CHAPTER

78

EXHAUST

MD-80
AIRCRAFT MAINTENANCE MANUAL

CHAPTER 78
EXHAUST

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GENERAL - DESCRIPTION AND OPERATION

1. General

A. Engine exhaust utilizes fan air and exhaust gases, directing flow for reversing engine thrust, to achieve aircraft ground deceleration.

B. Two thrust reverser doors (each engine) provide the means for directing fan air and exhaust gases. The left engine thrust reverser system is identical to, but independent of, the right engine system.

C. Engine exhaust consists of the exhaust cone and a thrust reverser system.

2. Nozzle

A. The exhaust cone (nozzle) consists of a fixed cone-shaped structure, mounted on the turbine rear frame.

B. The nozzle acts as an orifice, the size of which determines the density and velocity of the gases as they emerge from the engine. For a complete description and operation of exhaust cone, EXHAUST CONE - DESCRIPTION AND OPERATION, PAGEBLOCK 78-10-01/001.

3. Thrust Reverser

A. The thrust reverser consists of the following components: hydraulic accumulator, door actuator, door latch actuator, doors, control valve, interlock mechanism and push-pull cable, door actuating linkage, control valve sector, low-pressure warning switch, position indicator switch, and latch indicator switch.

B. In flight, thrust reverser doors are stowed and latched. An accumulator is used, for each thrust reverser, to supply hydraulic pressure to the stow side of the thrust reverser actuators while in the stow position. Actuation to the deploy position (doors open) on the ground is accomplished by pulling back on thrust reverser levers, with throttles in idle position. For a complete description and operation of thrust reversers, THRUST REVERSER - MAINTENANCE PRACTICES, PAGEBLOCK 78-30-01/201.

GENERAL - MAINTENANCE PRACTICES

1. General Maintenance Features

A. Maintenance Interphone System

(1) The maintenance interphone system provides a means of communication between the flight compartment and maintenance personnel working in the other areas of the aircraft. A maintenance interphone switch, located on the overhead switch panel, is utilized to actuate the system.

(2) Two interphone jacks are accessible to personnel working in the engine areas; one each on the left and right side of fuselage adjacent to the engines.

B. Engine Accessibility

(1) Accessibility is provided to all systems and components within the engine installation and nacelle. Engine cowl doors provide access to all parts of the engine and accessories that require check, maintenance, or servicing. (SUBJECT 71-00-00, page 201).

C. Component Interchangeability

(1) Identical accessories are installed on all engines.

D. System Pressurization

WARNING: WHEN PERSONNEL ARE WORKING IN AREA OF THRUST REVERSER DOORS, THRUST REVERSER HYDRAULIC SYSTEM MUST BE DEPRESSURIZED.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(1) The system is depressurized by manually placing the thrust reverser control valve arm in the dump position and installing the lockpin. After all maintenance has been completed, the reverser accumulator must be pressurized. This requires the aircraft hydraulic system to be pressurized as outlined in GENERAL - MAINTENANCE PRACTICES, PAGEBLOCK 29-00-00/201. Remove the lockpin from the control valve arm and place the arm in the open position until 3000 psi (20,700 kPa) is observed on the accumulator gage then release the arm.

NOTE: Movement of the control valve arm from dump position to open position should be controlled manually when removing the lockpin.

2. Safety and Operating Precautions

WARNING: BEFORE ANY ADJUSTMENT OF THROTTLE CONTROL SYSTEM, MAKE CERTAIN THAT THRUST REVERSER CONTROL VALVE IS IN DUMP POSITION AND LOCKPIN IS INSTALLED (PARAGRAPH 1.D.).

CAUTION: EXTRA CAUTION MUST BE OBSERVED TO MAKE CERTAIN ELECTRICAL CIRCUITS TO ALL FIRE EXTINGUISHER CONTAINER CARTRIDGES ARE ISOLATED WHEN TEST PROCEDURES REQUIRE OPERATION OF FIRE EXTINGUISHER OR EMERGENCY SHUTDOWN SYSTEMS.

A. Circuit Breakers

(1) All circuit breakers opened during maintenance should be tagged to prevent inadvertent operation of affected system.

B. High Voltage

(1) Prior to performing maintenance on high voltage systems or components, make certain that power to systems or components has been shut off and that all affected circuit breakers are open and tagged.

C. Thrust Reverser System Deactivation - Maintenance

(1) Place thrust reverser control valve in safe condition for maintenance (Figure 201).

(a) Open access door (5901C) for left engine and (5902C) for right engine.

(b) Remove lockpin from stowage clips.

(c) Pull control valve arm out and hold.

(d) Install lockpin, head aft, through holes in valve body locking control valve arm in dump position. Attach red streamer to lockpin. Route streamer through access hole to outside of aircraft.

(e) If installed, insert safety retaining pin through hole in forward end of lockpin.

(2) Place thrust reverser control valve in condition for operation or functional check.

(a) If installed, remove safety retaining pin from lockpin.

(b) Pull control valve arm out and remove lockpin.

(c) Release control valve arm.

(d) Remove streamer from lockpin. Install lockpin in stowage clips.

(e) Close access door (5901C) for left engine and (5902C) for right engine.

D. Thrust Reverser System Deactivation - Flight

(1) Make certain upper and lower thrust reverser doors are faired at leading edge.

(2) Make certain overcenter links are over center.

WJE 401-411, 415-427, 429, 861-866, 868, 869, 871-881, 883, 884, 886, 887, 891-893

(3) Place thrust reverser control valve in lock-out condition for flight. (Figure 201)

(a) Open access door (5901C) for left engine and (5902C) for right engine.

(b) Remove lockpin from stowage clips.

(c) Pull control valve arm out and hold.

(d) Install lockpin, head aft through holes in valve body locking control valve arm in dump position.

(e) If installed, insert safety retaining pin through hole in forward end of lockpin.

(f) Close access door (5901C) for left engine and (5902C) for right engine.

(g) Open and chicken ring thrust reverser accumulator low light circuit breaker.

(h) Place THRUST REVERSER INOP placard in cockpit.

WJE ALL

3. General Maintenance Practices

A. Engine Access

(1) To open cowl doors for all engines, refer to SUBJECT 71-00-00, page 201.

B. Engine Cowling Wind Restrictions

CAUTION: DO NOT OPEN COWL DOORS IF GROUND WIND VELOCITIES EXCEED 30 KNOTS.

C. General Rigging Procedures

(1) At each regular check cables, fairleads, pulleys, pulley guard pins, and seals should be checked for wear or damage. (PAGEBLOCK 20-10-17/201)

(2) When using rig pins, differentially adjust the turnbuckle or linkage rod ends to permit the pin to be freely removed and installed. Rig pin holes should not be sprung into alignment by stretching the cable, and should not spring out of alignment on rig pin removal. If any force is required to remove or install a rig pin, the cable turnbuckles or linkage rod ends must be readjusted to eliminate the force.

(3) No rigging procedure is considered complete until a check is made to ensure all bolts, nuts, cotter pins, safety wire, and guard pins have been replaced or secured. Further, no rigging procedure is complete until a check is made to ensure that every rig pin, clamp, tool, and fixture is removed from the aircraft.

D. Remove/Replace Electrical Connections

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(1) When electrical connectors are disconnected, caps or other protective materials should be used to prevent entry of oil, fuel, hydraulic fluid, moisture, or other foreign material.

E. Protective Covers

(1) When lines, cables, turnbuckles, push-pull control cables, rods, linkage, and electrical connectors are disconnected or components are removed, caps, covers, or other protection should be provided to prevent damage or foreign material contamination.

F. External Electrical Power

(1) For procedures to connect external electrical power to aircraft, refer to SUBJECT 24-40-00, page 1.

G. Engine Motoring

(1) For procedures to dry motor or wet motor engine, refer to SUBJECT 71-00-00, page 501.

H. Cleanup

WARNING: CLEANING OPERATIONS USING SOLVENTS SHOULD BE PERFORMED IN WELL-VENTILATED ATMOSPHERE. EXERCISE NORMAL SAFETY PRECAUTIONS DURING USE.

(1) Spilled oil, fuel, or hydraulic fluid should be cleaned up immediately to prevent damage to wiring or other components and to prevent false leak reports.

I. Cable Lubrication

CAUTION: USE EXTREME CARE WHEN WORKING WITH ENGINE-MOUNTED CONTROL CABLES. EACH CABLE FRICTION LIMIT IS DEPENDENT ON MANUFACTURED CONTOUR OF CABLE CONDUIT. DO NOT CLEAN CONTROL CABLE CONDUITS WITH PAINT STRIPPING SOLVENTS.

(1) Throttle and fuel shutoff fuselage control cable conduits are lubricated with Dow Corning Silicone Grease (DC-33). All other control cable conduits are internally dry lubricated and require no additional lubrication.

J. Functional Test

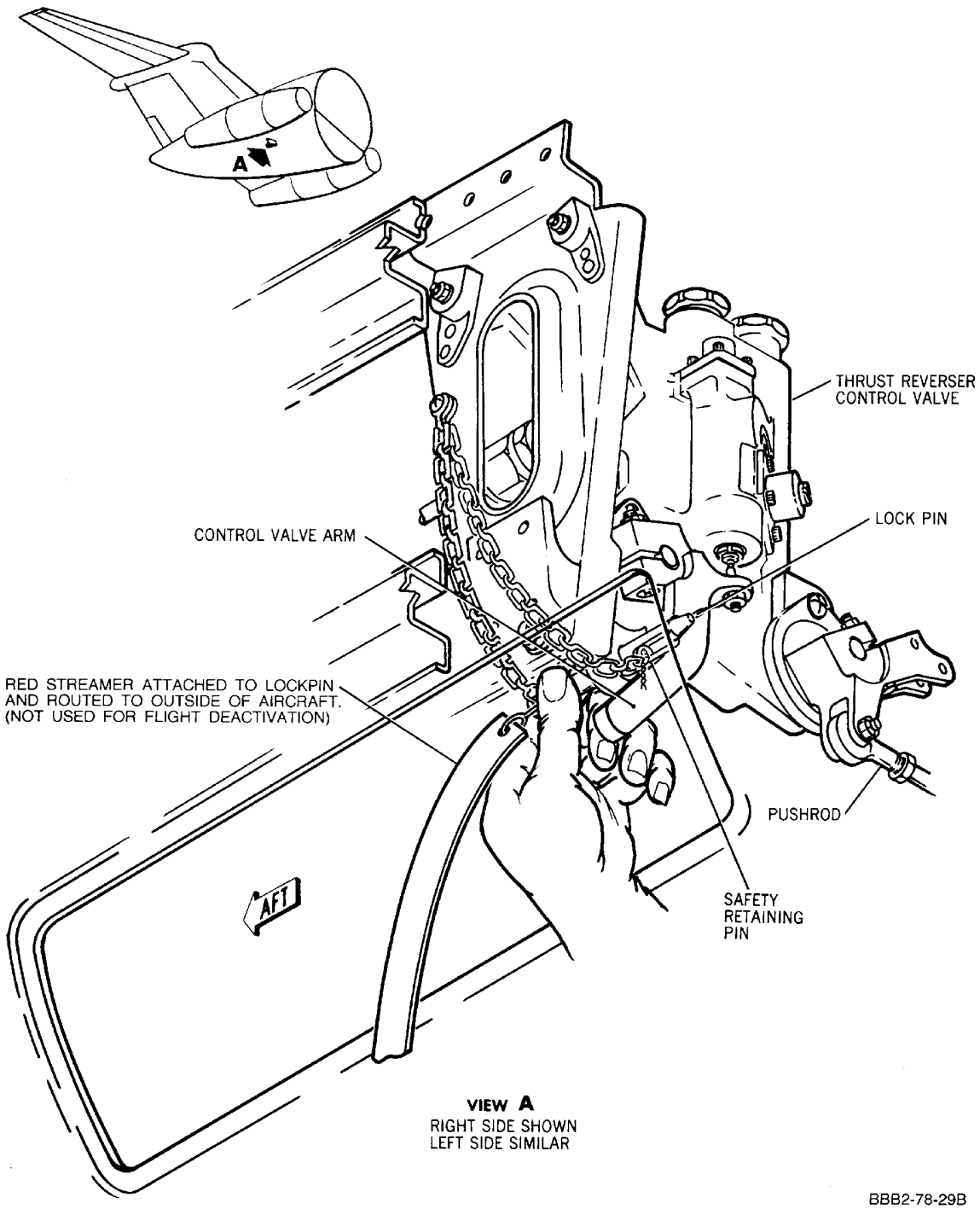
(1) A functional test should be performed after removal/installation, adjustment/test, or approved repairs of any thrust reverser component.

K. Seals, O-Rings, and Gaskets

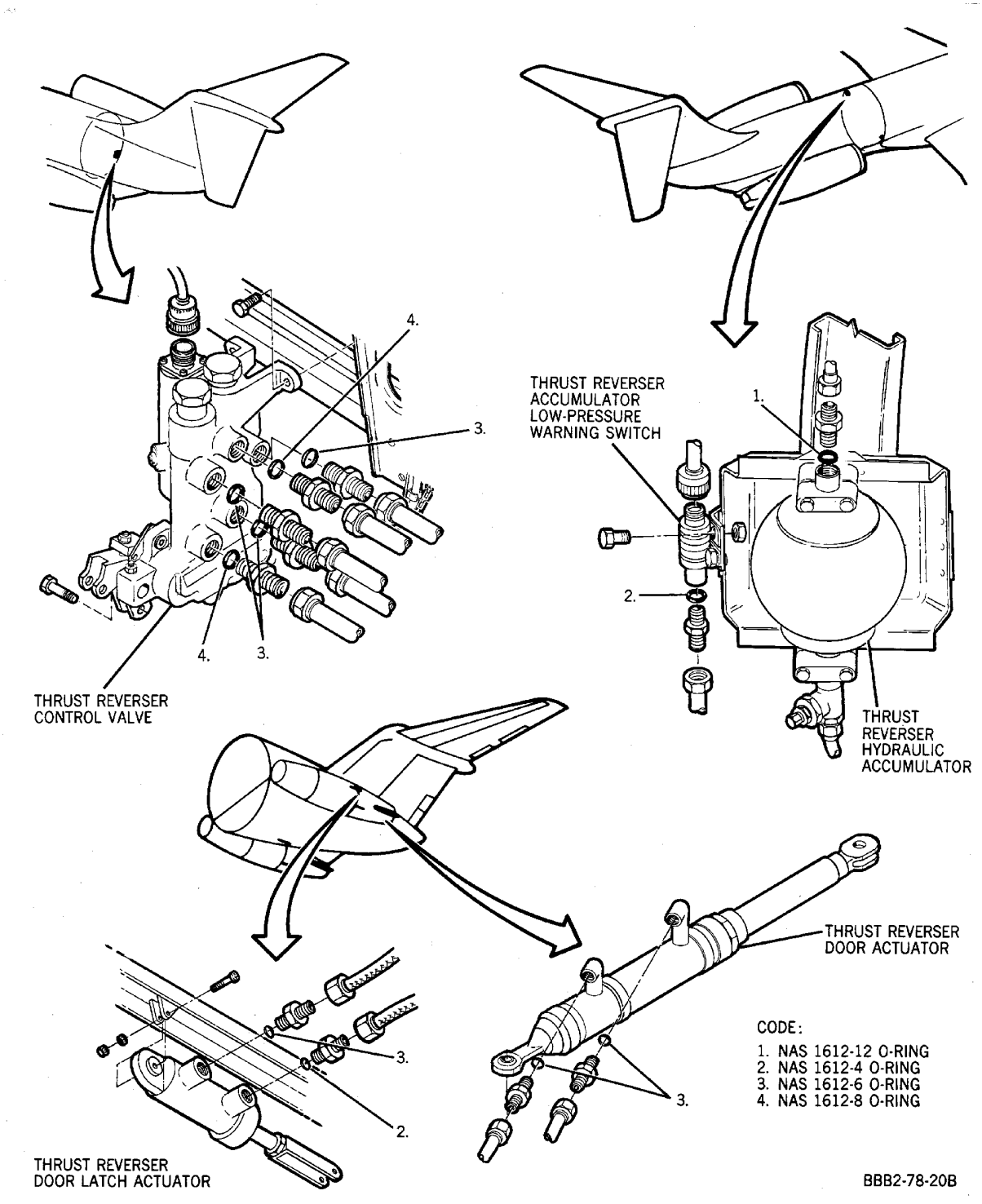
(1) Seals, O-rings, and gaskets are identified in (Figure 202).

L. Used O-Rings

(1) Discard all used O-rings.



Thrust Reverser System - Deactivation
Figure 201/78-00-00-990-801



Seals, O-Rings, and Gaskets
Figure 202/78-00-00-990-802

EXHAUST CONE - DESCRIPTION AND OPERATION

1. General

A. The exhaust cone mounts to the turbine rear frame. The cone and struts inside the exhaust duct serve to add strength to the duct, to impart an axial direction to the gas flow and to smooth the flow. The cone has no moving parts.

EXHAUST CONE - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation instructions for the exhaust cone. The exhaust cone is installed at the aft end of each engine turbine section.

B. Maintenance of the exhaust cone is limited to removal / installation procedures.

C. Access to the exhaust cone is through the thrust reverser inner liner.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Torque wrench, 0-150 inch-pounds (0 to 16.9 N·m)	
Antiseize lubricant MIL-L-25681 DPM 5782	
Lubricant/Oil/ Jet Engine MIL-L-6081 DPM 339	

3. Removal/Installation Exhaust Cone

A. Remove Exhaust Cone

(1) Tag throttle/thrust reverser levers.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

WARNING: BEFORE ATTEMPTING MAINTENANCE PROCEDURES, MAKE CERTAIN THAT THRUST REVERSER CONTROL VALVE IS IN DUMP POSITION AND LOCKPIN IS INSTALLED.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Open these circuit breakers and install safety tags:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	32	B1-288	LEFT START VALVE OPEN ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	32	B1-289	RIGHT START VALVE OPEN ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(3) Place thrust reverser control valve in dump position and install lockpin and safety retaining pin, if attached.

CAUTION: PROTECT THRUST REVERSER INNER LINER ACCESS AND WORKING AREA BY COVERING WITH CLEAN CARPET OR RUBBER MATTING.

(4) Remove bolts that attach exhaust cone to exhaust duct.

NOTE: Exhaust cone assemblies post Service Bulletin (SB) 5687 have spacers installed under of heads of bolts which are longer than those for pre SB 5687 configuration.

NOTE: A exhaust cone post SB 6091 is attached to turbine exhaust duct with 12 bolts through side of cone and duct. Post SB 6121 configuration have a flat washer under each bolt head.

(5) Remove exhaust cone from engine turbine section.

(6) Remove exhaust cone.

B. Install Exhaust Cone

(1) Make certain throttle/thrust reverser levers are tagged.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Make sure that these circuit breakers are open and have safety tags:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	32	B1-288	LEFT START VALVE OPEN ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	32	B1-289	RIGHT START VALVE OPEN ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

CAUTION: PROTECT THRUST REVERSER INNER LINER ACCESS AND WORKING AREA BY COVERING WITH CLEAN CARPET OR RUBBER MATTING.

(3) Make certain thrust reverser control valve is in dump position and lockpin is installed.

(4) Position exhaust cone for installation.

WARNING: JET ENGINE OIL LUBRICANT (GRADE 1010) IS AN AGENT THAT IS POISONOUS AND AN IRRITANT. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN JET ENGINE OIL LUBRICANT IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET JET ENGINE OIL LUBRICANT IN THE EYES, ON SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(WARNING PRECEDES)

(5) Lightly lubricate bolts with lubricant/oil/jet engine grade 1010 and install exhaust cone. (Figure 201)

NOTE: Exhaust cones pre SB 6091 are three types: unweighted (sheet metal tip), weighted with bolted solid tip, and weighted with welded-on solid tip. An unweighted cone can only go on a mixer assembly pre SB 5310; a weighted cone (bolted or welded type) can go on a mixer pre or post SB 5310.

NOTE: Exhaust cones post SB 6091 is of integral weight type. This exhaust is attached to duct with 12 bolts through side of exhaust cone. Post SB 6121 configuration have a flat washer under each bolt head

(6) On aircraft without SB 5687, torque bolts 85 to 95 inch-pounds (9.6 to 10.7 N·m). (Figure 201)

(7) On aircraft with Pratt & Whitney SB 5687 or SB 6091 incorporated, torque bolts 100 to 115 inch-pounds (11.3 to 12.9 N·m). (Figure 201)

(8) Remove tools, equipment, loose hardware, spilled fluid and debris from maintenance area.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(9) Remove tag from throttle/thrust reverser levers.

(10) Remove the safety tags and close these circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	32	B1-288	LEFT START VALVE OPEN ADVISORY

WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893 (Continued)

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	32	B1-289	RIGHT START VALVE OPEN ADVISORY

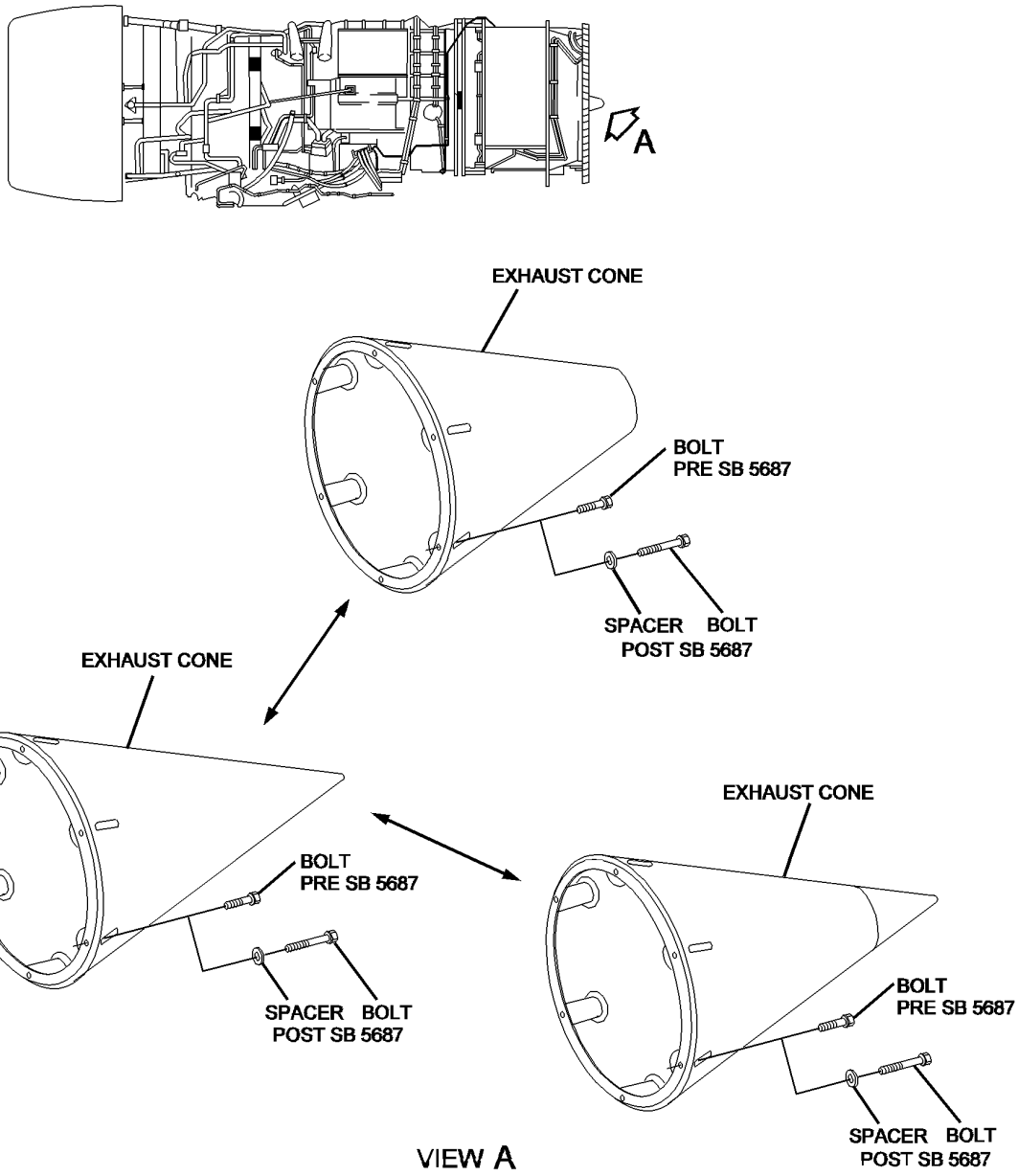
UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(11) Remove lockpin from thrust reverser control valve. Stow lockpin.



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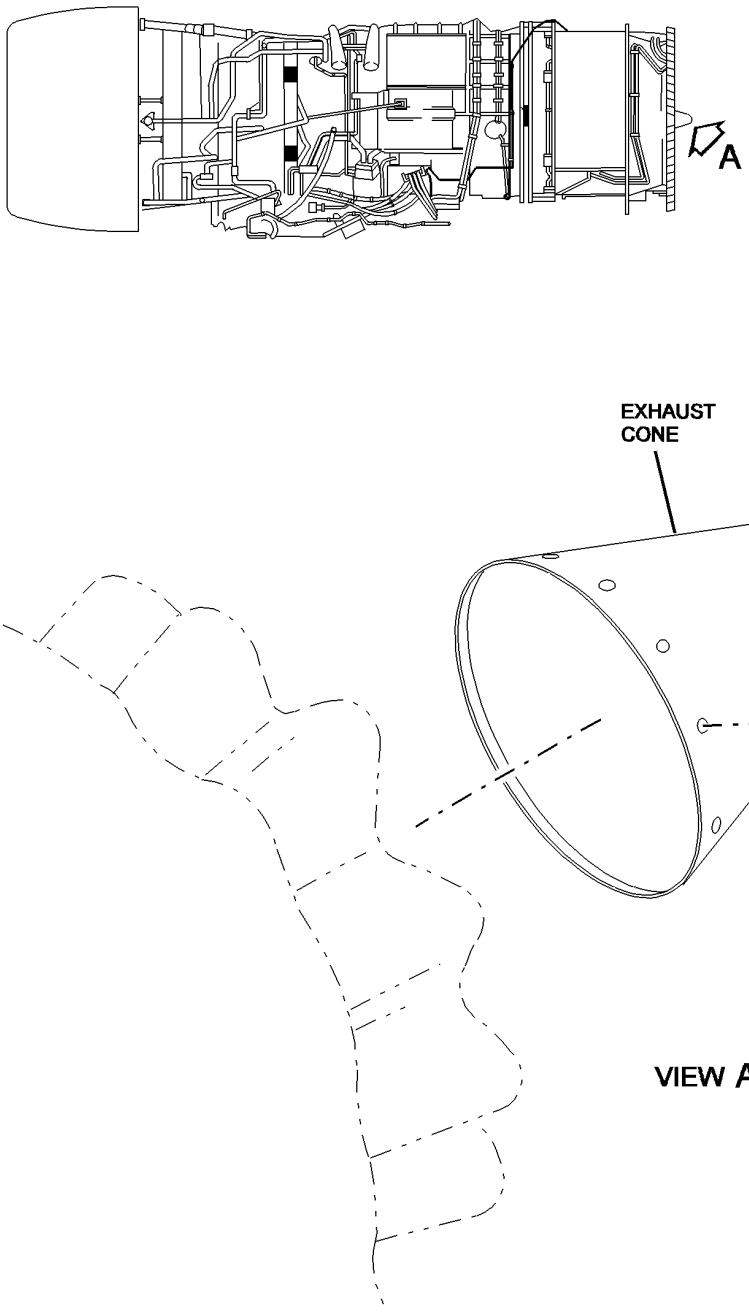
Exhaust Cone -- Removal/Installation
Figure 201/78-10-01-990-801 (Sheet 1 of 2)



Exhaust Cone -- Removal/Installation
Figure 201/78-10-01-990-801 (Sheet 2 of 2)

THRUST REVERSER - DESCRIPTION AND OPERATION

1. General

A. The thrust reverser provides the means during reverse thrust to alter the direction of fan air and exhaust gas flow. Each engine has an identical independent thrust reverser system. This consists of the thrust reverser, thrust reverser control, and thrust reverser indicating system.

B. The thrust reverser is a system mechanically initiated and hydraulically operated by electric and mechanical direction.

C. The thrust reverser control system responds to lever movement at the throttle quadrant, by activating the control valve.

D. The thrust reverser indicating system presents visible evidence in the cockpit of door and door latch positions and low accumulator pressure.

2. Thrust Reverser

A. Description

(1) The thrust reverser system consists of two thrust reverser door actuators, two thrust reverser door latch actuators, two reverser doors, and thrust reverser door actuating linkage.

(2) Thrust Reverser Door Actuator - The thrust reverser door actuator drives the actuating linkage guide carriages for upper and lower reverser doors. A dashpot installed in the forward end of each actuator absorbs energy as the reverser deploys, to prevent damage. The reverser consists of a guide carriage on each side connected through overcenter links to the driver links. A set of idler links complete the four bar linkage.

(a) Two thrust reverser door actuators are installed on each engine thrust reverser. The piston-type actuator is attached to the thrust reverser door actuating linkage through a moveable carriage. Selecting reverse thrust applies hydraulic pressure to the deploy port of the actuator causing the piston to retract and through over-center linkage, deploy the reverser doors. Selecting forward thrust applies hydraulic pressure to the stow port of the piston to stow the reverser doors. The piston actuator incorporates a dashpot consisting of two springs, a variable orifice, and a filter to protect the orifice. The dashpot prevents the reverser doors from forcibly bottoming out in the deployed position.

(3) Thrust Reverser Door Latch Actuator - The thrust reverser door latch actuator is a hydraulically powered safety device that retains the reverser doors in the stowed position if the reverser actuating linkage is moved out of overcenter position. Each latch consists of a door latch and tension spring, striker arm and tension spring, hydraulic actuator, and latch switch.

(a) One thrust reverser door latch actuator is installed at the forward edge of each door. The piston-type actuator is attached to the thrust reverser door latch. Selecting reverse thrust applies hydraulic pressure to the deploy port of the actuator causing the piston to retract and unlatch the doors. Selecting forward thrust applies hydraulic pressure to the stow port of the actuator causing the piston to extend and latch the reverser doors.

(4) Thrust Reverser Doors - The thrust reverser doors are target-type. The doors become the upper and lower aft fairing for the demountable power plant. The doors are hydraulically operated and mechanically controlled.

(5) Thrust Reverser Door Actuating Linkage - The thrust reverser door actuating linkage consists of a guided carriage connected to an overcenter linkage and driver links.

3. Thrust Reverser Control System

A. Description

(1) Thrust reverser control system levers are mounted on the control pedestal in the flight compartment. The levers, one for each engine, are hinged to each throttle lever. The levers are connected to the same clutches and cable systems used by the throttles, but cannot be operated unless the throttles are in the idle position. Each lever has a total travel of 120 degrees (2.09 rad) with the throttle at idle. The thrust reverser control system consists of thrust reverser levers, throttle cable system, control valve, hydraulic accumulator, interlock mechanism and push-pull cable, control valve sector, and flow regulator valve.

(2) Thrust Reverser Hydraulic Accumulator - The thrust reverser hydraulic accumulator provides hydraulic pressure to the actuating cylinders while the doors are stowed and the reverser system is isolated from the aircraft hydraulic system. The accumulator provides sufficient pressure to extend and partially stow the reverser doors. The accumulator is equipped with a pressure gage air filler valve, and a low-pressure warning switch.

(3) Thrust Reverser Interlock Mechanism and Push-Pull Cable - The thrust reverser interlock mechanism and push-pull cable located on the side of the thrust reverser consists of an interlock cam (operated by the guided carriage rod), an interlock crank and cam follower, and a push-pull control cable connected to the interlock crank. The interlock mechanism prevents power from being applied until the thrust reverser doors are fully deployed.

(4) Thrust Reverser Control Valve Sector - The thrust reverser control valve sector is mounted on both sides of the aft pressure bulkhead, connected by a shaft passing through the bulkhead. The sector transfers cable movement from the flight compartment thrust reverser levers (on throttle quad-rant) to actuate the control valve rod.

(5) Thrust Reverser Control Valve - The thrust reverser control valve consists of a mechanically actuated, slide-type, four-way control valve and a solenoid operated, hydraulically piloted slide-type, shutoff valve enclosed in the same housing. The four-way control valve is actuated through mechanical linkage and a cable system by thrust reverser lever travel, on each throttle. The thrust reverser lever is locked out until the throttle is placed in the idle position. The shutoff valve portion of the control valve is spring-loaded to the open position and solenoid actuated to the closed position. Electrical power to the solenoid is controlled by the thrust reverser latch indicator switch, in series with a ground control relay, actuated from the nose gear oleo switches. The ground control relay is normally closed when the nose gear strut is extended. The ground control relay will open and deenergize the solenoid when the nose gear strut is compressed. This allows the thrust reverser accumulator to be charged when the aircraft is on the ground, independent of thrust reverser position. When performing ground maintenance near the reverser doors, the valve should be manually placed in the dump position to render the doors inoperative.

(a) A check valve is incorporated in the system pressure port of the thrust reverser control valve. The check valve will prevent loss of accumulator pressure if system failure occurs upstream of the control valve, with the control valve open. A check valve is installed in the return line of the control valve and functions to prevent hydraulic surges from acting on the thrust reverser hydraulic system.

(6) Thrust Reverser Flow Regulator Valve - A thrust reverser flow regulator valve is installed in the stow pressure line on the firewall, forward of each thrust reverser door actuator. In the event of inadvertent thrust reverser deployment in flight the valve prevents pressure surge by limiting the pressure flow to the thrust reverser door actuator at 1500 psi (10342 kPa).

B. Operation

(1) When the throttles are in idle position and hydraulic pres-sure is applied to the aircraft, lifting the thrust reverser lever through the first 75 degrees (1.31 rad) actuates the thrust reverser control valve and retracts the door latch. The amber ENG REVERSE UNLOCK light comes on indicating the doors are unlatched. The four-way portion of the control valve moves to deploy and the accumulator and pressure ports are connected to the deploy port, releasing the interlock and moving the doors to deployed position. The blue ENG REVERSE THRUST light comes on. The sequence is completed in approximately 2 seconds.

(2) Placing the thrust reverser lever in the full forward position actuates the thrust reverser control valve and engages the interlock. The four-way portion of the control valve moves to the stow position, connecting the deploy port to return. The accumulator and pressure ports are connected to the stow port. The thrust reverser door actuator drives the doors to the stowed position in approximately 2 seconds. The blue ENG REVERSE THRUST light goes off before doors are half closed. As the door latch engages, the amber ENG REVERSE UNLOCK light goes off. Accumulator pressure retains the doors in the stowed position.

(3) While the aircraft is in flight, the shutoff portion of the control valve isolates aircraft system pressure from the thrust reverser door actuators and latch actuators after the latch has closed, isolating the thrust reverser hydraulic system from the aircraft hydraulic system. While isolated, the accumulator pressure is ported to the stow side of the door and latch actuators. However, normal thrust reverser deployment in flight is possible. Isolating the thrust reverser hydraulic system from the aircraft hydraulic system is accomplished through actuation of the ground control relay, in series with lower door latch switch supplying electrical power to thrust reverser isolation valve solenoid.

(4) Ground maintenance may be performed only after the system has been placed in a safe condition. This may be accomplished with the doors stowed or deployed, as desired by manually placing the control valve lever in the dump position and installing the lockpin. When the doors are stowed or deployed, the shutoff portion of the control valve blocks system pressure.

4. Thrust Reverser Indicating System

A. Description

(1) The thrust reverser indicating system for each engine thrust reverser consists of a thrust reverser accumulator low-pressure warning switch, mounted next to the thrust reverser hydraulic accumulator; a thrust reverser position indicator switch mounted on the thrust reverser interlock mechanism; two thrust reverser latch indicator switches, one mounted to the upper and one mounted to the lower thrust reverser door latch. These switches connected to indicator lights in the flight compartment provide the necessary information to the flight crew for thrust reverser operation.

(a) Thrust Reverser Accumulator Low-Pressure Warning Switch - A thrust reverser accumulator low-pressure warning switch is installed on each side of the fuselage aft of the pres-sure bulkhead, next to the thrust reverser hydraulic accumulator. The switch actuates an amber light (REVERSER ACCUMULATOR LOW) located on the overhead annunciator panel in the flight compartment. The switch settings are 2000 psi (13790 kPa) increasing and 1725 psi (11893 kPa) decreasing.

(b) Thrust Reverser Position Indicator Switch - The thrust reverser position indicator switch is mounted on the interlock mechanism. The switch actuates a blue light (ENG REVERSE THRUST) located on the center instrument panel in the flight compartment which indicates that the thrust reverser doors are in the extended (deployed) position.

(c) Thrust Reverser Latch Indicator Switch - The thrust reverser latch indicator switches are mounted to the upper and lower thrust reverser door latches. The switches actuate an amber light (ENG REVERSE UNLOCK) located on the center instrument panel in the flight compartment which indicates latches are not latched.

B. Operation

(1) Lifting the thrust reverser lever actuates the thrust reverser control valve which moves to connect hydraulic pressure to the thrust reverser door latch actuators, opening the latches. The thrust reverser doors unlock and the amber ENG REVERSE UNLOCK light will come on. The thrust reverser door actuators drive the thrust reverser doors to the deployed position. The blue ENG REVERSE THRUST indicating light will come on and the interlock will be released.

THRUST REVERSER - TROUBLE SHOOTING

1. General

A. The following trouble shooting procedures cover the entire thrust reverser system.

B. The thrust reverser indicating components are powered by 28-volts dc.

C. At the completion of trouble shooting procedures the thrust reverser system should be tested for proper operation.

2. Trouble Shooting Thrust Reverser

WARNING: MAKE CERTAIN THAT ALL PERSONNEL ARE CLEAR OF REVERSER DOORS BEFORE DEPLOYING OR STOWING DOORS. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

A. THRUST REVERSER INOPERATIVE (DOORS WILL NOT DEPLOY, AMBER ENG REVERSE UNLOCK, BLUE ENG REVERSE THRUST, AMBER REVERSER ACCUMULATOR LOW LIGHTS OFF)

Table 101

Possible Causes		Isolation Procedure	Correction
(1)	Control pedestal upper or lower shaft jammed	Remove control pedestal side panels.	
		Check for damaged or missing parts.	Replace damaged or missing parts (LEVER SUPPORT SHAFT - MAINTENANCE PRACTICES, PAGEBLOCK 76-10-01/201 and SECTOR SUPPORT SHAFT - MAINTENANCE PRACTICES, PAGEBLOCK 76-10-02/201)
(2)	Thrust reverser control valve sector jammed	Check control valve sector for damaged or missing parts.	Replace damaged or missing parts. Check rigging. (THRUST REVERSER CONTROL VALVE SECTOR - MAINTENANCE PRACTICES, PAGEBLOCK 78-31-03/201)

B. THRUST REVERSER INOPERATIVE (DOORS WILL NOT DEPLOY, AMBER ENG REVERSE UNLOCK LIGHT ON, AND AMBER REVERSER ACCUMULATOR LOW LIGHT OFF)

Table 102

Possible Causes		Isolation Procedure	Correction
(1)	Thrust reverser control valve defective (jammed in stow position)	Disconnect control push rod from thrust reverser control valve.	
		Cycle control valve arm manually from stow to extend.	

Table 102 (Continued)

Possible Causes		Isolation Procedure	Correction
		Valve arm should move freely.	If valve arm binds, replace valve.
(2)	Thrust reverser push-pull cable defective	Check thrust reverser push-pull cable.	Replace cable, check rigging. (THRUST REVERSER INTERLOCK MECHANISM AND PUSH-PULL CABLE MAINTENANCE PRACTICES, PAGEBLOCK 78-31-02/201)
(3)	Thrust reverser control valve sector defective	Check control valve sector for damaged or missing parts.	Replace damaged or missing parts, check rigging. (THRUST REVERSER CONTROL VALVE SECTOR - MAINTENANCE PRACTICES, PAGEBLOCK 78-31-03/201)
(4)	Thrust reverser control valve mechanism defective	Check control valve mechanism for damaged or broken parts.	Replace damaged or missing parts.
(5)	Thrust reverser driver links or overcenter linkage jammed	Check driver links and overcenter linkage for foreign object or damaged parts.	Remove foreign objects, replace damaged parts.
(6)	Thrust reverser door actuator defective	Check actuator for broken or damaged parts.	Replace actuator. (THRUST REVERSER DOOR ACTUATOR - MAINTENANCE PRACTICES, PAGEBLOCK 78-30-02/201)

C. THRUST REVERSER INOPERATIVE (DOORS WILL NOT DEPLOY, AMBER REVERSER ACCUMULATOR LOW AND AMBER ENG REVERSE UNLOCK LIGHTS ON)

Possible Causes		Isolation Procedure	Correction
(1)	Thrust reverser hydraulic system pressure low	Check thrust reverser control valve for leakage or defective hydraulic lines.	Replace or repair valve and lines as required.
		Check thrust reverser hydraulic accumulator for leakage or defective hydraulic lines.	Replace or repair accumulator or lines as required.
		Check thrust reverser door actuator for leakage or defective hydraulic lines.	Replace or repair actuator and lines as required.

D. THRUST REVERSER INOPERATIVE (DOORS WILL NOT STOW, AMBER ENG REVERSE UNLOCK AND BLUE ENG REVERSE THRUST LIGHT ON, AMBER REVERSER ACCUMULATOR LOW LIGHT OFF)

Table 103

Possible Causes		Isolation Procedure	Correction
(1)	Thrust reverser push-pull cable defective	Check thrust reverser push-pull cable .	Replace or repair cable as required, check rigging. (THRUST REVERSER INTERLOCK MECHANISM AND PUSH-PULL CABLE MAINTENANCE PRACTICES, PAGEBLOCK 78-31-02/201)
(2)	Thrust reverser interlock mechanism broken or jammed in reverse position	Check thrust reverser interlock linkage between guide carriage and interlock cam for damaged or missing parts.	Replace damaged or missing parts and check interlock rigging. (THRUST REVERSER INTERLOCK MECHANISM AND PUSH-PULL CABLE MAINTENANCE PRACTICES, PAGEBLOCK 78-31-02/201)

E. THRUST REVERSER INOPERATIVE (DOORS WILL NOT STOW, AMBER ENG REVERSE UNLOCK LIGHT ON, AMBER REVERSER ACCUMULATOR LOW AND BLUE ENG REVERSE THRUST LIGHTS OFF)

Possible Causes		Isolation Procedures	Correction
(1)	Thrust reverser control valve sector jammed	Reference condition A., step (2)	
(2)	Thrust reverser control valve defective (jammed in extend position)	Reference condition B., step (1)	
(3)	Thrust reverser push-pull cable broken	Reference condition D., step (1).	

F. THRUST REVERSER INOPERATIVE (DOORS WILL NOT STOW, AMBER ENG REVERSE UNLOCK, AMBER REVERSER ACCUMULATOR LOW, AND BLUE ENG REVERSE THRUST LIGHTS ON)

Possible Causes		Isolation Procedures	Correction
(1)	Thrust reverser control valve defective	Reference condition B., step (1).	
(2)	Thrust reverser hydraulic system pressure low	Reference condition C., step (1).	
(3)	Thrust reverser driver links or overcenter linkage damaged or jammed	Reference condition B., step (5).	
(4)	Thrust reverser door actuator defective	Reference condition B., step (6).	

G. THRUST REVERSER INOPERATIVE (DOORS DO NOT STOW, AMBER ENG REVERSE UNLOCK AND BLUE ENG REVERSE THRUST LIGHTS ON, REVERSER ACCUMULATOR LOW LIGHT OFF, REVERSER ACCUMULATOR GAGE READS BELOW 950 PSI (6549 KPA))

Table 104

Possible Causes		Isolation Procedure	Correction
(1)	Thrust reverser accumulator low-pressure warning switch amber indicating light burned out	Press warning/caution lights test switch located on overhead panel.	Replace lamp.
(2)	Thrust reverser accumulator low-pressure warning switch defective	Disconnect electrical connector from pressure switch.	
		Check for 28 vdc between ground and power pin A.	If power exists at check points, replace switch.
		If no power reference condition I., step (3).	
(3)	Thrust reverser hydraulic system pressure low	Reference condition C., step (1).	

H. THRUST REVERSER DOORS TAKE ABNORMAL TIME TO STOW AND DEPLOY (NORMAL TIME IS APPROXIMATELY 2 SECONDS)

Table 105

Possible Causes		Isolation Procedure	Correction
(1)	Thrust reverser system out of rig		Check thrust reverser door actuating linkage. (THRUST REVERSER DOOR ACTUATING LINKAGE - MAINTENANCE PRACTICES, PAGEBLOCK 78-30-05/201)

I. NO AMBER ENG REVERSE UNLOCK LIGHT WITH THRUST REVERSE LEVER IN REVERSE THRUST POSITION (BLUE ENG REVERSE THRUST LIGHT OFF)

Possible Causes		Isolation Procedure	Correction
(1)	Thrust reverser latch indicator switch amber indicating light burned out	Press light test switch.	Replace lamp.
(2)	Thrust reverser latch indicator switch defective	Disconnect electrical connector from switch.	
		Check for 28 vdc between power pins B and C.	If power exists at check point, replace switch.
		If no power, reference step (3)	
(3)	System wiring defective	Check system wiring for open circuit, wire to wire, or wire to ground short circuit	Repair wiring.
(4)	Latch out of rig		Check latch rigging. (THRUST REVERSER DOOR ACTUATING LINKAGE - MAINTENANCE PRACTICES, PAGEBLOCK 78-30-05/201)

J. NO BLUE ENG REVERSE THRUST LIGHT WITH THRUST REVERSER LEVER IN REVERSE DETENT POSITION (AMBER ENG REVERSE UNLOCK LIGHT

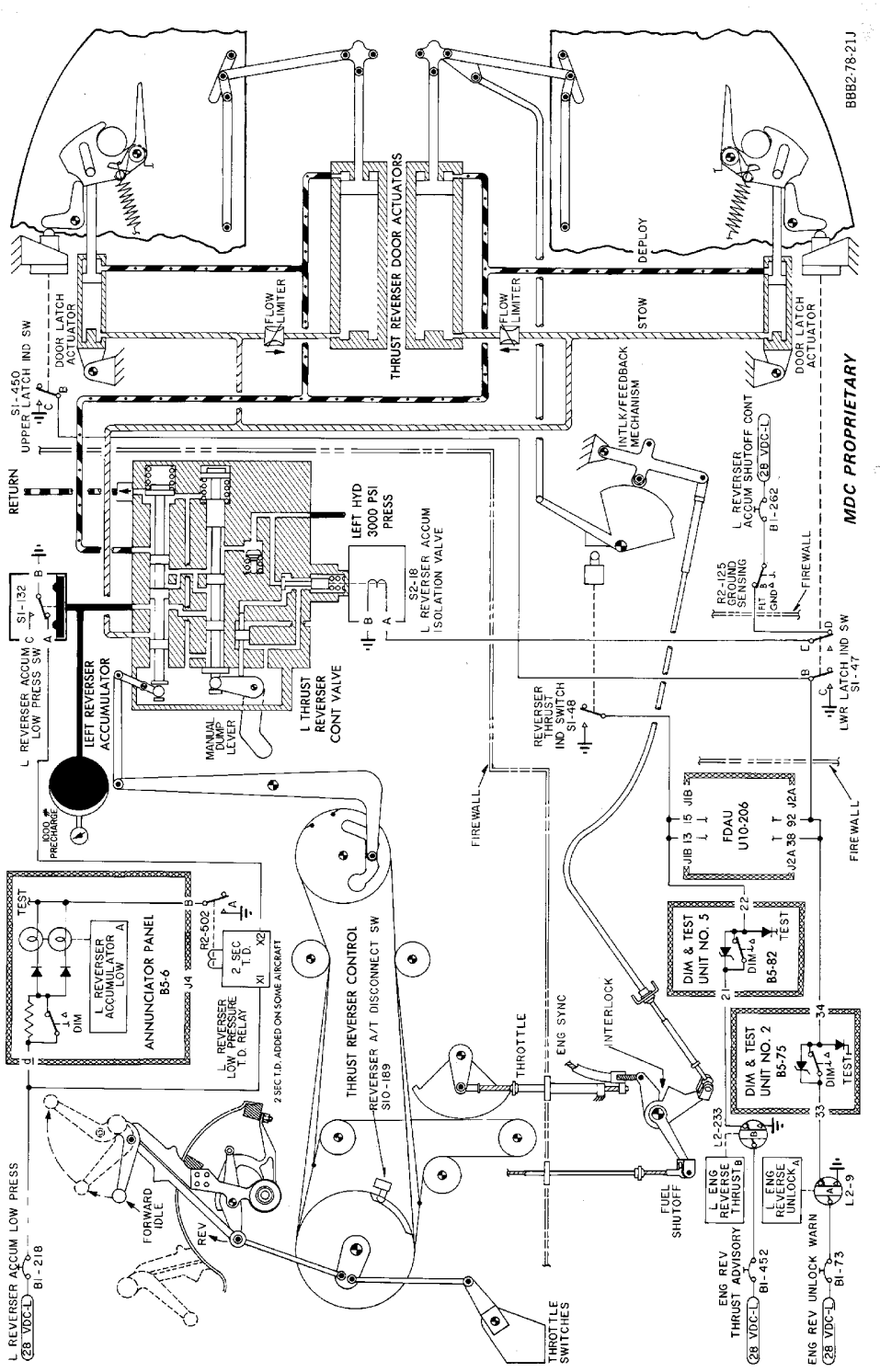
Table 106

Possible Causes		Isolation Procedure	Correction
(1)	Thrust reverser position indi- cator switch blue indicating light burned out	Press light test switch.	Replace lamp.
(2)	Thrust reverser position indi- cator switch defective	Disconnect electrical connector from switch	
		Check for 28 vdc between power pins B and C.	
		If no power, reference condition I., step (3).	

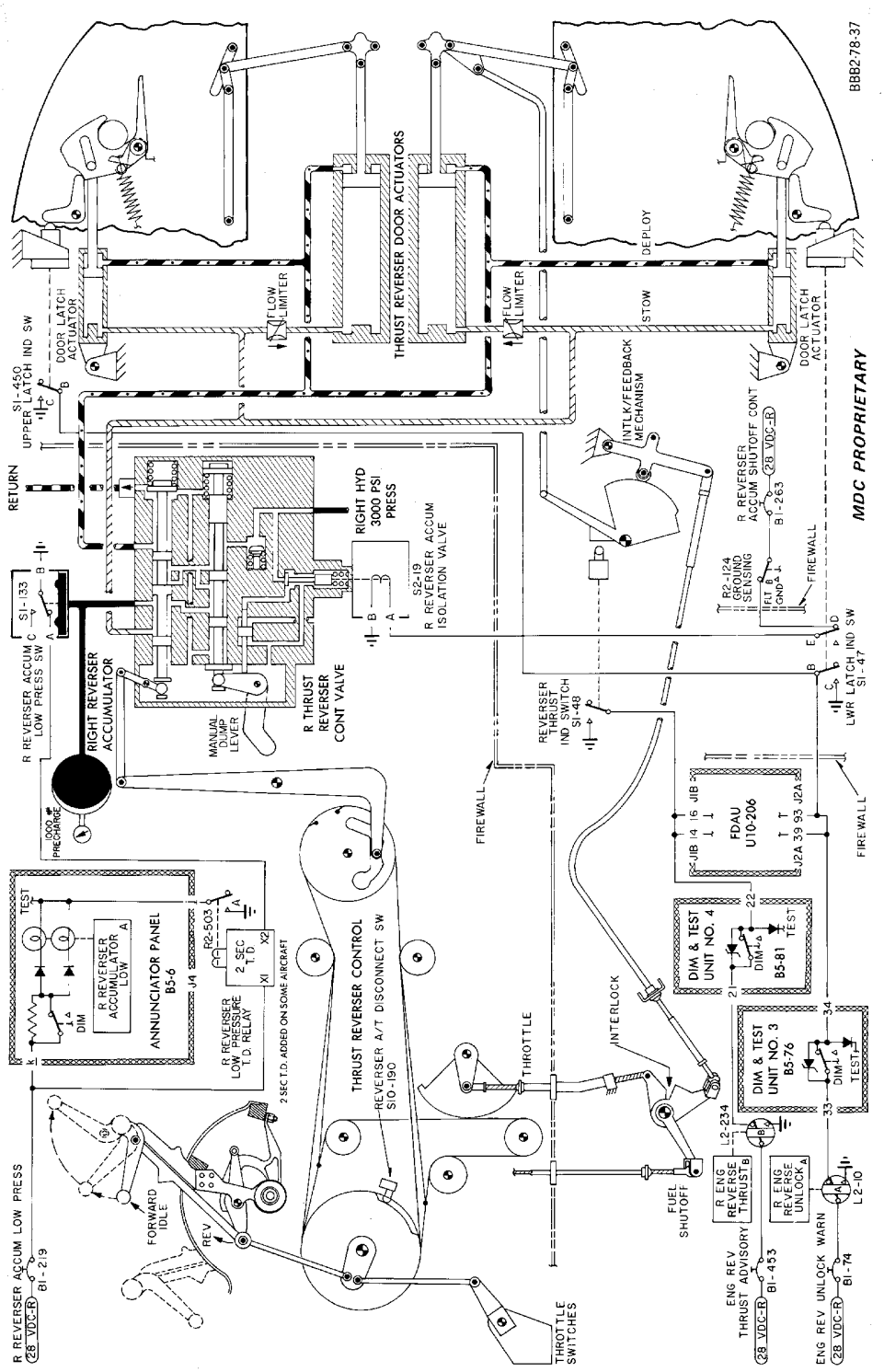
K. AMBER ENG REVERSE UNLOCK AND BLUE ENG REVERSE THRUST LIGHTS ON, REVERSER STOWED (LINKAGE IN OVERCENTER POSITION)

Table 107

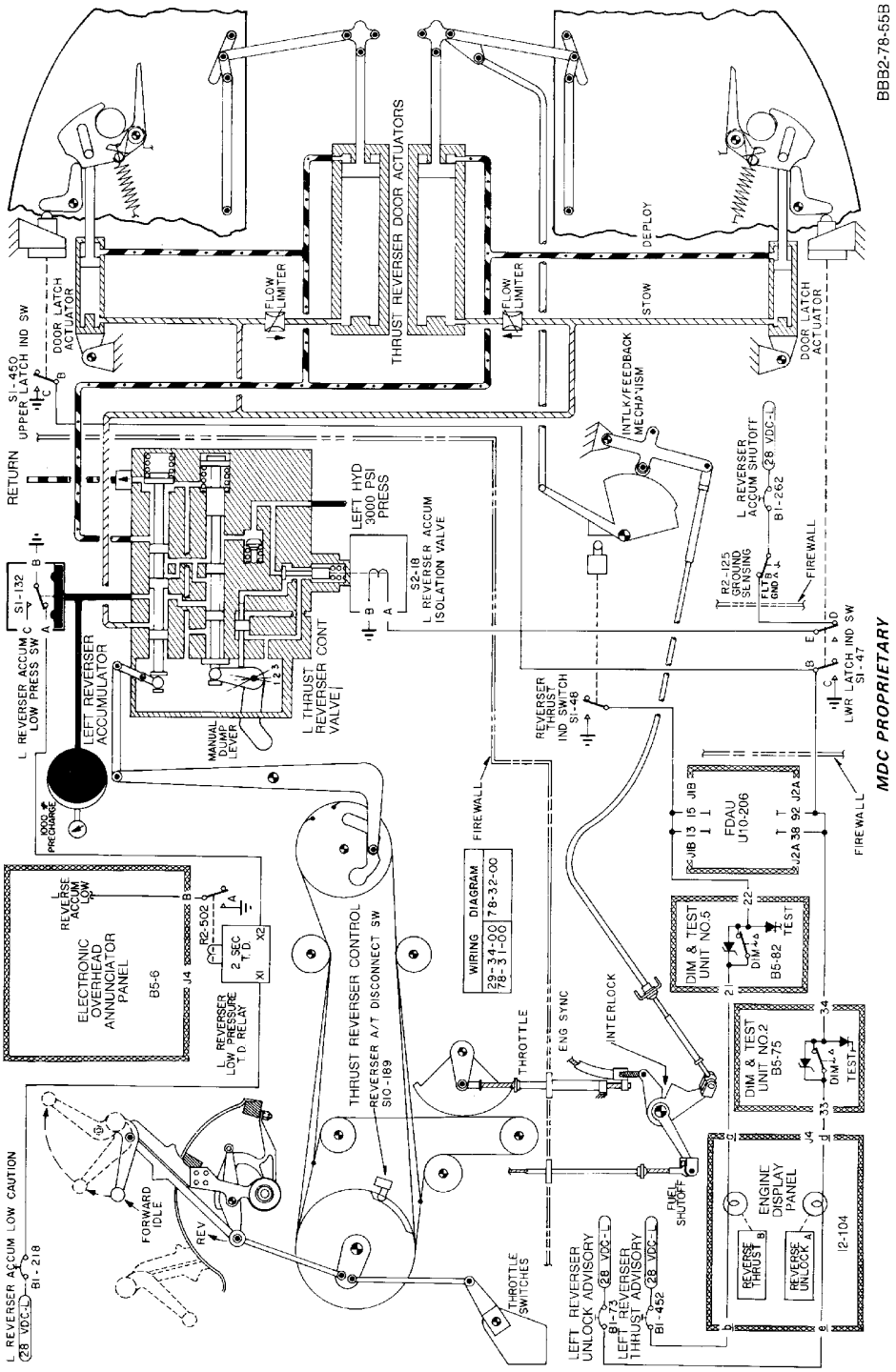
Possible Causes		Isolation Procedure	Correction
(1)	Latch out of rig	Reference condition I., step (4).	
(2)	Thrust reverser latch indicator switch defective	Disconnect electrical connector from switch.	If indicating light goes out, replace switch.
		If indicating light remains on, reference condition I., step (3).	



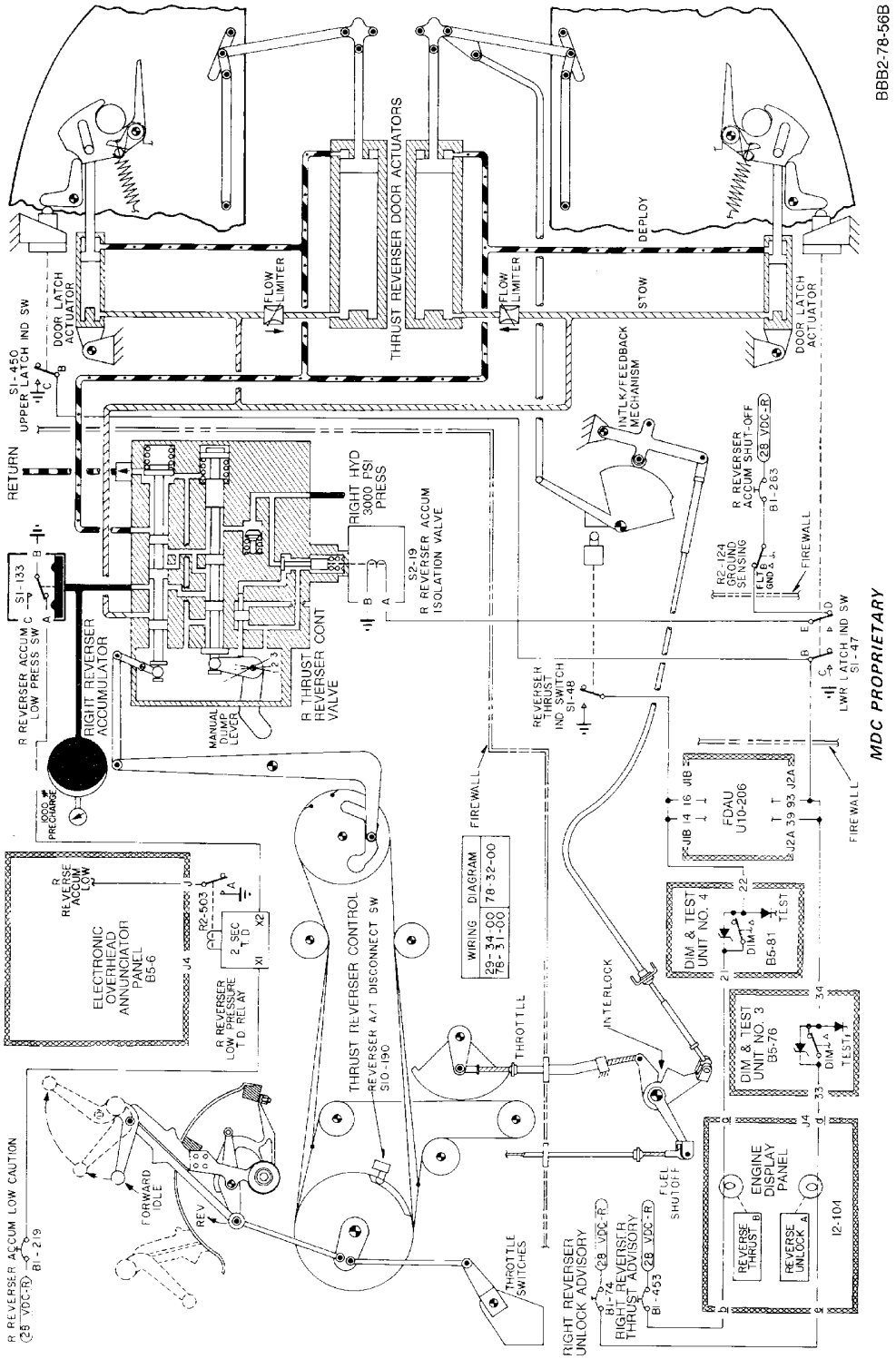
Left Thrust Reverser -- Schematic
Figure 101/78-30-00-990-804



Right Thrust Reverser -- Schematic
Figure 102/78-30-00-990-805



Left Thrust Reverser -- Schematic
Figure 103/78-30-00-990-808



Right Thrust Reverser -- Schematic
Figure 104/78-30-00-990-809

THRUST REVERSER - ADJUSTMENT/TEST

1. General

A. This maintenance practice provides adjustment/test instructions for the thrust reverser.

B. When installing rig pins, the cable turnbuckles must be differentially adjusted to permit free installation of the pins during test procedures. If any force is required to remove or install the rig pin, the cable turnbuckles, linkage rod ends, or clevis ends must be readjusted to eliminate the binding.

NOTE: Push-pull control cable has a flat internal sliding ribbon and will bend in one direction only.

CAUTION: USE EXTREME CARE WHEN WORKING WITH ENGINE PUSH-PULL CABLES. DO NOT BEND CABLE IN RADIUS SMALLER THAN 7-INCHES (177.8 MM) MINIMUM OR DAMAGE TO CABLE WILL RESULT.

C. Immediately after the adjustment/test procedure is complete, check that all rig pins have been removed and that all applicable components have been safetied.

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION.

D. All control cables are adjusted with the reverser system stowed; before beginning adjustment procedures, manually place the thrust reverser control valve in the dump position and install the lockpin.

E. The numbers and letters enclosed by the hexagon shaped symbol shown in adjustment diagrams correspond to cable run numbers and segments listed at the end of this section. Each cable run number is posted adjacent to the corresponding cable in the aircraft.

F. To determine if the thrust reverser pressure system will hold pressure without the main hydraulic system being pressurized, refer to Paragraph 5..

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

G. Access to engine area coutrol cables and thrust reverser components is through upper and lower cowl doors.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 501

Name and Number	Manufacturer
Inconel Lockwire 0.032 in, NASM20995N32, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.032 in NASM20995C32, DPM 5865	Not Specified
Pull scale (0 to 30 pounds range)	
Rig pin (4-2) 1/4 by 2 5/8 inches two (2) required	
Rigging aid (R-19) 1/4 by 2 7/16 inches	
Rigging aid (R-24) 15/32 by 4 inches	
Rig pin (4-3) 1/4 by 3 5/8 inches two (2) required	
Rigging aid (R-37) (Figure 501 (Sheet 3))	
Tensiometer (0 to 50 pounds range)	
Compound/Sealing/ Anti-Tamper EC-1252 DPM 570	Minnesota Mining & Mfg. Co. Los Angeles, CA.
NOTE: Rig pin sizes are in inches (diameter X length; length = grip plus 5/8 inch) (15.88 mm.)	

3. **Adjustment/Test Thrust Reverser**

A. Adjust Engine Cable Section, Interlock (Figure 501)

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(2) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

(3) Open engine cowl doors.

(4) Open access door (5901C) for left engine and (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(5) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(6) Check that thrust reverser doors are fully stowed.

NOTE: Thrust reverser door stowed position can be checked by looking outboard through opening in reverser stang fairing assembly.

(7) Check that point at which overcenter link is attached to guide carriage is overcenter and aft of driver link attachment.

(8) Check engine cross shaft to fuel control pushrod as follows:

(a) Rotate power control pushrod to idle and install rigging aid (R-37) in fuel idle slot provided between power arm and power control crank arm index plate.

(b) Insert rig pin (4-2) in rig pin hole (R-17) in power control crank; if rig pin can be freely installed, no adjustment is necessary. If rig pin cannot be freely installed, adjust pushrod as necessary. (THROTTLE SYSTEMS, SUBJECT 76-11-00, Page 501)

(c) Remove rig pin (4-2) and rigging aid (R-37).

CAUTION: FOLLOW SEQUENCE OF OPERATIONS, TO PREVENT DAMAGE TO THRUST REVERSER SYSTEM.

CAUTION: RESTRAIN FEEDBACK CABLE WHEN DISCONNECTING FEEDBACK CONTROL LINK OR GEARBOX OVERBOARD DRAIN TUBE MAY BE DAMAGED.

(9) Disconnect feedback control link from interlock control cam.

(10) Rotate interlock control cam to engage switch. Check that switch travel is free from binding.

(11) Rotate interlock control cam until rigging aid (R-19) can be inserted in rig pin hole (R-19) through cam and interlock mechanism.

(12) Adjust rod end of feedback control link until bolt can be freely inserted in attach hole of interlock control cam and feedback control link. Check rod end witness holes to ensure sufficient link engagement.

(13) Install bolt connecting feedback control link to interlock control cam. Safety nut with cotter pin.

(14) Restrain rod end and tighten jamnut. Safety feedback control link and jamnut with lockwire. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(15) Compress interlock push-pull control cable telescopic spring tube at engine cross shaft and retain in this position with lockwire. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(16) Disconnect interlock push-pull control cable forward rod end from idler crank at engine cross shaft.

(17) Install rig pin (4-2) in rig pin hole (R-17) in power control crank on right side of engine cross shaft.

(18) Install rigging aid (R-24) between reverser power stop interlock stop at engine cross shaft. Hold firmly in place.

(19) Rotate interlock control crank until cam follower is against interlock control cam. Hold firmly in place.

(20) Remove lockwire from telescopic spring tube.

(21) Adjust interlock cable forward rod end until connecting bolt can be freely installed. Check rod end witness holes to ensure sufficient cable engagement.

(22) Install bolt connecting interlock push-pull control cable to idler crank. Safety nut with cotter pin.

(23) Restrain rod end and tighten jamnut. Safety interlock push-pull control jamnut with lockwire. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(24) Remove rig pin (4-2) from rig pin hole (R-17) and rigging aids (R-19) and (R-24).

(25) Move thrust reverser lever to position where reverse idle roller drops into reverse idle detent. (Figure 501, View D-D)

(26) Position reverse idle detent cam so that there is 0.060(±0.010) inch (1.52(±.254) mm) gap between interlock stop and reverser power stop on control crank when the roller is in detent by loosening link bolt on thrust reverser control valve sector.

(27) Tighten link bolt to nearest serration.

(28) Move thrust reverser lever to forward idle (stow) position.

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOOR IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(29) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(30) Close access door (5901C) for left engine or (5902C) for right engine.

(31) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(32) Place thrust reverser lever in reverse thrust (deploy) position.

NOTE: Reverse thrust (deploy) position is reached when reverse idle roller drops into reverse idle detent.

(33) Check that thrust reverser doors move to reverse thrust (deploy) position.

(34) Place thrust reverser lever in forward thrust (stow) position.

(35) Check that thrust reverser doors move to forward thrust (stow) position and latch.

(36) Install rig pin (4-2) and rigging aids (R-19) and (R-24); binding of any rig pin or aid will require adjustment of that portion of linkage.

(37) Remove rig pin (4-2) and rigging aids (R-19) and (R-24).

(38) Cycle thrust reverser to reverse thrust (deploy) and forward thrust (stow) position and check indicator lights and doors for proper operation as follows:

NOTE: Reverse thrust deploy position is reached when reverse idle roller drops into reverse idle detent.

(a) Amber (ENG REVERSE UNLOCK) indicating light comes on when thrust reverser door latch actuators unlatch, and remains on while reverser is in transit beyond latched position.

NOTE: The amber (ENG REVERSE UNLOCK) and blue (ENG REVERSE THRUST) lights are located on the center instrument panel in the flight compartment.

(b) Amber (ENG REVERSE UNLOCK) indicating light is on, blue (ENG REVERSE THRUST) indicating light comes on when thrust reverser reaches reverse thrust (deploy) position.

(c) Blue (ENG REVERSE THRUST) indicating light goes off as thrust reverser moves from reverse thrust position.

(d) Amber (ENG REVERSE UNLOCK) indicating light goes off when thrust reverser reaches forward thrust (stow) position and door latch actuators latch.

(39) Place thrust reverser lever in forward thrust (stow) position.

(40) Check that amber (ENG REVERSE UNLOCK) and blue (ENG REVERSE THRUST) indicating lights go off.

(41) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(42) Close engine cowl doors.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(43) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

B. Adjust Fuselage Cables (Figure 501)

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(2) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

I (3) Open access door (5901C) for left engine and (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(4) Place thrust reverser control valve in dump position and install lockpin (PAGEBLOCK 78-00-00/201).

(5) Slowly move throttle/thrust reverser lever full forward and back to idle position. When throttle/thrust reverser lever is released it will move slightly away from idle stop. This is rig position.

(6) Loosen thrust reverser bridle cables 259 and 260, A and B, for left engine or 261 and 262, A and B, for right engine.

NOTE: Thrust reverser bridle cable turnbuckles are accessible through ceiling access panels 5732C and 5735C in aft cargo compartment.

(7) Adjust thrust reverser cable tension as follows:

NOTE: Thrust reverser cable turnbuckles are accessible through ceiling access panels 5154C and 5156C in forward cargo compartment and through ceiling access panels 5730C and 5732C in aft cargo compartment. Thrust reverser control valve drums are accessible through access panels 5703C and 5718C in aft cargo compartment.

CAUTION: PROPER CABLE ROUTING IS NECESSARY TO MAINTAIN CORRECT CABLE SYSTEM OPERATION AND PREVENT DAMAGE TO THE APPLICABLE AIRCRAFT CONTROL SYSTEM.

(8) At sta Y=101.550, make sure that cable 47A does not touch the center lug of cable pulley bracket on the forward side of structure at this station.

(9) Do a check of all new cable installations for correct routing over pulleys and cable guard installations.

(10) New cables must be rigged to double maximum rig load system cycled a minimum of five times, and cable tension then reduced to maximum cable rig load. (Figure 502)

NOTE: Doubling tension and cycling new cables is intended to stretch cable and help maintain proper cable tension.

(11) Adjust thrust reverser bridle cables 259 A & B and 260 A & B or 261 A & B and 262 A & B until tension on throttle cables 49C and 50C, or 53C and 54C is 5.0(±1.0) pounds (2.28(±0.45) kg less measured aft of bridle cable splice than it is measured forward of bridle cable splice.

NOTE: This step minimizes rig load on bridle cables by rigging them to approximately 5.0 pounds (2.28 kg) tension. Since cable tensiometers will not read this low, bridle cable tension is obtained by checking tension on throttle cables.

(12) Safety turnbuckles as required.

WARNING: ANTI-TAMPER SEALING COMPOUND IS AN AGENT THAT IS FLAMMABLE, EXPLOSIVE, POISONOUS, AND AN IRRITANT. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN ANTI-TAMPER SEALING COMPOUND IS USED.

- GAS/AIR MIXTURES MORE THAN THE LOWER EXPLOSIVE LIMIT (LEL) CAN CAUSE AN EXPLOSION IF HIGH HEAT, SPARKS, OR FLAMES SUPPLY IGNITION.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET ANTI-TAMPER SEALING COMPOUND IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

(WARNING PRECEDES)

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(a) Check safety wiring at bridle cable connecting fittings to be parallel to the cable and apply compound/anti-tamper EC-1252 to make sure that safety wiring does not hookup with neighbor cable safety wiring. (Figure 501)

(13) Remove all clamps and rig pins.

(14) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(15) Perform thrust reverser test. (Paragraph 3.)

C. Adjust Thrust Reverser Control Valve Pushrod

(1) Disconnect control valve pushrod from control valve sector cam link.

(2) Install rig pin (4-3) in rig pin hole (R-34) in thrust reverser control valve arm.

(3) Position thrust reverser control valve cam sector by setting throttle/thrust reverser lever fuel forward and back to idle position. When throttle/thrust reverser lever is released, it will move slightly away from idle stop. This is rig position.

(4) Hold cam sector and valve sector in place, rotate sector arm toward control valve arm bringing cam roller into contact with cam surface . Hold in this position. (Figure 501, View D-D)

(5) Adjust control valve pushrod until bolt can be freely inserted in attach hole of control valve pushrod and sector arm.

(6) Install bolt and safety nut with cotter pin. Safety bolt head to sector arm with lockwire. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(7) Remove rig pin (4-3) from rig pin hole (R-34).

D. Test Thrust Reverser

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARD-LESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(1) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

CAUTION: APPLICATION OF HYDRAULIC PRESSURE MUST BE WITH THRUST REVERSER LEVER IN FORWARD THRUST (STOW) POSITION. DO NOT PLACE THRUST REVERSER LEVER IN REVERSE THRUST (DEPLOY) POSITION FIRST OR GUIDE RODS WILL BE DAMAGED.

(2) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(3) Place throttle and thrust reverser levers in idle position (throttle against pedestal aft stop and thrust reverser lever fully down).

(4) Move throttle thrust reverser lever fully forward and observe following:

(a) Thrust reverser control valve arm remains in stowed position.

(b) Power control arm moves to full forward thrust position prior to or concurrent with throttle lever hitting against pedestal.

NOTE: Power control arm is in full forward thrust position when idle rigging slot and maximum forward power slot align.

(5) Move throttle/thrust reverser lever aft to idle position.

(6) Raise reverse thrust lever and check to see that reverser control valve arm has moved to extend position prior to rollers dropping into reverse idle detent.

(7) Cycle thrust reverser lever to reverse thrust (deploy) and forward thrust (stow) position and check indicator lights and doors for proper operation as follows:

NOTE: Reverse thrust deploy position is reached when reverse idle roller drops into reverse idle detent.

(a) Amber (ENG REVERSE UNLOCK) indicating light comes on when thrust reverser door latch actuators unlatch, and remains on while reverser is in transit beyond latched position.

NOTE: The amber (ENG REVERSE UNLOCK) and blue (ENG REVERSE THRUST) lights are located on the center instrument panel in the flight compartment.

(b) Amber (ENG REVERSE UNLOCK) indicating light is on, blue (ENG REVERSE THRUST) indicating light comes on when thrust reverser reaches reverse thrust (deploy) position.

(c) Blue (ENG REVERSE THRUST) indicating light goes off as thrust reverser moves from reverse thrust position.

(d) Amber (ENG REVERSE UNLOCK) indicating light goes off when thrust reverser reaches forward thrust (stow) position and door latch actuators latch.

(8) Place thrust reverser lever in forward thrust (stow) position.

(9) Move thrust reverser lever to reverse thrust (deploy) position and check following:

(a) Reverser doors fully extend.

(b) Rig aid (R-37) can be installed in fuel control maximum reverse power slot prior to or concurrent with thrust reverser lever moving to full reverse thrust position. (Figure 501, View J)

NOTE: Power control arm is in full reverse thrust position when idle rigging slot and maximum reverse power slot align.

(c) Hold thrust reverser lever with interlock crank against stop screw then release thrust reverser lever. Check for 0.015 inch (0.38 mm) minimum clearance between reverse power stops on power control arm index plate.

(10) If requirement of steps (9)(a) thru (9)(c) cannot be met, control valve bracket may be adjusted as follows:

(a) Make certain thrust reverser control valve drum in position as shown in Figure 501), View N-N or P-P.

(b) Remove nut and loosen clamp bolt on control valve bracket.

(c) Slide bracket off shaft of drum. Rotate bracket counter-clockwise for right hand side allowing rotation of bracket not to exceed one serration from index marks. Rotate bracket clockwise for left hand side allowing rotation of bracket not to exceed one serration from index marks.

NOTE: After adjusting bracket on shaft of drum, the index marks will not align. This is acceptable.

NOTE: Rig pin holes at R-31 should be within 1.00 inch (25.40 mm) of alignment when the throttle is at idle (Paragraph 3.B.(5)). If this dimension is exceeded, the fuselage cable rigging and bracket to drum alignment should be rechecked.

(d) Install bracket in shaft, tighten clamp bolt and install washer and nut. Safety nut with cotter pin.

(e) Check reverse idle detent per Paragraph 3.A.(25) thru Paragraph 3.A.(27).

(f) Check maximum reverse power per step (9)(a) thru (9)(c).

NOTE: In addition to adjusting bracket, control valve pushrod may be lengthened in 1/2 turn increments not to exceed one turn. If control valve pushrod is adjusted, rig pin will no longer fit in rig pin hole (R-34). This is acceptable.

(11) Move thrust reverser lever to forward thrust (stow) position and check following:

(a) Reverser doors fully stow with overcenter linkage in overcenter position.

(b) Blue (ENG REVERSE THRUST) indicating light goes off as thrust reverser moves from reverse thrust position. Amber (ENG REVERSE UNLOCK) indicating light goes off when thrust reverser reaches forward thrust (stow) position and door latch actuators latch.

(12) Check that force required to move an individual throttle fore-and-aft does not exceed 7.5 pounds (3.4 kg).

(13) Verify force required to move an individual thrust reverser lever in either direction does not exceed 13 pounds (5.9 kg). Minimum force required to move thrust reverser lever should be 2 pounds (0.91 kg) from 1.50 inches (38.1 mm) from full stow position and increase to 8 pounds (3.64 kg) minimum at reverse idle detent.

NOTE: An increase of 1 to 2 pounds (0.45 to 0.91 kg) force may be experienced when roller goes in or out of reverse idle detent.

(14) Move thrust reverser lever to reverse thrust (deploy) position. Amber (ENG REVERSE UNLOCK) and blue (ENG REVERSE THRUST) indicating lights should be on.

(15) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(16) Move thrust reverser lever to forward thrust (stow) position. Amber (ENG REVERSE UNLOCK) and blue (ENG REVERSE THRUST) indicating lights should remain on.

CAUTION: FIRST APPLICATION OF HYDRAULIC PRESSURE MUST BE WITH THRUST REVERSER LEVER IN FORWARD THRUST (STOW) POSITION, FOLLOWING MANUAL MOVEMENT OF DOORS IN STEPS (14) AND (15). DO NOT PLACE THRUST REVERSER LEVER IN REVERSE THRUST (DEPLOY) POSITION FIRST OR GUIDE RODS WILL BE DAMAGED.

(17) Manually move thrust reverser doors to stowed position. Blue (ENG REVERSE THRUST) indicating light should go off before doors are half closed. Amber (ENG REVERSE UNLOCK) indicating light should remain on until doors are pushed past door latch indicator arm and almost completely shut.

(18) Move thrust reverser lever to reverse thrust (deploy) position.

(19) Manually position doors in full reverse thrust (deploy) position. Amber (ENG REVERSE UNLOCK) and blue (ENG REVERSE THRUST) indicating lights should be on.

(20) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(21) Close access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(22) Place thrust reverser lever in forward thrust (stow) position. All indicating lights should be off.

(23) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

E. Test Reverse Thrust Detents (Aircraft With S/B 78-68 Incorporated)

NOTE: The test procedures contained in this paragraph only apply to aircraft with modified thrust reverser cam support equipped with an additional detent at 1.3 EPR (Ref. S/B 78-68).

(1) Open access door (5901C) for left engine or (5902C) for right engine to visually check function of cam support.

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARD-LESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(2) Pressurize hydraulic system. (PAGEBLOCK 29-00-00/201)

(3) Move thrust reverser lever in reverse thrust (deploy) position until reverse idle roller drops into first detent of cam.

(4) Wait for ENG REVERSE THRUST light to come on.

(5) Move thrust reverser lever toward full reverse thrust (deploy) position.

NOTE: There should be a noticeable change in lever feel (force) when the roller drops into the 1.3 EPR detent.

(6) Continue moving thrust reverser lever to full reverse thrust (deploy) position. Check that reverser doors are in reverse thrust (deploy) position.

NOTE: The lever feel (force) passing through the 1.3 EPR detent shall not exceed 18 pounds (8.2 Kg) maximum.

(7) Move thrust reverser lever forward until roller drops into 1.3 EPR detent of cam. Thrust reverser doors should remain in reverse thrust (deploy) position.

NOTE: There should be a noticeable change in lever feel (force) when the roller drops into the detent.

(8) Continue to move thrust reverser lever to (stow) position.

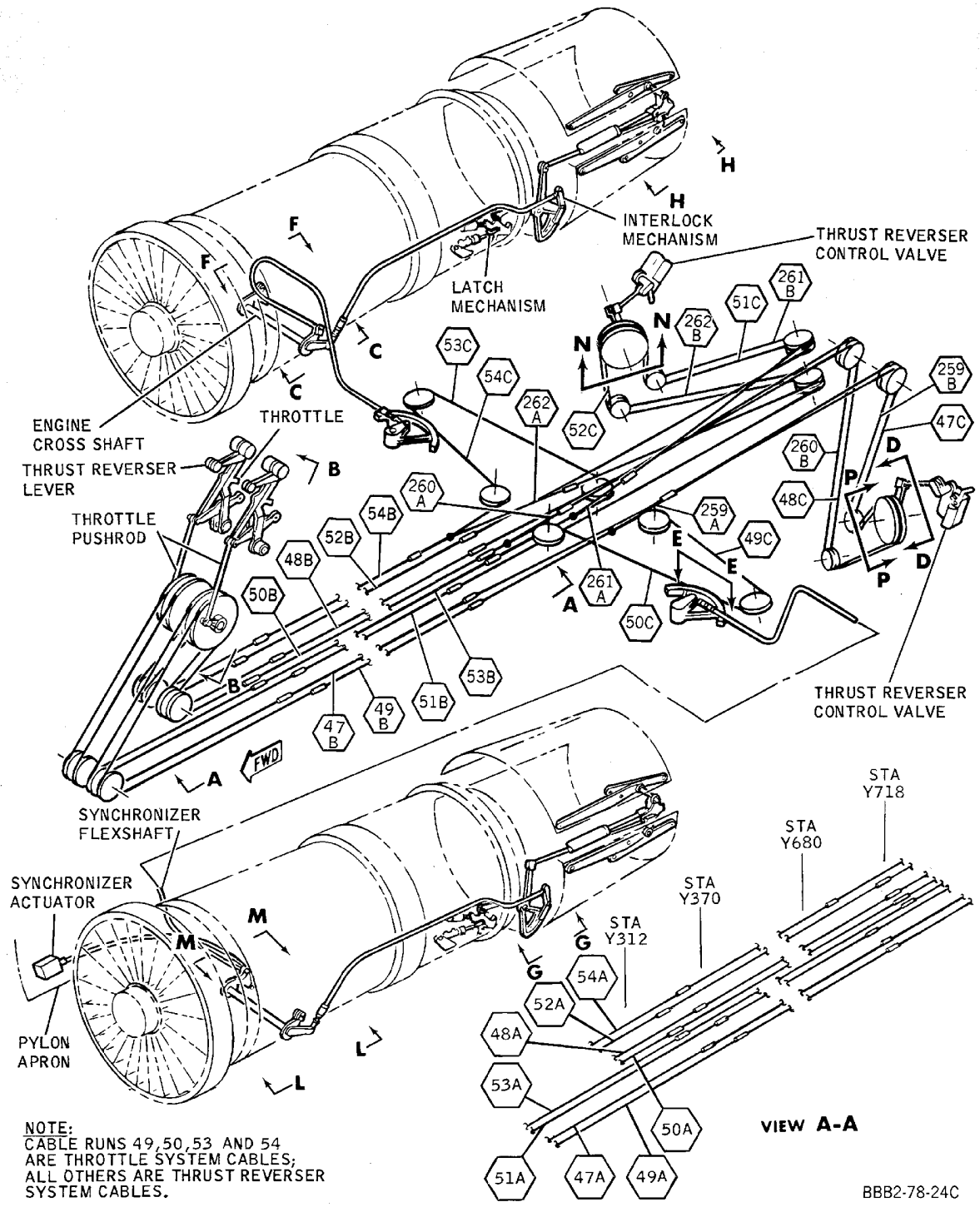
(9) Check that thrust reverser doors are stowed and latched.

(10) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

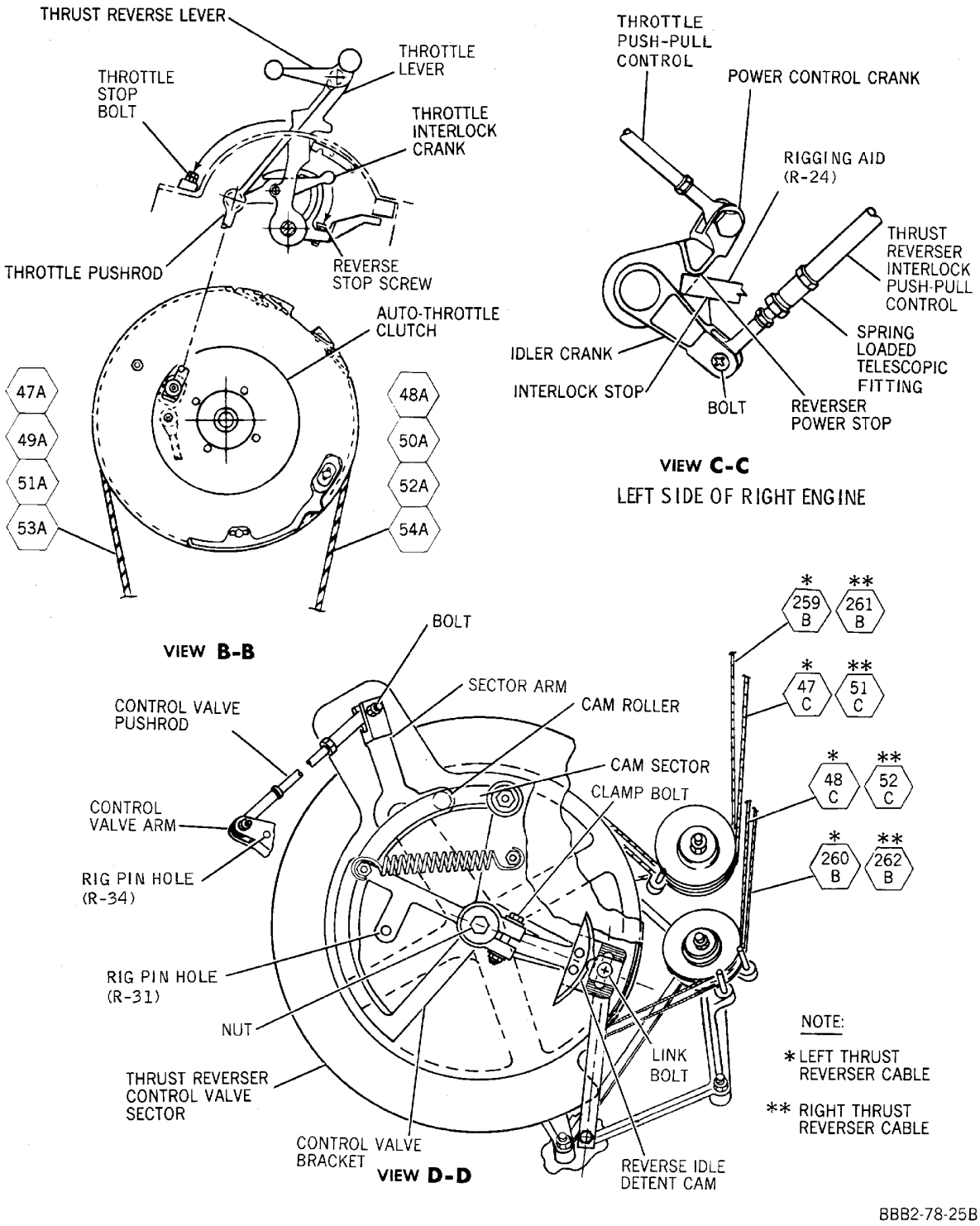
(11) Close access door (5901C) for left engine and (5902C) for right engine.

F. Test Reverse Thrust Detent (Aircraft With S/B 78-070)

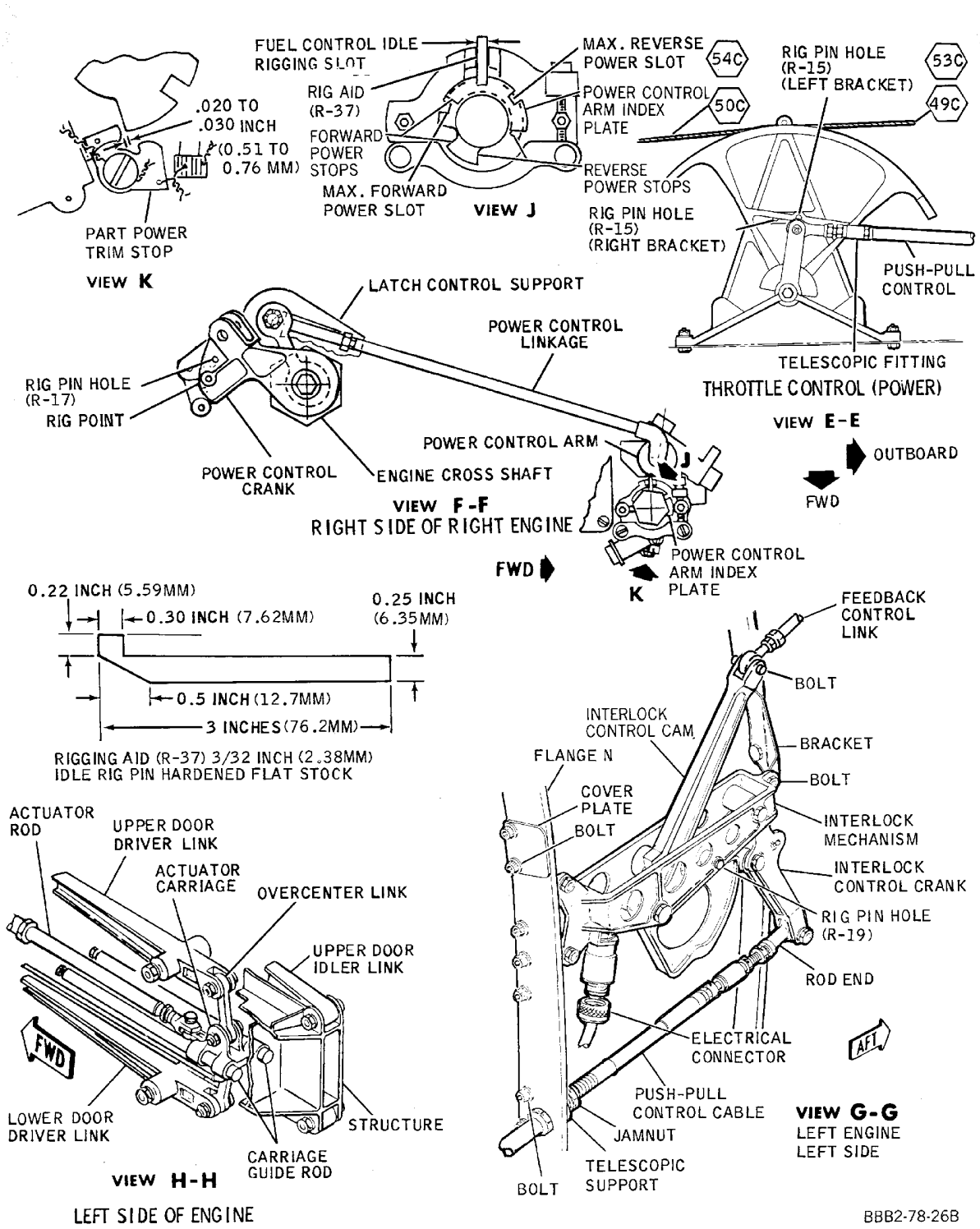
NOTE: Refer to THRUST REVERSER - ADJUSTMENT/TEST, 78-30-00/501 after accomplishment of S/B 78-070 (Thrust reverser cam support assembly without an intermediate detent) .



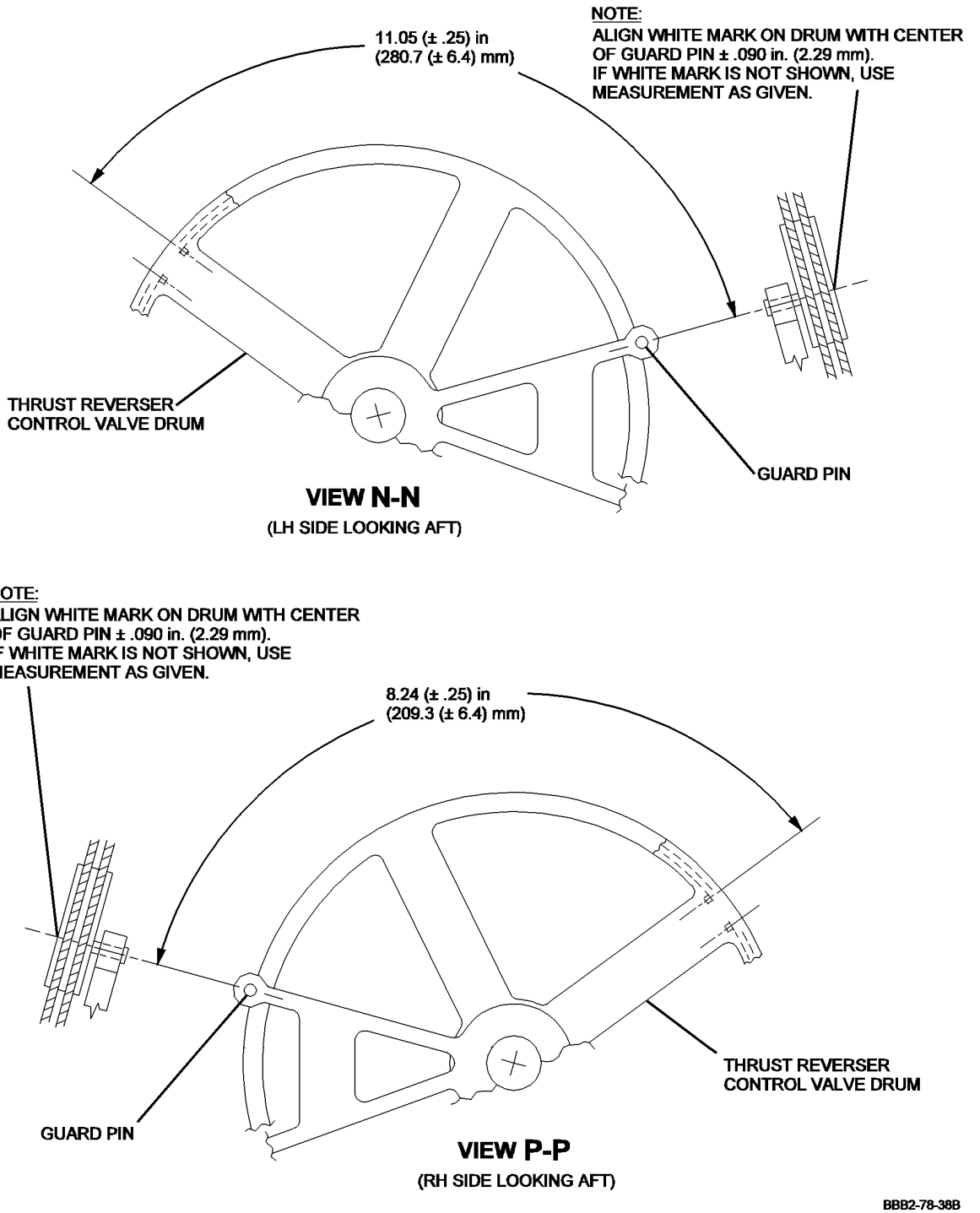
Thrust Reverser - Adjustment
Figure 501/78-30-00-990-801 (Sheet 1 of 6)



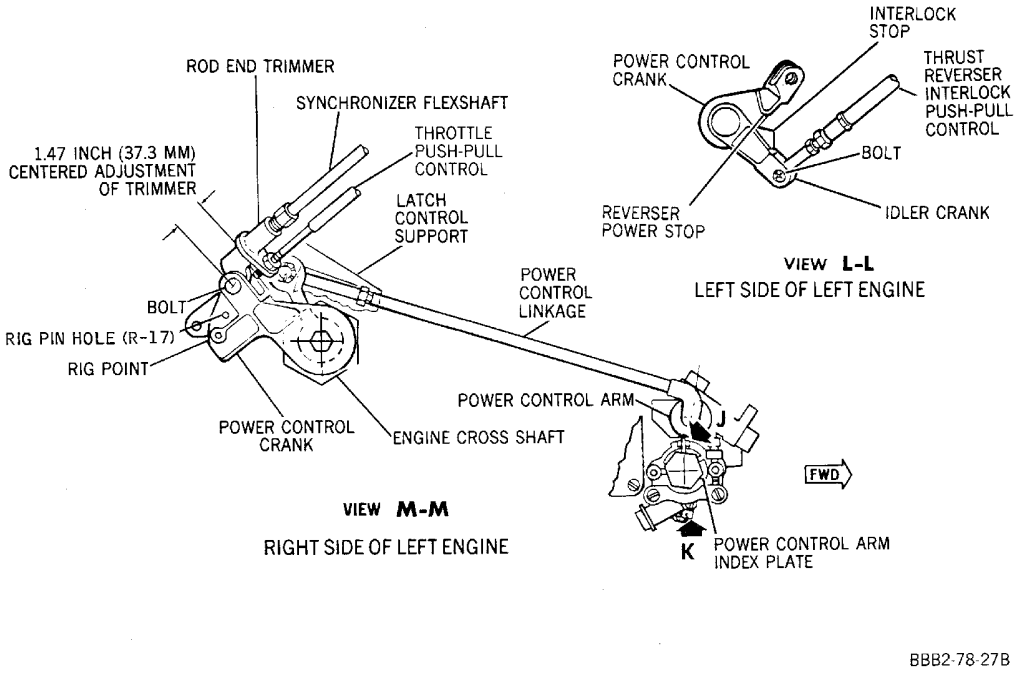
Thrust Reverser - Adjustment
Figure 501/78-30-00-990-801 (Sheet 2 of 6)



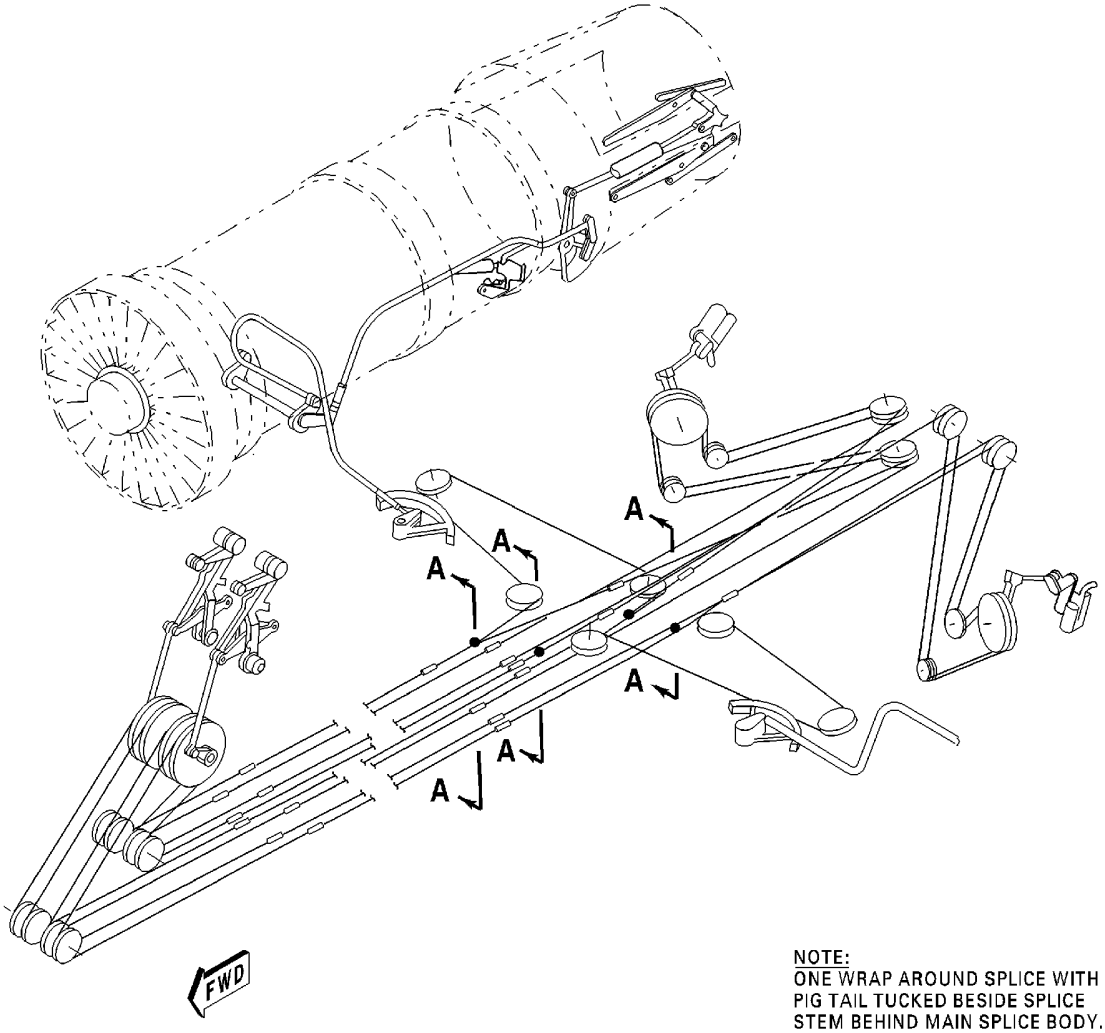
Thrust Reverser - Adjustment
Figure 501/78-30-00-990-801 (Sheet 3 of 6)



Thrust Reverser - Adjustment
Figure 501/78-30-00-990-801 (Sheet 4 of 6)



Thrust Reverser - Adjustment
Figure 501/78-30-00-990-801 (Sheet 5 of 6)



Thrust Reverser - Adjustment
Figure 501/78-30-00-990-801 (Sheet 6 of 6)

4. Cable Identification

Table 502 Cable Identification

Function	Cable Run Number	Segment Letter
Left engine reverser -- Extend	47 47 47	A B C
Left engine reverser -- Retract	48 48 48	A B C
Right engine reverser -- Extend	51 51 51	A B C
Right engine reverser -- Retract	52 52 52	A B C
Reverser - left engine bridle extend	259 259	A B
Reverser - left engine bridle retract	260 260	A B
Reverser - right engine bridle extend	261 261	A B
Reverser - right engine bridle retract	262 262	A B

TEMP deg F	MAX. CABLE RIG LOAD	MIN. CABLE RIG LOAD	MIN. ALLOW. SERV. LOAD	TEMP def F	MAX. CABLE RIG LOAD	MIN. CABLE RIG LOAD	MIN. ALLOW. SERV. LOAD
-60	11	5	3	40	24	18	13
-58	12	6	4	42	25	19	14
-56	12	6	4	44	25	19	14
-54	12	6	4	46	25	19	14
-52	13	7	4	48	25	19	14
-50	13	7	5	50	26	20	14
-48	13	7	5	52	26	20	15
-46	13	7	5	54	26	20	15
-44	14	8	5	56	27	21	15
-42	14	8	5	58	27	21	15
-40	14	8	6	60	27	21	16
-38	14	8	6	62	28	22	16
-36	15	9	6	64	28	22	16
-34	15	9	6	66	28	22	16
-32	15	9	6	68	28	22	17
-30	15	9	7	70	29	23	17
-28	16	10	7	72	29	23	17
-26	16	10	7	74	29	23	17
-24	16	10	7	76	30	24	18
-22	16	10	7	78	30	24	18
-20	17	11	7	80	30	24	18
-18	17	11	8	82	31	25	18
-16	17	11	8	84	31	25	19
-14	17	11	8	86	32	26	19
-12	18	12	8	88	32	26	19
-10	18	12	9	90	32	26	20
-8	18	12	9	92	33	27	20
-6	18	12	9	94	33	27	20
-4	19	13	9	96	33	27	20
-2	19	13	9	98	34	28	21
0	19	13	9	100	34	28	21
2	19	13	10	102	35	29	21
4	20	14	10	104	35	29	22
6	20	14	10	106	35	29	22
8	20	14	10	108	36	30	22
10	20	14	10	110	36	30	23
12	21	15	11	112	37	31	23
14	21	15	11	114	37	31	23
16	21	15	11	116	37	31	24
18	21	15	11	118	38	32	24
20	22	16	11	120	38	32	24
22	22	16	12	122	39	33	25
24	22	16	12	124	39	33	25
26	22	16	12	126	40	34	25
28	23	17	12	128	40	34	26
30	23	17	12	130	41	35	26
32	23	17	13	132	41	35	26
34	23	17	13	134	42	36	27
36	24	18	13	136	42	36	27
38	24	18	13	138	43	37	28
				140	43	37	28

CAG(KGDS)

BBB2-78-63A

Cable Tension Chart
Figure 502/78-30-00-990-802

5. **Thrust Reverser Hydraulic System Pressure Test**

A. Test Thrust Reverser System to Hold Pressure Without Main Hydraulic System Pressure

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(1) Pressurize hydraulic system. (PAGEBLOCK 29-00-00/201)

(2) Open access door (5901C) for left engine and (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 (6550 TO 7240 KPA) PRECHARGE PRESSURE.

(3) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(4) Check that thrust reverser accumulator pressure gage reads 950 to 1050 psi (6550 to 7240 kPa). If pressure is normal, remove lockpin from thrust reverser control valve and stow pin.

(5) Maintain system pressure for two to three minutes to stabilize thrust reverser pressure accumulator.

(6) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

(7) Verify that thrust reverser accumulator pressure does not drop more than 100 psi in ten minutes.

THRUST REVERSER - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and adjustment/test instructions for the thrust reverser.

B. Maintenance of the thrust reverser is limited to removal/ installation and adjustment/test. Removal/ installation and adjustment/test procedures for right and left thrust reverser are identical.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

WARNING: MLG DOORS MAY COME OPEN DURING RIGHT THRUST REVERSER DEPLOYMENT WHEN MAINTENANCE BYPASS VALVE IS IN BYPASS POSITION.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

CAUTION: TO PREVENT DAMAGE TO HYDRAULIC TUBING, AND TO PREVENT CONTAMINANTS FROM ENTERING HYDRAULIC SYSTEM, MAKE CERTAIN ALL OPEN TUBING AND FITTINGS ARE CAPPED.

C. Access to the thrust reverser is through engine cowl doors.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Hoist adapter, 3936853-1	Douglas Aircraft Co.
Thrust Reverser Sling 5936852-1	Douglas Aircraft Co.
Lockwire, NASM20995N32, DPM 684	Not Specified
Torque wrench, (0-300 inch pounds range)	

3. Removal/Installation Thrust Reverser

A. Remove Thrust Reverser (Figure 201).

(1) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

(2) Place thrust reverser lever in forward thrust (stow) position.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(3) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF
S	29	B1-218	LEFT REVERSER ACCUM LOW CAUTION
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF
T	29	B1-219	RIGHT REVERSER ACCUM LOW CAUTION
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(4) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

(5) Open engine cowl doors.

(6) Open access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(7) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

CAUTION: TO PREVENT DAMAGE TO HYDRAULIC TUBING AND TO PREVENT CONTAMINANTS FROM ENTERING HYDRAULIC SYSTEM, MAKE CERTAIN ALL OPEN TUBING AND FITTINGS ARE CAPPED.

(8) Disconnect thrust reverser door actuator/latch actuator hydraulic tubing.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT OR CONNECT PLUG.

(9) Disconnect electrical connectors from thrust reverser latch and position indicator switches.

NOTE: When electrical connectors are disconnected, caps or other protective materials should be used to prevent entry of oil, fuel, hydraulic fluid, moisture, and other foreign material.

(10) Remove four screws attaching channel to frame midway between flange N and flange P, two places.

(11) Remove bolt and disconnect feedback control link rod end from interlock cam.

(12) Remove bolts attaching support bracket to flange P.

(13) Deleted.

(14) Remove filler plugs from thrust reverser hoist points and attach hoist adapter with MS9209-18 bolts. Retain plugs for installation.

NOTE: Hoist adapter attaches to left hand holes for left thrust reverser and right hand holes for right thrust reverser.

(15) Connect hoist to hoist adapter or use thrust reverser sling to support reverser.

WARNING: THRUST REVERSER WEIGHS APPROXIMATELY 545 POUNDS (247.2 KG). MAKE CERTAIN SUFFICIENT PERSONNEL ARE AVAILABLE TO ASSIST IN REMOVING THRUST REVERSER.

(16) Remove bolts and countersunk washers attaching thrust reverser to flange P and remove reverser.

(17) Place thrust reverser on protective padding or work stand to prevent damage.

(18) Disconnect hoist and remove hoist adapter or remove thrust reverser sling. Install filler plugs.

B. Install Thrust Reverser. (Figure 201)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF
S	29	B1-218	LEFT REVERSER ACCUM LOW CAUTION
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF
T	29	B1-219	RIGHT REVERSER ACCUM LOW CAUTION
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and lockpin is installed.

(3) Remove filler plugs from thrust reverser hoist points and attach hoist adapter or thrust reverser sling with MS9209-18 bolts. Retain plugs for installation.

NOTE: Hoist adapter attaches to left hand holes for left thrust reverser and right hand holes for right thrust reverser.

(4) Connect hoist to hoist adapter or thrust reverser sling and support reverser.

WARNING: THRUST REVERSER WEIGHS APPROXIMATELY 545 POUNDS (247.2 KG). MAKE CERTAIN SUFFICIENT PERSONNEL ARE AVAILABLE TO ASSIST IN INSTALLING THRUST REVERSER.

(5) Operate hoist and raise thrust reverser into position and align with pin on flange P.

(6) Install bolts and countersunk washers attaching thrust reverser to flange P. Torque bolts 120 to 160 inch-pounds (13.6 to 18.1 N·m).

(7) Loosen and disconnect hoist.

(8) Remove bolts attaching hoist adapter to thrust reverser and store bolts in threaded holes or thrust reverser sling. Install plugs in attach points.

(9) Deleted.

(10) Install support bracket on flange P.

(11) Connect feedback control link rod end to interlock cam and install bolt. Safety nut with cotter pin.

(12) Install screws, washers and nuts attaching channel to frame midway between flange N and P, two places.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(13) Connect electrical connectors to thrust reverser latch and position indicator switches.

(14) Connect thrust reverser door actuator/latch actuator hydraulic tubing.

(15) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(16) Close access door (5901C) for left engine or (5902C) for right engine.

(17) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

(18) Check that thrust reverser lever is in forward thrust (stow) position.

(19) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(20) Remove the safety tags and close these circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF
S	29	B1-218	LEFT REVERSER ACCUM LOW CAUTION
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF
T	29	B1-219	RIGHT REVERSER ACCUM LOW CAUTION
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

4. Adjustment/Test Thrust Reverser

A. Test Thrust Reverser

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAIL-ABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(1) Place thrust reverser lever in reverse thrust (deploy) position.

NOTE: Reverse thrust (deploy) position is reached when reverse idle roller drops into reverse idle detent.

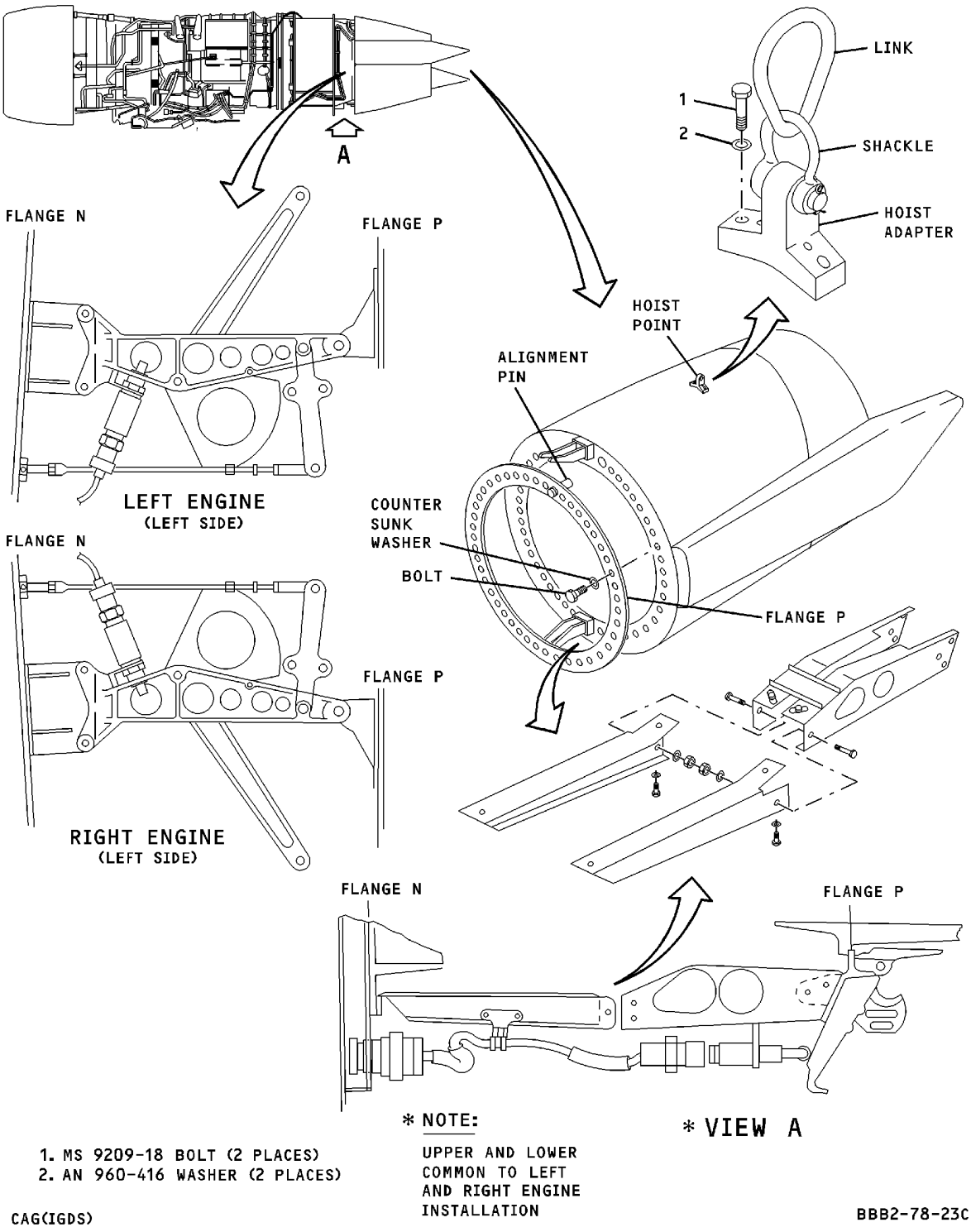
(2) Check that thrust reverser doors move to reverse thrust (deploy) position.

(3) Cycle thrust reverser system several times and check for proper indicator lights and reverser operation. (PAGEBLOCK 78-30-00/501)

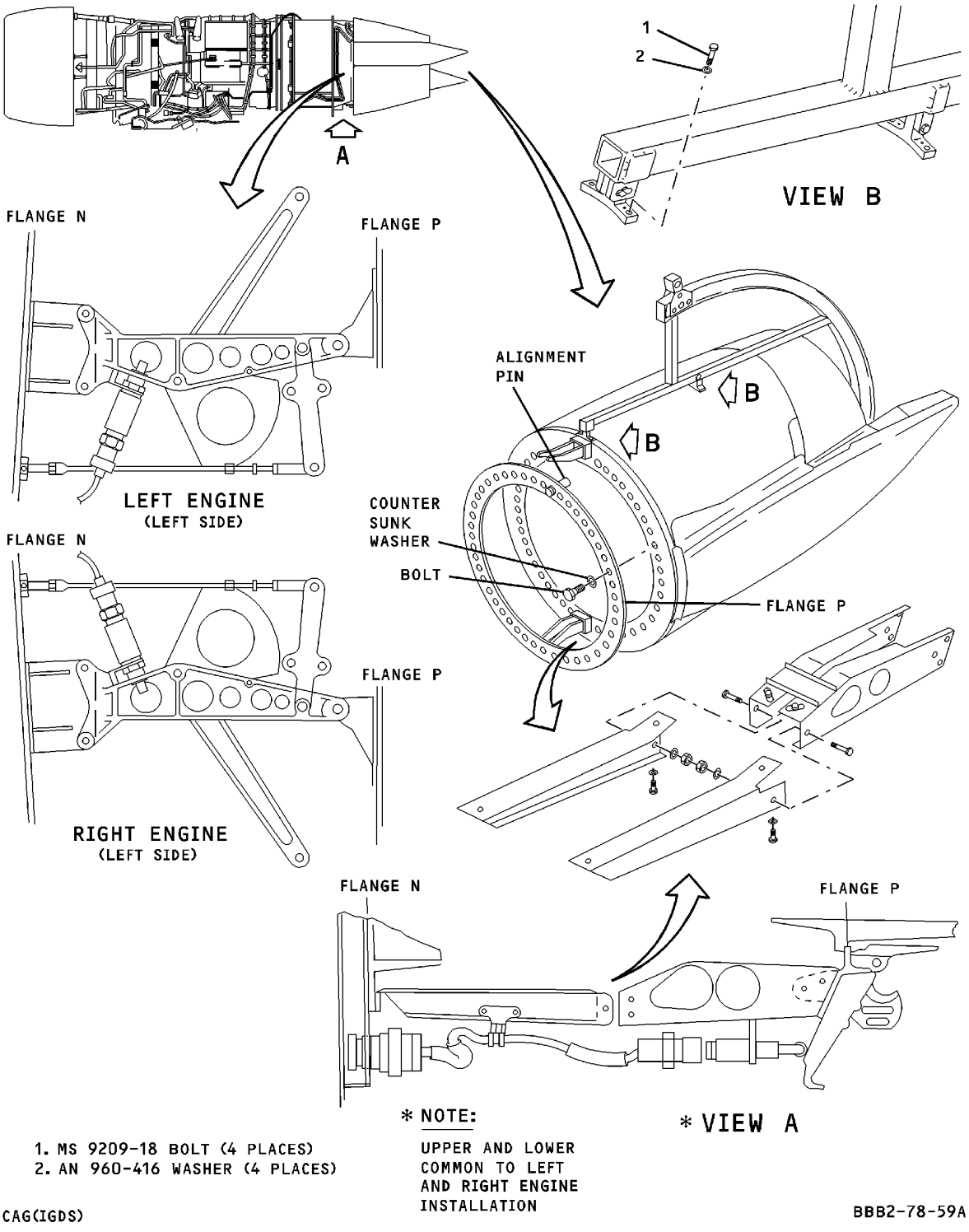
(4) Visually check for hydraulic leaks.

(5) Place thrust reverser lever in forward thrust (stow) position.

(6) Check that thrust reverser doors move to forward thrust (stow) position and latch.



Thrust Reverser - Removal/Installation
Figure 201/78-30-01-990-801 (Sheet 1 of 2)



Thrust Reverser - Removal/Installation
Figure 201/78-30-01-990-801 (Sheet 2 of 2)

THRUST REVERSER DOOR ACTUATOR - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and adjustment/test instructions for the thrust reverser door actuator.

B. Maintenance of the thrust reverser door actuator is limited to removal/installation and adjustment/test procedures. Removal/ installation and adjustment/test procedures for right and left door actuators are identical.

CAUTION: TO PREVENT DAMAGE TO HYDRAULIC TUBES AND ACTUATOR, AND TO PREVENT CONTAMINANTS FROM ENTERING HYDRAULIC SYSTEM, MAKE CERTAIN ALL OPEN TUBES AND ACTUATOR PORTS ARE CAPPED.

C. Access to the thrust reverser door actuator is through the thrust reverser stang fairing.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Lubricating oil, molybdenum disulfide, silicone base, high-temperature MIL-L-25681 DPM 5782	E/M Corporation, North Hollywood, CA
Lubricant, Skydrol assembly, MCS352 (Alternate, Skydrol fluid) DPM 5073	Aviation Fluid Service Co.

3. Removal/Installation Thrust Reverser Door Actuator

A. Remove Actuator. (Figure 201)

(1) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(2) Place thrust reverser lever in reverse thrust (deploy) position.

NOTE: Reverse thrust (deploy) position is reached when reverse idle roller drops into reverse idle detent.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(3) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(4) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

(5) Open access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(6) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(7) Remove thrust reverser stang fairing.

(8) Remove actuator cover.

(9) Disconnect hydraulic lines from thrust reverser door actuator.

(10) Remove unions from actuator and plug actuator ports. Discard O-rings.

(11) Remove attaching hardware and remove control rod (left actuator only) from carriage and bulkhead.

(12) Remove attaching hardware connecting aft end of actuator to carriage.

(13) Remove attaching hardware connecting forward end of actuator to nozzle support.

(14) Remove actuator from carriage and nozzle support.

B. Install Actuator. (Figure 201)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT
WJE ALL			

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and lockpin is installed.

WARNING: HYDRAULIC ASSEMBLY LUBRICANT IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN HYDRAULIC ASSEMBLY LUBRICANT IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET HYDRAULIC ASSEMBLY LUBRICANT IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

(WARNING PRECEDES)

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(3) Lightly lubricate new O-rings with lubricant (MCS352) and install on unions.

(4) Remove plugs from actuator ports and install unions in actuator.

(5) Install and align actuator between nozzle support and carriage.

WARNING: MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET MOLYBDENUM DISULFIDE SILICONE LUBRICANT IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(6) Apply light coating of oil (MIL-L-25681) to bolt threads.

(7) Align actuator (forward end) and nozzle support bolt holes and install bolt, washer and nut. Torque nut from 320 ft-lb to 340 ft-lb.

(8) Apply light coating of oil (MIL-L-25681) to bolt threads.

(9) Align actuator (aft end) and carriage bolt holes and install bolt washer and nut. Torque nut from 114 ft-lb to 126 ft-lb. Safety nut with cotter pin.

(10) Apply light coating of oil (MIL-L-25681) to bolt threads.

(11) Install and align control rod (left actuator only) with carriage and bulkhead bolt holes and install bolts, washer and nut. Torque nut from 96 in-lb to 114 in-lb.

(12) Remove protective caps from hydraulic lines and connect lines to actuator.

(13) Test actuator. (Paragraph 4.)

(14) Install thrust reverser actuator cover.

(15) Install thrust reverser fairing.

(16) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(17) Close access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

(18) Place thrust reverser lever in forward thrust (stow) position.

(19) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(20) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

4. Adjustment/Test Thrust Reverser Door Actuator

A. Test Actuator

(1) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(2) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAIL-ABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

(3) Place thrust reverser lever in forward thrust (stow) position.

(4) Check that thrust reverser doors move to forward thrust (stow) position and latch.

(5) Cycle thrust reverser system several times and check for proper actuator operation.

(6) Place thrust reverser lever in reverse thrust (deploy) position.

NOTE: Reverse thrust (deploy) position is reached when reverse idle roller drops into reverse idle detent.

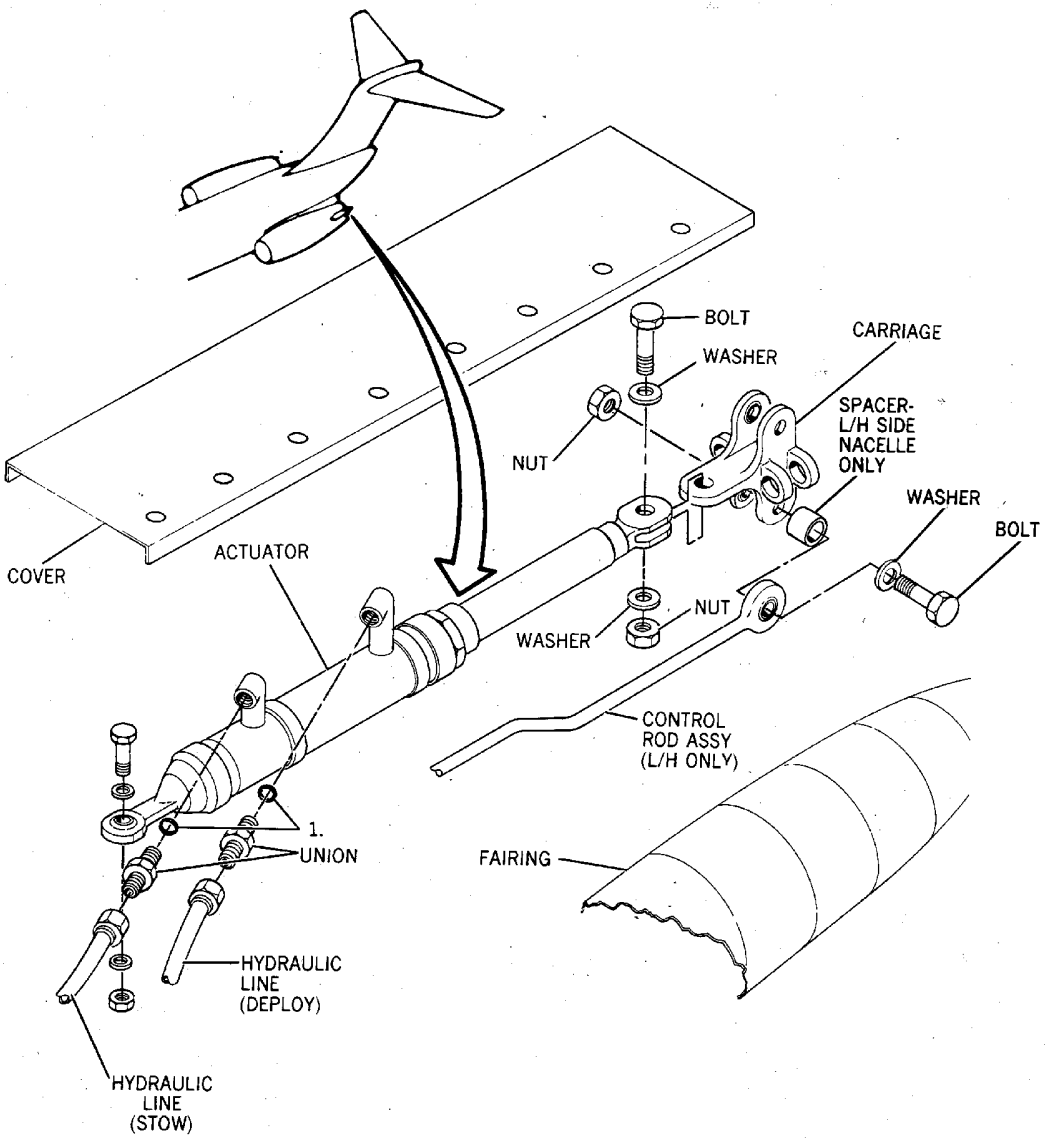
(7) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(8) Visually check for hydraulic leaks.

(9) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(10) Place thrust reverser lever in forward thrust (stow) position.

(11) Close access door (5901C) for left engine and (5902C) for right engine.



Thrust Reverser Door Actuator - Removal/Installation
Figure 201/78-30-02-990-801

THRUST REVERSER DOOR LATCH ACTUATOR - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and adjustment/test instructions for the thrust reverser door latch actuator.

B. Maintenance of the thrust reverser door latch actuator is limited to removal/installation and adjustment/test procedures. Removal/installation and adjustment/test procedures for upper and lower latch actuators are identical.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

CAUTION: TO PREVENT DAMAGE TO HYDRAULIC TUBES AND ACTUATOR, AND TO PREVENT CONTAMINANTS FROM ENTERING HYDRAULIC SYSTEM, MAKE CERTAIN ALL OPEN TUBES AND ACTUATOR PORTS ARE CAPPED.

C. Access to the thrust reverser door latch actuators is through engine cowl doors.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Lubricating oil, molybdenum disulfide, silicone base, high-temperature MIL-L-25681 DPM 5782	E/M Corporation North Hollywood, CA
Lubricant, Skydrol assembly, MCS352 (alternate, Skydrol fluid) DPM 5073	Aviation Fluid Service Co.

3. Removal/Installation Thrust Reverser Door Latch Actuator

A. Remove Actuator. (Figure 201)

(1) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARD-LESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(2) Place thrust reverser lever in reverse thrust (deploy) position.

NOTE: Reverse thrust (deploy) position is reached when reverse idle roller drops into reverse idle detent.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(3) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(4) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

(5) Open engine cowl doors.

(6) Open access door (5901C) for left engine and (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(7) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(8) Disconnect hydraulic lines from thrust reverser door latch actuator.

(9) Remove unions from actuator and plug actuator ports. Discard O-rings.

(10) Remove attaching hardware connecting aft end of actuator to latch hook.

(11) Remove attaching hardware connecting forward end of actuator to latch support.

(12) Remove actuator from latch support and hook.

B. Install Actuator. (Figure 201)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breaker are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT
WJE ALL			

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and lockpin is installed.

WARNING: HYDRAULIC ASSEMBLY LUBRICANT IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN HYDRAULIC ASSEMBLY LUBRICANT IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET HYDRAULIC ASSEMBLY LUBRICANT IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

(WARNING PRECEDES)

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(3) Lightly lubricate new O-rings with lubricant (MCS352) and install on unions.

(4) Remove plugs from actuator ports and install unions in actuator.

(5) Install and align actuator between latch support and hook.

WARNING: MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET MOLYBDENUM DISULFIDE SILICONE LUBRICANT IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(6) Apply light coating of oil (MIL-L-25681) to screw threads.

(7) Align actuator (forward end) and latch support screw holes and install screw. Safety nut with cotter pin.

(8) Apply light coating of oil (MIL-L-25681) to screw threads.

(9) Align actuator (aft end) clevis screw hole with slot in latch hook and install bushing and screw. Safety nut with cotter pin.

(10) Remove protective caps from hydraulic lines and connect lines to actuator.

(11) Test actuator. (Paragraph 4.)

(12) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(13) Close engine cowl doors.

(14) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT
WJE ALL			

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

4. **Adjustment/Test Thrust Reverser Door Latch Actuator**

A. Test Actuator

(1) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(2) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAIL-ABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

(3) Place thrust reverser lever in forward thrust (stow) position.

(4) Check that thrust reverser doors move to forward thrust (stow) position and latch.

(5) Cycle thrust reverser system several times and check for proper actuator operation.

(6) Place thrust reverser lever in reverse thrust (deploy) position.

NOTE: Reverse thrust (deploy) position is reached when reverse idle roller drops into reverse idle detent.

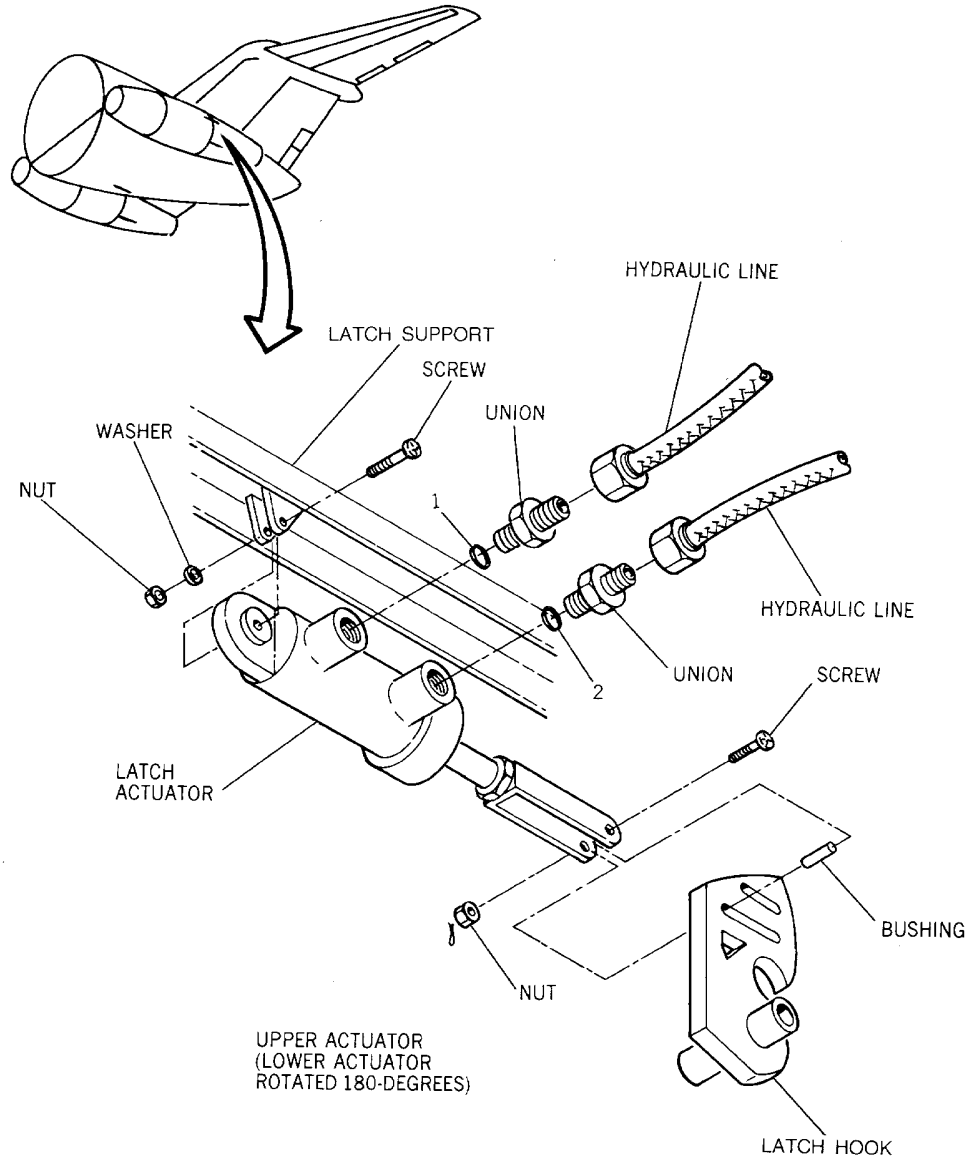
(7) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(8) Visually check for hydraulic leaks.

(9) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(10) Place thrust reverser lever in forward thrust (stow) position.

(11) Close access door (5901C) for left engine and (5902C) for right engine.



CODE:
1. NAS 1612-6 O-RING
2. NAS 1612-4 O-RING

BBB2-78-4A

Thrust Reverser Door Latch Actuator - Removal/Installation
Figure 201/78-30-03-990-801

THRUST REVERSER DOORS - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation instructions for the thrust reverser doors.

B. Maintenance of the thrust reverser doors is limited to removal/ installation procedures. Removal/ installation procedures for upper and lower doors are identical.

C. Access to thrust reverser doors is at aft end of engine nacelle.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Lubricating oil, molybdenum disulfide, silicone base, high-temperature MIL-L-25681 DPM 5782	E/M Corporation North Hollywood, CA
Inconel Lockwire 0.032 in, NASM20995N32, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.032 in NASM20995C32, DPM 5865	Not Specified

3. Removal/Installation Thrust Reverser Doors

A. Remove Doors

(Figure 201 or Figure 202 or Figure 203 or Figure 204)

(1) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARD-LESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(2) Place thrust reverser lever in reverse thrust (deploy) position.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

(3) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(4) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

(5) Open access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(6) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

WARNING: WEIGHT OF EACH THRUST REVERSER DOOR IS APPROXIMATELY 78 POUNDS (35.38 KG).

(7) Support thrust reverser door and disconnect idler links from thrust reverser door.

(8) Support thrust reverser door and disconnect driver links to thrust reverser door.

(9) Remove door from thrust reverser and place on suitable protective padding.

B. Install Doors

(Figure 201 or Figure 202 or Figure 203 or Figure 204)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and lockpin is installed.

WARNING: WEIGHT OF EACH THRUST REVERSER DOOR IS APPROXIMATELY 78 POUNDS (35.38 KG).

WARNING: MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET MOLYBDENUM DISULFIDE SILICONE LUBRICANT IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

CAUTION: ON AIRCRAFT WITH SB 78-63 INCORPORATED, UPPER AND LOWER THRUST REVERSER DOORS ARE NOT INTER-CHANGEABLE. MAKE CERTAIN THAT THRUST REVERSER DOOR WITH CUTOUT IN CENTER OF FORWARD END PLATE IS INSTALLED IN LOWER POSITION.

(3) Apply light coat of oil (MIL-L-25681) to threads of bolts and install and align thrust reverser door.

(4) Attach driver and idler links to door and tighten nuts to torque of 270 to 300 inch-pounds (30.4 to 33.9 N·m). Safety nuts with new cotter pins.

(5) Check adjustment of door. Refer toParagraph 4..

(6) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(7) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(8) Close access door (5901C) for left engine or (5902C) for right engine.

(9) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

(10) Place thrust reverser lever in forward thrust (stow) position.

(11) Check that thrust reverser doors move to forward thrust position (stow) position and latch.

(12) Cycle thrust reverser to reverse thrust (deploy) and forward thrust (stow) position and check doors for proper operation.

NOTE: Reverse thrust (deploy) position is reached when reverse idle roller drops into reverse idle detent.

(13) Place thrust reverser lever in forward thrust (stow) position.

(14) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

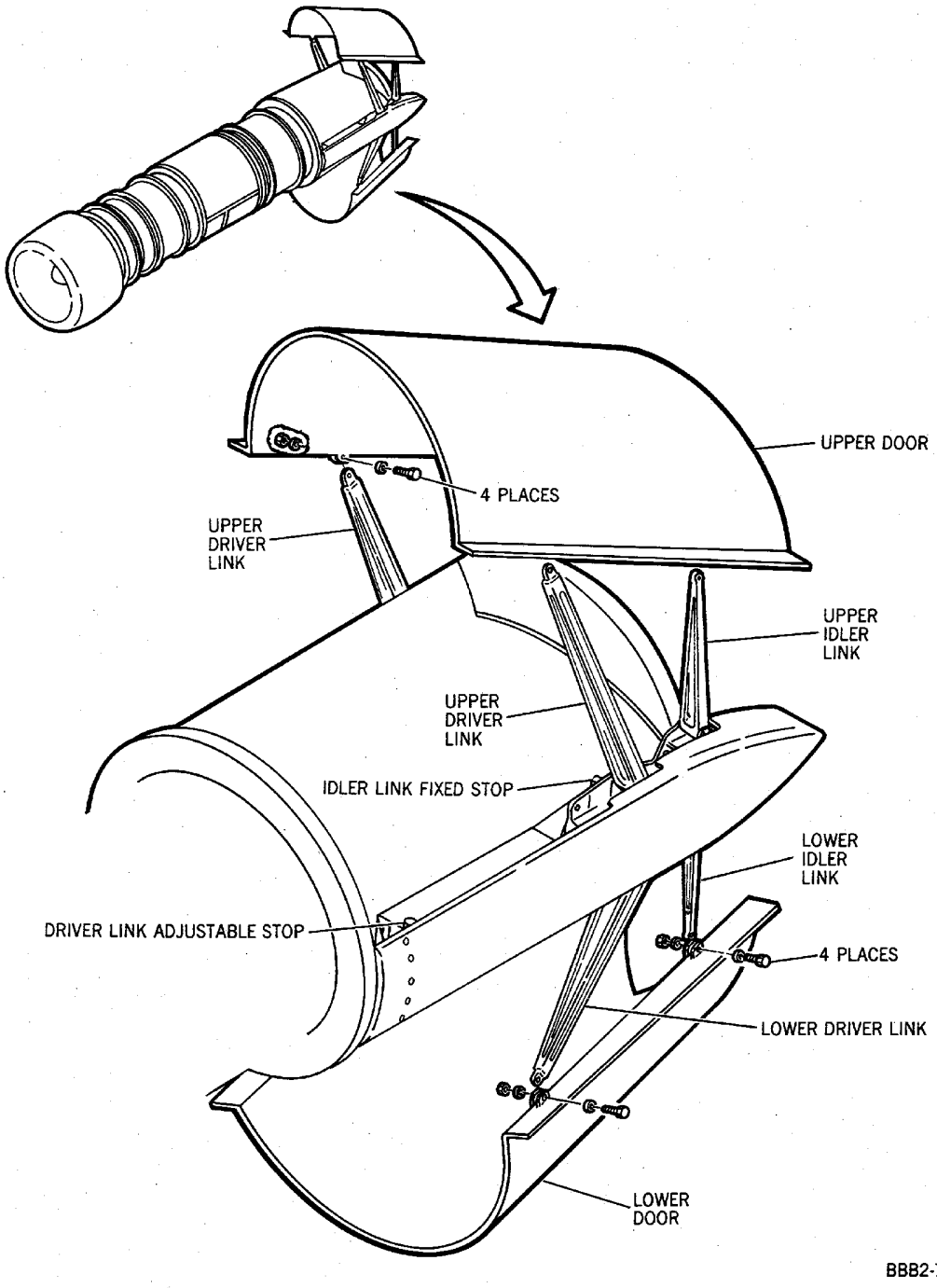
Row	Col	Number	Name

WJE ALL

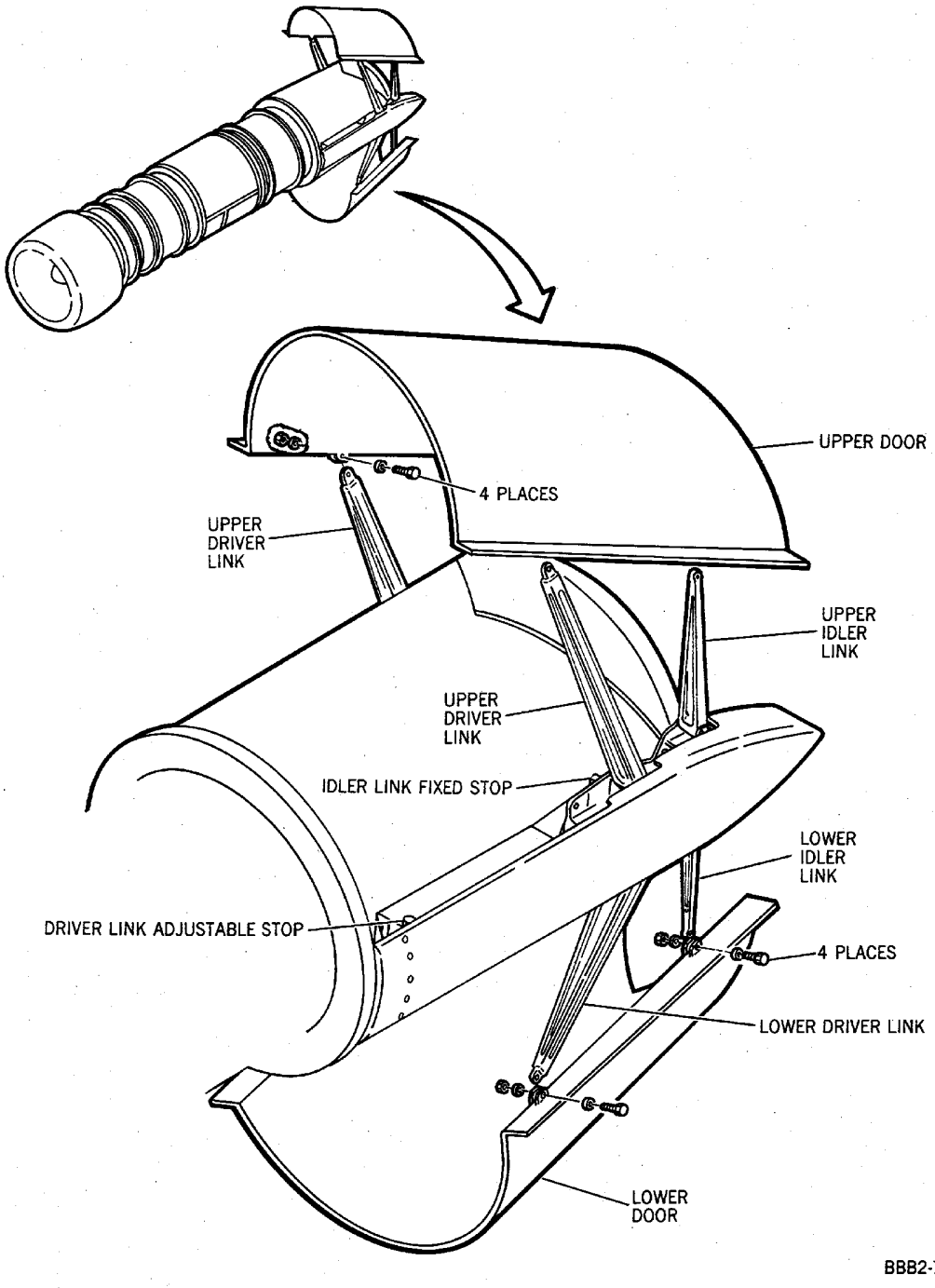
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

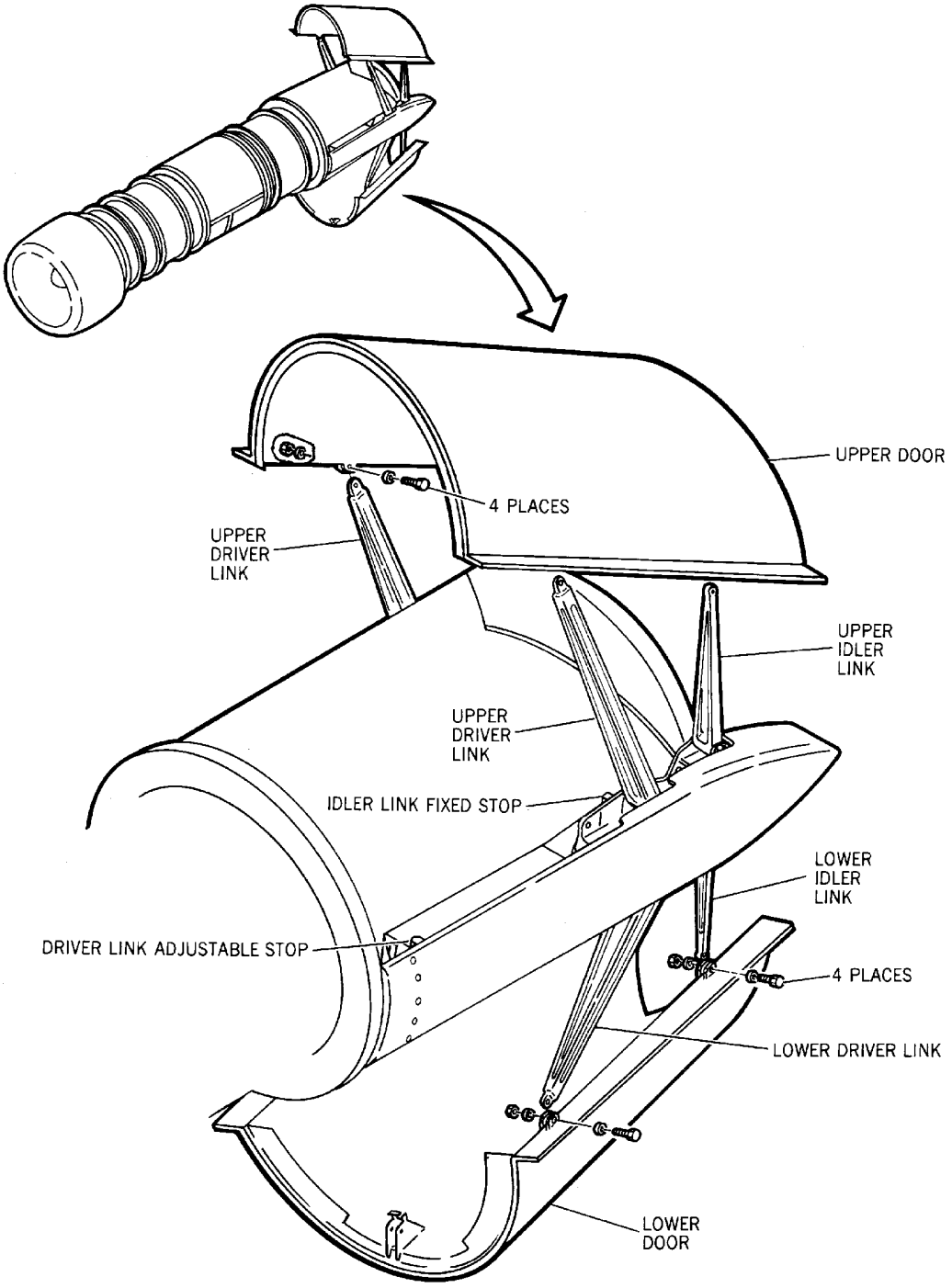
Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION



Thrust Reverser Doors -- Removal/Installation
Figure 201/78-30-04-990-801

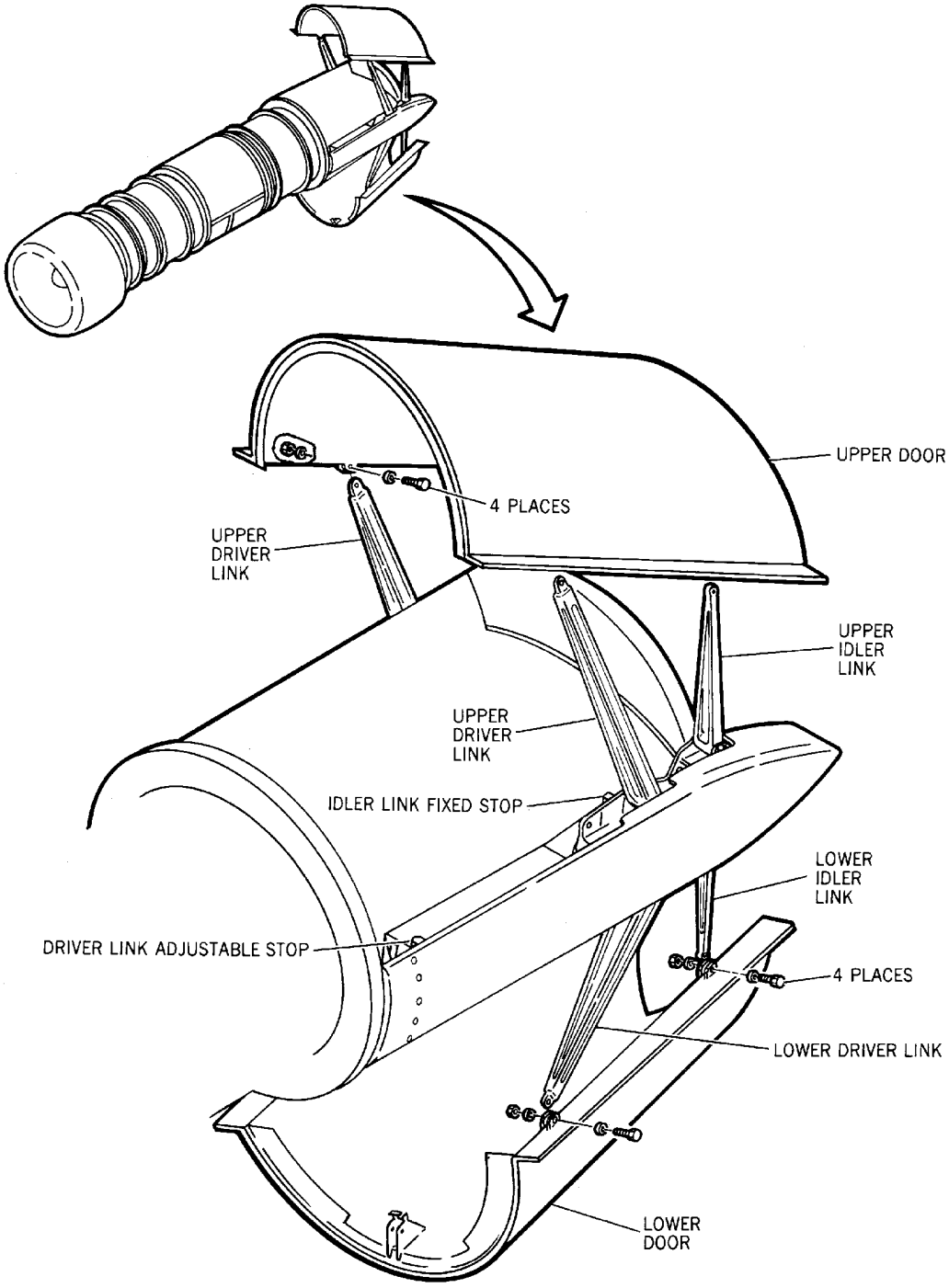


Thrust Reverser Doors -- Removal/Installation Without SB 78-63 Incorporated
Figure 202/78-30-04-990-802



Thrust Reverser Doors -- Removal/Installation With SB 78-63 Incorporated
Figure 203/78-30-04-990-803

EFFECTIVITY
WJE 405-411, 416-421, 423, 424, 426, 429, 861-866, 869, 871, 872, 880, 881, 883, 884, 891



Thrust Reverser Doors -- Removal/Installation
Figure 204/78-30-04-990-804

4. Adjustment/Test Thrust Reverser Doors

A. Adjust Doors

(1) Pressurize hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARD-LESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(2) Place thrust reverser lever in reverse thrust (deploy) position.

NOTE: Reverse thrust (deploy) position is reached when reverse thrust roller drops into reverse thrust detent.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY
S	31	B1-452	LEFT REVERSE THRUST ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(4) Open access door (5901C) for left engine or (5902C) for right engine.

(5) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

CAUTION: VERTICAL MISMATCH SHOULD BE SACRIFICED IN ORDER TO OBTAIN MINIMUM GAP BETWEEN THRUST REVERSER DOOR AND NOZZLE OR DAMAGE TO NOZZLE COULD RESULT.

(6) Remove stang fairings.

(7) Remove actuator support stop bolts and retain any washers under heads.

(8) Replace bolts and screw all the way in finger tight.

(9) Install one (1) shim and bumper on support lugs.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

(10) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT
WJE ALL			

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY
S	31	B1-452	LEFT REVERSE THRUST ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(11) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(12) Cycle doors several times, then actuate to overcenter closed position.

(13) Door trailing edge should fair with nozzle fairing within ±1/16 inch (±1.6 mm) except at any one point it may be ±3/32 inch (±2.4 mm). Adjust thickness of laminated shims, if required.

NOTE: Replace NAS517-3-7 screw with NAS517-3-9 screw if more than one shim is required.

NOTE: One shim is equivalent to 0.250 inch (6.4 mm) vertical adjustment in the thrust reverser door.

(14) Back out actuator support stop bolts until door leading edge has 0.130 to 0.250 inch (3.3 to 6.4 mm) step with bulkhead land.

(15) Measure preload deflection of driver links. Deflection should be 0.032 to 0.079 inch (.8 to 2.0 mm). Measure driver link deflection using locally manufactured tool and special deflector gauge as shown in Figure 206 and Figure 207. . Deflection can be measured with straight edge placed across top of driver link and a scale. Required adjustments may be accomplished by using driver or idler link stops, provided requirements of steps (13) and (14) are also adhered to. (Figure 208)

(16) Determine quantity of washers which will fit under head of actuator support stop bolts, add one to that total and install on bolt. Safety with lockwire. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(17) Depressurize hydraulic system. (PAGEBLOCK 29-00-00/201)

(18) Replace stang fairings.

(19) Close access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAIL-ABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

(20) Place thrust reverser lever in forward thrust (stow) position.

(21) Check that thrust reverser doors are stowed and latched.

(22) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

5. Adjustment-Upper Thrust Reverser Door Inboard Fairing

A. Adjust Upper Thrust Reverser Door Fairing

(1) Pressurize hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(2) Adjustment of upper thrust reverser door fairing is accomplished by using elongated holes manufactured into fairing.

NOTE: Before adjusting upper thrust reverser door fairing, adjustment of thrust reverser doors should be checked.

(3) Access to mounting screws is accomplished by deploying thrust reverser.

(4) Place thrust reverser lever in reverse thrust (deploy) position.

NOTE: Reverse thrust (deploy) position is reached when reverse thrust roller drops into reverse thrust detent.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY
S	31	B1-452	LEFT REVERSE THRUST ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(6) Open access door (5901C) for left engine or (5902C) for right engine.

(7) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(8) Determine amount of adjustment required to bring fairing within tolerance. Allowable mismatch between fairing and pylon is 0.0(±0.26) inches (0.0(±6.60) mm). Allowable gap between fairing and pylon is 0.25(±0.13) inches (6.35(±3.30) mm). (Figure 205)

(9) Loosen mounting screws and adjust fairing predetermined amount.

(10) Tighten screws and check for proper gap and mismatch.

(11) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(12) Depressurize hydraulic system. (PAGEBLOCK 29-00-00/201)

(13) Close access door (5901C) for left engine or (5902C) for right engine.

(14) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT
WJE ALL			

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY
S	31	B1-452	LEFT REVERSE THRUST ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

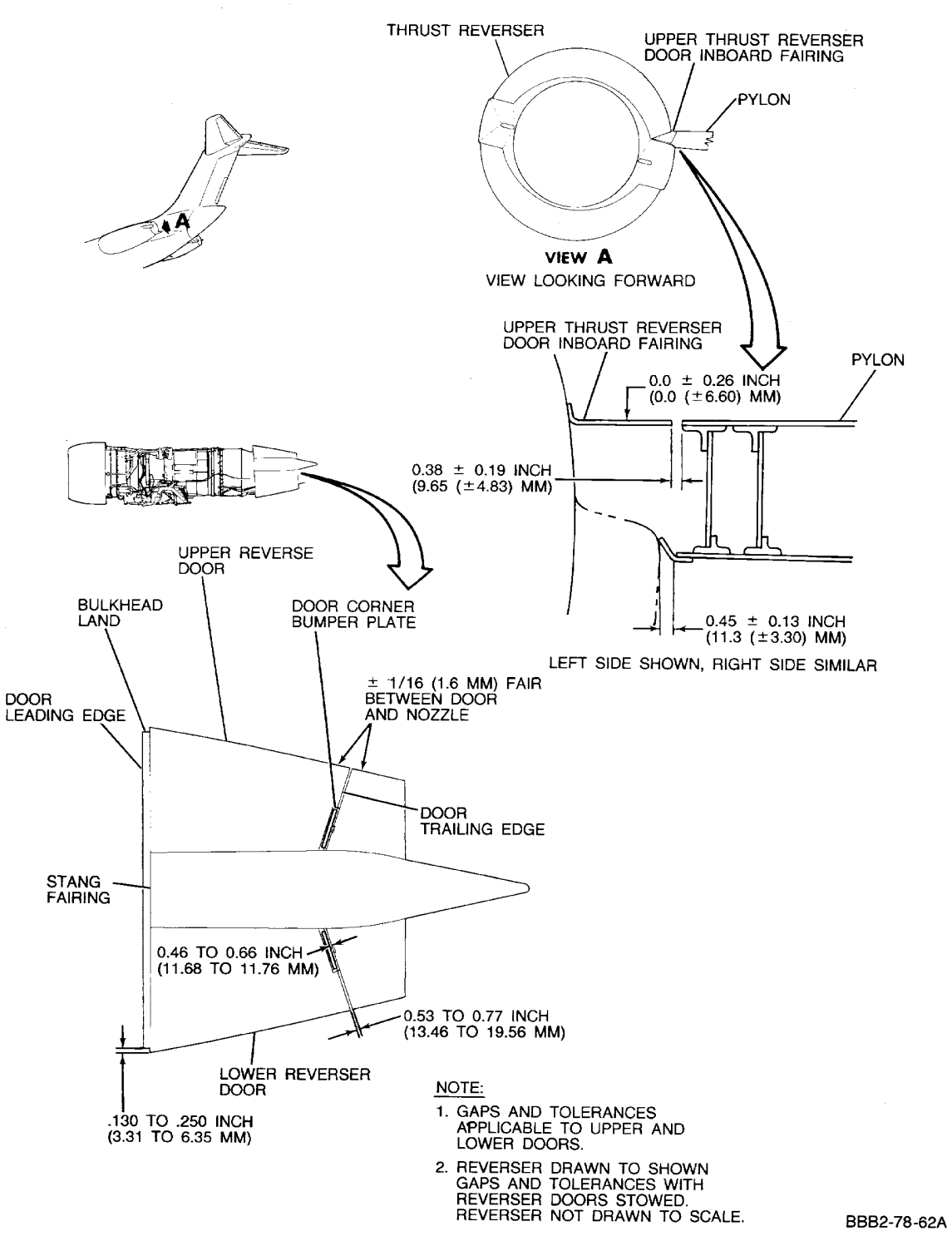
WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

(15) Place thrust reverser lever in forward thrust (stow) position.

(16) Check that thrust reverser doors are stowed and latched.

(17) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)



Thrust Reverser Doors---Gaps and Clearances
Figure 205/78-30-04-990-808

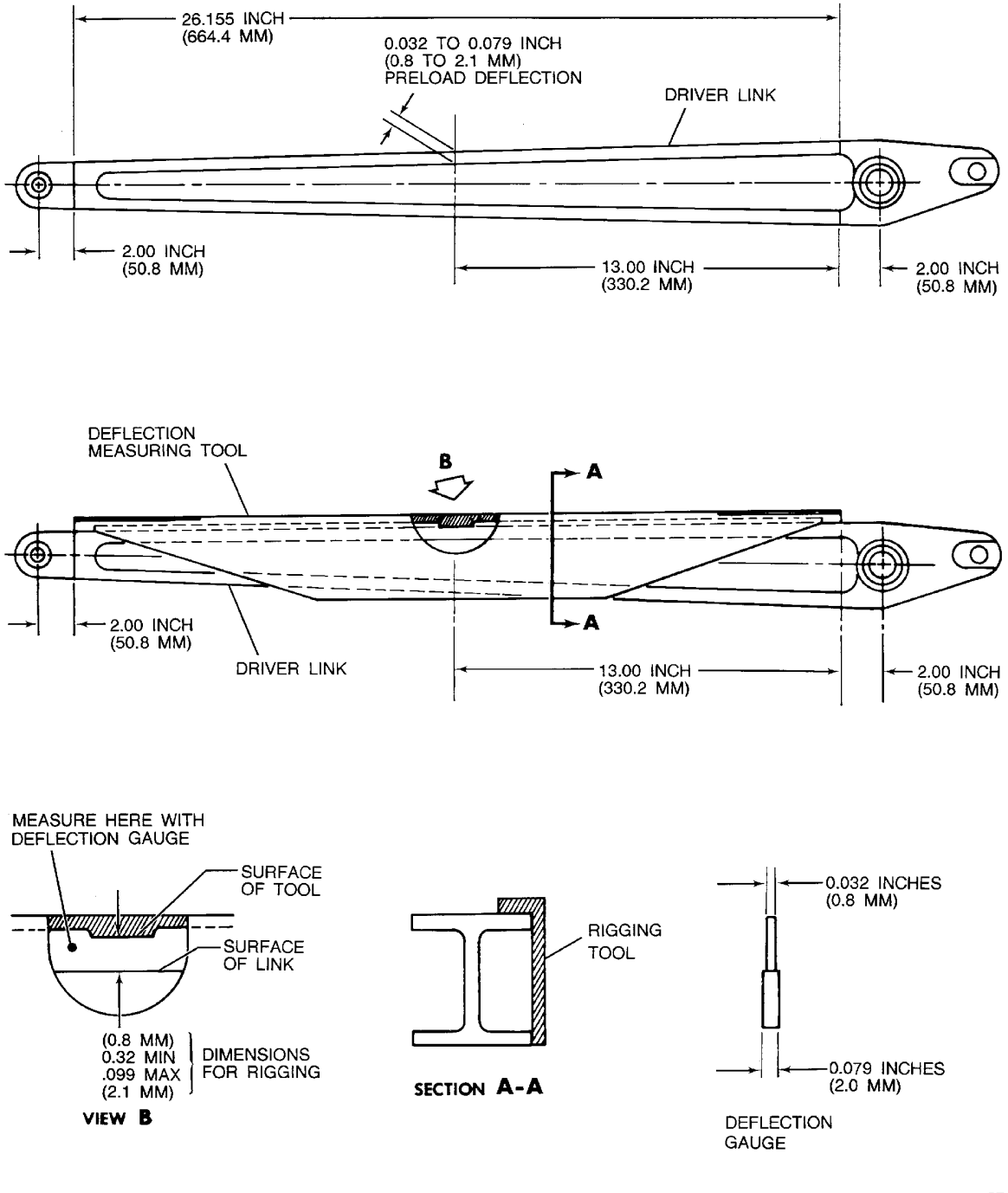
6. Thrust Reverser Doors Gap and Mismatch Tolerances

A. Trailing edge of thrust reverser door flush with leading edge of nozzle should have a gap of 0.53 inch (13.46 mm) to 0.77 inch (19.56 mm). (Figure 205)

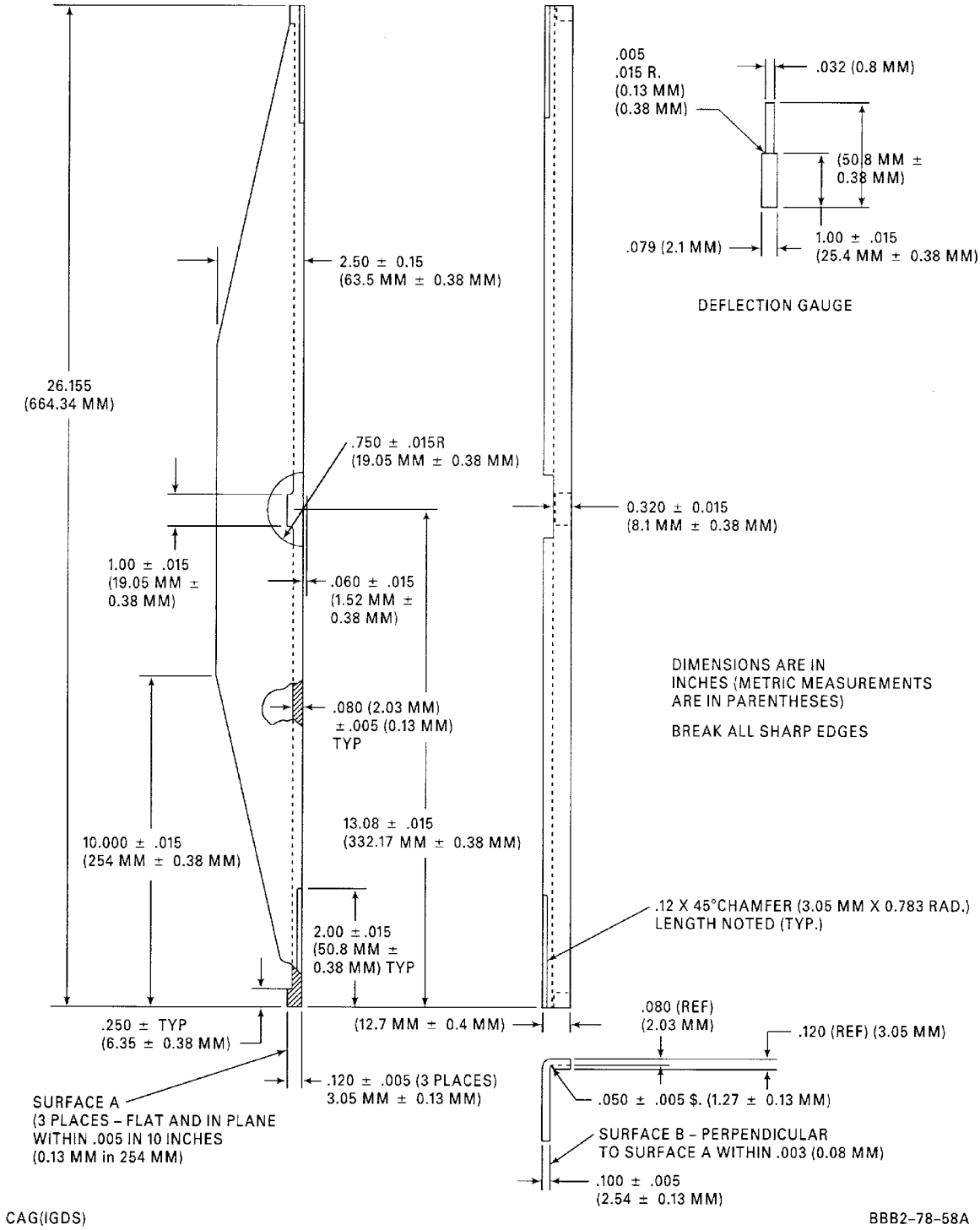
B. Gap at thrust reverser door corner bumper plate is 0.46 inch (11.68 mm) to 0.66 inch (16.76 mm). (Figure 205)

C. Gap between upper thrust reverser upper door inboard fairing and pylon is 0.38(±0.19) inches (9.65(±4.83) mm). (Figure 205)

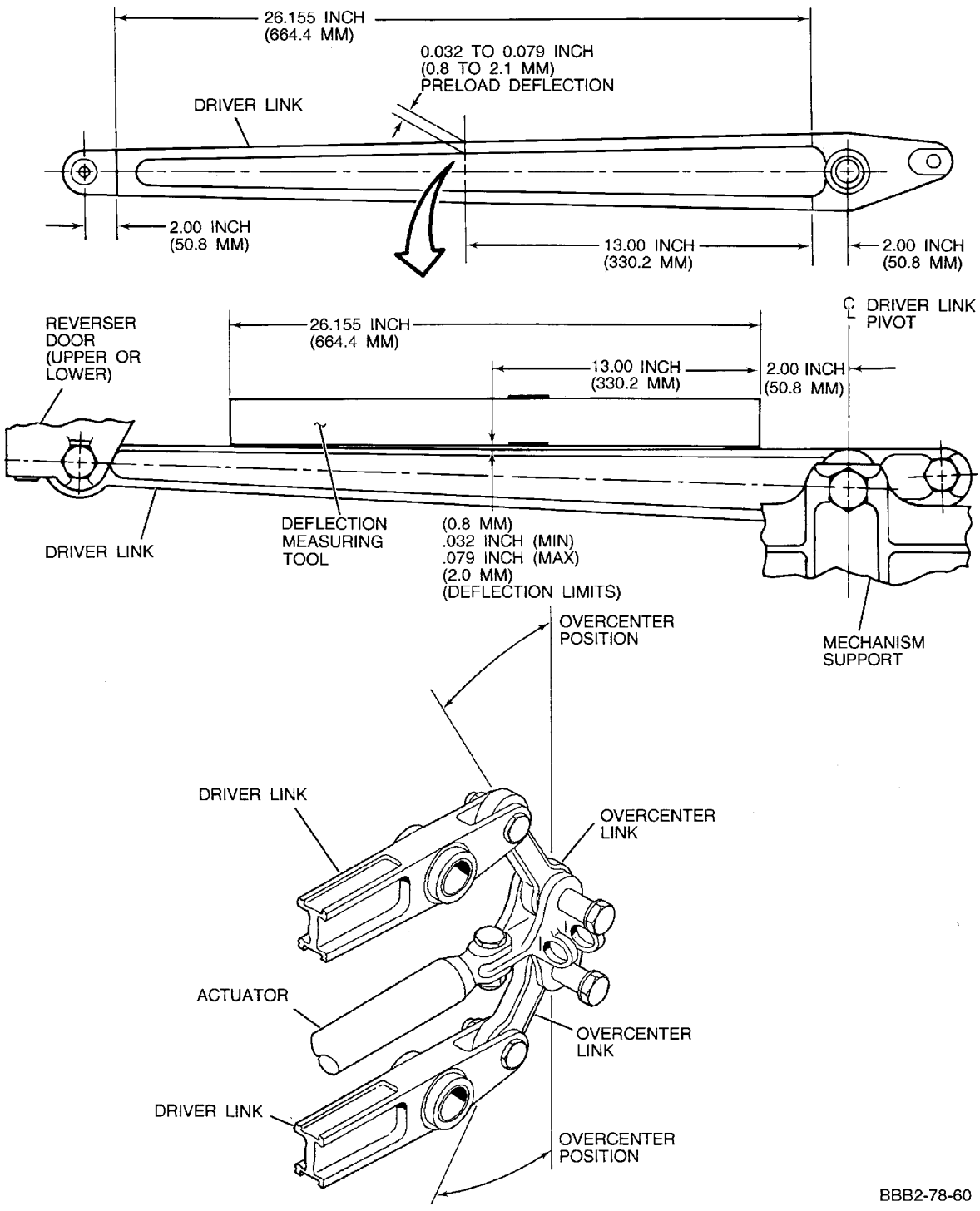
D. Mismatch between thrust reverser upper door inboard fairing and pylon is 0.0(±.26) inches (0.0(±6.60) mm). (Figure 205)



Driver Link - Deflection Limits
Figure 206/78-30-04-990-809



Driver Link Deflection Fixture
Figure 207/78-30-04-990-810



Driver Link - Deflection Check
Figure 208/78-30-04-990-811

THRUST REVERSER DOOR ACTUATING LINKAGE - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and adjustment/test instructions for the thrust reverser door actuating linkage.

B. Maintenance of the thrust reverser door actuating linkage is limited to removal/installation and adjustment/test procedures.

C. Access to thrust reverser door actuating linkage is through upper and lower thrust reverser doors and stang fairing removal.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Lubricating oil, molybdenum disulfide, silicone base, high temperature (MIL-L-25681) DPM 5782	E/M Corporation North Hollywood, CA
Inconel Lockwire 0.032 in, NASM20995N32, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.032 in NASM20995C32, DPM 5865	Not Specified
Torque wrench, 0-100 inch-pounds (0 to 11.3 N·m)	

3. Removal/Installation Thrust Reverser Door Actuating Linkage

A. Remove Actuating Linkage. (Figure 201)

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARD-LESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(1) Pressurize hydraulic system. (PAGEBLOCK 29-00-00/201)

(2) Place thrust reverser lever in reverse thrust (deploy) position.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(3) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY
S	31	B1-452	LEFT REVERSE THRUST ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(4) Depressurize aircraft hydrualic system. (PAGEBLOCK 29-00-00/201)

(5) Open access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(6) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(7) Remove lower pylon aft seal, if removing inboard stang fairing.

(8) Remove stang fairing from nozzle.

(9) Disconnect upper idler links from upper thrust reverser door.

WARNING: WEIGHT OF EACH THRUST REVERSER DOOR IS APPROXIMATELY 78 POUNDS (35.38 KG).

(10) Support upper thrust reverser door and disconnect upper driver links.

(11) Remove upper thrust reverser door.

(12) Disconnect lower idler links from lower thrust reverser door.

WARNING: WEIGHT OF EACH THRUST REVERSER DOOR IS APPROXIMATELY 78 POUNDS (35.38 KG).

(13) Support lower thrust reverser door and remove driver links.

(14) Remove lower thrust reverser door.

(15) Remove idler links from mechanism support and disconnect lower driver links.

(16) Remove driver links from mechanism support and remove links.

(17) Remove mechanism support from beam mounting support (4 places) and remove support.

(18) Remove top overcenter link from carriage and remove link.

(19) Remove bottom overcenter link from carriage (right side of nacelle only).

(20) Remove bottom overcenter link and rod from carriage (left side of nacelle only).

(21) Remove overcenter links and rod.

(22) Remove guide rods from carriage and remove carriage from actuator.

B. Install Actuating Linkage. (Figure 201) (Figure 202)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY
S	31	B1-452	LEFT REVERSE THRUST ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(2) Make certain thrust reverser control valve is in dump position and lockpin is installed.

WARNING: MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET MOLYBDENUM DISULFIDE SILICONE LUBRICANT IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(3) Apply light coat of oil (MIL-L-25681) to threads of bolt and install carriage on actuator. Safety nut with new cotter pin.

(4) Attach bottom overcenter link to carriage (right side of reverser only). Safety nut with new cotter pin.

(5) Attach bottom overcenter link and rod to carriage (left side of reverser only). Safety nut with new cotter pin.

(6) Install top overcenter link on carriage. Safety nut with new cotter pin.

(7) Install driver link on overcenter link. Safety nut with new cotter pin.

(8) Install idler link on mechanism support with larger boss end on outboard side from engine. Safety nut with new cotter pin. (Figure 202)

(9) Install mechanism support on beam mounting support (4 places). Safety nut with new cotter pin.

WARNING: WEIGHT OF EACH THRUST REVERSER DOOR IS APPROXIMATELY 78 POUNDS (35.38 KG).

(10) Support and install upper thrust reverser door and attach idler links (2 places) and tighten nuts to torque of 270 to 300 inch-pounds (30.4 to 33.9 N·m). Safety nut with new cotter pin.

(11) Install upper thrust reverser door driver links (2 places) and tighten nuts to torque of 270 to 300 inch-pounds (30.4 to 33.9 N·m). Safety nut with new cotter pin.

WARNING: WEIGHT OF EACH THRUST REVERSER DOOR IS APPROXIMATELY 78 POUNDS (35.38 KG).

(12) Support and install lower thrust reverser door and attach idler links (2 places) and tighten nuts to torque of 270 to 300 inch-pounds (30.4 to 33.9 N·m). Safety nut with new cotter pin.

(13) Install lower thrust reverser door driver links (2 places) and tighten nuts to torque of 270 to 300 inch-pounds (30.4 to 33.9 N·m). Safety nut with new cotter pin.

(14) Adjust and test thrust reverser door actuating linkage. (Paragraph 4.)

(15) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(16) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY
S	31	B1-452	LEFT REVERSE THRUST ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(17) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(18) Close access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAIL-ABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

(19) Place thrust reverser lever in forward thrust (stow) position.

(20) Check that thrust reverser doors are stowed and latched.

(21) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

(22) Install stang fairing on nozzle.

(23) Install lower pylon aft seal, if removed.

4. Adjustment/Test Thrust Reverser Door Actuating Linkage

A. Adjust Door Actuating Linkage. (Figure 203) (Figure 204)

WARNING: MAKE CERTAIN FLIGHT COMPARTMENT THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(1) Pressurize hydraulic system. (PAGEBLOCK 29-00-00/201)

(2) Place thrust reverser lever in reverse thrust (deploy) position.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(3) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(4) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(5) Adjust thrust reverser doors as follows:

(a) Remove stang fairings.

(b) Remove actuator support stop bolts and retain any washers under heads.

(c) Replace bolts and screw all the way in finger tight.

(d) Install one (1) shim and bumper on support lugs.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

(e) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(f) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(g) Cycle doors several times, then actuate to overcenter closed position.

(h) Door trailing edge should fair with structure within ±1/16 inch (±1.6 mm) except at any one point it may be ±3/32 inch (±2.4 mm). Adjust thickness of laminated shims, if required.

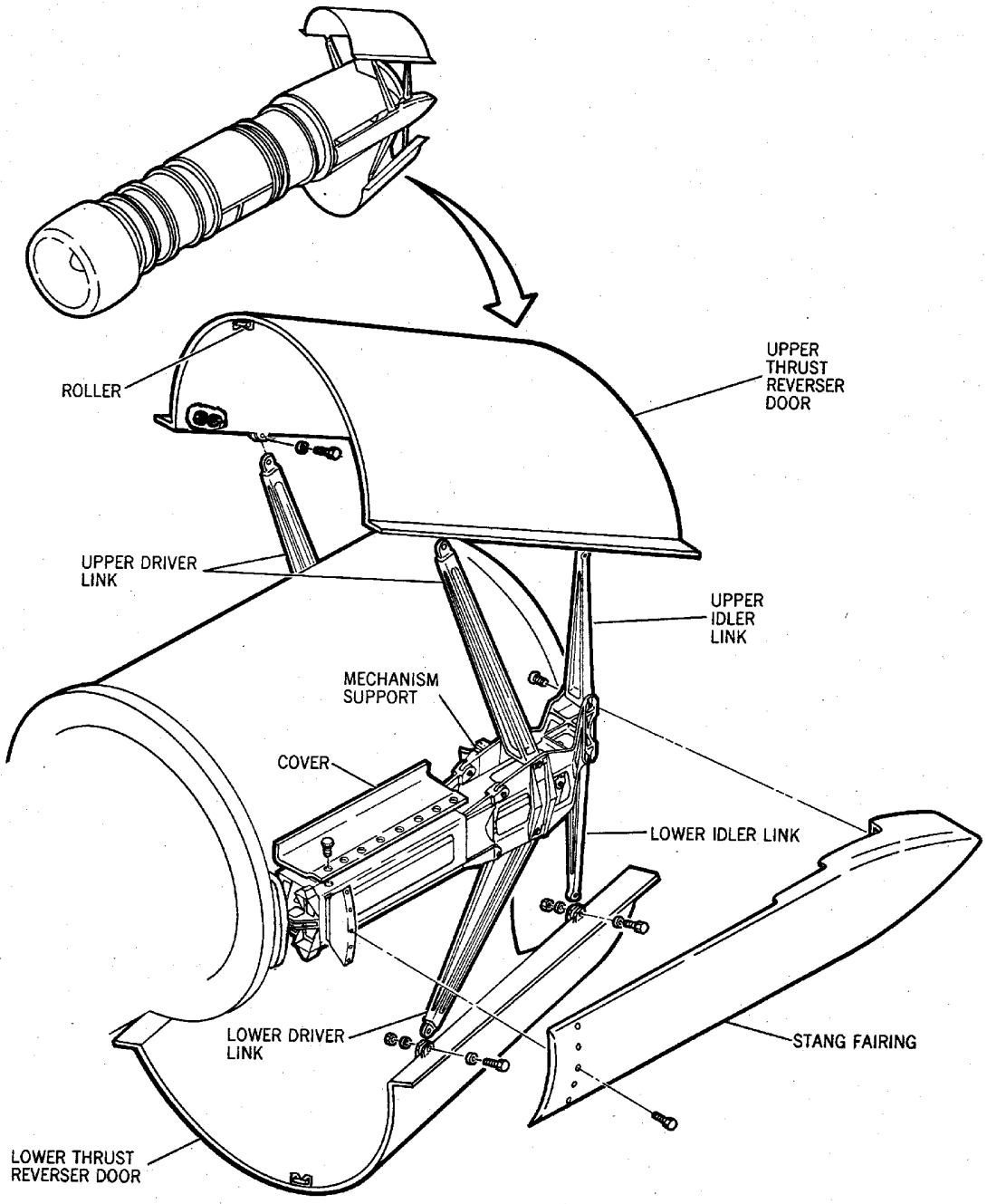
(i) Back out actuator support stop bolts until door leading edge has 0.130 to 0.250 inch (3.2 to 6.4 mm) step with bulkhead land. (Figure 203)

(j) Measure preload deflection of driver links. Deflection should be 0.032 to 0.079 inch (.8 to 2.0 mm) . Measure driver link deflection using locally manufactured tool and deflection gauge. Deflection can also be measured with straight edge placed across top of driver link and a scale . Required adjustments can be accomplished by using driver or idler link stops, provided requirements of two previous steps are also adhered to. (Figure 203) (Figure 204) (Figure 205) (Figure 206)

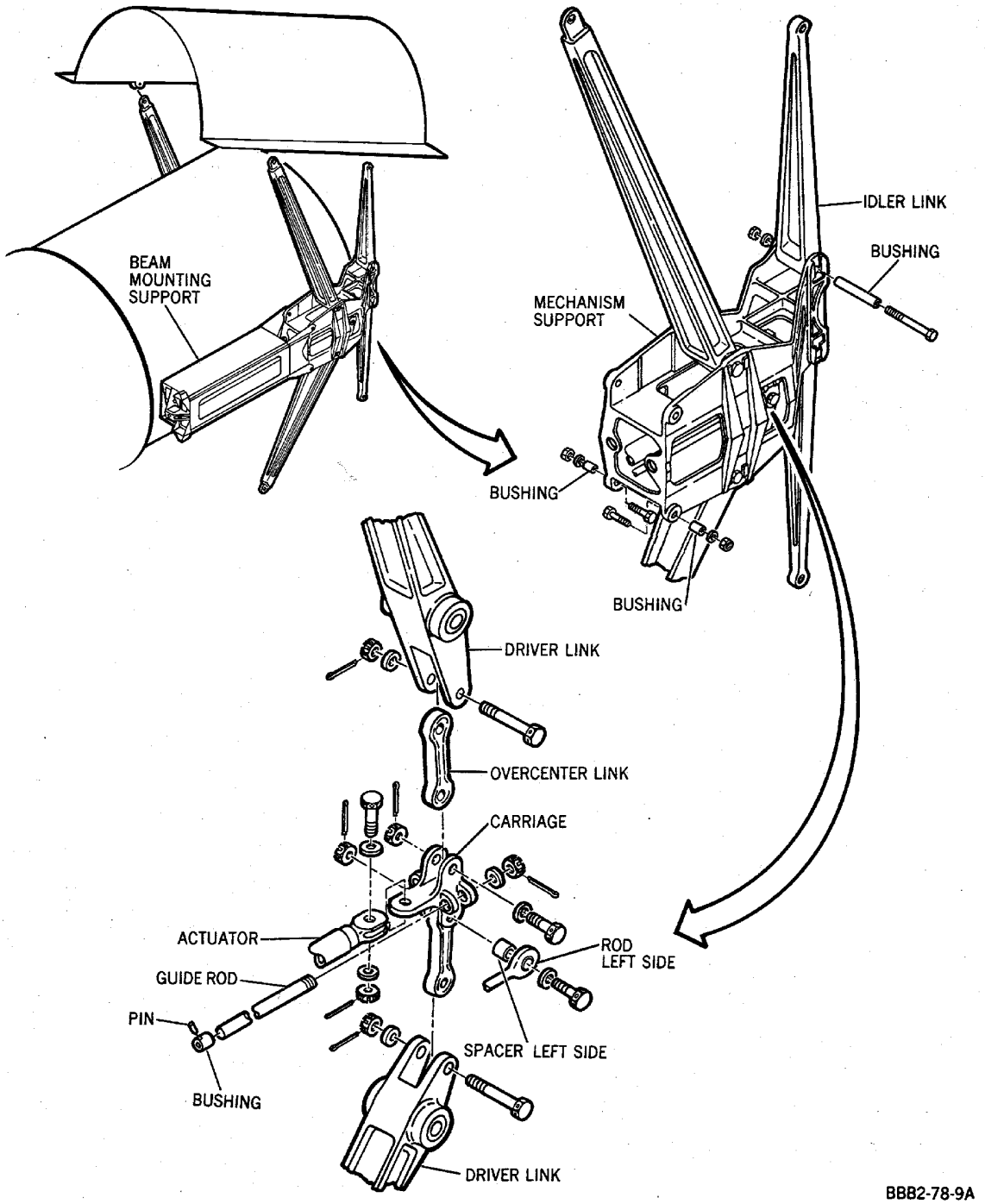
(k) Determine quantity of washers which will fit under head of actuator support stop bolts, add one to that total and install on bolt. Safety with lockwire. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(l) Depressurize hydraulic system. (PAGEBLOCK 29-00-00/201)

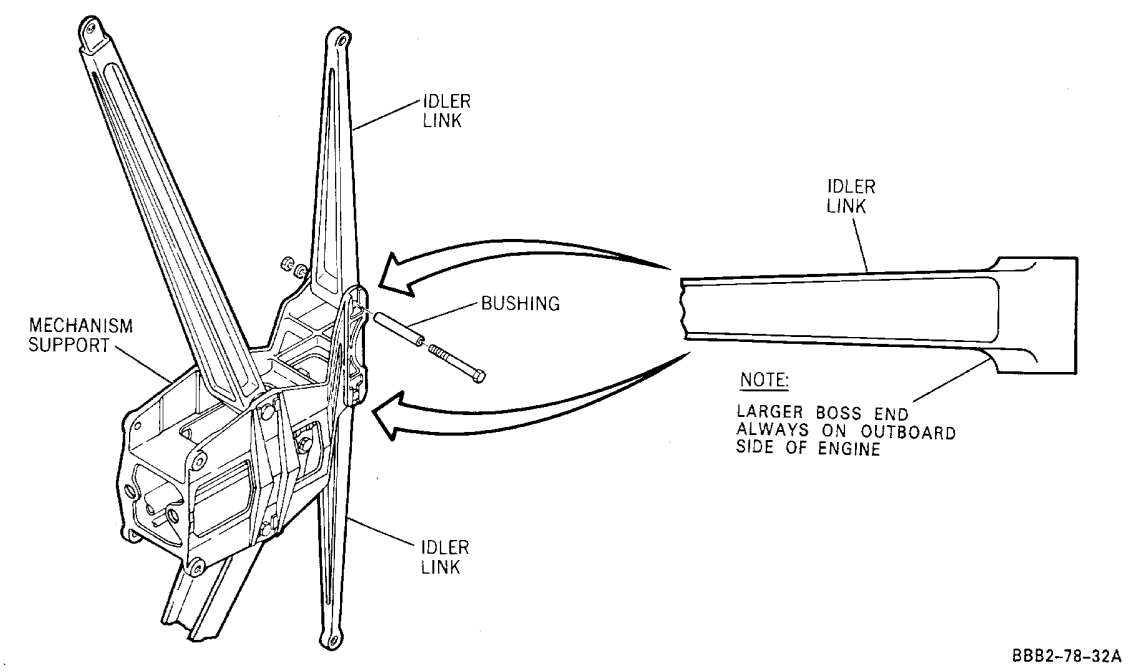
(m) Replace stang fairings.



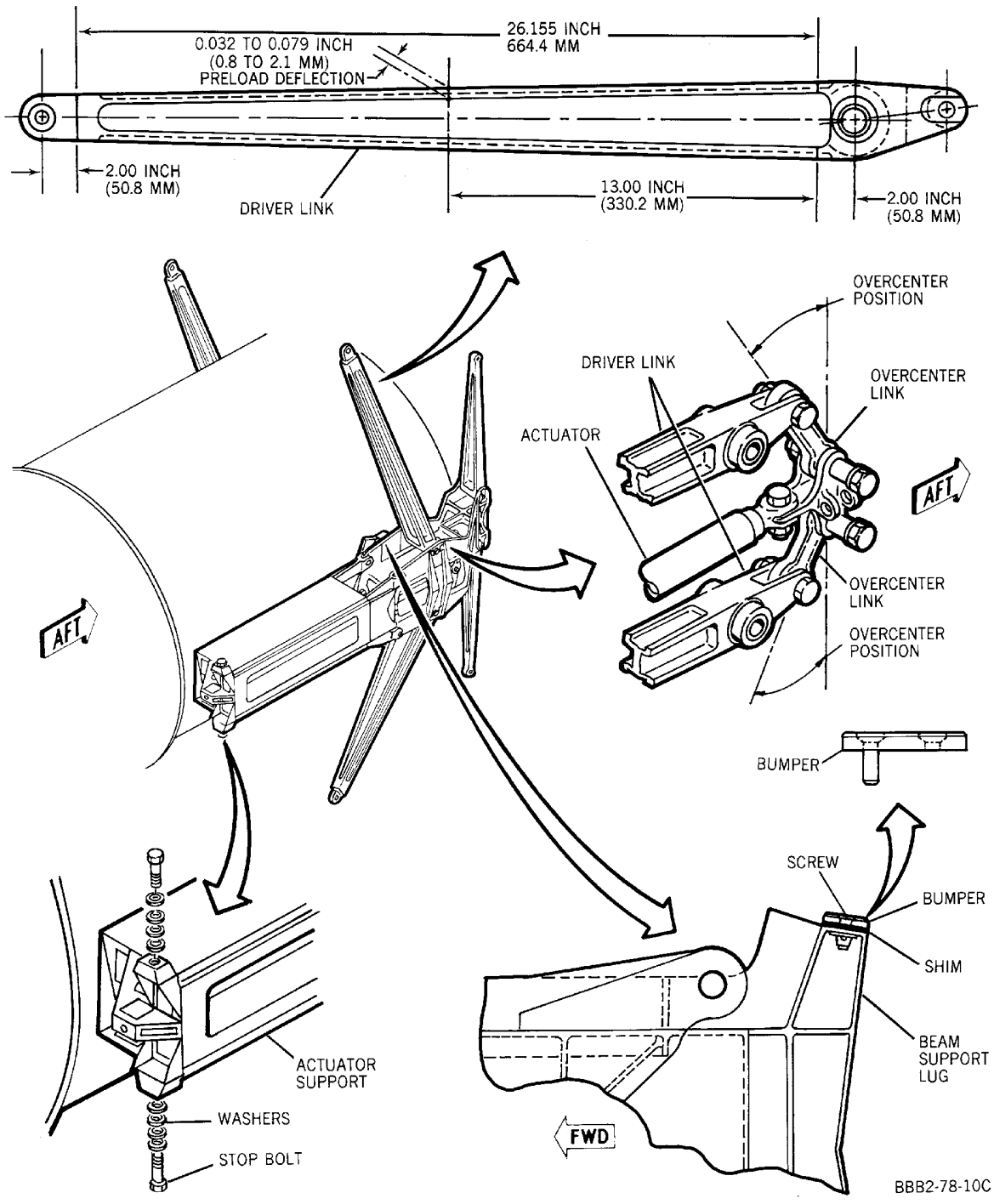
Thrust Reverser Door Actuating Linkage - Removal/Installation
Figure 201/78-30-05-990-801 (Sheet 1 of 2)



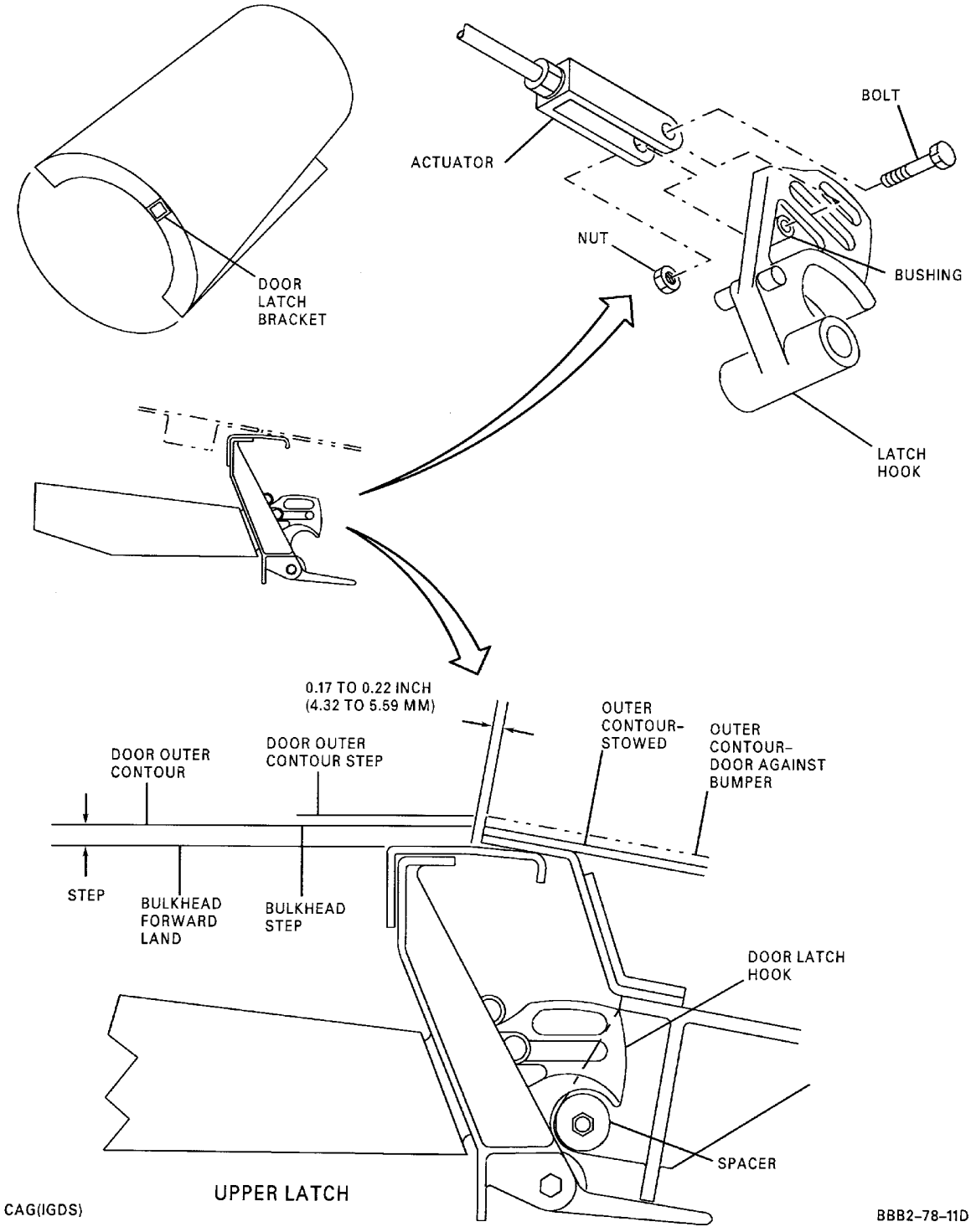
Thrust Reverser Door Actuating Linkage - Removal/Installation
Figure 201/78-30-05-990-801 (Sheet 2 of 2)



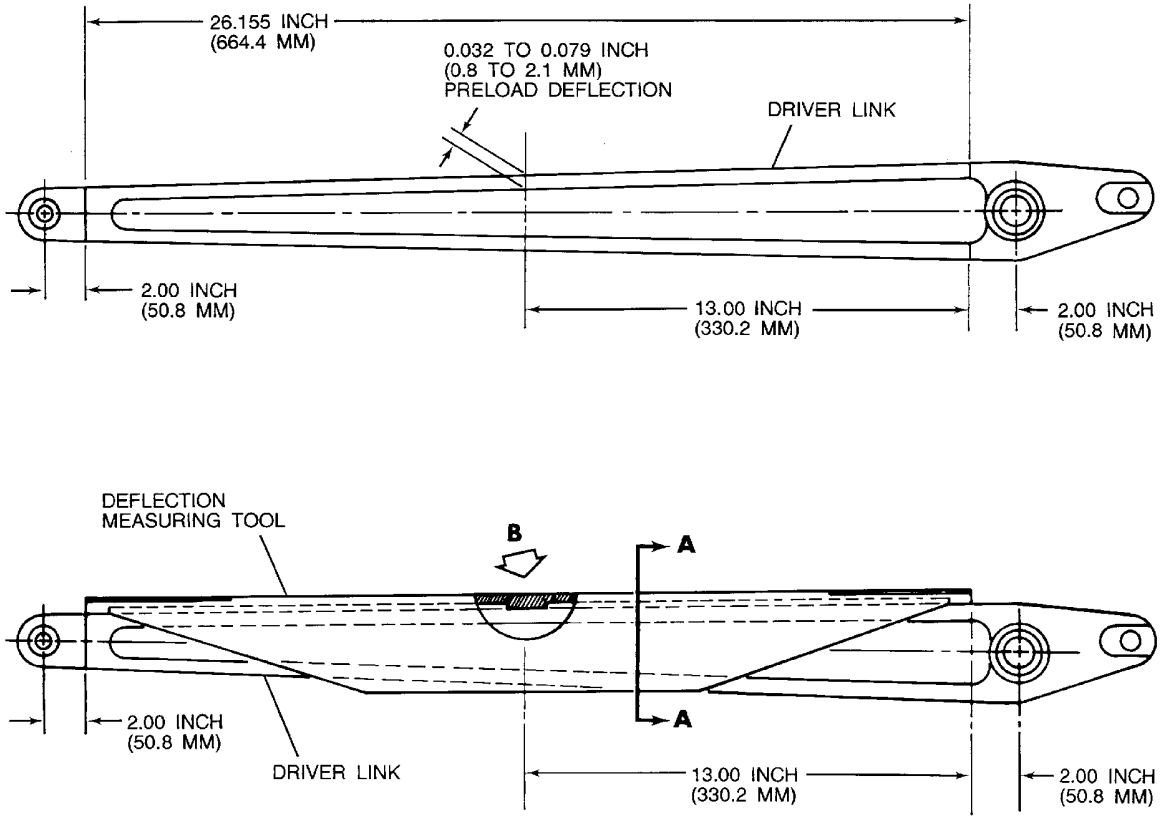
Thrust Reverser Door Idler Link - Installation
Figure 202/78-30-05-990-802



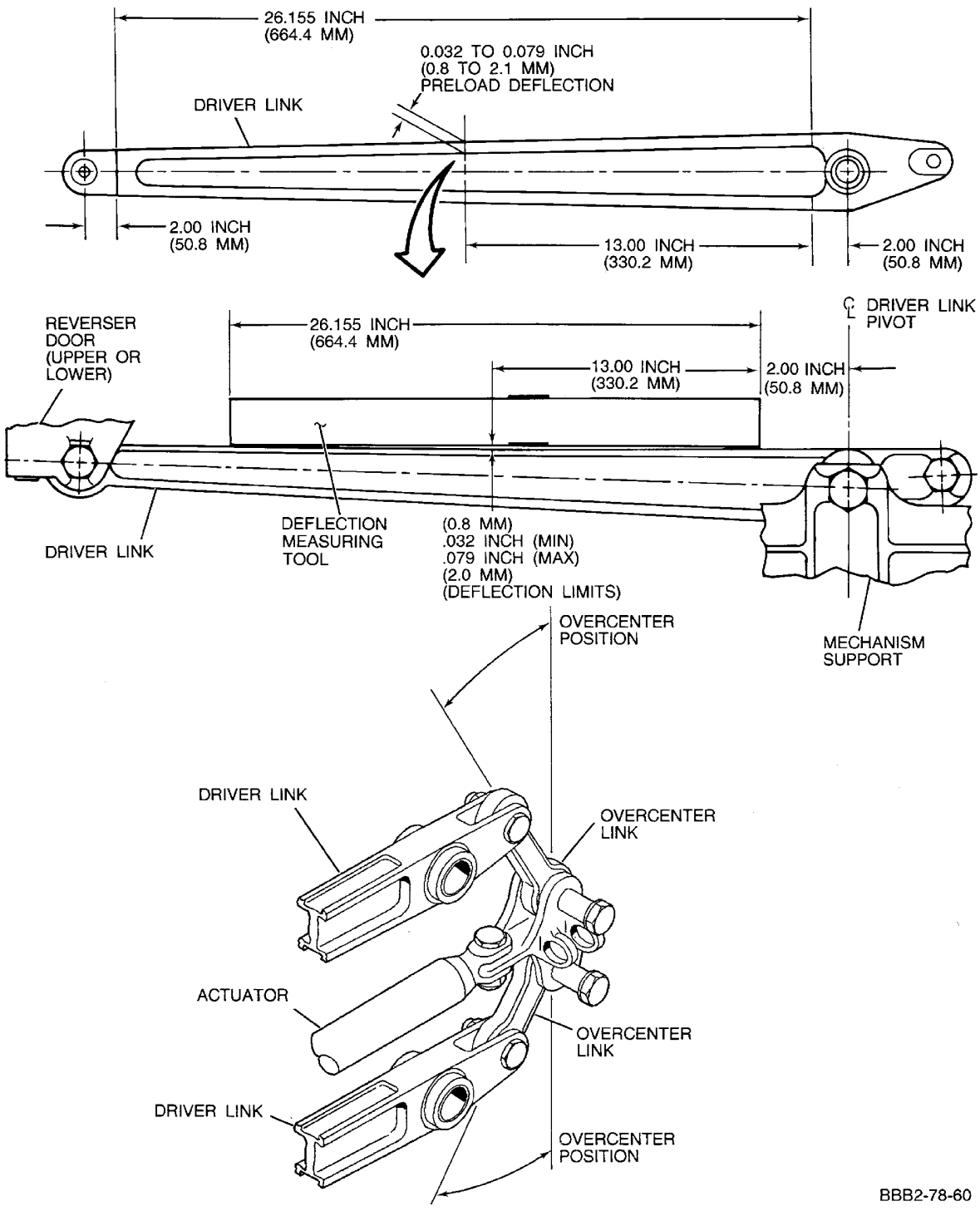
Thrust Reverser Door Actuating Linkage - Adjustment
Figure 203/78-30-05-990-803



Latch Assembly
Figure 204/78-30-05-990-804



Driver Link - Deflection Limits
Figure 205/78-30-05-990-805



Driver Link - Deflection Check
Figure 206/78-30-05-990-806

THRUST REVERSER - CHECK

1. Check

A. General Visual Check

(1) Check parts for cracks, corrosion, gouges, wear, and other damage or deterioration using a strong light and minimum of 10-power magnification.

B. Check Nozzle

(1) Visually check nozzle for pits, scratches, cracks, and corrosion using a strong light and minimum magnification of 10-power.

(2) Check allowable damage limits as follows:

NOTE: Damage meeting following criteria is considered negligible and does not require repair action.

(a) Two holes or punctures in 1 ft^2 (929 cm^2) up to 0.30 in. (7.62 mm) in length or diameter may remain in perforated skin without repair if check does not reveal any crack.

(b) Dents not exceeding 0.125 in. (3.175 mm) in depth and without cracks, delamination, or holes may remain in perforated skin without repair. Dents shall not exceed 1.5 in. (38.1 mm) in diameter, and are not allowed within 6.0 in. (152.4 mm) of the aft end of the nozzle, within 6.0 in. (152.4 mm) of the thrust reverser actuation mechanism, or within 6.0 in. (152.4 mm) from a similar unrepaired dent.

(c) Inner and outer core-to-skin delamination (voids) in area of densified core up to 1.0 in^2 (6.45 cm^2) and a minimum of 3.0 in. (76.2 mm) separation between edges may remain without repair, provided that total amount of delamination does not exceed 10 percent of densified core. Delamination (voids) outside densified core up to 3.0 in^2 (19.35 cm^2) and a minimum of 4.0 in. (101.6 mm) separation between edges may remain without repair, provided that total amount of delamination does not exceed 10 percent of total area. If delamination of any area exceeds 10 percent, area must be repaired.

(d) Repair of faying surface voids (metal-to-metal) not required when length is less than 1 in. (25 mm), width is not greater than 0.10 in. (2.54 mm), there is a minimum distance of 1 in. (25 mm) to next void area, and all cracks in void area are welded.

(e) Scratches or gouges that do not exceed 0.002 in. (0.051 mm) inch in depth may remain without repair.

C. Check Doors

(1) Check structure and skins of doors for dents, cracks, loose or missing rivets, distortion, nicks, gouges, or other damage. Loose rivets are permitted in doors as follows:

(a) No loose rivets permitted at hinges.

(b) One loose rivet in ten permitted in secondary structure providing there are three tight rivets on each side of loose rivet.

(c) Two loose adjacent rivets permitted in trailing edge, provided there are five tight rivets between loose rivets and any other two loose rivets.

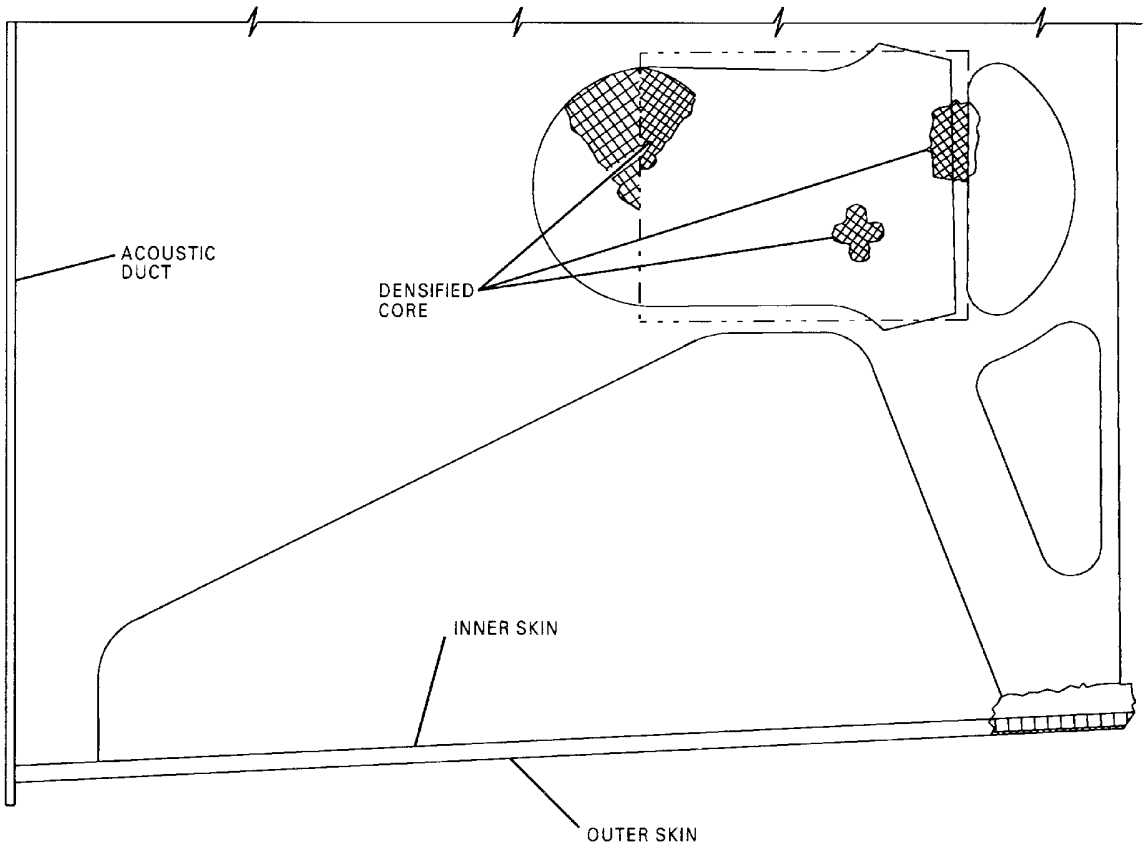
(2) Check condition and security of striker support brackets, laminated shims, serrated plates, and serrated bushings.

(3) Check condition of bumpers on trailing edge of door assemblies (specifications).

(a) No cracks allowed in bumpers.

(b) No welding of cracks in bumpers is permitted.

(c) Wear at contact area of bumpers is limited to one-half bumper thickness (approximately 0.030 in. (0.762 mm).



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Thrust Reverser Acoustic Exhaust Duct
Figure 601/78-30-06-990-803

THRUST REVERSER AND STANG FAIRING - APPROVED REPAIRS

1. General

A. The following procedures provide instructions for the repair of the thrust reverser doors and stang fairing.

B. Replace any bolts, screws, and nuts having damaged threads. Do not chase damaged threads on fasteners.

2. Thrust Reverser Door and Stang Fairing - Approved Repairs

A. Repair Door (Figure 801)

(1) Repair door as follows:

(a) Insulate following areas with epoxy primer as necessary, in conjunction with structural repairs. (PAGEBLOCK 20-70-01/201)

(b) Dissimilar metal faying surfaces and fasteners.

(c) Inner surface of outer skins of upper and lower doors. (Figure 801)

(d) Inner surface of stang fairing which contacts mechanism support. (Figure 801)

(2) Locate attaching parts (rivets, screws, bolts, and etc.) two times their diameter from joggles, edge of parts, and adjacent structure, unless otherwise noted.

(3) Repair doors (Figure 801), as required, in accordance with following: (Figure 801)

(a) Replace loose or missing rivets. For installation of rivets in trailing edge of door, refer to Figure 802.

1) Loose or missing rivets on outer skin may be replaced with following optional blind rivets to eliminate need for removing inner skin:

Table 801

Existing Rivet	Optional Blind Rivet	Optional Cherry Rivet
NAS1097AD	NAS1739B	CR2248
NAS1097AD	NAS1739E	CR2238

(b) Stop-drill and rout-out cracks in outer skin, and rivet doubler in place. If crack in outer skin is located adjacent to door frame, install doubler and door. Repair limitations are as follows:(Figure 803)

1) Only one crack repair per bay (area between frames) per Figure 803 is allowed.

2) Minimum allowable separation between adjacent repair doublers (from edge to edge) is 3.0 in. (76.2 mm) for all crack repairs.

(c) Replace bumpers if necessary, refer to Figure 804for material specification.

NOTE: Repair of cracks or worn areas in bumpers by welding is not permitted.

B. Repair Stang Fairing (Figure 801)

(1) Repair stang fairing as follows:

(a) Replace loose or missing rivets.

(b) Bump out dents to fair contour.

(c) Burnish minor nicks and gouges until smooth.

(d) Remove minor cracks with holesaw, and install doubler and flush patch with rivets. (Figure 805)

(e) Repair cracks at forward attaching area by stop-drilling both ends of crack, installing serviceable frame and doubler, and carefully drilling 0.199- to 0.202-inch (5.05 to 5.13 mm) diameter attach holes through doubler and frame; using skin as locating template refer to Figure 805 for repair procedures and Figure 806 for materials.

(f) Repair cracks at aft attaching area by stop-drilling both ends of crack, installing serviceable zee and doubler, and carefully drilling 0.257- to 0.261-inch (6.53 to 6.63 mm) diameter attach holes through doubler and zee; using skin as locating template refer to Figure 805 for repair procedures and Figure 806 for materials.

Table 802 Thrust Reverser Door Materials

FIG.	ITEM NO.	NOMENCLATURE	GAGE	MATERIAL	USAGE CODE
Figure 804	1	OUTER SKIN	0.050	CLAD 2024T3	
	2	INNER SKIN-AFT	0.040	REF. NOTE 1	
	2	INNER SKIN-FWD	0.040	REF. NOTE 1	
	3	BUMPER	0.163	REF. NOTE 9	
	4	TRAILING EDGE	0.140	TITANIUM AMS4901	
	5	STIFFENER	0.160	CLAD 2024T3	
	6	DOUBLER	0.063	CLAD 2024T3	
	7	DOUBLER	0.063	REF. NOTE 1	
	7	DOUBLER	0.063	REF. NOTE 1	
	8	LONGERON	0.050	REF. NOTE 1	
	9	FRAME	0.050	REF. NOTE 1	
	10	FRAME	0.063	REF. NOTE 1	
	11	ANGLE	0.063	REF. NOTE 1	
	12	CLIP	0.050		
	13	GUSSET	.063	REF. NOTE 1	
	14	ANGLE	.080	REF. NOTE 1	
	15	FAIRING	.050	CLAD 2024T42	
	16	FAIRING SUPPORT	.040	REF. NOTE 7	
	16	FAIRING SUPPORT	0.040	REF. NOTE 9	
	17	WEB	0.063	REF. NOTE 2	
	18	CHANNEL	0.063	REF. NOTE 2	
	19	DOUBLER	0.050	CLAD 2024T42	
	20	STIFFENER	0.063	REF. NOTE 1	
	21	ANGLE	0.050	CLAD 2024T42	
	22	ANGLE	0.063	REF. NOTE 1	
	23	GUSSET	0.050	REF. NOTE 1	
	24	ANGLE	0.050	REF. NOTE 1	

Table 802 Thrust Reverser Door Materials (Continued)

FIG.	ITEM NO.	NOMENCLATURE	GAGE	MATERIAL	USAGE CODE
	25	DELETED			
	26	DELETED			
	27	AFT HINGE		REF. NOTE 3	
	28	FWD HINGE		REF. NOTE 3	
	29	BRACKET		REF. NOTE 3	
	30	FITTING		REF. NOTE 4	
	31	SHIM	0.125	REF. NOTE 5	
	32	ANGLE	0.063	REF. NOTE 9	
	33	SHIM	0.060	REF. NOTE 6	
	34	CLIP	0.063	REF. NOTE 8	
	35	STRAP	0.040	REF. NOTE 1	
	36	CLIP	0.063	CLAD 2024-T42	

NOTE: 1. CRES STEEL TYPE A286 AMS5525
2. CRES STEEL TYPE 321 MIL-S-6721
3. CRES STEEL INVESTMENT CASTING H925 AMS5355
4. 0.50 X 0.50 CRES STEEL BAR TYPE 321 MIL-S-6721
5. CRES STEEL LAMINATED MIL-S-22499 CLASS 1 COMP 3 TYPE II
6. CRES STEEL LAMINATED MIL-S-22499 CLASS 2 COMP 3 TYPE I
7. NICKEL CHROME ALLOY SHEET INCONEL 718 AMS5596
8. CRES SHEET MIL-S-5059, COND ANLD, COMP 302 FINISH 2D
9. INCONEL 625 SHEET AMS5599

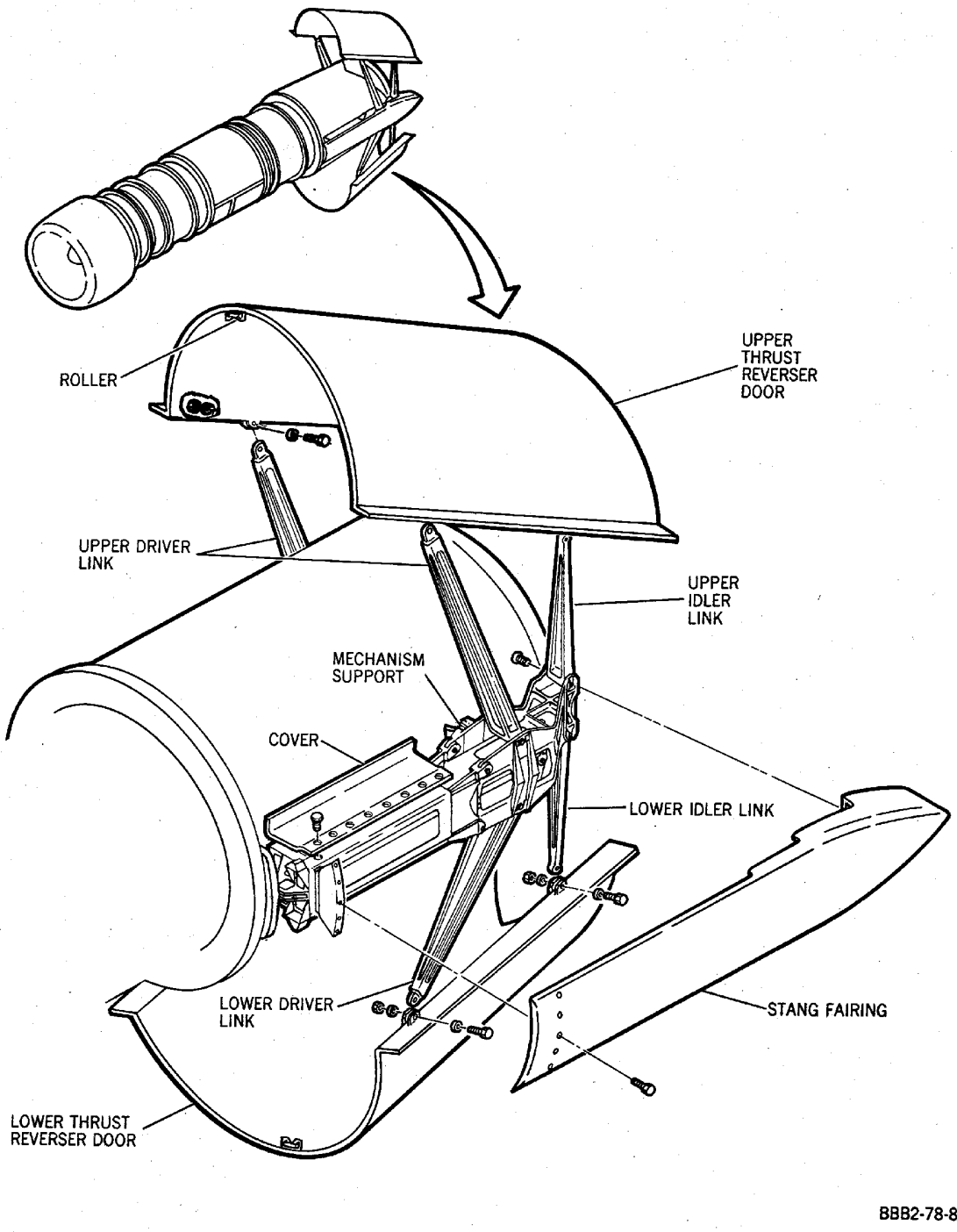
Table 803 Stag Fairing Material

FIG.	ITEM NO.	NOMENCLATURE	GAGE	MATERIAL	USAGE CODE
Figure 806	1	SKIN	0.063	ALCLAD	
	2	SKIN	0.050	SEE NOTE 1	
	3	LONGERON	0.063	ALCLAD	
	4	STRINGER	0.063	ALCLAD	
	5	ANGLE	0.063	SEE NOTE 1	
	6	BRACKET	0.063	SEE NOTE 1	
	7	CHANNEL	0.063	SEE NOTE 1	
	8	GUSSET	0.063	ALCLAD	
	9	FRAME	0.063	ALCLAD	
	10	LONGERON	0.063	SEE NOTE 1	
	11	FILLER	0.050	ALCLAD	

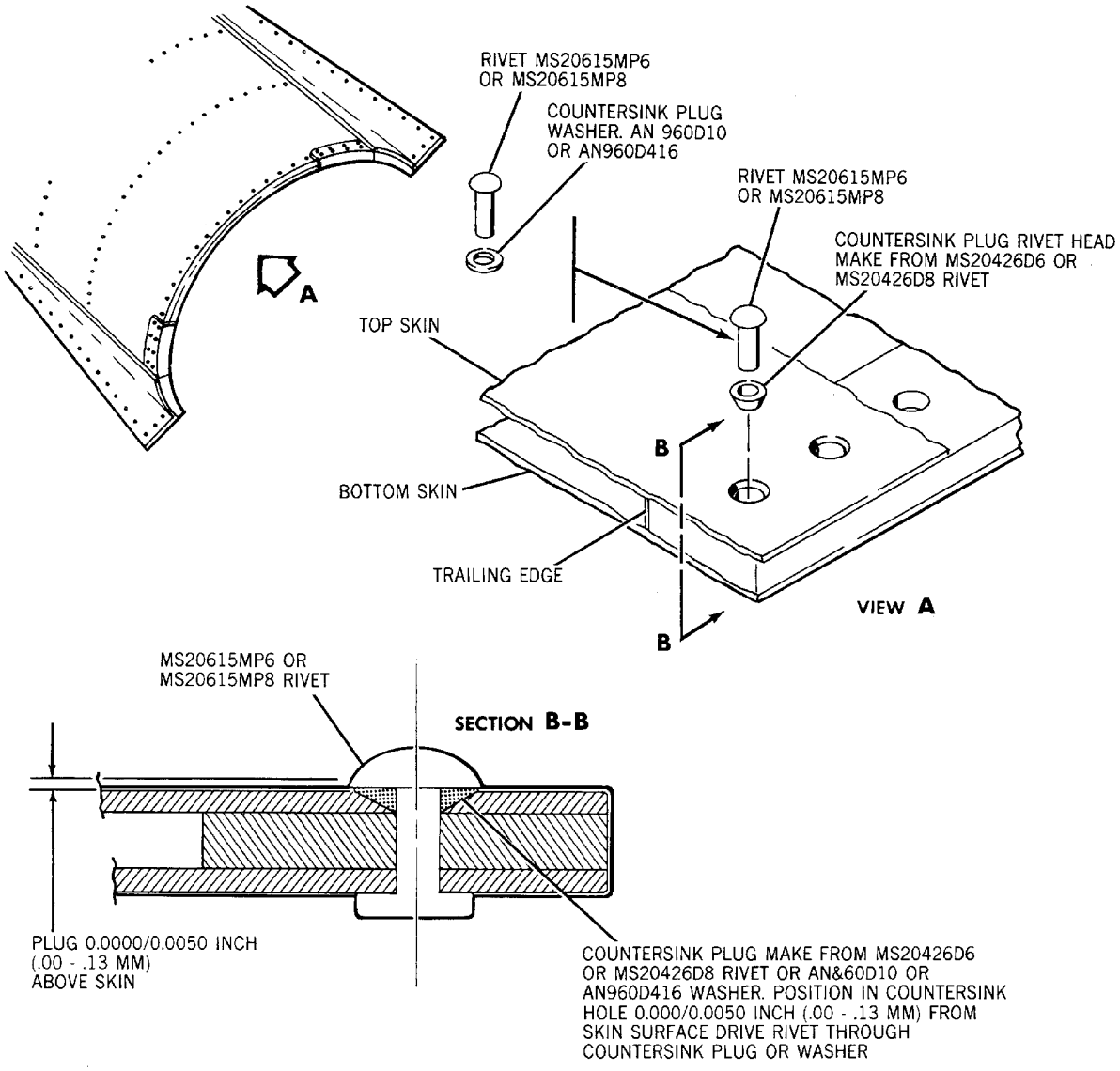
Table 803 Stag Fairing Material (Continued)

FIG.	ITEM NO.	NOMENCLATURE	GAGE	MATERIAL	USAGE CODE
	12	SEAL	0.020	SEE NOTE 2	
	13	SHIM	0.093	SEE NOTE 3	
	14	GUSSET	0.063	ALCLAD	
	15	BRACKET	0.050	SEE NOTE 4	
	16	COVER		SEE NOTE 5	

NOTE: 1. CRES SHEET TYPE 321 COMP TI, ANNEALED
2. INCONEL 718 SHEET-AMS5596
3. CRES SHEET-COMP 3 TYPE I, CLASS 1 (MIL-S-22499)
4. CRES PH15-7MO (AMS5520)
5. AL INVESTMENT



Thrust Reverser
Figure 801/78-30-07-990-802



CONDITION	REPAIR PROCEDURES
LOOSE OR MISSING RIVETS.	FABRICATE COUNTERSINK PLUG FROM RIVETS OR USE WASHERS, VIEW A. PLACE RIVETS OR WASHERS IN EXISTING COUNTERSINK HOLES. MAINTAIN 0.000/0.0050-INCH (.00 - .13 MM) TOLERANCE ABOVE SKIN, VIEW B-B, DRIVE RIVET, VIEW A, THROUGH COUNTERSINK PLUG.

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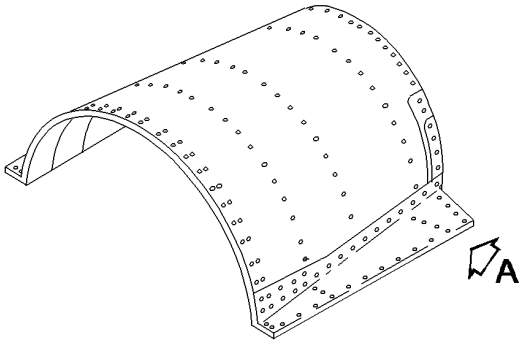
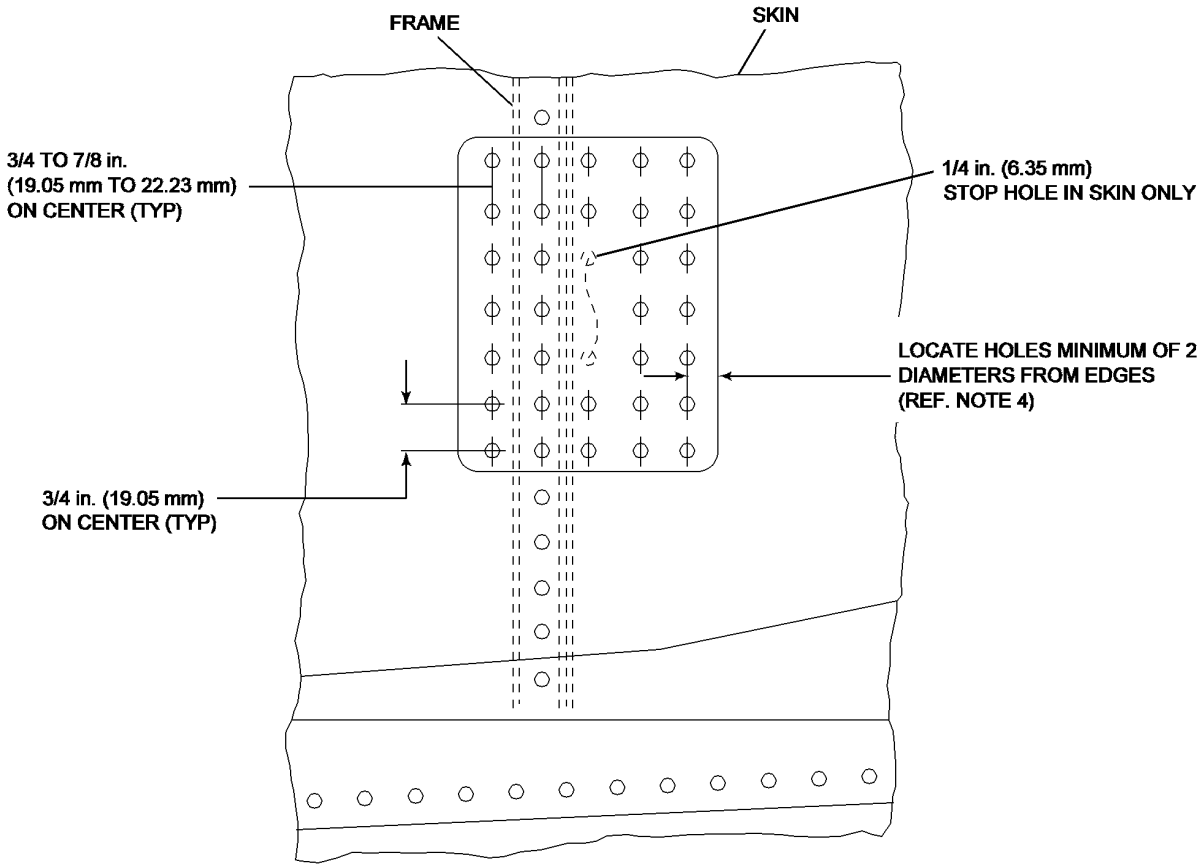
Thrust Reverser Door - Trailing Edge Repair
Figure 802/78-30-07-990-803



EXTERNAL DOUBLER REPAIR FOR CRACKS IN OUTER DOOR SKIN ON OR NEAR DOOR FRAME

NOTES:

1. FABRICATE DOUBLER FROM 2219-T81 OR 2024-T3 ALCLAD SHEET, 0.063 in. (1.6 mm) THICK.
2. ROLL DOUBLER TO MATCH OUTER SKIN CONTOUR AND AERO CHAMFER EDGES.
3. APPLY PHENOLIC PRIMER TO DOOR SKIN AND UNDERSIDE OF DOUBLER.
4. ATTACH DOUBLER TO THRUST REVERSER DOOR WITH CR2248 RIVETS OR EQUIVALENT.



VIEW A

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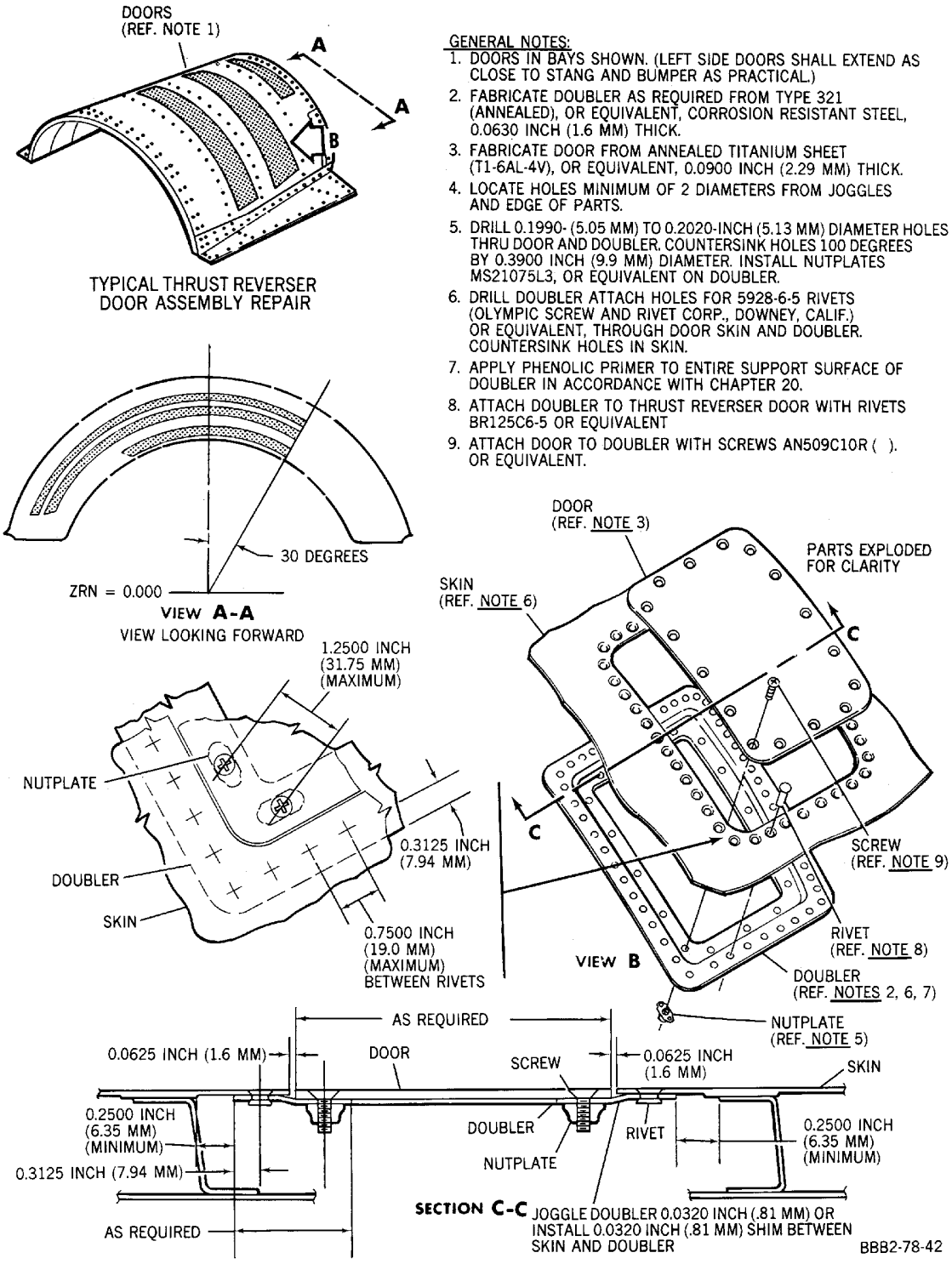
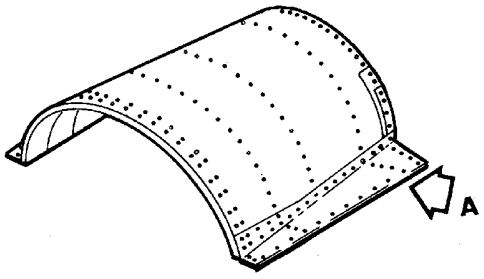
S0006556794V2

Thrust Reverser Door Repair
Figure 803/78-30-07-990-804 (Sheet 1 of 4)

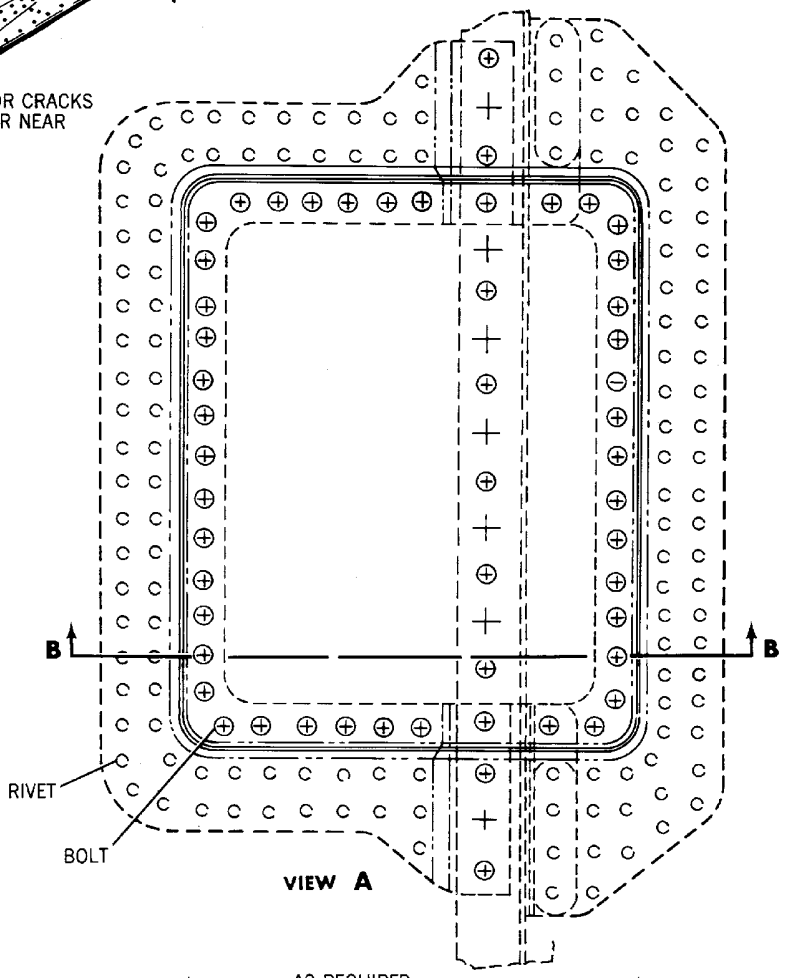


Thrust Reverser Door Repair
Figure 803/78-30-07-990-804 (Sheet 2 of 4)

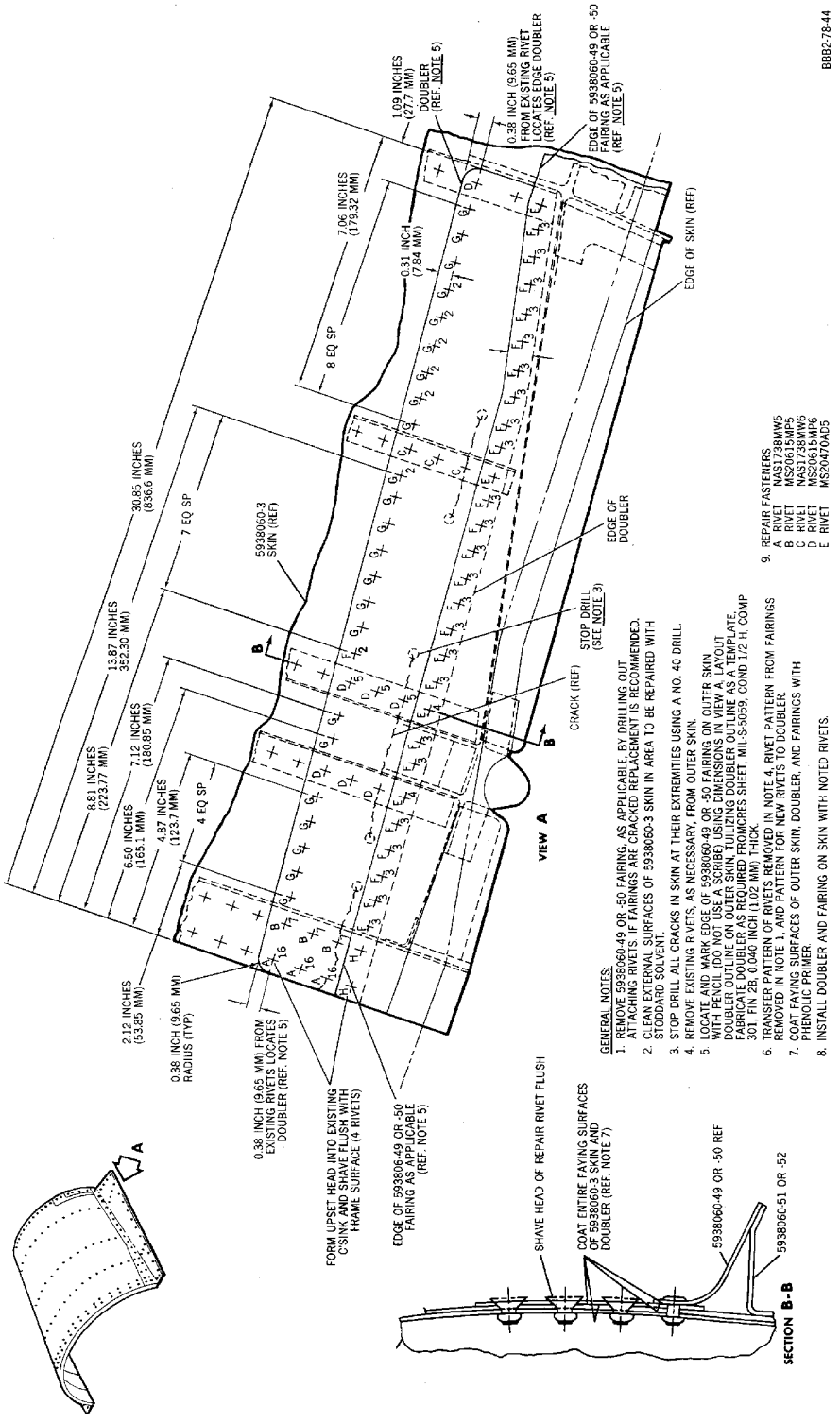


NOTES:
1. FABRICATE DOUBLERS AND ANGLES, AS REQUIRED, FROM ANNEALED TITANIUM (T16AL-4F) OR TYPE 321 (ANNEALED) CORROSION RESISTANT STEEL 0.0630 INCH (1.6 MM) THICK.
2. FABRICATE DOOR FROM ANNEALED TITANIUM SHEET (T16AL-4F) OR HEAT TREATED ALUMINUM 2219-T-62 OR 2024-T-81, 0.0630 INCH (1.6 MM) THICK.
3. FABRICATE SHIMS FROM HEAT TREATED ALUMINUM 2219-T-62 OR 2024-T-81, 0.023 INCH (.58 MM) THICK.
4. LOCATE HOLES MINIMUM OF 2 DIAMETERS FROM EDGES.
5. APPLY PHENOLIC PRIMER TO ENTIRE SUPPORT SURFACE OF DOUBLERS.

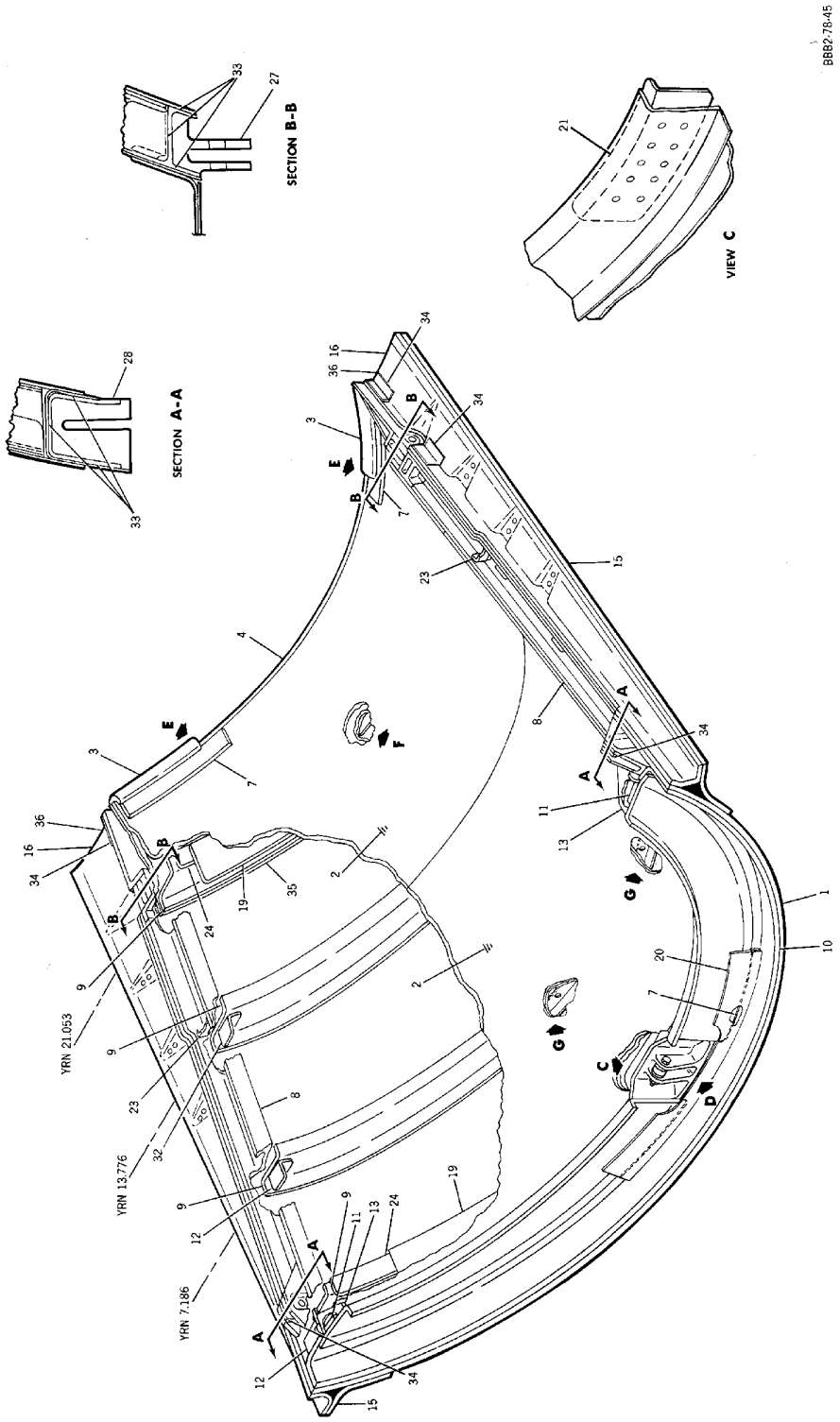
FLUSH DOUBLER REPAIR FOR CRACKS IN OUTER DOOR SKIN ON OR NEAR DOOR ZEE FRAME



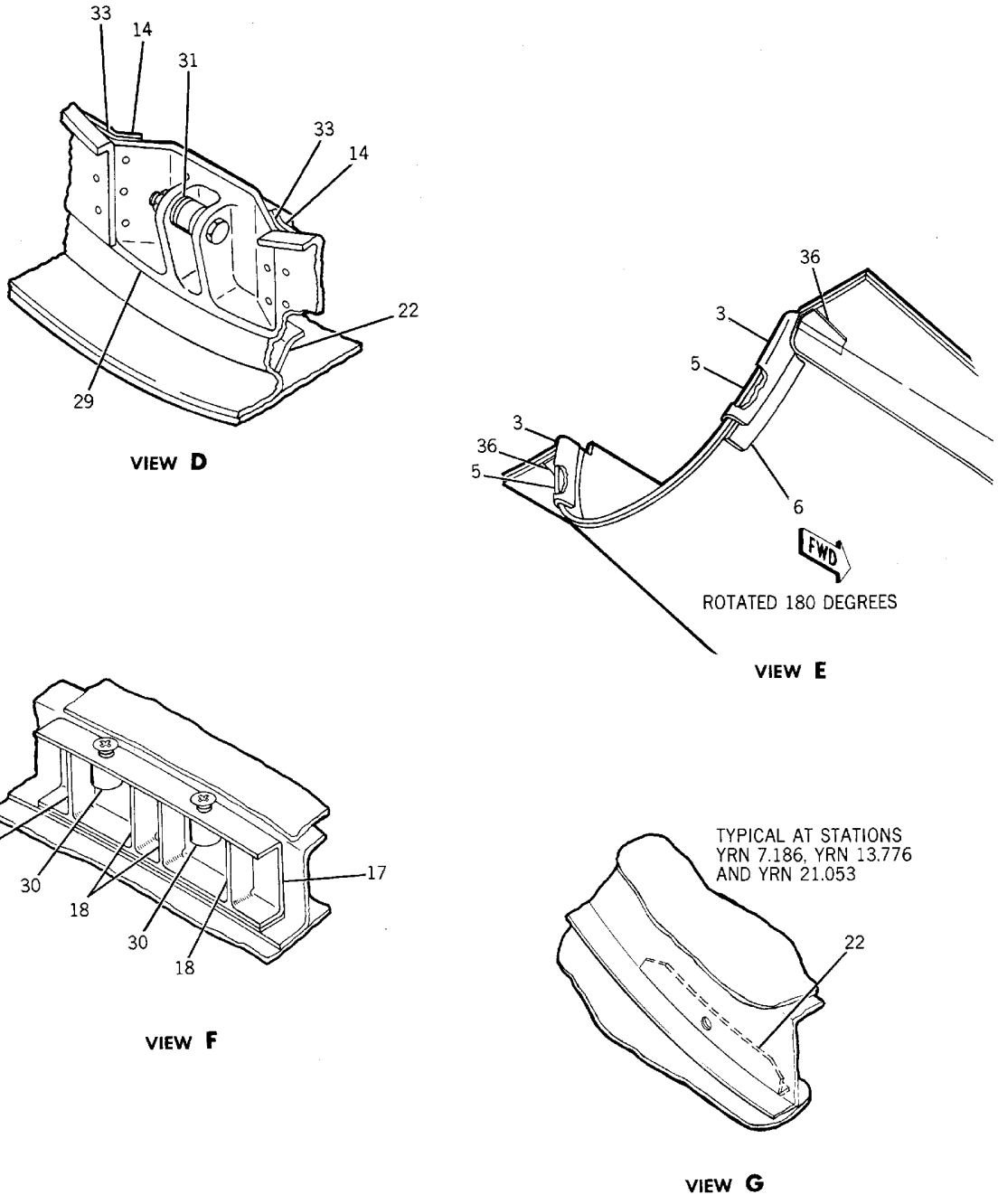
Thrust Reverser Door Repair
Figure 803/78-30-07-990-804 (Sheet 3 of 4)



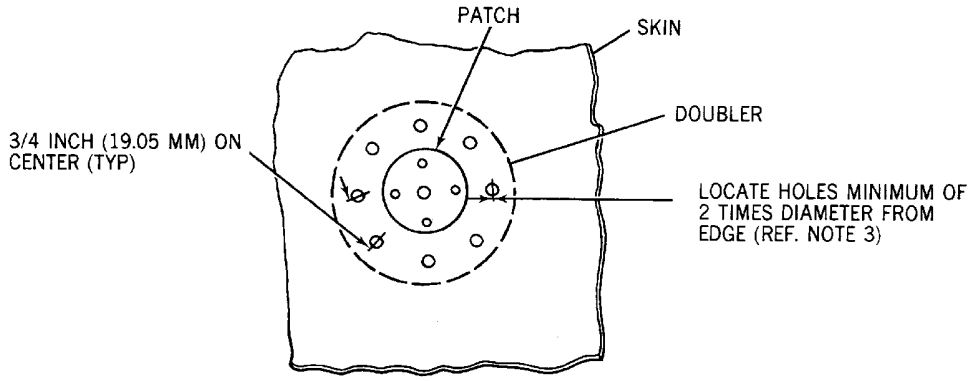
Thrust Reverser Door Repair
Figure 803/78-30-07-990-804 (Sheet 4 of 4)



Thrust Reverser Door Materials
Figure 804/78-30-07-990-805 (Sheet 1 of 2)



Thrust Reverser Door Materials
Figure 804/78-30-07-990-805 (Sheet 2 of 2)



TYPICAL FLUSH PATCH

NOTES:

1. FABRICATE REQUIRED DOUBLERS FROM 2024-T42 CLAD ALUMINUM, OR EQUIVALENT, 0.050 INCH (1.21 MM) THICK, OPTIONAL FABRICATE DOUBLERS FROM 301 1/4 HARD CRES PER MIL-S-5059.
2. LOCATE DOUBLERS AND ATTACHING PARTS FROM EXISTING STRUCTURE.
3. EDGE DISTANCE OF ATTACHING PARTS IS MINIMUM OF TWO TIMES DIAMETER.
4. FINISH FAYING SURFACES OF STEEL DOUBLERS WITH PHENOLIC PRIMER, AND INSTALL ALUMINUM RIVETS WITH WET PHENOLIC PRIMER.

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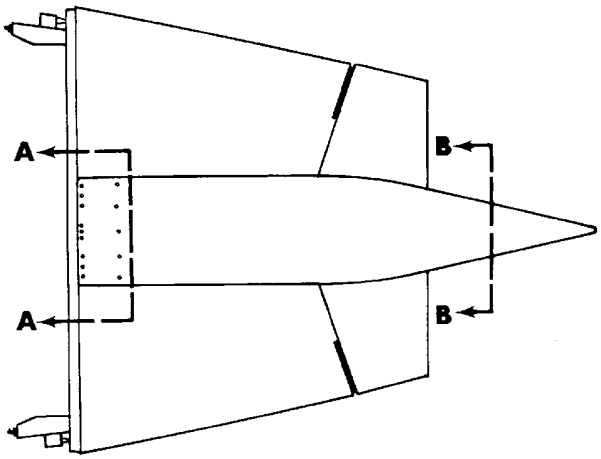
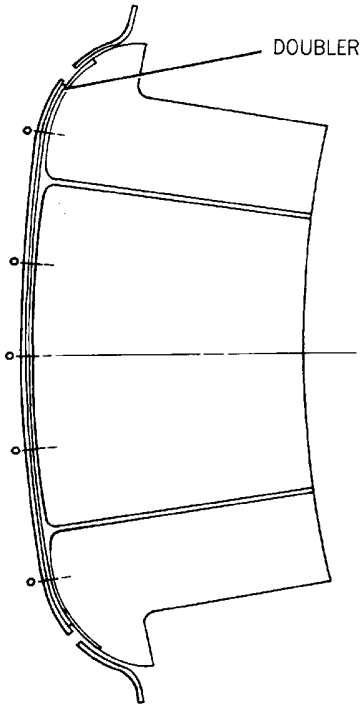
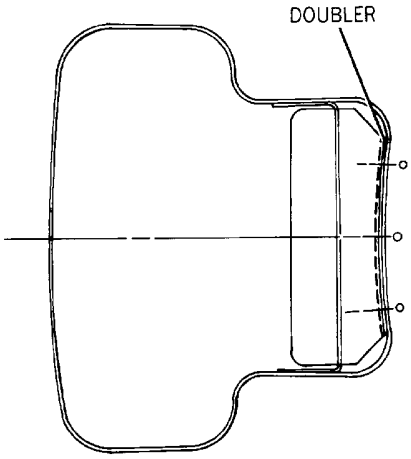
Stang Fairing Repair
Figure 805/78-30-07-990-806 (Sheet 1 of 2)



NOTES:
1. STOP DRILL BOTH ENDS OF CRACK WITH 0.060 INCH (1.52 MM) DIAMETER DRILL.
2. FABRICATE DOUBLER FROM 0.032 INCH (.81 MM) THICK 2024T3 CLAD ALUMINUM.
3. ATTACH DOUBLER TO SKIN WITH MS20426AD3 RIVETS OR EQUIVALENT.
4. LOCATE DOUBLER AND ATTACHING PARTS FROM EXISTING STRUCTURE.
5. EDGE DISTANCE OF ATTACHING PARTS IS TWO TIMES DIAMETER.
6. FINISH ALUMINUM RIVETS WITH PHENOLIC PRIMER.
7. PARTIAL DOUBLERS MAY BE USED IF REPAIR OR DAMAGED AREA DOES NOT REQUIRE FULL DOUBLER.
8. JOGGLE DOUBLER AS REQUIRED TO FIT EXISTING STRUCTURE.
9. o—- DENOTES EXISTING ATTACH HOLES THROUGH SKIN AND STRUCTURE.



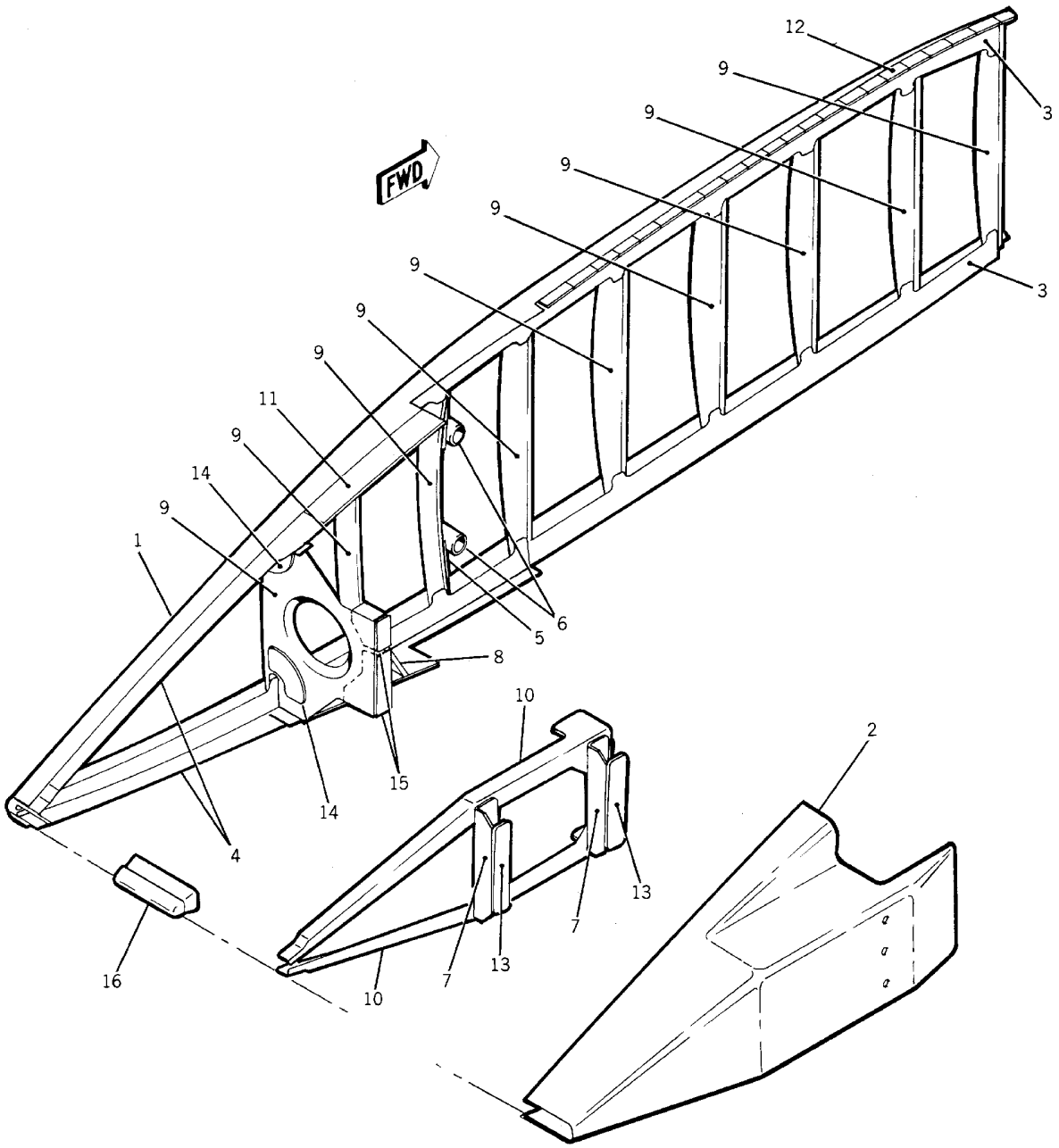
SECTION A-A



SECTION B-B

BBB2-78-48

Stang Fairing Repair
Figure 805/78-30-07-990-806 (Sheet 2 of 2)



Stang Fairing -- Materials
Figure 806/78-30-07-990-807

THRUST REVERSER HYDRAULIC ACCUMULATOR - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides servicing, removal/ installation and adjustment/test instructions for the thrust reverser hydraulic accumulator. One thrust reverser hydraulic accumulator is installed on each side of the fuselage, aft of the pressure bulkhead, in the aft fuselage compartment.

B. Maintenance of the thrust reverser hydraulic accumulators is limited to servicing, removal/installation and adjustment/test procedures. Servicing, removal/installation and adjustment/ test procedures, for both accumulators, are identical.

C. Access to the accumulator is through the passenger aft entrance door or the passenger aft entrance door stairway.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
DO NOT OPERATE tag	
Pressure cylinder (clean, dry, compressed nitrogen)	
Lubricant, Skydrol assembly, MCS352 (Alternate, Skydrol fluid) DPM 5073	Aviation Fluid Service Co.
Torque wrench, (0-100 inch-pounds range) (0-11.3 N·m)	
Suitable container 2 gallon	
Flared Plug, AN 806	
Flared Cap, AN 929	
Bubble leak test fliud DPM 6045	

3. Servicing Thrust Reverser Hydraulic Accumulator

A. Service Accumulator

(1) Open access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(3) Check accumulator pressure gage; gage should read 950 to 1050 psi (6550 to 7239 kPa). If pressure is normal, remove lockpin from control valve, and stow lockpin. (PAGEBLOCK 78-00-00/201).

WARNING: FIRE RESISTANT HYDRAULIC FLUID IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN FIRE RESISTANT HYDRAULIC FLUID IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET FIRE RESISTANT HYDRAULIC FLUID IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THESE HAZARDOUS AGENTS.

(4) If accumulator requires additional pressurization, leave thrust reverser control valve in dump position and proceed as follows:

(a) Remove filler valve cap.

(b) Check for bladder leakage.

1) Prepare a container and a hose to collect hydraulic fluid that can flow from the filler valve when opened.

WARNING: MAKE CERTAIN THAT FILLER VALVE IS NOT LOOSENED BEYOND THREE-QUARTERS OF A TURN. INJURY TO PERSONNEL COULD RESULT.

2) Slowly turn the filler valve swivel nut three quarters of a turn CCW (Counterclockwise).

3) Collect and measure all the hydraulic fluid that flows from the filler valve.

4) If the quantity is less than 1 fl-oz (32 cc), the accumulator can stay in service.

5) If the quantity is more than 1 fl-oz (32 cc) or if hydraulic fluid flows continuously for more than 1 minute, replace the accumulator. (Paragraph 4.)

(c) Attach nitrogen service hose chuck to filler valve stem.

WARNING: MAKE CERTAIN THAT FILLER VALVE IS NOT LOOSENED BEYOND THREE-QUARTERS OF A TURN. INJURY TO PERSONNEL COULD RESULT.

(d) Loosen filler valve swivel nut.

WARNING: DRY NITROGEN GAS IS AN AGENT THAT IS AN ASPHYXIANT AND IN HIGH PRESSURE CYLINDERS. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN DRY NITROGEN GAS IS USED.

- USE IN AN AREA OPEN TO THE AIR.
- SAFETY THE CYLINDERS AND KEEP THEM IN AN UPRIGHT POSITION WHEN NOT USED.
- DO NOT LET THE CYLINDER VALVE BECOME DAMAGED.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THESE HAZARDOUS AGENTS.

CAUTION: DO NOT PRESSURIZE AN ACCUMULATOR THAT HAS INTERNAL LEAKAGE. THIS CAN CAUSE NITROGEN TO GO INTO THE HYDRAULIC SYSTEM, AND A MALFUNCTION OF THE HYDRAULIC PUMP OR THE WHEEL BRAKE.

(e) Charge accumulator with dry nitrogen to 950 to 1050 psi (6550 to 7239 kPa).

(f) Torque swivel nut 40 to 60 inch-pounds (4.5 to 6.7 N·m).

(g) Remove service hose.

WARNING: LEAK TEST BUBBLE FLUID IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN LEAK TEST BUBBLE FLUID IS USED.

- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET LEAK TEST BUBBLE FLUID IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THESE HAZARDOUS AGENTS.

(h) Check accumulator and associated tubing for external air leaks with bubble solution.

(i) Install valve cap; tighten cap to maximum finger tightness.

(5) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(6) Close access door (5901C) for left engine or (5902C) for right engine.

4. Removal/Installation Thrust Reverser Hydraulic Accumulator

A. Remove Accumulator (Figure 201)

(1) Install DO NOT OPERATE tag on the throttle/thrust reverser level.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Open these circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF
S	29	B1-218	LEFT REVERSER ACCUM LOW CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF
T	29	B1-219	RIGHT REVERSER ACCUM LOW CAUTION

(3) Open access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(4) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(5) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

(6) Depressurize accumulator as follows:

CAUTION: MAKE CERTAIN ALL OPEN TUBES AND ACCUMULATOR PORTS ARE CAPPED TO PREVENT CONTAMINANTS FROM ENTERING HYDRAULIC SYSTEM. THIS WILL HELP PREVENT DAMAGE TO THE HYDRAULIC TUBES AND ACCUMULATOR.

(a) Remove filler valve cap.

WARNING: MAKE CERTAIN THAT FILLER VALVE IS NOT LOOSENED BEYOND THREE-QUARTERS OF A TURN. INJURY TO PERSONNEL COULD RESULT.

(b) Loosen filler valve swivel nut.

(7) Remove the accumulator as follows:

(a) Disconnect air line from accumulator.

(b) Disconnect hydraulic line from accumulator.

(c) Install a cap on the fitting and plug on the hydraulic line.

(d) Remove top and bottom retaining clamps.

(e) Remove accumulator from bracket.

CAUTION: MAKE SURE THAT THE ACCUMULATOR IS FIRMLY RESTRAINED DURING THE LINE HYDRAULIC FITTING REMOVAL AND INSTALLATION. DAMAGE TO THE ACCUMULATOR BLADDER AND INDEX PIN INSIDE THE ACCUMULATOR CAN OCCUR. THIS WILL HELP PREVENT DAMAGE CAUSED BY TWISTING BETWEEN THE SHELL AND AIR CAP.

(f) Use an accumulator restraining fixture or non-metallic/fabric strap to hold accumulator.

(g) Remove service fitting and reducer from accumulator. Discard O-rings.

B. Install Accumulator (Figure 201)

(1) Make sure that DO NOT OPERATE tags are on the throttle/thrust reverser level.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Make sure that these circuit breakers are open:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF
S	29	B1-218	LEFT REVERSER ACCUM LOW CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF
T	29	B1-219	RIGHT REVERSER ACCUM LOW CAUTION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(3) Make certain thrust reverser control valve is in dump position and lockpin is installed.

WARNING: HYDRAULIC ASSEMBLY LUBRICANT IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN HYDRAULIC ASSEMBLY LUBRICANT IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET HYDRAULIC ASSEMBLY LUBRICANT IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS MSDS FOR:

- MORE PRECAUTIONARY DATA.
- APPROVED SAFETY EQUIPMENT.
- EMERGENCY MEDICAL AID.
- TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(WARNING PRECEDES)

(4) Lightly lubricate new O-ring with lubricant (MCS352) and install on reducer.

CAUTION: MAKE SURE THAT THE ACCUMULATOR IS FIRMLY RESTRAINED DURING THE LINE HYDRAULIC FITTING REMOVAL AND INSTALLATION. DAMAGE TO THE ACCUMULATOR BLADDER AND INDEX PIN INSIDE THE ACCUMULATOR CAN OCCUR. THIS WILL HELP PREVENT DAMAGE CAUSED BY TWISTING BETWEEN THE SHELL AND AIR CAP.

(5) Install accumulator as follows:

(a) Use an accumulator restraining fixture or non-metallic/fabric strap to hold accumulator.

(b) Install reducer and service fitting with new O-rings in accumulator.

(c) Install accumulator on bracket.

(d) Install top and bottom retaining clamps.

(e) Remove the cap from the fitting and the plug from the air line.

(f) Connect air line to accumulator.

WARNING: FIRE RESISTANT HYDRAULIC FLUID IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN FIRE RESISTANT HYDRAULIC FLUID IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET FIRE RESISTANT HYDRAULIC FLUID IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THESE HAZARDOUS AGENTS.

(g) Remove the cap from the fitting and the plug from the hydraulic line.

(h) Connect hydraulic line to accumulator.

(6) Service accumulator per Paragraph 3..

(7) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

(8) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(9) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(10) Close access door (5901C) for left engine or (5902C) for right engine.

(11) Remove DO NOT OPERATE tags from the throttle/thrust reverser level.

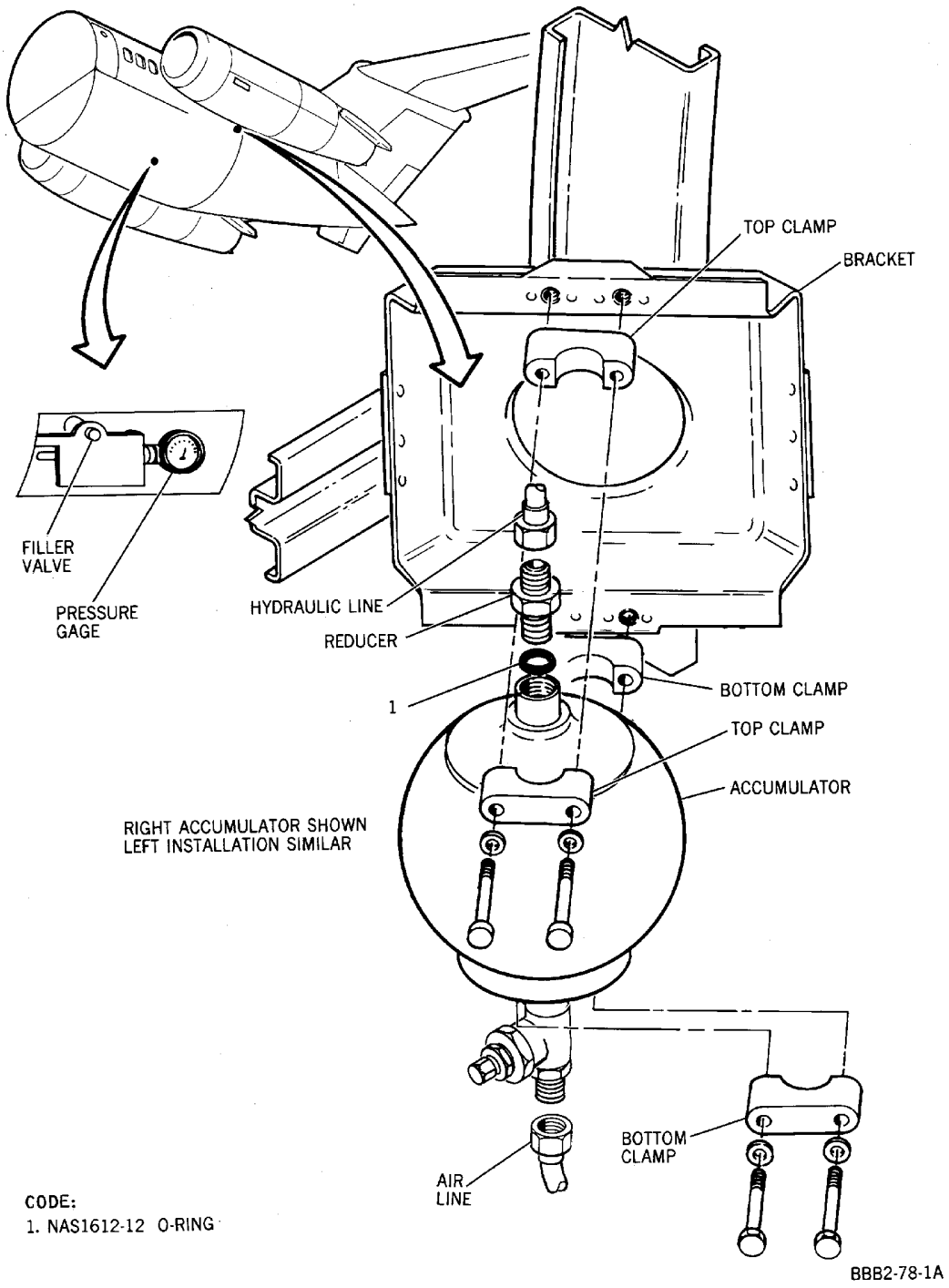
(12) Remove the safety tags and close these circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF
S	29	B1-218	LEFT REVERSER ACCUM LOW CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF
T	29	B1-219	RIGHT REVERSER ACCUM LOW CAUTION



Thrust Reverser Hydraulic Accumulator
Figure 201/78-31-01-990-801

5. Adjustment/Test Thrust Reverser Hydraulic Accumulator

A. Pressure Test Accumulator

(1) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

CAUTION: OPERATION OF THRUST REVERSER FROM THE STOW POSITION WITH INADEQUATE FLOW (LESS THAN 5 GPM) COULD RESULT IN EXTENSIVE THRUST REVERSER DAMAGE. PROPER OPERATION OF THE THRUST REVERSER IS DEPENDENT ON SUFFICIENT, MAINTAINED FLOW TO PERMIT THE LATCH ACTUATORS TO HOLD THE LATCHES IN THE RETARDED POSITION UNITL UNLOCKING THE OVERCENTER MECHANISM AND MOVEMENT OF THE DOORS BEYOND THE LATCHING MECHANISMS IS COMPLETED. MANUAL PUMPS (HAND/FOOT PUMPS) ARE NOT ACCEPTABLE UNLESS THE LATCHES ARE MANUALLY RETRACTED AND HELD IN THE RETRACTED POSITION PRIOR TO MOVEMENT OF THE THRUST REVERSER DOORS FROM THE STOW POSITION. THE LATCHES MUST BE HELD IN THE RETRACTED POSITION UNTIL MOVEMENT OF DOORS BEYOND THE LATCHING MECHANISM.

(2) Operate thrust reverser through deploy and stow cycle.

(3) Open access door (5901C) for left engine or (5902C) for right engine.

(4) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201).

(5) Visual check thrust reverser hydraulic tubing and associated components for leaks

(6) Check accumulator pressure gage; gage should read 950 to 1050 psi (6550 to 7239 kPa). If pressure is normal, remove lockpin from control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(7) If accumulator requires additional pressurization, leave thrust reverser control valve in dump position and proceed as follows:

(a) Remove filler valve cap.

(b) Attach nitrogen service hose chuck to filler valve stem.

WARNING: MAKE CERTAIN THAT FILLER VALVE IS NOT LOOSENED BEYOND THREE-QUARTERS OF A TURN. INJURY TO PERSONNEL COULD RESULT.

(c) Loosen filler valve swivel nut.

(d) Charge accumulator with dry nitrogen to 950 to 1050 psi (6550 to 7239 kPa).

(e) Torque swivel nut 40 to 60 inch-pounds (4.5 to 6.7 N·m).

(f) Remove service hose.

(g) Check accumulator and associated tubing for external air leaks with bubble solution.

(h) Install valve cap; tighten cap to maximum finger tightness.

(8) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(9) Close access door (5901C) for left engine or (5902C) for right engine.

B. Thrust Reverser System To Hold Pressure Without Main Hydraulic Pressure

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

CAUTION: OPERATION OF THRUST REVERSER FROM THE STOW POSITION WITH INADEQUATE FLOW (LESS THAN 5 GPM) COULD RESULT IN EXTENSIVE THRUST REVERSER DAMAGE. PROPER OPERATION OF THE THRUST REVERSER IS DEPENDENT ON SUFFICIENT, MAINTAINED FLOW TO PERMIT THE LATCH ACTUATORS TO HOLD THE LATCHES IN THE RETARDED POSITION UNITL UNLOCKING THE OVERCENTER MECHANISM AND MOVEMENT OF THE DOORS BEYOND THE LATCHING MECHANISMS IS COMPLETED. MANUAL PUMPS (HAND/FOOT PUMPS) ARE NOT ACCEPTABLE UNLESS THE LATCHES ARE MANUALLY RETRACTED AND HELD IN THE RETRACTED POSITION PRIOR TO MOVEMENT OF THE THRUST REVERSER DOORS FROM THE STOW POSITION. THE LATCHES MUST BE HELD IN THE RETRACTED POSITION UNTIL MOVEMENT OF DOORS BEYOND THE LATCHING MECHANISM.

(1) Pressurize aircraft hydraulic systems.

(2) Place thrust reverser control valve in dump position and install lockpin.

(3) Check accumulator pressure gage; gage should read 950 to 1050 psi (6550 to 7239 kPa). If pressure is normal, remove lockpin from control valve and stow lockpin.

(4) Maintain system pressure for 2 to 3 minutes to stabilize brake pressure accumulator.

(5) Shut off hydraulic pressure source. Thrust reverser accumulator pressure for system under test shall not drop more than 100 psi in 10 minutes.

(6) Depressurize hydraulic systems.

THRUST REVERSER HYDRAULIC ACCUMULATOR - SERVICING

1. General

A. This procedure contains MSG-3 task card data.

TASK 78-31-01-614-801

2. Service the Thrust Reverser Accumulator to Proper Charge

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
78-00-00 P/B 201	GENERAL - MAINTENANCE PRACTICES

B. Tools/Equipment

Reference	Description
STD-1014	Wrench - Torque, 0 to 150 in-lbs (0 to 16.9 N-m)
STD-3918	Pressure Source - Dry Nitrogen, 0 to 5000 psi (0 to 3447 kPa)

C. Consumable Materials

NOTE: Equivalent replacements are permitted for the items that follow.

NOTE: It is possible that some materials in the Consumable Materials chart cannot be used for some or all of the necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Reference	Description	Specification
B60047	Fluid - Bubble	DPM 6045 (MIL-PRF-25567)

D. Prepare to Service the Thrust Reverser Accumulator to Proper Charge

SUBTASK 78-31-01-010-002

(1) Open access doors.

SUBTASK 78-31-01-490-001

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install lockpin. (GENERAL - MAINTENANCE PRACTICES, PAGEBLOCK 78-00-00/201)

E. Service the Thrust Reverser Accumulator to Proper Charge

SUBTASK 78-31-01-212-002

(1) Check accumulator pressure gage. It should read 950 psi (6550 kPa) to 1050 psi (7239 kPa). If pressure is normal, remove lockpin from control valve, and stow lockpin. (GENERAL - MAINTENANCE PRACTICES, PAGEBLOCK 78-00-00/201)

NOTE: If accumulator requires additional pressurization, leave thrust reverser control valve in dump position.

SUBTASK 78-31-01-030-001

(2) Remove filler valve cap.

SUBTASK 78-31-01-790-001

WARNING: FIRE RESISTANT HYDRAULIC FLUID IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN FIRE RESISTANT HYDRAULIC FLUID IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET FIRE RESISTANT HYDRAULIC FLUID IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THESE HAZARDOUS AGENTS.

(3) Check for bladder leakage.

(a) Prepare a container and a hose to collect hydraulic fluid that can flow from the filler valve when opened.

WARNING: MAKE CERTAIN THAT FILLER VALVE IS NOT LOOSENED BEYOND THREE-QUARTERS OF A TURN. INJURY TO PERSONNEL COULD RESULT.

(b) Slowly turn the filler valve swivel nut three quarters of a turn CCW (Counterclockwise).

(c) Collect and measure all the hydraulic fluid that flows from the filler valve.

(d) If the quantity is less than 1 fl-oz (32 cc), the accumulator can stay in service.

(e) If the quantity is more than 1 fl-oz (32 cc) or if hydraulic fluid flows continuously for more than 1 minute, replace the accumulator.

SUBTASK 78-31-01-490-002

(4) Attach nitrogen service hose chuck to filler valve stem.

SUBTASK 78-31-01-030-002

WARNING: MAKE CERTAIN THAT FILLER VALVE IS NOT LOOSENED BEYOND THREE-QUARTERS OF A TURN. INJURY TO PERSONNEL COULD RESULT.

(5) Loosen filler valve swivel nut.

SUBTASK 78-31-01-614-001

WARNING: DRY NITROGEN GAS IS AN AGENT THAT IS AN ASPHYXIANT AND IN HIGH PRESSURE CYLINDERS. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN DRY NITROGEN GAS IS USED.

- USE IN AN AREA OPEN TO THE AIR.
- SAFETY THE CYLINDERS AND KEEP THEM IN AN UPRIGHT POSITION WHEN NOT USED.
- DO NOT LET THE CYLINDER VALVE BECOME DAMAGED.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THESE HAZARDOUS AGENTS.

CAUTION: DO NOT PRESSURIZE AN ACCUMULATOR THAT HAS INTERNAL LEAKAGE. THIS CAN CAUSE NITROGEN TO GO INTO THE HYDRAULIC SYSTEM, AND A MALFUNCTION OF THE HYDRAULIC PUMP OR THE WHEEL BRAKE.

(6) Charge accumulator with 0 to 5000 psi (0 to 3447 kPa) dry nitrogen pressure source, STD-3918 to 950 psi (6550 kPa) to 1050 psi (7239 kPa).

SUBTASK 78-31-01-220-001

(7) Torque swivel nut with torque wrench, STD-1014 to 40 in-lb (4.5 N·m) to 60 in-lb (6.8 N·m).

SUBTASK 78-31-01-090-001

(8) Remove service hose.

SUBTASK 78-31-01-790-002

WARNING: LEAK TEST BUBBLE FLUID IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN LEAK TEST BUBBLE FLUID IS USED.

- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET LEAK TEST BUBBLE FLUID IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THESE HAZARDOUS AGENTS.

(9) Check accumulator and associated tubing for external air leaks with bubble fluid, B60047.

SUBTASK 78-31-01-430-001

(10) Install valve cap and tighten it to maximum finger tightness.

F. Job Close-up

SUBTASK 78-31-01-090-002

(1) Remove lockpin from thrust reverser control valve and stow lockpin. (GENERAL - MAINTENANCE PRACTICES, PAGEBLOCK 78-00-00/201)

SUBTASK 78-31-01-942-001

(2) Remove all the tools and equipment from the work area. Make sure the area is clean.

SUBTASK 78-31-01-410-002

(3) Close access doors.

——— END OF TASK ———

THRUST REVERSER HYDRAULIC ACCUMULATOR - ADJUSTMENT/TEST

1. General

A. This procedure contains MSG-3 task card data.

TASK 78-31-01-720-801

2. Functional Check of the Thrust Reverser System to Hold Pressure Without Main Hydraulic Pressure

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-00-00 P/B 201	GENERAL - MAINTENANCE PRACTICES

B. Prepare for a Functional Check of Thrust Reverser System to Hold Pressure Without Main Hydraulic Pressure

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

CAUTION: OPERATION OF THRUST REVERSER FROM THE STOW POSITION WITH INADEQUATE FLOW (LESS THAN 5 GPM) COULD RESULT IN EXTENSIVE THRUST REVERSER DAMAGE. PROPER OPERATION OF THE THRUST REVERSER IS DEPENDENT ON SUFFICIENT, MAINTAINED FLOW TO PERMIT THE LATCH ACTUATORS TO HOLD THE LATCHES IN THE RETARDED POSITION UNITL UNLOCKING THE OVERCENTER MECHANISM AND MOVEMENT OF THE DOORS BEYOND THE LATCHING MECHANISMS IS COMPLETED. MANUAL PUMPS (HAND/FOOT PUMPS) ARE NOT ACCEPTABLE UNLESS THE LATCHES ARE MANUALLY RETRACTED AND HELD IN THE RETRACTED POSITION PRIOR TO MOVEMENT OF THE THRUST REVERSER DOORS FROM THE STOW POSITION. THE LATCHES MUST BE HELD IN THE RETRACTED POSITION UNTIL MOVEMENT OF DOORS BEYOND THE LATCHING MECHANISM.

SUBTASK 78-31-01-010-001

(1) Open the required access panel.

SUBTASK 78-31-01-863-001

(2) Pressurize aircraft hydraulic systems. (GENERAL - MAINTENANCE PRACTICES, PAGEBLOCK 29-00-00/201)

C. Do a Functional Check of the Thrust Reverser System to Hold Pressure Without Main Hydraulic Pressure

SUBTASK 78-31-01-040-001

(1) Place thrust reverser control valve in dump position and install lockpin.

SUBTASK 78-31-01-212-001

(2) Check the applicable accumulator pressure gage; gage should read 950 psi (6550 kPa) to 1050 psi (7239 kPa). If pressure is normal, remove lockpin from control valve and stow lockpin.

(3) Maintain system pressure for 2 to 3 minutes to stabilize brake pressure accumulator.

SUBTASK 78-31-01-720-001

(4) Shut off hydraulic pressure source.

(5) Record the pressure on the accumulator pressure gage.

(6) Wait 10 minutes and check the accumulator pressure gage again,

(a) Pressure shall not drop more than 100 psi (689 kPa) in 10 minutes.

D. Job Close-up

SUBTASK 78-31-01-864-001

(1) Depressurize hydraulic systems.

SUBTASK 78-31-01-410-001

(2) Close access panel.

——— END OF TASK ———

THRUST REVERSER INTERLOCK MECHANISM AND PUSH-PULL CABLE MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and adjustment/test instructions for the thrust reverser interlock mechanism and push-pull cable.

B. Maintenance of the thrust reverser interlock mechanism and push-pull cable is limited to removal/installation and adjustment/test procedures.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

C. Access to thrust reverser interlock mechanism and push-pull cable is through the engine cowl doors. (PAGEBLOCK 71-00-00/201)

NOTE: Forward lower cowl door overlaps the aft lower cowl door and must be opened first.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Rigging aid (R-24) 15/32 by 4 inches	
Rigging aid (R-37) 1/4 by 3 inches	
Inconel Lockwire 0.020 in, NASM20995N20, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.020 in NASM20995C20, DPM 5865	Not Specified
Inconel Lockwire 0.032 in, NASM20995N32, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.032 in NASM20995C32, DPM 5865	Not Specified
Lubricating oil, molybdenum disulfide, silicone base, high temperature (MIL-L-25681) DPM 5782	E/M Corporation, North Hollywood, CA
Rig pin (4-2) 1/4 by 2 5/8 inches	

Table 201 (Continued)

Name and Number	Manufacturer
Rigging aid (R-19) 1/4 by 2 7/16 inches	
Hunter Force Gage 0-30 lb. (0-13.6 kg)	
NOTE: Rig pin sizes are in inches (diameter x length); length = grip plus 5/8 inch (15.88 mm).	

3. **Removal/Installation Thrust Reverser Interlock Mechanism and Push-Pull Cable**

A. Remove Push-Pull Cable (Figure 201)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY
S	31	B1-452	LEFT REVERSE THRUST ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(2) Open access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(3) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(4) Remove rod end from interlock control crank.

(5) Loosen nut and remove rod end from push-pull cable.

(6) At crank forward, remove rod end.

(7) At crank forward, unscrew rod and nut from push-pull cable.

(8) Remove nut from support at bulkhead.

(9) Remove push-pull cable mounting clamps.

(10) Remove nut from bracket at forward support.

CAUTION: USE CARE NOT TO BEND, STRESS OR OTHERWISE MODIFY TUBING OR CABLE SHAPE.

(11) At bulkhead, pull cable forward until clear of support.

(12) At forward support bracket, pull cable aft until clear of bracket.

(13) Deleted.

B. Remove Interlock Mechanism (Figure 202)

(1) Remove push-pull control cable rod end from interlock control crank.

(2) Remove feedback control link rod end from interlock cam.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(3) Disconnect electrical connector from thrust reverser position indicator switch.

(4) Remove interlock mechanism from brackets.

C. Install Interlock Mechanism (Figure 202)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY
S	31	B1-452	LEFT REVERSE THRUST ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and lockpin is installed.

WARNING: MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET MOLYBDENUM DISULFIDE SILICONE LUBRICANT IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(3) Apply light coat of oil (MIL-L-25681) to threads of bolts, position and install interlock mechanism on mounting bracket.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO CONNECT PLUG. DO NOT OVERTIGHTEN.

(4) Connect electrical connector to thrust reverser position indicator switch. Safety connector with corrosion-resistant steel safety wire, G60845 or .032 inconel lockwire, G60169. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(5) Install feedback control link rod end on interlock cam. Safety nut with new cotter pin.

(6) Install interlock control crank on push-pull control cable rod end. Safety nut with new cotter pin.

(7) Adjust interlock mechanism. (Paragraph 4.A.)

D. Install Push-Pull Cable. (Figure 201)

(1) Deleted.

(2) Position push-pull cable on engine, inserting forward end through support bracket and aft end through fireseal and support.

WARNING: MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN MOLYBDENUM DISULFIDE SILICONE LUBRICANT IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET MOLYBDENUM DISULFIDE SILICONE LUBRICANT IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

(WARNING PRECEDES)

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(3) Apply light coat of oil (MIL-L-25681) to threads of bolts and install push-pull cable mounting clamps.

(4) Install nuts and push-pull cable and tighten nuts. Safety nuts with corrosion-resistant steel safety wire, G60845 or .032 inconel lockwire, G60169. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(5) Install nut and rod end on push-pull cable at idler crank and tighten nut. Safety with corrosion-resistant steel safety wire, G60845 or .032 inconel lockwire, G60169. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(6) Install nut and rod end on push-pull cable at interlock control crank. Tighten nut. Safety with with corrosion-resistant steel safety wire, G60845 or .032 inconel lockwire, G60169. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(7) Install idler crank on cable rod end. Safety nut with new cotter pin.

(8) Install interlock control crank on cable rod end. Safety nut with new cotter pin.

(9) Adjust interlock mechanism and push-pull cable. (Paragraph 4.A.)

(10) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(11) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY
S	31	B1-452	LEFT REVERSE THRUST ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

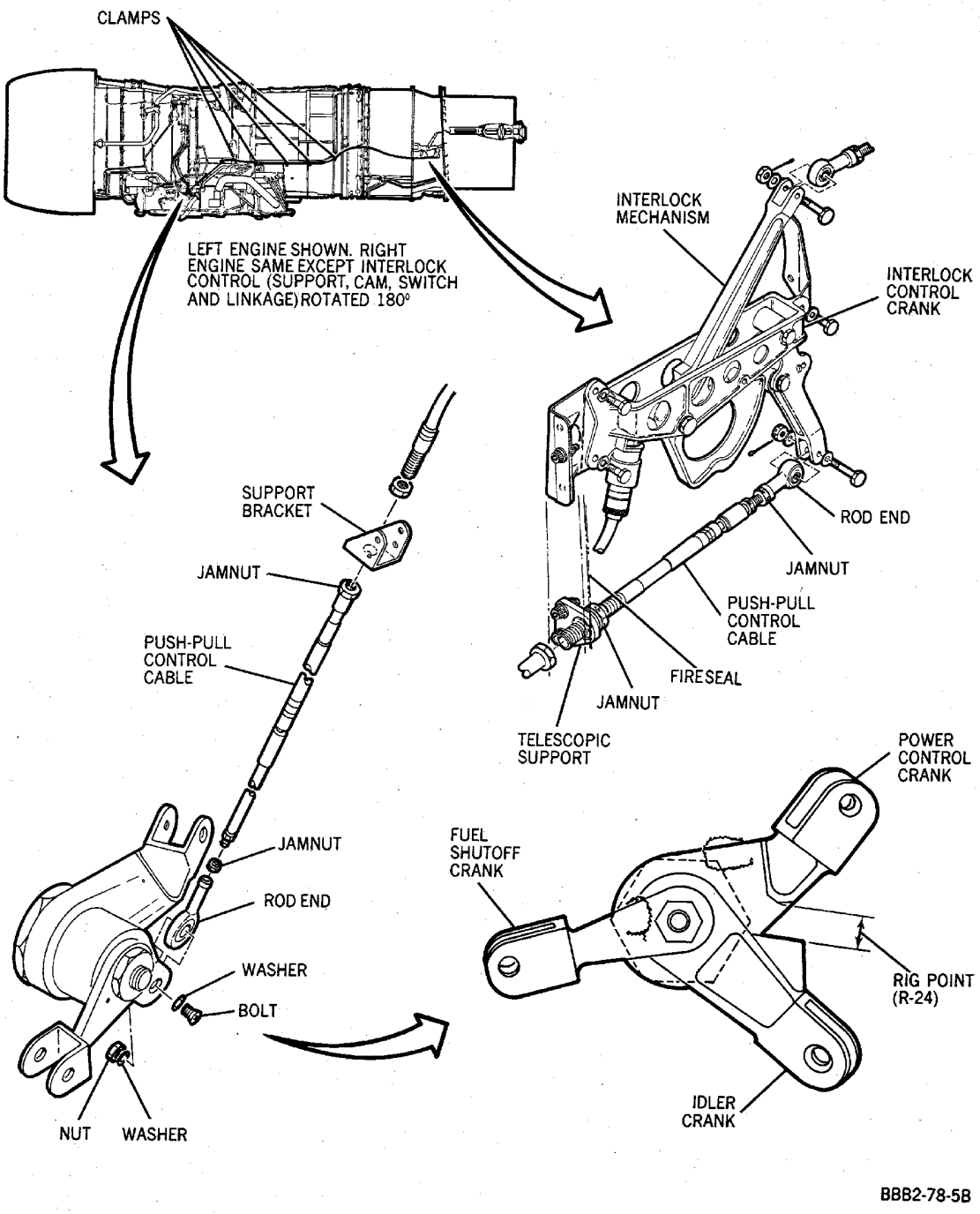
Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(12) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

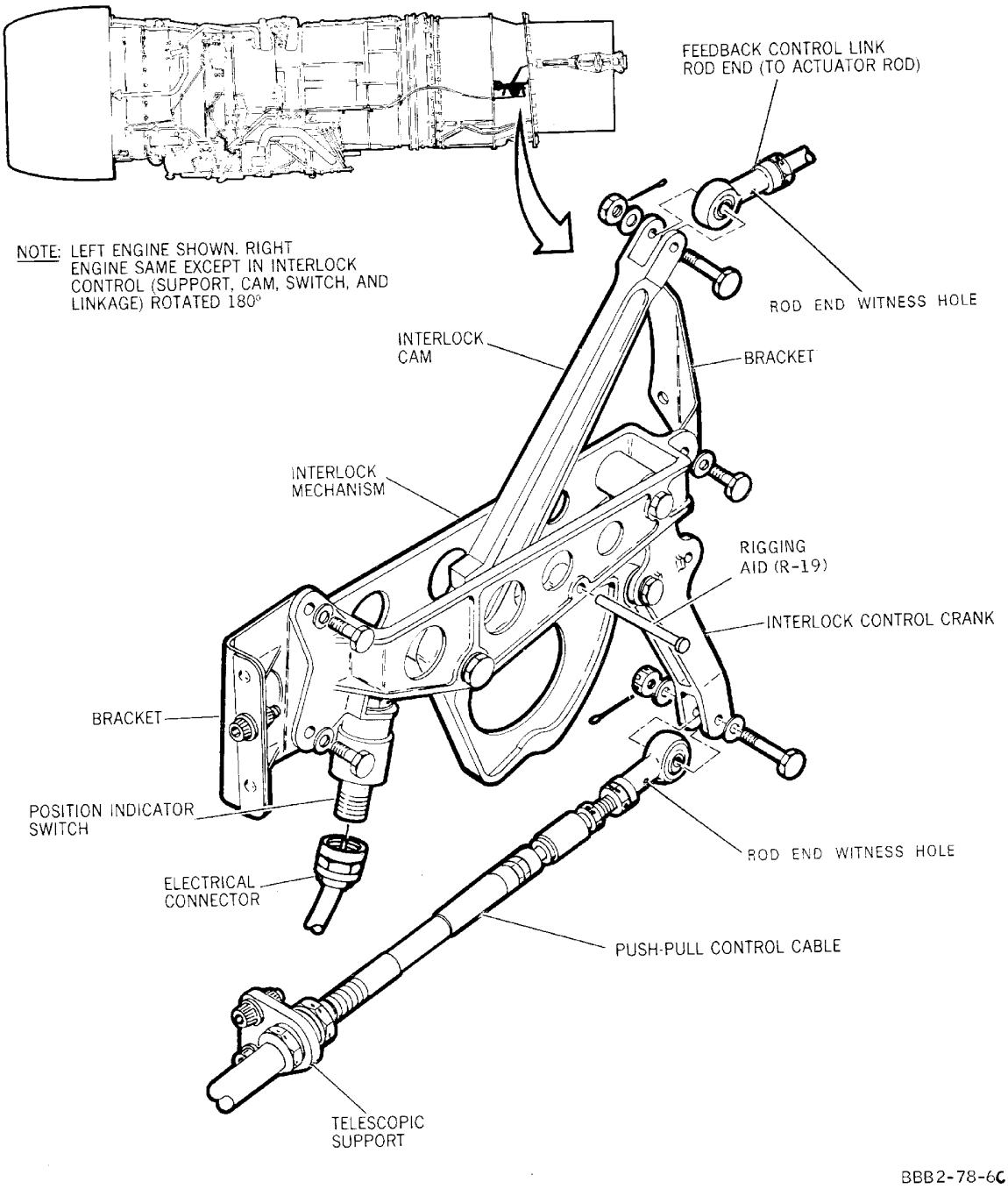
(13) Close access door (5901C) for left engine or (5902C) for right engine.

(14) Test thrust reverser interlock mechanism and push-pull cable. (Paragraph 4.B.)

(15) Close engine cowl doors.



Thrust Reverser Push-Pull Cable
Figure 201/78-31-02-990-801



Thrust Reverser Interlock Mechanism
Figure 202/78-31-02-990-802

4. Adjustment/Test Thrust Reverser Interlock Mechanism and Push-Pull Cable

A. Adjust Interlock Mechanism and Push-Pull Cable. (Figure 202) (Figure 203)

(1) Visually check carriage-to-overcenter link attach point. Attach point shall be both aft and overcenter of driver link-to-overcenter link attach points. (Figure 203)

(2) Insert rig pin (4-2) in rig pin hole (R-17) through power control crank and support. (Figure 203)

(3) Adjust power control linkage from engine crossover shaft to fuel control crank. Adjustment is correct when rigging aid (R-37) can be inserted freely into idle slot (between crank arm and control index plate). (Figure 203)

(4) Disconnect feedback control link rod end. (Figure 202)

(5) Rotate interlock cam counterclockwise (clockwise on right engine) until thrust reverser position indicator switch is engaged by cam seat.

(6) Check switch operation (mechanical) for freedom from binding.

CAUTION: ADJUSTMENT OF PUSH-PULL CABLE MUST BE MADE AT ROD ENDS. IF UNABLE TO OBTAIN CORRECT THREAD ENGAGEMENT AT WITNESS HOLE IN ROD ENDS, FORWARD SUPPORT BRACKET JAMNUT MAY BE SLIGHTLY ADJUSTED.

(7) Install push-pull cable rod end to interlock control crank.

NOTE: Push-pull cable rod end may need to be pulled against spring force to install rod end to interlock crank.

(8) Rotate interlock cam clockwise (counterclockwise on right engine).

(9) Insert rigging aid (R-19) in rig pin hole (R-19) through interlock cam and support. (Figure 202)

(10) Install feedback control link rod end on interlock cam and adjust at feedback control link until attaching bolt can be freely removed and installed. Safety nut with new cotter pin.

(11) Restrain feedback control link rod end and tighten jamnut. Safety jamnut with corrosion-resistant steel safety wire, G60845 or .032 inconel lockwire, G60169. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

CAUTION: ADJUSTMENT OF PUSH-PULL CONTROL CABLE MUST BE MADE AT ROD ENDS. IF UNABLE TO OBTAIN CORRECT THREAD ENGAGEMENT AT WITNESS HOLE IN ROD ENDS, FORWARD SUPPORT BRACKET JAMNUT MAY BE SLIGHTLY ADJUSTED.

(12) Restrain push-pull control cable rod end and tighten jamnut. Safety jamnut with with corrosion-resistant steel safety wire, G60845 or .032 inconel lockwire, G60169. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201).

(13) Check rod end witness hole to ensure sufficient threaded end engagement.

(14) Check that two exposed threads minimum, extend through nut at telescopic support. (Figure 201)

(15) Rotate interlock control crank clockwise (counterclockwise on right engine), until crank roller contacts cam surface of interlock cam.

(16) Adjust push-pull cable until 0.463 to 0.473-inch (11.76 to 12.01 mm) gap exists between idler crank and power control crank. (Figure 201)

(17) Remove all rig pins.

B. Test Interlock Mechanism and Push-Pull Cable

(1) Pressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

WARNING: MAKE CERTAIN ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPERATION OF THRUST REVERSER FROM STOW POSITION WITH HYDRAULIC FLOW LESS THAN 5 GPM (19 LPM) COULD RESULT IN EXTENSIVE DAMAGE. THRUST REVERSER OPERATION IS DEPENDENT ON SUFFICIENT FLOW TO PERMIT LATCH ACTUATORS TO HOLD LATCHES IN RETRACTED POSITION UNTIL UNLOCKING OF OVERCENTER MECHANISM AND MOVEMENT OF DOOR BEYOND LATCHING MECHANISM. MANUAL PUMPS ARE NOT ACCEPTABLE UNLESS LATCHES ARE MANUALLY RETRACTED AND HELD IN RETRACTED POSITION PRIOR TO MOVEMENT OF REVERSER DOORS.

(2) Place thrust reverser lever in reverse thrust (deploy) position.

NOTE: Reverse thrust (deploy) position is reached when reverse idle roller drops into reverse idle detent.

(3) Deleted.

(4) Deleted.

(5) Place thrust reverser lever in forward thrust (stowed) position.

(6) Insert rig pin 4-2 in rig pin hole (R-17) and rigging aid (R-19) in rig pin hole (R-19). (Figure 202) (Figure 203)

(7) Insert rigging aids (R-24) and (R-37) at rig points. (Figure 201) (Figure 203)

(8) Check that rig pins are inserted without mismatch of holes or noticeable binding.

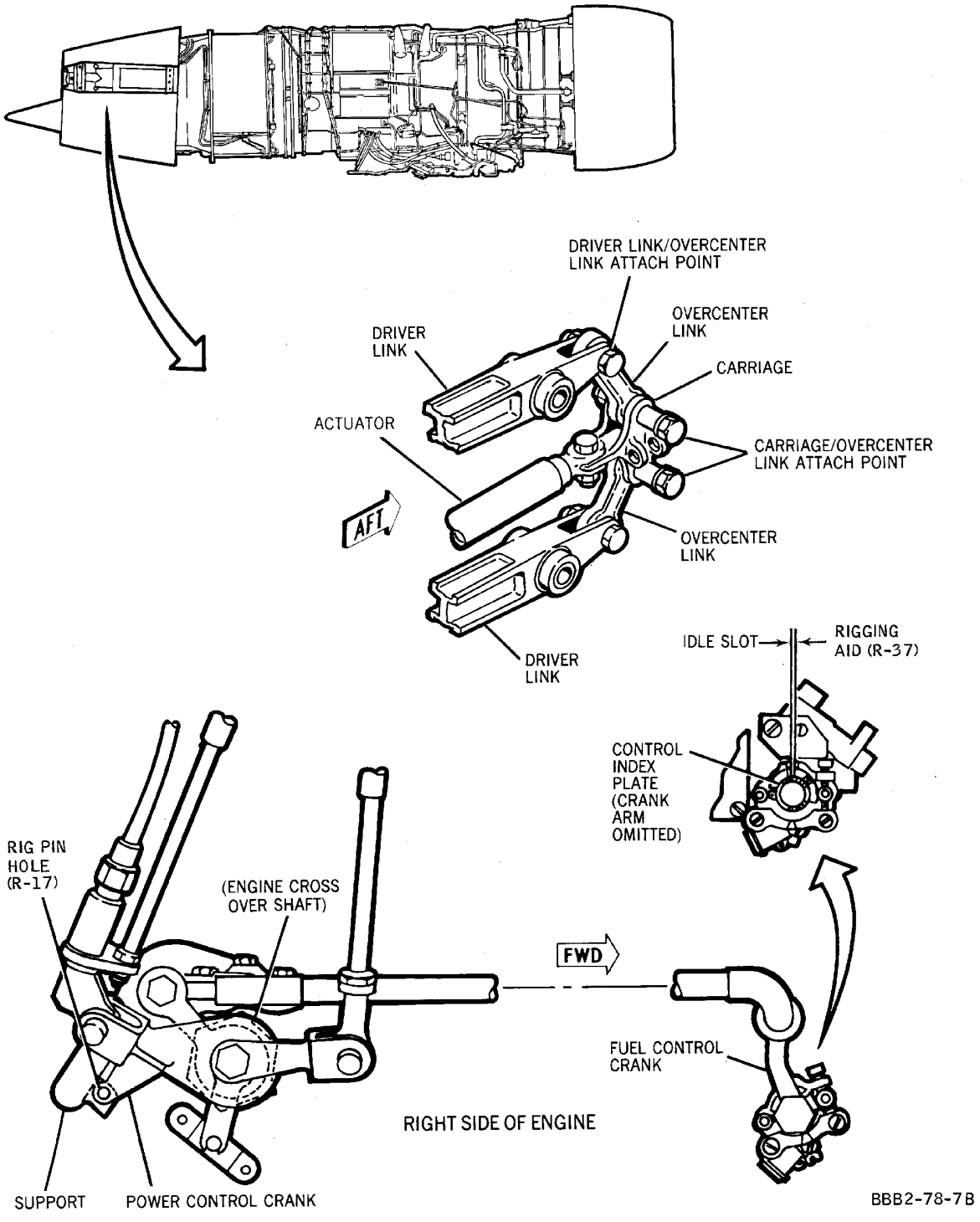
(9) Check rig length of rigging causing mismatch or binding.

(10) Remove all rig pins.

(11) Cycle thrust reverser to reverser thrust (deploy) and forward thrust (stow) positions.

(12) Check operation of thrust reverser position indicator switch blue light (ENG REVERSE THRUST) located on center instrument panel in flight compartment.

(13) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)



Thrust Reverser Interlock Mechanism
Figure 203/78-31-02-990-803

THRUST REVERSER CONTROL VALVE SECTOR - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation instructions for the thrust reverser control valve sector.

B. Maintenance of the thrust reverser control valve sector is limited to removal/installation procedures. Removal/ installation procedures for left and right control valve sectors are identical.

C. Thrust reverser control valve sectors are located on each side of the fuselage, on both forward and aft sides of the pressure bulkhead. Access to control valve sector is forward of the pressure bulkhead, in the aft lower cargo compartment. Access to components aft of the sector, is through the passenger aft entrance door or the passenger aft entrance door stairway.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Inconel Lockwire 0.032 in NASM20995N32, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.032 in NASM20995C32, DPM 5865	Not Specified

3. Removal/Installation Thrust Reverser Control Valve Sector

A. Remove Sector (Figure 201)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF

(2) Open access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(3) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(4) Remove control valve pushrod from crank arm. (Figure 201)

(5) Loosen turnbuckles and release drum cable tension.

NOTE: Thrust reverser cable turnbuckles are accessible through ceiling access panels 5154C and 5156C in forward cargo compartment and through ceiling access panels 5730C and 5732C in aft cargo compartment.

(6) Release and remove cables from drum.

(7) Remove mounting link from support crank.

(8) Remove pulley bolt, nut and washer.

(9) Remove cam sector and actuating cam from pulley bolt.

(10) Remove spring from cam sector and actuating cam.

(11) With actuating cam and cam sector removed from aircraft, remove spring from cam follower crank.

(12) Remove cam follower crank from cam sector and actuating cam.

(13) Remove remaining nut, washer, and screw attaching cam sector to actuating cam.

(14) Remove guard, spacer, support crank, cam support, bearing, and spacer (as a unit) from pulley bolt.

(15) Remove support crank from crank arm.

NOTE: Subsequent removal steps are performed forward of the pressure bulkhead. Not required unless removal of sector is mandatory.

(16) Remove bolt attaching mounting bracket to fuselage structure.

(17) Remove pulley bolt, washer, spacer, and bearing from control valve drum and mounting bracket.

(18) Remove sector from pressure bulkhead.

B. Install Sector (Figure 201)

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are open and tagged:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF

(2) Make certain thrust reverser control valve is in dump position and lockpin is installed.

NOTE: If control valve drum was not removed (forward of pressure bulkhead), steps (3) through (7) are not to be accomplished.

(3) Install bearing, mounting bracket, spacer, and washer on pulley bolt.

(4) Install pulley bolt thru control valve drum.

(5) Install drum thru pressure bulkhead.

(6) Attach mounting bracket to fuselage structure.

(7) Position cables into groove of drum and safety with lockwire. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(8) Install crank arm on support crank.

(9) Install guard, spacer, support crank, bearing, cam support, and spacer onto pulley bolt.

(10) Install mounting link on support crank and cam support.

(11) Install cam follower crank on cam sector and actuating cam.

(12) Install spring on cam sector and actuating cam.

(13) Install spring on cam follower crank.

(14) Install remaining screw, washer, and nut attaching cam sector to actuating cam.

(15) Align index mark and install cam sector on pulley bolt.

(16) Install washer and nut on pulley bolt. Safety nut with new cotter pin.

(17) Install crank arm on control valve pushrod. Safety nut with new cotter pin and bolt with lockwire. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(18) Tighten cable turnbuckles enough to remove slack.

(19) Adjust thrust reverser control valve sector. (PAGEBLOCK 78-30-00/501)

(20) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(21) Remove tag from throttle/thrust reverser lever and remove tag and close following circuit breakers:

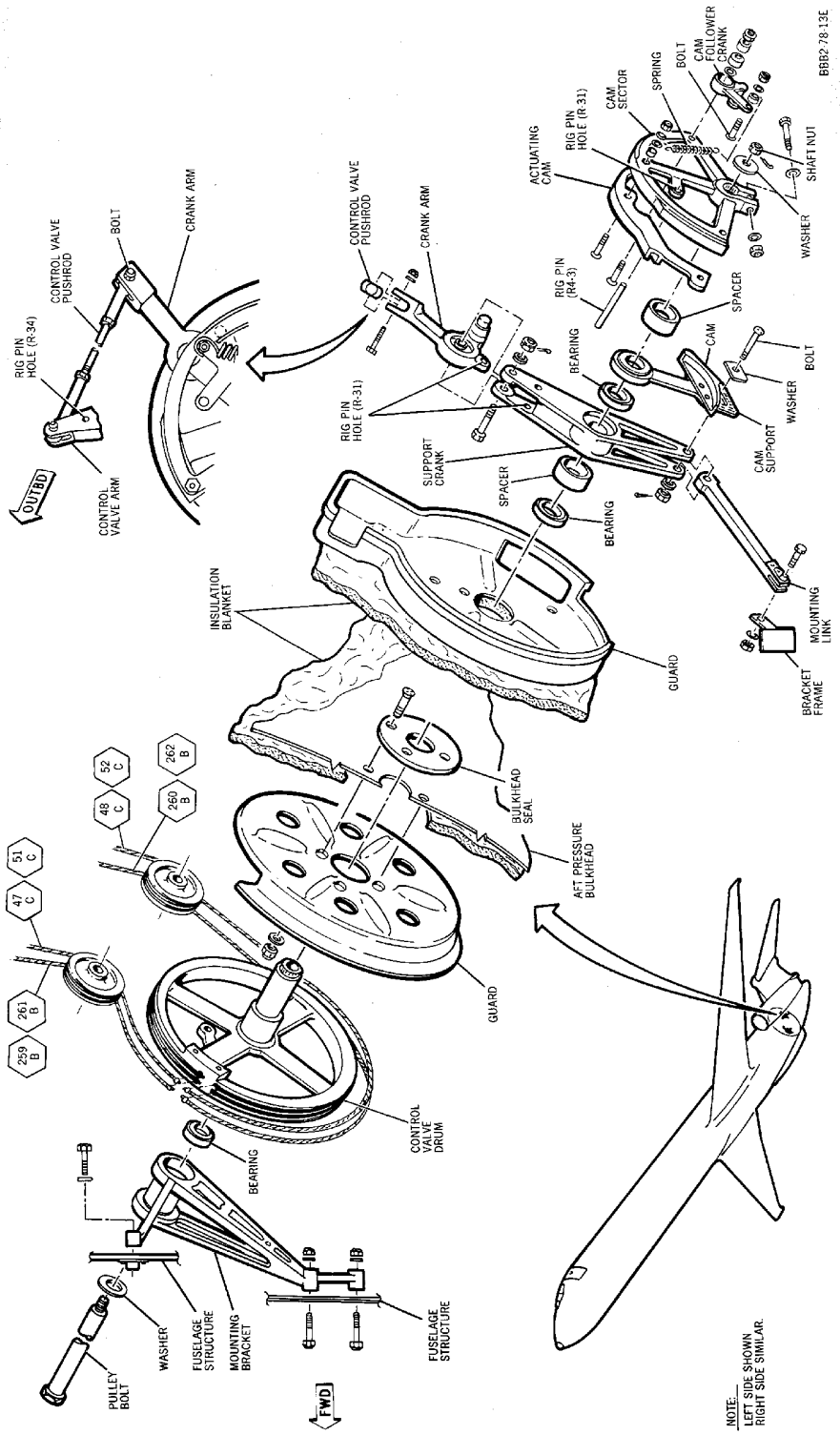
LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF

(22) Test thrust reverser control valve sector. (PAGEBLOCK 78-30-00/501)



Thrust Reverser Control Valve Sector
Figure 201/78-31-03-990-801

THRUST REVERSER CONTROL VALVE - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and adjustment/test instructions for the thrust reverser control valve. Thrust reverser control valves are located on each side of the fuselage, aft of the pressure bulkhead in the aft fuselage compartment.

B. Maintenance of the thrust reverser control valves is limited to removal/installation and adjustment/test procedures. Removal/ installation and adjustment/test procedures, for left and right control valves are identical.

CAUTION: TO PREVENT DAMAGE TO HYDRAULIC TUBES AND VALVE, AND TO PREVENT CONTAMINANTS FROM ENTERING HYDRAULIC SYSTEM, MAKE CERTAIN ALL OPEN TUBES AND VALVE PORTS ARE CAPPED.

C. Access to the thrust reverser control valves is through the passenger aft entrance door or the passenger aft entrance door stairway.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Rig pin (4-3) 1/4 by 3 5/8 inches	
Lubricant Skydrol assembly, MCS352 (alternate, Skydrol fluid) DPM 5073	Aviation Fluid Service Co.
Inconel Lockwire 0.020 in, NASM20995N20, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.020 in NASM20995C20, DPM 5865	Not Specified
Inconel Lockwire 0.032 in, NASM20995N32, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.032 in NASM20995C32, DPM 5865	Not Specified
NOTE: Rig pin sizes are in inches (diameter x length; length = grip plus 5/8 inch).	

3. Removal/Installation Thrust Reverser Control Valve

A. Remove Valve (Figure 201)

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF

(2) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

I (3) Open access door (5901C) for left engine, or (5902C) for right engine.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(4) Disconnect electrical connector.

(5) Disconnect thrust reverser control valve pushrod from valve control arm.

(6) Disconnect hydraulic lines from control valve.

(7) Remove unions, reducer and check valve (LH) from control valve. Discard O-rings.

(8) Remove control valve from mounting bracket.

B. Install Valve (Figure 201)

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser is tagged and following circuit breakers are opened and tagged:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF

(2) Install control valve on mounting bracket.

(3) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

WARNING: HYDRAULIC ASSEMBLY LUBRICANT IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY THE PRECAUTIONS WHEN HYDRAULIC ASSEMBLY LUBRICANT IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT GET HYDRAULIC ASSEMBLY LUBRICANT IN THE EYES, ON THE SKIN, OR ON YOUR CLOTHES.
- DO NOT BREATHE THE GAS.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(4) Lightly lubricate new O-rings with lubricant (MCS352) and install O-rings on unions, reducer and check valve (LH).

(5) Install unions, reducer and check valve (LH) in control valve.

NOTE: Check free flow arrow on check valve (LH). (Figure 201).

(6) Connect hydraulic lines to control valve.

(7) Connect thrust reverser control valve pushrod to valve control arm.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(8) Connect electrical connector. Safety connector with .020 corrosion resistant steel (CRES) lockwire, G60794 or .020 inconel lockwire, G60166. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(9) Adjust control valve pushrod. (Paragraph 4.)

(10) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(11) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF

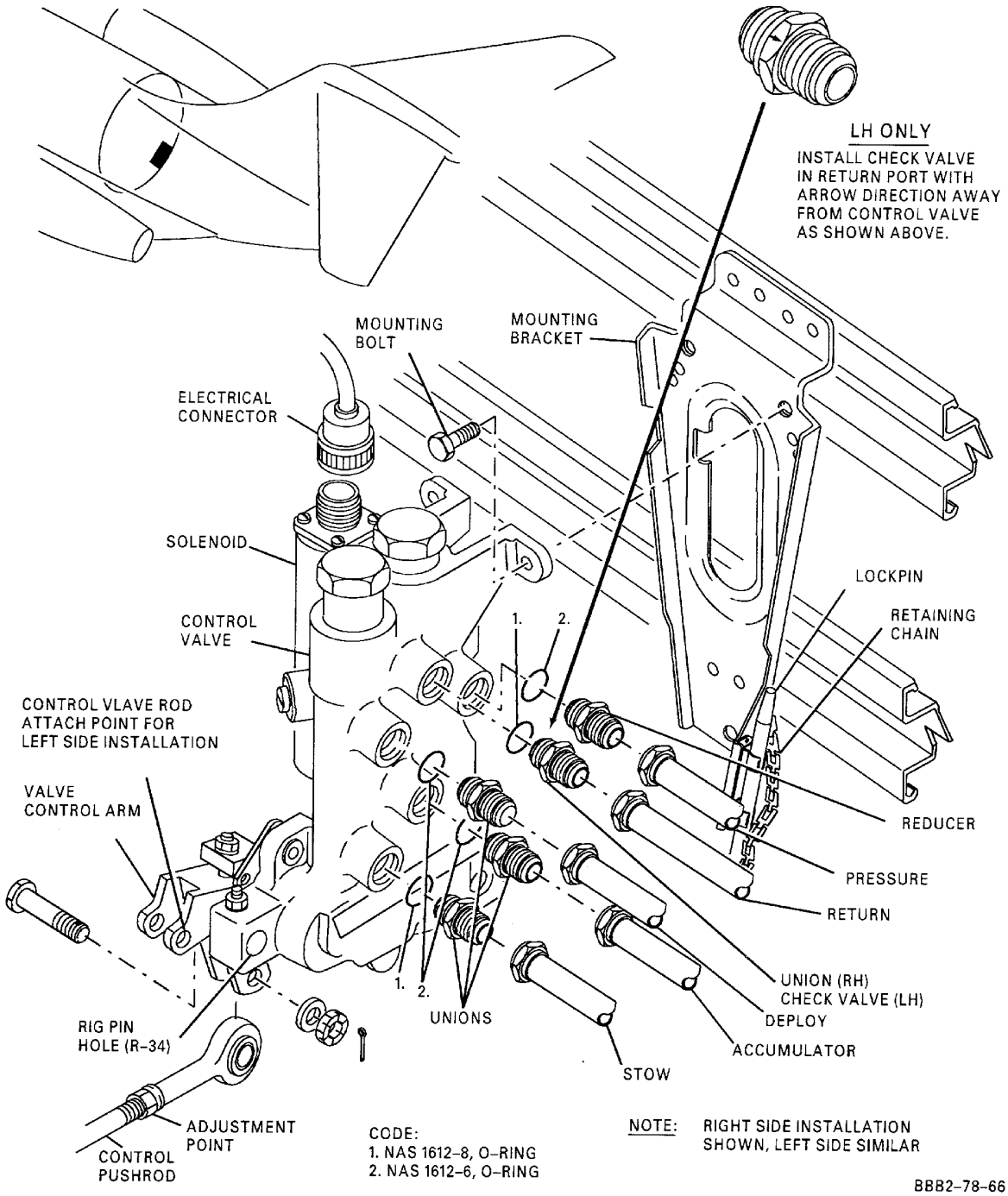
LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF

(12) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

I (13) Close access door (5901C) for left engine or (5902C) for right engine.

(14) Test thrust reverser system. (THRUST REVERSER - ADJUSTMENT/TEST, PAGEBLOCK 78-30-00/501, paragraph 3.D.)



Thrust Reverser Control Valve
Figure 201/78-31-04-990-802

WJE ALL

4. **Adjust Thrust Reverser Control Valve Pushrod**

A. Adjust Valve Pushrod

(1) Disconnect control valve pushrod from control valve sector cam link.

NOTE: Access thrust reverser control valve sector is through door (5901C) for left engine and (5902C) for right engine. Additional access, if required is ventral stairs side panels (5911A) for right side and (5918A) for left side.

(2) Install rig pin (4-3) in rig pin hole (R-34) through thrust reverser control valve control arm and valve body.

(3) Position thrust reverser control valve cam sector by setting throttle/thrust reverser lever full forward and back to idle position. When throttle/thrust reverser lever is released, it will move slightly away from idle stop. This is rig position.

(4) Hold cam sector and valve sector in place; rotate cam arm toward control valve control arm, bring cam roller into contact with cam surface. Hold in this position.

(5) Adjust control valve pushrod until bolt connecting pushrod and cam link can be freely installed and install bolt.

(6) Make certain control valve pushrod threads are visible through pushrod end witness hole.

(7) Safety nut with new cotter pin.

(8) Safety control valve pushrod with corrosion-resistant steel safety wire, G60845 or .032 inconel lockwire, G60169. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(9) Remove rig pin (4-3) from rig pin hole (R-34).

THRUST REVERSER INDICATING SYSTEM - TROUBLE SHOOTING

1. General

A. Trouble shooting procedures for the thrust reverser indicating system cover the mechanically actuated switches, and the indicating lights. Switches are mounted on the thrust reverser upper and lower door latches and one switch is mounted on the thrust reverser interlock mechanism. The indicating lights are located on the center instrument panel in the flight compartment. In addition, the thrust reverser hydraulic accumulator low-pressure warning system is covered and consists of a pressure actuated switch, mounted on the accumulator mounting bracket, and an indicating light located on the overhead annunciator panel in the flight compartment.

B. Substituted components should be in good working condition.

C. Adjustment/test procedures should be performed at completion of trouble shooting.

2. Trouble Shooting Thrust Reverser Indicating System

NOTE: Lubricants should not be applied to position switch plunger. Lubricants will cause the switch to eventually fail electrically.

A. AMBER ENG REVERSE UNLOCK AND BLUE ENG REVERSE THRUST LIGHTS OFF (THRUST REVERSE LEVER IN REVERSE THRUST POSITION)

Table 101

	Possible Causes	Isolation Procedure	Correction
(1)	Thrust reverser latch indicator switch amber indicating light burned out	Press light test switch.	Replace lamp.
(2)	Thrust reverser latch indicator switch defective	Disconnect electrical connector from switch.	
		Check for 28 vdc between power pins B and C.	If power exists at check points, replace switch.
		If no power, reference step (3).	
(3)	System wiring defective	Check system wiring for open circuit, wire to wire, or wire to ground short circuits.	Repair wiring.

B. NO BLUE ENG REVERSE THRUST INDICATING LIGHT WITH THRUST REVERSER LEVER IN REVERSE DETENT POSITION, AMBER ENG REVERSER UNLOCK LIGHT ON

	Possible Causes	Isolation Procedure	Correction
(1)	Thrust reverser position indicator switch blue indicating light burned out .	Press light test switch.	Replace lamp.
(2)	Thrust reverser position indicator switch defective	Disconnect electrical connector from switch.	
		Check for 28 vdc between power pins B and A.	If power exists at check points, replace switch.
		If no power, reference condition A., step (3).	
(3)	Thrust reverser rigging out of adjustment	Check rigging	Rerig thrust reverser

C. AMBER ENG REVERSE UNLOCK AND BLUE ENG REVERSE THRUST INDICATING LIGHTS ON (THRUST REVERSER LEVER IN FORWARD THRUST POSITION)

	Possible Causes	Isolation Procedure	Correction
(1)	Thrust reverser latch indicator switch defective	Disconnect electrical connector from latch switch.	If indicating light goes out, replace switch.
		If indicating light remains on, see condition A. step 3.	

D. AMBER ENG REVERSE UNLOCK AND BLUE ENG REVERSE THRUST INDICATING LIGHTS OFF (THRUST REVERSER LEVER IN REVERSE DETENT POSITION)

	Possible Causes	Isolation Procedure	Correction
(1)	Thrust reverser latch indicator switch defective	Disconnect electrical connector from switch.	
		Check for 28 vdc between power pins B and C.	If power exists at check points, replace switch.
		If no power, reference condition A., step (3).	

E. AMBER REVERSER ACCUMULATOR LOW LIGHT OFF (REVERSER ACCUMULATOR GAGE READS BELOW 950 PSI (6549 KPA)

	Possible Causes	Isolation Procedure	Correction
(1)	Thrust reverser accumulator low-pressure warning switch amber indicating light burned out	Press warning/caution lights test switch located on overhead panel.	Replace lamp.
(2)	Thrust reverser accumulator low-pressure warning switch defective	Disconnect electrical connector from switch. Check for 28 vdc between ground and power pins A. If no power, reference condition A., step (3).	If power exists at check points, replace switch.

THRUST REVERSER ACCUMULATOR LOW-PRESSURE WARNING SWITCH - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and check instructions for the thrust reverser accumulator low-pressure warning switch. Low-pressure warning switches are located on each side of the fuselage, aft of the pressure bulkhead.

B. Maintenance of the thrust reverser accumulator low-pressure warning switches is limited to removal/installation and check procedures.

CAUTION: TO PREVENT DAMAGE TO HYDRAULIC TUBE AND SWITCH, AND TO PREVENT CONTAMINANTS FROM ENTERING HYDRAULIC SYSTEM, MAKE CERTAIN ALL OPEN TUBES AND SWITCH PORTS ARE CAPPED.

C. Access to the thrust reverser accumulator low-pressure warning switches is through the passenger aft entrance door or the passenger aft entrance door stairway.

2. Equipment and Materials

NOTE: Equivalent substitute may be used instead of the following listed item.

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Inconel Lockwire 0.020 in, NASM20995N20, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.020 in NASM20995C20, DPM 5865	Not Specified

3. Removal/Installation Thrust Reverser Accumulator Low-Pressure Warning Switch

A. Remove Switch (Figure 201)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF
S	29	B1-218	LEFT REVERSER ACCUM LOW CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF
T	29	B1-219	RIGHT REVERSER ACCUM LOW CAUTION

(2) Open access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(3) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

(4) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

(5) Depressurize accumulator. (PAGEBLOCK 78-31-01/201)

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(6) Disconnect electrical connector.

(7) Disconnect hydraulic line from switch.

(8) Remove switch from bracket.

B. Install Switch (Figure 201)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF
S	29	B1-218	LEFT REVERSER ACCUM LOW CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF
T	29	B1-219	RIGHT REVERSER ACCUM LOW CAUTION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and lockpin is installed.

(3) Install switch on bracket.

(4) Connect hydraulic line to switch. Use new O-ring if union was removed with line.

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DIS-CONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(5) Connect electrical connector. Safety connector with lockwire. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(6) Service accumulator. (PAGEBLOCK 78-31-01/201)

(7) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(8) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	28	B1-262	LEFT REVERSER ACCUM SHUT-OFF
S	29	B1-218	LEFT REVERSER ACCUM LOW CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

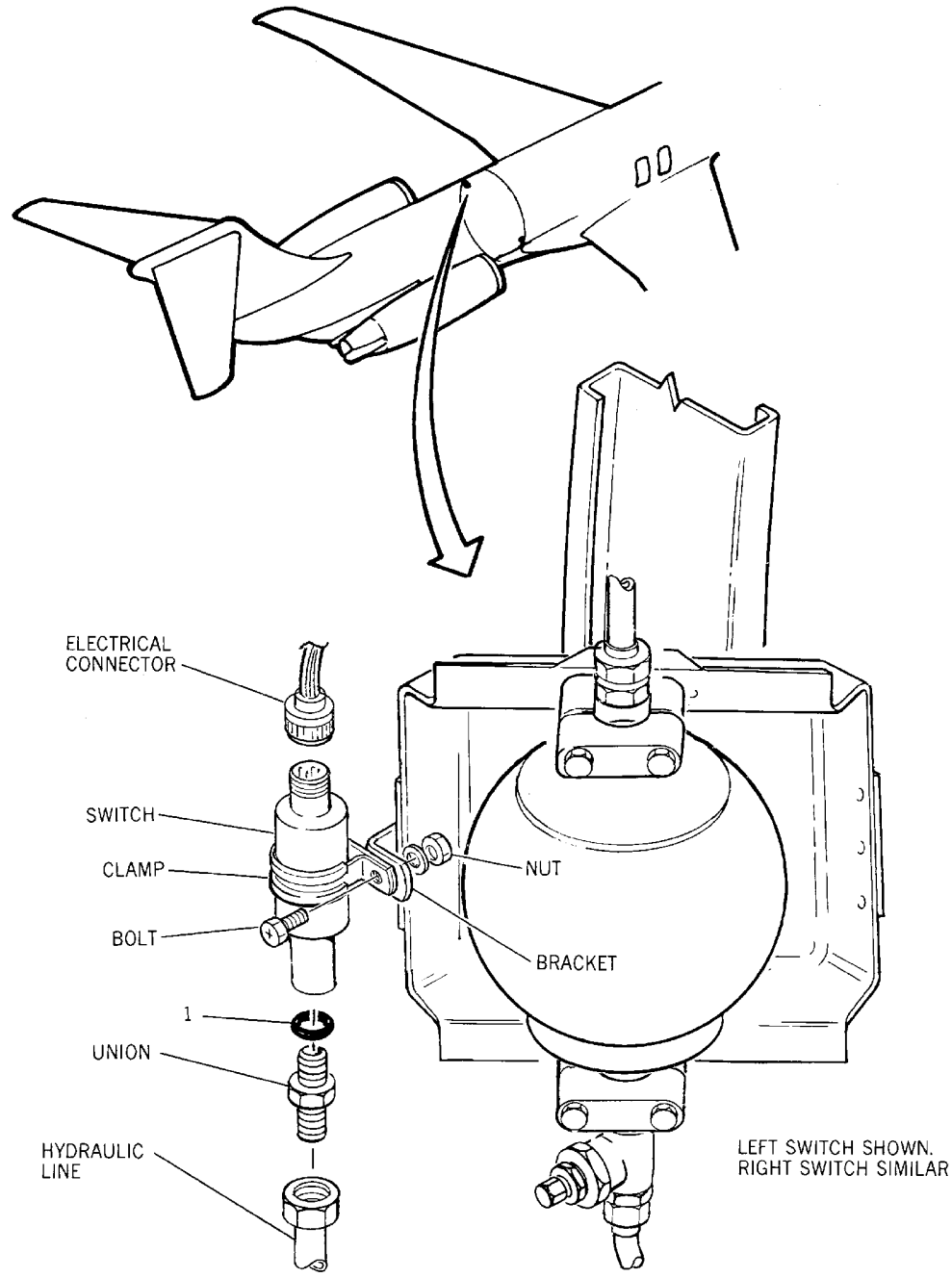
Row	Col	Number	Name
T	28	B1-263	RIGHT REVERSER ACCUM SHUT-OFF
T	29	B1-219	RIGHT REVERSER ACCUM LOW CAUTION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAIL-ABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(9) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(10) Do the check of the thrust reverser accumulator low-pressure warning switch (Paragraph 4.).

(11) Close access door (5901C) for left engine or (5902C) for right engine.



CODE:
1. NAS1612-4 O-RING

BBB2-78-16B

Thrust Reverser Accumulator Low-Pressure Warning Switch
Figure 201/78-32-01-990-801

4. Check Thrust Reverser Accumulator Low-Pressure Warning Switch

A. Check Switch

(1) Pressurize left or right (as applicable) hydraulic system with an external hydraulic pressure source (PAGEBLOCK 29-00-00/201).

(2) Check hydraulic line connection and fitting for leakage.

(3) Adjust external hydraulic source pressure output to approximately 1500 psi (10350 kPa).

(4) Operate thrust reverser control valve arm and observe pressure indication at which left or right (as applicable) hydraulic pressure low light comes on.

(5) Check amber REVERSER ACCUMULATOR LOW indicating light is on.

(6) Slowly increase hydraulic pressure and observe pressure indication at which left or right (as applicable) hydraulic pressure low light goes out.

NOTE: Light out pressure setting of switch is 2000 psi (13,800 kPa) maximum.

NOTE: Light on pressure setting of switch is 1725 (+50, -100) psi (11902.5 (+345, -690) kPa).

(7) Depressurize aircraft hydraulic system. (PAGEBLOCK 29-00-00/201)

THRUST REVERSER ACCUMULATOR LOW-PRESSURE WARNING SWITCH - ADJUSTMENT/TEST

1. General

A. This procedure contains MSG-3 task card data.

TASK 78-32-01-720-801

2. Functional Check of the Low Pressure Warning Switch

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-00-00 P/B 201	GENERAL - MAINTENANCE PRACTICES

B. Prepare to do a Functional Check of the Low Pressure Warning Switch

SUBTASK 78-32-01-010-001

(1) Open the applicable access panel.

SUBTASK 78-32-01-863-001

(2) Pressurize the applicable hydraulic system with an external hydraulic pressure source. (GENERAL - MAINTENANCE PRACTICES, PAGEBLOCK 29-00-00/201)

C. Perform a Functional Check of the Low Pressure Warning Switch

SUBTASK 78-32-01-212-001

(1) Check hydraulic line connection and fitting for leakage.

SUBTASK 78-32-01-863-002

(2) Adjust external hydraulic source pressure output to approximately 1500 psi (10,342 kPa)

SUBTASK 78-32-01-720-001

(3) Operate thrust reverser control valve arm and observe pressure indication at which the applicable hydraulic pressure low light comes on.

(4) Check amber REVERSER ACCUMULATOR LOW indicating light is on.

(5) Slowly increase hydraulic pressure and observe pressure indication at which the applicable hydraulic pressure low light goes out.

NOTE: Light out pressure setting of switch is 2000 psi (13,800 kPa) maximum.

NOTE: Light on pressure setting of switch is 1725 (+50, -100) psi (11902.5 (+345, -690) kPa).

D. Job Close-up

SUBTASK 78-32-01-864-001

(1) Depressurize the applicable aircraft hydraulic system. (GENERAL - MAINTENANCE PRACTICES, PAGEBLOCK 29-00-00/201)

SUBTASK 78-32-01-410-001

(2) Close applicable access panel.

END OF TASK

THRUST REVERSER POSITION INDICATOR SWITCH - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and check instructions for the thrust reverser position indicator switch.

B. Maintenance of the thrust reverser position indicator switch is limited to removal/installation procedures.

NOTE: Lubricants should not be applied to position switch plunger. Lubricants will cause the switch to eventually fail electrically.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

C. Access to the thrust reverser position indicator switch is through engine cowl doors. (PAGEBLOCK 71-00-00/201)

NOTE: Forward lower cowl door overlaps aft lower cowl door, and must be opened first.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items.

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Inconel Lockwire 0.020 in, NASM20995N20, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.020 in NASM20995C20, DPM 5865	Not Specified
Inconel Lockwire 0.032 in, NASM20995N32, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.032 in NASM20995C32, DPM 5865	Not Specified

3. Removal/Installation Thrust Reverser Position Indicator Switch

A. Remove Switch (Figure 201)

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT
WJE ALL			

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	31	B1-452	LEFT REVERSE THRUST ADVISORY
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	32	B1-288	LEFT START VALVE OPEN ADVISORY
WJE ALL			

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
T	32	B1-289	RIGHT START VALVE OPEN ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(2) Open access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(3) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(4) Disconnect electrical connector from switch.

(5) Remove switch from interlock mechanism.

(6) Remove shims and washer from switch.

B. Install Switch (Figure 201)

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE ALL			

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	31	B1-452	LEFT REVERSE THRUST ADVISORY
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	32	B1-288	LEFT START VALVE OPEN ADVISORY
WJE ALL			

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
T	32	B1-289	RIGHT START VALVE OPEN ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(2) Make certain thrust reverser control valve is in dump position and lockpin is installed.

(3) Install washer and shims on switch.

(4) Install switch on interlock mechanism.

NOTE: Install sufficient shims on switch plunger for switch plunger to depress 0.16(±0.06) inch (4.1(±1.5) mm) when thrust reverser is deployed.

(5) Safety nut with 0.032 inch lockwire. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(6) Connect electrical connector to switch. Safety connector with .020 corrosion resistant steel (CRES) lockwire, G60794 or .020 inconel lockwire, G60166. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(7) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(8) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883			
U	42	B1-872	ENG START VALVE LEFT & RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT
WJE ALL			

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	31	B1-452	LEFT REVERSE THRUST ADVISORY
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
S	32	B1-288	LEFT START VALVE OPEN ADVISORY
WJE ALL			

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	31	B1-453	RIGHT REVERSE THRUST ADVISORY
WJE 405, 407-409, 411, 416, 420, 422, 424-427, 429, 861, 862, 868, 873, 874, 880, 881, 883, 884, 891-893			
T	32	B1-289	RIGHT START VALVE OPEN ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

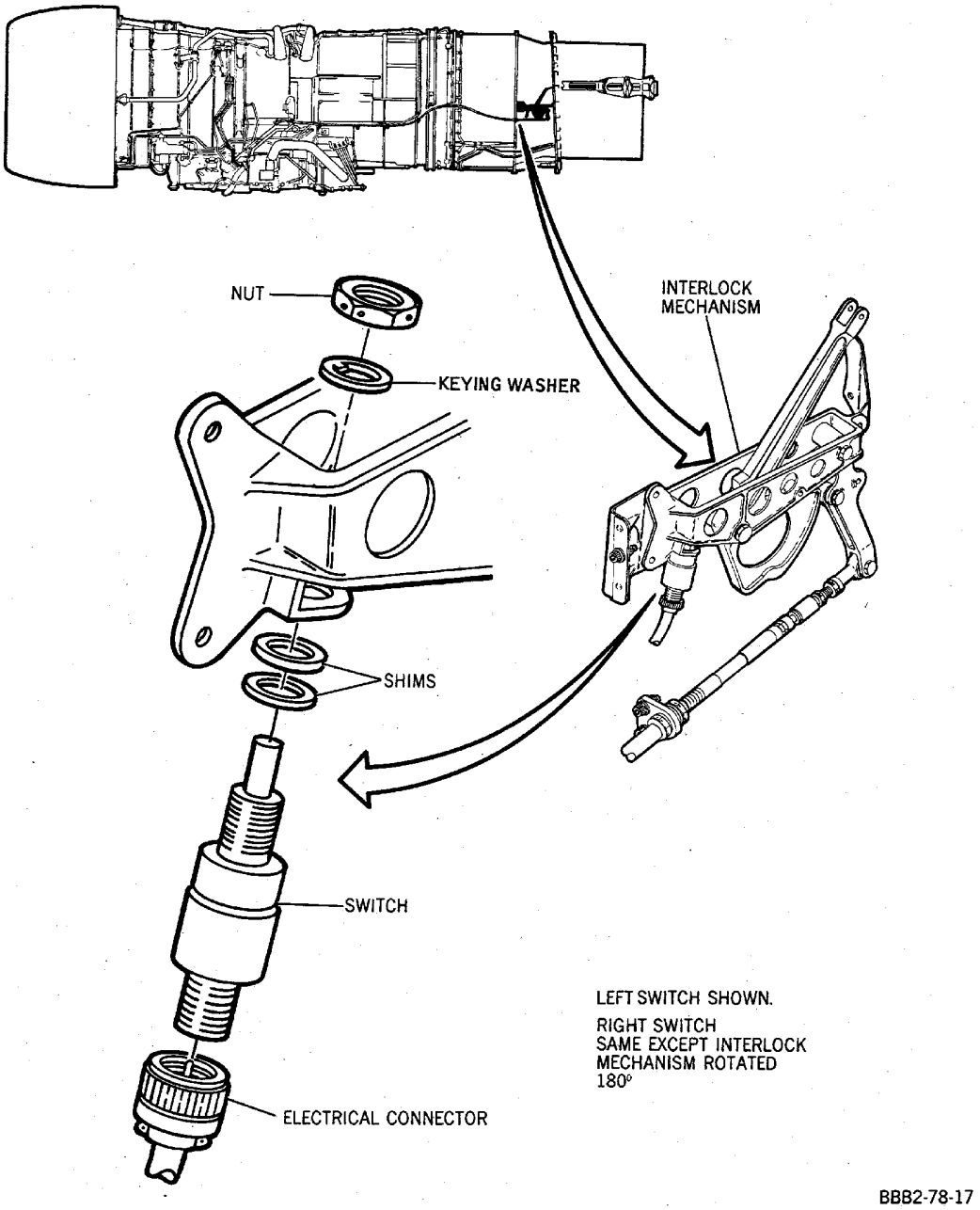
UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(9) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(10) Close access door (5901C) for left engine or (5902C) for right engine.

(11) Close engine cowl doors.



Thrust Reverser Position Indication Switch
Figure 201/78-32-02-990-801

4. Check Thrust Reverser Position Indicator Switch

A. Check Switch

(1) Check operation of thrust reverser position indicator switch blue light (ENG REVERSE THRUST) located on center instrument panel in flight compartment. (THRUST REVERSER - ADJUSTMENT/TEST, PAGEBLOCK 78-30-00/501)

THRUST REVERSER LATCH INDICATOR SWITCH - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and check instructions for the thrust reverser latch indicator switch.

B. Maintenance of the thrust reverser latch indicator switch is limited to removal/installation and check procedures.

NOTE: Lubricants should not be applied to door latch switch plungers. Lubricants will cause the switch to eventually fail.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

C. Access to the thrust reverser latch indicator switch is through engine cowl doors.

NOTE: Forward lower cowl door overlaps aft lower cowl door, and must be opened first.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items.

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Inconel Lockwire 0.020 in NASM20995N20, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.020 in NASM20995C20, DPM 5865	Not Specified
Inconel Lockwire 0.032 in NASM20995N32, DPM 684	Not Specified
Corrosion Resistant Steel Lockwire 0.032 in NASM20995C32, DPM 5865	Not Specified

3. Removal/Installation Thrust Reverser Latch Indicator Switch

A. Remove Switch (Figure 201)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT
U	42	B1-1	ENGINE IGNITION LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(2) Open access door (5901C) for left engine or (5902C) for right engine.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(3) Place thrust reverser control valve in dump position and install lockpin. (PAGEBLOCK 78-00-00/201)

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DISCONNECT PLUG.

(4) Disconnect electrical connector from switch.

(5) Remove switch from bracket.

(6) Remove shims from switch.

B. Install Switch (Figure 201)

NOTE: Lubricants should not be applied to door latch switch plungers. Lubricants will cause the switch to eventually fail.

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(2) Make certain thrust reverser control valve is in dump position and lockpin is installed.

(3) Install shims on switch.

(4) Install switch in bracket. Gap between switch roller and lever should be .010 to .030 inches (0.25 to 0.76 mm).

NOTE: Switch overtravel may be a maximum of 1/4 inch (6.35 mm).

(5) Safety nut with corrosion-resistant steel safety wire, G60845 or .032 inconel lockwire, G60169. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

CAUTION: TO PREVENT DAMAGE TO ELECTRICAL CONNECTOR, DO NOT USE ANY TOOL OTHER THAN PLUG PLIERS TO DIS-CONNECT OR CONNECT PLUG. WHEN CONNECTING PLUG, DO NOT OVERTIGHTEN.

(6) Connect electrical connector to switch. Safety connector with .020 corrosion resistant steel (CRES) lockwire, G60794 or .020 inconel lockwire, G60166. (LOCKWIRE SAFETYING - MAINTENANCE PRACTICES, PAGEBLOCK 20-10-18/201)

(7) Remove tools, equipment, loose hardware, spilled fluid, and debris from maintenance area.

(8) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 401-404, 412, 414, 875, 876, 878, 879, 881, 883

U	42	B1-872	ENG START VALVE LEFT & RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	30	B1-73	LEFT REVERSER UNLOCK ADVISORY

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	30	B1-74	RIGHT REVERSER UNLOCK ADVISORY

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

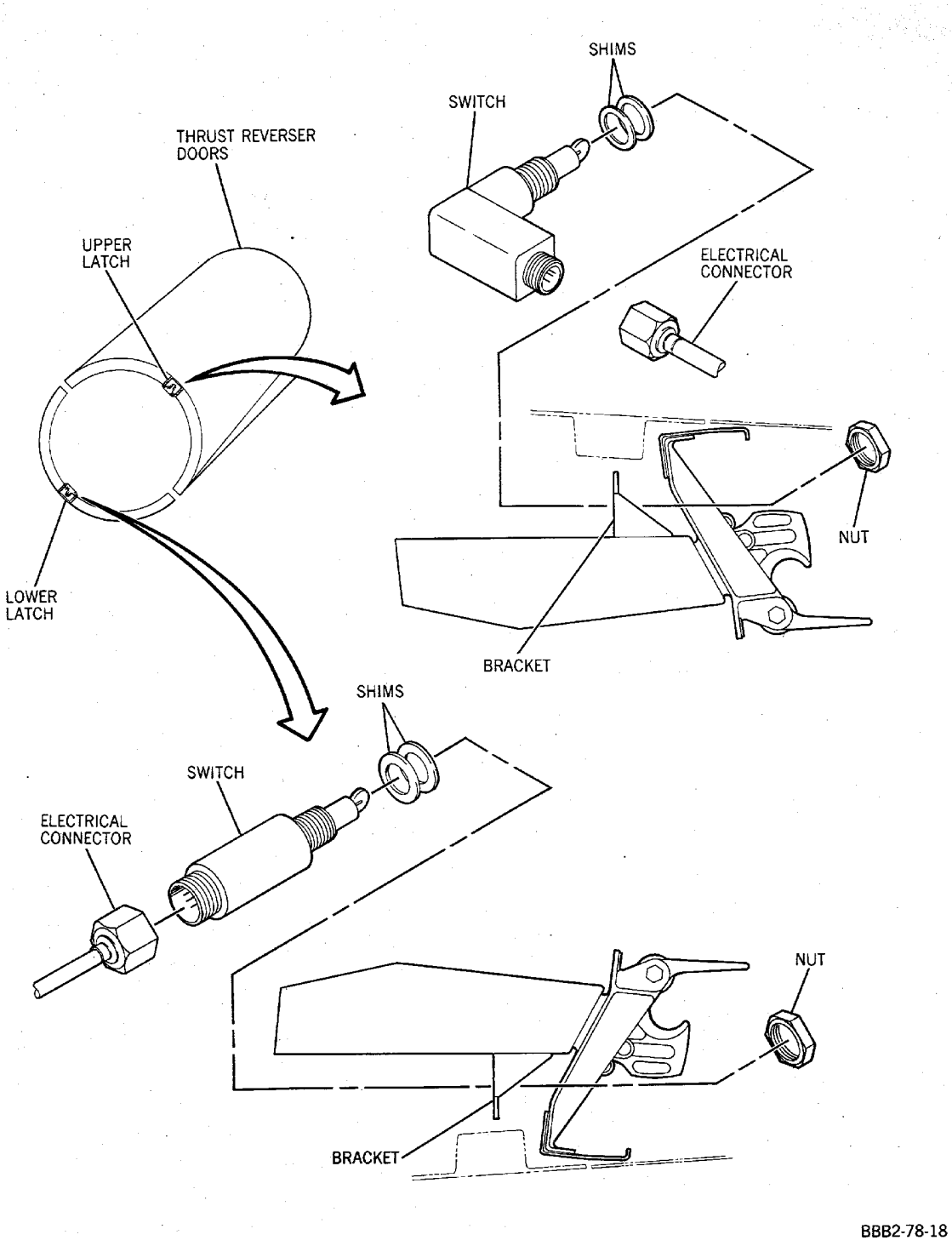
UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

(9) Remove lockpin from thrust reverser control valve and stow lockpin. (PAGEBLOCK 78-00-00/201)

(10) Close access door (5901C) for left engine or (5902C) for right engine.

(11) Close engine cowl doors.



Thrust Reverser Latch Indicator Switch
Figure 201/78-32-03-990-801

4. Check Thrust Reverser Latch Indicator Switch

A. Check Switch

(1) Check operation of thrust reverser latch indicator switch amber light (ENG REVERSE UNLOCK) located on center instrument panel in flight compartment. (THRUST REVERSER - ADJUSTMENT/TEST, PAGEBLOCK 78-30-00/501)