

Butterfield Industries, Inc.

208-466-4622

# INSTALLATION INSTRUCTIONS

P/N BI 2003

OIL RESIDUE COLLECTION SYSTEM  
KING AIR 90 SERIES

KIT P/N BI 2001-1

01/07/08

REV: B

# Butterfield Industries, Inc.

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## IMPORTANT NOTICE

THE BUTTERFIELD INDUSTRIES OIL RESIDUE COLLECTION SYSTEM INSTALLATION HAS BEEN APPROVED BY THE FEDERAL AVIATION ADMINISTRATION (FAA) UNDER SUPPLEMENT TYPE CERTIFICATE (STC)

THIS INSTALLATION MUST CONFORM TO THE FAA APPROVED BUTTERFIELD INDUSTRIES INSTALLATION DRAWINGS AND THE INSTRUCTIONS CONTAINED IN THIS DOCUMENT.

CONFORMITY VERIFICATION OF THE INSTALLED SYSTEM TO THE BUTTERFIELD INDUSTRIES INSTALLATION DRAWINGS AND INSTRUCTIONS IS THE RESPONSIBILITY OF THE INSTALLATION FACILITY.

DEVIATIONS TO THE FAA APPROVED BUTTERFIELD INDUSTRIES INSTALLATION DRAWINGS AND INSTRUCTIONS MUST BE APPROVED BY BOTH THE FAA AND BUTTERFIELD INDUSTRIES. THE INSTALLATION FACILITY IS RESPONSIBLE FOR BOTH COORDINATING AND OBTAINING THAT APPROVAL.

---

**DRAWN**

B. Whitcomb 01/31/03

**CHECKED**

J. Whitcomb 01/31/03

**ENGINEER**

J. Whitcomb 01/31/03

**STRESS****APPROVED**

W. Butterfield 02/24/03

**BUTTERFIELD INDUSTRIES, INC.**  
**INSTALLATION INSTRUCTIONS**  
**OIL RESIDUE COLLECTION**  
**SYSTEM**  
**MODEL 90 SERIES AIRCRAFT**

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## REVISIONS

LTR	DESCRIPTION	APPROVALS
A	<p>REVISION TO STANDARDIZE ATTACHMENT OF AIR/OIL SEPARATOR. ALL AIRCRAFT DO NOT HAVE FASTENERS MOUNTED IN FIREWALL. INSTALLATION OF STUDS (P/N CS125-1032-8CR) WILL KEEP ALL INSTALLATIONS IN COMMON.</p> <p>PETCOCK DRAIN FITTING ROTATED TO ALLOW FOR BETTER ACCESS AND NOT NEEDING TO CUT A HOLE IN TEAR DROP COWLING.</p> <p><b>REASON:</b> TO STANDARDIZE INSTALLATIONS</p> <p><b>PRODUCTION INFO:</b> ALL INSTALLATIONS WILL COMPLY</p>	<p>DRAWN: B. WHITCOMB 04/29/03</p> <p>CHECKED: J. WHITCOMB 04/29/03</p> <p>APPROVED W. BUTTERFIELD 04/30/03</p>
B	<p>REVISION TO CHANGE SEPARATOR ASSEMBLY CONSTRUCTION MATERIAL.</p> <p><b>REASON:</b> TO ALIGN CONSTRUCTION MATERIAL WITH OTHER SEPARATOR INSTALLATIONS</p> <p><b>PRODUCTION INFO:</b> EXISTING INSTALLATIONS SATISFACTORY</p>	<p>DRAWN: B. WHITCOMB</p> <p>CHECKED: J. WHITCOMB</p> <p>APPROVED: W. BUTTERFIELD 01/07/08</p>

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# Butterfield Industries, Inc.

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## 1.0 INTRODUCTION

THIS DOCUMENT IS INTENDED TO PROVIDE DETAILED INSTRUCTIONS FOR THE INSTALLATION OF THE BUTTERFIELD INDUSTRIES 'OIL RESIDUE COLLECTION SYSTEM' ON THE KING AIR 90 SERIES OF AIRCRAFT.

## 2.0 REQUIRED DOCUMENTATION

IN ADDITION TO THIS INSTRUCTION MANUAL, THE FOLLOWING DOCUMENTS WILL BE REQUIRED TO INSTALL THE OIL RESIDUE COLLECTION SYSTEM.

### 2.1 BUTTERFIELD SUPPLIED DOCUMENTS

THE FOLLOWING DRAWINGS OF THE CORRECT REVISION ARE SUPPLIED AS PART OF THIS DOCUMENTATION.

BI-2001 SHEET 1 THRU 5,  
TANK AND SEPARATOR INSTALLATION

BI-2002 DRAWING LIST

### 2.2 CUSTOMER SUPPLIED DOCUMENTATION

THE FOLLOWING DOCUMENTS OF THE LATEST REVISION IN EFFECT AT THE TIME OF THE KIT INSTALLATION SHALL BE SUPPLIED BY THE CUSTOMER OR THE INSTALLATION FACILITY:

101-590010-19 BEEHCRAFT KING AIR 90  
MAINTENANCE MANUAL

FAA-AC 43.13-1A ACCEPTED METHODS, TECHNIQUES AND  
PRACTICES FOR AIRCRAFT ALTERATION,  
INSPECTION AND REPAIR.

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## 3.0 GENERAL

THE OIL RESIDUE COLLECTION SYSTEM, PART NUMBER BI-2001-1, IS ELIGIBLE FOR INSTALLATION ON BEECHCRAFT KING AIR 90 SERIES OF AIRCRAFT UNDER AUTHORIZATION OF THESE INSTRUCTIONS AND STC # SA01800CH.

SERIAL NUMBER OF AUTHORIZED AIRCRAFT ARE AS FOLLOWS

LJ 1 THROUGH LJ 113	MODEL 65-90
LJ 114 THROUGH LJ 317	MODEL 65-A90
LJ 318 THROUGH LJ 501	MODEL B90
LJ 502 THROUGH LJ 1062	MODEL C90
LW 1 THROUGH LW 347	MODEL E90
LA 2 AND AFTER	MODEL F90

## 3.1 KIT DESCRIPTION

INSTALLATION OF THE BUTTERFIELD INDUSTRIES OIL RESIDUE COLLECTION SYSTEM ALLOWS THE COLLECTING OF DRAIN FLUID INTO A SINGLE SUMP ASSEMBLY. THE SUMP HAS A DRAIN VALVE, WHICH CAN BE USED PERIODICALLY TO DRAIN THE TANK. THE SYSTEM WILL ELIMINATE THE OIL MESS ON THE BOTTOM OF THE NACELLE AND ON THE MAIN LANDING GEAR. IT WILL ALSO CLEAN UP THE MESSY OIL SPOTS ON THE HANGAR FLOOR AND RAMP WHEN THE AIRCRAFT IS PARKED. THIS IS A MESS AS WELL AS AN EPA HAZARD.

## 3.2 KIT CONTENTS

THE CONTENTS OF THE BI-2001-1 KIT ARE AS SPECIFIED IN THE LIST OF MATERIALS ON SHEET 1 OF THE DRAWING LISTED IN PARAGRAPH 2.1. ADDITIONALLY, THE KIT CONTAINS A DATA PACKAGE CONTAINING:

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- 1) BI 2003 - "INSTALLATION INSTRUCTIONS "
- 2) A COPY OF THE PACKING LIST ( PAGE 15)
- 3) DRAWINGS LISTED IN PARAGRAPH 2.1
- 4) ONE COPY OF THE STC

BUTTERFIELD INDUSTRIES SHOULD BE NOTIFIED IMMEDIATELY OF ANY SHORTAGES OR OTHER DISCREPANCIES.

### **3.3 SPECIALIZED TOOLING REQUIRED**

OTHER THAN STANDARD AIRCRAFT TECHNICIAN'S TOOLS, NO SPECIAL TOOLS ARE REQUIRED.

### **4.0 AIRPLANE PREPARATION**

NO SPECIAL AIRPLANE PREPARATION IS REQUIRED PRIOR TO INITIATING INSTALLATION OF THE OIL RESIDUE COLLECTION KIT.

### **5.0 REMOVALS**

THE OPERATIONS DEFINED HERE ARE THOSE NECESSARY TO REMOVE AND ALTER COMPONENTS FROM THE LEFT AND RIGHT HAND NACELLE. THE SEQUENCE OF EVENTS IS PRESENTED IN A RECOMMENDED SEQUENCE. HOWEVER, THAT SEQUENCE MAY BE ALTERED TO SUIT THE CUSTOMER OR THE INSTALLATION FACILITY.

REF.            DRAWING BI-2001            SHEET 1

- 1) GAIN ACCESS TO THE FORWARD SIDE OF THE FIREWALL BY REMOVING LEFT SIDE PANEL, TEAR DROP PANEL AND THE OIL COOLER EXIT DUCT.



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- 2) DISCONNECT HOSES FROM EXISTING DRAIN MANIFOLD.
- 3) REMOVE AND DISCARD BREATHER LINE FROM DRAIN MANIFOLD. THE BREATHER LINE IS SECURED TO THE ENGINE MOUNT NEAR THE ATTACHMENT TO THE ENGINE. YOU MAY DISCARD THESE CLAMPS, NEW CLAMPS ARE PROVIDED FOR INSTALLATION.
- 4) REMOVE AND DISCARD MANIFOLD ( 50-910456-17 ).
- 5) IN THE UPPER LEFT CORNER, AS SHOWN IN THE LOCATION OF THE SEPARATOR IN DRAWING 2001 SHEET 5 THERE MAY BE AN UNUSED BRACKET. IF THE BRACKET IS PRESENT, REMOVE AND DISCARD. REINSTALL HARDWARE IN FIREWALL.

## 6.0 KIT INSTALLATION

THE FOLLOWING PARAGRAPHS DEFINE THE INSTALLATION OF THE RESIDUE OIL COLLECTION SYSTEM. THE ACTIVITIES SPECIFIED HEREIN ARE PRESENTED IN A RECOMMENDED SEQUENCE. HOWEVER, THAT SEQUENCE MAY BE ALTERED TO SUIT THE CUSTOMER OR THE INSTALLATION FACILITY. UNLESS OTHERWISE SPECIFIED, INSTALLATION OF ALL HARDWARE SHALL CONFORM TO FAA-AC 43.13-1A.

### 6.1 SUMP ASSEMBLY INSTALLATION

REF:           DRAWING BI 2001           SHEET 3 & 4

- 1) THE TANK ASSY (P/N BI 2201-1) WILL MOUNT TO THE OIL COOLER EXIT DUCT. THE BREATHER TUBE WILL EXIT THE SAME HOLE IN THE OIL COOLER EXIT DUCT.

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- 2) CLEAN THE SIDE OF THE EXIT DUCT.
- 3) INSTALL STUDS (P/N CS125-1032-8CR) INTO THE TABS ON THE TANK, SECURE WITH NUTS.
- 4) INSTALL TANK ON EXIT DUCT BY PUTTING BREATHER TUBE THROUGH EXIT HOLE AND ALLOW THE STUD PADS TO REST ON SIDE OF EXIT DUCT. INSURE TANK IS ALIGNED VERTICALLY ON SIDE OF EXIT DUCT.
- 5) WHILE HOLDING THE TANK, PLACE STUD PADS AGAINST THE EXIT DUCT. MARK THE DUCT AS TO THE LOCATION OF THE STUD PADS. ALSO MARK THE LOCATION OF WHERE THE DRAIN VALVE WILL STICK THROUGH THE SIDE OF THE EXIT DUCT.
- 6) REMOVE THE TANK FROM THE EXIT DUCT. REMOVE STUDS FROM TANK ASSY.
- 7) AS PER THE INSTRUCTIONS, EPOXY THE STUDS TO THE SIDE OF THE EXIT DUCT. ALLOW CURE TIME AS SHOWN ON EPOXY INSTRUCTIONS.
- 8) DRILL HOLE IN SIDE OF EXIT DUCT TO ALLOW INSTALLATION OF DRAIN VALVE.

## NOTE

**RECOMMEND WHILE EPOXY IS HARDENING, INSTALL THE SEPARATORS. THE STUDS WILL HAVE TO BE IN PLACE FOR THE MINIMUM OF 1 HOUR BEFORE THE EPOXY WILL BE HARD ENOUGH TO WORK WITH. BE CAREFUL, EVEN AT THE 1-HOUR TIME, NOT TO LOOSEN THE STUD. FULL CURE TIME IS 24 HOURS**

- 9) AFTER STUDS ARE SECURE TO THE EXIT DUCT, INSTALL TANK TO EXIT DUCT AND INSTALL EXIT DUCT.

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## 6.2 SEPARATOR INSTALLATION

REF: DRAWING BI 2001 SHEET 5

- 1) LOCATE POSITION OF MOUNTING STUDS (CS125-1032-8CR)

**NOTE: LOCATION OF FASTENERS MAY BE ALTERED SLIGHTLY FOR BETTER FIT AROUND ANY HOSES OR COMPONENTS IN THE AREA.**

**NOTE: ON SOME AIRCRAFT THERE ARE TOW NUT PLATES MOUNTED IN THE FIREWALL AT THIS LOCATION. THEY SHOULD HAVE THE SAME HOLE SEPARATION AS THE SEPARATOR. IF YOU WISH TO USE THEM INSTEAD OF THE STUDS, YOU MAY.**

- 2) CLEAN AREA AND INSTALL STUDS AS PER INSTRUCTIONS WITH STUDS.
- 3) AFTER STUDS HAVE CURED, INSTALL SEPARATOR. SECURE WITH NUTS (MS 200500-1032) AND WASHER (AN960KD10).

## 6.3 HOSE INSTALLATION

### 6.3.1 SUMP ASSY DRAIN HOSE INSTALLATION

- 1) REINSTALL FUEL STRAINER DRAIN HOSE TO THE NIPPLE ON THE VENT TUBE (LOCATION IS SAME AS ON THE OLD VENT TUBE).
- 2) INSTALL GARLOCK SEAL AND FUEL DRAIN TUBES TO THE TOP OF THE SUMP ASSY. THERE ARE THE SAME NUMBER OF NIPPLES ON THE SUMP ASSY AS THERE WERE ON THE ORIGINAL VENT TUBE. THERE WILL BE ONE 3/8" NIPPLE LEFT OPEN. THIS WILL BE USED LATER FOR THE AIR/OIL SEPARATOR DRAIN. HOSES MAY BE TRIMMED FOR BETTER FIT.

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## 6.3.2 AIR/OIL SEPARATOR HOSE INSTALLATION

- 1) INSTALL HOSE (P/N BI 2001-10) FROM ENGINE VENT EXIT TO INLET OF AIR/OIL SEPARATOR. SECURE WITH CLAMPS (MS 35842-11) ON ENDS. USING ADEL CLAMPS (MS 21919-G16 & G18) TO SECURE VENT LINE TO ENGINE MOUNT AS PREVIOUS VENT LINE WAS SECURED.
- 2) INSTALL HOSE (P/N BI 2001-12) TO CONNECT AIR/OIL SEPARATOR TO TOP END OF VENT TUBE MOUNTED ON SIDE OF SUMP ASSY. SECURE ENDS WITH CLAMPS (MS 35842-11)
- 3) CUT A LENGTH OF HOSE (F4040 TYGON 3/8 I.D.) FROM HOSE PROVIDED TO CONNECT OIL DRAIN EXIT ON THE AIR/OIL SEPARATOR TO THE REMAINING OPEN 3/8 NIPPLE ON THE SUMP ASSY. SECURE ENDS OF HOSE WITH CLAMPS (B-6604). DRAIN TUBE MAY BE SECURED TO VENT LINE OR TO OTHER OBJECTS TO PASS FROM SEPARATOR TO SUMP.

## 6.3.3 DRAIN VALVE INSTALLATION

WITH OIL COOLER EXIT DUCT SECURED AND TANK SECURED TO EXIT DUCT. INSTALL DRAIN VALVE THROUGH HOLE IN EXIT DUCT INTO TANK ASSY. THE 1" HOLE IN EXIT DUCT CAN BE ENLARGED TO INSURE DRAIN VALVE DOES NOT RUB

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## 6.4 FINAL INSTALLATION

CHECK TO SEE IF NEW BREATHER LINE OR TYGON TUBING NEEDS SECURING TO PREVENT CHAFFING ON OTHER LINES. WHATEVER DEVICE IS USED, INSURE THE TUBE IS NOT DEFORMED AS TO RESTRICT THE FLOW OF AIR OR FOR FLUID DRAINAGE.

REINSTALL COWLING OR PANELS REMOVED TO INSTALL SUMP ASSY AND AIR/OIL SEPARATOR.

## 6.5 INSPECTION

THERE IS NO INSPECTION CRITERIA FOR THE SEPARATOR OR THE SUMP. CHECK CONTINUED AIRWORTHINESS INSTRUCTIONS ON PAGE 16 FOR SUGGESTIONS AS TO PERIODIC MAINTENANCE.

## 7.0 RETURN AIRPLANE TO SERVICE

- 1) COMPLETE AN APPROPRIATE ENTRY IN THE AIRPLANE LOGBOOK

EXAMPLE:           INSTALLED BUTTERFIELD INDUSTRIES OIL RESIDUE COLLECTION SYSTEM, PART NUMBER 2001-1 AS PER STC SA01800CH.

- 2) COMPLETE THREE COPIES OF FAA FORM 337. INSERT ORIGINAL IN AIRPLANE FLIGHT MANUAL. MAIL ONE COPY TO LOCAL FAA-FSDO AND RETAIN ONE COPY FOR THE INSTALLER.

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3) NO WEIGHT AND BALANCE CHANGE

## FOR YOUR REFERENCE

ADDED WEIGHT OF AIR/OIL SEPARATOR AND OIL  
RESIDUE TANK

2.5 Lb

THE ARM FOR THE FIRE WALL IS

125.000 INCHES

# PACKING LIST

## KIT P/N BI 2001-1

RESIDUE TANK ASSEMBLY	BI 2201-1	2 EA.
AIR/OIL SEPARATOR ASSY	BI 3450-3	2 EA.
HOSE ASSY, BREATHER	BI 2001-10 21.0"	2 EA.
HOSE ASSY, BREATHER	BI 2001-12 36.0"	2 EA.
HOSE ASSY, DRAIN	F-4040A 3/8"	8 FT.
CLAMP	MS 35842-11	8 EA.
CLAMP	B-6604	18 EA.
CLAMP	MS 21919 G16	2 EA.
CLAMP	MS21919 G18	2 EA.
STUD KIT	CS125-9	1 EA.
NUT	MS 20500-1032	8 EA.
WASHER	AN960KD10	8 EA.

**CONTINUED AIRWORTHINESS INSTRUCTIONS**

**THERE ARE NO SCHEDULED INSPECTION PERIODS FOR ANY COMPONENT OF THE BUTTERFIELD INDUSTRIES 'OIL RESIDUE COLLECTION SYSTEM'.**

**USE THE FOLLOWING GUIDELINES FOR SUCCESSFUL CONTINUED AIRWORTHINESS.**

**ANYTIME THE COWLING IS OPEN FOR INSPECTION, THE OIL RESIDUE TANK AND AIR/OIL SEPARATOR SHOULD BE INSPECTED FOR CONDITION AND SECURITY.**

**ALL HOSE CLAMPS TO TANK AND SEPARATOR SHOULD BE INSPECTED FOR CONDITION AND SECURITY.**

**THE AIR/OIL SEPARATOR END CAP CAN BE REMOVED FOR INSPECTION OF THE INTERNAL SCREEN. IF ANY MATERIAL OTHER THAN OIL IS FOUND, THE CAUSE SHOULD BE INVESTIGATED.**

**THE TANK SHOULD BE DRAINED ON A PERIODIC BASIS.**

**IF THE TANK IS NOT DRAINED, THE RESIDUE OIL WILL DRAIN FROM THE OVERFLOW TUBE.**



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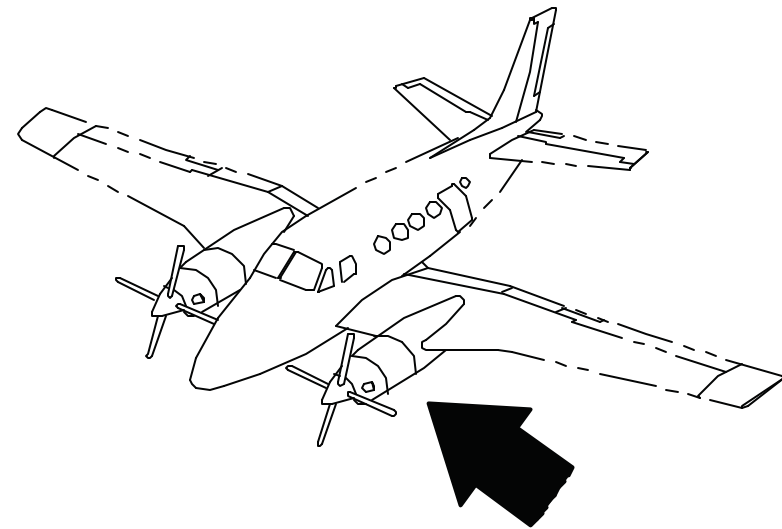
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NOTES:

- 1 SLIGHT ENLARGEMENT OF HOLE PERMISSABLE FOR CLEARANCE OF DRAIN VALVE AND TUBE.
- 2 INSTALL BOLTS PER EA-AC43.13
- 3 ALTERNATE PART NUMBER: AN960JD10

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	REVISED ITEMS 1D, 15 & 1B QTY WAS 4 REVISED APPLICATION BLOCK	04-28-03	WB
B	REVISED ITEMS 3, WAS: BI-2301-1, IS: BI-2401-1	01-04-08	WB
C	REVISED ITEMS 3, WAS: BI-2301-1, IS: BI-3450-3	04-19-10	



**-1 OIL RESIDUE COLLECTION SYSTEM**

SEE SHEET 2

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ZONE	FINISH	PART MARK	ITEM INCL
							2D
							19
8	CS125-1032-8CR	STUD	CLICK BOND CARSON CITY, NEVADA				18
AR	F-4040A	HOSE	3/8" I.D. 1/2 O.D. TYGON TUBING UNIVERSAL PLASTIC, SEATTLE, WA.				17
AR	CB2DD	ACRYLIC ADHESIVE	CLICK BOND CARSON CITY, NEVADA				16
8	MS20500-1032	NUT					15
16	NAS1922-0075-1	CLAMP					14
4	MS21919-G18	CLAMP					13
4	MS21919-G16	CLAMP					12
8	MS35842-11	CLAMP					11
8	AN960KD10	WASHER	ALT: AN960JD10				10
							9
AR	MS20995-C32	SAFETY WIRE					8
							7
2	BI-2001-12	HOSE	36.0" LONG SNOOK INC. GRANDHAVEN, MI.				6
2	BI-2001-1D	HOSE	21.5" LONG SNOOK INC. GRANDHAVEN, MI.				5
2	BI-22D1-1	SUMP KIT ASSEMBLY					4
2	BI-345D-3	SEPARATOR ASSEMBLY					3
							2
-	-1	OIL RESIDUE COLLECTION SYSTEM					1

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES -TOLERANCES-		DRAWN B. W. 01-01-03		BUTTERFIELD INDUSTRIES. ROCHESTER, MINNESOTA.	
.X ± .1 .XX ± .03 .XXX ± .010 ANGULAR ± 2°		CHECKED J. W. 01-01-03			
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PART DASH NO.		APPRVD		SIZE D	REV LTR C
NEXT ASSY		USED DN		DWG NO. BI-2001	
APPLICATION				SCALE 1/1	SHEET 1 OF 5

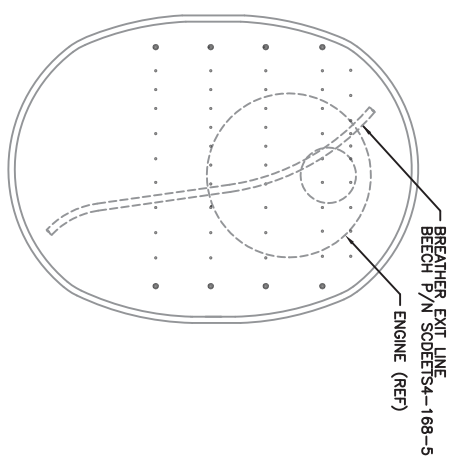
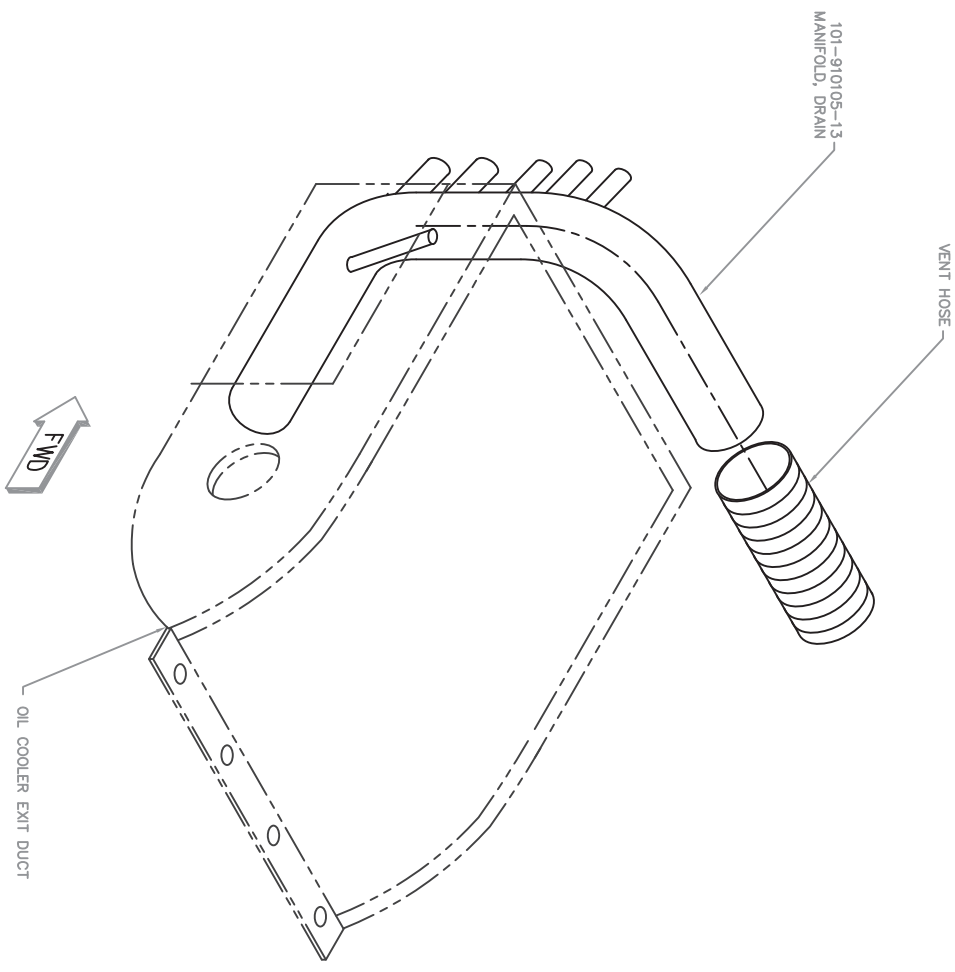
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C:\BUTTER\BI-2001-01

REV#	DESCRIPTION	DATE	APPROVED



**REMOVAL**  
L/H R/H ENGINE  
VIEW LOOKING AFT AT FIREWALL

**MANIFOLD REMOVAL**  
TYPICAL L.H. AND R.H. ENGINES

SEE SHEET 1 FOR LIST OF MATERIAL, NOTES AND APPLICATION DATA.

PART NO.	PART NAME	USED ON	APPLICATION	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DIMENSIONS:			DETAILED DATE	OIL RESIDUE COLLECTION SYSTEM INSTALLATION	REV/LEN
				X	Y	Z			
<b>PROHIBITIVE NOTICE</b> THIS PART IS NOT TO BE USED IN THE ASSEMBLY OF THE BREATHER EXIT LINE BEECH P/N SCODETS4-168-5 UNLESS OTHERWISE SPECIFIED. THE DIMENSIONS OF THIS PART MUST BE AS SHOWN IN THE DRAWING.				<b>PROHIBITIVE NOTICE</b> THIS PART IS NOT TO BE USED IN THE ASSEMBLY OF THE BREATHER EXIT LINE BEECH P/N SCODETS4-168-5 UNLESS OTHERWISE SPECIFIED. THE DIMENSIONS OF THIS PART MUST BE AS SHOWN IN THE DRAWING.					

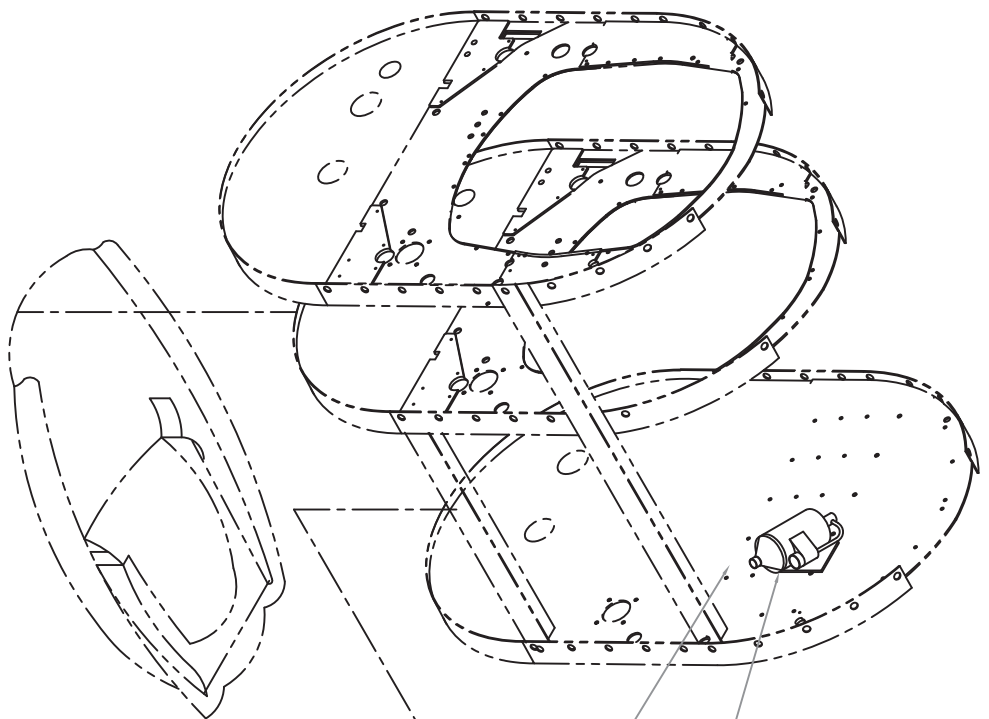
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REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	REVISED BI-2201-1 SWAMP ASSEMBLY PICTURE	03-15-03	



ENGINE NACELLE L.H.

PART NO.	HEAT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DIMENSIONS: X ± .1 X ± .1 XXX ± .010 ANGULAR ± .2°	DRAWN Checked DATE SYNCS	BY 01-01-03 01-01-03	BUTTERFIELD INDUSTRIES, ROCHESTER, MINNESOTA	SEE DRAWING NO. BI-2001	SCALE 1/1	DATE MADE	SHEET 3 OF	REV. LTR A
	APPLICATION										

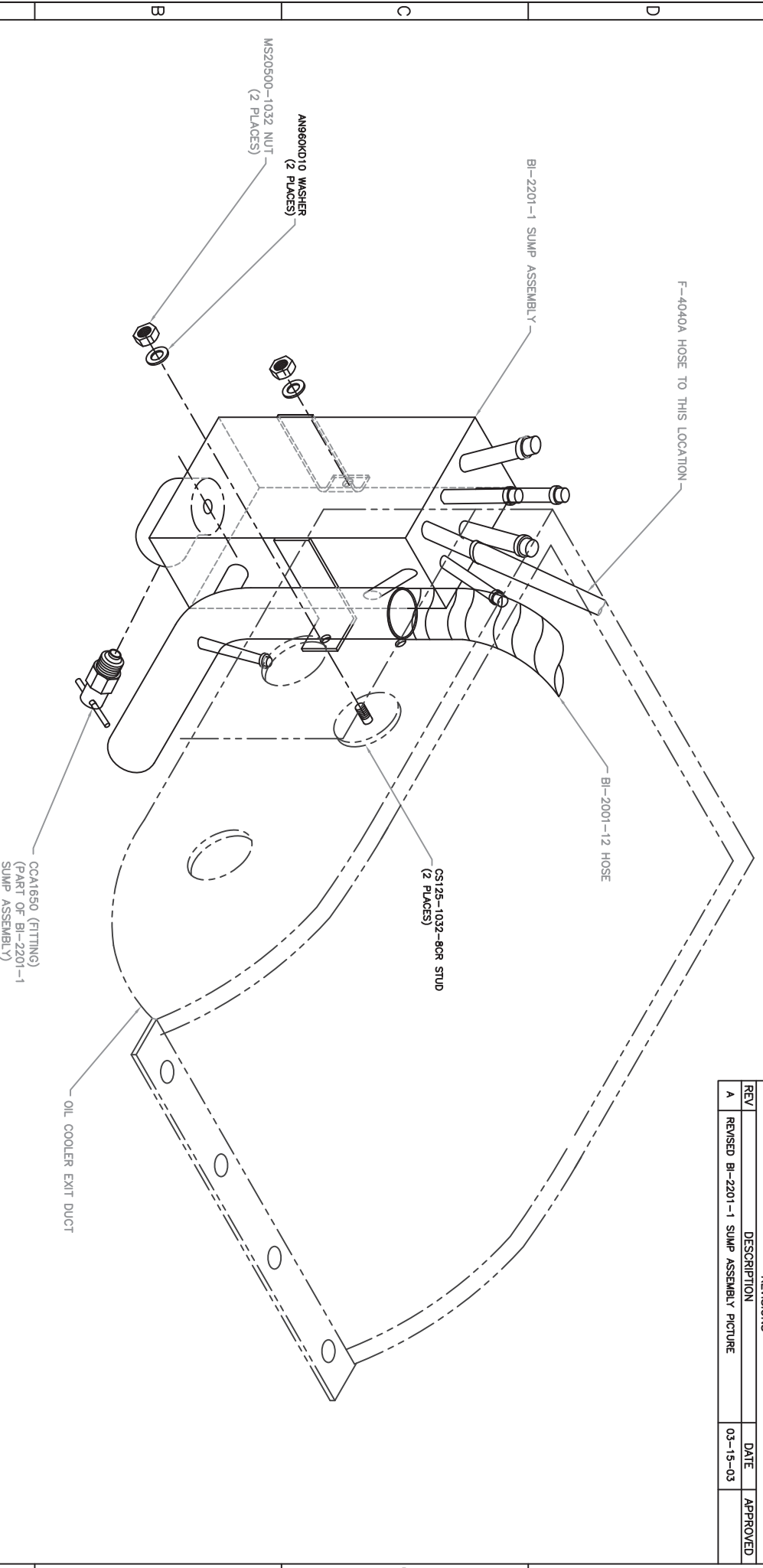
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REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	REVISED BI-2201-1 SUMP ASSEMBLY PICTURE	03-15-03	

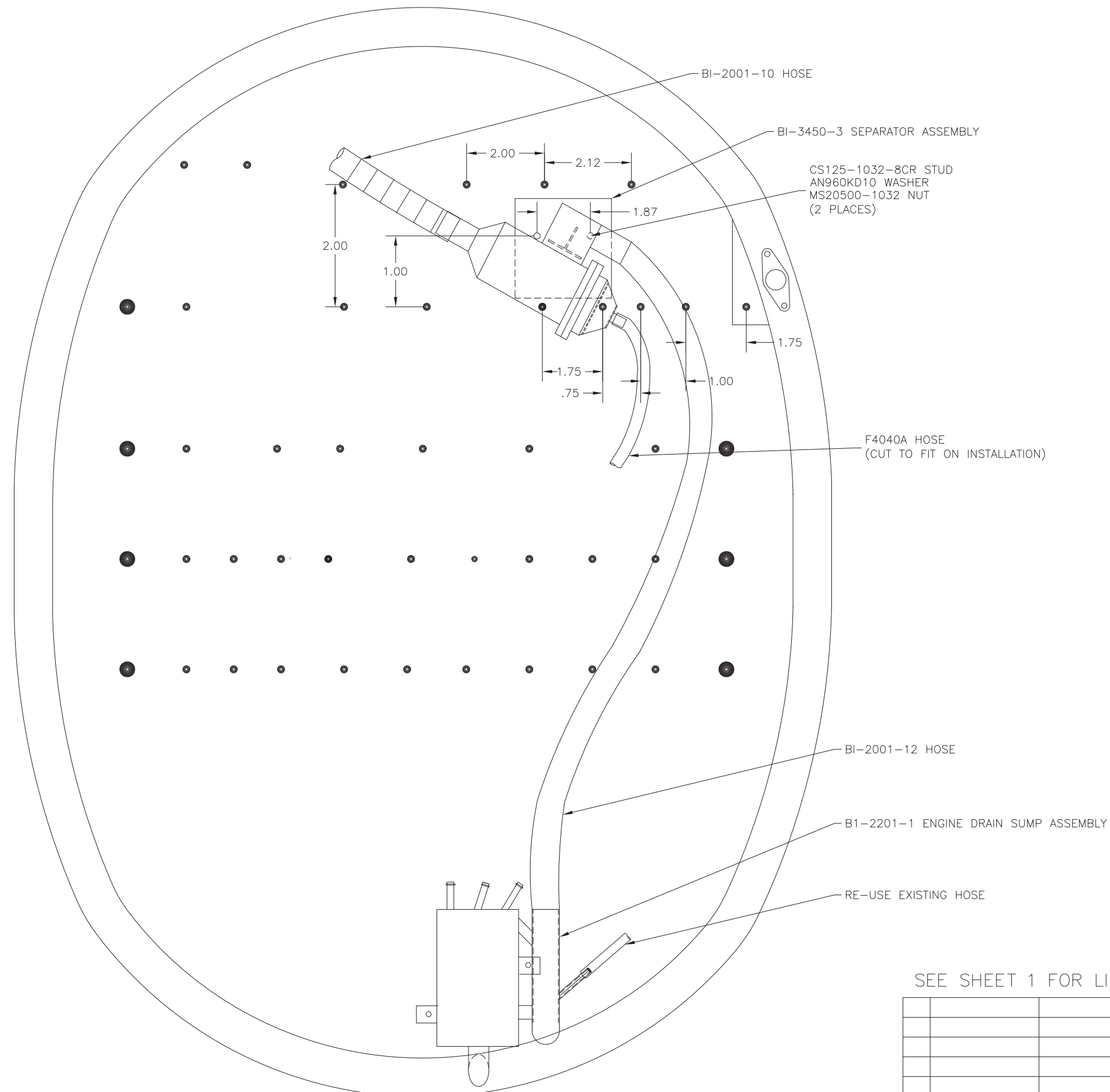


SEE SHEET 1 FOR LIST OF MATERIAL, NOTES AND APPLICATION DATA.

**-1 DRAIN SUMP KIT INSTALLATION**  
(INSTALLATION TYP. BOTH ENGINES)

PART NO.	PART NAME	APPLICATION	USED ON	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS X .1 Y .1 Z .1 X .1 Y .1 Z .1 ANGULAR ± .2	PROHIBITIVE NOTICE NO PARTS ARE TO BE USED UNLESS SPECIFICALLY LISTED IN THE PART LIST OR OTHERWISE APPROVED BY THE ENGINEER IN CHARGE. DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS. DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS. DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS. DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS. DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS.	CHECKED	BY	DATE	SCALE	SHEET	OF	REV	DATE

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	REVISED BI-2201-1 SUMP ASSEMBLY PICTURE REVISED BI-2301-1 ATTACHMENT	03-15-03	WB
B	REVISED CALLOUT WAS: BI-2301-1 SEPERATOR ASSEMBLY IS: BI-2401-1 SEPERATOR ASSEMBLY, REVISED PICTURE	01-04-08	WB
C	REVISED CALLOUT WAS: BI-2401-1 SEPERATOR ASSEMBLY IS: BI-3450-3 SEPERATOR ASSEMBLY	04-19-10	



**-1 DRAIN SUMP KIT INSTALLATION**  
(INSTALLATION TYP. BOTH ENGINES)

SEE SHEET 1 FOR LIST OF MATERIAL, NOTES AND APPLICATION DATA.

PART DASH NO.	NEXT ASSY	USED ON	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES --TOLERANCES-- .X ± .1 .XX ± .03 .XXX ± .010 ANGULAR ± 2'	DRAWN B. W.	01-01-03	BUTTERFIELD INDUSTRIES. ROCHESTER, MINNESOTA.
	APPLICATION			CHECKED J. W.	01-01-03	
			PROPRIETARY NOTICE BUTTERFIELD INDUSTRIES, INC. PROPRIETARY RIGHTS ARE INCLUDED IN THE INFORMATION DISCLOSED HEREIN. NEITHER THIS DOCUMENT NOR THE INFORMATION DISCLOSED HEREIN SHALL BE REPRODUCED, USED OR PERMITTED IN WHOLE OR IN PART WITHOUT THE WRITTEN PERMISSION OF BUTTERFIELD INDUSTRIES, INC. THE FOREGOING DOES NOT APPLY TO VENDOR DATA.	ENGR		REV LTR C
				STRESS		
				APPVD		DWG NO. BI-2001
						SHEET 5 OF 5
						SCALE 1/1
						RLSE DATE
						SHEET 5 OF 5
						DBW