CHAPTER

79

OIL

(CFM56 ENGINES (CFM56-7))

CHAPTER 79
OIL

Subject/Page	Date	COC
79-EFFECTIVE PAGES		
1 thru 3	Feb 15/2025	
4	BLANK	
79-CONTENTS		
1	Oct 15/2023	
2	Jun 15/2019	
3	Feb 15/2021	
4	Oct 15/2021	
5	Jun 15/2020	
6	BLANK	
79-00-00		
601	Jun 15/2020	
602	Jun 15/2019	
603	Oct 15/2017	
604	Jun 15/2016	
605	Jun 15/2016	
606	Jun 15/2016	
607	Jun 15/2016	
608	Jun 15/2019	
609	Feb 15/2022	
610	Feb 15/2022	
611	Feb 15/2022	
612	Jun 15/2016	
613	Jun 15/2016	
614	Jun 15/2019	
615	Feb 15/2018	
616	Oct 15/2023	
R 617	Feb 15/2025	
618	Oct 15/2023	
619	Oct 15/2023	
620	Oct 15/2023	
621	Oct 15/2024	
622	Oct 15/2024	
623	Oct 15/2024	
624	Oct 15/2023	
625	Oct 15/2024	
626	Jun 15/2024	
79-00-00 (cont)		
627	Jun 15/2024	
628	Jun 15/2024	
629	Jun 15/2024	
630	Oct 15/2024	
631	Oct 15/2023	
632	Oct 15/2023	
633	Oct 15/2023	
634	Oct 15/2023	
635	Oct 15/2023	
636	Oct 15/2023	
637	Oct 15/2023	
638	Oct 15/2023	
639	Oct 15/2023	
640	Oct 15/2023	
641	Oct 15/2023	
642	BLANK	
79-00-00		
901	Oct 15/2022	
902	Jun 15/2019	
903	Oct 15/2020	
904	BLANK	
79-11-01		
401	Jun 15/2018	
402	Oct 15/2017	
403	Jun 15/2020	
404	Jun 15/2018	
405	Feb 15/2024	
406	Oct 15/2024	
407	Feb 15/2024	
408	Oct 15/2024	
409	Oct 15/2024	
410	BLANK	
79-11-01		
601	Jun 15/2018	
602	Jun 15/2018	
603	Jun 15/2015	
604	Jun 15/2018	
79-11-01 (cont)		
605	Jun 15/2018	
606	BLANK	
79-11-01		
701	Jun 15/2021	
702	Jun 15/2021	
703	Jun 15/2021	
704	Jun 15/2018	
79-11-01		
801	Jun 15/2023	
802	Oct 15/2023	
803	Oct 15/2023	
804	Jun 15/2023	
805	Oct 15/2023	
806	Jun 15/2016	
807	Jun 15/2023	
808	Jun 15/2018	
809	Jun 15/2018	
810	Jun 15/2018	
811	Jun 15/2018	
812	Jun 15/2023	
813	Jun 15/2023	
814	Jun 15/2018	
79-21-00		
201	Feb 15/2020	
202	Feb 15/2020	
203	Jun 15/2016	
204	Jun 15/2016	
205	Jun 15/2016	
206	Oct 15/2017	
207	Oct 15/2017	
208	Oct 15/2017	
209	Oct 15/2017	
210	Oct 15/2017	
211	Oct 15/2017	
212	Oct 15/2017	
213	Oct 15/2017	
214	Oct 15/2017	

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

79-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 79
OIL

Subject/Page	Date	COC
79-21-00 (cont)		
215	Oct 15/2017	
216	BLANK	
79-21-01		
401	Oct 15/2024	
402	Jun 15/2023	
403	Jun 15/2023	
404	Jun 15/2023	
405	Oct 15/2022	
406	Jun 15/2020	
407	Oct 15/2017	
408	Jun 15/2020	
409	Jun 15/2020	
410	Oct 15/2017	
411	Oct 15/2017	
412	Oct 15/2017	
413	Oct 15/2024	
414	Oct 15/2024	
415	Jun 15/2023	
416	Jun 15/2023	
79-21-01		
801	Oct 15/2024	
802	Jun 15/2024	
803	Jun 15/2024	
804	Feb 15/2021	
805	Oct 15/2023	
806	Feb 15/2021	
807	Oct 15/2024	
808	Oct 15/2023	
809	Oct 15/2023	
810	Jun 15/2023	
811	Oct 15/2023	
812	Feb 15/2021	
813	Feb 15/2021	
814	Feb 15/2021	
815	Oct 15/2024	
816	Jun 15/2024	
817	Oct 15/2023	
79-21-01 (cont)		
818	BLANK	
79-21-02		
401	Jun 15/2024	
402	Jun 15/2024	
403	Jun 15/2024	
404	Jun 15/2021	
405	Jun 15/2021	
406	Jun 15/2021	
407	Jun 15/2021	
408	Jun 15/2024	
R 409	Feb 15/2025	
R 410	Feb 15/2025	
R 411	Feb 15/2025	
O 412	Feb 15/2025	
O 413	Feb 15/2025	
414	BLANK	
79-21-03		
401	Oct 15/2020	
402	Oct 15/2020	
403	Jun 15/2016	
404	Oct 15/2024	
405	Oct 15/2024	
406	Jun 15/2023	
407	Jun 15/2022	
408	BLANK	
79-21-04		
401	Oct 15/2020	
402	Oct 15/2020	
403	Jun 15/2016	
404	Oct 15/2024	
405	Jun 15/2023	
406	Jun 15/2023	
79-21-05		
R 401	Feb 15/2025	
R 402	Feb 15/2025	
R 403	Feb 15/2025	
R 404	Feb 15/2025	
79-21-05 (cont)		
R 405	Feb 15/2025	
R 406	Feb 15/2025	
R 407	Feb 15/2025	
R 408	Feb 15/2025	
R 409	Feb 15/2025	
410	Oct 15/2021	
R 411	Feb 15/2025	
R 412	Feb 15/2025	
R 413	Feb 15/2025	
414	BLANK	
79-21-06		
401	Oct 15/2020	
402	Oct 15/2020	
403	Jun 15/2019	
404	Oct 15/2020	
405	Jun 15/2016	
406	Oct 15/2024	
407	Oct 15/2024	
408	Oct 15/2024	
79-21-07		
401	Jun 15/2021	
402	Jun 15/2021	
403	Jun 15/2016	
404	Jun 15/2023	
405	Oct 15/2020	
406	Oct 15/2017	
79-21-08		
401	Jun 15/2018	
402	Jun 15/2018	
403	Jun 15/2016	
404	Jun 15/2016	
405	Oct 15/2024	
406	Oct 15/2021	
79-21-09		
401	Jun 15/2018	
402	Jun 15/2018	
403	Oct 15/2017	

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

79-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 79
OIL

Subject/Page	Date	COC	Subject/Page	Date	COC	Subject/Page	Date	COC
79-21-09 (cont)			79-34-02 (cont)					
404	Jun 15/2016		408	BLANK				
405	Jun 15/2016							
406	Oct 15/2024							
407	Oct 15/2017							
408	Oct 15/2017							
79-21-10								
401	Jun 15/2015							
402	Oct 15/2017							
403	Jun 15/2016							
404	Oct 15/2024							
405	Jun 15/2021							
406	Oct 15/2017							
79-31-00								
501	Jun 15/2015							
502	Jun 15/2015							
79-31-01								
401	Feb 15/2024							
402	Feb 15/2024							
403	Jun 15/2018							
404	Oct 15/2024							
405	Feb 15/2024							
406	Feb 15/2024							
79-32-01								
401	Jun 15/2022							
402	Feb 15/2023							
403	Jun 15/2016							
404	Oct 15/2024							
405	Jun 15/2023							
406	Jun 15/2023							
79-34-02								
401	Jun 15/2022							
402	Feb 15/2022							
403	Jun 15/2016							
404	Jun 15/2016							
405	Oct 15/2024							
406	Jun 15/2023							
407	Feb 15/2022							

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

79-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - See title page for details

737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

CHAPTER 79
OIL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
OIL - INSPECTION/CHECK	79-00-00		601	LOM ALL
External Oil System Inspection TASK 79-00-00-200-802-F00			601	LOM ALL
Internal Oil System Inspection TASK 79-00-00-200-803-F00			608	LOM ALL
Aft Sump Oil System Inspection TASK 79-00-00-200-806-F01			609	LOM ALL
CDU Interrogation of the DMS Detectors TASK 79-00-00-710-801-F00			614	LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM
DMS Operational Check TASK 79-00-00-710-806-F00			614	LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM
Chip Detectors and Scavenge Screens - Inspection TASK 79-00-00-200-804-F00			616	LOM ALL
Oil Supply Filter Pop-Out Indicator Inspection (Visual Check) TASK 79-00-00-200-805-F00			638	LOM ALL
OIL - DDG MAINTENANCE PROCEDURES	79-00-00		901	LOM ALL
MMEL 79-1 (DDPG) Preparation - Oil Quantity Indication Inoperative TASK 79-00-00-040-801-F00			901	LOM ALL
MMEL 79-1 (DDPG) Restoration - Oil Quantity Indication Inoperative TASK 79-00-00-440-801-F00			901	LOM ALL
MMEL 79-2–1 (DDPG) Preparation - Oil Filter Bypass Warning Systems Inoperative TASK 79-00-00-040-802-F00			902	LOM ALL
MMEL 79-2–1 (DDPG) Restoration - Oil Filter Bypass Warning Systems Inoperative TASK 79-00-00-440-802-F00			902	LOM ALL
MMEL 79-2-2 (DDPG) Preparation - Oil Filter Bypass Warning Systems Inoperative TASK 79-00-00-040-803-F00			902	LOM ALL

79-CONTENTS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 79
OIL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
MMEL 79-2–2 (DDPG) Restoration - Oil Filter Bypass Warning Systems Inoperative TASK 79-00-00-440-803-F00			903	LOM ALL
OIL TANK - REMOVAL/INSTALLATION	79-11-01		401	LOM ALL
Oil Tank Removal TASK 79-11-01-000-801-F00			401	LOM ALL
Oil Tank Installation TASK 79-11-01-400-801-F00			406	LOM ALL
OIL TANK - INSPECTION/CHECK	79-11-01		601	LOM ALL
Oil Tank Inspection TASK 79-11-01-200-801-F00			601	LOM ALL
OIL TANK - CLEANING/PAINTING	79-11-01		701	LOM ALL
Oil Tank Cleaning TASK 79-11-01-100-801-F00			701	LOM ALL
OIL TANK - REPAIRS	79-11-01		801	LOM ALL
Replacement of the Filler Cap Packing or Filler Cap TASK 79-11-01-300-801-F00			801	LOM ALL
Replacement of the Oil Cap Assembly Packings TASK 79-11-01-300-802-F00			804	LOM ALL
Replacement of the Plugs by the Remote Filling Kit TASK 79-11-01-300-803-F00			807	LOM ALL
Replacement of the Sight Glass TASK 79-11-01-800-801-F00			812	LOM ALL
OIL DISTRIBUTION - MAINTENANCE PRACTICES	79-21-00		201	LOM ALL
Calibration of the Air Flow Test Rig TASK 79-21-00-280-801-F00			201	LOM ALL
Air Flow Test of the Engine Oil Circuit TASK 79-21-00-700-801-F00			206	LOM ALL
LUBRICATION UNIT - REMOVAL/INSTALLATION	79-21-01		401	LOM ALL
Lubrication Unit Removal TASK 79-21-01-000-801-F00			401	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 79
OIL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Lubrication Unit Installation TASK 79-21-01-400-801-F00			413	LOM ALL
LUBRICATION UNIT - REPAIRS	79-21-01		801	LOM ALL
Packing Replacement On The Inner Sealing Spool (Lubrication Unit Installed) TASK 79-21-01-400-802-F00			801	LOM ALL
Packing Replacement On The Inner and Outer Sealing Spools (Lubrication Unit Removed) TASK 79-21-01-400-803-F00			807	LOM ALL
Packing Replacement On The Inner and Outer Sealing Spools (Lubrication Unit Installed) TASK 79-21-01-400-804-F00			815	LOM ALL
MAIN OIL/FUEL HEAT EXCHANGER - REMOVAL/INSTALLATION	79-21-02		401	LOM ALL
Main Oil/Fuel Heat Exchanger Removal TASK 79-21-02-000-801-F00			401	LOM ALL
Main Oil/Fuel Heat Exchanger Installation TASK 79-21-02-400-801-F00			409	LOM ALL
OIL SUPPLY FILTER - REMOVAL/INSTALLATION	79-21-03		401	LOM ALL
Oil Supply Filter Removal TASK 79-21-03-000-802-F00			401	LOM ALL
Oil Supply Filter Installation TASK 79-21-03-400-801-F00			404	LOM ALL
SCAVENGE OIL FILTER ASSEMBLY - REMOVAL/INSTALLATION	79-21-04		401	LOM ALL
Scavenge Oil Filter Assembly Removal TASK 79-21-04-000-801-F00			401	LOM ALL
Scavenge Oil Filter Assembly Installation TASK 79-21-04-400-801-F00			404	LOM ALL
CHIP DETECTOR REMOVAL/INSTALLATION	79-21-05		401	LOM ALL
Magnetic Chip Detector (MCD) Removal TASK 79-21-05-000-806-F00			401	LOM ALL; ENGINES WITH MAGNETIC CHIP DETECTOR
Magnetic Chip Detector (MCD) Installation TASK 79-21-05-400-804-F00			404	LOM ALL; ENGINES WITH MAGNETIC CHIP DETECTOR

79-CONTENTS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Debris Monitoring System (DMS) Detector Removal TASK 79-21-05-000-807-F00			406	LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM
Debris Monitoring System (DMS) Detector Installation TASK 79-21-05-400-805-F00			411	LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM
SCAVENGE OIL FILTER ELEMENT - REMOVAL/INSTALLATION	79-21-06		401	LOM ALL
Scavenge Oil Filter Element Removal TASK 79-21-06-000-801-F00			401	LOM ALL
Scavenge Oil Filter Element Installation TASK 79-21-06-400-801-F00			406	LOM ALL
SCAVENGE OIL FILTER CLOGGING TRANSMITTER - REMOVAL/INSTALLATION	79-21-07		401	LOM ALL
Scavenge Oil Filter Clogging Transmitter Removal TASK 79-21-07-000-801-F00			401	LOM ALL
Scavenge Oil Filter Clogging Transmitter Installation TASK 79-21-07-400-801-F00			404	LOM ALL
DEBRIS MONITORING SYSTEM (DMS) BOX - REMOVAL/INSTALLATION	79-21-08		401	LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM
Debris Monitoring System (DMS) Box Removal TASK 79-21-08-000-801-F00			401	LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM
Debris Monitoring System (DMS) Box Installation TASK 79-21-08-400-801-F00			405	LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM
OIL ANTI-LEAK VALVE - REMOVAL/INSTALLATION	79-21-09		401	LOM ALL
Oil Anti-Leak Valve Removal TASK 79-21-09-000-801-F00			401	LOM ALL
Oil Anti-Leak Valve Installation TASK 79-21-09-400-801-F00			406	LOM ALL
CLOGGING INDICATOR - REMOVAL/INSTALLATION	79-21-10		401	LOM ALL
Clogging Indicator Removal TASK 79-21-10-000-801-F00			401	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 79
OIL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Clogging Indicator Installation TASK 79-21-10-400-801-F00			404	LOM ALL
OIL QUANTITY INDICATING SYSTEM - ADJUSTMENT/TEST	79-31-00		501	LOM ALL
System Test - Oil Quantity Indicating System TASK 79-31-00-730-801-F00			501	LOM ALL
OIL QUANTITY TRANSMITTER - REMOVAL/INSTALLATION	79-31-01		401	LOM ALL
Oil Quantity Transmitter Removal TASK 79-31-01-000-801-F00			401	LOM ALL
Oil Quantity Transmitter Installation TASK 79-31-01-400-801-F00			404	LOM ALL
OIL PRESSURE SENSOR - REMOVAL/INSTALLATION	79-32-01		401	LOM ALL
Oil Pressure Sensor Removal TASK 79-32-01-000-801-F00			401	LOM ALL
Oil Pressure Sensor Installation TASK 79-32-01-400-801-F00			404	LOM ALL
OIL TEMPERATURE SENSOR - REMOVAL/INSTALLATION	79-34-02		401	LOM ALL
Oil Temperature Sensor Removal TASK 79-34-02-000-801-F00			401	LOM ALL
Oil Temperature Sensor Installation TASK 79-34-02-400-801-F00			405	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

OIL - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has these tasks:

(1) The inspection of the external oil system

(2) The inspection of the internal oil system

LOM ALL; ENGINES WITH MAGNETIC CHIP DETECTOR

(3) Chip Detector Inspection for Bearing and Gearbox Deterioration

LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM

(4) CDU Interrogation of the DMS Detectors

(5) Operational Check of the DMS

LOM ALL

(6) The inspection of the chip detectors and scavenge screens

(7) The inspection of the oil supply filter pop-out indicator.

TASK 79-00-00-200-802-F00

2. External Oil System Inspection

(Figure 601), (Figure 602), (Figure 603), (Figure 604)

A. General

(1) This task is a visual check of the engine and nacelle for evidence of oil leakage.

B. References

Reference	Title
71-00-02-000-801-F00	Power Plant - Removal (P/B 401)
71-00-02-400-801-F00	Power Plant - Installation (P/B 401)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-71-00-200-801-F00	Engine Vents and Drains Inspection (P/B 601)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Do a Check for the External Oil Leakage

SUBTASK 79-00-00-210-001-F00

(1) With the engine stopped, do a check of the bottom of the fan cowls for oil leakage at these locations (Figure 601):

(a) The starter air discharge duct.

(b) The forward drain holes.

(c) The aft drain holes.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-00-00-010-001-F00

(2) If you find oil leakage, do this task: Engine Vents and Drains Inspection, TASK 71-71-00-200-801-F00.

SUBTASK 79-00-00-210-005-F00

(3) Do a check of the inner side of the primary nozzle on the turbine frame struts and the stage 4 LPT blades for oil leakage (Figure 602).

(a) If they are wet with oil and the oil consumption is above serviceable limits, replace the engine.

These are the tasks:

- Power Plant - Removal, TASK 71-00-02-000-801-F00
- Power Plant - Installation, TASK 71-00-02-400-801-F00.

SUBTASK 79-00-00-210-006-F00

(4) Do a check of the fan blades and the stage 1 vanes at the 6:00 o'clock position for oil leakage (Figure 603).

(a) If they are wet with oil, replace the engine.

These are the tasks:

- Power Plant - Removal, TASK 71-00-02-000-801-F00
- Power Plant - Installation, TASK 71-00-02-400-801-F00.

SUBTASK 79-00-00-010-002-F00

(5) If the fan cowl panels are not open, do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-00-00-210-007-F00

(6) Do a check of these components to see if they are wet with oil:

(a) The fan cowl panels.

(b) The engine surfaces.

(c) The oil system components.

(d) The fan frame interface points with the transfer gearbox.

(e) If they are wet with oil, replace the applicable engine component.

SUBTASK 79-00-00-010-008-F00

WARNING	DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 79-00-00-210-008-F00

(8) Do a check of the oil scavenge and the oil supply tubes for damage or for loose connections (Figure 604):

NOTE: Look for oil stripes and drops of oil.

(a) Tubes and tube coupling nuts with cracks are not serviceable.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) There is no limit to the number of nicks, scratches, chafing or scores that are permitted if the depth is less than 0.01 inch (0.3 mm) (after you remove the high metal).

(c) Two dents for each tube is permitted if they have a smooth contour and the depth is less than 0.05 inch (1.30 mm).

(d) Replace or tighten the nuts and bolts which are loose or missing.

(e) Replace or repair the tube clamps which are loose or worn.

SUBTASK 79-00-00-410-009-F00

WARNING

OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G20697 S0006583569_V2

Fan Cowl Inspection
Figure 601/79-00-00-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G23978 S0006583570_V2

Primary Nozzle Assembly Inspection
Figure 602/79-00-00-990-802-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G23980 S0006583571_V2

Fan Blades and Stage 1 Vanes Inspection
Figure 603/79-00-00-990-803-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G23982 S0006583572_V2

Oil Supply and Oil Scavenge Tubes Inspection
Figure 604/79-00-00-990-804-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-00-00-200-803-F00

3. Internal Oil System Inspection

A. General

(1) This task is a borescope inspection of areas of the internal engine where oil leakage could occur. When you do the fault isolation for an oil consumption problem, an inspection for an internal oil leak could be necessary.

(2) This task includes a borescope inspection of the High Pressure Compressor (HPC) and an inspection of the scavenge screens and chip detectors.

B. References

Reference	Title
71-00-00-800-806-F00	Engine Operation Limits (P/B 201)
71-00-02-000-801-F00	Power Plant - Removal (P/B 401)
71-00-02-400-801-F00	Power Plant - Installation (P/B 401)
72-00-00-200-804-F00	HP Compressor Blades Borescope Inspection (P/B 601)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Procedure

SUBTASK 79-00-00-010-003-F00

WARNING

DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 79-00-00-290-001-F00

(2) To do a check of the stage 1 and 2 blades on the HPC, do this task: HP Compressor Blades Borescope Inspection, TASK 72-00-00-200-804-F00.

NOTE: Look for signs of oil on the blades.

(a) If the stage 1 and 2 blades on the HPC are wet with oil and the engine oil consumption is above serviceable limits specified in Engine Operation Limits, TASK 71-00-00-800-806-F00, replace the engine.

These are the tasks:

- Power Plant - Removal, TASK 71-00-02-000-801-F00
- Power Plant - Installation, TASK 71-00-02-400-801-F00.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-00-00-410-002-F00

WARNING OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 79-00-00-211-001-F00

(4) Do this task: Chip Detectors and Scavenge Screens - Inspection, TASK 79-00-00-200-804-F00.

END OF TASK

TASK 79-00-00-200-806-F01

4. Aft Sump Oil System Inspection

(Figure 605)

A. General

(1) This task is a visual check of the aft sump oil system for oil leakage.

B. References

Reference	Title
71-00-02-000-801-F00	Power Plant - Removal (P/B 401)
71-00-02-400-801-F00	Power Plant - Installation (P/B 401)
72-56-00-000-802-F00	Turbine Rear Frame (TRF) Oil Inlet Cover Removal (P/B 401)
72-56-00-300-801-F00	Oil Supply Tube Replacement (P/B 801)
72-56-00-400-801-F00	Turbine Rear Frame (TRF) Oil Inlet Cover Installation (P/B 401)
78-11-01-000-801-F00	Primary Nozzle Assembly Removal (P/B 401)
78-11-01-000-802-F00	Primary Nozzle Assembly Removal (P/B 401)
78-11-01-400-801-F00	Primary Nozzle Assembly Installation (P/B 401)
78-11-01-400-802-F00	Primary Nozzle Assembly Installation (P/B 401)
78-11-02-000-801-F00	Primary Plug Assembly Removal (P/B 401)
78-11-02-000-802-F00	Primary Plug Assembly Removal (P/B 401)
78-11-02-400-801-F00	Primary Plug Assembly Installation (P/B 401)
78-11-02-400-802-F00	Primary Plug Assembly Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-4968	Wrench - Nipple Line, No. 5 Bearing Support (Post CFMI SB 72-0169/SB 72-0254 and Pre CFMI SB 72-0676) Part #: 856A3492G04 Supplier: 58828
SPL-21063	Wrench - Nipple Line, No. 5 Bearing Support (Post CFMI SB 72-0676) Part #: 856A3492G06 Supplier: 58828

ECCN 9E991 BOEING PROPRIETARY - See title page for details

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Procedure

SUBTASK 79-00-00-210-015-F01

(1) With the engine stopped, do a visual check of the oil tubes at the Turbine Rear Frame (TRF) interface for oil leakage and coking.

NOTE: A continue-in-service limit of 50 cycles is permitted for oil coking or oil wetting on oil scavenge tube, only if you do a daily inspection to check that drain holes are not blocked.

SUBTASK 79-00-00-360-001-F01

(2) If there is oil leakage or large amount of coking at the TRF interface, do these steps:

(a) Do this task: Primary Nozzle Assembly Removal, TASK 78-11-01-000-802-F00 or Primary Nozzle Assembly Removal, TASK 78-11-01-000-801-F00.

(b) Do this task: Primary Plug Assembly Removal, TASK 78-11-02-000-802-F00 or Primary Plug Assembly Removal, TASK 78-11-02-000-801-F00.

(c) Remove the flame arrestor, refer to: TASK 72-56-00-000-802-F00.

(d) Remove the flange assembly, refer to: TASK 72-56-00-000-802-F00.

(e) Examine the oil supply coupling nuts for loose connections.

LOM ALL PRE SB 737-CFM56-7B-72-0676

NOTE: Do not touch, disconnect, or tighten the scavenge tube coupling nut to the TRF scavenge nipple unless you have the counter wrench, SPL-4968. Damage to the equipment can occur which can lead to oil loss.

LOM ALL POST SB 737-CFM56-7B-72-0676

NOTE: Do not touch, disconnect, or tighten the scavenge tube coupling nut to the TRF scavenge nipple unless you have the counter wrench, SPL-21063. Damage to the equipment can occur which can lead to oil loss.

LOM ALL

1) If necessary, tighten the loose coupling nuts.

(f) Examine the oil scavenge tube and connection for cracks.

1) If there is a crack on the scavenge tube or connection, replace the engine.

a) To replace the engine, do these tasks:

- Power Plant - Removal, TASK 71-00-02-000-801-F00.
- Power Plant - Installation, TASK 71-00-02-400-801-F00.

(g) Examine the oil supply tube assembly for cracks.

1) If there is a crack on the oil supply tube that goes through the No. 10 TRF strut, do this step:

LOM ALL PRE SB 737-CFM56-7B-72-0339

a) Do the CFM-SB 72-0339 to install a replaceable oil tube.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL POST SB 737-CFM56-7B-72-0339

b) Replace the oil supply tube, do this task: TASK 72-56-00-300-801-F00.

LOM ALL

(h) If there are no cracks on the oil supply tube or loose coupling nuts, replace the oil inlet cover o-ring and gasket.

1) To replace the o-ring and gasket, do these tasks:

- Turbine Rear Frame (TRF) Oil Inlet Cover Removal, TASK 72-56-00-000-802-F00.
- Turbine Rear Frame (TRF) Oil Inlet Cover Installation, TASK 72-56-00-400-801-F00.

(i) Install the flange assembly, refer to: TASK 72-56-00-400-801-F00.

(j) Install the flame arrestor, refer to: TASK 72-56-00-400-801-F00.

(k) Do this task: Primary Plug Assembly Installation, TASK 78-11-02-400-802-F00 or Primary Plug Assembly Installation, TASK 78-11-02-400-801-F00.

(l) Do this task: Primary Nozzle Assembly Installation, TASK 78-11-01-400-802-F00 or Primary Nozzle Assembly Installation, TASK 78-11-01-400-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(VIEW IN THE FORWARD DIRECTION)

W77311 S0000130171_V2

Aft Sump Oil System Inspection
Figure 605/79-00-00-990-808-F01 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

A

MATERIAL:
1: INCONEL 718 (NC19FeNB)
2: AISI 321 (Z10CNT18) 3:
AISI 321 (Z10CNT18)

W77313 S0000130172_V3

Aft Sump Oil System Inspection
Figure 605/79-00-00-990-808-F01 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM

TASK 79-00-00-710-801-F00

5. CDU Interrogation of the DMS Detectors

A. General

(1) This task is a FMCS CDU interrogation of the Debris Monitoring System (DMS) for debris on the detectors.

B. References

Reference	Title
73-21-00-740-803-F00	EEC BITE TEST - RECENT FAULTS (P/B 501)

C. CDU Interrogation of the DMS Detectors

SUBTASK 79-00-00-220-003-F00

(1) Do this task: EEC BITE TEST - RECENT FAULTS, TASK 73-21-00-740-803-F00.

(a) Look for one or more of these maintenance messages 79-11151, 79-11152, 79-21151, 79-21152, 79-31151 or 79-31152.

NOTE: This step will make sure that the DMS is serviceable.

1) If one or more of the maintenance messages show, then you must manually examine the DMS detectors, do this task: Chip Detectors and Scavenge Screens - Inspection, TASK 79-00-00-200-804-F00

2) If a maintenance message does not show, then continue with subsequent step.

(b) To find out if the DMS has found debris on the detectors, do this task, FIM 79-21 TASK 808, Initial Evaluation only.

——— END OF TASK ———

TASK 79-00-00-710-806-F00

6. DMS Operational Check

A. General

(1) This task is a functional check of the Debris Monitoring System (DMS).

B. References

Reference	Title
79-21-05-000-806-F00	Magnetic Chip Detector (MCD) Removal (P/B 401)
79-21-05-000-807-F00	Debris Monitoring System (DMS) Detector Removal (P/B 401)
79-21-05-400-805-F00	Debris Monitoring System (DMS) Detector Installation (P/B 401)
FIM 79-21 TASK 808	DMS Requires Inspection - Fault Isolation

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Access Panels

Number	Name/Location
413BL	Chip Detector/Pressure Relief Door, Engine 1
423BL	Chip Detector/Pressure Relief Door, Engine 2

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. DMS Operational Check

SUBTASK 79-00-00-740-001-F00

(1) Do a check of the DMS STATUS on the Flight Management Computer/Control Display Unit (FMCS CDU):

(a) Push the INIT REF key two times:

NOTE: This causes the PERF INIT INDEX to show

(b) Push the INDEX line select key (LSK).

(c) Push the MAINT (LSK).

(d) Push the ENGINE LSK.

(e) Push the line select key for the applicable engine (ENGINE 1 or ENGINE 2).

NOTE: This causes the ENGINE X BITE TEST MAIN MENU to show.

(f) Push the DMS STATUS LSK.

NOTE: This causes the ENGINE X BITE TEST DMS STATUS to show.

(g) If DEBRIS DETECTED: YES shows, this indicates debris detection is active, then continue (FIM 79-21 TASK 808).

(h) If DEBRIS DETECTED: NO shows, this indicates debris detection is not active, then continue.

SUBTASK 79-00-00-010-009-F00

(2) Open the applicable doors:

Number	Name/Location
413BL	Chip Detector/Pressure Relief Door, Engine 1
423BL	Chip Detector/Pressure Relief Door, Engine 2

SUBTASK 79-00-00-710-001-F00

(3) Do these steps for a test of the DMS line:

(a) Remove one DMS detector from the lubrication unit (TASK 79-21-05-000-806-F00 or TASK 79-21-05-000-807-F00).

(b) Put a clean metallic wire jumper or any metallic piece onto the DMS detector magnet to bridge the gap.

(c) Do a check of the DMS STATUS on the FMC-CDU. If DEBRIS DETECTED: YES shows, the line has passed the test.

1) Remove the wire jumper and clean the Detector magnet.

2) Install and lock the DMS detector back into the lubrication unit (TASK 79-21-05-400-805-F00).

(d) If DEBRIS DETECTED: NO shows, the DMS has failed the test.

NOTE: This is caused by an open circuit within the DMS Detector, the DMS Box or the J8 Harness.

1) Remove the wire jumper and clean the detector magnet.

2) Do this task: DMS Requires Inspection - Fault Isolation, FIM 79-21 TASK 808, to determine the cause and correct it.

SUBTASK 79-00-00-710-002-F00

(4) Do the DMS line test above again on the other two DMS detectors, one at a time.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM (Continued)

SUBTASK 79-00-00-410-010-F00

(5) Close the applicable doors:

Number	Name/Location
413BL	Chip Detector/Pressure Relief Door, Engine 1
423BL	Chip Detector/Pressure Relief Door, Engine 2

LOM ALL

——— END OF TASK ———

TASK 79-00-00-200-804-F00

7. Chip Detectors and Scavenge Screens - Inspection

(Figure 606, Figure 607, and Figure 608)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task provides the instructions on how to do the inspection of the chip detectors and scavenge screens.

(2) For identification of a bearing failure and other failures of the oil system components, examine the chip detectors and scavenge screens.

(3) Accumulation, of a specific volume, of particles over a series of regularly scheduled chip detector inspections is not used as a method to identify any specific engine failure. However, based on initial chip detector findings, reduced interval chip detector inspections may be necessary to determine the amount, type, and source of collected particles. Particle identification is based on visual or laboratory analysis. Corrective action is taken after you have identified the collected particles.

B. References

Reference	Title
12-13-11-100-801	Flush the Engine Oil System (P/B 301)
71-00-00-800-806-F00	Engine Operation Limits (P/B 201)
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (P/B 201)
71-00-02-000-801-F00	Power Plant - Removal (P/B 401)
71-00-02-400-801-F00	Power Plant - Installation (P/B 401)
72-00-00-980-801-F00	Turn the N2 Rotor (P/B 201)
72-23-08-000-801-F00	Oil Return Tube No. 7 Strut Removal (P/B 401)
72-23-08-400-801-F00	Oil Return Tube No. 7 Strut Installation (P/B 401)
72-55-00-200-801-F00	Low Pressure Turbine Shaft Assembly Inspection (P/B 601)
72-56-00-000-801-F00	Oil Supply Line Cleaning (P/B 701)
72-56-00-000-802-F00	Turbine Rear Frame (TRF) Oil Inlet Cover Removal (P/B 401)
72-56-00-100-802-F00	Oil Scavenge Line Cleaning (P/B 701)
72-56-00-200-801-F00	Turbine Frame Assembly Inspection (P/B 601)
72-56-00-300-801-F00	Oil Supply Tube Replacement (P/B 801)
72-60-00-000-802-F00	Sealol Seal - Removal (P/B 201)
72-60-00-400-802-F00	Sealol Seal - Installation (P/B 201)
72-62-00-000-801-F00	Transfer Gearbox Assembly Removal (P/B 401)
72-62-00-400-801-F00	Transfer Gearbox Assembly Installation (P/B 401)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

Reference	Title
72-63-00-000-804-F00	Accessory Gearbox Removal (P/B 401)
72-63-00-400-804-F00	Accessory Gearbox Installation (P/B 401)
73-21-08-000-801-F00	EEC Alternator and Alternator Rotor Removal (P/B 401)
73-21-08-400-801-F00	EEC Alternator and Alternator Rotor Installation (P/B 401)
79-21-01-000-801-F00	Lubrication Unit Removal (P/B 401)
79-21-01-400-801-F00	Lubrication Unit Installation (P/B 401)
79-21-01-400-802-F00	Packing Replacement On The Inner Sealing Spool (Lubrication Unit Installed) (P/B 801)
79-21-01-400-804-F00	Packing Replacement On The Inner and Outer Sealing Spools (Lubrication Unit Installed) (P/B 801)
79-21-04-000-801-F00	Scavenge Oil Filter Assembly Removal (P/B 401)
79-21-04-400-801-F00	Scavenge Oil Filter Assembly Installation (P/B 401)
79-21-05-000-806-F00	Magnetic Chip Detector (MCD) Removal (P/B 401)
79-21-05-000-807-F00	Debris Monitoring System (DMS) Detector Removal (P/B 401)
79-21-05-400-804-F00	Magnetic Chip Detector (MCD) Installation (P/B 401)
79-21-05-400-805-F00	Debris Monitoring System (DMS) Detector Installation (P/B 401)
79-21-06-000-801-F00	Scavenge Oil Filter Element Removal (P/B 401)
79-21-06-400-801-F00	Scavenge Oil Filter Element Installation (P/B 401)
80-11-01-200-801-F00	Starter Magnetic Plug Inspection (P/B 601)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2196	Set - Borescope Fiber, 6 mm diameter Part #: 856A1321P06 Supplier: 58828 Opt Part #: 856A1321P03 Supplier: 58828 Opt Part #: 856A1321P05 Supplier: 58828
SPL-2197	Light Source - Borescope, Lenox (150W) Part #: 856A1322P02 Supplier: 58828
SPL-2450	Set - Print, Identification, Magnetic Chip Detector Debris Part #: 856A2683G01 Supplier: 58828 Opt Part #: 856A1364G02 Supplier: 58828
STD-1070	Lens - Magnifying, 10X, Hand Held
STD-1280	Source - Air, Regulated, Dry Filtered, 0-30 PSIG
STD-1400	Fiberscope - Flexible Borescope
STD-10717	Light Source - Borescope, (Meets General Electric or CFM Standard Practices Manual Specification)

D. Consumable Materials

Reference	Description	Specification
B00676 [CP1041]	Alcohol - Isopropyl	
B00682 [CP2011]	Solvent - Stoddard	MIL-PRF-680 Type I, II or III
G01659	Swab - Cotton Or Rayon, (Disposable)	

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

Reference	Description	Specification
G51767	Cloth - 100% Synthetic or Blended Synthetic, Cotton or Cellulose Material	AMS3819 Class 1 or 2, Grade A or B, Form 1

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Chip Detectors and Scavenge Screens Inspection

SUBTASK 79-00-00-020-001-F00

> **CAUTION** REMOVE AND TAG ONE MAGNETIC CHIP DETECTOR AT A TIME. THIS CAN PREVENT AN ERROR IN IDENTIFICATION OF THE SOURCE OF THE MATERIAL ON THE MAGNETIC CHIP DETECTORS. IF YOU DO NOT OBEY, DAMAGE CAN OCCUR.

(1) Do this task: Magnetic Chip Detector (MCD) Removal, TASK 79-21-05-000-806-F00 or Debris Monitoring System (DMS) Detector Removal, TASK 79-21-05-000-807-F00.

LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM

NOTE: If the Debris Monitoring System (DMS) detector is removed for inspection only, it is not necessary to disconnect the DMS detector connector from the DMS box.

NOTE: Make sure that there is the DMS round-head plug (small round and flat piece on the plug handle). If there is a hole, replace DMS as quickly as possible.

LOM ALL

(a) Place without dripping, the chip detector or scavenge screen with particles in a new polyethylene bag.

(b) Attach a tag to identify each chip detector location.

1) The tag identifies the plug location for each sump scavenge circuit (Accessory Gear Box (AGB)/Transfer Gearbox (TGB) Scavenge, Front FWD Sump Scavenge, AFT Sump Scavenge).

SUBTASK 79-00-00-020-002-F00

> **CAUTION** REMOVE THE SCREEN FROM THE CHIP DETECTOR TO EXAMINE THE CHIP DETECTOR MAGNET FOR THE PRESENCE OF PARTICLES. IF YOU DO NOT REMOVE THE SCREEN FROM THE CHIP DETECTOR, IT IS POSSIBLE THAT YOU WILL NOT BE ABLE TO SEE THE PARTICLES THAT ARE CAUGHT BY THE CHIP DETECTOR MAGNET.

> **CAUTION** CFM DOES NOT RECOMMEND THE USE OF ADHESIVE TAPE. HOWEVER, IF A PIECE OF ADHESIVE TAPE IS USED TO COLLECT THE PARTICLES, MAKE SURE THE ADHESIVE IS NOT TOO STRONG. IF THE ADHESIVE ON THE TAPE IS TOO STRONG, THE PARTICLES MAY BE DAMAGED WHEN THEY ARE REMOVED AND/OR IT WILL AFFECT THE LABORATORY ANALYSIS OF THE MATERIAL.

(2) Do these steps to remove the scavenge screen from the chip detector and clean the scavenge screen (Figure 606):

(a) Make sure that you do not remove the particles from the chip detector magnet.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Make sure that you collect all the particles in the scavenge screen while you remove the scavenge screen from the chip detector.

(c) Place the chip detector on a clean surface, keep the plastic bag and identification tag.

(d) Push the spring-loaded pin that attaches the scavenge screen to the chip detector with a swab, G01659.

(e) Carefully remove the scavenge screen from the chip detector.

1) Examine the chip detector and scavenge screen for particles and debris.

a) If you find particles, carefully remove and keep the particles away from the scavenge screen.

> **CAUTION** DO NOT INSTALL THE CHIP DETECTOR WITHOUT THE PACKING. INSTALLATION OF THE CHIP DETECTOR WITHOUT THE PACKING CAN CAUSE OIL LEAKAGE DURING ENGINE OPERATION AND A POSSIBLE ENGINE FAILURE

b) If no particles were found during the inspection of the Magnetic Chip Detector (MCD) or the DMS, do this task: Magnetic Chip Detector (MCD) Installation, TASK 79-21-05-400-804-F00 or Debris Monitoring System (DMS) Detector Installation, TASK 79-21-05-400-805-F00.

> **WARNING** DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE IN THE FUMES FROM THE SOLVENT. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE THE SOLVENT. KEEP THE SOLVENT AWAY FROM SPARKS, FLAME, AND HEAT. THE SOLVENT IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(f) Clean the scavenge screen with solvent, B00682 [CP2011], or alcohol, B00676 [CP1041].

1) Dry the scavenge screen with a 0-30 psig dry filtered regulated air source, STD-1280.

2) Make sure that the scavenge screen is free of all particles prior to its installation.

SUBTASK 79-00-00-210-016-F00

(3) If you find particles or debris, continue with the inspection.

NOTE: No more action is necessary if the chip detector and scavenge screen are clean and free of debris.

SUBTASK 79-00-00-170-001-F00

> **CAUTION** REMOVE THE SCREEN FROM THE CHIP DETECTOR TO EXAMINE THE CHIP DETECTOR MAGNET FOR THE PRESENCE OF PARTICLES. IF YOU DO NOT REMOVE THE SCREEN FROM THE CHIP DETECTOR, IT IS POSSIBLE THAT YOU WILL NOT BE ABLE TO SEE THE PARTICLES THAT ARE CAUGHT BY THE CHIP DETECTOR MAGNET.

> **CAUTION** DO NOT USE A MAGNET TO REMOVE THE PARTICLES FROM THE MAGNETIC CHIP DETECTOR. IF YOU USE A MAGNET, IT CAN DECREASE THE MAGNETIC PERFORMANCE OF THE MAGNETIC CHIP DETECTOR. IF YOU DO NOT OBEY, DAMAGE CAN OCCUR.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(CAUTION PRECEDES)

> **CAUTION**
> CFM DOES NOT RECOMMEND THE USE OF ADHESIVE TAPE. HOWEVER, IF A PIECE OF ADHESIVE TAPE IS USED TO COLLECT THE PARTICLES, MAKE SURE THE ADHESIVE IS NOT TOO STRONG. IF THE ADHESIVE ON THE TAPE IS TOO STRONG, THE PARTICLES MAY BE DAMAGED WHEN THEY ARE REMOVED AND/OR IT WILL AFFECT THE LABORATORY ANALYSIS OF THE MATERIAL.

(4) Do these steps to remove the particles from the chip detector magnet and clean the chip detector (Figure 607):

(a) Carefully remove and keep the particles from the chip detector magnet with cloth, G51767, on a thin sheet of paper.

> **WARNING**
> DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE IN THE FUMES FROM THE SOLVENT. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE THE SOLVENT. KEEP THE SOLVENT AWAY FROM SPARKS, FLAME, AND HEAT. THE SOLVENT IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(b) After you remove all the particles, clean the chip detector magnet with solvent, B00682 [CP2011], or alcohol, B00676 [CP1041].

1) Dry the chip detector magnet with a 0-30 psig dry filtered regulated air source, STD-1280.

LOM ALL; ENGINES WITH MAGNETIC CHIP DETECTOR

2) Make sure that the chip detector is free of all particles.

LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM

3) Make sure that the chip detector is free of all particles.

NOTE: If all the particles are not removed from the DMS detector, the “DMS DETECTOR REQUIRES INSPECTION” maintenance message can show again after the subsequent flight.

LOM ALL

4) Do this task: Magnetic Chip Detector (MCD) Installation, TASK 79-21-05-400-804-F00 or Debris Monitoring System (DMS) Detector Installation, TASK 79-21-05-400-805-F00.

SUBTASK 79-00-00-160-002-F00

(5) Prepare all particles collected from the chip detector and scavenge screen to examine them.

> **WARNING**
> DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE IN THE FUMES FROM THE SOLVENT. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE THE SOLVENT. KEEP THE SOLVENT AWAY FROM SPARKS, FLAME, AND HEAT. THE SOLVENT IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Remove the oil from the particles that are not metallic with solvent, B00682 [CP2011], or alcohol, B00676 [CP1041].

(b) Use a magnet to isolate the metallic particles.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-00-00-212-001-F01

(6) Examine the particles from the chip detector and scavenge screen to identify the physical properties of the material (shape, size, quantity, magnetic properties, color) to be used in SUBTASK 79-00-00-240-001-F00.

NOTE: Accumulation, of a specific volume, of particles over a series of regularly scheduled chip detector inspections is not used as a method to identify any specific engine failure. However, based on initial chip detector findings, reduced interval chip detector inspections may be necessary to determine the amount, type and source of collected particles. Particle identification is based on visual or laboratory analysis. Corrective action is taken after you have identified the collected particles.

(a) Any quantity of material that is less than or equal to 0.004 in. (0.102 mm) in all dimension is satisfactory.

NOTE: Material that is greater than 0.004 in. (0.102 mm) in any dimension is not normal fuzz.

(b) Use a 10x hand held magnifying lens, STD-1070, and a magnetic bar to examine the magnetic particles from the chip detectors if more than 0.004 in. (0.102 mm) in any dimension.

1) Refer to CFM NDT manual Part 10 "CFMI-TP.NT.11" and/or set, SPL-2450, CD-ROM 856A2683G01 to identify possible source and/or refer to Figure 608 for examples of shapes that may be seen on a chip detector.

(c) Use a 10x hand held magnifying lens, STD-1070, to examine the non-magnetic particles from the chip detectors if more than 0.004 in. (0.102 mm) in any dimension.

1) Refer to CFM NDT manual Part 10 "CFMI-TP.NT.11" and/or set, SPL-2450, CD-ROM 856A2683G01 to identify possible source and/or refer to Figure 608 for examples of shapes that may be seen on a chip detector.

SUBTASK 79-00-00-240-001-F00

(7) If you have identified the collected particles, do these steps:

(a) If you find magnetic rectangular tang [approximate size 0.12 in. (3.05 mm) X 0.16 in. (4.06 mm) X 0.06 in. (1.52 mm)] from the AGB/TGB detector, it can be an AGB sealol seal anti-rotation tab, do these steps:

1) Continue the engine in service provided that the oil consumption is in the limit (TASK 71-00-00-800-806-F00).

2) If there is an AGB pad oil leakage, replace the affected sealol seal (TASK 72-60-00-000-802-F00 and TASK 72-60-00-400-802-F00).

(b) If you find magnetic material on the AGB/TGB scavenge screen or chip detector, examine the starter magnetic plug for contamination (TASK 80-11-01-200-801-F00).

1) If you find particles on the starter magnetic plug, examine the area behind the Quick Attach/Detach (QAD) adapter for debris.

a) Clean all debris.

2) If the starter magnetic plug has contamination or if there was a recent starter failure, do these steps:

a) Replace the scavenge oil filter element (TASK 79-21-06-000-801-F00 and TASK 79-21-06-400-801-F00).

b) Re-examine the AGB/TGB chip detector each 10 to 20 flight cycles until the chip detector is found to be clean.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

<1> Replace the scavenge oil filter element each time you find contamination on the AGB/TGB chip detector.

3) If you find that the material is not from the starter or from a recent starter removal, do these steps:

a) Do this task: EEC Alternator and Alternator Rotor Removal, TASK 73-21-08-000-801-F00.

b) Do a visual check of the Electronic Engine Control (EEC) alternator and rotor and look for debris and obvious damage.

c) If damage or debris is found, do these steps:

<1> Remove the debris from the alternator pad area and clean as necessary.

<2> Install a new EEC alternator and rotor (TASK 73-21-08-400-801-F00).

<3> Do this task: Flush the Engine Oil System, TASK 12-13-11-100-801.

<4> Re-examine the AGB/TGB chip detector every 10 to 20 flight cycles until it is found to be clean.

<a> Replace the scavenge oil filter element each time you find contamination.

d) If no damage or debris is found, do this task: EEC Alternator and Alternator Rotor Installation, TASK 73-21-08-400-801-F00.

e) If no damage or debris is found, and bearing material (M50 material from either the inner/outer race and/or rolling elements) has been identified on the AGB/TGB chip detector, do these steps:

NOTE: M50 material has the appearance as thin shiny bright laminated magnetic flakes.

<1> Replace the AGB (TASK 72-63-00-000-804-F00 and TASK 72-63-00-400-804-F00).

<2> Replace the TGB (TASK 72-62-00-000-801-F00 and TASK 72-62-00-400-801-F00).

(c) If you find non-magnetic flat piece with castellated portion in the AGB/TGB scavenge screen, it can be a key lock, AGB stud or insert, do this step:

1) Continue the engine in service provided there is no other metallic debris.

(d) If you find aluminum debris in the AGB/TGB sump scavenge screen, do these steps:

NOTE: Aluminum on the AGB/TGB scavenge screen can indicate either a failed alternator or AGB.

1) Do this task: EEC Alternator and Alternator Rotor Removal, TASK 73-21-08-000-801-F00.

2) Do a visual check of the EEC alternator and rotor and the AGB pad, look for debris and obvious damage.

a) If there was no damage in the AGB, but debris was found, remove the debris from the alternator pad area and clean as necessary.

b) Install a new EEC alternator and rotor (TASK 73-21-08-400-801-F00).

c) Do this task: Flush the Engine Oil System, TASK 12-13-11-100-801.

d) Re-examine the AGB/TGB chip detector and the scavenge oil filter element every 10 to 20 flight cycles until they are found to be clean.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

3) If the damage is in the AGB alternator pad, replace the AGB (TASK 72-63-00-000-804-F00 and TASK 72-63-00-400-804-F00).

4) If the checks of the EEC alternator, rotor, and AGB alternator pad are satisfactory, do these steps for suspect AGB deterioration:

a) Clean or replace the scavenge oil filter (TASK 79-21-04-000-801-F00 and TASK 79-21-04-400-801-F00).

b) In 25 flight cycles or less, do one of these steps:

<1> Replace the engine (TASK 71-00-02-000-801-F00 and TASK 71-00-02-400-801-F00), or

<2> Replace the AGB (TASK 72-63-00-000-804-F00 and TASK 72-63-00-400-804-F00).

(e) If you find only 16NCD13/AISI 9315 material in the AGB/TGB sump scavenge screen, do one of these steps:

NOTE: These debris/particle could be gearshaft material.

1) Replace the engine (TASK 71-00-02-000-801-F00 and TASK 71-00-02-400-801-F00).

2) Replace the AGB (TASK 72-63-00-000-804-F00 and TASK 72-63-00-400-804-F00).

(f) If you find coke particles in the AGB/TGB screen only, do these steps:

1) Do this task: EEC Alternator and Alternator Rotor Removal, TASK 73-21-08-000-801-F00.

2) Do a visual check of the EEC alternator and alternator rotor for coke particles.

a) If it is necessary, clean the coke particles.

3) Do this task: EEC Alternator and Alternator Rotor Installation, TASK 73-21-08-400-801-F00.

4) Replace the scavenge oil filter element (TASK 79-21-06-000-801-F00 and TASK 79-21-06-400-801-F00).

(g) If you find bearing material (material from either the inner/outer race and/or rolling elements) on the Aft sump or Fwd sump scavenge screen or chip detector, replace the engine (TASK 71-00-02-000-801-F00 and TASK 71-00-02-400-801-F00).

NOTE: Material from the inner/outer race and/or rolling elements has the appearance as thin shiny bright laminated magnetic flakes. Refer to CFM NDT manual Part 10 "CFMI-TP.NT.11" and/or set, SPL-2450, CD-ROM 856A2683G01 to identify possible source.

(h) If you find bearing cage material from any sump, E-40NCD7, decrease the chip detector inspection interval to 50-75 flight hours.

NOTE: E-40NCD7 should be found in conjunction with other bearing material to require engine removal.

(i) If you find Polytetraflouroethylene (Teflon) (PTFE) material in the forward sump scavenge screen, do these steps:

NOTE: Teflon material is an indication of a deterioration of the No. 3 bearing forward stationary air seal abradable material.

1) Continue in service for a maximum of 10 flight cycles.

2) In not more than 10 flight cycles, do these steps:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

a) Disconnect the forward sump oil scavenge tube from the lubrication unit (TASK 79-21-01-000-801-F00).

NOTE: The chip detector plugs must be installed when you remove the forward sump oil scavenge tube from the lubrication unit. Removal of the chip detector plugs can permit the spool valves to translate and prevent a correct visual inspection of debris on the forward sump scavenge port on the lubrication unit.

b) Do a visual inspection of the forward sump scavenge tube and the forward sump scavenge port on the lube unit.

<1> Do an inspection of the tube internally for clogs or contamination.

<2> If you find clogs or contamination inside the tube, remove the unwanted material.

<3> If the material cannot be removed, remove the forward sump oil scavenge tube (TASK 72-23-08-000-801-F00).

c) Use a fiberscope, STD-1400, and light source, STD-10717, or use a borescope, COM-2196, and light source, SPL-2197, to do a BSI (Borescope Inspection) of the forward sump oil scavenge tube.

<1> Make sure that it is free of any plastic, or organic material, or dis-bonded Teflon.

<a> If you find any contamination inside the tube, remove the unwanted material.

<b> If the material cannot be removed, remove the forward sump oil scavenge tube (TASK 72-23-08-000-801-F00).

d) If necessary, install the forward sump oil scavenge tube (TASK 72-23-08-400-801-F00).

e) Connect the forward sump oil scavenge tube on the lubrication unit (TASK 79-21-01-400-801-F00).

f) Do this task: Flush the Engine Oil System, TASK 12-13-11-100-801.

g) For engines listed in CFM56-7B Service Bulletin 72-1023, do these steps:

<1> Decrease the chip detector inspection interval to 250 flight hours.

<2> Return to usual inspection interval when the chip detector is found to be clean for five consecutive checks.

h) Continue the engine in service if the oil consumption is in the limit (TASK 71-00-00-800-806-F00).

(j) If you find plastic or organic (non-Teflon) material in the Fwd sump scavenge screen, do these steps:

NOTE: The plastic or organic material is an indication of a deterioration of the No. 3 bearing forward stationary air seal abradable material or separator ducts and can include one or more of these:

1) Glass fiber with polyamide material with grooves (reddish-brown color)

2) Phenolic or plastic material (greenish-white color)

3) Resin polyamide material (green or brown color).

1) Continue the engine in service if the oil consumption is in the limit (TASK 71-00-00-800-806-F00).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(k) If you find one or more 0.25 in. (6.4 mm) hexagonal nuts in the Fwd Sump, replace the engine (TASK 71-00-02-000-801-F00 and TASK 71-00-02-400-801-F00).

NOTE: This nut came from the Inlet Gearbox (IGB).

(l) If you find 17-4PH and/or AISI 4340 debris in the Fwd Sump scavenge screen or on the Fwd Sump magnetic chip detector, it can be an early sign of IGB distress.

1) Operate the engine at a minimum of 70 percent N1 for 10 minutes (TASK 71-00-00-800-807-F00).

2) Do a check of the Fwd Sump scavenge screen and Fwd Sump magnetic chip detector.

a) If you do not find 17-4PH or AISI 4340 debris, do these steps:

<1> Decrease the chip detector inspection interval to 50-75 flight hours.

<2> Return to usual inspection interval when the chip detector is found to be clean for three consecutive checks.

(m) If you find hastelloy X material that looks the same as honeycomb or AS7G06 material in the aft sump scavenge screen, it can be from the air/oil separator.

1) If the engine has operated within allowable operating limits (TASK 71-00-00-800-806-F00), a chip detectors and scavenge screens inspection was completed with no findings except the aft sump scavenge screen (TASK 79-00-00-200-804-F00), and a handcranking check (TASK 72-00-00-980-801-F00) was performed to ensure the engine rotates freely, replace the air/oil separator.

2) If the engine has not met the criteria defined in the above step, replace the engine (TASK 71-00-02-000-801-F00 and TASK 71-00-02-400-801-F00).

(n) If you find the following materials in the Aft Sump scavenge screen, it can be abradable material from the air/oil seals.

NOTE: There are alternatives of abradables used in the aft sump parts: silver base or composite base with an undercoat made of Ni.Al spray and a top coat made of Al.Si polyester.

1) Non-magnetic, gray and granular - top coat made of Al.Si polyester.

a) Continue the engine in service provided that the oil consumption is in the limit (TASK 71-00-00-800-806-F00).

2) Non-magnetic metallic debris or magnetic nickel particles.

a) Continue the engine in service provided that the oil consumption is in the limit, but decrease the chip detector inspection interval to 50-75 hours (TASK 71-00-00-800-806-F00).

<1> Return to usual inspection interval when the chip detector is found to be clean for three consecutive checks.

b) If you have repeated finding during check of the magnetic chip detector at 50-75 hours interval and if the engine is more than or equal to 15000 flight hours since new or since overhaul of the Center Vent Tube (CVT) line and oil inlet cover, remove the scavenge oil filter element and send it to laboratory for analysis (TASK 79-21-06-000-801-F00 and TASK 79-21-06-400-801-F00).

NOTE: Silver filaments are expected during engine break-in from initial penetration of the seal teeth into silver abradable.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

<1> If the Oil Filter analysis confirms more than 500 silver filaments or/and 500 nickel particles or/and 500 flakes of 17-4PH and/or 500 flakes of Z12CNDV12, do the following inspections for evidence of rear center vent tube orbiting:

<a> Remove the oil inlet cover of the turbine rear frame (TASK 72-56-00-000-802-F00).

<b> Examine the abradable coating of the inlet cover (TASK 72-56-00-200-801-F00).

<c> Examine the seal teeth of the center vent tube rear extension duct (TASK 72-55-00-200-801-F00).

<d> If the inspection is not satisfactory, this is an evidence of center vent tube orbiting.

NOTE: A service extension for 25 flight hours or 10 flight cycles (use the first limit to occur) is permitted before engine removal provided that the oil consumption is in the limit (TASK 71-00-00-800-806-F00).

<e> Remove engine for replacement of center vent tube in shop (TASK 71-00-02-000-801-F00 and TASK 71-00-02-400-801-F00).

<2> If the oil filter analysis does not confirm more than 500 particles of silver and nickel and 17-4PH and Z12CNDV12, continue the decreased chip detector inspection interval to 50-75 flight hours.

<a> Return to usual inspection interval when the chip detector is found to be clean for three consecutive checks.

(o) If you find organic material from packings (O-rings), that has black broken pieces from any sump, do these steps:

1) Make sure that the oil pressure and the oil consumption are in the limits (TASK 71-00-00-800-806-F00).

2) Examine the scavenge oil filter element for similar packing material (TASK 79-21-06-000-801-F00).

CAUTION

THE OUTER SPOOL VALVE O-RING WILL BE CAPTURED IN THE SCAVENGE FILTER. THE INNER SPOOL VALVE O-RING WILL BE CAPTURED IN THE CHIP DETECTOR SCAVENGE SCREEN. IF EITHER OF THE ABOVE O-RINGS ARE MISSING OR DAMAGED, THE ENGINE OIL CAN LEAK OUT IF THE CHIP DETECTOR IS NOT INSTALLED CORRECTLY.

3) If black packing debris is found in the scavenge screen, it is probably from the inner and/or outer sealing spool valve on the lubrication unit, do these steps:

a) Replace the packing for the inner and/or outer spool of the lubrication unit (TASK 79-21-01-400-802-F00 or TASK 79-21-01-400-804-F00).

b) If you do not replace these packings, a Continue-In-Service (CIS) limit of 250 flight cycles is permitted with these conditions:

<1> All chip detectors are examined for correct installation (locked) by two different persons prior to the closing of the fan cowls (TASK 79-21-05-400-804-F00 or TASK 79-21-05-400-805-F00).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

<2> Do the chip detector installation check (by two persons) again each time the chip detectors are removed and installed.

(p) If you find granular carbon material in the Aft Sump scavenge screen, it can be from a cracked scavenge line in the Turbine Rear Frame (TRF) or coke buildup in the aft sump oil system, do these steps:

1) Do this task: Aft Sump Oil System Inspection, TASK 79-00-00-200-806-F01.

2) If the engine oil pressure trend does not show a gradual increase but a shift, do these tasks at the next convenient opportunity in less than 10 cycles.

a) Do this task: Oil Scavenge Line Cleaning, TASK 72-56-00-100-802-F00.

b) Do this task: Oil Supply Line Cleaning, TASK 72-56-00-000-801-F00 or Oil Supply Tube Replacement, TASK 72-56-00-300-801-F00.

3) If the engine oil pressure trend shows a gradual increase, do these tasks in less than 25 flight cycles.

a) Do this task: Oil Scavenge Line Cleaning, TASK 72-56-00-100-802-F00.

b) Do this task: Oil Supply Line Cleaning, TASK 72-56-00-000-801-F00 or Oil Supply Tube Replacement, TASK 72-56-00-300-801-F00.

4) Replace the scavenge oil filter element (TASK 79-21-06-000-801-F00 and TASK 79-21-06-400-801-F00).

5) Monitor the engine oil pressure during the next 20 to 50 flight hours of operation.

(q) If you find the materials that follow from any sump, continue the engine in service.

1) Machining chips that are shiny curls of metal or that have parallel marks from machine tools when you see them with a 10x hand held magnifying lens, STD-1070.

2) Rub strips from the labyrinth seal that are made of stainless steel that look like silver shavings.

(r) If you find pure silver flakes from any sump, not related with bearing material, continue the engine operation but decrease the chip detector inspection interval to 50-75 flight hours.

1) Return to usual inspection interval when the chip detector is found to be clean for three consecutive checks.

(s) If you find tang from retaining ring of retainer nut of No. 4 roller bearing outer race in the aft sump scavenge screen, wire shape (approximately 0.08 in. (2.03 mm) in diameter and 0.24 in. (6.10 mm) in length) and if material is AMS6450 or AISI6150 steel type, black-oxide coated (Refer to CFM NDT manual Part 10 "CFMI-TP.NT.11" for illustration), do this step:

1) Replace the engine within 50 flight cycles or 100 flight hours (whichever comes first).

(t) If the material was not identified in one of the above categories, continue the engine operation but decrease the chip detector inspection interval to 50-75 flight hours.

1) Return to usual inspection interval when the chip detector is found to be clean for three consecutive checks.

SUBTASK 79-00-00-210-009-F00

(8) If you find magnetic particles that you cannot identify, do these steps:

(a) SATISFACTORY CONDITION - If you find less than four particles with the condition below, continue the engine in service.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) The largest particle is more than 0.004 in. (0.102 mm) and less than 0.01 in. (0.25 mm) in any dimension.

(b) MARGINAL CONDITION - Do these steps for the limits, that are given below (Table 601):

Table 601/79-00-00-993-809-F00

PARTICLES FOUND	LARGEST PARTICLE DIMENSION
4 or more	More than 0.004 in. (0.102 mm) and less than 0.01 in. (0.25 mm)
Less than 4	More than or equal to 0.01 in. (0.25 mm), But less than 0.02 in. (0.51 mm)

1) Send the particles to the laboratory for analysis.

2) Do the inspection of the chip detectors for particles after each flight until you get the analysis from the laboratory.

3) If you find magnetic particles during the post-flight inspections that you cannot identify, limit the engine operation to 5 flight cycles or 25 flight hours whichever comes first.

4) After you get the analysis from the laboratory, then do the applicable corrective action for the type of material that you found as defined in SUBTASK 79-00-00-240-001-F00.

NOTE: For more information on particle analysis, refer to the CFMI Non-Destructive Test Manual, Part 9 and Part 10 or CD-ROM 856A2683G01.

(c) UNSATISFACTORY CONDITION - Do these steps for the limits, that are given below (Table 602):

Table 602/79-00-00-993-810-F00

PARTICLES FOUND	LARGEST PARTICLE DIMENSION
Any amount	More than or equal to 0.02 in. (0.51 mm)
4 or more	More than or equal to 0.01 in. (0.25 mm), But less than 0.02 in. (0.51 mm)

1) Send the particles to the laboratory for analysis.

CAUTION DO NOT INSTALL THE CHIP DETECTOR WITHOUT THE PACKING. INSTALLATION OF THE CHIP DETECTOR WITHOUT THE PACKING CAN CAUSE OIL LEAKAGE DURING ENGINE OPERATION AND A POSSIBLE ENGINE FAILURE

2) Do this task: Magnetic Chip Detector (MCD) Installation, TASK 79-21-05-400-804-F00 or Debris Monitoring System (DMS) Detector Installation, TASK 79-21-05-400-805-F00.

3) Operate the engine at a minimum of 70 percent N1 for 10 minutes (TASK 71-00-00-800-807-F00).

4) Do a check of the chip detectors where magnetic particles were identified.

a) If you do not find magnetic particles, do these steps:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

<1> If you cannot get the analysis from the laboratory, do a check of the chip detectors after each flight until you get the analysis from the laboratory.

<2> If you find magnetic particles larger than 0.004 in. (0.102 mm) in any dimension during any chip detector inspection, do not operate the engine until the first sample of magnetic particles has been identified.

b) If you find magnetic particles larger than 0.004 in. (0.102 mm) in any dimension during any chip detector inspection, do not operate the engine until the first sample of magnetic particles has been identified.

5) After you get the analysis from the laboratory, then do the applicable corrective action for the type of material that you found as defined in SUBTASK 79-00-00-240-001-F00.

NOTE: For more information on particle analysis, refer to the CFMI Non-Destructive Test Manual, Part 9 and Part 10, or set, SPL-2450, CD-ROM 856A2683G01.

SUBTASK 79-00-00-210-010-F00

(9) If you find non-magnetic particles that you cannot identify in the Fwd or Aft Sump scavenge screen or in the AGB/TGB scavenge screen which are not aluminum-like, do these steps:

(a) SATISFACTORY CONDITION - If you find less than four particles with the condition below, continue the engine in service.

1) The largest particle is less than 0.4 in. (10.2 mm) in all dimensions.

(b) UNSATISFACTORY CONDITION - Do these steps for the limits, that are given below (Table 603):

Table 603/79-00-00-993-811-F00

PARTICLES FOUND	LARGEST PARTICLE DIMENSION
Any amount	More than or equal to 0.4 in. (10.2 mm)
4 or more	Less than 0.4 in. (10.2 mm)

1) Send the particles to the laboratory for analysis.

CAUTION DO NOT INSTALL THE CHIP DETECTOR WITHOUT THE PACKING. INSTALLATION OF THE CHIP DETECTOR WITHOUT THE PACKING CAN CAUSE OIL LEAKAGE DURING ENGINE OPERATION AND A POSSIBLE ENGINE FAILURE

2) Do this task: Magnetic Chip Detector (MCD) Installation, TASK 79-21-05-400-804-F00 or Debris Monitoring System (DMS) Detector Installation, TASK 79-21-05-400-805-F00.

3) Operate the engine at a minimum of 70 percent N1 for 10 minutes (TASK 71-00-00-800-807-F00).

4) Do a check of the scavenge screens where the particles were found.

a) If you do not find particles, continue the engine in operation until you get the analysis from the laboratory.

b) If you find particles which are less than 0.2 in. (5.1 mm), do these steps:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

<1> Do a check of the scavenge screens after each flight until you get the analysis from the laboratory.

<2> If you find non-magnetic particles which are more than 0.4 in. (10.2 mm) during post-flight chip detector inspections, limit the engine operation to 10 flight cycles.

c) If you find non-magnetic particles which are more than 0.2 in. (5.1 mm), limit the engine operation to 10 flight cycles.

<1> Do a post-flight check of the chip detector and scavenge screens until you get the analysis from the laboratory.

5) After you get the analysis from the laboratory, then do the applicable corrective action for the type of material that you found as defined in SUBTASK 79-00-00-240-001-F00.

NOTE: For more information on particle analysis, refer to the CFM International (CFMI) Nondestructive Test (NDT) Manual, Part 9 and Part 10, or set, SPL-2450, CD-ROM 856A2683G01.

SUBTASK 79-00-00-420-001-F00

CAUTION

DO NOT INSTALL THE CHIP DETECTOR WITHOUT THE PACKING. INSTALLATION OF THE CHIP DETECTOR WITHOUT THE PACKING CAN CAUSE OIL LEAKAGE DURING ENGINE OPERATION AND A POSSIBLE ENGINE FAILURE

(10) If not already done, do this task: Magnetic Chip Detector (MCD) Installation, TASK 79-21-05-400-804-F00 or Debris Monitoring System (DMS) Detector Installation, TASK 79-21-05-400-805-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Scavenge Screen Inspection
Figure 606/79-00-00-990-805-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Scavenge Screen Inspection
Figure 606/79-00-00-990-805-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

NOTE: DO NOT INSPECT WITH SCREEN INSTALLED.

A

NOTE: REMOVE SCREEN TO CLOSELY INSPECT DETECTOR
CLEANING REQUIRED AFTER INSPECTION.

MM-00051-00-B

G22048 S0006583585_V2

Chip Detector Inspection
Figure 607/79-00-00-990-806-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

NOTE: DO NOT INSPECT WITH SCREEN INSTALLED.

A

NOTE: REMOVE SCREEN TO CLOSELY INSPECT DETECTOR.

B

NOTE: CLEANING REQUIRED AFTER INSPECTION.

MM-00051-00-B

G88417 S0006583588_V3

Chip Detector Inspection
Figure 607/79-00-00-990-806-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MAGNETIC CHIP DETECTOR

D66520 S0000161926_V2

Chip Detector Particles
Figure 608/79-00-00-990-809-F00 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

DMS CHIP DETECTOR

D63147 S0000161928_V2

Chip Detector Particles
Figure 608/79-00-00-990-809-F00 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLAKE

A

SLIVER

A

CHUNK

A

MACHINING CHIPS

A

HEXAGONAL NUT 1/4 in.

A

D63060 S0000161929_V2

Chip Detector Particles
Figure 608/79-00-00-990-809-F00 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-00-00-200-805-F00

8. **Oil Supply Filter Pop-Out Indicator Inspection (Visual Check)**
(Figure 609)

A. **General**

(1) This procedure is a visual check of the oil supply filter pop-out indicator (referred to as the pop-out indicator).

B. **References**

Reference	Title
12-13-11-100-801	Flush the Engine Oil System (P/B 301)
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
12-13-11-600-803	Drain the Engine Oil (P/B 301)
79-21-03-000-802-F00	Oil Supply Filter Removal (P/B 401)
79-21-03-400-801-F00	Oil Supply Filter Installation (P/B 401)
FIM 79-05 TASK 817	OIL FILTER BYPASS Message Shows on the Engine Display - Fault Isolation

C. **Location Zones**

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. **Access Panels**

Number	Name/Location
413BL	Chip Detector/Pressure Relief Door, Engine 1
423BL	Chip Detector/Pressure Relief Door, Engine 2

E. **Pop-Out Indicator Visual Check**

SUBTASK 79-00-00-010-006-F00

(1) Open the applicable access doors on the left fan cowl panel.

Number	Name/Location
413BL	Chip Detector/Pressure Relief Door, Engine 1
423BL	Chip Detector/Pressure Relief Door, Engine 2

SUBTASK 79-00-00-210-011-F00

(2) Do a visual check of the pop-out indicator.

(a) If you see that the pop-out indicator is not extended, no additional work is necessary.

1) Close the applicable access doors on the left fan cowl panel.

Number	Name/Location
413BL	Chip Detector/Pressure Relief Door, Engine 1
423BL	Chip Detector/Pressure Relief Door, Engine 2

(b) If you see that the pop-out indicator is extended, continue.

SUBTASK 79-00-00-810-003-F00

(3) Do these steps if you can see the pop-out indicator:

(a) If the OIL FILTER BYP warning light was illuminated on the last flight, do this task: OIL FILTER BYPASS Message Shows on the Engine Display - Fault Isolation, FIM 79-05 TASK 817.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) If the OIL FILTER BYP warning light was not illuminated on the last flight, then do these steps:

1) Examine the oil supply filter. Do this task: Oil Supply Filter Removal, TASK 79-21-03-000-802-F00.

2) If the filter has obvious contamination, do this task: Drain the Engine Oil, TASK 12-13-11-600-803.

NOTE: Do this for the oil tank only.

3) Install a new oil supply filter. Do this task: Oil Supply Filter Installation, TASK 79-21-03-400-801-F00.

a) For the filter installation, make sure to reset the pop-out indicator.

4) Do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

(c) Identify the type and source of material on the oil supply filter.

1) If it has contamination, then do these steps:

a) Send the oil filter to the laboratory for analysis of the contamination.

b) Correct the cause of the contamination.

c) Do this task: Flush the Engine Oil System, TASK 12-13-11-100-801.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 79-00-00-410-006-F00

(1) Close the applicable access doors on the left fan cowl panel.

Number	Name/Location
413BL	Chip Detector/Pressure Relief Door, Engine 1
423BL	Chip Detector/Pressure Relief Door, Engine 2

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Supply Filter Pop-Out Indicator Inspection
Figure 609/79-00-00-990-807-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Supply Filter Pop-Out Indicator Inspection
Figure 609/79-00-00-990-807-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1. General

A. This procedure has the maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Procedures Guide (DDPG). These tasks prepare the airplane for flight with systems/components that are inoperative.

B. This procedure also has the tasks that put the airplane back to its usual condition.

C. These are the tasks for the components in the oil system:

(1) MMEL 79-1 (DDPG) Preparation - Oil Quantity Indication Inoperative.

(2) MMEL 79-1 (DDPG) Restoration - Oil Quantity Indication Inoperative.

(3) MMEL 79-2-1 (DDPG) Preparation - Oil Filter Bypass Warning Systems Inoperative.

(4) MMEL 79-2–1 (DDPG) Restoration - Oil Filter Bypass Warning Systems Inoperative.

(5) MMEL 79-2-2 (DDPG) Preparation - Oil Filter Bypass Warning Systems Inoperative.

(6) MMEL 79-2–2 (DDPG) Restoration - Oil Filter Bypass Warning Systems Inoperative.

TASK 79-00-00-040-801-F00

2. MMEL 79-1 (DDPG) Preparation - Oil Quantity Indication Inoperative

A. General

(1) This task gives the maintenance steps which prepare the airplane for flight with the Oil Quantity Indication Inoperative.

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
71-00-00-800-806-F00	Engine Operation Limits (P/B 201)

C. Procedure

SUBTASK 79-00-00-220-001-F00

(1) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

SUBTASK 79-00-00-210-012-F00

(2) Make sure that the oil consumption is in the limits Engine Operation Limits, TASK 71-00-00-800-806-F00.

SUBTASK 79-00-00-210-013-F00

(3) Do a check of the airplane flight log and maintenance records to make sure that the oil consumption is within limits.

——— END OF TASK ———

TASK 79-00-00-440-801-F00

3. MMEL 79-1 (DDPG) Restoration - Oil Quantity Indication Inoperative

A. General

(1) This task puts the airplane back to its usual condition after operation with the Oil Quantity Indication Inoperative.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

B. Procedure

SUBTASK 79-00-00-810-001-F00

(1) Do the applicable fault isolation task in the Fault Isolation Manual (FIM) to correct the problem.

——— END OF TASK ———

TASK 79-00-00-040-802-F00

4. MMEL 79-2–1 (DDPG) Preparation - Oil Filter Bypass Warning Systems Inoperative

A. General

(1) This task gives the maintenance steps which prepare the airplane for flight with the Oil Filter Bypass Warning Systems Inoperative.

B. References

Reference	Title
79-21-06-000-801-F00	Scavenge Oil Filter Element Removal (P/B 401)

C. Procedure

SUBTASK 79-00-00-020-004-F00

(1) Do this task: Scavenge Oil Filter Element Removal, TASK 79-21-06-000-801-F00.

SUBTASK 79-00-00-210-014-F00

(2) Do a visual inspection of the scavenge oil filter element for debris or contamination once each flight day.

(a) If the filter element is not contaminated, the malfunction is in the bypass warning system.

——— END OF TASK ———

TASK 79-00-00-440-802-F00

5. MMEL 79-2–1 (DDPG) Restoration - Oil Filter Bypass Warning Systems Inoperative

A. General

(1) This task puts the airplane back to its usual condition after operation with the Oil Filter Bypass Warning Systems Inoperative.

B. Procedure

SUBTASK 79-00-00-810-002-F00

(1) Do the applicable fault isolation task in the Fault Isolation Manual (FIM) to correct the problem.

——— END OF TASK ———

TASK 79-00-00-040-803-F00

6. MMEL 79-2-2 (DDPG) Preparation - Oil Filter Bypass Warning Systems Inoperative

A. General

(1) This task gives the maintenance steps which prepare the airplane for flight with the Oil Filter Bypass Warning Systems Inoperative.

B. References

Reference	Title
73-21-00 P/B 501	FUEL CONTROL SYSTEM - ADJUSTMENT/TEST
79-00-00-200-804-F00	Chip Detectors and Scavenge Screens - Inspection (P/B 601)
79-00-00-200-805-F00	Oil Supply Filter Pop-Out Indicator Inspection (Visual Check) (P/B 601)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

C. Procedure

SUBTASK 79-00-00-810-006-F00

(1) Do these steps to verify the malfunction is in the bypass warning system:

(a) Verify presence of fault code 79-n112X on the FMC CDU(FUEL CONTROL SYSTEM - ADJUSTMENT/TEST, PAGEBLOCK 73-21-00/501).

(b) If fault code 79-n112x is not present, access the CDU INPUT MONITORING / OIL FILTER Screen on the FMC CDU and verify FILTER BYPASS state is "CLOGGED", which corresponds to the following FILTER INPUTS displayed on the FMC CDU:

1) Switch 1 (Channels A and B) are OPEN

2) Switch 2 (Channels A and B) are CLOSED.

SUBTASK 79-00-00-200-003-F00

(2) Inspect all three Magnetic Chip Detectors for contaminants once each flight day (Chip Detectors and Scavenge Screens - Inspection, TASK 79-00-00-200-804-F00).

SUBTASK 79-00-00-210-018-F00

(3) Verify the oil supply filter pop-out indicator is not extended once each flight day (Oil Supply Filter Pop-Out Indicator Inspection (Visual Check), TASK 79-00-00-200-805-F00).

SUBTASK 79-00-00-200-004-F00

(4) If Magnetic Chip Detectors inspection reveals no contaminants and oil supply filter pop-out indicator is not extended, then the malfunction is in the warning system.

END OF TASK

TASK 79-00-00-440-803-F00

7. MMEL 79-2–2 (DDPG) Restoration - Oil Filter Bypass Warning Systems Inoperative

A. General

(1) This task puts the airplane back to its usual condition after operation with the Oil Filter Bypass Warning Systems Inoperative.

B. Procedure

SUBTASK 79-00-00-810-007-F00

(1) Do the applicable fault isolation task in the Fault Isolation Manual (FIM) to correct the problem.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

OIL TANK - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the oil tank.

(2) The installation of the oil tank.

TASK 79-11-01-000-801-F00

2. Oil Tank Removal

(Figure 401)

A. General

(1) This task is the removal procedure for the oil tank.

(2) The oil tank is installed on the right side of the fan case on three brackets at the B4, B5, B6 and B7 flanges.

(3) This procedure refers to the oil quantity transmitter as the transmitter.

B. References

Reference	Title
12-13-11-600-803	Drain the Engine Oil (P/B 301)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
79-31-01-000-801-F00	Oil Quantity Transmitter Removal (P/B 401)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 79-11-01-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	10	C01361	DISPLAY DEU 1 HOLDUP

SUBTASK 79-11-01-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	9	C01362	DISPLAY DEU 2 HOLDUP

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	11	C01360	DISPLAY DEU 2 PRI

SUBTASK 79-11-01-010-005-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

E. Oil Tank Removal

SUBTASK 79-11-01-610-009-F00

(1) If the new oil tank does not come with a new oil quantity transmitter, do this step:

(a) Do this task: Oil Quantity Transmitter Removal, TASK 79-31-01-000-801-F00.

SUBTASK 79-11-01-020-008-F00

(2) If the new oil tank does come with a new oil quantity transmitter, do this step:

(a) Disconnect the electrical connector, DP1301 [25] from the transmitter receptacle.

SUBTASK 79-11-01-610-001-F00

(3) Do this task: Drain the Engine Oil, TASK 12-13-11-600-803.

SUBTASK 79-11-01-020-002-F00

(4) Remove the vent [9], oil-in [11] and oil-out [7] hoses from the oil tank [5] (Figure 401):

(a) Remove the four bolts [4] from vent hose [9].

(b) Disconnect the vent hose [9].

(c) Remove and examine the gasket [3] Seals (Preformed Packings and O-Rings) and Gaskets, TASK 70-30-01-910-802-F00.

NOTE: Use the gasket if it is in good condition.

1) Discard the gasket [3], if it is in unsatisfactory condition.

(d) Remove the four bolts [10] from oil-in hose [11].

(e) Disconnect the oil-in hose [11].

(f) Remove and examine the gasket [12].

NOTE: Use the gasket if it is in good condition.

1) Discard the gasket [12], if it is in unsatisfactory condition.

(g) Loosen the oil-in coupling nut to the oil-in hose [11].

(h) Turn the oil-in hose [11] counterclockwise.

(i) Remove the four bolts [6] from the oil-out hose [7].

(j) Disconnect the oil-out hose [7].

(k) Remove and examine the gasket [8].

NOTE: Use the gasket if it is in good condition.

1) Discard the gasket [8], if it is in unsatisfactory condition.

SUBTASK 79-11-01-020-003-F00

(5) Remove the drain hose [2] from the oil tank [5] (Figure 401):

ECCN 9E991 BOEING PROPRIETARY - See title page for details

> **CAUTION** USE TWO WRENCHES TO LOOSEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(a) Disconnect the drain hose [2] from the oil scupper nipple [1].

(b) Install protective caps in the open ends of the hoses, the tubes and the oil tank General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

SUBTASK 79-11-01-020-004-F00

(6) Disconnect the bonding strip [15] from the fan frame on flange B6 (Figure 401) (View B):

(a) Remove the nut [17], spacer [16], washer [14] and bolt [13] to remove the bonding strip [15].

NOTE: The bonding strip stays with the oil tank.

SUBTASK 79-11-01-020-005-F00

(7) Disconnect the forward and the aft bottom mounts from the brackets on flanges B4, B5 and B7 (Figure 401) (Views D and E):

(a) Remove the two shoulder-headed pins [24].

SUBTASK 79-11-01-020-006-F00

(8) Disconnect the top mount from the bracket on flange B6 (Figure 401) (View C):

NOTE: The oil tank weighs 24 pounds (11 Kg) empty.

(a) Remove and discard the cotter pin [18].

(b) Remove the castellated nut [21] and the washer [22].

> **CAUTION** HOLD THE OIL TANK DURING THE REMOVAL OF THE SHOULDER-HEADED PIN. THIS WILL PREVENT DAMAGE TO THE OIL TANK.

(c) Remove the shoulder-headed pin [20] from the top mount.

(d) Disengage the oil tank [5] from the forward and the aft bottom mounts.

(e) Disengage the oil tank [5] from the top mount and remove the oil tank [5].

(f) Remove the four dampers [23] from the bottom mounts and brackets on flanges B4, B5 and B7.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Tank Installation
Figure 401/79-11-01-990-801-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Tank Installation
Figure 401/79-11-01-990-801-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-11-01-400-801-F00

3. Oil Tank Installation

(Figure 401)

A. General

(1) This task is the installation procedure for the oil tank.

(2) This procedure refers to the oil quantity transmitter.

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
79-31-01-400-801-F00	Oil Quantity Transmitter Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
A50447	Compound - Jointing [CP2773], Corrosion Inhibiting, Chromate Free, Mastinox CA1010	
B00676 [CP1041]	Alcohol - Isopropyl	
D00599 [CP2442]	Oil - Engine	
D00601 [CP2101]	Vaseline - Graphite Mineral	
D00625 [CP2338]	Grease - Conductive - Brisal-OX 50-855	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Gasket	79-21-00-03-025	LOM ALL
5	Tank	79-11-01-01-085	LOM ALL
8	Gasket	79-21-00-03-030	LOM ALL
12	Gasket	79-21-00-03-025	LOM ALL
15	Strip	79-11-01-01-027	LOM ALL
18	Pin	79-11-01-01-040	LOM ALL

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Oil Tank Installation

SUBTASK 79-11-01-210-001-F00

(1) Do these steps to prepare for the installation of the oil tank [5] (TASK 70-10-02-910-801-F00):

(a) Make sure that the mating interfaces of the three square hose flanges and the oil-out, oil-in and vent bosses are clean and in a good condition.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-11-01-420-001-F00

(2) Attach the top mount to the top bracket on flange B6:

(a) Lubricate the threads and the shank of the shoulder-headed pin [20] with graphite mineral vaseline, D00601 [CP2101].

(b) Loosen the nut [19].

(c) Put the top mount of the oil tank [5] in its position on flange B6.

(d) Install the shoulder-headed pin [20], the washer [22], and the castellated nut [21].

NOTE: Install the shoulder-headed pin with the head in the forward position.

1) Tighten the castellated nut [21] with your fingers.

SUBTASK 79-11-01-420-002-F00

(3) Attach the forward and aft bottom mounts to the brackets on flanges B4, B5 and B7:

(a) Lubricate the threads and the shank of the two shoulder-headed pins [24] and mating faces of the two dampers [23] with graphite mineral vaseline, D00601 [CP2101].

(b) Install the dampers [23] to the brackets on flanges B4, B5 and B7.

(c) Put the forward and aft bottom mounts on the four dampers [23].

(d) Install the two shoulder-headed pins [24] to attach the oil tank [5].

1) Torque the shoulder-headed pins [24] and the nut [19] at the same time, to 314 in-lb (35 N·m) - 346 in-lb (39 N·m).

2) Torque the castellated nut [21] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).

(e) Install a new cotter pin [18] in the castellated nut [21].

NOTE: If it is necessary, loosen the castellated nut to be clear of the first slot to aid with the installation of the cotter pin.

SUBTASK 79-11-01-420-003-F00

WARNING

DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(4) Install the bonding strip [15] to the fan frame on flange B6:

(a) Clean the bolt [13], the washer [14], and the bonding strip [15] terminal lug and the mating area of the fan frame with alcohol, B00676 [CP1041].

(b) Carefully clean the fasteners, terminal lug and the mating area on the fan frame with a dry cotton wiper, G00034.

(c) Apply the jointing compound, A50447.

1) Apply a large quantity of jointing compound, A50447, to the shaft of the bolt [13] (thread included) and below the bolt head.

2) Install the washer [14], bolt [13], spacer [16], and nut [17].

NOTE: Install the bolt head forward.

3) Torque the nut [17] to 257 in-lb (29 N·m) - 274 in-lb (31 N·m).

4) Remove the nut [17], spacer [16], bolt [13], and washer [14].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

5) Remove all unwanted jointing compound, A50447, that must remain inside the attachment hole only.

NOTE: Mating faces must be clean and dry before you apply new grease to make sure that it is efficient.

(d) Apply a thin layer of Brisal-OX 50-855 grease, D00625 [CP2338], to the clean mating faces.

(e) Lubricate the mating faces of the terminal lug on the bonding strip [15] and mating area on the fan frame with a thin layer of Brisal-OX 50-855 grease, D00625 [CP2338].

(f) Install the washer [14] and bolt [13] to attach the terminal lug on the bonding strip [15] to the fan frame flange with the spacer [16] and the nut [17].

1) Torque the nut [17] to 257 in-lb (29 N·m) - 274 in-lb (31 N·m).

(g) Remove all unwanted grease with a dry clean cloth.

NOTE: The area around the attachment holes must be clean and dry.

SUBTASK 79-11-01-420-004-F00

(5) Attach the oil-out hose [7], oil-in hose [11], and vent hose [9] to the oil tank [5]:

(a) Remove the protective caps from the hoses, tubes and oil tank openings.

(b) Lubricate the gasket [8], gasket [12], and gasket [3] with oil, D00599 [CP2442].

(c) Lubricate the threads of the bolt [6], bolt [10] and bolt [4] with graphite mineral vaseline, D00601 [CP2101].

(d) Install the gasket [8] between the oil-out boss and oil-out hose [7].

(e) Install the four bolts [6] to attach the oil-out hose [7].

1) Torque the bolts [6] to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

(f) Install the gasket [12] between the oil-in boss and oil-in hose [11].

(g) Install the four bolts [10] to attach the oil-in hose [11].

(h) Install the gasket [3] between the vent boss and vent hose [9].

(i) Install the four bolts [4] to attach the vent hose [9].

1) Torque the bolt [10] and the bolt [4] to 45 in-lb (5.1 N·m) - 55 in-lb (6.2 N·m).

2) Torque the oil-in coupling nut to 900 in-lb (102 N·m) - 1100 in-lb (124.3 N·m).

SUBTASK 79-11-01-420-005-F00

(6) Connect the drain hose [2] to the oil tank [5]:

(a) Lubricate the threads of the oil scupper nipple [1] with oil, D00599 [CP2442].

(b) Connect the drain hose [2] to the bottom of the oil scupper nipple [1].

CAUTION USE TWO WRENCHES TO TIGHTEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

1) Tighten the drain hose [2] to 257 in-lb (29 N·m) - 284 in-lb (32.1 N·m).

2) Loosen the drain hose [2] to release the torque.

3) Tighten the drain hose [2] to 257 in-lb (29 N·m) - 284 in-lb (32 N·m).

SUBTASK 79-11-01-610-008-F00

(7) If the new oil tank did not come with a new oil quantity transmitter, do this step:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Do this task: Oil Quantity Transmitter Installation, TASK 79-31-01-400-801-F00.

SUBTASK 79-11-01-020-009-F00

(8) If the new oil tank did come with a new oil quantity transmitter, do this step:

(a) Connect the electrical connector, DP1301 to the transmitter receptacle.

SUBTASK 79-11-01-610-006-F00

(9) Do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 79-11-01-410-004-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-11-01-860-015-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	10	C01361	DISPLAY DEU 1 HOLDUP

SUBTASK 79-11-01-860-016-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI

H. Oil Tank Installation Test

SUBTASK 79-11-01-800-001-F00

(1) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

SUBTASK 79-11-01-610-007-F00

(2) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

OIL TANK - INSPECTION/CHECK

1. **General**

A. This procedure has one task:

(1) The visual inspection of the oil tank for damage and leaks.

TASK 79-11-01-200-801-F00

2. **Oil Tank Inspection**

(Figure 601)

A. General

(1) This task is the inspection procedure for the oil tank envelope (referred to as the envelope).

B. References

Reference	Title
12-13-11-600-803	Drain the Engine Oil (P/B 301)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
79-11-01-000-801-F00	Oil Tank Removal (P/B 401)
79-11-01-300-801-F00	Replacement of the Filler Cap Packing or Filler Cap (P/B 801)
79-11-01-400-801-F00	Oil Tank Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-1238	Indicator - Dial

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Oil Tank Inspection

SUBTASK 79-11-01-010-006-F00

(1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. Oil Tank Inspection

SUBTASK 79-11-01-900-001-F00

(1) If you find damage that is more than the limits, replace the oil tank, unless you are given other instructions.

These are the tasks:

- Oil Tank Removal, TASK 79-11-01-000-801-F00.
- Oil Tank Installation, TASK 79-11-01-400-801-F00.

SUBTASK 79-11-01-210-002-F00

(2) Examine the envelope for damage:

(a) Cracks

1) Cracks in the envelope are not permitted.

2) Cracks in the forward bottom mount are not permitted.

3) Cracks in the aft bottom mount are not permitted.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Nicks or scratches

1) No more than three nicks or scratches are permitted, with these conditions:

a) The depth of the nicks or scratches is no more than 0.015 inches (0.38 mm).

b) The length of the nicks or scratches is no more than 0.375 inches (9.52 mm).

c) Damage does not connect.

d) You can not feel the nicks or scratches with a 0.030 inch (0.760 mm) dial indicator, STD-1238.

(c) Cracks or a cloudy glass window

1) Cracks or a cloudy glass window in the sight gage are not permitted.

(d) Small dents or bumps

1) No more than three small dents or bumps are permitted, with these conditions:

a) The contour is smooth.

b) The damage is not connected or aligned.

c) The capacity of the oil tank does not change.

d) The damage does not cause distortion of adjacent items that you can see.

SUBTASK 79-11-01-210-003-F00

(3) Examine the sealing interfaces between the areas that follow for leaks:

(a) The sight gage and the envelope

1) Leaks between the sight gage and the envelope are not permitted.

(b) The drain plug and the envelope boss recess

1) Leaks between the drain plug and the envelope boss recess are not serviceable.

2) If you find leaks, do these steps:

a) Torque the drain plug to 135-150 pound-inches (15.2-16.9 Newton meters).

b) If it still leaks, do this task: Drain the Engine Oil, TASK 12-13-11-600-803 and, replace the packing.

(c) The flanges of the oil-in, vent and oil-out hoses and the envelope boss

1) Leaks between the flanges are not serviceable.

2) If you find leaks, do these steps:

a) Tighten the flange bolts.

b) If it still leaks, replace the gaskets; and, if it still leaks, then replace the oil tank. These are the tasks:

- Oil Tank Removal, TASK 79-11-01-000-801-F00.
- Oil Tank Installation, TASK 79-11-01-400-801-F00.

(d) The filler cap and the oil cap assembly

1) Leaks between the filler cap and the oil cap assembly are not serviceable.

2) If you find leaks, do these steps:

a) Make sure that the filler cap is correctly locked.

b) If the filler cap is correctly locked, replace the filler cap packing Replacement of the Filler Cap Packing or Filler Cap, TASK 79-11-01-300-801-F00.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G. Put the Airplane Back to Its Usual Condition

SUBTASK 79-11-01-410-002-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G26492 S0006583611_V3

Oil Tank Inspection
Figure 601/79-11-01-990-802-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Tank Inspection
Figure 601/79-11-01-990-802-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

OIL TANK - CLEANING/PAINTING

1. **General**

A. This procedure has one task:

(1) The oil tank cleaning (external and internal).

TASK 79-11-01-100-801-F00

2. **Oil Tank Cleaning**

(Figure 701)

A. General

(1) This task is the cleaning procedure for the external and internal surfaces of the oil tank.

(2) You must remove the oil tank to clean the internal surfaces.

B. References

Reference	Title
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
79-11-01-000-801-F00	Oil Tank Removal (P/B 401)
79-11-01-400-801-F00	Oil Tank Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-1271	Screen - 300 Micron, for Oil Tank Contaminate Inspection
STD-1280	Source - Air, Regulated, Dry Filtered, 0-30 PSIG
STD-3911	Brush - Bristle, Medium Nylon

D. Consumable Materials

Reference	Description	Specification
B00676 [CP1041]	Alcohol - Isopropyl	
B00682 [CP2011]	Solvent - Stoddard	MIL-PRF-680 Type I, II or III
B00683 [CP1008]	Solvent - Stabilized Trichloroethylene	
B01028 [CP1010]	Solvent - Perchloroethylene	ASTM D4081

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Oil Tank Cleaning

SUBTASK 79-11-01-860-011-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
D	5	C01359	DISPLAY DEU 1 PRI

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	10	C01361	DISPLAY DEU 1 HOLDUP

SUBTASK 79-11-01-860-012-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI

SUBTASK 79-11-01-010-002-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-11-01-020-007-F00

(4) If you clean the oil tank internally, do this task: Oil Tank Removal, TASK 79-11-01-000-801-F00.

G. Oil Tank Cleaning (External)

SUBTASK 79-11-01-110-001-F00

(1) Do these steps to clean the external surface of the oil tank:

WARNING DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE IN THE FUMES FROM THE SOLVENT. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE THE SOLVENT. KEEP THE SOLVENT AWAY FROM SPARKS, FLAME, AND HEAT. THE SOLVENT IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

CAUTION MAKE SURE THAT YOU SEAL ALL OIL TANK OPENINGS BEFORE YOU START TO CLEAN. IF YOU DO NOT SEAL THE OIL TANK OPENINGS, THEN CONTAMINATION OF THE OIL CIRCUIT CAN CAUSE DAMAGE TO THE ENGINE.

(a) Clean the outer wall of the oil tank with solvent, B00683 [CP1008], or solvent, B01028 [CP1010], or solvent, B00682 [CP2011], or alcohol, B00676 [CP1041] and a medium nylon bristle brush, STD-3911.

(b) Dry the outer wall with an 0-30 psig dry filtered regulated air source, STD-1280 (200 kPa).

H. Oil Tank Cleaning (Internal)

SUBTASK 79-11-01-110-002-F00

(1) Do these steps to clean the internal surface of the oil tank:

(a) Fill the oil tank about 1/3 full with solvent, B00683 [CP1008], or solvent, B01028 [CP1010], or solvent, B00682 [CP2011], or alcohol, B00676 [CP1041], through the fill port.

(b) Shake the oil tank to loosen all the contamination from the inner wall.

(c) Drain the oil tank through the drain port with a screen, STD-1271.

(d) Examine the screen for all particles of 300 microns or more.

(e) If you find particles, clean the oil tank again until there are no particles.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(f) Dry the inner wall with 0-30 psig dry filtered regulated air source, STD-1280 (200 kPa).

(g) Put protective covers on all the oil tank orifices General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 79-11-01-420-007-F00

(1) If you removed the oil tank, then, do this task: Oil Tank Installation, TASK 79-11-01-400-801-F00.

SUBTASK 79-11-01-410-003-F00

(2) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-11-01-860-017-F00

(3) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	10	C01361	DISPLAY DEU 1 HOLDUP

SUBTASK 79-11-01-860-018-F00

(4) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F93712 S0006583619_V3

Oil Tank Cleaning
Figure 701/79-11-01-990-803-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

OIL TANK - REPAIRS

1. General

A. This procedure contains these tasks:

(1) The replacement of the filler cap packing or the filler cap.

(2) The replacement of the oil cap assembly packings.

(3) The replacement of the plugs by the remote filling kit.

(4) The replacement of the sight glass.

TASK 79-11-01-300-801-F00

2. Replacement of the Filler Cap Packing or Filler Cap

(Figure 801)

A. General

(1) Replace the filler cap packing if you find an oil leak between the oil tank and the filler cap.

(2) Replace the filler cap if you find it damaged.

(3) The oil tank is installed on the right side of the fan case.

(4) This procedure refers to the oil tank filler cap as the filler cap.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Filler cap packing	79-11-01-01-095	LOM ALL

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Procedure

SUBTASK 79-11-01-010-004-F00

(1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-11-01-960-001-F00

(2) Do these steps to replace the filler cap packing [1] or the filler cap [2]:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CAUTION

MAKE SURE THAT THE OIL SCUPPER IS CLEAN. A DIRTY SCUPPER CAN CAUSE THE CONTAMINATION OF THE OIL TANK.

(a) Use a cotton wiper, G00034, to clean the oil scupper.

(b) Lift the filler cap handle.

(c) Turn the filler cap handle counterclockwise to open it.

(d) Pull the filler cap [2] from the gravity fill port.

(e) Disconnect the chain [3] from the split ring [4] on the filler cap.

(f) Remove and discard the filler cap packing [1] from the groove of the filler cap [2].

NOTE: If you find the filler cap [2] is damaged, replace it.

(g) Lubricate a new filler cap packing [1] with oil, D00599 [CP2442].

(h) Install the filler cap packing [1] in the groove of the filler cap [2].

1) Make sure to install the filler cap packing [1] fully in the groove.

(i) Connect the chain [3] to the split ring [4] on the filler cap [2].

(j) Put the filler cap [2] in its position in the gravity fill port.

(k) Push the filler cap [2] in and turn the handle clockwise to lock it.

WARNING

IF THE HANDLE POSITION IS OPPOSITE TO THE OIL QUANTITY TRANSMITTER, THERE IS A RISK OF INJURY TO YOUR FINGERS.

WARNING

IF THE HANDLE POSITION IS OPPOSITE TO THE OIL QUANTITY TRANSMITTER, THE HANDLE OF THE FILLER CAP CAN ACCIDENTALLY MOVE TO ITS (UNLOCKED) VERTICAL POSITION. IF IT DOES THIS, THERE IS A RISK THAT PRESSURIZED HOT OIL WILL FLOW OUT OF THE TANK AND CAUSE INJURY (DANGEROUS BURNS).

(l) Push the filler cap handle down to the closed position.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 79-11-01-410-005-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Replacement of the Filler Cap Packing
Figure 801/79-11-01-990-804-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-11-01-300-802-F00

3. Replacement of the Oil Cap Assembly Packings

A. General

(1) Replace the oil cap assembly packings if you find them damaged.

(2) The oil tank is installed on the right side of the fan case.

(3) This procedure refers the oil tank cap assembly as the oil cap assembly.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
24	Oil cap assembly packing	79-11-01-01-088	LOM ALL
26	Oil cap assembly packing	79-11-01-01-099	LOM ALL

E. Procedure

SUBTASK 79-11-01-010-007-F00

(1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-11-01-960-003-F00

(2) Do these steps to replace the oil cap assembly packing [24] and oil cap assembly packing [26].

> **CAUTION**
> MAKE SURE THAT THE OIL SCUPPER IS CLEAN. A DIRTY SCUPPER CAN CAUSE THE CONTAMINATION OF THE OIL TANK.

(a) Use a cotton wiper, G00034, to clean the oil scupper.

(b) Put the oil tank filler cap handle to the (unlocked) vertical position and turn the filler cap [2] counterclockwise to open it.

(c) Remove the two bolts [22] and washers [21].

(d) Remove the oil cap assembly [23] from the oil scupper [25].

(e) Put the oil cap assembly [23] in a clean container to collect oil drippings.

(f) Remove and discard the oil cap assembly packing [24] and the oil cap assembly packing [26] from the grooves of the oil cap assembly.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

WARNING DO NOT LET THE ENGINE OIL STAY ON YOUR SKIN. ENGINE OIL IS POISONOUS. DO NOT BREATHE THE FUMES. USE ENGINE OIL IN AN AREA WITH GOOD AIRFLOW. DO NOT GET ENGINE OIL ON YOUR CLOTHES OR ON THE AIRPLANE. ENGINE OIL CAN CAUSE INJURIES.

(g) Lubricate the new oil cap assembly packing [24] and the new oil cap assembly packing [26] with oil, D00599 [CP2442].

(h) Install a new oil cap assembly packing [24] in the groove of the oil cap assembly [23].

(i) Open up the flapper of the oil cap assembly [23]. Install a new oil cap assembly packing [26] in the groove.

NOTE: Make sure that the surfaces are clean before you install the parts.

(j) Install the oil cap assembly [23] on the oil scupper [25]. Make sure that you do not damage the new oil cap assembly packing [24].

NOTE: Make sure that the oil cap assembly [23] and the oil scupper [25] are installed in the correct position.

(k) Install the two bolts [22] and washers [21] to attach the oil cap assembly [23] to the oil tank.

(l) Tighten the bolts [22] to between 75 in-lb (8.5 N·m) and 85 in-lb (9.6 N·m).

WARNING IF THE HANDLE POSITION IS OPPOSITE TO THE OIL QUANTITY TRANSMITTER, THERE IS A RISK OF INJURY TO YOUR FINGERS.

WARNING IF THE HANDLE POSITION IS OPPOSITE TO THE OIL QUANTITY TRANSMITTER, THE HANDLE OF THE FILLER CAP CAN ACCIDENTALLY MOVE TO ITS (UNLOCKED) VERTICAL POSITION. IF IT DOES THIS, THERE IS A RISK THAT PRESSURIZED HOT OIL WILL FLOW OUT OF THE TANK AND CAUSE INJURY (DANGEROUS BURNS).

(m) Push the filler cap [2] in and turn the filler cap handle clockwise to lock it. Push the filler cap handle down to the closed position.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 79-11-01-410-006-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

J95733 S0000188667_V2

Replacement of the Cap Assembly Packings
Figure 802/79-11-01-990-805-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-11-01-300-803-F00

4. Replacement of the Plugs by the Remote Filling Kit

A. General

(1) The oil tank is installed on the right side of the fan case.

(2) This procedure gives the instructions to replace the plugs by the remote filling kit.

(3) The procedure must be done after you drain the oil tank to prevent oil leakage and contamination (TASK 12-13-11-600-803).

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
12-13-11-600-803	Drain the Engine Oil (P/B 301)
12-13-11-600-806	Replenish the Engine Oil (Remote Fill Procedure) (P/B 301)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Procedure

SUBTASK 79-11-01-010-008-F00

(1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-11-01-960-004-F00

(2) Do these steps to replace the plug [42] and the plug [43] by the remote filling kit.

> **CAUTION**
> MAKE SURE THAT THE OIL SCUPPER IS CLEAN. A DIRTY SCUPPER CAN CAUSE THE CONTAMINATION OF THE OIL TANK.

(a) Use a cotton wiper, G00034, to clean the oil scupper.

(b) Put the oil tank filler cap handle to the (unlocked) vertical position. Turn the filler cap [2] counterclockwise to open it.

(c) Remove the plug [42] and the plug [43] and discard the packing [41] and the packing [44].

> **WARNING**
> DO NOT LET THE ENGINE OIL STAY ON YOUR SKIN. ENGINE OIL IS POISONOUS. DO NOT BREATHE THE FUMES. USE ENGINE OIL IN AN AREA WITH GOOD AIRFLOW. DO NOT GET ENGINE OIL ON YOUR CLOTHES OR ON THE AIRPLANE. ENGINE OIL CAN CAUSE INJURIES.

(d) Lubricate the new packing [41] and the new packing [44] with oil, D00599 [CP2442].

(e) Install a new packing [41] in the groove on the over flow block head coupling [61] with the toolkit 9970-957-740.

NOTE: Make sure that the surfaces are clean before you install the parts.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(f) Install a new packing [44] in the groove on the remote filling block head coupling [62] with the tool kit 9970-957-740.

NOTE: Make sure that the surfaces are clean before you install the parts.

(g) Install the remote filling block head coupling [62] in the remote filling port (lower opening). Tighten the coupling by hand.

NOTE: Make sure that the surfaces are clean before you install the parts.

(h) Torque the remote filling block head coupling [62] to between 181.5 in-lb (20.5 N·m) and 203.0 in-lb (22.9 N·m).

(i) Install the over flow block head coupling [61] in the over flow port (upper opening). Tighten the coupling by hand.

NOTE: Make sure that the surfaces are clean before you install the parts.

(j) Torque the over flow block head coupling [61] to between 270 in-lb (30.5 N·m) and 300 in-lb (33.9 N·m).

WARNING DO NOT LET THE ENGINE OIL STAY ON YOUR SKIN. ENGINE OIL IS POISONOUS. DO NOT BREATHE THE FUMES. USE ENGINE OIL IN AN AREA WITH GOOD AIRFLOW. DO NOT GET ENGINE OIL ON YOUR CLOTHES OR ON THE AIRPLANE. ENGINE OIL CAN CAUSE INJURIES.

(k) Lubricate the new plug [42] with oil, D00599 [CP2442].

(l) Lubricate the new plug [43] with oil, D00599 [CP2442].

(m) Attach the new plug [42] with its chain to the scupper hole and install it on the remote filling block head coupling [62].

(n) Push the plug [42] to lock it.

(o) Attach the new plug [43] with its chain to the scupper hole and install it on the remote filling block head coupling [62].

(p) Push the plug [43] to lock it.

WARNING IF THE HANDLE POSITION IS OPPOSITE TO THE OIL QUANTITY TRANSMITTER, THERE IS A RISK OF INJURY TO YOUR FINGERS.

WARNING IF THE HANDLE POSITION IS OPPOSITE TO THE OIL QUANTITY TRANSMITTER, THE HANDLE OF THE FILLER CAP CAN ACCIDENTALLY MOVE TO ITS (UNLOCKED) VERTICAL POSITION. IF IT DOES THIS, THERE IS A RISK THAT PRESSURIZED HOT OIL WILL FLOW OUT OF THE TANK AND CAUSE INJURY (DANGEROUS BURNS).

(q) Push the filler cap [2] in and turn the filler cap handle clockwise to lock it. Push the filler cap handle down to its closed position.

SUBTASK 79-11-01-612-001-F00

(3) Do this task: Replenish the Engine Oil, TASK 12-13-11-600-801 or Replenish the Engine Oil (Remote Fill Procedure), TASK 12-13-11-600-806.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Put the Airplane Back to Its Usual Condition

SUBTASK 79-11-01-410-007-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

J95738 S0000188757_V3

Remote Filling Kit
Figure 803/79-11-01-990-806-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Remote Filling Kit
Figure 803/79-11-01-990-806-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-11-01-800-801-F00

5. Replacement of the Sight Glass

(Figure 804)

A. General

(1) Replace the sight glass if you find it damaged.

(2) The oil tank is installed on the right side of the fan case.

(3) This task refers to the oil tank sight glass as the sight glass.

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
71-00-00-700-801-F00	Test 3A - Idle-Power Leak Check (P/B 501)
71-00-00-700-823-F00	Test 3B - Part-Power Leak Check (P/B 501)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G50135	Leak Detector - Liquid, Non-Corrosive Soap Compound	MIL-PRF-25567
G50464	Talcum Powder (White)	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
84	Sight glass	79-11-01-01-135	LOM ALL
85	Packing	79-11-01-01-140	LOM ALL

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Sight Glass Replacement

SUBTASK 79-11-01-010-009-F00

(1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-11-01-960-005-F00

(2) Do these steps to replace the sight glass [84]:

(a) Remove the eight flat head screws [83].

(b) Remove the plate [82].

(c) Remove the gasket [81].

(d) Remove and discard the sight glass [84].

(e) Remove and discard the packing [85].

(f) Examine and clean the area below the sight glass with a cotton wiper, G00034.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(g) Install a new packing [85].

(h) Install a new sight glass [84].

(i) Install the gasket [81].

(j) Install the plate [82].

(k) Install the eight flat head screws [83].

(l) Tighten the screws [83] to 24.8 in-lb (2.8 N·m) - 30.1 in-lb (3.4 N·m).

SUBTASK 79-11-01-790-001-F00

(3) Do the idle-power leak test:

(a) Fill the oil tank with engine oil below the sight glass [84], do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

(b) Apply leak detector, G50135, solution on the sight glass level.

(c) Do this task: Test 3A - Idle-Power Leak Check, TASK 71-00-00-700-801-F00.

1) Do a visual check for the bubbles.

2) Make sure that there are no bubbles.

(d) Clean the sight glass [84] with cotton wiper, G00034.

SUBTASK 79-11-01-790-002-F00

(4) Do the part-power leak test:

(a) Fill the oil tank with engine oil to the maximum level, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

(b) Apply Powder - Talc, G50464, on the sight glass [84].

(c) Do this task: Test 3B - Part-Power Leak Check, TASK 71-00-00-700-823-F00.

1) Do a visual check for oil seepage.

2) Make sure that there are no oil leaks.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 79-11-01-410-008-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1554734 S0000285650_V3

Replacement of the Sight Glass
Figure 804/79-11-01-990-807-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1. General

A. This procedure has these tasks:

(1) Calibration of the Air Flow Test Rig used for the Air Flow Test of the Engine Oil Circuit.

(2) Air Flow Test of the Engine Oil Circuit.

TASK 79-21-00-280-801-F00

2. Calibration of the Air Flow Test Rig

(Figure 201)

A. General

(1) This task is for the calibration of the air flow test rig used in the Air Flow Test of the Engine Oil Circuit.

(2) Read the procedure to know the instructions before you try to do this procedure.

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2458	Kit - Tool, Masters Air Nozzle Part #: 856A2662G01 Supplier: 58828
SPL-3933	Adapter - Test Rig, No. 1 and No. 2 Bearing Support, Air Flow Check Part #: 856A3267G02 Supplier: 58828
STD-3940	Air Source - Regulated, Dry Filtered, 0-150 psig

C. Air Flow Parameters, Formula and References

SUBTASK 79-21-00-480-001-F00

(1) regulated air source, STD-3940 for the calibration of the test rig and air flow test.

(a) Clean and dry

(b) Pressure 34.5 Psia (237.5 KPa)

(c) Hose with maximum length 13 feet (4 meters) and with minimum section 0.1 square inches (.64 sq.cm)

SUBTASK 79-21-00-970-001-F00

(2) Use this air flow formula to correct the measured air flow (in pph or kg/h only) for the calibration of the test rig and the air flow test (Table 201).

Table 201/79-21-00-993-806-F00 Air Flow Correction Formula

Wcorrected = Wmeasured X sq.root (Tmeasured/293.15) X 34.5/Pmeasured	
Parameter	**Definition**
Wmeasured	Air flow measured (pph or kg/h only)
293.15 Deg K	Reference temperature for air flow, = 528 Deg Rankin (for info only, not to correct Wmeasured, = 20 Deg C = 68 Deg F)
Tmeasured	Air temperature supplied for calibration or sent into engine tube for test in Deg K or Deg R
34.5	Reference pressure in PSIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 201/79-21-00-993-806-F00 Air Flow Correction Formula (Continued)

Wcorrected = Wmeasured X sq.root (Tmeasured/293.15) X 34.5/Pmeasured	
Parameter	**Definition**
Pmeasured	Air pressure supplied for calibration or sent into engine tube for test in PSIA, If air pressure supplied is measured in PSIG, then sum up Pambient and Pmeasured, Pambient + Pmeasured to correct Wmeasured

SUBTASK 79-21-00-970-002-F00

(3) Air flow reference for the test rig (3 and 5 mm restrictors)

(a) The air flow check varies with the restrictor criteria, so no reference is provided and is left to the user's monitoring.

SUBTASK 79-21-00-970-003-F00

(4) Air flow reference (Table 202) for the test rig used with the kit, SPL-2458.

Table 202/79-21-00-993-807-F00 Air Flow References

Air Nozzle Diam.		Necessary Air Flow Rate			
inch	mm	pph	kgh	scfm	m3/h
0.06	1.5	7.3/7.9	3.3/3.6	1.6/1.8	2.7/3.0
0.13	3.4	37.3/41.3	16.9/18.7	8.2/9.2	14.0/15.5
0.18	4.5	67.4/74.6	30.5/33.8	14.9/16.5	25.3/28.0

D. Calibration of the Air Test Rig (3 and 5 mm restrictors)

SUBTASK 79-21-00-970-004-F00

(1) For each restrictor (Figure 201), (Sheet 1) measure and record the air flows.

SUBTASK 79-21-00-970-005-F00

(2) Correct the air flows with the formula (in pph or kg/hr only) (Table 201).

(a) The corrected air flows is left to the user's monitoring.

E. Calibration of the Air Test Rig with the Master Air Nozzle

SUBTASK 79-21-00-480-002-F00

(1) Connect the supply hose (Figure 201), (Sheets 2 and 3) with the test rig adapter, SPL-3933 to the kit, SPL-2458.

SUBTASK 79-21-00-970-006-F00

(2) Do these steps to measure the air flow of each of the three calibrated nozzles:

(a) Firmly hold the body of the master air nozzle.

(b) Put the nozzle, calibrated hole first, inside the body of the tool.

(c) Measure and record the air flow.

1) Do the steps again, to measure and record the air flow for each nozzle.

SUBTASK 79-21-00-970-007-F00

(3) Correct the air flows with the formula (in pph or kg/hr only) (Table 201).

(a) The corrected air flows must be in the reference limits (Table 202).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AIR TEST RIG

A. Pamb INDICATOR
B. Tamb INDICATOR
C. P1 PRESSURE INDICATOR
D. P2 PRESSURE INDICATOR
E. AIR SUPPLY PRESSURE INDICATOR
F. AIR SUPPLY CONTROL
G. AIR MEASURING CIRCUIT SYNOPTIC
-1 SMALL SIZE PORT SELECTOR (3 mm DIA RESTRICTOR)
-2 MEDIUM SIZE PORT SELECTOR (5 mm DIA RESTRICTOR)

MM-00099-00-B

L82622 S0006583630_V2

Oil Circuit Air Flow Check - Test Equipment
Figure 201/79-21-00-990-801-F00 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AIR TEST RIG

A. Pamb INDICATOR
B. Tamb INDICATOR
C. P1 PRESSURE INDICATOR
D. P2 PRESSURE INDICATOR
E. AIR SUPPLY PRESSURE INDICATOR
F. AIR SUPPLY CONTROL

MM-00-109-00-B

L82623 S0006583631_V2

Oil Circuit Air Flow Check - Test Equipment
Figure 201/79-21-00-990-801-F00 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MM-00-110-00-B

L82763 S0006583632_V2

Oil Circuit Air Flow Check - Test Equipment
Figure 201/79-21-00-990-801-F00 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-00-700-801-F00

3. Air Flow Test of the Engine Oil Circuit

(Figure 202), (Figure 203), (Figure 204), (Figure 205)

A. General

(1) The air flow test is for these parts of the engine oil circuit:

(a) Forward sump.

(b) Transfer gearbox (TGB).

(c) Accessory gearbox (AGB).

(d) Rear sump.

(2) Read the procedure to know the instructions before you try to do this procedure.

(3) The air flow test rig must be calibrated before you do this procedure.

(4) This test can be done without flushing the engine, when the engine is off the oil supply goes back to the oil tank.

(5) Some oil can leak when the oil supply tubes are disconnected, it is necessary to clean these areas before the engine continued in service.

(6) Plug or cover any connections not used to prevent objects from entering the engine.

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-3933	Adapter - Test Rig, No. 1 and No. 2 Bearing Support, Air Flow Check Part #: 856A3267G02 Supplier: 58828

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Test

SUBTASK 79-21-00-010-001-F00

WARNING

DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSERS (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-21-00-700-001-F00

> **CAUTION**
> IF THE AIR FLOW TEST RIG IS NOT CALIBRATED, THE AIR FLOW TEST RESULTS WILL NO BE ACCURATE.

(2) Make sure that the air flow test rig is calibrated, do this task: Calibration of the Air Flow Test Rig, TASK 79-21-00-280-801-F00

F. Forward Sump Air Flow Check

SUBTASK 79-21-00-480-003-F00

(1) If you use the Air Test Rig (3 and 5 mm restrictors), use the 5 mm restrictor.

SUBTASK 79-21-00-480-004-F00

(2) Connect the air supply hose of the test rig to the forward sump (Figure 202):

(a) Disconnect the coupling nut [1] of the fwd sump oil supply external tube.

(b) Remove the bolt, nut [2] and clamp [3].

(c) Disconnect the coupling nut [4].

(d) If the tube at the fwd sump elbow connection cannot be disconnected, disconnect or loosen the coupling nut [5].

(e) Connect the supply hose with the test rig adapter, SPL-3933 to the fwd sump elbow connection.

1) Tighten the adapter to 225-275 pound-inches (25-31 Newton meters).

SUBTASK 79-21-00-970-008-F00

(3) Measure and record the air flow.

SUBTASK 79-21-00-970-009-F00

(4) Correct the air flow with the Air Flow Correction Formula (in pph or kg/hr only) (Table 201) Calibration of the Air Flow Test Rig, TASK 79-21-00-280-801-F00.

(a) The corrected air flow (Fwd Sump) must be in these limits:

NOTE: The reference temperature of the air flows is 293.15 degrees K.

1) 53.2/61.9 pph.

2) 24.12/28.08 kg/hr.

3) 11.6/13.5 scfm.

4) 19.7/22.98 m3/h.

SUBTASK 79-21-00-080-001-F00

(5) Disconnect the test rig (Figure 202):

(a) Disconnect the air supply hose of the test rig from the fwd sump.

(b) Install the fwd sump external oil supply tube at the elbow and connect the coupling nuts [1 and 5].

(c) Connect the coupling nut [4].

(d) Install the clamp [3], bolt and nut [2].

(e) Before you tighten the connections, make sure the fwd sump external oil supply tube is unrestrained.

1) Tighten the nut [2] to 98-110 pound-inches (11.0-12.5 Newton meters).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2) Tighten the coupling nuts [1 and 5] to 450-550 pound-inches (50.0-60.0 Newton meters).

3) Tighten the coupling nut [4] to 270-300 pound-inches (30.0-35.0 Newton meters).

G. TGB Air Flow Check

SUBTASK 79-21-00-480-005-F00

(1) If you use the Air Test Rig (3 and 5 mm restrictors), use the 3 mm restrictor.

SUBTASK 79-21-00-480-006-F00

(2) Use the part identification to make a hose to connect at the TGB oil supply tube and to the supply hose of the air flow test rig:

(a) Dash number - 06.

(b) Coupling nut - 649-676-146-0.

(c) Ferrule tube coupling - 649-688-806-0.

SUBTASK 79-21-00-480-007-F00

(3) Connect the air supply hose of the test rig to the TGB connection (Figure 203):

(a) Disconnect the two coupling nuts [1] and remove the TGB oil supply tube.

(b) Install the hose (you made) at the TGB connection.

(c) Connect the hose with the air supply hose of the test rig.

SUBTASK 79-21-00-970-010-F00

(4) Measure and record the air flow.

SUBTASK 79-21-00-970-011-F00

(5) Correct the air flow with the Air Flow Correction Formula (in pph or kg/hr only) (Table 201)Calibration of the Air Flow Test Rig, TASK 79-21-00-280-801-F00.

(a) The corrected air flow (TGB) must be in these limits:

NOTE: The reference temperature of the air flows is 293.15 degrees K.

1) 8.3/10.2 pph.

2) 3.78/4.68 kg/hr.

3) 1.8/2.2 scfm.

4) 3.05/3.75 m3/h.

SUBTASK 79-21-00-080-002-F00

(6) Disconnect the test rig (Figure 203):

(a) Disconnect the hose at the TGB connection.

(b) Install the TGB oil supply tube with the two coupling nuts [1].

(c) Before you tighten the coupling nuts [1], make sure the TGB oil supply tube is unrestrained.

1) Tighten the two coupling nuts [1] to 270-300 pound-inches (30.0-35.0 Newton meters).

H. AGB Air Flow Check

SUBTASK 79-21-00-480-008-F00

(1) If you use the Air Test Rig (3 and 5 mm restrictors), use the 3 mm restrictor.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-21-00-480-009-F00

(2) Use the part identification to make a hose to connect between the AGB connection and the supply hose of the air flow test rig:

(a) Dash number - 06.

(b) Coupling nut - 649-676-146-0.

(c) Ferrule tube coupling - 649-688-806-0.

SUBTASK 79-21-00-480-010-F00

(3) Connect the air supply hose of the test rig to the AGB connection (Figure 204):

(a) Disconnect the two coupling nuts [1] and remove the AGB oil supply tube.

(b) Install the hose (you made) at the AGB connection.

(c) Connect the hose with the air supply hose of the test rig.

SUBTASK 79-21-00-970-012-F00

(4) Measure and record the air flow.

SUBTASK 79-21-00-970-013-F00

(5) Correct the air flow with the Air Flow Correction Formula (in pph or kg/hr only) (Table 201) Calibration of the Air Flow Test Rig, TASK 79-21-00-280-801-F00.

(a) The corrected air flow (AGB) must be in these limits:

NOTE: The reference temperature of the air flows is 293.15 degrees K.

1) 21.9/27.4 pph.

2) 9.9/12.42 kg/hr.

3) 4.75/6.0 scfm.

4) 8.1/10.1 m3/h.

SUBTASK 79-21-00-080-003-F00

(6) Disconnect the test rig (Figure 204):

(a) Disconnect the hose at the AGB connection.

(b) Install the AGB oil supply tube with the two coupling nuts [1].

(c) Before you tighten the coupling nuts [1], make sure the AGB oil supply tube is unrestrained.

1) Tighten the two coupling nuts [1] to 270-300 pound-inches (30.0-35.0 Newton meters).

I. Rear Sump Air Flow Check

SUBTASK 79-21-00-480-011-F00

(1) If you use the Air Test Rig (3 and 5 mm restrictors), use the 3 mm restrictor.

SUBTASK 79-21-00-480-012-F00

(2) Use the part identification to make a hose to connect between the rear sump connection and the supply hose of the air flow test rig:

(a) Dash number - 06.

(b) Coupling tube - J1328P06B.

SUBTASK 79-21-00-480-013-F00

(3) Connect the air supply hose of the test rig to the rear sump connection at the turbine rear frame (Figure 205):

(a) Remove the bolt, nut [1], clamp [2] and the heat shield [3].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Remove the coupling nut [4].

(c) Loosen the bolt [5] and disconnect the rear sump oil supply tube.

(d) Install the hose (you made) at the rear sump connection.

(e) Connect the hose with the air supply hose of the test rig.

SUBTASK 79-21-00-970-014-F00

(4) Measure and record the air flow.

SUBTASK 79-21-00-970-015-F00

(5) Correct the air flow with the Air Flow Correction Formula (in pph or kg/hr only) (Table 201)Calibration of the Air Flow Test Rig, TASK 79-21-00-280-801-F00.

(a) The corrected air flow (Rear Sump) must be in these limits:

NOTE: The reference temperature of the air flows is 293.15 degrees K.

1) 22.2/26.6 pph.

2) 10.08/12.06 kg/hr.

3) 4.8/5.75 scfm.

4) 8.2/9.8 m3/h.

SUBTASK 79-21-00-080-004-F00

(6) Disconnect the test rig (Figure 205):

(a) Disconnect the hose at the rear sump connection.

(b) Install the rear sump oil supply tube with the coupling nut [4].

(c) Before you tighten the connections, make sure the rear sump oil supply tube is unrestrained.

1) Tighten the bolt [5] to 62-71 pound-inches (7.0-8.0 Newton meters).

2) Tighten the coupling nut [4] to 270-300 pound-inches (30.0-35.0 Newton meters).

(d) Install the clamp [2], heat shield [3], bolt and nut [1].

1) Tighten the nut [1] to 62-71 pound-inches (7.0-8.0 Newton meters).

J. Put the Airplane Back To Its Usual Condition

SUBTASK 79-21-00-100-001-F00

(1) Do a check for signs of oil leakage at the test connections and clean those areas.

SUBTASK 79-21-00-410-001-F00

WARNING

OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 79-21-00-700-002-F00

(3) Do the tests that are listed for the oil system pipes and manifold in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

(a) Examine the test connections for signs of oil leakage.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-21-00-610-001-F00

(4) Do a check of the engine oil quantity, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Forward Sump Air Flow Check
Figure 202/79-21-00-990-802-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MM-00-101-00-B
L82788 S0006583635_V2

TGB Air Flow Check
Figure 203/79-21-00-990-803-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MM-00-102-00-B

L82792 S0006583636_V2

AGB Air Flow Check
Figure 204/79-21-00-990-804-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MM-00-104-00-B
L82810 S0006583637_V2

Rear Sump Air Flow Check
Figure 205/79-21-00-990-805-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LUBRICATION UNIT - REMOVAL/INSTALLATION

1. **General**

A. This procedure has these tasks:

(1) A removal of the lubrication unit

(2) An installation of the lubrication unit.

TASK 79-21-01-000-801-F00

2. **Lubrication Unit Removal**

(Figure 401, Figure 402, Figure 403)

A. General

(1) This task is the removal procedure for the lubrication unit.

(2) The lubrication unit is located on the Accessory Gear Box (AGB) at the 6:00 o'clock position.

B. References

Reference	Title
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
79-21-05-000-806-F00	Magnetic Chip Detector (MCD) Removal (P/B 401)
79-21-05-000-807-F00	Debris Monitoring System (DMS) Detector Removal (P/B 401)
79-21-05-400-804-F00	Magnetic Chip Detector (MCD) Installation (P/B 401)
79-21-05-400-805-F00	Debris Monitoring System (DMS) Detector Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2446	Adapter - Drain, Lubrication Unit Part #: 856A3601G01 Supplier: 58828
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

D. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
22	Packing	79-21-01-01A-365	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-350	LOM 402, 404, 406, 407, 411, 416, 445

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Prepare for the Removal

SUBTASK 79-21-01-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-01-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 79-21-01-010-001-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

H. Lubrication Unit Removal

SUBTASK 79-21-01-020-001-F00

(1) Do these steps to prepare the lubrication unit [1] for removal (Figure 401):

(a) Put a 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the lubrication unit [1].

(b) Put protective caps on the connection interfaces while you disconnect them (TASK 70-10-02-910-801-F00).

SUBTASK 79-21-01-020-002-F00

WARNING DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

WARNING DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE IS STOPPED. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

WARNING DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(WARNING PRECEDES)

> **CAUTION** DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

(2) Drain the oil from the lubrication unit [1] (Figure 401):

(a) Do this task: Magnetic Chip Detector (MCD) Removal, TASK 79-21-05-000-806-F00 or Debris Monitoring System (DMS) Detector Removal, TASK 79-21-05-000-807-F00.

(b) Put the adapter, SPL-2446, in the lubrication unit [1] at a chip detector location.

(c) At the same time, push and turn the drain adapter 1/4 turn clockwise.

1) Let the oil drain in the container.

(d) At the same time, push and turn the drain adapter 1/4 turn counterclockwise.

(e) Pull the drain adapter down.

(f) Remove the drain adapter from the lubrication unit [1].

(g) Drain the oil from all of the other chip detector locations.

> **CAUTION** DO NOT INSTALL THE CHIP DETECTOR WITHOUT THE PACKING. INSTALLATION OF THE CHIP DETECTOR WITHOUT THE PACKING CAN CAUSE OIL LEAKAGE DURING ENGINE OPERATION AND A POSSIBLE ENGINE FAILURE

(h) Do this task: Magnetic Chip Detector (MCD) Installation, TASK 79-21-05-400-804-F00 or Debris Monitoring System (DMS) Detector Installation, TASK 79-21-05-400-805-F00.

SUBTASK 79-21-01-020-003-F00

(3) Disconnect the oil supply tube [10] from the lubrication unit [1] (Figure 401):

(a) Remove the four bolts [12].

(b) Disconnect the oil supply tube [10].

(c) Remove and examine the gasket [11] (TASK 70-30-01-910-802-F00).

NOTE: If the gasket is in good condition, it can be used for the subsequent installation.

1) Discard the gasket [11], if it is in unsatisfactory condition.

SUBTASK 79-21-01-020-004-F00

(4) Disconnect the AGB tube [8] from the lubrication unit [1] (Figure 401):

(a) Remove the four bolts [13].

(b) Disconnect the AGB tube [8].

(c) Remove and examine the gasket [9].

NOTE: If the gasket is in good condition, it can be used for the subsequent installation.

1) Discard the gasket [9], if it is in unsatisfactory condition.

(d) Remove the four bolts [5].

(e) Disconnect the forward sump tube [6].

(f) Remove and examine the gasket [7].

NOTE: If the gasket is in good condition, it can be used for the subsequent installation.

1) Discard the gasket [7], if it is in unsatisfactory condition.

(g) Remove the four bolts [2].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(h) Disconnect the aft sump tube [3].

(i) Remove and examine the gasket [4].

NOTE: If the gasket is in good condition, it can be used for the subsequent installation.

1) Discard the gasket [4], if it is in unsatisfactory condition.

SUBTASK 79-21-01-020-005-F00

(5) Disconnect the oil inlet tube [15] to the scavenge filter from the lubrication unit [1] (Figure 402):

(a) Remove the four bolts [18].

(b) Disconnect the oil inlet tube [15].

(c) Remove and examine the gasket [16].

NOTE: If the gasket is in good condition, it can be used for the subsequent installation.

1) Discard the gasket [16], if it is in unsatisfactory condition.

SUBTASK 79-21-01-020-006-F00

CAUTION: USE TWO WRENCHES TO LOOSEN THE COUPLING NUTS. USE ONE TO HOLD THE FITTINGS, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(6) Disconnect the AGB tubes [14], aft sump tube [19], and forward sump tube [17] from the lubrication unit [1] (Figure 402):

(a) Disconnect the AGB tube [14] from the AGB.

(b) Disconnect the aft sump tube [19] and forward sump tube [17].

SUBTASK 79-21-01-020-007-F00

(7) Remove the lubrication unit [1] from the AGB (Figure 403):

CAUTION: HOLD THE LUBRICATION UNIT WHEN YOU REMOVE THE V-CLAMP. THE WEIGHT OF THE LUBRICATION UNIT CAN CAUSE DAMAGE TO THE DRIVE SHAFT AND SPLINES.

(a) Loosen the V-clamp nut [20].

(b) Open the V-clamp [21].

(c) Remove the V-clamp [21].

(d) Remove the lubrication unit [1].

CAUTION: YOU MUST BE CAREFUL WHILE YOU REMOVE THE PACKING. IF YOU DO NOT OBEY, DAMAGE TO THE TUBES AND HOSES CAN OCCUR.

1) Remove and discard the packing [25] and packing [24].

SUBTASK 79-21-01-020-008-F00

(8) Do these steps if the hollow drive shaft [23] moves from the pad drive shaft to the AGB (Figure 403):

(a) Remove the hollow drive shaft [23].

(b) Remove and discard the packing [22].

(c) Lubricate a new packing [22] with oil, D00599 [CP2442].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CAUTION	MAKE SURE THAT YOU INSTALL THE PACKING CORRECTLY DURING THE INSTALLATION PROCEDURE. IF YOU DO NOT INSTALL THE PACKING CORRECTLY, OIL LOSS AND DAMAGE TO THE ENGINE CAN OCCUR.

(d) Install the packing [22] in the groove of the hollow drive shaft [23].

(e) Install the hollow drive shaft [23] in the pad drive shaft.

(f) Install protective covers on all the open hoses and the AGB.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F31257 S0006583641_V2

Oil Return Tube Installation
Figure 401/79-21-01-990-801-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Return Tube Installation
Figure 401/79-21-01-990-801-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G88160 S0006583647_V2

Oil Supply Tube Installation
Figure 402/79-21-01-990-808-F00 (Sheet 1 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F31188 S0006583650_V2

Oil Supply Tube Installation
Figure 402/79-21-01-990-808-F00 (Sheet 2 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F25248 S0006583648_V2

Oil Supply Tube Installation
Figure 402/79-21-01-990-808-F00 (Sheet 3 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Supply Tube Installation
Figure 402/79-21-01-990-808-F00 (Sheet 4 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

C

G88201 S0006583655_V2

Drive Shaft Installation
Figure 403/79-21-01-990-809-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-01-400-801-F00

3. Lubrication Unit Installation

(Figure 401, Figure 402, Figure 403)

A. General

(1) This task is the installation procedure for the lubrication unit.

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
D00601 [CP2101]	Vaseline - Graphite Mineral	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Unit	79-21-01-01A-065	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-033	LOM 402, 404, 406, 407, 411, 416, 445
4	Gasket	79-21-00-01-140	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-00-01A-230	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
7	Gasket	79-21-00-01-160	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-00-01A-250	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
9	Gasket	79-21-00-01-180	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-00-01A-280	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
11	Gasket	79-21-00-01-200	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-00-01A-300	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
16	Gasket	79-21-00-01-120	LOM 402, 404, 406, 407, 411, 416, 445

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
16 (cont.)		79-21-00-01A-210	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
24	Packing	79-21-01-01A-055	LOM 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-031	LOM 402, 404, 406, 407, 411, 416, 445
25	Packing	79-21-01-01A-060	LOM 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-032	LOM 402, 404, 406, 407, 411, 416, 445

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Installation

SUBTASK 79-21-01-840-001-F00

CAUTION

THE HOLLOW DRIVE SHAFT CAN STAY ATTACHED TO THE LUBE PUMP DRIVE-SHAFT. WHEN YOU REMOVE THE LUBE-PUMP FROM THE AGB. MAKE SURE THAT THE HOLLOW DRIVE SHAFT STAYS ON THE AGB. IF YOU DO NOT INSTALL THE HOLLOW DRIVE SHAFT, THE ENGINE WILL NOT HAVE SUFFICIENT LUBRICATION WHEN IT OPERATES. DAMAGE TO THE ENGINE CAN OCCUR.

(1) Do these steps to prepare the lubrication unit [1] for the installation (TASK 70-10-02-910-801-F00):

(a) Remove all the protective caps from the connection interfaces.

(b) Make sure that all the mating interfaces to the lubrication unit [1] are clean and in good condition.

(c) Lubricate all the gaskets with oil, D00599 [CP2442].

(d) Lubricate the threads of all the bolts with graphite mineral vaseline, D00601 [CP2101].

(e) Lubricate the threads of all the nipples with oil, D00599 [CP2442].

(f) Make sure that the hollow drive shaft [23] is installed in the pad drive shaft of the Accessory Gear Box (AGB).

G. Lubrication Unit Installation

SUBTASK 79-21-01-420-001-F00

(1) Install the lubrication unit [1] (Figure 403).

(a) Lubricate the new packing [24] and new packing [25] with oil, D00599 [CP2442].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

> **CAUTION** MAKE SURE THAT YOU INSTALL THE PACKING CORRECTLY DURING THE INSTALLATION PROCEDURE. IF YOU DO NOT INSTALL THE PACKING CORRECTLY, OIL LOSS AND DAMAGE TO THE ENGINE CAN OCCUR.

(b) Install the packing [24] in the drive shaft groove of the lubrication unit [1].

(c) Install the packing [25] in the groove of the lubrication unit [1].

(d) Put the V-clamp [21] around the lubrication unit housing.

NOTE: The V-clamp nut must be on the side of the lubrication unit by the identification plate.

(e) Put the lubrication unit [1] in its position on the AGB.

(f) Attach the lubrication unit [1] with the V-clamp [21].

(g) Lubricate the threads of the V-clamp stud with graphite mineral vaseline, D00601 [CP2101].

1) Tighten the V-clamp nut [20] to 115 in-lb (13 N·m) - 133 in-lb (15 N·m).

SUBTASK 79-21-01-420-002-F00

> **CAUTION** USE TWO WRENCHES TO TIGHTEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(2) Connect the three oil supply tubes to the lubrication unit [1] (Figure 402):

(a) Connect the aft sump tube [19].

1) Tighten the coupling nut to 270 in-lb (31 N·m) - 300 in-lb (34 N·m).

(b) Connect the forward sump tube [17].

1) Tighten the coupling nut to 450 in-lb (51 N·m) - 550 in-lb (62 N·m).

(c) Connect the AGB tube [14].

1) Tighten the coupling nut to 270 in-lb (31 N·m) - 300 in-lb (34 N·m).

SUBTASK 79-21-01-420-003-F00

(3) Connect the oil inlet tube [15] to the scavenge filter to the lubrication unit [1] (Figure 402):

(a) Install the gasket [16].

(b) Install the four bolts [18] to attach the oil inlet tube [15].

1) Tighten the bolts [18] to 49 in-lb (5.5 N·m) - 53 in-lb (6.0 N·m).

SUBTASK 79-21-01-420-006-F00

(4) Connect the oil supply tube [10] to the lubrication unit [1] (Figure 401):

(a) Install the gasket [11].

(b) Install the four bolts [12] to attach the oil supply tube [10].

1) Tighten the bolts [12] to 49 in-lb (5.5 N·m) - 53 in-lb (6.0 N·m).

SUBTASK 79-21-01-420-004-F00

(5) Connect the oil scavenge tubes to the lubrication unit [1] (Figure 401):

(a) Install the gasket [9].

(b) Install the four bolts [13] to attach the AGB tube [8].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) Install the gasket [7].

(d) Install the four bolts [5] to attach the forward sump tube [6].

(e) Install the gasket [4].

(f) Install the four bolts [2] to attach the aft sump tube [3].

1) Tighten the bolts [13], bolts [5], and bolts [2] to 49 in-lb (5.5 N·m) - 53 in-lb (6.0 N·m).

SUBTASK 79-21-01-610-002-F00

(6) Do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 79-21-01-410-002-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-21-01-860-005-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-01-860-006-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

I. Lubrication Unit Installation Test

SUBTASK 79-21-01-800-001-F00

(1) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

SUBTASK 79-21-01-610-001-F00

(2) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LUBRICATION UNIT - REPAIRS

1. General

A. This procedure has the tasks to replace the packing in these areas of the lubrication unit:

(1) Inner sealing spool (lubrication unit installed)

(2) Inner and outer sealing spools (lubrication unit removed)

(3) Inner and outer sealing spools (lubrication unit installed).

TASK 79-21-01-400-802-F00

2. Packing Replacement On The Inner Sealing Spool (Lubrication Unit Installed)

(Figure 801, Figure 802)

A. General

(1) Replace this packing if you find debris from the packing on the applicable detector of the lubrication unit.

NOTE: It is recommended to replace the packing from all of the inner sealing spools at the same time.

(2) The lubrication unit is located on the accessory gearbox at the 6 o'clock position.

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
71-00-00-700-801-F00	Test 3A - Idle-Power Leak Check (P/B 501)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
79-21-05-000-806-F00	Magnetic Chip Detector (MCD) Removal (P/B 401)
79-21-05-000-807-F00	Debris Monitoring System (DMS) Detector Removal (P/B 401)
79-21-05-400-804-F00	Magnetic Chip Detector (MCD) Installation (P/B 401)
79-21-05-400-805-F00	Debris Monitoring System (DMS) Detector Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2199	Adapter - Inner Seal, Lubrication Unit Part #: 856A3625G01 Supplier: 58828
SPL-9649	Tool Set - A/D Lubrication Unit Scavenge Filter Housing Part #: 856A2957G01 Supplier: 58828

D. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Packing	79-21-01-01A-245	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
1 (cont.)		79-21-01-01B-220	LOM 402, 404, 406, 407, 411, 416, 445

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Packing Replacement On The Inner Sealing Spool (Lubrication Unit Installed)

SUBTASK 79-21-01-010-002-F00

(1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-21-01-020-009-F00

(2) Remove the applicable detector from the lubrication unit, do this task: Magnetic Chip Detector (MCD) Removal, TASK 79-21-05-000-806-F00 or Debris Monitoring System (DMS) Detector Removal, TASK 79-21-05-000-807-F00.

SUBTASK 79-21-01-020-017-F00

(3) Remove each sealing spool with tool set, SPL-9649, as follows (Figure 801, Figure 802):

(a) Retract the finger and lock in position with the latch.

(b) Install the tool through the lubrication unit sleeve [29] in the scavenge.

(c) Push the lubrication unit outer sealing spool [31] and release the latch.

(d) Engage the finger in the oil port to the pump.

(e) Engage the latch into the body of the tool to lock the finger in extended position.

WARNING LOCK THE SPOOL VALVES BEFORE YOU REMOVE THE FASTENERS FOR THE RETAINING PLATE. SPOOL VALVE EXTENSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(f) Remove the bolts [27], washers [25], nuts [24], and retaining plate [26].

(g) Use the wrench to remove the lubrication unit sleeve [29].

(h) Hold the body, release the latch and carefully retract the finger to release the lubrication unit outer sealing spool assembly springs.

(i) Remove the lubrication unit sealing spool assembly.

(j) Remove and discard the packing [1] from the inner sealing spool [22].

SUBTASK 79-21-01-400-001-F00

(4) Install a new packing [1] on the inner sealing spool, do these steps:

CAUTION MAKE SURE THAT YOU INSTALL THE PACKING IN THE CLEAN DETECTOR LOCATION. IF YOU DO NOT OBEY, THE DAMAGE TO THE PACKING IN THE GROOVE OF THE INNER SEALING SPOOL CAN OCCUR.

(a) Make sure that the detector location in the lubrication unit is clean.

(b) Lightly apply a layer of oil, D00599 [CP2442], on a packing [1].

(c) Put the sliding handle of the adapter, SPL-2199, in the down position.

(d) Put the packing around the top end of the tool, so that it touches the packing stops.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(e) Install the lubrication unit sleeve [29].

(f) Put the tool in the spool lubrication unit sleeve [29] with the centering pin engaged through the hole in the inner sealing spool.

(g) Turn the tool and engage it farther in the lubrication unit sleeve [29] until the stops of the handle touch the edge of the sleeve.

(h) Keep the handle stops against the lubrication unit sleeve [29] while you move the handle to the up position.

(i) While you keep the handle stops against the lubrication unit sleeve [29], move the handle to the down position.

(j) Do these steps to install the retaining plate [26]:

1) Hold the retaining plate [26] on the housing and install bolts [27], washers [25], and nuts [24].

2) Tighten nuts [24] to 39.9 in-lb (4.5 N·m) - 48.6 in-lb (5.5 N·m).

CAUTION MAKE SURE THAT THE SLIDING HANDLE AND THE HANDLE COME BACK TO THEIR DOWN POSITIONS BELOW THE UNBENDING SPRINGS. IF YOU DO NOT OBEY, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(k) Remove the installation tool from the lubrication unit.

SUBTASK 79-21-01-210-001-F00

(5) Do a check that the inner and outer sealing spools move freely in the lubrication unit housing.

SUBTASK 79-21-01-410-004-F00

(6) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-21-01-790-001-F00

(7) Do this task: Test 3A - Idle-Power Leak Check, TASK 71-00-00-700-801-F00.

NOTE: The detector is not yet installed in the lubrication unit.

SUBTASK 79-21-01-020-010-F00

(8) Install the applicable detector in the lubrication unit, do this task: Magnetic Chip Detector (MCD) Installation, TASK 79-21-05-400-804-F00 or Debris Monitoring System (DMS) Detector Installation, TASK 79-21-05-400-805-F00.

SUBTASK 79-21-01-610-003-F00

(9) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

NOTE:
DETECTORS NOT INSTALLED.

M24715 S0006583660_V3

Packing Replacement on the Inner Sealing Spool
Figure 801/79-21-01-990-804-F00 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

A-A

M24775 S0006583662_V3

Packing Replacement on the Inner Sealing Spool
Figure 801/79-21-01-990-804-F00 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2957014 S0000734842_V1

Packing Replacement on the Inner Sealing Spool
Figure 801/79-21-01-990-804-F00 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-01-400-803-F00

3. Packing Replacement On The Inner and Outer Sealing Spools (Lubrication Unit Removed)

(Figure 802, Figure 803, Figure 804, Figure 805)

A. General

(1) Replace this packing if you find debris from this packing in the scavenge filter cartridge.

NOTE: It is recommended to replace the packing from all of the outer sealing spools at the same time.

(2) It is necessary to remove the lubrication unit to do this task.

(3) This task has two procedures to remove and two procedures to install the outer and inner sealing spools. The sealing spools are installed in the lubrication unit and are called check valves in procedure.

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
71-00-00-700-801-F00	Test 3A - Idle-Power Leak Check (P/B 501)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
79-21-01-000-801-F00	Lubrication Unit Removal (P/B 401)
79-21-01-400-801-F00	Lubrication Unit Installation (P/B 401)
79-21-05-000-806-F00	Magnetic Chip Detector (MCD) Removal (P/B 401)
79-21-05-000-807-F00	Debris Monitoring System (DMS) Detector Removal (P/B 401)
79-21-05-400-804-F00	Magnetic Chip Detector (MCD) Installation (P/B 401)
79-21-05-400-805-F00	Debris Monitoring System (DMS) Detector Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
21	Packing	79-21-01-01A-245	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-220	LOM 402, 404, 406, 407, 411, 416, 445
28	Packing	79-21-01-01A-230	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-210	LOM 402, 404, 406, 407, 411, 416, 445
30	Packing	79-21-01-01A-235	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-215	LOM 402, 404, 406, 407, 411, 416, 445

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Packing Replacement On The Inner and Outer Sealing Spools (Lubrication Unit Removed)

SUBTASK 79-21-01-010-003-F00

(1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-21-01-020-011-F00

(2) Remove the detectors from the lubrication unit (TASK 79-21-05-000-806-F00 or TASK 79-21-05-000-807-F00).

SUBTASK 79-21-01-020-012-F00

CAUTION AFTER THE REMOVAL OF THE LUBRICATION UNIT, MAKE SURE TO PUT THE LUBRICATION UNIT ON A CLEAN TABLE. UNWANTED CONTAMINATION CAN CAUSE AN INCORRECT INSTALLATION OF THE PACKING.

(3) Do this task: Lubrication Unit Removal, TASK 79-21-01-000-801-F00.

(a) Make sure that you do not remove the nipples installed on the ports of the lubrication unit.

SUBTASK 79-21-01-400-002-F00

(4) Do these steps to remove each check valve with the locally manufactured tool (Figure 802):

(a) Make the pusher tool and locking tools (Figure 803).

(b) Put the pusher tool into the scavenge screen hole in the lubrication unit housing (Figure 804).

(c) Push back the outer sealing spool [31] and at the same time put the locking tool into the oil inlet to block the valve assembly in the upper position.

(d) Remove the pusher.

(e) Do the above steps again, to install a locking tool at the other scavenge screen holes.

WARNING LOCK THE SPOOL VALVES BEFORE YOU REMOVE THE FASTENERS FOR THE RETAINING PLATE. SPOOL VALVE EXTENSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(f) Remove the two nuts [24], washers [25], and bolts [27] that attach the retaining plate [26] on the lubrication unit housing.

(g) Remove the retaining plate [26].

(h) Remove the lubrication unit sleeve [29].

(i) Remove and discard the packing [28].

(j) Put the pusher into the scavenge screen hole in the lubrication unit housing.

WARNING MAKE SURE THAT YOU HOLD THE OUTER SEALING SPOOL TIGHTLY WHEN YOU REMOVE THE LOCKING TOOL. THE SPRING LOAD IS 30.24 LBF (134.51 N). THE UNCONTROLLED RELEASE OF THE SPRING CAN CAUSE INJURY.

(k) Push the outer sealing spool [31] and remove the locking tool from the lubrication unit housing.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(l) Remove the outer sealing spool [31], inner sealing spool [22], spring [23], and spring [32].

(m) Remove and discard the packing [30] from the outer sealing spool [31] and packing [21] from the inner sealing spool [22].

(n) Examine the inner diameter of the outer sealing spool [31] for the presence of wear:

1) If the wear is less than 0.024 in. (0.61 mm), the part is serviceable.

2) If the wear is 0.024 in. (0.61 mm) to 0.028 in. (0.71 mm), a continue-in-service extension of 500 hours is permitted.

3) If the wear is more than 0.028 in. (0.71 mm), discard the outer sealing spool.

SUBTASK 79-21-01-400-003-F00

(5) Do these steps to install each check valve with the locally manufactured tool:

(a) Make sure that the check valve location in the lubrication unit is clean.

NOTE: If the location is not clean, it can cause an incorrect installation of the packings in the groove of the outer and inner sealing spool.

(b) Lightly apply a layer of oil, D00599 [CP2442], on the new packing [30], new packing [21], and new packing [28].

(c) Install the packing [30] on the outer sealing spool [31].

(d) Install the packing [21] on the inner sealing spool [22].

(e) Install the spring [32] and spring [23] in the scavenge screen hole.

(f) Install the inner sealing spool [22] on the spring [23].

1) Note the orientation of the inner sealing spool [22] (Figure 802).

(g) Install the outer sealing spool [31] on the spring [32] so that the inner sealing spool [22] and spring [23] are fully engaged in the inner diameter of the outer sealing spool.

1) Note the orientation of the parts (Figure 802).

(h) Push the outer sealing spool [31] with the pusher and hold until you can install the locking tool to hold the valve assembly in place.

(i) Remove the pusher.

(j) Install the packing [28] on the lubrication unit sleeve [29].

(k) Install the lubrication unit sleeve [29] in the scavenge screen hole in the lubrication unit housing.

1) Make sure that the packing [28] is fully engaged in the housing.

(l) Do these steps to install the retaining plate [26]:

1) Hold the retaining plate [26] on the housing and install two bolts [27], washers [25], and nuts [24].

2) Tighten the nuts [24] to 39.9 in-lb (4.5 N·m) - 48.6 in-lb (5.5 N·m).

(m) Do these steps to release the outer sealing spool [31]:

1) Push the outer sealing spool [31] with the pusher.

2) Remove the locking tool.

3) Release the outer sealing spool [31] and remove the pusher.

SUBTASK 79-21-01-210-002-F00

(6) Make sure that the inner sealing spool [22] and outer sealing spool [31] move freely in the lubrication unit housing.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-21-01-400-004-F00

(7) Do this task: Lubrication Unit Installation, TASK 79-21-01-400-801-F00.

SUBTASK 79-21-01-410-005-F00

(8) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-21-01-790-002-F00

(9) Do this task: Test 3A - Idle-Power Leak Check, TASK 71-00-00-700-801-F00.

NOTE: The detector is not yet installed in the lubrication unit.

SUBTASK 79-21-01-020-013-F00

(10) Install the applicable detector in the lubrication unit (TASK 79-21-05-400-804-F00 or TASK 79-21-05-400-805-F00).

SUBTASK 79-21-01-610-004-F00

(11) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Packing Replacement on the Outer Sealing Spool and Inner Sealing Spool
Figure 802/79-21-01-990-805-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MATERIAL: ERTALON OR NYLON TYP6

M45469 S0006583670_V2

Tool Fabrication
Figure 803/79-21-01-990-806-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

M45465 S0006583671_V3

Locking Tool Installation
Figure 804/79-21-01-990-807-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1558395 S0000287839_V3

Scavenge Filter Housing Tool Set Installation
Figure 805/79-21-01-990-812-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-01-400-804-F00

4. Packing Replacement On The Inner and Outer Sealing Spools (Lubrication Unit Installed)

(Figure 802, Figure 805)

A. General

(1) Replace this packing if you find debris from this packing in the scavenge filter cartridge.

NOTE: It is recommended to replace the packing from all of the outer sealing spools at the same time.

(2) The sealing spools are installed in the lubrication unit and are called check valves in procedure.

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
71-00-00-700-801-F00	Test 3A - Idle-Power Leak Check (P/B 501)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
79-21-05-000-806-F00	Magnetic Chip Detector (MCD) Removal (P/B 401)
79-21-05-000-807-F00	Debris Monitoring System (DMS) Detector Removal (P/B 401)
79-21-05-400-804-F00	Magnetic Chip Detector (MCD) Installation (P/B 401)
79-21-05-400-805-F00	Debris Monitoring System (DMS) Detector Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-9649	Tool Set - A/D Lubrication Unit Scavenge Filter Housing Part #: 856A2957G01 Supplier: 58828

D. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
21	Packing	79-21-01-01A-245	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-220	LOM 402, 404, 406, 407, 411, 416, 445
28	Packing	79-21-01-01A-230	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-210	LOM 402, 404, 406, 407, 411, 416, 445
30	Packing	79-21-01-01A-235	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
30 (cont.)		79-21-01-01B-215	LOM 402, 404, 406, 407, 411, 416, 445

F. Location Zones

Zone	Area
411	Engine 1 - Engine
412	Engine 1 - Nose Inlet Cowl

G. Packing Replacement

SUBTASK 79-21-01-010-004-F00

(1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-21-01-020-015-F00

(2) Remove the detectors from the lubrication unit (TASK 79-21-05-000-806-F00 or TASK 79-21-05-000-807-F00).

SUBTASK 79-21-01-020-016-F00

(3) Remove each check valve with tool set, SPL-9649, as follows (Figure 805):

(a) Retract the finger and lock in position with the latch.

(b) Install the tool through the lubrication unit sleeve [29] in the scavenge.

(c) Push the outer sealing spool [31] and release the latch.

(d) Engage the finger in the oil port to the pump.

(e) Engage the latch into the body of the tool to lock the finger in extended position.

WARNING LOCK THE SPOOL VALVES BEFORE YOU REMOVE THE FASTENERS FOR THE RETAINING PLATE. SPOOL VALVE EXTENSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(f) Remove the bolts [27], washers [25], nuts [24], and retaining plate [26].

(g) Use the wrench to remove the lubrication unit sleeve [29].

(h) Remove and discard the packing [28].

(i) Hold the body, release the latch and carefully retract the finger to release the lubrication unit outer sealing spool assembly springs.

(j) Remove the lubrication unit sealing spool assembly.

(k) Remove and discard the packing [30] from the outer sealing spool [31] and packing [21] from the inner sealing spool [22].

(l) Examine the inner diameter of the outer sealing spool [31] for the presence of wear as follows:

1) If the wear is less than 0.024 in. (0.61 mm), the part is serviceable.

2) If the wear is 0.024 in. (0.61 mm) - 0.028 in. (0.71 mm), a continue-in-service extension of 500 hours is permitted.

3) If the wear is more than 0.028 in. (0.71 mm), discard the outer sealing spool [31].

SUBTASK 79-21-01-420-008-F00

(4) Install each check valve with tool set, SPL-9649, as follows:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Make sure that the check valve location in the lubrication unit is clean.

NOTE: If the location is not clean, it can cause an incorrect installation of the packings in the groove of the outer and inner sealing spool.

(b) Apply a light layer of oil, D00599 [CP2442], on the packing [30], packing [21], and packing [28].

(c) Install the new packing [30] on the outer sealing spool [31] groove.

(d) Install the new packing [21] on the inner sealing spool [22] groove.

(e) Install the spring [32] and spring [23] in the scavenge screen hole.

(f) Install the lubrication unit sealing spool assembly in the scavenge cavity.

(g) Retract the finger and lock in position with the latch.

(h) Install the tool in the scavenge.

(i) Push the lubrication unit outer sealing spool and release the latch.

(j) Engage the finger in the oil port to the pump.

(k) Engage the latch into the body of the tool to lock the finger in the extended position.

(l) Install the packing [28] on the lubrication unit sleeve [29].

(m) Install the lubrication unit sleeve [29].

(n) Do these steps to install the retaining plate [26]:

1) Hold the retaining plate [26] on the housing and install two bolts [27], washers [25], and nuts [24].

a) Tighten the nuts [24] to 39.9 in-lb (4.5 N·m) - 48.6 in-lb (5.5 N·m).

(o) Hold the body, release the latch and retract the finger and remove the body from the lubrication unit.

SUBTASK 79-21-01-212-002-F00

(5) Make sure that the inner sealing spool [22] and outer sealing spool [31] move freely in the lubrication unit housing.

SUBTASK 79-21-01-410-006-F00

(6) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-21-01-790-003-F00

(7) Do this task: Test 3A - Idle-Power Leak Check, TASK 71-00-00-700-801-F00.

NOTE: You do the idle power leak check before you install the detectors.

SUBTASK 79-21-01-420-009-F00

(8) Install the applicable detectors in the lubrication unit (TASK 79-21-05-400-804-F00 or TASK 79-21-05-400-805-F00).

SUBTASK 79-21-01-612-001-F00

(9) If the oil level is low, replenish the engine oil (TASK 12-13-11-600-801).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MAIN OIL/FUEL HEAT EXCHANGER - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the main oil/fuel heat exchanger

(2) The installation of the main oil/fuel heat exchanger.

TASK 79-21-02-000-801-F00

2. Main Oil/Fuel Heat Exchanger Removal

(Figure 401)

A. General

(1) This task is the removal procedure for the main oil/fuel heat exchanger (referred to as the heat exchanger).

(2) The main oil/fuel heat exchanger is installed on the fuel pump package.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
73-11-07-000-801-F00	Servo Fuel Heater Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Removal

SUBTASK 79-21-02-840-001-F00

(1) Isolate the fuel from the fuel pump:

(a) Make sure that the electrical power is supplied (TASK 24-22-00-860-811).

(b) Make sure that the engine start lever is in the CUTOFF position.

1) Install a DO NOT OPERATE tag, STD-858, tag on the applicable engine start lever.

(c) Make sure that the ENG VALVE CLOSED and SPAR VALVE CLOSED lights on the fuel control panel (P5 overhead panel) are dim.

NOTE: The lights for the fuel shutoff valves have three positions:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

- Bright when the valves are in transition or when the valves do not agree with the commanded position
- Dim when the valves are closed
- Off when the valves are opened.

(d) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

1) Set the BAT switch on the Electrical Meters Battery and Galley Power Module (P5-13) to the OFF position and install a DO NOT OPERATE tag, STD-858.

SUBTASK 79-21-02-010-001-F00

(2) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-21-02-010-002-F00

(3) Do this task: Servo Fuel Heater Removal, TASK 73-11-07-000-801-F00.

G. Main Oil/Fuel Heat Exchanger Removal

SUBTASK 79-21-02-020-002-F00

WARNING	DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.
WARNING	DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE STOPS. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.
WARNING	DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.
CAUTION	DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.
CAUTION	MAKE SURE THAT YOU SEPARATE THE FUEL SERVO FROM THE HEAT EXCHANGER DUE TO THE CLEARANCE BETWEEN THE TOP OF THE HEAT EXCHANGER HOUSING AND THE SERVO HEATER HOUSING TO THE ADJACENT TUBES AND THE TGB. IF YOU DO NOT, THE CONTACT WITH THE FUEL PUMP STUDS CAN CAUSE DAMAGE TO THE HEAT-EXCHANGER FUEL-PUMP FLANGE.

(1) Disconnect the fuel tube [7] and fuel tube [3]:

(a) Disconnect the fuel tube [3] from the fuel tube [7].

1) Let the fuel drain from the fuel tube [3] and fuel tube [7].

(b) Remove the nut [15], bolt [14], and clamp [16] that attach the fuel tube [7] to the bracket [9].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL PRE CFM56-7B-79-0023 OR PRE CFM56-7B-72-0468

(c) Remove the bolts [6] and washers [20] that attach the fuel tube [7] to the heat exchanger [1].

LOM ALL POST CFM56-7B-79-0023 AND POST CFM56-7B-72-0468

(d) Remove the bolts [21] that attach the fuel tube [7] to the heat exchanger [1].

LOM ALL

(e) Disconnect the fuel tube [7] from the heat exchanger [1].

1) Let the fuel drain from the fuel tube [7] and heat exchanger [1].

(f) Remove and examine the gasket [8] (TASK 70-30-01-910-802-F00).

NOTE: Use the gasket if it is in good condition.

1) Discard the gasket [8] if it is in unsatisfactory condition.

(g) Push the fuel tube [7] forward of the heat exchanger [1].

NOTE: It is necessary to move the fuel tube to get access to the fasteners and to remove the heat exchanger. You can temporarily attach or put the fuel tube behind a different tube.

(h) Remove the bolts [2] that attach the fuel tube [3] to the Hydro-Mechanical Unit (HMU).

(i) Remove the fuel tube [3].

(j) Remove and examine the gasket [4].

NOTE: Use the gasket if it is in good condition.

1) Discard the gasket [4] if it is in unsatisfactory condition.

(k) Install protective covers on the fuel tubes (TASK 70-10-02-910-801-F00).

SUBTASK 79-21-02-020-005-F00

(2) Remove the drain tube [5]:

(a) Remove the nut [12], bolt [10], washer [11], and clamp [13] that attach the drain tube [5] to the bracket [9].

(b) Disconnect the drain tube [5] from the heat exchanger [1].

1) Let the fluid drain from the drain tube [5] and heat exchanger [1].

(c) Disconnect the drain tube [5] from the drain manifold.

1) Let the fluid drain from the drain tube [5] and drain manifold.

(d) Remove the drain tube [5].

1) Install protective covers on the drain tube [5].

SUBTASK 79-21-02-020-006-F00

(3) Remove the heat exchanger [1]:

(a) Remove the nuts [19] and washers [18] that attach the heat exchanger [1] to the fuel pump.

(b) Remove the heat exchanger [1] from the fuel pump.

(c) Remove and examine the gasket [17].

NOTE: Use the gasket if it is in good condition.

1) Discard the gasket [17] if it is in unsatisfactory condition.

2) Install protective covers on the fuel pump and the heat exchanger (TASK 70-10-02-910-801-F00).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-21-02-620-001-F00

(4) If it is necessary, do these steps for the preservation of the heat exchanger:

(a) Remove the protective plugs and caps from all the orifices.

(b) Put oil, D00599 [CP2442], in the oil and fuel circuits of the heat exchanger.

(c) Put protective plugs and caps in all the open orifices.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Main Oil/Fuel Heat-Exchanger Installation
Figure 401/79-21-02-990-801-F00 (Sheet 1 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F24658 S0006583676_V4

Main Oil/Fuel Heat-Exchanger Installation
Figure 401/79-21-02-990-801-F00 (Sheet 2 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

J61200 S0000173342_V3

Main Oil/Fuel Heat-Exchanger Installation
Figure 401/79-21-02-990-801-F00 (Sheet 3 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Main Oil/Fuel Heat-Exchanger Installation
Figure 401/79-21-02-990-801-F00 (Sheet 4 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-02-400-801-F00

3. Main Oil/Fuel Heat Exchanger Installation

(Figure 401)

A. General

(1) This task is the installation procedure for the main oil/fuel heat exchanger (referred to as the heat exchanger).

B. References

Reference	Title
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
73-11-07-400-801-F00	Servo Fuel Heater Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
D00601 [CP2101]	Vaseline - Graphite Mineral	
D00672 [CP5070]	Vaseline - Pure Mineral	V V-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	AMS 5687
G02495 [CP8002]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	AMS5689
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	M50 TF 9 CL-A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Heat exchanger	79-21-02-01-255	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-02-01A-100	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
4	Gasket	73-11-00-02A-310	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		73-11-00-02B-260	LOM 402, 404, 406, 407, 411, 416, 445
8	Gasket	73-11-00-02A-310	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
8 (cont.)		73-11-00-02B-260	LOM 402, 404, 406, 407, 411, 416, 445
17	Gasket	79-21-02-01-250	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-02-01A-095	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
22	Nipple	79-21-02-01-230	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-02-01A-075	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
23	O-ring	79-21-02-01-235	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-02-01A-080	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Prepare for the Installation

SUBTASK 79-21-02-630-001-F00

(1) If you did a preservation of the heat exchanger, drain the oil from the oil circuits and fuel circuits.

SUBTASK 79-21-02-840-002-F00

(2) Do these steps to prepare the heat exchanger for the installation (TASK 70-10-02-910-801-F00):

(a) Remove all the protective covers and caps.

(b) Clean the mating interfaces of the heat exchanger flanges, adapter, fuel pump, and adjacent areas with a cotton wiper, G00034.

(c) Make sure that the heat exchanger flanges, adapter, fuel pump, and adjacent areas are clean and in a good condition.

(d) Lubricate the gaskets with oil, D00599 [CP2442].

(e) Lubricate the threads of the bolts and studs with graphite mineral vaseline, D00601 [CP2101], before the installation.

(f) Lubricate the threads of the nipples with oil, D00599 [CP2442], before the connection.

H. Main Oil/Fuel Heat Exchanger Installation

SUBTASK 79-21-02-420-002-F00

(1) Install the heat exchanger [1] on the fuel pump:

(a) Install the gasket [17].

(b) Put the heat exchanger [1] in its position on the fuel pump.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) Attach the heat exchanger [1] to the fuel pump with the washers [18] and nuts [19].

1) Tighten the nuts [19] to 120 in-lb (13.6 N·m) - 140 in-lb (15.8 N·m) in a criss-cross pattern.

SUBTASK 79-21-02-420-003-F00

(2) Install the drain tube [5]:

CAUTION	USE TWO WRENCHES TO TIGHTEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TURN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(a) Connect the drain tube [5] to the drain manifold.

1) Tighten the tube coupling nut to 257 in-lb (29.0 N·m) - 284 in-lb (32.1 N·m).

(b) Connect the drain tube [5] to the heat exchanger [1] as follows:

1) If not installed, install the nipple [22] with the new O-ring [23] on the heat exchanger [1] as follows:

a) Lubricate the threads of the nipple [22] with engine oil, D00599 [CP2442].

b) Lubricate the new O-ring [23] with pure mineral vaseline, D00672 [CP5070].

c) Install the O-ring [23] into the groove of the nipple [22].

d) Install the nipple [22] in the port of the heat exchanger [1].

e) Tighten the nipple [22] to 170 in-lb (19.2 N·m) - 185 in-lb (20.9 N·m).

f) Fix the nipple [22] with a safety wire, G02345 [CP8001], safety wire, G02495 [CP8002], or cable, G50065 [CP8006].

2) Connect the drain tube [5] to the heat exchanger [1].

3) Tighten the tube coupling nut to 257 in-lb (29.0 N·m) - 284 in-lb (32.1 N·m).

(c) Attach the drain tube [5] to the bracket [9] with the clamp [13], bolt [10], washer [11], and nut [12].

1) Tighten the nut [12] to 63 in-lb (7.1 N·m) - 67 in-lb (7.6 N·m).

LOM ALL PRE CFM56-7B-79-0023 OR PRE CFM56-7B-72-0468

SUBTASK 79-21-02-420-006-F00

(3) Connect the fuel tube [7] and fuel tube [3]:

(a) Install the gasket [8].

(b) Connect the fuel tube [7] to the heat exchanger [1] with the bolts [6] and washers [20].

(c) Install the gasket [4].

(d) Put the fuel tube [3] in its position.

(e) Install the bolts [2].

(f) Connect the fuel tube [3] to the fuel tube [7].

(g) Attach the fuel tube [7] to the bracket [9] with the clamp [16], bolt [14], and nut [15].

(h) Tighten the bolts [6] as follows:

NOTE: You must apply the following steps at each of the four bolts [6] to cross-tighten them.

Start with the first bolt at the top left side of the port.

The second bolt is at the diagonal opposite location of the first bolt.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL PRE CFM56-7B-79-0023 OR PRE CFM56-7B-72-0468 (Continued)

The third bolt is at the bottom left side of the port.

The fourth bolt is at the diagonal opposite location of the third bolt.

1) Tighten the bolts [6] to 40 in-lb (4.5 N·m) - 45 in-lb (5.1 N·m).
2) Loosen the bolts [6] but do not remove them.
3) Measure the locking tighten of each bolt [6].
4) This value must be least 2 in-lb (0.2 N·m), if not, replace the bolt [6]
5) If the locking tighten is still below 2 in-lb (0.2 N·m), replace the heat exchanger.
6) Tighten the bolts [6] to 49 in-lb (5.5 N·m) - 53 in-lb (6.0 N·m).

(i) Tighten the bolts [2] to 49 in-lb (5.5 N·m) - 53 in-lb (6.0 N·m).

(j) Tighten the tube coupling nut to 900 in-lb (101.7 N·m) - 1100 in-lb (124.3 N·m).

(k) Tighten the nut [15] to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

LOM ALL POST CFM56-7B-79-0023 AND POST CFM56-7B-72-0468

SUBTASK 79-21-02-430-001-F00

(4) Connect the fuel tube [7] and fuel tube [3]:

(a) Install the gasket [8].

(b) Connect the fuel tube [7] to the heat exchanger [1] with the bolts [21].

(c) Install the gasket [4].

(d) Put the fuel tube [3] in its position.

(e) Install the bolts [2].

(f) Connect the fuel tube [3] to the fuel tube [7].

(g) Attach the fuel tube [7] to the bracket [9] with the clamp [16], bolt [14], and nut [15].

(h) Tighten the bolts [21] as follows:

NOTE: You must apply the following steps at each of the four bolts [21] to cross-tighten them.

Start with the first bolt at the top left side of the port.

The second bolt is at the diagonal opposite location of the first bolt.

The third bolt is at the bottom left side of the port.

The fourth bolt is at the diagonal opposite location of the third bolt.

1) Tighten the bolts [21] to 40 in-lb (4.5 N·m) - 45 in-lb (5.1 N·m).
2) Loosen the bolts [21] but do not remove them.
3) Measure the locking tighten of each bolt [21].
4) This value must be at least 2 in-lb (0.2 N·m), if not, replace the bolt [21].
5) If the locking tighten is still below 2 in-lb (0.2 N·m), replace the heater exchanger.
6) Tighten the bolts [21] to 49 in-lb (5.5 N·m) - 53 in-lb (6.0 N·m).

(i) Tighten the bolts [2] to 49 in-lb (5.5 N·m) - 53 in-lb (6.0 N·m).

(j) Tighten the tube coupling nut to 900 in-lb (101.7 N·m) - 1100 in-lb (124.3 N·m).

(k) Tighten the nut [15] to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

I. Put the Airplane Back to Its Usual Condition

SUBTASK 79-21-02-410-003-F00

(1) Do this task: Servo Fuel Heater Installation, TASK 73-11-07-400-801-F00.

SUBTASK 79-21-02-410-002-F00

(2) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-21-02-860-006-F00

(3) Remove the DO NOT OPERATE tag, STD-858, from the start levers.

SUBTASK 79-21-02-860-007-F00

(4) Remove the DO NOT OPERATE tag, STD-858, from the BAT switch.

J. Main Oil/Fuel Heat Exchanger Installation Test

SUBTASK 79-21-02-800-001-F00

(1) Do the test listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

OIL SUPPLY FILTER - REMOVAL/INSTALLATION

1. **General**
   A. This procedure contains scheduled maintenance task data.
   B. This procedure contains these tasks:
      (1) The removal of the oil supply filter
      (2) The installation of the oil supply filter.

TASK 79-21-03-000-802-F00

2. **Oil Supply Filter Removal**
(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General
(1) This task is the removal procedure for the oil supply filter (referred to as the filter).
(2) The lubrication unit is located on the aft side of the accessory gearbox (AGB) at approximately the 7:00 o'clock position.
(3) The engine has one oil supply filter installed in a cavity of the lubrication unit housing.
(4) This procedure refers to the oil supply filter housing as the filter housing.

B. References

Reference	Title
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-195	Container - 1 Quart, Oil/Fuel Resistant

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 79-21-03-860-005-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-03-860-006-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 79-21-03-010-002-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. Oil Supply Filter Removal

SUBTASK 79-21-03-680-002-F00

(1) Drain the filter housing (Figure 401):

(a) Put a 1 quart oil/fuel resistant container, STD-195, below the filter.

WARNING DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

WARNING DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE SHUTDOWN. A PRESSURIZED ENGINE CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

WARNING DO NOT LET HOT OIL GET ON YOU. PUT ON GOGGLES AND OTHER EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

CAUTION DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

(b) Remove the drain plug [9] from the bottom of the cover [7].

1) Let the oil drain from the filter housing.

(c) Remove and discard the packing [8].

SUBTASK 79-21-03-020-002-F00

(2) Remove the filter element [4] (Figure 401):

(a) Remove the three bolts [10], washers [1] and nuts [2] that attach the cover [7] to the filter housing.

(b) Remove the cover [7] from the filter housing with your hands.

(c) Remove and discard the packing [6] from the cover [7].

(d) Remove and discard the filter element [4], packing [3] and packing [5].

(e) Install a protective cover on the filter housing General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Supply Filter Installation
Figure 401/79-21-03-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-03-400-801-F00

3. Oil Supply Filter Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task is the installation procedure for the oil supply filter (referred to as the filter).

(2) This procedure refers to the oil supply filter housing as the filter housing.

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
79-00-00-200-805-F00	Oil Supply Filter Pop-Out Indicator Inspection (Visual Check) (P/B 601)

C. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
D00601 [CP2101]	Vaseline - Graphite Mineral	
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	M50 TF 9 CL-A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Packing	79-21-01-01A-105	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-060	LOM 402, 404, 406, 407, 411, 416, 445
4	Filter element	79-21-01-01A-110	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-065	LOM 402, 404, 406, 407, 411, 416, 445
5	Packing	79-21-01-01A-105	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-060	LOM 402, 404, 406, 407, 411, 416, 445
6	Packing	79-21-01-01A-100	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-055	LOM 402, 404, 406, 407, 411, 416, 445

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Packing	79-21-01-01A-075	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-038	LOM 402, 404, 406, 407, 411, 416, 445

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Installation

SUBTASK 79-21-03-100-001-F00

(1) Do these steps to prepare the filter housing for the installation:

(a) Do this task: General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

(b) Make sure that the mating flanges to the cover [7] and the filter housing are clean and in good condition.

(c) Make sure that the grooves of the new filter element [4] are clean and in good condition.

(d) Remove the protective cover from the filter housing.

G. Oil Supply Filter Installation

SUBTASK 79-21-03-420-001-F00

(1) Install the filter element [4].

(a) Lubricate the new packing [3], packing [5], packing [6], and packing [8] with oil, D00599 [CP2442].

> **CAUTION**
> MAKE SURE THAT YOU INSTALL THE PACKING CORRECTLY DURING THE INSTALLATION PROCEDURE. IF YOU DO NOT INSTALL THE PACKING CORRECTLY, OIL LOSS AND DAMAGE TO THE ENGINE CAN OCCUR.

(b) Install the packing [3] and packing [5] on the filter element [4].

(c) Install the packing [6] on the cover [7].

(d) Carefully, engage the new filter element [4], with the packing [3] and packing [5], in the filter housing.

(e) Install the cover [7] on the filter housing.

1) Make sure that the oil filter cover [7] does not interfere with the clogging indicator.

(f) Lubricate the bolts [10] with graphite mineral vaseline, D00601 [CP2101].

(g) Install the bolts [10], washers [1], and nuts [2] that attach the cover [7] to the filter housing.

1) Tighten the bolts [10] to 45 in-lb (5 N·m) - 50 in-lb (5.6 N·m).

(h) Install the packing [8] on the drain plug [9].

(i) Install the drain plug [9] on the cover [7].

1) Tighten the drain plug [9] to 45 in-lb (5 N·m) - 50 in-lb (5.6 N·m).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2) Install safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the drain plug [9].

SUBTASK 79-21-03-210-001-F00

(2) Do a visual check of the red clogging indicator [11].

(a) If you can see the red clogging indicator [11], do these steps:

1) Do the steps below to set the red clogging indicator [11].

2) Do this task: Oil Supply Filter Pop-Out Indicator Inspection (Visual Check), TASK 79-00-00-200-805-F00.

(b) If you can not see the red clogging indicator [11], put the airplane back to its usual condition.

SUBTASK 79-21-03-820-001-F00

(3) Set the red clogging indicator [11].

(a) Manually remove the knurled retaining ring [13].

(b) Remove the glass inspection bowl [12].

(c) Push the button on the red clogging indicator [11] to the retracted position.

NOTE: The button must stay in the retracted position.

(d) Install the glass inspection bowl [12].

(e) Lubricate the knurled retaining ring [13] with oil, D00599 [CP2442].

(f) Install the knurled retaining ring [13] with your hand.

(g) Make sure that the red clogging indicator [11] stays in its retracted position.

(h) Install safety wire, G02345 [CP8001], or cable, G50065 [CP8006], to the knurled retaining ring [13] and the clogging indicator body.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 79-21-03-410-002-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-21-03-860-007-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-03-860-008-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

I. Oil Supply Filter Installation Test

SUBTASK 79-21-03-800-001-F00

(1) Do the applicable tests given in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-21-03-610-002-F00

(2) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SCAVENGE OIL FILTER ASSEMBLY - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the scavenge oil filter assembly.

(2) The installation of the scavenge oil filter assembly.

TASK 79-21-04-000-801-F00

2. Scavenge Oil Filter Assembly Removal

(Figure 401)

A. General

(1) This task is the removal procedure for the scavenge oil filter assembly (referred to as the filter assembly).

(2) The scavenge oil filter assembly is located on the aft face of the accessory gearbox (AGB) at the 7:00 o'clock position.

B. References

Reference	Title
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-195	Container - 1 Quart, Oil/Fuel Resistant

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 79-21-04-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-04-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-21-04-010-001-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. Scavenge Oil Filter Assembly Removal

SUBTASK 79-21-04-020-002-F00

(1) Remove the filter assembly [9]:

(a) Disconnect the electrical connector, DP0703 [4] from the clogging transmitter receptacle.

(b) Put a 1 quart oil/fuel resistant container, STD-195, below the filter assembly [9].

(c) Remove the four bolts [5] to disconnect the inlet hose [6] from the filter assembly [9].

(d) Loosen the four bolts [8] that attach the inlet tube [6] to the lubrication unit.

NOTE: This will give sufficient clearance between the inlet tube and the filter to remove and install the gasket.

(e) Remove and examine the gasket [7] Seals (Preformed Packings and O-Rings) and Gaskets, TASK 70-30-01-910-802-F00.

NOTE: Use the gasket if it is in good condition.

1) Discard the gasket [7], if it is in unsatisfactory condition.

(f) Remove the four bolts [1] to disconnect the outlet hose [2] from the filter assembly [9].

(g) Remove and examine the gasket [12].

NOTE: Use the gasket if it is in good condition.

1) Discard the gasket [12], if it is in unsatisfactory condition.

(h) Remove the three bolts [10] and the three washers [11] that attach the filter assembly [9] to the AGB.

(i) Remove the filter assembly [9].

1) Let the oil drain in the container.

(j) Install protective covers on the filter assembly [9] and the hose flanges General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Scavenge Oil Filter Assembly Installation
Figure 401/79-21-04-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-04-400-801-F00

3. Scavenge Oil Filter Assembly Installation

(Figure 401)

A. General

(1) This task is the installation procedure for the scavenge oil filter assembly (referred to as the filter assembly).

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00599 [CP2442]	Oil - Engine	
D00601 [CP2101]	Vaseline - Graphite Mineral	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Gasket	79-21-00-01-115	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-00-01A-205	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
12	Gasket	79-21-00-01-090	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-00-01A-175	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Installation

SUBTASK 79-21-04-840-001-F00

(1) Do these steps to prepare the filter assembly [9] for the installation General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00:

(a) Remove the protective covers from the filter assembly [9] and the hose flanges.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Clean the flanges on the filter and the hose flanges with alcohol, B00130 and a cotton wiper, G00034.

(c) Make sure that all the flanges on the filter and the hoses are clean and in good condition.

G. Scavenge Oil Filter Assembly Installation

SUBTASK 79-21-04-420-001-F00

(1) Install the filter assembly [9]:

(a) Lubricate the threads of the three bolts [10] with graphite mineral vaseline, D00601 [CP2101].

(b) Put the filter assembly [9] in its position.

(c) Install the three bolts [10] and the three washers [11] to attach the filter assembly [9] to the AGB.

1) Tighten the bolts [10] to 370-400 pound-inches (42-45 Newton meters).

SUBTASK 79-21-04-420-002-F00

(2) Install the outlet hose [2]:

(a) Lubricate the four bolts [1] with graphite mineral vaseline, D00601 [CP2101].

(b) Lubricate the gasket [12] with oil, D00599 [CP2442].

(c) Install the gasket [12] between the outlet hose [2] and the filter assembly [9].

(d) Install the four bolts [1] to attach the outlet hose [2] to the filter assembly [9].

1) Tighten the bolts [1] to 98-110 pound-inches (11.0-12.5 Newton meters).

SUBTASK 79-21-04-420-003-F00

(3) Install the inlet hose [6]:

(a) Lubricate the four bolts [5] with graphite mineral vaseline, D00601 [CP2101].

(b) Lubricate the gasket [7] with oil, D00599 [CP2442].

(c) Install the gasket [7] between the inlet hose [6] and the filter assembly [9].

(d) Install the four bolts [5] to attach the inlet hose [6] to the filter assembly [9].

1) Tighten the bolts [5] to 98-110 pound-inches (11-12.5 Newton meters).

(e) Tighten the bolts [8] at the lubrication unit to 49-53 pound-inches (5.5-6 Newton meters).

SUBTASK 79-21-04-420-004-F00

(4) Connect the electrical connector, DP0703 [4] to the clogging transmitter receptacle.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 79-21-04-410-002-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-21-04-860-005-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-21-04-860-006-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

I. Filter Assembly Installation Test

SUBTASK 79-21-04-800-001-F00

(1) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

SUBTASK 79-21-04-610-002-F00

(2) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHIP DETECTOR REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

LOM ALL; ENGINES WITH MAGNETIC CHIP DETECTOR

(1) A removal of the Magnetic Chip Detector (MCD).

(2) An installation of the MCD.

LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM

(3) A removal of the Debris Monitoring System (DMS) detector.

(4) An installation of the DMS detector.

LOM ALL; ENGINES WITH MAGNETIC CHIP DETECTOR

TASK 79-21-05-000-806-F00

2. Magnetic Chip Detector (MCD) Removal

(Figure 401)

A. General

(1) This task provides the instructions on how to remove the Magnetic Chip Detector (MCD).

(2) The MCDs are located on the lubrication unit at the 6:00 o'clock position.

(3) The engine has three MCDs in the lubrication unit.

B. References

Reference	Title
79-00-00-200-804-F00	Chip Detectors and Scavenge Screens - Inspection (P/B 601)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2447	Puller - Magnetic Plug, Lubrication Unit Part #: 856A3617G01 Supplier: 58828

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Access Panels

Number	Name/Location
413BL	Chip Detector/Pressure Relief Door, Engine 1
423BL	Chip Detector/Pressure Relief Door, Engine 2

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F. Prepare for the Removal

SUBTASK 79-21-05-010-004-F00

(1) Open the Chip Detector/Pressure Relief Door access panels.

Number	Name/Location
413BL	Chip Detector/Pressure Relief Door, Engine 1
423BL	Chip Detector/Pressure Relief Door, Engine 2

SUBTASK 79-21-05-100-005-F00

(2) Make sure that the area around each magnetic chip detector [6] is clean before you remove it.

G. Magnetic Chip Detector Removal

SUBTASK 79-21-05-020-005-F00

(1) Remove the magnetic chip detector [6]:

> **WARNING** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

(a) Install the puller, SPL-2447, on the magnetic chip detector [6].

> **CAUTION** REMOVE AND TAG ONE MAGNETIC CHIP DETECTOR AT A TIME. THIS CAN PREVENT AN ERROR IN IDENTIFICATION OF THE SOURCE OF THE MATERIAL ON THE MAGNETIC CHIP DETECTORS. IF YOU DO NOT OBEY, DAMAGE CAN OCCUR.

(b) When you remove each magnetic chip detector [6], attach a tag to identify it.

1) The tags identify the plug location to each scavenge circuit (AGB/TGB Sump Scavenge, FWD Sump Scavenge, or AFT Sump Scavenge).

(c) Push and turn the magnetic chip detector [6] 1/4 turn counterclockwise.

(d) Pull the magnetic chip detector [6] and tool assembly from the lubrication unit.

1) Make sure that you do not lose the debris from the scavenge screen [1] and magnetic chip detector [6], to bring them for analysis if it is necessary.

2) Make sure that you do not move the particles from the magnetic chip detector [6] or scavenge screen [1].

(e) Remove the puller, SPL-2447, from the magnetic chip detector [6].

(f) Push the spring-loaded pin [2].

(g) Remove the scavenge screen [1].

(h) Immediately, examine the magnetic plug [7] and scavenge screen [1] very carefully for unusual or unwanted material (TASK 79-00-00-200-804-F00).

NOTE: Be careful not to remove the debris on the scavenge screen.

(i) Remove and discard the packing [3].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Chip Detector Installation
Figure 401/79-21-05-990-804-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-05-400-804-F00

3. **Magnetic Chip Detector (MCD) Installation**
(Figure 401)

A. **General**

(1) This task provides the instructions on how to install the Magnetic Chip Detector (MCD).

(2) The MCDs are located on the lubrication unit at the 6:00 o'clock position.

(3) The engine has three MCDs in the lubrication unit.

B. **References**

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)

C. **Tools/Equipment**

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-2447	Puller - Magnetic Plug, Lubrication Unit Part #: 856A3617G01 Supplier: 58828
SPL-2449	Tool - Seal Fitting, D-Shape Part #: 856A3557G01 Supplier: 58828

D. **Consumable Materials**

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	

E. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Scavenge screen	79-21-01-01A-135	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-090	LOM 402, 404, 406, 407, 411, 416, 445
3	Packing	79-21-01-01A-120	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-075	LOM 402, 404, 406, 407, 411, 416, 445
5	D-shaped seal	79-21-01-01A-130	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-085	LOM 402, 404, 406, 407, 411, 416, 445

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Magnetic chip detector	79-21-01-01A-125	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-080	LOM 402, 404, 406, 407, 411, 416, 445

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Access Panels

Number	Name/Location
413BL	Chip Detector/Pressure Relief Door, Engine 1
423BL	Chip Detector/Pressure Relief Door, Engine 2

H. Prepare for the Installation

SUBTASK 79-21-05-210-004-F00

(1) Do these steps to prepare the magnetic chip detector [6] for the installation:

(a) Examine the D-shaped seal [5] for tears, cuts, or other damage (TASK 70-30-01-910-802-F00).

1) Use the D-shaped seal [5] again, if it is in good condition.

(b) If there is damage to the D-shaped seal [5], replace the seal as follows:

1) Break the D-shaped seal [5].

2) Remove and discard the D-shaped seal [5] from the groove.

3) Lubricate a new D-shaped seal [5] with oil, D00599 [CP2442].

4) Install the D-shaped seal [5] in the groove nearest the handle of the magnetic chip detector [6], with the tool, SPL-2449.

NOTE: The D-shaped seal does not replace the packing. You must install the two seals for a correct sealing of the magnetic chip detector.

CAUTION MAKE SURE THAT YOU INSTALL A PACKING. THE INSTALLATION OF THE MAGNETIC CHIP DETECTOR WITHOUT A PACKING CAN CAUSE OIL LOSS DURING ENGINE OPERATION AND POSSIBLE ENGINE FAILURE.

(c) Lubricate a new packing [3] with oil, D00599 [CP2442].

1) Install the packing [3] in the magnetic chip detector groove.

(d) Install the scavenge screen [1] on the magnetic chip detector [6].

I. Magnetic Chip Detector Installation

SUBTASK 79-21-05-420-005-F00

(1) Install the magnetic chip detector [6]:

(a) Install the puller, SPL-2447, on the magnetic chip detector [6].

(b) Carefully, engage the magnetic chip detector [6] in the lubrication unit.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; ENGINES WITH MAGNETIC CHIP DETECTOR (Continued)

(c) Align the bayonet pins [4] with the slots of the bayonet housing on the lubrication unit.

(d) At the same time, push and turn the magnetic chip detector [6] and tool assembly 1/4 turn clockwise.

> **CAUTION**
> MAKE SURE THAT YOU INSTALL THE MAGNETIC CHIP DETECTORS CORRECTLY WITH THE TWO BAYONET PINS ENGAGED. MAKE SURE THAT YOU CAN SEE THE RED STRIPES CLEARLY THROUGH THE LUBRICATION UNIT SLOTS. THE INCORRECT INSTALLATION CAN CAUSE OIL LOSS DURING ENGINE OPERATION AND A POSSIBLE ENGINE FAILURE.

(e) Make sure that the magnetic chip detector [6] is correctly installed.

NOTE: The three plug handles must be aligned and in the locked position.

(f) Remove the puller, SPL-2447, from the magnetic chip detector [6].

J. Put the Airplane Back to Its Usual Condition

SUBTASK 79-21-05-610-005-F00

(1) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

SUBTASK 79-21-05-410-005-F00

(2) Close the Chip Detector/Pressure Relief Door access panels:

Number	Name/Location
413BL	Chip Detector/Pressure Relief Door, Engine 1
423BL	Chip Detector/Pressure Relief Door, Engine 2

END OF TASK

LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM

TASK 79-21-05-000-807-F00

4. Debris Monitoring System (DMS) Detector Removal

(Figure 402)

A. General

(1) This task provides the instructions on how to remove the Debris Monitoring System (DMS) detector.

(2) The DMS detectors are located on the lubrication unit at the 6:00 o'clock position.

(3) The engine has three DMS detectors in the lubrication unit.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
79-00-00-200-804-F00	Chip Detectors and Scavenge Screens - Inspection (P/B 601)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Reference	Description
COM-2460	Remover/Installer - Detector, Debris Monitoring System (DMS) Part #: 856A3900G01 Supplier: 06083

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 79-21-05-010-005-F00

(1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-21-05-100-006-F00

(2) Make sure that the area around each DMS detector [27] is clean before you remove it.

F. DMS Detector Removal

SUBTASK 79-21-05-020-006-F00

(1) Do these steps to remove one of the DMS detector [27] from the lubrication unit:

> **WARNING** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

> **CAUTION** REMOVE AND TAG ONE DMS DETECTOR AT A TIME. THIS CAN PREVENT AN ERROR IN IDENTIFICATION OF THE SOURCE OF THE MATERIAL ON THE DMS DETECTOR.

(a) When you remove each DMS detector [27], attach a tag to identify it.

NOTE: If the DMS detector is not to be replaced but only to be inspected for debris, it is not necessary to disconnect the DMS detector connectors from the DMS box. The tags identify the plug location to each scavenge circuit (AGB/TGB Scavenge, FWD Sump Scavenge, or AFT Sump Scavenge).

(b) Disconnect the applicable electrical connector, DJB802, DJB803, or DJB804 from the DMS box receptacle.

(c) Remove the three DMS detector [27] cables from the four spring clips.

(d) Use the remover/installer, COM-2460, to push and turn the DMS detector [27] 1/4 turn counterclockwise.

(e) Pull the DMS detector [27] from the lubrication unit.

1) Make sure that you do not lose the debris from the scavenge screen [21] and DMS detector [27], to bring them for analysis if it is necessary.

2) Make sure that you do not move the particles from the DMS detector [27] or scavenge screen [21].

(f) Push the spring-loaded pin [23].

(g) Remove the scavenge screen [21].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM (Continued)

(h) Immediately, examine the magnetic plug [22] and scavenge screen [21] very carefully for unusual or unwanted material (TASK 79-00-00-200-804-F00).

NOTE: Be careful not to remove the debris on the scavenge screen.

(i) Remove and discard the packing [24].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Chip Detector Installation
Figure 402/79-21-05-990-806-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Chip Detector Installation
Figure 402/79-21-05-990-806-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-05-400-805-F00

5. **Debris Monitoring System (DMS) Detector Installation**
(Figure 402)

A. **General**

(1) This task provides the instructions on how to install the Debris Monitoring System (DMS) detector.

(2) The DMS detectors are located on the lubrication unit at the 6:00 o'clock position.

(3) The engine has three DMS detectors in the lubrication unit.

B. **References**

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. **Tools/Equipment**

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2460	Remover/Installer - Detector, Debris Monitoring System (DMS) Part #: 856A3900G01 Supplier: 06083
SPL-2449	Tool - Seal Fitting, D-Shape Part #: 856A3557G01 Supplier: 58828

D. **Consumable Materials**

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	

E. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
21	Scavenge screen	79-21-05-01-060	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-05-01A-080	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
24	Packing	79-21-05-01-050	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-05-01A-070	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
25	D-shaped seal	79-21-05-01-055	LOM 402, 404, 406, 407, 411, 416, 445

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM (Continued)

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
25 (cont.)		79-21-05-01-055J	LOM 402, 404, 406, 407, 411, 416
		79-21-05-01A-075	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
27	DMS detector	79-21-05-01-045	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-05-01A-065	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Prepare for the Installation

SUBTASK 79-21-05-210-005-F00

(1) Do these steps to prepare the DMS detector [27] for the installation:

(a) Make sure that there is the DMS detector [27] round-head plug (small round and flat piece on the plug handle).

1) If there is a hole, replace the DMS detector [27] as quickly as possible.

(b) Examine the D-shaped seal [25] for tears, cuts, or other damage (TASK 70-30-01-910-802-F00).

1) Use the D-shaped seal [25] again, if it is in good condition.

(c) If there is damage to the D-shaped seal [25], replace the seal as follows:

1) Break the D-shaped seal [25].

2) Remove and discard the D-shaped seal [25] from the groove.

3) Lubricate a new D-shaped seal [25] with oil, D00599 [CP2442].

4) Install the D-shaped seal [25] in the groove nearest the cables of the DMS detector [27], with the tool, SPL-2449.

NOTE: The D-shaped seal does not replace the packing. You must install the two seals for a correct sealing of the DMS detector.

CAUTION DO NOT INSTALL THE DMS DETECTOR WITHOUT THE PACKING. INSTALLATION OF THE DMS DETECTOR WITHOUT A PACKING CAN CAUSE OIL LEAKAGE DURING ENGINE OPERATION AND POSSIBLE ENGINE DAMAGE.

(d) Lubricate a new packing [24] with oil, D00599 [CP2442].

1) Install the packing [24] in the DMS detector groove.

(e) Install the scavenge screen [21] on the DMS detector [27].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; ENGINES WITH DEBRIS MONITORING SYSTEM (Continued)

H. DMS Detector Installation

SUBTASK 79-21-05-420-006-F00

(1) Install the DMS detector [27]:

(a) Use remover/installer, COM-2460, to carefully engage the DMS detector [27] in the lubrication unit.

(b) Align the bayonet pins [26] with the slots of the bayonet housing on the lubrication unit.

(c) At the same time, push and turn the DMS detector [27] 1/4 turn clockwise.

> **CAUTION**
> MAKE SURE THAT YOU INSTALL THE DMS DETECTORS CORRECTLY WITH THE TWO BAYONET PINS ENGAGED. MAKE SURE THAT YOU CAN SEE THE RED STRIPES CLEARLY THROUGH THE LUBRICATION UNIT SLOTS. INCORRECT INSTALLATION CAN CAUSE OIL LEAKAGE DURING ENGINE OPERATION AND A POSSIBLE ENGINE SHUTDOWN.

(d) Make sure that the DMS detector [27] is correctly installed.

NOTE: The three plug handles must be aligned and in the locked position.

SUBTASK 79-21-05-420-007-F00

(2) Install the three DMS detector [27] cables:

> **CAUTION**
> MAKE SURE THAT THE ROUTING OF THE DMS DETECTOR HARNESS IS CORRECT. INCORRECT HARNESS ROUTING CAN CAUSE THE DETECTOR TO DISENGAGE FROM THE LUBE RECESS UNIT. THIS CAN CAUSE OIL LEAKAGE DURING ENGINE OPERATION AND POSSIBLE ENGINE DAMAGE.

(a) Install the three DMS detector [27] cables in the four spring clips (Figure 402).

NOTE: Start with the spring clip that is nearest to the DMS detector and end with the spring clip that is nearest to the DMS box connector. Do not cross the DMS detector cables.

(b) Connect the electrical connector DJB802, DJB803, or DJB804 to the applicable DMS box receptacle.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 79-21-05-410-006-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

J. DMS Detector Installation Test

SUBTASK 79-21-05-800-003-F00

(1) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

SUBTASK 79-21-05-610-006-F00

(2) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SCAVENGE OIL FILTER ELEMENT - REMOVAL/INSTALLATION

1. **General**
   A. This procedure contains scheduled maintenance task data.
   B. This procedure has two tasks:
      (1) The removal of the scavenge oil filter element.
      (2) The installation of the scavenge oil filter element.

TASK 79-21-06-000-801-F00

2. **Scavenge Oil Filter Element Removal**
(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task is the removal procedure for the scavenge oil filter element (referred to as the filter element).

(2) The scavenge oil filter assembly is attached to the aft face of the accessory gearbox (AGB) at the 7:00 o'clock position.

(3) Each scavenge oil filter assembly has a scavenge oil filter element and a filter bowl.

(4) The scavenge oil filter element is in the filter bowl of the scavenge oil filter assembly.

(5) This procedure refers to the scavenge oil filter assembly as the filter assembly.

B. References

Reference	Title
12-13-11-100-801	Flush the Engine Oil System (P/B 301)
71-00-02-000-801-F00	Power Plant - Removal (P/B 401)
71-00-02-400-801-F00	Power Plant - Installation (P/B 401)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
72-56-00-000-801-F00	Oil Supply Line Cleaning (P/B 701)
72-56-00-100-802-F00	Oil Scavenge Line Cleaning (P/B 701)
72-56-00-300-801-F00	Oil Supply Tube Replacement (P/B 801)
73-21-08-000-801-F00	EEC Alternator and Alternator Rotor Removal (P/B 401)
73-21-08-400-801-F00	EEC Alternator and Alternator Rotor Installation (P/B 401)
79-00-00-200-804-F00	Chip Detectors and Scavenge Screens - Inspection (P/B 601)
79-00-00-200-806-F01	Aft Sump Oil System Inspection (P/B 601)
79-21-01-400-803-F00	Packing Replacement On The Inner and Outer Sealing Spools (Lubrication Unit Removed) (P/B 801)
79-21-01-400-804-F00	Packing Replacement On The Inner and Outer Sealing Spools (Lubrication Unit Installed) (P/B 801)
79-21-05-400-804-F00	Magnetic Chip Detector (MCD) Installation (P/B 401)
79-21-05-400-805-F00	Debris Monitoring System (DMS) Detector Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-195	Container - 1 Quart, Oil/Fuel Resistant

ECCN 9E991 BOEING PROPRIETARY - See title page for details

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 79-21-06-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-06-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 79-21-06-010-001-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. Filter Element Removal

SUBTASK 79-21-06-420-004-F00

WARNING DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

WARNING DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE SHUTDOWN. A PRESSURIZED ENGINE CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

WARNING DO NOT LET HOT OIL GET ON YOU. PUT ON GOGGLES AND OTHER EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

CAUTION DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

(1) Remove the filter bowl [4]:

(a) Put a 1 quart oil/fuel resistant container, STD-195, below the filter assembly.

(b) Push the ratchet lever with one hand.

NOTE: This releases the filter bowl.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) While you push on the ratchet lever, loosen the filter bowl [4] counterclockwise with the other hand.

NOTE: If the filter bowl is too tight, put the blade of a large screwdriver between the lugs at the bottom of the filter bowl. Use the screwdriver only as a lever to "break" the tightening force of the filter bowl and to loosen it.

(d) Remove the filter bowl [4].

1) Let the oil in the filter bowl [4] drain into the container.

2) Examine the oil for unusual color or grit content.

(e) Remove and discard the packing [3] from the filter bowl [4].

SUBTASK 79-21-06-810-001-F00

(2) If the filter bowl is seized and the filter element removal is for the Oil Filter Bypass alert, it is necessary to do these steps:

(a) Assume the filter element has unwanted debris. Do the checks that follow before you put the engine back into service.

(b) Continue to the check of the filter element and do the applicable steps for these unwanted debris.

1) unusual debris

2) black packing debris

3) aluminum debris

SUBTASK 79-21-06-020-001-F00

(3) Pull the filter element [2] from the filter housing.

(a) Examine the filter element and the inside of the filter bowl [4] for unusual debris.

(b) If unusual debris is found, do this task: Chip Detectors and Scavenge Screens - Inspection, TASK 79-00-00-200-804-F00.

1) Do the corrective action for the unusual contamination.

(c) If black packing debris is found, it is probably from the inner and outer sealing spool valves on the lubrication unit, do these steps:

1) Replace the packing on the inner and outer spool of the lubrication unit. Do one of these tasks: Packing Replacement On The Inner and Outer Sealing Spools (Lubrication Unit Removed), TASK 79-21-01-400-803-F00 or Packing Replacement On The Inner and Outer Sealing Spools (Lubrication Unit Installed), TASK 79-21-01-400-804-F00.

2) If you do not replace these packings, a continue-in-service limit of 250 cycles is permitted with these conditions:

a) All three detectors are examined for correct installation [locked] by two different persons prior to the close of the fan cowls (TASK 79-21-05-400-804-F00 or TASK 79-21-05-400-805-F00).

NOTE: The first person does the initial installation and check. The second person does the second check.

b) Do the detector installation check again each time the fan cowls are opened.

(d) If aluminum debris is found, do these steps:

1) Do this task: EEC Alternator and Alternator Rotor Removal, TASK 73-21-08-000-801-F00.

2) Do a visual check of the EEC alternator and rotor for debris and obvious damage.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

3) Examine the alternator rotor area in the AGB for damage.
   a) If there is damage in the AGB, replace the engine. These are the tasks:Power Plant - Removal, TASK 71-00-02-000-801-F00 and Power Plant - Installation, TASK 71-00-02-400-801-F00.
   b) If there is no damage in the AGB but debris was found, remove the debris in the AGB pad and clean as necessary.
   c) Install a new EEC alternator and rotor, do this task: EEC Alternator and Alternator Rotor Installation, TASK 73-21-08-400-801-F00.
   d) Do this task:Flush the Engine Oil System, TASK 12-13-11-100-801.
4) Re-examine the AGB/TGB chip detector and scavenge oil filter element every 10 to 20 cycles until they are found to be clean.

(e) If coke/carbon debris is found in the filter or if oil drained from bowl is unusually heavy dark or has grit in it, do these steps:
1) Do a Check of the AFT sump oil system for Oil Leakage Aft Sump Oil System Inspection, TASK 79-00-00-200-806-F01.
2) If engine oil pressure trend does not show a gradual increase, do these tasks at the next convenient opportunity.
   a) Do this task:Oil Scavenge Line Cleaning, TASK 72-56-00-100-802-F00.
   b) Do this task: Oil Supply Line Cleaning, TASK 72-56-00-000-801-F00 or do this task:Oil Supply Tube Replacement, TASK 72-56-00-300-801-F00.
3) If the engine oil pressure trend show a gradual increase but is still in the limits, do these tasks in less than 25 cycles:
   a) Do this task: Oil Scavenge Line Cleaning, TASK 72-56-00-100-802-F00.
   b) Do this task: Oil Supply Line Cleaning, TASK 72-56-00-000-801-F00 or do this task:Oil Supply Tube Replacement, TASK 72-56-00-300-801-F00.
4) Monitor the engine oil pressure during the next 20-50 hours of operation.

(f) Discard the filter element [2] and the packing [1].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Scavenge Oil Filter Element Installation
Figure 401/79-21-06-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-06-400-801-F00

3. **Scavenge Oil Filter Element Installation**

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task is the installation procedure for the scavenge oil filter element (referred to as the filter element).

(2) This procedure refers to the scavenge oil filter assembly as the filter assembly.

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-3911	Brush - Bristle, Medium Nylon

D. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
D00640 [CP2104]	Lubricant - Molybdenum Disulfide, Solid - Molykote G Rapid Plus	
D00673 [CP2569]	Lubricant - Molybdenum Disulfide, Solid - Dow Corning G-n Metal Assembly	
D50019 [CP2444]	Lubricant - Molydisulfide Solid Film, Paste - Molykote G-n Plus	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Packing	79-21-04-01-130	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-04-01A-080	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
2	Filter element	79-21-04-01-125	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-04-01A-075	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
3	Packing	79-21-04-01-135	LOM 402, 404, 406, 407, 411, 416, 445

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
3 (cont.)		79-21-04-01A-085	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Filter Element Installation

SUBTASK 79-21-06-840-001-F00

(1) Do these steps to prepare for the installation General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00:

(a) Clean the mating interfaces of the filter housing and the filter bowl [4] with a cotton wiper, G00034.

(b) Make sure that the filter housing flanges and the filter bowl [4] are clean and in good condition.

SUBTASK 79-21-06-420-001-F00

(2) Install the new filter element [2]:

(a) Lubricate a new packing [1] and a new packing [3] with oil, D00599 [CP2442].

CAUTION MAKE SURE THAT YOU INSTALL THE PACKING CORRECTLY DURING THE INSTALLATION PROCEDURE. IF YOU DO NOT INSTALL THE PACKING CORRECTLY, OIL LOSS AND DAMAGE TO THE ENGINE CAN OCCUR.

(b) Install the packing [1] in the filter element groove.

(c) Put the filter element bore below the filter housing core.

(d) Push the filter element [2] on the filter housing core.

SUBTASK 79-21-06-420-002-F00

CAUTION DO NOT USE A TOOL TO TIGHTEN THE FILTER BOWL. IF YOU USE TOOLS TO TIGHTEN THE FILTER BOWL, DAMAGE TO THE FILTER ASSEMBLY CAN OCCUR.

(3) Install the filter bowl [4]:

CAUTION MAKE SURE THAT YOU INSTALL THE PACKING CORRECTLY DURING THE INSTALLATION PROCEDURE. IF YOU DO NOT INSTALL THE PACKING CORRECTLY, OIL LOSS AND DAMAGE TO THE ENGINE CAN OCCUR.

(a) Install the packing [3] in the filter bowl groove.

CAUTION MAKE SURE THAT YOU APPLY SUFFICIENT LUBRICANT ON ALL THREADS. IF YOU DO NOT APPLY SUFFICIENT LUBRICANT ON ALL CONTACT SURFACES, IT CAN CAUSE DAMAGE TO THE FILTER BOWL AND HOUSING THREADS.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(CAUTION PRECEDES)

> **CAUTION** MAKE SURE THAT THERE IS NO EXCESS LUBRICANT. MAKE SURE THAT THE LUBRICANT DOES NOT OVER-FLOW AS YOU TIGHTEN THE FILTER BOWL. IF THERE IS TOO MUCH LUBRICANT, IT CAN CAUSE DAMAGE TO THE EQUIPMENT.

(b) Use a medium nylon bristle brush, STD-3911, to lubricate the threads and the mating surfaces of the filter bowl [4] with Molykote G Rapid Plus lubricant, D00640 [CP2104], Dow Corning G-n Metal Assembly lubricant, D00673 [CP2569], or Molykote G-n Plus lubricant, D50019 [CP2444].

1) Make sure that there is no excess lubricant on the filter bowl.

a) If it is necessary, use a cotton wiper, G00034, to remove the excess lubricant.

(c) Align the filter bowl [4] with the filter housing.

(d) Engage the filter bowl [4] in the filter housing.

(e) Use one hand to press the ratchet lever to release it from the notches in the filter bowl [4].

(f) Use your other hand to turn the filter bowl [4] clockwise into the filter housing until the filter bowl [4] does not turn.

(g) Make sure that the ratchet lever fully engages a notch on the filter bowl [4] to hold the filter assembly in its position.

NOTE: This locks the filter bowl to the filter housing.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 79-21-06-410-002-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-21-06-860-005-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-06-860-006-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

I. Filter Element Installation Test

SUBTASK 79-21-06-800-001-F00

(1) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

SUBTASK 79-21-06-610-003-F00

(2) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SCAVENGE OIL FILTER CLOGGING TRANSMITTER - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the scavenge oil filter clogging transmitter.

(2) The installation of the scavenge oil filter clogging transmitter.

TASK 79-21-07-000-801-F00

2. Scavenge Oil Filter Clogging Transmitter Removal

(Figure 401)

A. General

(1) This task is the removal procedure for the scavenge oil filter clogging transmitter (referred to as the clogging transmitter).

(2) The clogging transmitter is located on the aft face of the scavenge oil filter assembly.

(3) This procedure refers to the scavenge oil filter assembly as the filter assembly.

B. References

Reference	Title
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

D. Consumable Materials

Reference	Description	Specification
B00676 [CP1041]	Alcohol - Isopropyl	
B00682 [CP2011]	Solvent - Stoddard	MIL-PRF-680 Type I, II or III

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Removal

SUBTASK 79-21-07-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-21-07-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 79-21-07-010-001-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

G. Clogging Transmitter Removal

SUBTASK 79-21-07-020-001-F00

WARNING DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

WARNING DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE IS STOPPED. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

WARNING DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

CAUTION DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

(1) Remove the clogging transmitter [1]:

(a) Clean the clogging transmitter [1] and clogging transmitter housing area with a soft bristle brush, STD-123 and solvent, B00682 [CP2011] or alcohol, B00676 [CP1041].

(b) Disconnect the electrical connector, DP0703 [4] from the clogging transmitter receptacle.

(c) Put a 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the filter assembly.

CAUTION DO NOT LET UNWANTED PARTICLES TOUCH THE CLOGGING TRANSMITTER. THE CLOGGING TRANSMITTER CONTAINS MAGNETIC COMPONENTS. CONTAMINATION IN THE CLOGGING TRANSMITTER PORTS CAN CAUSE DAMAGE TO EQUIPMENT.

(d) Remove the two bolts [3].

(e) Remove the clogging transmitter [1] from the clogging transmitter housing.

1) Let the oil drain in the container.

(f) Remove and discard the packing [2] and the packing [5].

(g) Install a protective cover on the clogging transmitter [1] General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G48642 S0006583712_V3

Scavenge Oil Filter Clogging Transmitter Installation
Figure 401/79-21-07-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-07-400-801-F00

3. Scavenge Oil Filter Clogging Transmitter Installation

(Figure 401)

A. General

(1) This task is the installation procedure for the scavenge oil filter clogging transmitter (referred to as the clogging transmitter).

B. References

Reference	Title
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
D00601 [CP2101]	Vaseline - Graphite Mineral	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Transmitter	79-21-07-01-025	LOM ALL
2	Packing	79-21-07-01-015	LOM ALL
5	Packing	79-21-07-01-020	LOM ALL

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Installation

SUBTASK 79-21-07-840-001-F00

(1) Do these steps to prepare the clogging transmitter [1] for the installation General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00:

(a) Remove the protective cover from the clogging transmitter [1].

> **WARNING** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

(b) Make sure that all the flanges on the clogging transmitter switch [1] and the clogging transmitter housing are clean and in good condition.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G. Pressure Switch Installation

SUBTASK 79-21-07-420-001-F00

> **CAUTION** THE CLOGGING TRANSMITTER CONTAINS MAGNETIZED COMPONENTS. DO NOT LET FOREIGN PARTICLES TOUCH THE CLOGGING TRANSMITTER. CONTAMINATION IN THE CLOGGING TRANSMITTER PORTS CAN CAUSE DAMAGE OF THE ENGINE COMPONENT.

(1) Install the clogging transmitter [1]:

(a) Lubricate the new packings [2] and [5] with oil, D00599 [CP2442].

> **CAUTION** MAKE SURE YOU INSTALL THE PACKING CORRECTLY ON THE CLOGGING TRANSMITTER. IF YOU DO NOT INSTALL THE PACKING CORRECTLY, OIL LOSS CAN OCCUR DURING ENGINE OPERATION AND CAN CAUSE DAMAGE TO THE ENGINE.

(b) Install the new packing [5] on the clogging transmitter [1].

(c) Install the new packing [2] on the clogging transmitter [1].

> **CAUTION** KEEP THE CLOGGING TRANSMITTER ALIGNED WITH THE CLOGGING TRANSMITTER HOUSING RECESS. YOU MUST BE CAREFUL WHEN YOU INSTALL THE CLOGGING TRANSMITTER OR DAMAGE CAN OCCUR.

(d) Install the clogging transmitter [1] in the clogging transmitter housing.

(e) Lubricate the two bolts [3] with graphite mineral vaseline, D00601 [CP2101].

(f) Install the two bolts [3].

1) Tighten the bolts [3] to 35-53 pound-inches (4-6 Newton meters).

SUBTASK 79-21-07-420-002-F00

(2) Connect the electrical connector, DP0703 [4] to the clogging transmitter receptacle.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 79-21-07-410-001-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-21-07-860-003-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-07-860-004-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

ECCN 9E991 BOEING PROPRIETARY - See title page for details

I. Clogging Transmitter Installation Test

SUBTASK 79-21-07-800-001-F00

(1) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

DEBRIS MONITORING SYSTEM (DMS) BOX - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the Debris Monitoring System (DMS) box.

(2) The installation of the Debris Monitoring System (DMS) box.

TASK 79-21-08-000-801-F00

2. Debris Monitoring System (DMS) Box Removal

(Figure 401)

A. General

(1) The DMS box is located on the right side of the lubrication unit at the end of the three harnesses from the DMS detectors.

B. References

Reference	Title
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 79-21-08-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-08-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 79-21-08-010-001-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

E. DMS Box Removal

SUBTASK 79-21-08-020-001-F00

(1) Remove the DMS box [2]:

(a) Disconnect the electrical connector, DP0806 [6] from the DMS box receptacle.

(b) Disconnect the electrical connectors, DJB802 [5], DJB803 [3] and DJB804 [4] from the DMS box receptacles.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) Remove the two bolts [1] that attach the DMS box [2] to the engine bracket.

(d) Remove the DMS box [2].

(e) Put protective covers in the openings of the DMS box and DMS detector connectors General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G58166 S0006583717_V2

Debris Monitoring System Box Installation
Figure 401/79-21-08-990-801-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

DEBRIS MONITORING SYSTEM BOX

B

G58174 S0006583718_V2

Debris Monitoring System Box Installation
Figure 401/79-21-08-990-801-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-08-400-801-F00

3. Debris Monitoring System (DMS) Box Installation

(Figure 401)

A. References

Reference	Title
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Box	79-21-05-01-040	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-05-01A-060	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. DMS Box Installation

SUBTASK 79-21-08-840-001-F00

(1) Do these steps to prepare the DMS box for the installation:

(a) Remove protective covers from the openings on the electrical connectors and DMS box General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

SUBTASK 79-21-08-420-001-F00

(2) Install the DMS box [2]:

(a) Put the DMS box [2] in its position.

NOTE: The three DMS box receptacles point at the AGB.

(b) Lubricate the two bolts [1] with oil, D00599 [CP2442].

(c) Install the two bolts [1] to attach the DMS box [2] to the engine bracket.

1) Tighten the two bolts to 98-110 pound-inches (11-12.5 Newton meters).

(d) Connect the electrical connectors, DJB802 [5], DJB803 [3] and DJB804 [4] to the DMS box receptacles.

NOTE: The wire harnesses must go straight from the spring clamp to the DMS box receptacles. Connect the electrical connectors to the DMS box receptacles and make sure the wire harnesses are not twisted or crossed.

(e) Connect the electrical connector, DP0806 [6] to the DMS box receptacle.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F. Put the Airplane Back to Its Usual Condition

SUBTASK 79-21-08-410-001-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-21-08-860-003-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-08-860-004-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

G. DMS Box Installation Test

SUBTASK 79-21-08-800-001-F00

(1) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

OIL ANTI-LEAK VALVE - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the oil anti-leak valve.

(2) The installation of the oil anti-leak valve.

TASK 79-21-09-000-801-F00

2. Oil Anti-Leak Valve Removal

(Figure 401)

A. General

(1) This task is the removal procedure for the oil anti-leak valve (referred to as the valve).

(2) The oil anti-leak valve is installed at the 6:00 o'clock position on the fan case.

B. References

Reference	Title
12-13-11-600-803	Drain the Engine Oil (P/B 301)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 79-21-09-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	10	C01361	DISPLAY DEU 1 HOLDUP

SUBTASK 79-21-09-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	9	C01362	DISPLAY DEU 2 HOLDUP

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	11	C01360	DISPLAY DEU 2 PRI

SUBTASK 79-21-09-010-001-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 79-21-09-680-001-F00

(4) Drain the oil from the oil tank Drain the Engine Oil, TASK 12-13-11-600-803.

F. Oil Anti-Leak Valve Removal

SUBTASK 79-21-09-020-001-F00

(1) Do these steps to prepare the valve [1] for removal:

(a) Put a 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the valve [1].

(b) Put protective caps on the connection interfaces after you disconnect them General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

SUBTASK 79-21-09-020-002-F00

WARNING DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

WARNING DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE SHUTDOWN. A PRESSURIZED ENGINE CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

WARNING DO NOT LET HOT OIL GET ON YOU. PUT ON GOGGLES AND OTHER EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

CAUTION DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

(2) Disconnect the oil supply tube from the valve [1]:

(a) Remove the bolt [2], nut [4] and clamp [3] that attach the oil supply tube to the engine bracket.

(b) Remove the four bolts [9] that attach the oil supply tube to the valve [1].

1) Let the oil drain in the container.

(c) Remove and examine the gasket [5] Seals (Preformed Packings and O-Rings) and Gaskets, TASK 70-30-01-910-802-F00.

NOTE: Use the gasket if it is in good condition.

1) Discard the gasket [5], if it is in unsatisfactory condition.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-21-09-020-003-F00

(3) Disconnect the oil pressure tube from the valve [1]:

(a) Disconnect the oil pressure tube from the valve [1].

1) Let the oil drain into the container.

SUBTASK 79-21-09-020-004-F00

(4) Disconnect the oil outlet tube from the valve [1]:

(a) Remove the four bolts [6] that attach the oil outlet tube to the valve [1].

(b) Remove and discard the packing [7].

SUBTASK 79-21-09-020-005-F00

(5) Remove the valve [1]:

(a) Remove the four bolts [8] that attach the valve [1] to the fan case bracket.

(b) Remove the valve [1].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Anti-Leak Valve Installation
Figure 401/79-21-09-990-801-F00 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

H32606 S0006583724_V2

Oil Anti-Leak Valve Installation
Figure 401/79-21-09-990-801-F00 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-09-400-801-F00

3. Oil Anti-Leak Valve Installation

(Figure 401)

A. General

(1) This task is the installation procedure for the oil anti-leak valve (referred to as the valve).

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
D00601 [CP2101]	Vaseline - Graphite Mineral	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Valve	79-21-00-03-090	LOM ALL
5	Gasket	79-21-00-03-080	LOM ALL
7	Packing	79-21-00-01-205	LOM 402, 404, 406, 407, 411, 416, 445
		79-21-00-01A-305	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Prepare for the Installation

SUBTASK 79-21-09-840-001-F00

(1) Do these steps to prepare the valve [1] for the installation General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00:

(a) Remove all the protective caps from the connection interfaces.

(b) Make sure that all the mating interfaces to the valve [1] are clean and in good condition.

> **CAUTION**
> EXAMINE THE USED GASKET FOR DAMAGE BEFORE YOU USE IT AGAIN. REPLACE THE GASKET AS NECESSARY. OIL LEAKAGE COULD OCCUR.

(c) Lubricate the gasket with oil, D00599 [CP2442].

(d) Lubricate the packing with oil, D00599 [CP2442].

(e) Lubricate the threads of all the bolts with graphite mineral vaseline, D00601 [CP2101].

(f) Lubricate the threads of the valve nipple with oil, D00599 [CP2442].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G. Oil Anti-Leak Valve Installation

SUBTASK 79-21-09-420-001-F00

(1) Install the valve [1]:

(a) Put the valve [1] in its position on the fan case bracket.

(b) Attach the valve [1] to the fan case bracket with the four bolts [8].

1) Tighten the bolts [8] to 98-110 pound-inches (11-12.5 Newton meters).

SUBTASK 79-21-09-420-002-F00

(2) Connect the oil outlet tube to the valve [1]:

> **CAUTION** MAKE SURE YOU INSTALL THE PACKING CORRECTLY ON THE VALVE. IF YOU DO NOT INSTALL THE PACKING CORRECTLY, OIL LOSS CAN OCCUR DURING ENGINE OPERATION AND CAN CAUSE DAMAGE TO THE ENGINE.

(a) Install the packing [7].

(b) Install the four bolts [6] to attach the oil outlet tube to the valve [1].

1) Tighten the bolts [6] to 98-110 pound-inches (11-12.5 Newton meters).

SUBTASK 79-21-09-420-003-F00

(3) Connect the oil pressure tube to the valve [1]:

> **CAUTION** USE TWO WRENCHES TO TIGHTEN THE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(a) Connect the oil pressure tube to the valve [1].

(b) Tighten the tube coupling nut to 135-150 pound-inches (15.3-17 Newton meters).

SUBTASK 79-21-09-420-004-F00

(4) Connect the oil supply tube to the valve [1]:

(a) Install the gasket [5].

(b) Install the four bolts [9] to attach the oil supply tube to the valve [1].

1) Tighten the bolts [9] to 98-110 pound-inches (11-12.5 Newton meters).

(c) Attach the supply tube to the engine bracket with the clamp [3], bolt [2] and nut [4].

1) Tighten the bolt [2] to 98-110 pound-inches (11-12.5 Newton meters).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 79-21-09-610-001-F00

(1) Do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

SUBTASK 79-21-09-410-001-F00

(2) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-21-09-860-003-F00

(3) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
D	5	C01359	DISPLAY DEU 1 PRI

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	10	C01361	DISPLAY DEU 1 HOLDUP

SUBTASK 79-21-09-860-004-F00

(4) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI

I. Oil Anti-Leak Valve Installation Test

SUBTASK 79-21-09-800-001-F00

(1) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CLOGGING INDICATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the clogging indicator

(2) The installation of the clogging indicator.

TASK 79-21-10-000-801-F00

2. Clogging Indicator Removal

(Figure 401)

A. General

(1) This task is the removal procedure for the clogging indicator.

(2) The clogging indicator is installed in a cavity of the lubrication unit housing.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-3941	Container - Calibrated, 1 quart (1 l), oil resistant

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 79-21-10-865-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-10-865-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 79-21-10-010-001-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F. Procedure

SUBTASK 79-21-10-490-001-F00

WARNING	DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

WARNING	DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE STOPS. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

WARNING	DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

CAUTION	IMMEDIATELY CLEAN OFF ALL ENGINE OIL THAT FALLS ON THE PAINTED SURFACES AND RUBBER PARTS OF THE AIRPLANE. THE SPECIFIED OIL FOR THIS OIL SYSTEM WILL CAUSE DAMAGE TO THE PAINTED SURFACES AND SOME TYPES OF RUBBER AND MUST NOT BE PERMITTED TO TOUCH THESE PARTS OF THE ENGINE. USE VERY CLEAN CONTAINERS AND EQUIPMENT. OIL CONTAMINATION BY SMALL QUANTITIES OF SOME ALKALINE CLEANERS CAN CAUSE A FAILURE OF THE SYNTHETIC OIL. DO NOT PUT THE OIL THAT IS DRAINED FROM THE ENGINE BACK INTO THE ENGINE.

(1) Put the 1 quart (1 l) oil resistant calibrated container, STD-3941 below the clogging indicator [1] to catch the oil.

SUBTASK 79-21-10-030-001-F00

(2) Remove the safety wire.

SUBTASK 79-21-10-616-001-F00

(3) Remove the clogging indicator [1].

(a) Let the oil drain in the container.

SUBTASK 79-21-10-030-002-F00

(4) Remove and discard the packing [2] and the packing [3].

SUBTASK 79-21-10-490-002-F00

(5) Install a cap in clogging indicator housing in the lubrication unit.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1844498 S0000327509_V2

Clogging Indicator Installation
Figure 401/79-21-10-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-21-10-400-801-F00

3. Clogging Indicator Installation

(Figure 401)

A. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	AMS 5687
G02495 [CP8002]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	AMS5689

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Clogging indicator	79-21-01-01A-150	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-110	LOM 402, 404, 406, 407, 411, 416, 445
2	Packing	79-21-01-01A-220	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-180	LOM 402, 404, 406, 407, 411, 416, 445
3	Packing	79-21-01-01A-225	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
		79-21-01-01B-185	LOM 402, 404, 406, 407, 411, 416, 445

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Installation

SUBTASK 79-21-10-030-003-F00

(1) Remove the protective cover from the clogging indicator [1].

SUBTASK 79-21-10-212-001-F00

> **WARNING** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

(2) Make sure that all the flanges on the clogging indicator [1] and the lubrication unit housing are clean and in good condition.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F. Procedure

SUBTASK 79-21-10-640-001-F00

> **WARNING** DO NOT LET OIL STAY ON YOUR SKIN. THE SYNTHETIC OIL CONTAINS ADDITIVES THAT CAN BE POISONOUS IF THEY ARE ABSORBED THROUGH THE SKIN. CLEAN AWAY ALL OIL THAT GETS ON THE SKIN.

(1) Lubricate the new packing [2] and the new packing [3] with oil, D00599 [CP2442].

SUBTASK 79-21-10-420-001-F00

> **CAUTION** DO NOT CAUSE DAMAGE TO THE PREFORMED PACKING. OIL LEAKS WILL OCCUR. THIS CAN CAUSE DAMAGE TO THE ENGINE.

(2) Install the new packing [2] and the new packing [3] on the clogging indicator [1].

SUBTASK 79-21-10-090-001-F00

(3) Remove the cap from the lubrication unit.

SUBTASK 79-21-10-430-001-F00

(4) Engage the clogging indicator [1] in the lubrication unit housing and fully install by hand.

SUBTASK 79-21-10-430-002-F00

(5) Tighten the clogging indicator [1] to 127-139 pound-inches (14.25-15.75 Newton meters).

SUBTASK 79-21-10-420-002-F00

(6) Install safety wire, G02345 [CP8001] or safety wire, G02495 [CP8002] on the clogging indicator [1].

G. Put the Airplane Back to its Usual Condition

SUBTASK 79-21-10-612-001-F00

(1) Do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

SUBTASK 79-21-10-865-003-F00

(2) For Engine 1, close these circuit breakers and remove the safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-21-10-865-004-F00

(3) For Engine 2, close these circuit breakers and remove the safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 79-21-10-410-001-F00

(4) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

H. Clogging Indicator Installation Test

SUBTASK 79-21-10-790-001-F00

(1) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

OIL QUANTITY INDICATING SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure contains one task, the system test procedure for the oil quantity indication system.

TASK 79-31-00-730-801-F00

2. System Test - Oil Quantity Indicating System

A. General

(1) The system test drains the oil tank and adds known quantities of oil to the oil tank.

(2) Approximately 2.2-2.76 quarts (2.1-2.6 liters) of oil are in the engine sumps.

(a) This oil is not usable by the engine and is not measured by the indicator system.

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
12-13-11-600-803	Drain the Engine Oil (P/B 301)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare to Do the System Test for the Oil Quantity Indicating System

SUBTASK 79-31-00-860-001-F00

(1) For Engine 1, make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	10	C01361	DISPLAY DEU 1 HOLDUP

SUBTASK 79-31-00-860-002-F00

(2) For Engine 2, make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI

SUBTASK 79-31-00-010-001-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Do the System Test for the Oil Quantity Indicating System

SUBTASK 79-31-00-680-001-F00

(1) Drain the oil from the oil tank Drain the Engine Oil, TASK 12-13-11-600-803.

SUBTASK 79-31-00-730-001-F00

(2) Do a check of the oil quantity indicating system:

(a) Add 2 U.S. quarts (1.90 liters) of oil to the oil tank.

(b) Make sure that the OIL QTY display reads zero to 6% or zero to one quart or zero to one liter.

(c) Add 10 U.S. quarts (9.50 liters) of oil to the oil tank.

(d) Make sure that the OIL QTY display reads 53 ±6% or 9 to 11 quarts or 8 to 11 liters.

(e) Add 9 U.S. quarts (8.50 liters) of oil to the oil tank.

(f) Make sure that the OIL QTY display reads 97 ±3% or 18 to 20 quarts or 17 to 19 liters.

SUBTASK 79-31-00-610-002-F00

(3) Do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

SUBTASK 79-31-00-410-001-F00

(4) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-31-00-800-001-F00

(5) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

OIL QUANTITY TRANSMITTER - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the oil quantity transmitter.

(2) The installation of the oil quantity transmitter.

TASK 79-31-01-000-801-F00

2. Oil Quantity Transmitter Removal

(Figure 401)

A. General

(1) This task gives instruction to remove the oil quantity transmitter (referred to as the transmitter).

(2) The oil quantity transmitter is installed on top of the oil tank cover.

(3) The engine has one oil quantity transmitter.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare for the Removal

SUBTASK 79-31-01-210-002-F00

(1) Record the oil quantity indicated in the flight compartment display.

NOTE: The oil quantity recorded will be used to make a comparison with the oil quantity after the oil quantity transmitter installation task is completed.

SUBTASK 79-31-01-860-001-F00

(2) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	10	C01361	DISPLAY DEU 1 HOLDUP

SUBTASK 79-31-01-860-002-F00

(3) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI

SUBTASK 79-31-01-010-001-F00

(4) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Oil Quantity Transmitter Removal

SUBTASK 79-31-01-020-002-F00

WARNING DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

WARNING DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE IS STOPPED. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

WARNING DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

CAUTION DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

(1) Remove the transmitter:

(a) Disconnect the electrical connector, DP1301 [11] from the transmitter receptacle.

(b) Remove the four bolts [1] and washers [2].

(c) Remove the oil quantity transmitter [9] from the oil tank recess [7].

(d) Put a protective cover on the oil tank recess [7].

(e) Remove and discard the packing [10] from the oil quantity transmitter [9].

——— **END OF TASK** ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F23012 S0006583733_V4

Oil Quantity Transmitter Installation
Figure 401/79-31-01-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-31-01-400-801-F00

3. Oil Quantity Transmitter Installation

(Figure 401)

A. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

B. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00599 [CP2442]	Oil - Engine	
D00601 [CP2101]	Vaseline - Graphite Mineral	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
9	Oil quantity transmitter	79-31-01-01-045	LOM 402, 404, 406, 407, 411, 416, 445
		79-31-01-01A-065	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
10	Packing	79-31-01-01-040	LOM 402, 404, 406, 407, 411, 416, 445
		79-31-01-01A-060	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Installation

SUBTASK 79-31-01-210-003-F00

(1) Make sure that there is no damage or blockages in the floater [8], tube assembly, and electronic components.

SUBTASK 79-31-01-210-001-F00

(2) Do a visual check through the bottom of the oil quantity transmitter [9] to make sure that you can see the floater [8].

NOTE: If the floater is not at the bottom of the transmitter before installation, an incorrect indication (always full) in the flight compartment will occur.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) If you do not see the floater [8], shake the oil quantity transmitter [9] upwards to release the floater [8].

(b) Make sure that the floater [8] moves freely and is at the bottom of the transmitter.

SUBTASK 79-31-01-840-001-F00

(3) Do these steps to prepare for the installation:

(a) Clean the transmitter flange [3] and oil tank flange [5] with alcohol, B00130, and cotton wiper, G00034.

(b) Make sure that the mating interfaces of the transmitter are clean and in a good condition (TASK 70-10-02-910-801-F00).

(c) Remove the protective cover from the oil tank recess [7].

F. Oil Quantity Transmitter Installation

SUBTASK 79-31-01-420-001-F00

(1) Install the transmitter:

> **CAUTION** DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

(a) Lubricate a new packing [10] with oil, D00599 [CP2442].

(b) Lubricate the threads of the four bolts [1] with graphite mineral vaseline, D00601 [CP2101].

> **CAUTION** MAKE SURE THAT YOU INSTALL THE PACKING ON THE TRANSMITTER CORRECTLY DURING THE INSTALLATION OF THE TRANSMITTER. IF YOU DO NOT OBEY, OIL CAN LEAK OUT DURING ENGINE OPERATION AND DAMAGE TO THE ENGINE CAN OCCUR.

(c) Install the packing [10] in the transmitter groove.

(d) Put the oil quantity transmitter [9] in the oil tank recess [7].

(e) Install the four bolts [1] and washers [2] to attach the oil quantity transmitter [9] to the oil tank cover [6].

1) Tighten the bolts [1] to 98 in-lb (11.1 N·m) - 110 in-lb (12.4 N·m).

(f) Connect the electrical connector, DP1301 [11] to the transmitter receptacle.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 79-31-01-610-002-F00

(1) Make sure that the level in the oil tank is full (TASK 12-13-11-600-801).

SUBTASK 79-31-01-410-002-F00

(2) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-31-01-860-005-F00

(3) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
D	5	C01359	DISPLAY DEU 1 PRI

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	10	C01361	DISPLAY DEU 1 HOLDUP

SUBTASK 79-31-01-860-006-F00

(4) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI

H. Oil Quantity Transmitter Installation Test

SUBTASK 79-31-01-710-002-F00

(1) If oil was added, compare the oil reading recorded in the removal task.

(a) Make sure that the indicator in the flight compartment displays a change.

SUBTASK 79-31-01-710-001-F00

(2) Make sure that the oil quantity indication reads full on the display in the flight compartment.

SUBTASK 79-31-01-800-001-F00

(3) Do the Oil Quantity Transmitter test listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

OIL PRESSURE SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the oil pressure sensor.

(2) The installation of the oil pressure sensor.

TASK 79-32-01-000-801-F00

2. Oil Pressure Sensor Removal

(Figure 401)

A. General

(1) This task is the removal procedure for the oil pressure sensor (referred to as the sensor).

(2) The oil pressure sensor is installed on the fan inlet case at the 10:00 o'clock position, adjacent to the oil temperature sensor.

B. References

Reference	Title
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 79-32-01-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-32-01-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 79-32-01-010-001-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. Oil Pressure Sensor Removal

SUBTASK 79-32-01-020-002-F00

WARNING DO NOT START THIS TASK IF THE ENGINE IS HOT. DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. WAIT UNTIL THE ENGINE IS COOL. DRY-MOTOR IMMEDIATELY AFTER YOU STOP THE ENGINE CAN DECREASE THE TIME FOR A COOL ENGINE. IF YOU DO NOT OBEY, HOT COMPONENTS CAN BURN YOU.

WARNING DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE STOPS. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

WARNING DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

CAUTION DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

(1) Remove the sensor [2] from the oil pressure manifold (Figure 401):

(a) Disconnect the electrical connector, DP0705 (CH A) [5] and electrical connector, DP0805 (CH B) [6] from the sensor receptacles.

(b) Put a cotton wiper, G00034, below the sensor [2].

(c) Remove the three bolts [1] and the three washers [3] from the sensor [2].

NOTE: Move the bonding strip out of the way.

(d) Remove the sensor [2].

1) Clean the oil off with a cloth.

(e) Remove the vespel plate [7] and the four packings [8] Seals (Preformed Packings and O-Rings) and Gaskets, TASK 70-30-01-910-802-F00.

NOTE: Use the vespel plate [7] again if it is in good condition.

1) Discard the four packings [8].

(f) Put protective covers in the opening of the oil pressure manifold and the sensor flange General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Pressure Sensor Installation
Figure 401/79-32-01-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-32-01-400-801-F00

3. Oil Pressure Sensor Installation

(Figure 401)

A. General

(1) This task is the installation procedure for the oil pressure sensor (referred to as the sensor).

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
D00601 [CP2101]	Vaseline - Graphite Mineral	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Bolt	79-32-01-01-035	LOM 402, 404, 406, 407, 411, 416, 445
		79-32-01-01A-050	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
2	Sensor	79-32-01-01-060	LOM 402, 404, 406, 407, 411, 416, 445
		79-32-01-01A-075	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
7	Vespel plate	79-32-01-01-065	LOM 402, 404, 406, 407, 411, 416, 445
		79-32-01-01A-080	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
8	Packing	79-32-01-01-070	LOM 402, 404, 406, 407, 411, 416, 445
		79-32-01-01A-085	LOM 412, 415, 416, 420, 422-434, 437-447, 450-999

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F. Prepare for the Installation

SUBTASK 79-32-01-840-001-F00

(1) Do these steps to prepare the sensor [2] for the installation General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00:

(a) Make sure that the mating flanges to the sensor [2] and the oil pressure manifold are clean and in a good condition.

(b) Remove protective covers from the opening in the oil pressure manifold and on the sensor flange.

G. Oil Pressure Sensor Installation

SUBTASK 79-32-01-420-003-F00

(1) Install the sensor [2] (Figure 401):

(a) Lubricate the four new packings [8] with oil, D00599 [CP2442].

(b) Install the three washers [3] on the three bolts [1].

(c) Lubricate the threads of the three bolts [1] with graphite mineral vaseline, D00601 [CP2101].

> **WARNING** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

(d) Install the four packings [8] in the grooves of the vespel plate [7].

> **CAUTION** MAKE SURE THAT THE PACKINGS STAY IN THE GROOVES OF THE VESPEL PLATE. IF THE PACKINGS ARE NOT ON THE VESPEL PLATE CORRECTLY, THERE WILL BE A LOSS OF OIL. IF YOU DO NOT OBEY, DAMAGE TO THE ENGINE CAN OCCUR.

(e) Install the vespel plate [7] on the mating face of the oil pressure manifold.

(f) Install the sensor [2] on the mating face of the oil pressure manifold.

(g) Loosely install the two lower bolts [1] that attach the sensor [2] to the oil pressure manifold.

(h) Install the top bolt [1] to attach the bonding strip.

NOTE: It is permitted to attach the bonding strip to one of the three bolts [1] on the oil pressure sensor [2], if the bonding strip does not touch the other components.

1) Torque the three bolts [1] to 98 in-lb (11 N·m) - 110 in-lb (12.4 N·m).

(i) Connect the electrical connector, DP0705 (CH A) [5] and electrical connector, DP0805 (CH B) [6] to the applicable sensor receptacles, CH A and CH B.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 79-32-01-410-001-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-32-01-860-006-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-32-01-860-007-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

I. Sensor Installation Test

SUBTASK 79-32-01-800-001-F00

(1) Do the tests that are listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

SUBTASK 79-32-01-610-003-F00

(2) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

OIL TEMPERATURE SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the oil temperature sensor.

(2) The installation of the oil temperature sensor.

TASK 79-34-02-000-801-F00

2. Oil Temperature Sensor Removal

(Figure 401),
(Figure 402)

A. General

(1) The oil temperature sensor is installed on the fan inlet case at the 10:00 o'clock position, adjacent to the oil pressure sensor.

(2) This task is the removal procedure for the oil temperature sensor (referred to as the sensor).

B. References

Reference	Title
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 79-34-02-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-34-02-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 79-34-02-010-001-F00

(3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. Oil Temperature Sensor Removal

SUBTASK 79-34-02-020-002-F00

WARNING	DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

WARNING	DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE SHUTDOWN. A PRESSURIZED ENGINE CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

WARNING	DO NOT LET HOT OIL GET ON YOU. PUT ON GOGGLES AND OTHER EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

CAUTION	DO NOT LET HOT OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE COMPONENT IF OIL FALLS ON IT. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

(1) Remove the sensor [2]:

(a) Disconnect the electrical connector, DP0602 [4] from the sensor receptacle.

(b) Put a cotton wiper, G00034, below the sensor [2].

(c) Remove the two bolts [5] that attach the sensor [2] to the sensor probe housing.

(d) Carefully, pull the sensor [2] down.

1) Clean the oil off with the cloth.

(e) Remove the sensor [2] from the sensor probe housing.

(f) Remove and discard the packing [7] from the sensor probe groove.

(g) Put protective covers in the openings of the sensor probe housing and the sensor General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Temperature Sensor Installation
Figure 401/79-34-02-990-801-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Oil Temperature Sensor Lockwire (ENGINES WITH SENSOR HOUSING P/N 340-091-804-0) Installation
Figure 402/79-34-02-990-802-F00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 79-34-02-400-801-F00

3. Oil Temperature Sensor Installation

(Figure 401), (
Figure 402)

A. General

(1) This task is the installation procedure for the oil temperature sensor (referred to as the sensor).

B. References

Reference	Title
12-13-11-600-801	Replenish the Engine Oil (P/B 301)
70-10-02-910-801-F00	General Precautions during the Removal and Installation of Engine Components (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Sensor	79-34-02-01-035	LOM 402, 404, 406, 407, 411, 416, 445
		79-34-02-01A-060	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
7	Packing	79-34-02-01-030	LOM 402, 404, 406, 407, 411, 416, 445
		79-34-02-01A-055	LOM 412, 415, 416, 420, 422-434, 437-447, 450-999

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Oil Temperature Sensor Installation

SUBTASK 79-34-02-840-001-F00

(1) Do these steps to prepare the sensor for the installation General Precautions during the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00:

(a) Remove protective covers from the openings in the sensor probe housing and the sensor [2].

(b) Clean the mating interfaces of the sensor [2] and the sensor probe housing with a cotton wiper, G00034.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) Make sure that the mating interfaces of the sensor [2] and the sensor probe housing are clean and in a good condition.

SUBTASK 79-34-02-420-002-F00

(2) Install the sensor [2] in the sensor probe housing:

(a) Lubricate a new packing [7] with oil, D00599 [CP2442].

(b) Lubricate the threads of the two bolts [5] with oil, D00599 [CP2442].

> **CAUTION** MAKE SURE YOU INSTALL THE PACKING CORRECTLY ON THE SENSOR. IF YOU DO NOT INSTALL THE PACKING CORRECTLY, OIL LOSS CAN OCCUR DURING ENGINE OPERATION AND CAN CAUSE DAMAGE TO THE ENGINE.

(c) Install the packing [7] in the sensor probe groove.

(d) Engage the sensor [2] in the sensor probe housing.

(e) Install the two bolts [5].

> **CAUTION** DO NOT TIGHTEN THE BOLTS TOO MUCH. IF YOU OVER-TIGHTEN THE BOLTS, THEN DAMAGE TO THE SENSOR HOUSING CAN OCCUR. IF THE SENSOR HOUSING IS DAMAGED, THEN ENGINE OIL LOSS CAN OCCUR.

1) Tighten the bolts [5] to 38-42 pound-inches (4.3-4.7 Newton meters).

(f) Connect the electrical connector, DP0602 [4] to the sensor receptacle.

LOM ALL; AIRPLANES WITH SENSOR PROBE HOUSING P/N 340-091-804-0

SUBTASK 79-34-02-410-002-F00

(3) It is necessary to install lockwire on the oil temperature sensor and housing to prevent possible loss of engine oil.

NOTE: The part number is found on the outside of the housing.

(a) Refer to CFMI-SB-72-A336 for the details to install the lockwire (Figure 402).

LOM ALL

G. Put the Airplane Back to Its Usual Condition

SUBTASK 79-34-02-410-001-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 79-34-02-860-005-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 79-34-02-860-006-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

ECCN 9E991 BOEING PROPRIETARY - See title page for details

H. Oil Temperature Sensor Installation Test

SUBTASK 79-34-02-800-001-F00

(1) Do the test listed in the Power Plant Test Reference Table, TASK 71-00-00-800-811-F00.

SUBTASK 79-34-02-610-001-F00

(2) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details