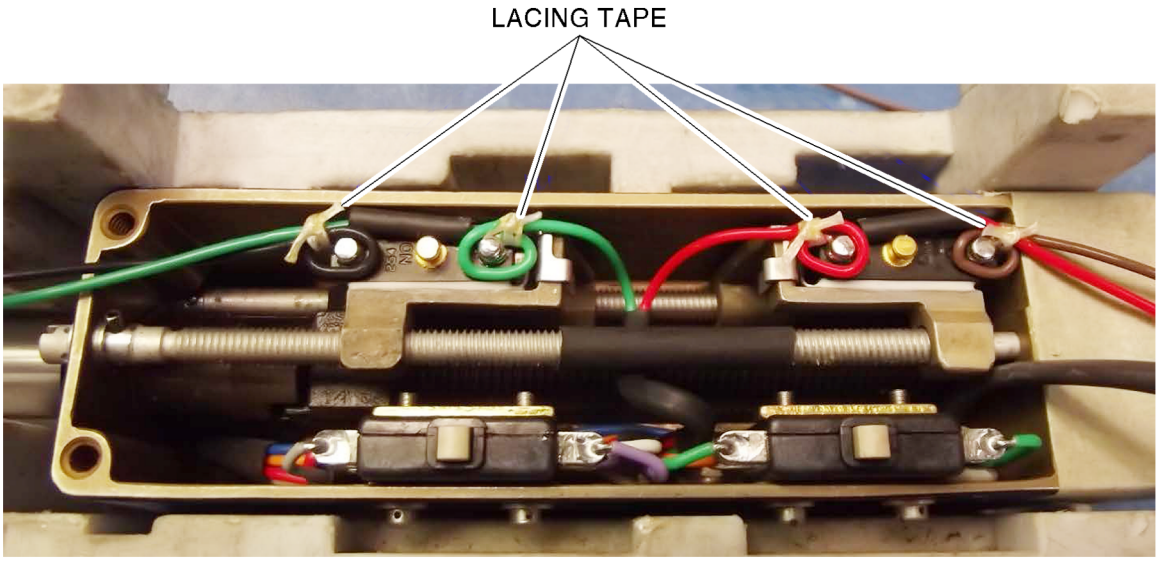


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**Figure 7002. Jackscrew and Gear Assembly Lacing Tape Placement**

**F. Setting the Mechanical Stroke** (Subtask 21-20-36-400-006-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Calculate depth at full extend.

(a) Completely extend the jackscrew assembly (375).

(b) Measure the depth flush with the end of the nut assembly (380). Put calipers or equivalent on the outer face of the jackscrew end and carefully measure the depth perpendicular to the nut assembly (380) end face. Be careful not to measure the counterbore in the jackscrew assembly (375).

(3) Calculate depth of the nut assembly (380) as follows:

(a) (541674-1-1) Subtract the nominal stroke 2.8925 inches (73.4695 mm) from the depth dimension determined above. The result equals the depth of the nut assembly (for stop (355)).

(b) (541674-3, -4, -5, -6) Subtract the nominal stroke 2.608 inches (66.2432 mm) from the depth dimension determined above. The result equals the depth of the nut assembly (for stop (355)).

(4) Calculate the recess or protrusion of the stop (355).

(a) Measure the length of the stop (355).

(b) Subtract the depth of the nut assembly (380) from the stop (355) dimension. The result equals the protrusion (+) or recess (-) of the stop (355).

**NOTE:** The stop will be flush if the result is 0.00 inch (0 mm). The stop will protrude if the result is positive. The stop will be recessed if the result is negative.

**G. Installation of Stop in the Ram Air Modulation Linear Electromechanical Actuator Nut Assembly** (Subtask 21-20-36-400-007-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Install a used stop (355) in a used nut assembly (380).

(a) Align the holes in the stop (355) with the holes for the pins (350) in the nut assembly (380).

(b) Install the stop (355) with the slotted end outward.

(c) Push the pins (350) in place.

(3) Install a new stop (355) as follows:

**NOTE:** Install a new stop (355) if a new nut assembly (380) is used.

(a) If a new stop (355) and the existing nut assembly (380) is used, insert the stop in the nut assembly at the dimension determined above.

**NOTE:** The stop will be flush if the result is 0.00 inch (0 mm). The stop will protrude if the result is positive. The stop will be recessed if the result is negative.

(b) Use the holes in the nut assembly (380) as pilot holes to drill the holes through the stop (355). The hole diameter is Diameter E. Refer to Figure 7001.

(c) Install the pins (350, IPL Figure 1).

(d) After assembly of the stop (355) is complete, chase the threads on the nut assembly (380) with a 9/16-32NS3A die.

(e) If a new stop (355) and new nut assembly (380) are used, insert the stop in the nut assembly at the dimension determined above.

**NOTE:** The stop will be flush if the result is 0.00 inch (0 mm). The stop will protrude if the result is positive. The stop will be recessed if the result is negative.

(f) Put the pin holes 90 degrees from each other at Dimension C and Dimension D. Refer to Figure 7001.

(g) Drill one hole to Diameter E. Refer to Figure 7001.

(h) Install one pin (350, IPL Figure 1) in the drilled hole.

(i) Drill the other hole to the same Diameter E. Refer to Figure 7001.

(j) Install the other pin (350, IPL Figure 1).

(k) After assembly of the stop (355) is complete, chase the threads on the nut assembly (380) with a 9/16-32NS3A die.

(4) Install a new pin (225) in the screw (260) at this time. Make sure a washer (240) is against the pin (225).

(5) Make sure the screws (445) are installed in the machined housing (465).

**NOTE:** The screws fill holes in the machined housing (465). They do not attach parts.

**H. Installation of the Ram Air Modulation Linear Electromechanical Actuator End Fittings** (Subtask 21-20-36-400-008-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Remove the tape that was temporarily used to hold the spacer (430) and washer(s) (420, 425) in place.

(3) Use the screws (280) and washers (285) to temporarily attach the fitting (289) to the machined housing (465).

(4) Measure the gear assembly (440) endplay. It must be 0.002 to 0.006 inches (0.0508 to 0.1524 mm). Find the thickness of washers (420, 425) necessary to get the correct endplay. Refer to Dimension A in Figure 7001.

(5) Remove the fitting (289, IPL Figure 1). Install the thickness of washers (420, 425) necessary for the correct endplay.

(6) Use the screws (280) and washers (285) to attach the fitting (289) to the machined housing (465).

(7) Thread the nut (345) on the nut assembly (380).

(8) Install the washer (340) on the nut assembly (380). Make sure that the tang on the washer (340) inside diameter is correctly positioned in the slot on the nut assembly (380).

(9) Install the fitting (335) on the nut assembly (380).

(10) Make sure that the tangs on the washer (340) are correctly positioned in the slots of the fitting (335).

(11) Measure the dimension from the centerline of each mounting eye with the nut assembly (380) fully extended.

(a) (541674-1-1) The extended length from fitting (289) to fitting (335) must be 11.21 inches (284.734 mm).

(b) (541674-3, -4, -5, -6) The extended length from fitting (289) to fitting (335) must be 10.92 inches (277.368 mm).

(12) Align the fitting (335) parallel to the fitting (289) with angular rotation divided equally within ±7 degrees.

(13) Secure the nut (345) and washer (340) using NASM20995 lockwire.

**I. Installation of the AC Motor** (Subtask 21-20-36-400-009-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Apply a light layer of MIL-PRF-23827, Type II grease to the motor (405) pinion.

(3) Install the plate (415) on the machined housing (465). Make sure the spacer (410) is towards the machined housing (465), away from the motor (405).

(4) (541674-4 Series 2, 3, 4) Notch a hole 0.50 inch (12.70 mm) from one end of a piece of S9352-14-0-800 sleeving approximately 3.00 inches (76.20 mm) in length.

(5) (541674-4 Series 2, 3, 4) Slide the sleeving over the motor leads. The leads need to be put in the notch with the notch towards the motor (405).

(6) Pull the motor leads through the plate (415) and machined housing (465).

(7) Install the motor (405). Use the clamps (400) and screws (385, 390) to secure the motor (405). Make sure the grounding terminal (395) is attached as shown in IPL Figure 1 and Figure 7001.

**NOTE:** Orientation of the clamps (400, IPL Figure 1) is optional.

(8) Apply FA1076 adhesive or Stabond C-lll adhesive where the motor leads enter the machined housing (465).

**J. Assembly of the Wiring** (Subtask 21-20-36-400-010-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Attach a terminal (300A) on the two white motor leads tied together.

(3) If a terminal (300A) is not on the white ground lead from the connector to the machined housing (465), attach the terminal (300A).

CAUTION: THE WIRING DIAGRAM PLATE CAN BE DAMAGED. THE SCREW (310) IS COUNTERSUNK BEHIND THE WIRING DIAGRAM PLATE. DO NOT PRESS ON THE SCREW (310) FROM THE INSIDE OF THE HOUSING UNLESS THE WIRING DIAGRAM PLATE IS REMOVED.

(4) If the screw (310) has been removed, insert the screw in the machined housing (465). Put the terminals (300A) and nut (305A) on the screw (310). Install the nut (305A) on the screw (310).

**NOTE:** If the wiring diagram plate is installed, apply pressure on the screw head with your finger to keep the screw from damaging the wiring diagram plate while the nut is tightened.

(5) Pull the wires through the machined housing (465) to where the adapter (200) will be installed.

(6) Form the wires in the machined housing (465).

CAUTION: THE WIRING DIAGRAM PLATE CAN BE DAMAGED. THE SCREW (325) IS COUNTERSUNK BEHIND THE WIRING DIAGRAM PLATE. DO NOT PRESS ON THE SCREW (325) FROM THE INSIDE OF THE HOUSING UNLESS THE WIRING DIAGRAM PLATE IS REMOVED.

(7) If the screw (325) has been removed, insert the screw (325) in the machined housing (465).

(8) Keep the wires in place with a clip (315) and nut (320A) installed on the screw (325). Apply pressure on the screw head with your finger to keep the screw from damaging the wiring diagram plate while the nut is tightened.

**NOTE:** If the wiring diagram plate is installed, apply pressure on the screw head with your finger to keep the screw from damaging the wiring diagram plate while the nut is tightened.

(9) Use the screws (170), washers (175), and lockplates (180) to attach the switches (165) and insulators (182) to the machined housing (465).

**NOTE:** Lockplates (180) with an undercut on one side must be oriented with the flat side away from the switches (165) or binding of the switch plunger may occur.

(10) Rotate the jackscrew assembly (375) by hand to make sure it rotates smoothly.

**WARNING: USE CORRECT PROTECTION. WELDING, CUTTING, BRAZING OR SOLDERING OPERATIONS CAUSE HEAT, METAL FUMES, SLAG, RADIATION AND LOOSE PARTICLES. THESE OPERATIONS MUST BE DONE ONLY BY QUALIFIED PERSONNEL.**

(11) Use a soldering iron to solder the wires to the switches (165) and switch assemblies (230, 235) using Sn60 solder. Refer to Figure 2002 or Figure 2003 for the ram air modulation linear electromechanical actuator wiring diagram.

**NOTE:** Do not use liquid or paste flux to solder switches.

**WARNING:** **USE CORRECT PROTECTION. WELDING, CUTTING, BRAZING OR SOLDERING OPERATIONS CAUSE HEAT, METAL FUMES, SLAG, RADIATION AND LOOSE PARTICLES. THESE OPERATIONS MUST BE DONE ONLY BY QUALIFIED PERSONNEL.**

(12) Pull the motor wires and switch wires through the machined housing extension (160, IPL Figure 1). Solder the wires to the capacitor-filter assembly (25) using Sn60 solder.

(13) Apply AA52080-C-5 lacing tape as shown in Figure 7003. Secure lacing tape knots with MIL-V-173, Notice 1 varnish.

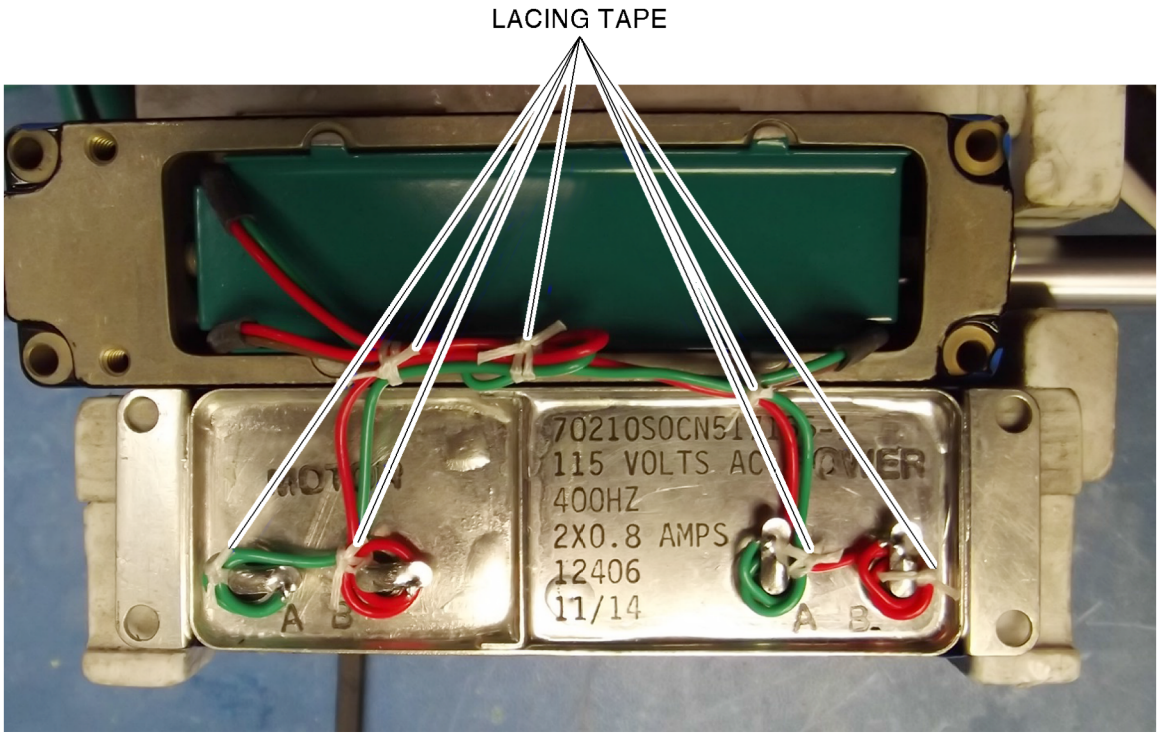


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**Figure 7003. Wiring Harness Lacing Tape Placement**

(14) Sleeve the brown wire (from the retract switch) and the black wire (from the extend switch) between where the wires exit the housing and the connector with S9352-14-0 sleeving cut to approximately 2.0 inches (50.8 mm) in length.

(15) Pull the wires through the machined housing (465) to the hole for the adapter (200).

(16) Install the adapter (200) over the wires.

(17) Use screws (205) and washers (210) to attach the adapter to the machined housing (465).

(18) Secure the screws (205) using NASM33540 lockwire.

(19) Make sure there are no pieces of wire or solder drippings in the machined housing (465).

(20) Insert the M39029/31-627 electrical pins in the actuator connector (185A). Refer to Figure 2002 or Figure 2003 for the ram air modulation linear electromechanical actuator wiring diagram.

(21) Secure wire bundle by applying AA52080-C-5 lacing tape as shown in Figure 7004. Secure lacing tape knots with MIL-V-173, Notice 1 varnish.


ICN-70210-0000597633-001-01

**Figure 7004. Connector Harness Lacing Tape Placement**

(22) Use the screws (190, IPL Figure 1) and washers (195) to attach the actuator connector (185A) to the adapter (200). Note the orientation of the keyway on the connector. Refer to Figure 7005.

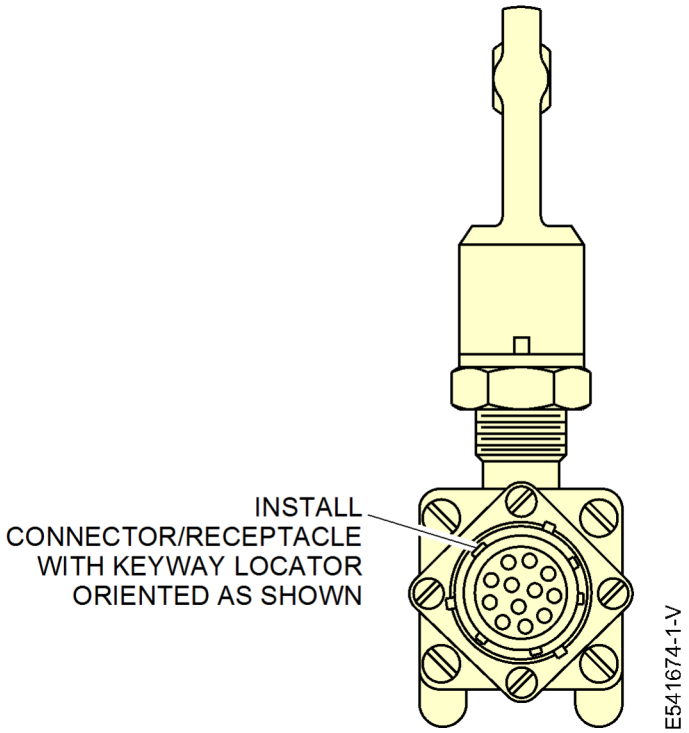


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**Figure 7005. Connector Assembly Requirements**

(23) Turn the gearshaft (120, IPL Figure 1) until the cam arms align with the switches.

(24) Install the protector (45) on the machined housing extension (160).

(25) Install the screws (50) and washers (55) in the machined housing extension (160), but do not thread the screws into the machined housing (465). Fasten the capacitor filter assembly (25) to the machined housing with screws (30) and washers (40). Do not install the nuts (35) or washers (40).

**K. Calibration of the Ram Air Modulation Linear Electromechanical Actuator Switch Assemblies and DPDT Switches** (Subtask 21-20-36-400-011-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Install the ram air modulation linear electromechanical actuator in the 834380-3 linear actuator test stand or 834380-4 linear actuator test stand. Refer to Figure 1002. Make sure the fittings (289, 335, IPL Figure 1) are restrained from rotating. Refer to Figure 2001 for the ram air modulation linear electromechanical actuator schematic diagram.

(3) Use 2025587-1 linear actuator interface test box to connect the ram air modulation linear electromechanical actuator electrical connector to the 834380-3 linear actuator test stand or 834380-4 linear actuator test stand.

(4) With no load applied to the ram air modulation linear electromechanical actuator, intermittently apply power to retract the ram air modulation linear electromechanical actuator to the electrical retracted length. Turn the screw (265, IPL Figure 1) CW to move the retract limit switch assembly (230) toward the follow up nut (370) until the switch clicks.

**NOTE:** If a switch assembly is moved past the trip position during adjustment, back off and readjust the switch to click open.

(5) With the ram air modulation linear electromechanical actuator in the retracted position, make sure the end fittings are aligned. The fitting (335) must be set to give an adjustment of 0.250 inch (6.350 mm) in retract or extend direction.

(6) Intermittently apply power to travel the ram air modulation linear electromechanical actuator to the electrical extended length. Turn the screw (260) CCW to travel the limit switch assembly (235) toward the follow up nut (370) until the switch clicks.

(7) With the two switches set, pulse the ram air modulation linear electromechanical actuator at no load and 45 VAC maximum in the switches. Retracted and extended lengths must be within tolerances given in Table 1, for the correct ram air modulation linear electromechanical actuator.

(8) Put the ram air modulation linear electromechanical actuator in the electrical retract position. Turn the gear on the gearshaft (120) to position the arms (100, 105, 107, 107A, 107B) so that the foot of the arms will engage each of the plungers on the switches (165) as close to heel of arms as possible.

CAUTION: THE ARMS (100, 105, 107, 107A, 107B) MUST BE POSITIONED SO THE HEEL OF THE ARM WILL NOT LOSE CONTACT WITH PLUNGER OF SWITCHES (165), FROM SWITCH ACTUATION POINT TO FULL MECHANICAL RETRACT POSITION. KEEP DIMENSION F OR DIMENSION G IN FIGURE 7003 AND TABLE 7005 TO MAKE SURE CONTACT WILL OCCUR AND ARMS (100, 105, 107, 107A, 107B, IPL FIGURE 1) ARE POSITIONED CORRECTLY.

(9) Do the steps that follow until the M1 switch (165) actuates within the necessary range:

(a) Temporarily install the machined housing extension (160) with the attached parts and fasten with a screw (60) and washer (65), and with screws (50) and washers (55). Make sure that the arms (100, 105, 107, 107A, 107B) are positioned so that the foot of the arms will engage each of the plungers on the switches (165) as close to heel of arms as possible.

(b) Intermittently operate the ram air modulation linear electromechanical actuator toward the extend position. Make sure that the electrical continuity is kept between the connector Pins 2 and 3, and between Pins 5 and 10, from the electrical retract position to a distance of 0.70 to 0.785 inches (17.78 to 19.939 mm) from the electrical retract position.

(c) If the continuity is not kept within the given range, correct as follows:

1 Write the magnitude and direction of out of tolerance condition.

2 Drive the ram air modulation linear electromechanical actuator back to the electrical retract position.

3 Remove the temporarily installed machined housing extension (160). Turn the gear of gearshaft (120) one tooth for each 0.0074 inch (0.18796 mm) of travel error.

4 Turn the gear CW (viewing fixed mounting eye end of ram air modulation linear electromechanical actuator) when continuity is lost at an extension less than 0.70 inch (17.780 mm).

5 Turn the gear CCW when continuity is lost at an extension more than 0.785 inch (19.939 mm).

CAUTION: IF THE GEARSHAFT (120) IS TURNED IN A CLOCKWISE DIRECTION, MAKE SURE THE ARMS (100, 105, 107, 107A, 107B) WILL STILL MAKE CONTACT WITH THE PLUNGERS OF SWITCHES (165) WHEN EXTENSION IS REINSTALLED. ROTATION IN THE COUNTERCLOCKWISE DIRECTION WILL AUTOMATICALLY MAKE SURE CONTACT WILL OCCUR BETWEEN ARMS AND SWITCH PLUNGERS.

(10) Do the steps that follow until the M2 switch (165) actuates within the necessary range:

(a) With the M1 switch (165) calibrated correctly, intermittently drive the ram air modulation linear electromechanical actuator toward the extend position. Make sure that electrical continuity exists between Pins 3 and 4. Make sure there is no continuity between Pins 5 and 10 from the extension (from the electrical retract position) of less than 0.785 inch (19.939 mm) to the electrical extend position.

(b) Intermittently drive the ram air modulation linear electromechanical actuator from the extend position toward the retract position. Make sure that the electrical continuity is kept between the connector Pins 8 and 9 and between Pins 1 and 6 from the electrical extend 0.815 to 0.90 inches (20.701 to 22.860 mm) of travel from the electrical retract position.

(c) If the continuity is not within the necessary range, correct as follows:

1 Write the magnitude and direction of the out of tolerance condition.

2 Drive the ram air modulation linear electromechanical actuator to the electrical extend position.

3 Loosen the screws (170) that attach the M2 switch (165) to the machined housing (465). Adjust the position of the M2 switch 0.004 inch (0.1016 mm) for each 0.01 inch (0.254 mm) of travel error.

4 Move the switch to the right viewing heads of screws (170) when continuity is lost at an extension more than 0.90 inch (22.860 mm).

5 Move the switch to the left when continuity is lost at an extension less than 0.815 inch (20.701 mm).

(11) If the switch cannot be adjusted or the correct actuation made within the range of the switch adjustment, correct as follows:

(a) Intermittently drive the ram air modulation linear electromechanical actuator to the electrical retract position.

(b) Remove the temporarily installed machined housing extension (160).

(c) Turn the gear of gearshaft (120) one tooth for each 0.0074 inch (0.18796 mm) of travel error.

(d) Turn the gear CW (viewing fixed mounting eye end of the ram air modulation linear electromechanical actuator) when the continuity is lost at an extension less than 0.815 inch (20.701 mm).

(e) Turn the gear CCW when the continuity is lost at an extension more than 0.90 inch (22.860 mm).

(f) Recalibrate until the M1 and M2 switches (165) actuate within the necessary ranges as specified before.

(12) If adjustments can be made to get the correct actuation of the M1 and M2 switches (165), proceed to operate the ram air modulation linear electromechanical actuator from the extend toward the retract position. Make sure that electrical continuity exists between connector Pins 7 and 8, and no continuity exists between Pins 1 and 6, for a distance of 0.815 inch (20.701 mm) of travel from the retract position.

(13) If a combination of the M2 switch and gearshaft (120) adjustments cannot be made to get correct actuation of the M1 and M2 switches (165), the spacing between the cams (115) (Dimension F or Dimension G in Figure 7001) must be changed as follows:

(a) Remove the temporarily installed gear housing extension (147, IPL Figure 1) with attached parts.

(b) Remove the ring (125), guide (145), and washers (130, 135, 140).

(c) Turn the cam (115) for M2 switch (165) one revolution for each 0.076 inch (1.9304 mm) of travel error.

(d) Turn the cam CW (viewing the fixed mounting eye end of the ram air modulation linear electromechanical actuator) to increase Dimension F or Dimension G when the M1 switch actuation occurs at an extension less than 0.70 inch (17.780 mm or the M2 switch actuation occurs at an extension greater than 0.90 inch (22.86 mm) when the other switch actuates correctly.

(e) Turn the cam CCW to decrease Dimension F or Dimension G when the M1 switch actuation occurs at an extension more than 0.785 inch (19.939 mm) or the M2 switch actuation occurs at an extension less than 0.815 inch (20.701 mm) when the other switch actuates correctly.

(f) Install the guide (145) through the machined housing extension (160), washers (130, 135, 140), cams (115), and into the inner wall of the gear housing extension (147). Lock the guide (145) in place with the ring (125). Refer to IPL Figure 1 for washer and ring locations.

(g) Recalibrate until the M1 and M2 switches (165) actuate within the necessary ranges as specified before.

(14) After the switch adjustments are completed, continue to operate the ram air modulation linear electromechanical actuator from the extend toward the retract position. Make sure that electrical continuity exists between connector Pins 7 and 8, and no continuity exists between Pins 1 and 6, for a distance of 0.815 inch (20.701 mm) of travel from the retract position.

**L. Installation of the Machined Housing** (Subtask 21-20-36-400-012-A01)

(1) Refer to IPL Figure 1 for all the item numbers unless specified differently.

(2) Use the screws (50, 60) and washers (55, 65) to attach the machined housing extension (160) to the machined housing (465).

(3) Install the nuts (35) and washers (40) to attach the capacitor-filter assembly (25).

(4) Use NASM33540 lockwire to secure the screws (30, 60, 170).

(5) If necessary, refer to REPAIR to install the wiring diagram plate (20).

(6) If necessary, refer to REPAIR to install the identification plate (10D).

(7) Do the tests in TESTING AND FAULT ISOLATION.

**M. Job Close-up** (Subtask 21-20-36-400-013-A01)

(1) Remove all tools, equipment, used parts, and materials from the work area.

# FITS AND CLEARANCES

1. **Planning Data** (TASK 21-20-36-99C-808-A01)

   A. **Reason for the Job** (Subtask 21-20-36-99C-016-A01)

      (1) This section gives the fits and clearances used when the LRU was made.

      (2) This section gives the torque data required for repair and assembly of the LRU.

   B. **Job Setup Data** (Subtask 21-20-36-99C-017-A01)

      (1) Not applicable.

2. **Fits and Clearances** (TASK 21-20-36-220-801-A01)

   A. **Fits and Clearances of the Ram Air Modulation Linear Electromechanical Actuator** (Subtask 21-20-36-220-001-A01)

      (1) Refer to Table 8001 when you do the procedures in REPAIR and ASSEMBLY.

**Table 8001. Fits and Clearances**

| Design Limits (Manufacturing) | | | | | |
|---|---|---|---|---|---|
| Component (Item No., IPL Figure 1) | Condition to Measure | Diameter | | Diametrical Clearances(1) | |
| | | Minimum Inch (mm) | Minimum Inch (mm) | Minimum Inch (mm) | Minimum Inch (mm) |
| Bearing (75) | ID | 0.1557 (3.9548) | 0.1562 (3.9675) | 0.0002L (0.0051) | 0.0012L (0.0305) |
| Gearshaft (120) | OD | 0.1550 (3.9370) | 0.1555 (3.9497) | | |
| Bearing (150) | ID | 0.1560 (3.9624) | 0.1565 (3.9751) | 0.0005L (0.0127) | 0.0015L (0.0381) |
| Gearshaft (120) | OD | 0.1550 (3.9370) | 0.1555 (3.9497) | | |
| Machined housing extension (160) | ID | 0.2495 (6.3373) | 0.2500 (6.3500) | 0.0005L (0.0127) | 0.0015L (0.0381) |
| Bearing (75) | OD | 0.2485 (6.3119) | 0.2490 (6.3246) | | |
| Machined housing extension (160) | ID | 0.2180 (5.5372) | 0.2190 (5.5626) | 0.0015T (0.0381) | 0.0000 (0.0000) |
| Bearing (150) | OD | 0.2190 (5.5626) | 0.2195 (5.5753) | | |
| Fitting (289) | ID | 0.6552 (16.6421) | 0.6556 (16.6522) | 0.0010T (0.0254) | 0.0001T (0.0025) |
| Bearing (287) | OD | 0.6557 (16.6547) | 0.6562 (16.6675) | | |
| Fitting (335) | ID | 0.6552 (16.6421) | 0.6556 (16.6522) | 0.0010T (0.0254) | 0.0001T (0.0025) |
| Bearing (330) | OD | 0.6557 (16.6547) | 0.6562 (16.6675) | | |
| Bearing (450) | ID | 0.2500 (6.3500) | 0.2503 (6.3576) | 0.0000 (0.0000) | 0.0008L (0.0203) |
| Jackscrew assembly (375) | OD | 0.2495 (6.3373) | 0.2500 (6.3500) | | |

**Table 8001. Fits and Clearances (Cont)**

| Design Limits (Manufacturing) | | | | | |
|---|---|---|---|---|---|
| Component (Item No., IPL Figure 1) | Condition to Measure | Diameter | | Diametrical Clearances(1) | |
| | | Minimum Inch (mm) | Minimum Inch (mm) | Minimum Inch (mm) | Minimum Inch (mm) |
| Bearing (435) | ID | 0.1247 (3.1674) | 0.1250 (3.1750) | 0.0000 (0.0000) | 0.0006L (0.0152) |
| Gear assembly (440) | OD | 0.1244 (3.1598) | 0.1247 (3.1674) | | |
| Housing (465) | ID | 0.3754 (9.5352) | 0.3758 (9.5453) | 0.0004L (0.0102) | 0.0012L (0.0305) |
| Bearing (435) | OD | 0.3746 (9.5148) | 0.3750 (9.5250) | | |
| Housing (465) | ID | 0.6250 (15.8750) | 0.6257 (15.8928) | 0.0007T (0.0178) | 0.0004L (0.0102) |
| Bearing (450) | OD | 0.6253 (15.8826) | 0.6257 (15.8928) | | |
| Bushing (460) | ID | 0.4920 (12.4968) | 0.4925 (12.5095) | 0.0010L (0.0254) | 0.0025L (0.0635) |
| Nut assembly (380) | OD | 0.4900 (12.4460) | 0.4910 (12.4714) | | |
| Housing (465) | ID | 0.575 (14.6050) | 0.576 (14.6304) | 0.003T (0.0762) | 0.001T (0.0254) |
| Bushing (460) | OD | 0.577 (14.6558) | 0.578 (14.6812) | | |

**NOTE:**

(1) “L” indicates loose fit. “T” indicates tight fit.

**B. Torque Values** (Subtask 21-20-36-220-002-A01)

(1) Tighten nuts, bolts, screws, and tube fittings to the standard torque unless specified differently. Refer to FAA Manual AC65-9A, Airframe and Powerplant Mechanics General Handbook, for standard torque.

(2) Tighten nuts, bolts, screws, and tube fittings to the standard torque unless specified differently.

(3) Tighten fasteners installed through non-elastic boundaries to remove visible clearance between the parts. Monitor the rundown torque necessary just before the fastener becomes tight. Then tighten to the final torque (refer to Table 8002 for the correct thread size) and add the rundown torque. This procedure is sufficient for all fasteners not shown under torque values below. Refer to Table 8003 for final torque data after rundown torque.

(4) Tighten fasteners installed through elastic boundaries (sealed by means of a diaphragm or similar elastomeric gasket) equally to get a pressure tight seal.

**Table 8002. Thread Size and Torque Data**

| | Torque in-lb (Nm) | |
|---|---|---|
| **Thread Size** | **Aluminum Fastener** | **CRES Fastener** |
| 6-32 | 5 (0.565) | 10 (1.13) |
| 8-32 | 10 (1.13) | 20 (2.26) |

**Table 8002. Thread Size and Torque Data (Cont)**

| | Torque in-lb (Nm) | |
|---|---|---|
| **Thread Size** | **Aluminum Fastener** | **CRES Fastener** |
| 10-24 | 15 (1.695) | 35 (3.955) |
| 1/4-20 | 45 (5.085) | 75 (8.475) |
| 5/16-18 | 80 (9.04) | 160 (18.08) |
| 3/8-24 | 140 (15.82) | 275 (31.075) |

**Table 8003. Final Torque Data**

| Thread Size | Approximate Turn After Run-Down |
|---|---|
| 6-32 | 45 degrees |
| 8-32 | 60 degrees |
| 10-24 | 40 degrees |
| 1/4-20 | 40 degrees |
| 5/16-18 | 40 degrees |
| 3/8-24 | 60 degrees |

**C. Specified Torque Values** (Subtask 21-20-36-220-003-A01)

(1) Table 8004 gives information necessary to tighten fasteners to specified torque. Values shown do not include frictional torque caused by self-locking devices or rundown resistance. Frictional torque values must be added to the specified torque.

**Table 8004. Specified Torque**

| Figure Number | Item Number | Nomenclature | Torque in-lb (Nm) |
|---|---|---|---|
| Not applicable | Not applicable | Not applicable | Not applicable |

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# SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES

1. **Planning Data** (TASK 21-20-36-99C-809-A01)

   A. **Reason for the Job** (Subtask 21-20-36-99C-018-A01)

      (1) This section gives the special tools, fixtures, equipment, and consumable materials that are necessary for LRU maintenance.

   B. **Job Setup Data** (Subtask 21-20-36-940-001-A01)

      (1) You can use equivalent alternatives for the special tools, fixtures, equipment, and consumable materials unless specified differently. The user must find equivalent alternatives.

      (2) Refer to Table 9001 for the special tools, fixtures, and equipment in this section.

      (3) CAGE codes and manufacturer's addresses are available at https://cage.dla.mil.

**Table 9001. Special Tools, Fixtures, and Equipment**

| Number | Description | Source |
|---|---|---|
| | Calipers | Commercially available |
| | Fluorescent penetrant unit | Commercially available |
| | Hot air gun | Commercially available |
| | Magnifying glass | Commercially available |
| | Oven | Commercially available |
| | Soft-bristle brush | Commercially available |
| | Soldering iron | Commercially available |
| | Source of compressed air | Commercially available |
| | Wire brush | Commercially available |
| 2025587-1 | Linear actuator interface test box<br>(Mates to 834380-3, -4 and actuator connector per MS24266R12B12SN) | CAGE: 06848 |
| 834380-3 | Linear actuator test stand | CAGE: 06848 |
| 834380-4 | Linear actuator test stand | CAGE: 06848 |
| 4300B | Bonding resistance meter | CAGE: 53504 |
| 5250SL-3-11 | AC power supply | CAGE: 25965 |
| 8840A | Digital multimeter | CAGE: 89536 |
| Model D990R | Magnetizing unit | CAGE: 37676 |
| Model S-10 | Timer | CAGE: 56631 |
| Model SB2824T | Demagnetizing unit | CAGE: 37676 |
| Weston Model 433/2916007 | AC ammeter | CAGE: 32590 |

**Table 9001. Special Tools, Fixtures, and Equipment (Cont)**

| Number | Description | Source |
|---|---|---|
| **NOTE :** 834380-3, -4 linear actuator test stand replaces both 912986-2-1 actuator load test set and 257916-1 electrical power test set. | | |

**WARNING:** **BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

(4) Refer to Table 9002 for the consumable materials in this section.

**Table 9002. Consumable Materials**

| Number | Description | Source |
|---|---|---|
| | Lint-free cloth | Commercially available |
| | Penetrant oil | Commercially available |
| 44GN11 | Primer paint | CAGE: 33461 |
| 446-22-1002, X-530 | High solids epoxy enamel (Black BAC-701) | CAGE: 91342 |
| A-A-55827 | Chromic acid (Chromium trioxide) | Commercially available |
| A-A-883 | Masking tape (SAE-AMS-T-21595) | Commercially available |
| AA52080-C-5 | Lacing tape | Commercially available |
| ANSI B74.18 | Abrasive paper | Commercially available |
| ANSI B74.18 | Aluminum-oxide abrasive paper | Commercially available |
| ANSI B74.18 | Crocus cloth | Commercially available |
| ANSI B74.18 | Silicon-carbide abrasive paper | Commercially available |
| AS5272, Type I | Dry-film lubricant | Commercially available |
| Desoclean 45 | Solvent | CAGE: 83574 |
| FA1076 | Adhesive | CAGE: 79833 |
| M39029/31-627 | Electrical pins | CAGE: 96906 |
| Magnaglo Carrier II | Magnetic base oil | CAGE: 37676 |
| Magnaglo Dry Concentrate No. 14A | Magnetic particles compound | CAGE: 37676 |
| MIL-D-3464 | Desiccant | Commercially available |
| MIL-PRF-23827, Type II | Grease | Commercially available |
| MIL-PRF-680 | Solvent | Commercially available |
| MIL-PRF-7808 | Oil | Commercially available |

**Table 9002. Consumable Materials (Cont)**

| Number | Description | Source |
|---|---|---|
| MIL-V-173, Notice 1 | Varnish | Commercially available |
| MS20995C020 | Lockwire | Commercially available |
| NASM20995 | Lockwire | Commercially available |
| NASM33540 | Lockwire | Commercially available |
| S8935F0S30 | Wire leads (black) | CAGE: 06848 |
| S8935F1S52 | Wire leads (brown) | CAGE: 06848 |
| S8935F2S45 | Wire leads (red) | CAGE: 06848 |
| S8935F2S55 | Wire leads (red) | CAGE: 06848 |
| S8935F3S60 | Wire leads (orange) | CAGE: 06848 |
| S8935F4S35 | Wire leads (yellow) | CAGE: 06848 |
| S8935F5S35 | Wire leads (green) | CAGE: 06848 |
| S8935F5S45 | Wire leads (green) | CAGE: 06848 |
| S8935F5S60 | Wire leads (green) | CAGE: 06848 |
| S8935F7S35 | Wire leads (blue) | CAGE: 06848 |
| S8935F7S45 | Wire leads (violet) | CAGE: 06848 |
| S8935F8S44 | Wire leads (grey) | CAGE: 06848 |
| S8935F90S35 | Wire leads (white/black) | CAGE: 06848 |
| S8935F9S44 | Wire leads (white) | CAGE: 06848 |
| S9352-10-0-400 | Sleeving | CAGE: 06848 |
| S9352-14-0-800 | Sleeving | CAGE: 06848 |
| S9352-14-0 | Sleeving | CAGE: 06848 |
| Sn60 | Solder (EIA J-STD-006) | Commercially available |
| Stabond C-lll | Adhesive | CAGE: 25670 |
| TT-P-1757, Type I, Class C, Color Y or T | Zinc chromate primer | Commercially available |

(5) The list that follows identifies Honeywell publications that are related to this section:

- Not applicable.

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# SPECIAL PROCEDURES

**1. Not Applicable**

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# REMOVAL

**1. Not Applicable**

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# INSTALLATION

**1. Not Applicable**

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# SERVICING

**1. Not Applicable**

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# STORAGE (INCLUDING TRANSPORTATION)

**1.** **Planning Data** (TASK 21-20-36-99C-810-A01)

**A.** **Reason for the Job** (Subtask 21-20-36-99C-019-A01)

(1) Use these procedures to prepare the LRU for storage or transportation. The function of these procedures is to make sure that the LRU has protection from dust, moisture, and other contamination.

**B.** **Job Setup Data** (Subtask 21-20-36-99C-020-A01)

(1) You can use equivalent alternatives for the special tools, fixtures, equipment, and consumable materials unless specified differently. The user must find equivalent alternatives.

(2) Refer to Table 15001 for the special tools, fixtures, and equipment in this section.

(3) CAGE codes and manufacturer's addresses are available at https://cage.dla.mil.

**Table 15001. Special Tools, Fixtures, and Equipment**

| Number | Description | Source |
|---|---|---|
| Not applicable | Not applicable | Not applicable |

**WARNING:** **BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

(4) Refer to Table 15002 for the consumable materials in this section.

**Table 15002. Consumables**

| Number | Description | Source |
|---|---|---|
| | Lint-free cloth | Commercially available |
| A-A-883 | Masking tape (SAE-AMS-T-21595) | Commercially available |
| MIL-D-3464 | Desiccant | Commercially available |

(5) The list that follows identifies Honeywell publications that are related to this section:

- Not applicable.

**2.** **Procedure** (TASK 21-20-36-550-801-A01)

**A.** **Job Setup** (Subtask 21-20-36-550-001-A01)

**WARNING:** **BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.**

CAUTION: DO NOT USE MATERIALS THAT ARE NOT EQUIVALENT TO HONEYWELL SPECIFIED MATERIALS. MATERIALS THAT ARE NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

CAUTION: DO NOT HIT OR LET THE LRU FALL DURING THESE PROCEDURES. THE LRU CONTAINS AN ASSEMBLY THAT CAN BE DAMAGED FROM INCORRECT USE.

CAUTION: DO THESE PROCEDURES IN A CLEAN ENVIRONMENT TO PREVENT DAMAGE TO THE MECHANICAL COMPONENTS.

CAUTION: BEFORE YOU USE ISOPROPYL ALCOHOL, DO A TEST TO MAKE SURE THAT IT DOES NOT CAUSE DAMAGE TO THE PAINTED SURFACES.

CAUTION: DO NOT LET THE ISOPROPYL ALCOHOL TOUCH THE CONNECTOR BODY. IT CAN CAUSE DAMAGE TO THE PARTS. USE ISOPROPYL ALCOHOL CAREFULLY WHEN YOU CLEAN FLUX FROM THE SOLDER CONNECTIONS.

(1) Obey the precautions.

**B.** **Preservation** (Subtask 21-20-36-550-002-A01)

(1) Clean the external surfaces with a clean, lint-free cloth.

**C.** **Packing** (Subtask 21-20-36-550-003-A01)

(1) Pack the ram air modulation linear electromechanical actuator in a padded container to store or ship the ram air modulation linear electromechanical actuator.

(2) Seal the container with A-A-883 masking tape if it will not be stored in a moisture-free area. A MIL-D-3464 desiccant must be included if the ram air modulation linear electromechanical actuator is not stored in a moisture-free area.

**NOTE:** When correctly packaged, the ram air modulation linear electromechanical actuator can be stored indefinitely at a temperature between -65 to 120°F (-54 to 49°C).

**D.** **Storage** (Subtask 21-20-36-550-004-A01)

(1) Keep the ram air modulation linear electromechanical actuator in an area away from high temperatures, dust, moisture, and corrosive fumes.

(2) Keep the ram air modulation linear electromechanical actuator at a temperature below 100°F (38°C). Do not permit the temperature to go higher than 125°F (52°C).

(3) Control the humidity to prevent moisture from collecting on the ram air modulation linear electromechanical actuator.

**E.** **Transportation** (Subtask 21-20-36-550-005-A01)

(1) Not applicable.

**F.** **Job Close-up** (Subtask 21-20-36-550-006-A01)

(1) Remove all tools, equipment, used parts, and materials from the work area.

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# REWORK (SERVICE BULLETIN ACCOMPLISHMENT PROCEDURES)

**1. Not Applicable**

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# ILLUSTRATED PARTS LIST

**1.** **Description** (TASK 21-20-36-99C-811-A01)

**A.** **General** (Subtask 21-20-36-99C-021-A01)

(1) This section gives the parts that are used to make the LRU. It also supplies the necessary data to get replacement parts for REPAIR and TESTING AND FAULT ISOLATION.

(2) The DPL part of the ILLUSTRATED PARTS LIST gives a breakdown, in disassembly sequence, of assemblies and detail parts of the unit.

(3) The illustrations show where you can find each part and are an important aid in DISASSEMBLY and ASSEMBLY.

(4) The item numbers shown in the DPL are the same as the item numbers on the exploded view illustration(s). To find a part number, find the part on the illustration and record the item number. Go to the DPL to find the item number and related part number.

**B.** **Job Setup Data** (Subtask 21-20-36-99C-022-A01)

(1) The list that follows identifies references that are related to this section:

- CAGE codes and manufacturer's addresses are available at https://cage.dla.mil.

**2.** **Contents of the IPL** (TASK 21-20-36-99C-812-A01)

**A.** **Vendor Code List** (Subtask 21-20-36-99C-023-A01)

(1) The vendor code list shows the vendor CAGE code, name, and address in numerical sequence for all vendors shown in the DPL. Refer to the Vendor Code List.

(2) The vendor CAGE code is given in the NOMENCLATURE column of the DPL to identify the vendor.

**B.** **Equipment Designator Index** (Subtask 21-20-36-99C-024-A01)

(1) Not Applicable.

**C.** **Numerical Index** (Subtask 21-20-36-99C-025-A01)

(1) The NI is an alphanumeric list of all the part numbers shown in the part number column of the DPL.

(2) Also included in the index are the Honeywell part numbers that are equivalent to the manufacturer part number. Optional manufacturer part numbers are not included in the index.

(3) The figure item column gives all of the locations of a part. If a part number is in more than one figure item location, the part number is shown only one time in the part number column.

(4) The total required column shows the total number of parts that are used at each figure item location.

(5) The airline stock number column has space for customers to use.

**D.** **Detailed Parts List** (Subtask 21-20-36-99C-026-A01)

**NOTE:** Refer to Figure 10001.

(1) An item number is given to each part in the DPL and on the related illustration. The item numbers show the general disassembly sequence.

(2) To find a part number in the DPL.

(a) If the part number is known, refer to the Numerical Index to find the figure and item numbers in the DPL.

(b) If the part number is not known, turn to the illustration; locate the part, and record the item number. The part number is shown opposite the item number in the DPL.

(c) If the equipment designator is known, refer to the EDI to find the figure and item numbers in the DPL.

(3) Revision codes for added, changed, or deleted data.

(a) Revision bars (I) in the left margin adjacent to an entry shows changed or added data to the part in the DPL.

(4) Figure item column.

(a) A part not shown on the illustration is identified in the DPL as non-illustrated by a dash (-) before the item number.

(b) When two or more items that are visually alike are listed in sequence, only the first item is illustrated. The illustration, however, is applicable to both items.

(c) When the detailed parts of an assembly or installation are illustrated, they can be identified by a bracket. The bracket identifies the next higher assembly or installation. If brackets are not used, the detail parts are illustrated, but the next higher assembly or installation is not.

(d) The parts that make up a select-from range group (i.e. calibration resistor assortments) have a non-illustrated item number or a different figure.

(5) Part number column.

(a) A part number that is prefixed usually indicates a type of part or method of procurement. Examples of these prefixes are AN, MS, and NAS. These standard part numbers may be suffixed by numbers only or numbers and letters. Suffix numbers usually indicate configuration or design difference. Suffix letters usually indicate material, color, or finish differences.

(b) All procurable components manufactured by Honeywell have a part number. The part number is stamped, etched, or cast on the part at time of manufacture when size, space, or shape is available. More manufacturing symbol(s), letter(s), or number(s) can be shown with the part number to identify a manufacturing process, a design change, or for a proprietary repair. Do not use this data to order a part. Use only the item part number and nomenclature as shown in the DPL.

(c) The letter "S" prefix of a part number designates a Honeywell standard part number. These standard part numbers have suffix letters and numbers.

(d) Honeywell commercial standard numbers are used in the parts lists to identify off-the-shelf items procured from another manufacturer. A commercial standard number can be a 10 or 11 digit number.

(e) Nonprocurable part numbers are usually easy to identify and are primarily used for information purposes. The part numbers NONPROCXXX, ORDERNHA,

GAREFXXX, TUCREFXXX, AIREFXXX, and TORREFXXX are not procurable and should not be ordered.

1 The part number NONPROCXXX is primarily used to sub-divide components into a logical, easy to use, subgroup. The subgroup is not procurable, but is used to identify a group of procurable components.

2 The part number ORDERNHA (Order Next Higher Assembly) is primarily used to identify nonprocurable details of an assembly.

3 The part number GAREFXXX, TUCREFXXX, AIREFXXX, and TORREFXXX is used when a procurable part number exceeds 15 digits. When the part number GAREFXXX, TUCREFXXX, AIREFXXX, and TORREFXXX appears in the PART NUMBER column, refer to the nomenclature for the actual part number of the item desired.

(6) Airline stock number column.

(a) The airline stock number column has space for customers to use.

(7) Nomenclature column.

(a) The indenture code shows the relationship of each item to its NHA.

1 Each item goes in the nomenclature column one indenture (one dot) to the right of the assembly to which it belongs.

2 The items at the same indenture are all components of a single assembly or subassembly. Refer to Figure 10002 for an example of the indenture code system.

(b) Wherever possible, abbreviations will agree with the ASME Y14.38 specification. The non-standard abbreviations that spell words are not used.

(c) The vendor code data are as follows:

1 The vendors with a code number have the letter V before the number. This code identifies where to get that item.

2 No vendor code is shown in the nomenclature column of the DPL if the item is a U.S. standard part or Honeywell is the vendor.

3 The vendors with no code number (NCN) are identified by (VNCN__).

(d) A Honeywell specification drawing number will be shown if applicable.

(e) Refer to this list of possible explanation terms. These terms may be abbreviated.

1 OPTIONAL shows that the part is an optional alternative to other parts in the same item number variant group.

2 ALTERNATE shows that the part is an alternative to other parts in the same item number variant group.

3 SUPERSEDED BY shows that the part is replaced by the part number or item number shown and is not interchangeable.

4 SUPERSEDES shows that the part replaces the part number or item number shown and is not interchangeable.

5 REPLACED BY shows that the part is replaced by the part number or item number shown and is interchangeable. Part can be used until the supply is gone.

6 REPLACES shows that the part replaces the part number or item number shown and is interchangeable.

7 PRE SERVICE BULLETIN XXXX shows that the part is used if service bulletin XXXX was not done.

8 POST SERVICE BULLETIN XXXX shows that the part is used if service bulletin XXXX was done.

9 PRE SPARE PARTS BULLETIN XXXX shows that the part is used if spare parts bulletin XXXX was not done.

10 POST SPARE PARTS BULLETIN XXXX shows that the part is used if spare parts bulletin XXXX was done.

11 NONREPAIRABLE shows that the part cannot be repaired.

12 NONPROCURABLE shows that the part or assembled parts cannot be purchased. The term NONPROC is used in the PART NUMBER column when no part number exists for the assembly. The components of the assembled parts can be ordered unless differently specified.

13 ORDER NEXT HIGHER ASSEMBLY shows that the part number is part of a matched set and cannot be ordered independently. The next higher assembly can be ordered.

14 REFERENCE (GAREF, TUCREF, AIREF, TOREF etc.) shows the procurable part number that exceeds 15 digits in the NOMENCLATURE column as ORDER PN NNNN.

15 ORDER PART NUMBER shows a nonstandard or reference part number.

16 PART ADDED shows the part is added with no comparable component involved in the change. Interchangeability of other parts is not affected by the additions, unless specified.

17 DELETED shows the part is not available for use.

18 SEE FIGURE FOR DETAILS shows the part number details in a different figure.

19 SEE FIGURE FOR NEXT HIGHER ASSEMBLY refers the part number to the next higher assembly.

20 USE WITH (ITEM or PART NUMBER) shows a part is used with a different part.

21 COMPONENT OF (ITEM or PART NUMBER) shows that the part is a component of a different part.

22 MAY BE SUBSTITUTED shows that the part in the Nomenclature column with its vendor code is an equivalent alternative for the part in the Part Number column.

23 REFER TO ATA or PUBLICATION NUMBER identifies the assemblies that have their own Component Maintenance Manuals.

24 Control Source Drawing (CSD) shows the Honeywell part number for the part in the PART NUMBER column and is fully interchangeable.

25 Honeywell Control Source Drawing (HCSD) shows the Honeywell part number for the part in the PART NUMBER column and is fully interchangeable.

26 HAZARDOUS MATERIAL identifies parts that can have dangerous effects.

27 ESDS identifies parts that are electrostatic sensitive.

28 MOISTURE SENSITIVE identifies parts that are moisture sensitive.

(8) The effectivity code column.

(a) The effectivity code identifies the different configurations of the top assembly in each IPL figure.

(b) If this column is empty, the part is used in all configurations of the top assembly for that IPL figure.

(c) If this column has a letter code in it, the part is only used in the configuration of the top assembly that has the same letter code.

(d) If this column has more than one letter code, the part is used in each top assembly with the same letter codes.

(e) If a comma separates the column entry (A, C), the other codes do not apply. For example, a component coded "A, C" is applicable for Codes A and C only and not applicable for Code B.

(f) If a dash separates the column entry (A-C), the other codes do apply. For example, a component coded "A-C" is applicable for Codes A, B, and C.

(9) The units per assembly column.

(a) The units per assembly column show the quantity of parts necessary in the assembly of one next higher assembly. The letters AR in this column show "as required" items and refer to bulk items or adjustable quantity items, such as shims or spacers. The letters RF are used to show an item that is shown in another area with a quantity.

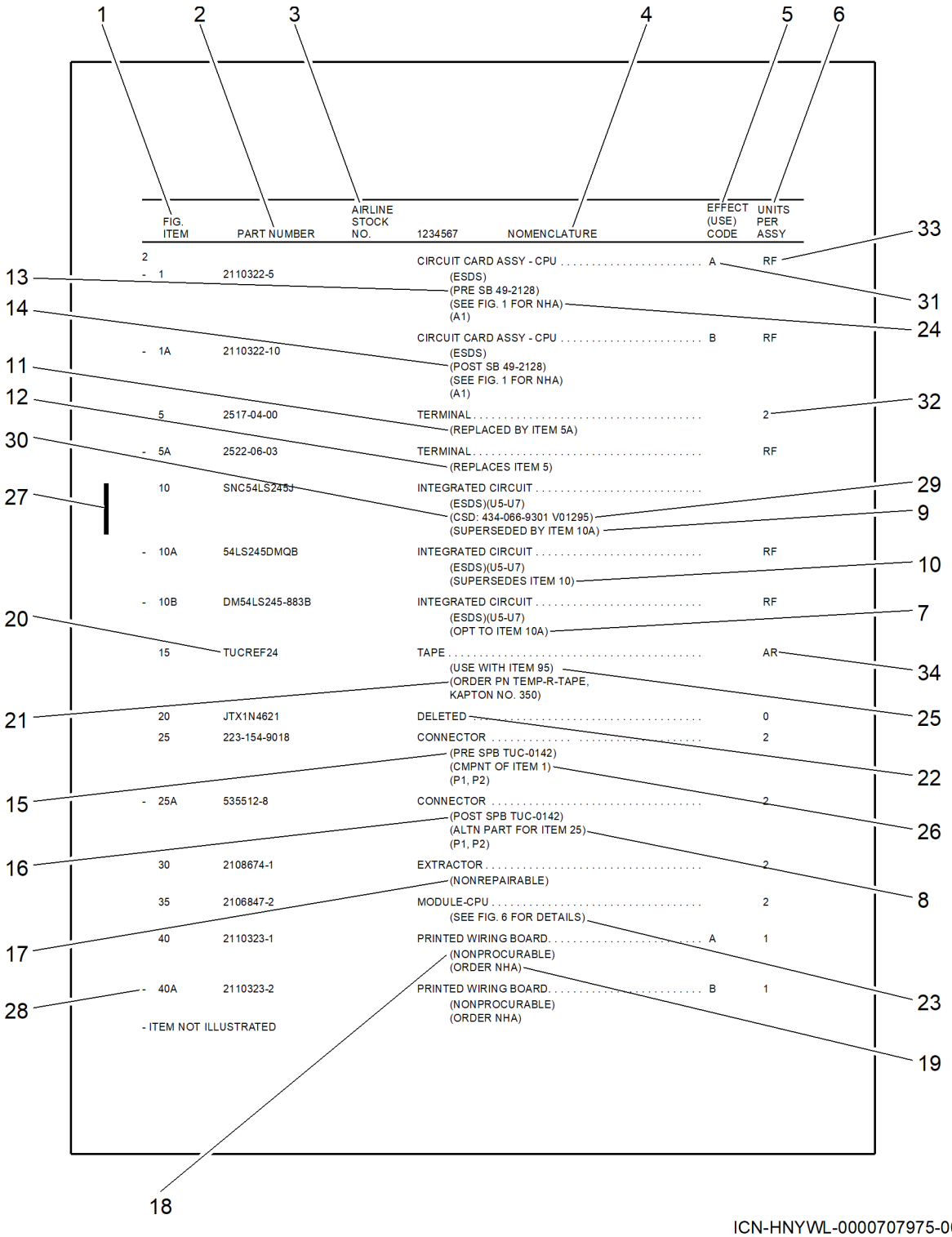


**Figure 10001. DPL Example**

Key to Figure 10001

1. FIGURE/ITEM column
2. PART NUMBER column
3. AIRLINE STOCK NUMBER column
4. NOMENCLATURE column
5. EFFECTIVITY (USE) CODE column
6. UNITS PER ASSEMBLY column
7. OPTIONAL example
8. ALTERNATE example
9. SUPERSEDED BY example
10. SUPERSEDES example
11. REPLACED BY example
12. REPLACES example
13. PRE SERVICE BULLETIN example
14. POST SERVICE BULLETIN example
15. PRE SPARE PARTS BULLETIN example
16. POST SPARE PARTS BULLETIN example
17. NONREPAIRABLE example
18. NONPROCURABLE example
19. ORDER NEXT HIGHER ASSEMBLY example
20. REFERENCE example
21. ORDER PART NUMBER example
22. DELETED example
23. SEE FIGURE FOR DETAILS example
24. SEE FIGURE FOR NEXT HIGHER ASSEMBLY example
25. USE WITH (ITEM or PART NUMBER) example
26. COMPONENT OF (ITEM or PART NUMBER) example
27. Changed or added data indicator example
28. Non-illustrated indicator example
29. Vendor code example
30. Control Specification or Drawing Number for the related part in the Part Number column example
31. Effectivity (A) example
32. Quantity example
33. RF indicates item referenced elsewhere
34. As required example

1 2 3 4 5 6 7
Assembly or installation descriptive title
• Detail parts
• Assembly
• Attaching parts for assembly
• • Detail parts for assembly
• • Subassembly
• • Attaching parts for subassembly
• • • Detail parts for subassembly
• • • Sub-subassembly
• • • Attaching parts for sub-subassembly
• • • • Detail parts for sub-subassembly

ICN-HNYWL-0000233104-001-99

**Figure 10002. Nomenclature Indentures**

## 3. Vendor Code List

**NOTE:** The vendor codes and part numbers that are shown in the DPL must not be construed as an authorization of the vendor, pursuant to the FAA regulations, to ship directly to the user. Neither must it be construed as a certification by Honeywell that parts shipped by vendors directly to users will conform to the type design or that such parts are airworthy or safe for installation.

| Code | Vendor |
|---|---|
| V00779 | TYCO ELECTRONICS CORP 2800 FULLING MILL RD BLDG 38 MIDDLETOWN, PA 17057-3142 |
| V019L2 | MACLEAN-FOGG CO DBA MAC LEAN-ESNA 611 COUNTRY CLUB RD POCAHONTAS, AR 72455-8803 |
| V04426 | ILLINOIS TOOL WORKS INC DIV ILLINOIS TOOL WORKS DBA ITW SWITCHES 2550 MILLBROOK DR BUFFALO GROVE, IL 60089-4694 |
| V08928 | ABBOTT-INTERFAST CORP 190 ABBOTT DR WHEELING, IL 60090 FORMERLY:FORMERLY ABBOTT INTERFACE CORP WHEELING IL |
| V15860 | NEW HAMPSHIRE BALL BEARINGS INC ASTRO DIV 155 LEXINGTON DR LACONIA, NH 03246-2937 |
| V27687 | GREER STOP NUT INC 481 MCNALLY DR NASHVILLE, TN 37211-3311 |
| V70210 | HONEYWELL AEROSPACE-TORRANCE 2525 W 190TH ST TORRANCE CA, 90504 USA |
| V73134 | ROLLER BEARING CO OF AMERICA INC DBA RBC HEIM BEARINGS DIVISION 60 ROUND HILL RD FAIRFIELD, CT 06824-5172 |
| V80205 | NATIONAL AEROSPACE STANDARDS COMMITTEE AEROSPACE INDUSTRIES |
| V88044 | AERONAUTICAL STANDARDS GROUP DEPT OF NAVY AND AIR FORCE |
| V96906 | MILITARY STANDARDS PROMULGATED BY MILITARY DEPARTMENTS UNDER AUTHORITY OF DEFENSE STANDARDIZATION MANUAL 4120 3-M |
| V99193 | HONEYWELL AEROSPACE-PHOENIX 111 SOUTH 34TH ST PHOENIX AZ, 85034 USA |
| V99528 | RADIAL BEARING CORP 21 TAYLOR ST DANBURY, CT 06810-6982 |

**4. Detailed Parts List**

## Equipment Designator Index

| EQUIPMENT DESIGNATOR | FIG. ITEM | GEOGRAPHIC LOCATION | EQUIPMENT DESIGNATOR | FIG. ITEM | GEOGRAPHIC LOCATION |
|---|---|---|---|---|---|

NOT APPLICABLE

## Numerical Index

| PART NUMBER | | AIRLINE STOCK NO. | FIG. ITEM | TTL REQ. |
|---|---|---|---|---|
| ABG4-105 | (DELETED) | | 1 -287A | 0 |
| AG 4SP12 | | | 1 287 | 1 |
| AN320-4 | | | 1 295 | 1 |
| AN500A2-5 | | | 1 95 | 4 |
| AN500A2-7 | | | 1 170 | 4 |
| AN500A2-8 | | | 1 -170A | 4 |
| AN500A4-4 | | | 1 190 | 4 |
| AN500A6-14 | | | 1 60 | 2 |
| AN500A6-3 | | | 1 445 | 2 |
| AN500A6-5 | | | 1 30 | 2 |
| AN500A6-6 | | | 1 205 | 4 |
| AN503-6-6 | | | 1 385 | 2 |
| AN503-6-8 | | | 1 390 | 2 |
| AN503-8-6 | | | 1 280 | 4 |
| FKS4 | (DELETED) | | 1 -287C | 0 |
| GAREF16 | (DELETED) | | 1 -185 | 0 |
| GAREF920 | (DELETED) | | 1 -10 | 0 |
| GAREF921 | (DELETED) | | 1 -10A | 0 |
| GAREF922 | (DELETED) | | 1 -10B | 0 |
| GAREF923 | (DELETED) | | 1 -10C | 0 |
| LHA4 | | | 1 287 | 1 |
| LHA4 | (DELETED) | | -287B | 0 |
| LHB4AE | | | 1 287 | 1 |
| M39029-31-627 | | | 1 -186 | 12 |
| MS16632-1015 | | | 1 125 | 1 |
| MS16632-1025 | | | 1 70 | 1 |
| MS171433 | | | 1 225 | 2 |
| MS20364-632 | | | 1 35 | 2 |
| MS21083N06 | | | 1 -35A | 2 |
| MS21261R202 | | | 1 365 | 1 |
| MS24264R12B12PN | | | 1 185A | 1 |
| MS24642-1 | | | 1 15 | 2 |
| MS35191-215 | | | 1 325 | 1 |
| MS35191-225 | | | 1 310 | 1 |
| MS35265-13 | | | 1 -190A | 4 |
| MS35265-25 | | | 1 -445A | 2 |
| MS35265-27 | | | 1 -30A | 2 |
| MS35265-28 | | | 1 -205A | 4 |
| MS35265-33 | | | 1 -60A | 2 |
| MS35265-4 | | | 1 -95A | 4 |
| MS35265-7 | | | 1 -170B | 4 |
| MS49362 | | | 1 -146A | 1 |
| MS9389-02 | | | 1 110 | 2 |
| MS9389-32 | | | 1 350 | 2 |
| NAS1352-06LL6P | | | 1 -385A | 2 |
| | | | -385B | 2 |
| NAS1352-06LL8P | | | 1 -390A | 2 |
| | | | -390B | 2 |

## Numerical Index

| PART NUMBER | | AIRLINE STOCK NO. | FIG. ITEM | TTL REQ. |
|---|---|---|---|---|
| NAS620-6 | | | 1 40 | 4 |
| NAS620C4L | | | 1 195 | 4 |
| REF541674-3-2 | (DELETED) | | 1 -1K | 0 |
| REF541674-4-2 | (DELETED) | | 1 -1L | 0 |
| REF541674-4-3 | (DELETED) | | 1 -1N | 0 |
| REF541674-4-4 | (DELETED) | | 1 -1Q | 0 |
| REF541674-5-2 | (DELETED) | | 1 -1M | 0 |
| RS4 | | | 1 287 | 1 |
| RS4 | (DELETED) | | -287D | 0 |
| S8154-146C002 | | | 1 420 | AR |
| S8154-146C005 | | | 1 425 | AR |
| S8154-206C002 | | | 1 130 | AR |
| S8154-206C005 | | | 1 135 | AR |
| S8154-206C010 | | | 1 140 | AR |
| S8154-286C002 | | | 1 -80A | AR |
| S8154-286C005 | | | 1 -85A | AR |
| S8154-286C010 | | | 1 -90A | AR |
| S8157C232-020 | | | 1 175 | 4 |
| S8157C7-032 | | | 1 285 | 4 |
| S8157C82-020 | | | 1 210 | 4 |
| | | | 55 | 2 |
| | | | 65 | 2 |
| S8157N136-002 | | | 1 245 | AR |
| S8157N136-005 | | | 1 250 | AR |
| | | | 255 | 2 |
| S8157N136-016 | | | 1 240 | 2 |
| | | | 253 | AR |
| S8157N214-002 | | | 1 80 | AR |
| S8157N214-005 | | | 1 85 | AR |
| S8157N214-010 | | | 1 90 | AR |
| S8168-44H0160 | | | 1 430 | 1 |
| S8168-54C0150 | | | 1 410 | 1 |
| S8847B1H1-54167 | | | 1 -10K | 1 |
| | | | -10L | 1 |
| | | | -10M | 1 |
| | | | -10N | 1 |
| XX9496-1517-69 | | | 1 320A | 1 |
| XX9496-1520-69 | | | 1 305A | 1 |
| 2023038-1 | | | 1 -10E | 1 |
| 2023038-2 | | | 1 -10F | 1 |
| 2023038-3 | | | 1 -10G | 1 |
| 26-804F0RMZZ | | | 1 165 | 2 |
| | | | -165A | 2 |
| 26-830070 | | | 1 -165B | 2 |
| | | | -165C | 2 |
| 2712024-1 | | | 1 -10H | 1 |
| 27399 | | | 1 290 | 1 |
| 2745227-1 | | | 1 10D | 1 |

## Numerical Index

| PART NUMBER | AIRLINE STOCK NO. | FIG. ITEM | TTL REQ. |
|---|---|---|---|
| 2745987-1 | | 1 97 | 2 |
| 2745988-1 | | 1 107 | 2 |
| | | 107A | 1 |
| 2745988-2 | | 1 107B | 1 |
| | | -107C | 2 |
| 2748043-1 | | 1 -10J | 1 |
| 2748045-1 | | 1 -165D | 2 |
| | | -165E | 2 |
| 28182-187 | | 1 460 | 1 |
| 29342-6 | | 1 180 | 2 |
| 30716-19 | | 1 355 | 1 |
| 333-020-9002 | SEE MS49362 | | |
| 33342 | | 1 435 | 2 |
| 33378 | | 1 450 | 1 |
| 34104 | | 1 300A | 2 |
| 34104 | (DELETED) | -300 | 2 |
| 38414-4 | | 1 440 | 1 |
| 38611 | | 1 315 | 1 |
| 40250-2 | | 1 215 | 1 |
| 40250-4 | | 1 220 | 1 |
| 40292 | | 1 360 | 1 |
| 40293-24 | | 1 375 | 1 |
| 40381-10 | | 1 370 | 1 |
| 40618-1 | | 1 340 | 1 |
| 40680-43 | | 1 230 | 1 |
| 40680-44 | | 1 235 | 1 |
| 40680-47 | | 1 -230A | 1 |
| 40680-48 | | 1 -235A | 1 |
| 40795 | | 1 345 | 1 |
| 40988-13 | | 1 380 | 1 |
| 40988-14 | | 1 -380A | 1 |
| 46339-1-1 | | 1 405 | 1 |
| 46339-2 | | 1 -405A | 1 |
| 46366-1 | | 1 -405B | 1 |
| 46366-2 | | 1 -405C | 1 |
| | | -405D | 1 |
| 49330-2 | | 1 146 | 1 |
| 49330-2 | (DELETED) | -155 | 0 |
| 517155-1 | | 1 25 | 1 |
| 525-010-9004 | | 1 320A | 1 |
| 525-010-9008 | | 1 305A | 1 |
| 526326-1 | | 1 400 | 2 |
| 526353 | | 1 287 | 1 |
| | | 330 | 1 |
| 526353 | (DELETED) | -270 | 0 |
| 526403 | | 1 335 | 1 |
| 526430 | | 1 395 | 1 |
| 526497 | | 1 415 | 1 |

## Numerical Index

| PART NUMBER | AIRLINE STOCK NO. | FIG. ITEM | TTL REQ. |
|---|---|---|---|
| 526725-1 | | 1 -327 | 1 |
| 527275-12 | | 1 260 | 1 |
| 527275-2 | | 1 265 | 1 |
| 528994-8 | | 1 182 | 2 |
| 530939-1 | | 1 289 | 1 |
| 530939-1 | (DELETED) | -275 | 0 |
| 530939-3 | | 1 -277 | 1 |
| 531002-1 | | 1 -455 | 1 |
| 531002-2 | | 1 465 | 1 |
| 531002-3 | | 1 -455A | 1 |
| 531002-4 | | 1 -465A | 1 |
| 531051-1 | | 1 160 | 1 |
| 531051-5 | | 1 -147 | 1 |
| 531078-1 | | 1 115 | 2 |
| 531079-1 | | 1 105 | 1 |
| 531079-2 | | 1 100 | 1 |
| 531080-1 | | 1 120 | 1 |
| 531081-1 | | 1 200 | 1 |
| 531082-1 | | 1 45 | 1 |
| 531083-1 | | 1 50 | 2 |
| 531087-1 | | 1 150 | 1 |
| 531088-1 | | 1 75 | 1 |
| 531089-1 | | 1 145 | 1 |
| 531270-1 | | 1 20 | 1 |
| 531270-2 | | 1 -20A | 1 |
| 541674-1-1 | | 1 -1 | RF |
| 541674-3 | | 1 -1A | RF |
| | | -1B | RF |
| 541674-4 | | 1 -1C | RF |
| | | -1D | RF |
| | | -1H | RF |
| | | -1J | RF |
| 541674-5 | | 1 -1E | RF |
| | | -1F | RF |
| 541674-6 | | 1 -1G | RF |
| 541675-1 | | 1 -5 | 1 |
| 541675-2 | | 1 -5A | 1 |
| 541675-3 | | 1 -5B | 1 |
| 541675-4 | | 1 -5D | 1 |
| 541675-5 | | 1 -5E | 1 |
| 541675-7 | | 1 -5C | 1 |
| 541675-8 | | 1 -5F | 1 |
| 541675-9 | | 1 -5G | 1 |
| 68-1660-24 | | 1 320A | 1 |
| 68-1660-24 | (DELETED) | -320 | 1 |
| 68-1660-264 | | 1 320A | 1 |
| 68-1660-48 | | 1 305A | 1 |
| 68-1660-48 | (DELETED) | -305 | 1 |

## Numerical Index

| PART NUMBER | AIRLINE STOCK NO. | FIG. ITEM | TTL REQ. |
|---|---|---|---|
| 724-509-9004 | | 1 300A | 2 |

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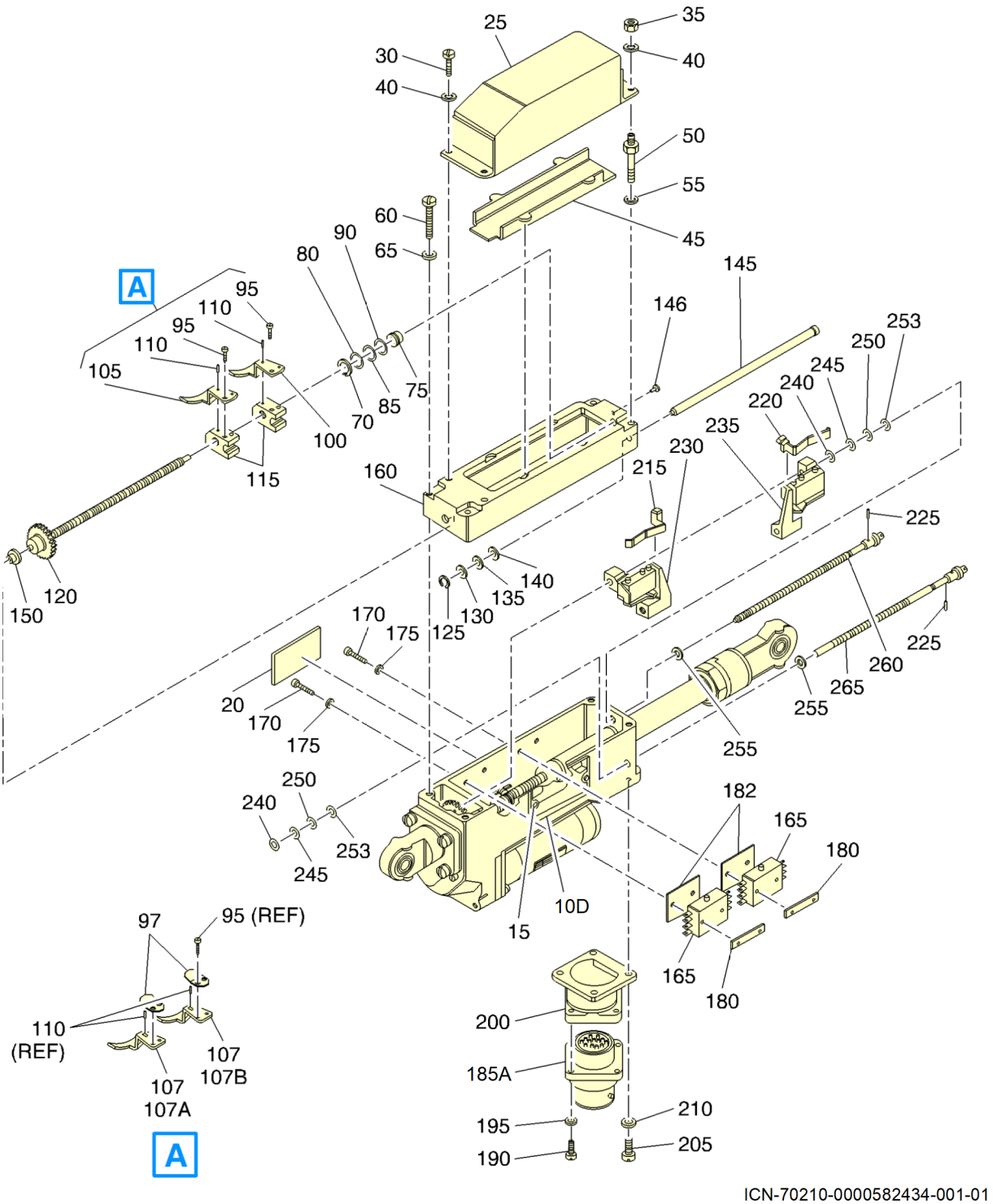
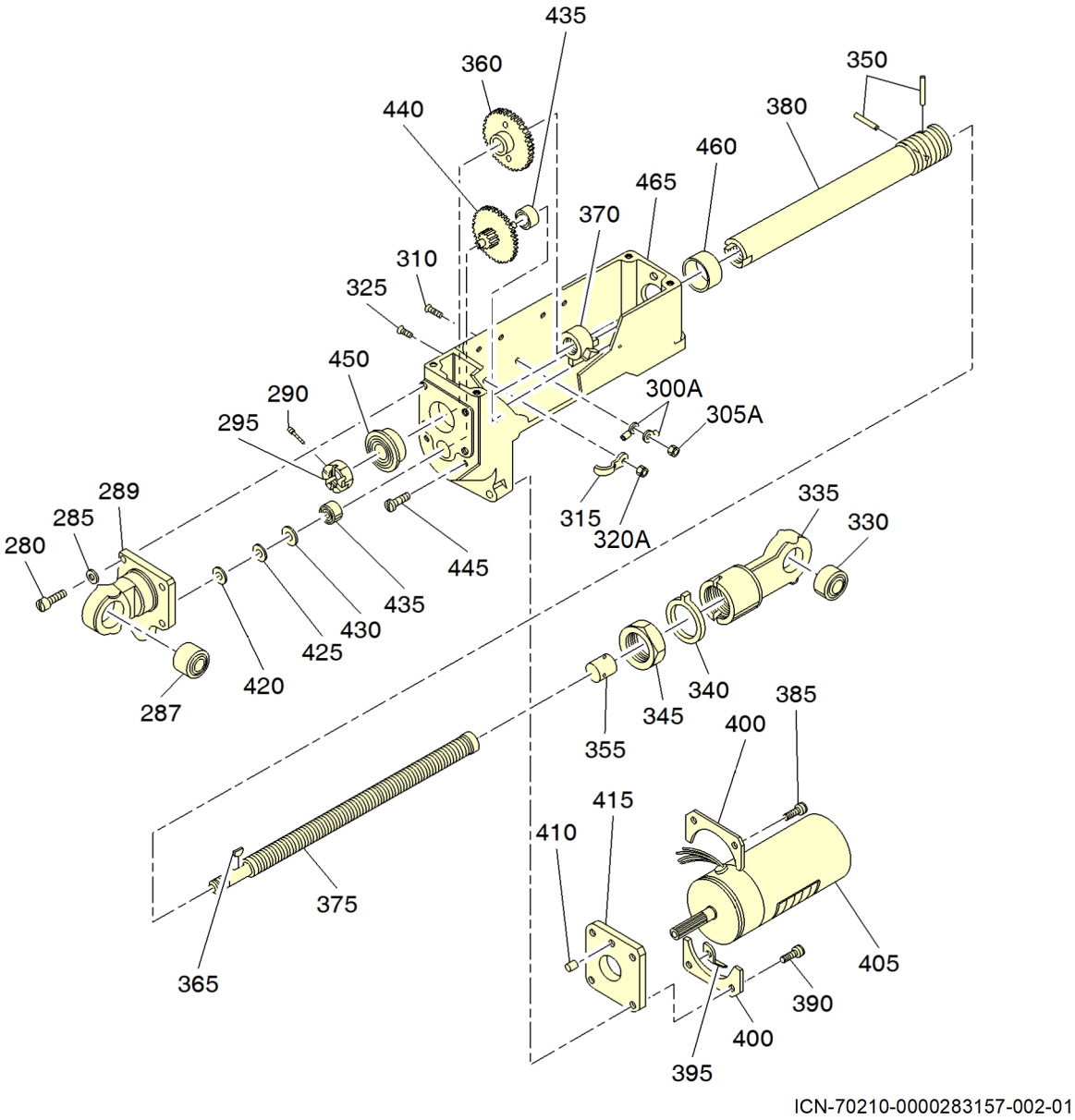



**IPL Figure 1. (Sheet 1 of 2) Ram Air Modulation Linear Electromechanical Actuator**




**IPL Figure 1. (Sheet 2 of 2) Ram Air Modulation Linear Electromechanical Actuator**

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 | NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| - 1 | 541674-1-1 | | | ACTUATOR..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (INSTL OUTLINE) (SERIES 1) | A | RF |
| - 1A | 541674-3 | | | ACTUATOR..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (INSTL OUTLINE) (SERIES 1) | B | RF |
| - 1B | 541674-3 | | | ACTUATOR..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (INSTL OUTLINE) (SERIES 2) | C | RF |
| - 1C | 541674-4 | | | ACTUATOR..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (INSTL OUTLINE) (SERIES 1) | D | RF |
| - 1D | 541674-4 | | | ACTUATOR..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (INSTL OUTLINE) (SERIES 2) | E | RF |
| - 1E | 541674-5 | | | ACTUATOR..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (INSTL OUTLINE) (SERIES 1) | F | RF |
| - 1F | 541674-5 | | | ACTUATOR..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (INSTL OUTLINE) (SERIES 2) | G | RF |
| - 1G | 541674-6 | | | ACTUATOR..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (INSTL OUTLINE) (SERIES 1) | H | RF |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 | NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| - 1H | 541674-4 | | | ACTUATOR..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (INSTL OUTLINE) (SERIES 3) | J | RF |
| - 1J | 541674-4 | | | ACTUATOR..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (INSTL OUTLINE) (SERIES 4) | K | RF |
| - 1K | REF541674-3-2 | | | DELETED..... | | 0 |
| - 1L | REF541674-4-2 | | | DELETED..... | | 0 |
| - 1M | REF541674-5-2 | | | DELETED..... | | 0 |
| - 1N | REF541674-4-3 | | | DELETED..... | | 0 |
| - 1Q | REF541674-4-4 | | | DELETED..... | | 0 |
| - 5 | 541675-1 | | | .ACTUATOR ASSEMBLY..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (SERIES 1) (NONPROCURABLE) | A | 1 |
| - 5A | 541675-2 | | | .ACTUATOR ASSEMBLY..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (SERIES 1, 2) (NONPROCURABLE) | B,C | 1 |
| - 5B | 541675-3 | | | .ACTUATOR ASSEMBLY..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (SERIES 1) (NONPROCURABLE) | D | 1 |
| - 5C | 541675-7 | | | .ACTUATOR ASSEMBLY..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (SERIES 2) (NONPROCURABLE) | E | 1 |
| - 5D | 541675-4 | | | .ACTUATOR ASSEMBLY..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (SERIES 1, 2) (NONPROCURABLE) | F,G | 1 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 | NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| - 5E | 541675-5 | | | .ACTUATOR ASSEMBLY..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (SERIES 1) (NONPROCURABLE) | H | 1 |
| - 5F | 541675-8 | | | .ACTUATOR ASSEMBLY..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (SERIES 3) (NONPROCURABLE) | J | 1 |
| - 5G | 541675-9 | | | .ACTUATOR ASSEMBLY..... ELECTROMECHANICAL, LINEAR, RAM AIR MODULATION (SERIES 4) (NONPROCURABLE) | K | 1 |
| - 10 | GAREF920 | | | ..DELETED..... | | 0 |
| - 10A | GAREF921 | | | ..DELETED..... | | 0 |
| - 10B | GAREF922 | | | ..DELETED..... | | 0 |
| - 10C | GAREF923 | | | ..DELETED..... | | 0 |
| 10D | 2745227-1 | | | ..PLATE..... IDENTIFICATION (SERIES 2) | E | 1 |
| - 10E | 2023038-1 | | | ..PLATE..... IDENTIFICATION (SERIES 1) | F | 1 |
| - 10F | 2023038-2 | | | ..PLATE..... IDENTIFICATION (SERIES 2) | G | 1 |
| - 10G | 2023038-3 | | | ..PLATE..... IDENTIFICATION (SERIES 1) | H | 1 |
| - 10H | 2712024-1 | | | ..PLATE..... IDENTIFICATION (SERIES 3) | J | 1 |
| - 10J | 2748043-1 | | | ..PLATE..... IDENTIFICATION (SERIES 4) | K | 1 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 | NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| - 10K | S8847B1H1-54167 | | | ..PLATE..... IDENTIFICATION (ORDER PN S8847B1H1-541674-1-1) (SERIES 1) | A | 1 |
| - 10L | S8847B1H1-54167 | | | ..PLATE..... IDENTIFICATION (ORDER PN S8847B1H1-541674-3 SERIES 1) (SERIES 1) | B | 1 |
| - 10M | S8847B1H1-54167 | | | ..PLATE..... IDENTIFICATION (ORDER PN S8847B1H1-541674-3 SERIES 2) (SERIES 2) | C | 1 |
| - 10N | S8847B1H1-54167 | | | ..PLATE..... IDENTIFICATION (ORDER PN S8847B1H1-541674-4 SERIES 1) (SERIES 1) | D | 1 |
| | | | | (ATTACHING PARTS) | | |
| 15 | MS24642-1 | | | ..SCREW..... (V96906) | | 2 |
| | | | | ---*--- | | |
| 20 | 531270-1 | | | ..PLATE..... WIRING DIAGRAM (SERIES 1, 2) | A-C,F,G | 1 |
| - 20A | 531270-2 | | | ..PLATE..... WIRING DIAGRAM (SERIES 1, 2, 3, 4) | D,E,H,J, K | 1 |
| 25 | 517155-1 | | | ..CAPACITOR..... FILTER ASSEMBLY | | 1 |
| | | | | (ATTACHING PARTS) | | |
| 30 | AN500A6-5 | | | ..SCREW..... (V88044) (REPLACED BY ITEM 30A) | | 2 |
| - 30A | MS35265-27 | | | ..SCREW..... (REPLACES ITEM 30) | | 2 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|
| 1 | | | | | |
| 35 | MS20364-632 | | ..NUT.....<br>(V96906)<br>(REPLACED BY ITEM 35A) | | 2 |
| - 35A | MS21083N06 | | ..NUT.....<br>(V96906)<br>(REPLACES ITEM 35) | | 2 |
| 40 | NAS620-6 | | ..WASHER.....<br>FLAT<br>(V80205) | | 4 |
| | | | ---*--- | | |
| 45 | 531082-1 | | ..PROTECTOR.....<br>ELECTRICAL CABLE | | 1 |
| 50 | 531083-1 | | ..SCREW.....<br>HEX, DOUBLE END THREAD | | 2 |
| 55 | S8157C82-020 | | ..WASHER.....<br>SPECIAL<br>0.020 IN. (0.51 MM) THK | | 2 |
| 60 | AN500A6-14 | | ..SCREW.....<br>(V88044)<br>(REPLACED BY ITEM 60A) | | 2 |
| - 60A | MS35265-33 | | ..SCREW.....<br>(REPLACES ITEM 60) | | 2 |
| 65 | S8157C82-020 | | ..WASHER.....<br>SPECIAL<br>0.020 IN. (0.51 MM) THK | | 2 |
| 70 | MS16632-1025 | | ..RING.....<br>RETAINING<br>(V96906) | | 1 |
| 75 | 531088-1 | | ..BEARING.....<br>PLAIN, ACTUATOR | | 1 |
| 80 | S8157N214-002 | | ..WASHERS.....<br>SPECIAL<br>0.002 IN (0.05 MM) THK<br>(SERIES 1) | A | AR |
| - 80A | S8154-286C002 | | ..WASHER.....<br>SPECIAL STEEL SHIM<br>0.002 IN. (0.05 MM) THK<br>(SERIES 1, 2, 3, 4) | B-H,J,K | AR |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 | NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 85 | S8157N214-005 | | | ..WASHER.....<br>SPECIAL<br>0.005 IN. (0.13 MM) THK<br>(SERIES 1) | A | AR |
| - 85A | S8154-286C005 | | | ..WASHER.....<br>SPECIAL STEEL SHIM<br>0.005 IN. (0.13 MM) THK<br>(SERIES 1, 2, 3, 4) | B-H,J,K | AR |
| 90 | S8157N214-010 | | | ..WASHER.....<br>SPECIAL<br>0.010 IN. (0.25 MM) THK<br>(SERIES 1) | A | AR |
| - 90A | S8154-286C010 | | | ..WASHER.....<br>SPECIAL STEEL SHIM<br>0.010 IN. (0.25 MM) THK<br>(SERIES 1, 2, 3, 4) | B-H,J,K | AR |
| 95 | AN500A2-5 | | | ..SCREW.....<br>(V88044)<br>(REPLACED BY ITEM 95A) | | 4 |
| - 95A | MS35265-4 | | | ..SCREW.....<br>(V96906)<br>(REPLACES ITEM 95) | | 4 |
| 97 | 2745987-1 | | | ..PLATE.....<br>PIN RETAINING<br>(SERIES 3, 4) | J,K | 2 |
| 100 | 531079-2 | | | ..ARM.....<br>SWITCH OPERATING<br>(SERIES 1, 2) | A-H | 1 |
| 105 | 531079-1 | | | ..ARM.....<br>SWITCH OPERATING<br>(SERIES 1, 2) | A-H | 1 |
| 107 | 2745988-1 | | | ..CAM.....<br>SWITCH<br>(SERIES 3) | J | 2 |
| 107A | 2745988-1 | | | ..CAM.....<br>SWITCH<br>(SERIES 4) | K | 1 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 | NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 107B | 2745988-2 | | | ..CAM<br>SWITCH<br>(SERIES 4) | K | 1 |
| - 107C | 2745988-2 | | | ..CAM<br>SWITCH<br>(ALTN PART FOR ITEM 100)<br>(ALTN PART FOR ITEM 105)<br>(ALTN PART FOR ITEM 107)<br>(SERIES 1, 2, 3)<br>(USED WITH ITEM: 165E) | A-H,J | 2 |
| 110 | MS9389-02 | | | ..PIN<br>(V96906) | | 2 |
| 115 | 531078-1 | | | ..CAM<br>SWIITCH, OPERATING, THREADED | | 2 |
| 120 | 531080-1 | | | ..GEARSHAFT<br>THREADED, SWITCH OPERATING | | 1 |
| 125 | MS16632-1015 | | | ..RING<br>RETAINING<br>(V96906) | | 1 |
| 130 | S8154-206C002 | | | ..WASHER<br>SPECIAL STEEL SHIM<br>0.002 IN. (0.05 MM) THK | | AR |
| 135 | S8154-206C005 | | | ..WASHER<br>SPECIAL STEEL SHIM<br>0.005 IN. (0.13 MM) THK | | AR |
| 140 | S8154-206C010 | | | ..WASHER<br>SPECIAL STEEL SHIM<br>0.010 IN. (0.25 MM) THK | | AR |
| 145 | 531089-1 | | | ..GUIDE<br>CAM, SWITCH OPERATING | | 1 |
| 146 | 49330-2 | | | ..RIVET<br>(REPLACED BY ITEM 146A) | | 1 |
| - 146A | MS49362 | | | ..FASTENER<br>PANEL, PUSH RIVET<br>(CSD: 333-020-9002 V70210)<br>(REPLACES ITEM 146) | | 1 |
| - 147 | 531051-5 | | | ..EXTENSION<br>GEAR HOUSING | | 1 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 | NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 150 | 531087-1 | | | ...BEARING.....<br>PLAIN, ACTUATOR | | 1 |
| - 155 | 49330-2 | | | ..DELETED..... | | 0 |
| 160 | 531051-1 | | | ...EXTENSION.....<br>GEAR HOUSING, MACHINED | | 1 |
| 165 | 26-804F0RMZZ | | | ..SWITCH.....<br>DPDT<br>(V04426)<br>(ORDER PN 26-804FORMZZ)<br>(SERIES 1, 2) | A-C,F,G | 2 |
| - 165A | 26-804F0RMZZ | | | ..SWITCH.....<br>DPDT<br>(V04426)<br>(ORDER PN 26-804FORMZZ)<br>(SERIES 1)<br>(REPLACED BY ITEM 165B) | D,H | 2 |
| - 165B | 26-830070 | | | ..SWITCH.....<br>DPDT<br>(V04426)<br>(SERIES 1)<br>(REPLACES ITEM 165A) | D,H | 2 |
| - 165C | 26-830070 | | | ..SWITCH.....<br>DPDT<br>(V04426)<br>(SERIES 2, 3) | E,J | 2 |
| - 165D | 2748045-1 | | | ..SWITCH.....<br>DPDT<br>(SERIES 4) | K | 2 |
| - 165E | 2748045-1 | | | ..SWITCH.....<br>DPDT<br>(ALTN PART FOR ITEM 165)<br>(ALTN PART FOR ITEM 165A)<br>(ALTN PART FOR ITEM 165B)<br>(ALTN PART FOR ITEM 165C)<br>(SERIES 1, 2, 3)<br>(USED WITH ITEM: 107C) | A-H,J | 2 |
| | | | | (ATTACHING PARTS) | | |
| 170 | AN500A2-7 | | | ..SCREW.....<br>(V88044)<br>(REPLACED BY ITEM 170A) | | 4 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|
| 1 | | | | | |
| - 170A | AN500A2-8 | | ..SCREW.....<br>(V88044)<br>(REPLACES ITEM 170)<br>(SUPERSEDED BY ITEM 170B) | | 4 |
| - 170B | MS35265-7 | | ..SCREW.....<br>(SUPERSEDES ITEM 170A) | | 4 |
| 175 | S8157C232-020 | | ..WASHER.....<br>SPECIAL<br>0.020 IN. (0.51 MM) THK | | 4 |
| 180 | 29342-6 | | ..LOCKPLATE.....<br>SWITCH, SUBMINIATURE | | 2 |
| | | | ---*--- | | |
| 182 | 528994-8 | | ..INSULATOR.....<br>SWITCH<br>(SERIES 1, 2, 3, 4) | D,E,H,J, K | 2 |
| - 185 | GAREF16 | | ..DELETED..... | | 0 |
| 185A | MS24264R12B12PN | | ..CONNECTOR.....<br>RECEPTACLE<br>(V96906) | | 1 |
| | | | (ATTACHING PARTS) | | |
| - 186 | M39029-31-627 | | ..ELECTRICAL PIN.....<br>(V96906)<br>(ORDER PN M39029/31-627) | | 12 |
| 190 | AN500A4-4 | | ..SCREW.....<br>(V88044)<br>(REPLACED BY ITEM 190A) | | 4 |
| - 190A | MS35265-13 | | ..SCREW.....<br>(REPLACES ITEM 190) | | 4 |
| 195 | NAS620C4L | | ..WASHER.....<br>FLAT<br>(V80205) | | 4 |
| | | | ---*--- | | |
| 200 | 531081-1 | | ..ADAPTER..... | | 1 |
| | | | (ATTACHING PARTS) | | |
| 205 | AN500A6-6 | | ..SCREW.....<br>(V88044)<br>(REPLACED BY ITEM 205A) | | 4 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|
| 1 | | | | | |
| - 205A | MS35265-28 | | ..SCREW.....<br>(REPLACES ITEM 205) | | 4 |
| 210 | S8157C82-020 | | ..WASHER.....<br>SPECIAL<br>0.020 IN. (0.51 MM) THK | | 4 |
| | | | ---*--- | | |
| 215 | 40250-2 | | ..CLIP.....<br>SPRING | | 1 |
| 220 | 40250-4 | | ..CLIP.....<br>SPRING | | 1 |
| 225 | MS171433 | | ..PIN.....<br>SPRING<br>(V96906) | | 2 |
| 230 | 40680-43 | | ..SWITCH ASSEMBLY.....<br>ACTUATOR<br>(SERIES 1, 2) | A-H | 1 |
| - 230A | 40680-47 | | ..SWITCH ASSEMBLY.....<br>ACTUATOR<br>(SERIES 3, 4) | J,K | 1 |
| 235 | 40680-44 | | ..SWITCH ASSEMBLY.....<br>ACTUATOR<br>(SERIES 1, 2) | A-H | 1 |
| - 235A | 40680-48 | | ..SWITCH ASSEMBLY.....<br>ACTUATOR<br>(SERIES 3, 4) | J,K | 1 |
| 240 | S8157N136-016 | | ..WASHER.....<br>SPECIAL<br>0.016 IN. (0.41 MM) THK<br>(SERIES 1, 2) | A-H | 2 |
| 245 | S8157N136-002 | | ..WASHER.....<br>SPECIAL<br>0.002 IN. (0.05 MM) THK | | AR |
| 250 | S8157N136-005 | | ..WASHER.....<br>SPECIAL<br>0.005 IN. (0.13 MM) THK | | AR |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|
| 1 | | | | | |
| 253 | S8157N136-016 | | ..WASHER<br>SPECIAL<br>0.016 IN. (0.41 MM) THK<br>(SERIES 2, 3, 4) | E,J,K | AR |
| 255 | S8157N136-005 | | ..WASHER<br>SPECIAL<br>0.005 IN. (0.13 MM) THK | | 2 |
| 260 | 527275-12 | | ..SCREW<br>SWITCH ADJUSTING | | 1 |
| 265 | 527275-2 | | ..SCREW<br>SWITCH ADJUSTING | | 1 |
| - 270 | 526353 | | ...DELETED | | 0 |
| - 275 | 530939-1 | | ...DELETED | | 0 |
| - 277 | 530939-3 | | ..END FITTING<br>ACTUATOR<br>(ATTACHING PARTS) | | 1 |
| 280 | AN503-8-6 | | ..SCREW<br>(V88044) | | 4 |
| 285 | S8157C7-032 | | ..WASHER<br>SPECIAL<br>0.032 IN. (0.81 MM) THK | | 4 |
| | | | ---*--- | | |
| 287 | 526353 | | ...BEARING<br>SELF ALIGNING<br>(ORDER PN RS4)<br>(OPT MFR: AG 4SP12 V15860)<br>(OPT MFR: LHB4AE V73134)<br>(OPT MFR: LHA4 V73134)<br>(OPT MFR: RS4 V99528) | | 1 |
| - 287A | ABG4-105 | | ...DELETED | | 0 |
| - 287B | LHA4 | | ...DELETED | | 0 |
| - 287C | FKS4 | | ...DELETED | | 0 |
| - 287D | RS4 | | ...DELETED | | 0 |
| 289 | 530939-1 | | ...END FITTING<br>ACTUATOR | | 1 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 | NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 290 | 27399 | | | ..PIN<br>RETAINING | | 1 |
| 295 | AN320-4 | | | ..NUT<br>(V88044) | | 1 |
| - 300 | 34104 | | | ..DELETED | | 0 |
| 300A | 724-509-9004 | | | ..TERMINAL<br>LUG-RING TONGUE<br>(V99193)<br>(OPT MFR: 34104 V00779) | | 2 |
| - 305 | 68-1660-48 | | | ..DELETED | | 0 |
| 305A | 525-010-9008 | | | ..NUT<br>SELF-LOCKING<br>(OPT MFR: 68-1660-48 V019L2)<br>(OPT MFR: XX9496-1520-69 V08928) | | 1 |
| | | | | (ATTACHING PARTS) | | |
| 310 | MS35191-225 | | | ..SCREW<br>(V96906) | | 1 |
| | | | | ---*--- | | |
| 315 | 38611 | | | ..CLIP<br>WIRE | | 1 |
| - 320 | 68-1660-24 | | | ..DELETED | | 0 |
| 320A | 525-010-9004 | | | ..NUT<br>SELF-LOCKING<br>(OPT MFR: 68-1660-24 V019L2)<br>(OPT MFR: 68-1660-264 V27687)<br>(OPT MFR: XX9496-1517-69 V08928) | | 1 |
| | | | | (ATTACHING PARTS) | | |
| 325 | MS35191-215 | | | ..SCREW<br>(V96906) | | 1 |
| | | | | ---*--- | | |
| - 327 | 526725-1 | | | ..BEARING<br>PLAIN, ROD END, ASSEMBLY OF | | 1 |
| 330 | 526353 | | | ...BEARING<br>SELF ALIGNING | | 1 |
| 335 | 526403 | | | ...END FITTING ASSEMBLY<br>ACTUATOR | | 1 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 | NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 340 | 40618-1 | | | ..WASHER.....<br>LOCK, ROD END | | 1 |
| 345 | 40795 | | | ..NUT.....<br>PLAIN, HEXAGON | | 1 |
| 350 | MS9389-32 | | | ..PIN.....<br>(V96906) | | 2 |
| 355 | 30716-19 | | | ..STOP HOUSING.....<br>NUT | | 1 |
| 360 | 40292 | | | ..GEAR.....<br>SPUR, EXTERNAL | | 1 |
| 365 | MS21261R202 | | | ..KEY.....<br>GEAR<br>(V96906) | | 1 |
| 370 | 40381-10 | | | ..NUT.....<br>FOLLOW-UP | | 1 |
| 375 | 40293-24 | | | ..JACKSCREW ASSEMBLY.....<br>ACTUATOR | | 1 |
| 380 | 40988-13 | | | ..NUT ASSEMBLY.....<br>ACTUATOR DRIVE<br>(SERIES 1)<br>(NONREPAIRABLE) | A | 1 |
| - 380A | 40988-14 | | | ..NUT ASSEMBLY.....<br>ACTUATOR DRIVE<br>(SERIES 1, 2, 3, 4)<br>(NONREPAIRABLE) | B-H,J,K | 1 |
| 385 | AN503-6-6 | | | ..SCREW.....<br>(V88044)<br>(SERIES 1, 2)<br>(REPLACED BY ITEM 385A) | A-C | 2 |
| - 385A | NAS1352-06LL6P | | | ..SCREW.....<br>(V80205)<br>(SERIES 1, 2)<br>(REPLACES ITEM 385) | A-C | 2 |
| - 385B | NAS1352-06LL6P | | | ..SCREW.....<br>(V80205)<br>(SERIES 1, 2, 3, 4) | D-H,J,K | 2 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|
| 1 | | | | | |
| 390 | AN503-6-8 | | ..SCREW.....<br>(V88044)<br>(SERIES 1, 2)<br>(REPLACED BY ITEM 390A) | A-C | 2 |
| - 390A | NAS1352-06LL8P | | ..SCREW.....<br>(V80205)<br>(SERIES 1, 2)<br>(REPLACES ITEM 390) | A-C | 2 |
| - 390B | NAS1352-06LL8P | | ..SCREW.....<br>(V80205)<br>(SERIES 1, 2, 3, 4) | D-H,J,K | 2 |
| 395 | 526430 | | ..TERMINAL STRIP.....<br>GROUNDING | | 1 |
| 400 | 526326-1 | | ..CLAMP.....<br>RIM CLENCHING | | 2 |
| 405 | 46339-1-1 | | ..MOTOR.....<br>ALTERNATING CURRENT<br>(SERIES 1)<br>(SEE CMM 21-20-09 FOR DETAILS) | A | 1 |
| - 405A | 46339-2 | | ..MOTOR.....<br>ALTERNATING CURRENT<br>(SERIES 1, 2)<br>(SEE CMM 21-20-09 FOR DETAILS) | B,C,F,G | 1 |
| - 405B | 46366-1 | | ..MOTOR.....<br>ALTERNATING CURRENT<br>(SERIES 1)<br>(SEE CMM 21-20-54 FOR DETAILS) | D,H | 1 |
| - 405C | 46366-2 | | ..MOTOR.....<br>ALTERNATING CURRENT<br>(SERIES 2, 3, 4)<br>(SEE CMM 21-20-54 FOR DETAILS) | E,J,K | 1 |
| - 405D | 46366-2 | | ..MOTOR.....<br>ALTERNATING CURRENT<br>(ALTN PART FOR ITEM 405B)<br>(SERIES 1)<br>(SEE CMM 21-20-54 FOR DETAILS) | D,H | 1 |
| 410 | S8168-54C0150 | | ..SPACER.....<br>PLAIN | | 1 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 | NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 415 | 526497 | | | ..PLATE.....<br>MOUNTING, MOTOR | | 1 |
| 420 | S8154-146C002 | | | ..WASHER.....<br>SPECIAL STEEL SHIM<br>0.002 IN. (0.05 MM) THK | | AR |
| 425 | S8154-146C005 | | | ..WASHER.....<br>SPECIAL STEEL SHIM<br>0.005 IN. (0.13 MM) THK | | AR |
| 430 | S8168-44H0160 | | | ..SPACER.....<br>PLAIN METAL | | 1 |
| 435 | 33342 | | | ..BEARING.....<br>BALL, ANNULAR | | 2 |
| 440 | 38414-4 | | | ..GEAR ASSEMBLY.....<br>SPUR | | 1 |
| 445 | AN500A6-3 | | | ..SCREW.....<br>(V88044)<br>(REPLACED BY ITEM 445A) | | 2 |
| - 445A | MS35265-25 | | | ..SCREW.....<br>(REPLACES ITEM 445) | | 2 |
| 450 | 33378 | | | ..BEARING.....<br>BALL, ANNULAR | | 1 |
| - 455 | 531002-1 | | | ..HOUSING ASSEMBLY.....<br>SWITCH AND GEAR<br>(SERIES 1, 2) | A-H | 1 |
| - 455A | 531002-3 | | | ..HOUSING ASSEMBLY.....<br>SWITCH AND GEAR<br>(SERIES 3, 4) | J,K | 1 |
| 460 | 28182-187 | | | ...BUSHING..... | | 1 |
| 465 | 531002-2 | | | ...HOUSING.....<br>MACHINED<br>(ORDER NHA)<br>(SERIES 1, 2)<br>(NONPROCURABLE) | A-H | 1 |

- ITEM NOT ILLUSTRATED

| FIG. ITEM | PART NUMBER | AIRLINE STOCK NO. | 1234567 | NOMENCLATURE | EFFECT (USE) CODE | UNITS PER ASSY |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| - | 465A | 531002-4 | | ...HOUSING..... MACHINED (ORDER NHA) (SERIES 3, 4) (NONPROCURABLE) | J,K | 1 |

- ITEM NOT ILLUSTRATED