

CHAPTER

78

EXHAUST



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

CHAPTER 78
EXHAUST

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
78-EFFECTIVE PAGES		78-30-03		78-30-09	
1 thru 2	Feb 05/2016	1	Aug 05/2014	1	Aug 05/2014
78-CONTENTS		2	Aug 05/2014	2	Aug 05/2014
O 1	Feb 05/2016	3	Aug 05/2014	3	Aug 05/2014
2	Aug 05/2015	4	BLANK	4	BLANK
78-00-01		78-30-04		78-30-10	
1	Aug 05/2015	1	Aug 05/2014	1	Aug 05/2014
2	Aug 05/2015	2	Aug 05/2014	2	Aug 05/2014
3	Aug 05/2014	3	Aug 05/2015	3	Aug 05/2014
4	Aug 05/2014	4	Aug 05/2015	4	Aug 05/2014
5	Aug 05/2014	5	Aug 05/2015	78-30-11	
6	Aug 05/2014	6	Aug 05/2014	1	Aug 05/2015
7	Aug 05/2014	7	Aug 05/2014	R 2	Feb 05/2016
8	Aug 05/2014	8	Aug 05/2014	3	Aug 05/2015
9	Aug 05/2014	9	Aug 05/2014	4	Aug 05/2015
10	Aug 05/2014	10	Aug 05/2014	5	Aug 05/2015
11	Aug 05/2014	78-30-05		6	Aug 05/2015
12	BLANK	1	Aug 05/2015	7	Aug 05/2015
78-10-01		R 2	Feb 05/2016	8	Aug 05/2015
R 1	Feb 05/2016	3	Aug 05/2015	9	Aug 05/2015
R 2	Feb 05/2016	4	Aug 05/2015	10	Aug 05/2015
R 3	Feb 05/2016	5	Aug 05/2015	78-30-12	
R 4	Feb 05/2016	6	Aug 05/2015	1	Aug 05/2014
R 5	Feb 05/2016	78-30-06		2	Aug 05/2014
R 6	Feb 05/2016	1	Aug 05/2015	3	Aug 05/2014
78-30-01		R 2	Feb 05/2016	4	BLANK
1	Aug 05/2015	78-30-13		1	Aug 05/2014
2	Aug 05/2015	3	Aug 05/2015	2	Aug 05/2014
3	Aug 05/2015	4	Aug 05/2015	78-30-14	
4	Aug 05/2015	5	Aug 05/2015	1	Aug 05/2015
78-30-02		78-30-07		R 2	Feb 05/2016
1	Aug 05/2015	1	Aug 05/2015	3	Aug 05/2015
2	Aug 05/2015	2	Aug 05/2015	4	Aug 05/2015
3	Aug 05/2015	78-30-08		5	Aug 05/2014
4	Aug 05/2015	1	Aug 05/2015	6	Aug 05/2014
		2	Aug 05/2015	7	Aug 05/2014

A = Added, R = Revised, D = Deleted, O = Overflow

78-EFFECTIVE PAGES



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

CHAPTER 78
EXHAUST

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
78-30-14 (cont)		78-30-21		78-30-47 (cont)	
8	Aug 05/2014	1	Aug 05/2014	3	Aug 05/2015
9	Aug 05/2014	2	Aug 05/2014	4	Aug 05/2015
10	BLANK	3	Aug 05/2014	5	Aug 05/2015
78-30-15		4	Aug 05/2014	6	Aug 05/2015
1	Aug 05/2014	78-30-22		78-40-01	
2	Aug 05/2014	1	Aug 05/2014	1	Aug 05/2015
3	Aug 05/2014	2	Aug 05/2014	2	Aug 05/2015
4	BLANK	3	Aug 05/2014	3	Aug 05/2015
78-30-16		4	Aug 05/2014	4	Aug 05/2015
1	Aug 05/2014	78-30-23		5	Aug 05/2015
2	Aug 05/2014	1	Aug 05/2015	6	Aug 05/2015
3	Aug 05/2014	2	Aug 05/2015		
4	BLANK	3	Aug 05/2015		
78-30-17		4	BLANK		
R 1	Feb 05/2016	78-30-24			
R 2	Feb 05/2016	1	Aug 05/2014		
3	Aug 05/2014	2	Aug 05/2014		
R 4	Feb 05/2016	3	Aug 05/2014		
78-30-19		4	Aug 05/2014		
1	Aug 05/2014	5	Aug 05/2014		
2	Aug 05/2014	6	Aug 05/2014		
3	Aug 05/2014	7	Aug 05/2014		
4	Aug 05/2014	8	Aug 05/2014		
5	Aug 05/2014	9	Aug 05/2014		
6	Aug 05/2014	10	BLANK		
7	Aug 05/2014	78-30-44			
8	BLANK	1	Aug 05/2014		
78-30-20		2	Aug 05/2014		
1	Aug 05/2014	3	Aug 05/2014		
2	Aug 05/2014	4	BLANK		
3	Aug 05/2014	78-30-46			
4	Aug 05/2014	1	Aug 05/2014		
5	Aug 05/2014	2	Aug 05/2014		
6	BLANK	78-30-47			
		1	Aug 05/2015		
		2	Aug 05/2015		

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78-EFFECTIVE PAGES

Page 2
Feb 05/2016

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

CHAPTER 78
EXHAUST

<u>SUBJECT</u>	<u>TITLE</u>	<u>PART NO.</u>
78	EXHAUST	
78-00-01	BOOM HOIST - GROUND BASED REMOVAL/INSTALLATION (CE)	C78026-161, -259
78-10-01	REMOVE/INSTALL TOOL - PRIMARY EXHAUST ASSEMBLIES (CE)	C78009-1, -19, -38, -39, -72
78-30-01	HAND PUMP - OPENING SYSTEM, THRUST REVERSER	C78005-26, -53
78-30-02	HAND PUMP - OPENING SYSTEM, THRUST REVERSER	A78019-27, -29
78-30-03	LOCKPIN EQUIPMENT - THRUST REVERSER ACTUATION MODULE LOCKOUT	C78004-1
78-30-04	SLING EQUIPMENT - THRUST REVERSER, CFM56-7 (CE)	C78018-50
78-30-05	HOLD OPEN EQUIPMENT - THRUST REVERSER COWL, CFM56-7 ENGINE (CE)	C78019-15
78-30-06	LOCK ASSEMBLY - THRUST REVERSER ACTUATOR, CFM56-7 (CE)	C78023-1
78-30-07	RIGGING BAR - THRUST REVERSER POSITION FEEDBACK LINEAR VARIABLE DISPLACEMENT TRANSDUCER (LVDT)	B78006-7
78-30-08	LOCK EQUIPMENT - THRUST REVERSER MAINTENANCE	B78009-21, -26
78-30-09	LATCHING TOOL - THRUST REVERSER C-DUCT HALVES	C78020-11, -14
78-30-10	HYDRAULIC PUMP - ENGINE C-DUCT	B54001-53
78-30-11	65-DEGREE HOLD OPEN EQUIPMENT - THRUST REVERSER COWL, CFM56-7 ENGINE (CE)	C78021-1
78-30-12	DOLLY AND HYDRAULIC EQUIPMENT	C78011-37, -60, -78
78-30-13	ACTUATOR - INSTALLATION/REMOVAL TOOL	C78025-21
78-30-14	SLING EQUIPMENT - THRUST REVERSER SLEEVE (CE)	C78022-1
78-30-15	STAND - FUNCTIONAL TEST EQUIPMENT, LOCKING AND NON-LOCKING THRUST REVERSER ACTUATOR	B78010-28, -9
78-30-16	TEST FIXTURE - ROD END AND STROKE STOP, LOCKING AND NON-LOCKING THRUST REVERSER ACTUATOR	B78014-29, -37
78-30-17	OVERHAUL SET - THRUST REVERSER LOCKING ACTUATOR ASSEMBLY	B78015-17, -23, -39
78-30-19	WRENCH SET - THRUST REVERSER ACTUATOR	B78008-19
78-30-20	OVERHAUL EQUIPMENT - THRUST REVERSER LOCKING ACTUATOR ASSEMBLY	B78013-1
78-30-21	OVERHAUL SET - THRUST REVERSER LOCKING AND NON-LOCKING ACTUATOR ASSEMBLY	B78016-1
78-30-22	INSTALLATION EQUIPMENT - BEARING - LEAD SCREW, THRUST REVERSER NON-LOCKING ACTUATOR ASSEMBLY	B78017-1

78-CONTENTS



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

CHAPTER 78
EXHAUST

<u>SUBJECT</u>	<u>TITLE</u>	<u>PART NO.</u>
78-30-23	TORQUE FIXTURE - LOCKING AND NON-LOCKING THRUST REVERSER ACTUATOR ASSEMBLY	C78027-1
78-30-24	BREAKOUT BOX - TEST, THRUST REVERSER (AND AIRPLANE RELAYS)	A78025-100, -93
78-30-44	GAUGE - WEAR MEASUREMENT, THRUST REVERSER BLOCKER DOOR	G78009-1
78-30-46	GAP MEASUREMENT GAUGE - THRUST REVERSER ACTUATOR SYSTEM LOCKING ACTUATOR	C78030-1
78-30-47	TEST EQUIPMENT - VELOCITY/POSITION TRANSDUCER	J32091-1, -3, -7
78-40-01	TEST EQUIPMENT - VELOCITY/POSITION TRANSDUCER	B20005-41, -52, -75, -82

78-CONTENTS



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78026-161, -259

NAME: BOOM HOIST - GROUND BASED REMOVAL/INSTALLATION (CE)

AIRPLANE MAINTENANCE: YES

AMM 54-52-04, AMM 71-11-01, AMM 78-31-01, AMM 78-31-02

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78026-161 (option, non-CE) and -259 (preferred, CE) boom hoist is used on 737-600 thru -900 airplanes.

C78026 is used for the removal/installation of the thrust reverser, the thrust reverser translating sleeve, inlet cowl and strut aft fairing if there is no vertical lifting equipment available. Casters allow for easy movement around the engine and an integral hand pump enhances both portability and simplicity.

Refer to the current C78026 tool drawing, AMM 54-52-04, AMM 71-11-01, AMM 78-31-01 and AMM 78-31-02 for complete usage instructions.

C78026-161 and -259 consists of:

C78026-161		
QUANTITY	NOMENCLATURE	PART NUMBER
1	CASTER TURNER ASSEMBLY	C78026-2
2	TOWBAR ASSEMBLY	C78026-4
1	PUMP HANDLE ASSEMBLY	C78026-8
1	BOOM SUPPORT ASSEMBLY	C78026-158
1	HOIST ASSEMBLY	C78026-162
1	POST ADAPTER	C78026-163
VARIOUS	CONNECTING HARDWARE	

C78026-161		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SLING ASSEMBLY	C78026-124
1	HYDRAULIC DIAGRAM	C78026-165
1	STORAGE BOX	

C78026-259		
QUANTITY	NOMENCLATURE	PART NUMBER
2	CASTER TURNER ASSEMBLY	C78026-2
2	TOWBAR ASSEMBLY	C78026-4
1	PUMP HANDLE ASSEMBLY	C78026-8
1	HOIST ASSEMBLY	C78026-261
1	POST ADAPTER	C78026-163

78-00-01

Page 1
Aug 05/2015

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

(Continued)

C78026-259		
QUANTITY	NOMENCLATURE	PART NUMBER
VARIOUS	CONNECTING HARDWARE	

C78026-259		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SLING ASSEMBLY	C78026-260
1	HYDRAULIC DIAGRAM	C78026-165
1	STORAGE BOX	

WEIGHT: C78026-161 - 850 lbs (386 kg)
C78026-259 - 1200 lbs (544 kg)

DIMENSIONS: C78026-161 or -259 - 114 x 90 x 55 inches (2896 x 2286 x 1397 mm)

NOTE: C78026-161 supersedes C78026-156.
C78026-259 replaces C78026-161 for future procurement.

DECLARATION OF CONFORMITY: The design of C78026 meets the requirements of the Machinery Directive 2006/42/EC including its amendments. See fabricator of this equipment in case the Declaration of Conformity is missing.

OPERATING INSTRUCTIONS: Refer to the current C78026 and the 737 AMM procedures for detailed instructions on the use of this equipment. This equipment shall only be used in conjunction with Boeing 737 AMM procedures to maintain Boeing 737 airplanes.

The following safety messages shall be included in the information for use and follow the form as denoted on the engineering drawing (they should mimic decals on the drawing or notes on the usage placard):

1. Study, understand, and follow all instructions before operating this device. This includes instructions furnished by the vendors for subcomponents of this equipment.
2. Do not exceed rated capacity.
3. Use only on hard level surfaces.
4. Failure to heed these markings may result in personal injury and/or property damage.
5. Do not use for general transportation of load.
6. Use only attachments specifically identified by Boeing for use with this equipment.
7. No alterations shall be made to this product unless shown in Boeing Tool Change Bulletin (TCB) application to the respective drawings.
8. This equipment is only to be used in the support of Boeing aircraft.

78-00-01

Page 2
Aug 05/2015

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

MAINTENANCE: Basic care of the equipment includes cleaning the equipment of dirt, corrosives, or contaminants. Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent clean and wipe dry with a clean cloth. Hang freely to dry, but away from excessive heat or steam.

Slings:

1. Synthetic: Maintenance and inspection of synthetic shall be performed in accordance with ASME B30.9, Chapter 9-5 and 9-6.
2. Chain: Maintenance and inspection of chain shall be performed in accordance with EN 1492-1, Section 6, Section Annex B and ASME B30.9, Chapter 9-1.

Caster and Brakes: Lubricate all casters as recommended by the manufacturer. Normal conditions may warrant lubrication every six months, but monthly lubrication may be necessary for applications in wet or corrosive environments.

PROOF LOAD: Proof load testing for the C78026 shall be performed per the current C78026 drawing proof load diagram(s) (example Figure 2) and:

1. In conjunction with initial fabrication.
2. Subsequent to modification of this equipment (equipment shall only be modified in accordance with the GSE drawing).
3. After repair of load carrying components.
4. After replacement of load carrying components (except for load carrying components such as shackles and hoist rings that carry their own certification).

INSPECTION: FREQUENT

General Inspection (before use):

1. Missing fasteners.
2. Notes, Cautions and Warnings are legible.
3. Usage placards are legible.

Jacking Equipment:

1. Inspect for physical damage, wear and corrosion.
2. Missing or damaged parts.
3. Hydraulic leakage from the cylinder, hydraulic hose or pump.
4. Hydraulic fluid level.
5. If defects are discovered, the unit shall be removed from service until repairs are made by a qualified person.
6. The unit shall be repaired in compliance with the engineering drawing.

78-00-01

Page 3
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

Slings General: Prior to use, all new, altered, modified or repaired slings shall be inspected by a designated person to verify compliance with the applicable provisions of ASME B30.9.

Synthetic:

1. Visual inspection for damage shall be performed by the user or other designated person each day or shift the slings used.
2. Slings shall not be returned to service until approved by a qualified person.
3. A written record of frequent inspections is not required.
4. Conditions detailed below and in ASME B30.9 or conditions that may result in a hazard shall cause the sling to be removed from service.
 - Red warning yarns visible
 - Acid or caustic burns
 - Melting or charring of any part of the sling surface
 - Snags, punctures, tears or cuts
 - Broken or worn stitches in load bearing splices
 - Excessive abrasive wear
 - Knots in any part of the sling
 - Discoloration and brittle or stiff areas on any part of the sling
 - Distortion of fittings
 - Missing or illegible sling tag

Chain:

1. Visual inspection for damage shall be performed by the user or other designated person each day or shift the sling is used.
2. Conditions such as those listed in ASME B30.9, para. 9-1.9.4 or any other conditions that may result in hazard shall cause the sling to be removed from service.
3. Slings shall not be returned to service until approved by a qualified person.

Casters and Brakes:

1. Inspect the swivel assembly to see if excessive play exists due to wear. If swivel assembly is loose, it must be replaced.
2. If the caster has a king-bolt and nut, ensure that it is securely fastened.
3. If the swivel does not turn freely, check for corrosion or dirt binding the raceways. It may be necessary to replace the swivel assembly or the entire caster.
4. For rigid casters, ensure the horns are not bent or distorted.

78-00-01

Page 4
Aug 05/2014

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

5. Check caster brakes for proper function before each use. Apply brakes one-at-a-time and ensure the brakes are not slipping or loose.
6. If brakes are slipping or loose due to damage or wear, replace the brakes and/or casters immediately and retest the brakes.

PERIODIC

Welding Inspection:

1. Magnetic particle or dye penetrant inspection for all welds, after all proof load tests.
2. Inspect and evaluate per GSE Welding Document A00001 Inspection Requirements Tables 1 & 2, and Acceptance Criteria Table 3.
3. Reject cracked or deformed parts.

Jacking Equipment:

1. Inspect to ensure jack is in complete compliance with the engineering drawing.
2. Inspect structure and components for damage, excessive wear and corrosion.
3. Inspect safety markings and messages are in place and legible.
4. Inspect for correct operation of relief valves.

Slings - General:

1. A complete inspection for damage to the sling shall be periodically performed by a designated person.
2. Each sling and component shall be examined individually, taking care to expose and examine all surfaces.
3. The sling shall be examined for the conditions noted in the frequent inspection and in ASME B30.9 or any other conditions that may result in a hazard shall cause the sling to be removed from service.
4. Slings shall not be returned to service until approved by a qualified person.
5. A written record of the most recent periodic inspection shall be maintained and shall include the condition of the sling.

Synthetic:

1. The straps shall be examined for the conditions noted in the frequent inspection and in ASME B30.9 or any other conditions that may result in a hazard shall cause the sling to be removed from service.

Chain:

1. Each link and component shall be examined individually, taking care to expose and examine all surfaces, including the inner link surfaces.

78-00-01

Page 5
Aug 05/2014

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

2. Chain inspection shall be examined for conditions listed in ASME B30.9, para. 9-1.9.4.
3. Deficiencies found during the inspection are analyzed and the wire rope shall not be used, if deficiencies are determined to be hazardous.

Casters and Brakes:

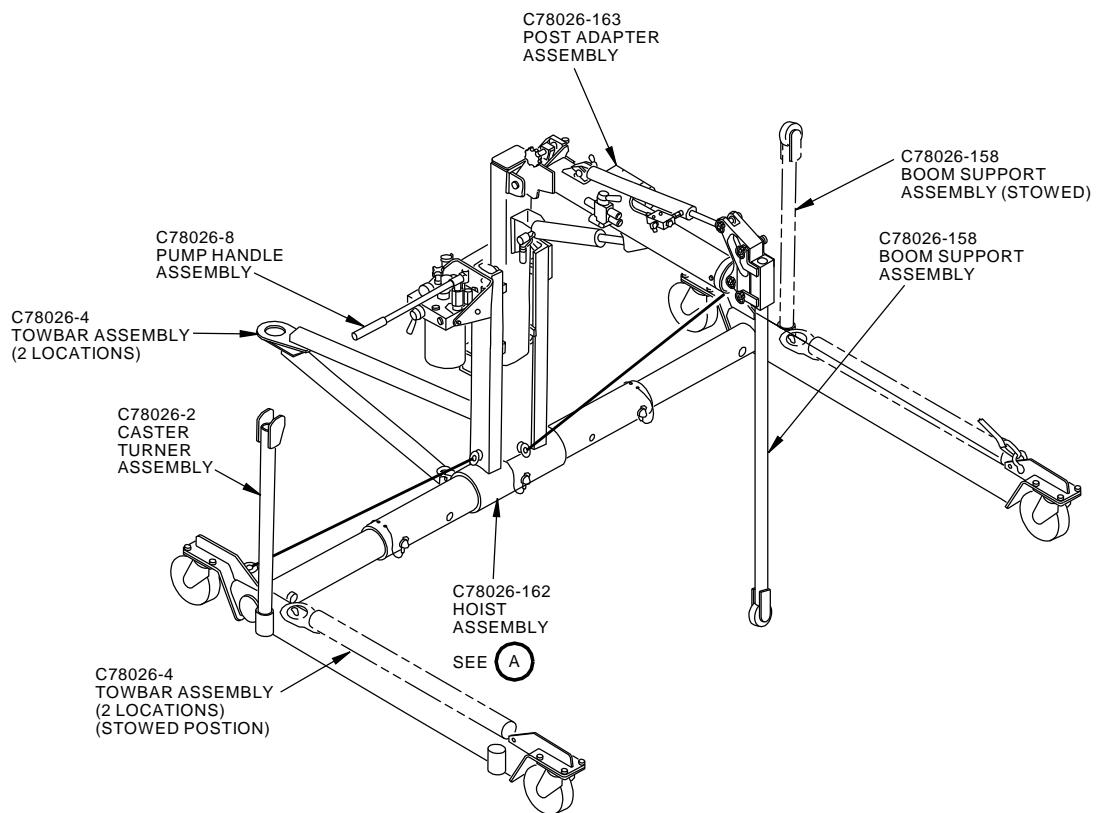
1. Inspect king-bolt, axle, swivel locks, brakes and wheel.

STORAGE: C78026 shall be stored clean, dry, free of exposure to fumes or corrosive elements, indoors and in the furnished storage box (if provided).

DECOMMISSIONING: C78026 parts and assemblies shall be permanently altered to prevent their unauthorized re-use. Recycling is the preferred manner of disposal for those materials where that option is available.

78-00-01

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



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Ground Based Removal/Installation Boom Hoist
Figure 1 (Sheet 1 of 3)

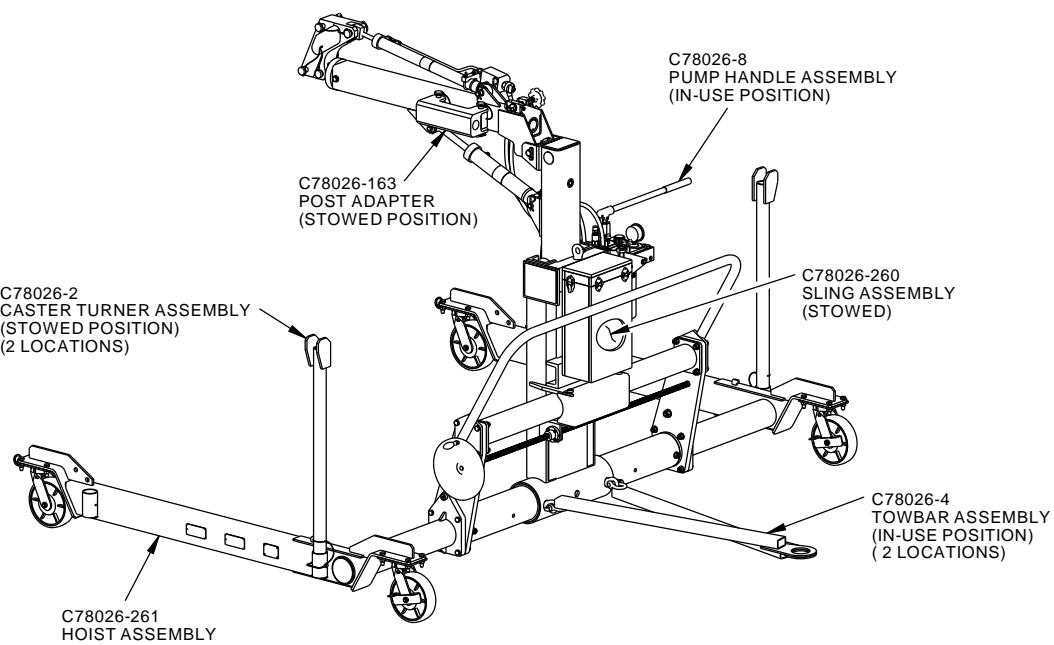
78-00-01

D634A501

BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

Page 7
Aug 05/2014

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



C78026-259 BOOM HOIST

2276258 S0000512796_V1

Ground Based Removal/Installation Boom Hoist
Figure 1 (Sheet 2 of 3)

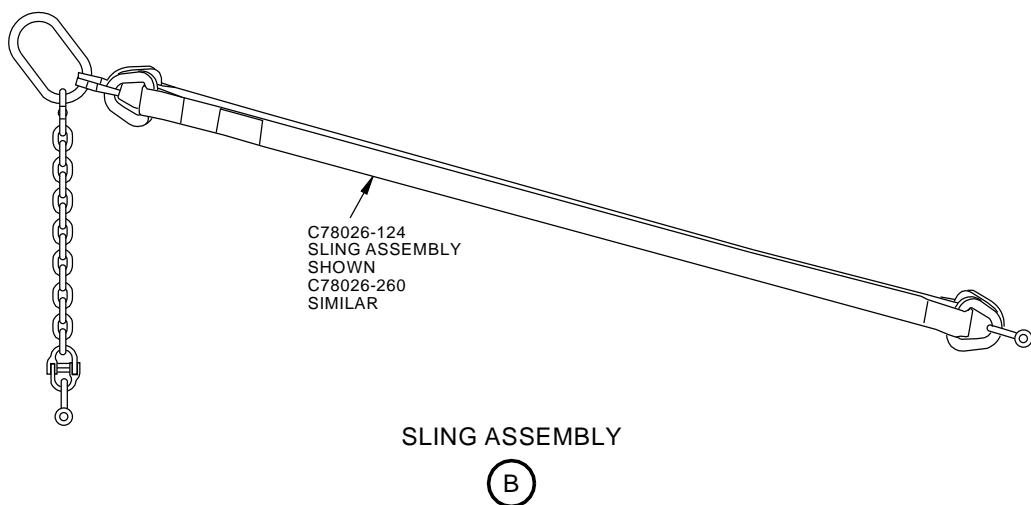
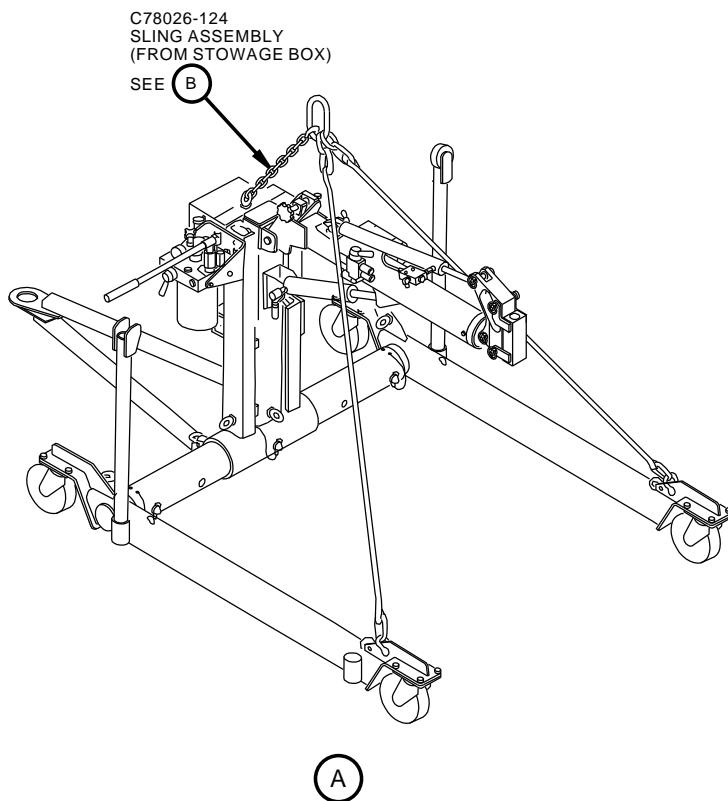
78-00-01

Page 8
Aug 05/2014

D634A501

BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



H40133 S0006832184_V5

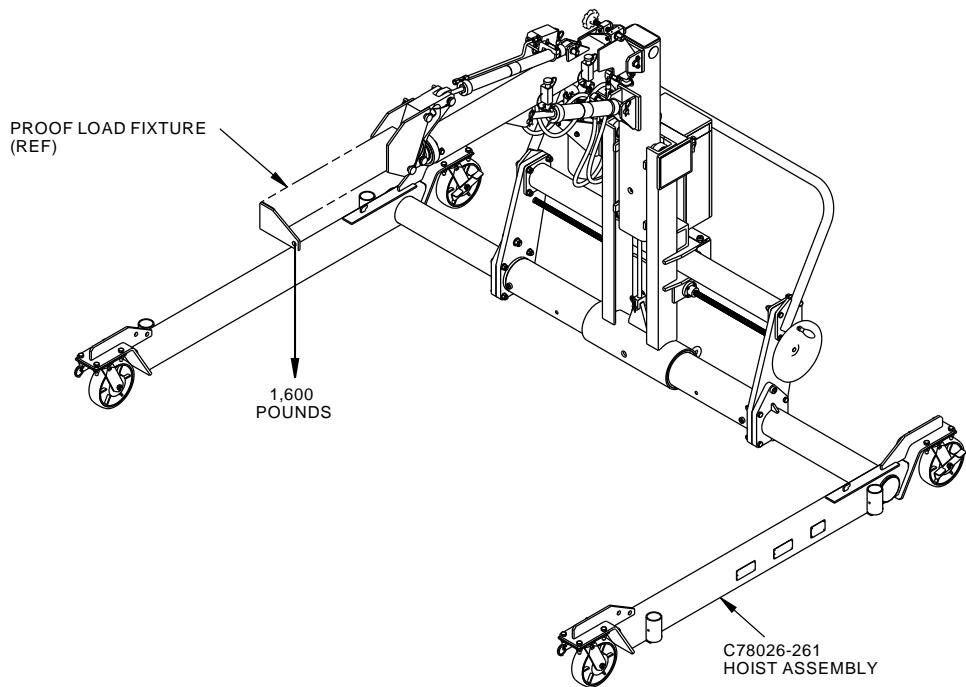
Ground Based Removal/Installation Boom Hoist
Figure 1 (Sheet 3 of 3)

78-00-01

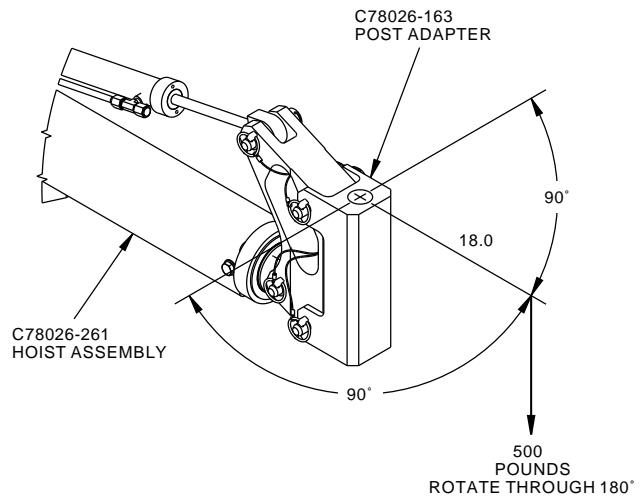
Page 9
Aug 05/2014

D634A501

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



C78026-261
PROOF LOAD DIAGRAM 1
(EXAMPLE)



C78026-261
PROOF LOAD DIAGRAM 2
(EXAMPLE)

2276259 S0000512797_V1

C78026 Proof Load Diagrams (Example)
Figure 2

78-00-01

Page 10
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[1]	C78026-233 (CE-4-10)	FILTER ELEMENT	ZINGA INDUSTRIES 2400 ZINGA DR REEDSBURG, WI 53959

78-00-01



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78009-1, -19, -38, -39, -72

NAME: REMOVE/INSTALL TOOL - PRIMARY EXHAUST ASSEMBLIES (CE)

AIRPLANE MAINTENANCE: YES

AMM 78-11-01, AMM 78-11-02

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78009-38 (option, non-CE qualified) or C78009-39 (option, CE qualified) or C78009-72 (preferred, CE qualified) remove/install tool are used on all 737-300 thru -900 airplanes, including performance improvement package (PIP) engines.

The C78009-1 (option, non-CE qualified) or C78009-19 (option, non-CE qualified) is used on 737-300 thru -500 airplanes.

C78009-38 or -39 or -72 is used to remove or install the exhaust nozzle and plug of the CFM56-7 engine and the earlier CFM56-3 engine.

C78009-39 or -72 is qualified as CE and is used in conjunction with a customer-furnished, 1-ton, hydraulic, transmission jack. C78009-38 includes a 1-ton, hydraulic, transmission jack as part of the C78009-38 remove/install tool.

C78009-1 or -19 may be used to remove or install the exhaust nozzle on CFM56-3 engines. C78009-1 includes a 1-ton, hydraulic, transmission jack as part of the C78009-1 remove/install tool. C78009-19 is used in conjunction with a customer-furnished, 1-ton, hydraulic, transmission jack.

Refer to the current C78009 for up-to-date information on qualified, 1-ton, hydraulic, transmission jacks.

Refer to AMM 78-11-01, AMM 78-11-02 and the current C78009 drawing for complete usage instructions.

C78009-1, -19, -38, -39 and -72 consist of:

C78009-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	JACK ADAPTER	C78009-2
1	JACK	C78009-16
VARIOUS	CONNECTING HARDWARE	
1	STORAGE BOX	

C78009-19		
QUANTITY	NOMENCLATURE	PART NUMBER
1	JACK ADAPTER	C78009-20
VARIOUS	CONNECTING HARDWARE	
1	STORAGE BOX	

78-10-01



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

C78009-38		
QUANTITY	NOMENCLATURE	PART NUMBER
1	JACK ASSEMBLY	C78009-34
1	STORAGE BOX	

C78009-39		
QUANTITY	NOMENCLATURE	PART NUMBER
1	JACK ADAPTER ASSEMBLY	C78009-40
1	STORAGE BOX	

C78009-72		
QUANTITY	NOMENCLATURE	PART NUMBER
1	JACK ADAPTER ASSEMBLY	C78009-73
1	STORAGE BOX	

WEIGHT: C78009-1, -19 - 30 lbs (14 kg)
C78009-38, -39, -72 - 70 lbs (32 kg)

DIMENSIONS: C78009-1, -19 - 17 x 14 x 8 inches (432 x 356 x 203 mm)
C78009-38, -39 - 18 x 20 x 15 inches (457 x 508 x 381 mm)
C78009-72 - 15 x 20 x 22 inches (381 x 508 x 559 mm)

NOTE: C78009-38 supersedes C78009-33.
C78009-72 replaces C78009-1, -19, -38 and -39 for future procurement.

DECLARATION OF CONFORMITY: C78009-39 or -72 require a written Declaration of Conformity from the C78009-39 or -72 fabricator if it is to be used in the European Union. The design of C78009-39 or -72 meets the European requirements of Machinery Directive 2006/42/EC including its amendments. When used within the European Union, the fabricator of C78009-39 or -72 must also meet the requirements of that directive. At a minimum for the tool fabricator, this requires the retention of a technical file, a labeling of the equipment with the CE mark, and the completion of an EC Declaration of Conformity. If C78009-39 or -72 is to be used within the European Union and the Declaration of Conformity is missing, contact the fabricator of C78009-39 or -72 for a replacement Declaration of Conformity.

78-10-01

Page 2
Feb 05/2016

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

OPERATING INSTRUCTIONS: Refer to the current C78009 drawing, AMM 78-11-01 and AMM 78-11-02 procedures for detailed instructions on the use of this equipment. This equipment shall only be used in conjunction with Boeing maintenance procedures to maintain Boeing airplanes.

C78009-39 or -72 is jacking or adapter equipment requires the following safety messages be included in the information for use and follow the form as denoted on the engineering drawing (they should mimic decals on the drawing or notes on the usage placard):

- Study, understand, and follow all instructions before operating this device. This includes instructions furnished by the vendors for subcomponents of this equipment.
- Do not exceed rated capacity.
- Use only on hard level surfaces.
- Failure to heed these markings may result in personal injury and/or property damage.
- Do not use for general transportation of load.
- Use only attachments specifically identified by Boeing for use with this equipment.
- No alterations shall be made to this product unless shown in Boeing Tool Change Bulletin (TCB) application to the respective drawings.
- This equipment is only to be used in the support of Boeing aircraft.

MAINTENANCE: General Cleaning: Basic care of the equipment includes cleaning the equipment of dirt, corrosives, or contaminants. Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent, clean the components and wipe dry with a clean cloth. Hang the components freely to dry, but away from excessive heat or steam.

Structural and Mechanical Lifting Devices, (supporting lifter):

1. Maintenance shall be done based on the recommendations made by the lifter manufacturer or qualified person.
2. Before adjustments and repairs are started on a lifter, the following precautions shall be taken:
 - All courses of power shall be disconnected, locked out, and tagged "Out of Service".
 - A lifter removed from service for repair shall be tagged "Out of Service".
3. Only a qualified person shall perform adjustments and tests when required.
4. Replacement parts shall be at least equal to the original manufacturer's specifications.
5. After adjustments and repairs have been made, the lifter shall not be returned to service until it has been inspected according to ASME B-30.20, para. 20-1.3.4.

78-10-01



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

6. Dated records of repairs and replacements shall be made.
7. Adjustments and repairs. Any hazardous conditions disclosed by the inspection requirements of ASME B-30.20, para. 20-1.3.1 shall be corrected before normal operations of the lifter is resumed. Adjustments and repairs shall be done under the direction of , or by a qualified person.

INSPECTION: FREQUENT

General Inspection (before use):

1. Missing fasteners
2. Notes, Cautions and Warnings are legible
3. Usage placards are legible

Structural and Mechanical Lifting Devices (supporting lifter):

1. Visual Inspection by the operator before and during each lift of the device. Records are not required. Inspect for:
 - Structural deformation, cracks or excessive wear of any parts of the lifting device.
 - Loose or missing guards, fasteners, covers, stops or nameplates.
 - All functional operational mechanisms and automatic hold and release mechanisms for misadjustments interfering with operation.

PERIODIC

Welding Inspection:

1. Magnetic particle or dye penetrant inspection for all welds.
2. Inspect and evaluate per GSE Welding Document A00001 Inspection Requirements Tables 1 & 2, and Acceptance Criteria Table 3.
3. Reject cracked or deformed parts.

Structural and Mechanical Lifting Devices (supporting lifter):

1. A written record of a visual inspection, by a qualified person is required.
2. Inspection is made of external conditions for a continuing evaluation of the following factors:
 - Loose bolts or fasteners.
 - Excessive wear of linkages and other mechanical parts.
 - Excessive wear at hoist hooking points and load support clevises or pins.
 - Deficiencies found during the inspection are analyzed and the lifting device shall not be used, if deficiencies are determined to be hazardous.
 - The lifting device shall not be used until the hazardous

78-10-01



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

deficiencies are corrected.

STORAGE: C78009-39 or -72 shall be stored clean, dry, and free of exposure to fumes or corrosive elements, indoors and in the furnished storage box.

DECOMMISSIONING: Parts and assemblies of this equipment shall be permanently altered to prevent their unauthorized reuse. Recycling is the preferred manner of disposal for those materials where that option is available.

78-10-01

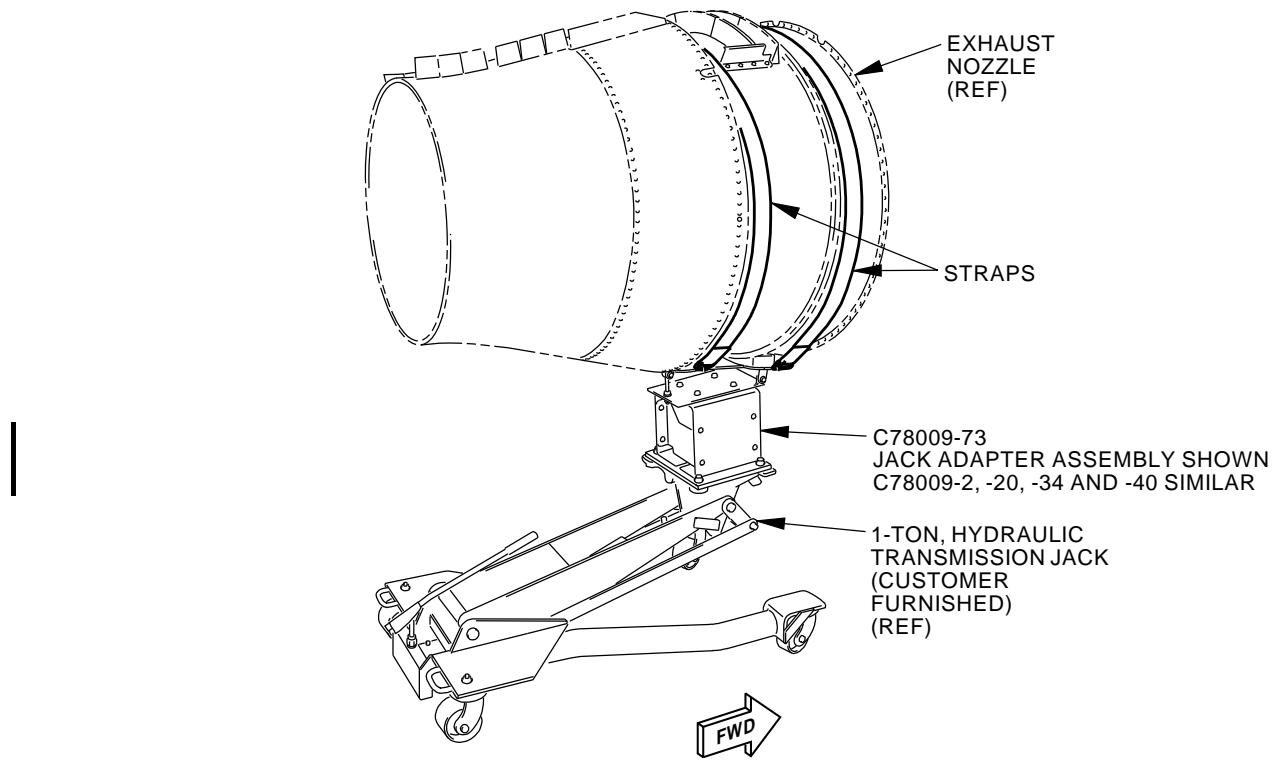
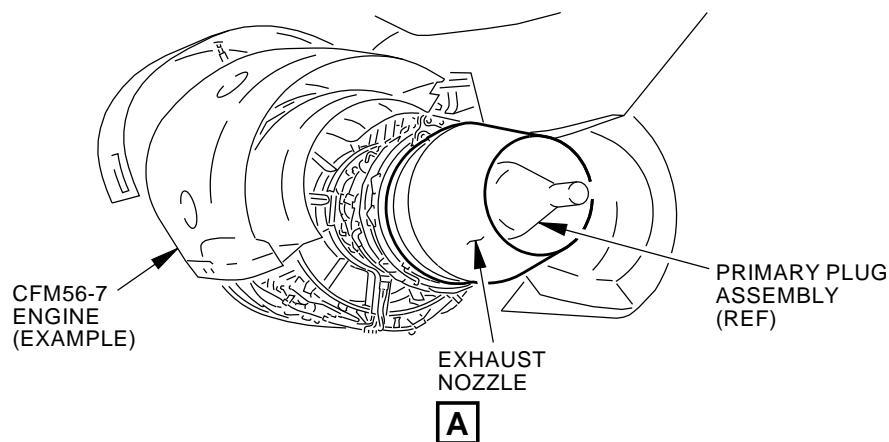
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Page 5
Feb 05/2016



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



M63933 S0006832187_V6

Primary Exhaust Sleeve and Plug Removal/Installation Tool
Figure 1

78-10-01

D634A501

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Page 6
Feb 05/2016



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78005-26, -53

NAME: HAND PUMP - OPENING SYSTEM, THRUST REVERSER

AIRPLANE MAINTENANCE: YES

AMM 71-00-02, AMM 78-31-00, AMM 78-31-01, AMM 78-31-08

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78005-26 (option) or C78005-53 (preferred) hand pump is used on all 737 airplanes, except 737-100 and -200 airplanes.

C78005 is used to manually supply hydraulic pressure to the actuators that are used to open the thrust reverser "C" ducts for engine maintenance. C78005 is attached to the "C" duct lift actuator.

The design of C78005 meets the requirements of Article 3, Paragraph 3 of the Pressure Equipment Directive 97/23/EC.

C78005 is included as flyaway equipment on each delivered airplane. The B54001 hydraulic pump and the A78019 hand pump are non-flyaway options to C78005.

Refer to AMM 71-00-02, AMM 78-31-00, AMM 78-31-01, AMM 78-31-08 and the current C78005 drawing for complete usage instructions.

C78005-26 and -53 consist of:

C78005-26		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PUMP ASSEMBLY	C78005-22
1	STORAGE BOX	

C78005-53		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PUMP ASSEMBLY	C78005-54
1	STORAGE BOX	

WEIGHT: C78005-26 or -53 - 19 lbs (9 kg)

DIMENSIONS: C78005-26 or -53 - 5 x 6 x 30 inches (127 x 152 x 762 mm)

NOTE: C78005-53 replaces C78005-26 for future procurement.

C78005-26 supersedes C78005-21.

A78019 hand pump and B54001 hydraulic pump are options to C78005.

78-30-01

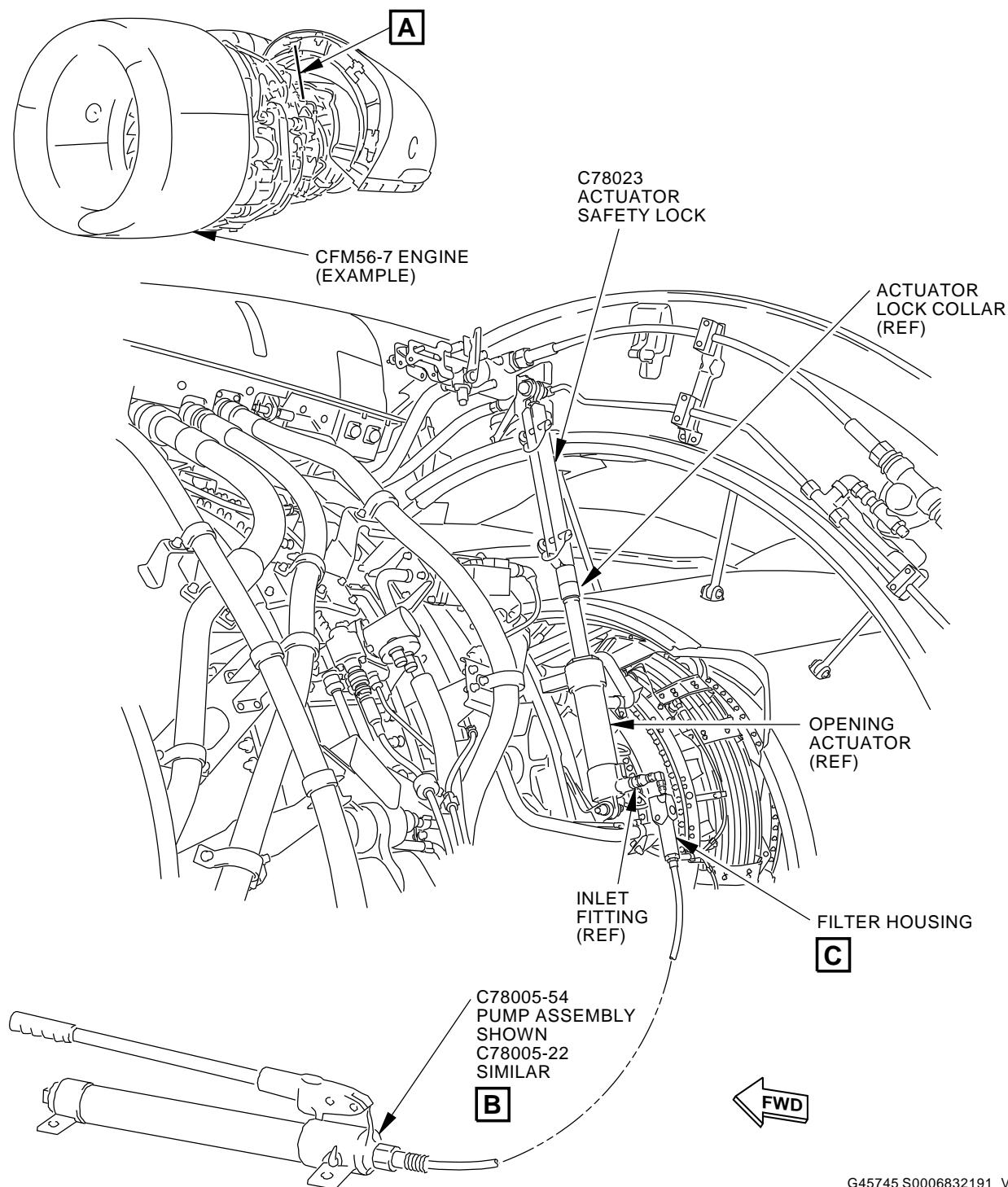
Page 1
Aug 05/2015

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



G45745 S0006832191_V4

Thrust Reverser Opening System Hand Pump
Figure 1

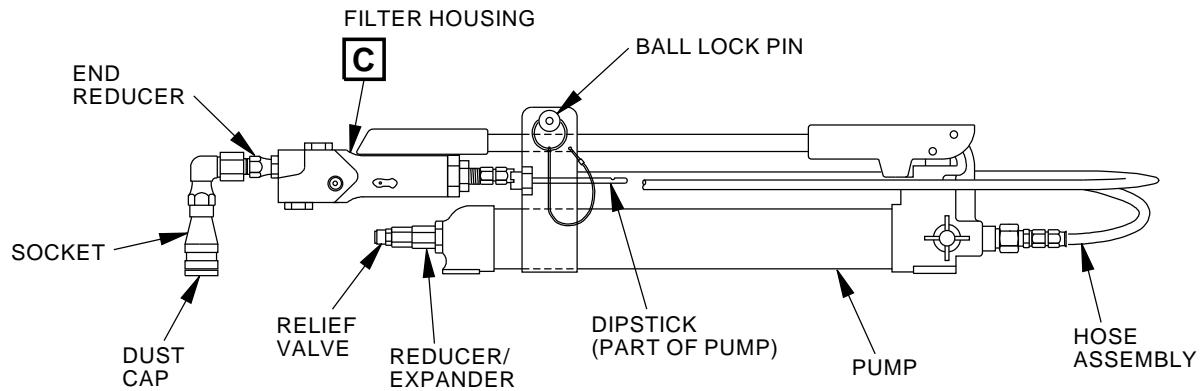
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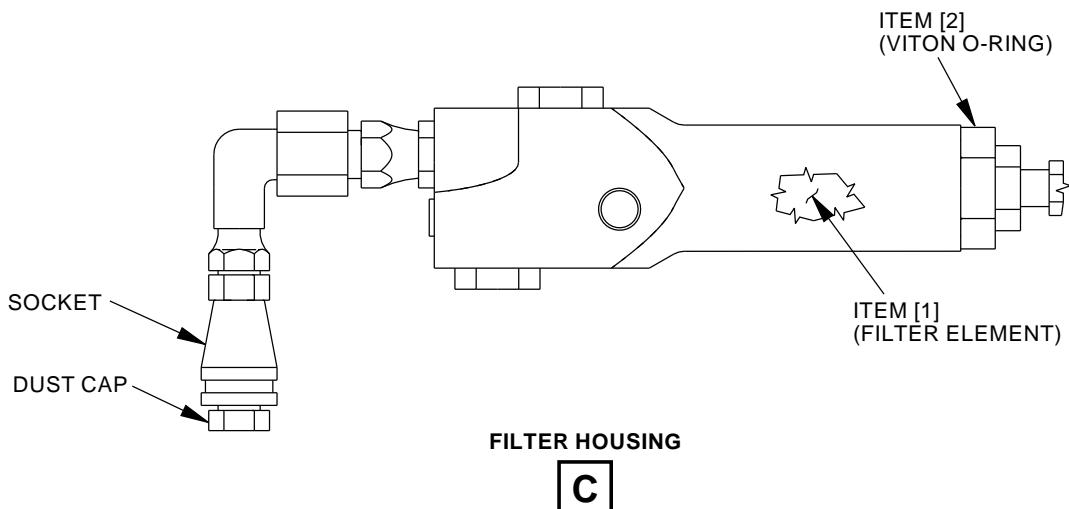
Page 2
Aug 05/2015


BOEING
 737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



C78005-22
PUMP ASSEMBLY SHOWN
C78005-54 SIMILAR

[B]



G45724 S0006832192_V5

Thrust Reverser Opening System Hand Pump Components
Figure 2

78-30-01

Page 3
 Aug 05/2015

D634A501



**737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL**

REPAIRABLE/REPLACEABLE PARTS			
ITEM NUMBER	PART NUMBER	NOMENCLATURE	VENDOR CODE
[1]	C78005-43 (412F-B10CN)	FILTER ELEMENT	59165
[2]	AS3208-12	VITON O-RING	5Y411

78-30-01



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: A78019-27, -29

NAME: HAND PUMP - OPENING SYSTEM, THRUST REVERSER

AIRPLANE MAINTENANCE: YES

AMM 71-00-02, AMM 72-31-00, AMM 78-31-00, AMM 78-31-01, AMM 78-31-08

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The A78019-27 (option) or A78019-29 (preferred) hand pump is used on all 737-300 thru -900 airplanes.

A78019 is used to manually supply hydraulic pressure to the actuators that open the thrust reverser "C" ducts for engine maintenance. A78019 has higher flow capacity than the C78005 pump that is included as airplane fly-away equipment.

The design of A78019 meets the requirements of Article 3, Paragraph 3 of the Pressure Equipment Directive 97/23/EC.

Refer to AMM 71-00-02, AMM 72-31-00, AMM 78-31-00, AMM 78-31-01, AMM 78-31-08 and the current A78019 drawing for complete usage instructions.

The A78019-27 and A78019-29 both include a hand pump, hose, plumbing fittings and is mounted on a wheeled cart for ease of transportation to the work area.

WEIGHT: 100 lbs (45 kg)

DIMENSIONS: 27 x 31 x 38 inches (686 x 787 x 965 mm)

NOTE: A78019-29 replaces A78019-27 for future procurement.

A78019-27 supersedes A78019-21.

C78005 hand pump and B54001 hydraulic pump are options to A78019.

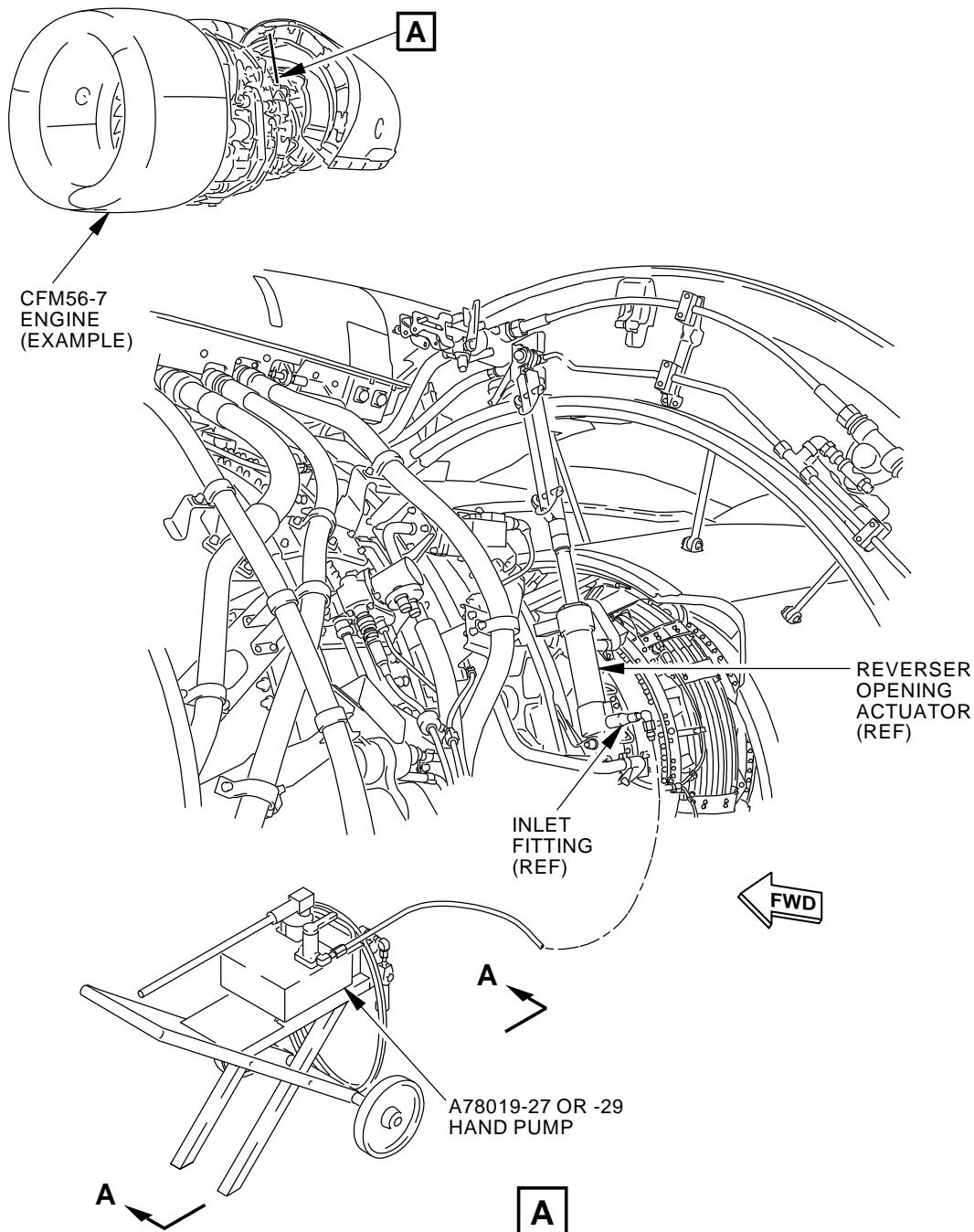
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Page 1
Aug 05/2015


BOEING
 737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



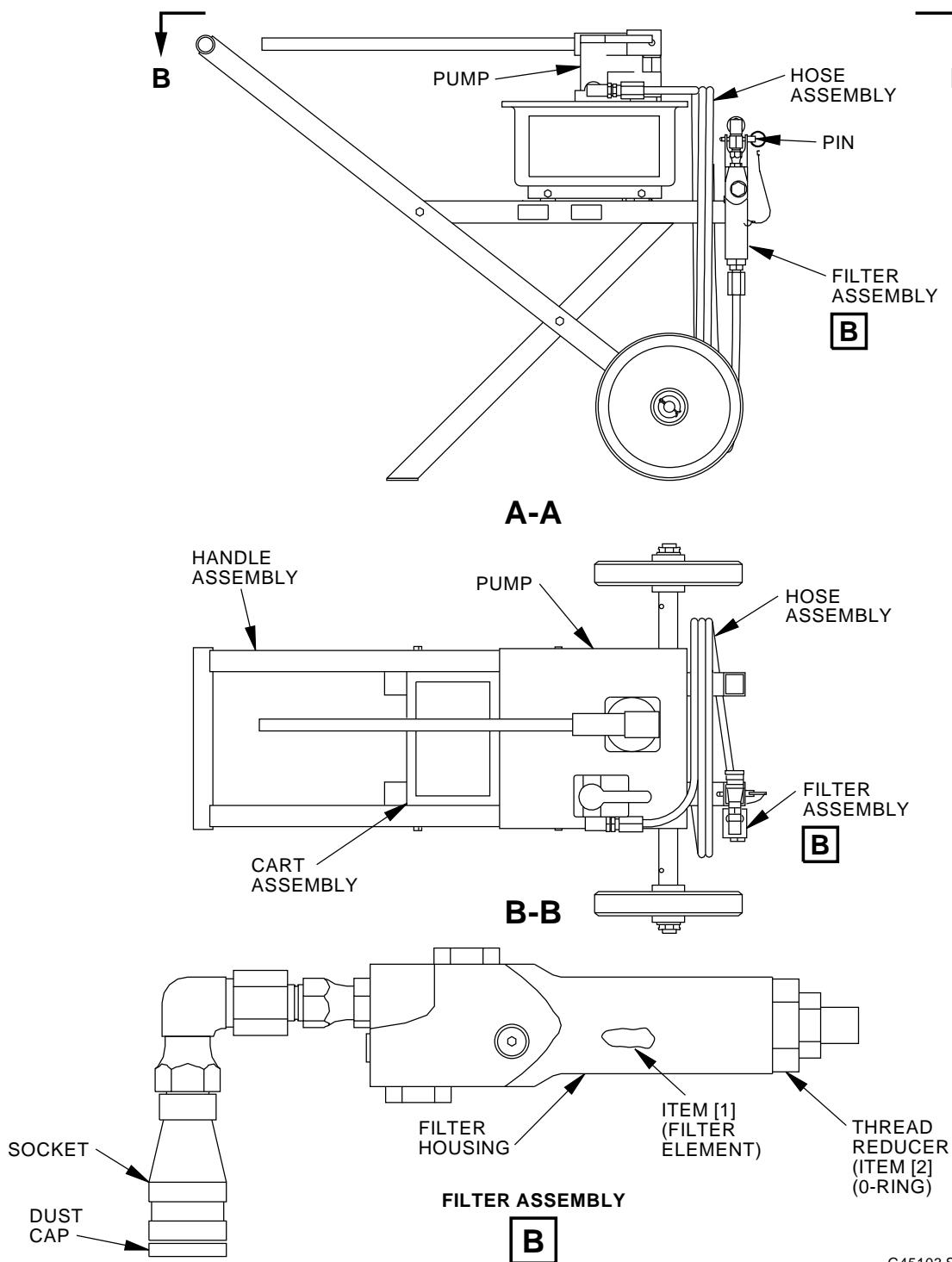
G45016 S0006832194_V6

Thrust Reverser Opening System Hand Pump
Figure 1 (Sheet 1 of 2)

78-30-02



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



G45103 S0006832195_V5

Thrust Reverser Opening System Hand Pump
Figure 1 (Sheet 2 of 2)

78-30-02

Page 3
Aug 05/2015

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

REPAIRABLE/REPLACEABLE PARTS			
ITEM NUMBER	PART NUMBER	NOMENCLATURE	VENDOR CODE
[1]	A79019-54 (412F-B10CN)	REPLACEABLE FILTER ELEMENT	59165
[2]	AS3208-12	VITON O-RING	5Y411

78-30-02



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78004-1

NAME: LOCKPIN EQUIPMENT - THRUST REVERSER ACTUATION MODULE
LOCKOUT

AIRPLANE MAINTENANCE: YES

AMM 73-71-00, AMM 78-00-00, AMM 78-31-00

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78004-1 lockpin equipment is used on all 737-300 thru -900 airplanes.

C78004 is used to prevent the thrust reverser translating sleeve from actuating during maintenance. C78004 locks the manual isolation valve handle on the thrust reverser actuation control valve module, keeping the translating sleeve from moving.

Refer to AMM 73-71-00, AMM 78-00-00, AMM 78-31-00 and the current C78004 drawing for complete usage instructions.

C78004-1 consists of:

C78004-1		
QUANTITY	NOMENCLATURE	PART NUMBER
2	PIN ASSEMBLY	C78004-2
1	STORAGE BAG	

WEIGHT: 1 lb (0.45 kg)

DIMENSIONS: 1 x 8 x 8 inches (25 x 200 x 200 mm)

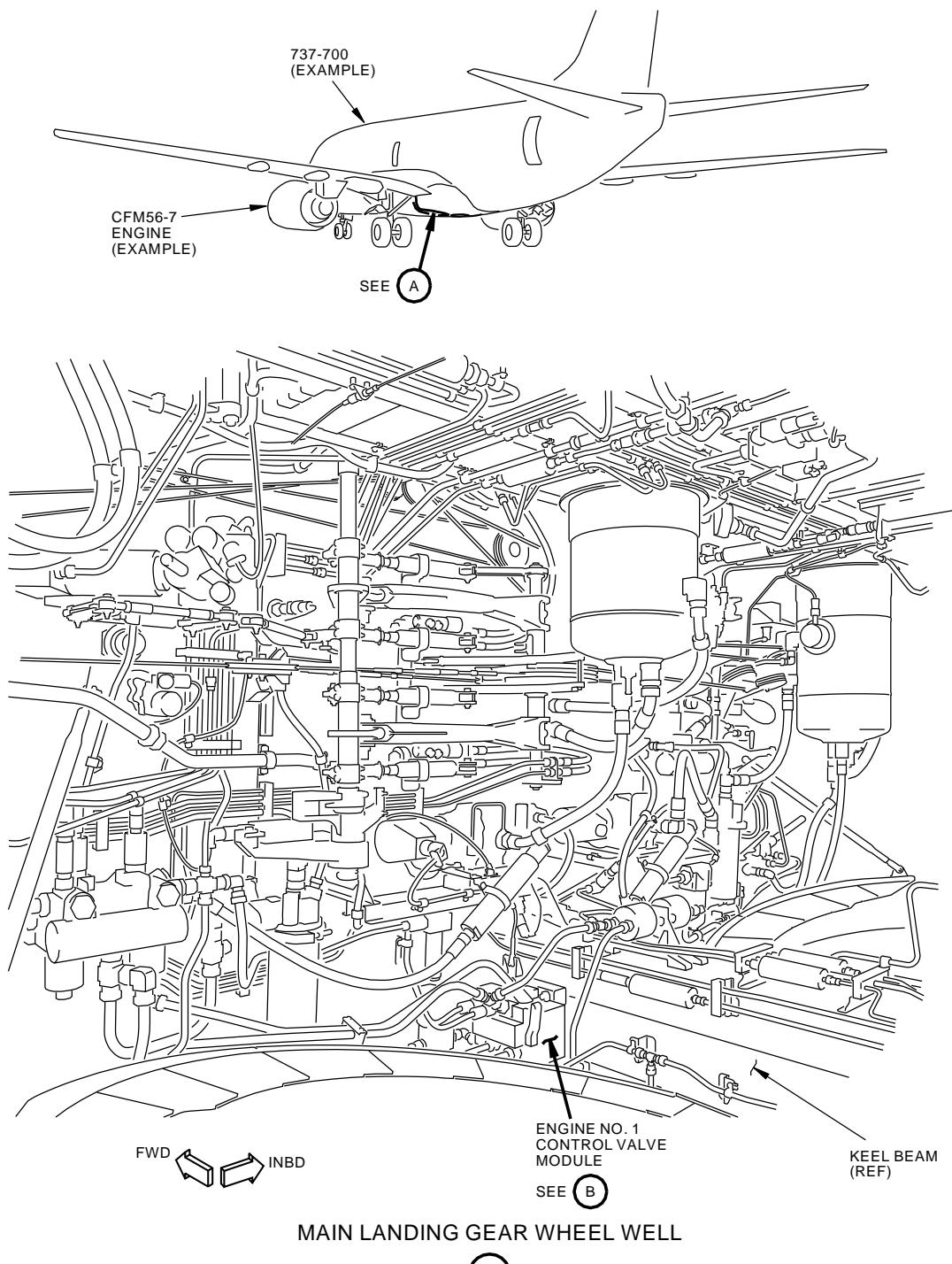
78-30-03

D634A501

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Page 1
Aug 05/2014

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



G77608 S0006832197_V3

Lockpin Equipment - Thrust Reverser Actuation Module Lockout
Figure 1 (Sheet 1 of 2)

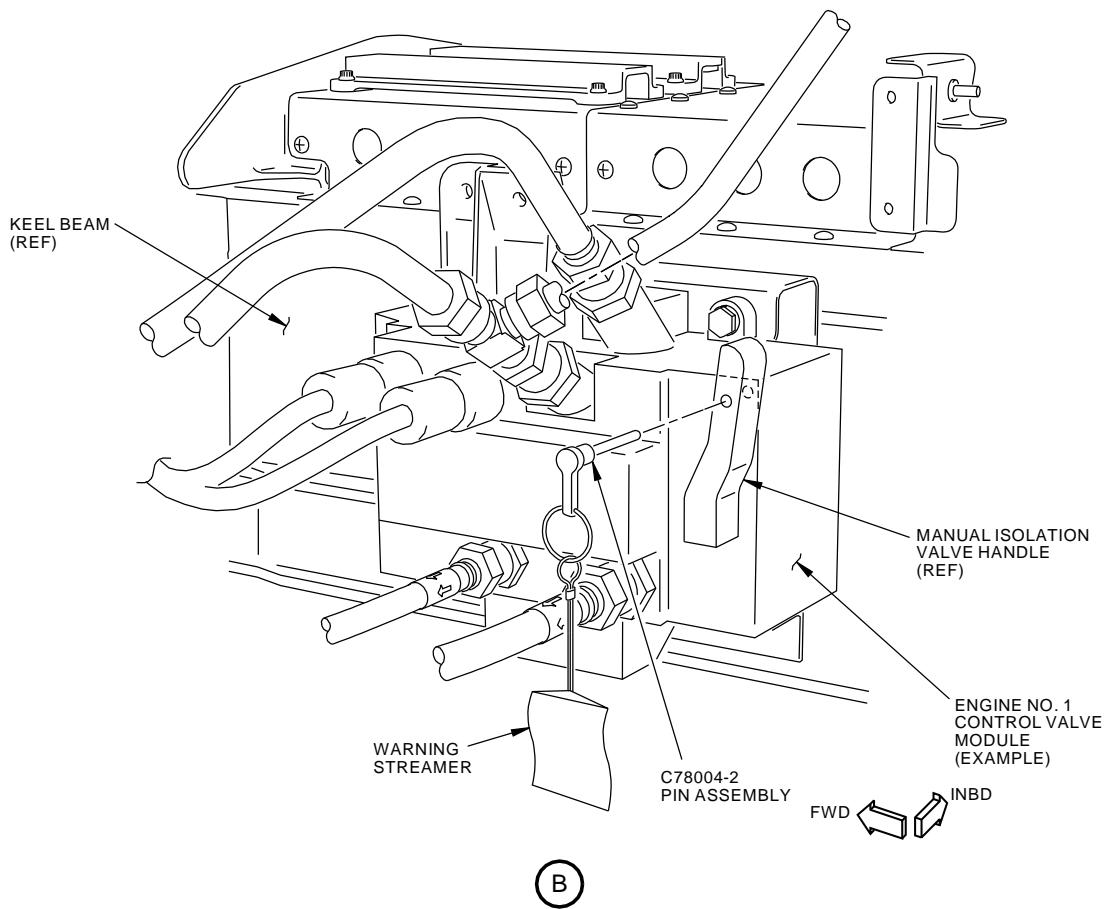
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Page 2
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2079578 S0000434260_V1

Lockpin Equipment - Thrust Reverser Actuation Module Lockout
Figure 1 (Sheet 2 of 2)

78-30-03

D634A501

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Page 3
Aug 05/2014



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78018-50

NAME: SLING EQUIPMENT - THRUST REVERSER, CFM56-7 (CE)

AIRPLANE MAINTENANCE: YES

AMM 78-31-01

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78018-50 sling equipment is used on all 737-600 thru -900 airplanes.

C78018 is used in conjunction with a customer-furnished load cell to remove and install the CFM56-7 thrust reversers. C78018-50 is also used in conjunction with a customer-furnished C78026 ground based boom hoist to remove and install the thrust reversers.

Refer to the current C78018 tool drawing and AMM 78-31-01 for complete usage instructions.

C78018-50 consists of:

C78018-50		
QUANTITY	NOMENCLATURE	PART NUMBER
1	STRONGBACK ASSEMBLY	C78018-4
2	LATCH FITTING ASSEMBLY	C78018-5
1	FORWARD HINGE FITTING ASSEMBLY	C78018-6
2	SPUD ASSEMBLY	C78018-8
1	AFT HINGE FITTING ASSEMBLY	C78018-51
1	C FRAME ASSEMBLY	C78018-52
4	WASHER	C78018-9 ^[1]
2	THREAD PROTECTOR	C78018-13
4	BOLT	C78018-54 ^[1] (NAS6604-12)
1	MASTER LINK	C78018-55 (A-342-3/4W)
1	SHACKLE	C78018-56 (G-209-1/2)
1	HAND CHAIN HOIST	C78018-57
1	STORAGE BOX	

*[1] C78018-9 AND -54 ARE STOWED ON C78018-5.

WEIGHT: 240 lbs (109 kg)

DIMENSIONS: 38 x 45 x 87 inches (965 x 1143 x 2210 mm)

NOTE: C78018-50 supersedes C78018-1 and -47.

78-30-04

Page 1
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

DECLARATION OF CONFORMITY: The design of C78018 meets the requirements of the machinery directive 2006/42/EC including its amendments. For use within the European Union, the manufacture of this equipment must also meet the requirements of that directive. At a minimum for the manufacturer, this entails the retention of a technical file, the labeling of the equipment with the CE mark, and the completion of an EC declaration of conformity.

OPERATING INSTRUCTIONS: Refer to the current C78018 and the 737 AMM procedures for detailed instructions on the use of this equipment. This equipment shall only be used in conjunction with Boeing 737 AMM procedures to maintain Boeing 737 airplanes.

MAINTENANCE: General Cleaning: Basic care of the equipment includes cleaning the equipment of dirt, corrosives, or contaminants. Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent clean and wipe dry with a clean cloth. Hang freely to dry, but away from excessive heat or steam.

Fishpole / Lever Hoists: Lubricate and clean appropriate parts of the hoists as stated in the maintenance service manual by the manufacturer.

Slings:

1. Synthetic: Maintenance and inspection of synthetic shall be performed in accordance with ASME B30.9, Chapter 9-5 and 9-6.

Structural and Mechanical Lifting Devices (supporting lifters, spreader bars, etc): Maintenance shall be done based on the recommendations made by the lifter manufacturer or qualified person.

1. Before adjustments and repairs are started on a lifter, the following precautions shall be taken:
 - All courses of power shall be disconnected, locked out, and tagged "Out of Service".
 - A lifter removed from service for repair shall be tagged "Out of Service".
2. Only a qualified person shall perform adjustments and tests when required.
3. Replacement parts shall be at least equal to the original manufacturer's specifications.
4. After adjustments and repairs have been made, the lifter shall not be returned to service until it has been inspected according to ASME B30.20, para. 20-1.3.4.
5. Dated records of repairs and replacements shall be made.
6. Adjustments and repairs. Any hazardous conditions disclosed by the inspection requirements of ASME B30.21, para. 21-1.3.1 shall be corrected before normal operations of the lifter is resumed. Adjustments and repairs shall be done under the direction of, or by, a qualified person.

78-30-04

Page 2
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PROOF LOAD: Proof load testing for the C78018 SLING EQPT - THRUST REVERSER, CFM56-7 shall be performed per the current C78018 drawing proof load diagram(s) (example Figure 3) and:

1. In conjunction with initial fabrication
2. Subsequent to modification of this equipment (equipment shall only be modified in accordance with the C78018 GSE drawing)
3. After repair of load carrying components
4. After replacement of load carrying components (except for load carrying components such as shackles and hoist rings that carry their own certification).

On-going integrity/safety of the device to be assured by inspection.

INSPECTION: FREQUENT

General Inspection (before use):

1. Missing fasteners
2. Notes, Cautions and Warnings are legible
3. Usage placards are legible

Fishpole / Lever Hoists:

1. General: Prior to use, all new, altered, modified or repaired slings shall be inspected by a designated person to verify compliance with the applicable provisions of ASME B30.9.
2. Webbing:
 - Visual inspection for damage shall be performed by the user or other designated person each day or shift the slings used.
 - Slings shall not be returned to service until approved by a qualified person.
 - A written record of frequent inspections is not required.
 - Conditions detailed below and in ASME B30.9 or conditions that may result in a hazard shall cause the sling to be removed from service.
 - Red warning yarns visible
 - Acid or caustic burns
 - Melting or charring of any part of the sling surface
 - Snags, punctures, tears or cuts
 - Broken or worn stitches in load bearing splices
 - Excessive abrasive wear
 - Knots in any part of the sling
 - Discoloration and brittle or stiff areas on any part of the sling
 - Distortion of fittings

78-30-04



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

- Missing or illegible sling tag

Structural and Mechanical Lifting Devices (supporting lifters, spreader bars, etc):

1. Visual Inspection by the operator before and during each lift of the device. Records are not required. Inspect for:
 - Structural deformation, cracks or excessive wear of any parts of the lifting device.
 - Loose or missing guards, fasteners, covers, stops or nameplates.
 - All functional operational mechanisms and automatic hold and release mechanisms for mis-adjustments interfering with operation.

PERIODIC

Welding Inspection:

1. Magnetic particle or dye penetrant inspection for all welds, after all proof load tests.
2. Inspect and evaluate per GSE Welding Document A00001 Inspection Requirements Tables 1 & 2, and Acceptance Criteria Table 3.
3. Reject cracked or deformed parts.

Fishpole / Lever Hoists:

1. Periodic inspection shall be done as recommended by the manufacturer. See Standard EN 13157.

Slings:

1. General:
 - A complete inspection for damage to the sling shall be periodically performed by a designated person.
 - Each sling and component shall be examined individually, taking care to expose and examine all surfaces.
 - The sling shall be examined for the conditions noted in the frequent inspection and in ASME B30.9 or any other conditions that may result in a hazard shall cause the sling to be removed from service.
 - Slings shall not be returned to service until approved by a qualified person.
 - A written record of the most recent periodic inspection shall be maintained and shall include the condition of the sling.
2. Synthetic:
 - The straps shall be examined for the conditions noted in the frequent inspection and in ASME B30.9 or any other conditions that may result in a hazard shall cause the sling to be removed from service.

78-30-04



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

Structural and Mechanical Lifting Devices (supporting lifters, spreader bars, etc):

1. A written record of a visual inspection, by a qualified person is required.
2. Inspection is made of external conditions for a continuing evaluation of the following factors:
 - Loose bolts or fasteners
 - Cracked or worn gears, pulleys, sheaves, sprockets, bearings, chains and belts.
 - Excessive wear of linkages and other mechanical parts.
 - Excessive wear at hoist hooking points and load support clevises or pins.
 - Deficiencies found during the inspection are analyzed and the lifting device shall not be used, if deficiencies are determined to be hazardous.
 - The lifting device shall not be used until the hazardous deficiencies are corrected.

STORAGE: C78018 shall be stored clean, dry, free of exposure to fumes or corrosive elements, indoors and in the furnished storage box.

DECOMMISSIONING: Parts and assemblies of C78018 shall be permanently altered to prevent their unauthorized re-use. Recycling is the preferred manner of disposal for those materials where that option is available.

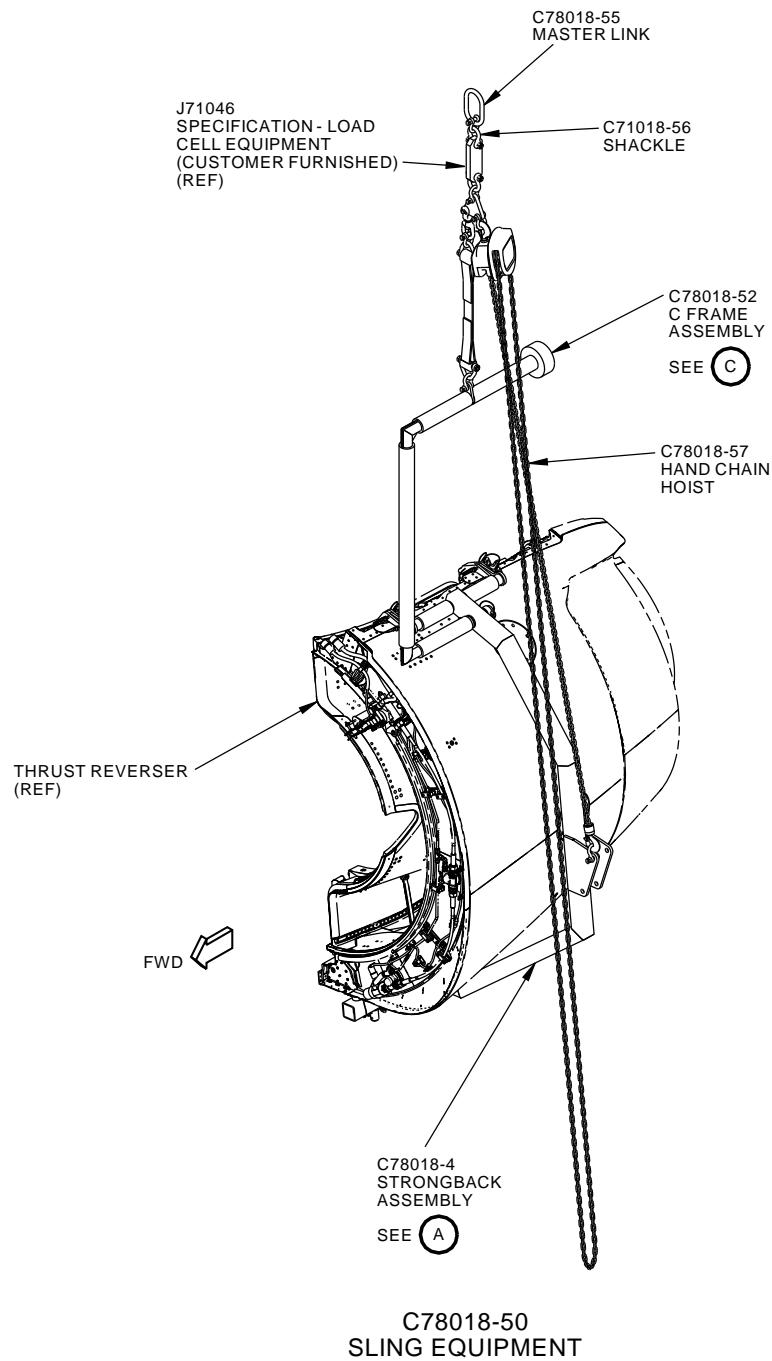
78-30-04

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Page 5
Aug 05/2015

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



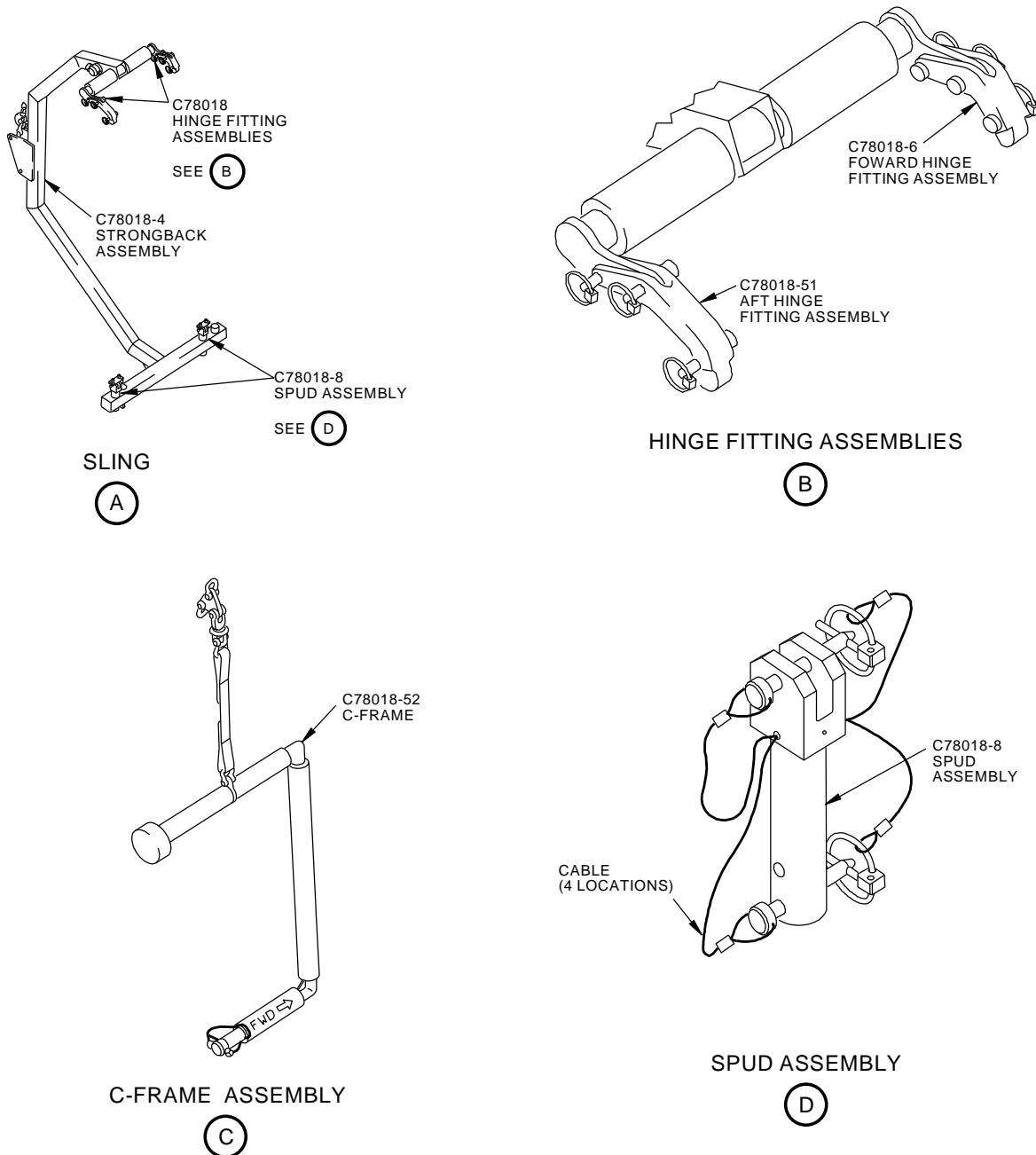
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CFM56-7 Engine Thrust Reverser Cowl Sling Assembly
Figure 1 (Sheet 1 of 2)

78-30-04



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



G83840 S0006832200_V4

CFM56-7 Engine Thrust Reverser Cowl Sling Assembly
Figure 1 (Sheet 2 of 2)

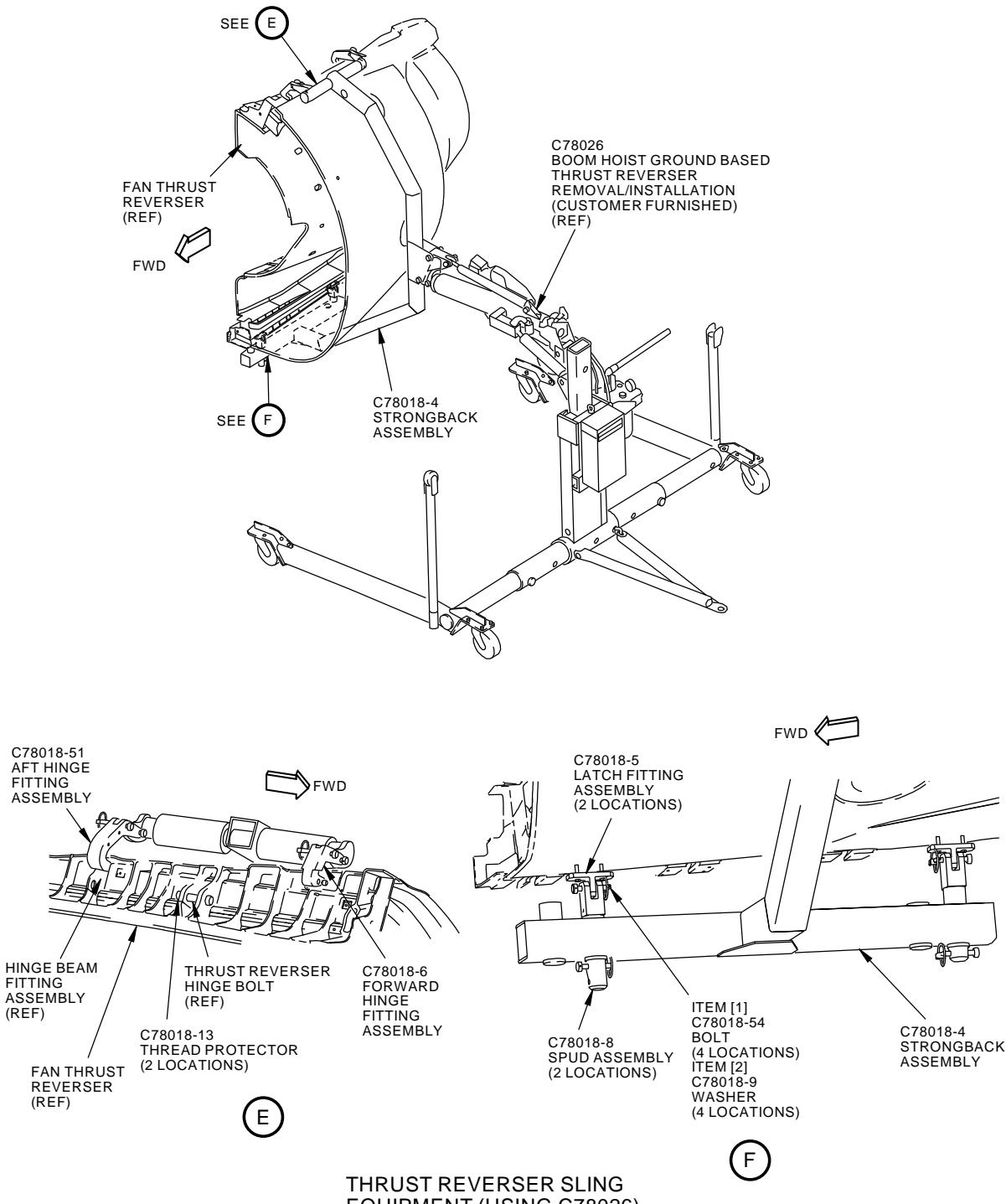
78-30-04

Page 7
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



K00181 S0006832201_V4

Alternate Use of Thrust Reverser Sling Equipment
Figure 2

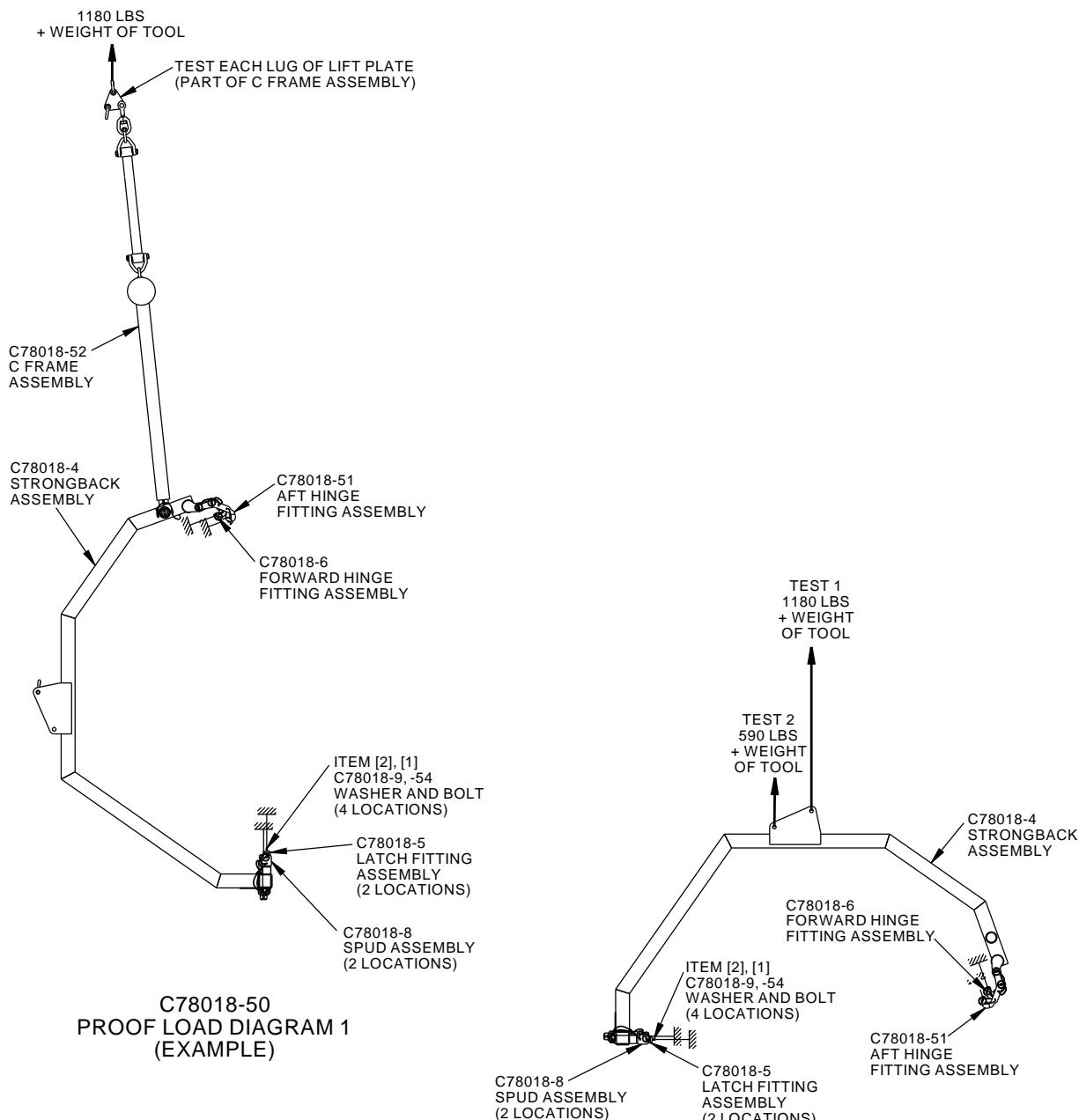
78-30-04

D634A501

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Page 8
Aug 05/2014

**737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL**



(TEST BOTH LUGS USING TEST 1 AND TEST 2)

**C78018-4
PROOF LOAD DIAGRAM 2
(EXAMPLE)**

2292759 S0000519171_V1

**C78018 Proof Load Diagrams 1 and 2 (Example)
Figure 3**

78-30-04

Page 9
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[1]	C78018-54 (NAS6604-12)	BOLT	---
[2]	C78018-9	WASHER	---

78-30-04

D634A501

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Page 10
Aug 05/2014



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78019-15

NAME: HOLD OPEN EQUIPMENT - THRUST REVERSER COWL, CFM56-7 ENGINE (CE)

AIRPLANE MAINTENANCE: YES

AMM 71-00-02, AMM 78-31-00, AMM 78-31-01

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78019-15 (CE qualified) hold open equipment is used on 737-600 thru -900 airplanes.

C78019 is used to hold the CFM56-7 inboard and outboard thrust reverser cowls open at 45 degrees during engine change.

Refer to AMM 71-00-02, AMM 78-31-00, AMM 78-31-01 and the current C78019 drawing for complete usage instructions.

C78019-15 consists of:

C78019-15		
QUANTITY	NOMENCLATURE	PART NUMBER
1	CENTER BEAM ASSEMBLY	C78019-17
1	THRUST REVERSER ARM ASSEMBLY	C78019-5
1	THRUST REVERSER ARM ASSEMBLY	C78019-6
2	ARM	C78019-7
1	STORAGE BOX	

WEIGHT: 52 lbs (24 kg)

DIMENSIONS: 4 x 15 x 15 inches (102 x 381 x 381 mm)

NOTE: C78019-15 supersedes C78019-1.

DECLARATION OF CONFORMITY: C78019 requires a written Declaration of Conformity from the C78019 fabricator if it is to be used in the European Union. The design of C78019 meets the European requirements of Machinery Directive 2006/42/EC including its amendments. When used within the European Union, the fabricator of C78019 must also meet the requirements of that directive. At a minimum for the tool fabricator, this requires the retention of a technical file, a labeling of the equipment with the CE mark, and the completion of an EC Declaration of Conformity. If C78019 is to be used within the European Union and the Declaration of Conformity is missing, contact the fabricator of C78019 for a replacement Declaration of Conformity.

OPERATING INSTRUCTIONS: Refer to the current C78019 drawing, AMM 71-00-02, AMM 78-31-00 and AMM 78-31-01 maintenance procedures for detailed instructions on the use of this equipment. This equipment shall only be used in conjunction with Boeing maintenance procedures to maintain Boeing airplanes.

78-30-05



737-600/700/800/900

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MAINTENANCE: General Cleaning: Basic care of the equipment includes cleaning the equipment of dirt, corrosives, or contaminants. Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent, clean the components and wipe dry with a clean cloth. Hang the components freely to dry, but away from excessive heat or steam.

Structural and Mechanical Lifting Devices, (supporting lifter):

1. Maintenance shall be done based on the recommendations made by the lifter manufacturer or qualified person.
2. Before adjustments and repairs are started on a lifter, the following precautions shall be taken:
 - All courses of power shall be disconnected, locked out, and tagged "Out of Service".
 - A lifter removed from service for repair shall be tagged "Out of Service".
3. Only a qualified person shall perform adjustments and tests when required.
4. Replacement parts shall be at least equal to the original manufacturer's specifications.
5. After adjustments and repairs have been made, the lifter shall not be returned to service until it has been inspected according to ASME B-30.20, para. 20-1.3.4.
6. Dated records of repairs and replacements shall be made.
7. Adjustments and repairs. Any hazardous conditions disclosed by the inspection requirements of ASME B-30.20, para. 20-1.3.1 shall be corrected before normal operations of the lifter is resumed. Adjustments and repairs shall be done under the direction of , or by a qualified person.

PROOF LOAD: Proof load testing for the C78019-15 hold open equipment shall be performed per the current C78019 drawing proof load diagrams (example Figure 2) and:

- In conjunction with initial fabrication
- Subsequent to modification of this equipment (equipment shall only be modified in accordance with the C78019 drawing).
- After repair of load carrying components.
- After replacement of load carrying components (except for load carrying components such as shackles and hoist rings that carry their own certification).
- Continuing integrity/safety of the device to be assured by inspection.

INSPECTION: FREQUENT

General Inspection (before use):

1. Missing fasteners

78-30-05



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

2. Notes, Cautions and Warnings are legible
3. Usage placards are legible

Structural and Mechanical Lifting Devices (supporting lifter):

1. Visual Inspection by the operator before and during each lift of the device. Records are not required. Inspect for:
 - Structural deformation, cracks or excessive wear of any parts of the lifting device.
 - Loose or missing guards, fasteners, covers, stops or nameplates.
 - All functional operational mechanisms and automatic hold and release mechanisms for misadjustments interfering with operation.

PERIODIC

Structural and Mechanical Lifting Devices (supporting lifter):

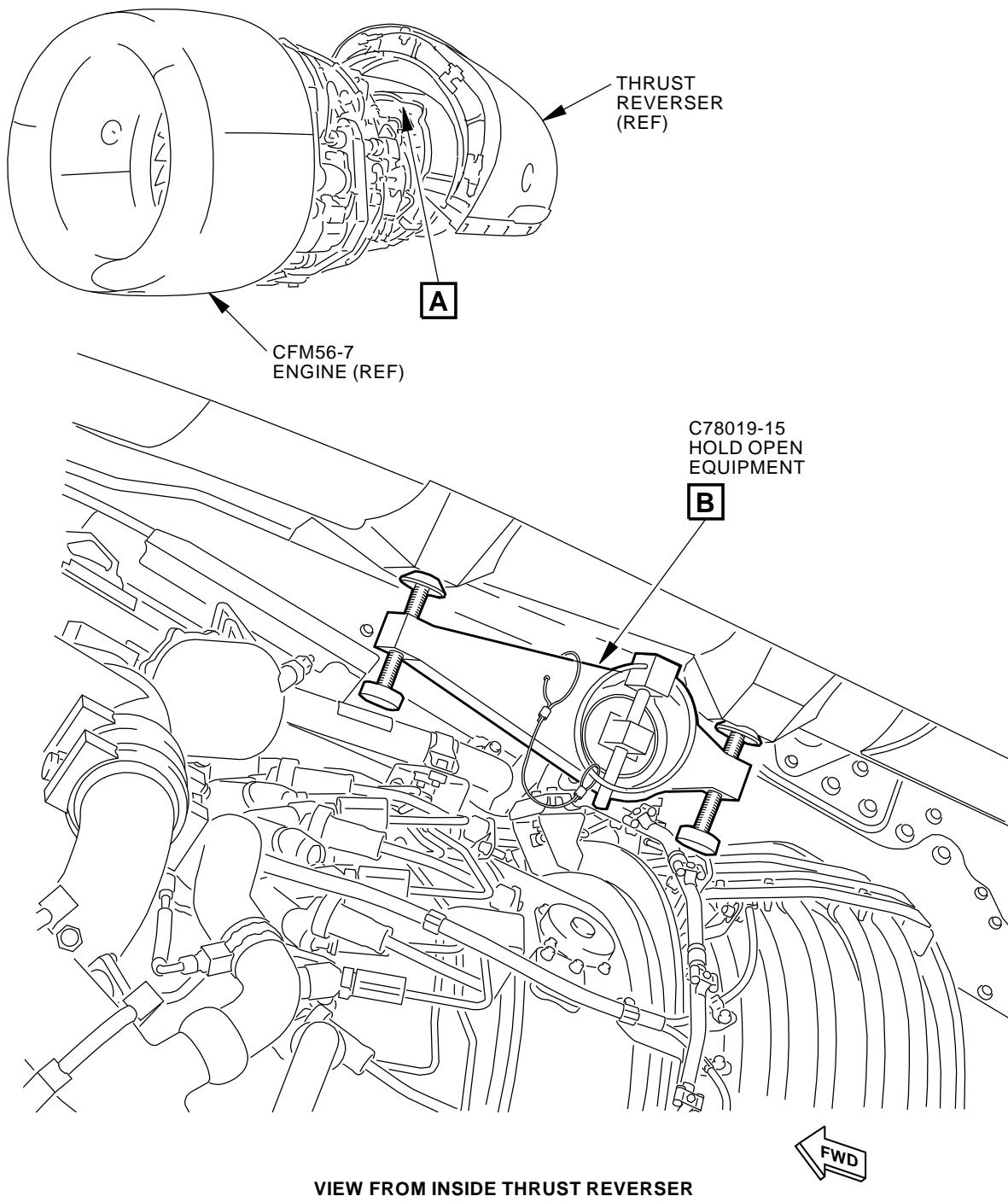
1. A written record of a visual inspection, by a qualified person is required.
2. Inspection is made of external conditions for a continuing evaluation of the following factors:
 - Loose bolts or fasteners.
 - Excessive wear of linkages and other mechanical parts.
 - Excessive wear at hoist hooking points and load support clevises or pins.
 - Deficiencies found during the inspection are analyzed and the lifting device shall not be used, if deficiencies are determined to be hazardous.
 - The lifting device shall not be used until the hazardous deficiencies are corrected.

STORAGE: C78019 shall be stored clean, dry, and free of exposure to fumes or corrosive elements, indoors and in the furnished storage box.

DECOMMISSIONING: Part and assemblies of this equipment shall be permanently altered to prevent their unauthorized reuse. Recycling is the preferred manner of disposal for those materials where that option is available.

78-30-05

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



L72700 S0006832204_V4

CFM56-7 Engine Thrust Reverser Cowl Hold Open Equipment
Figure 1 (Sheet 1 of 2)

78-30-05

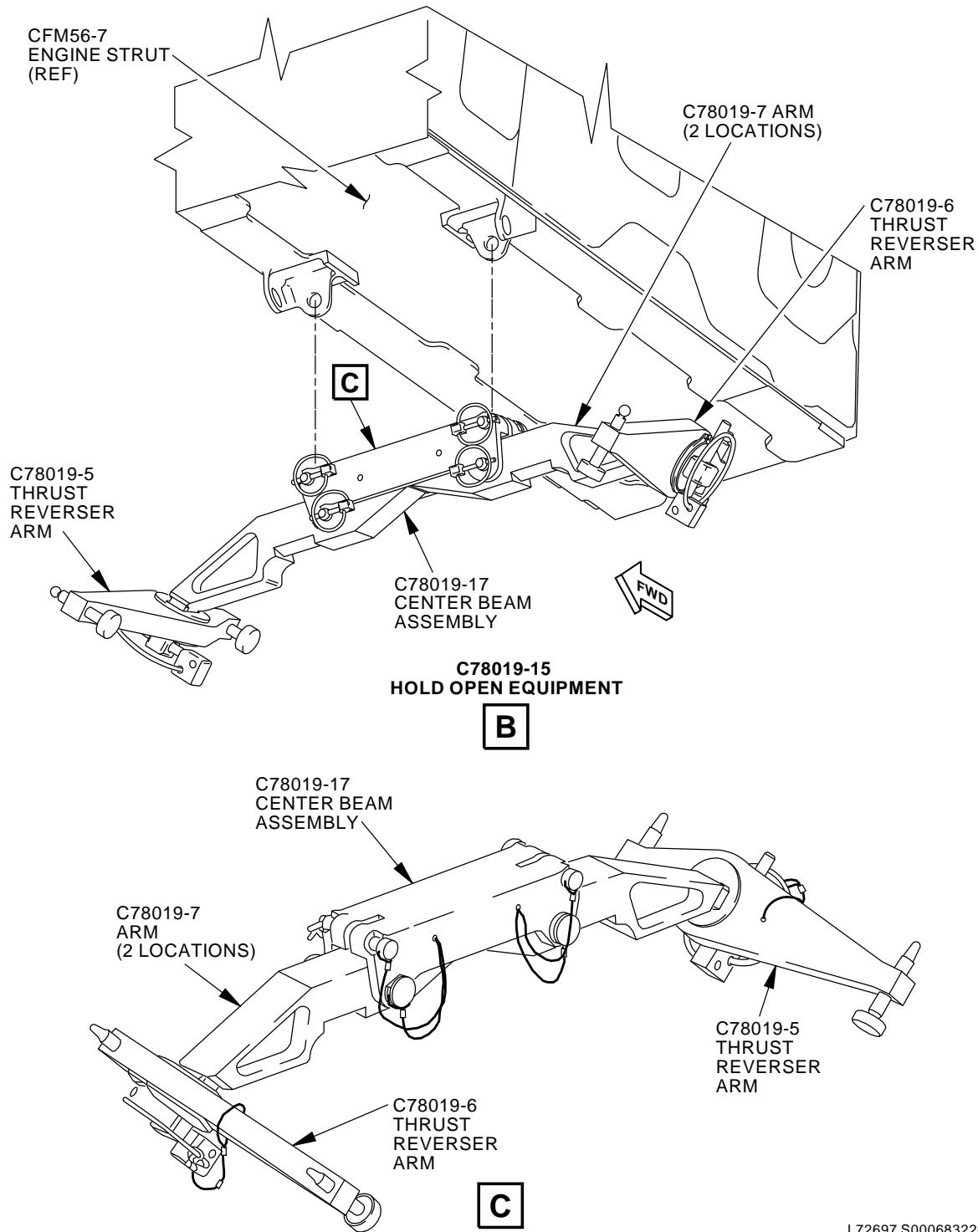
Page 4
Aug 05/2015

D634A501

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737-600/700/800/900
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L72697 S0006832203_V4

CFM56-7 Engine Thrust Reverser Cowl Hold Open Equipment
Figure 1 (Sheet 2 of 2)

78-30-05

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Page 5
Aug 05/2015



737-600/700/800/900
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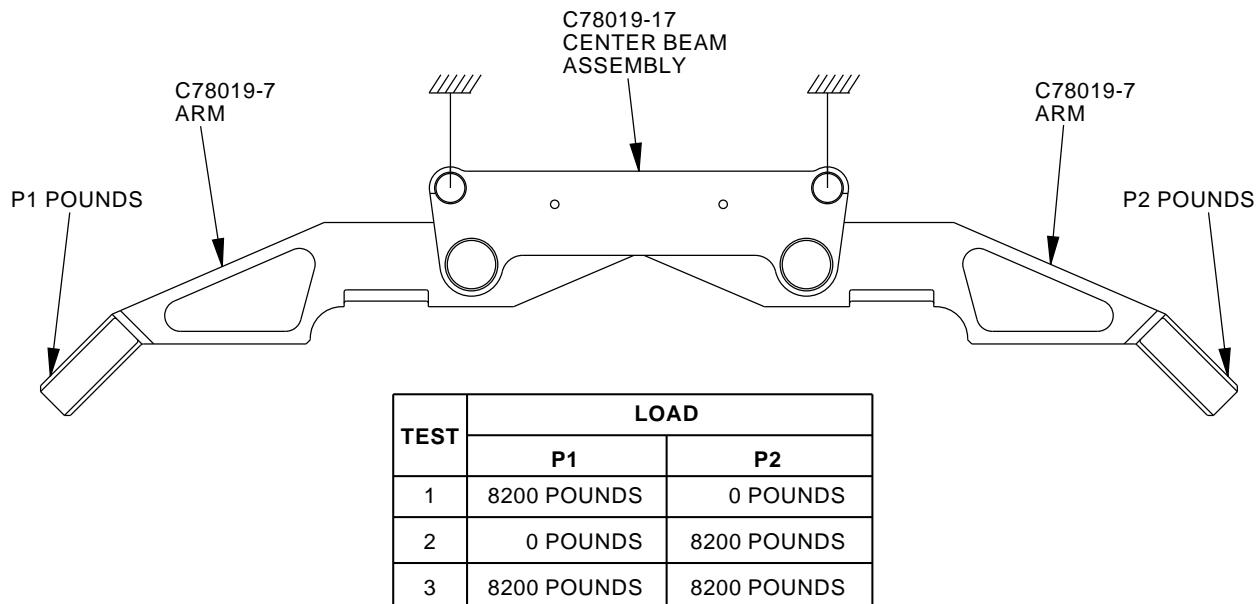
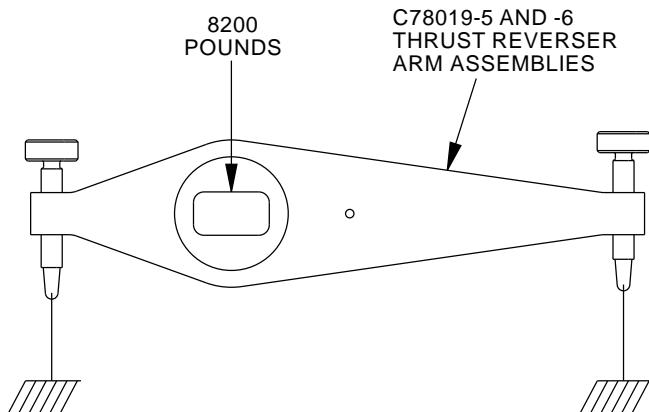


TABLE 1

C78019 PROOF LOAD DIAGRAM 1
(EXAMPLE)



C78019 PROOF LOAD DIAGRAM 2
(EXAMPLE)

2428484 S0000561677_V1

C78019 Proof Load Diagrams (Examples)
Figure 2

78-30-05

Page 6
Aug 05/2015

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78023-1

NAME: LOCK ASSEMBLY - THRUST REVERSER ACTUATOR, CFM56-7 (CE)

AIRPLANE MAINTENANCE: YES

AMM 78-31-00

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78023-1 (CE qualified) lock assembly is used on 737-600 thru -900 airplanes equipped with CFM56-7 engines.

C78023 is used to hold the thrust reverser actuator rod in the extended position to prevent accidental closing of the thrust reverser cowl. The collar is placed on the actuator rod and is locked in position with the two snapper pins.

Refer to AMM 78-31-00 and the current C78023 drawing for complete usage instructions.

C78023-1 consists of:

C78023-1		
QUANTITY	NOMENCLATURE	PART NUMBER
2	COLLAR ASSEMBLY	C78023-2
1	STORAGE BOX	

WEIGHT: 4 lbs (2 kg)

DIMENSIONS: 2 x 4 x 13 inches (51 x 102 x 330 mm)

DECLARATION OF CONFORMITY: C78023 requires a written Declaration of Conformity from the C78023 fabricator if it is to be used in the European Union. The design of C78023 meets the European requirements of Machinery Directive 2006/42/EC including its amendments. When used within the European Union, the fabricator of C78023 must also meet the requirements of that directive. At a minimum for the tool fabricator, this requires the retention of a technical file, a labeling of the equipment with the CE mark, and the completion of an EC Declaration of Conformity. If C78023 is to be used within the European Union and the Declaration of Conformity is missing, contact the fabricator of C78023 for a replacement Declaration of Conformity.

OPERATING INSTRUCTIONS: Refer to the current C78023 drawing and AMM 78-31-00 maintenance procedures for detailed instructions on the use of this equipment. This equipment shall only be used in conjunction with Boeing maintenance procedures to maintain Boeing airplanes.

78-30-06

D634A501

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Page 1
Aug 05/2015



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

MAINTENANCE: General Cleaning: Basic care of the equipment includes cleaning the equipment of dirt, corrosives, or contaminants. Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent, clean the components and wipe dry with a clean cloth. Hang the components freely to dry, but away from excessive heat or steam.

Structural and Mechanical Lifting Devices, (supporting lifter):

1. Maintenance shall be done based on the recommendations made by the lifter manufacturer or qualified person.
2. Before adjustments and repairs are started on a lifter, the following precautions shall be taken:
 - All courses of power shall be disconnected, locked out, and tagged "Out of Service".
 - A lifter removed from service for repair shall be tagged "Out of Service".
3. Only a qualified person shall perform adjustments and tests when required.
4. Replacement parts shall be at least equal to the original manufacturer's specifications.
5. After adjustments and repairs have been made, the lifter shall not be returned to service until it has been inspected according to ASME B-30.20, para. 20-1.3.4.
6. Dated records of repairs and replacements shall be made.
7. Adjustments and repairs. Any hazardous conditions disclosed by the inspection requirements of ASME B-30.20, para. 20-1.3.1 shall be corrected before normal operations of the lifter is resumed. Adjustments and repairs shall be done under the direction of , or by a qualified person.

PROOF LOAD: Proof load testing for the C78023-1 lock assembly shall be performed per the current C78023 drawing proof load diagrams (example Figure 2) and:

- In conjunction with initial fabrication
- Subsequent to modification of this equipment (equipment shall only be modified in accordance with the C78023 drawing).
- After repair of load carrying components.
- After replacement of load carrying components (except for load carrying components such as shackles and hoist rings that carry their own certification).
- Continuing integrity/safety of the device to be assured by inspection.

INSPECTION: FREQUENT

General Inspection (before use):

1. Missing fasteners

78-30-06



737-600/700/800/900
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2. Notes, Cautions and Warnings are legible
3. Usage placards are legible

Structural and Mechanical Lifting Devices (supporting lifter):

1. Visual Inspection by the operator before and during each lift of the device. Records are not required. Inspect for:
 - Structural deformation, cracks or excessive wear of any parts of the lifting device.
 - Loose or missing guards, fasteners, covers, stops or nameplates.
 - All functional operational mechanisms and automatic hold and release mechanisms for misadjustments interfering with operation.

PERIODIC

Structural and Mechanical Lifting Devices (supporting lifters):

1. A written record of a visual inspection, by a qualified person is required.
2. Inspection is made of external conditions for a continuing evaluation of the following factors:
 - Excessive wear of linkages and other mechanical parts.
 - Excessive wear at hoist hooking points and load support clevises or pins.
 - Deficiencies found during the inspection are analyzed and the lifting device shall not be used, if deficiencies are determined to be hazardous.
 - The lifting device shall not be used until the hazardous deficiencies are corrected.

STORAGE: C78021 shall be stored clean, dry, and free of exposure to fumes or corrosive elements, indoors and in the furnished storage box.

DECOMMISSIONING: Part and assemblies of this equipment shall be permanently altered to prevent their unauthorized reuse. Recycling is the preferred manner of disposal for those materials where that option is available.

78-30-06

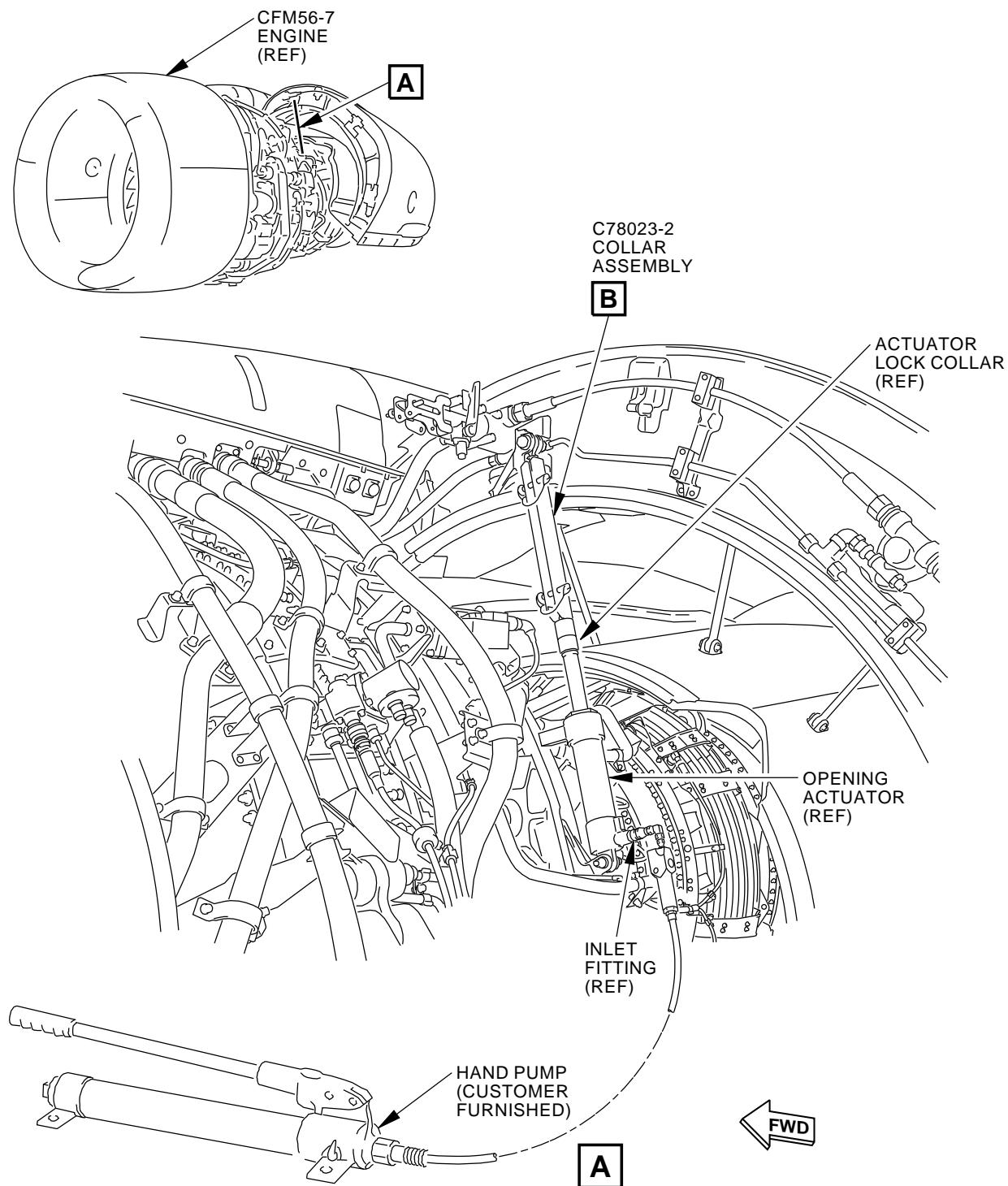
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Page 3
Aug 05/2015



737-600/700/800/900
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G85602 S0006832206_V3

Thrust Reverser Actuator Lock Assembly
Figure 1 (Sheet 1 of 2)

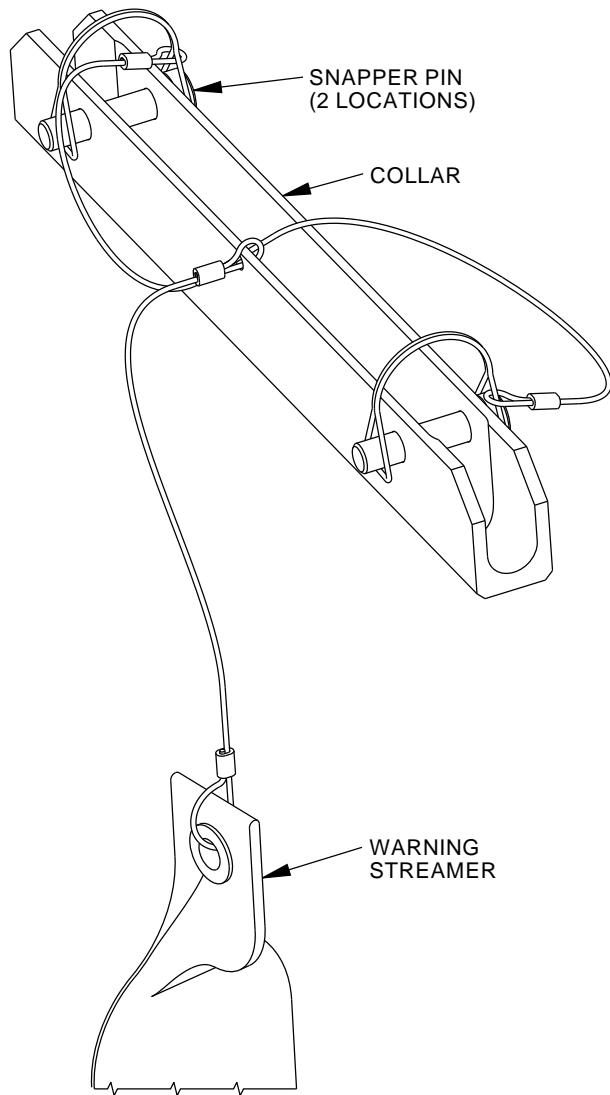
78-30-06

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Page 4
Aug 05/2015

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C78023-2
COLLAR ASSEMBLY

B

2428888 S0000561728_V1

Thrust Reverser Actuator Lock Assembly
Figure 1 (Sheet 2 of 2)

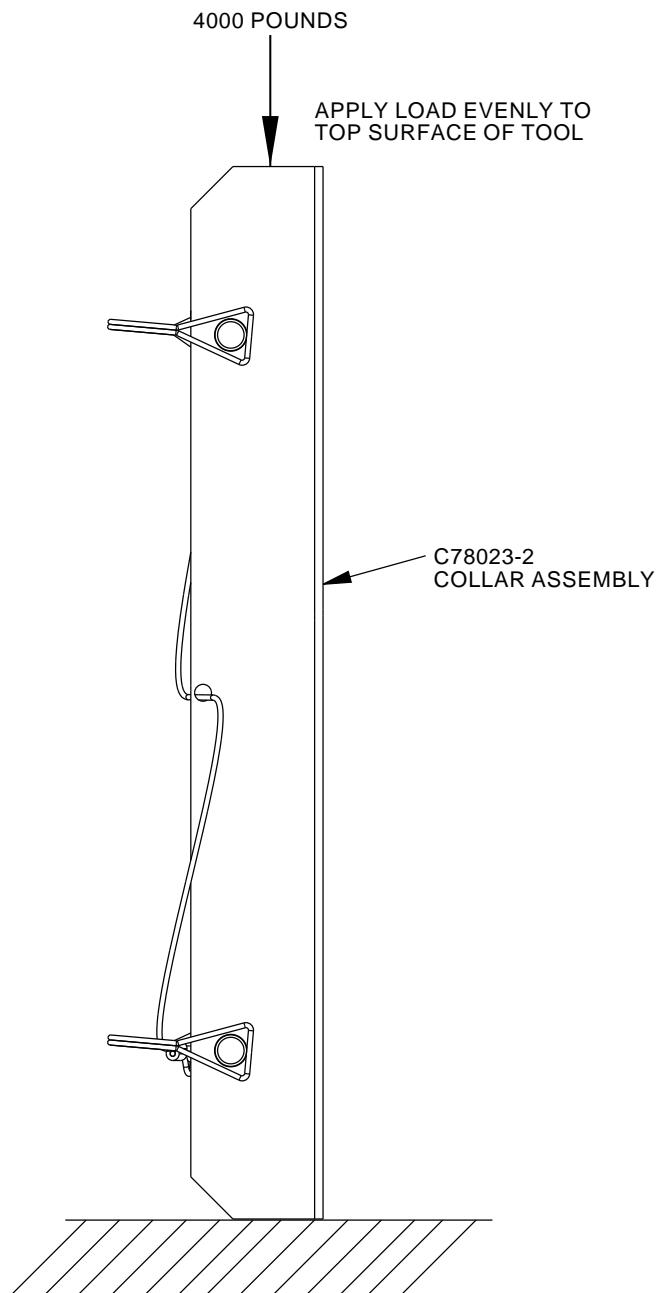
78-30-06

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Page 5
Aug 05/2015

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**C78023 PROOF LOAD DIAGRAM
(EXAMPLE)**

2428892 S0000561729_V1

**C78023 Proof Load Diagram (Example)
Figure 2**

78-30-06



737-600/700/800/900
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PART NUMBER: B78006-7

NAME: RIGGING BAR - THRUST REVERSER POSITION FEEDBACK LINEAR VARIABLE DISPLACEMENT TRANSDUCER (LVDT)

AIRPLANE MAINTENANCE: YES

AMM 78-36-02

COMPONENT MAINTENANCE: YES

CMM 78-31-19

USAGE & DESCRIPTION: The B78006-7 rigging bar is used on all 737 airplanes, except 737-100 thru -500 airplanes.

B78006 is used to determine the shim thickness required on the actuator feedback spindle when installing the thrust reverser position feedback LVDT on the locking actuator.

Refer to AMM 78-36-02, CMM 78-31-19 and the current B78006 drawing for complete usage instructions.

B78006-7 consists of:

B78006-7		
QUANTITY	NOMENCLATURE	PART NUMBER
1	RIGGING BAR	B78006-8
1	STORAGE BOX	

WEIGHT: 1 lb (0.5 kg)

DIMENSIONS: 1 x 3 x 9 inches (25 x 76 x 229 mm)

NOTE: B78006-7 supersedes B78006-1.

78-30-07

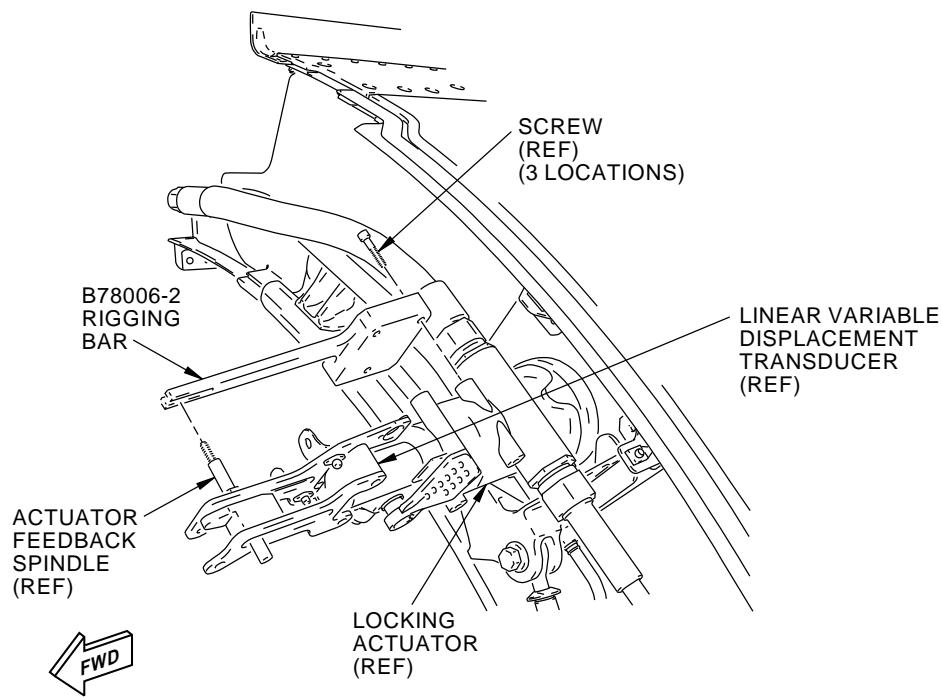
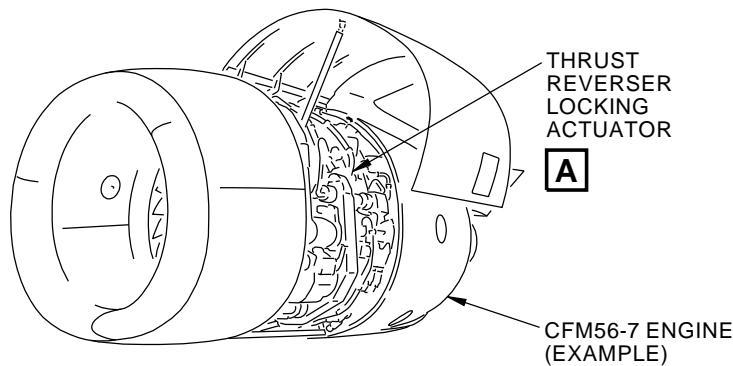
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Page 1
Aug 05/2015



737-600/700/800/900
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THRUST REVERSER LOCKING ACTUATOR

A

G79211 S0006832208_V3

Thrust Reverser Position Feedback LVDT Rigging Bar
Figure 1

78-30-07

D634A501

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Page 2
Aug 05/2015



737-600/700/800/900
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PART NUMBER: B78009-21, -26

NAME: LOCK EQUIPMENT - THRUST REVERSER MAINTENANCE

AIRPLANE MAINTENANCE: YES

AMM 78-31-01, AMM 78-31-03, AMM 78-31-04

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The B78009-21 lock equipment is an option for use on 737-300 thru -500 airplanes.

The B78009-26 (preferred) lock equipment is used on all 737 airplanes except 737-100 and -200 airplanes..

B78009 is used to prevent actuation of the thrust reverser "deploy" circuit. B78009 energizes the thrust reverser arm solenoid. B78009 positively prevents the deploy command to the directional control valve module during rigging of the thrust reverser sync shaft.

Refer to AMM 78-31-01, AMM 78-31-03, AMM 78-31-04 and the current B78009 drawing for complete usage instructions.

B78009-21 and -26 consist of:

B78009-21		
QUANTITY	NOMENCLATURE	PART NUMBER
2	WIRE BUNDLE ASSEMBLY	B78009-5
1	STORAGE BOX	B78009-22

B78009-26		
QUANTITY	NOMENCLATURE	PART NUMBER
2	WIRE BUNDLE ASSEMBLY	B78009-5
1	STORAGE BOX	B78009-27

WEIGHT: 1 lb (0.45 kg)

DIMENSIONS: 6 x 6 x 12 inches (152 x 152 x 305 mm)

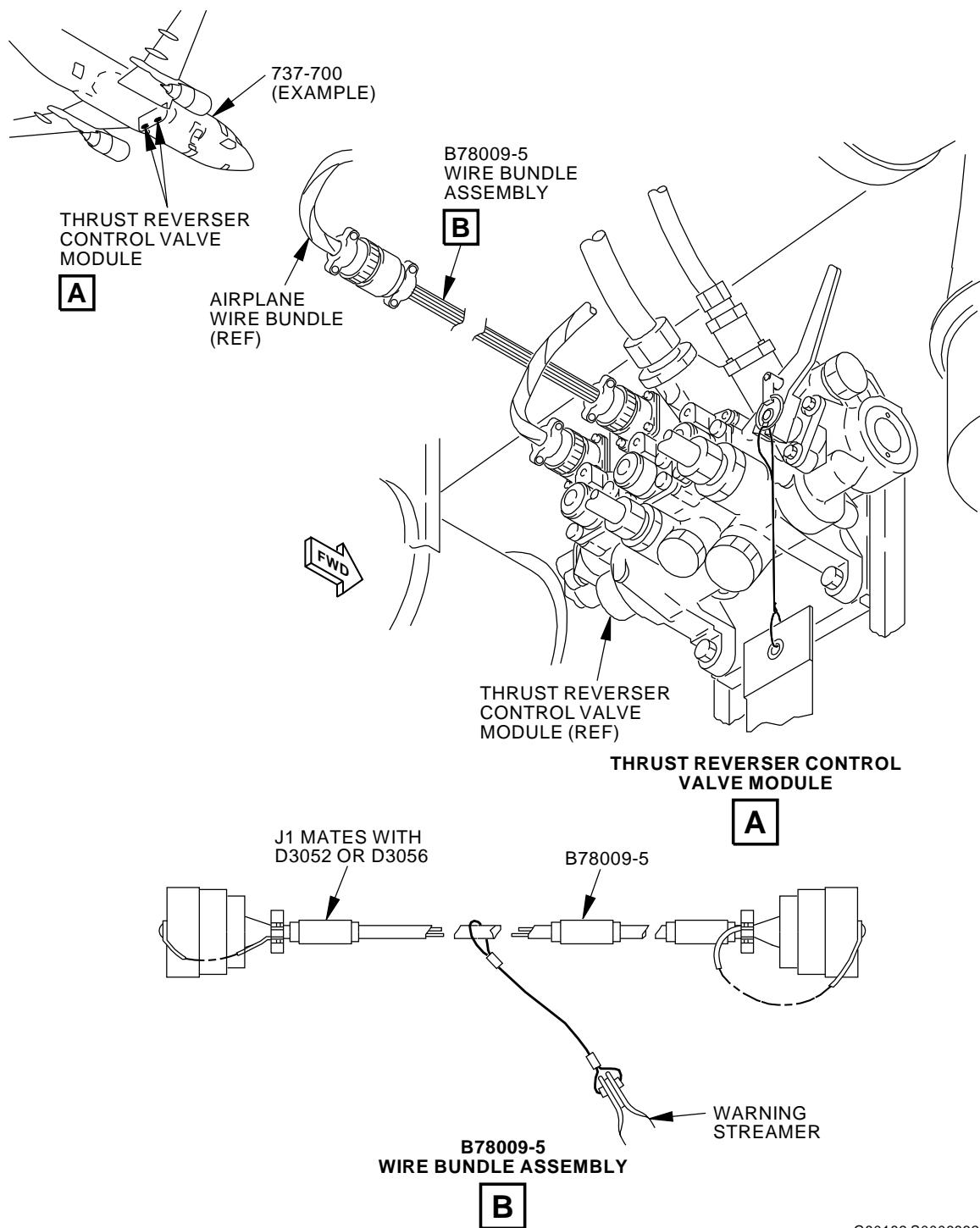
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Page 1
Aug 05/2015

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G80182 S0006832210_V4

Thrust Reverser Maintenance Lock Equipment
Figure 1

78-30-08

Page 2
Aug 05/2015

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78020-11, -14

NAME: LATCHING TOOL - THRUST REVERSER C-DUCT HALVES

AIRPLANE MAINTENANCE: YES

AMM 78-31-00, AMM 78-31-08

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78020-11 (option) or -14 (preferred) retaining pin set is used on 737-600 thru -900 airplanes.

C78020 is used to help close the thrust reverser cowlings.

Refer to AMM 78-31-00, AMM 78-31-08 and the current C78020 drawing for complete usage instructions.

C78020-11 and -14 consist of:

C78020-11		
QUANTITY	NOMENCLATURE	PART NUMBER
1	LATCHING TOOL	C78020-12
1	STORAGE BOX	

C78020-14		
QUANTITY	NOMENCLATURE	PART NUMBER
1	LATCHING TOOL	C78020-15
1	STORAGE BOX	

WEIGHT: C78020-11 or -12 - 1 lb (0.5 kg)

DIMENSIONS: C78020-11 or -12 - 14 x 4 x 2 inches (356 x 102 x 51 mm)

NOTE: C78020-11 supersedes C78020-8.

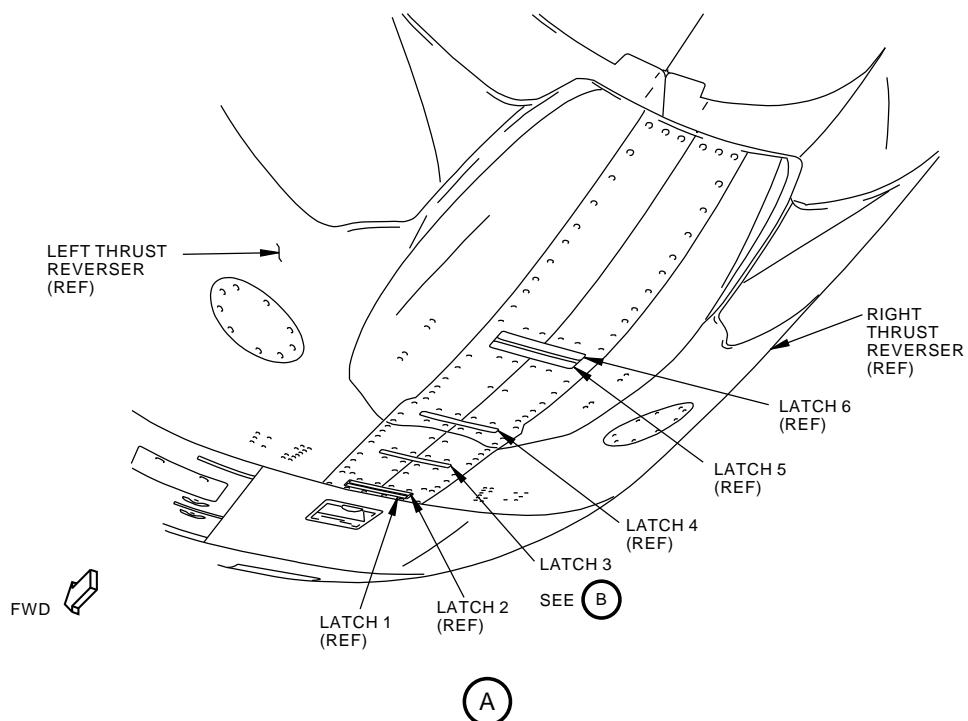
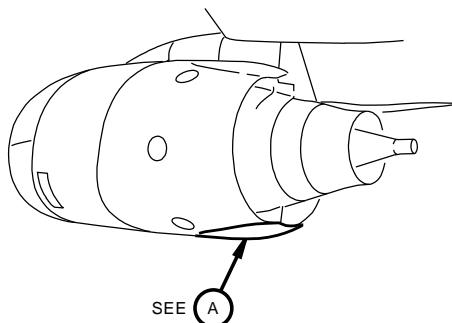
C78020-14 replaces the C78020-11 tool for future procurement.

78-30-09

Page 1
Aug 05/2014

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



G79431 S0006832212_V3

Latching Tool for Thrust Reverser C-Duct Halves
Figure 1

78-30-09

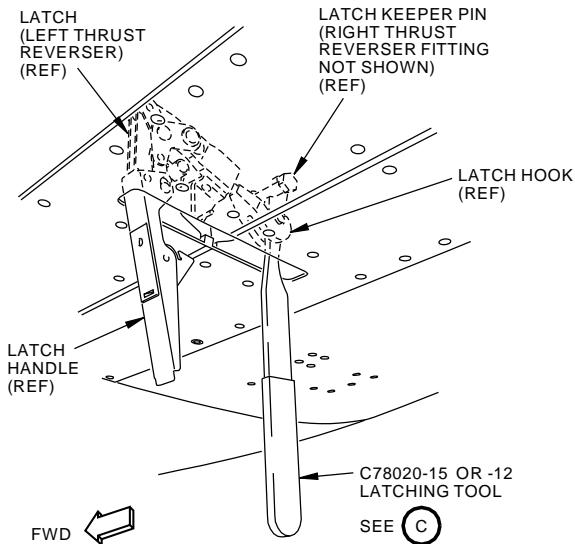
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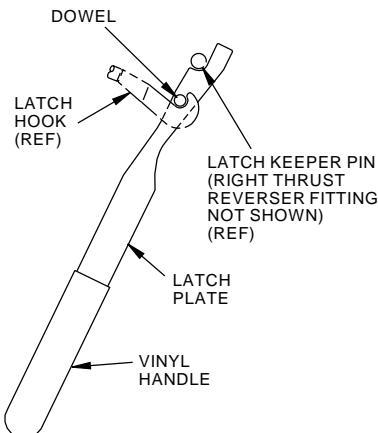
Page 2
Aug 05/2014



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



LATCH 3



C78020-15
LATCHING TOOL SHOWN
C78020-12 SIMILAR



H61163 S0006832213_V3

Thrust Reverser Latch Tool
Figure 2

78-30-09

D634A501

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Page 3
Aug 05/2014



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: B54001-53

NAME: HYDRAULIC PUMP - ENGINE C-DUCT

AIRPLANE MAINTENANCE: YES

AMM 71-00-02, AMM 78-31-00, AMM 78-31-08

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The B54001-53 hydraulic pump is used on 737-300 thru -900 airplanes.

B54001 is used to manually supply hydraulic pressure to the actuators that open the thrust reverser C-ducts for engine maintenance. B54001 attaches to the C-duct lift actuator.

Refer to AMM 71-00-02, AMM 78-31-00, AMM 78-31-08 and the current B54001 drawing for complete usage instructions.

B54001-53 consists of:

B54001-53		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PUMP ASSEMBLY	B54001-31
1	STORAGE CASE	

WEIGHT: 40 lbs (18.2 kg)

DIMENSIONS: 8 x 13 x 27 inches (203 x 330 x 686 mm)

NOTE: B54001-53 supersedes B54001-30.

A78019 hand pump and C78005 hand pump are options to B54001.

78-30-10

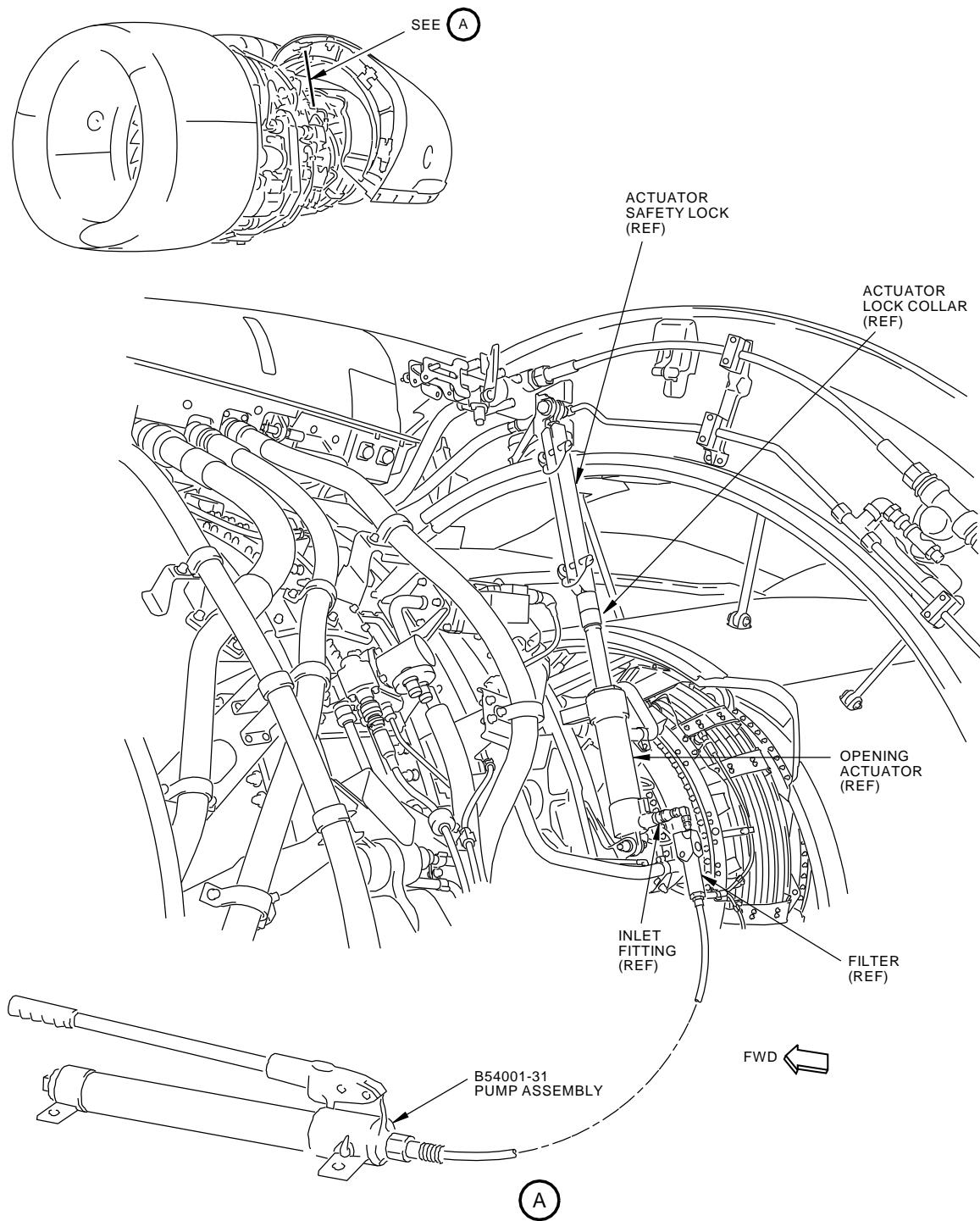
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Page 1
Aug 05/2014



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



H73141 S0006832215_V3

Engine C-Duct Hydraulic Pump Usage
Figure 1 (Sheet 1 of 2)

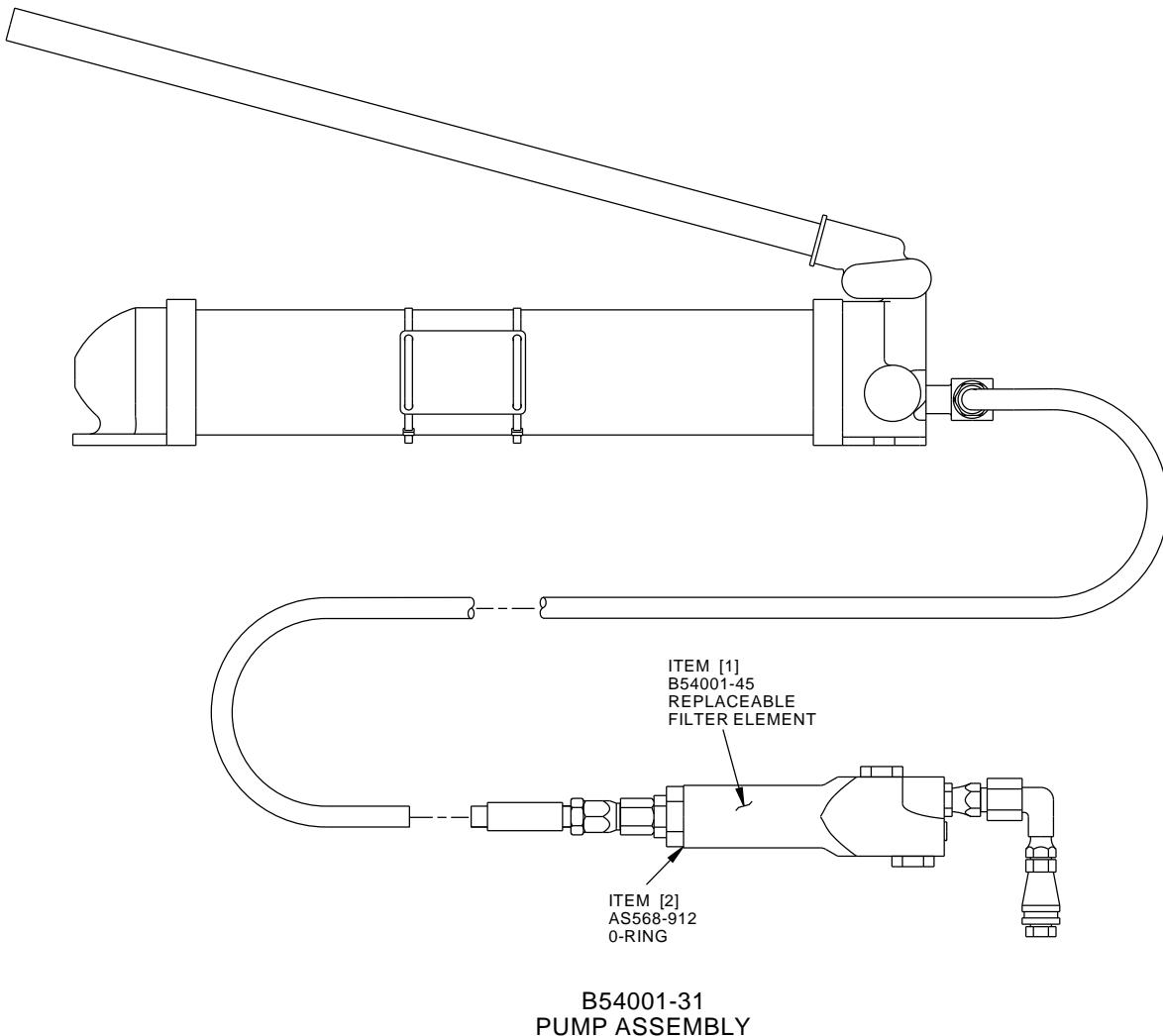
78-30-10

Page 2
Aug 05/2014

D634A501

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL



1962819 S0000374899_V2

Engine C-Duct Hydraulic Pump Usage
Figure 1 (Sheet 2 of 2)

78-30-10

Page 3
Aug 05/2014

D634A501

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737-600/700/800/900
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REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[1]	B54001-45	REPLACEABLE FILTER ELEMENT	----
[2]	AS568-912	O-RING	----

78-30-10

Page 4
Aug 05/2014

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78021-1

NAME: 65-DEGREE HOLD OPEN EQUIPMENT - THRUST REVERSER COWL,
CFM56-7 ENGINE (CE)

AIRPLANE MAINTENANCE: YES

AMM 71-21-02, AMM 78-21-02, AMM 78-31-00, AMM 78-31-01

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78021-1 (CE qualified) 65-degree hold open equipment is used on 737-600 thru -900 airplanes equipped with CFM56-7 engines.

C78021 is used in conjunction with customer-furnished C78019 hold open equipment, an overhead lift and J71046 specification load cell equipment. C78021 is used to open and hold the thrust reverser cowl at 65-degrees. C78021 allows for precooler installation and removal with the engine installed on the airplane. To use this equipment, the C78021-4 sling assembly is used to raise the thrust reverser cowl open to the 65-degree position. C78019 hold open equipment is used with the outboard arm replaced by the C78021-2, 65-degree hold open arm.

Refer to AMM 71-21-02, AMM 78-21-02, AMM 78-31-00, AMM 78-31-01 and the current C78021 drawing for complete usage instructions.

C78021-1 consists of:

C78021-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	65-DEGREE HOLD OPEN ARM	C78021-2
4	FLAT WASHER	C78021-3
1	SLING ASSEMBLY	C78021-4
1	THRUST LINK THREAD PROTECTOR	C78021-5
4	BOLT (NAS6604-12)	C78021-15
1	STORAGE BOX	

WEIGHT: 20 lbs (9 kg)

DIMENSIONS: 2 x 7 x 18 inches (51 x 178 x 457 mm)

DECLARATION OF CONFORMITY: C78021 requires a written Declaration of Conformity from the C78021 fabricator if it is to be used in the European Union. The design of C78021 meets the European requirements of Machinery Directive 2006/42/EC including its amendments. When used within the European Union, the fabricator of C78021 must also meet the requirements of that directive. At a minimum for the tool fabricator, this requires the retention of a technical file, a labeling of the equipment with the CE mark, and the completion of an EC Declaration of Conformity. If C78021 is to be used within the European Union and the Declaration of Conformity is missing, contact the fabricator of C78021 for a replacement Declaration of Conformity.

78-30-11

D634A501

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Page 1
Aug 05/2015



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

OPERATING INSTRUCTIONS: Refer to the current C78021 drawing, AMM 71-21-02, AMM 78-21-02, AMM 78-31-00 and AMM 78-31-01 maintenance procedures for detailed instructions on the use of this equipment. This equipment shall only be used in conjunction with Boeing maintenance procedures to maintain Boeing airplanes.

MAINTENANCE: General Cleaning: Basic care of the equipment includes cleaning the equipment of dirt, corrosives, or contaminants. Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent, clean the components and wipe dry with a clean cloth. Hang the components freely to dry, but away from excessive heat or steam.

Slings, Synthetic: Maintenance and inspection of synthetic shall be performed in accordance with ASME B-30.9, Chapter 9-5 and 9-6.

Structural and Mechanical Lifting Devices, (supporting lifter):

1. Maintenance shall be done based on the recommendations made by the lifter manufacturer or qualified person.
2. Before adjustments and repairs are started on a lifter, the following precautions shall be taken:
 - All courses of power shall be disconnected, locked out, and tagged "Out of Service".
 - A lifter removed from service for repair shall be tagged "Out of Service".
3. Only a qualified person shall perform adjustments and tests when required.
4. Replacement parts shall be at least equal to the original manufacturer's specifications.
5. After adjustments and repairs have been made, the lifter shall not be returned to service until it has been inspected according to ASME B-30.20, para. 20-1.3.4.
6. Dated records of repairs and replacements shall be made.
7. Adjustments and repairs. Any hazardous conditions disclosed by the inspection requirements of ASME B-30.20, para. 20-1.3.1 shall be corrected before normal operations of the lifter is resumed. Adjustments and repairs shall be done under the direction of , or by, a qualified person.

78-30-11



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PROOF LOAD: Proof load testing for the C78021-1, 65-degree hold open equipment shall be performed per the current C78021 drawing proof load diagrams (example Figure 2) and:

- In conjunction with initial fabrication
- Subsequent to modification of this equipment (equipment shall only be modified in accordance with the C78021 drawing).
- After repair of load carrying components.
- After replacement of load carrying components (except for load carrying components such as shackles and hoist rings that carry their own certification).
- Continuing integrity/safety of the device to be assured by inspection.

INSPECTION: FREQUENT

General Inspection (before use):

1. Missing fasteners
2. Notes, Cautions and Warnings are legible
3. Usage placards are legible

Slings, General: Prior to use, all new, altered, modified or repaired slings shall be inspected by a designated person to verify compliance with the applicable provisions of EN 1492-1, Section 6, Section Annex B and ASME B-30.9

Slings, Webbing:

1. Visual inspection for damage shall be performed by the user or other designated person each day or shift the sling is used.
2. Slings shall not be returned to service until approved by a qualified person.
3. A written record of frequent inspections is not required.
4. Conditions detailed below and in EN 1492-1, Section 6, Section Annex B and ASME B-30.9, or conditions that may result in a hazard shall cause the sling to be removed from service.
 - Red warning yarns visible.
 - Acid or caustic burns.
 - Melting or charring of any part of the sling surface.
 - Snags, punctures, tears or cuts.
 - Broken or worn stitches in load bearing splices.
 - Excessive abrasive wear.
 - Knots in any part of the sling.
 - Discoloration and brittle or stiff areas on any part of the sling.
 - Distortion of fittings.
 - Missing or illegible sling tag.

78-30-11

Page 3
Aug 05/2015

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

Structural and Mechanical Lifting Devices (supporting lifter):

1. Visual Inspection by the operator before and during each lift of the device. Records are not required. Inspect for:
 - Structural deformation, cracks or excessive wear of any parts of the lifting device.
 - Loose or missing guards, fasteners, covers, stops or nameplates.
 - All functional operational mechanisms and automatic hold and release mechanisms for misadjustments interfering with operation.

PERIODIC

Slings, General:

1. A complete inspection for damage to the sling shall be periodically performed by a designated person.
2. Each sling and component shall be examined individually, taking care to expose and examine all surfaces.
3. The sling shall be examined for the conditions noted in the frequent inspection and in ASME B-30.9 or any other conditions that may result in a hazard shall cause the sling to be removed from service.
4. Slings shall not be returned to service until approved by a qualified person.
5. A written record of the most recent periodic inspection shall be maintained and shall include the condition of the sling.

Slings, Synthetic: The straps shall be examined for the conditions noted in the frequent inspection and in ASME B-30.9 or any other conditions that may result in a hazard shall cause the sling to be removed from service.

Structural and Mechanical Lifting Devices (supporting lifter):

1. A written record of a visual inspection, by a qualified person is required.
2. Inspection is made of external conditions for a continuing evaluation of the following factors:
 - Loose bolts or fasteners.
 - Excessive wear of linkages and other mechanical parts.
 - Excessive wear at hoist hooking points and load support clevises or pins.
 - Deficiencies found during the inspection are analyzed and the lifting device shall not be used, if deficiencies are determined to be hazardous.
 - The lifting device shall not be used until the hazardous deficiencies are corrected.

STORAGE: C78021 shall be stored clean, dry, and free of exposure to fumes or corrosive elements, indoors and in the furnished storage box.

78-30-11

Page 4

Aug 05/2015

D634A501

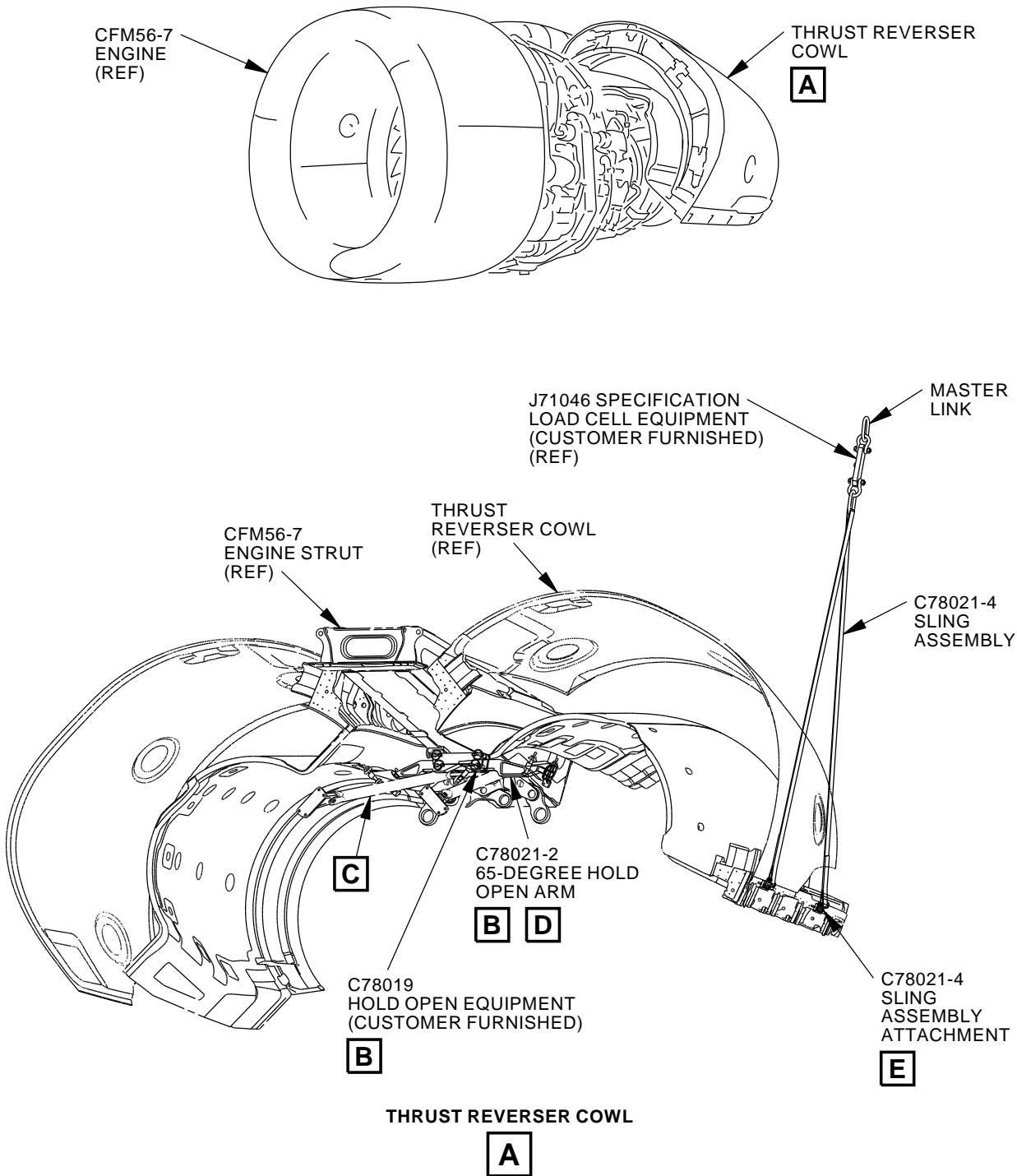


737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

DECOMMISSIONING: Part and assemblies of this equipment, including textile components, shall be permanently altered to prevent their unauthorized reuse. Recycling is the preferred manner of disposal for those materials where that option is available.

78-30-11

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



H84388 S0006832217_V4

CFM56-7 Engine Thrust Reverser Cowl 65-Degree Hold Open Equipment
Figure 1 (Sheet 1 of 4)

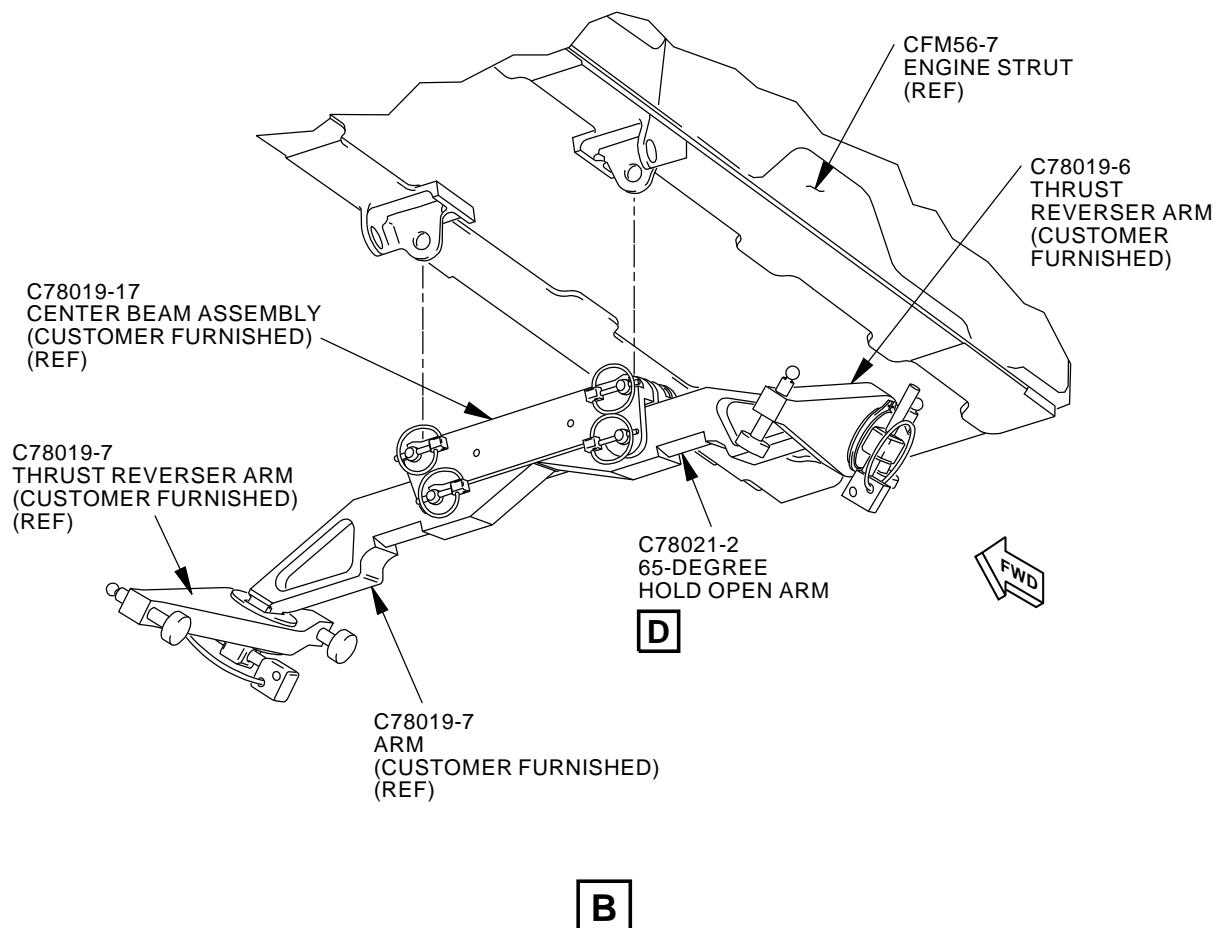
78-30-11

Page 6
Aug 05/2015

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2428630 S0000561684_V1

CFM56-7 Engine Thrust Reverser Cowl 65-Degree Hold Open Equipment
Figure 1 (Sheet 2 of 4)

78-30-11

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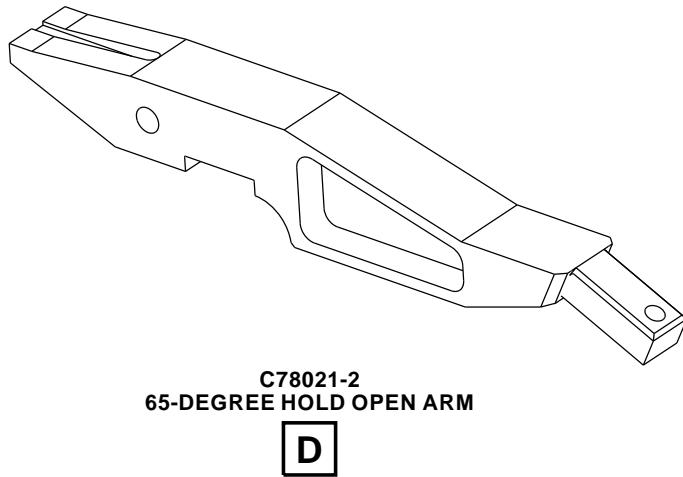
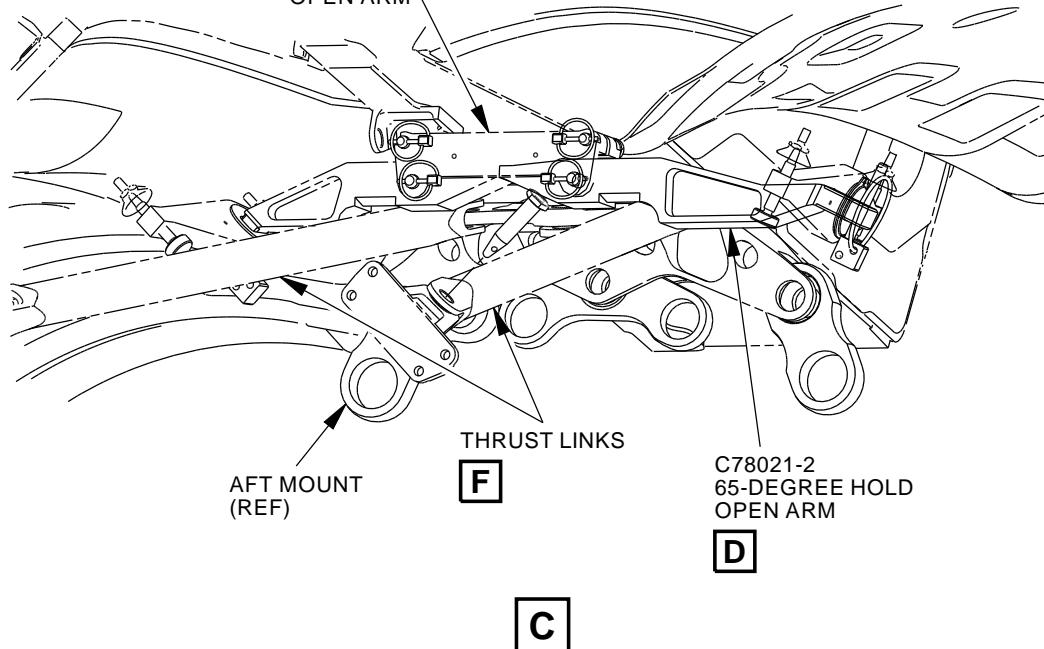
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Page 7
Aug 05/2015



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

C78019 HOLD OPEN EQUIPMENT
WITH OUTBOARD ARM REPLACED
WITH C78021-2 65-DEGREE HOLD
OPEN ARM



C78021-2
65-DEGREE HOLD OPEN ARM

D

2428651 S0000561685_V1

CFM56-7 Engine Thruster Cowl 65-Degree Hold Open Equipment
Figure 1 (Sheet 3 of 4)

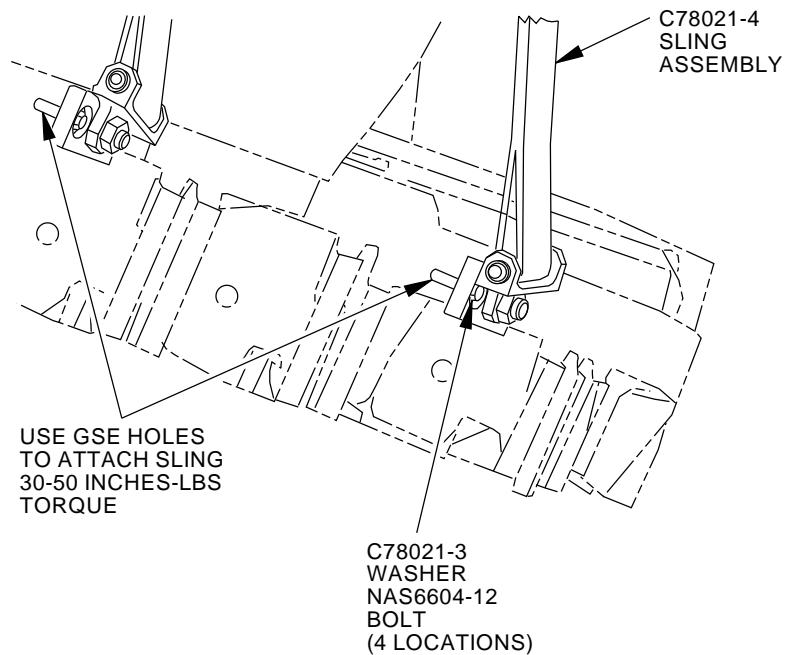
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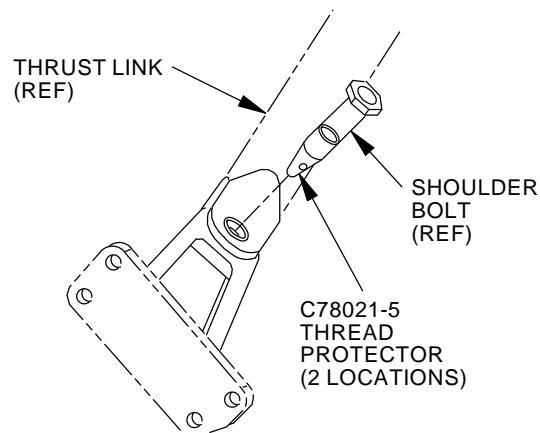
Page 8
Aug 05/2015

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



C78021-4 SLING ASSEMBLY ATTACHMENTS

E



THRUST LINKS

F

H84401 S0006832218_V4

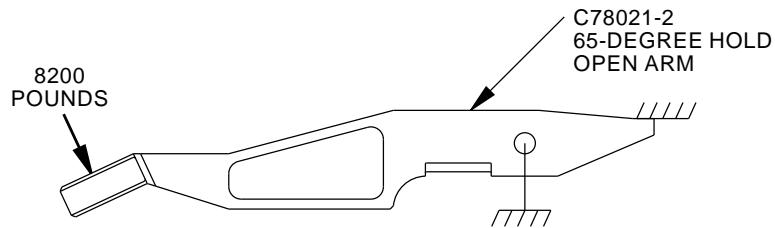
CFM56-7 Engine Thrust Reverser Cowl 65-Degree Hold Open Equipment
Figure 1 (Sheet 4 of 4)

78-30-11

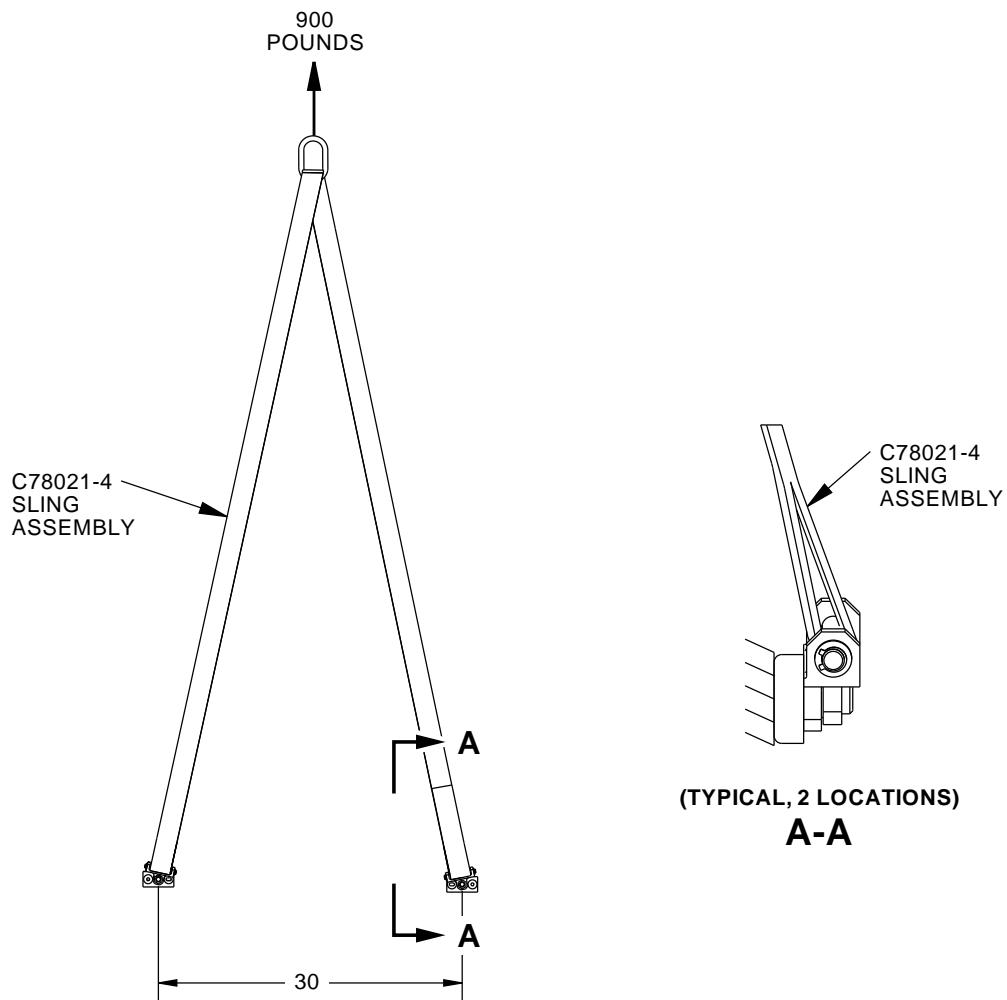
Page 9
 Aug 05/2015

D634A501

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



**C78021 PROOF LOAD DIAGRAM 1
(EXAMPLE)**



**C78021 PROOF LOAD DIAGRAM 2
(EXAMPLE)**

2428695 S0000561686_V1

**C78021 Proof Load Diagrams (Examples)
Figure 2**

78-30-11

Page 10
Aug 05/2015

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78011-37, -60, -78

NAME: DOLLY AND HYDRAULIC EQUIPMENT

AIRPLANE MAINTENANCE: YES

AMM 78-31-01

COMPONENT MAINTENANCE: YES

CMM 71-13-28, CMM 78-31-13, CMM 78-31-24 and CMM 78-31-37

USAGE & DESCRIPTION: The C78011-37 dolly equipment is used on all 737-300 thru -900 airplanes (both CFM56-3 and CFM56-7 engines).

The C78011-60 dolly equipment is used on all 737-300 thru -500 airplanes (CFM56-3 engines only).

The C78011-78 hydraulic equipment is optionally used in conjunction with either C78011-37 or C78011-60 dolly equipment.

The C78011-37 or -60 dolly equipment is used for line or shop transportation and storage of a single, left or right thrust reverser. The C78011-37 or -60 dolly is a steel weldment, equipped with fittings for securing the thrust reverser during shop transportation. C78011-37 or -60 is not to be used as a shipping stand.

The C78011-78 hydraulic pump equipment is used in conjunction with the C78011-37 or -60 dolly equipment and a customer-furnished, 3000 psi, 4 gallon/minute, hydraulic source, to actuate the thrust reverser.

Refer to AMM 78-31-01, CMM 71-13-28, CMM 78-31-13, CMM 78-31-24, CMM 78-31-37 and the current C78011 drawing for complete usage instructions.

The C78011-37 or -60 consists of a steel weldment frame, hydraulic fittings, fork lift ports, a pair of rigid casters, a pair of swiveling casters and a trailer tongue. The C78011-78 consists of a panel assembly and associated hydraulic plumbing.

WEIGHT: 900 lbs (408 kg)

DIMENSIONS: 72 x 77 x 89 inches (1829 x 1956 x 2261 mm)

NOTE: C78011-78 supersedes C78011-73.

C78011-37 replaces C78002 for future procurement.

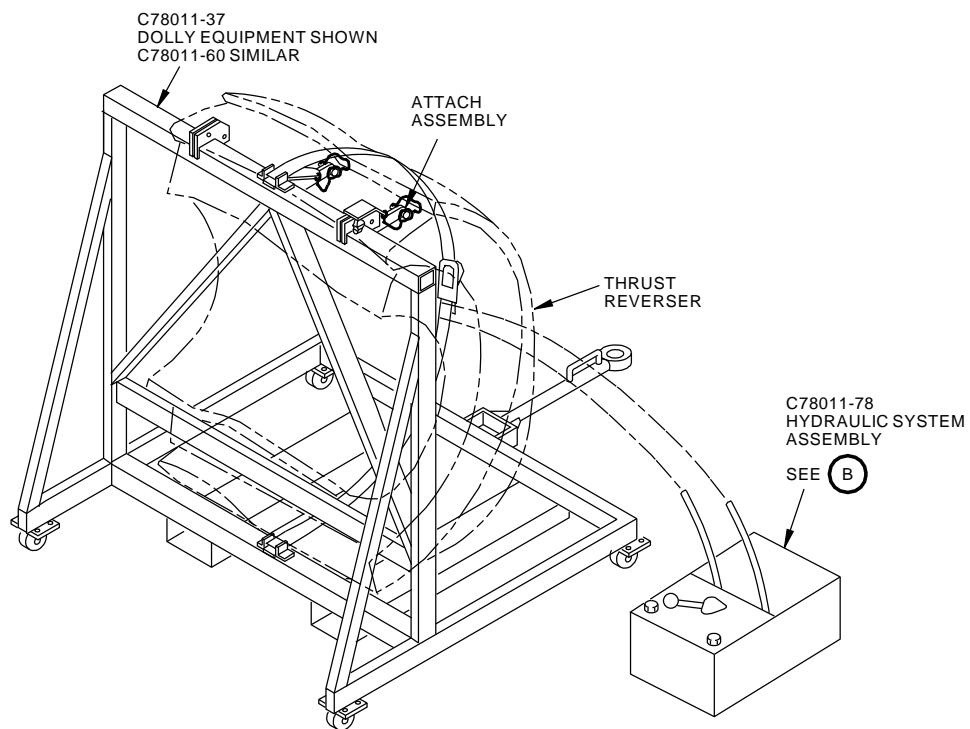
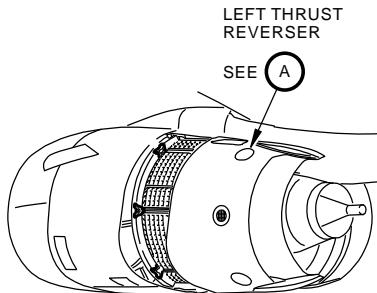
C78011-60 supersedes C78011-1.

78-30-12

Page 1
Aug 05/2014

D634A501

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



LEFT THRUST REVERSER

(A)

K11621 S0006832220_V3

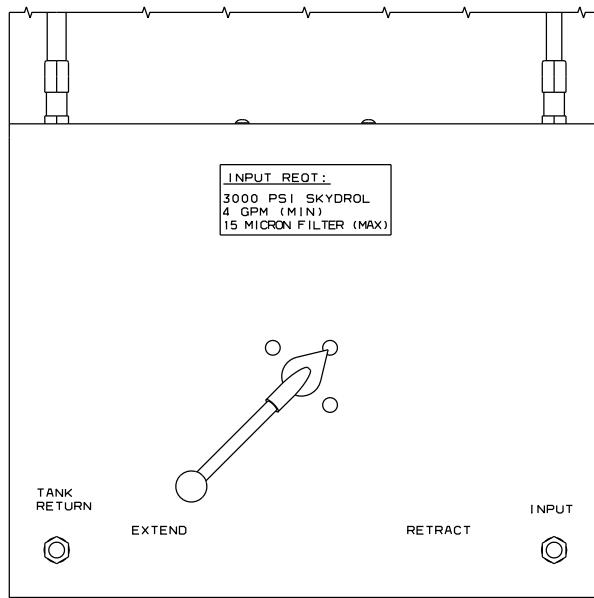
Dolly and Hydraulic Equipment Usage
Figure 1 (Sheet 1 of 2)

78-30-12

Page 2
Aug 05/2014

D634A501

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



C78011-78
HYDRAULIC SYSTEM ASSEMBLY

(B)

2079507 S0000434649_V1

Dolly and Hydraulic Equipment Usage
Figure 1 (Sheet 2 of 2)

78-30-12

Page 3
Aug 05/2014

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78025-21

NAME: ACTUATOR - INSTALLATION/REMOVAL TOOL

AIRPLANE MAINTENANCE: YES

AMM 78-31-03

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78025-21 actuator tool is used on all 737-600 thru -900 airplanes.

C78025 is used to remove and install the thrust reverser actuators from the thrust reverser assembly.

Refer to the current C78025 tool drawing and AMM 78-31-03 for complete usage instructions.

C78025-21 tool consists of:

C78025-21		
QUANTITY	NOMENCLATURE	PART NUMBER
1	CLAMP ASSEMBLY	C78025-22
1	STORAGE BOX	

WEIGHT: 7 lbs (3 kg)

DIMENSIONS: 3 x 3 x 12 inches (76 x 76 x 305 mm)

NOTE: C78025-21 supersedes C78025-1.

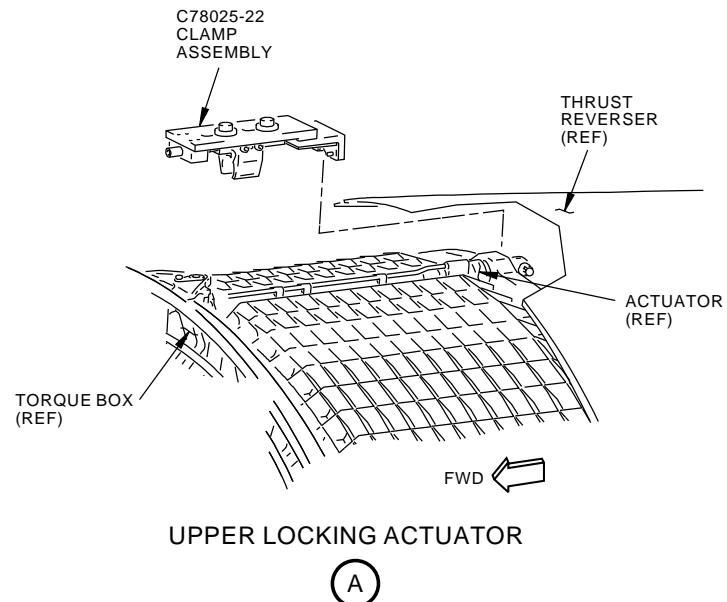
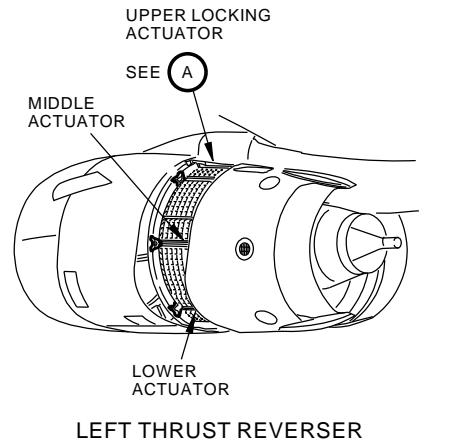
78-30-13

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Page 1
Aug 05/2014

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



K11449 S0006832222_V3

Actuator Installation/Removal Tool
Figure 1

78-30-13

Page 2
Aug 05/2014

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78022-1

NAME: SLING EQUIPMENT - THRUST REVERSER SLEEVE (CE)

AIRPLANE MAINTENANCE: YES

AMM 78-31-03

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78022-1 (CE qualified) sling equipment is used on 737-600 thru -900 airplanes.

C78022 is used with a customer-furnished overhead lift or a ground based unit, such as the C78026 hoist or a customer-furnished A20001 boom hoist. C78022 is used to remove or install the thrust reverser sleeve from CFM56-7 engines. C78022 uses a strongback assembly that attaches at two hard points.

Refer to AMM 78-31-03 and the current C78022 drawing for complete usage instructions.

C78022-1 consists of:

C78022-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	INDEX PIN	C78022-3
1	STRONGBACK ASSEMBLY	C78022-5
1	FORWARD ATTACHMENT ASSEMBLY	C78022-6
2	AFT ATTACHMENT ASSEMBLY	C78022-7
1	HAND KNOB	C78022-27 (CL-3-HK-4)
1	STORAGE BOX	

WEIGHT: 43 lbs (20 kg)

DIMENSIONS: 8 x 28 x 45 inches (203 x 711 x 1143 mm)

DECLARATION OF CONFORMITY: C78022 requires a written Declaration of Conformity from the C78022 fabricator if it is to be used in the European Union. The design of C78022 meets the European requirements of Machinery Directive 2006/42/EC including its amendments. When used within the European Union, the fabricator of C78022 must also meet the requirements of that directive. At a minimum for the tool fabricator, this requires the retention of a technical file, a labeling of the equipment with the CE mark, and the completion of an EC Declaration of Conformity. If C78022 is to be used within the European Union and the Declaration of Conformity is missing, contact the fabricator of C78022 for a replacement Declaration of Conformity.

78-30-14

Page 1
Aug 05/2015

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

OPERATING INSTRUCTIONS: Refer to the current C78022 drawing and AMM 78-31-03 procedures for detailed instructions on the use of this equipment. C78022 shall only be used in conjunction with 737 airplane maintenance manual procedures to maintain Boeing 737 airplanes.

MAINTENANCE: General Cleaning: Basic care of the equipment includes cleaning the equipment of dirt, corrosives, or contaminants. Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent, clean the components and wipe dry with a clean cloth. Hang the components freely to dry, but away from excessive heat or steam.

Structural and Mechanical Lifting Devices, (supporting lifter):

1. Maintenance shall be done based on the recommendations made by the lifter manufacturer or qualified person.
2. Before adjustments and repairs are started on a lifter, the following precautions shall be taken:
 - All courses of power shall be disconnected, locked out, and tagged "Out of Service".
 - A lifter removed from service for repair shall be tagged "Out of Service".
3. Only a qualified person shall perform adjustments and tests when required.
4. Replacement parts shall be at least equal to the original manufacturer's specifications.
5. After adjustments and repairs have been made, the lifter shall not be returned to service until it has been inspected according to ASME B-30.20, para. 20-1.3.4.
6. Dated records of repairs and replacements shall be made.
7. Adjustments and repairs. Any hazardous conditions disclosed by the inspection requirements of ASME B-30.20, para. 20-1.3.1 shall be corrected before normal operations of the lifter is resumed. Adjustments and repairs shall be done under the direction of, or by a qualified person.

PROOF LOAD: Proof load testing for the C78022 sling equipment shall be performed per the current C78022 drawing proof load diagrams (example Figure 2) and:

- in conjunction with initial fabrication
- subsequent to modification of this equipment (equipment shall only be modified in accordance with the C78022 drawing)
- after repair of load carrying components
- after replacement of load carrying components.
- Continuing integrity/safety of the device to be assured by inspection.

78-30-14



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

INSPECTION: FREQUENT

General Inspection (before use):

1. Missing fasteners
2. Notes, Cautions and Warnings are legible
3. Usage placards are legible

Slings, General: Prior to use, all new, altered, modified or repaired slings shall be inspected by a designated person to verify compliance with the applicable provisions of EN 1492-1, Section 6, Section Annex B and ASME B-30.9

Structural and Mechanical Lifting Devices (supporting lifter):

1. Visual Inspection by the operator before and during each lift of the device. Records are not required. Inspect for:
 - Structural deformation, cracks or excessive wear of any parts of the lifting device.
 - Loose or missing guards, fasteners, covers, stops or nameplates.
 - All functional operational mechanisms and automatic hold and release mechanisms for misadjustments interfering with operation.

PERIODIC

Welding Inspection:

1. Magnetic particle or dye penetrant inspection for all welds, after all proof load tests.
2. Visually inspect all parts. See Boeing drawing: A00001, Welding Specification, Ground Support Equipment, Section 9.9.2, Table IX, for visual inspection acceptance criteria.
3. Reject cracked or deformed parts.

Slings, General:

1. A complete inspection for damage to the sling shall be periodically performed by a designated person.
2. Each sling and component shall be examined individually, taking care to expose and examine all surfaces.
3. The sling shall be examined for the conditions noted in the frequent inspection and in ASME B-30.9 or any other conditions that may result in a hazard shall cause the sling to be removed from service.
4. Slings shall not be returned to service until approved by a qualified person.
5. A written record of the most recent periodic inspection shall be maintained and shall include the condition of the sling.

Structural and Mechanical Lifting Devices (supporting lifter):

1. A written record of a visual inspection, by a qualified person is required.

78-30-14



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

2. Inspection is made of external conditions for a continuing evaluation of the following factors:
 - Loose bolts or fasteners.
 - Excessive wear of linkages and other mechanical parts.
 - Excessive wear at hoist hooking points and load support clevises or pins.
 - Deficiencies found during the inspection are analyzed and the lifting device shall not be used, if deficiencies are determined to be hazardous.
 - The lifting device shall not be used until the hazardous deficiencies are corrected.

STORAGE: C78022 shall be stored clean, dry, free of exposure to fumes or corrosive elements, indoors and in the furnished storage box.

DECOMMISSIONING: Parts and assemblies of this equipment shall be permanently altered to prevent their unauthorized reuse. Recycling is the preferred manner of disposal for those materials where that option is available.

78-30-14

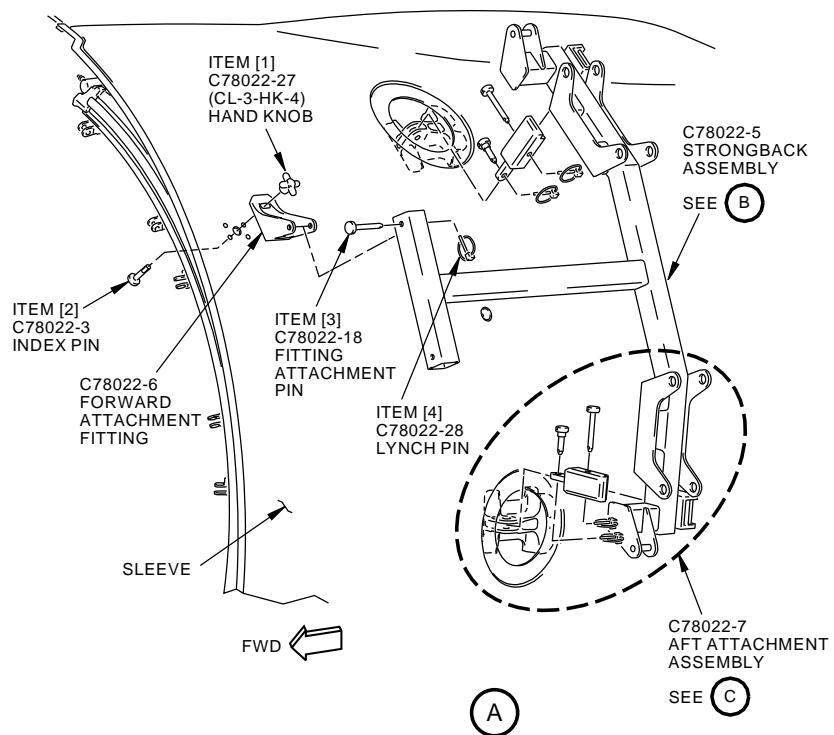
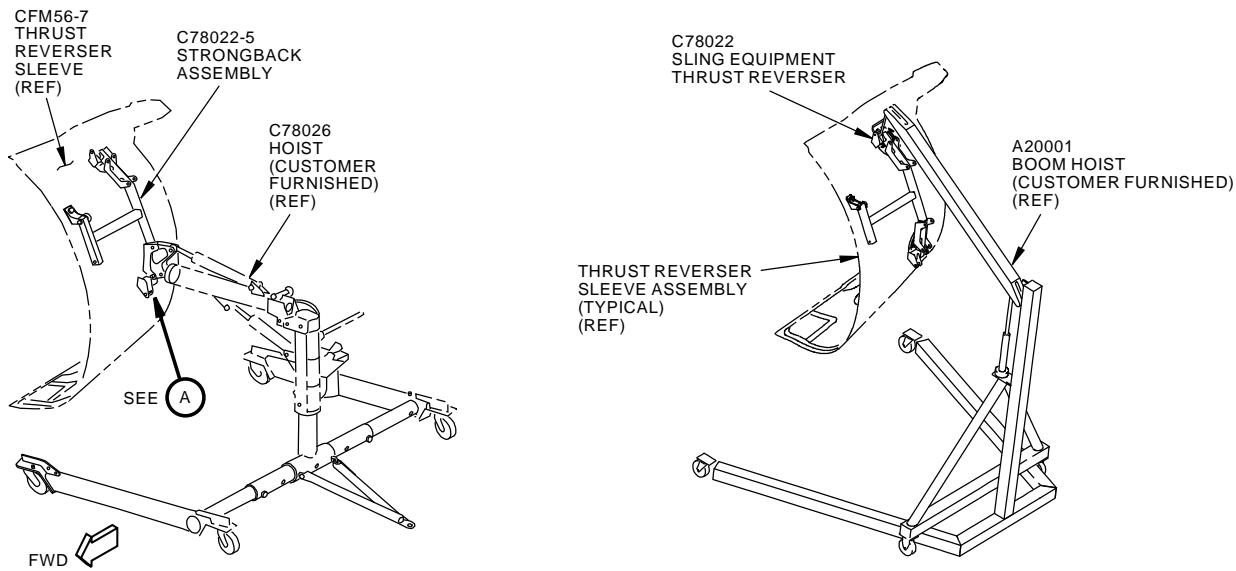
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Page 4
Aug 05/2015



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



NOTE: THE LEFT TRANSLATING SLEEVE IS SHOWN,
THE RIGHT TRANSLATING SLEEVE IS THE SAME.

K38461 S0006832224_V5

Thrust Reverser Sleeve Sling Equipment
Figure 1 (Sheet 1 of 2)

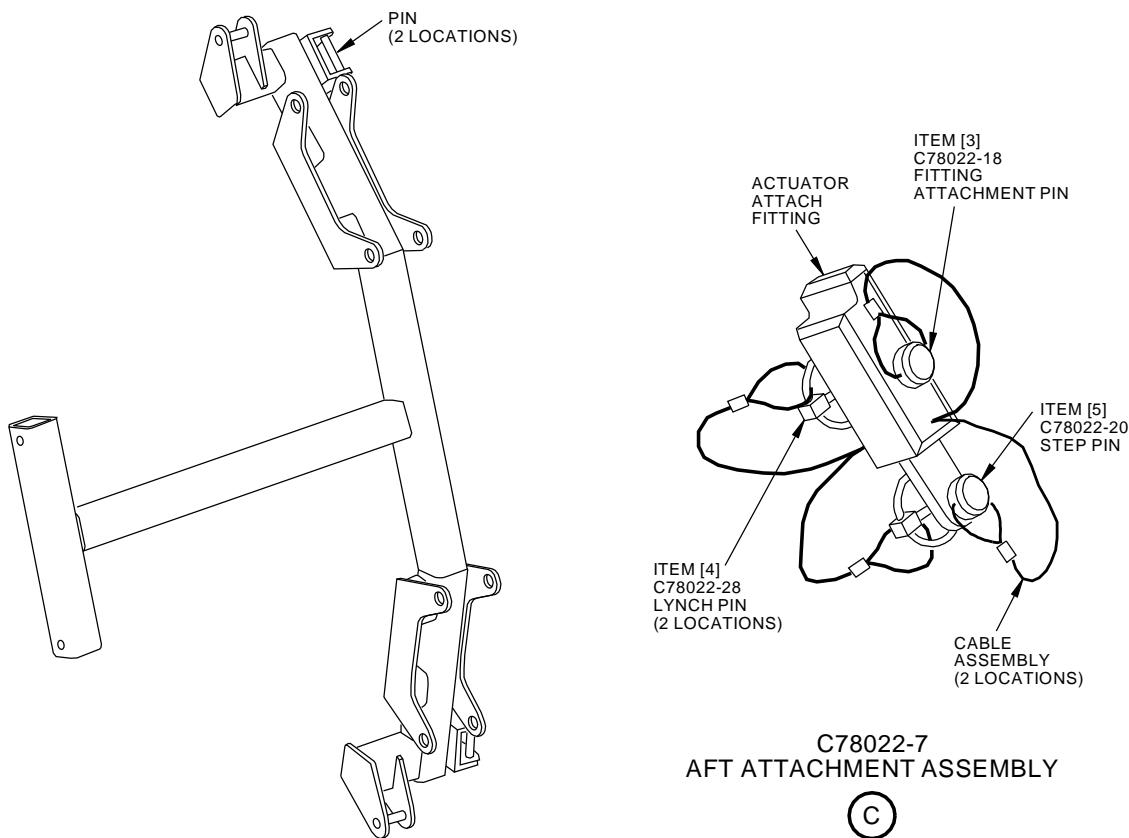
78-30-14

Page 5
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



C78022-5
STRONGBACK ASSEMBLY

(B)

C78022-7
AFT ATTACHMENT ASSEMBLY

(C)

K38463 S0006832225_V4

Thrust Reverser Sleeve Sling Equipment
Figure 1 (Sheet 2 of 2)

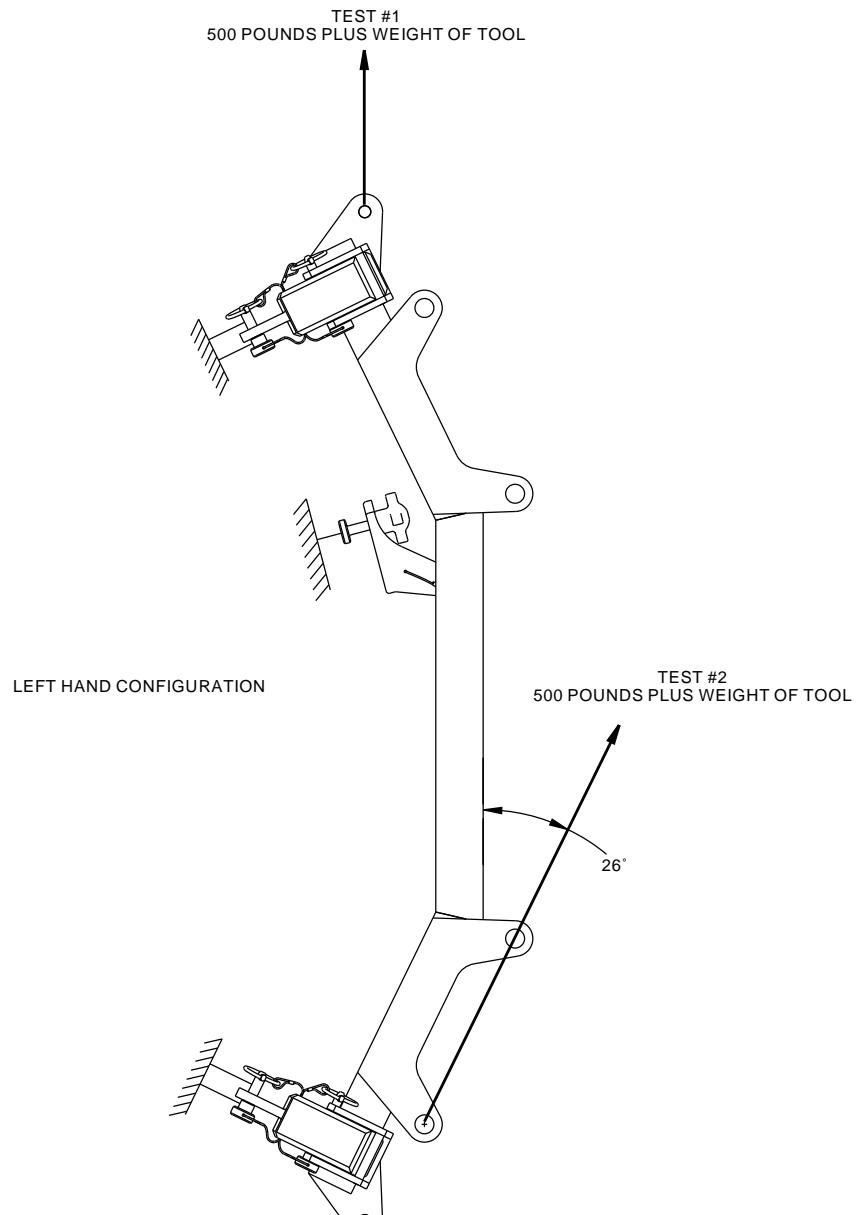
78-30-14

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Page 6
Aug 05/2014

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



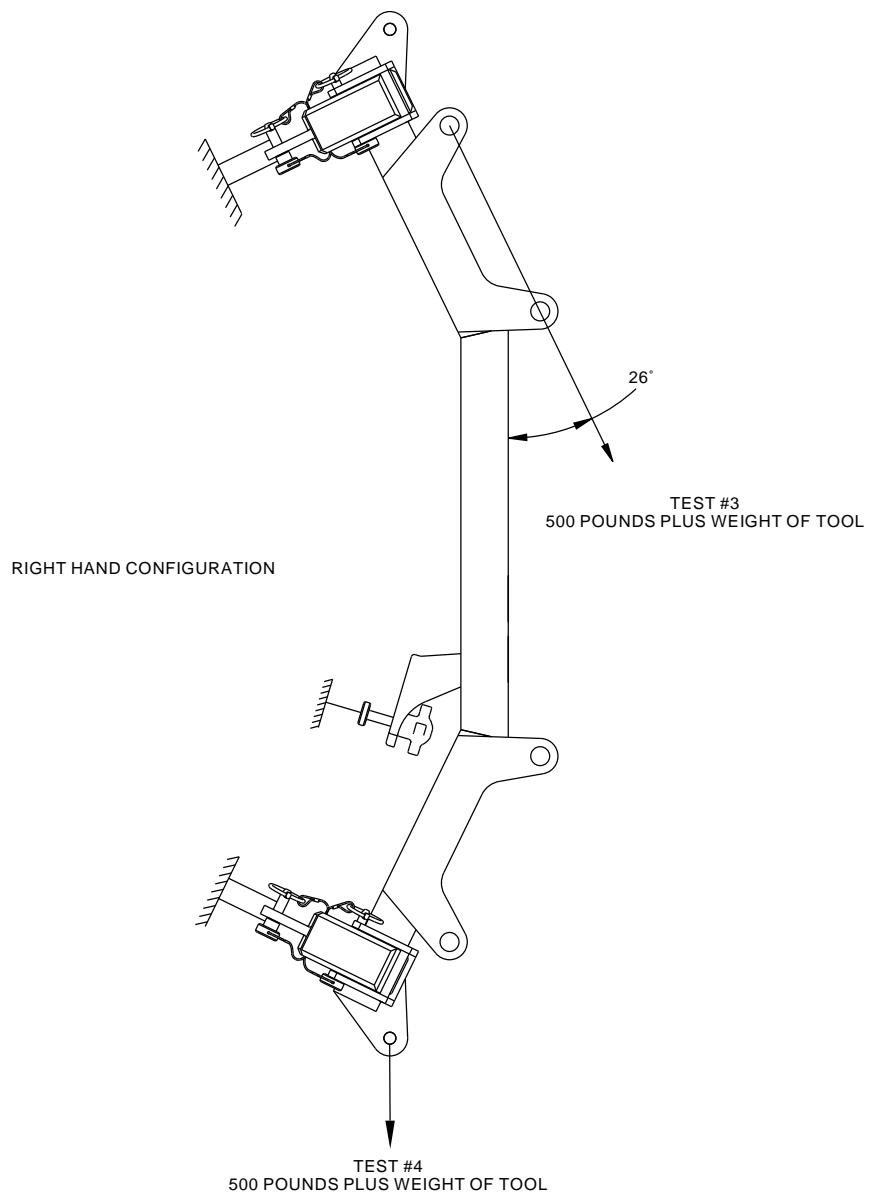
C78022-1
PROOF LOAD DIAGRAM 1
(EXAMPLE)

2341661 S0000533181_V1

C78022 Sling Equipment - Thrust Reverser Sleeve Proof Load Diagram
Figure 2 (Sheet 1 of 2)

78-30-14

BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



C78022-1
PROOF LOAD DIAGRAM 2
(EXAMPLE)

2341678 S0000533183_V1

C78022 Sling Equipment - Thrust Reverser Sleeve Proof Load Diagram
Figure 2 (Sheet 2 of 2)

78-30-14

Page 8
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[1]	C78022-27 (CL-3-HK-4)	HAND KNOB	---
[2]	C78022-3	INDEX PIN (1.00" X 2.3", 4340 STEEL, 160-180 KSI)	---
[3]	C78022-18	FITTING ATTACH PIN (1.00" X 3.6", 4340 STEEL, 160-180 KSI)	---
[4]	C78022-28 (63-01)	LYNCH PIN	---
[5]	C78022-20	STEP PIN (1.00" X 2.2", 4340 STEEL, 160-180 KSI)	---

78-30-14

D634A501

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Page 9
Aug 05/2014



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: B78010-9, -28

NAME: STAND - FUNCTIONAL TEST EQUIPMENT, LOCKING AND NON-LOCKING THRUST REVERSER ACTUATOR

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 78-31-04, CMM 78-31-05, CMM 78-31-18, CMM 78-31-19

USAGE & DESCRIPTION: The B78010-9 locking and non-locking thrust reverser actuator functional test equipment stand is used on 737-300 thru -500 airplanes.

The B78010-28 locking and non-locking thrust reverser actuator functional test equipment stand is used on 737-300 thru -900 airplanes.

B78010 is used during component maintenance in conjunction with a customer-furnished, B20005 test equipment. B78010 supports either the locking (315A1801 and 315A2801) or non-locking (315A1800 and 315A2800) thrust reverser actuators during the rod-end velocity vs. position test.

Refer to CMM 78-31-04, CMM 78-31-05, CMM 78-31-18, CMM 78-31-19 and the current B78010 tool drawing for complete usage instructions.

The B78010-9 and B78010-28 locking and non-locking thrust reverser actuator functional test equipment stand consist of:

B78010-9		
QUANTITY	NOMENCLATURE	PART NUMBER
1	FUNCTIONAL TEST STAND	B78010-10
1	GUIDE BRACKET ASSEMBLY	B78010-17
1	STORAGE BOX	

B78010-28		
QUANTITY	NOMENCLATURE	PART NUMBER
1	FUNCTIONAL TEST STAND	B78010-29
1	GUIDE BRACKET ASSEMBLY	B78010-17
1	LARGE GUIDE ASSEMBLY	B78010-33
1	STORAGE BOX	

WEIGHT: 50 lbs (22.7 kg)

DIMENSIONS: 8 x 10 x 55 inches (203 x 254 x 849 mm)

NOTE: B78010-28 replaces B78010-9 for future procurement.

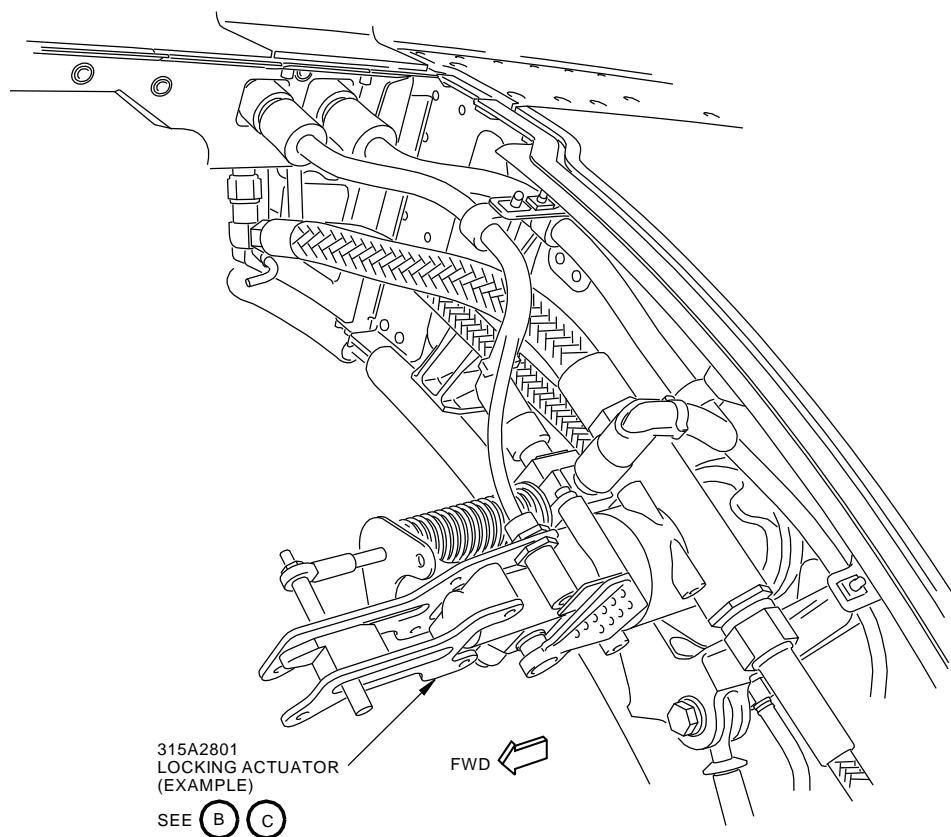
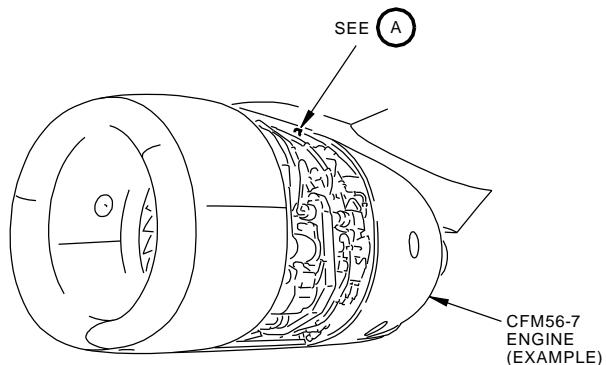
78-30-15

Page 1
Aug 05/2014

D634A501

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2079546 S0000434782_V1

Locking and Non-Locking Thrust Reverser Actuator Functional Test Equipment Stand
Figure 1 (Sheet 1 of 2)

78-30-15

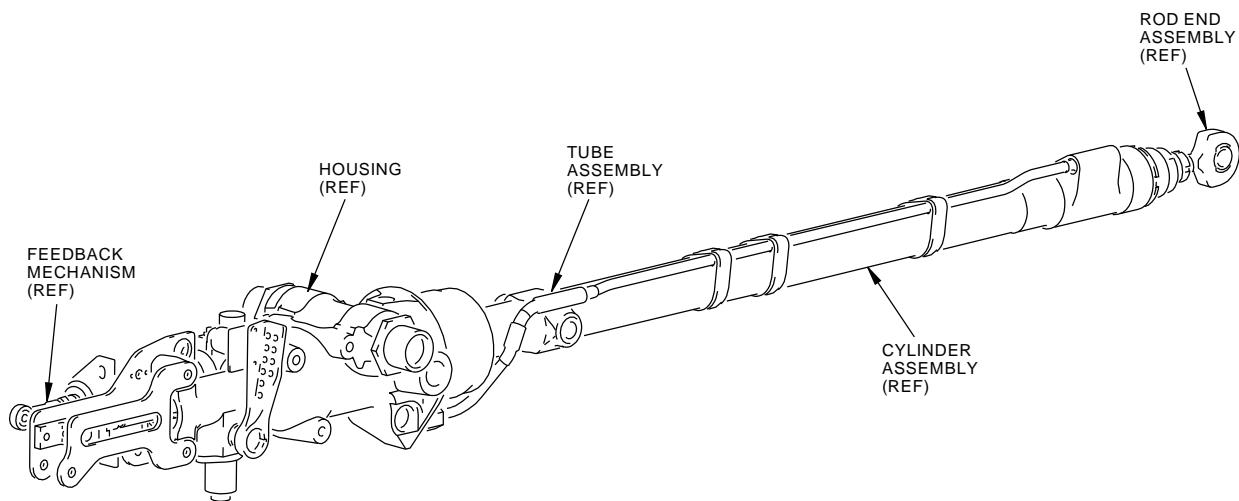
Page 2
Aug 05/2014

D634A501

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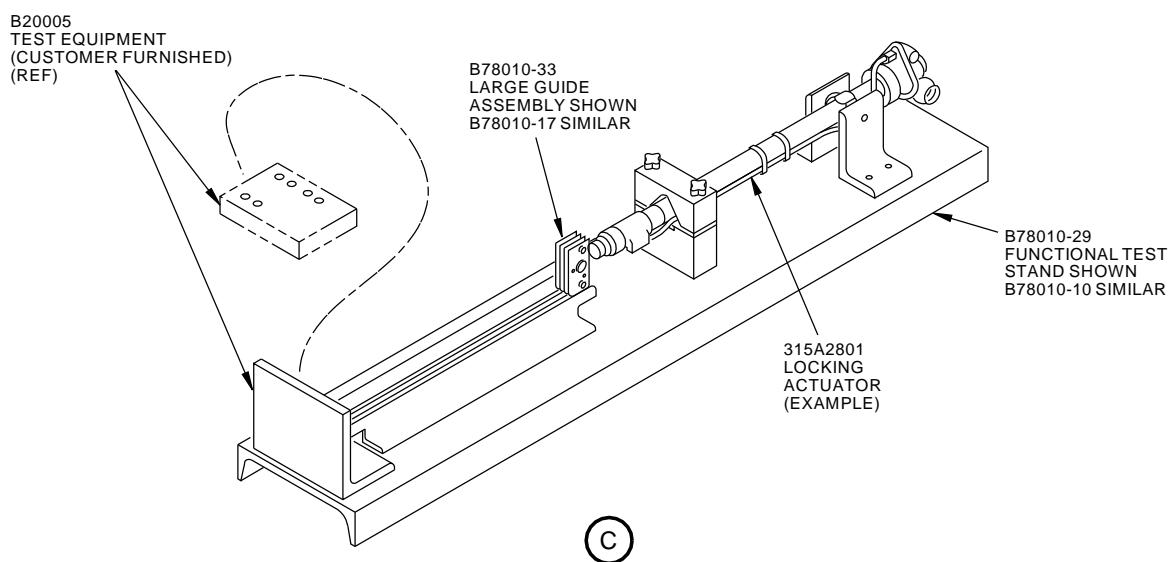


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315A2801
LOCKING ACTUATOR
(EXAMPLE)

(B)



W51085 S0006832227_V3

Locking and Non-Locking Thrust Reverser Actuator Functional Test Equipment Stand
Figure 1 (Sheet 2 of 2)

78-30-15

Page 3
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: B78014-29, -37

NAME: TEST FIXTURE - ROD END AND STROKE STOP, LOCKING AND NON-LOCKING THRUST REVERSER ACTUATOR

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 78-31-04, CMM 78-31-05, CMM 78-31-18, CMM 78-31-19

USAGE & DESCRIPTION: The B78014-29 test fixture is used during component maintenance on all 737-300 thru -500 airplanes.

The B78014-37 test fixture is used during component maintenance on all 737-300 thru -900 airplanes.

B78014 is used to adjust the rod length and stroke stop on both locking (315A1801 and 315A2801) and non-locking (315A1800 and 315A2800) thrust reverser actuators.

Refer to the current B78014 tool drawing, CMM 78-31-04, CMM 78-31-05, CMM 78-31-18 and CMM 78-31-19 for complete usage instructions.

B78014-29 and -37 consists of:

B78014-29		
QUANTITY	NOMENCLATURE	PART NUMBER
1	TEST STAND ASSEMBLY	B78014-30
1	STORAGE BOX	

B78014-37		
QUANTITY	NOMENCLATURE	PART NUMBER
1	TEST STAND ASSEMBLY	B78014-38
1	STORAGE BOX	

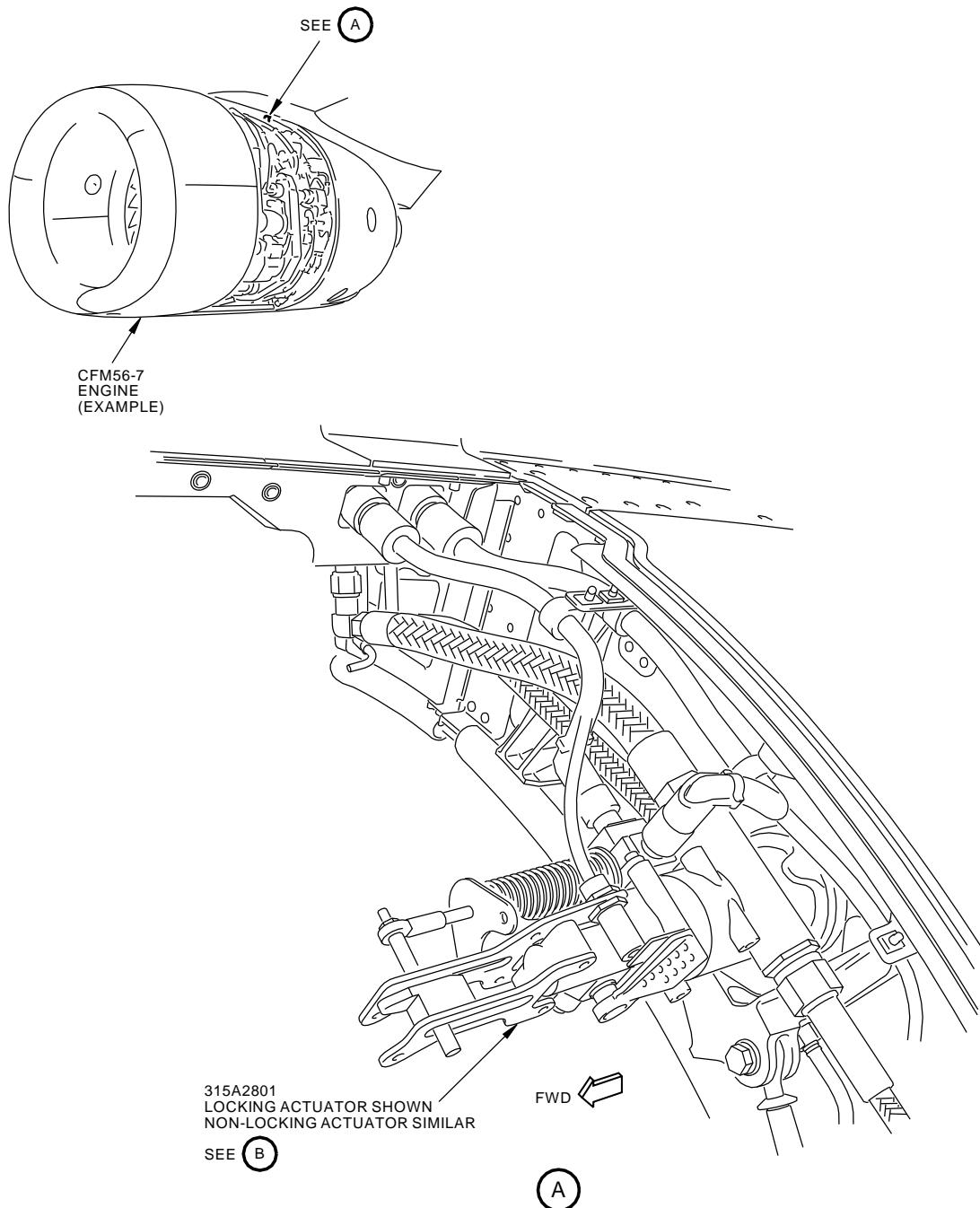
WEIGHT: B78014-29 or -37 - 110 lbs (50 kg)

DIMENSIONS: B78014-29 or -37 - 9 x 10 x 52 inches (229 x 254 x 1321 mm)

NOTE: B78014-37 replaces B78014-29 for future procurement.
B78014-29 supersedes B78014-24.

78-30-16

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NOTE: LEFT SIDE IS SHOWN,
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2079453 S0000435047_V1

Test Fixture - Rod End and Stroke Stop, Locking and Non-Locking Thrust Reverser Actuator
Figure 1 (Sheet 1 of 2)

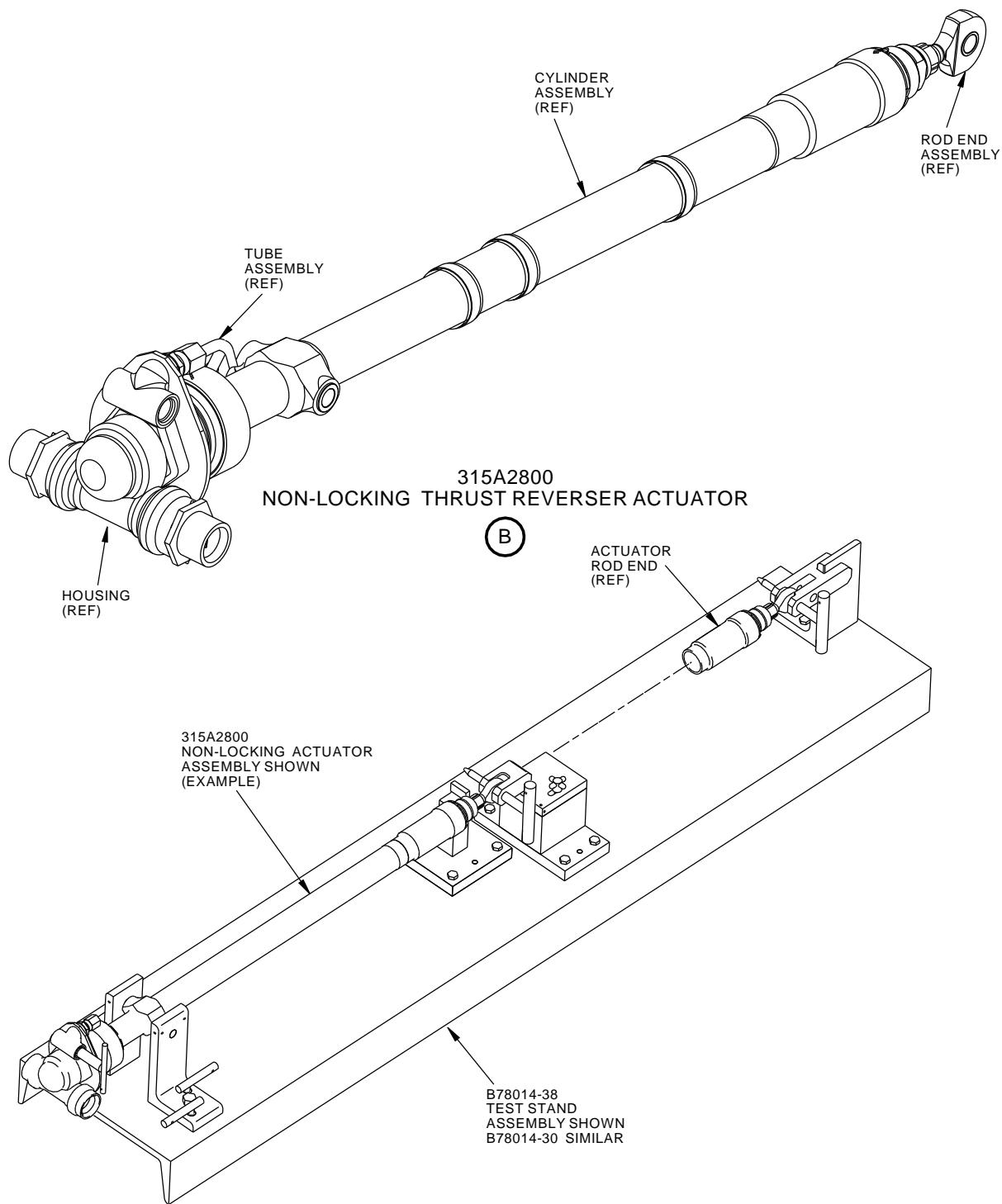
78-30-16

Page 2
 Aug 05/2014

D634A501



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ILLUSTRATED TOOL AND EQUIPMENT MANUAL



414766 S0006832229_V4

Test Fixture - Rod End and Stroke Stop, Locking and Non-Locking Thrust Reverser Actuator
Figure 1 (Sheet 2 of 2)

78-30-16

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Page 3
Aug 05/2014



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: B78015-17, -23, -39

NAME: OVERHAUL SET - THRUST REVERSER LOCKING ACTUATOR ASSEMBLY

AIRPLANE MAINTENANCE: YES

AMM 78-31-03

COMPONENT MAINTENANCE: YES

CMM 78-31-04, CMM 78-31-19

USAGE & DESCRIPTION: The B78015-17 overhaul set is used during component maintenance on 737-300 thru -500 airplanes equipped with locking thrust reverser actuators 315A1801.

The B78015-23 overhaul set is used on 737-300 thru -900 airplanes equipped with locking thrust reverser actuators 315A1801 or 315A2801.

The B78015-39 (preferred) overhaul set is used on 737-600 thru -900 airplanes equipped with locking thrust reverser actuators.

B78015 is used for aircraft maintenance on 737-600 thru -900 airplanes during thrust reverser manual lockout assembly replacement.

B78015 is used during thrust reverser overhaul of the thrust reverser locking actuator assembly on 737-300 thru -900 airplanes.

Refer to AMM 78-31-03, CMM 78-31-04, CMM 78-31-19 and the current B78015 drawing for complete usage instructions.

B78015-17, -23 and -39 overhaul sets consist of:

B78015-17		
QUANTITY	NOMENCLATURE	PART NO.
1	CLEVIS ADJUSTMENT ASSEMBLY	B78015-2
1	PLATE	B78015-7
1	PLATE DISASSEMBLY	B78015-8
1	SLEEVE	B78015-10
1	WASHER	B78015-11
1	GAUGE	B78015-14
1	DRILL JIG ASSEMBLY	B78015-18
1	CAP	B78015-21
1	STORAGE BOX	

B78015-23		
QUANTITY	NOMENCLATURE	PART NO.
1	CLEVIS ADJUSTMENT ASSEMBLY	B78015-2
1	PLATE	B78015-7
1	PLATE DISASSEMBLY	B78015-8

78-30-17

Page 1
Feb 05/2016

D634A501

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL

(Continued)

B78015-23		
QUANTITY	NOMENCLATURE	PART NO.
1	SLEEVE	B78015-10
1	WASHER	B78015-11
1	CAP	B78015-21
1	DRILL JIG ASSEMBLY	B78015-24
1	PROXIMITY SWITCH LOCATOR ASSEMBLY	B78015-28
1	GAUGE	B78015-14
1	DRILL JIG ASSEMBLY	B78015-18
1	STORAGE BOX	

B78015-39		
QUANTITY	NOMENCLATURE	PART NO.
1x	CLEVIS ADJUSTMENT ASSEMBLY	B78015-2
1x	PLATE	B78015-7
1x	PLATE DISASSEMBLY	B78015-8
1x	SLEEVE	B78015-10
1x	WASHER	B78015-11
1x	CAP	B78015-21
1x	PROXIMITY SWITCH LOCATOR ASSEMBLY	B78015-40
1x	STORAGE BOX	

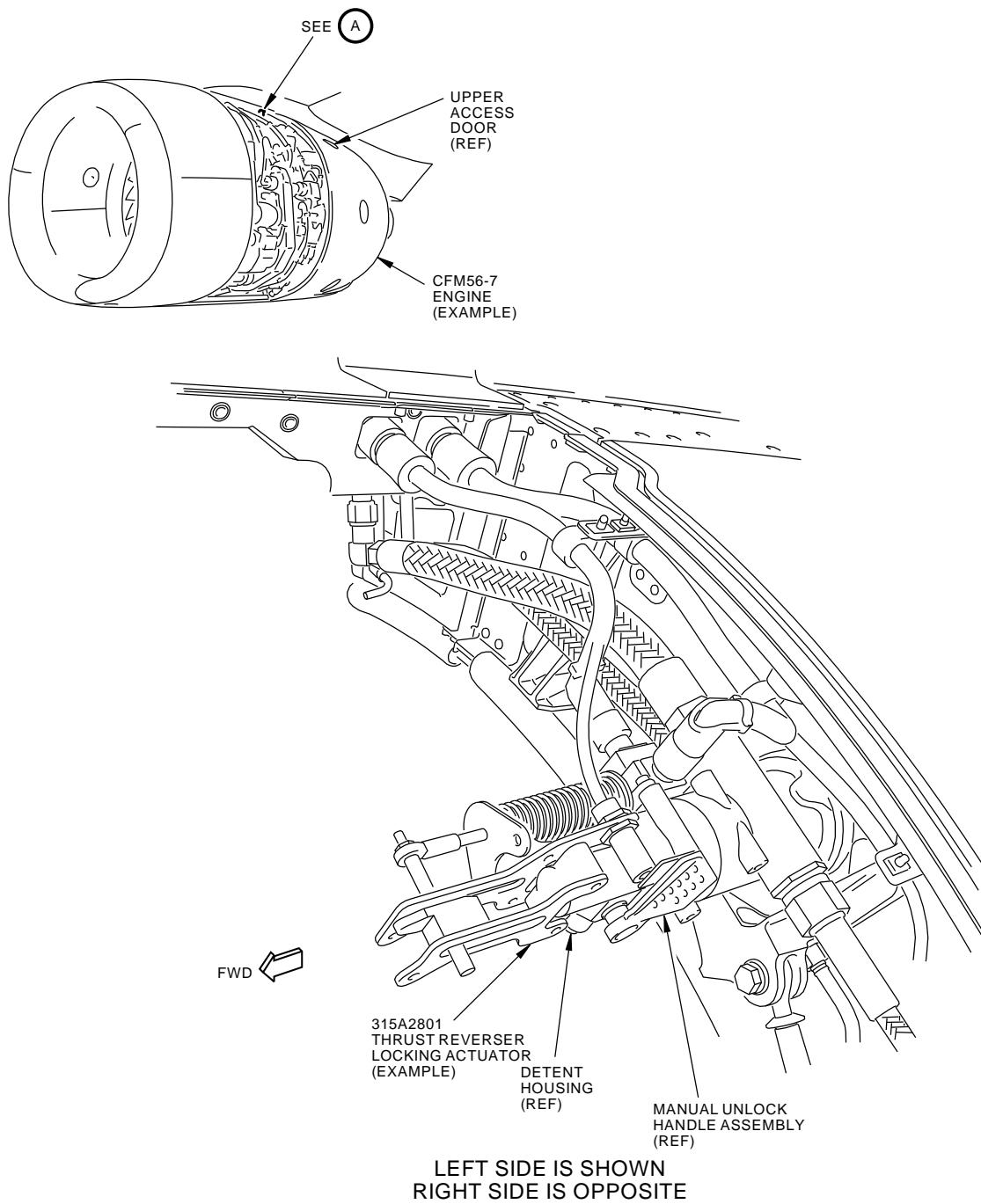
WEIGHT: B78015-17, -23 - 18 lbs (8 kg)
B78015-39 - 8 lbs (3.6 kg)

DIMENSIONS: B78015-17, -23 - 5 x 16 x 20 inches (127 x 406 x 508 mm)
B78015-39 - 5 x 9 x 10 inches (127 x 229 x 254 mm)

NOTE: B78015-23 replaces B78015-17 for future procurement.
B78015-23 and B78015-17 supersedes B78015-1.
B78015-39 replaces B78015-23 for future procurement.

78-30-17

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J83761 S0000180582_V2

Thrust Reverser Upper Locking Actuator Location
Figure 1

78-30-17

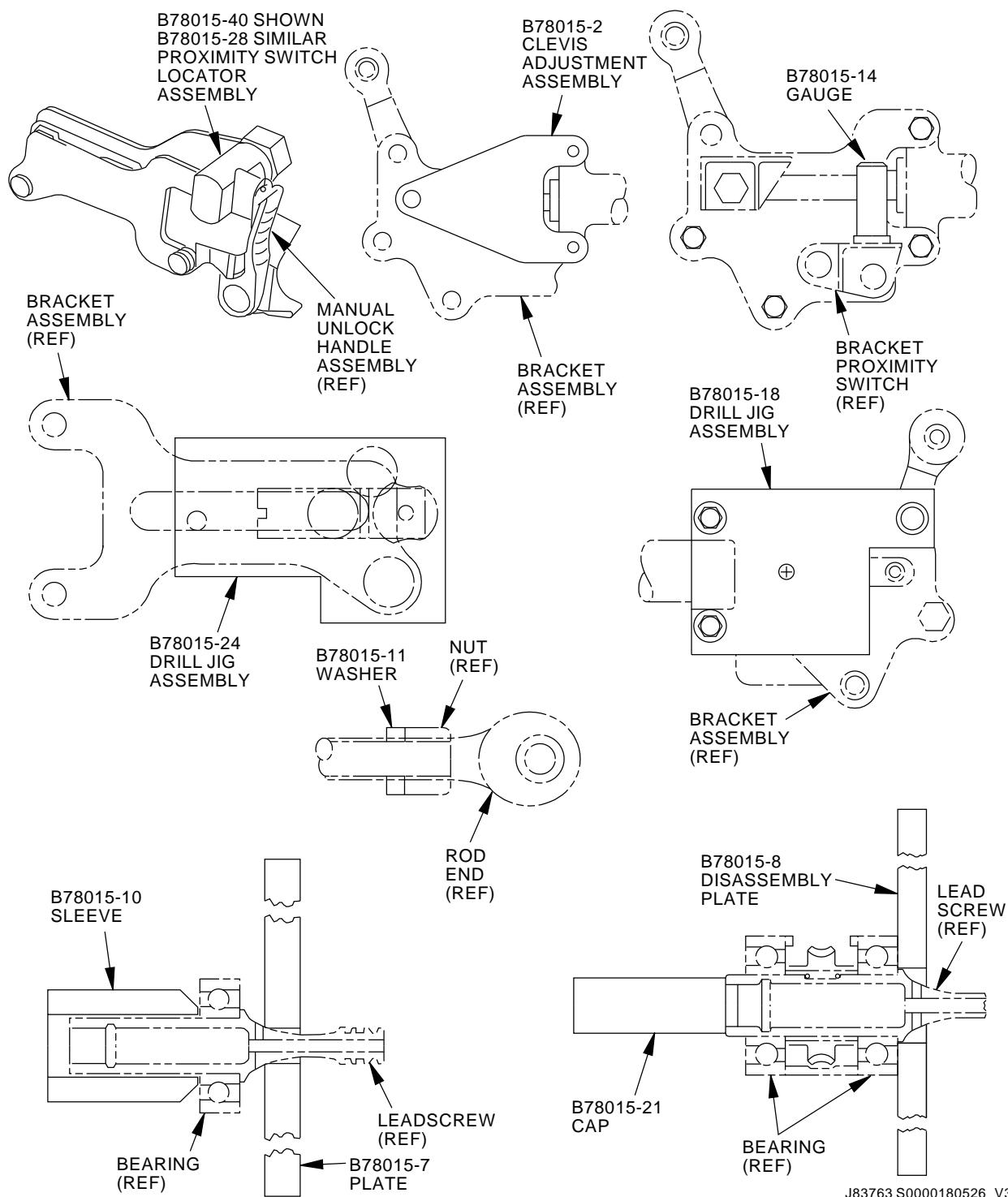
Page 3
Aug 05/2014

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J83763 S0000180526_V3

B78015 Thrust Reverser Locking Actuator Assembly Overhaul Set
Figure 2

78-30-17



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: B78008-19

NAME: WRENCH SET - THRUST REVERSER ACTUATOR

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 78-31-04, CMM 78-31-05, CMM 78-31-18, CMM 78-31-19

USAGE & DESCRIPTION: The B78008-19 wrench set is used on 737-300 thru -900 airplanes.

B78008 is used to torque, hold, align and check various components of 315A1801 and 315A2801 locking; 315A1800 and 315A2800 non-locking actuators.

Refer to CMM 78-31-04, CMM 78-31-05, CMM 78-31-18, CMM 78-31-19 and the current B78008 drawing for complete usage instructions.

The B78008-19 wrench set applications are:

B78008-19 APPLICATIONS		
WRENCH	PART NUMBER	NOMENCLATURE
B78008-5	315A1866	GLAND NUT
B78008-6	315A1819	NON-LOCKING ACTUATOR PISTON ASSEMBLY
B78008-6	315A1870	LEAD SCREW NUT
B78008-7	315A1874	NUT
B78008-9	315A1843	FEEDBACK GLAND NUT
B78008-10	315A1850	LEAD SCREW
B78008-11	315A1350	LEAD SCREW
B78008-12	315A1815	LEAD SCREW NUT
B78008-12	315A1820	THRUST REVERSER LOCKING ACTUATOR PISTON ASSEMBLY
B78008-12	315A1850	LEAD SCREW
B78008-12	315A2815	LOCKING ACTUATOR LEAD SCREW NUT
B78008-16	315A1811	CYLINDER NUT
B78008-17	315A1839	LOCKING ACTUATOR CYLINDER NUT
AN8508-22	315A1818	END FITTING
AN8508-22	315A1903	SCREW ACTUATOR ADAPTER
B78008-20	315A1822	LEAD SCREW
B78008-22	315A1822	LEAD SCREW
B78008-22	315A1850	LEAD SCREW

B78008-19 consists of:

B78008-19 CONTENTS		
QUANTITY	NOMENCLATURE	PART NUMBER
1	WRENCH	B78008-5
1	WRENCH	B78008-6

78-30-19

Page 1
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

(Continued)

B78008-19 CONTENTS		
QUANTITY	NOMENCLATURE	PART NUMBER
1	WRENCH	B78008-7
1	WRENCH	B78008-9
1	WRENCH	B78008-10
1	SLEEVE	B78008-11
1	WRENCH ASSEMBLY	B78008-12
1	SPANNER ASSEMBLY	B78008-16
1	SPANNER ASSEMBLY	B78008-17
1	CROWFOOT WRENCH	AN850822B
1	WRENCH	B78008-20
1	ADAPTER ASSEMBLY	B78008-21
1	STORAGE BOX	

WEIGHT: 10 lbs (4.5 kg)

DIMENSIONS: 3 x 9 x 12 inches (76 x 229 x 305 mm)

NOTE: B78008-19 supersedes B78008-15.

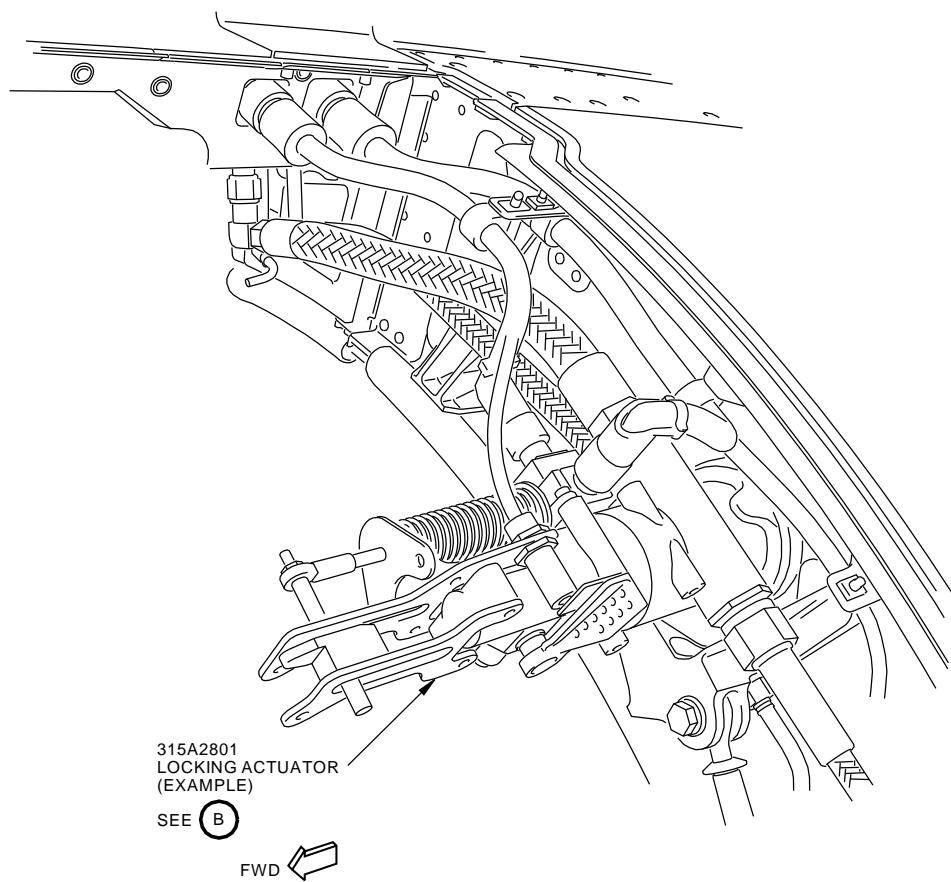
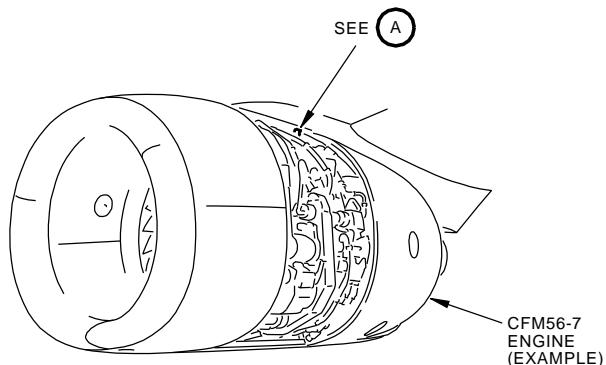
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Page 2
Aug 05/2014

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NOTE: LEFT SIDE IS SHOWN,
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1570408 S0000292045_V2

Thrust Reverser Actuator Wrench Set
Figure 1 (Sheet 1 of 5)

78-30-19

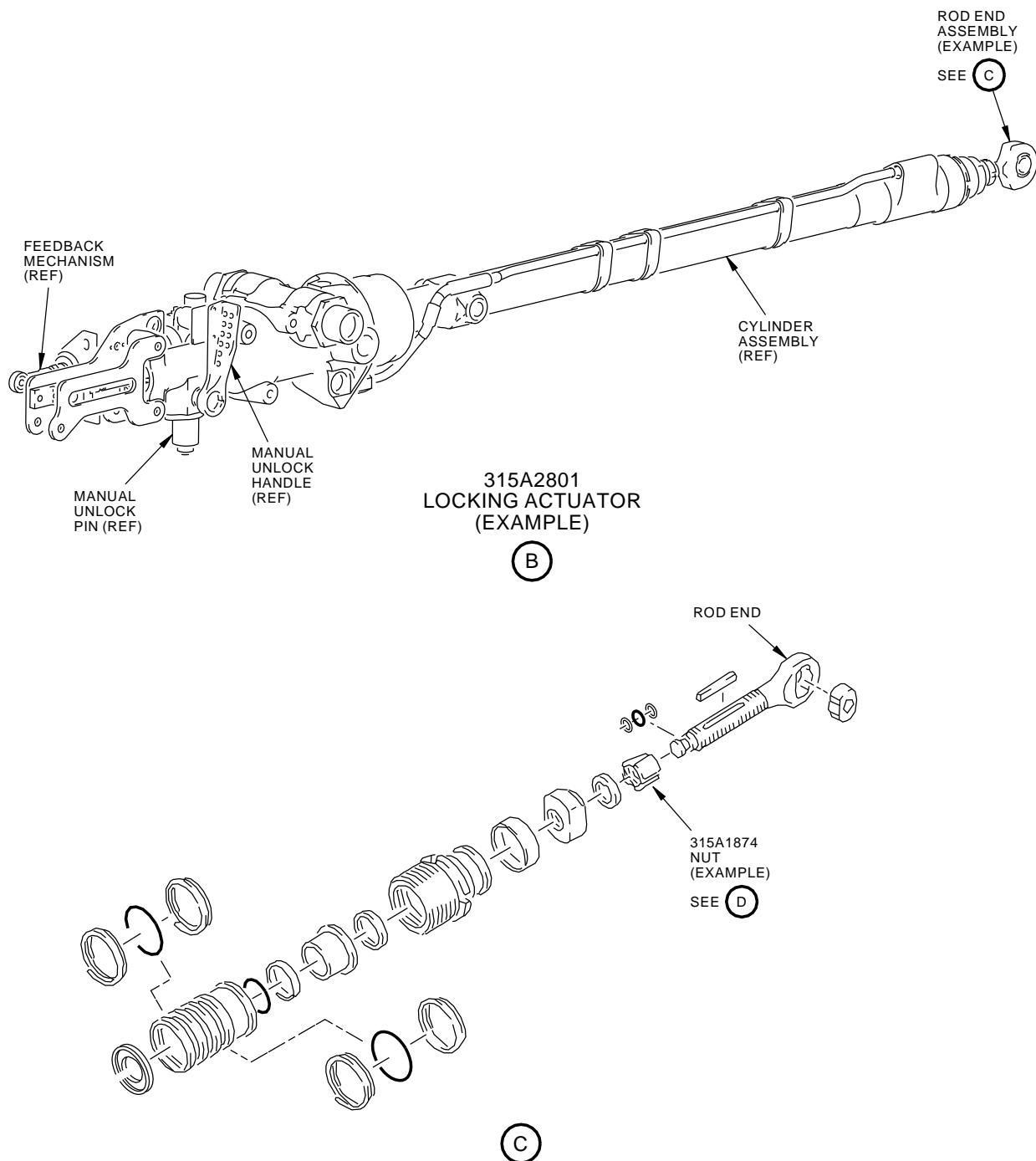
Page 3
Aug 05/2014

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1570572 S0000292047_V2

Thrust Reverser Actuator Wrench Set
Figure 1 (Sheet 2 of 5)

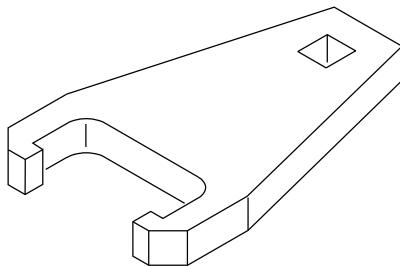
78-30-19

Page 4
Aug 05/2014

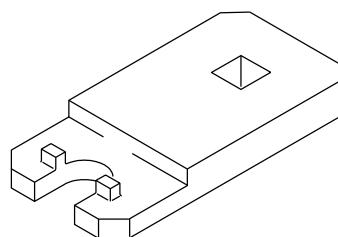
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B78008-5



B78008-6

1570573 S0000292005_V1

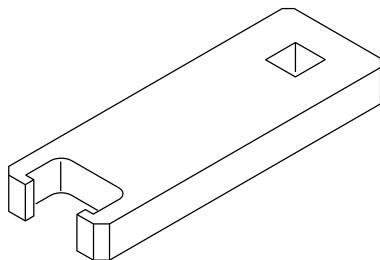
Thrust Reverser Actuator Wrench Set
Figure 1 (Sheet 3 of 5)

78-30-19

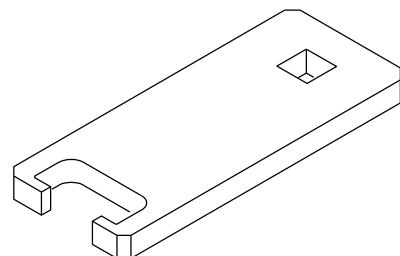
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Page 5
Aug 05/2014

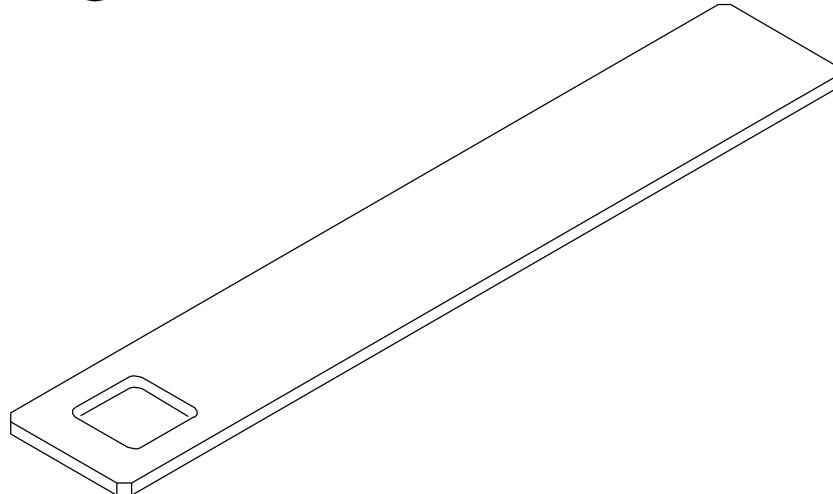
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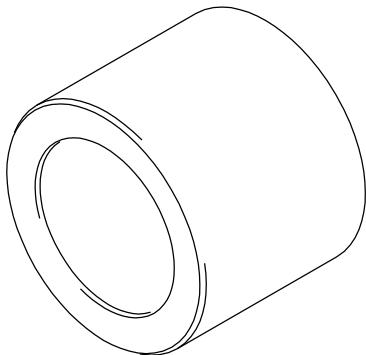
B78008-7



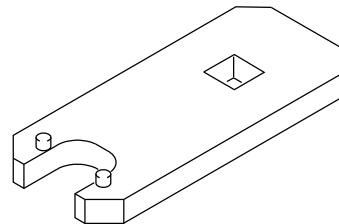
B78008-9



B78008-10
(B78008-20 SIMILAR)



B78008-11



B78008-12

1570575 S0000292007_V2

Thrust Reverser Actuator Wrench Set
Figure 1 (Sheet 4 of 5)

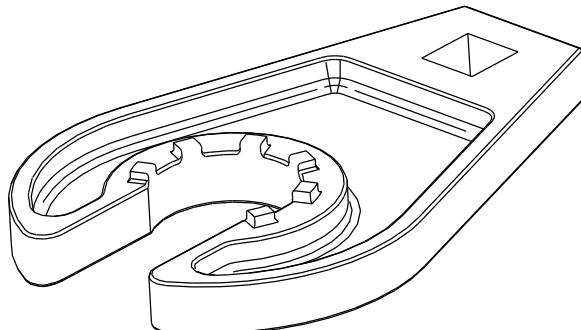
78-30-19

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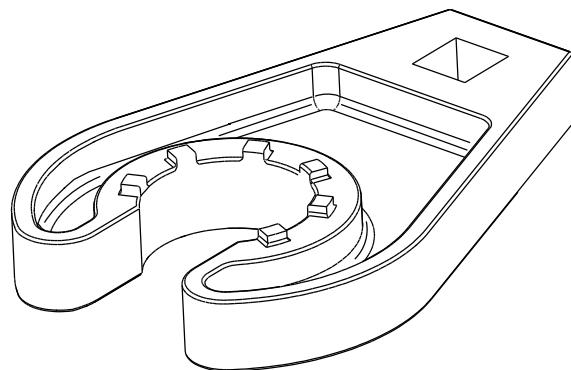
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Page 6
Aug 05/2014

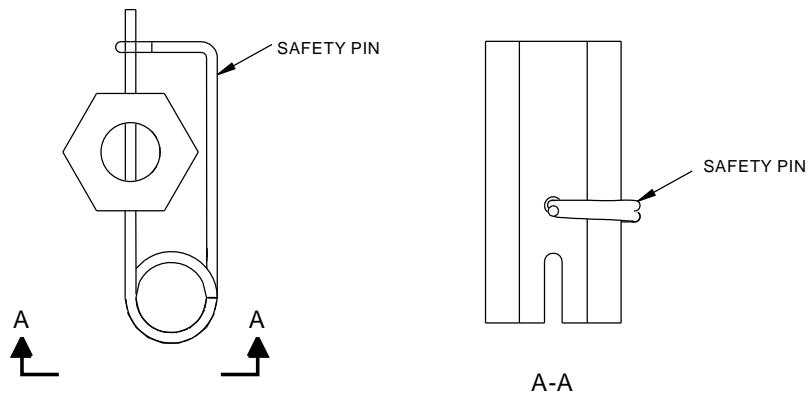
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B78008-16



B78008-17



B78008-21

1570580 S0000292009_V1

Thrust Reverser Actuator Wrench Set
Figure 1 (Sheet 5 of 5)

78-30-19



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: B78013-1

NAME: OVERHAUL EQUIPMENT - THRUST REVERSER LOCKING ACTUATOR ASSEMBLY

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 78-31-02, CMM 78-31-04, CMM 78-31-07, CMM 78-31-19

USAGE & DESCRIPTION: The B78013-1 overhaul equipment is used during component maintenance on 737-300 thru -900 airplanes equipped with thrust reverser locking actuators.

B78013 is used to overhaul the 315A2801 thrust reverser locking actuator feedback mechanism.

Refer CMM 78-31-02, CMM 78-31-04, CMM 78-31-07, CMM 78-31-19 and to the current B78013 drawing for complete usage instructions.

B78013-1 consists of:

B78013-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	FEEDBACK LEVER HOLDER ASSEMBLY	B78013-3
1	SPRING COMPRESSOR ASSEMBLY	B78013-4
1	BELLCRANK POSITIONING ASSEMBLY	B78013-5
1	SPACER	B78013-8
1	SPACER	B78013-9
1	STORAGE BOX	

WEIGHT: 7 lbs (3.2 kg)

DIMENSIONS: 6 x 8 x 15 inches (152 x 203 x 381 mm)

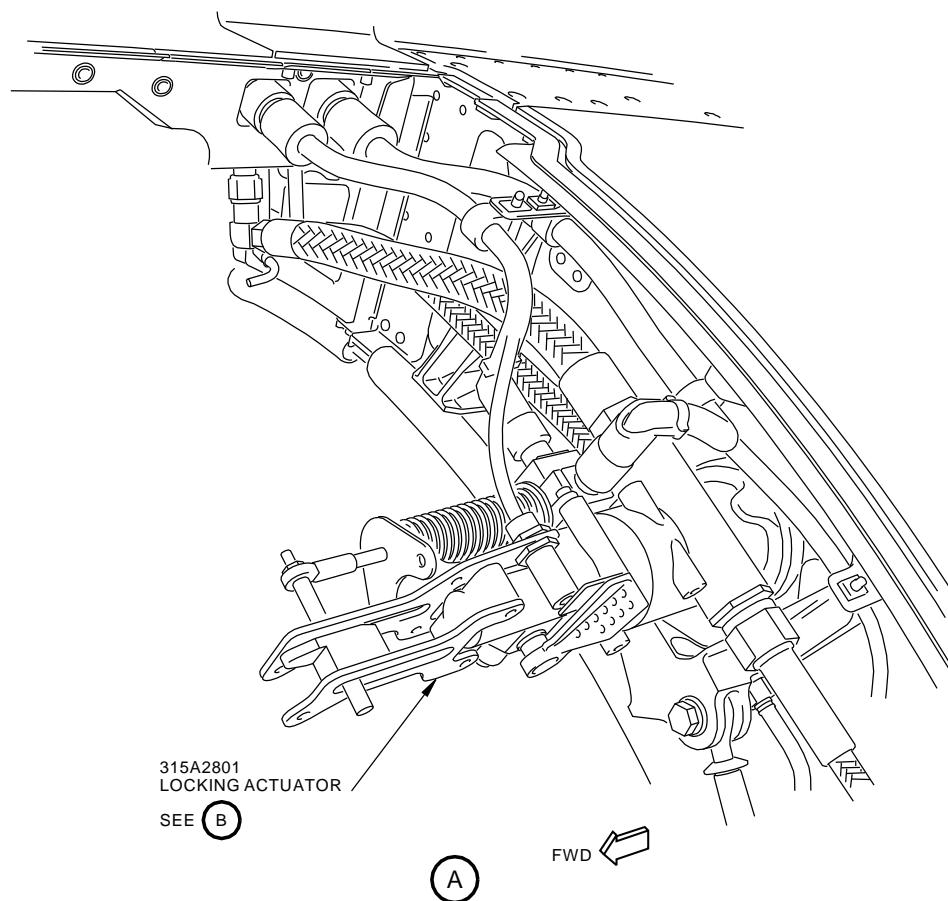
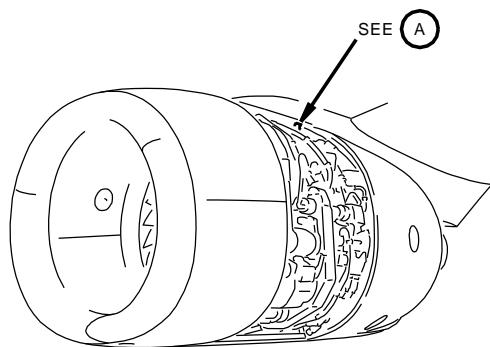
78-30-20

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Page 1
Aug 05/2014

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NOTE: LEFT SIDE IS SHOWN,
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1570606 S0000292090_V1

Thrust Reverser Locking Actuator Assembly Overhaul Equipment
Figure 1 (Sheet 1 of 4)

78-30-20

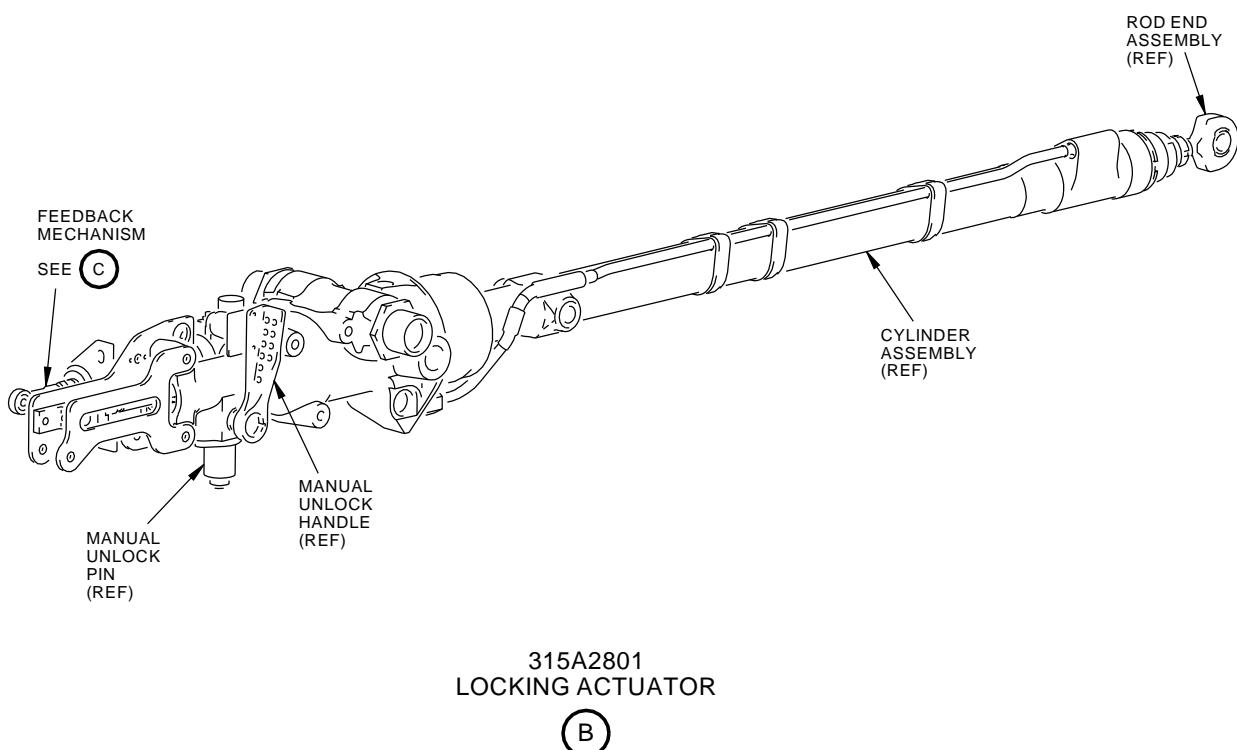
Page 2
Aug 05/2014

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315A2801
LOCKING ACTUATOR

(B)

1570610 S0000292093_V1

Thrust Reverser Locking Actuator Assembly Overhaul Equipment
Figure 1 (Sheet 2 of 4)

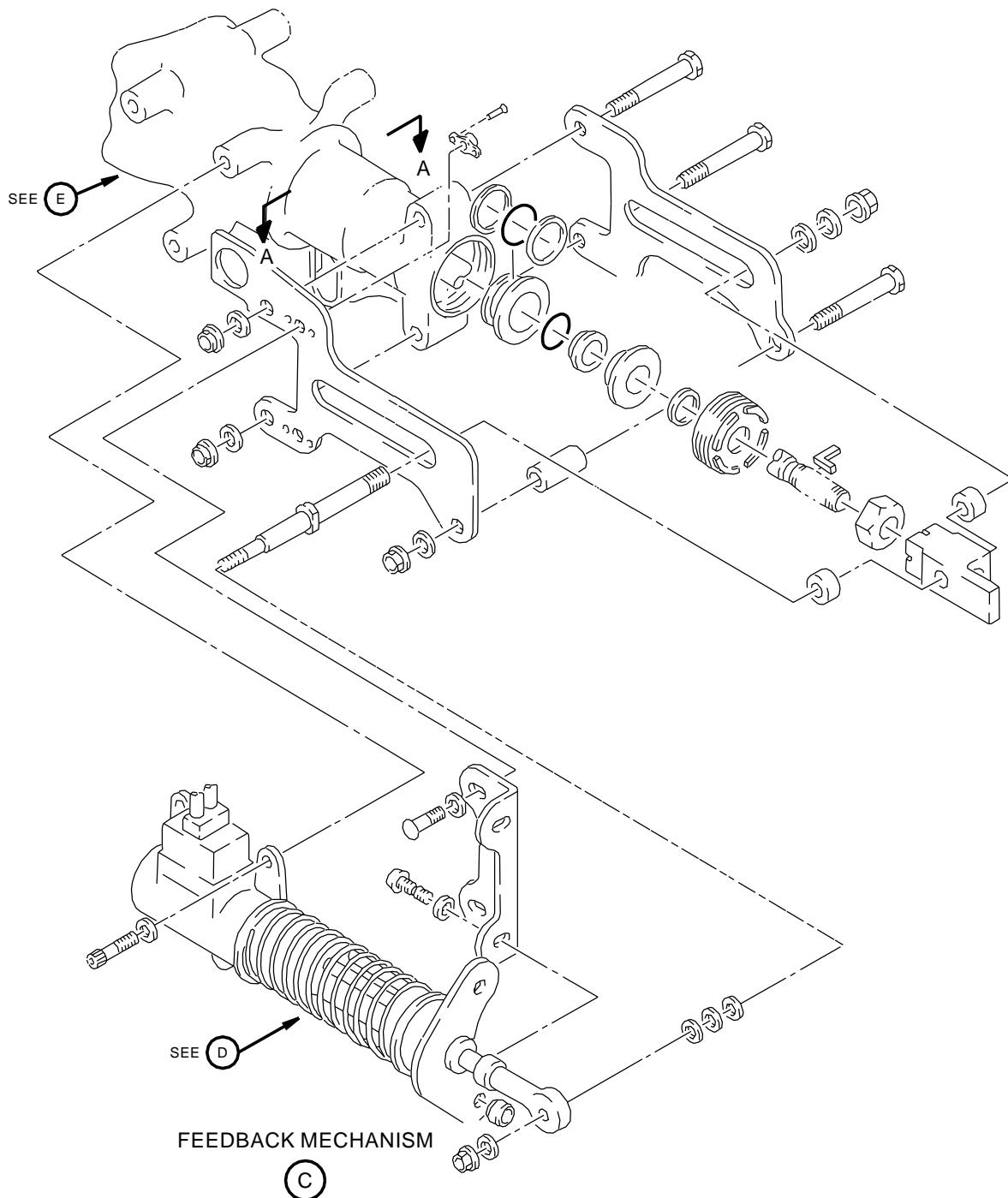
78-30-20

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Page 3
Aug 05/2014

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1570611 S0000292094_V1

Thrust Reverser Locking Actuator Assembly Overhaul Equipment
Figure 1 (Sheet 3 of 4)

78-30-20

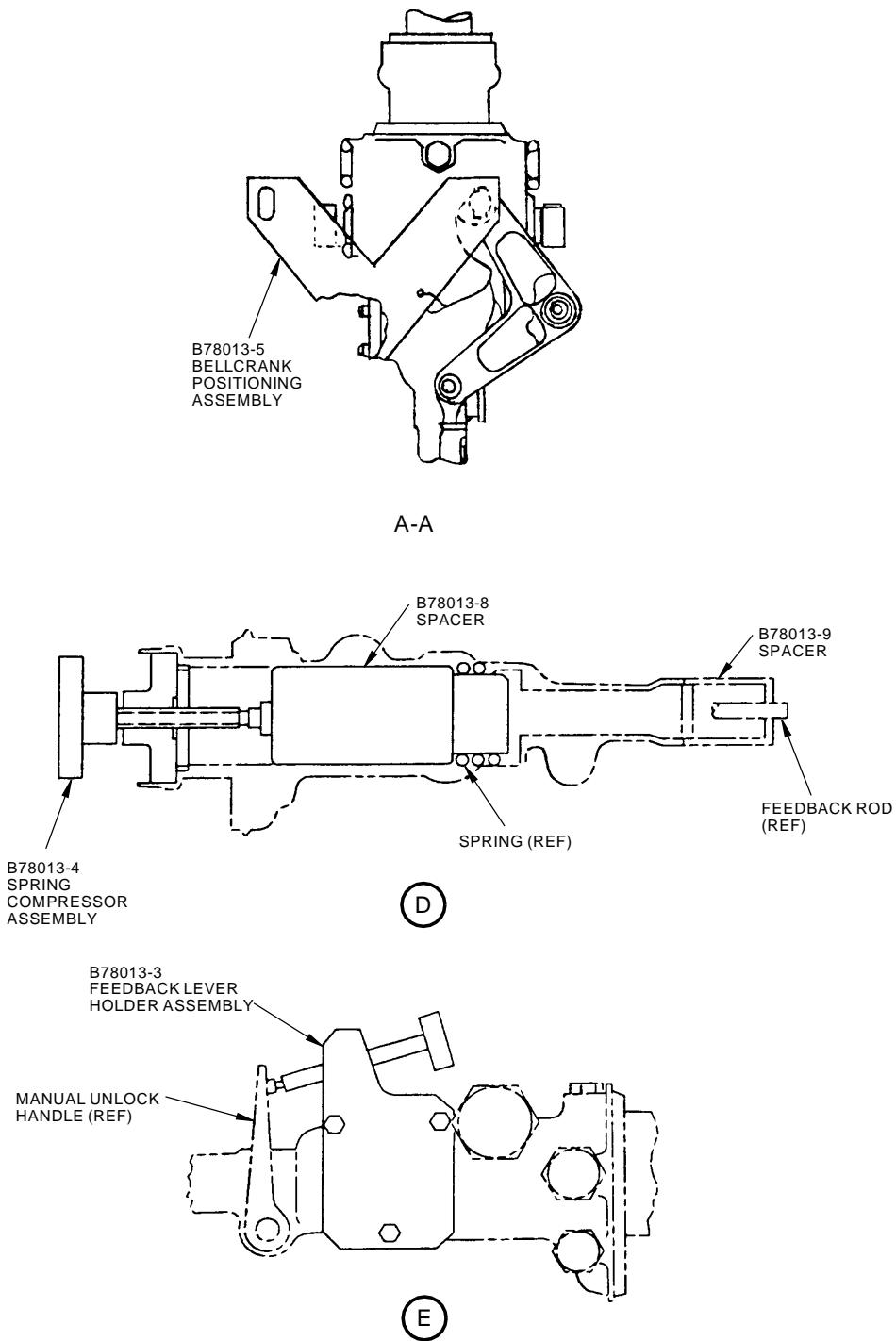
Page 4
Aug 05/2014

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737-600/700/800/900
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1570616 S0000292096_V1

Thrust Reverser Locking Actuator Assembly Overhaul Equipment
Figure 1 (Sheet 4 of 4)

78-30-20

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Page 5
Aug 05/2014



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: B78016-1

NAME: OVERHAUL SET - THRUST REVERSER LOCKING AND NON-LOCKING ACTUATOR ASSEMBLY

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 78-31-04, CMM 78-31-05, CMM 78-31-18, CMM 78-31-19

USAGE & DESCRIPTION: The B78016-1 overhaul set is used during component maintenance on all 737-300 thru -900 airplanes.

B78016 is used on the thrust reverser non-locking actuators (315A1800 and 315A2800) and thrust reverser locking actuators (315A1801 and 315A2801). B78016 is used to assemble, disassemble, check the worm gear and hydraulic actuators during overhaul.

Refer CMM 78-31-04, CMM 78-31-05, CMM 78-31-18, CMM 78-31-19 and to the current B78016 drawing for complete usage instructions.

B78016-1 consists of:

B78016-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	CAP	B78016-3
1	PLATE	B78016-4
1	SLEEVE	B78016-5
1	PLUG	B78016-6
1	LOCKING HOUSING	B78016-7
1	NON-LOCKING HOUSING	B78016-8
1	ADAPTER	B78016-9
1	STORAGE BOX	

WEIGHT: 10 lbs (4.5 kg)

DIMENSIONS: 3 x 6 x 12 inches (76 x 152 x 305 mm)

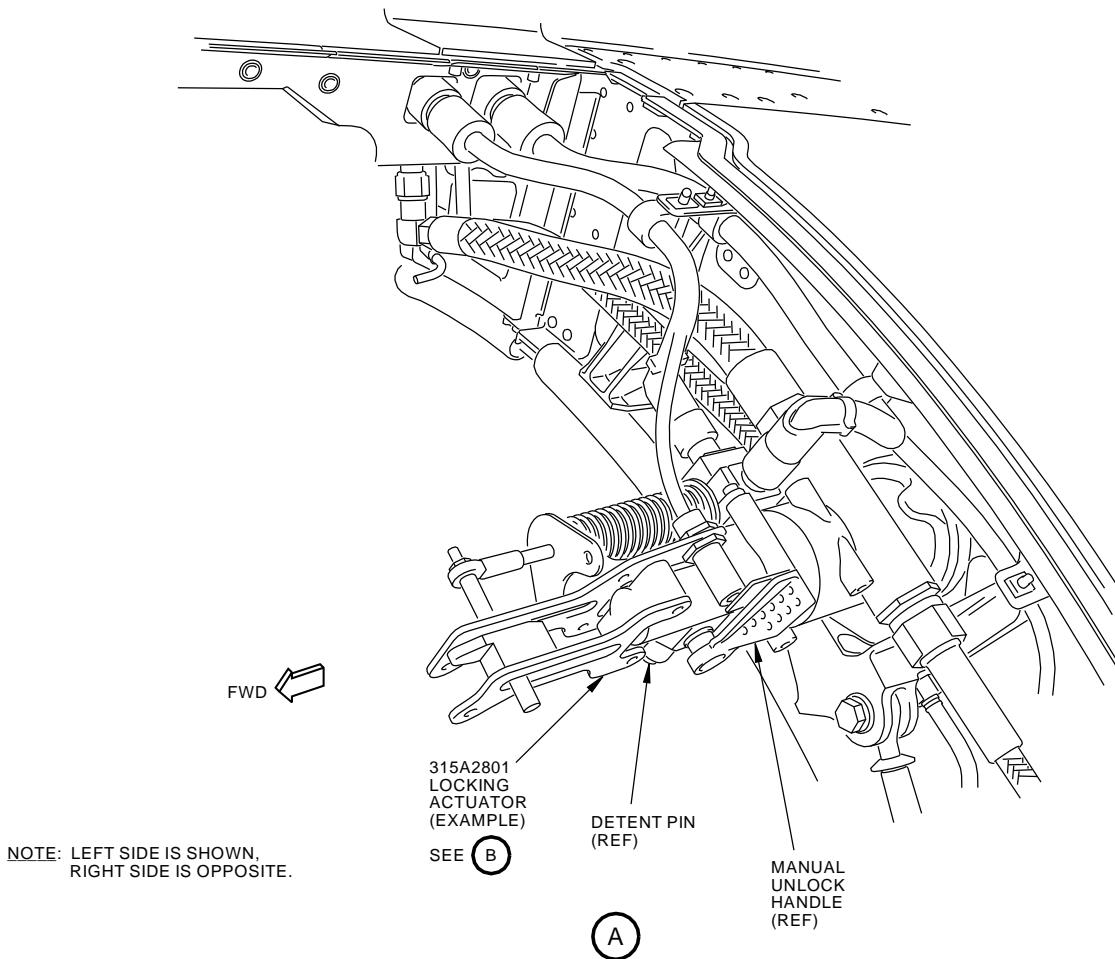
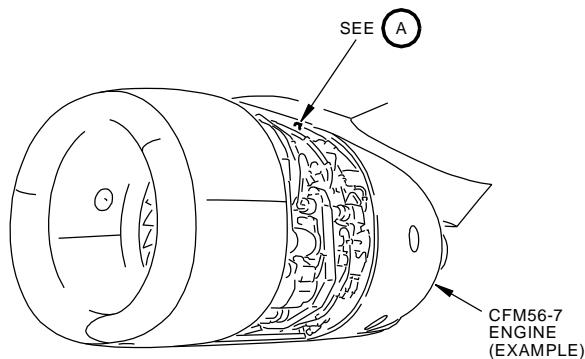
78-30-21

Page 1
Aug 05/2014

D634A501

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NOTE: LEFT SIDE IS SHOWN,
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1570621 S0000292184_V2

Thrust Reverser Locking and Non-Locking Actuator Assembly Overhaul Set
Figure 1 (Sheet 1 of 3)

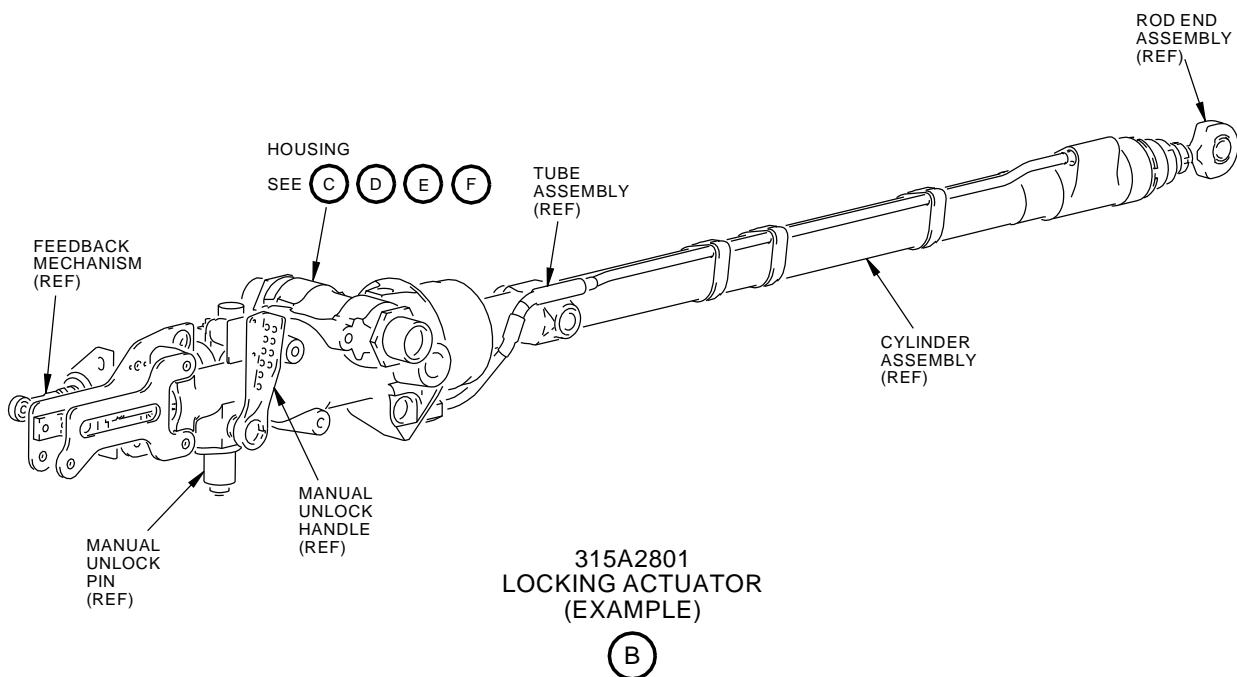
78-30-21

Page 2
 Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



315A2801
LOCKING ACTUATOR
(EXAMPLE)

B

1570646 S0000292201_V1

Thrust Reverser Locking and Non-Locking Actuator Assembly Overhaul Set
Figure 1 (Sheet 2 of 3)

78-30-21

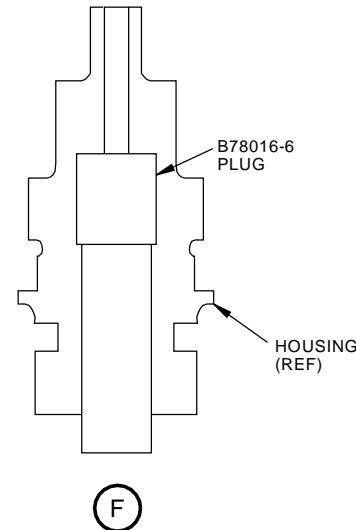
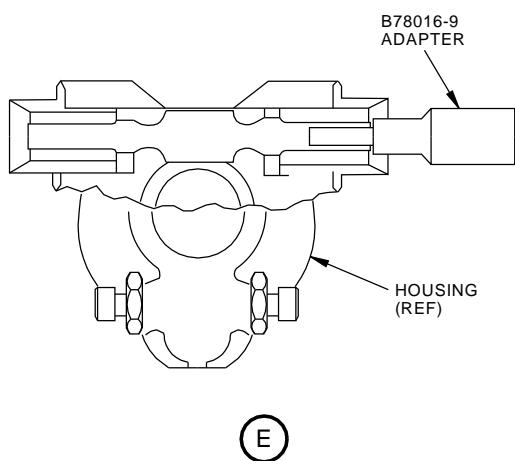
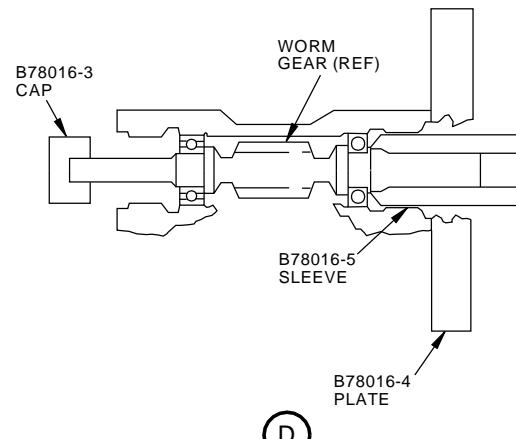
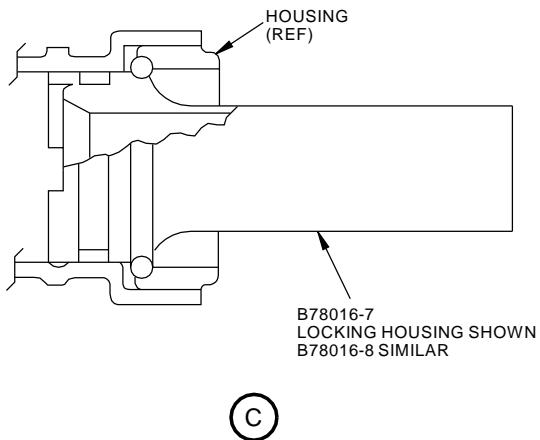
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Page 3
Aug 05/2014



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



1570641 S0000292207_V1

Thrust Reverser Locking and Non-Locking Actuator Assembly Overhaul Set
Figure 1 (Sheet 3 of 3)

78-30-21

Page 4
Aug 05/2014

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: B78017-1

NAME: INSTALLATION EQUIPMENT - BEARING - LEAD SCREW, THRUST REVERSER NON-LOCKING ACTUATOR ASSEMBLY

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 78-31-05, CMM 78-31-18

USAGE & DESCRIPTION: The B78017-1 installation equipment is used during component maintenance on all 737-300 thru -900 airplanes.

B78017 is used to install and remove the lead screw bearings on the 315A1800 and 315A2800 non-locking thrust reverser actuators.

Refer to CMM 78-31-05, CMM 78-31-18 and the current B78017 drawing for complete usage instructions.

B78017-1 consists of:

B78017-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PLATE	B78017-3
1	PLATE	B78017-4
1	CAP	B78017-5
1	SLEEVE	B78017-6
1	SLEEVE	B78017-7
1	STORAGE BOX	

WEIGHT: 15 lbs (7 kg)

DIMENSIONS: 3 x 8 x 9 inches (76 x 203 x 305 mm)

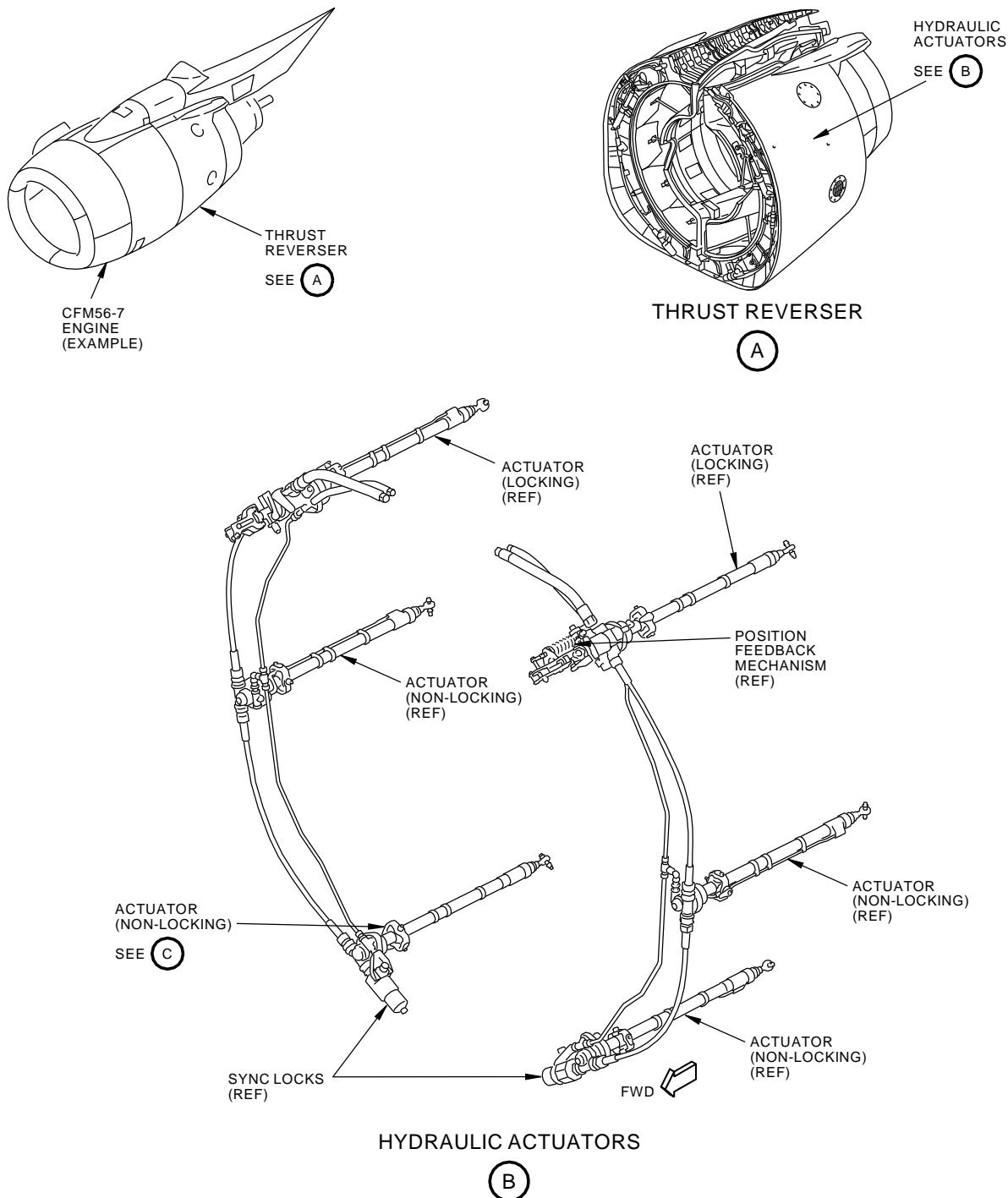
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Page 1
Aug 05/2014

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1570582 S0000292295_V2

Thrust Reverser Non-Locking Actuator Assembly Lead Screw Bearing Installation Equipment
Figure 1 (Sheet 1 of 3)

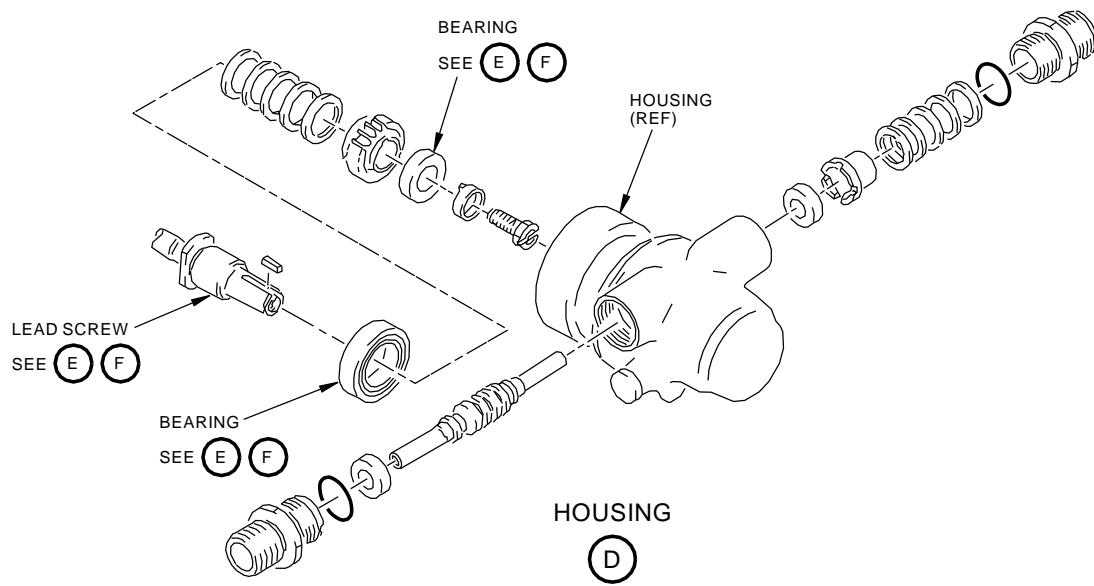
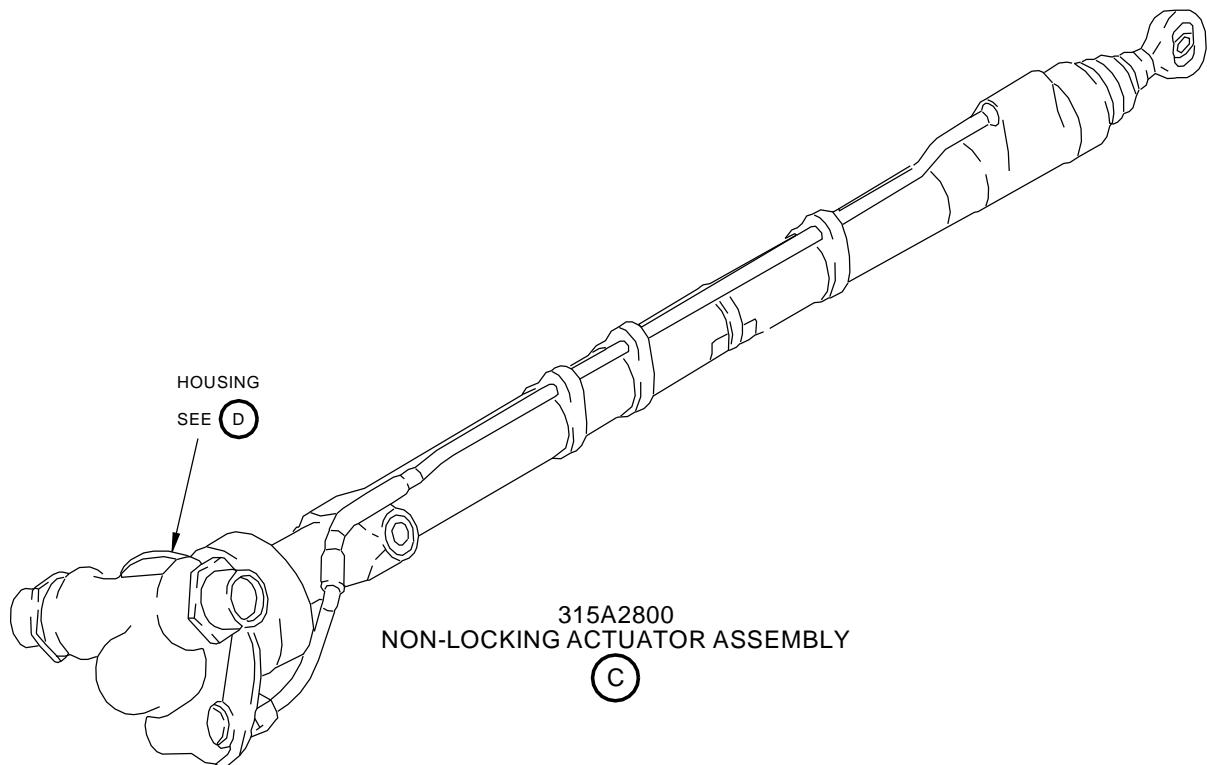
78-30-22

Page 2
 Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



1570591 S0000292296_V2

Thrust Reverser Non-Locking Actuator Assembly Lead Screw Bearing Installation Equipment
Figure 1 (Sheet 2 of 3)

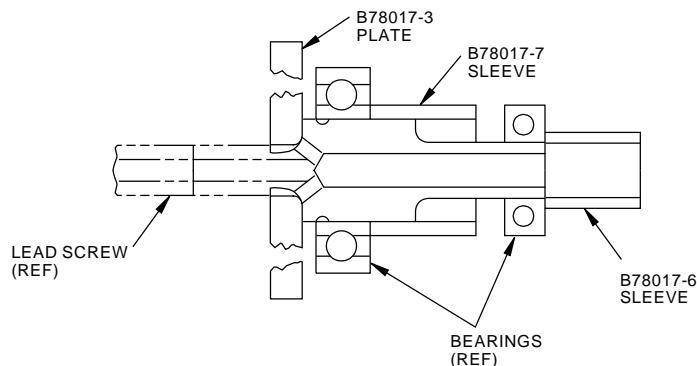
78-30-22

Page 3
Aug 05/2014

D634A501

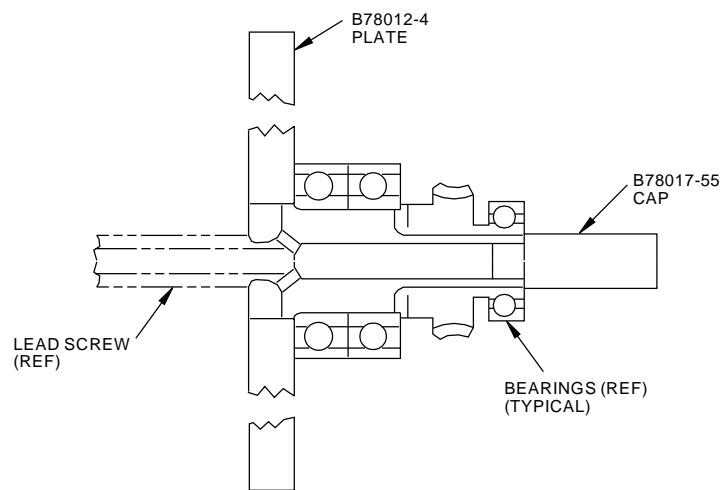
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FOR ASSEMBLY

(E)



FOR DISASSEMBLY

(F)

1570599 S0000292299_V2

Thrust Reverser Non-Locking Actuator Assembly Lead Screw Bearing Installation Equipment
Figure 1 (Sheet 3 of 3)

78-30-22

Page 4
Aug 05/2014

D634A501

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737-600/700/800/900
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PART NUMBER: C78027-1

NAME: TORQUE FIXTURE - LOCKING AND NON-LOCKING THRUST REVERSER ACTUATOR ASSEMBLY

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 78-31-18, CMM 78-31-19

USAGE & DESCRIPTION: The C78027-1 torque fixture is used during component maintenance on all 737 airplanes except 737-100 thru -500 airplanes.

C78027 is used to hold the thrust reverser non-locking (315A2800) and locking (315A2801) actuator assemblies during torquing of the cylinder and gland nuts in assembly. C78027 is also used to adjust the retracted and extended position of the rod end assembly.

Refer to CMM 78-31-18, CMM 78-31-19 and the current C78027 drawing, for complete usage instructions.

C78027-1 consists of:

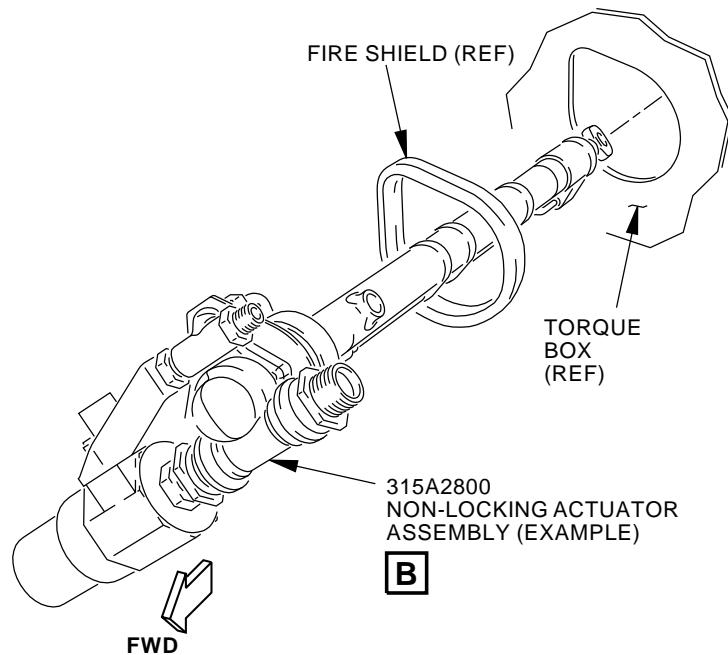
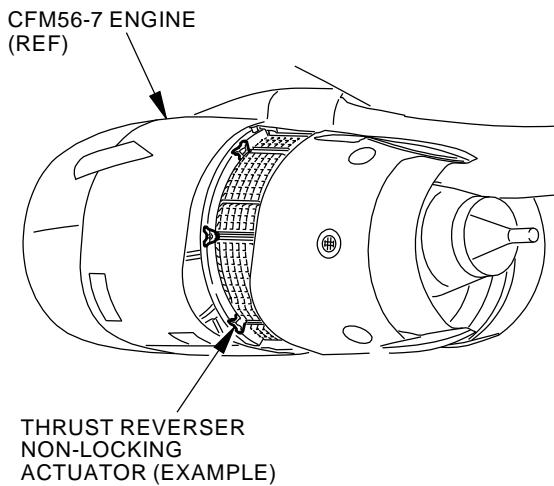
C78027-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	FIXTURE ASSEMBLY	C78027-2
2	THREADED PIN	C78027-11
2	TRUNNION PIN	C78027-12
1	ROD END PIN ASSEMBLY	C78027-14
1	STORAGE BOX	

WEIGHT: 53 lbs (24 kg)

DIMENSIONS: 4 x 8 x 56 inches (102 x 203 x 1422 mm)

78-30-23

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THRUST REVERSER NON-LOCKING ACTUATOR

[A]

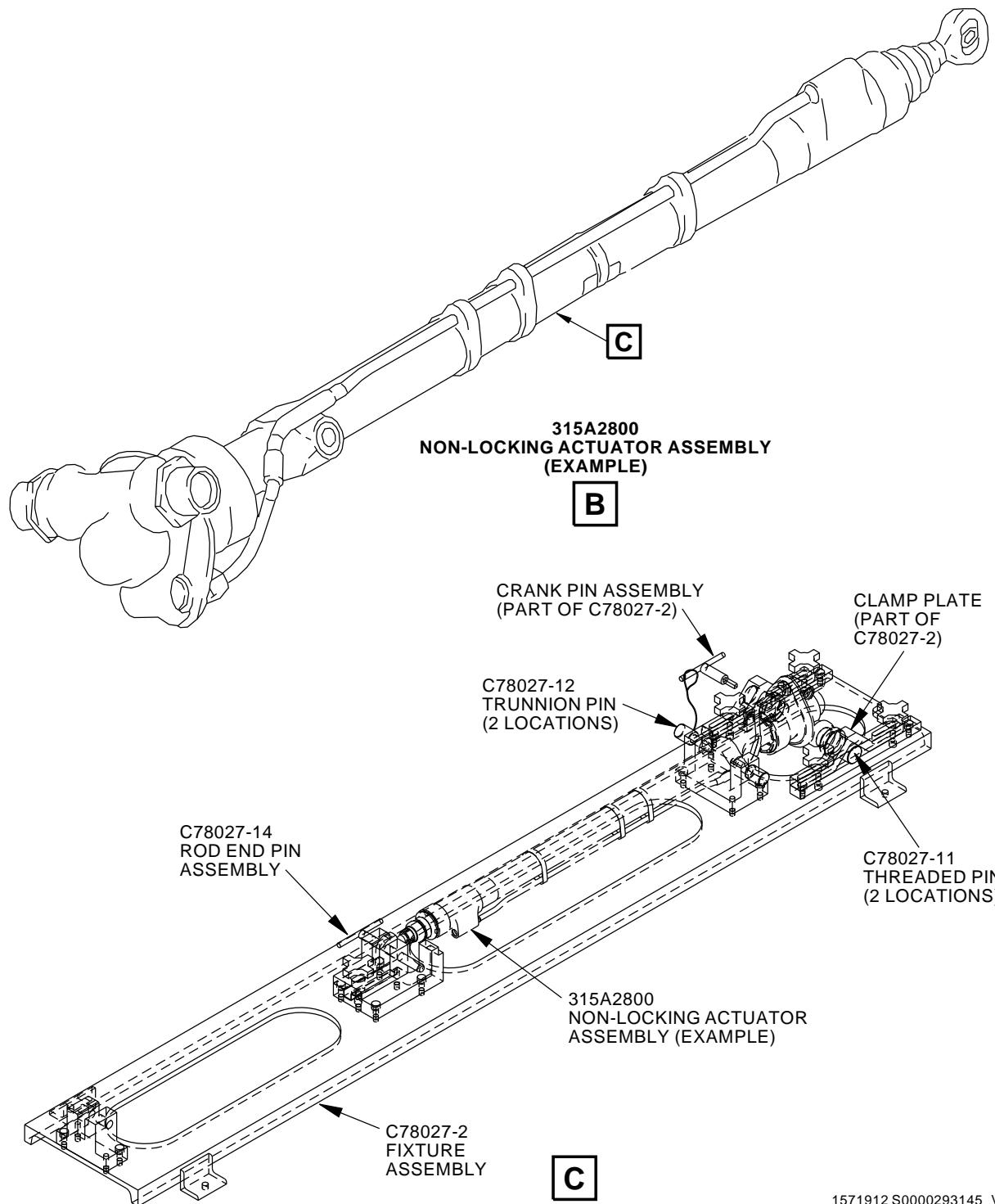
1571908 S0000293144_V2

Locking and Non-Locking Thrust Reverser Actuator Assembly Torque Fixture
Figure 1 (Sheet 1 of 2)

78-30-23



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



1571912 S0000293145_V2

Locking and Non-Locking Thrust Reverser Actuator Assembly Torque Fixture
Figure 1 (Sheet 2 of 2)

78-30-23



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: A78025-93, -100

NAME: BREAKOUT BOX - TEST, THRUST REVERSER (AND AIRPLANE RELAYS)

AIRPLANE MAINTENANCE: YES

AMM 78-34-04, AMM 78-34-05

COMPONENT MAINTENANCE: NO

OTHER MANUALS: YES

FAULT ISOLATION MANUAL

USAGE & DESCRIPTION: The A78025-93 breakout box is used on 737-300 thru -500 airplanes.

The A78025-100 breakout box assembly (multipurpose) is used on all 737 airplanes.

The A78025-93 thrust reverser breakout box kit is used to troubleshoot (continuity, voltage and signal checks) the electrical equipment of the thrust reverser system. The A78025 is used to breakout contacts of MIL-C-5015 and MIL-C-26500 circular connectors. Refer to AMM 78-34-04, AMM 78-34-05 and the current A78025 tool drawing for complete usage instructions.

A78025-100 may be used for general applications in interfacing with BACS16AG1 or BACS16X1A/4A relay sockets and BACR13CD2 or BACR13CF2 series relays. For interfacing with BACS16AF1 or BACS16W1A/6A relay sockets and BACR13CE2 or BACR13CG2 series relays, use a customer furnished A32074 breakout box.

Refer to the current A78025 tool drawing, the applicable AMM and Fault isolation Manual (FIM) for complete usage instructions.

A78025-93 and -100 consist of:

A78025-93		
QUANTITY	NOMENCLATURE	PART NUMBER
1	BREAKOUT BOX ASSEMBLY	A78025-3
1	CABLE ASSEMBLY	A78025-5
1	CABLE ASSEMBLY	A78025-6
1	CABLE ASSEMBLY	A78025-7
1	CABLE ASSEMBLY	A78025-8
1	CABLE ASSEMBLY	A78025-9
1	CABLE ASSEMBLY	A78025-94
1	CABLE ASSEMBLY	A78025-11
1	CABLE ASSEMBLY	A78025-12
1	STORAGE BOX	

78-30-24

Page 1
Aug 05/2014

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

A78025-100		
QUANTITY	NOMENCLATURE	PART NUMBER
1	BREAKOUT BOX ASSEMBLY	A78025-3
1	CABLE ASSEMBLY	A78025-5
1	CABLE ASSEMBLY	A78025-6
1	STORAGE BOX	

WEIGHT: A78025-93 - 15 lbs (7 kg)
A78025-100 - 10 lbs (5 kg)

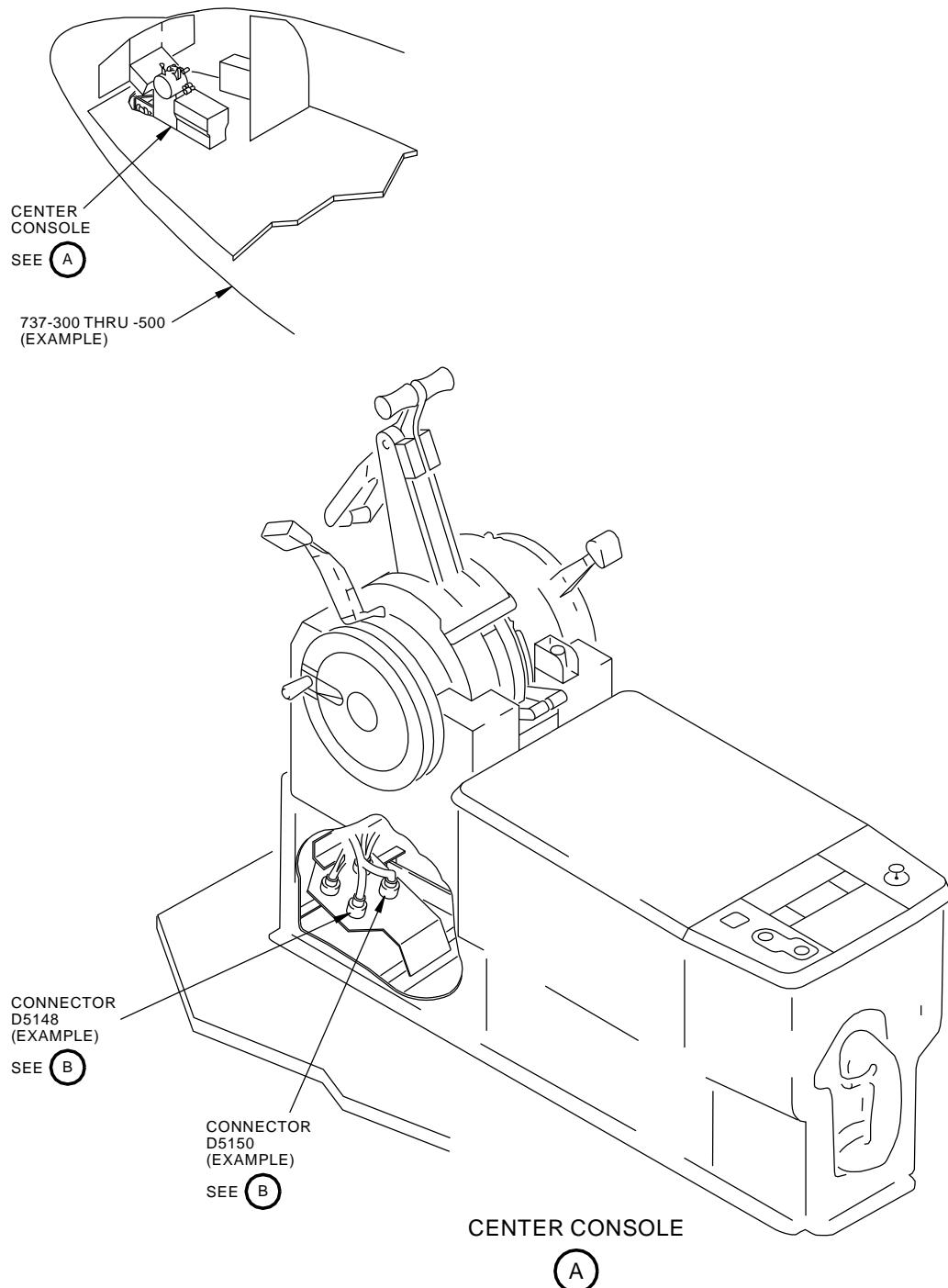
DIMENSIONS: A78025-93 - 10 x 15 x 18 inches (254 x 381 x 457 mm)
A78025-100 - 8 x 9 x 16 inches (203 x 229 x 406 mm)

NOTE: A78025-93 supersedes A78025-1.
A78025-100 supersedes A78025-2 and -77.

78-30-24



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2079217 S0000435745_V1

Breakout Box Assembly
Figure 1 (Sheet 1 of 5)

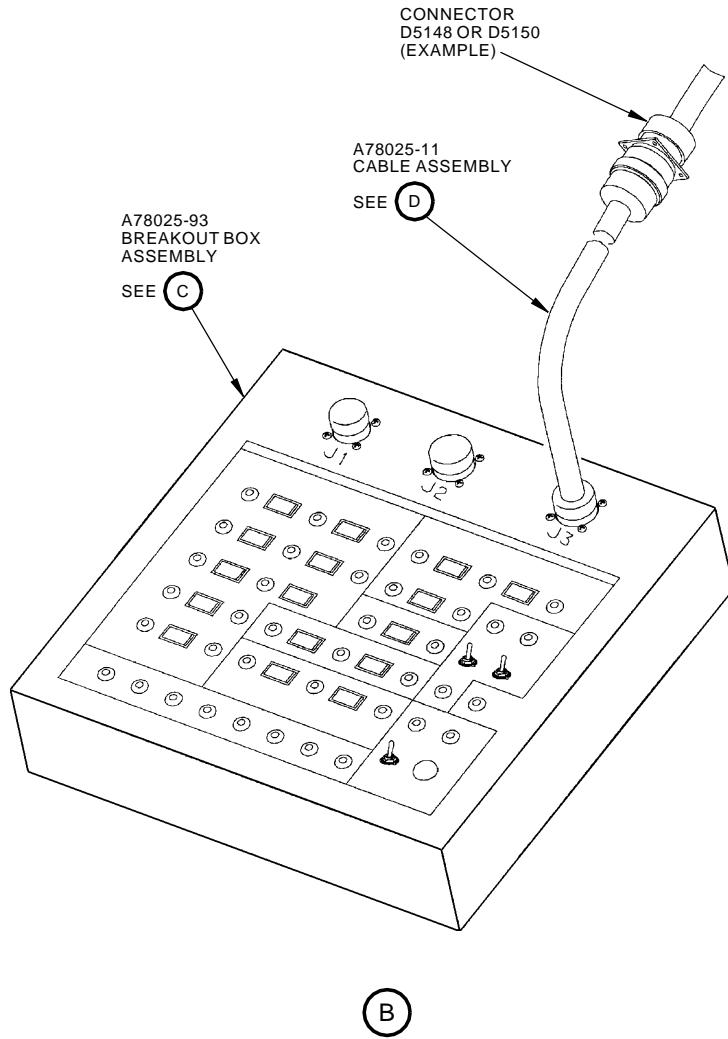
78-30-24

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Page 3
Aug 05/2014

BOEING
737-600/700/800/900
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2079221 S0000435746_V1

Breakout Box Assembly
Figure 1 (Sheet 2 of 5)

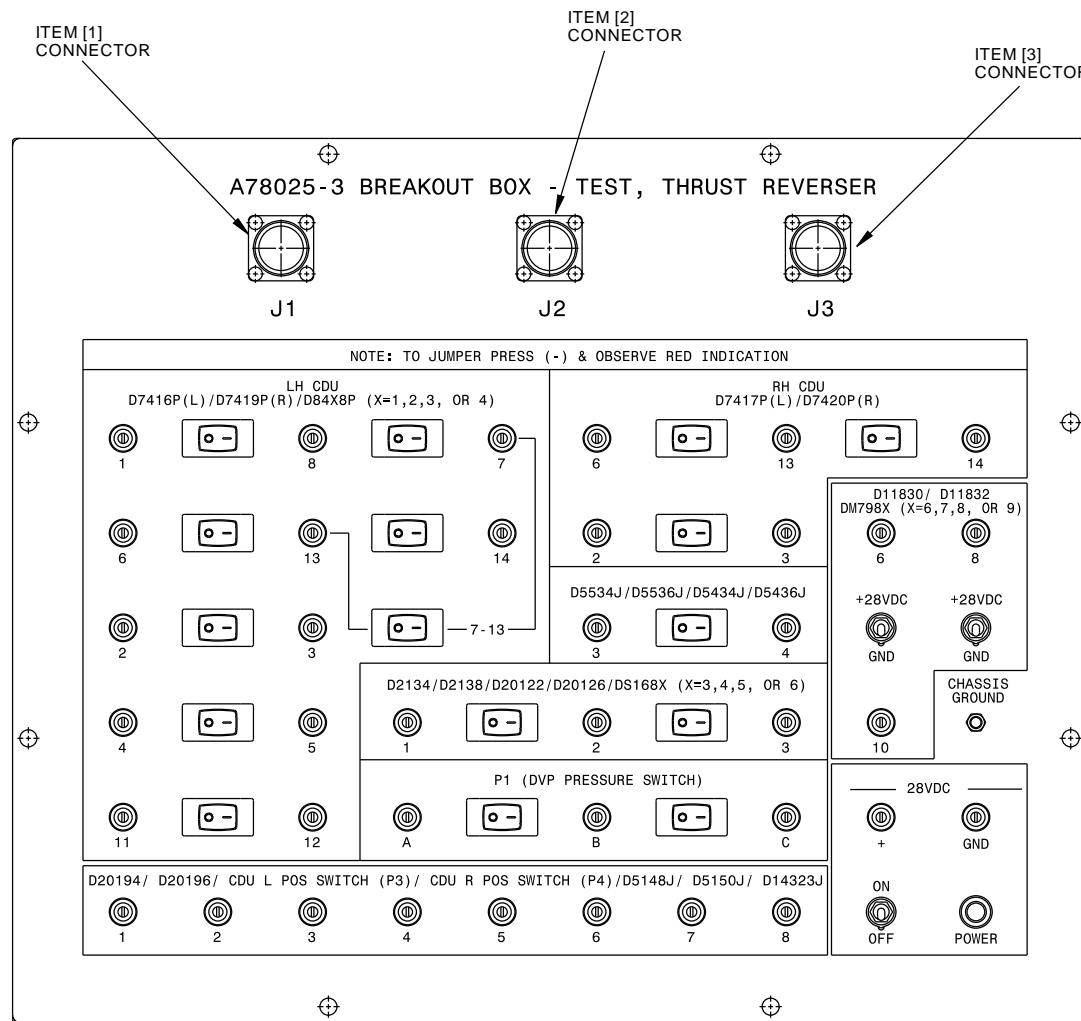
78-30-24

Page 4
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



A78025-3
BREAKOUT BOX ASSEMBLY

(C)

2079248 S0000435753_V1

Breakout Box Assembly
Figure 1 (Sheet 3 of 5)

78-30-24

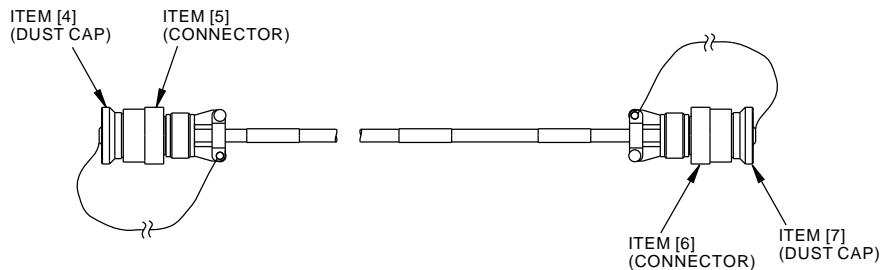
Page 5
Aug 05/2014

D634A501

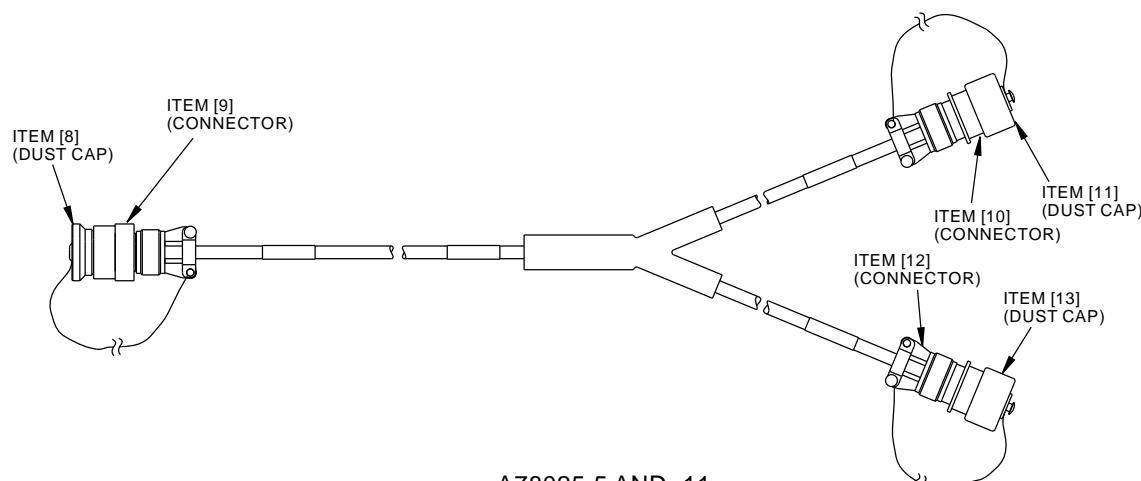
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A78025-6,-7,-8,-9,-12 AND -94
CABLE ASSEMBLY



A78025-5 AND -11
CABLE ASSEMBLY

(D)

2079255 S0000435756_V1

Breakout Box Assembly
Figure 1 (Sheet 4 of 5)

78-30-24

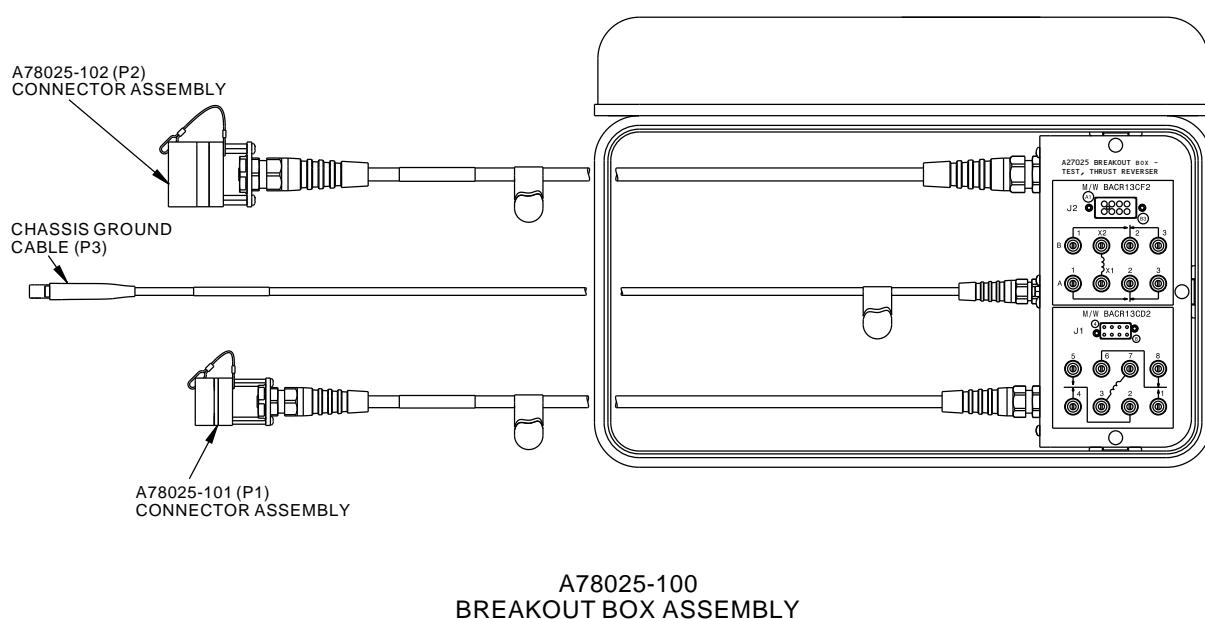
Page 6
Aug 05/2014

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2065841 S0000427326_V1

Breakout Box Assembly
Figure 1 (Sheet 5 of 5)

78-30-24

Page 7
Aug 05/2014

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

A78025-3 BREAKOUT BOX ASSEMBLY REPAIRABLE/REPLACEABLE PARTS

ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[1]	M83723/72A1212N	CONNECTOR	---
[2]	M83723/72A12129	CONNECTOR	---
[3]	M83723/72A123N	CONNECTOR	---

A78025-6 CABLE ASSEMBLY REPAIRABLE/REPLACEABLE PARTS

ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[4]	M83723/59-212AR	DUST CAP	---
[5]	M83723/76A1212N	CONNECTOR	---
[6]	M83723/72A123N	CONNECTOR	---
[7]	M83723/59-212AR	DUST CAP	---

A78025-7 CABLE ASSEMBLY REPAIRABLE/REPLACEABLE PARTS

ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[4]	M83723/59-212AR	DUST CAP	---
[5]	M83723/75A12129	CONNECTOR	---
[6]	M83723/83A18146	CONNECTOR	---
[7]	M83723/60-118AR	DUST CAP	---

A78025-8 CABLE ASSEMBLY REPAIRABLE/REPLACEABLE PARTS

ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[1]	M83723/59-212AR	DUST CAP	---
[2]	M83723/75A1212N	CONNECTOR	---
[3]	M83723/83A1814N	CONNECTOR	---
[4]	M83723/60-118AR	DUST CAP	---

A78025-9 CABLE ASSEMBLY REPAIRABLE/REPLACEABLE PARTS

ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[4]	M83723/59-212AR	DUST CAP	---
[5]	M83723/75A1212N	CONNECTOR	---
[6]	M83723/88A1810N	CONNECTOR	---
[7]	M83723/59-116AR	DUST CAP	---

A78025-94 CABLE ASSEMBLY REPAIRABLE/REPLACEABLE PARTS

ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[4]	M83723/59-212AR	DUST CAP	---
[5]	M83723/75A1212N	CONNECTOR	---
[6]	MS3451L1CSL-3P	CONNECTOR	---
[7]	MS25043-10DA	DUST CAP	---

78-30-24

Page 8
Aug 05/2014

D634A501

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737-600/700/800/900
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A78025-12 CABLE ASSEMBLY REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[4]	M83723/59-212AR	DUST CAP	---
[5]	M83723/75A1212N	CONNECTOR	---
[6]	M83723/87A147N	CONNECTOR	---
[7]	M83723/59-114AR	DUST CAP	---

A78025-5 CABLE ASSEMBLY REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[8]	M83723/59-212AR	DUST CAP	---
[9]	M83723/75A1212N	CONNECTOR	---
[10]	M83723/83A123N	CONNECTOR	---
[11]	M83723/60-112AR	DUST CAP	---
[12]	M83723/83A1236	CONNECTOR	---
[13]	M83723/60-112AR	DUST CAP	---

A78025-11 CABLE ASSEMBLY REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
[8]	M83723/59-212AR	DUST CAP	---
[9]	M83723/75A1212N	CONNECTOR	---
[10]	M83723/75A16246	CONNECTOR	---
[11]	M83723/59-216AR	DUST CAP	---
[12]	M83723/75A16248	CONNECTOR	---
[13]	M83723/59-216AR	DUST CAP	---

78-30-24

Page 9
Aug 05/2014

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: G78009-1

NAME: GAUGE - WEAR MEASUREMENT, THRUST REVERSER BLOCKER DOOR

AIRPLANE MAINTENANCE: YES

AMM 78-31-06

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The G78009-1 gauge is used on all 737-300 thru -900 airplanes.

G78009 is used to check the radial and axial movement of the thrust reverser blocker doors.

Refer to the current G78009 tool drawing and AMM 78-31-06 for complete usage instructions.

G78009-1 gauge consists of:

G78009-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	GAUGE ASSEMBLY	G78009-2
1	STORAGE BOX	

WEIGHT: 10 lbs (4.5 kg)

DIMENSIONS: 6 x 11 x 20 inches (152 x 279 x 508 mm)

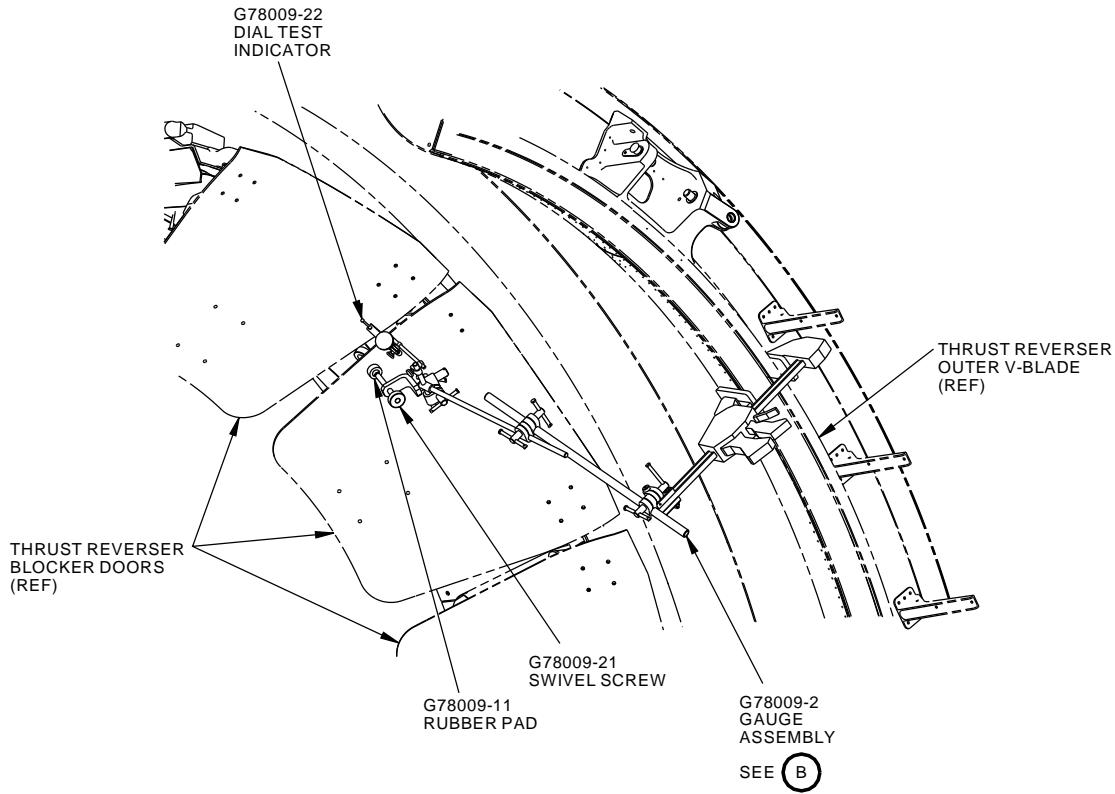
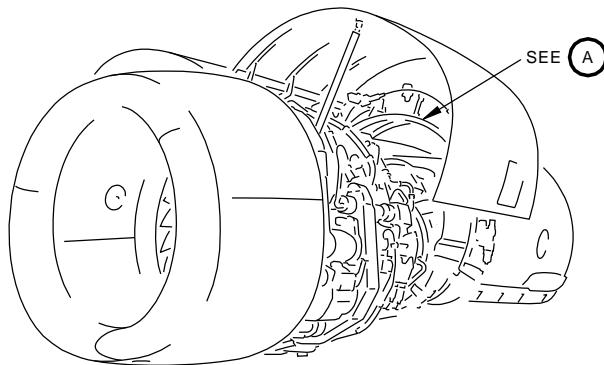
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Page 1
Aug 05/2014

BOEING
737-600/700/800/900
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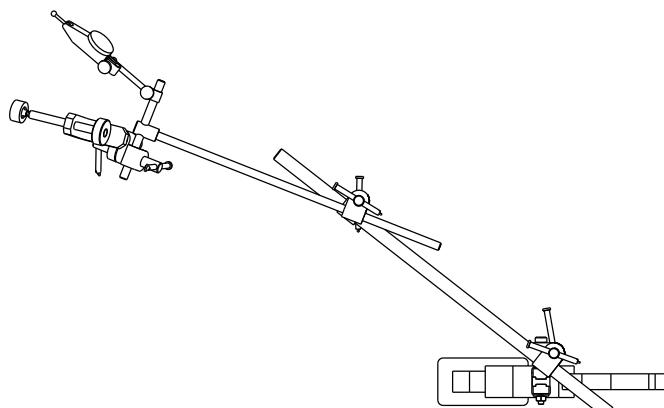
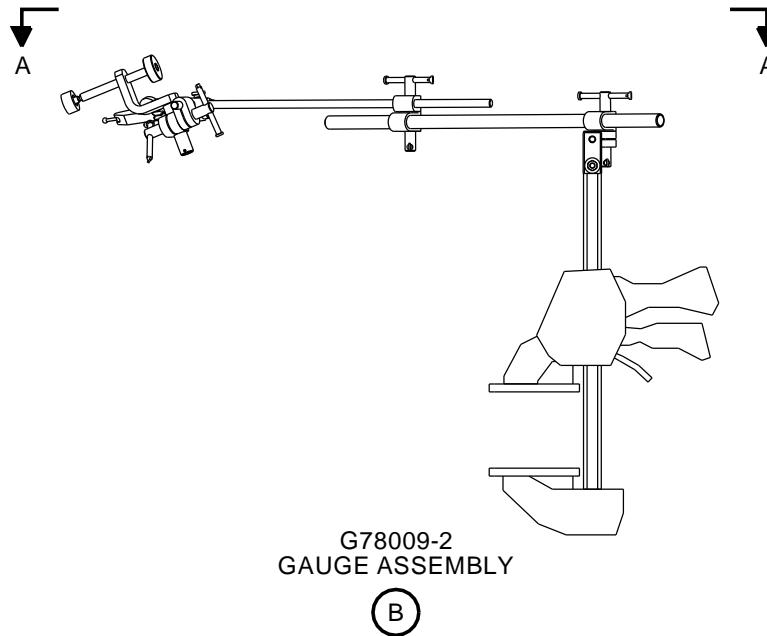
2122134 S0000457366_V1

Thrust Reverser Blocker Door Wear Measurement Gauge
Figure 1 (Sheet 1 of 2)

78-30-44



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



A-A

2122136 S0000457367_V1

Thrust Reverser Blocker Door Wear Measurement Gauge
Figure 1 (Sheet 2 of 2)

78-30-44

Page 3
Aug 05/2014

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: C78030-1

NAME: GAP MEASUREMENT GAUGE - THRUST REVERSER ACTUATOR
SYSTEM LOCKING ACTUATOR

AIRPLANE MAINTENANCE: YES

AMM 78-34-03

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The C78030-1 gap measurement gauge is used on all 737-600 thru -900 airplanes.

C78030 is used to ensure the gap between the proximity sensor and the target on the thrust reverser actuator is within the proper range.

Refer to AMM 78-34-03 and the current C78030 drawing for complete usage instructions.

C78030-1 consists of:

C78030-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	GAUGE ASSEMBLY	C78030-2
1	STORAGE BOX	

WEIGHT: 0.2 lbs (0.1 kg)

DIMENSIONS: 3 x 2 x 22 inches (76 x 51 x 559 mm)

78-30-46

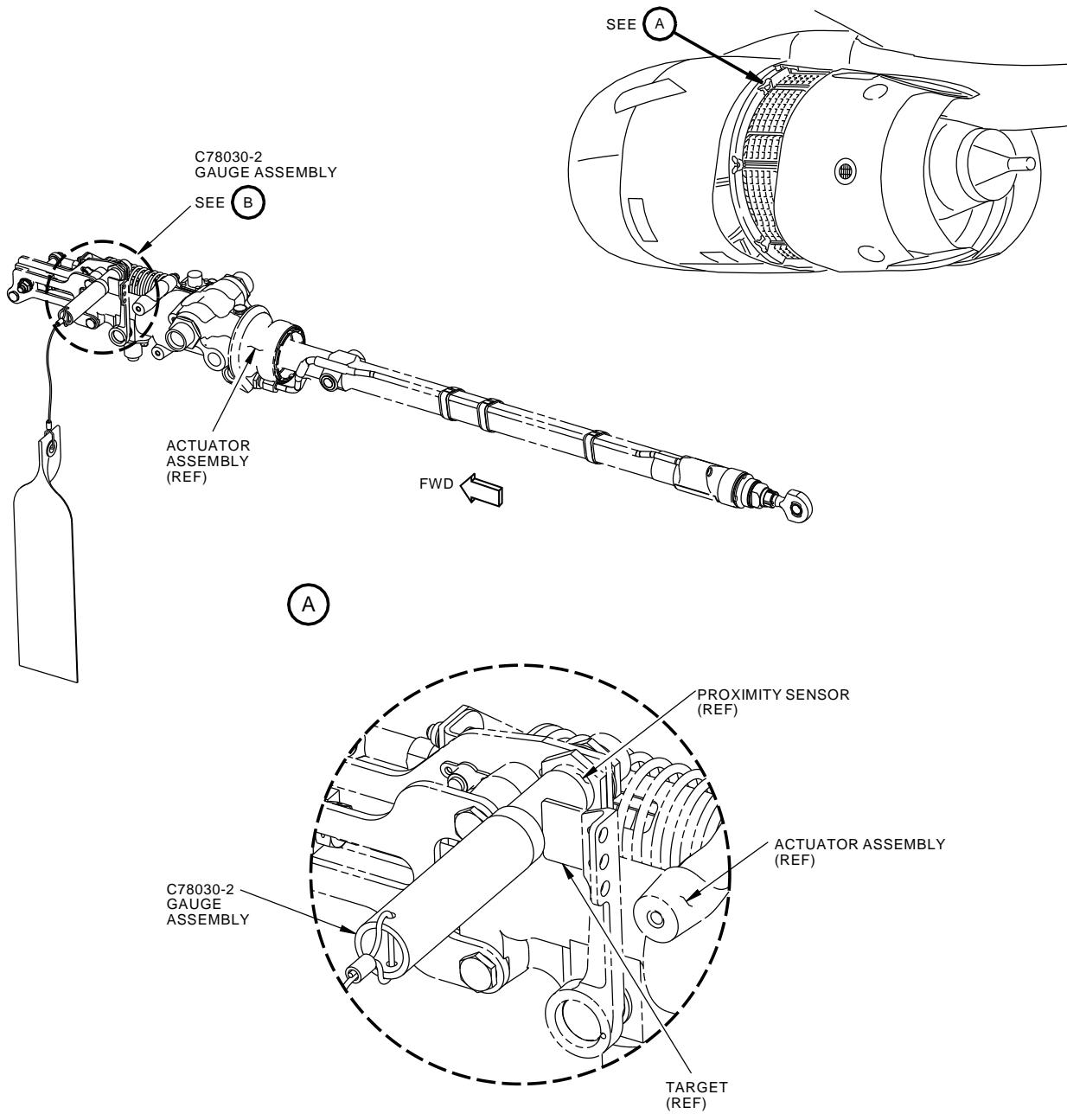
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Page 1
Aug 05/2014



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



C78030
GAP MEASUREMENT GAUGE - THRUST REVERSER ACTUATOR SYSTEM
LOCKING ACTUATOR

(B)

2173905 S0000478012_V1

TRAS Locking Actuator Gap Measurement Gauge
Figure 1

78-30-46

D634A501

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Page 2
Aug 05/2014



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: J32091-1, -3, -7

NAME: TEST EQUIPMENT - VELOCITY/POSITION TRANSDUCER

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 78-31-04, CMM 78-31-05, CMM 78-31-18, CMM 78-31-19

USAGE & DESCRIPTION: The J32091-1 test equipment, J32091-3 test equipment and the J32091-7 data post - processing macro set are used together during component maintenance on 737-300 thru -900 airplanes.

The J32091-1 and -3 are used in conjunction with a customer-furnished, B78010 functional test stand, a hydraulic test stand and a laptop computer. J32091-1 and -3 are used with the B78010 functional test stand to measure and record the position and velocity of hydraulic actuators. J32091-1 and -3 use a time-based, magnetostrictive position sensing principle on the 315A2800 and 315A2801 thrust reverser actuators to define the snubbing action. J32091 provides advantages over the replaced B20005 test equipment with improved accuracy, data acquisition, post-processing and also accommodates any rotation of the actuator rod end during extension or retraction..

The J32091-7 data post - processing macro set (programmed sequence of operations) is auxiliary and optional equipment for use with the J32091-3 test equipment. A macro can be obtained individually instead of the set by customer option. For easier data post-processing, files with macros and their usage instructions are available through the Boeing Common Download Service (CDS) portal under My Boeing Fleet (MBF): MBF >> CDS >> Ground Support Equipment Applications >> J32091). To request CDS access, contact your local Electronic Access Focal (EAF). If a local EAF is not available, contact Boeing Digital Data Customer Support (DDCS) at: DDCS@BOEING.COM.

Refer to CMM 78-31-04, CMM 78-31-05, CMM 78-31-18, CMM 78-31-19 and the current J32091 drawing for complete usage instructions.

J32091-1 (two storage cases), J32091-3 and J32091-7 consist of:

J32091-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SLIDING MAGNET ASSEMBLY	J32091-53
1	GROUNDING CABLE ASSEMBLY	J32091-54
1	TEMPOSONICS RP SENSOR (ANALOG)	J32091-130
1	STORAGE CASE (J32091-1, CASE 1)	J32091-52

J32091-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	SENSOR INTERFACE CABLE ASSEMBLY	J32091-82

78-30-47

Page 1
Aug 05/2015

D634A501



737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

(Continued)

J32091-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	STORAGE CASE (J32091-1, CASE 2)	J32091-51

J32091-3		
QUANTITY	NOMENCLATURE	PART NUMBER
1	ROD END CLAMP ASSEMBLY - C1	J32091-61
1	FORWARD SUPPORT ASSEMBLY - C	J32091-62
1	REAR SUPPORT ASSEMBLY - C	J32091-63
1	ROD END CLAMP ASSEMBLY - C2	J32091-81
1	STORAGE CASE ASSEMBLY C	J32091-72

J32091-7		
QUANTITY	NOMENCLATURE	PART NUMBER
1	MACRO USAGE INSTRUCTION	J32091-900
1	MACRO EXCEL FILE	J32091-910

WEIGHT: J32091-1, (case 1) - 30 lbs (14 kg)
J32091-1, (case 2) - 16 lbs (8 kg)
J32091-3 - 36 lbs (17 kg)

DIMENSIONS: J32091-1, (case 1) - 7 x 16 x 53 inches (178 x 406 x 1347 mm)
J32091-1, (case 1) - 7 x 13 x 18 inches (178 x 330 x 457 mm)
J32091-3 - 12 x 20 x 25 inches (305 x 508 x 635 mm)

NOTE: J32091 replaces B20005 for future procurement.

78-30-47

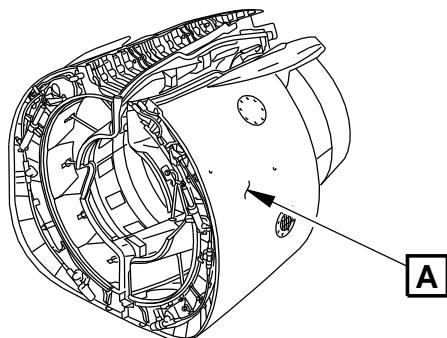
Page 2
Aug 05/2015

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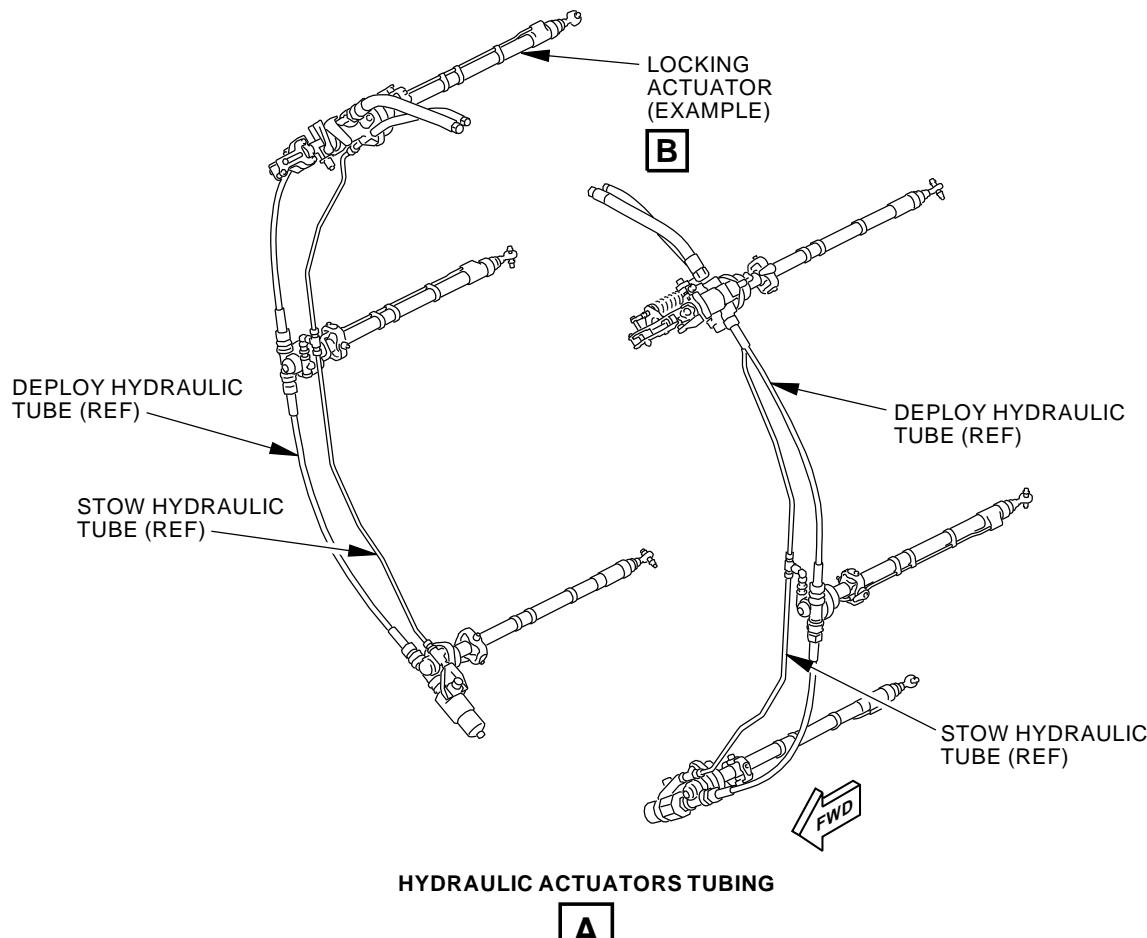
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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



CFM56-7 THRUST REVERSER
(EXAMPLE)



2426753 S0000561380_V1

Velocity/Position Transducer Test Equipment
Figure 1 (Sheet 1 of 4)

78-30-47

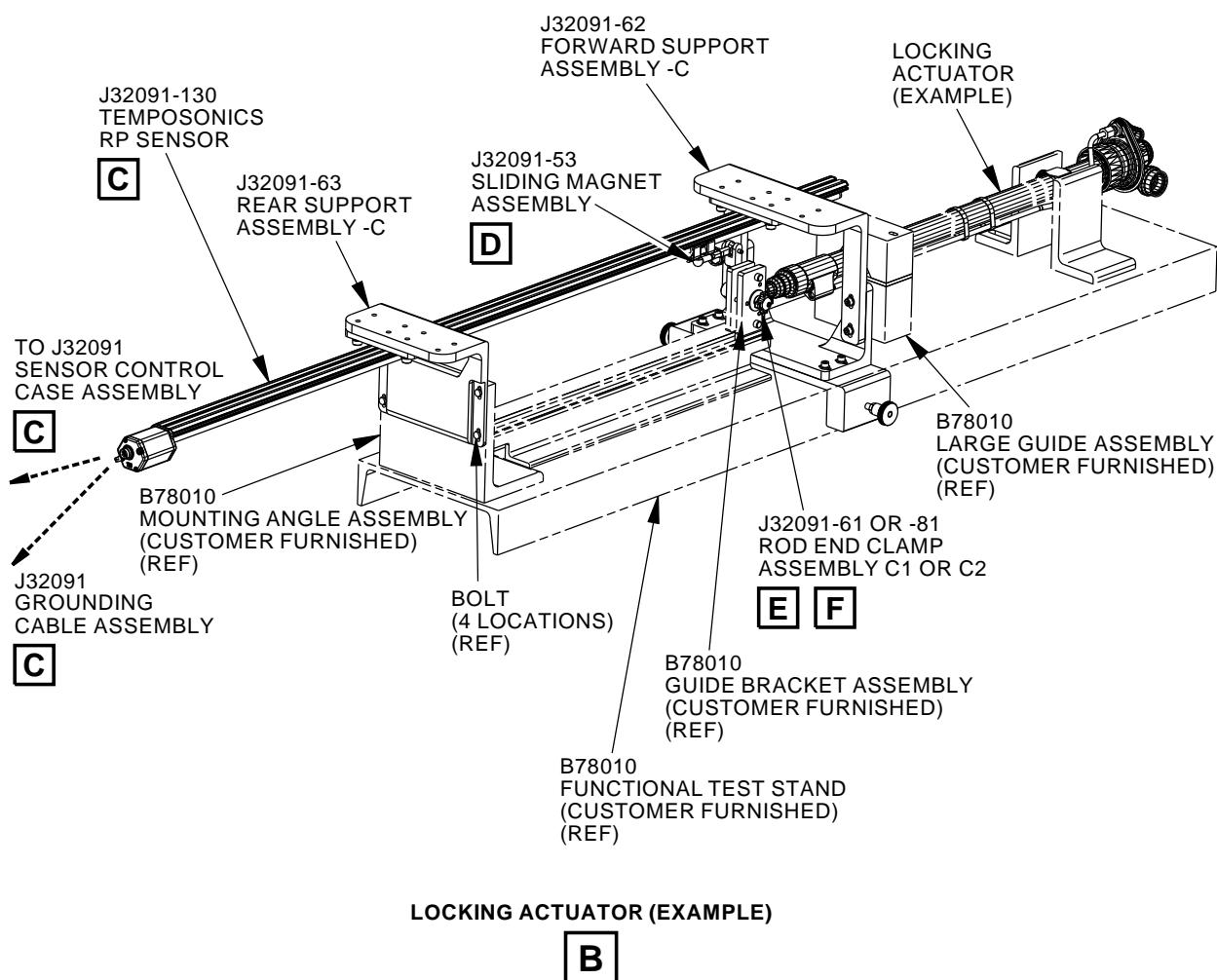
Page 3
Aug 05/2015

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2426788 S0000561383_V1

Velocity/Position Transducer Test Equipment
Figure 1 (Sheet 2 of 4)

78-30-47

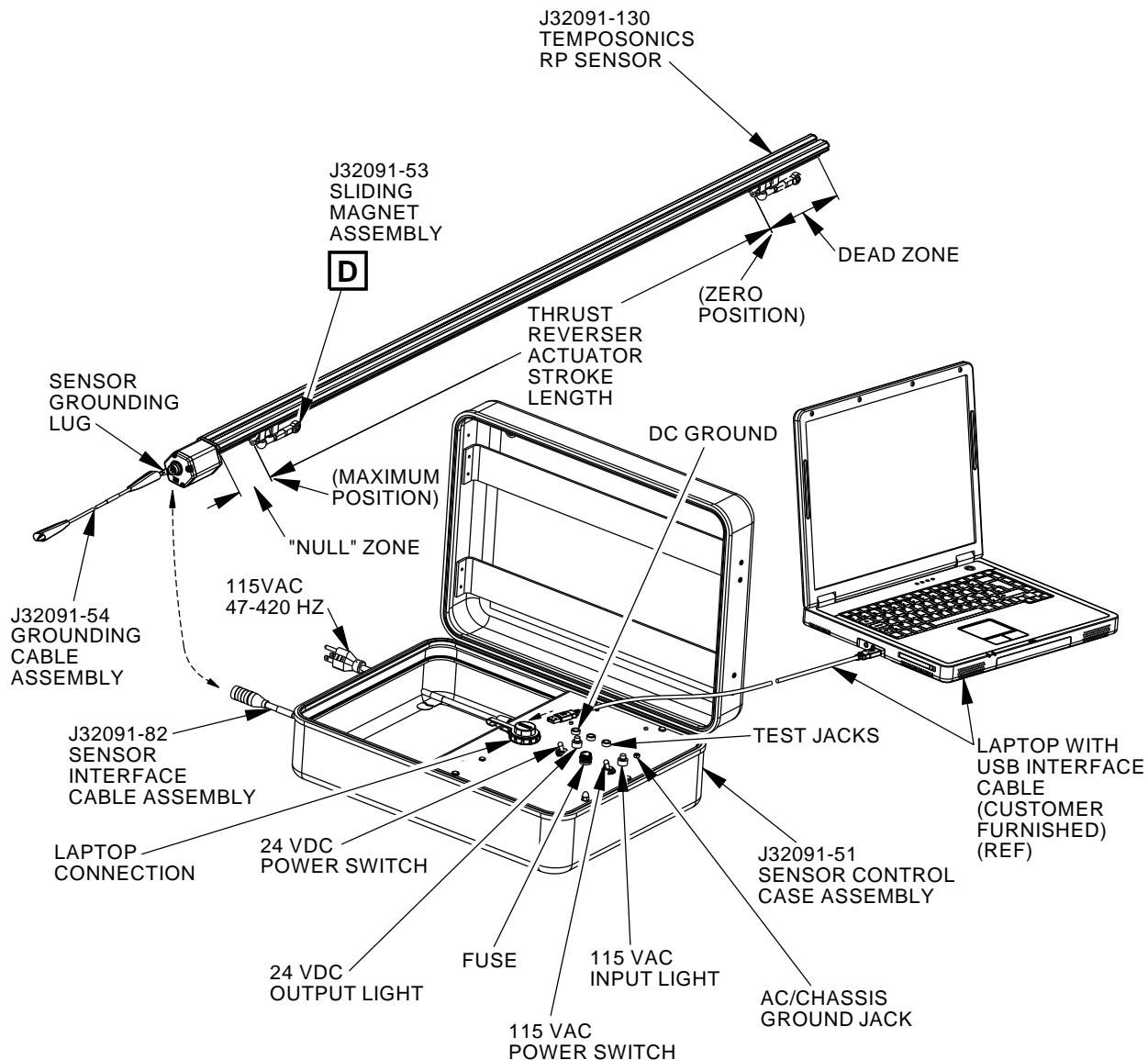
Page 4
Aug 05/2015

D634A501

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737-600/700/800/900
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C

2426807 S0000561385_V1

Velocity/Position Transducer Test Equipment
Figure 1 (Sheet 3 of 4)

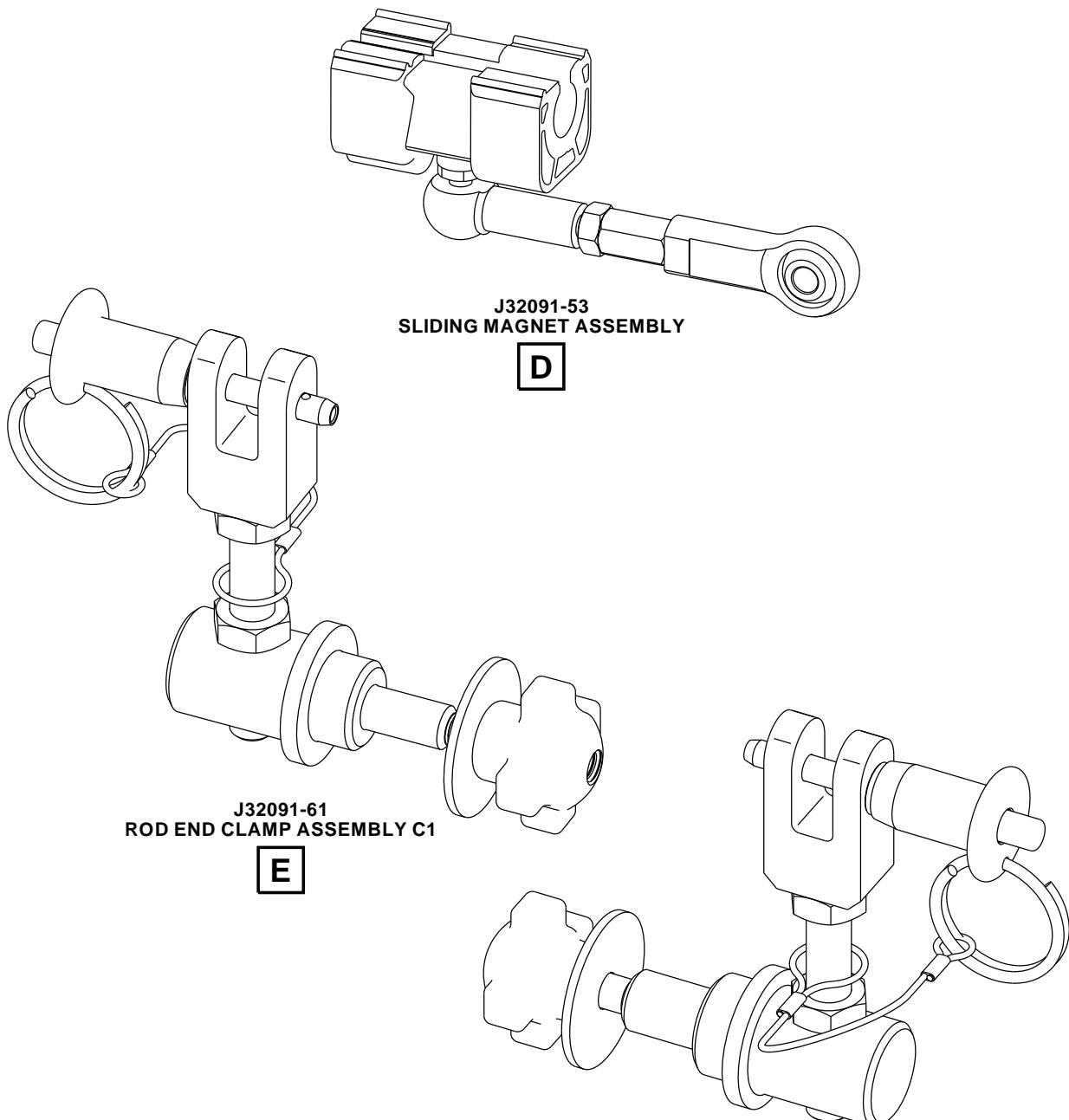
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Page 5
Aug 05/2015

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ILLUSTRATED TOOL AND EQUIPMENT MANUAL



2426813 S0000561386_V1

Velocity/Position Transducer Test Equipment
Figure 1 (Sheet 4 of 4)

78-30-47

Page 6
Aug 05/2015

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

PART NUMBER: B20005-41, -52, -75, -82

NAME: TEST EQUIPMENT - VELOCITY/POSITION TRANSDUCER

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

CMM 78-31-04, CMM 78-31-05, CMM 78-31-18, CMM 78-31-19

USAGE & DESCRIPTION: The B20005-41 transducer assembly and either B20005-52 test equipment or B20005-75 test equipment (optional to B20005-52) or B20005-82 (preferred over B20005-75) test equipment is used during component maintenance on 737-300 thru -900 airplanes.

The B20005-41 transducer assembly and B2005-52, or -75 or -82 test equipment is used in conjunction with a customer-furnished B78010 functional test stand, X-Y plotter and/or oscilloscope. B20005 is used on 315A1800, 315A1801, 315A2800, 315A2801 and 65B97904 thrust reverser actuators to define the snubbing action. B20005 is used with the B78010 functional test stand to interface with the X-Y plotter and/or oscilloscope.

B20005-52 is a simple breakout box for connecting between the B20005-41 transducer assembly and plotter or scope.

B20005-75 is a breakout box that also provides regulated voltage references used for the B20005-41 transducer assembly operation and electronic triggering of X-Y plotter or scope.

B20005-82 is a breakout box which also provides regulated voltage references used for the B20005-41 transducer assembly operation and electronic triggering of X-Y plotter or scope. B20005-82 improves function and usability by reducing the oscillating region between DS1 red and green states.

When procuring B20005-52, -75 or -82 test equipment, also order the B20005-41 transducer assembly if the customer does not already have one.

Refer to CMM 78-31-04, CMM 78-31-05, CMM 78-31-18, CMM 78-31-19 and the current B20005 drawing for complete usage instructions.

B20005-41, -52, -75 and -82 consists of:

B20005-41		
QUANTITY	NOMENCLATURE	PART NUMBER
1	POSITION/VELOCITY TRANSDUCER	B20005-41

B20005-52		
QUANTITY	NOMENCLATURE	PART NUMBER
1	TEST BOX ASSEMBLY	B20005-53
1	DATA PACKAGE	B20005-65

78-40-01

Page 1
Aug 05/2015

D634A501



BOEING
737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

(Continued)

B20005-52		
QUANTITY	NOMENCLATURE	PART NUMBER
1	STORAGE BOX	B20005-3

B20005-75		
QUANTITY	NOMENCLATURE	PART NUMBER
1	TEST BOX ASSEMBLY	B20005-76
1	DATA PACKAGE	B20005-81
1	STORAGE BOX	B20005-15

B20005-82		
QUANTITY	NOMENCLATURE	PART NUMBER
1	TEST BOX ASSEMBLY	B20005-83
1	DATA PACKAGE	B20005-55
1	STORAGE BOX	B20005-89

WEIGHT: B20005-52 - 6 lbs (2.7 kg)
 B20005-75, -82 - 10 lbs (4.5 kg)

DIMENSIONS: B20005-52 - 2.5 x 4 x 7.5 inches (89 x 102 x 190 mm)
 B20005-75, -82 - 3.5 x 8 x 13.5 inches (90 x 206 x 348 x 90 mm)

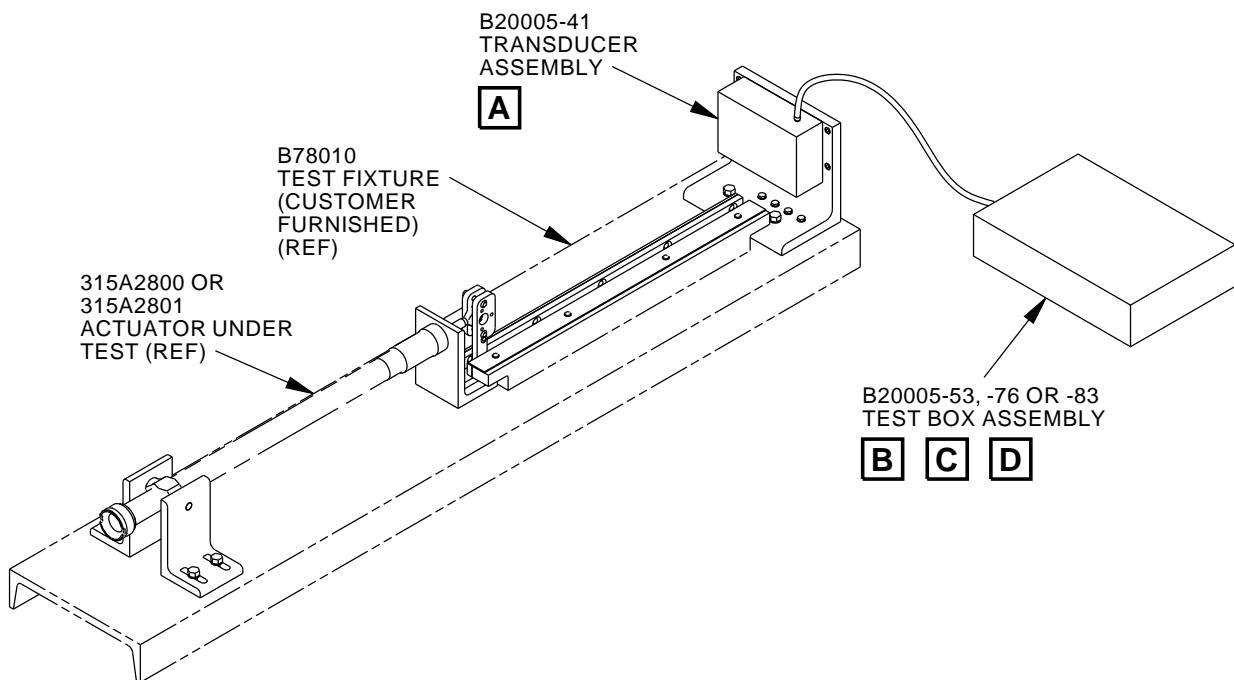
NOTE: B20005-82 replaces B20005-75 for future procurement.
 B20005-75 supersedes B20005-68.
 J32091 replaces B20005 for future procurement.

78-40-01

Page 2
 Aug 05/2015

D634A501

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737-600/700/800/900
ILLUSTRATED TOOL AND EQUIPMENT MANUAL

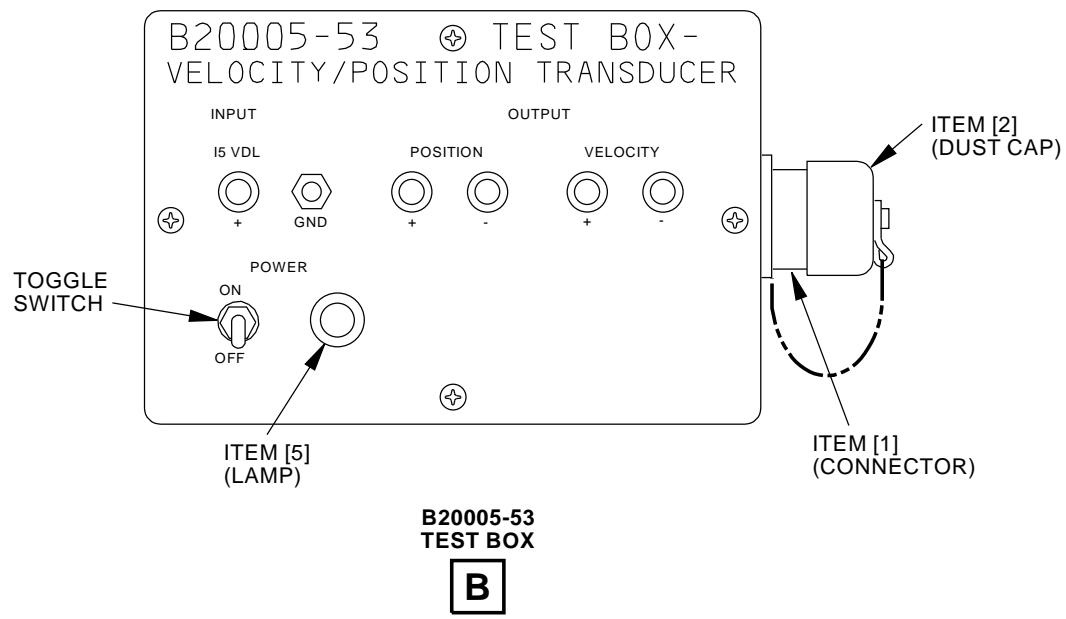
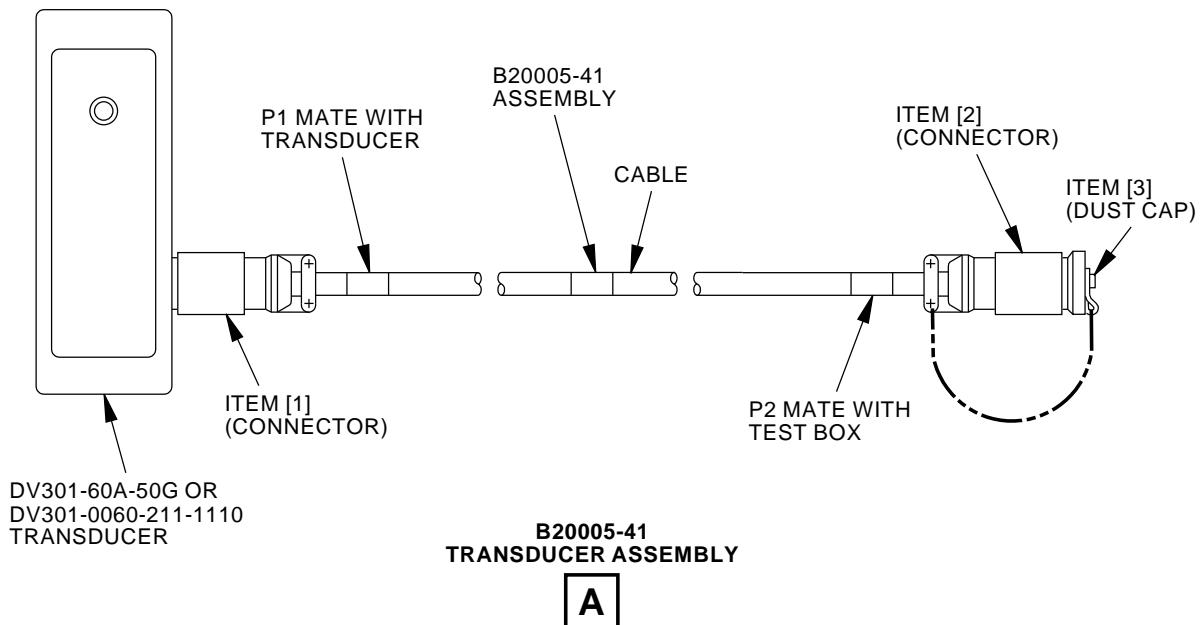


L72770 S0006832232_V4

Velocity/Position Transducer Test Equipment
Figure 1 (Sheet 1 of 3)

78-40-01

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L72789 S0006832233_V5

Velocity/Position Transducer Test Equipment
Figure 1 (Sheet 2 of 3)

78-40-01

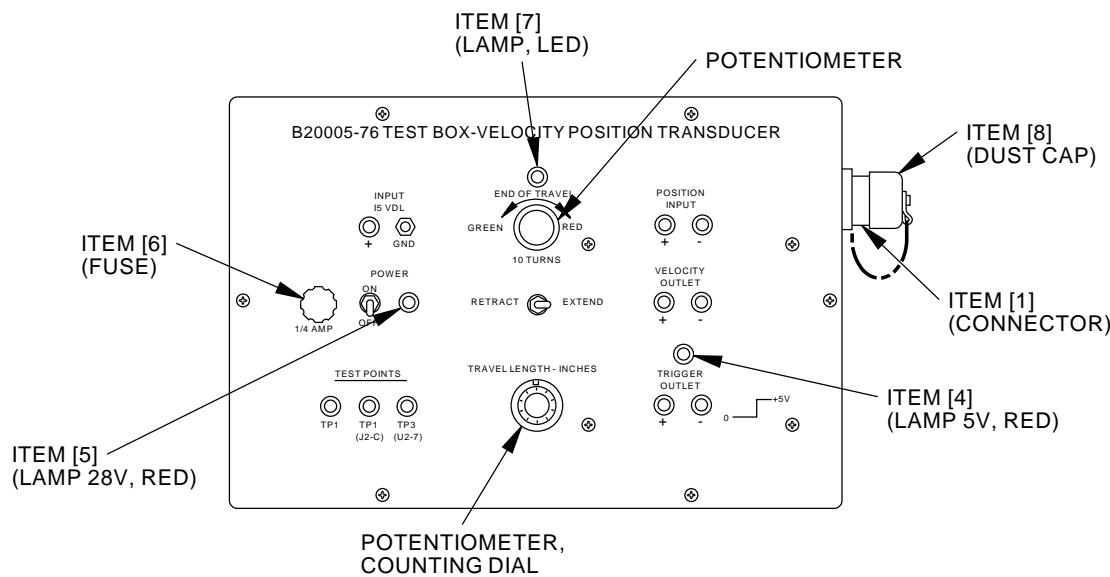
Page 4
Aug 05/2015

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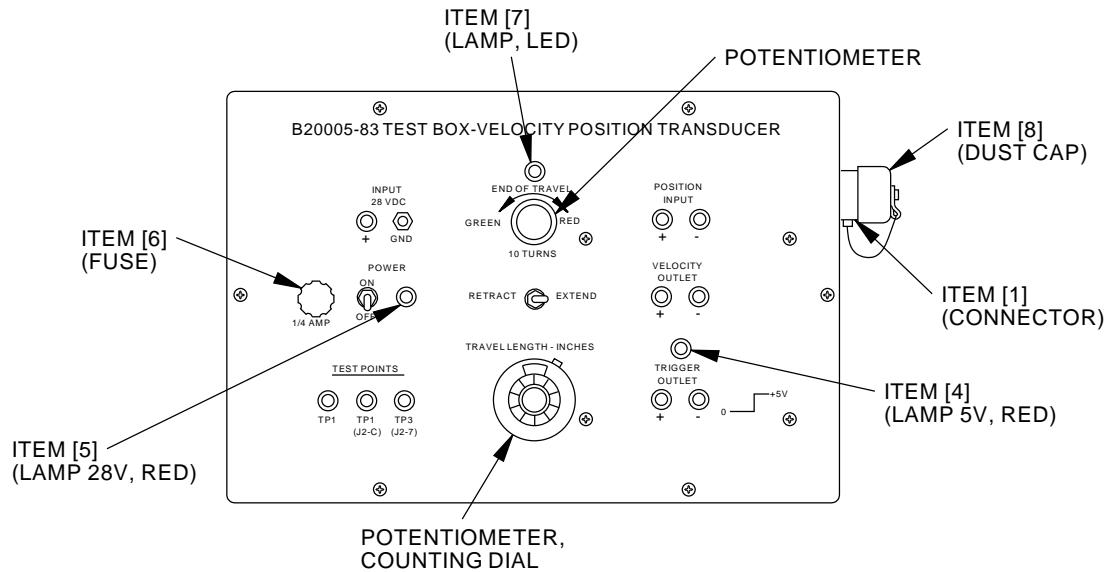


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B20005-76 TEST BOX

C



B20005-83 TEST BOX

D

L72821 S0006832234_V5

**Velocity/Position Transducer Test Equipment
Figure 1 (Sheet 3 of 3)**

78-40-01

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737-600/700/800/900
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REPAIRABLE/REPLACEABLE PARTS			
ITEM NUMBER	PART NUMBER	NOMENCLATURE	VENDOR CODE
[1]	MS3106E-14S-6S	CONNECTOR	---
[2]	MS3106E-14S-6P	CONNECTOR	---
[3]	MS25042-14DA	DUST CAP	---
[4]	507-4757-3331-500	LAMP, 5V, (RED)	83330
[5]	507-3918-1471-600	LAMP, 28V, (RED)	83330
[6]	312-250	FUSE	50186
[7]	MV5491A	LAMP, LED	50186
[8]	MS25043-14DA	DUST CAP	---

78-40-01