
FACET FILTER KIT NO. 1741350-01

**INSTALLATION AND SERVICE MANUAL
SCAVENGE LUBE OIL FILTER SYSTEM FOR
EUROCOPTER (MBB) BK117A-1, A-3, A-4, B-1 AND B-2
MODEL HELICOPTERS
(Update for filter kit no. 1741280)**

CONTENTS:

INSTALLATION AND SERVICE INSTRUCTIONS
WARRANTY INFORMATION
FLIGHT MANUAL SUPPLEMENT
STC NO. SH2397SO
E-961 Rev. E AUGUST 10, 1993

PUROLATOR FACET, INC.
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NOTICE TO PERSONS RECEIVING THIS DOCUMENT:

PUROLATOR FACET, INC. CLAIMS PROPRIETARY RIGHTS IN THE MATERIAL DISCLOSED HEREON. THIS DOCUMENT IS ISSUED IN THE CONFIDENCE FOR ENGINEERING INFORMATION ONLY AND MAY NOT BE USED TO MANUFACTURE ANYTHING SHOWN WITHOUT THE DIRECT WRITTEN PERMISSION FROM PUROLATOR TO THE USER.

GENERAL INFORMATION

The purpose of the Facet Scavenge Lube Oil Filter is to clean the oil to a much finer degree than factory equipped strainers. The filter has a 3 micron absolute element. Located in the line from the engine to the oil cooler, the filter prevents particles from contaminating the oil cooler and supply tank and recirculating through the engine.

The filter assembly is equipped with a relief valve that opens when the differential pressure across the element reaches 12 ± 1.2 PSID. The bypass indicator extends a red indicator pin when the valve opens. The pin remains extended until manually reset. Thermal lockout prevents indicator actuation below $110\pm 15^{\circ}\text{F}$.

**FACET KIT NO. 1741350-01 FOR MBB BK117A-1, A-3, A-4, B-1, B-2
WITH FACET FILTER KIT 1741280 INSTALLED**

REG. NO. _____

SER. NO. _____

FLIGHT HOURS _____

INSTALLATION DATE _____

It is recommended that this manual be included in the permanent records of the modified helicopter to comply with the FAA requirement that the STC be retained and to have for service reference.

At the time of installation, please fill out the warranty card and mail.

**PARTS LIST FOR FACET KIT NO. 1741350-01
FOR MBB HELICOPTER MODELS BK117A-1, A-3, A-4, B-1, B-2
WITH FACET FILTER KIT 1741280 INSTALLED**

Item No.	Part Number	Description	Qty Req'd
1	AN4-32A	Bolt	6
2	AN960-416	Washer	12
3	1741111-01	Spacer	6
4	MS21042-L4	Nut - Self Locking	6
5	AN924-10J	Nut	2
6	1741110-50	Hose Assembly - LH	1
7	1741282	Reducer	4
8	040373	O-ring FLBN-912	4
9	034937	O-ring FLBN-910	8
10	AN832-10J	Bulkhead Fitting Straight	2
11	1741110-51	Hose Assembly - RH	1
12	1741352	Junction Assembly - LH	1
13	1741353	Junction Assembly - RH	1
14	MS21919WDG-10	Clamp	8
15	MS35207-263	Screw	4
16	MS21042-L3	Nut - Self Locking	8
17	AN960-10L	Washer	4
18	MS21919WDG-12	Clamp	2
19	MS35207-267	Screw	4
20	1741285	Extension Wire	2
21	1741283	Doubler	2
22	1741126	Spiral Wrap	24"
23	1741110-52	Hose Assembly - LH	1
24	1741110-55	Hose Assembly - RH	1
25	E-961	Installation Manual	1
26	MS21919WDG-14	Clamp	2
27	1741175	Tool (not shown)	1
28	1741350-01	Installation Drawing	1
29	1743866	Warning Tag	1

RH - Right-hand
LH - Left-hand

IMPORTANT INFORMATION FOR FACET KIT NO. 1741350-01

Preflight Inspection Procedure Change:

Scavenge line oil filter check red indicator.

Scavenge Oil Filter Check:

- A. Inspect red button on head assembly for indication of filter bypass.
 - B. If red button is not showing, proceed with preflight.
 - C. Red button showing, reset button once and run engine.
 - D. If red button reappears, discontinue operations and investigate reason for filter bypass indication.
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Red Bypass Indicator Reset:

Press and turn in.

Scavenge Oil Filter Service:

- A. Replace element whenever the engine oil is changed.
 - B. When filter is serviced after bypass indication, a new filter element and O-ring should be installed.
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Scavenge Oil Filter Assembly Functional Check:

At installation and every subsequent 1000 hours, using Facet Tool P/N 1741175, functionally check filter assembly bypass indicator.

- A. Remove safety wire, unscrew bowl, remove and discard installed filter element.
- B. Install Tool P/N 1741175, reinstall bowl, do not safety at this time, leave cowling locked open or removed for visual access to filter assembly.
- C. Start engine, operate at ground idle until normal operating temperatures are reached, and filter bypass indicator button extends (approximately 10 minutes). Indicator must reach $110\pm 15^{\circ}\text{F}$ to operate.
- D. Secure engine, remove bowl and tool, install new seal kit and filter element, reinstall and safety bowl, reset indicator, drain and reservice engine oil system.

CAUTION: ENSURE TOOL IS REMOVED PRIOR TO FLIGHT.

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- E. If bypass indicator fails to extend, or will not reset, contact Facet Filter Products Division, 919-668-4444.
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Weight Change:

Kit 1741280 Removal Weight Change: -8.62 lbs Arm: 4485 mm
Kit 1741350-01 Installation Weight Change: +7.9 lbs Arm: 4820 mm

REPLACEMENT PARTS FOR FACET FILTER ASSEMBLY P/N 1742500

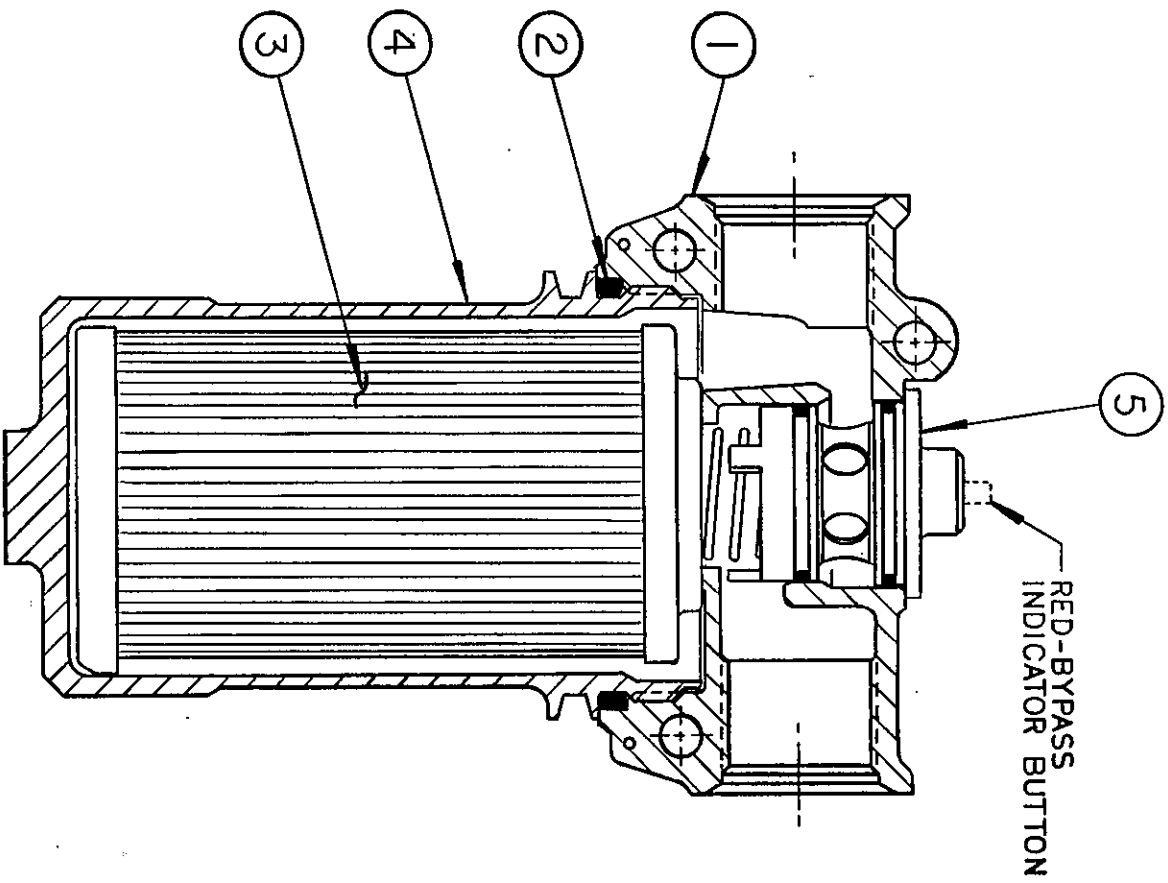
<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	1742224-01	Head Assembly
2	1742439	O-ring
3	1742510	Element
4	1742241-01	Bowl
5	1742227-01-42	Valve and Indicator Assembly

NOTE: For optional Kit Replacement Element with Bowl O-ring and Instructions use P/N 1742510-01.

Filter Element Change Instruction:

- A. Remove head to bowl lockwire and unscrew bowl.
- B. Remove dirty element.
- C. Remove and discard o-ring from filter bowl.
- D. Install new element.
- E. Install new o-ring on filter bowl.
- F. Hand tighten until tight against head and lockwire.

NOTE: Only Facet authorized approved replacement parts may be used to maintain warranty. Valve and indicator assemblies are factory set.



**INSTALLATION INSTRUCTIONS FOR FACET KIT NO. 1741350-01 FOR MBB
HELICOPTER BK117A-1, A-3, A-4, B-1, B-2 WITH FACET KIT 1741280 PREVIOUSLY
INSTALLED**

General:

This installation can best be accomplished at a time when the oil is drained from both engine lubrication systems.

Both left and right engine installations will be almost the same.

The filter assembly was factory tested and shipped wet with MIL-L-7808, aircraft turbine engine lubricating oil.

It is recommended that the installer read through the instructions completely before starting, to ensure that there will be no problems with completing this installation.

Preparation:

1. Disconnect battery.
2. Remove cowling as required to work in the transmission and engine sections (both LH and RH). Drain engine oil systems.

Note: LH - Left-hand, RH - Right-hand

Note: Refer to drawing 1741280, furnished with kit 1741280, for location of removed items.

3. Remove and discard hose clamp Item 17, 1741025, reinstall screw in transmission oil pump cover. Remove and discard clamp assemblies (4) Item 9, 1741012 (LH and RH).
4. Remove and discard inlet hose Item 12, 1741110-39 (LH and RH), outlet hose Item 23, 1741110-37 (RH) and Item 8, 1741110-35 (LH). Disconnect thermal valve inlet hose (117-67060-03) at tee fitting Item 16, AN824-10D, remove and discard tee and tube assembly Item 5, 1741016. Remove and discard tiwrap Item 19, 1741013, drain tube Item 18, 1741009 and clamp assembly Item 15, 1741021 (LH and RH).

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5. Remove drainpan attaching hardware, remove drainpan and filter assembly, reinstall attaching hardware. Remove filter assembly from drainpan Item 6, 1741017 (RH), Item 7, 1741018 (LH). Discard drain pan and filter assembly attach hardware. Remove and discard union Item 12, AN913-20D at filter assembly inlet and outlet ports. Retain filter assembly for reinstallation (LH and RH).

Note: Replacement filter element (not furnished) may be installed at this time.

6. Locate and gain access to debris monitor, remove chip detector plug. Remove two bolts securing debris monitor bracket to firewall. Disconnect vent hose at forward side of firewall, remove jam nut and washer. Remove screw for transducer adel clamp from firewall (if installed). Retain all hardware for reinstallation (LH and RH).
7. On engine side of firewall, locate and disconnect engine oil hose at debris monitor bulkhead fitting. Remove jam nut on bulkhead fitting, remove debris monitor from firewall, retain all attaching hardware (LH and RH).
8. Remove 90° elbow fitting Item 11, AN833-10D, from debris monitor outlet, retain fitting and jam nuts; discard bracket. Remove 90° bulkhead fitting and union from debris monitor inlet, discard fitting, retain union for reinstallation (LH and RH).

Note: Discard drawing 1741280. See new drawing 1741350-01.

9. Temporarily install doubler Item 21, 1741283 at debris monitor bracket mounting nutplates with previously removed screws and washers and at debris monitor bulkhead fitting hole with bulkhead fitting and nut, Items 10 and 5.
10. Mark filter assembly mounting holes and transducer mount hole if not drilled. Remove doubler. Drill and deburr filter assembly mounting holes (.266 dia. inches) and transducer mount hole (.213 dia. inches). Reinstall doubler with bracket mounting screws and washers. Attach transducer screw, or screw Item 15, MS35207-263, nut Item 16, MS21042-L3, and washer Item 17, AN960-10L (LH and RH).

CAUTION: Make sure all cables and lines are clear before drilling.

11. Install O-ring Item 9, 034937 on the adapter end of bulkhead fitting Item 10, AN832-10J, and install securely into the inlet end of the debris monitor (LH and RH).
12. Install O-ring, Item 9, 034937, on end of previously removed union AN815-10D and install in outlet end of debris monitor. Set debris monitor aside temporarily. (LH and RH).

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13. Place O-rings Item 8, 040373, on reducers Item 7, 1741282, and install securely into the inlet and outlet of filter assembly 1742500. Place jam nut (previously removed) and O-ring Item 9, 034937, on on bulkhead end of previously removed fitting AN833-10D (90°), and install in inlet of filter assembly. Place jam nut (previously removed) and O-ring Item 9, 034937 on junction fitting Item 12, 1741352 (LH) and Item 13, 1741353 (RH) and install in filter assembly outlet. (LH and RH)
 14. Using bolts Item 1, AN4-32A, nuts Item 4, MS21042-L4, washers Item 2, AN960-416, and spacers Item 3, 1741111-01, mount filter assembly to doubler and firewall. Torque nuts 50 to 55 inch lbs., index and tighten outlet fitting with 90° outlet forward, angle outlet up. Connect thermal valve inlet hose to forward outlet and install hose assembly Item 23, 1741110-52 (LH), and Item 24, 1741110-55 (RH) between junction fitting and oil cooler inlet. Reinstall and secure vent line fitting and vent line (LH and RH).
 15. Install debris monitor assembly inlet bulkhead fitting through doubler and firewall, reinstall previously removed washer and new jam nut Item 5, AN924-10J. Reconnect oil line. (LH and RH) (Refer to View A Drawing 1741350-01.)
 16. Install 45° end of hose Item 6, 1741110-50 (LH), Item 11, 1741110-51 (RH), on debris monitor outlet, route under thermal valve inlet hose, up and out to connect to filter assembly inlet. Index and tighten inlet fitting. Secure filter inlet hose to engine oil inlet hose with clamp Item 14, MS21919WDG-10, clamp Item 18, MS21919WDG-12, screw Item 19, MS35207-267, and nut Item 16, MS21042-L3. (LH and RH) (Refer to Drawing 1741350-01.)
 17. Approximately 2½ inches from oil cooler inlet fitting, secure filter inlet hose to oil cooler inlet hose with 2 clamps Item 14, MS21919WDG-10, screw Item 19, MS35207-267 and nut Item 16, MS21042-L3 (See drawing). Install spiral wrap, Item 22, 1741126, as required (LH and RH).
 18. Remove electrical connector at chip detector plug and install wire, extension Item 20, 1741285. Install adel clamp Item 26, MS21919WDG-14, on aft transmission support tube approximately two inches above deck line (see drawing). Using adel clamp Item 14, MS21919WDG-10, attach extension wire cannon plug to transmission support tube adel clamp with screw Item 15, MS35207-263 and nut Item 16, MS21042-L3. Reinstall chip detector plug. (LH and RH)
 19. Inspect engine and transmission compartments for tools, rags, etc. Check all bolts, fittings and other components for security. Check hoses for clearance.

20. Reservice both engine oil systems. Reinstall cowling. Prepare for engine runup, leak check, and functional check. Reconnect battery. After runup and leak check, prepare helicopter for flight.

21. Scavenge Oil Filter Assembly Functional Check:

At installation, using Facet Tool P/N 1741175, functionally check filter assembly bypass indicator.

- A. Remove safety wire, unscrew bowl, remove and retain installed filter element.
- B. Install Tool P/N 1741175, reinstall bowl, do not safety at this time, leave cowling locked open or removed for visual access to filter assembly.
- C. Start engine, operate at ground idle until normal operating temperatures are reached, and filter bypass indicator button extends (approximately 10 minutes). Indicator must reach $100\pm 15^{\circ}\text{F}$ to operate.
- D. Secure engine, remove bowl and tool, reinstall filter element, reinstall and safety bowl, reset indicator.

CAUTION: ENSURE TOOL IS REMOVED PRIOR TO FLIGHT.

- E. If bypass indicator fails to extend, or will not reset, contact Facet Filter Products Division, 919-668-4444.
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WARRANTY:

Seller warrants that at the time of delivery products delivered under the Order will conform to applicable drawings and specifications and will be free from defects in material and workmanship. Any claim for defective material or workmanship must be made within a period of ninety (90) days from the date of delivery to Buyer. Upon prompt notice of any claimed nonconformity or defect, Seller's obligation under this warranty is limited, at its option, to repairing or replacing at its plant, with transportation charges prepaid by Buyer, the product or component part thereof that is proved to be other than as herein warranted. This warranty does not extend to any of the Seller's products which have been subject to misuse, accident or improper installation, maintenance or application, nor does it extend to products which have been repaired or altered outside of Seller's plant unless authorized in writing by Seller or unless such installation, repair or alteration is performed by Seller, nor does this warranty extend to any labor charges for removal and/or replacement of the nonconforming or defective product or part hereof. **THIS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.** In no event shall Seller be liable for special, incidental or consequential damages for any breach of warranty of this contract, including but not limited to, costs of removal and reinstallation of goods, loss of goodwill or loss of profits and loss of use. Only authorized Facet FAA/PMA approved replacement parts may be used to maintain warranty.

**PUROLATOR PRODUCTS COMPANY
FACET FILTER PRODUCTS DIVISION**

United States of America
Department of Transportation — Federal Aviation Administration
Supplemental Type Certificate

Number SH2397SO

This certificate, issued to Facet Filter Products Division
Purolator Products
8439 Triad Drive
Greensboro, NC 27409-9621

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 21.29 of the Federal Aviation Regulations.

Original Product — Type Certificate Number: H13EU
Make: Messerschmitt-Bolkow-Blohm
Model: MBB-BK-117A-1, A-3, A-4, B-1, and B-2

Description of Type Design Change:

Installation of a scavenge lub oil filter in accordance with Facet Enterprises, Inc. installation instructions E-960 Rev. D, dated 8-10-93 or E-961 Rev. E, dated 8-10-93 or later FAA approval revision. Facet Enterprises, Inc. FAA Approved Rotorcraft Flight Manual Supplement dated October 12, 1993, or later FAA approved revision is required with this installation.

Limitations and Conditions:

The approval should not be extended to other aircraft of this model on which other previously approved modifications are incorporated unless it is determined by the installer that the interrelationship between this change and any of those other previously approved modifications will produce no adverse effect upon the airworthiness of this aircraft.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: June 30, 1988

Date issued: May 1, 1990

Date of issuance: September 19, 1988

Date amended: October 12, 1993



By direction of the Administrator

Roger D. Anderson

Roger D. Anderson
Manager, Atlanta Aircraft
Certification Office

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

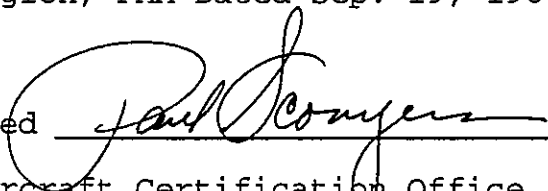
Facet Filter Products Division
Purolator Products Company
8439 Triad Drive
Greensboro, NC 27409

FAA APPROVED
ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
FOR
EUROCOPTER DEUTSCHLAND GmbH, GERMANY MODEL:
MBB - BK117 A-1, A-3, A-4, B-1, B-2

REG. NO. _____
SER. NO. _____

This supplement must be attached to the Rotorcraft Flight Manual dated _____ or latter FAA approved revisions when an engine scavenge oil line filter is installed in accordance with STC number SH2397SO. The information herein supplements the information of the basic Rotorcraft Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this supplement, consult the basic Rotorcraft Flight Manual.

Original issued and signed by Gerald R. Mack
Manager, Atlanta Aircraft Certification Office
Central Region, FAA Dated Sep. 19, 1988.

Reissued; FAA Approved 
Manager,
Atlanta Aircraft Certification Office
Central Region, FAA.

Dated: OCT 12 1993

Rev. 1

Facet Filter Products Division
 Purolator Products Company
 8439 Triad Drive
 Greensboro, NC 27409

RFM Supplement for Eurocopter
 BK117 A-1, A-3, A-4, B-1, B-2

LOG OF REVISIONS				
REV. NO.	PAGE	DESCRIPTION	DATE	FAA APPROVAL
1	1,2,3	Added model BK117 B-2		
	1	Removed Limitations, Procedures and Performance changes from page 1		
	2	Added Log of Revisions page 2		
	3	Added Page 3 with Limitations, Procedures and Performance changes		

Paul [Signature]
 10-12-93

OCT 12 1993

Facet Filter Products Division RFM Supplement for Eurocopter
Purolator Products Company BK117 A-1, A-3, A-4, B-1, B-2
8439 Triad Drive
Greensboro, NC 27409

SECTION I - LIMITATIONS

No Change.

SECTION II - PROCEDURES

Preflight Inspection:

- A. Inspect red button on top of filter head for indication of filter bypass.
- B. If red button is not showing, proceed with preflight.
- C. Red button showing, reset button once and run engine.
- D. If red button reappears, discontinue operations and investigate reason for filter bypass indication.

During preflight inspection, to reset the red button (bypass indicator) of filter assembly p/n: 1742500:

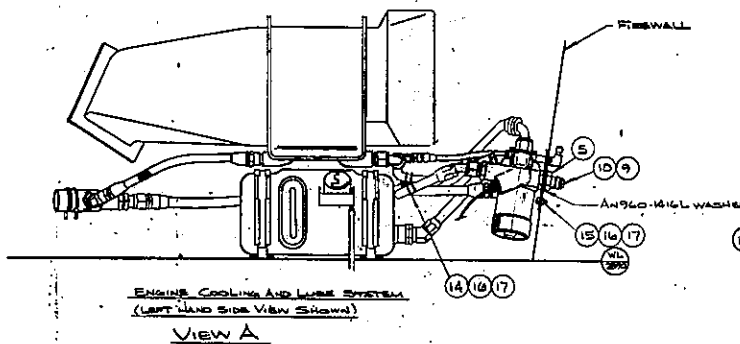
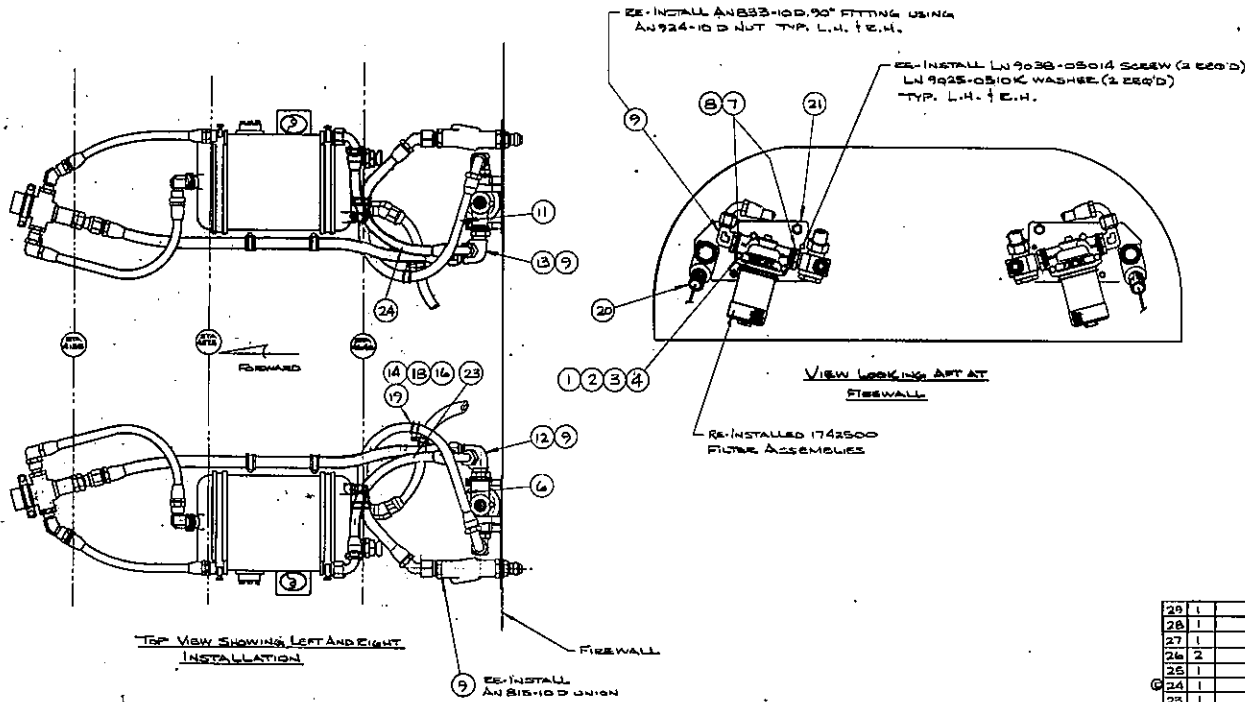
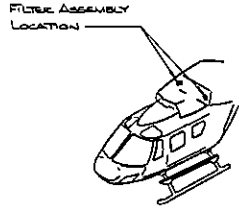
Press and turn in.

SECTION III - Performance

No change

APPLY TO PORTION UNLESS OTHERWISE SPECIFIED.
 ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
 DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY.
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REVISIONS			
LTR.	DESCRIPTION	DATE	APPROVED
A	REVISIONS TO DRAWING	8-2-88	SL
B	REVISIONS TO DRAWING	9-20-88	SL
C	RELEASED TO PRODUCTION	11/1/88	WH
D	ISSUE 1741350-01	6/18/90	SL
E	ISSUE 1741350-02	12/2/90	WH



QTY	CODE	DESCRIPTION	MATL.	MATL. SPEC.	FINISH
29	1	1742500	WARNING TAG		LEFT SHOWN
28	1	1741350-01	INSTALLATION BLUEPRINT		LEFT SHOWN
27	1	174175-00-50	INDICATOR TEST ELEMENT		LEFT SHOWN
26	2	4329906-14	CLAMP		
25	1	E-361	INSTALLATION MANUAL		
24	1	174110-55	HOSE ASSEMBLY E.H.		
23	1	174110-52	HOSE ASSEMBLY L.H.		
22	24	174125	SPECIAL WEAR		
21	2	174125	DOUBLE		
20	2	174125	EXTENSION WIRE		
19	4	4329207-247	SCREW 10-32 X 1" LG		
18	2	4329106-10	CLAMP		
17	4	AN960-10L	WASHER - #10		
16	8	4321042-13	NUT SELF LOCKING 10-32		
15	4	4329207-263	SCREW 10-32 X 1.5 LG		
14	8	4329906-10	CLAMP		
13	1	174125	JUNCTION ASSEMBLY E.H.		
12	1	174125	JUNCTION ASSEMBLY L.H.		
11	1	174110-51	HOSE ASSEMBLY RIGHT HAND		
10	2	AN832-10J	BUSHING FITTING STRAIGHT		
9	8	Q34937	O-RING RUBN-910		
8	4	Q34937	O-RING RUBN-912		
7	4	174125	REDUCER		
6	1	174110-50	HOSE ASSEMBLY LEFT HAND		
5	2	AN924-10J	NUT 7/8-28		
4	6	MS21042-14	NUT SELF LOCKING 1/8-28		
3	6	174111-01	SPACE		
2	12	AN960-416	WASHER - 1/8		
1	8	AN4-32A	BOLT 3/4-28 X 3.28 LG		

FAA APPROVED PART
 as shown, as required by
 FAA in their operations
 subject to FAA approval

NEXT ASSY.		USED ON		APPLICATION	

UNLESS OTHERWISE SPECIFIED	
DIMENSIONS ARE IN INCHES	
TOLERANCES - ANGLES ± °	
DECIMALS .001 ± .015 .0001 ± .010	
REMOVE BURRS	
AND SHARP EDGES	
MACH. SURFACE FINISH	
ENGINEERING SPECIFICATIONS	
FRS-SP-0001 APPLIES	
FILED - 3011 (001)	
DO NOT SCALE THIS DRAWING	
MATERIAL	

LIST OF MATERIAL				
PART NO.	DESCRIPTION	MATL.	MATL. SPEC.	FINISH

Purifier	
Scavenge Oil Filter Kit for MB8 Helicopter Models BK-117A-1, A-3, A-4, B-1, B-2 with Facet Filter Kit 1741250 Installed	
DRAWN	SL 4/2/88
CHECKED	WH 12/2/88
APR.	WH 8-1-88
APPROVAL	

SCAVENGE OIL FILTER KIT FOR MB8 HELICOPTER MODELS BK-117A-1, A-3, A-4, B-1, B-2 WITH FACET FILTER KIT 1741250 INSTALLED	
SIZE	CODE IDENT. NO DRAWING NO.
D 90005	1741350-01
SCALE	WT.
	SHEET 1 OF 1

1741350-01