# CHAPTER 78

# **EXHAUST**



#### CHAPTER 78 EXHAUST

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<u>Title</u>	Part No.
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ENGINE	A78024-1
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	<u>Title</u> Alignment Fixture - Inner fan Duct Wall CF6-80A Engine Breakout Box - Test, Thrust Reverser



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#### PART NUMBER: A78001-21, -22, -31, -48

NAME:

HOLD OPEN EQUIPMENT - THRUST REVERSER, 40 KNOT

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: NO

**USAGE & DESCRIPTION:** A78001 is used to hold open a thrust reverser during an engine change. A78001 can be used in conjunction with the G78005 thrust reverser hold open rod adapter. G78005 is a sleeve-like tool that is used to extend the effective length of the thrust reverser hold open rod. The G78005 allows for more room for the A78001 thrust reverser equipment to be safely attached to the thrust reverser actuator. The A78001 equipment is not to be used if wind speed exceeds 40 knots. Refer to AMM 71-00-00, AMM 71-00-02 and current A78001 drawing for complete usage instructions. The A78001-21,-22,-31,-48 are similar in appearance and function. The A78001-22 and -31 are used for manually opened thrust reversers. The A78001-22 uses two -23 removable brass rings attached with screws to the clamp. The A78001-31 uses a fixed end cap on the clamp. The A78001-21 and -48 are used on powered-open actuators. The A78001-48 includes the fixed end cap of the A78001-31 and also mounts two A78001-51 brass M-rings for use with S315T363-1 Dowty actuators on PW4000 engines. Also included with the A78001-48 equipment, are two A78001-44 brass S-rings for S315T363-1 Dowty actuators (for CF6-80A engines) and two A78001-45 brass L-rings for use on S315T363-5 Frisby actuators. There are two clamps each, contained in a storage box in the A78001-22,-31 and -48 equipment.

The A78001-21, -22, -31 or -48 hold open equipment is used on 767 airplanes according to the following table:

767 POWERPLANT	MANUAL OPEN THRUST REVERSER	POWERED OPEN THRUST REVERSER
JT9D-7R4D	A78001-31	A78001-48
CF6-80A	A78001-22 OR -31	A78001-21 OR -48
CF6-80C2	-	-
PW4000	A78001-31	A78001-48

WEIGHT:	10 lbs (4.5 kg)
DIMENSIONS:	6 x 6 x 12 inches (152 x 152 x 305 mm)
<u>NOTE</u> :	A78001-48 supersedes A78001-41 for PW4000 or JT9D-7R4D engines. A78001-48 replaces A78001-21 for future procurement for CF6-80A engines. A78001-31 supersedes A78001-22 for PW4000 engines. A78001-31 replaces A78001-22 for future procurement for CF6-80A engines.



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Thrust Reverser, 40 Knot, Hold Open Equipment Figure 1 (Sheet 1 of 4)











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Thrust Reverser, 40 Knot, Hold Open Equipment Figure 1 (Sheet 3 of 4)



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Thrust Reverser, 40 Knot, Hold Open Equipment Figure 1 (Sheet 4 of 4)







REPAIRABLE/REPLACEABLE PARTS					
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE		
1	A78001-17	RING			
2	A78001-25	RING			
3	MS24693-BB4	BRASS SCREW			
4	A78001-7	KNURLED HEAD SCREW			
5	MS24693-BB6	BRASS SCREW			
6	A78001-35	FIXED END CAP			
7	MS24693-BB2	BRASS SCREW			
8	A78001-54	KNURLED HEAD SCREW			
9	A78001-50	FIXED END CAP			
10	A78001-44	REMOVABLE S-RING			
11	A78001-45	REMOVABLE L-RING			
12	A78001-51	REMOVABLE M-RING			





#### PART NUMBER: A78002-1, -8, -9

NAME:	THREAD PROTECTOR EQUIPMENT - THRUST REVERSER REMOVAL/ INSTALLATION				
AIRPLANE MAINTENANCE:	YES				
COMPONENT MAINTENANCE:	NO				
USAGE & DESCRIPTION:	The A78002-1 thread protector equipment is used on 767 airplanes equipped with PW4000 and JT9D-7R4D/E engines. The A78002-8 thread protector equipment is used on 767 airplanes equipped with CF6-80A. The A78002-9 hread protector equipment is used on 767 airplanes equipped with CF6- 0C2. A78002 is used to provide thread protection of thrust reverser hinge bolts. Refer to AMM 78-31-01 for complete usage instructions. The A78002-1 consists of three A78002-2 thread protectors contained in a storage box. The A78002-8 consists of two A78002-2 thread protectors contained in a storage box. The A78002-9 consists of a A78002-10 and a A78002-11 thread protectors contained in a storage box.				
WEIGHT:	1 lb (0.5 kg)				
DIMENSIONS:	1 x 1.5 x 4 inches (25 x 36 x 102 mm)				
NOTE:	A78002-8 supersedes A78002-4.				



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Thrust Reverser Thread Protector Removal/Installation Equipment Figure 1 (Sheet 1 of 2)



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#### Thrust Reverser Thread Protector Removal/Installation Equipment Figure 1 (Sheet 2 of 2)







REPAIRABLE/REPLACEABLE PARTS				
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE	
1	A78002-2	THREAD PROTECTOR		
2	A78002-3	THREAD PROTECTOR		





#### PART NUMBER: G78005-10

NAME:	ADAPTER EQUIPMENT - THRUST REVERSER HOLD OPEN ROD
AIRPLANE MAINTENANCE:	YES
COMPONENT MAINTENANCE:	NO
USAGE & DESCRIPTION:	The G78005-10 adapter equipment is used on 767 airplanes equipped with PW4000 engines. G78005 is used to extend the effective length of the thrust reverser hold open rod, allowing the A78001 thrust reverser hold open equipment to be safely attached to the thrust reverser equipment. Refer to AMM 71-00-02 for complete usage instructions. G78005-10 consists of two G78005-11 adapter assemblies contained in a storage box.
WEIGHT:	4 lbs (1.8 kg)
DIMENSIONS:	2 x 4 x 14 inches (51 x 76 x 356 mm)
<u>NOTE</u> :	G78005-10 supersedes G78005-1.











#### PART NUMBER: A78005-5

NAME:

TENSION LATCH WRENCH SET - FAN DUCT

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The A78005-5 tension latch wrench set is used on 767 airplanes with JT9D-7R4 engines. The A78005-5 wrench set is used to remove and install fan duct tension latch pivot nuts through a difficult access hole. Refer to AMM 78-31-04 for complete usage instructions. A78005-5 consists of an A78005-6 wrench (modified 1120LB wrench) and an A78005-7 (modified 1125LB wrench) Both 1120LB and 1125LB wrenches are manufactured by Utica Precision Tool Company, Orangeburg, SC 23115. The wrench set is contained in a storage box.

**WEIGHT:** 0.5 lbs (0.22 kg)

**DIMENSIONS:** 1 x 4 x 8 inches (25 x 102 x 203 mm)

**NOTE**: A78005-5 supersedes A78005-1.



Fan Duct Tension Latch Wrench Set Figure 1 (Sheet 1 of 2)





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#### PART NUMBER: A78013-1, -2, -11

NAME: SLING - EXHAUST SLEEVE, ENGINE

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The A78013-1 sling is used on General Electric CF6-80A engines. The A78013-2 sling is on with Pratt and Whitney JT9D-7R4D and PW4000 engines. The A78013-11 sling is used on General Electric CF6-80C2 engines. A78013 and an overhead lift device, aids in the removal and reinstallation of the engine exhaust sleeve. Refer to AMM 78-11-01 and the current A78013 drawing for complete usage instructions. A78013 consists of a webbing assembly and related hardware.

- **WEIGHT:** 14 lbs (6.4 kg)
- **DIMENSIONS:** 6 x 8 x 38 inches (152 x 203 x 965 mm)



Figure 1





#### PART NUMBER: A78003-28, -41

NAME:

CRADLE - EXHAUST NOZZLE

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: NO

**USAGE & DESCRIPTION:** The A78003-28 or -41 cradle is used on all 767 airplanes. A78003 is used in conjunction with the A71015 lift fixture to cradle the exhaust sleeve during removal and installation of GE or PW engines . Refer to AMM 78-11-01 and AMM 78-11-02 for complete usage instructions. The A78003-28 cradle consists of a A78003-3 frame assembly, a A78003-23 side plate assembly, four casters, two different strap assemblies and related hardware. The A78003-41 cradle consists of a A78003-43 frame assembly, four casters, two different strap assemblies and related hardware.

WEIGHT: 62 lbs (28.1 kg)

DIMENSIONS: 16 x 40 x 51 inches (406 x 1016 x 1295 mm)

NOTE: A78003-41 replaces A78003-28 for future procurement. A78003-41 supersedes A78003-38.



Exhaust Nozzle Cradle. Figure 1 (Sheet 1 of 2)





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A78003-28



Exhaust Nozzle Cradle. Figure 1 (Sheet 2 of 2)

REPAIRABLE/REPLACEABLE PARTS					
ITEM NO. PART NO. NOMENCLATURE VENDOR CODE					
1	2–219–103	CASTER	Jarvis Caster Co		





#### PART NUMBER: A78020-66

NAME:	HOIST EQUIPMENT - REMOVAL/INSTALLATION, INTEGRATED NOZZLE ASSEMBLY (INA)
AIRPLANE MAINTENANCE:	YES
COMPONENT MAINTENANCE:	NO
USAGE & DESCRIPTION:	The A78020-66 hoist equipment is used on 767 airplanes equipped with RB211-524G/H engines. A78020 is used for on-wing installation/removal of RB211-524 G/H engine exhaust pipe. Refer to AMM 78-11-05 for complete usage instructions. A78020-66 consists of A78020-67 left and A78020-8 right hand frame assemblies, one A78020-4 lower cross tube, two A78020-5 lower brace assemblies, A78020-69 left and A78020-70 right hand mast assemblies, A78020-71 right and A78020-72 left hand spreader assemblies and one A78020-10 spreader tie, all contained in a storage box.
WEIGHT:	150 lbs (68 kg)
DIMENSIONS:	20 x 33 x 86 inches (508 x 838 x 2184 mm)
<u>NOTE</u> :	A78020-66 supersedes A78020-1





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Integrated	Nozzle	Assembly	Remova	l/Install	lation	Hoist	Equi	pment
			Figure 1					

REPAIRABLE/REPLACEABLE PARTS			
ITEM NO. PART NO. NOMENCLATU		NOMENCLATURE	VENDOR CODE
1	26–05	COTTER PIN	V99862







#### PART NUMBER: A71002-50

NAME: SLING EQUIPMENT - THRUST REVERSER - JT9D-7R4D AND PW4000 **AIRPLANE MAINTENANCE:** YES **COMPONENT MAINTENANCE:** NO **USAGE & DESCRIPTION:** The A71002-50 thrust reverser sling is used on all 767 airplanes equipped with either JT9D-7R4D or PW4000 engines. A71002 is used to open, close or remove and install the thrust reversers. Refer to AMM 78-30-00 and AMM 78-31-01 for complete usage information. A71002-50 consists of an A71002-52 beam assembly and a J71002-53 curved beam assembly, both contained in a storage box. WEIGHT: 60 lbs (27.2 kg) **DIMENSIONS:** 12 x 12 x 50 inches (305 x 305 x 1270 mm) A71002-50 supersedes A71002-48. NOTE:



JT9D-7R4D and PW4000 Thrust Reverser Sling Equipment Figure 1 (Sheet 1 of 2)







#### JT9D-7R4D and PW4000 Thrust Reverser Sling Equipment Figure 1 (Sheet 2 of 2)





REPAIRABLE/REPLACEABLE PARTS				
ITEM NO. PART NO. NOMENCLATURE VENDOR COL				
1	G215-3/8	SHACKLE	V75535	
2	G215-1/4	SHACKLE	V75535	
3	G403-1/4	JAW END SWIVEL	V75535	
4	G209-1/4	SHACKLE	V75535	
5	NAS6604-10	BOLT		
6	NAS6604-7	BOLT	V79136	
7	A71002-43	VINYL TUBING		





#### PART NUMBER: A71009-25, -26

NAME: SLING - THRUST REVERSER CF6-80A

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: YES

**USAGE & DESCRIPTION:** The A71009-25 or -26 sling is used on 767 airplanes equipped with CF6-80A thrust reversers. A71009 is used with an overhead crane to remove/install the CF6-80A thrust reverser. Refer to AMM 78-31-01 for complete usage instructions. A71009-25 consists of an A71009-2 straight beam assembly, an A71009-3 curved beam assembly, an A71009-19 upper link assembly, an A71009-20 lower link assembly, an A71009-21 aft assembly and connecting hardware. A71009-26 consists of the A71009-25 sling equipment contained in a storage box.

**WEIGHT:** 48 lbs (21.7 kg)

DIMENSIONS: 12 x 12 x 56 inches (305 x 305 x 1422 mm)

NOTE: A71009-26 replaces A71009-25 for future procurement.







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CF6-80A Thrust Reverser Sling Figure 1 (Sheet 2 of 2)

REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	NAS13365C08D	QUICK RELEASE PIN	
2	NAS1304–12	BOLT	
3	NAS1304–17	BOLT	
4	NAS603-5	SCREW	
5	AN960-716	WASHER	
6	AN960-416	WASHER	
7	G209-1/4	SHACKLE	V75535
8	G215-3/8	SHACKLE	V75535

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REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
9	5304-37	RETAINING RING	V79136
10	CL-73-KA-8.0	LANYARD	V99862
11	F70308-15	PROOF LOAD TAG	
12	A71009-6	CABLE ASSEMBLY	







#### PART NUMBER: B78001-1, -2, -5, -14

NAME: LOCK - THRUST REVERSER ISOLATION VALVE (GROUND AND FLYAWAY) **AIRPLANE MAINTENANCE:** YES COMPONENT MAINTENANCE: NO **USAGE & DESCRIPTION:** The B78001-1 lock is used on 767 airplanes equipped with JT9D or CF6-80A engines. The B78001-2 lock is used on 767 airplanes with JT9D, PW4000, or CF6-80A engines (except Qantas airplanes). The B78001-5 lock is used on Qantas 767 airplanes with JT9D engines (airplanes are retired from Qantas fleet). The B78001-14 lock is used on 767 airplanes equipped with PW4000 engines. The B78001-1, -2 –5 or –14 lock is used to prevent thrust reverser operation. B78001-1 and -14 are used to lock thrust reversers for ground maintenance and not to be used in flight. B78001-1 is used on 767 airplanes equipped with JT9D or CF6-80A engines during ground maintenance procedures to prevent thrust reverser operation on the ground but will allow manual thrust reverser operation. B78001-14 is used on 767 airplanes equipped with PW4000 engines during ground maintenance procedures to prevent thrust reverser operation on the ground but will allow manual thrust reverser operation. B78001-2 or -5 are used to lock inoperative thrust reversers for flight dispatch (not for ground maintenance). B78001-2 is used on 767 airplanes with JT9D, PW4000, or CF6-80A engines (except Qantas airplanes) to prevent thrust reverser operation during flight. The B78001-2 lock is part of the airplane's flight dispatch kit. B78001-5 is used on Qantas 767 airplanes with JT9D engines to prevent thrust reverser operation during flight (airplanes are retired from Qantas fleet). The B78001-5 lock is part of the airplane's flight dispatch kit.

Refer to AMM 54-53-02, AMM 78-31-00, the current B78001 drawing and the 767 Dispatch Deviation Guide for complete usage instructions.

B78001-1		
QUANTITY	NOMENCLATURE	PART NUMBER
2	PIN	B78001-3
2	HITCH PIN	AN415-3
1	STREAMER	NAS1756-12
2	CL-21-KA-6.0LR	CABLE ASSEMBLY

The B78001-1, -2, -5 and -14 thrust reverser isolation valve lock consists of:

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B78001-1		
QUANTITY	NOMENCLATURE	PART NUMBER
1	CL-22-KA-12.0LR	CABLE ASSEMBLY

B78001-2		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PIN	B78001-3
1	BAG	B78001-4

B78001-5		
QUANTITY	NOMENCLATURE	PART NUMBER
1	PIN	B78001-3
1	BAG ASSEMBLY	B78001-6

B78001-14		
QUANTITY	NOMENCLATURE	PART NUMBER
1	LOCK ASSEMBLY	B78001-15
1	BAG	B78001-18

WEIGHT:	B78001-1 - 0.5 lb (0.2 kg) B78001-2 - 0.25 lb (0.1 kg) B78001-5 - 0.25 lb (0.1 kg) B78001-14 - 0.75 lb (0.3 kg)
DIMENSIONS:	B78001-1 - 4 x 4 x 4 inches (102 x 102 x 102 mm) B78001-2 - 1 x 4 x 6 inches (25 x 102 x 152 mm) B78001-5 - 1 x 4 x 6 inches (25 x 102 x 152 mm) B78001-14 - 1 x 8 x 14 inches (25 x 203 x 356 mm)
NOTE	B78001-14 supersedes B78001-1 for all airplanes with PW4000 Engines.





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Thrust Reverser Isolation Valve Lock Figure 1 (Sheet 1 of 6)





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Thrust Reverser Isolation Valve Lock Figure 1 (Sheet 2 of 6)









Figure 1 (Sheet 3 of 6)





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#### PART NUMBER: A78012-1

NAME: WRENCH - CROWFOOT, TUBING NUT, FLOW CONTROL, THRUST REVERSER

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The A78012-1 wrench is used on all 767 airplanes. A78012 is used to gain access through a difficult aperture to left and right flow divider coupling nuts on the fan cowl support structure. Refer to AMM 78-31-01 for complete usage instructions. A78012-1 consists of an AN8508-11 crowfoot wrench and a FX11 extension bar.

**WEIGHT:** 1 lb (0.5 kg)

DIMENSIONS:

2 x 2 x 12 inches (51 x 51 x 305 mm)





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#### PART NUMBER: A78010-1

NAME:

CHECK FIXTURE - SPRING INTERLOCK BELLCRANK, JT9D

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

**USAGE & DESCRIPTION:** The A78010-1 check fixture is used during component maintenance on 767 airplanes equipped with JT9D engines. A78010 is used to check maximum and minimum torque of the feedback interlock bellcrank springs used on the JT9D thrust reverser. refer to CMM 78-31-14 and CMM 78-31-16 for complete usage instructions. A78010-1 consists of an A78010-2 angle assembly, an A78010-4 index assembly and a WW #22 pin.

**WEIGHT:** 6 lbs (2.7 kg)

DIMENSIONS:

4 x 5 x 6 inches (102 x 127 x 152 mm)



JT9D Spring Interlock Bellcrank Check Fixture Figure 1







#### PART NUMBER: A78011-69, -70

NAME: STAND SUPPORT - FAN DUCT COWL AND THRUST REVERSER **AIRPLANE MAINTENANCE:** NO COMPONENT MAINTENANCE: NO **USAGE & DESCRIPTION:** The A78011-69 stand support is used on 767 airplanes equipped JT9D-7R4D and PW4000 engines. The A78011-70 stand support is used on 767 airplanes equipped with CF6-80A engines. A78011 facilitates disassembly, assembly, or build-up check out, functional test and storage of the duct cowl and thrust reverser. For the airplanes with JT9D-7R4D engines, refer to CMM 78-31-14 and CMM 78-31-16 for complete usage instructions. For airplanes with CF6-80A engines, refer to CMM 78-31-15 for complete usage instructions. For airplanes with PW4000 engines, refer to CMM 78-31-41 for complete usage instructions. A quantity of two A78011 stands are required for working on both sides of the engine at the same time. A78011 has a closed (down) and an open (up) position which are illustrated below. Each A78011 consists of 3 movable hinge assemblies and movable compression assemblies to accommodate either the left or right fan duct cowl and thrust reverser. The stand assemblies consist of the following major parts; frame assembly, base assembly, and leg assembly and related hardware. WEIGHT: 1500 lbs (680 kg) **DIMENSIONS:** 28 x 95 x 130 inches (711 x 2413 x 3302 mm) A78011-69 supersedes A78011-63 and -67. NOTE:

A78011-70 supersedes A78011-64 and -68.



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OPEN POSITION A78011-69 STAND ASSEMBLY (A78011-70 EQUIVALENT)

Fan Duct Cowl and Thrust Reverser Stand Support Figure 1 (Sheet 1 of 2)



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CLOSED POSITION A78011-69 STAND ASSEMBLY (A78011-70 EQUIVALENT)

#### Fan Duct Cowl and Thrust Reverser Stand Support Figure 1 (Sheet 2 of 2)



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REPAIRABLE/REPLACEABLE PARTS					
ITEM NO. PART NO. NOMENCLATURE VENDOR CODE					
1	AN10-30A	BOLT			
2	AN12-34A	BOLT			
3	AN12-41A	BOLT			
4	AN12-36A	BOLT			
5	MS20392-7C47	STRAIGHT PIN			







#### PART NUMBER: A78014-1

NAME:	CLAM SHELL EQUIPMENT - TRACK SLIDER, THRUST REVERSER
AIRPLANE MAINTENANCE:	NO
COMPONENT MAINTENANCE:	YES
USAGE & DESCRIPTION:	The A78014-1 clam shell equipment is used on 767 airplanes equipped with JT9D-7R4 and CF6-80A engines. A78014 is used for clamping Rulon J tape to thrust reverser slider during bonding. Refer to CMM 78-31-22, 78-31-25, 78-31-45, and current A78014 drawing for additional usage instructions. A78014-1 consists of two A78014-2 clamps contained in a storage box. The A78014-1 is a recommended spares item.
WEIGHT:	15 lbs (6.8 kg)
DIMENSIONS:	1.5 x 3.0 x 37 inches (38 x 76 x 940 mm)



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Figure 1









**Thrust Reverser Track Slider Clam Shell Equipment** Figure 2







#### PART NUMBER: A78015-1

NAME:	REWORK JIG - HINGE, BLOCKER DOORS, THRUST REVERSER (PRATT & WHITNEY)
AIRPLANE MAINTENANCE:	NO

COMPONENT MAINTENANCE: YES

USAGE & DESCRIPTION: The A78015-1 rework jig is used on 767 airplanes equipped with Pratt and Whitney engines. A78015 is used to locate and hold blocker door and hinges for rework of hinges. Refer to CMM 78-31-21 for complete usage instructions. A78015-1 consists of an A78015-2 jig assembly, an A78015-3 jig assembly and an A78015-4 jig assembly all contained in a storage box.

WEIGHT: 50 lbs (22.7 kg)

DIMENSIONS: 35 x 30 x 20 inches (508 x 762 x 889 mm)



Pratt and Whitney Thrust Reverser Blocker Doors Hinge Rework Jig Figure 1 (Sheet 1 of 3)





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Pratt and Whitney Thrust Reverser Blocker Doors Hinge Rework Jig Figure 1 (Sheet 2 of 3)





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#### Pratt and Whitney Thrust Reverser Blocker Doors Hinge Rework Jig Figure 1 (Sheet 3 of 3)







REPAIRABLE/REPLACEABLE PARTS				
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE	
1	CL-2-SHS	SWIVEL SCREW	V99862	
2	CL-29-SHS	SWIVEL SCREW	V99862	
3	CL-23-KA-12.0LR	CABLE ASSEMBLY	V99862	
4	CL-551-HTC-S	CLAMP	V99862	
5	NAS1334C5C20D	PIN		
6	MS16562-250	PIN		







#### PART NUMBER: C78005-21

NAME:	HAND PUMP - OPENING SYSTEM, THRUST REVERSER
AIRPLANE MAINTENANCE:	YES
COMPONENT MAINTENANCE:	NO
USAGE & DESCRIPTION:	The C78005-21 is used on 767 airplanes that are equipped with the manual thrust reverser system (W315T3800) installed. C78005 is used to supply hydraulic pressure to supply hydraulic pressure to the actuator that opens the thrust reverser "C" ducts for engine maintenance. Refer to AMM 71-00-02, AMM 78-31-00 , and current C78005 drawing for additional usage instructions. C78005-21 hand pump consists of the C78005-22 pump assembly contained in a storage box.
WEIGHT:	25 lbs (9 kg)
DIMENSIONS:	6 x 6 x 18 inches (152 x 152 x 457 mm)
<u>NOTE</u> :	C78005-21 supersedes C78005-17.







Thrust Reverser Opening System Hand Pump Figure 1







#### PART NUMBER: A27097-1

NAME:

ADAPTER - PROTRACTOR, THRUST REVERSER LEVER

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The A27097-1 adapter is used on all 767 airplanes. G78002 is used in conjunction with A27021-30 or 4MIT65B80307-1 protractor, to measure angular displacement of the Thrust Reverser Lever. Refer to AMM 78-34-06 for complete usage instructions. The A27097-1 consists of an A27097-3 clamp, an A27097-4 adapter thrust reverser lever, a CL-0-KN knurled nut, all contained in a storage box.

WEIGHT: 3 lbs (1.4 kg)

DIMENSIONS:

7.0 x 2.0 x 3.0 inches (178 x 51 x 76 mm)



Figure 1







#### PART NUMBER: G78002-1

NAME:

HOLD OPEN SET - THRUST REVERSER COWL, CF6-80C2B ENGINE

**AIRPLANE MAINTENANCE:** YES

COMPONENT MAINTENANCE: NO

**USAGE & DESCRIPTION:** The G78002-1 hold open set is used on 767 airplanes equipped with CF6-80C2B engines. G78002 is used to hold CF6-80C2B engine thrust reverser cowl open during engine change. Refer to AMM 71-00-02 and AMM 78-31-02 for complete usage instructions. G78002-1 consists of a G78002-3 hold open assembly contained in a storage box.

WEIGHT: 25 lbs (11.3 kg)

**DIMENSIONS:** 6 x 12 x 25 inches (152 x 305 x 635 mm)



CF6-80C2 Engine Thrust Reverser Cowl Hold Open Set Figure 1



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#### PART NUMBER: G78003-53

NAME:

SLING EQUIPMENT - FAN REVERSER, CF6-80C2B ENGINE

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The G78003-53 sling equipment is used on 767 airplanes equipped with CF6-80C2B engines. G78003 is used to remove and/or install CF6-80C2B fan cowl reversers. Refer to AMM 78-31-01 for complete usage instructions. G78003-53 consists of a G78003-6 lower beam assembly, a G78003-57 upper beam assembly, a G78003-8 forward strap assembly, a G-209-1/2 shackle and a G-341-3/4 pear ring, all contained in a storage box.

#### NOTE:

G78003-53 supersedes G78003-1.



CF6-80C2B Engine Fan Reverser Sling Equipment Figure 1







#### PART NUMBER: A78017-1

NAME: SLING - FAN REVERSER OPENING

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The A78017-1 sling is applicable to 767 airplanes equipped with CF6-80C2 engines. A78017 is used to open the fan reverser on CF6-80C2 engine when the opening system is inoperative. Refer to AMM 78-31-00 for complete usage instructions. A78017-1 consists of a A78017-2 sling assembly contained in a storage box.

2 x 5 x 8 inches (51 x 127 x 203 mm)

**WEIGHT:** 3 lbs (1.4 kg)

DIMENSIONS:

FAN REVERSER (REF) FAN REVERSER (REF) SLING (REF) (REF

Fan Reverser Opening Sling Figure 1



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#### PART NUMBER: A78007-1

NAME:

SLING - SLEEVE, THRUST REVERSER CF6-80A

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The A78007-1 sling is used on 767 airplanes equipped with CF6-80A engines. A78007 is used with A20001 general boom hoist, or equivalent, to remove the CF6-80A thrust reverser sleeve when the thrust reverser is opened to 23°. Refer to AMM 78-31-10 for complete usage instructions. A78007-1 consists of an A78007-2 sling assembly and an A78007-3 strap assembly contained in a storage box.

WEIGHT: 3 lbs (1.4 kg)

DIMENSIONS:

2 x 5 x 8 inches (51 x 127 x 203 mm)



CF6-80A Thrust Reverser Sleeve Sling Figure 1 (Sheet 1 of 2)







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CF6-80A Thrust Reverser Sleeve Sling Figure 1 (Sheet 2 of 2)

REPAIRABLE/REPLACEABLE PARTS				
ITEM NO. PART NO. NOMENCLATURE VENDOR CODE				
1	A78007-7	FITTING		
2	A78007-8	FITTING		







#### PART NUMBER: A78008-1, -16

NAME: SLING - SLEEVE, THRUST REVERSER

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The A78008 sling is used on 767-200, -200ER, -300 and -300ER airplanes equipped with JT9D-7R4D or PW4000 engines. A78008 is used with the A20001 general boom hoist, or equivalent, to remove the JT9D-7R4D or PW4000 thrust reverser sleeve when the thrust reverser is opened to 23°. Refer to AMM 78-31-10 for complete usage instructions. A78008-16 consists of a A78018-17 sling assembly and a A78018-18 strap assembly contained in a storage box.

The A78008-16 replaces A78008-1 for future procurement.

**WEIGHT:** 3 lbs (1.4 kg)

**DIMENSIONS:** 2 x 5 x 8 inches (51 x 127 x 203 mm)

NOTE:



SLING

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



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

REPAIRABLE/REPLACEABLE PARTS			
ITEM NO. PART NO. NOMENCLATURE VENDOR CODE			
1	A78008-7	FITTING	
2	A78008-8	FITTING	

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#### PART NUMBER: A78018-11

NAME:	SLING - THRUST REVERSER TRANSLATING SLEEVE, CF6-80C2
AIRPLANE MAINTENANCE:	YES
COMPONENT MAINTENANCE:	NO
USAGE & DESCRIPTION:	The A78018-11 sling is used on 767 airplanes equipped with CF6-80C2 engines. A78018 is used with the A20001 general boom hoist, or equivalent, to remove and install the thrust reverser translating sleeves for the CF6-80C2 engine. A78018-11 consists of a A78018-12 sleeve sling assembly contained in a storage box.
WEIGHT:	6 lbs (2.7 kg)
DIMENSIONS:	6 x 12 x 24 inches (152 x 305 x 610 mm)
NOTE:	A78018-11 supersedes A78018-1.



CF6-80C2 Thrust Reverser Translating Sleeve Sling Figure 1







#### PART NUMBER: G78006-74, -75

NAME: DOLLY - THRUST REVERSER, CF6-80C2 ENGINE **AIRPLANE MAINTENANCE:** YES COMPONENT MAINTENANCE: NO **USAGE & DESCRIPTION:** The G78006-74 (left hand) and -75 (right hand) dollies are used on 767 airplanes equipped with General Electric CF6-80C2 engines. G78006 is used to provide a platform to store thrust reverser after removal from engine for maintenance purposes. Refer to AMM 78-31-00 for complete usage instructions. Each of the G78006-74 and -75 consists of a base frame assembly, an upper frame assembly, 2 strut assemblies and related hardware. WEIGHT: 2300 lbs (1043 kg) **DIMENSIONS:** 46 x 88 x 133 inches (1168 x 2235 x 3378 mm) NOTE: G78006-74 and -75 supersedes G78006-1 and -2 respectively.



Figure 1







#### PART NUMBER: A78019-21

NAME:	HAND PUMP - OPENING SYSTEM, THRUST REVERSER
AIRPLANE MAINTENANCE:	YES
COMPONENT MAINTENANCE:	NO
USAGE & DESCRIPTION:	A78019-21 is used on all 767 airplanes except those equipped with RB211 engines. A78019 is used to supply hydraulic pressure to the actuator that opens the thrust reverser "C" duct for engine maintenance. Refer to AMM 78-31-00, AMM 78-31-06 and AMM 78-31-08 for complete usage instructions. The A78019 hand pump consists of a manual hydraulic pump installed on a hand cart, including hose and plumbing connections.
WEIGHT:	92 lbs (41.7 kg)
DIMENSIONS:	28 x 31 x 36 inches (711 x 787 x 914 mm)
NOTE:	A78019-21 supersedes A78019-17.



#### Thrust Reverser Opening System Hand Pump Figure 1







REPAIRABLE/REPLACEABLE PARTS				
ITEM NO. PART NO. NOMENCLATURE VENDOR CODE				
1	412F-B10CN	FILTER ELEMENT	NORMAN FILTER COMPANY 9850 SOUTH INDUSTRIAL DRIVEBRIDGEVIEW, IL 60455	





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#### PART NUMBER: A78023-1, -89, -121

NAME:

REPAIR FIXTURE EQUIPMENT - PW4000 ENGINE THRUST REVERSER

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

USAGE & DESCRIPTION: The A78023-1 (fixture equipment), -89 (upper fixture equipment) and -121 (block set) repair fixture equipment are all used on 767-200ER and 767-300ER airplanes equipped with PW4000 engines. A78023-89 is used to locate the upper hinge beam and the A78023-1 to locate the lower track fittings of the PW4000 thrust reverser during replacement. For complete usage information refer to CMM 71-11-56. The A78023 repair fixture equipment consists of:

A78023-1			
QUANTITY	NOMENCLATURE	PART NUMBER	
1	LOWER TOOL RIGHT ASSEMBLY	A78023-2	
1	LOWER TOOL LEFT ASSEMBLY	A78023-3	
1	STORAGE BOX		

A78023-89			
QUANTITY	NOMENCLATURE	PART NUMBER	
1	UPPER FIXTURE	A78023-90	
1	STORAGE BOX		

A78023-121			
QUANTITY	NOMENCLATURE	PART NUMBER	
1	BLOCK ASSEMBLY	A78023-113	
1	STORAGE BOX		

WEIGHT:	A78023-1 - 25 lbs (11.3 kg) A78023-89 - 21.5 lbs (10 kg) A78023-121 - 33 lbs (15 kg)
DIMENSIONS:	A78023-1 - 6 x 21 x 43 inches (152 x 533 x 1092 mm) A78023-89 - 4 x 30 x 60 inches (102 x 457 x 610 mm) A78023-121 - 18 x 18 x 24 inches (457 x 457 x 610 mm)
NOTE	A78023-89 supersedes A78023-35.



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Figure 1 (Sheet 1 of 2)









A78023-89

PW4000 Engine Thrust Reverser Repair Fixture Equipment Figure 1 (Sheet 2 of 2)







#### PART NUMBER: A78024-1

NAME:

ALIGNMENT FIXTURE - INNER FAN DUCT WALL CF6-80A ENGINE

AIRPLANE MAINTENANCE: NO

COMPONENT MAINTENANCE: YES

USAGE & DESCRIPTION: The A78024-1 alignment fixture is used on 767 airplanes equipped with CF6-80A engines. A78024 is used to support and hold the thrust reverser (CF6-80A) while the inner fan duct is removed for repair of delamination. Refer to CMM 78-31-15 for complete usage instructions. The fixture assembly consists of a base assembly, three tower assemblies, a channel clamp assembly, a core support assembly, three clamp plates, a data package, forty hand knob assemblies, six L-pins and an identification tag.

WEIGHT: 1500 lbs (680 kg)

DIMENSIONS: 64 X 72 x 120 inches (1626 x 1829 x 3048 mm)



Inner Duct Fan Wall CF6-80A Engine Alignment Fixture Figure 1

REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	CL-7C-HK4T	HAND KNOB ASSEMBLY	V99862





REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
2	CL-13-LP	L-PIN	V99862
3	A78024-58	FLANGE SCREW	





#### PART NUMBER: A78025-1, -77

NAME:

BREAKOUT BOX - TEST, THRUST REVERSER

AIRPLANE MAINTENANCE: YES

COMPONENT MAINTENANCE: NO

USAGE & DESCRIPTION: The A78025-1 or A78025-77 breakout boxes are used on 767 airplanes with PW JT9D, PW4000, GE CF6-80A, GE CF6-80C2, and RR RB211-524 engines. The tools are used for specific AMM procedures to check the electrical equipment of the thrust reverser system. The A78025-1 assembly is used to breakout contacts of MIL-C-5015 and MIL-C-26500 type circular connectors. The A78025-77 assembly is used for testing relays and to breakout relay sockets of BAC516 series. To breakout ARINC 600 type rack connectors, the A34016-42 and A34016-65 test boxes are used. Troubleshooting or other specified tests may include continuity checks, voltage checks, and signal checks, as applicable. Refer to AMM 78-31-00, AMM 78-34-00, AMM 78-34-03, AMM 78-34-04, AMM 78-34-05, AMM 78-34-07, AMM 78-34-13, AMM 78-36-00, AMM 78-36-02, AMM 78-36-03, AMM 78-36-04, AMM 78-76-07, and current A78025 drawing for additional usage instructions. The A78025-1 and A78025-77 consist of the folowing components:

A78025-1		
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	A78025-10
1	CABLE ASSEMBLY	A78025-11
1	CABLE ASSEMBLY	A78025-12
1	STORAGE BOX	

A78025-77		
QUANTITY	NOMENCLATURE	PART NUMBER
1	BREAKOUT BOX ASSEMBLY	A78025-79
1	CABLE ASSEMBLY	A78025-80
1	CABLE ASSEMBLY	A78025-87
1	CABLE ASSEMBLY	A78025-88







A78025-77		
QUANTITY	NOMENCLATURE	PART NUMBER
1	CABLE ASSEMBLY	A78025-89
1	STORAGE BOX	

WEIGHT:	A78025-1 - 15 lbs (6.8 kg) A78025-77 - 10 lbs (4.5 kg)
DIMENSIONS:	A78025-1 - 18 x 15 x 10 inches (457 x 381 x 254 mm) A78025-77 - 14 x 8 x 8 inches (356 x 203 x 203 mm)
NOTE:	A78025-77 supersedes A78025-2.




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A78025-5 CABLE ASSEMBLY - REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	M83723/83A1236	CONNECTOR	
2	M83723/83A123N	CONNECTOR	
3	M83723/75A1212N	CONNECTOR	
4	M83723/60-112AC	PROTECTIVE CAP	
5	M83723/59-212AC	PROTECTIVE CAP	

A78025-6 CABLE ASSEMBLY - REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	M83723/75A123N	CONNECTOR	
2	M83723/76A1212N	CONNECTOR	
3	M83723/60-212AC	PROTECTIVE CAP	
4	M83723/59-212AC	PROTECTIVE CAP	

A78025-7 CABLE ASSEMBLY - REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	M83723/83A18146	CONNECTOR	
2	M83723/75A12129	CONNECTOR	
3	M83723/60-118AC	PROTECTIVE CAP	
4	M83723/59-212AC	PROTECTIVE CAP	

A78025-8 CABLE ASSEMBLY - REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	M83723/83A1814N	CONNECTOR	
2	M83723/75A1212N	CONNECTOR	
3	M83723/60-118AC	PROTECTIVE CAP	
4	M83723/59-212AC	PROTECTIVE CAP	

A78025-9 CABLE ASSEMBLY - REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	M83723/86A1610N	CONNECTOR	
2	M83723/75A1212N	CONNECTOR	
3	M83723/59-116AC	PROTECTIVE CAP	
4	M83723/59-212AC	PROTECTIVE CAP	

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A78025-10 CABLE ASSEMBLY - REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	M83723/86A123N	CONNECTOR	
2	M83723/75A1212N	CONNECTOR	
3	M83723/59-112AC	PROTECTIVE CAP	
4	M83723/59-212AC	PROTECTIVE CAP	

A78025-11 CABLE ASSEMBLY - REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	M83723/75A16248	CONNECTOR	
2	M83723/75A16246	CONNECTOR	
3	M83723/75A1212N	CONNECTOR	
4	M83723/59-216AC	PROTECTIVE CAP	
5	M83723/59-212AC	PROTECTIVE CAP	

A78025-12 CABLE ASSEMBLY - REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	M83723/87A147N	CONNECTOR	
2	M83723/75A1212N	CONNECTOR	
3	M83723/59-114AC	PROTECTIVE CAP	
4	M83723/59-212AC	PROTECTIVE CAP	

A78025-80 CABLE ASSEMBLY -R EPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	M83723/75A803N	CONNECTOR	
2	M83723/59-208AC	PROTECTIVE CAP	

A78025-87 CABLE ASSEMBLY - REPAIRABLE/REPLACEABLE PARTS				
ITEM NO. PART NO. NOMENCLATURE VENDOR CODE				
1	M83723/75A1212N	CONNECTOR		
2	M83723/59-212AC	PROTECTIVE CAP		

A78025-88 CABLE ASSEMBLY - REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	M83723/75A1212N	CONNECTOR	
2	M83723/59-212AC	PROTECTIVE CAP	

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A78025-89 CABLE ASSEMBLY - REPAIRABLE/REPLACEABLE PARTS			
ITEM NO.	PART NO.	NOMENCLATURE	VENDOR CODE
1	M83723/75A1212N	CONNECTOR	
2	M83723/59-212AC	PROTECTIVE CAP	

