DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL

MAINTENANCE MANUAL

INCLUDING REPAIR PARTS AND

SPECIAL TOOLS LIST

FILTER-SEPARATOR, 350-GPM

OPTIMUM PERFORMANCE

(GENERAL STEEL TANK CO. MODEL 0217)

FSN 4330-150-6123

This copy is a reprint which includes current pages from Changes 1 through 8,9

HEADQUARTERS, DEPARTMENT OF THE ARMY

OCTOBER 1971

WARNING

Do not smoke or use open flame in vicinity of filter-separator.

Do not drain fuel from the unit on the ground. Drain the unit into a metal container that can be closed. Avoid fuel spillage, cover all spilled fuel with earth or sand.

Use protective equipment to prevent skin and eye contact with fuel. Some of the liquids this unit is capable of filtering are very caustic and will induce severe irritation. Use rubber fuel resistant gloves when replacing elements due to the toxic effects of some fuel additives.

The filter separator must be depressurized in order to remove any components. Release pressure by opening the manual vent valve.

Used filter elements present a constant fire hazard; bury used filter elements as soon as possible. Air vent valve should remain open during temporary shutdown periods to prevent pressure buildup.

Do not operate the filter/separator until it has been attached to a suitable ground.

Changes In force: C1, C2, C3, C4, C5, C6, C7, C8, C9, and C10.

TM 5-4330-211-12
C10

CHANGE

NO. 10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 23 May 1996

Operator and Organizational Maintenance Manual
(Including Repair Parts and Special Tools List)

FILTER-SEPARATOR, 350 GPM, OPTIMUM PERFORMANCE
(GENERAL STEEL TANK CO. MODEL 0217)
NSN 4330-00-150-6123
(BETA SYSTEMS, INC. MODEL 010-2-001)
NSN 4330-00-77-8485
(K E E N E CORPORATION MODEL 844-18-V-350AL)
NSN 4330-00-177-8485
(GIL, INC. MODEL GFS-18-V-350)
NSN 4330-00-177-8485

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

TM 5-4330-211-12, 2 October 1971, is changed as follows:

Page i, Change 8, Reporting of Errors and Recommending Improvements, change to read as follows.

You can help improve this manual. If you find any mistakes, or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. You may also submit your recommended changes by E-mail directly to <mpmt%avma28@st-louis-emh7.army.mil> A reply will be furnished directly to you. Instructions for sending an electronic 2028 maybe found at the back of this manual immediately preceding the hard copy 2028.

Page 7, Change 3, Line 1, FILTER SEPARATOR, 350 GPM, 0217 (15277), Figure C1, Column E, NATIONAL STOCK NUMBER 4330-150-6123 is changed to read 4330-00-177-8485.

Page 7, Change 3, Line 3, SCREW, COVER MTG. MS90726-162, Figure C1, Item 1, Column E, NATIONAL STOCK NUMBER 5305-727-5677 is changed to read 5305-00-727-2283.

Page 7, Change 3, Line 4, SCREW, COVER MTG. MS90726-163, Figure C1A, Item 1, Column E, NATIONAL STOCK NUMBER 5305-725-4109 is changed to read 5305-00-726-2550.

Page 1-1, Paragraph 1-3, REPORTING OF ERRORS, is changed to read as follows.

You can help improve this manual. If you find any mistakes, or if you know of a way to improve these procedures, please let us know. Mall your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished directly to you.

Page C-3, Paragraph C-7, 2nd sentence, Recommendations for Maintenance Publications Improvements, is changed to read.

Reports should be submitted on DA Form 2028, Recommended Changes to Publications, and forwarded direct to Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO. 63120-1798. A reply will be furnished directly to you.

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
01917

DISTRIBUTION:

To be distributed in accordance with DA Form 12-25-E, block no. 0796, requirements for TM 5-4330-211-12.

Changes in force: C1, C2, C3, C4, C5, C6, C7, C8, and C9.

TM 5-4330-211-12
C 9

CHANGE
NO. 9

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 26 January 1990

Operator and Organizational Maintenance Manual
(Including Repair Parts and Special Tools List)

FILTER-SEPARATOR, 350 GPM, OPTIMUM PERFORMANCE
(GENERAL STEEL TANK CO. MODEL 0217)
NSN 4330-00-150-6123
(BETA SYSTEMS, INC. MODEL 010-2-001)
NSN 4330-00-177-8485
(KEENE CORPORATION MODEL 844-18-V-350AL)
NSN 4330-00-177-8485
(GIL, INC. MODEL GFS-18-V-350)
NSN 4330-00-177-8485

Approved for public release; distribution is unlimited.

TM 5-4330-211-12, 2 October 1971, is changed as follows:

Page C-6. Lines 8 and 9 on Clamp, Ground Cable, Attaching 13217E9339 (97403) should be designated as the final entry. The item number in the Item No. column should be changed from 2 to 7.

Page C-6. Beginning on Line 8, the following entries should be made in the appropriate columns.

(1)	(2)	(3)	(4)	(5)	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW				(7) ILLUS-TRATION	
SMR CODE	FEDERAL STOCK NUMBER	DESCRIPTION REF NUMBER & MFR CODE USABLE ON CODE	UNIT OF MEAS	QTY INC IN UNIT	(a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(a) FIG. NO.	(b) ITEM NO.
PA	5975-00-794-3532	COUPLING (81 349)	EA	3	*	*	*	*	C11	2
PA	5975-01-143-7340	GROUND ROD (81 349)	EA	3	*	*	*	*	C11	3
PA	6145-00-189-6695	WIRE, AWG, NUMBER 6 (6-ft.) (81 349)	EA	1	*	*	*	*	C11	4
PA	5999-00-186-3912	CLAMP (81 349)	EA	1	*	*	*	*	C11	5
PA	5940-00-271-9504	TERMINAL, GROUND (81349)	EA	1	*	*	*	*	C11	6
PA	5975-01-011-0376	CLAMP, COUPLING (98245)	EA	1	*	*	*	*	C11	7

Page C-17. Figure C-11. Ground rod. Should be modified as follows:

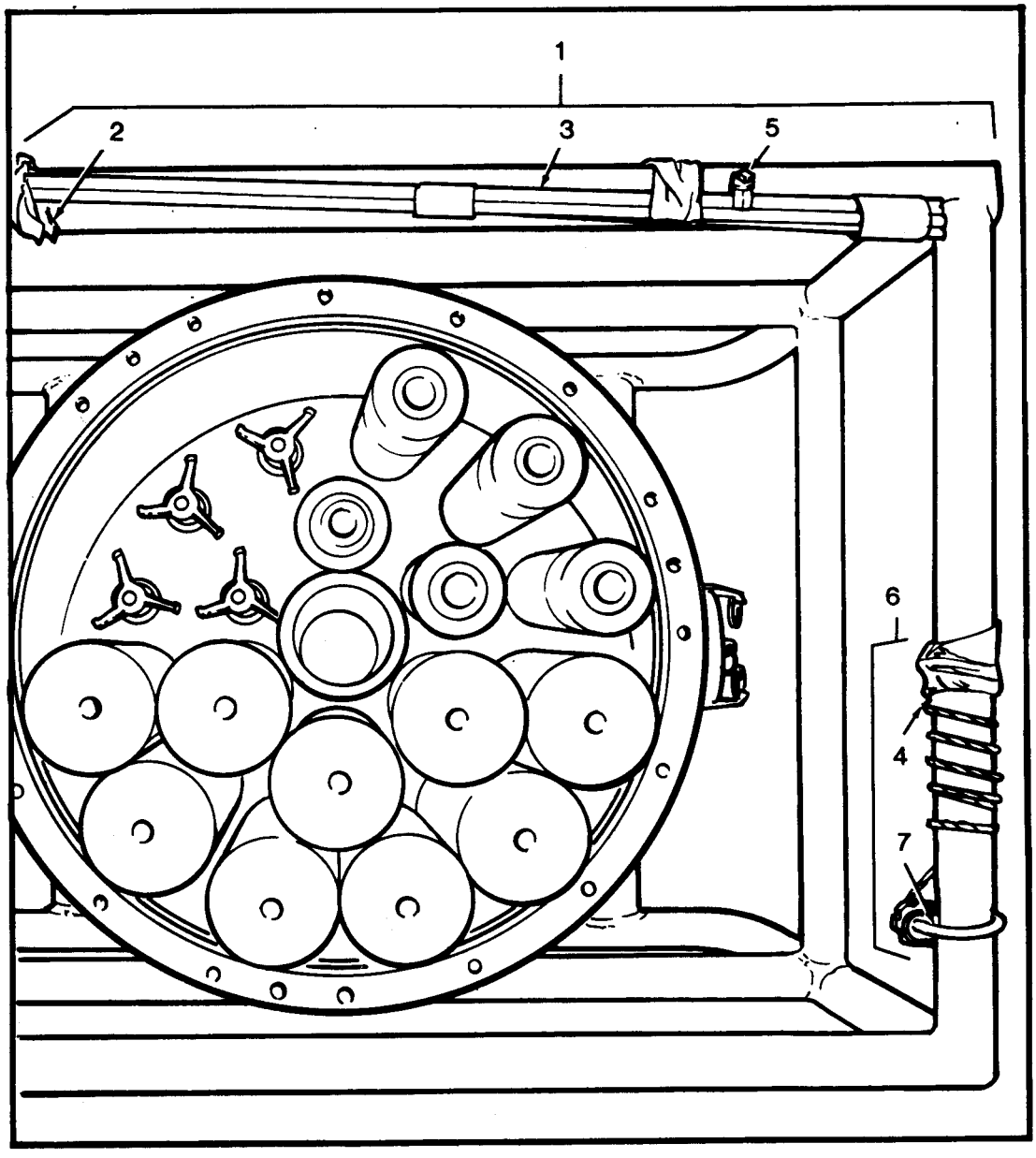


Figure C-11. Ground rod. ME 4330-211-12/C11

Changes in Force: C 1 and C 2

TM 5-4330-211-12
C 2

Change No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., *2 December 1974*

Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools Lists FILTER-SEPARATOR, 350-GPM OPTIMUM PERFORMANCE (GENERAL STEEL TANK CO. MODEL 0217) FSN 4330-150-6123 (BETA SYSTEMS INC. MODEL 010-Z-001) FSN 4330-177-8485

TM 5-4330-211-12, 2 October 1971, is changes as follows:

The title is changed as shown above:

Inside Front Cover, the following WARNING is added:

WARNING

Dry cleaning solvent, PD-680, used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Flash point of solvent is 100°F. - (38 c) - 138°F. - (59 c).

Page iii. List of Illustrations. Add in numerical order the following:

Number	*Title*
2-1A(2)	Controls and instruments (Sheet 2 of 3)
4-4A	Differential pressure indicator, lines and fittings
C-6A	Lines and fittings.
C-9A	Pressure differential indicator

Page 1-1. Paragraph 1-1, is superseded as follows:

1-1 Scope

This manual is for your use in operating and maintaining the Filter-Separator, General Steel Tank Model 0217, and Beta Systems Inc., Model 010-Z-001.

Paragraph 1-3, is superseded as follows:

1-3. Recommendation for Maintenance Publications Improvements

You can improve this manual by recommending improvements, using DA Form 2028 (Recommended Changes to Publications and Blank Forms) and mailing the form to Commander, US Army Troop Support Command, ATTN: AMSTS-MPP, 4300 Goodfellow Boulevard, St. Louis, Mo. 63120. A reply will be furnished direct to you.

Page 1-4. Paragraph 1-8.1 is added as follows:

1-8.1 Tabulated Data. (Beta Systems Model)

a. Identification Plate. The filter separator has one identification plate. Information shown on the plate is listed below.

Specification No.	MIL-F-52666
Design activity Code No.	97403
Manufacturer	Beta Systems Inc.
Filter/Separator Liquid Fuel	Frame Mounted
Capacity	350 GPM
Element Quantity	18
Working pressure max	150
Weight	375 pounds

FSN	4330-177-8485
Mode	010F-Z-001
Contract No.	DSA 700-74-C-8929
Date of Manufacturer*	Qtr 4 year 74

b. Differential Pressure Indicator.

Manufacturer	Army Engineer Research and Development Laboratories, Fort Belvoir, Va.
Part Number	13219E9747-1
Maximum Allowable Differential Pressure	35 PSI
Differential Pressure Gauge Tolerance	± 2 PSI

c. Dimensions and Weight.

Length	47 inches
Width	33
Height	40
Weight	375 (pounds)

Page 1-4, paragraph 1-9. is superseded as follows

1-9. Differences in Models

This manual covers both the General Steel Tank Co. 350-GPM Filter/Separator Model 0217 and the Beta Systems Inc., 350 GPM Filter/Separator Model 010F-Z-001. The difference between models being that Model 0217 has a "pop-up" Differential Pressure Indicator, where Model 010F-Z-001 has a gauge Differential Pressure Indicator.

Page 2-3, Figure 2-1A is added as follows:

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *29 May 1973*

Operator and Organizational Maintenance Manual
Including Repair Parts and Special Tools Lists
FILTER-SEPARATOR, 350-GPM OPTIMUM PERFORMANCE
(GENERAL STEEL TANK CO. MODEL 0217)
FSN 4330-150-6123

TM 5-4330-211-12, 2 October 1971, is changed as follows:

Page C-4. Line 15 is changed as follows: Col 2, add FSN 4730-162-4003.
Line 24 is changed as follows: Col 3, change part No. to 13217E5365-1.

Page C-5. Line 3 is changed as follows: Col 2, change FSN 4730-278-4684.
Line 15 is changed as follows: Col 3, change part No. to RC742MFP85.

Page C-6. Line 2 is changed as follows: Col 1, change SMR code to X20.

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25A (qty rqr block No. 154) organizational maintenance requirements for Petroleum Distribution.

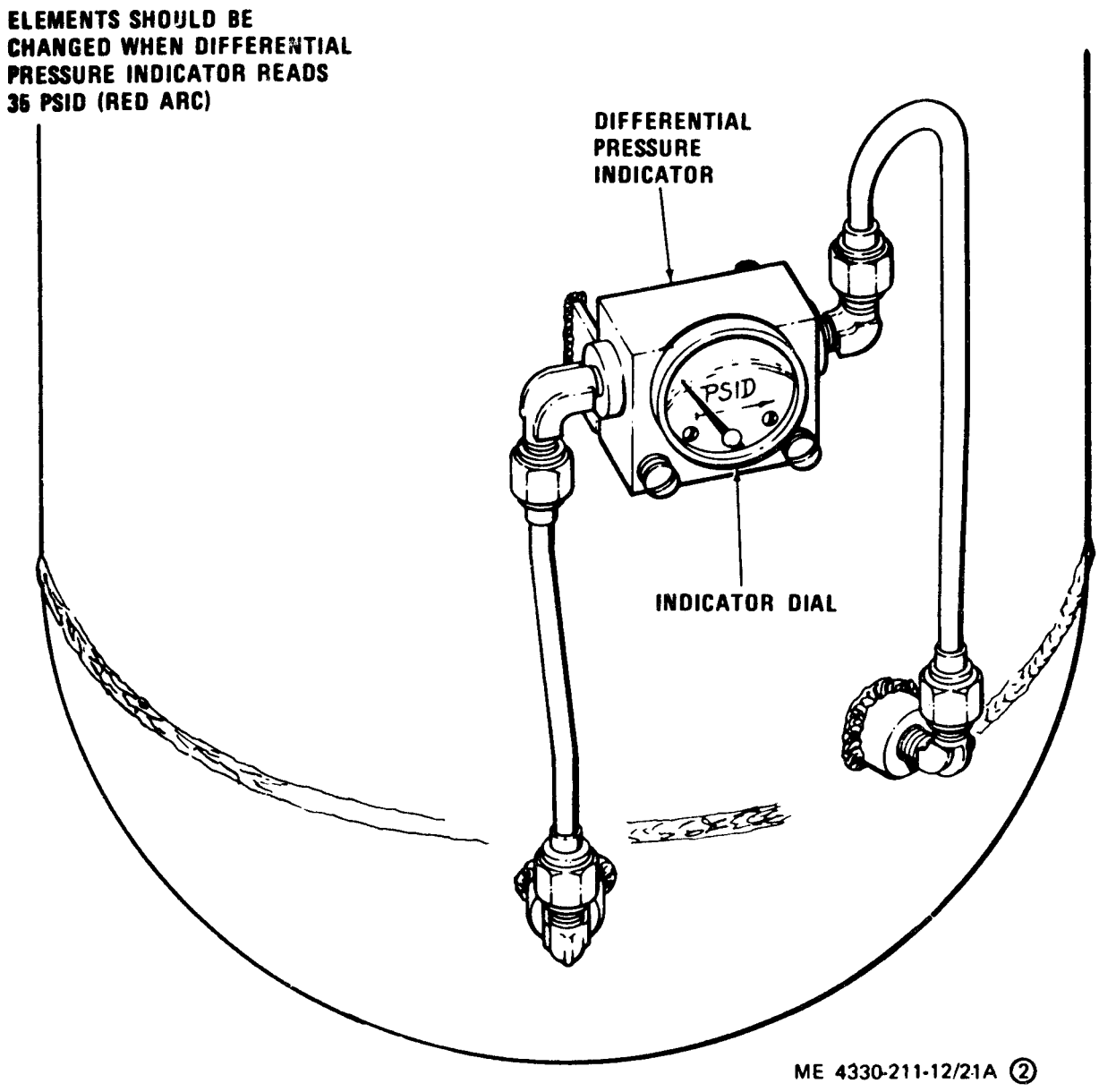


Figure 2-1A.② Controls and Instruments. Beta Systems Inc., Model 010F-Z-001. (Sheet 2 of 3)

Page 3-2, Table 3-2, Malfunction 2. After step 3 add the following note:

NOTE

On the Beta Systems Inc. Model, the Differential Pressure Indicator reads 35 PSID (Pounds per Square Inch Differential or Higher).

Page 4-3, Table 4-2, Line 1 — After DIFFERENTIAL PRESSURE INDICATOR "POPS UP", add:

NOTE

On Beta Systems Inc. Model 010F-Z-001, the Differential Pressure Indicator Reads 35 PSID or higher.

Page 4-5, paragraph 4-8*b*. (2.1) is added as follows:

(2.1) on Beta Systems Inc. Model, the differential pressure indicator may be tested by applying an equal, gauged pressure of 50 PSI to each of the ports, then increasing the pressure at the high pressure inlet port. The differential pressure gauge should indicate the difference between the two applied pressures within ± 2 PSI. Replace a defective differential pressure gauge.

Page 4-5. After figure 4-4, Figure 4-4A. is added as follows:

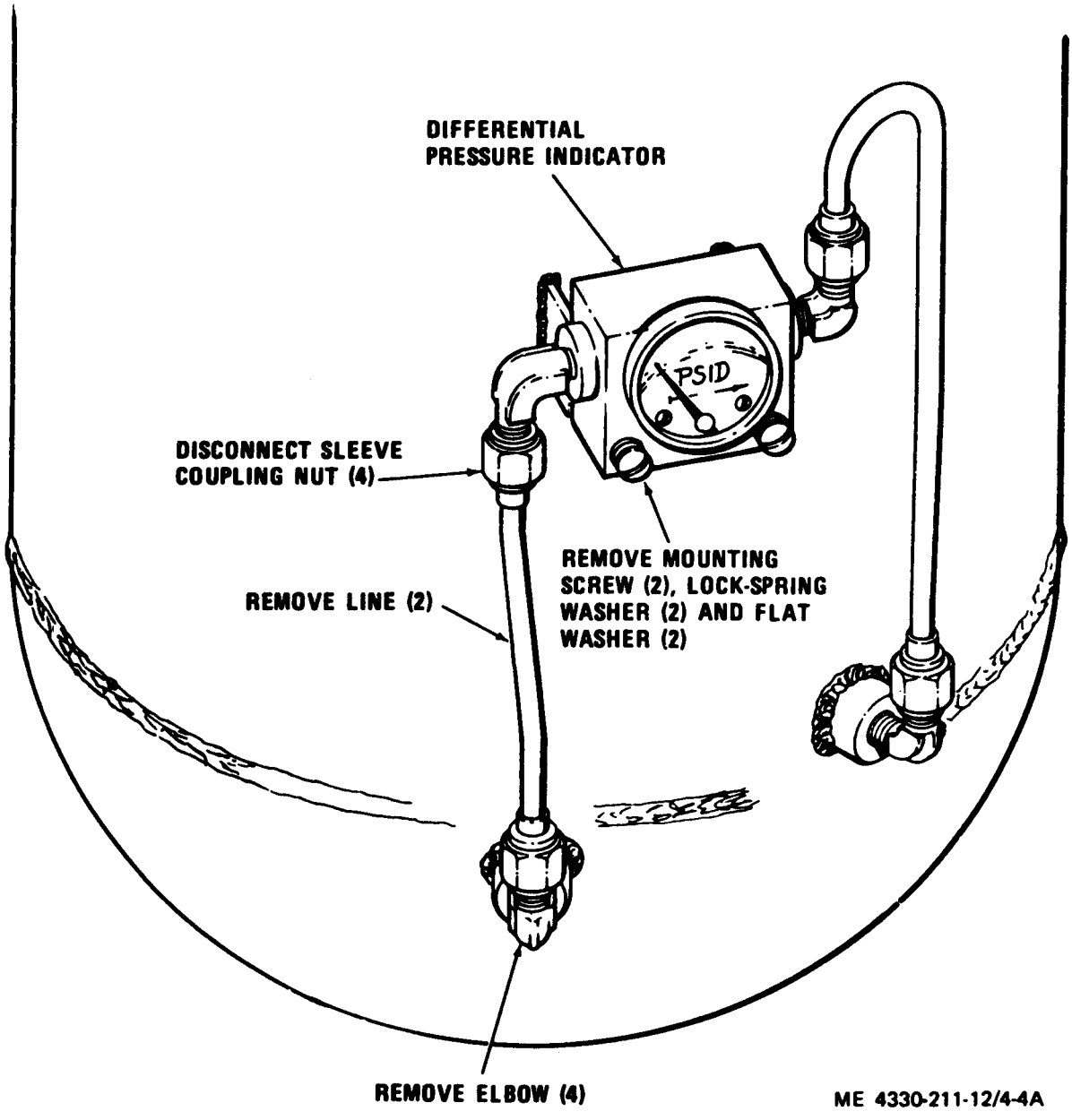


Figure 4-4A. Differential Pressure Indicator, Lines and Fittings on Beta Systems Inc. Model 010F-Z-001.

Page B-2, Section III, B-1. In remarks Column, change Repair includes straightening and welding of the frame by experienced aluminum welder only to read as follows: Repair Includes straightening of the frame.
Page C-5. Make the following changes:

Page	Line	Action	(1) SMR code	(2) Federal stock Number	(3) Description Ref Number & mfr code Usable on code	(4) Unit of meas	(5) Qty inc in unit	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.
					GROUP 2 — FLOW LIMITER, LINES AND FITTINGS								
C-5	9	Add item			ELBOW, 90° MS 20822-5D (96906)	EA	2	•	•	•	•	C6A	8
					GROUP 3 — SIGHT GAGE AND DIFFERENTIAL PRESSURE INDICATOR								
	11	Add items			INDICATOR DIFFERENTIAL PRESSURE 13219E9749-1 (97403)	EA	1	•	•	•	•	C9A	1
	12				SCREW, MACHINE INDICATOR MTG MS51957-85 (96906)	EA	2	•	•	•	•	C9A	2
	13				WASHER, LOCKSPRING MS35338-44 (96906)	EA	2	•	•	•	•	C9A	3
	14				WASHER, FLAT AN960-416L (81352)	EA	2	•	•	•	•	C9A	4

Page C-12. Figure C-6A. is added as follows.

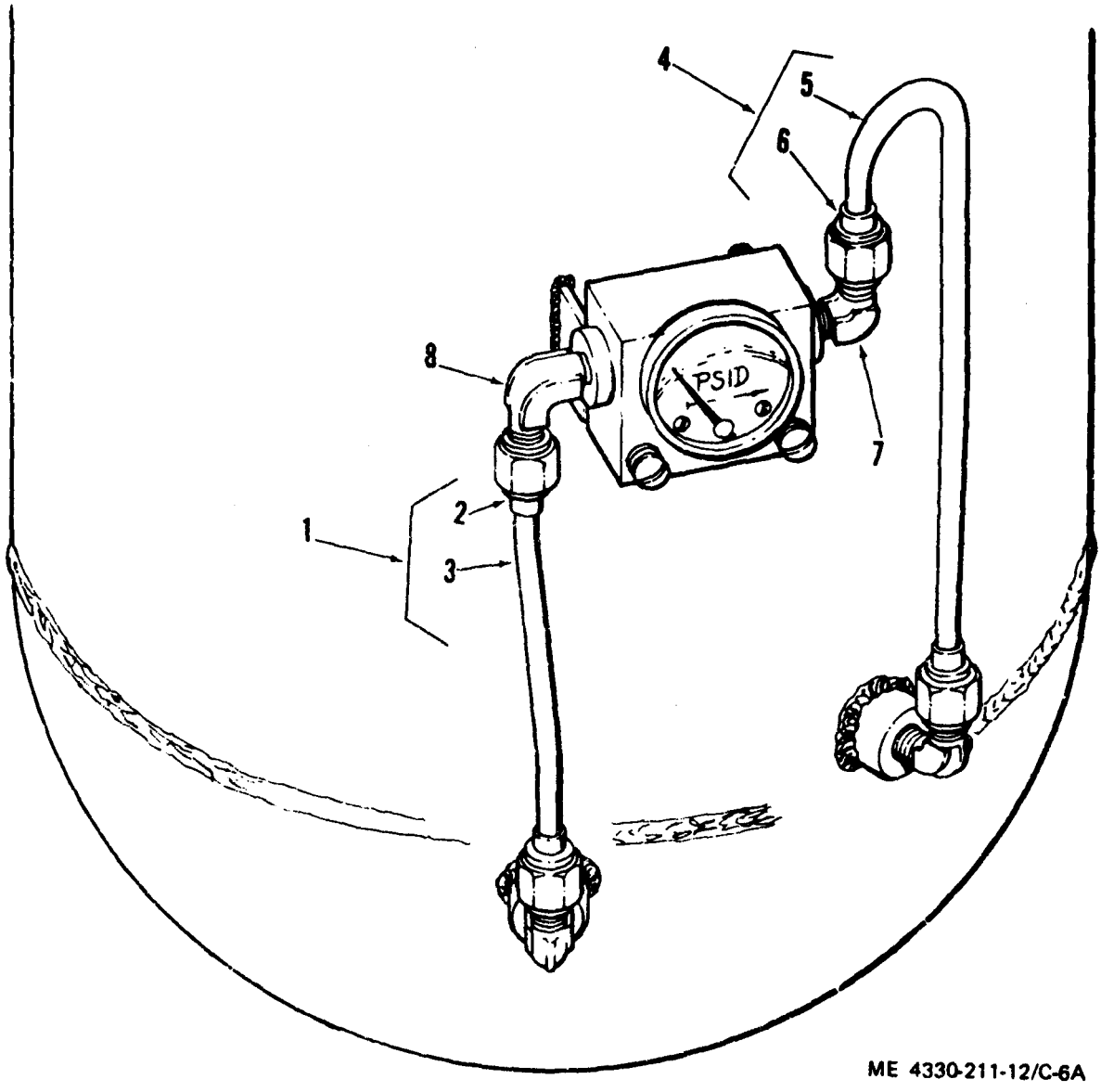


Figure C-6A. Lines and Fittings. Beta Systems Inc. Model 010F-Z401.

Page C-15. Figure C-9A. is added as follows.

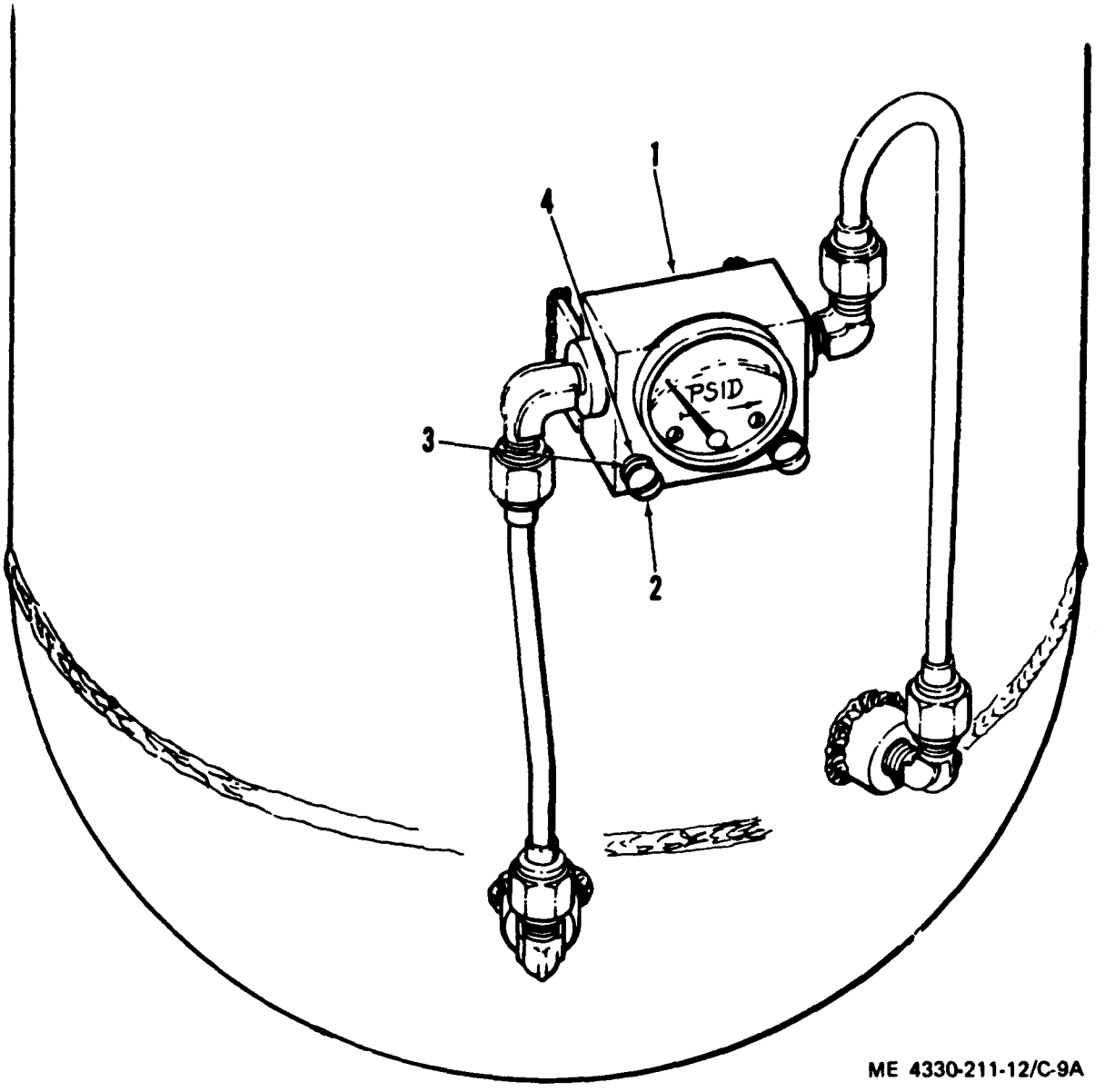


Figure C-9A. Differential Pressure Indicator, Beta Systems Inc. Model 010F-Z-001.

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25A, (qty rqr block No. 154) Organizational maintenance requirements for Petroleum Distribution.

TM 5-4330-211-12
C 3

CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D C, *20 November 1975*

Operator and Organizational Maintenance Manual Including Repair Parts and Special Tools List

FILTER-SEPARATOR, 350 GPM OPTIMUM PERFORMANCE (GENERAL STEEL TANK CO. MODEL 0217) NSN 4330-00-150-6123 (BETA SYSTEMS INC. MODEL 010-Z-001) NSN 4330-00-177-8485 (KEENE CORPORATION MODEL 844-18-V-350AL) NSN 4330-00-177-8485

TM 5-4330-211-12, 2 October 1971, is changed as follows:

The title is changed as shown above.

NOTE

All "Federal Stock Numbers" appearing in this publication should be corrected to the new "National Stock Numbers" before using. This can be done by inserting -00- after the Federal Supply Class. For example, Federal Stock Number 6115-937-0929 will be corrected to the following National Stock Number: 6115-00-937-0929. Wherever the words "Federal Stock Number" appear throughout the publication, correct to read "National Stock Number."

Page 1-1. Paragraph 1-1 is superseded as follows:

1-1. Scope

This manual is for your use in operating and maintaining the Filter-Separator, General Steel Tank Model 0217, Beta Systems Inc., Model 010-Z-001 and Keene Corporation Model 844-18-V-350AL.

Paragraph 1-5. Delete the word, "storage" on bottom line.

Paragraph 1-6. Add word "storage" to end of sentence.

Paragraph 1-8*c* is superseded as follows:

c. Dimensions and Weights.

(1) General Steel Tank Model 0217.

Length	47 (inches)
Width	33
Height	40
Weight	375 (pounds)

(2) Keene Corporation Model 844-18-V-350AL.

Length	47.00 (inches)
Width	33.25
Height	40.00
Weight	500 (pounds)

Page 1-4. Paragraph 1-8.2 is added as follows:

1-8.2. Tabulated Data (Keene Corp.)

a. Keene Corporation Model 844-18-V-350AL.

Specification No.	MIL-F-52666
Design activity code No.	97403
Manufacturer	Keene Corp. Fluid Handling Division
Element quantity	18
Working pressure max.	150
Weight 400 (pounds)	FSN 4330-177-8485
Model 844-18-V-350AL	
Contract No. DSA-700-73-C-9330	
Date of Manufacture:	Qtr. 3 Yr. 1974

b. Differential Pressure Indicator.

Part No.	13218E9749-1
Indication Range	0 - 35 psi

Figure 1-2A is added as follows:

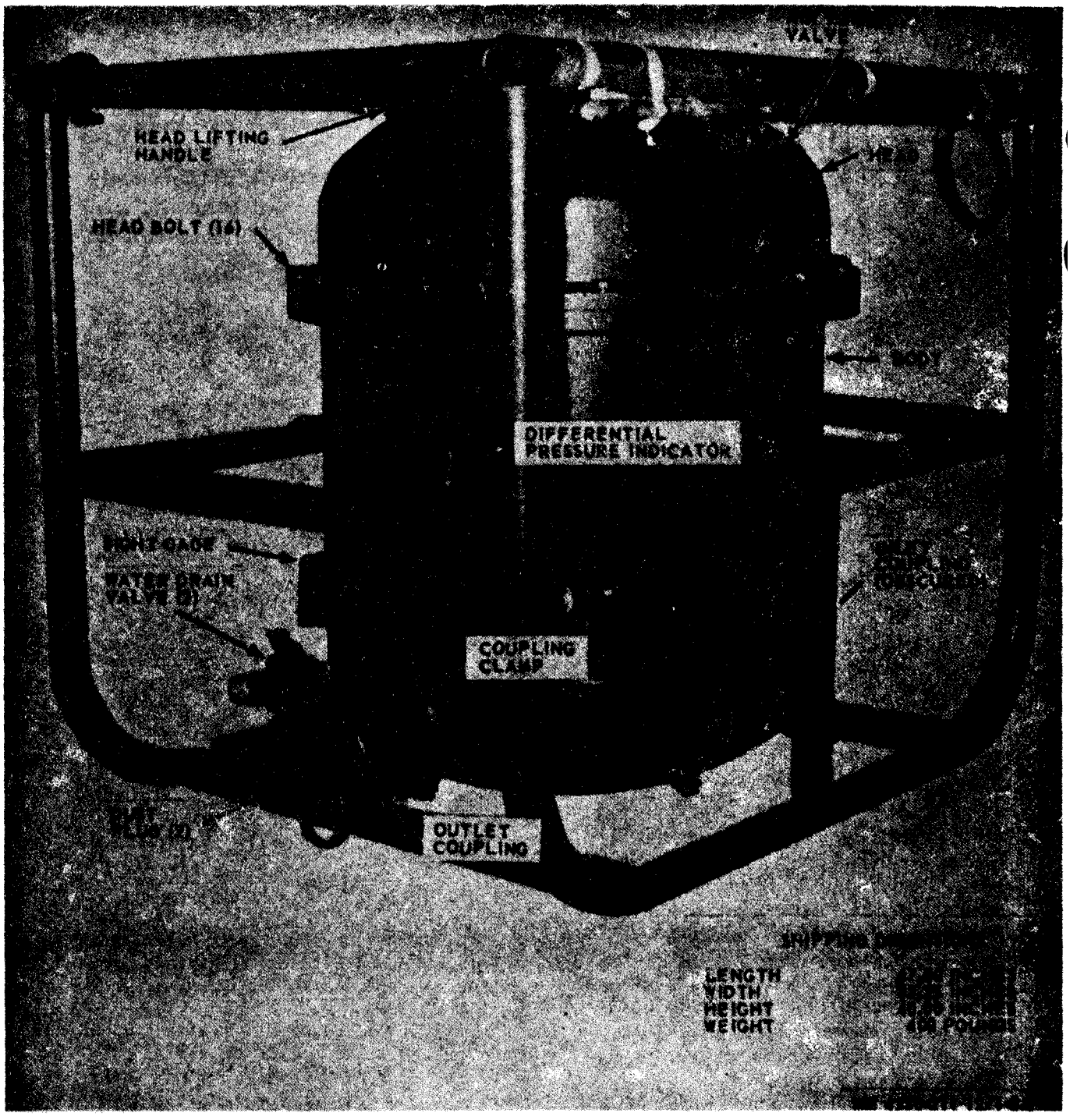


Figure 1-2A. Filter-separator (Keene Corp. Model 844-18-V-350AL, 3/4 right-front view with shipping dimensions.

Paragraph 1-9 is superseded as follows:

1-9. Differences in Models

This manual covers the General Steel Tank Co. Model 0217, Beta Systems Inc. Model 010-Z-001, and the Keene Corporation Model 844-18-V-350AL filter-separators. The basic differences in these models is that the General Steel Tank co. Model 0217 provides a popup button type differential pressure indicator; while the Keene Corporation Model 844-18-V-350AL includes a direct-reading dial type differential pressure indicator.

Page 2-1, paragraph 2-1*a*, lien 2. Change "from" to read, "for".

Paragraph 2-2, lien 5. Add "refer to" at the end of the line.

Page 2-3. Figure 2-1 (2), change title to read:

"Controls and Instruments (General Steel Tank Co. Model 0217) Sheet (2) of 3."

Page 2-5. Figure 2-2 is added as follows:

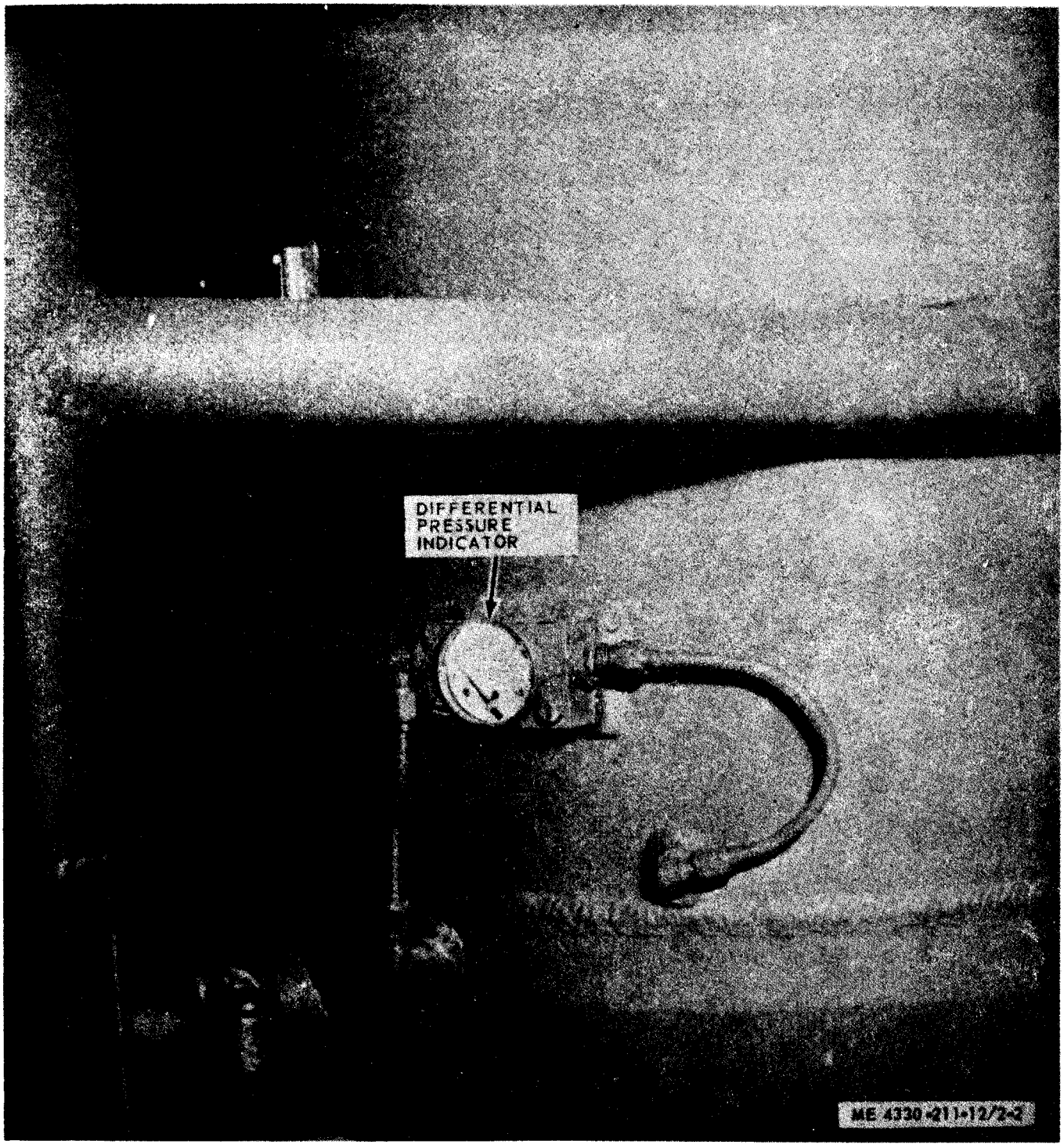


Figure 2-2. Controls and Instruments (Keene Corp. Model 844-18-V-350AL)

Page 3-2. Table 3-2, malfunction item 2 is changed as follows:

2. Differential Pressure Indicator Button Activated (General Steel Tank Co. Model 0217) or Differential Pressure Gage Constantly Shows a High Reading (Keene Corp. Model 844-18-V-350AL).

Paragraph 3-2, subparagraph *a* is superseded as follows:

a. If the differential pressure indicator button is raised (fig. 2-1 (2) — General Steel Tank Co. Model 0217) or if differential pressure gage (fig. 2-2 — Keene Corp. Model 844-18-V-350AL) is reading constantly high (20-35 psid), this indicates need for changing filter elements. Remove head (fig. 3-2). Refer to figure 3-1 and remove the elements.

Page 4-3, table 4-2 is superseded as follows:

Table 4-2. Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
DIFFERENTIAL PRESSURE INDICATION BUTTON POPS UP AFTER TROUBLESHOOTING PER TABLE 3-2 (General Steel Tank Co. Model 0217 Only)
Step 1. Differential pressure line(s) leaking or broken. **Repair or replace lines (Para 4-8)**
Step 2. Defective differential pressure indicator **Test differential pressure indicator and replace if defective. Button should release (pop-up) at 20± 3 psi.**
DIFFERENTIAL PRESSURE GAGE SHOWS HIGH READING AFTER TROUBLESHOOTING PER TABLE 3-2 (Keene Corp. Model 844-18-V-350AL)
Step 1. Differential pressure line(s) leaking or broken. **Repair or replace lines.**
Step 2. Defective differential pressure gage. **Check gage against known pressures in a test hoop-up and replace gage if not properly calibrated.**

Page 4-5, figure 4-4. Change the title to read:

"Figure 4-4. Differential pressure indicator, lines, and fittings (General Steel Tank Co. Model 0217)"

Paragraph 4-8. Change the title to read:

"4-8. Differential Pressure Indicator (General Steel Tank Co. — Model 0217)"

Figure 4-4B is added as follows:

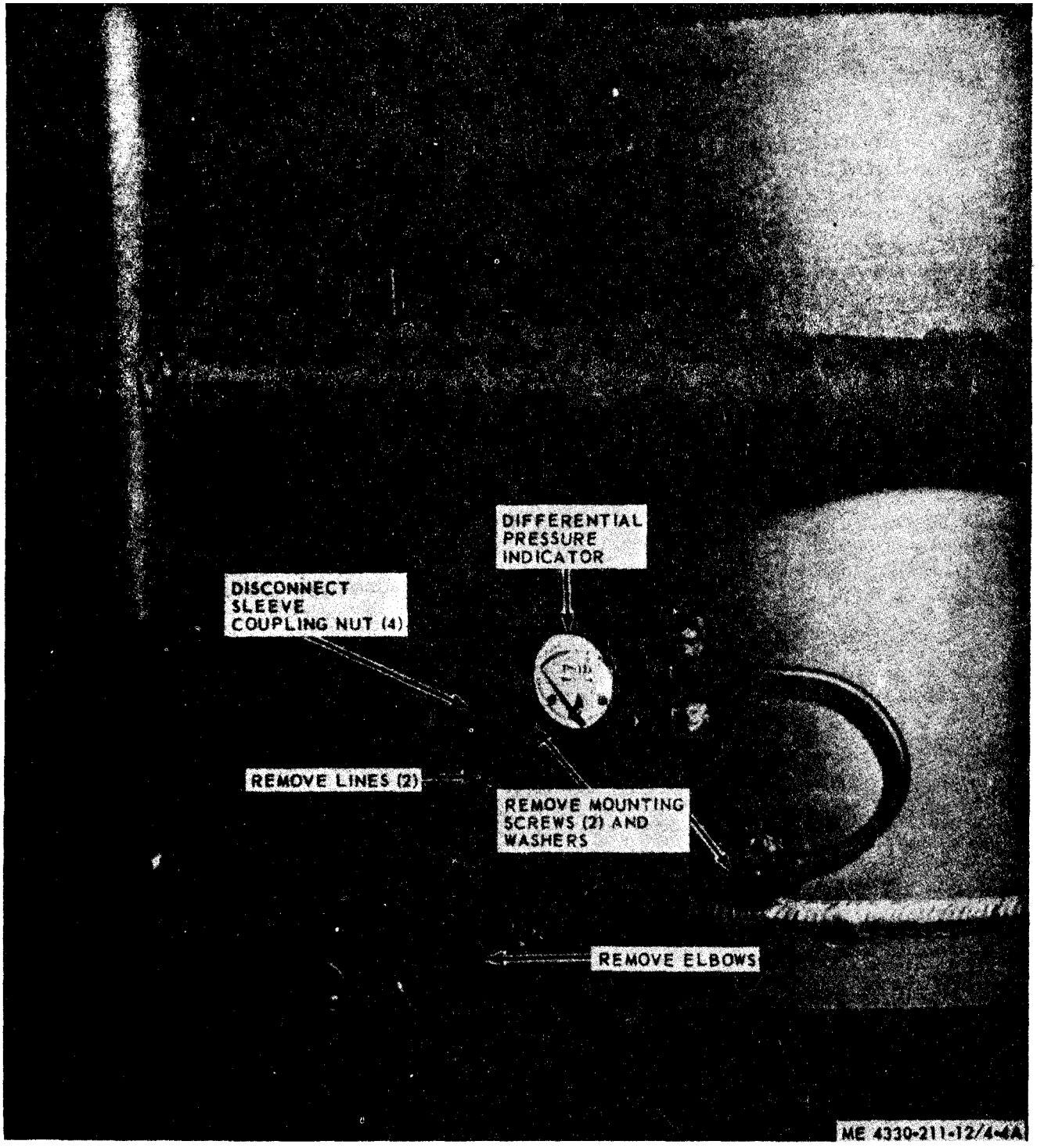


Figure 4-4B. Differential Pressure Gage (Keene Corp. Model 844-18-V-350AL)

Paragraph 4-8.1 is added as follows:

4-8.1 Differential Pressure Gage (Keene Corp — Model 844-18-V-350AL)

a. Removal. Refer to figure 4-4A and remove the differential pressure gage as shown in the illustration.

b. Testing. Verify gage readings by connecting the gage in a test set-up where differential pressures are known, or by comparing readings with a gage of known accuracy. Replace a gage if readings are not correct.

c. Installation.

(1) Refer to figure 4-4A and mount the gage to the side of the tank, using screws, lockwashers, and flat washers.

(2) Connect the high and low pressure lines and fittings. Check for leakage as unit is first operated after repair.

Page C-3, paragraph C-6. Add the following:

08181 . . . Keene Corporation
Fluid Handling Division
Cookeville, Tenn. 38501

NOTE

Changes to Repair Parts and Special Tools List shall have action change codes entered, as applicable, in the left margin of the page, outside the listing format opposite the first line of the item entry. The codes are as follows:

N — Indicates an added item
C — Indicates a change in data
R — Indicates a change in NSN only

Source code				National stock number	Description	Unit of issue	Expendability	Quantity Incorporated in unit	15 Days organizational maintenance allowance per 100 equipments	Illustrations	
Technical Service	Source	Maintenance	Recoverability							Fig. No.	Item No.
A	B	C	D	E	F	G	H	I	J	K	L
N				4330-150-6123	FILTER SEPARATOR, 350 GPM					C1	
					0217 (15277) A						
N				4330-177-8485	FILTER SEPARATOR, 350 GPM					C1A	
					844-18-V350AL (08181) B						
N	PO			5305-727-5677	SCREW; COVER MTG.					C1	1
					MS90726-162 A	EA	16				
N				5305-725-4109	SCREW, COVER MTG					C1A	1
					MS90726-163 B	EA	16				
N	P20				CLAMP, BAND, Canister retainer					C3	3
					7120-3050 (98625) A	EA		1			
N					CLAMP, BAND, Canister retainer					C3	3
					13216E2789-6 (97403) B	EA		1			
N	X20				NIPPLE					C4	1
					975001 (15277) A	EA		1			
N					NIPPLE, 1 inch NPT x 1½					C4	1
					20640 (08181) B	EA		1			
C	PO			4730-640-6188	PLUG, DUST, COUPLING, SIZE 4					C5	6
					MS27029-17 (96906)	EA		1			
C	MO				TUBE ASSEMBLY					C6	1
					13217E9044-1 (97403) A	EA	1				
					MANUFACTURED FROM:						
C	PO			4730-639-9869	NUT, SLEEVE COUPLING: 2 ea.					C6	2
					AN 817-5D (88044) A						
C	PO			4710-278-8727	TUBING, ALUMINUM: 12 in. req'd.					C6	3
					(81348) A	FT					
C	MO				TUBE ASSEMBLY					C6	4
					13217E5365-3 (97403) A			1			
					MANUFACTURED FROM:						
C	PO			4730-639-9869	NUT, SLEEVE COUPLING: 2 ea.					C6	5
					AN 817-5D (88044) A						
C	PO			4710-278-8727	TUBING, ALUMINUM, 12 in. req'd.					C6	6
					(81348)						
C	MO				TUBE ASSEMBLY					C6A	1
					13217E5365-3 (97403) B	1		1			
					MANUFACTURED FROM:						
N	PO				TUBING					C6A	3
					WW-T-70074 (81349) B	FT		1			
N	PO			4730-639-9869	NUT, SLEEVE COUPLING, 2 ea.					C6A	2
					AN 817-5D (88044) B						

	Source code				National stock number	Description		Unit of issue	Expendability	Quantity Incorporated in unit	15 Days organizational maintenance allowance per 100 equipments	Illustrations	
	Technical Service	Source	Maintenance	Recoverability								Fig. No.	Item No.
	A	B	C	D	E	F		G	H	I	J	K	L
N	MO					TUBE ASSEMBLY						C6A	4
						13217E5365-8 (97403)		1		1			
						MANUFACTURED FROM:							
N	PO					TUBING						C6A	6
						WW-T-70074 (81340)	B	FT		1			
N	PO				4730-639-9869	NUT, SLEEVE COUPLING, 2 ea						C6A	5
						AN 817-5D (88044)	B						
C	PO				4720-278-4684	ELBOW						C6,	7
						MS20822-5-4D (96906)		EA		X2			
						NIPPLE						C6A	7
						AN816-5D						C6B	
N	PO					ELBOW							
						MS20822-5D (96906)		EA		2		C6A	8
C	PO				4730-196-9585	NIPPLE							
						AN 816-5-4D (88044)	A	EA		2		C6	8
C	X20					PLUG, PIPE							
						975004 (15277)	A	EA		1			
N	X20					PLUG, PIPE							
						MS20913-4D (96906)	B	EA		1			
C	PO				6685-105-3344	INDICATOR, DIFFERENTIAL PRESSURE	A	EA		1		C9	1
						PC742MFP85 (06816)							
C	PO				5305-995-3441	SCREW, MACHINE						C9	2
						MS35207-269 (96906)	A	EA		2			
C	PO				5310-045-3296	WASHER, SPLIT						C9	3
						MS35338-43 (96906)	A	EA		2			
C	PO				5310-167-0834	WASHER, FLAT						C9	4
						AN960-10L (88044)	A	EA		2			
N	PO					GAGE, DIFFERENTIAL PRESSURE						C6A	9
						13219E9749-1 (97403)	B	EA		1			
N	PO					SCREW, MACHINE						C6A	10.
						FF-S-92 (81348)	B	EA		2			
N	PO				5310-582-5965	WASHER, LOCK						C6A	11
						MS35338-44 (96906)	B	EA		2			
N	PO				5310-167-0835	WASHER, FLAT						C6A	12
						AN960-416L (88044)	B	EA		2			
C	X20					PLATE, INSTRUCTION: element change						C10	6
						13217E9326 (97403)	A	EA		1			
N						PLATE, INSTRUCTION: element change						C10	6
						13219E9750 (97403)	B	EA		1			

Page C-7. **Figure C-1A is added as follows:**
Figure C-1A as follows:

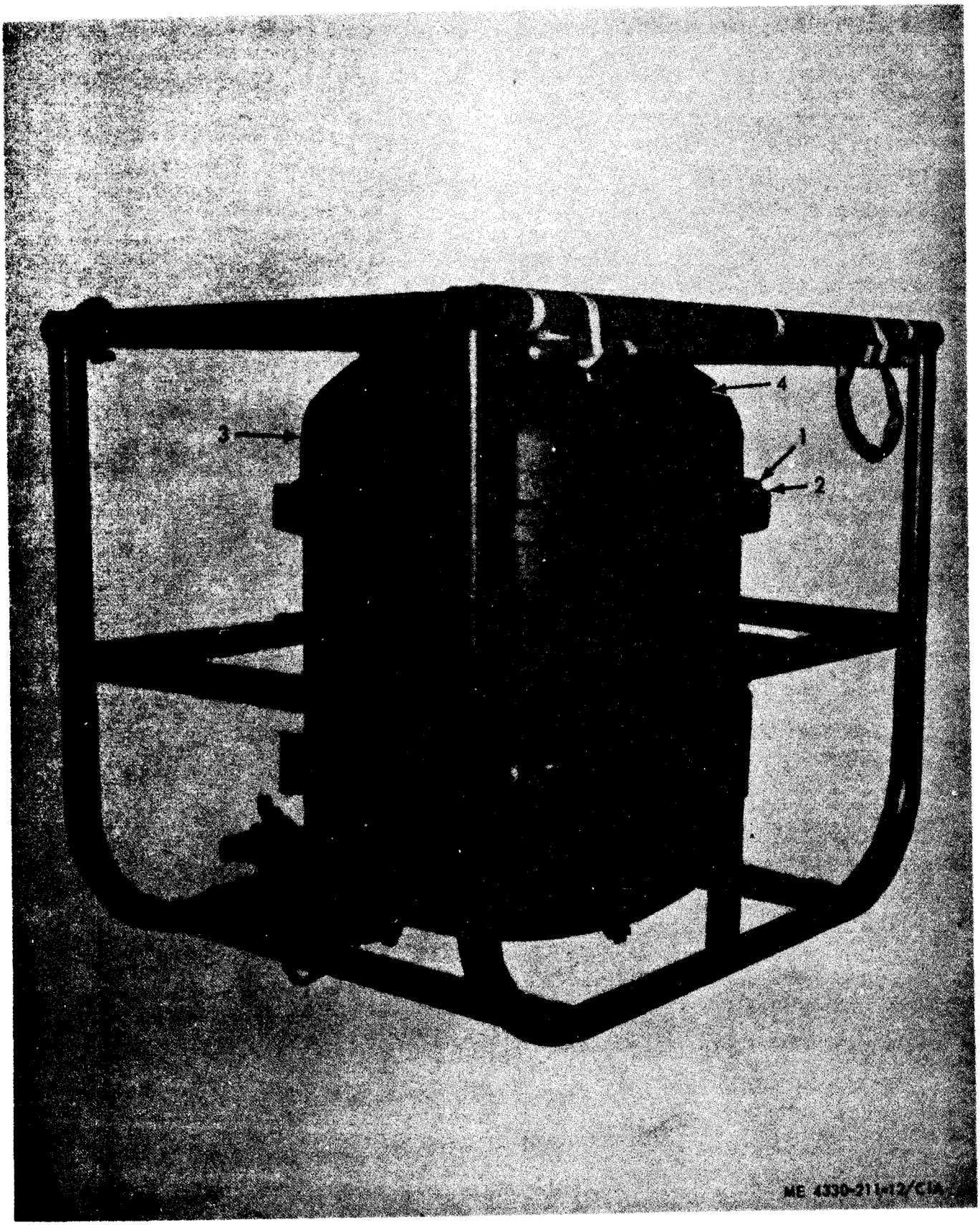


Figure C-1A. Tank and Cover.

Page C-12. **Figure C-6A is added as follows:**
Figure C-6A as follows:

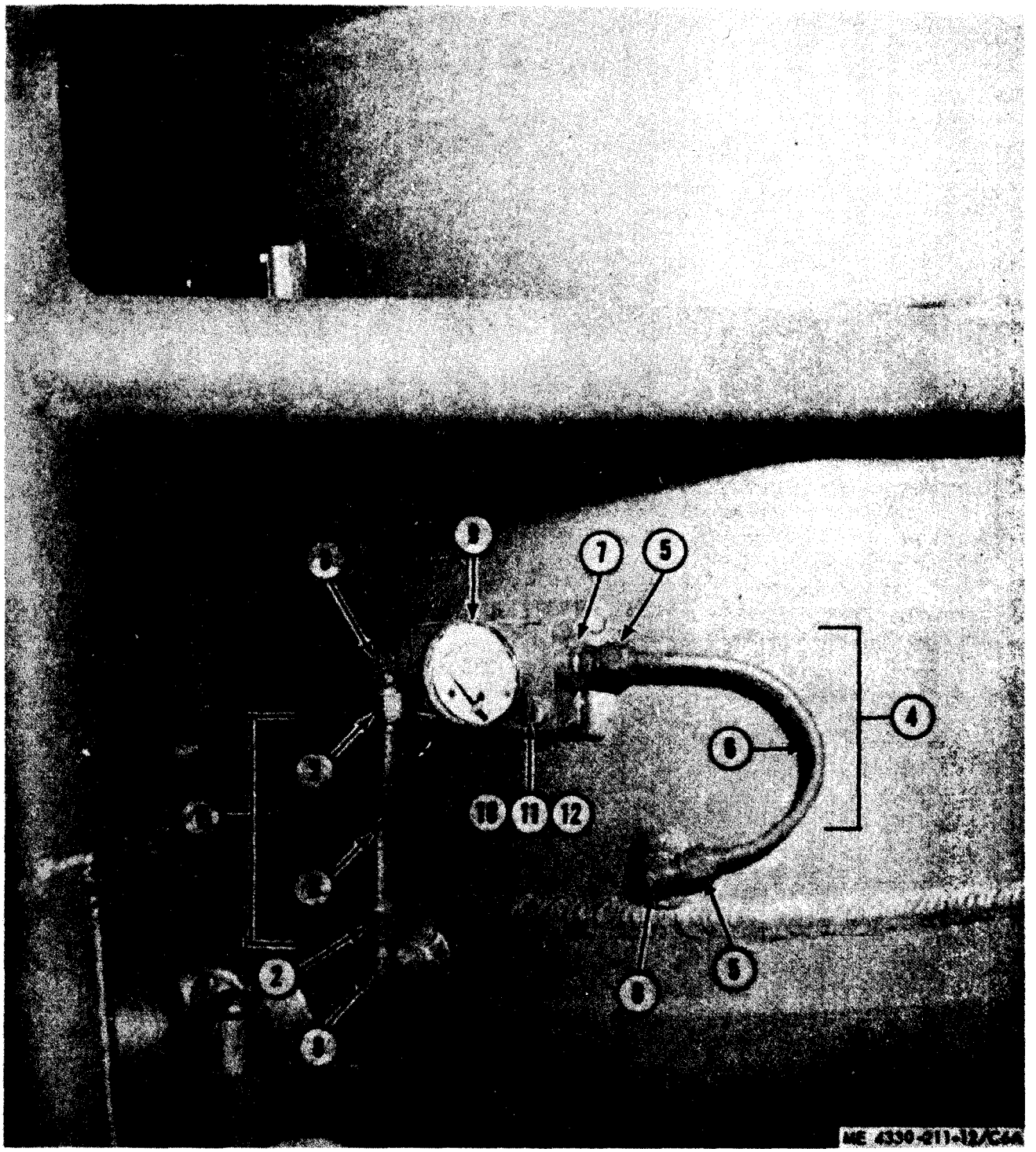


Figure C-6A. Pressure Differential Gage (Keene Corp Model 844-18-V-350AL Only).

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States Army
Chief of Staff

Official:

PAUL T. SMITH
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25A (qty rqr block No. 154), Organizational maintenance requirements for Petroleum Distribution.

TM 5-4330-211-12
C 4

CHANGE No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *20 August 1976*

Operator and Organizational Maintenance Manual Including Repair Parts and Special Tools List FILTER-SEPARATOR, 350 GPM OPTIMUM PERFORMANCE (GENERAL STEEL TANK CO. MODEL 0217) NSN 4330-00-150-6123 (BETA SYSTEMS INC. MODEL 010-Z-001) NSN 4330-00-177-8485 (KEENE CORPORATION MODEL 844-18-V-350AL) NSN 4330-00-177-8485

Current as of 26 March 1976

TM 5-4330-211-12, 2 October 1971, is changed as follows:

Page i. Below the title add the following:

REPORTING OF ERRORS

You can help to improve this manual by calling attention to errors and by recommending improvements. Your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 (Recommended Changes to Equipment Technical Manuals), may be used. Copies of DA Form 2028-2 are attached for your use. Please mail your recommended changes direct to Commander, US Army Troop Support Command, ATTN: DRSTS-MPP, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished direct to you.

Page 1-1. Paragraph 1-3 is deleted.

Paragraph 1-7*a* add the following after the last sentence:

"An adapter (fig. 1-2B) is supplied with the filter-separator. It is required to attach the fuel contamination test kit NSN 6640-00-244-9478 at the filter-separator's outlet. The test kit is used to determine if the filter-separator is filtering properly. Refer to figure 1-2B for identification of the adapter assembly components."

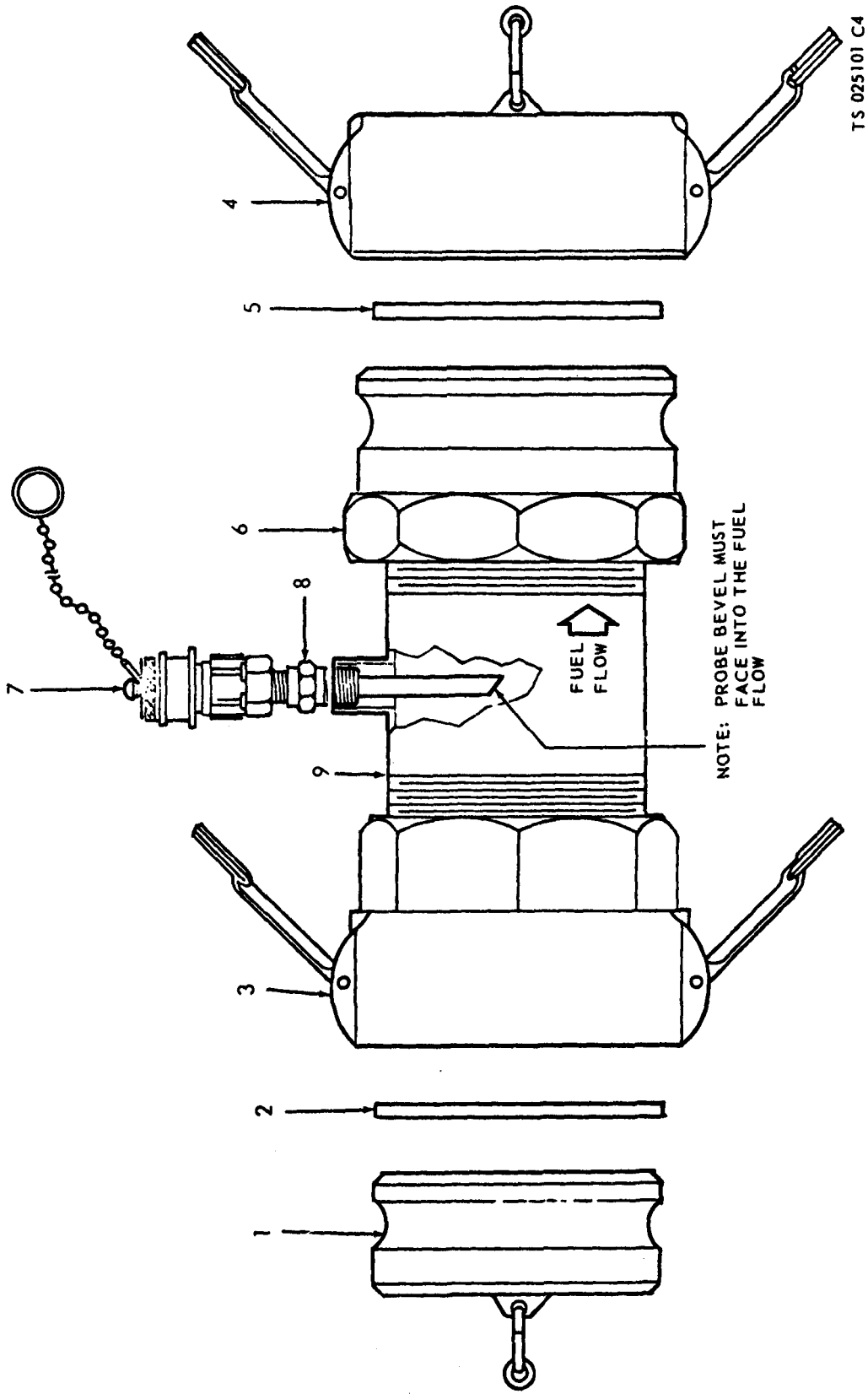
Paragraph 1-7. Subparagraph *d* is added as follows:

d. Fuel Sampling. An adapter (fig. 1-2B) is attached to the filter-separator's outlet fitting. The adapter contains a sampling probe, which extends into a pipe nipple that fuel flows through from the filter-separator's outlet fitting. The Detector Kit, Automotive and Aviation Fuels for Water and Solid Contamination, NSN 6640-00-244-9478 is attached to the adapter's sampling probe.

NOTE

Test kit NSN 6640-00-244-9778 is not furnished with the filter separator, but is authorized to be used with it.

Page 1-4. Figure 1-2B is added as follows:



1 Dust plug
2 Gasket
3 Female coupling
4 Dust cap
5 Gasket
6 Male coupling
7 Probe assembly
8 Hexagon nut
9 Pipe nipple

Figure 1-2R. Adapter, water detector kit

Page 3-2, paragraph 3-2a. Change the last sentence from "Refer to figure 3-1 and remove the elements", to "Refer to figure 3-1 and remove the canisters and elements".

Page 3-3, figure 3-1. The NOTE on upper center portion of illustration is superseded as follows:

NOTE: Press down on top of canisters, turn counterclockwise and lift them from tank. Inspect filter elements for damage, dirt, or other contaminants before installing, be sure "O" rings are in place. Press elements onto outlet ports. Install canisters over filter elements, engaging canister notches over outlet port dogs. Press down and turn canister clockwise to lock.

Page 4-1. Figure 4-1, change the lower right hand label on illustration from "ATTACH 4 IN. HOSE WITH FEMALE COUPLING HALF TO OUTLET COUPLING. DRIVE CAMS HOME TO SECURE COUPLING", to "ATTACH ADAPTER WITH FEMALE COUPLING HALF TO OUTLET COUPLING. DRIVE CAMS HOME TO SECURE COUPLING."

Paragraph 4-2. Subparagraph *c* is superseded as follows:

c. Connections.

NOTE

Make certain that the quick disconnect cams on female couplings are pulled all the way so that male couplings can be positioned into a secure seat.

(1) Remove dust plug from the filter-separator's inlet coupling and connect 4 inch hose to the inlet coupling as instructed in figure 4-1.

(2) Look at direction of arrow on hexagon nut (8, fig. 1-2B) to make certain the bevel on the probe faces into the fuel flow.

(3) Remove dust cap from the filter-separator's outlet coupling.

(4) Remove dust plug (1, fig. 1-2B) from the adapter.

(5) Install or make certain that gasket (2) has been installed in female coupling (3), and attach the adapter to the filter-separator's outlet coupling (fig. 4-1).

(6) Remove dust cap (4, fig. 1-2B).

(7) Attach 4-inch hose with female coupling half to the adapter's outlet coupling half (6). Drive hose coupling cams home to secure coupling.

Page 4-11. Paragraph 4-15.1 is added as follows:

4-15.1. Water Detector Kit Adapter

a. Inspection.

(1) Inspect adapter for missing dust cap and plugs.

(2) Inspect female coupling (3, fig. 1-2B) and dust cap (4) for missing or damaged gasket (2) and (5).

(3) Inspect fittings for leaks.

(4) Inspect dust cap, couplings, and dust plugs for cleanliness.

(5) Inspect couplings for scored surfaces.

(6) Inspect the probe assembly (7, fig. 1-2B) for dirt, obstructions and obvious damage.

b. Repair.

(1) Clean all parts as required.

(2) Remove and replace all damaged parts as required.

Page C-6. Add the following:

(1)	(2)	(3) Description	(4)	(5)	(6) 15-day organizational maintenance ALW				(7) Illustration	
					(a)	(b)	(c)	(d)	(a)	(b)
SMR code	National stock number	Ref number & MFR code — Usable on code	unit of meas	qty inc in unit	1-5	6-20	21-50	51-100	fig. no.	item no.
		GROUP 05 — DETECTOR KIT ADAPTER								
PAOZZ		ADAPTER, WATER DETECTOR KIT 13220E9406-2 (97403)	EA	1					C12	1
XBOZZ		PLUG, DUST: ADAPTER MS27029-17 (96906)	EA	1					C12	2
PAOZZ	5330-00-899-4509	GASKET, COUPLING MS27030-9 (96906)	EA	1					C12	3
PAOZZ		COUPLING HALF, FEMALE MS27024-17 (96906)	EA	1					C12	4
PAOZZ	4730-00-640-6156	CAP, DUST MS27028-17 (96906)	EA	1					C12	5
PAOZZ	5330-00-899-4509	GASKET, COUPLING MS27030-9 (96906)	EA	1					C12	6
PAOZZ		COUPLING HALF, MALE MS27030-17 (96906)	EA	1					C12	7
PAOZZ		PROBE ASSEMBLY WATER DETECTOR KIT 13220E9914-2 (97403)	EA	1					C12	8
PAOZZ		PLUG, DUST: PROBE AMPE 4 (W/BC) (82218)	EA	1					C12	9
XBOZZ		COUPLER, QUICK DISCONNECT: FEMALE AVEC4-4F (82218)	EA	1					C12	10
XBOZZ		PROBE, SAMPLING GTP 144-3 (82218)	EA	1					C12	11
XBOZZ		NIPPLE, PIPE SCH40-AL-6061 T6 4 IN. NPT 6 IN. LG MIL-P-25995 TYPE II (81349)	EA	1					C12	12

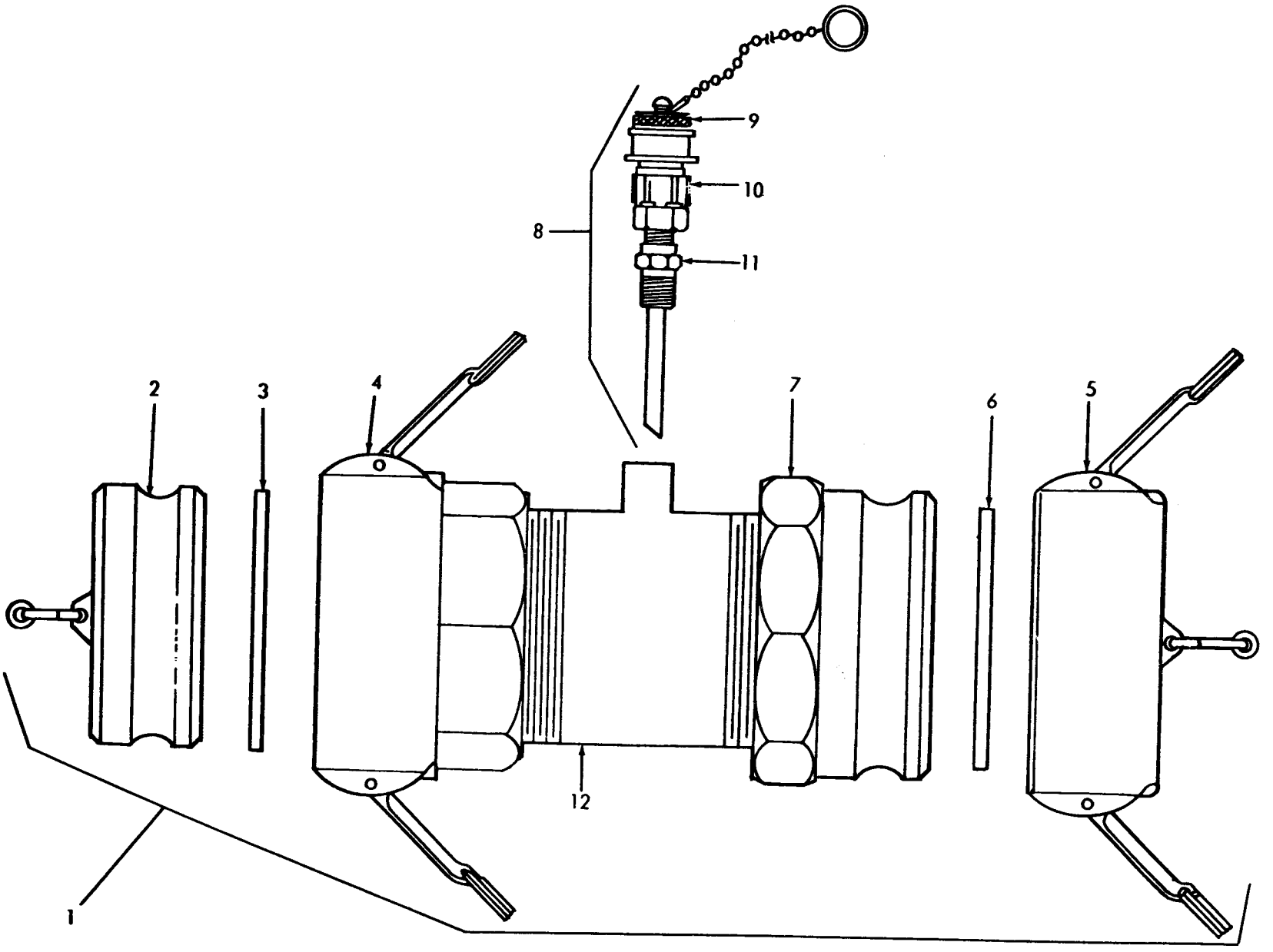


Figure C-12. Adapter, water detector kit.

(1) SMR code	(2) National stock number	(3) Description Ref number & MFR code	Usable on code	(4) unit of meas	(5) qty inc in unit	(6) 15-day organizational maintenance ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) Illustration (a) fig. no.	(b) item no.
		Section III. SPECIAL TOOLS AND SUPPORT EQUIPMENT FOR ORGANIZATIONAL MAINTENANCE GROUP 06 — FUEL TEST KIT									
PBOZZ	6640-00-244-9778	DETECTOR KIT, AUTOMOTIVE AND AVIATION FUELS: WATER AND SOLID CONTAMINATION MODEL GTP-323MM SERIES II (32218)									

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States Army
Chief of Staff

Official:
PAUL T. SMITH
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25A, Organizational maintenance Requirements for Petroleum Distribution.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)
CDR, 1st Bn, 65th ADA
ATTN: SP4 John Doe
Key West, FL 33040

DATE 14 January 1975

PUBLICATION NUMBER	DATE	TITLE
TM 9-1430-550-34-1	7 Sep 72	Unit of Radar Set AN/MPQ-50 Tested at the HFC

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.
9-19		9-5	
21-2	step 1C		21-2

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

"B" Ready Relay K11 is shown with two #9 contacts. That contact which is wired to pin 8 of relay K16 should be changed to contact #10.

Reads: Multimeter B indicates 600 K ohms to 9000 K ohms.

Change to read: Multimeter B indicates 600 K ohms minimum.

Reason: Circuit being checked could measure infinity. Multimeter can read above 9000 K ohms and still be correct.

NOTE TO THE READER:

Your comments will go directly to the writer responsible for this manual, and he will prepare the reply that is returned to you. To help him in his evaluation of your recommendations, please explain the reason for each of your recommendations, unless the reason is obvious.

All comments will be appreciated, and will be given immediate attention. Handwritten comments are acceptable.

For your convenience, blank "tear out" forms, preprinted, addressed, and ready to mail, are included in this manual.

SAMPLE

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
SP4 John Doe, Autovon 222-2222

SIGN HERE: John Doe

DA FORM 1 AUG 74 2028-2 (TEST)

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

TEAR ALONG DOTTED LINE

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

Commander
US Army Troop Support Command
ATTN: DRSTS-MPP
4300 Goodfellow Boulevard
St. Louis, MO 63120

CUT ALONG DOTTED LINE

FOLD BACK

REVERSE OF DA FORM 2028-2 (TEST)

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CUT IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

DATE

PUBLICATION NUMBER	DATE	

BE EXACT...PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:

CUT ALONG DOTTED LINE

DA FORM 1 AUG 74 2028-2 (TEST)

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

Commander
US Army Troop Support Command
ATTN: DRSTS-MPP
4300 Goodfellow Boulevard
St. Louis, MO 63120

CUT ALONG DOTTED LINE

FOLD BACK

REVERSE OF DA FORM 2028-2 (TEST)

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CUT IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

DATE

PUBLICATION NUMBER	DATE	

BE EXACT...PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:

CUT ALONG DOTTED LINE

DA FORM 1 AUG 74 2028-2 (TEST)

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

Commander
US Army Troop Support Command
ATTN: DRSTS-MPP
4300 Goodfellow Boulevard
St. Louis, MO 63120

CUT ALONG DOTTED LINE

FOLD BACK

REVERSE OF DA FORM 2028-2 (TEST)

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CUT IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

DATE

PUBLICATION NUMBER	DATE	

BE EXACT...PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:

CUT ALONG DOTTED LINE

DA FORM 1 AUG 74 2028-2 (TEST)

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

Commander
US Army Troop Support Command
ATTN: DRSTS-MPP
4300 Goodfellow Boulevard
St. Louis, MO 63120

CUT ALONG DOTTED LINE

FOLD BACK

REVERSE OF DA FORM 2028-2 (TEST)

TM 5-4330-211-12
C 5

CHANGE
No. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *6 December 1976*

Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools List FILTER-SEPARATOR, 350 GPM OPTIMUM PERFORMANCE (GENERAL STEEL TANK CO. MODEL 0217) NSN 4330-00-150-6123 (BETA SYSTEMS INC MODEL OKO-Z-001) NSN 4330-00-177-8485 (KEENE CORPORATION MODEL 844-18-V-359 AL) NSN 4330-00-177-8485

Current as of 15 October 1976

TM 5-4330-211-12, 2 October 1971, is changed as follows:

Page ii. Add "Appendix A.1. COMPONENTS OF END ITEMS LIST" immediately following "Appendix A." Add "Appendix A.2. ADDITIONAL AUTHORIZATION LIST" immediately following "Appendix A.1." Add "Appendix D. EXPENDABLE SUPPLIES AND MATERIALS LIST (Not applicable)" immediately following "Appendix C."

Page 3-1. Section II is superseded as follows:

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-1. General

To insure that the filter separator is ready for operation at all times, it must be inspected systematically so that the defects may be discovered and corrected before they result in serious damage or failure. Defects discovered during operation of the unit shall be noted for future corrections, to be made as soon as an operation has ceased. Stop operation which would damge the equipment if operation were to continue. All deficiencies and shortcomings shall be recorded together with the corrective action taken on DA Form 2404, "Equipment Inspection and Maintenance Worksheet", at the earliest opportunity. When performing your "Before Operation" (B) and "During Operation" (D) PMCS, always keep in mind the CAUTIONS and WARNINGS. After operation, be sure to perform your (A) PMCS.

3-2. Preventive Maintenance Checks and Services

Refer to table 3-1 for preventive maintenance checks and services.

a. Item Number Column. Checks and services are numbered in chronological order regardless of interval. This column will be used as a source of item numbers for the "TM Item Number" column on DA Form 2404 in recording results of PMCS.

b. Interval Columns. The columns headed "B", "D", "A", "W", and "M", will contain a dot (•) opposite the appropriate check indicating it is to be performed Before, During, After, Weekly, or Monthly.

c. Combat Operability Column. A dot (•) in the "C" column will identify combat operability checks for unit readiness reporting purposes.

d. Item to be Inspected Column. The items listed in this column are divided into groups and identifies the items to be inspected.

e. Procedures Column. This column contains a brief description of the procedure by which the check is to be performed.

f. Equipment will be Reported Not Ready (RED) Column. This column will contain the criteria which will cause the equipment to be classified as not ready (RED) because of inability to perform its primary mission.

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shutdown.

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services

NOTE: With in designated interval, these checks are to be performed in the order list

B—Before A—After M—Monthly
D—During W—Weekly C—Combat Operability Checks

Item No.	Interval B	D	A	W	M	C	Item to be inspected	Procedures Check for and have repaired or adjusted as necessary	Equipment will be reported not ready (RED) if:
1	•	•			•		Inlet and outlet couplings	Check for secure fit, and that gaskets are in place and not damaged.	
2	•				•		Head bolts	Check to insure that head bolts are tight.	
3	•	•			•		Sight gage	Check sight gage for cracked or broken glass, insure that ball floats freely, and that gasket is in place and is secure.	
4	•				•		Air, vent valve	Check to insure that it is tight and works freely.	
5	•	•					Drain valve	Check for leakage, and that handle turns freely.	
6	•	•			•		Differential pressure gage	Check to insure the gage is working properly. Check differential pressure variation during operation.	
7					•		Filter separator	Check for damage to body, frame, and other external components.	
8	•				•		Ground rod assembly	Check for broken cable, clamps and insure the paint is removed where it is attached to the frame.	
9			•				Dust plugs and dust caps	Check to insure they are installed after operation.	

Page A-1. Appendix A.1 is added immediately after Appendix A as follows:

APPENDIX A.1
COMPONENTS OF END ITEMS LIST

Section I. INTRODUCTION

1. Scope
This appendix lists integral components of and basic issue items for the filter-separator to help you inventory items required for safe and efficient operation.

2. General
The Components of End Item List is divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the filter-separator and must accompany it whenever it is transferred or turned in. These illustrations will help you identify these items.

b. Section III. Basic Issue Items. Not Applicable.

Section II. INTEGRAL COMPONENTS OF END ITEM

(1) Illustration (a) Figure No.	(1) Illustration (b) Item No.	(2) National stock number	(3) Part No. & FSCM	(4) Description	(5) Location	(6) Usable on code	(7) Qty reqd	(8) Quantity Rev'd	Date	Date	Date
C-11	1	5975-00-878-3791	MIL-R-11461(81349)	Rod, Ground, Assembly			1				
C-11	2		13217E9339(97408)	Clamp Ground, Cable			2				
C-1a			13220E9406-2(97408)	Adaptor			1				
C-1b			13220E9914-2(97408)	Probe, Assembly			1				

Appendix A.2 is added immediately after Appendix A.1 as follows:

APPENDIX A.2
ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

1. Scope
This appendix lists additional items you are authorized for the support of the filter-separator.

2. General
This list identifies items that do not have to accompany the filter-separator and that do not have to be turned in with it. These items are authorized to you by CTA, MTOE, TDA, or JTA.

3. Explanation of Listing
National stock number, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. "USABLE ON" codes are identified as follows:

Code	Used on
Not applicable	

Section II. ADDITIONAL AUTHORIZATION LIST

(1) National stock number	(2) Description Part number & FSCM	Usable on code	(3) U/M	(4) Qty auth
6640-00-244-9478	Mdl GTP323 Series II(32218) detector kit Each 350GPM Filter Separator has an overpack shipped with each item, and consist of the following items:		EA	1
	13217E9325-1(97403) O'Ring, cover to vessel		EA	1
4330-00-963-0998	MIL-F-52308 (81349) element		EA	18
5330-00-235-4716	13217E5363 (97403) Gasket, Sight, Gage		EA	1

By Order of the Secretary of the Army:

BERNARD W. ROGERS
General, United States Army
Chief of Staff

Official:
PAUL T. SMITH
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25A, organizational maintenance requirements for petroleum distribution.

CHANGE
No. 6

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *22 October 1979*

**Operator and Organizational Maintenance Manual
Including Repair Parts and Special Tools List**

**FILTER-SEPARATOR, 350 GPM OPTIMUM PERFORMANCE
(GENERAL STEEL TANK CO. MODEL 0217)
NSN 4330-00-150-6123
(BETA SYSTEMS INC. MODEL 010-Z-001)
NSN 4330-00-177-8485
(KEENE CORPORATION MODEL 844-18-V-350AL)
NSN 4330-00-177-8485**

TM 5-4330-211-12, 2 October 1971, is changed as follows:

Page II - Line 9 and 20 are deleted.
Page III - Line 13 is deleted.

Page 1 - Line 1 is changed as follows: Change NSN to 6680-00-244-9478.
Page 3-2 - Delete first four lines of Table 3-2.
Page 4-7 - Delete Remove Flow Limiter (Hidden) from Figure 4-6.
Page 4-8 - Delete Paragraph 4-12 Flow Limiter. The following paragraphs are renumbered, 4-13 to 4-12, 4-14 to 4-13, 4-15 to 4-14, 4-16 to 4-15.
Page B-2 - Lines 10 and 13 delete Flow Limiter from column 2 of the MAC Chart.
Page C-4 - Column 1, line 3 is changed as follows: Change SMR Code to PAOZZ.
After Group 02 delete Flow Limiter.
Lines 15, 16, 17, 18, 19, and 20, Columns 1 thru 7 are deleted.
Column 3, Line 21 is changed as follows: Delete MS27027-17 and substitute MS27029-17.
Page C-11 - Delete the following from Figure C-5: After coupling "and flow limiter" call outs 3, 4 and 5.

Page 2 Change 5 - After Section II Integral Components of End Item add Section III Basic Issue Items.

Section III. BASIC ISSUE ITEMS LIST

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	Maintenance allocation number	Part No. & FSCM	Description	Location	Usable on code	Qty regd	Rec'd	Date	Date	Date

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-25A, Line A-48, Operator's maintenance requirements for Petroleum Distribution.

Changes in force: C1, C2, C3, C4, C5, C6, and C7.

TM 5-4330-211-12
C7

Change No. 7

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 April 1981

Operator and Organizational Maintenance Manual
(Including Repair Parts and Special Tools List)
FILTER-SEPARATOR, 350 GPM, OPTIMUM PERFORMANCE
(GENERAL STEEL TANK CO. MODEL 0217)
NSN 4330-00-150-6123
(BETA SYSTEMS, INC. MODEL 010-2-001)
NSN 4330-00-177-8485
(KEENE CORPORATION MODEL 844-18-V-350AL)
NSN 4330-00-177-8485
(GIL, INC. MODEL GFS-18-V-350)
NSN 4330-00-177-8485

TM 5-4330-211-12, 2 October 1971, is changed as follows:

Title is changed as shown above.

Page 1-1. Paragraph 1-1 is superseded as follows: This manual is for your use in operating and maintaining the General Steel Tank Model 0217 Filter-Separator; and Filter-Separator, Liquid Fuel, 350 GPM, Model GFS-18-V-350.

Paragraph 1-8 is superseded as follows: 1-8. TABULATED DATA. Change line 6 to read, "Manufacturer. . .Gil, Inc."; line 12 to read, "NSN. . .4330-00-177-8485"; line 13 to read, "Model. . .GFS-18-V-350"; line 14 to read, "Contract No. . . .DAAJ09-79-C-5047"; and line 15 to read, "Date of Manufacture. . .Qtr, 2 yr. '79".

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A, Operator Maintenance requirements for Petroleum Distribution.

Changes in force: C1, C2, C3, C4, C5, C6, C7, and C8

TM 5-4330-211-12
C 8

CHANGE
No. 8

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 7 February 1985

Operator and Organizational Maintenance Manual
(Including Repair Parts and Special Tools List)

FILTER-SEPARATOR, 350 GPM, OPTIMUM PERFORMANCE
(GENERAL STEEL TANK CO. MODEL 0217)
NSN 4330-00-150-6123
(BETA SYSTEMS, INC. MODEL 010-2-001)
NSN 4330-00-177-8485
(KEENE CORPORATION MODEL 844-18-V-350AL)
NSN 4330-00-177-8485
(GIL, INC. MODEL GFS-18-V-350)
NSN 4330-00-177-8485

TM 5-4330-211-12, 12 October 1971, is changed as follows:

Page i. Reporting Errors and Recommending Improvements block is superseded as follows:

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 direct to: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-MPS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

Page 1-1. Paragraph 1-2 is superseded as follows:

1-2. Maintenance Forms and Records

Maintenance forms and records that you are required to use are explained in DA PAM 738-750.

Page 3-1. Table 3-1 is superseded by Table 3-1.

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services

NOTE

Within designated interval, these checks are to be performed in the order listed.

B-Before D-During A-After

Item No.	Interval B	Interval D	Interval A	Item To be Inspected	Procedures Check for and have repaired or adjusted as necessary	Equipment is Not Ready/ Available if:
					Make the following walk around checks:	
1	●			Filter/ Separator	a. Check for leaks. Check for loose or missing bolts in cover assembly. Check frame for breaks and dents. b. Check that valves, air, drain, and vent work freely and are tight. c. Check that inlet and outlet coupling gaskets are in place. Check gaskets for damage or leaks. d. Check grounding rod assembly for missing or broken cable and clamps. Ensure paint is removed from frame where rod attaches.	
2		●		Sight glass	Check for breaks and damage. Ensure ball floats freely.	
3		●		Differential pressure gage	Check pressure gage for an indication below RED BAND on the gage. If yellow, change elements after operation.	
4			●	Dust caps and plugs	Ensure dust caps and plugs are installed after operation.	

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

DONALD J. DELANDRO
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A, Operator Maintenance requirements for Petroleum Distribution.

TECHNICAL MANUAL
No. 5-4330-211-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 2 *October* 1971

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST

FILTER-SEPARATOR, 350-GPM

OPTIMUM PERFORMANCE

(GENERAL STEEL TANK CO. MODEL 0217)

FSN 4330-150-6123

Current As of 20 September 1971

LIST OF ILLUSTRATIONS

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual is for your use in operating and maintaining the General Steel Tank Model 0217 Filter-Separator.

1-2. Maintenance Forms and Records

Maintenance forms and records that you are required to use are explained in TM 38-750.

1-3. Reporting of Errors

You can improve this manual by calling attention to errors and by recommending improvements, using DA Form 2028 (Recommended Changes to Publications) or by letter and mail directly to the Commanding General, U. S. Army Mobility Equipment Command, ATTN: AMSME-MPP, 4300 Goodfellow Boulevard, St. Louis, Mo. 63120.

1-4. Equipment Serviceability Criteria

This equipment is not covered by an ESC.

1-5. Destruction of Army Materiel to Prevent Enemy Use

Refer to TM 750-244-3 for destruction of army materiel.
storage.

1-6. Administrative Storage

Refer to TM 740-90-1 for administrative

Section II. DESCRIPTION AND DATA

1-7. Description

a. General. The 350 GPM (gallons per minute) optimum performance filter-separator is a two stage vertical-type unit designed to remove undissolved water and solid contaminants from military fuels. The filter-separator (fig. 1-1 and 1-2) has a water level indicator (sight gage), a manual water drain valve, and a differential pressure indicator.

b. Filtration, Coalescence, and Separation. The first stage consists of fluid pressure filter elements which perform a dual function. Contaminated fuel under pressure enters the filter-separator through the inlet line manifold and into and through the filter elements which filter out all solids and coalesces the finely dispersed water into droplets of sufficient size to be separated. The second stage consists of teflon coated screen-lined canisters (18 canisters per unit). The fuel flows through the teflon coated screen where the water droplets are stopped and pulled downward by gravity to the sump for subsequent draining. Clean fuel then flows into the top of the outlet tube and out the outlet connection at bottom rear of the unit.

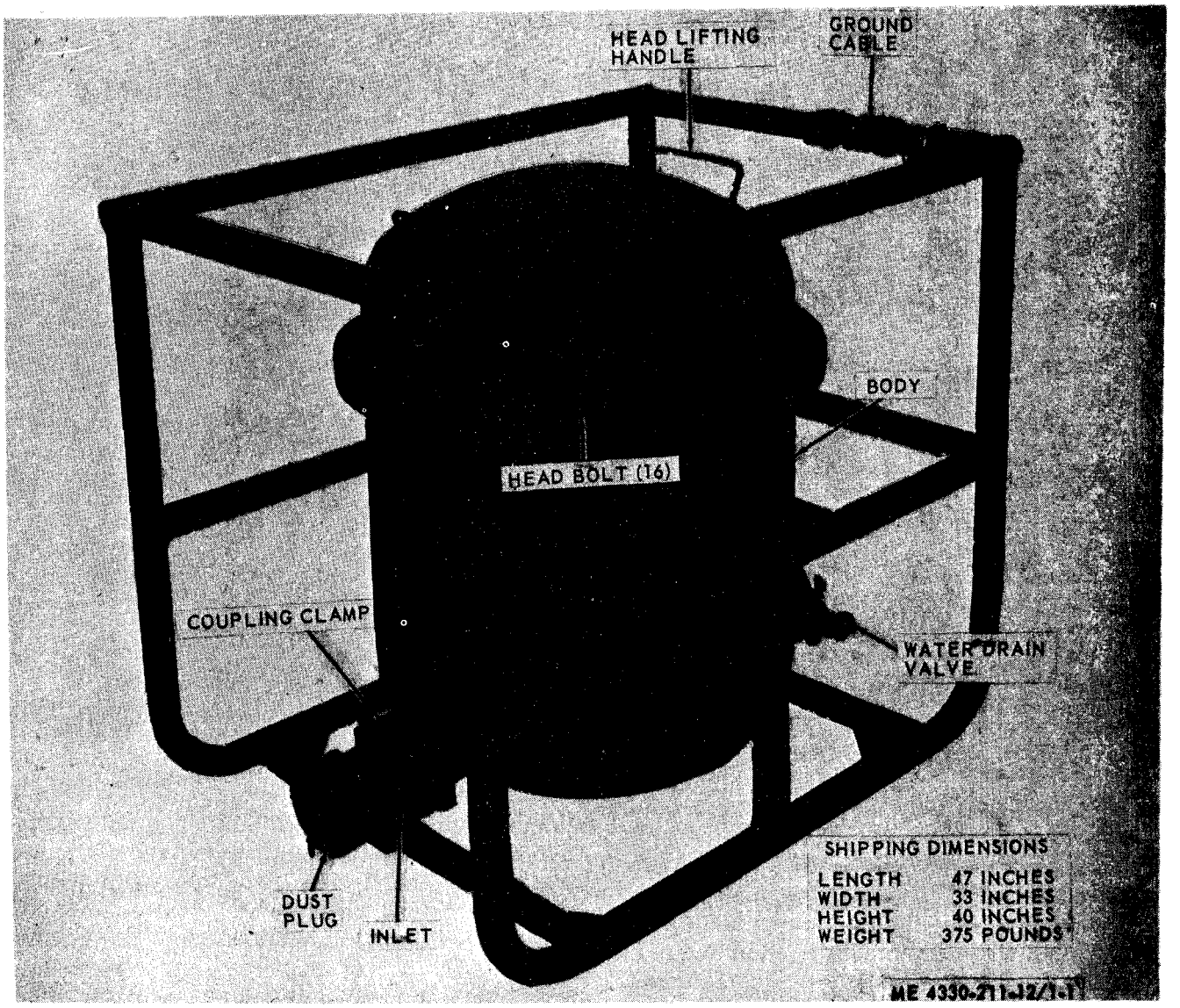


Figure 1-1. *Filter-separator, 3/4-right front view, with shipping dimensions.*

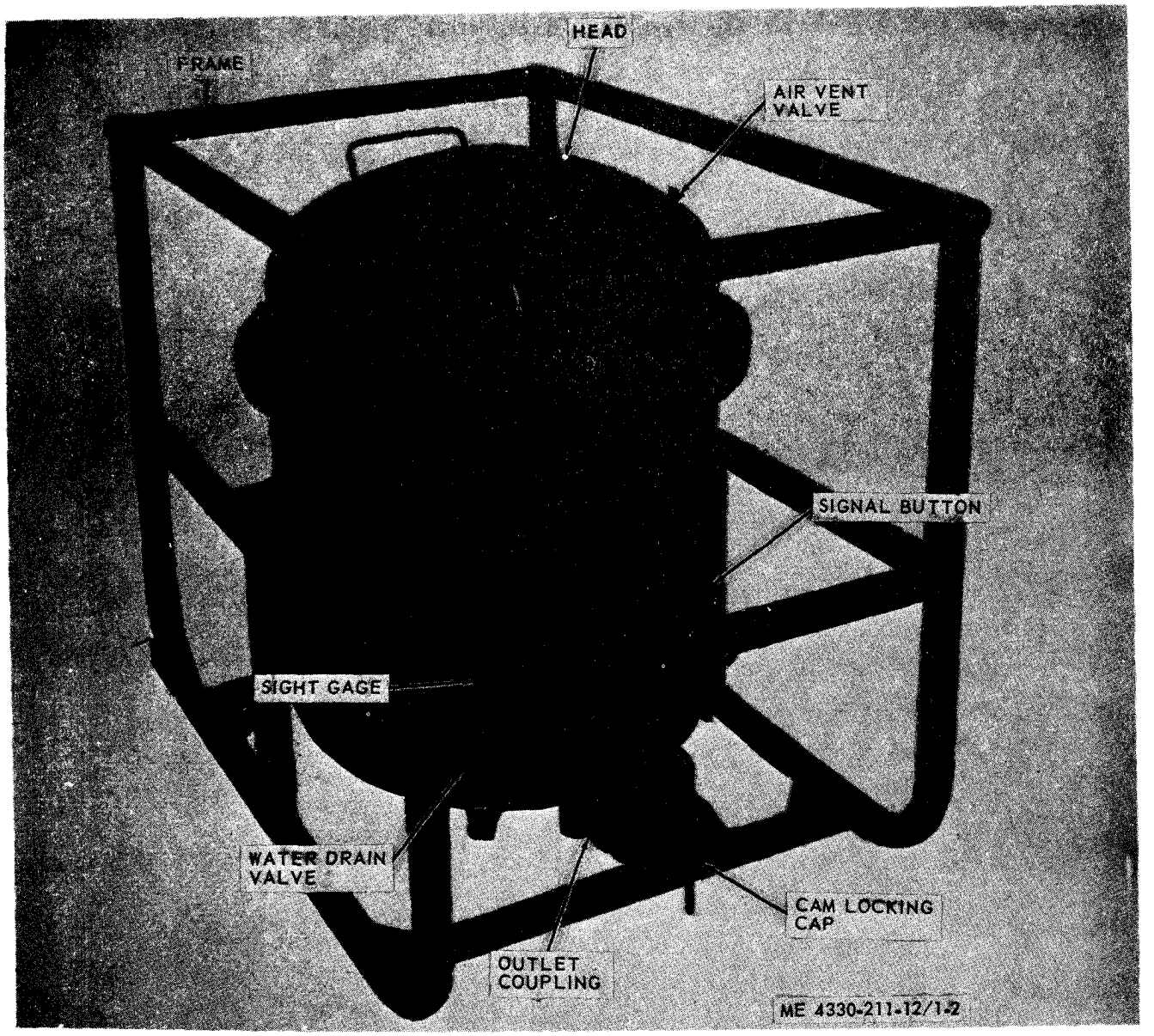


Figure 1-2. Filter-separator, 3/4-left front view.

c. Water Drainage. The level of accumulated water in the sump is indicated by a ball float in the sight gage. The ball float must not rise above the level indicated by the line across the sight gage. Water is drained by turning the handle on top of the water drain valve counter-clockwise parallel with the drain valve (fig. 2-1 ③).

1-8. Tabulated Data

a. Identification plate. The filter separator has one identification plate. Information shown on the plate is listed below.

Specification No. . . . . MIL-F-52666 (ME)
Design activity Code No. 97403
Manufacturer . . . . . General Steel Tank Co.
Filter/Separator Liquid Fuel; Frame Mounted
Capacity . . . . . 350 GPM
Element quantity 18
Working pressure max. 150
Weight . . . . . 375#
FSN 4330-150-6123
Model 0217
Contract No. DAAKO1-70-C-7579
Date of Manufacture . . . . . Qtr 1 year 71

b. Differential Pressure Indicator.

Manufacturer . . . . . Pall Corporation
Part Number RC742MFP85
Actuation Pressure . . . . . 20 psi ± 3 SPSI

c. Dimensions and Weight.

Length	47 (inches)
Width	33
Height	40
Weight	375 (pounds)

1-9. Differences in Models

This manual covers only the General Steel Tank Co. 350 GPM filter-separator. No known differences exist for the model covered by this manual.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. OPERATING PROCEDURES

If equipment fails to operate, refer to trouble-shooting procedures in chapter 3.

2-1. General

a. The instructions in this section are published from the information and guidance of personnel responsible for operating the filter-separator.

b. It is important that the operator know how to perform every operation of which the filter-separator is capable. This section gives instructions on starting and stopping the equipment and detailed operating instructions. Since nearly every job presents a different problem, the operator may have to vary the given procedure to fit the individual job.

CAUTION

Operate filter-separator only in the upright position. If unit tips over during operation, stop operation at once. Upright and drain unit and allow to dry before continuing operation.

2-2. Starting

Perform the daily preventive maintenance checks and services, table 3-1. Prior to starting, the external valve between the pump and filter-separator inlet should be completely closed and the air vent valve open.

Fig. 2-1 ①, 2-1 ② and 2-1 ③ for location and purpose of the air vent valve, drain valve, differential pressure indicator, and sight gage). This procedure will prevent damage to the filter coalescer elements from sudden fuel surges into an empty or partially filled vessel on pump startup. Gradually open external valve and fill vessel slowly until all air is expelled and fuel flows from air vent valve (fig. 2-1 ①). Close air vent valve and open external valve to full flow rate. If the red indicator signal button on the differential pressure indicator pops up (fig. 2-1 ②) during starting, reset button by pushing downward into body after system is operational. It is mandatory that the performance of filter/separators on all aircraft refueling equipment be checked every 30 days through the submission of samples taken from the effluent stream of the filter/separators. Upon request, the petroleum representative will furnish sample containers to components of the Army, Army National Guard, or Reserve operating aircraft refueling equipment. Samples will be sent to the petroleum laboratory designated by the petroleum representative. In the event a sample indicates unsatisfactory performance of filter/separator equipment, the submitting activity will be notified by telephone and will be advised to change the filter-separator elements. (AR 703-1, 1 Apr 1971).

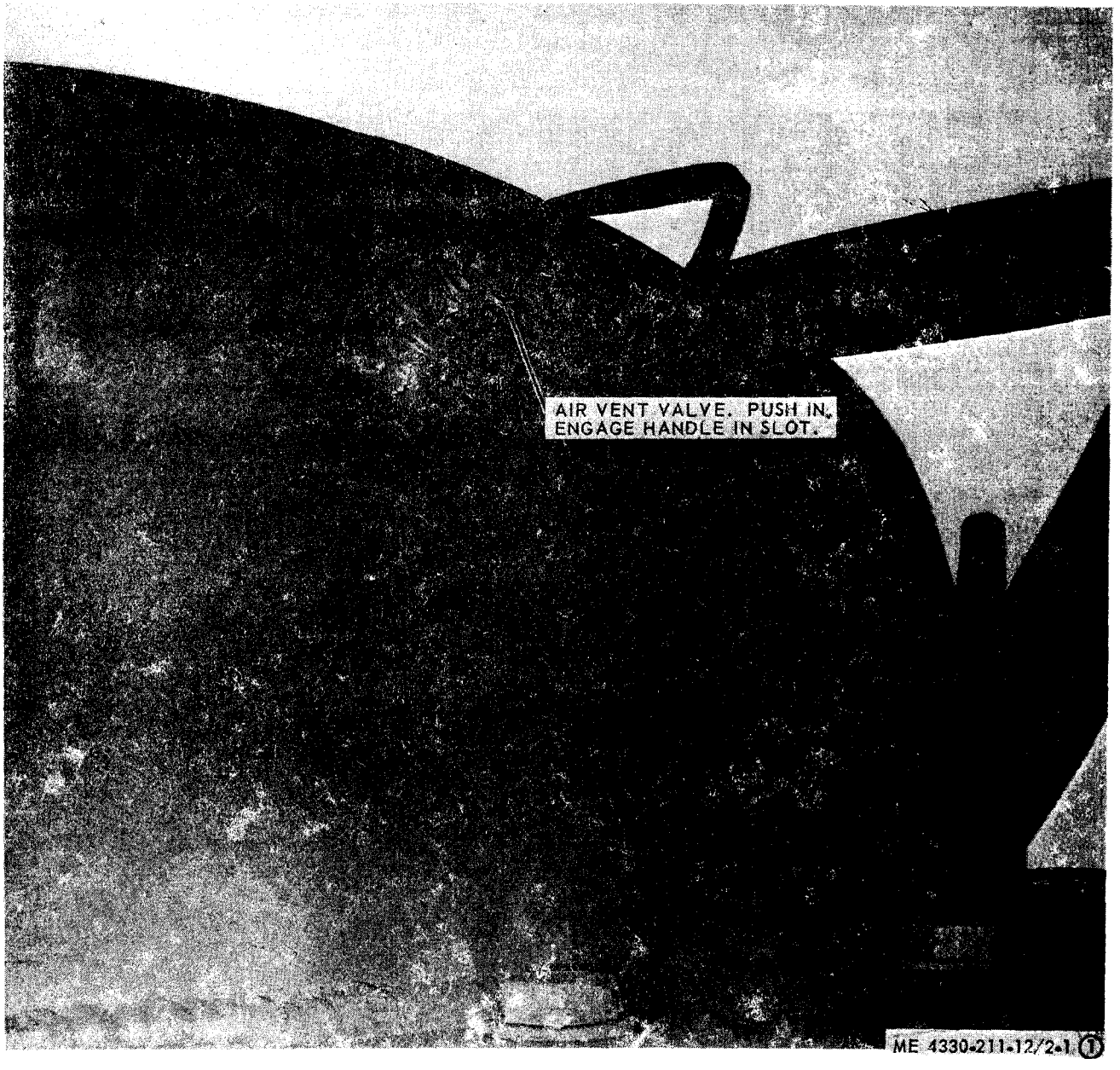


Figure 2-1 ① *. Controls and instruments (Sheet 1 of 3).*

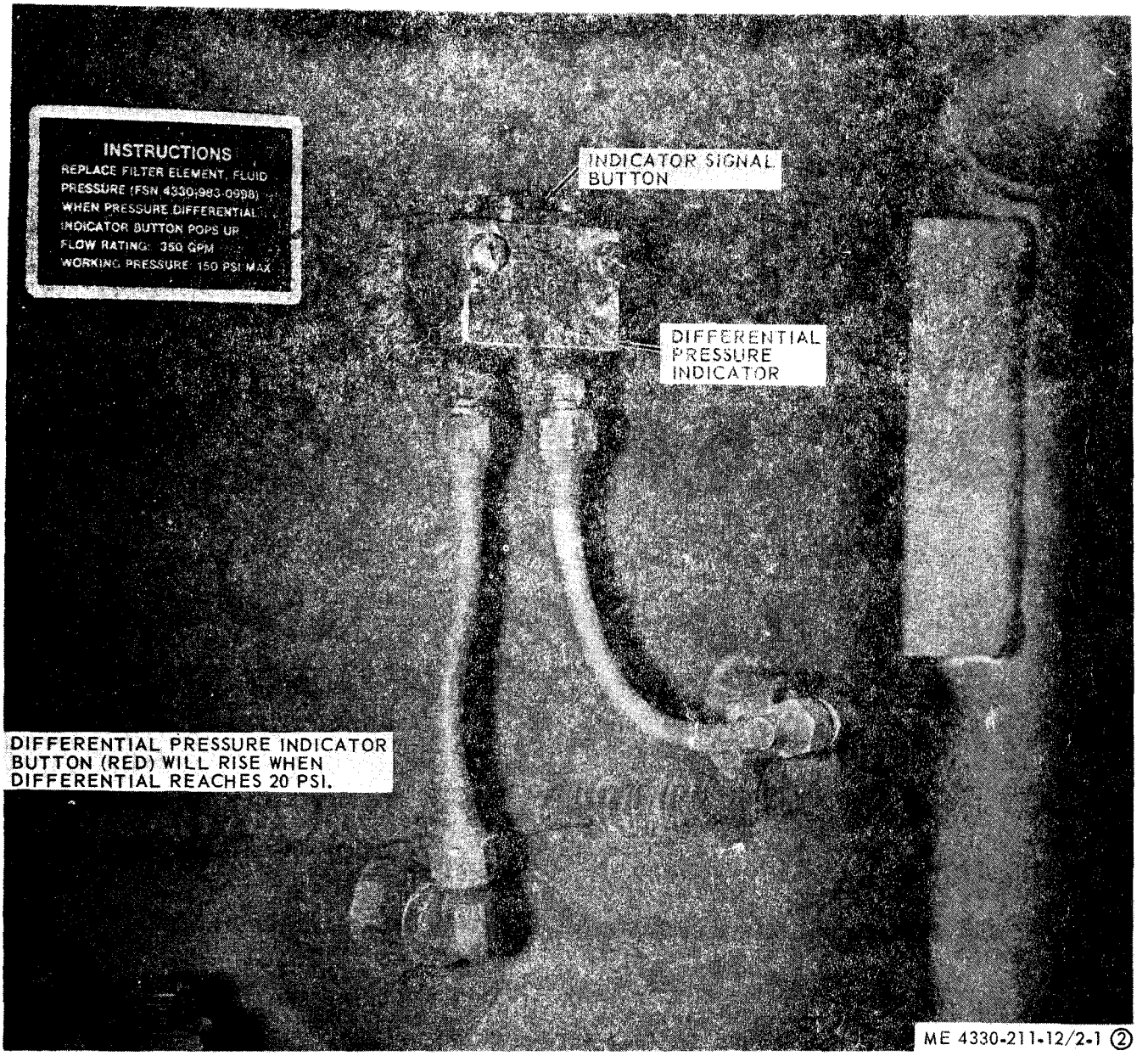


Figure 2-1 2 Controls and instruments (Sheet (2) of 3).

2-3. Stopping

Stop the pump and drain water from filter-separator (fig. 2-1 (3)) before venting air from unit (fig. 2-1 (1)). Leave air vent valve open during temporary shutdown. In the event that the filter/separator is inadvertently flooded with water, change the filter coalescer elements immediately.

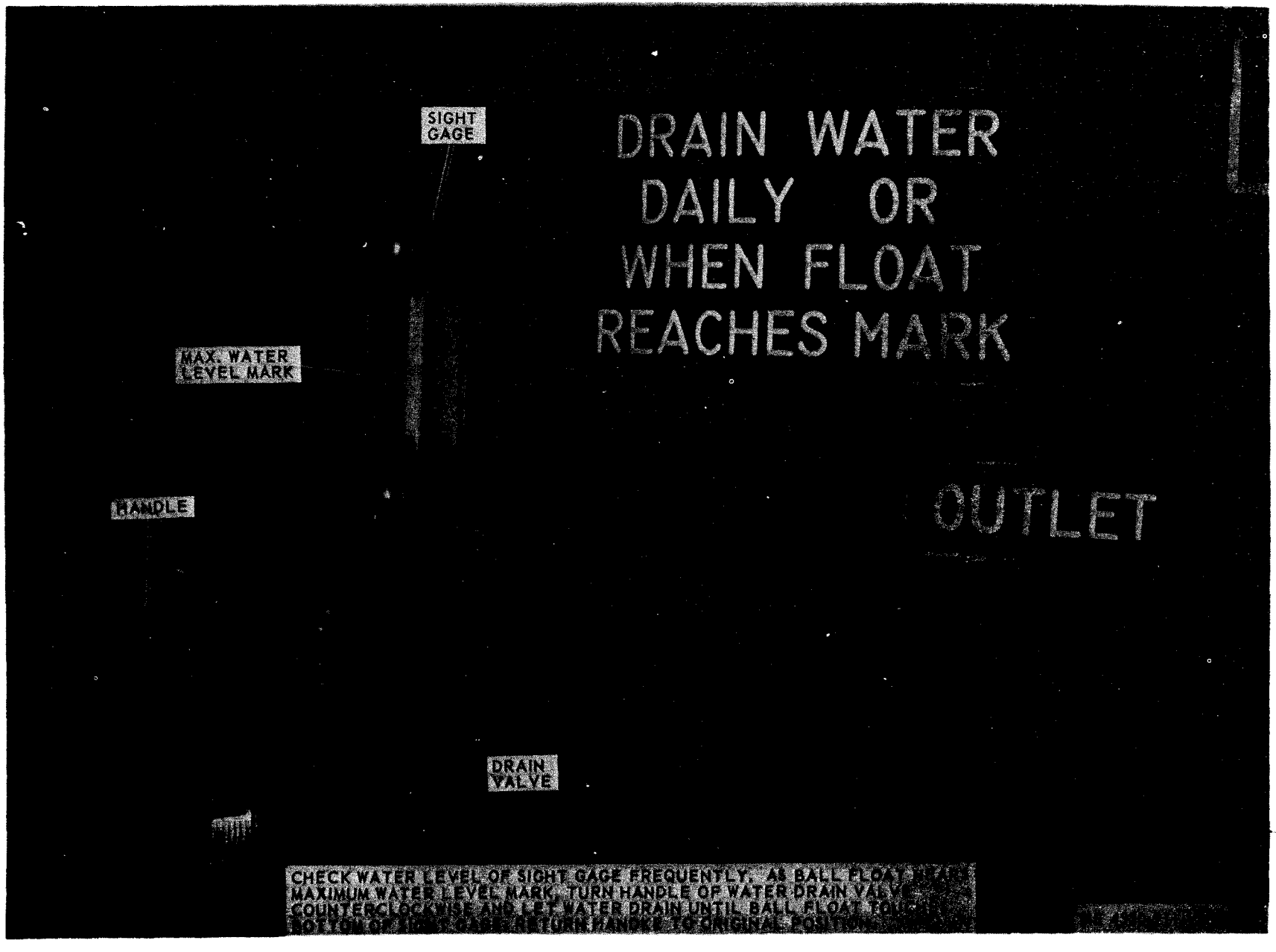


Figure 2-1 (3.) Controls and instruments (Sheet 3 of 3).

Section II. OPERATION UNDER UNUSUAL CONDITIONS

2-4. Operation in Extreme Cold

a. If a heated shelter cannot be provided, locate unit so that natural barriers can be utilized to the fullest extent possible to prevent water in the filter-separator from freezing.

b. Prior to stopping unit drain all water from body and valve (fig. 2-1 (3)) until clear fuel is discharged from the drain valve. This will prevent water from freezing in unit. Do this at each shut-down of operation.

2-5. Operation in Dusty or Sandy Areas

Precaution must be taken to prevent foreign matter from entering inlet or outlet lines and valves during coupling operations. Remove dust plugs and cap from filter-separator and hoses only when ready to connect hoses to unit. Replace dust plugs and cap on filter-separator inlet and outlet couplings and all hoses as soon as connections are broken.

2-6. Operation Under Rainy or Humid Conditions

Cover unit body if head is removed, do not allow water to enter unit at anytime.

2-7. Operation in Salt Water Areas

Protect unit as much as possible. Keep filter elements and inside of unit protected from exposure to salt water.

2-8. Operation in High Ambient Temperature

Leave vent valve closed to prevent loss of fuel by expansion during shutdown and open the valve to the inlet of the filter/separator; vent the unit prior to restarting.

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

Section I. Lubrication Instructions

There are no lubrication requirements for the filter separator.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

To insure that the filter-separator is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The preventive maintenance checks and services will be performed by the operator before operation. The item numbers indicate the sequence of inspection requirements. Defects discovered during operation of the unit shall be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted during operation which would damage the equipment if operation were continued. Only those faults that cannot be corrected by the operator or crew, or that are corrected by replacing parts, will be recorded on DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

Table 3-1. Preventive Maintenance Checks and Services.

Interval and sequence No. B	D	A	Item to be inspected
1			lNLET AND OUTLET COUPLINGS Inspect for secure fit. See that cams are tight.
2			HEAD BOLTS See that head bolts are tight.
3			SIGHT GAGE Inspect for cracked sight gage. See that bolts are tight.
4			AIR VENT VALVE Inspect for secure fit. See that winged screw works freely.
5			DRAIN VALVE Inspect for secure fit. See that handle is in OFF position.

Section III. TROUBLESHOOTING

Table 3-2 provides information useful in diagnosing and correcting troubles which cause unsatisfactory operation or failure of the filter-separator and its components. Each malfunction stated is followed by a list of probable causes. The corrective action recommended is described opposite the probable cause. Any trouble beyond the scope of operator maintenance must be reported to organizational maintenance.

Table 3-2. Troubleshooting.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. Flow Limiter Shuts Off Liquid Flow
Step 1. Pump is pumping fuel too fast for filter-separator.
Reduce pump speed
2. Differential Pressure Indicator Button Activated.
Step 1. Filter elements require changing.
Change elements (para 3-2d)
Step 2. Pump operating too fast.
Check pump, reduce speed
Step 3. Discharge line obstructed or kink.
Straighten line, clear obstruction, or replace hose.
3. Inadequate Performance
Step 1. Canister screen coated or clogged.
Remove canister and clean screen with solvent and compressed air.

Table 3-2. Troubleshooting.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Do not use metal scraper or wire brush on teflon coated screen.
CAUTION: Prior to using compressed air flush lines and port with fresh water.
Step 2. Filter elements dirty
Change elements (para 3-2d).
Step 3. Pumps not operating properly.
Check pump rate flow and performance.
Step 4. Air vent line or valve clogged.
Apply compressed air to line from inside head.
4. Inadequate Drainage
Drain line or valve clogged.
Remove valve (para 4-10).

Section IV. MAINTENANCE PROCEDURES

3-1. General

The instructions in this section are published for the information and guidance of the operator to maintain the filter-separator.

3-2. Filter-Separator Service

a. If the differential pressure indicator button is raised (fig. 2-1 (2)) this indicates a defective filter. Remove Head (fig. 3-2). Refer to figure 3-1 and remove the elements.

WARNING

Drain water from the sump, vent air from unit, and wait 5 minutes before servicing the unit.

b. Inspection. Inspect tank cover for cracks or other damage. Inspect gasket for tears or other damage. Inspect canister to determine if screen has become clogged. Pay particular attention to wave spring. Inspect elements for a dirty condition. Inspect band clamp for visible signs of damage.

c. Repair. If tank cover is cracked or damaged in any way, it must be replaced. The gasket is routinely replaced each time canisters are moved and inspected. The canisters will be cleaned with PD-680 cleaning solvent if found to be dirty. Damaged wave spings will be replaced by organizational maintenance. The elements will be replaced if found to be dirty. Replace band clamp if damaged in any way.

d. Installation. Install element as shown on figure 3-1 and tighten head bolts as shown on figure 3-2.

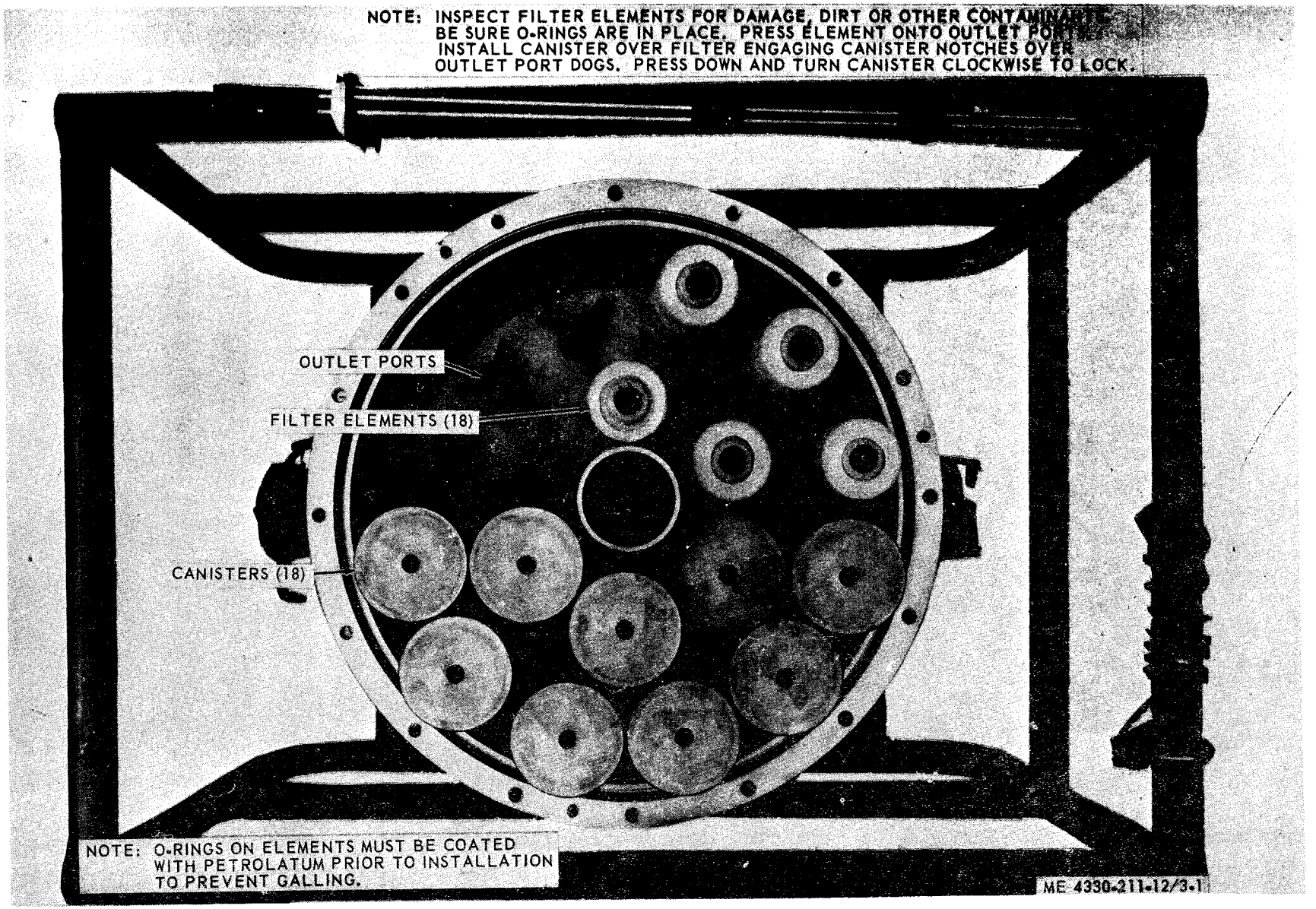


Figure 3-1. *Canister and filter element installation.*

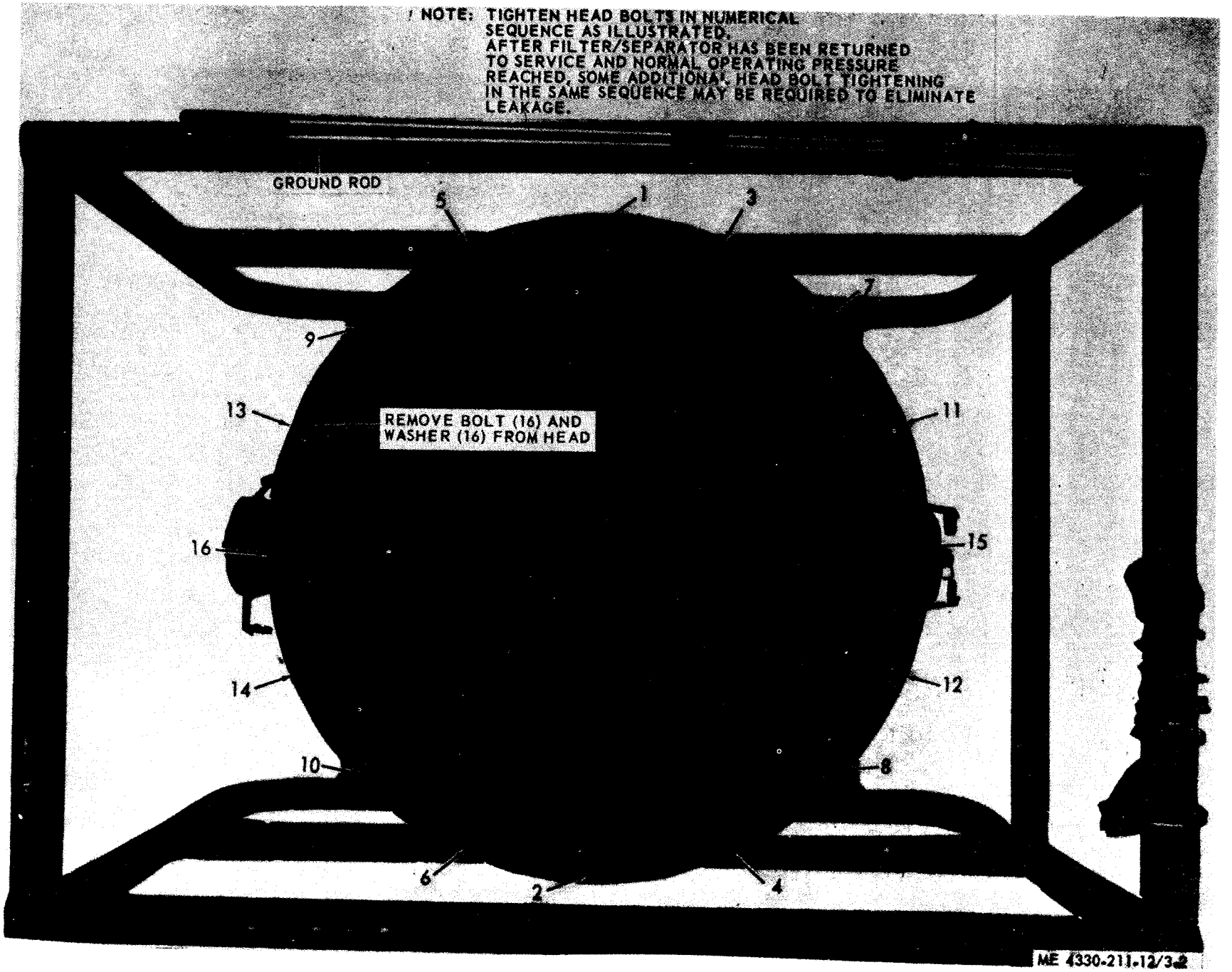


Figure 3-2. Head bolt tightening sequence.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE

Section I. SERVICE UPON RECEIPT OF MATERIEL

4-1. Inspecting And Servicing The Equipment

Inspect entire unit for loose or missing couplings, loose head bolts, and loose connections on tubing. Check for loose or missing bolts and inspect gage for cracks. Perform the daily preventive maintenance checks and services as instructed in table 3-1.

4-2. Installation

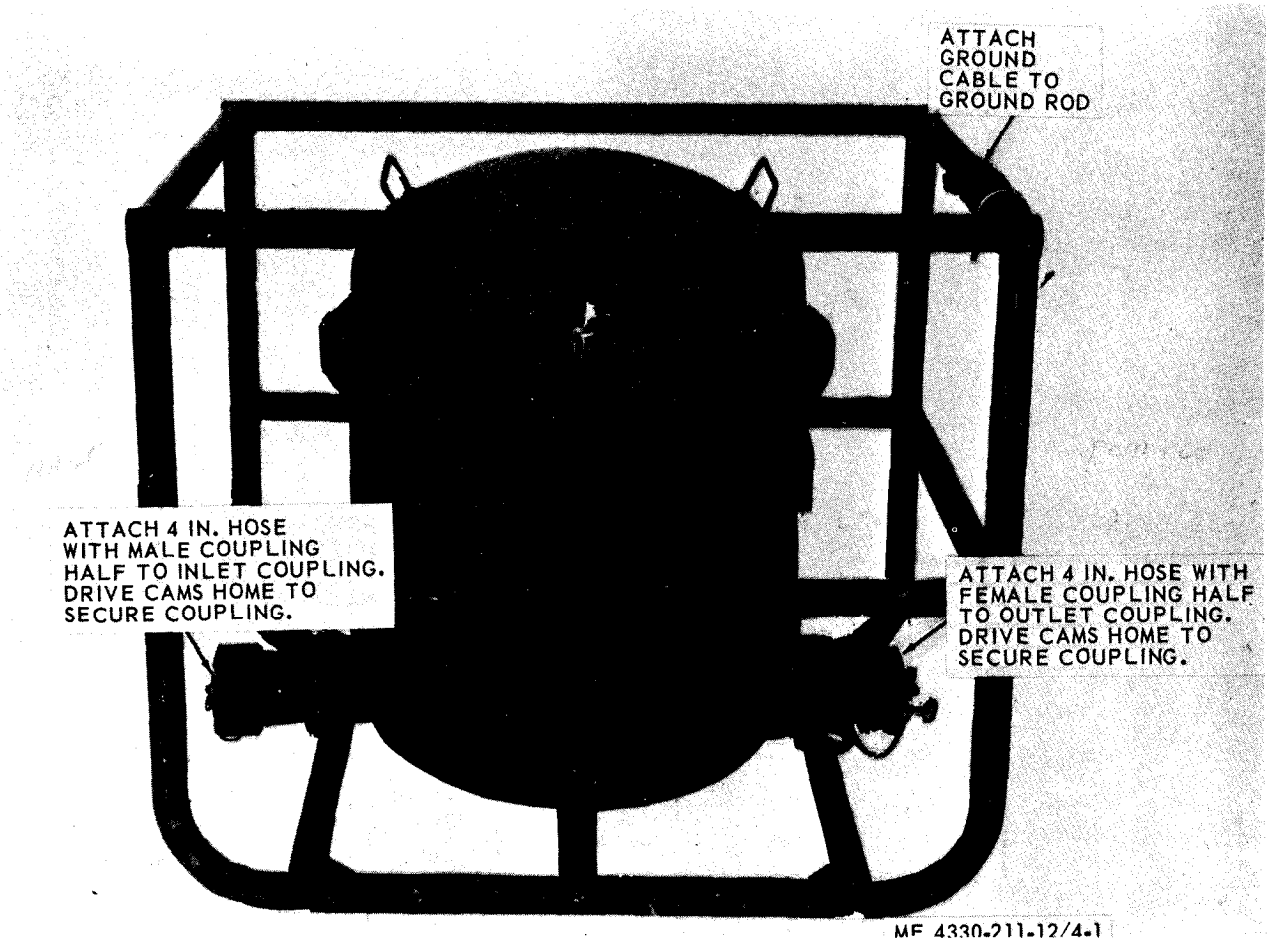
a. Site. The filter-separator must be placed on a level site in an upright position. If necessary level an area and place unit on two planks placed 90° to front of unit. Take precaution against possible toppling of unit; use blocks or sandbags on each side to prevent tilting.

CAUTION

Filter separator must be installed in an upright position only.

b. Grounding. Drive ground rod into earth approximately 8 feet deep, and securely fasten ground cable (fig. 4-1) to ground rod. Place rod so as to avoid loose cable between unit and ground rod. In the event that impregnable soil is encountered, bury in a horizontal trench not less than 8-feet in length and at least 8-inches beneath the surface.

c. Connections. Connect 4 inch hose with quick disconnect coupling to inlet and outlet lines (fig. 4-1). When installing hose coupling, make certain that the quick disconnect cams on female couplings are pulled all the way so that male couplings will be driven into a secure seat.



NOTE

There is a steel band around the canisters near the top, to secure the canisters from movement when equipment is in operation or being mobilized. This band shall be replaced around canisters only after replacing elements.

Section II. MOVEMENT TO A NEW WORKSITE

4-3. Dismantling For Movement

The filter-separator will require no dismantling for movement. Drain unit (fig. 2-1 (3)) and 4-2). When unit is drained, open air vent valve (fig. 2-1 (1)) and vent air from filter-separator. Disconnect the inlet and outlet hose (fig. 4-1).

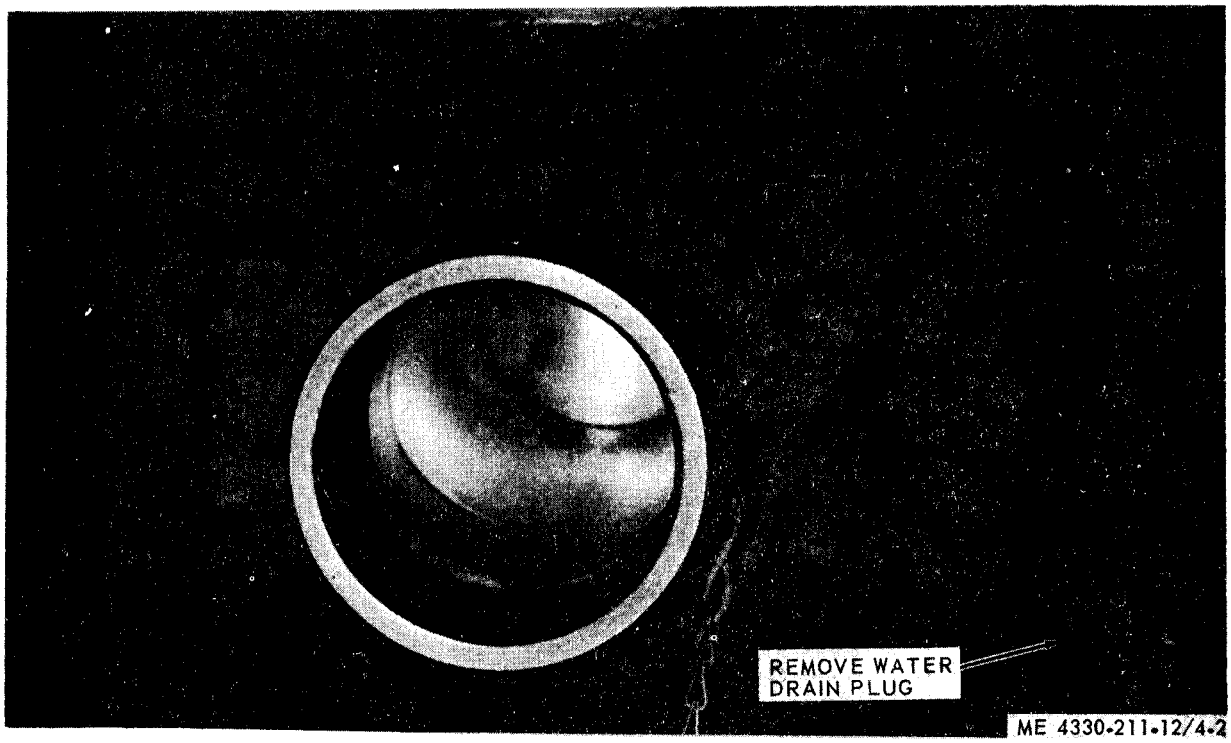


Figure 4-2. *Water drain plug.*

4-4. Reinstallation After Movement

Refer to paragraph 4-2 and reinstall the filter-separator in a similar manner.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

To insure that the filter-separator is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance checks and services to be performed are listed in table 4-1. The item numbers indicate the sequence of minimum inspection requirements. Only those faults that cannot be corrected by the Operator or Crew or that are corrected by replacing parts will be recorded on DA Form 2404.

Table 4-1. Preventive Maintenance Checks and Services.

M	Q	Items to be inspected Procedure
	1	SIGHT GAGE Inspect for cracked sight gage and ball float for damage. Replace if damaged.
	2	FILTER SEPARATOR Inspect filter-separator for damage to body or external components. Replace damaged components.

Section IV. TROUBLESHOOTING

Table 4-1 provides information useful in diagnosing and correcting troubles which cause unsatisfactory operation or failure of the filter-separator. Corrective action recommended is described opposite the probable cause.

Table 4-2. Troubleshooting.

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
DIFFERENTIAL PRESSURE INDICATOR "POPS UP."	
Step 1. Differential pressure lines leaking or broken.	**Repair or replace lines (para 4-8)**
Step 2. Defective differential pressure indicator.	**Test differential pressure indicator and replace if defective.**

Section V. ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

4-5. General

This section provides instructions for organizational maintenance of the filter-separator.

4-6. Air Vent Valve

a. Removal. Refer to figure 4-3 and remove the air vent valve.

b. Installation. Install the air vent valve in reverse order of removal.

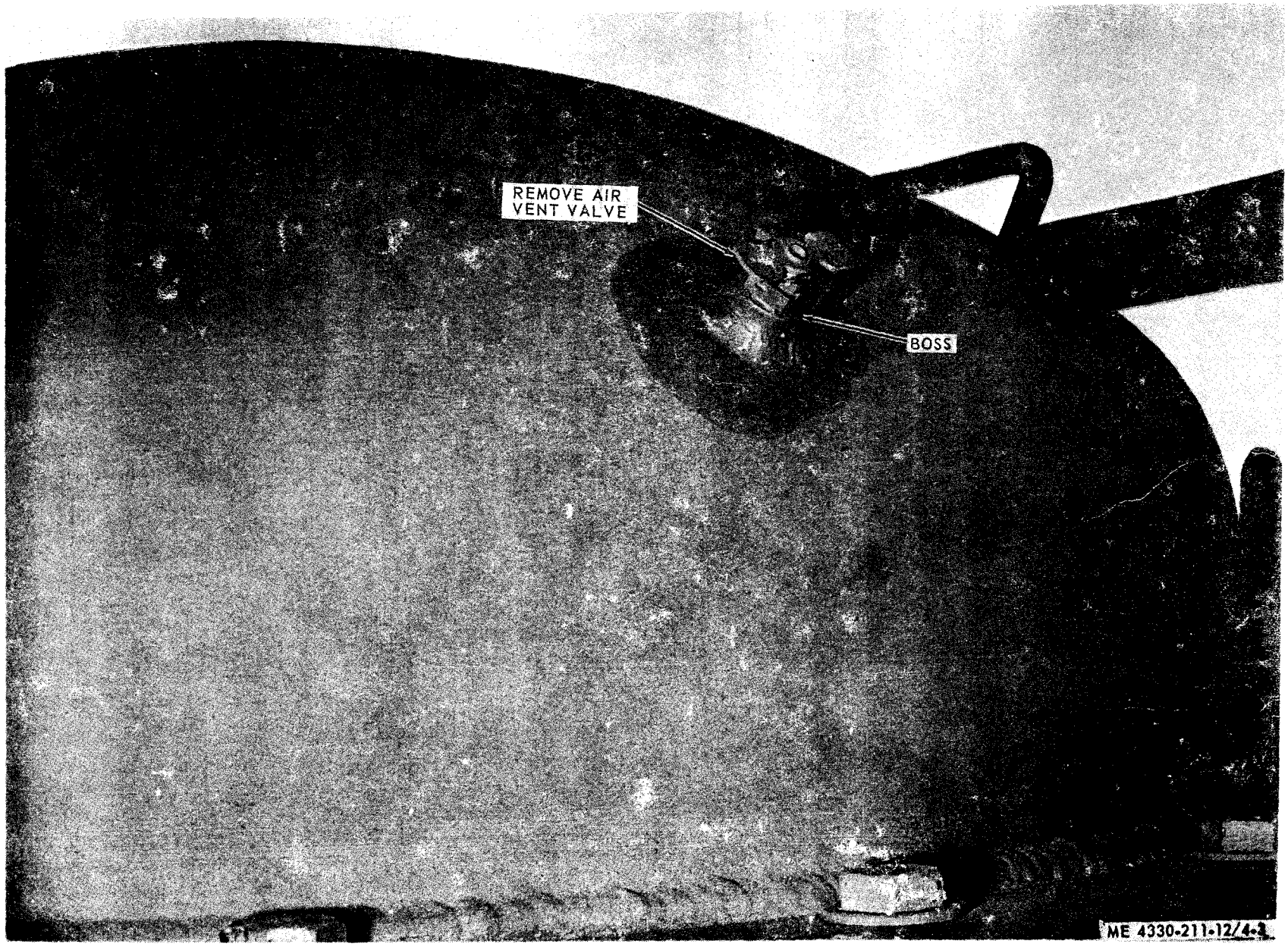


Figure 4-3. Air vent valve.

4-7. Lines and Fittings

N O T E

These lines are the inlet and outlet lines for the differential pressure indicator.

a. Removal. *Remove lines and fittings as* shown in figure 4-4. Fabricate new lines as required.

b. Installation. Install the lines and fittings in reverse order of removal.

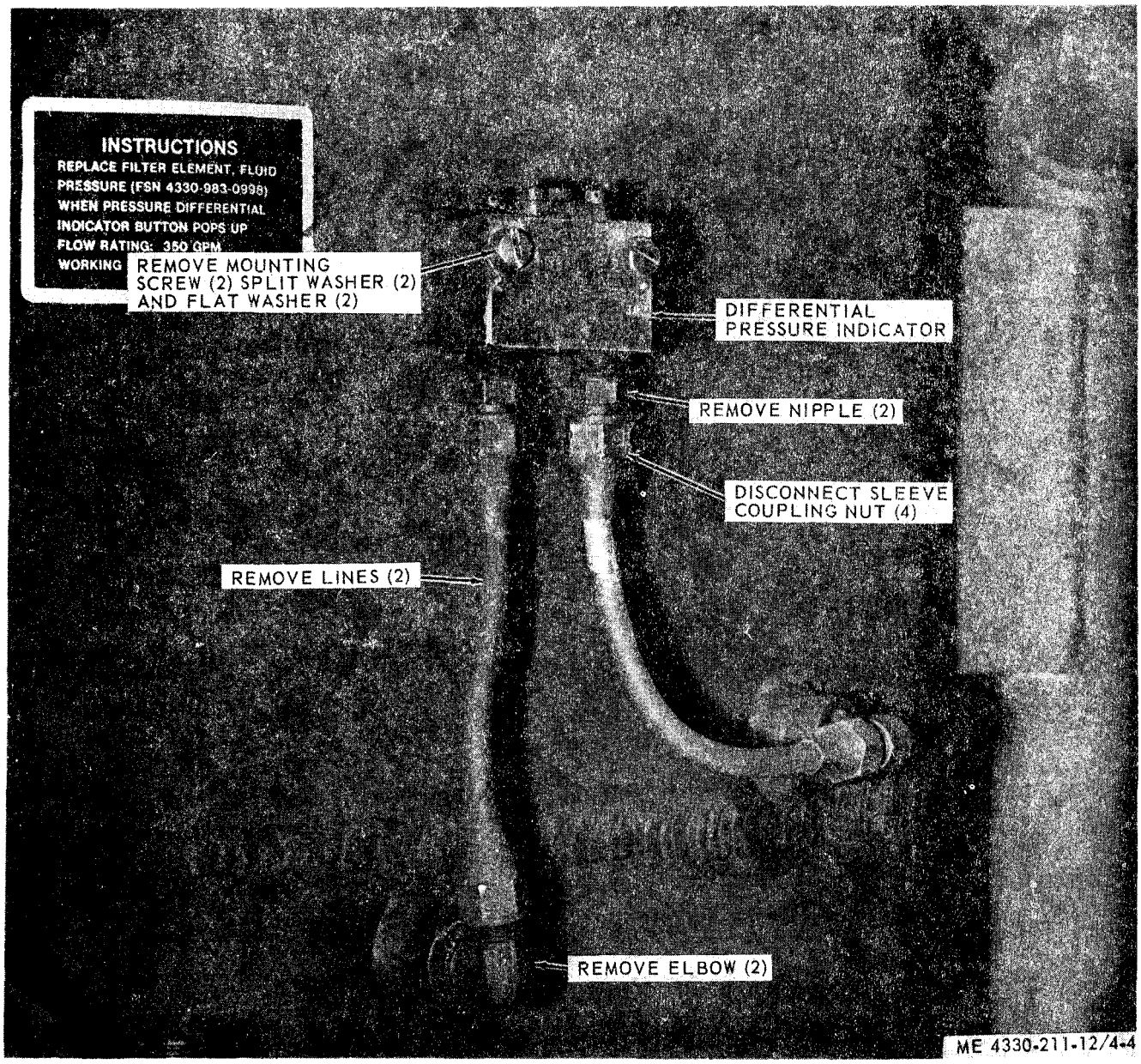


Figure 4-4. Differential pressure indicator, lines, and fittings.

4-8. Differential Pressure Indicator

a. Removal. Refer to figure 4-4 and remove the differential pressure indicator.

b. Testing.

(1) Connect a compressed air line to high and low pressure lines.

(2) Maintain an equal pressure on both lines then reduce air pressure in the low pressure line 20 PSI and see if the differential pressure indicator (raising of the signal button) works properly. Replace a defective differential pressure indicator.

c. Installation.

(1) Refer to figure 4-4 and install the differential pressure indicator in reverse order of removal.

(2) Connect the high and low pressure lines after securing the differential pressure indicator to the unit.

4-9. Sight Gage

a. Removal. Refer to figure 4-5 and remove the sight gage.

b. Inspection. Inspect sight gage for cracked lens or a float ball that has lost its color.

c. Repair. Defective parts will be replaced.

d. Refer to figure 4-5 and install sight gage in reverse order of removal.

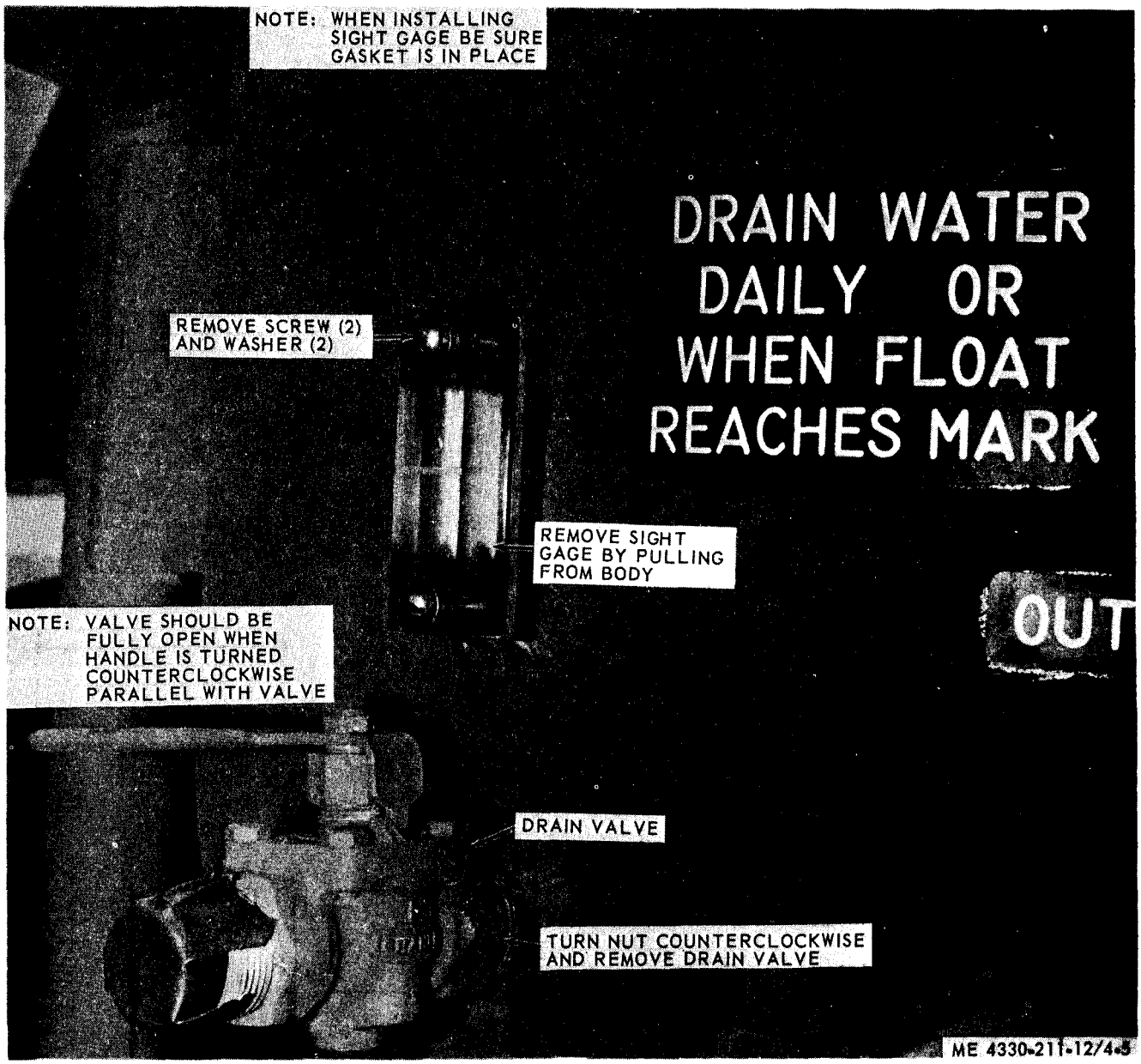


Figure 4-5. *Sight gage and water drain valve.*

4-10. Drain Valve

a. Removal. Refer to figure 4-5 and remove the drain valve.

b. Installation. Refer to figure 4-5 and install drain valve in reverse order of removal.

4-11. Coupling Clamp

a. *Removal.*

(1) Refer to figure 4-6 and 4-7 and remove bolt (2) and nut (2).

(2) Remove clamp half (2) and coupling gasket.

(3) Remove coupling half.

b. Installation. Installation is the reverse removal. Reference figure 4-6 and 4-7.

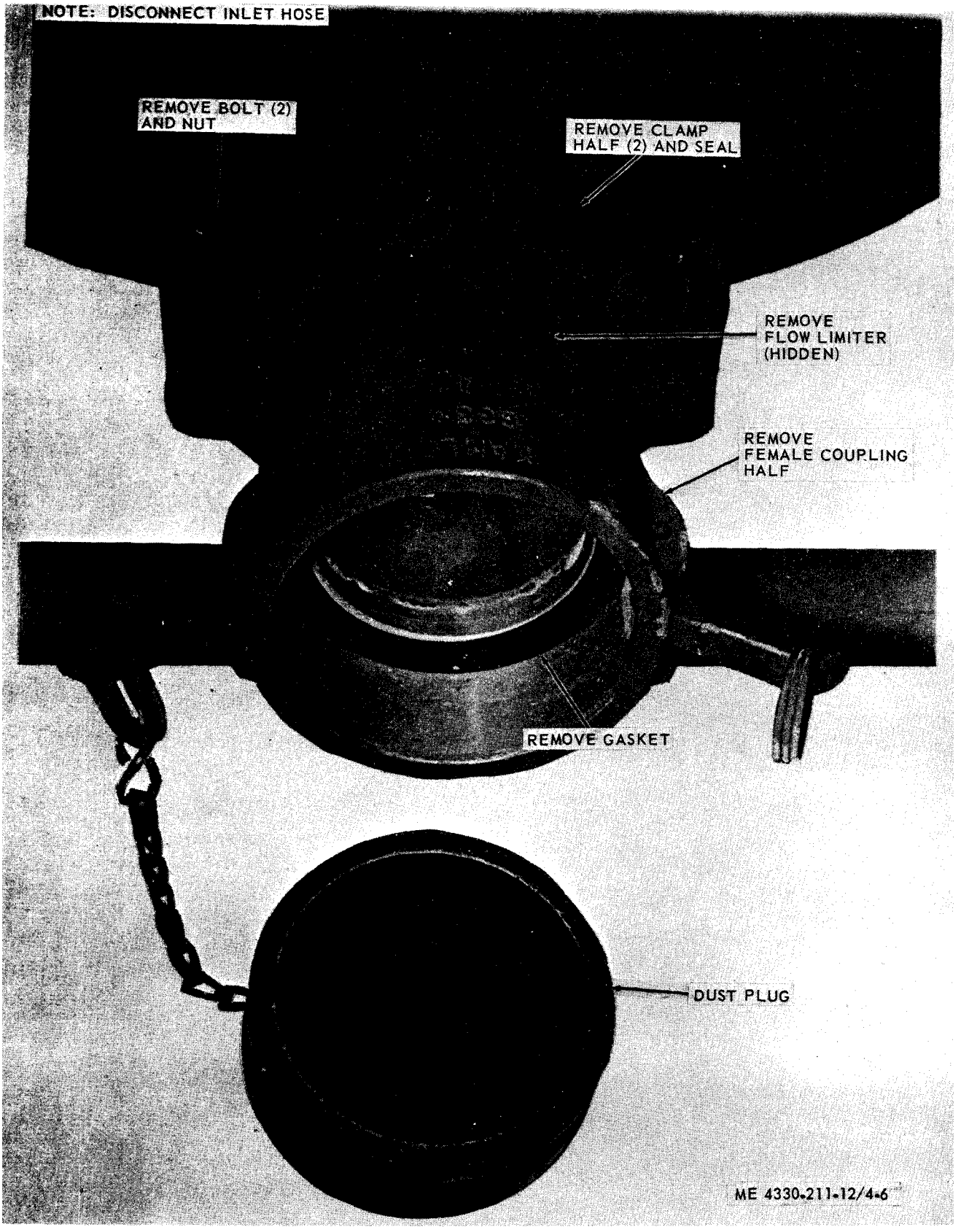
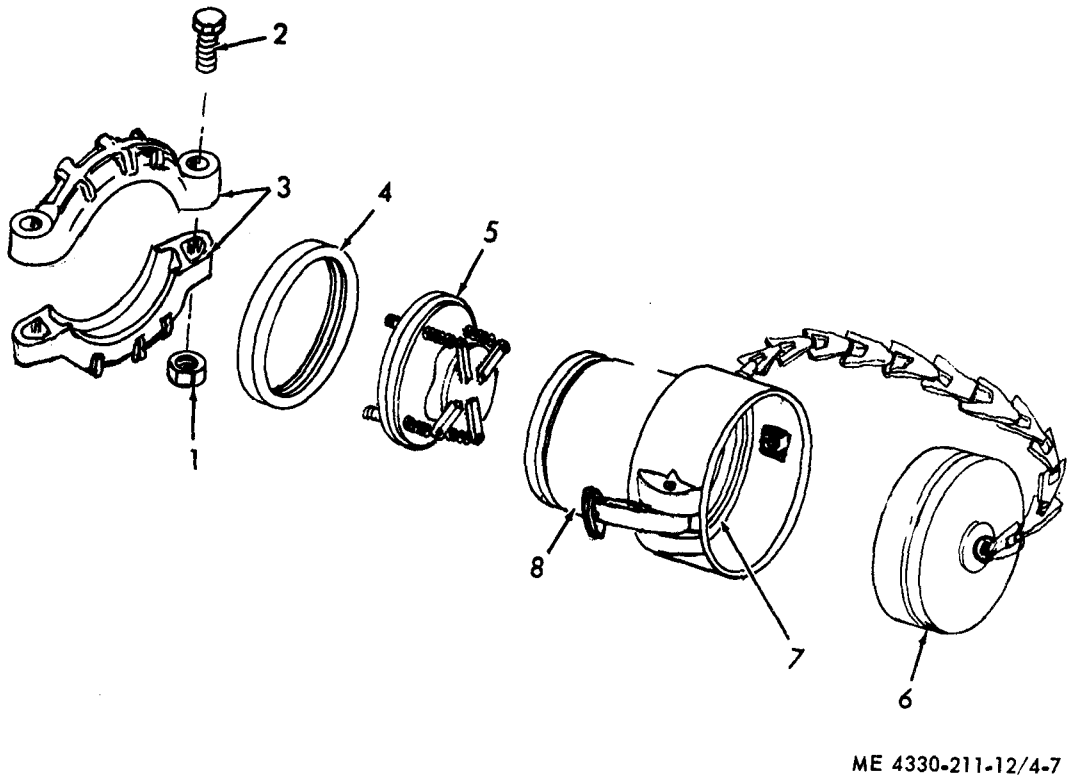


Figure 4-6. Flow limiter and coupling half removal.



1 Nut
2 Bolt
3 Coupling clamp
4 Gasket, coupling clamp
5 Flow limiter
6 Dust plug
7 Gasket, coupling half
8 Coupling half

Figure 4-7. *Coupling ha[f and flow limiter, exploded view.*

4-12. Flow Limiter

a. General. The function of the flow limiter is to prevent the filter-separator flow rate from exceeding 350 GPM. The flow limiter consists of an orifice plate to which a spring loaded baffle plate is mounted. The flow limiter is designed so that its pressure differential increases gradually with the increased flow to the trigger point (approximately 370 GPM). The baffle plate closes to within 1/16 inch of the orifice plate and reduces the flow to 350 GPM.

b. Removal. Refer to figure 4-6 and 4-7 and remove the flow limiter as instructed.

c. Installation. Refer to figure 4-6 and 4-7 and install the flow limiter in reverse order of removal.

4-13. Outlet Port Service

a. Refer to paragraph ***3-2d*** and remove the filter elements and canisters as instructed.

b. Refer to figure 4-8 and service outlet port as instructed.

c. Refer to paragraph 3-2d and install filter elements and canisters as instructed.

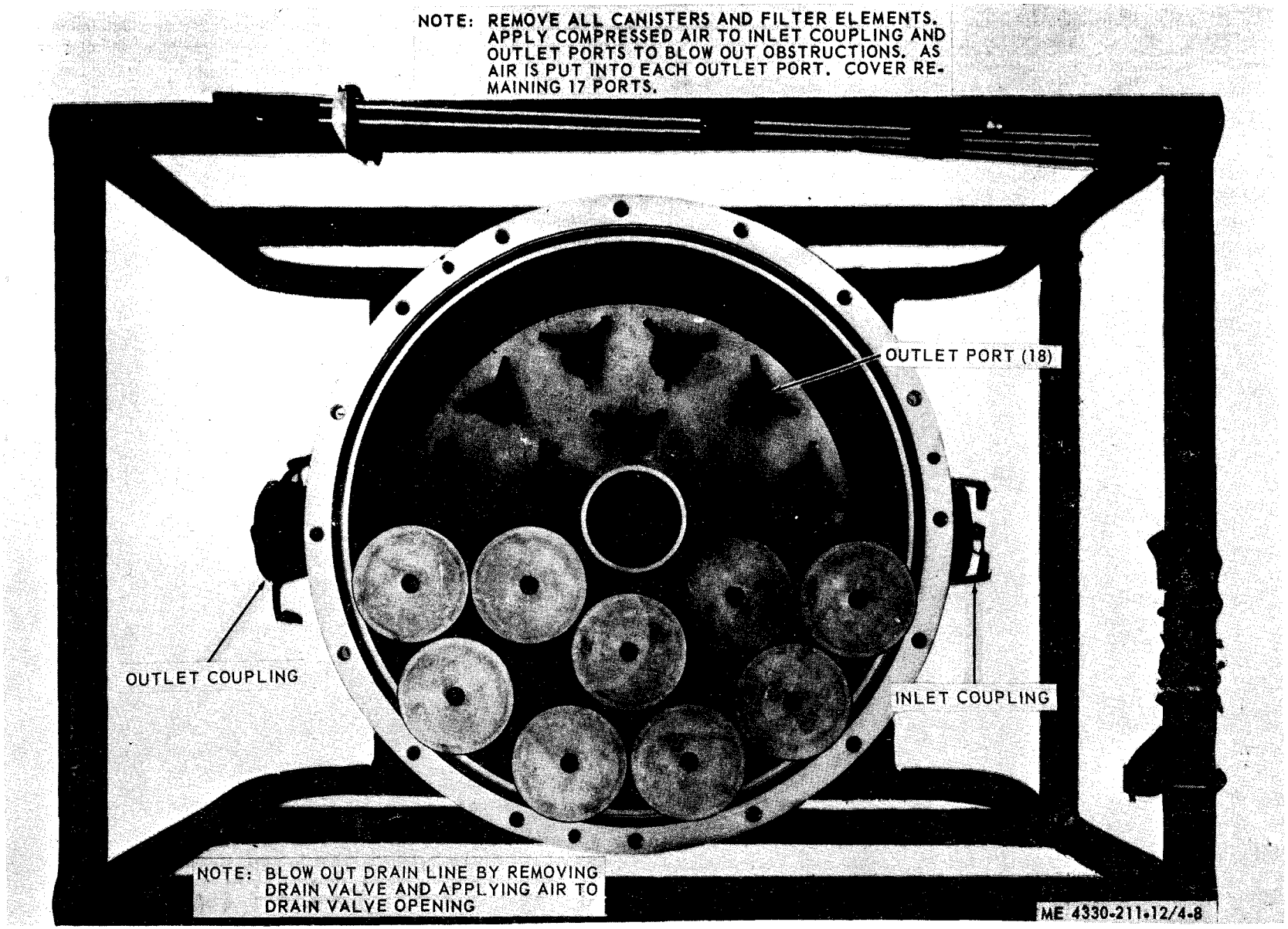


Figure 4-8. *Outlet port service.*

4-14. Wave Springs

a. Removal.

(1) Refer to paragraph 3-2 and remove the canisters as instructed.

(2) Refer to figure 4-9 and remove wave spring as instructed.

b. Installation.

(1) Refer to figure 4-9 and install wave springs as shown.

(2) Refer to paragraph 3-2 and install the canisters as instructed.

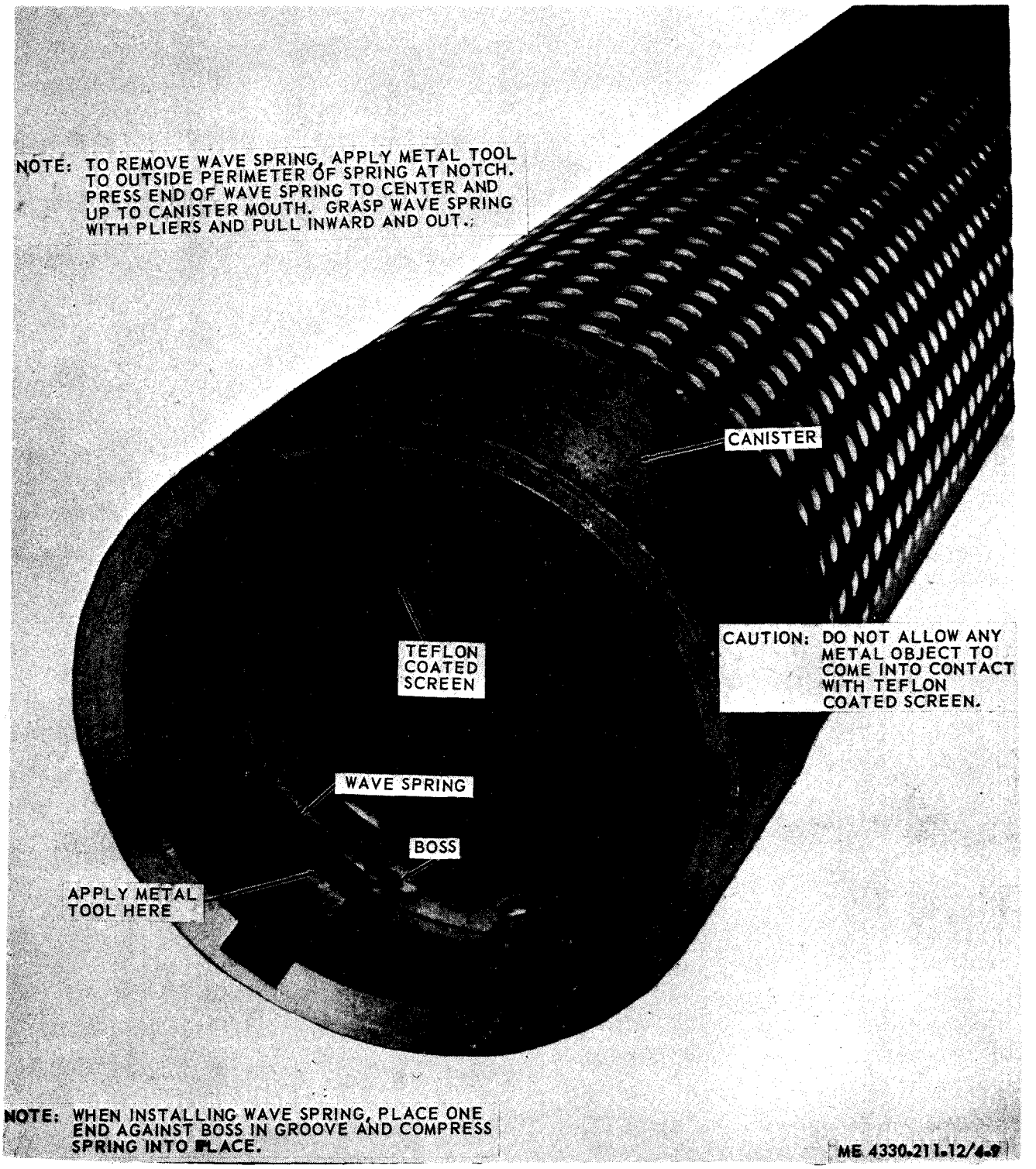


Figure 4-9. Wave spring, removal and installation.

4-15. Tank and Frame

a. Inspection. Inspect tank and frame for defects.

b. Repair. If the tank is found to be defective, it will not be repaired, it must be replaced.

c. Repair. If the frame has been bent or cracked it will be repaired by experienced aluminum welder only.

4-16. Data, Instruction, and Warning Plates

a. Removal. Refer to figure 1-2 and remove data, instruction, and warning plates.

b. Installation. Refer to figure 1-2 and install data, instruction, and warning plates.

APPENDIX A

REFERENCES

A-1. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users.

A-2. Painting

TM 9-213	Painting Instruction for Field Use.

A-3. Maintenance

TM 38-750	The Army Maintenance Management System.

A-4. Shipment and Limited Storage

TM 38-230-1	Preservation and Packing of Military Equipment.
TM 740-90-1	Administrative Storage of Equipment.
MIL-F-52429	Packaging of Fuel Filter Separators.

A-5. Demolition

TM 750-244-3	Destruction of Materiel to Prevent Enemy Use.

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III contains supplemental instructions, explanatory notes and/or illustrations required for a particular maintenance function.

B-2. Explanation of Columns in Section II

a. Group Number. The assembly group is a numerical group assigned to each assembly in a top down breakdown sequence. The applicable assembly groups are listed on the MAC in disassembly sequence beginning with the first assembly removed in a top down disassembly sequence.

b. Assembly Group. This column contains a brief description of the components of each assembly group.

c. Maintenance Functions. This column lists the various maintenance functions (A through K) and indicates the lowest maintenance level authorized to perform these functions. The symbol designations for the various maintenance levels are as follows:

C-Operator or crew
O-Organizational maintenance

The maintenance functions are defined as follows:

A-Inspect: To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

B-Test: To verify serviceability and to detect electrical or mechanical failure by use of test equipment.

C-Service: To clean, to preserve, to charge, to paint, and to add fuel, lubricants, cooling agents, and air.

D-Adjust: To rectify to the extent necessary to bring into proper operating range.

E-Aline: To adjust specified variable elements of an item to bring to optimum performance.

F-Calibrate: To determine the corrections to be made in the readings of instruments or test equipments used in precise measurement. Consists of the comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.

G-Install: To set up for use in an operational environment such as an emplacement, site, or vehicle.

H-Replace: To replace unserviceable items with serviceable assemblies, subassemblies, or parts.

I-Repair: To restore an item to serviceable condition. This includes, but is not limited to, inspection, cleaning, preserving, adjusting, replacing, welding, riveting, and strengthening.

J-Overhaul: To restore an item to a completely serviceable condition as prescribed by maintenance serviceability standards using the Inspect and Repair Only as Necessary (IROAN) technique.

K-Rebuild: To restore an item to a standard as nearly as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through complete disassembly of the item, inspection of all parts to components, repair or replacement of worn or unserviceable elements (items) using original manufacturing tolerances and specifications, and subsequent reassembly of the item.

d. Tools and Equipment. This column is not applicable.

e. Remarks. This column is provided for referencing by code the remarks (sec. III) pertinent to the maintenance functions.

B-3. Explanation of Columns in Section III

a. Reference Code. This column consists of two letters separated by a dash, both of which are references to section II. This first letter references column (5) and the second letter references a maintenance function, column (3), A through K.

b. Remarks. This column lists information pertinent to the maintenance function being performed, as indicated on the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group No.	(2) Assembly group	(3) Maintenance functions											(4) Tools and equipment	(5) Remarks
		A Inspect	B Test	C Service	D Adjust	E Align	F Calibrate	G Install	H Replace	I Repair	J Overhaul	K Rebuild		
01	COVER, CANISTER, & ELEMENTS AND VALVES													
	Cover, Tank	C	..	..	..	..	..	..	C					
	Gasket, Cover	C	..	..	..	..	..	..	C					
	Canisters	C	..	C	..	..	..	..	C	O	..	..	..	A-C
	Elements	C	..	..	..	..	..	..	C					
	Clamp, Band	C	..	..	..	..	..	..	C					
	Valve, Drain	C	..	..	..	..	..	..	O					
	Valve, Air Vent	C	..	..	..	..	..	..	O					
02	FLOW LIMITER, VALVES, LINES AND FITTINGS													
	Lines and Fittings	C	..	..	..	..	..	..	O	O				
	Flow Limiter	O	..	..	..	..	..	..	O					
	Clamps and Couplings	C	..	..	..	..	..	..	O					
03	SIGHT, GAGE, & DIFFERENTIAL PRESSURE INDICATOR													
	Gage, Sight, Water Level	C	..	..	..	..	..	..	O	O				
	Indicator, Differential Pressure	C	O	..	..	..	..	..	O					
04	TANK & FRAME													
	Tank and Frame	C	..	..	..	..	..	..	O	O	..	..		B-I
	Ground Rod and Cable	C	..	..	..	..	..	..	O					
	Data, Instruction, and Warning Plates	C	..	..	..	..	..	..	O					

Section III. REMARKS

Reference code	*Remarks*
A-C	Service to the Filter/Separator consists of cleaning of the canisters and replacing the filter elements.
B-I	Repair includes straightening and welding of the frame by experienced aluminum welder only.

APPENDIX C

REPAIR LIST FOR ORGANIZATIONAL MAINTENANCE

Section I. INTRODUCTION

C-1. Scope

a. This appendix lists repair parts, special tools, test and support equipment required for the performance of organizational maintenance of the Filter-Separator.

b. Repair parts listed represent those authorized for use at indicated maintenance levels and will be requisitioned (on an "as required" basis until stockage is justified by demand in accordance with AR 735-35 or AR 710-2).

C-2. General

This Repair Parts and Special Tools List is divided into the following sections:

a. Repair Parts-Section II. A list, in figure and item number sequence, of repair parts authorized at the organizational level for the performance of maintenance, including those items which must be removed for replacement of the authorized item. Items, except kits and sets, are listed by assembly group in top down breakdown sequence.

b. Special Tools, Test and Support Equipment-Section III. (Not *Applicable).*

c. Federal Stock Number and Reference Number Index-Section IV. (Not Applicable).

NOTE

Items not illustrated are cross-referenced to group number.

C-3. Explanation of Columns

The following provides and explanation of columns in the tabular lists in Sections II and III.

a. Source, Maintenance, and Recoverability Codes (SMR):

(1) Source code indicates the source for the listed item. Source codes are:

Code	*Explanation*
P	Repair Parts, Special Tools and Test Equipment supplied from GSA/DSA, or Army supply system, and authorized for use at indicated maintenance levels.
P2	Repair Parts, Special Tools and Test Equipment which are procured and stocked for insurance purposes because combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.
M	Repair Parts, Special Tools and Test Equipment which are not procured or stocked, as such, in the supply system but are to be manufactured at indicated maintenance levels.
A	Assemblies which are not procured or stocked as such, but are made up of two or more units. Such component units carry individual stock numbers and descriptions, are procured and stocked separately and can be assembled to form the required assembly at indicated maintenance levels.
X	Parts and assemblies that are not procured or stocked because the failure rate is normally below that of the applicable end item of component. The failure of such part or assembly should result in retirement of the end item from the supply system.
X1	Repair Parts which are not procured or stocked. The requirement for such items will be filled by the next higher assembly or component.
X2	Repair Parts, Special Tools and Test Equipment which are not stocked and have no foreseen mortality. The indicated maintenance level requiring such repair parts will attempt to obtain the parts through cannibalization or salvage, if not obtainable through cannibalization or salvage, the item may be requisitioned with exception data, from the end item manager, for immediate use.
G	Major assemblies that are procured with PEMA funds for initial issue only as exchange assemblies at DSU and GSU level. Those assemblies will not be stocked above the DS and GS level or returned to depot supply level.

NOTE

Cannibalization or salvage may be used as a source of supply for any items source coded above except those coded X1 and aircraft support items as restricted by AR 700-42.

(2) Maintenance code indicates the lowest level of maintenance authorized to install the listed item. Repair Parts and Special Tools assigned maintenance code "C" may be stocked at the operator level of maintenance when authorized by the Unit Commander. The maintenance level codes are:

Code	Explanation
C.....	Crew or Operator maintenance.
O.....	Organizational maintenance.

(3) Recoverability code indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable. Recoverability codes are:

Code	Explanation
R	Applied to repair parts, (assemblies and components) special tools and test equipment which are considered economically reparable at direct and general support maintenance levels. When the item is no longer economically reparable, it is normally disposed of at the GS level. When supply considerations dictate, some of these repair parts may be listed for automatic return to supply for depot level repair as set forth in AR 710-50. When so listed, they will be replaced by supply on an exchange basis.
S	Repair Parts, Special Tools, and Test Equipment and assemblies which are economically reparable at DSU and GSU activities and which normally are furnished by supply on an exchange basis. When items are determined by a GSU to be uneconomically reparable, they will be evacuated to a depot for evaluation and analysis before final disposition.
T	High dollar value recoverable repair parts, special tools and test equipment which are subject to special handling and are issued on an exchange basis. Such items will be evacuated to the depot for overhaul or final disposition. Communication-Electronics and Missile Support items will be repaired overhauled only at depots.
U	Repair Parts, Special Tools and Test Equipment specifically selected for salvage by reclamation units because of their precious metal content, critical materials, high dollar value or reusable casings or castings.

b. Federal Stock Number. This column indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description. This column indicates the Federal item name and a minimum characteristic description required to describe the item. Assembly components and subassemblies are indented under major assemblies. The abbreviation "w/e", when used as part of the nomenclature, indicates the Federal stock number includes all armament, equipment, accessories, and repair parts issued with the item. A part number or other reference number is followed by the applicable five-digit Federal supply code for manufacturers in parenthesis. Material required for manufacture or fabrication is identified.

d. Unit of Measure (U/M). A two-character alphabetic abbreviation indicating the amount or quantity of the item, as used, upon which the allowances are based, e.g. ft., ea., pr., etc.

e. Quantity Incorporated in Unit. This column indicates the quantity of the item used in the assembly group. A "V" appearing in this column in lieu of a quantity indicates that a definite quantity cannot be indicated, e.g., shims, spacers, etc.

f. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item number.* Indicates the callout number used to reference the item on the illustration.

C-4. Special Information

a. Identifications of the useable on codes included in the description column of this publication are: (Not applicable).

b. Parts which require manufacture or assembly at a level higher than that authorized for installation will indicate in the source column the higher level.

C-5. How to Locate Repair Parts

a. When Federal Stock Number, Reference Number, or Part Number is unknown:

(1) Using the table of contents, determine the assembly group within which the repair part belongs. This is necessary since illustrations are prepared for assembly groups and listings are divided into the same groups.

(2) Find the illustration covering the assembly group to which the repair part belongs.

(3) Identify the repair part on the illustration and note the illustration figure and item number of the repair part.

(4) Using the Repair Parts Listing, find the assembly to which the repair part belongs and locate the illustration figure and item number noted on the illustration.

b. When the Federal Stock Number, Reference Number, or Part Number is known: Use the Repair Parts Listing to find the assembly group of the repair part and the illustration figure number and item number.

c. When the Federal Stock Number, Reference Number, or Part Number is Known and the Repair Part is not Illustrated: Using the applicable group number and page number, lo-

cate the pertinent stock number, reference number, or part no. in the repair parts listing. Items which are not illustrated are listed at the end of assembly group to which they belong.

C-6. Federal Supply Codes for Manufacturers

Code	*Manufacturer*
06816	Pall Corporation Glen Cover, New York
15277	General Steel Tank Co. Reidsville, North Carolina
81348	Federal Specifications Promulgated by General Services Administration
81349	Military Specification Promulgated by Standardization Div. Directorate of Logistic Services DSA
87755	Universal Brass Co. Arlington, New Jersey
88044	Aeronautical Standards Group Dept of Navy and Air Force
96906	Military Standard Promulgated by Standardization Div. Directorate of Logistic Services DSA
97403	Army Engineer Research and Development Laboratories Fort Belvoir, Virginia
98625	Aeroquip Corp. Marman Division 11214 Exposition Blvd. Los Angeles, Calif.

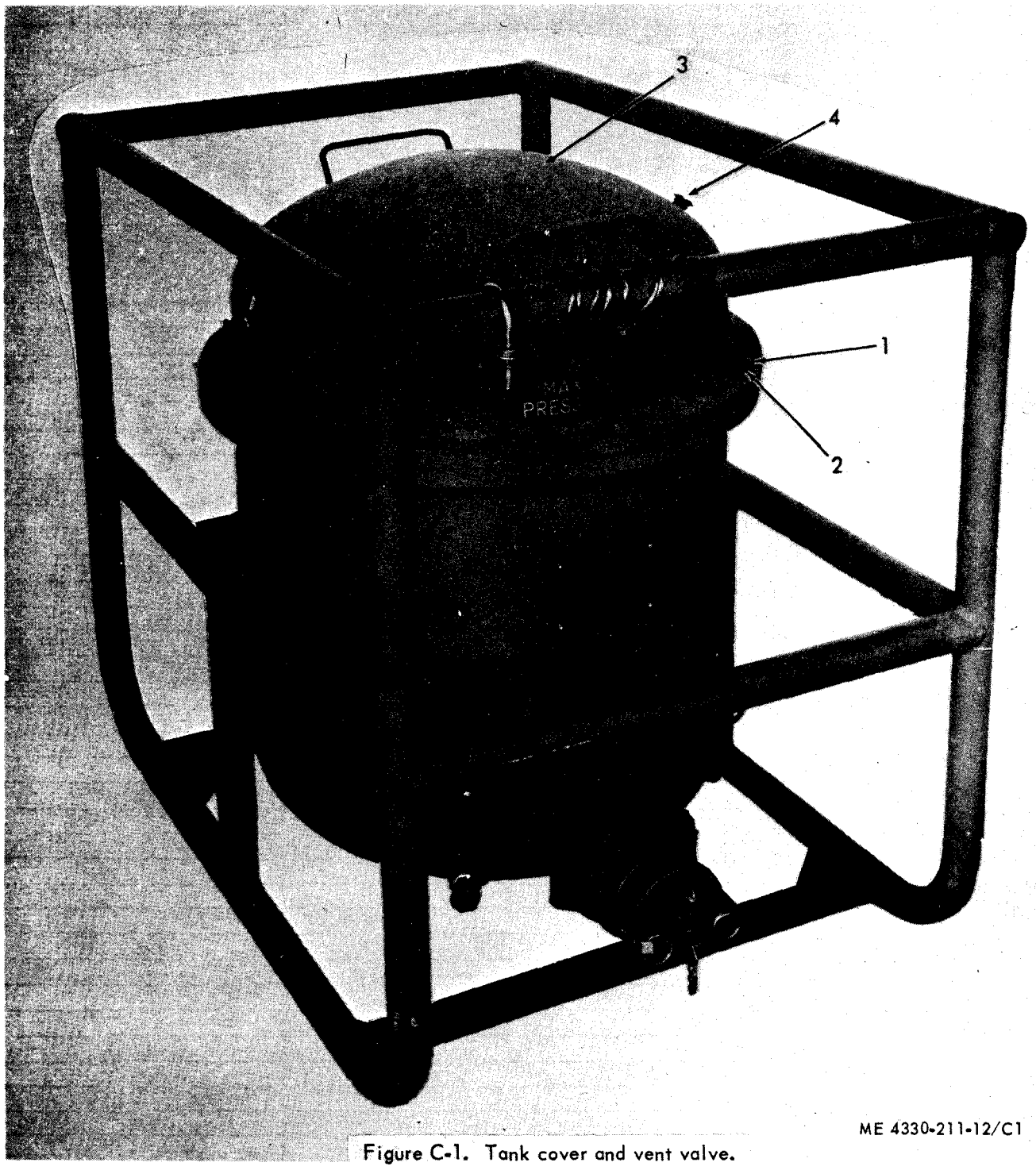
C-7. Recommendations for Maintenance Publications Improvements

Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028, Recommended Changes to Publications, and forwarded direct to Commanding General, U. S. Army Mobility Equipment Command, ATTN: AMSME-MPP, 4300 Goodfellow Boulevard, St. Louis, Mo. 63120.

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REF NUMBER & MFR CODE	USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATION (a) FIG. NO.	(b) ITEM NO.
		Section II. REPAIR PARTS LIST									
		GROUP 01 - COVER, CANISTER, ELEMENTS, AND VALVES									
PO	5305-727-5677	SCREW, COVER MTG MS90726-162 (96906)		EA	16	*	*	*	*	C1	1
PO	5310-823-8803	WASHER MS27183-21 (96906)		EA	16	*	*	*	*	C1	2
X20		COVER, TANK 13217E9322 (97403)		EA	1					C1	3
PO	4820-407-2581	VALVE, PRESSURE; VENT; MANUAL 13216E2798 (97403)		EA	1	*	*	*	*	C1	4
PO	4330-112-0256	CANISTER 13216E2773 (97403)		EA	18	*	*	*	*	C2	1
PO		WAVE SPRING 13216E2774 (97403)		EA	18	*	*	*	*	C2	2
PO		PACKING, O-ring; cover-to-vessel 13217E9325-1 (97403)		EA	1	*	*	*	*	C3	1
PO	5315-889-2767	PIN, cover alignment MS16555-667 (96906)		EA	1	*	*	*	*	C3	2
P20		CLAMP, band; canister retainer 7120-3050 (98625)		EA	1	*	*	*	*	C3	3
PO	4330-983-0998	ELEMENT MIL-F-52308 (81349)		EA	18	*	*	*	*	C3	4
X20		NIPPLE, Pipe; 1.00 inch nom size; 1.5 inch lg.; thd both ends 975001 (15277)		EA	1					C4	1
PO	4820-407-6449	VALVE, BALL TYPE; WATER DRAIN 13207E9044-1 (97403)		EA	1	*	*	*	*	C4	2
		GROUP 02 - FLOW LIMITER, LINES AND FITTINGS									
PO	4730-640-6512	CLAMP ASSY, COUPLING; STYLE 77A; 4 INCH SIZE MIL-C-10387 (81349)		EA	2	*	*	*	*	C5	1
PO	5330-141-4224	GASKET, COUPLING CLAMP; TYPE C; 4W PIPE SIZE; SYNTHETIC MIL-C-10387 (81349)		EA	2	*	*	*	*	C5	2
PO		LIMITER,FLOW 13217E9330 (97403)		EA	1	*	*	*	*	C5	3
X1		NUT, Flow limiter MS35649-264 (96906)		EA	4					C5	4
X1		SCREW, Flow limiter MS51957-37 (96906)		EA	4					C5	5
X1		SPRING, Helical 13217E9333 (97403)		EA	4					C5	
X1		Plate, Baffle 13217E9332 (97403)		EA	1					C5	
X1		PLATE ORIFICE 13217E9331 (97403)		EA	1					C5	
PO	4730-640-6188	PLUG, DUST, COUPLING; SIZE 4 MS27027-17 (96906)		EA	1	*	*	*	*	C5	6
PO	5330-899-4509	GASKET, COUPLING MS27030-9 (96906)		EA	1	*	*	*	*	C5	7
P20		COUPLING HALF, QUICK DISCONNECT, INLET 13217E9327 (97403)		EA	1	*	*	*	*	C5	8
MO		TUBE ASSEMBLY 13217E9044-1 (97403) MANUFACTURED FROM:		EA	1					C6	1
PO	4730-639-9869	NUT, SLEEVE COUPLING; 2 ea AN817-5D (88044)								C6	2
PO	4710-278-8727	TUBING, ALUMINUM; 12 in. required (81348)								C6	3
MO		TUBE ASSEMBLY 13217E5365-3 (97403) MANUFACTURED FROM:		EA	1					C6	4

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REF NUMBER & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW				(7) ILLUSTRATION (a) FIG. NO.	(7) ILLUSTRATION (b) ITEM NO.
		GROUP 02 - FLOW LIMITER, LINES AND FITTINGS (CONT)								
PO	4730-639-9869	NUT, SLEEVE COUPLING; 2 ea AN817-5D (88044)							C6	5
PO	4710-278-8727	TUBING, ALUMINUM; 12 in. required (81348)	FT	1					C6	6
PO	4720-278-4684	ELBOW MS20822-5-4D (96906)	EA	2					C6	7
PO	4730-196-9585	NIPPLE AN816-5-4D (88044)	EA	2					C6	8
P20		COUPLING HALF, QUICK DISCONNECT, OUTLET 13217E9336 (97403)	EA	1					C7	2
PO	5330-899-4509	GASKET, COUPLING HALF CAP MS27030-9 (96906)								
X20		PLUG, PIPE 975004 (15277)	EA	1						
PO	4730-640-6156	CAP, DUST; COUPLING HALF MS27028-17 (96906)	EA	1					C7	1
		GROUP 03 - SIGHT GAGE AND DIFFERENTIAL PRESSURE INDICATOR								
PO	6680-197-4941	GAGE, SIGHT; WATER LEVEL ASSEMBLY 13217E5360 (97403)	EA	1					C8	1
PO	5305-071-2088	SCREW, MACHINE; sight gage mtg MS51957-85 (96906)	EA	2					C8	2
PO	5310-582-5677	WASHER, FLAT; SIGHT GAGE MTG MS15795-810 (96906)	EA	2					C8	3
PO	5330-235-4716	GASKET, SIGHT GAGE 13217E5363 (97403)	EA	1					C8	4
P20	6680-197-4942	BALL, FLOAT; SIGHT GAGE 13217E5362 (97403)	EA	1					C8	5
X1		BODY, WATER LEVEL SIGHT GAGE 13217E5361 (97403)	EA	1					C8	6
PO	6685-105-3344	INDICATOR, DIFFERENTIAL PRESSURE PC742MFP85 (06816)	EA	1	*	*	*	*	C9	1
PO	5305-995-3441	SCREW, MACHINE; INDICATOR MTG MS35207-269 (96906)	EA	2	*	*	*	*	C9	2
PO	5310-045-3296	WASHER, SPLIT; INDICATOR MTG MS35338-43 (96906)	EA	2	*	*	*	*	C9	3
PO	5310-167-0834	WASHER, FLAT; INDICATOR MTG AN960-10L (88044)	EA	2	*	*	*	*	C9	4
		GROUP 04 - TANK AND FRAME								
X20		PLATE, INSTRUCTION; MAXIMUM WORKING PRESSURE 13217E9323 (97403)	EA	1					C10	1
X20		PLATE, IDENTIFICATION 13217E5357-2 (97403)	EA	1					C10	2
PO	5305-253-5615	SCREW, IDENTIFICATION PLATE MTG MS21318-21 (96906)	EA	4					C10	3
X20		PLATE, INSTRUCTION; WATER DRAIN 13216E2768 (97403)	EA	1					C10	4
X20		PLATE, INSTRUCTION; OUTLET 13216E2766 (97403)	EA	1					C10	5
X20		PLATE, INSTRUCTION; element change 13217E9326 (97403)	EA	1					C10	6
X20		PLATE, INSTRUCTION; INLET 13216E2767 (97403)	EA	1					C10	7

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REF NUMBER & MFR CODE	USABLE ON CODE	(4) UNIT OF EA	(5) QTY INC IN UNIT	(6) 15-DAY ORGANIZATIONAL MAINTENANCE ALW (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) ILLUSTRATION (a) FIG. NO.	(b) ITEM NO.
		GROUP 04 - TANK AND FRAME (CONTINUED)									
X1		TANK AND FRAME ASSEMBLY 13217E9321 (97403)		EA	1					11	
X1		INSERT, Screw threads MS21209F1015 (96906)		EA	16					11	
PO	975-878-3791	ROD, GROUND ASSEMBLY; TYPE II, STYLE 2 MIL-R-11461 (81349)		EA	1	*	*	*	*	11	1
PO		CLAMP, GROUND CABLE ATTACHING 13217E9339 (97403)		EA	1	*	*	*	*	11	2



ME 4330-211-12/C1

Figure C-1. Tank cover and vent valve.

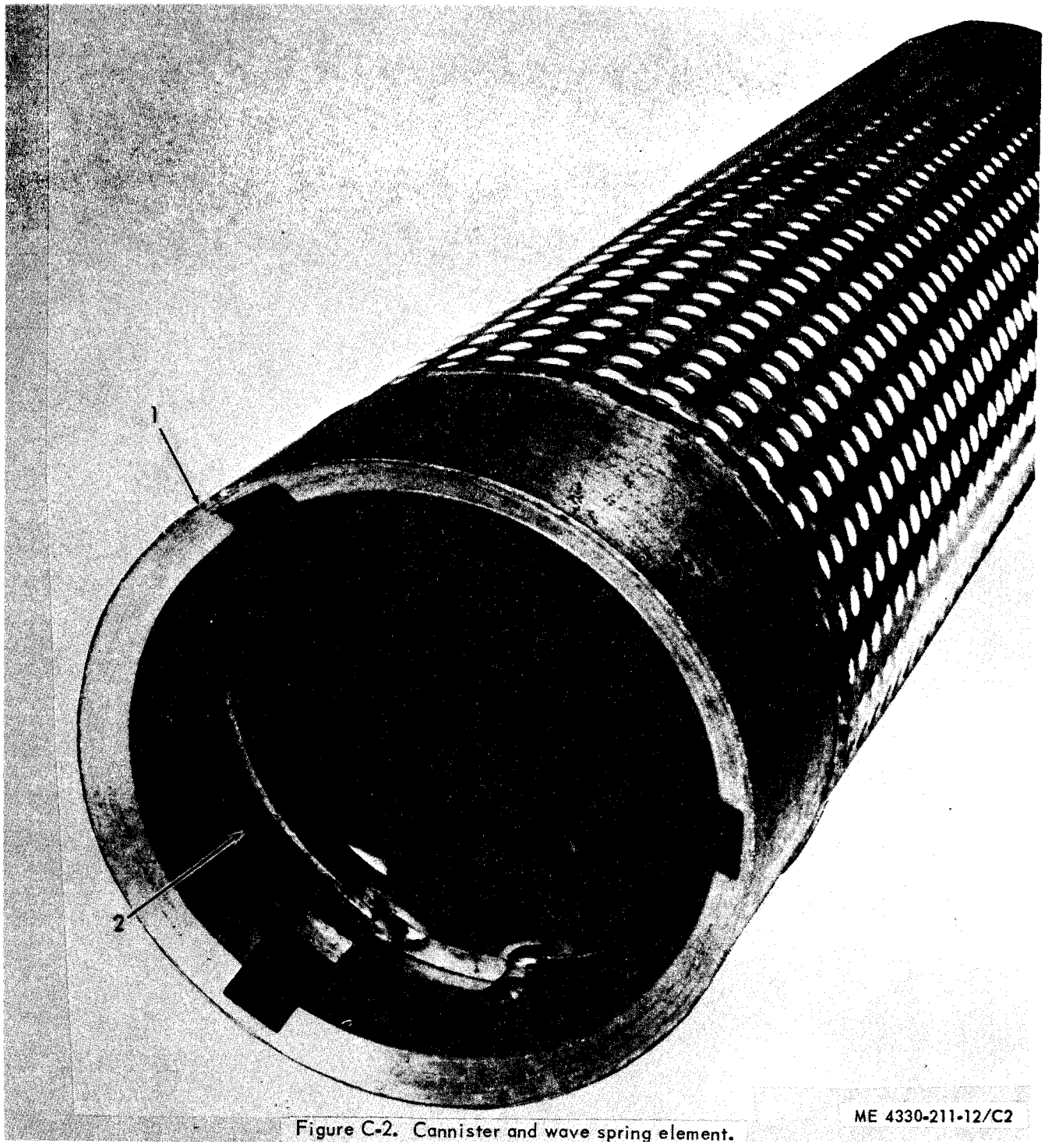


Figure C-2. Cannister and wave spring element.

ME 4330-211-12/C2

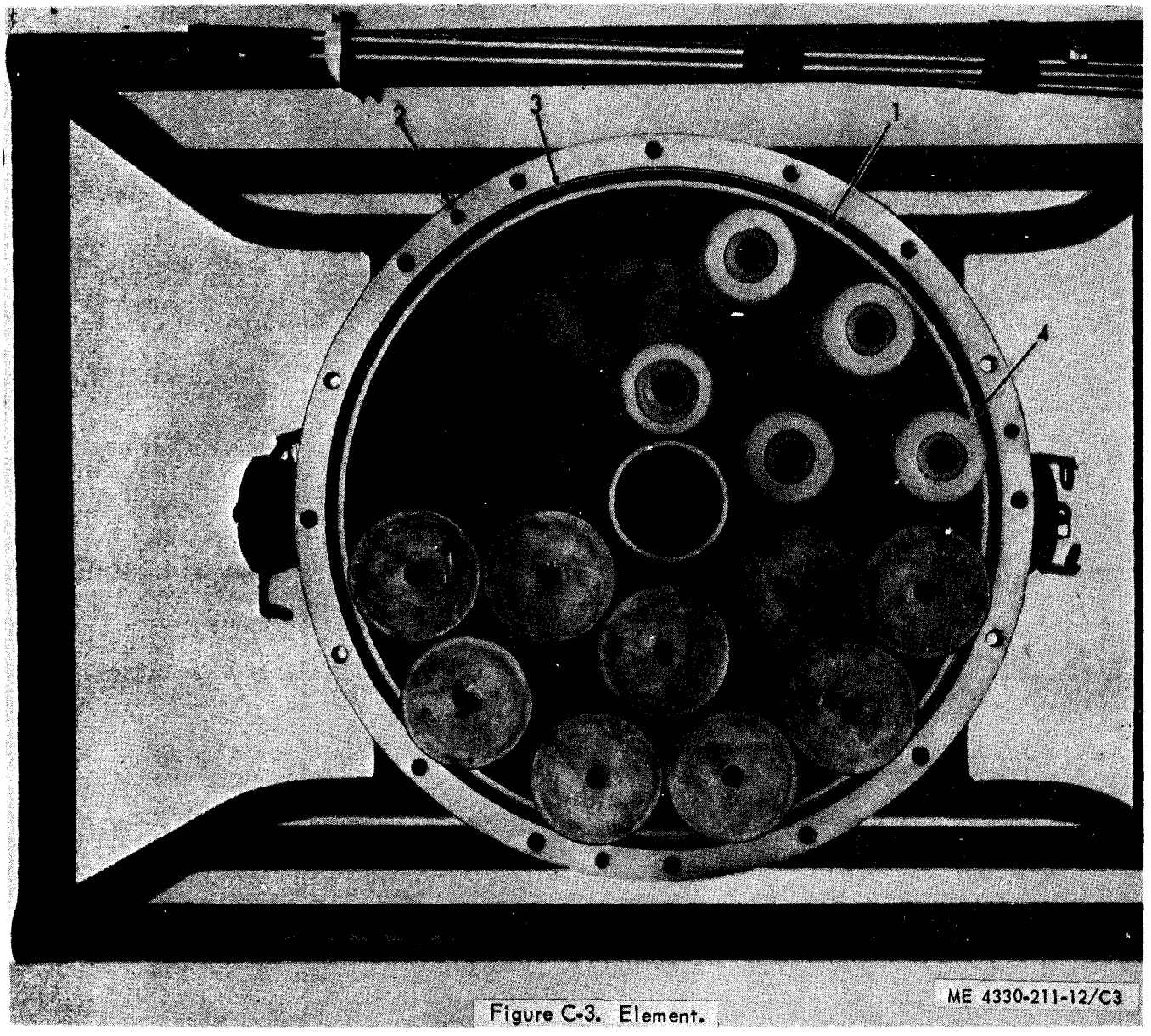


Figure C-3. Element.

ME 4330-211-12/C3

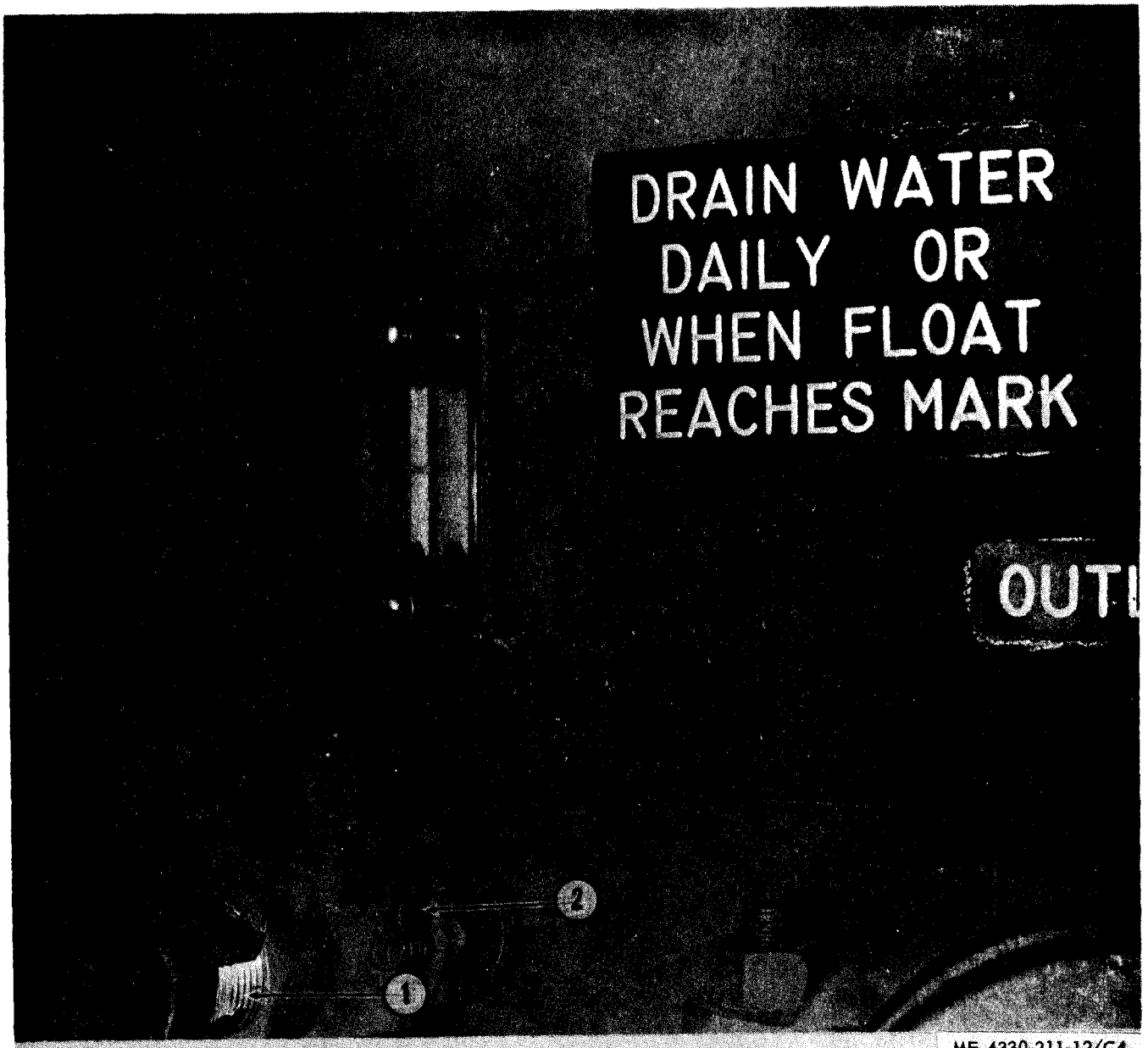
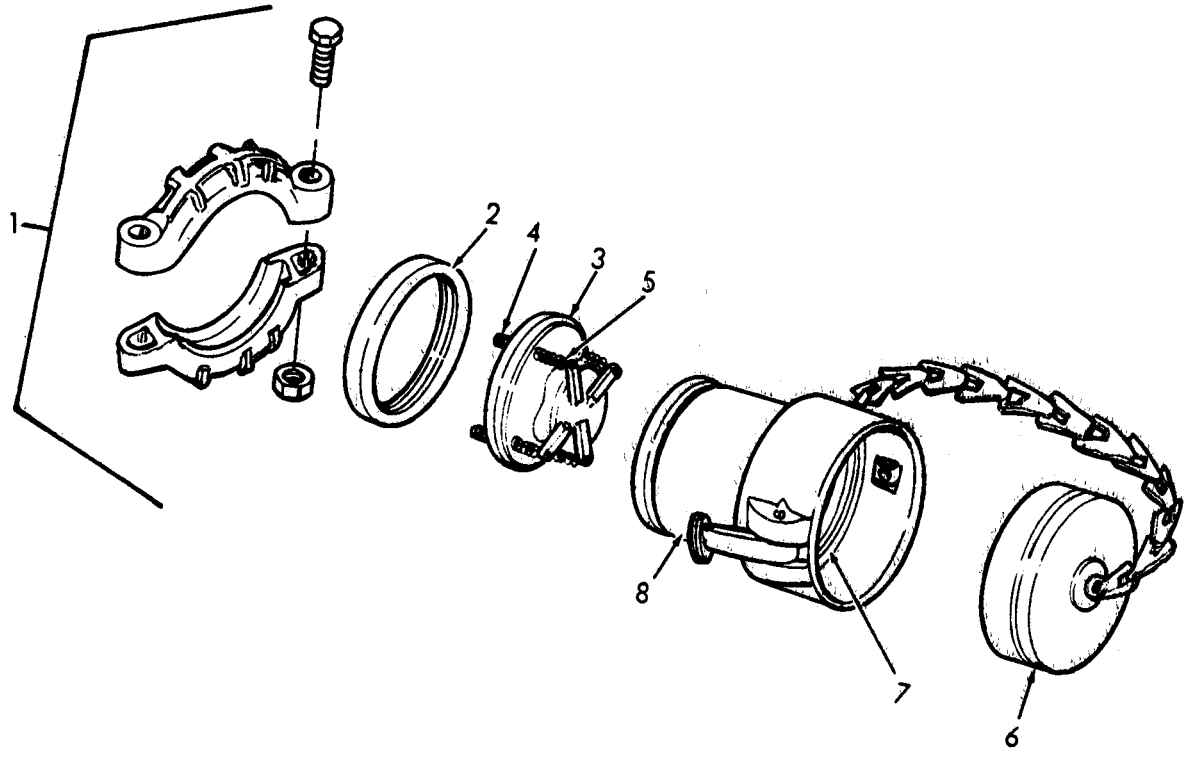
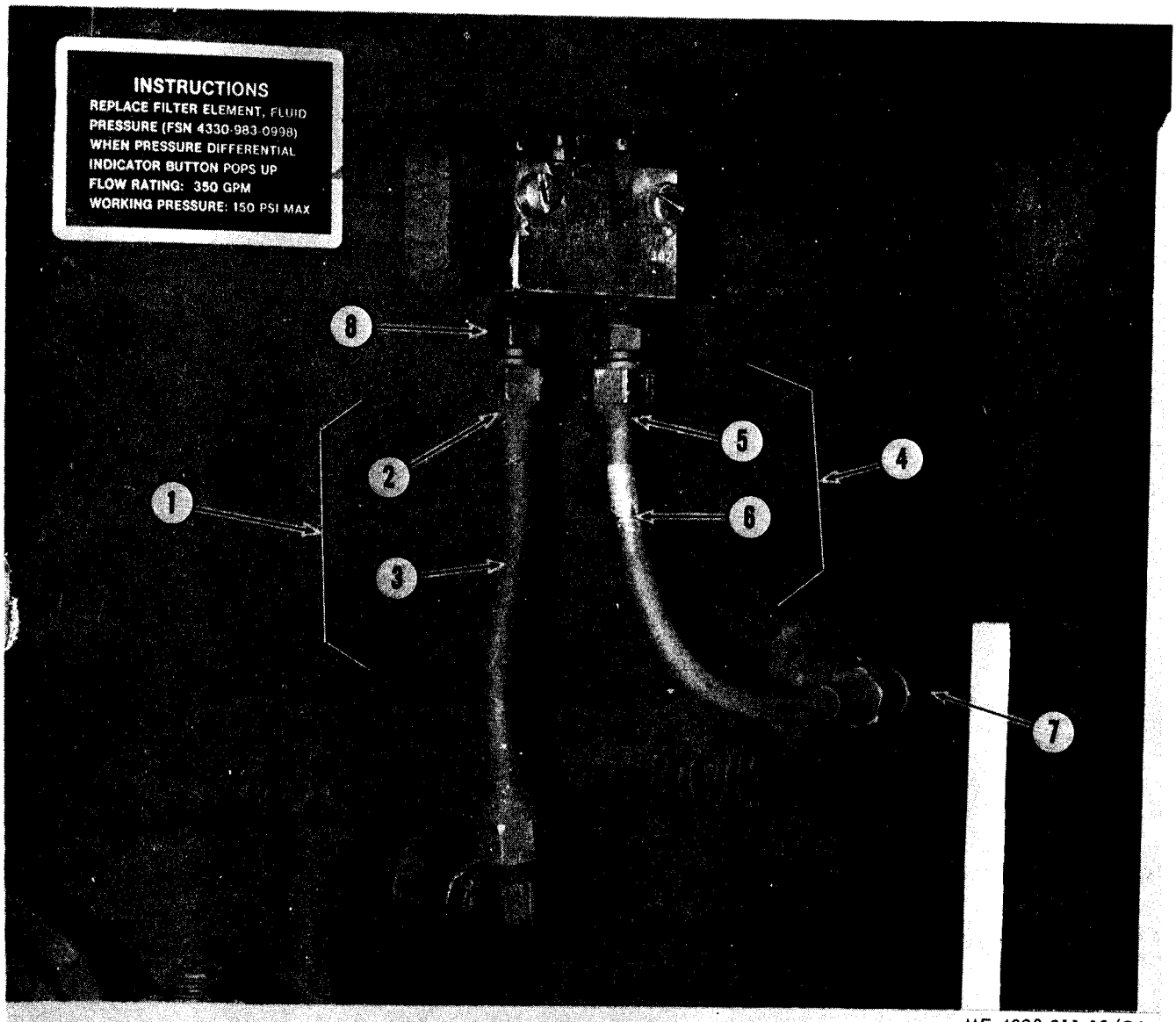


Figure C-4. Drain valve.



ME 4330-211-12/C5

Figure C-5. Inlet coupling and flow limiter.



ME 4330-211-12/C6

Figure C-6. Lines and fittings.

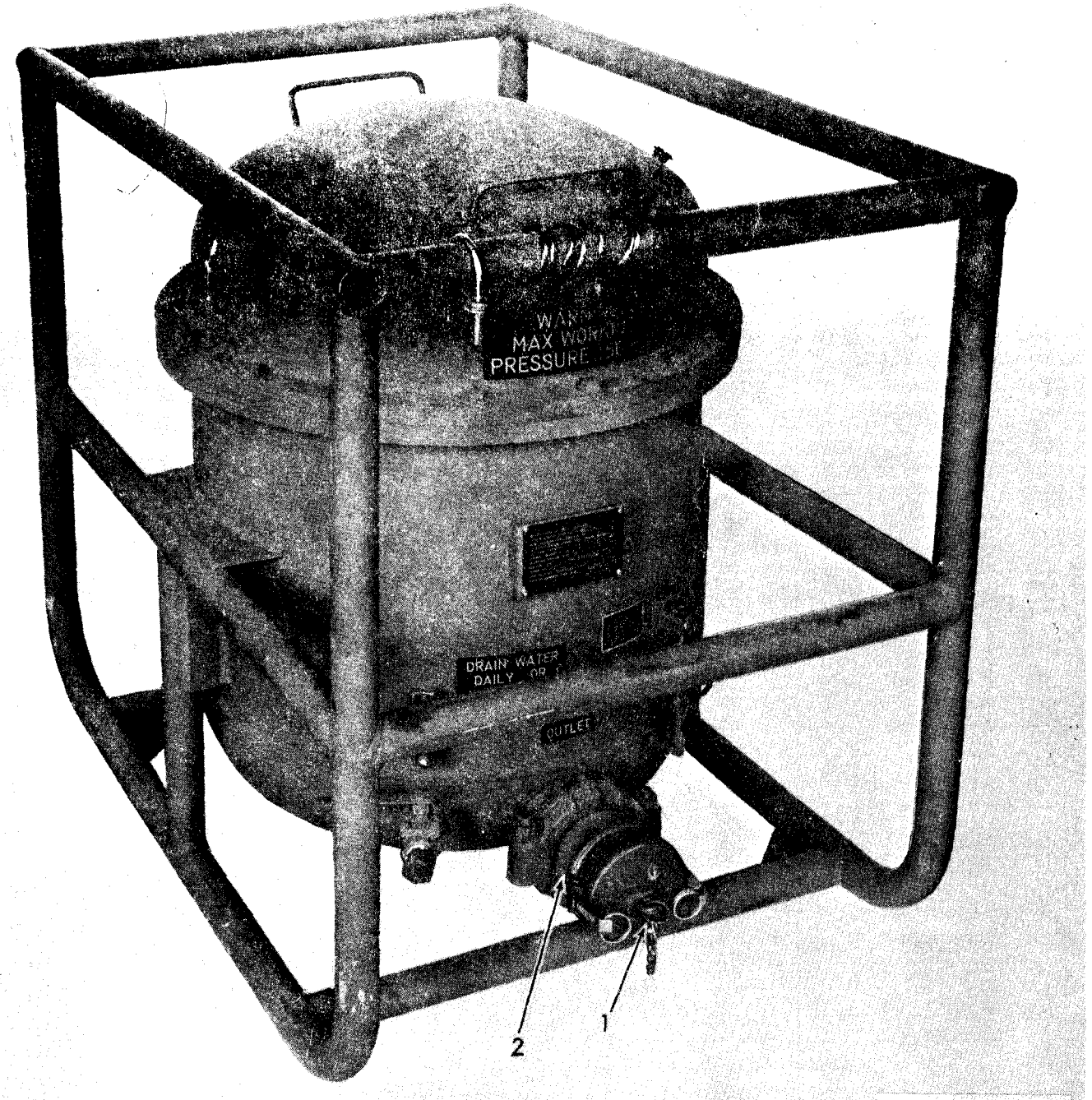
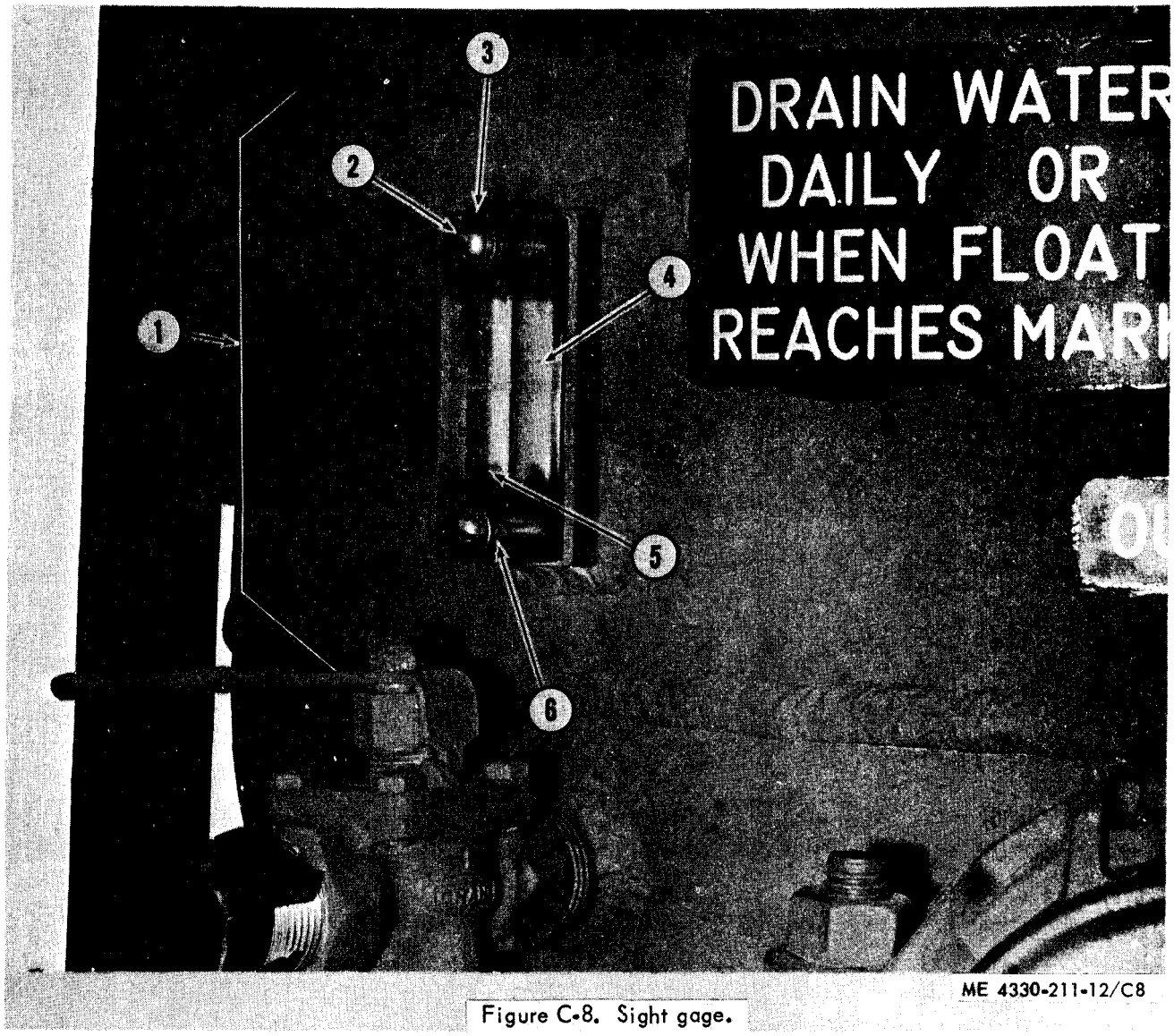


Figure C-7. Outlet coupling and cap.



ME 4330-211-12/C8

Figure C-8. Sight gage.

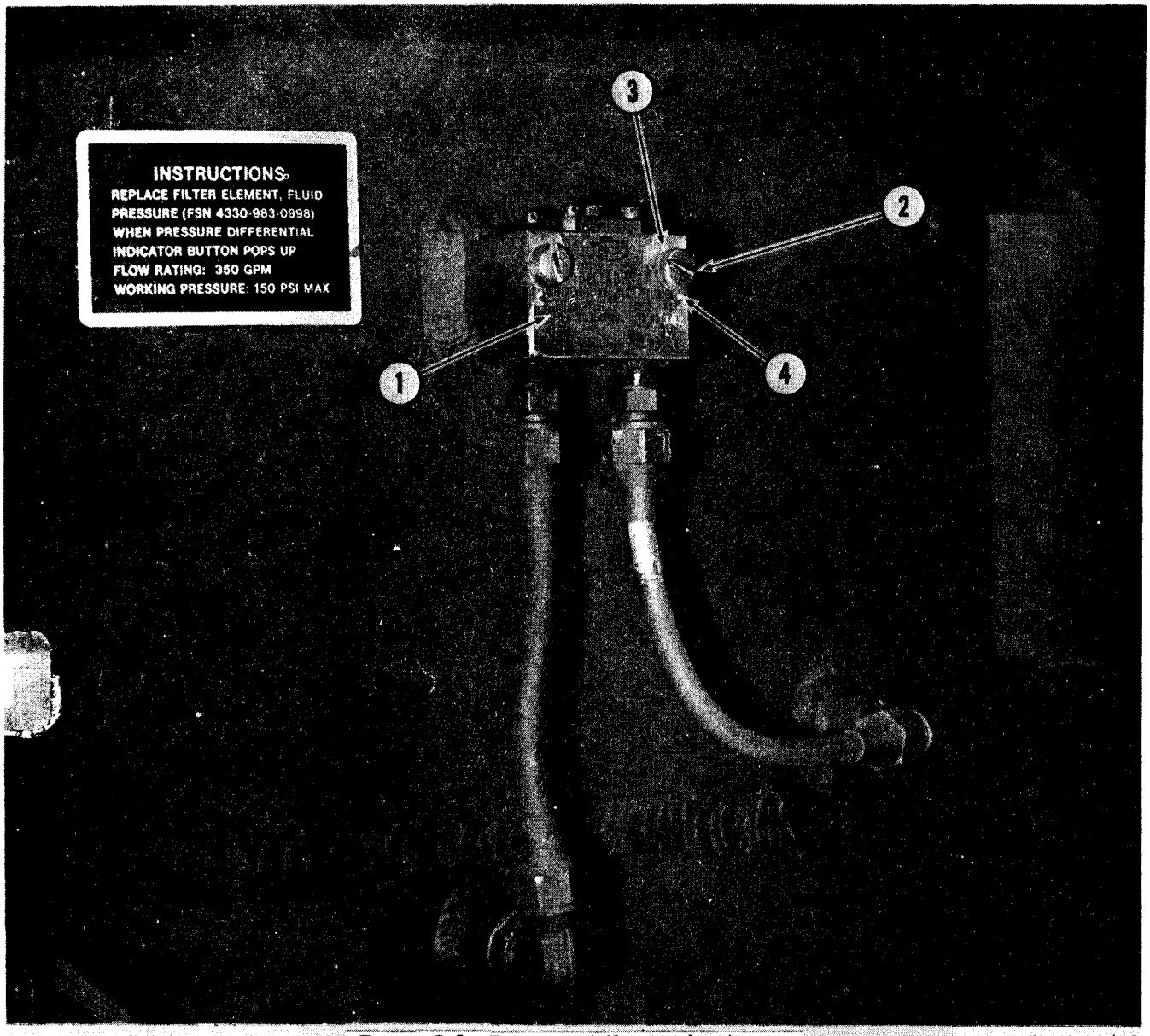


Figure C-9. Pressure differential indicator. ME 4330-211-12/C9

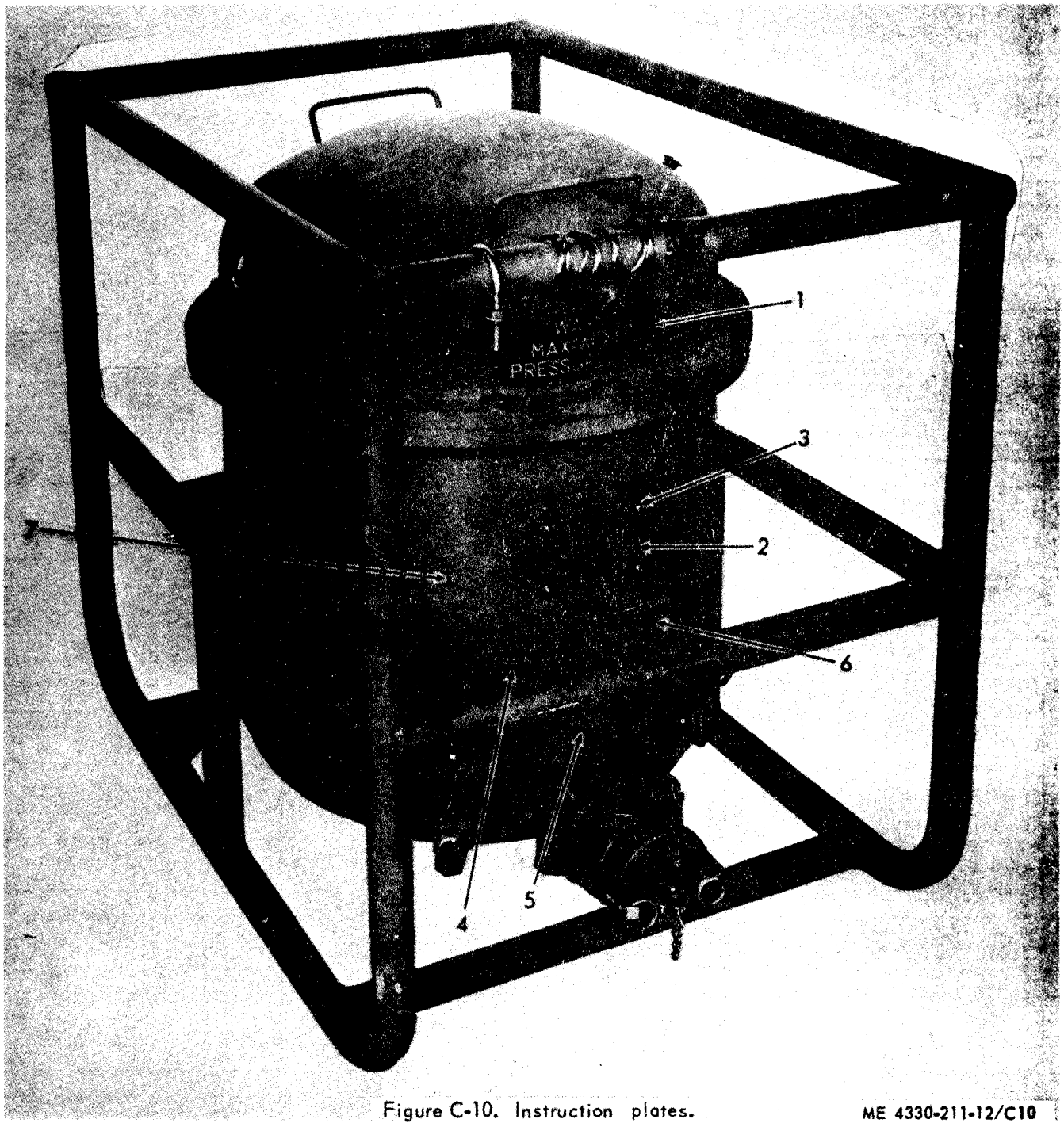


Figure C-10. Instruction plates. ME 4330-211-12/C10

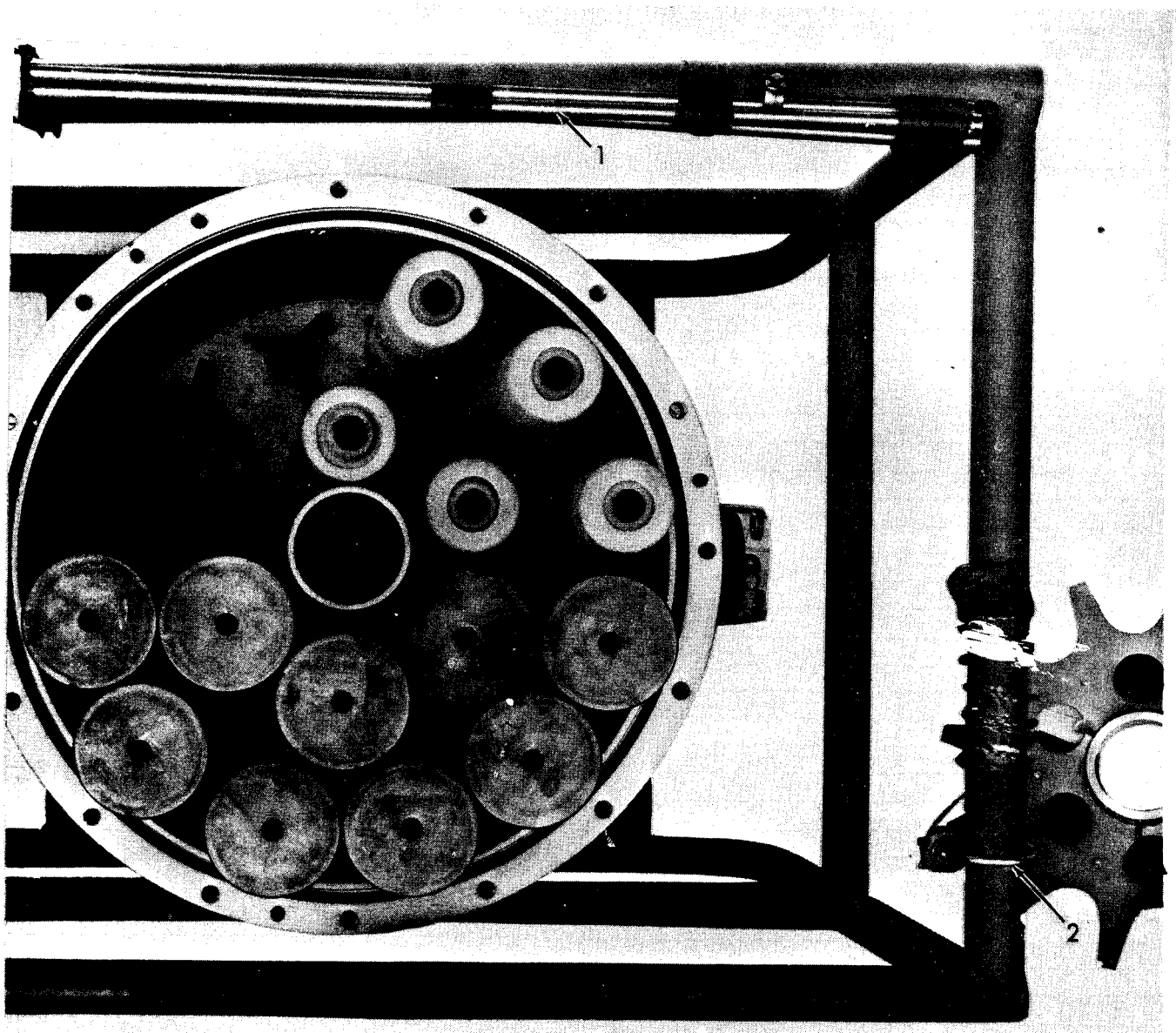


Figure C-11. Ground rod.

ME 4330-211-12/C11

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

THOMAS F. SIKORA
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A, Operator and Unit Maintenance requirements for Petroleum Distribution System.

☆U.S. GOVERNMENT PRINTING OFFICE: 1990 - 754-029/20029

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13,15, 16, 17, and 27.

From: "Whomever" <whomever@avma27.army.mil>
To: mpmt%avma28@st-louis-emh7.army.mil

Subject: DA Form 2028

1. From: Joe Smith
2. Unit: home
3. Address: 4300 Park
4. City: Hometown
5. St: MO
6. Zip: 77777
7. Data Sent: 19-OCT-93
8. Pub no: 55-2840-229-23
9. Pub Title: TM
10. Publication Data: 04-JUL-85
11. Change Number: 7
12. Submitter Rank: MSG
13. Submitter FName: Joe
14. Submitter MName: T
15. Submitter LName: Smith
16. Submitter Phone: 123-123-1234
17. Problem: 1
18. Page: 2
19. Paragraph: 3
20. Line: 4
21. NSN: 5
22. Reference: 6
23. Figure: 7
24. Table: 8
25. Item: 9
26. Total: 123
27. Text:
This is the text for the problem below line 27.

'U.S. GOVERNMENT PRINTING OFFICE: 1996 - 755-025/40120

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
PFC John DOE
CO A 3rd Engineer Bn
Ft. Leonardwood, MO 63108

DATE SENT
22 August 1992

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 1-1520-250-10	15 June 1992	Operator's manual MH60K Helicopter

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO
6	2-1 a		
B1		4-3	

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.

Callout 16 on figure 4-3 is pointed at a bolt. In key to figure 4-3, item 16 is called a shim. Please correct one or the other

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
JOHN DOE, PFC (268) 317-7111

SIGN HERE
JOHN DOE John Doe

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M verprint2, 1 Nov 80

P.S.- - IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION, MAKE A CARBON COPY OF THIS AND GIVE TO YOUR HEADQUARTERS.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 5-4330-211-12	20 0CTOBER 1971	FILTER-SEPARATOR, 350-GPM

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M verprint2, 1 Nov 80

P.S.- - IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION, MAKE A CARBON COPY OF THIS AND GIVE TO YOUR HEADQUARTERS.

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2, 1 Nov 80

TEAR ALONG PERFORATED LINE

FILL IN YOUR UNITS ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

COMMANDER
U.S. ARMY AVIATION AND TROOP COMMAND
ATTN: AMSAT-I-MP
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

. Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

'VEIGHTS

Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

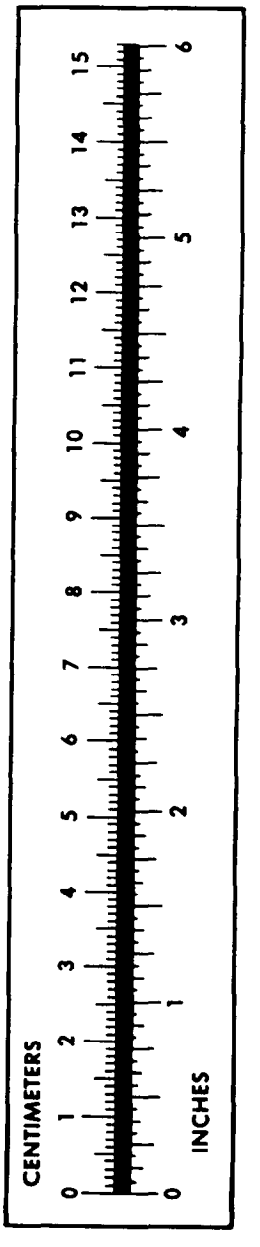
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
ıts	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
'ers	Gallons	0.264
.ms	Ounces	0.035
.ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
lometers per Liter	Miles per Gallon	2.354
›meters per Hour	Miles per Hour	0.621



PIN: 005925 - 010