TM 10-4230-203-14

TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT AND GENERAL SUPPORT MAINTENANCE MANUAL

DELOUSING OUTFIT, POWER DRIVEN; GASOLINE ENGINE, 4-CYCLE, AIR-COOLED, 3600 RPM, 4.7 HP; 10 DUSTING GUNS

(CURTIS AUTOMOTIVE DEVICES, INC. MODEL CDR 70000)
FSN 4230-078-5455
(CURTIS DYNA-PRODUCTS CORPORATION MODEL CDR 70000B)
FSN 4230-935-9361

This copy is a reprint which includes current pages from Changes 1 through 4.

HEADQUARTER, DEPARTMENT OF THE ARMY
NOVEMBER 1970

W A R N I N G

AIR UNDER PRESSURE

Air under pressure is used in the operation of this equipment. Severe injury may result if personnel fail to observe safety precautions.

POISONOUS GAS HAZARD

Exhaust gases contain carbon-monoxide, a colorless, odorless, poisonous gas. Be sure the delousing outfit has adequate ventilation and exhaust gases are piped to the open atmosphere.

EXPLOSIVE VAPOR HAZARD

Provide metal-to-metal contact between fuel tank and fuel container when refueling tank to prevent spark from being generated when fuel flows over the metallic surface.

DUST HAZARD

Wear respirator and eye protection when using dusting gun to prevent inhalation of dust and damage to eyes.

Changes in force: C1, C2, C3 and C4

TM 10-4230-203-14
C4

CHANGE NO. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *28 October 1986*

Operator, Organizational, Direct and General Support Maintenance Manual

DELOUSING OUTFIT, POWER DRIVEN; GASOLINE ENGINE, 4-CYCLE, AIR-COOLED, 3600 RPM, 4.7 HP; 10 DUSTING GUNS
(CURTIS AUTOMOTIVE DEVICES, INC. MODEL CDR 70000)
FSN 4230-078-5455
(CURTIS DYNA-PRODUCTS CORPORATION MODEL CDR 70000B)
FSN 4230-935-9361

TM 10-4230-203-14, 5 November 1970, is changed as follows:

Page 1-4, Table No. 1-1. Change "Compression . . . ..110-120 psi" to read, "Compression. . ...90-100 psi".

By Order of the Secretary of the Army:

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

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A, Operator, Organizational, Direct Support and General Support Maintenance requirements for Delousing Outfit, Power Driven, Gasoline Engine, Air Cooled, 4.7HP, 4CY, with 10 Dusting Guns (CDR 70000)

Changes in force: C1, C2, and C3

TM 10-4230-203-14
C 3

CHANGE NO. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 5 October 1984

Operator, Organizational, Direct and General
Support and Depot Maintenance Manual

DELOUSING OUTFIT; POWER DRIVEN; GASOLINE ENGINE,
4-CYCLE, AIR COOLED, 3600 RPM, 4.7 HP; 10 DUSTING GUNS
(CURTIS AUTOMOTIVE DEVICES, INC. MODEL CDR 70000)
NSN 4230-00-078-5455
(CURTIS DYNA-PRODUCTS CORPORATION MODEL CDR 70000B)
NSN 4230-00-935-9361

TM 10-4230-203-14, 5 November 1970, is changed as follows:

Page i. Reporting Errors and Recommending Improvement 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 located in the back of this manual 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 ii. The following figures are added to the List of Illustrations.

2-1.1 Storage box and delousing gun (CSI Model B9798).
2-1.2 Storage box conversion.

Page 1-1, paragraph 1-2. In line 3, change "TM 38-750" to read "DA Pamphlet 738-750."

Page 2-1. Figure 2-1.1 is added after figure 2-1.

Page 2-1. Note is added after paragraph 2-2e.

NOTE

When old gun becomes inoperative requisition new gun (figure 2-1.1).

Page 2-1. Paragraph 2-2.1 is added after paragraph 2-2 as follows:

2-2.1. Storage Box Conversion Instructions.

a. Remove guns from box and clean surfaces which the foam will be glued on. This may best be done using trichlorolethyene or equal.

b. Coat surfaces of the metal and foam which will come in contact with commercial quality contact cement.

c. Once in place use either clamps or props to hold foam in place to avoid incomplete bonding. Allow one hour setting time.

d. Install retaining cord assembly.

Page 2-1. Figure 2-1.2 is added after figure 2-1.1.

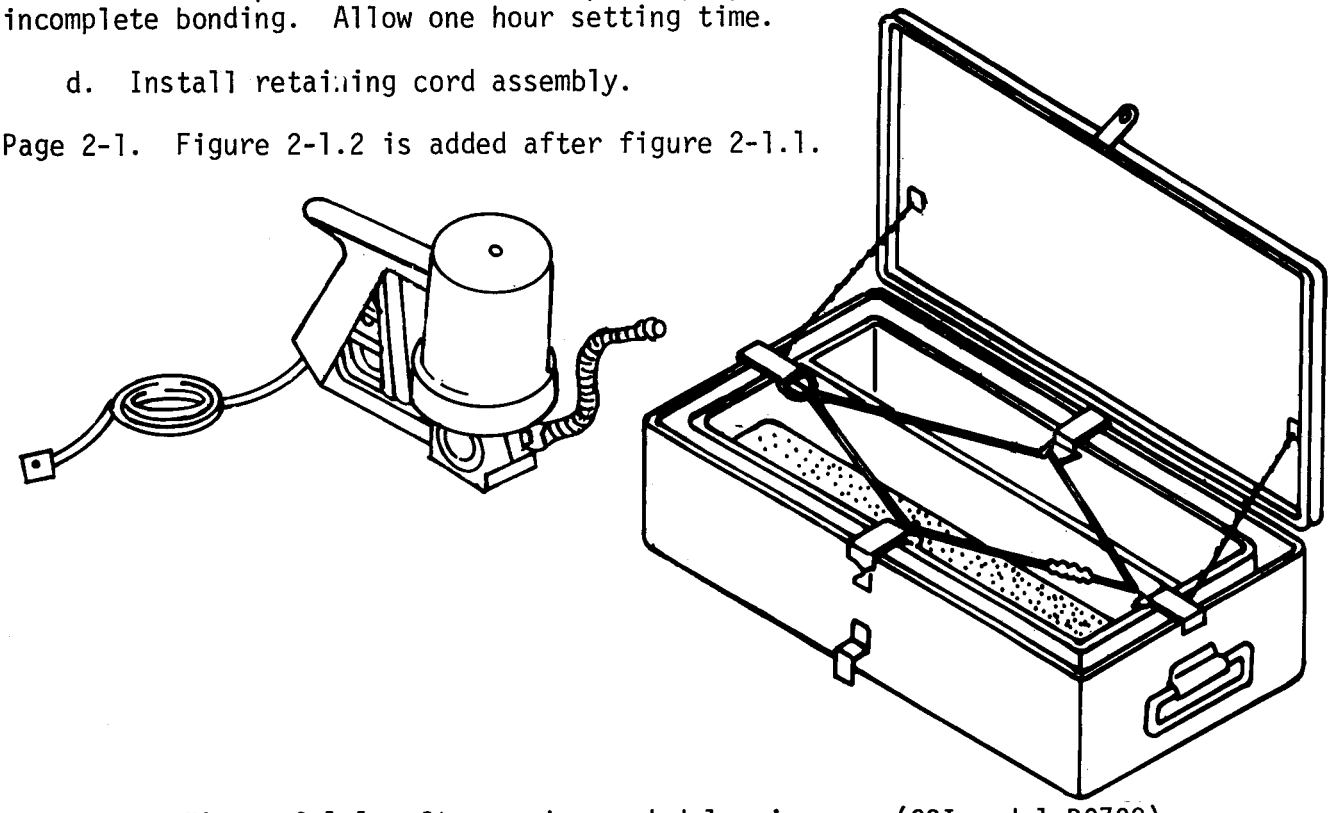


Figure 2-1.1. Storage box and delousing gun (CSI model B9798)

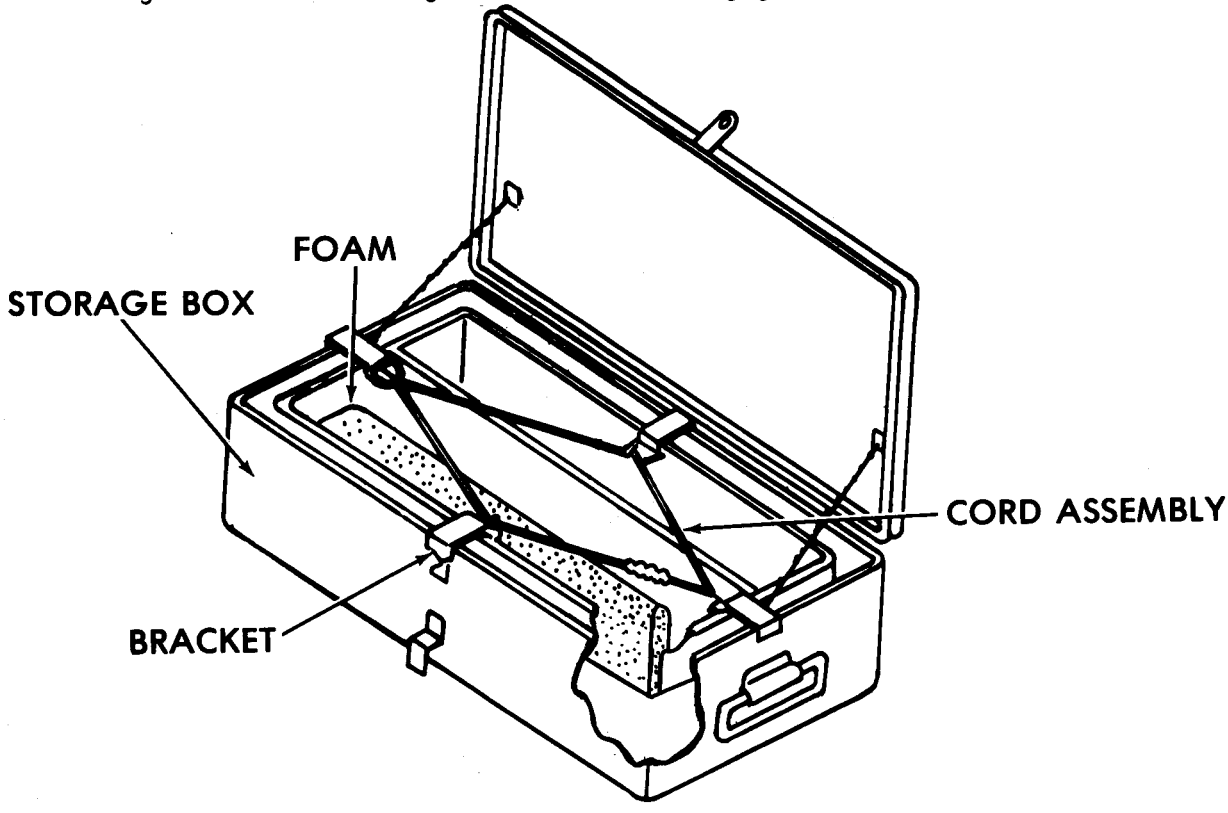


Figure 2-1.2. Storage box conversion

Page 2-6. Paragraph 2-10b is superseded as follows:

b. The new CSI Model B9798 powder dispensing gun is designed to utilize all existing equipment supplied with the Army's Delousing Outfit. This gun is designed to dispense either 1.8 grams or 4.0 grams. The gun is supplied with the screen already set for 1.8 grams. To check which amount will be decanted by the gun is done by looking at the cylinder (fig. 4-39, item 13) with the trigger in the normal position and seeing which slot the screen is in. The upper slot will deliver 1.8 grams while the bottom setting will deliver 4.0 grams. By removing the metal retaining ring (fig. 4-39, item 5) the plastic cover (fig. 4-39, item 6), will drop out, allowing adjustment of the screen for the needed dosage.

SET UP PROCEDURE:

1. Check screen setting for required dosage.

2. Turn gun upside down and screw on full canister (fig. 4-39, item 2).

3. Connect air hose from compressor to the gun at the hose adapter (fig. 4-39, item 30).

4. To secure equipment remove canister and purge gun for one (1) minute. Never store this unit with any powder in the gun.

CAUTION

When canister appears empty there is usually more powder still in the hopper area of the gun. Continue to use until no powder is decanted at that point refilling is necessary. (See procedure 2, above.)

Page 3-1, paragraph 3-1. Change "DA Pamphlet 310-4" to read "DA Pamphlet 310-1."

Page 4-30. Figure 4-39 is superseded.

Page 4-31. Paragraph 4-44 is superseded as follows:

4-44. Dusting Gun.

The Model B9798 Dusting Gun can be completely disassembled for inspection, cleaning and replacement of worn parts.

a. Disassembly.

(1) Remove the canister from the gun (fig. 4-39, item 2).

(2) Remove retaining ring from cylinder area (fig. 4-39, item 5).

(3) Remove plastic cover (fig. 4-39, item 6).

(4) Unscrew hex head set screw from cylinder and pin to release.

(5) Pull trigger back all the way to the delousing position. This will allow the cylinder (fig. 4-30, item 13) to fall out.

NOTE

Cylinder can not be removed with the trigger in the normal position.

(6) Remove spring pin in handle to release the trigger (fig. 4-39, item 6). This will let the lever and trigger be removed as an assembly.

(7) Spring behind trigger will drop out once trigger has been removed.

(8) Once trigger has been removed the cartridge valve can be removed.

(9) Once out the cartridge valve can be disassembled to check "O" rings.

b. Cleaning and Inspection.

(1) Use a round soft bristle brush to clean passage in the gun. If dusting powder has become caked in passages, wash with warm water and brush to remove caked powder. Blow dry with compressed air.

(2) Inspect valve stem, cap and valve for wear. Replace parts if leakage can't be stopped by installing new "O" rings.

(3) Inspect body for stipped or missing threads, especially in the valve area. Replace handle if threads can't be repaired.

c. Assembly. Assembly of dusting gun is the reverse of order of disassembly above. Use new or serviceable "O" rings and gaskets. After reassembly apply 25 pounds air pressure to gun and check for leakage past the valve. If leakage occurs, replace "O" rings and tighten valve cap.

Page A-1, Appendix A. Change "TM 38-750" to read "DA Pamphlet 738-750."

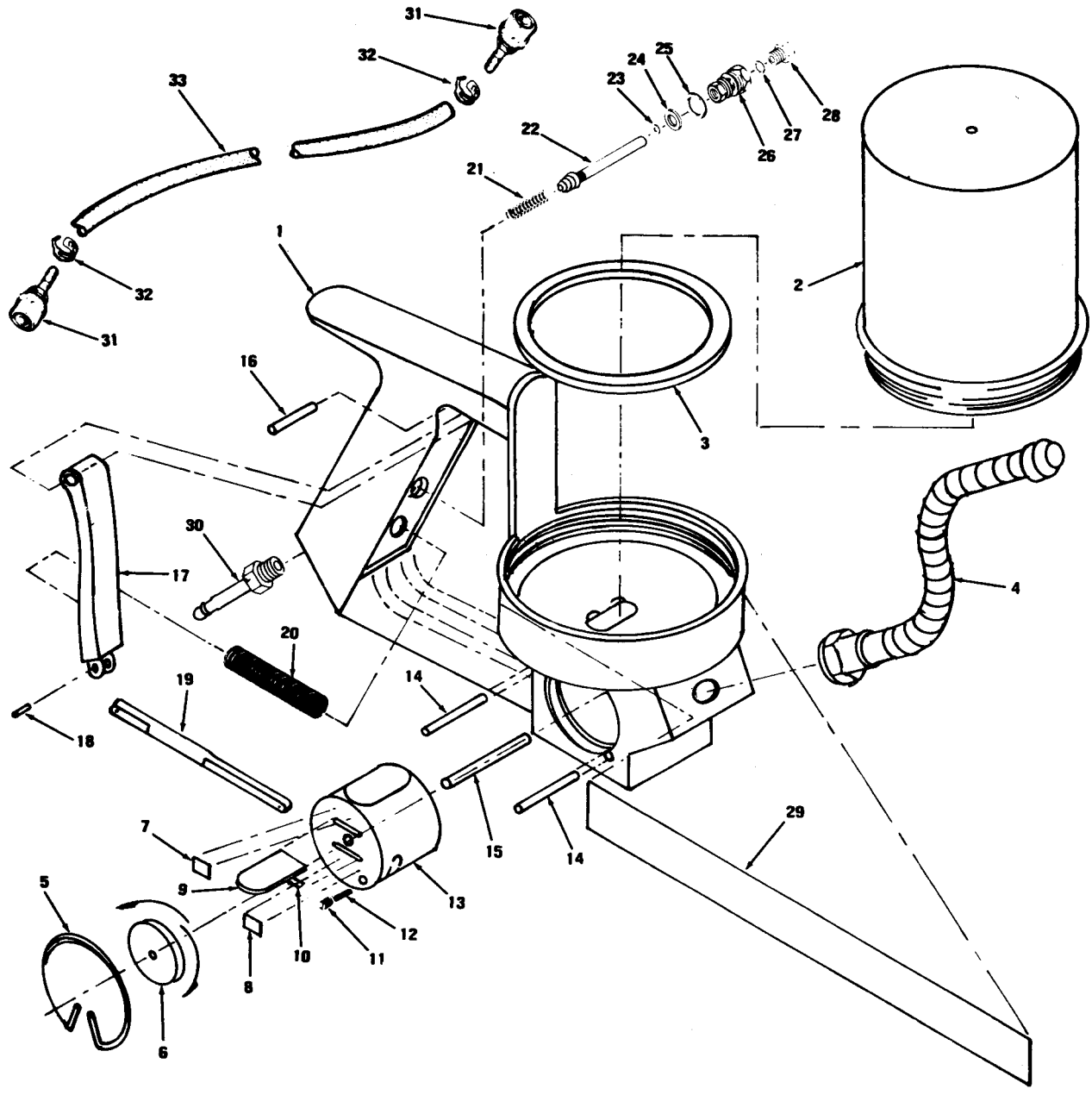
By Order of the Secretary of the Army:

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

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A, Operator Maintenance Requirements for Delousing Equipment.



1.	Gun weld assembly	12.	Pin	23.	Valve stem gasket
2.	Canister	13.	Cylinder	24.	Body valve gasket
3.	Gasket	14.	Wiper	25.	Valve gasket
4.	Flexible hose	15.	Axle	26.	Valve body
5.	Retaining ring	16.	Pin	27.	Valve cap gasket
6.	Plastic cover	17.	Trigger	28.	Valve cap
7.	Decal 1.8	18.	Pin	29.	Nameplate
8.	Decal 4.0	19.	Lever	30.	Hose adapter
9.	Screen	20.	Spring, trigger	31.	Coupler
10.	Seal	21.	Spring	32.	Hose clamp
11.	Set screw	22.	Valve stem	33.	Hose

Figure 4-39. Dusting gun and hose assemblies

TM 10-4230-203-14
C2

CHANGE

NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D, C, *24 March 1978*

**Operator, Organizational, Direct and
General Support Maintenance Manual**

DELOUSING OUTFIT; POWER-DRIVEN GASOLINE ENGINE; 4-CYCLE, AIR-COOLED, 3600 RPM, 4.7 HP; 10 DUSTING GUNS (CURTIS AUTOMOTIVE DEVICES, INC. MODEL CDR 70000) NSN 4230-00-078-5455 (CURTIS DYNA-PRODUCTS CORP. MODEL CDR 70000B) NSN 4230-00-935-9361

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve tnis 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 located in the back of this manual direct to: Commander, U. S. Army Troop Support & Aviation Materiel Readiness Command, ATTN: DRSTS-MTPS, 4300 Goodfellow Boulevard, St. Louis, MO 63120. A reply will be furnished directly to you.

TM 10-4230-203-14, 5 November 1970, is changed as follows:

Back of Cover Page. Air Under Pressure paragraph is superseded as follows:

AIR UNDER PRESSURE

Do not use compressed air for cleaning purposes, except where reduced to less than 30 psi and then only with effective chip guarding and personnel protection equipment.

Add Noise Hazard paragraph after Dust Hazard as follows:

NOISE HAZARD

Operation of this equipment presents a noise hazard to personnel in this area. The noise level exceeds the allowable limits for unprotected personnel. Wear ear muffs or ear plugs which were fitted by a trained professional.

Page i. Table of Contents Page is changed as shown above.

Appendix B is superseded as follows:

APPENDIX B COMPONENTS OF END ITEMS LIST

Page 1-1. Delete paragraph 1-3 "Reporting of Errors".

Page 3-3. Paragraph 3-5, add the following:

WARNING

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personnel protection equipment.

Page 4-3. Paragraph 4-3, add the following:

WARNING

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personnel protection equipment.

Page 4-15. Paragraph 4-21, add the following:

WARNING

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personnel protection equipment.

Appendix B. Appendix B is superseded as follows:

***APPENDIX B**

COMPONENTS OF END ITEMS LIST

Section I. INTRODUCTION

B-1. SCOPE

This appendix lists Integral Components of and Basic Issue Items (BII) for the Delousing Outfit to help you inventory items required for safe and efficient operation.

B-2. GENERAL

The components of end item list are divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the Delousing Outfit 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. These are minimum essential items required to place the Delousing Outfit in operation, to operate it and to perform emergency repairs. Although shipped separately packed, they must accompany the Delousing Outfit during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII based on Table(s) of Organizational and Equipment (TOE)/Modification Table of Organization and Equipment(MTOE) authorization of the end item.

B-3. EXPLANATION OF COLMUNS

a. Illustrations. This column is divided as follows:

(1) **Figure Number.** Indicates the figure number of the illustration on which the item is shown (if applicable).

(2) **Item Number.** The number used to identify item called out in the illustration.

b. National Stock Number (NSN). Indicates the national stock number assigned to the end item which will be used for requisitioning.

c. Part Number (P/N). Indicates the primary number used by the manufacturer which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards and inspection requirements to identify an item or range of items.

d. Description. Indicates the federal item name and, if required, a mimnimum description to identify the item.

e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

f. Usable on Code. "USABLE ON" codes are included to help you identify which component items are used on the different models. Identification of the codes used in this list are:

CODE	USED ON
BPY	NSN 4230-00-078-5455
BPZ	NSN 4230-00-935-9361

g. Quantity Required (Qty Reqd). This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during invenotry. Under the received column, list the quantity you actually receive on your major item. The date columns are for use when you inventory the major item at a later date, such as for shipment to another site.

Section II. INTEGRAL COMPONENTS OF END ITEM

(1) ILLUSTRATION (a) FIGURE NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) NATIONAL STOCK NO.	(3) PART NO. & FSCM	(4) DESCRIPTION	(5) LOCATION	(6) USABLE ON CODE	(7) QTY REQD	(8) QUANTITY RCVD	DATE	DATE	DATE
2-1		3740-00-253-5715	CFD70163 (82254)	Gun Assembly		BPY	1				
2-1		4230-00-869-7831	CFD70032 (81154)	Gun Assembly		BPZ	1				
2-1		8115-00-134-3130	CFR70144 (82254)	Box, Storage		BPY	1				
2-1		8115-00-134-3130	CFR70016 (82254)	Box, Storage		BPZ	1				
		2990-00-338-1916		Rope, Start		BPY BPZ	1				
2-1		4230-00-087-7780		Hose Assembly		BPY BPZ	1				

Section III. BASIC ISSUE ITEMS

(1) ILLUSTRATION (a) FIGURE NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) NATIONAL STOCK NO.	(3) PART NO. & FSCM	(4) DESCRIPTION	(5) LOCATION	(6) USABLE ON CODE	(7) QTY REQD	(8) QUANTITY RCVD	DATE	DATE	DATE
		7520-00-559-9618		Case, Manual		BPY BPZ	1				
				DA Lubrication Order		BPY	1				
				LO 10-4230-203-15		BPZ					
				DA TM10-4230-203-14		BPY BPZ	1				
2-1		4240-00-368-6149		Respirator, Dust		BPY BPZ	10				
		4210-00-889-2221		Extinguisher, Fire		BPY BPZ	1				

Appendix C. After Appendix B, add Appendix C as follows:

*APPENDIX C

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

C-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.

C-2. EXPLANATION CF COLUMNS IN SECTION II

a. Group Number, Column (1). A group number is assigned to each assembly. The applicable assembly groups are listed on the MAC in disassembly sequence beginning with the first assembly removed in a topdown disassembly sequences.

b. Assembly Group, Column (2). This column contains a brief description of the components of each assembly group.

c. Maintenance Functions, Column (3). 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
F Direct support maintenance
H General support 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, and to add fuel, lubricants, cooling, and air.
D Adjust. To rectify to the extent necessary to bring into proper operating range.
E Align. 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 equipment used in precise measurement. Consists of the comparison 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 like items
I Repair. Those maintenance operations necessary to restore an items to serviceable condition through correction of material damage or a specific failure. Repair may be accomplished at each level of maintenance.
J Overhaul. Normally, the highest degree of maintenance performed by the Army in order to minimize time work in process is consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition.
K Rebuild. The highest degree of materiel maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with origianal manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance level. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.

d. Tools and Equipment, Column (4). This column is provided for referencing by code the special tools and test equipment required to perform the maintenance functions.

e. Remarks, Column (5). This column is provided for referencing by code the remarks (sec. III) pertinent to the maintenance functions.

C-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. The 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)	(2)	(3) MAINTENANCE FUNCTIONS											(4)	(5)
		A	B	C	D	E	F	G	H	I	J	K		
GROUP NO.	FUNCTIONAL GROUP	INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD	TOOLS AND EQUIPMENT	REMARKS
01	BOX AND FRAME ASSEMBLY; BOX, PARTS	...	...	...	...	...	...	...	O	O				
02	GUN ASSEMBLY, DUSTING	...	...	C	C	...	...	...	C	O				
03	ENGINE, GASOLINE	O	O	C	...	...	...	...	O	O	H	...	...	A
04	FUEL TANK AND BRACKET	...	...	C	...	...	...	...	O	F				
05	FUEL FILTER	...	...	C	...	...	...	...	...	O				
06	AIR CLEANER	...	...	C	...	...	...	...	...	O				
07	CARBURETOR	...	...	O	O	...	...	...	...	O	O			
08	FLYWHEEL, BLOWER HOUSING, AND BAFFLES	O	...	...	...	...	...	...	...	O				
09	IGNITION COMPONENTS													
	Spark Plug	...	...	...	O	...	...	...	O					
	Points, Ignition	...	...	...	O	...	...	...	O					
12	VALVES	...	...	...	...	...	...	...	F	F				
	Tappets and Rotator	...	...	...	F	...	...	...	F					
15	COMPRESSOR AND DRIVE COUPLING	C	...	...	...	...	...	...	O	F	H	...	...	B
18	COMPRESSOR CYLINDER HEAD	...	...	...	...	...	...	...	O	F				

Section III. REMARKS

References Code	Remarks
A-B	Test includes engine operation for compression check.
B-A	Inspection of compressor includes gage pressure and checking for leaks.

Appendix D. After Appendix C, add Appendix D as follows:

*APPENDIX D

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists Expendable Supplies and Materials you will need to operate and maintain the Delousing Outfit. These items are authorized to you by CTA50-970, Expendable Items (except Medical, Class V, Repair Parts and Heraldic Items).

D-2. EXPLANATION OF COLUMNS

a. Column 1 - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material.

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.

c. Column 3 - National Stock Number. This is the national stock number assigned to the item; use it to request or requisition the item.

d. Column 4 - Description. Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parenthesis, if applicable.

e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., each(ea), inch(in), pair(pr), etc.). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	C	9150-00-265-9433	Oil, Eng OE30	QT
2	C	9150-00-402-2372	Oil, Eng Sub Zero	GL
3	C	9130-00-160-1818	91A Gasoline Automotive	GL
4	C	9150-00-190-0904	GAA Grease Automotive	CN

By Order of the Secretary of the Army:

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

Official:

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

Distribution:
To be distributed in accordance with DA Form 12-25A, Operator maintenance requirements for Delousing Equipment.

TM 10-4230-203-14
C 1

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *9 May 1972*

Operator, Organizational, Direct and General Support Maintenance Manual

DELOUSING OUTFIT; POWER DRIVEN; GASOLINE ENGINE; 4-CYCLE, AIR-COOLED, 3600 RPM, 4.7 HP; 10 DUSTING GUNS (CURTIS AUTOMOTIVE DEVICES, INC. MODEL CDR 70000) FSN 4230-078-5455 (CURTIS DYNA-PRODUCTS CORP. MODEL CDR 70000B) FSN 4230-935-9361

TM 10-4230-203-14, 5 November 1970, is changed as follows:

Page C-1. Appendix C is rescinded. There are no basic issue items for the delousing outfit.

W. C. WESTMORELAND,
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. 514) organizational maintenance requirements for Delousing Equipment.

TECHNICAL MANUAL
NO. 10-4230-203-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *5 November 1970*

OPERATOR, ORGANIZATIONAL, DIRECT AND GENERAL SUPPORT MAINTENANCE MANUAL

DELOUSING OUTFIT, POWER DRIVEN; GASOLINE ENGINE, 4-CYCLE, AIR-COOLED, 3600 RPM, 4.7 HP; 10 DUSTING GUNS (CURTIS AUTOMOTIVE DEVICES, INC. MODEL CDR 70000) FSN 4230-078-5455 (CURTIS DYNA-PRODUCTS CORPORATION MODEL CDR 70000B) FSN 4230-935-9361

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***This manual together with TM 10-4230-203-24P, supersedes TM 10-4230-203-15, dated 14 January 1966, and all changes thereto.**

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual contains instructions for the use of personnel to whom the Curtis Automotive Devices Inc., Model CDR 70000 and/or Curtis Dyna-Products Corp Model CDR 70000B Delousing Outfit is issued. This manual also contains instructions for maintain*ing* the delousing outfit as authorized in the Maintenance Allocation Chart.

b. Information pertinent to shipment and limited storage will be found in TM 740-90-1.

c. Information pertinent to destruction to prevent enemy use will be found in TM 750-244-3.

1-2. Maintenance Forms and Records

Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed and prescribed in TM 38-750.

1-3. Reporting of Errors

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.

Section II. DESCRIPTION AND DATA

1-4. Description

The delousing outfit (fig. 1-1 and 1-2) is mounted on a tubular steel skid frame of all welded construction and is a portable, self-contained unit. It is powered by a one-cylinder gasoline engine that is connected to the air compressor by means of a coupling. Dusting guns for dispensing dusting agents are connected to the air manifold by hose assemblies. Face masks are provided to prohibit breathing dusting agents by the operator when dusting personnel or their equipment.

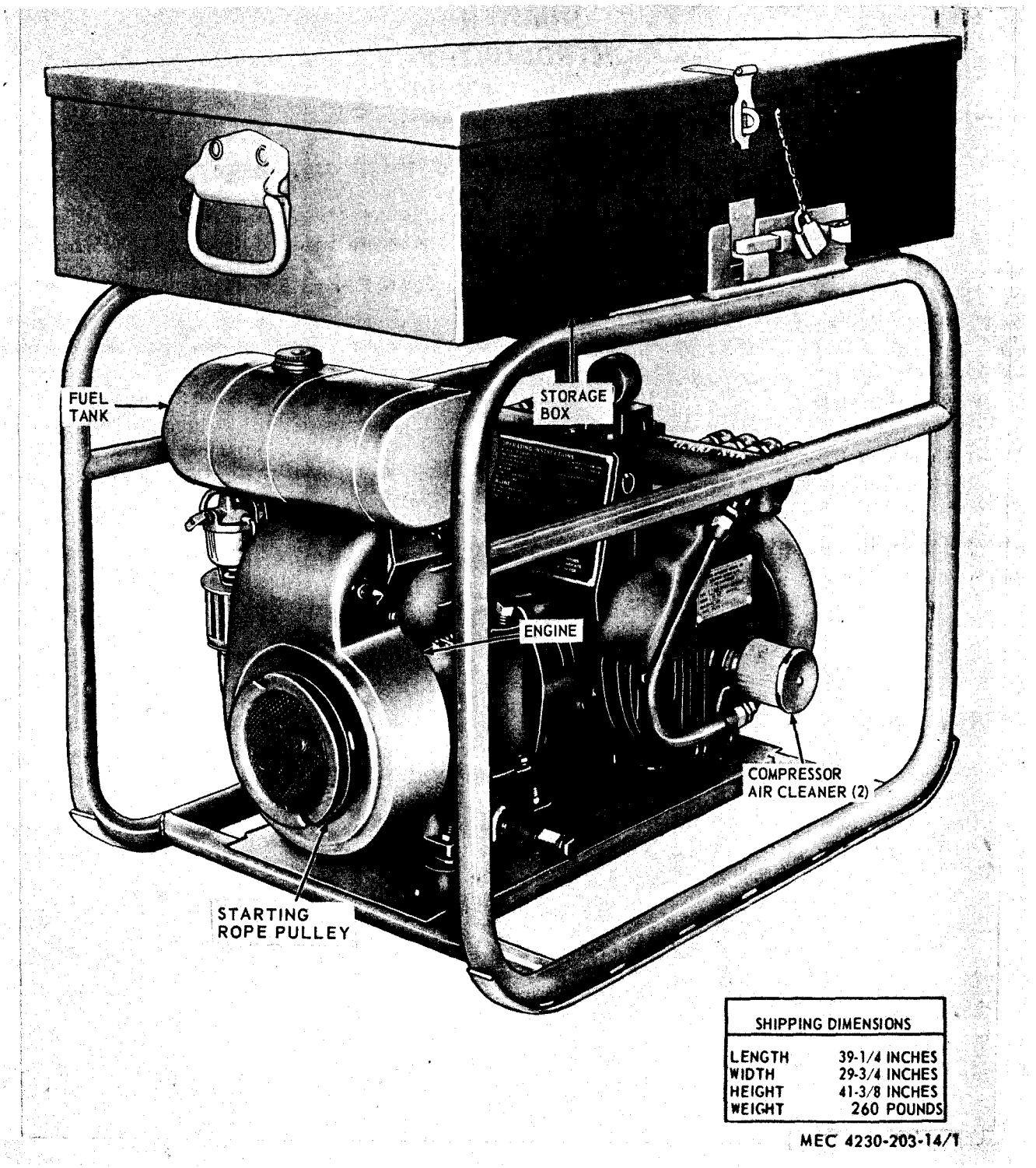


Figure 1-1. Delousing outfit, left-front ¾ view, with shipping dimensions

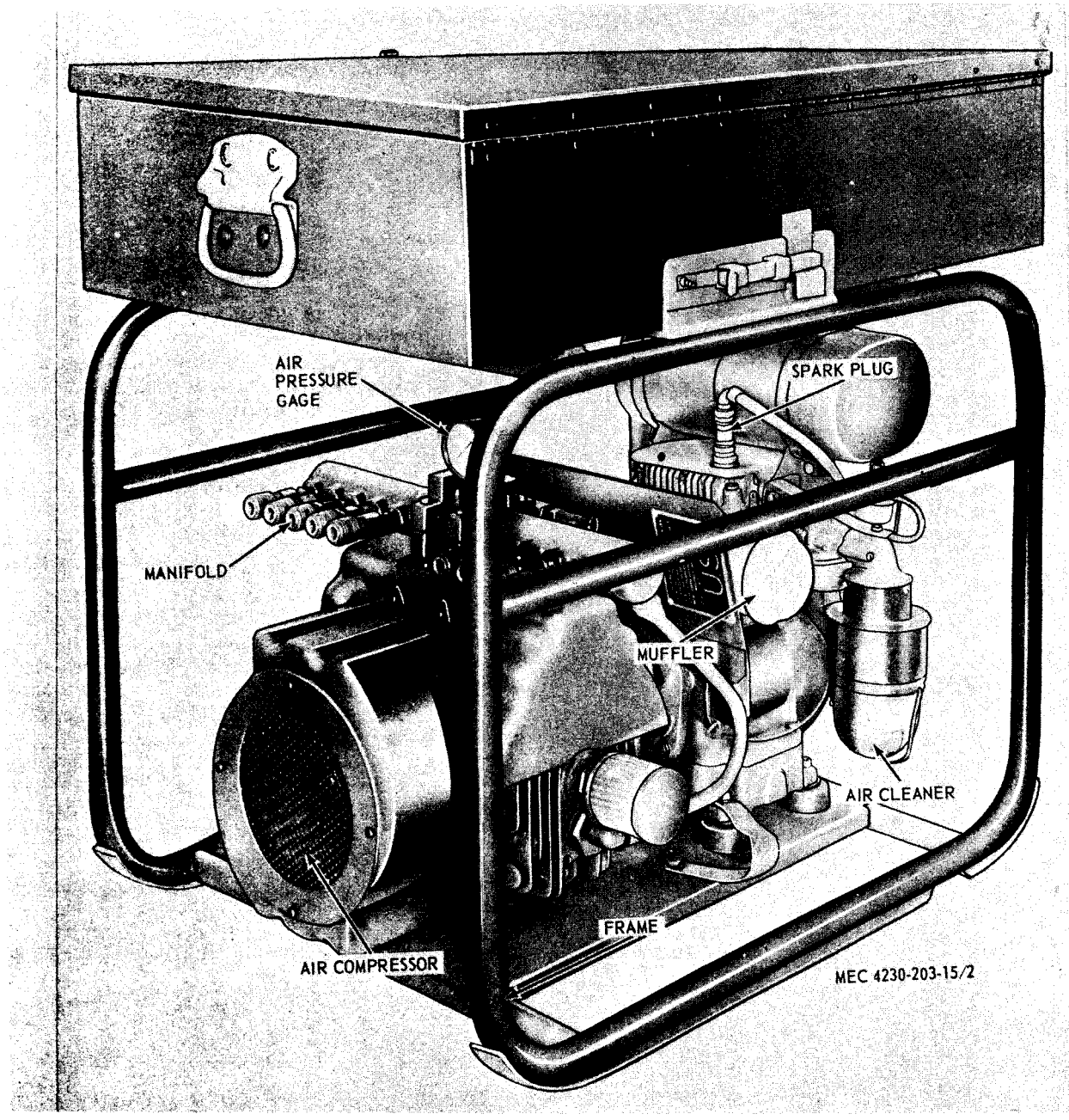


Figure 1-2. Delousing outfit, right-rear ¾ view.

1-5. Difference in Models

This manual covers the Curtis Automotive Devices Model CDR 70000 and the Curtis Dyna-Products Corporation Model CDR 70000B delousing outfits. Differences in the two models are found in the method of mounting the manifold and the configuration and method of attaching the dusting gun cannister to the gun cover.

1-5. Identification and Tabulated Data

a. Identification. The delousing outfit has two identification plates, one located on the engine housing and the other on the compressor housing. The date from these plates can be found in tabulated data *(b* below).

b. Tabulated Data.

(1) *Engine.*

Manufacturer ..... Kohler Co.
Type ..... air-cooled
Rating ..... 4.7 at 3,600 rpm
Model K161P

(2) *Compressor.*

Manufacturer ..... Curtis Automotive Devices, Inc. and Curtis Dyna-Products Corp.
Type ..... Twin opposed diaphragm
Model CPR-700002
Max. (maximum) rpm 2,200
Rate ..... 11 cfm (cubic feet per minute) at 30 psi (pounds per square inch)

(3) *Carburetor.*

Manufacturer ..... Carter
Model ..... N
Type ..... Float

(4) *Air cleaner.*

Manufacturer ..... Air Cleaner Division of Industrial Corp.
Type ..... Oil bath

(5) *Dimensions and weight (crated).*

Length ..... 39¼ in. (inch)
Width ..... 29¾ in.
Height ..... 41 3/8 in.
Weight ..... 260 lb (pound)

(6) *Capacities.*

Air cleaner ..... 5/16 pt (pint)
Fuel tank ..... 1¼ gal (gallon)
Crankcase ..... 2½ pt

(7) *Torque data.*

Blower wheel capscrew ..... 35-40 ft-lb.
Connecting rod screws ..... 14-18 ft-lb.
*Cylinder head capscrews 15
Flywheel nut ..... 75 ft-lb.
Spark plug ..... 25 ft-lb.

*Lubricate with grease at assembly. Always use torque wrench on above parts.

Table 1-1. Engine Repair and Replacement Standards

Item	Tolerances in inches
Crankshaft end clearance	.002/.023
Connecting rod-large end	.001/.002
Connecting rod-large end side clearance	.005/.016
Piston skirt clearance at thrust face	.0050/.0065
Piston ring end clearance	.007/.017
Intake valve stem in guide	.0010/.0025
Exhaust valve stem in guide	.0025/.0040
Tappet in block	.0005/.0020
Camshaft running clearance	.0005/.0020
Camshaft end clearance	.005/.025
Valve clearance-intake (cold)	.006/.008
Valve clearance-exhaust (cold)	.011/.013
Crankpin size	1.186
Piston pin size	0.625
Cylinder bore	2.875
Spark run	20 B.
Spark retard	3 A.
Compression	110-120 psi

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

2-1. Inspecting and Servicing the Equipment

a. Perform the daily preventive maintenance services (para 3-4).

b. Make a thorough visual inspection of the entire unit for loose or missing parts or hardware and for damage.

c. Refer to appendix C and fill the fuel tank with proper grade of fuel.

WARNING

When filling the fuel tank always provide a metal-to-metal contact between the container and the fuel tank. This will prevent a spark from being generated as fuel flows over the metallic surface.

2-2. Installation or Setting-Up Instructions

a. The delousing outfit is a portable unit designed to operate satisfactorily on any level surface. Position the unit on any reasonably level surface and block the skid frame to complete the leveling.

b. Ample space must be provided on all sides to assure adequate ventilation and working area for starting and servicing the unit.

WARNING

Be sure the delousing outfit has adequate ventilation or has a proper exhaust connection to the outside before operating in an enclosed area. Exhaust gases contain carbon monoxide, a colorless, odorless, poisonous gas.

c. The delousing outfit comes with separately packed components consisting of face masks, air guns, hoses, and dust cans. Refer to figure 2-1 for the separately packed components.

d. Slide the accessory box locks to the rear and remove box from frame.

e. Remove hoses, guns, and face masks from accessory box.

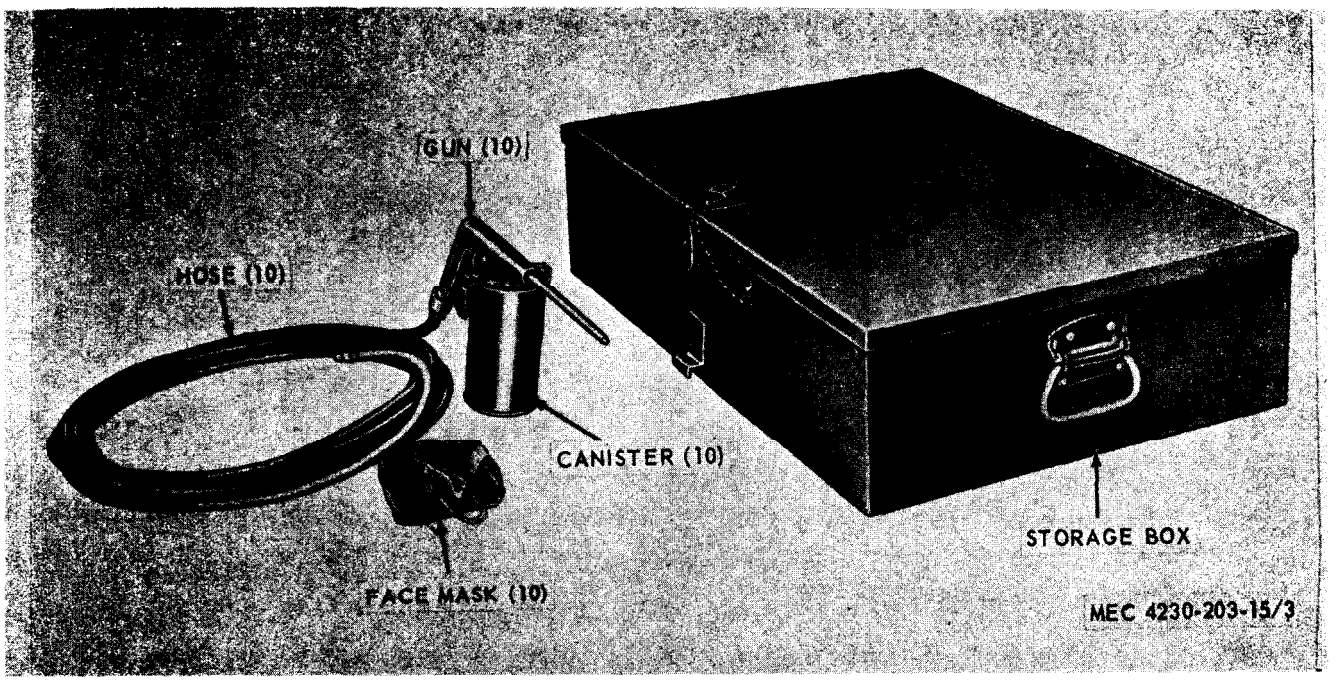


Figure 2-1. Separately packed componets.

Section II. MOVEMENT TO A NEW WORKSITE

2-3. Dismantling for Movement

a. General. The delousing outfit is completely self-contained and can be moved short distances manually.

b. Preparation For Movement.

(1) Disconnect spray guns and stow them in the storage box provided for them.

(2) Disconnect the hoses and stow them in the storage box.

(3) Position the accessory box on the tabular frame and secure it to the bracket. Secure the lid of the storage box.

2-4. Reinstallation After Movement

Refer to paragraph 2-2 for reinstallation instructions after movement to a new worksite.

Section III. CONTROLS AND INSTRUMENTS

2-5. General

This section describes, locates, illustrates, and furnishes the operator and maintenance personnel sufficient information about the various controls and instruments for the proper operation of the delousing outfit.

2-6. Controls and Instruments

Refer to figure 2-2 for the purpose, normal reading, and location of all controls and instruments.

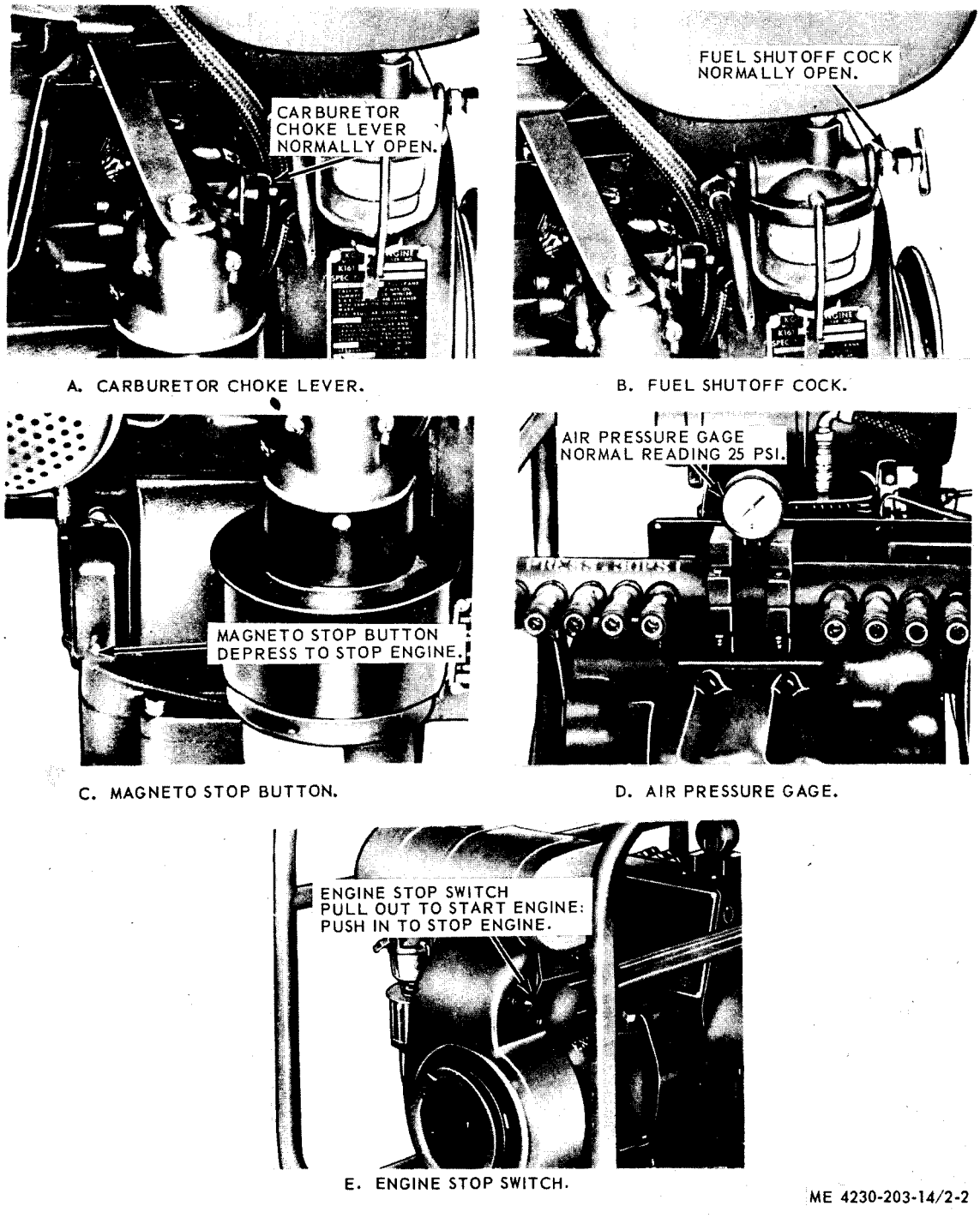


Figure 2-2. Controls and instruments.

Section IV. OPERATION UNDER USUAL CONDITIONS

2-7. General

The instructions in this section are published for the information and guidance of the personnel responsible for the operation of the delousing outfit. This section gives instructions on starting and stopping the delousing outfit and operating details of the unit.

2-8. Starting

Refer to figure 2-3 for starting instructions.

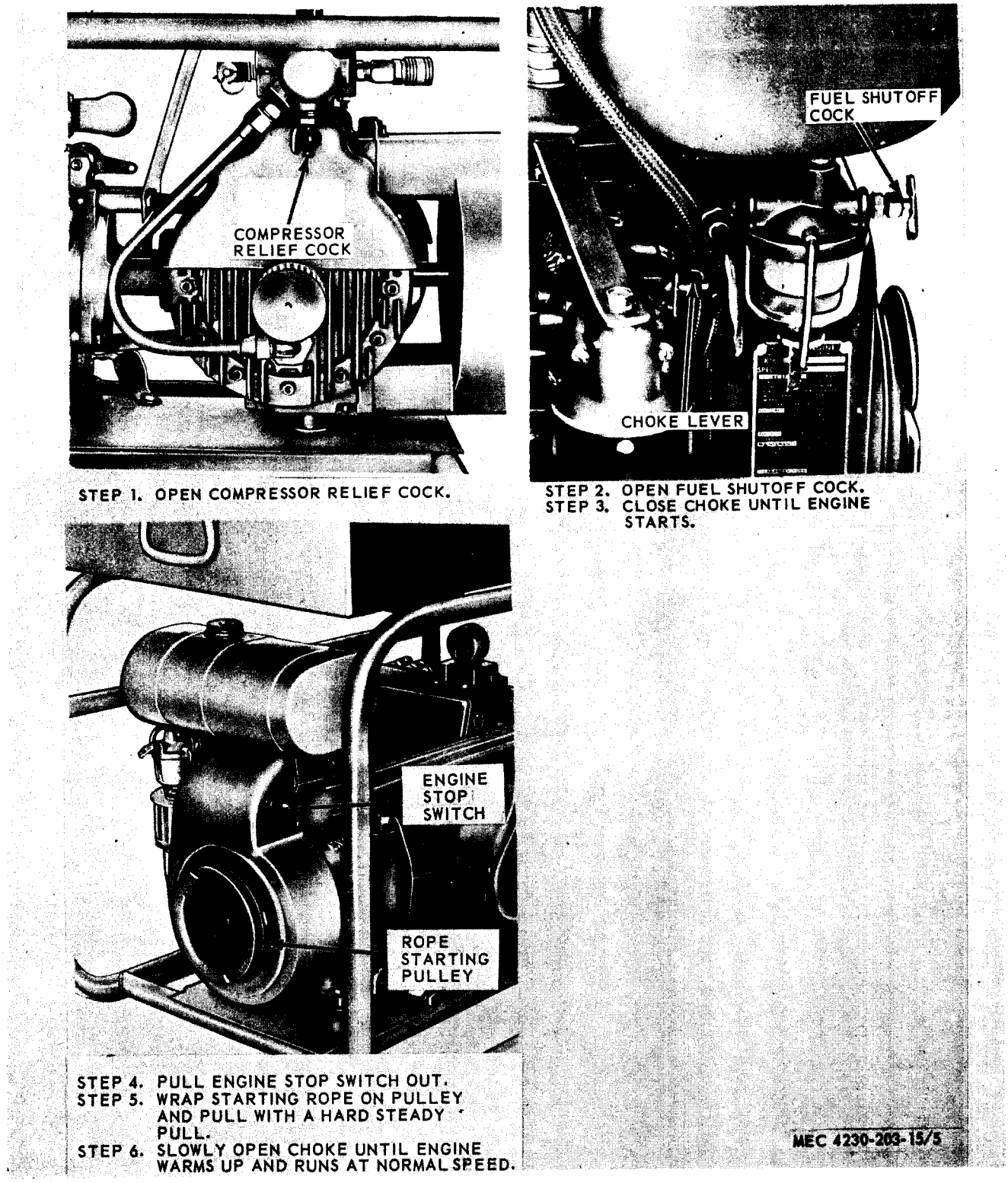


Figure 2-3. Starting instructions

2-9. Stopping

Refer to figure 2-4 for stopping instructions.

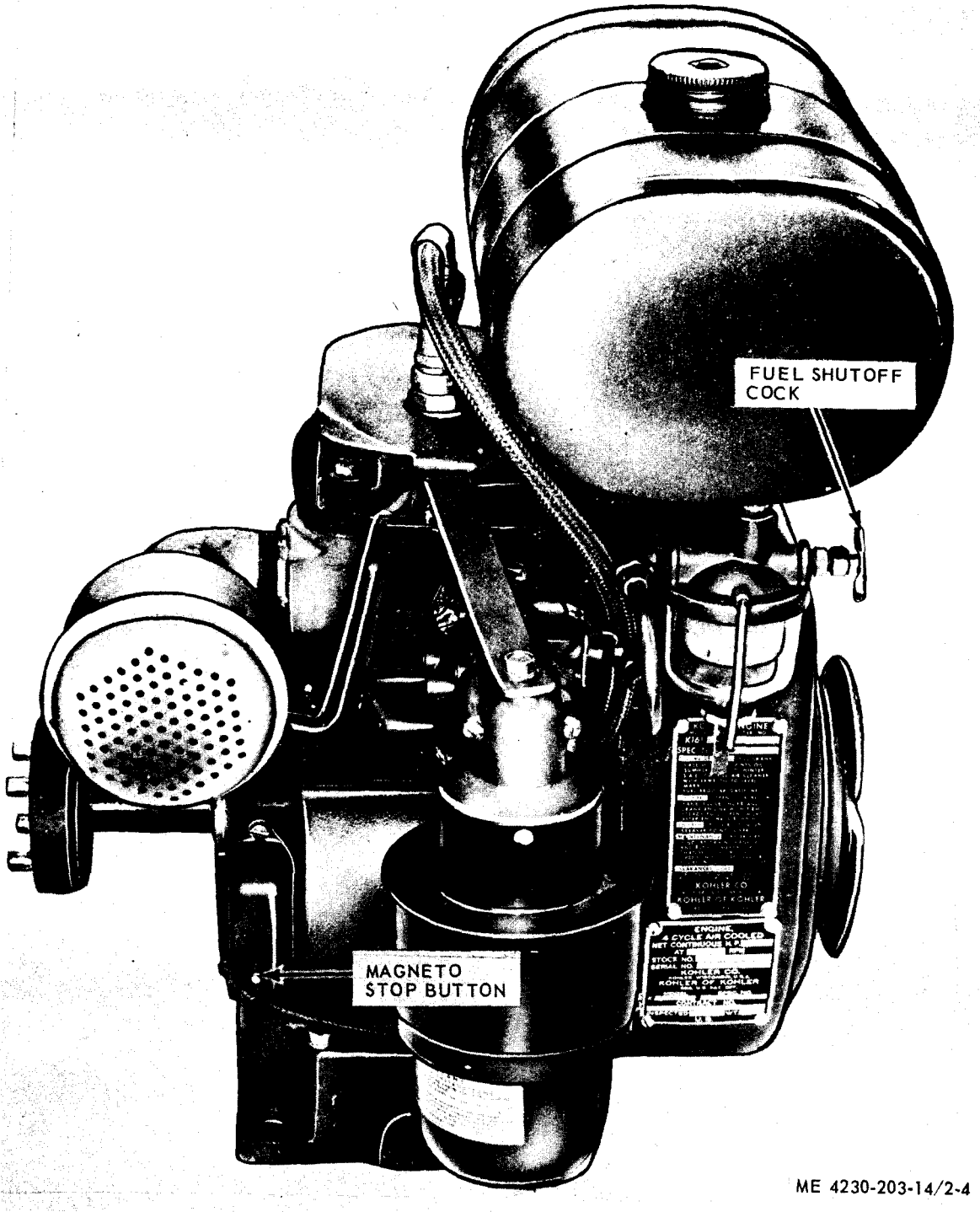


Figure 2-4. Stopping instructions

2-10. Operation

The delousing outfit is intended to be used in the field for disinfecting personnel and clothing without removing clothing from the body as prescribed in TM 3-220.

WARNING

Never point compressed air hose at personnel. At close range, compressed air can cause serious damage to the eyes and ears.

a. Connect the host assemblies to the connectors (fig. 2-5).

b. Fill dusting guns three-fourths full with the proper dusting agent and connect the guns to the hoses.

c. Start engine (para 2-9).

d. When the air pressure gage reads 25 psi, delousing operation can be started.

e. The operator must don a face mask and personnel being dusted should wear face masks or cover the face with toweling to prevent dust entering the eyes and nose.

NOTE

When handling large groups of individuals, keep hose off the ground. Suspend hose over a rope or ropes stretched about eight feet above the ground to permit guns to be reached easily. The operator using the gun can rapidly uncouple an empty gun and replace it with a full one. The operator of the compressor engine can then fill dust containers to the empty guns three-quarters full, making the gun again ready for use. This permist continuous delousing operation.

f. Press control trigger on gun until desired amount of powder has been ejected.

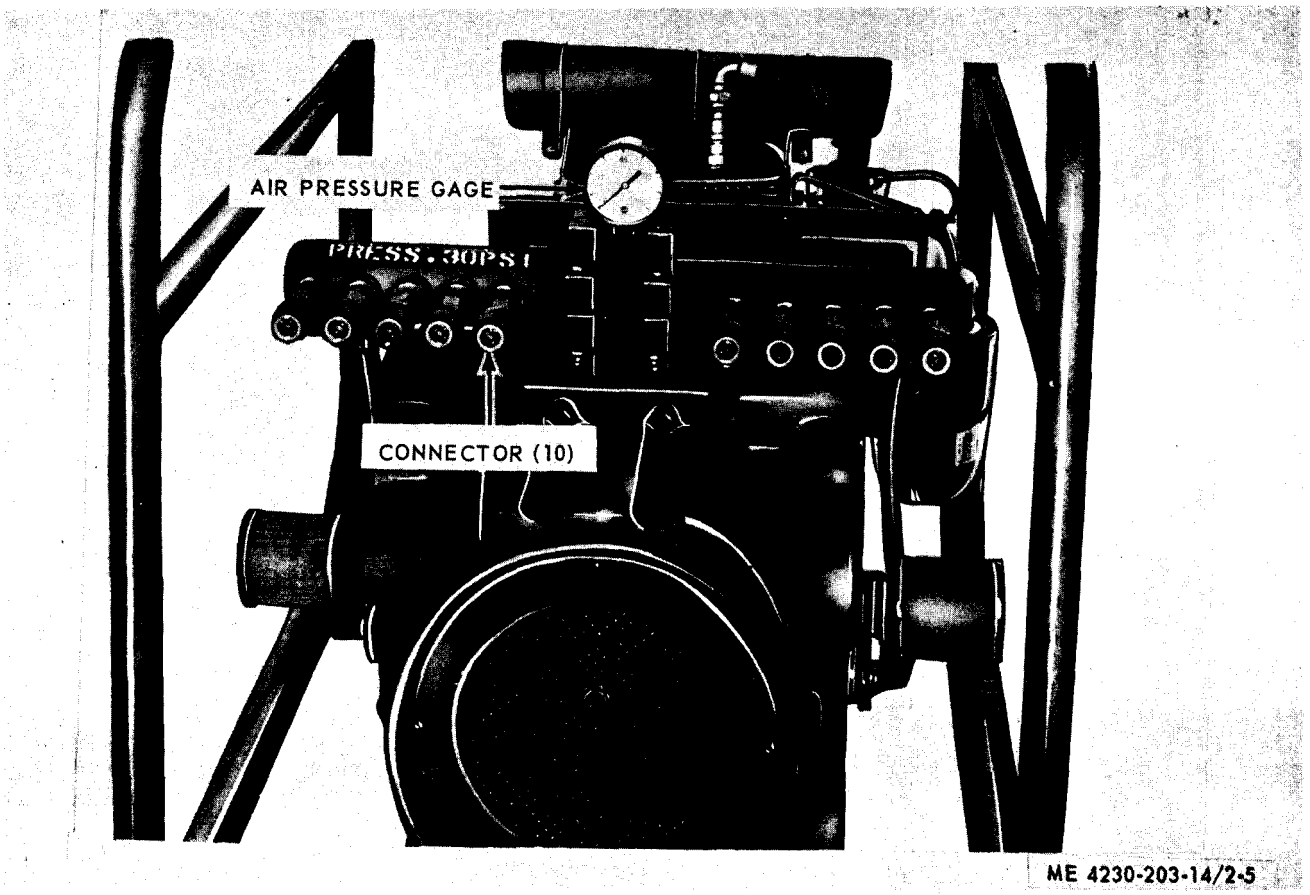


Figure 2-5. Air pressure gage and hose connectors.

Section V. OPERATION UNDER UNUSUAL CONDITIONS

2-11. Operation in Extreme Cold Below 0°F)

a. Genral. Operation of the delousing outfit under conditions of extreme cold presents problems that demand special precautions and extreme care in servicing the unit.

b. Fuel System. In cold temperatures, condensation of moisture will cause water to accumulate in the fuel system. This water will freeze and form ice crystals. Take the following precautions to prevent these crystals from clogging the fuel system:

(1) Remove snow and ice from the fuel tank cap prior to filling the tank; keep the tank full at all times.

(2) Keep the fuel tank cap tight to prevent moisture and dirt from entering the tank.

(3) Service the fuel filter more frequently than during normal conditions.

c. Ignition System. In cold weather, be sure the spark plug is kept clean and free from moisture. Remove ice and snow from the spark plug and cable. See that the ignition connections are clean and tight. Since the insulation on the cable tends to become brittle at low temperatures, avoid excessive handling and sharp bending.

d. Lubrication.

(1) Lubricate the delousing outfit in accordance with the current lubrication order.

(2) Service the carburetor air cleaner more frequently than under normal conditions.

2-12. Operation in Extreme Heat

a. General. Efficient cooling, adequate ventilation, and lubrication are of vital importance for the operation of the delousing outfit under conditions of extreme heat.

b. Cooling. Check the flywheel shroud, cylinder crankcase, air compressor fins, and blower scroll screen for insufficient ventilation of the engine and air compressor in extreme heat. Clean the fins and screen at regular intervals.

c. Lubrication. Lubricate the unit in accordance with the current lubrication order.

2-13. Operation in Dusty or Sandy Areas

a. Cleaning. Service the engine air cleaner frequently when operating the unit under dusty or sandy conditions. Replace oil in the bowl when it becomes dirty. Remove the two compressor air cleaners and blow out the dirt, dust, or other debris or replace as required. Keep the compressor blower scroll screen clean and free of clogging.

b. Fuel System.

(1) Provide adequate protection to keep sand and dirt from entering the fuel system when filling the tank.

(2) Service the fuel filter as often as necessary to keep it free of sand and dirt.

c. Cooling. Keep the flywheel shroud, cylinder crankcase, compressor fins, and blower scroll screen free from all dust, dirt, and other materiel that might prevent proper engine and compressor cooling.

d. Lubrication.

(1) Lubricate the delousing outfit in accordance with the current lubrication order.

(2) Service the carburetor air cleaner more frequently than under normal conditions.

2-14. Operation Under Rainy or Humid Conditions

a. General. When the unit is not operating, place a canvas or other waterproof covering over the unit. Do not use the unit in the rain unless it is protected by a tarpaulin. During humid periods, dry the unit before operating. Keep the fuel tank full to avoid condensation.

b. Ignition System. Spark plug and cable often become unserviceable because of high humidity. Affected parts should be removed and dried. If this does not remedy the condition, replace the parts.

2-15. Operation in Salt Water Areas

a. General. Salt water creates a strong corrosive action on metal. Care must be. taken to avoid direct contact with salt water. Wash down the unit with clean, fresh water at frequent intervals. Take care not to contaminate the fuel system or damage the ignition system with water.

b. Protection Against Corrosion. Coat exposed metal surfaces with an approved rust-proofing material to prevent moisture from causing rust. Remove any rust immediately and paint exposed surfaces.

c. Lubrication. Lubricate the unit in accordance with the current lubrication order.

2-16. Operation at High Altitudes

a. The air compressor output in cubic feet per minute and pounds per square inch will gradually decrease as the operating altitude above sea level increases. For each 1000 feet of altitude above sea level, there will be a reduction in horsepower.

b. Should the air compressor cfm decrease because of rarefied air in high altitudes, increase the engine speed by advancing the governor control linkage.

c. Service the two air compressor air cleaners as necessary (para 3-10).

d. Open the needle valve slightly more than normal, and adjust to normal running position after engine has started. This will facilitate easy engine starting.

e. Lubricate the unit in accordance with the current lubrication order.

CHAPTER 3
OPERATOR'S MAINTENANCE INSTRUCTIONS

Section I. BASIC ISSUE ITEMS

Tools, equipment, and repair parts issued with or authorized for the delousing outfit are listed in the basic issue items list, appendix C.

Section II. LUBRICATION

3-1. General Lubrication information

This section contains instructions which are supplemental to and not specifically covered in the lubrication order. For current lubrication order, refer to DA Pamphlet 310-4.

3-2. Detailed Lubrication Information

a. Care of Lubricants. Keep all lubricants in closed containers and store in a clean, dry place away from external heat. Allow no dirt, dust, or water to mix with the lubricants at any time. Keep all lubrication equipment clean and ready for use.

b. Points of Lubrication. Follow the detailed lubrication instructions given on the current lubrication order. Always apply lubricant specified on the current LO.

c. Cleaning. Keep all external parts not requiring lubrication free of lubricants. After each lubrication operation, remove excess lubrication from the points of application and wipe away spilled lubricant.

d. Operation Immediately After Lubrication. Operate the unit for 5 minutes after lubrication to work the clean oil into bearing surfaces. Stop the unit, wait 5 minutes, then check oil level. Add oil to bring the level up to the FULL mark.

Section III. Preventive MAINTENANCE SERVICES

3-3. General

To insure that the delousing outfit 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 services to be performed are listed and described in paragraph 3-4. 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. All deficiencies and shortcomings will be recorded, together with the corrective action taken, on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) at the earliest possible opportunity.

3-4. Preventive Maintenance Checks and Services

This paragraph contains a listing of preventive maintenance checks and services which must be performed by the operator. The item numbers listed consecutively in table 3-1 indicate the sequence of requirements.

Table 3-1. Preventive Maintenance Checks and Services

Item number	Interval: Operator: Daily B	D	A	W	Item to be inspected	Procedure	Reference
	B — Before operation		A — After operation				
	D — During operation		W — Weekly				
1	X				FUEL TANK	Add fuel as required. Tighten loose mounting. Replace leaking tank. Replace defective cap gasket.	
2	X				AIR CLEANER	Clean cup and fill with clean oil to level of bead.	(para 3-6)
3	X				OIL FILL GAGE	Add oil as indicated to fill mark.	
4	X			X	FUEL FILTER	Tighten thumb nut if gasket is leaking. Clean weekly.	(para 3-8)
5	X				AIR PRESSURE GAGI	Tighten loose mounting. Replace a defective gage. With unit operating, correct reading is 25 psi.	
6				X	SCREEN	Clean dirty screen. Replace a defective screen.	(para 3-9)
7				X	AIR CLEANERS	Clean weekly. Replace a defective air cleaner	(para 3-10)
					Note 1. OPERATION	During operation observe for any unusual noise or vibration. Make adjustments during operational test.	

Section IV. TROUBLESHOOTING

This section contains information useful in diagnosing and correcting unsatisfactory operation or failure of the delousing outfit and its" components. Malfunctions which may occur are listed in table 3-2. Each malfunction stated is followed by a list of probable causes of the trouble. The corrective action recommended is described opposite the probable cause.

Table 3-2. Troubleshooting

Malfunction	Probable cause	Corrective action
1. Engine hard to start or fails to start.	*a.* Fuel tank empty.	*a.* Service fuel tank.
	b. Fuel shutoff cock closed.	*b.* Open fuel shutoff cock.
	c. Spark plug defective or out of adjustment.	*c.* Report to organizational maintenance.
	d. Carburetor out of adjustment.	*d.* Report to organizational maintenance.
2. Engine misses or runs erratically.	*a.* Spark plug gap incorrect.	*a.* Report to organizational maintenance.
	b. Spark plug cable loose or worn.	*b.* Report to organizational maintenance.
3. Engine stops suddenly.	*a.* Fuel tank empty.	*a.* Service fuel tank.
	b. Fuel filter clogged.	*b.* Service fuel filter (para 3-8).
	c. Carburetor defective.	*c.* Report to organizational maintenance.
	d. Fuel tank cap air vent clogged.	*d.* Clean vent hole.
4. Engine overheats.	*a.* Crankcase oil level low.	*a.* Fill crankcase in accordance with current LO.
	b. Flywheel housing defective	*b.* Report to organizational maintenance.
	c. Cylinder cooling fins dirty.	*c.* Clean fins.
5. Engine noisy.	*a.* Crankcase oil level low.	*a.* Fill crankcase in accordance with current LO.
	b. Carbon deposits in cylinder head.	*b.* Report to organizational maintenance
6. Engine backfires.	Engine cold.	Run engine at low speed until warm.

Malfunction	Probable cause	Corrective action
7. Compressor noisy.	Mounting bolts loose or missing	Tighten or replace loose or missing hardware.
8. Compressor builds up pressure slowly.	*a.* Compressor air filters clogged.	*a.* Clean air filters (para 3-11).
	b. Manifold tubing and connections loose.	*b.* Tighten tubing and connections
	c. Compressor inlet and outlet valves defective.	*c.* Report to organizational maintenance.
	d. Diaphragms defective.	*d.* Report to organizational maintenance.
9. Compressor overheats.	*a.* Blower screen clogged.	*a.* Clean screen (para 3-9).
	b. Blower wheel defective.	*b.* Report to organizational maintenance.
10. Valve assemblies and diaphragm noisy.	*a.* Valves defective or broken.	*a.* Report to organizational maintenance.
	b. Diaphragm retaining plate screws loose.	*b.* Report to organizational maintenance.

Section V. OPERATOR'S MAINTENANCE

3-5. General

This sections contains information on the maintenance of the delousing outfit which is the responsibility of the operator.

3-6. Air Cleaner

Refer to figure 3-1 and service the air cleaner.

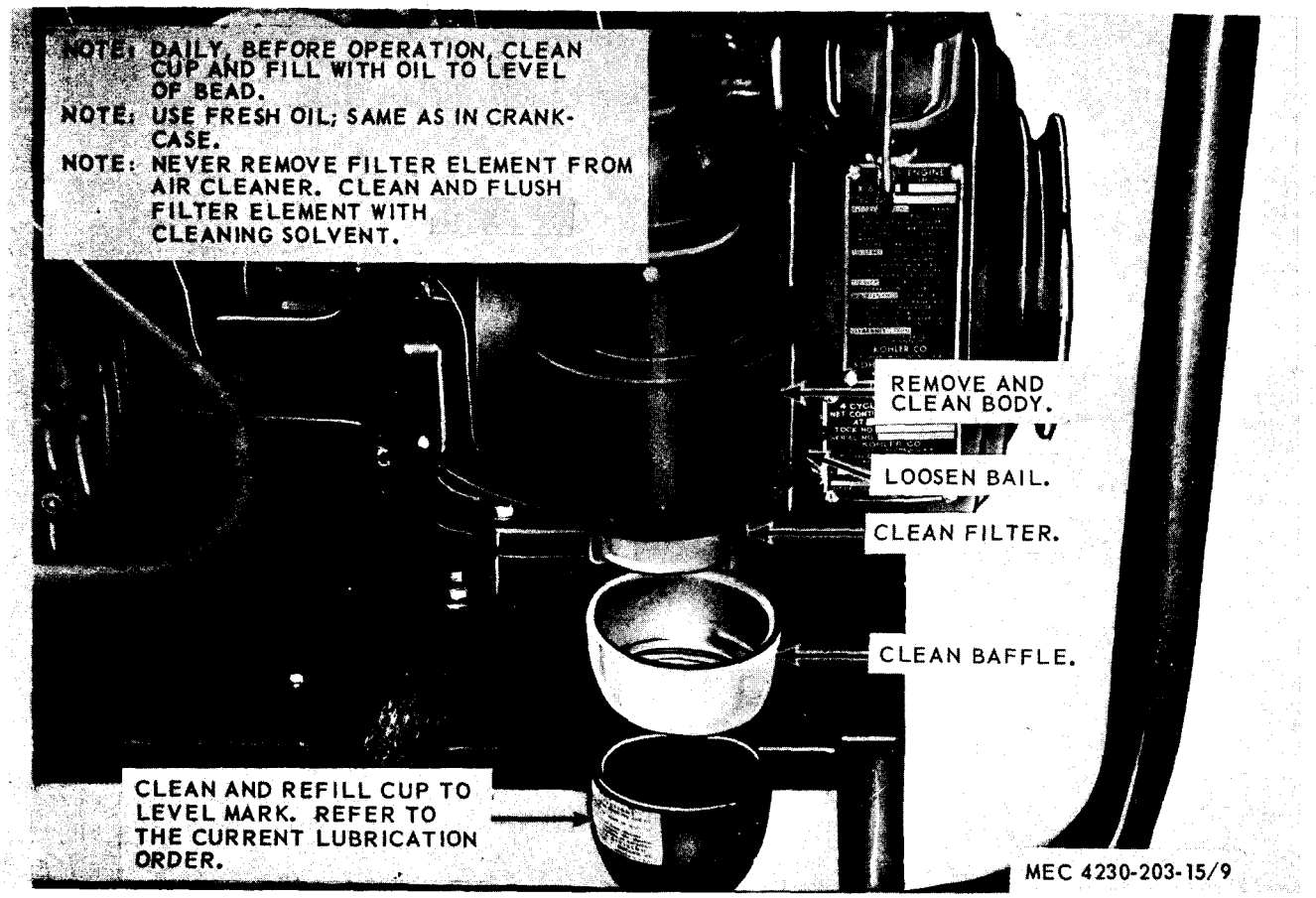


Figure 3-1. Engine air cleaner service

3-7. Breather Service

Refer to figure 3-2 and service the breather.

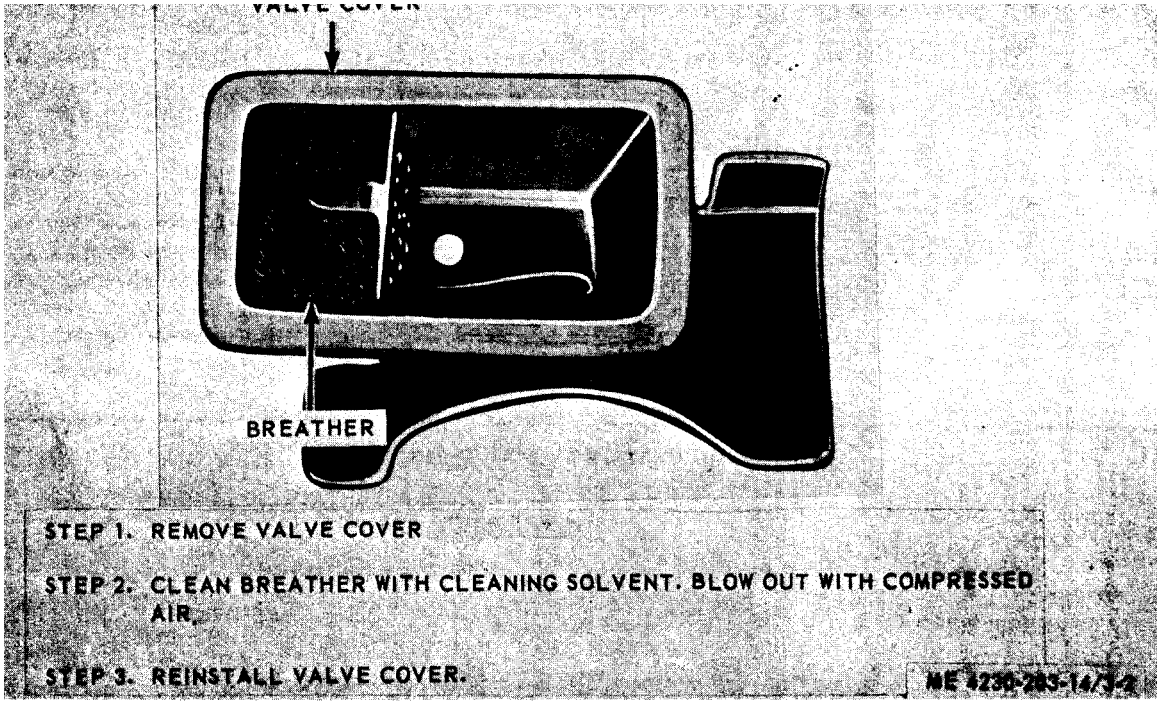


Figure 3-2. Breather service.

3-8. Fuel Filter Service

Refer to figure 3-3 and service the fuel filter.

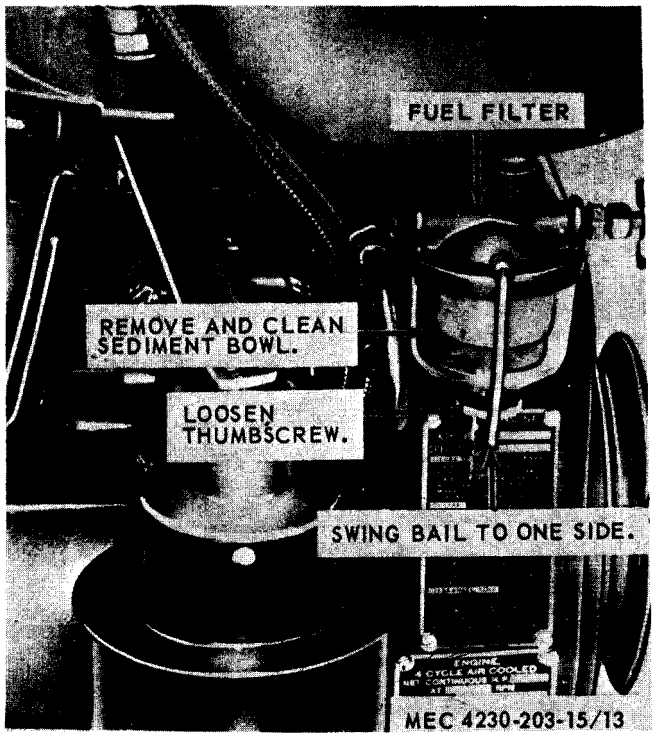


Figure 3-3. Fuel filter service.

3-9. Compressor Blower Screen Service

Refer to figure 3-4 and service the compressor blower screen.

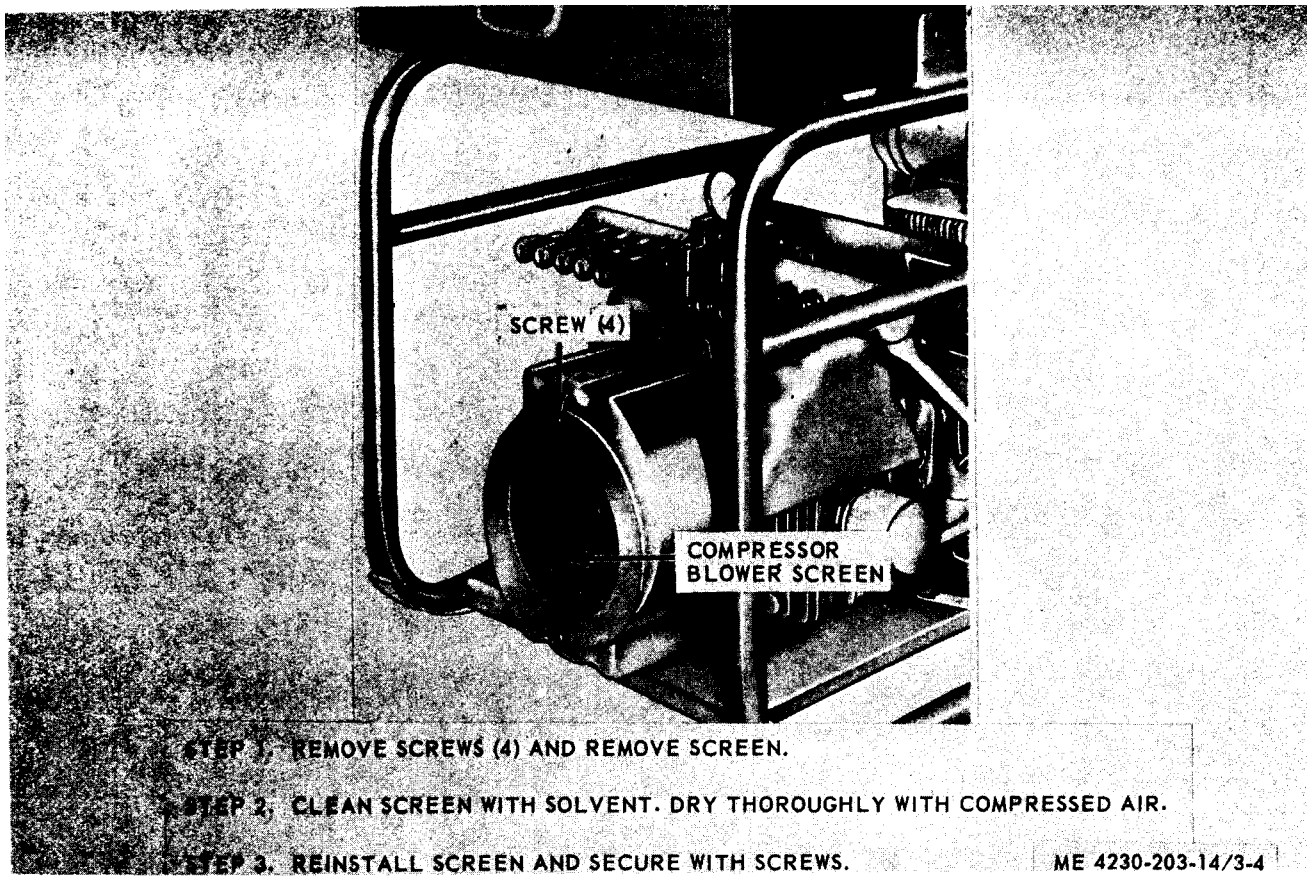


Figure 3-4. Compressor blower screen service.

3-10. Compressor Air Cleaner Service

Refer to figure 3-5 and service the compressor air cleaners.

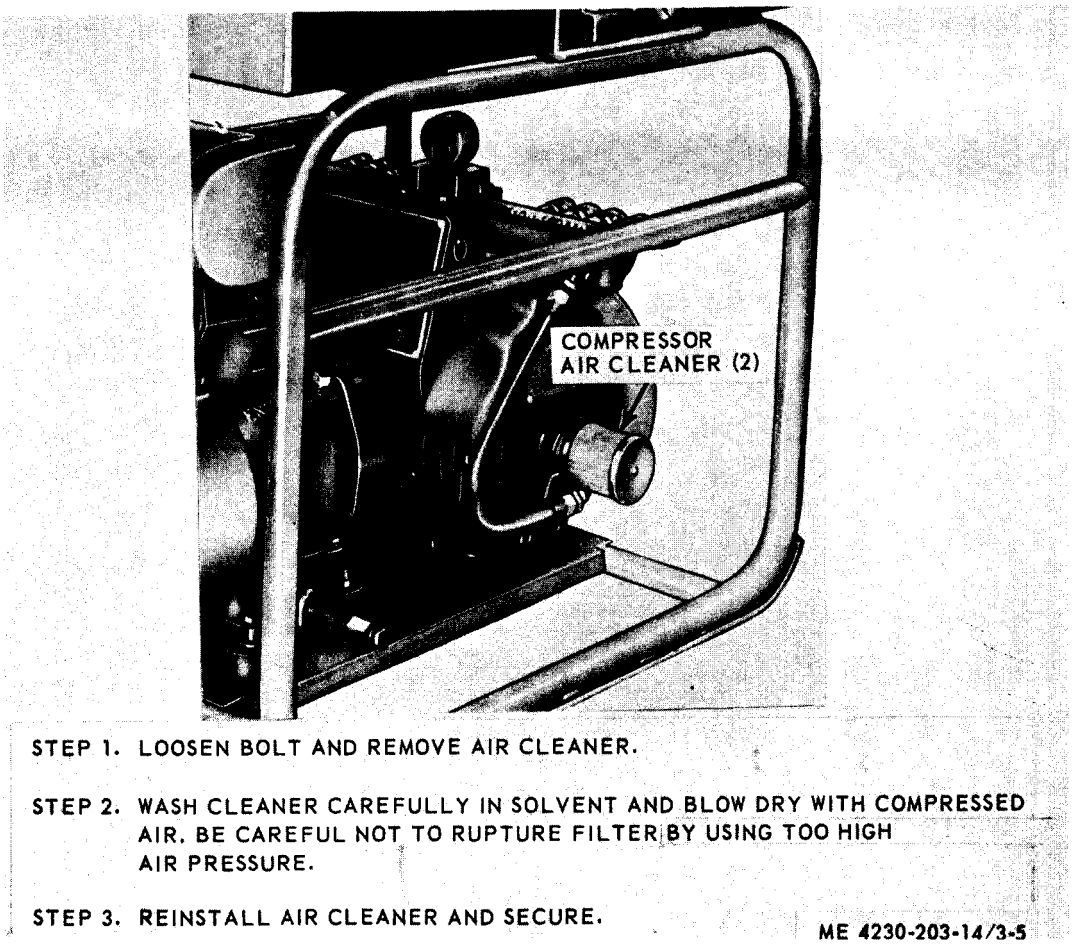


Figure 3-5. Compressor air cleaner service.

3-11. Engine Shroud Screen Service

Refer to figure 3-6 and service the engine shroud screen.

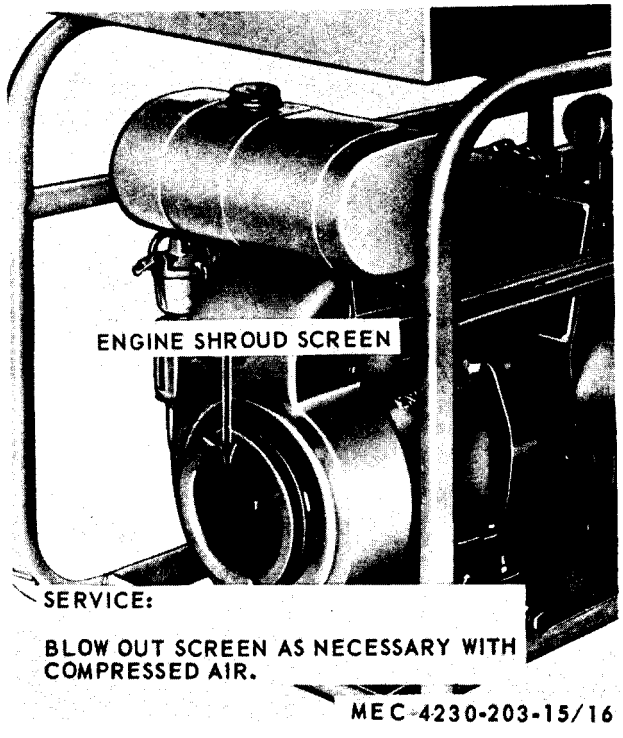


Figure 3-6. Engine shroud screen service.

CHAPTER 4
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

Refer to Chapter 2 for instructions for servicing the delousing outfit upon receipt by organizational maintenance personnel.

Section II. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

No special tools or equipment are required by organizational maintenance personnel for maintaining the delousing outfit. Organizational maintenance repair parts are listed and illustrated in TM 10-4230-203-24P.

Section III. PREVENTIVE MAINTENANCE SERVICES

This section contains a listing, table 4-1, of the preventive maintenance checks and services that are to be performed by organizational maintenance personnel in addition to those listed in table 3-1.

Section IV. TROUBLESHOOTING

This section contains a listing, table 4-2, for troubleshooting those malfunctions which are within the scope of organizational maintenance as allocated by the maintenance allocation chart.

Section V. RADIO INTERFERENCE SUPPRESSION

4-1. General Methods Used to Attain Proper Suppression

Refer to TM 11-483 for definitions, purposes, sources, and methods used to obtain proper radio suppression. Essentially radio suppression is attained by providing a low resistance path to ground for stray currents. The methods need to attain suppression include shielding the ignition and high frequency wires and grounding the frame with bonding straps.

Table 4-1. Preventive Maintenance Checks and Services

Item number	Interval		M—Monthly Q—Quarterly		
	Org.				
		Q	Item to be inspected	Procedure	Reference
1		X	CONTACT POINTS	Replace pitted or burned magneto points. Proper point gap adjustment is 0.020 inch (Check adjustment every 500 hrs).	(para 4-23)

4-2. Interference Suppression Components Location and Replacement

a. Figure 4-1 locates and provides instructions for removal of interference suppression components.

b. Always replace suppression components with identical parts.

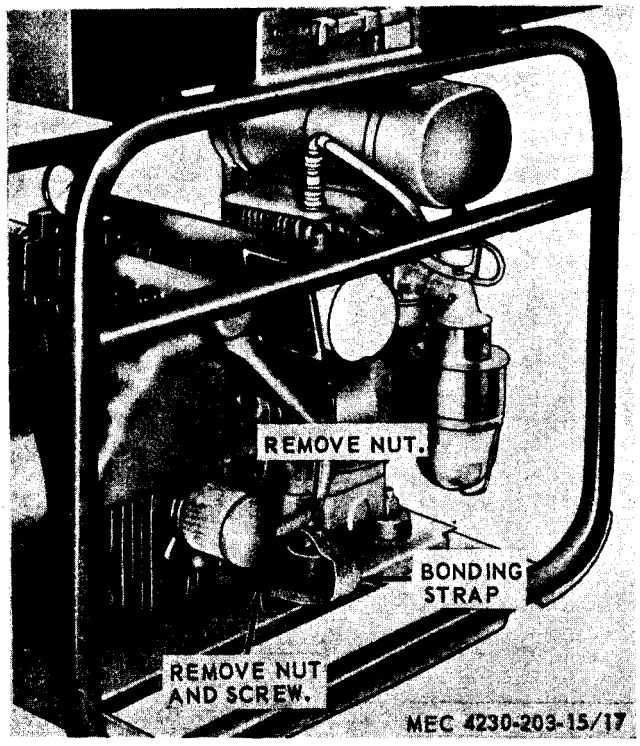


Figure 4-1. Interference suppression components, location and removal.

Table 4-2 Troubleshooting

Malfunction	Probable cause	Corrective action
1. Engine hard to start or fails to start.	*a.* Defective spark plug.	*a.* Clean or replace spark plug (para 4-22).
	b. Carburetor out of adjustment.	*b.* Adjust carburetor (fig. 4-5).
	c. Contact points dirty or out of adjustment.	*c.* Clean or replace points (para 4-23).
	d. Defective magneto.	*d.* Replace magneto (para 4-25).
2. Engine misses or runs erratically	*a.* Defective spark plug.	*a.* Clean or replace spark plug (para 4-22).
	b. Defective spark plug cable.	*b.* Replace cable.
	c. Defective magneto	*c.* Replace magneto (para 4-25).
3. Engine stops suddenly	*a.* Defective carburetor.	*a.* Repair or replace carburetor (para 4-7).
	b. Piston rod-to-crankshaft seizure.	*b.* Report to direct support maintenance.
4. Engine overheats.	Flywheel housing defective.	Replace flywheel housing or baffles (para 4-11).
5. Engine noisy.	*a.* Carbon deposits on cylinder head.	*a.* Remove and clean head (para 4-19).
	b. Loose connecting rod.	*b.* Report to direct support maintenance.
6. Compressor builds up pressure slowly.	*a.* Defective inlet or outlet valve.	*a.* Replace defective valve (para 4-35, 4-37).
	b. Diaphragm defective.	*b.* Replace diaphragm (para 4-38).

Section VI. FUEL SYSTEM

4-3. General

The engine fuel system consists of a fuel tank, a combination shutoff cock and fuel filter, a fuel line from the filter to the float-type carburetor, governor control assembly and linkage, and an air cleaner. The fuel system is gravity fed, requiring no fuel pump. Fuel flows from the fuel tank to the filter which removes solids and water from the fuel, collecting this foreign matter in a removable sediment bowl. From the filter, fuel 'passes into the carburetor. The oil bath type air cleaner removes dust and grit from the air and passes clean air into, the carburetor where it is mixed with the fuel for proper combustion.

4-4. Fuel Filter

a. Removal.

(1) Refer to figure 4-2 and remove the fuel filter and line.

(2) Loosen thumbscrew and swing bail to one side.

(3) Remove sediment bowl. gasket, and element.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, stripped threads, and deteriorated gasket or element.

(3) Replace a damaged or defective fuel filter and line.

c. Installation. Reverse procedure *a* and install the fuel filter and line. DO NOT overtighten fuel filter bowl bail.

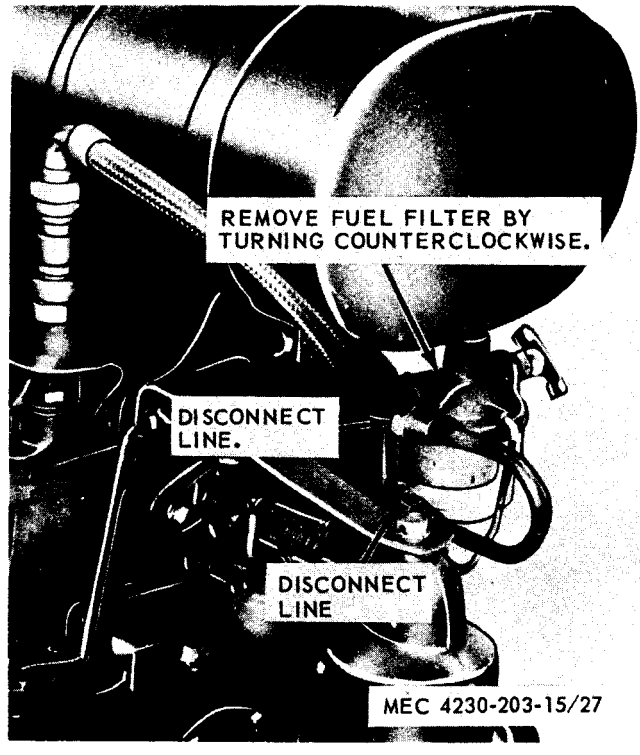


Figure 4-2. Fuel filter and line, removal and installation

4-5. Air Cleaner and Support Bracket

a. Removal.

(1) Refer to figure 4-3 and remove the air cleaner and support bracket. Be careful when removing elbow from carburetor so as not to damage gasket.

(2) Remove screws (3) that secure air cleaner to elbow.

(3) Loosen bail and remove cup, baffle, and filter as illustrated in figure 3-1.

b. Cleaning and Inspection.

(1) Inspect for cracks, breaks, and other damage.

(2) Replace a damaged or defective air cleaner and support bracket.

c. Installiation. Reverse procedure *a* and install the air cleaner and support bracket. Service the air cleaner as described in figure 3-1.

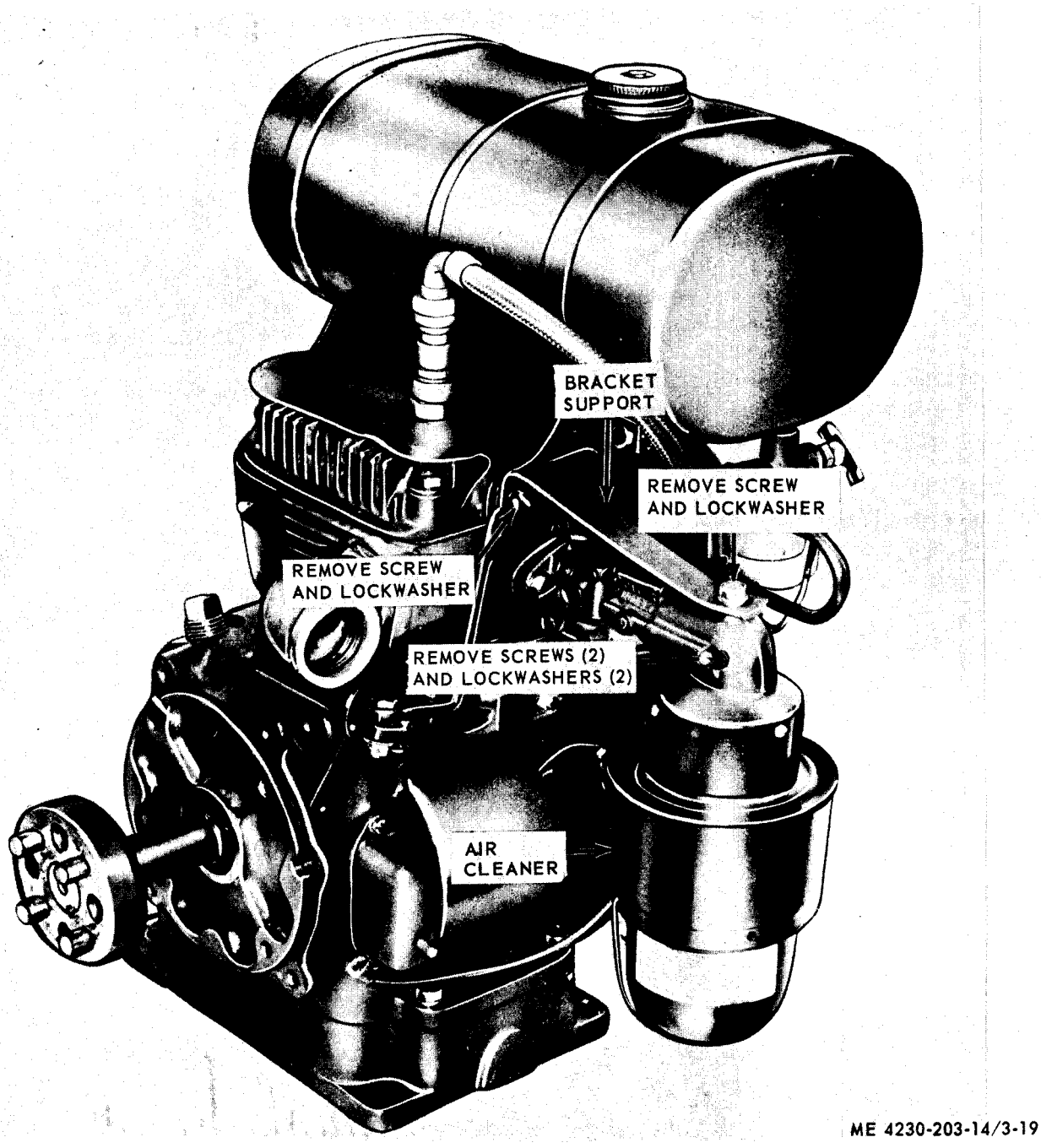


Figure 4-3. Air cleaner and support bracket, removal and installation.

4-6. Fuel Tank and Bracket

a. Removal.

(1) Remove the fuel filter (para 4-4).

(2) Refer to figure 4-4 and remove the fuel tank and bracket.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, dents, clogged cap vent, and other damage.

(3) Replace a damaged or defective part.

c. Installation

(1) Refer to figure 4-4 and install the fuel tank and bracket.

(2) Install the fuel filter (para 4-4).

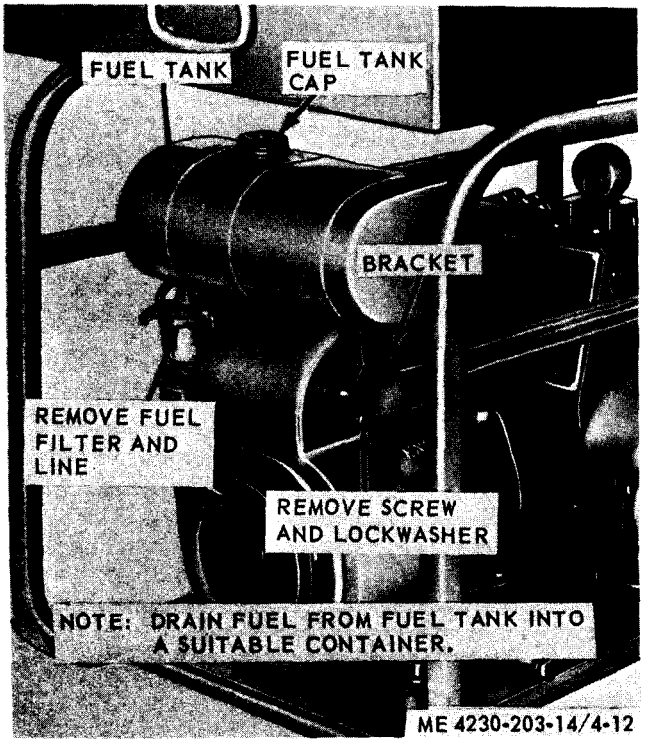


Figure 4-4. Fuel tank and bracket, removal and installation.

4-7. Carburetor

a. Removal.

(1) Remove the air cleaner and support bracket (para 4-5).

(2) Refer to figure 4-5 and remove the carburetor. Be careful not to damage the gasket.

b. Disassembly. Refer to figure 4-6 and disassemble the carburetor,

c. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly. Use compressed air to blow out passages in carburetor,

(2) Inspect for cracks, breaks, leaks, and other damage.

d. Reassembly. Using carburetor repair parts kit components, reassemble carburetor. Do not bottom idle adjusting and speed adjusting screws.

e. Installation.

(1) Refer to figure 4-5 and install the carburetor.

(2) Install the air cleaner and support bracket (para 4-5).

f. Adjustment. Refer to figure 4-5 and adjust the carburetor.

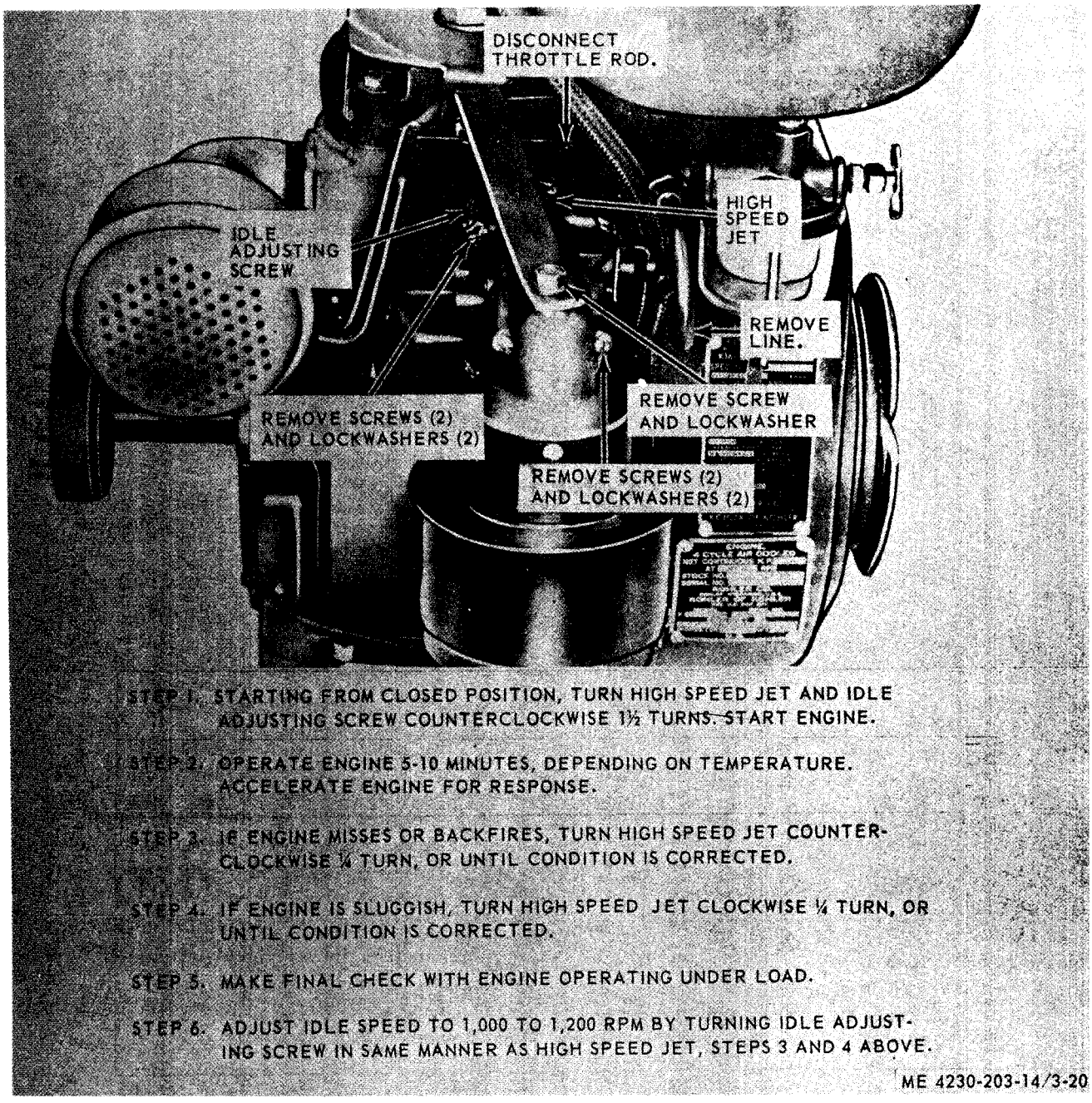
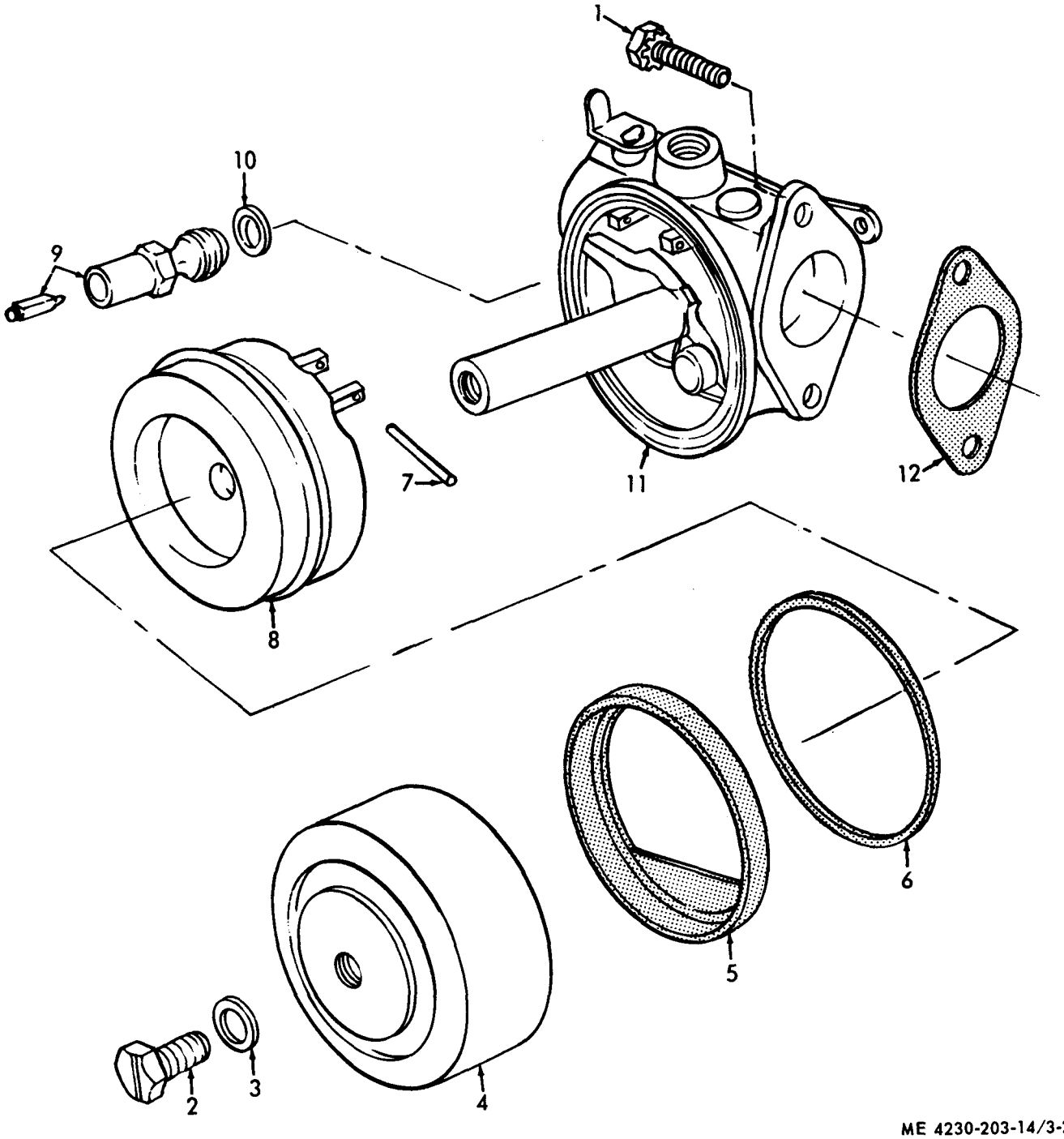


Figure 4-5. Carburetor removal, installation, and adjustment.



ME 4230-203-14/3-21

1 Screw	7 Pin
2 Screw	8 Float
3 Gasket	9 Needle and seat
4 Bowl	10 Gasket
5 Gasket	11 Carburetor body
6 Gasket	12 Gasket

Figure 4-6. Carburetor, exploded view.

4-8. Governor Regulator Lever

a. Removal. Refer to figure 4-7 and remove the governor regulator lever.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, bends, and other damage.

(3) Replace a damaged or defective governor regulator lever.

c. Installation. Reverse procedure a above. Adjust governed speed to 2200 rpm.

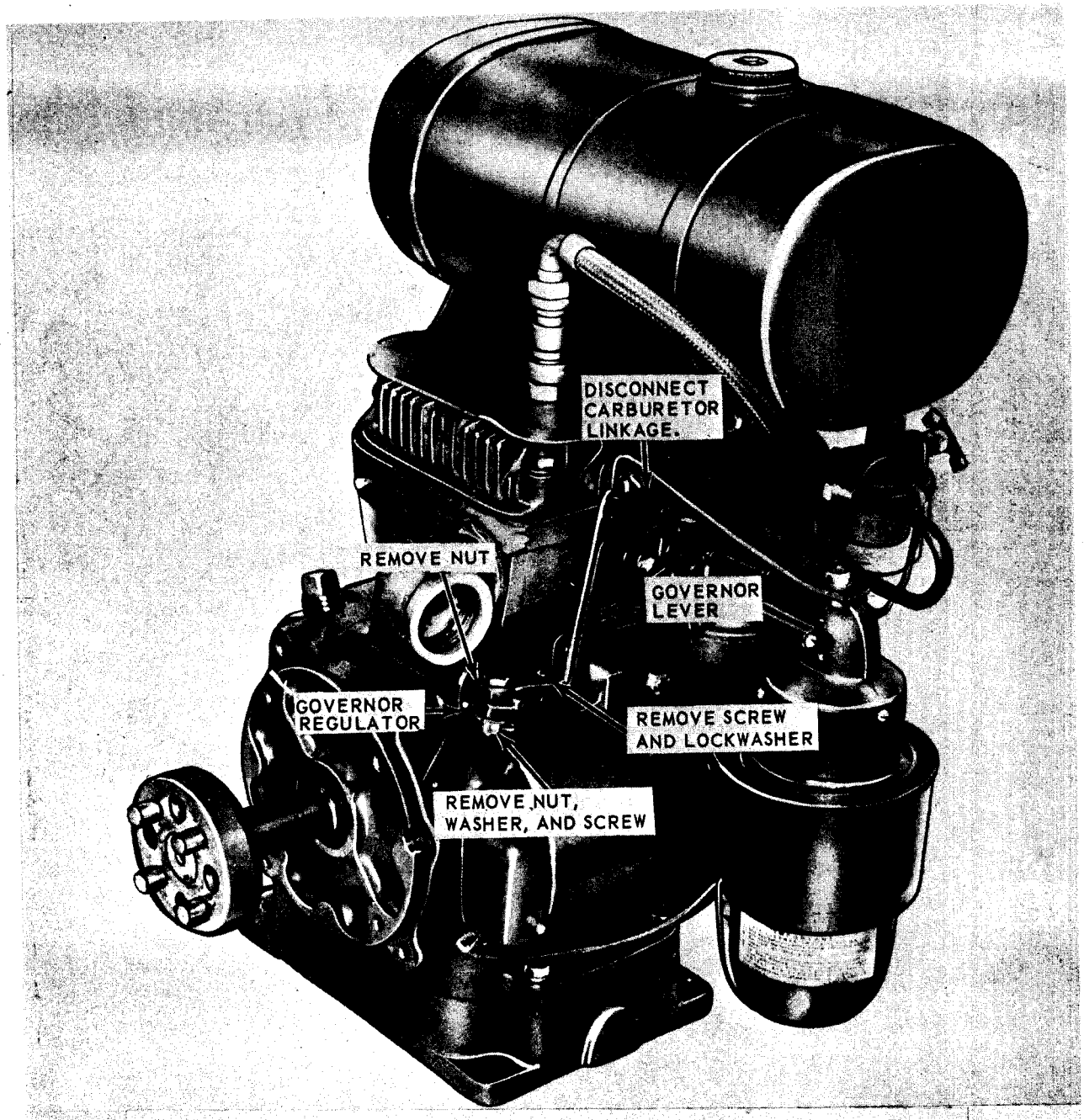


Figure 4-7. Governor regulator lever, removal and installation.

Section VII. EXHAUST MUFFLER AND ENGINE COOLING SYSTEM

4-9. General

A combination fan and flywheel forces air through the flywheel housing to circulate around the cylinder and cylinder head. Engine baffle plates attached to the flywheel housing are provided to direct the flow of air. The exhaust muffler is mounted on the cylinder-crankcase.

4-10. Exhaust Muffler

a. Removal. Refer to figure 4-8 and remove the exhaust muffler.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, dents, leaks, and other damage.

(3) Replace a damaged or defective exhaust muffler.

c. Installation. Refer to figure 4-8 and install the exhaust muffler.

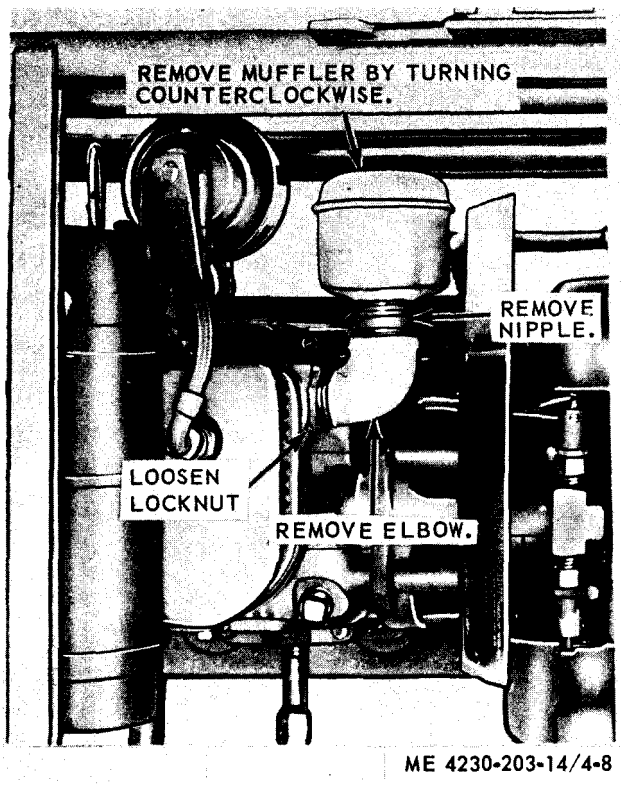


Figure 4-8. Exhaust muffler.

4-11. Flywheel Housing, Screen, and Baffles

a. Removal.

(1) Remove the fuel tank and bracket (para 4-6).

(2) Refer to figure 4-9 and remove the flywheel housing, screen, and baffles.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective flywheel housing, screen, and baffle.

c. Installation.

(1) Refer to figure 4-9 and install the flywheel, screen, and baffles.

(2) Install the fuel tank and bracket (para 4-6).

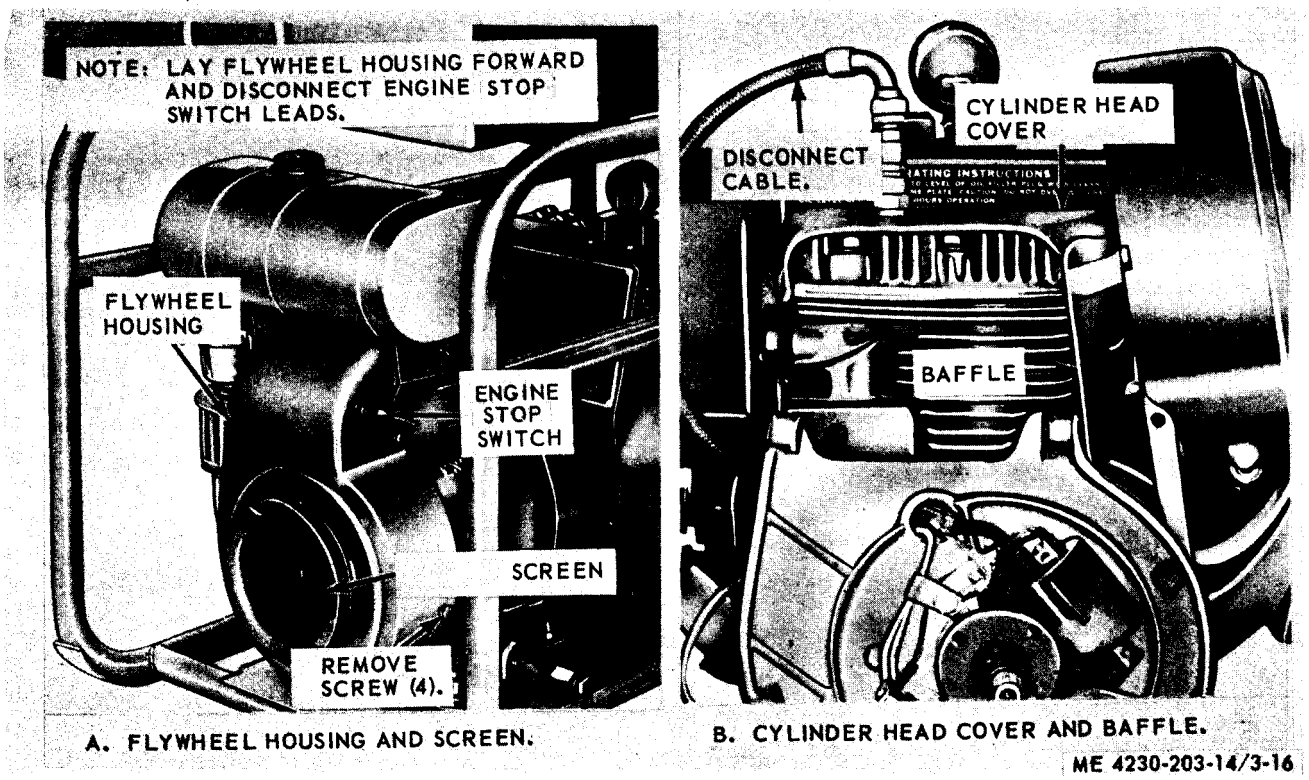


Figure 4-9. Flywheel housing, screen, and baffles, removal and installation.

Section VIII. MAINTENANCE OF THE ENGINE

4-12. General

Organizational maintenance of the engine consist of replacing the rope starting pulley, flywheel, and cylinder head. The flywheel is mounted on the front end of the crankshaft. It is a combination fan and flywheel and, like the cylinder head, acts as an integral part of the engine cooling system. The pulley, located on the front of the engine, secures the flywheel to the crankshaft and is slotted to facilitate starting of the engine with a rope.

4-13. Instruction Mounting Plate

a. Removal. Refer to figure 4-10 and remove the instruction mounting plate.

b. Installation. Installation of the plate is reverse procedure of removal, *a* above.

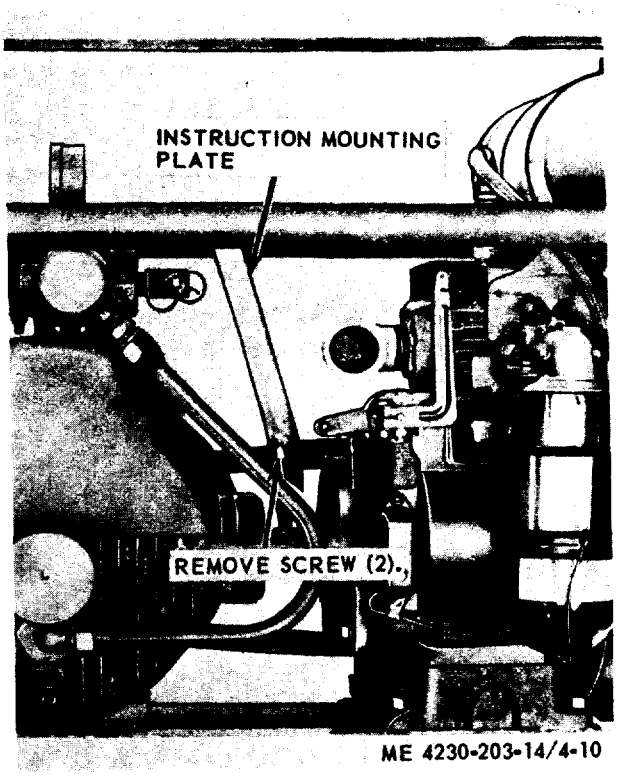


Figure 4-10. Instruction mounting plate, removal and installation.

4-14. Engine

a. Removal. **Refer to figure 4-11 and remove the engine.**

b. Installation. **Refer to figure 4-16 and install the engine.**

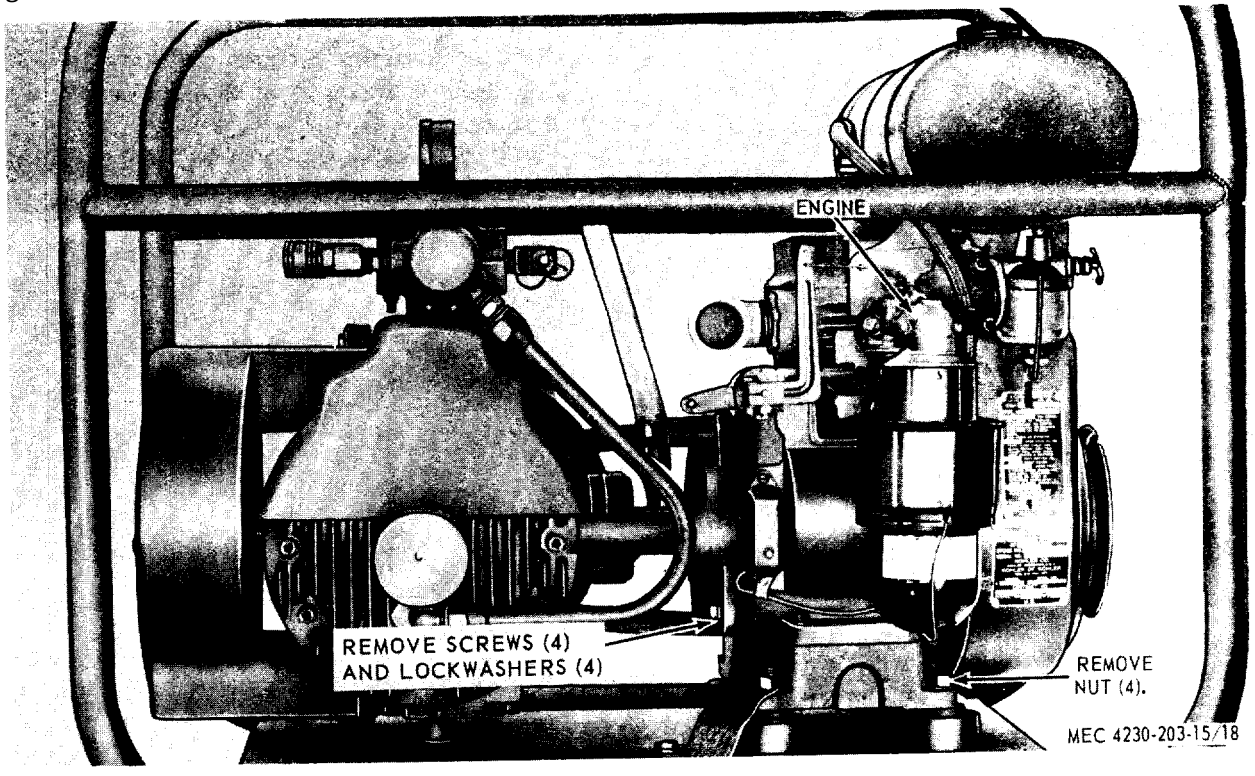


Figure 4-11. Engine removal and installation.

4-15. Oil Fill Plug and Gage and Drain

a. ***Removal.*** Refer to figure 4-12 and remove the oil fill plug and gage and oil drain.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective oil fill plug and gage and oil drain.

c. ***Installation.*** Refer to figure 4-12 and install the oil fill plug and gage and oil drain.

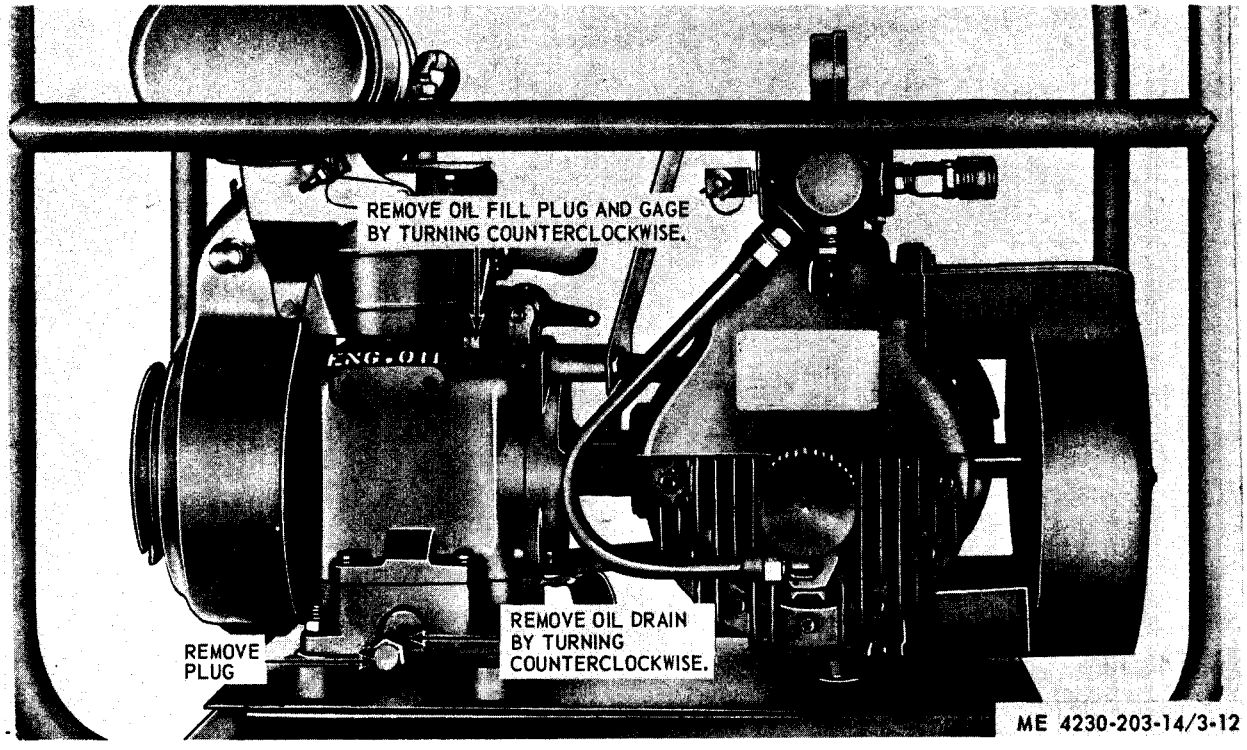


Figure 4-12. Oil fill plug and gage and drain.

4-16. Valve Cover and Breather

u. ***Removal.*** Refer to figure 4-13 and remove the valve cover and breather.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective valve cover and breather.

c. Installation. Refer to figure 4-13 and install the valve cover and breather.

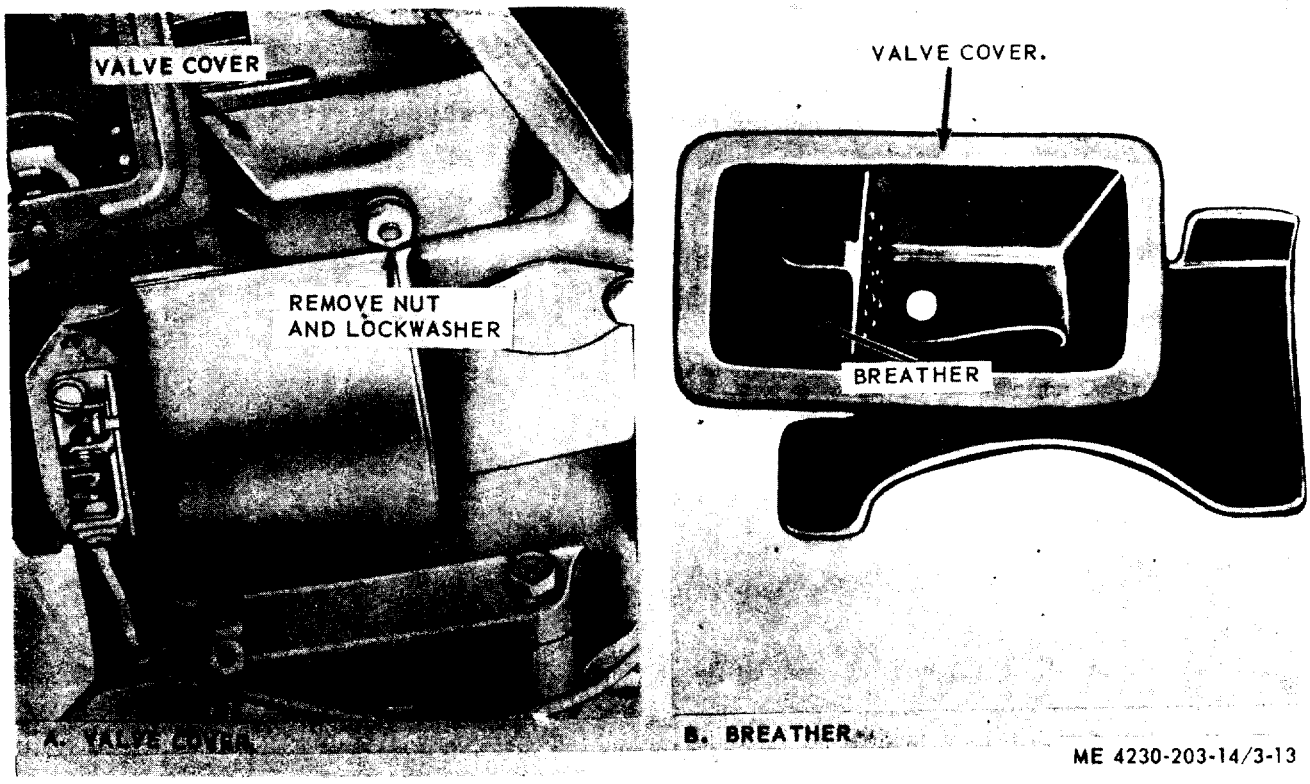


Figure 4-13. Valve cover and breather, removal and installation

4-17. Rope Starting Pulley

a. Removal. Remove the engine shroud screen and refer to figure 4-14 and remove the rope starting pulley.

b. Cleaning and Inspection.

(1) Clean the pulley with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective rope starting pulley.

c. *Installation.* Reverse procedure a and install the rope starting pulley. Torque the nut to 75 ft-lb. Install the screen.

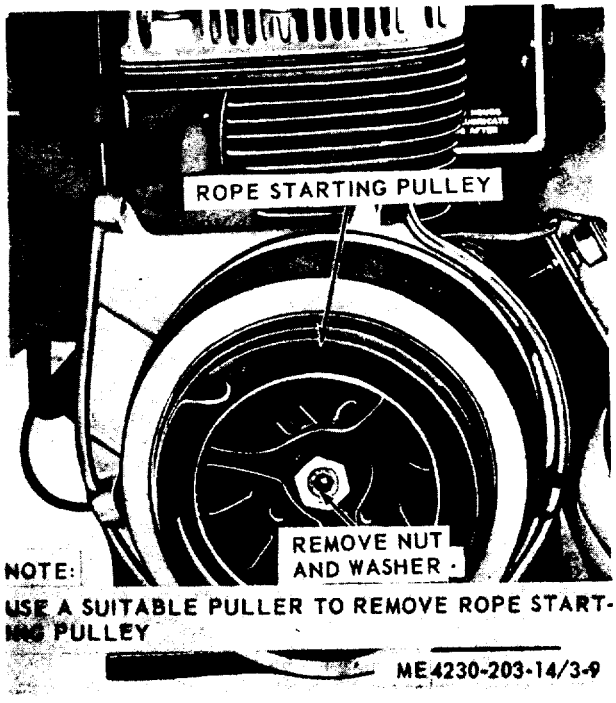


Figure 4-14. *Rope starting pulley, removal and installation*

4-18. Flywheel

a. Removal.

(1) Remove the rope starting pulley (para 4-17).

(2) Remove the flywheel housing and baffles (para 4-11).

(3) Refer to figure 4-15 and remove the flywheel.

b. Cleaning and Inspection.

(1) Clean the flywheel with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective flywheel.

c. ***Installation.***

(1) Install the flywheel.

(2) Install the flywheel housing and baffles (para 4-11).

(3) Install the rope starting pulley (para 4-17).

4-19. Cylinder Head

a. Removal.

(1) Remove the spark plug.

(2) Remove the flywheel housing and baffles (para 4-11).

(3) Refer to figure 4-16) and remove the cylinder head and gasket.

b. ***Cleaning and Inspection.***

(1) Clean the head with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace the gasket. Replace a damaged or defective cylinder head.

c. Installation.

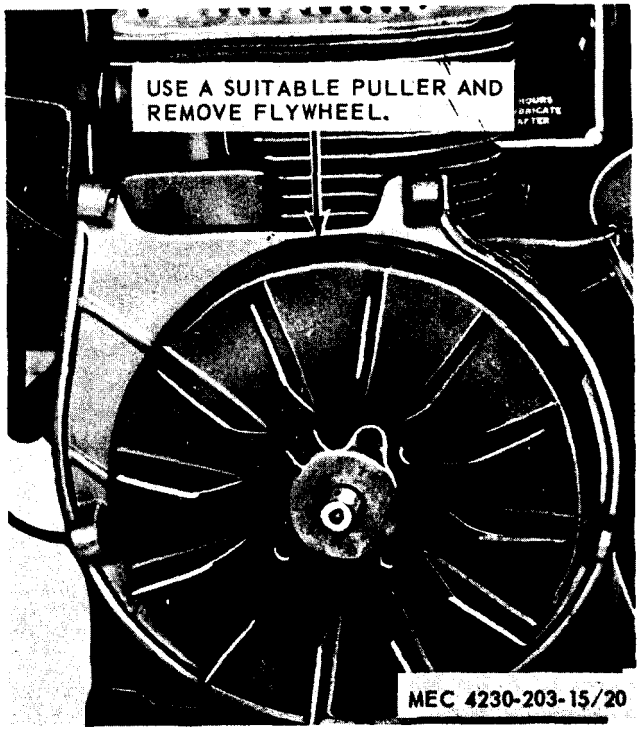


Figure 4-15. Flywheel removal and installation.

(1) Refer to figure 4-16 and install the cylinder head and gasket. Torque capscrews to 15 ft-lb.

(2) Install the flywheel housing and baffles (para 4-11).

(3) Install the spark plug.

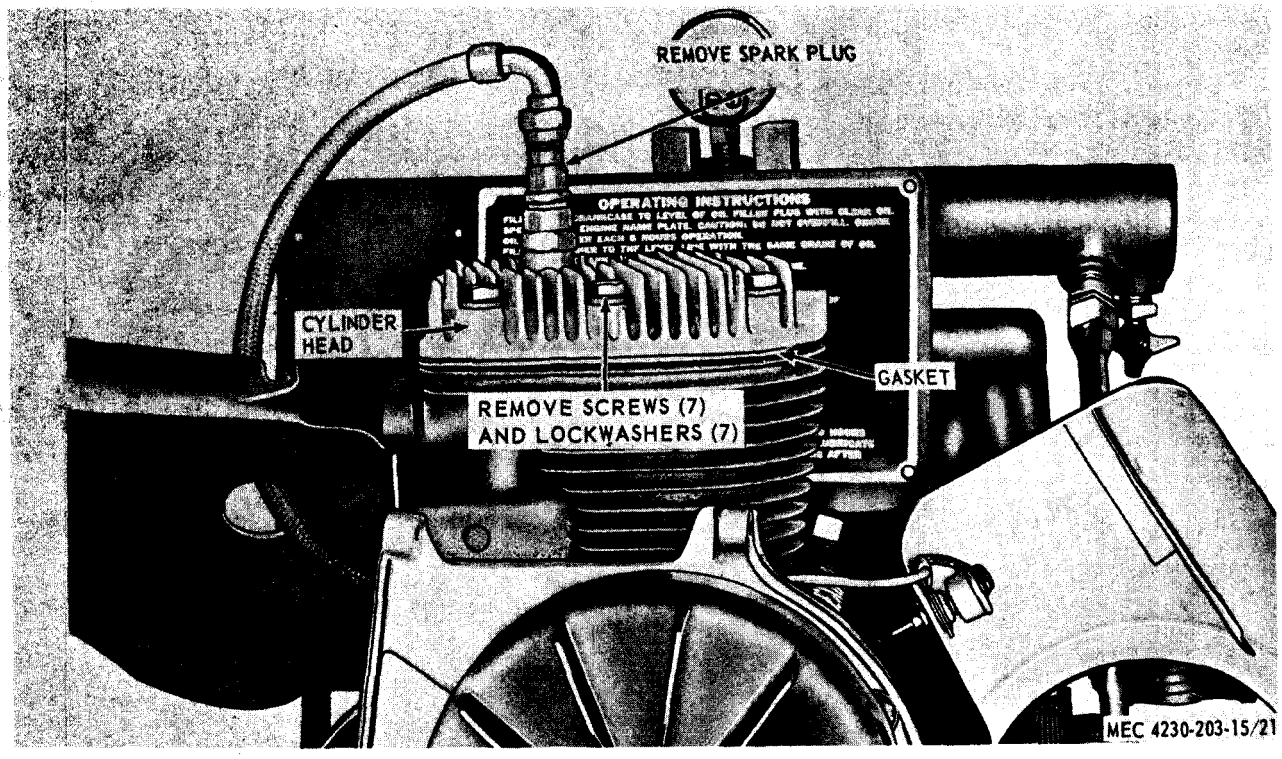


Figure 4-16. Cylinder head, removal and installation.

4-20. Oil Pan

a. ***Removal.***

(1) Remove the engine (para ***4-14).***

(2) Refer to figure ***4-17*** and remove the oil pan and gasket.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective oil base.

c. Installation.

(1) Refer to figure 4-17 and install the oil pan and gasket.

(2) Install the engine (para 4-14).

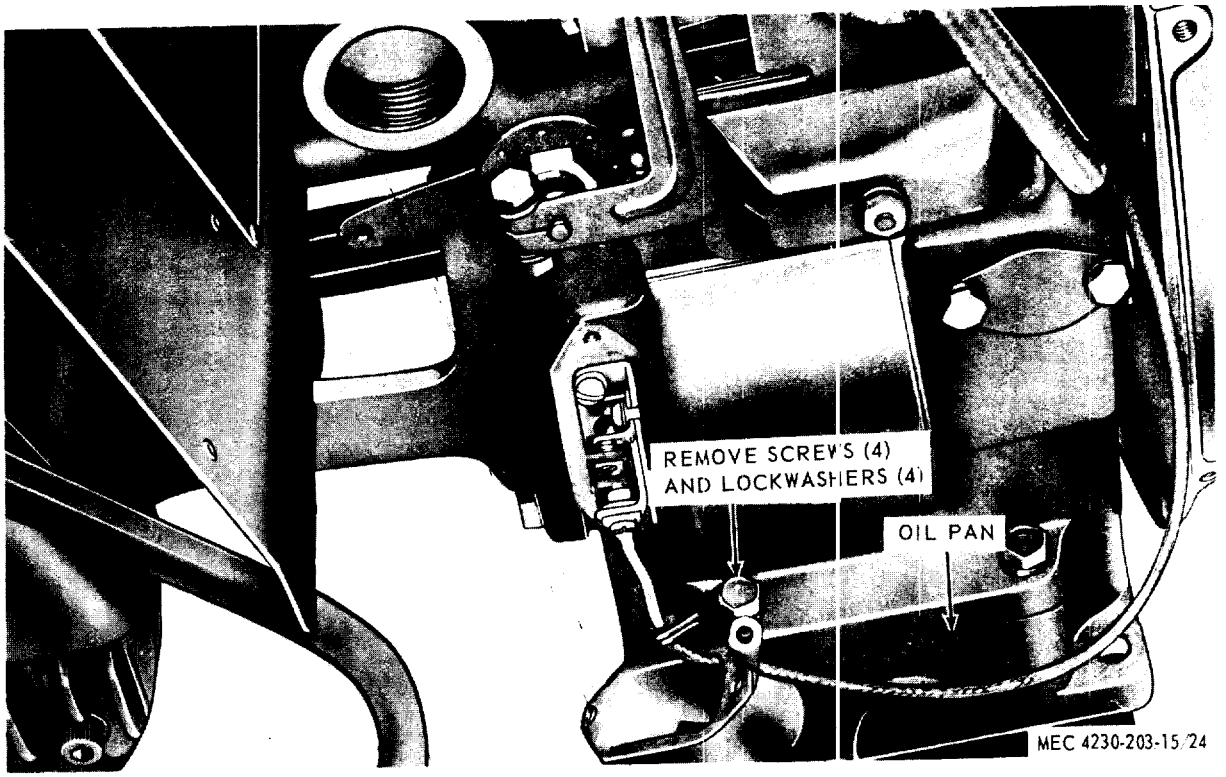


Figure 4-17. Oil pan removal and installation.

Section IX. IGNITION SYSTEM

4-21. General

The ignition system consists of a stop switch, high-tension magneto, spark plug, and cable. This section contains information on the maintenance of these components.

4-22. Spark Plug

a. Removal. Refer to figure 4-18 and remove the spark plug.

b. Cleaning and Inspection.

(1) Clean the spark plug on a spark plug cleaner. Clean the cable with a cloth dampened with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, damaged or burned electrodes, and other damage.

(3) Replace a damaged or defective sparkplug.

c. Gap Adjustment. Set the spark plug gap 0.028 - to 0.033-inch.

d. Installation. Refer to figure 4-18 and install the spark plug.

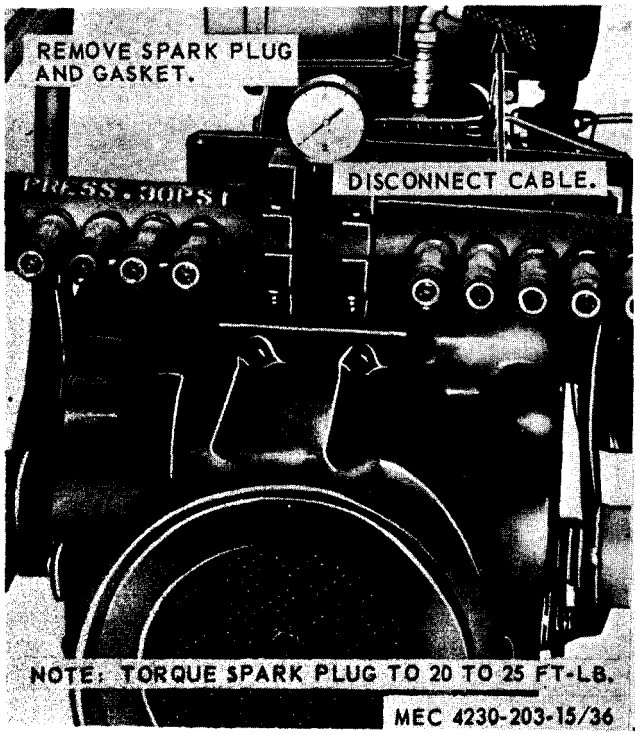


Figure 4-18. Spark plug, removal and installation.

4-23. Contact Points

a. Removal. Refer to figure 4-19 and remove the contact points.

b. Cleaning and Inspection.

(1) Clean all parts with dry compressed air.

(2) Inspect for pitted or burned contacts and other damage.

(3) Replace damaged or defective contact points.

c. Installation. Refer to figure *4-19* and install the contact points.

d. Contact Adjustment. Refer to figure 4-19 and adjust the contact points.

e. Timing. Refer to figure 4-20 and time the engine.

WARNING

Remove the ignition cable from the spark plug before making adjustments or before performing maintenance operations which require turning the engine over by hand.

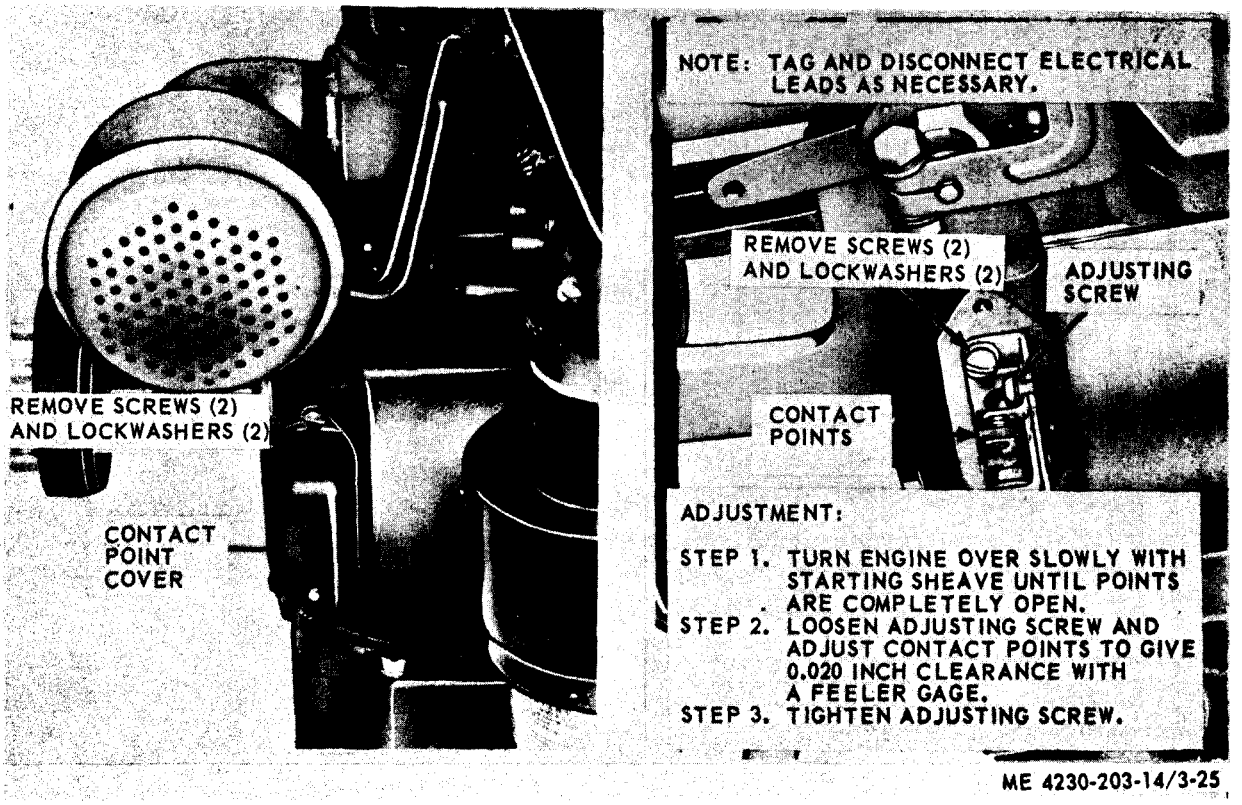


Figure 4-19. Contact points, removal installation, and adjustment.

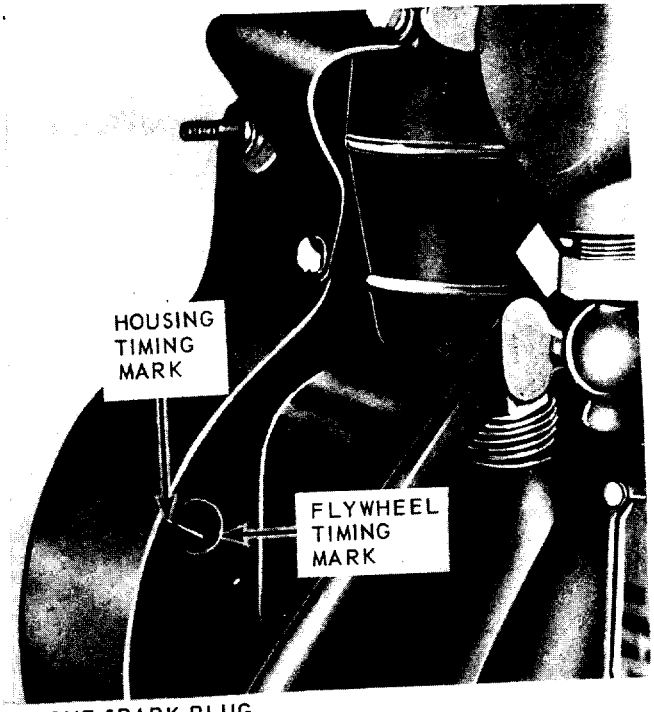


Figure 4-20. Engine timing.

4-24. Engine Stop Switch

a. Removal.

(1) Remove the flywheel housing (para 4-11).

(2) Refer to figure 4-21 and remove the engine stop switch.

b. Cleaning and inspection.

(1) Clean the switch with a clean, dry, lint-free cloth.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective switch.

c. Installation.

(1) Refer to figure 4-21 and install the switch.

(2) Install the flywheel housing (para 4-11).

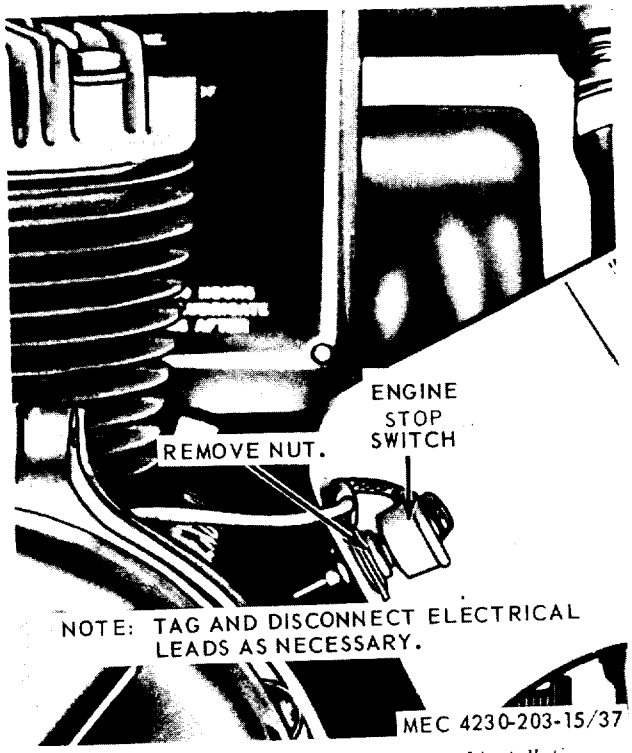


Figure 4-21. Engine stop switch, removal and installation.

4-25. Magneto

a. Magneto Spark Ignition Testing. Refer to figure 4-22 and test the magneto ignition spark.

b. Removal.

(1) Remove the flywheel housing (para 4-11),

(2) Refer to figure 4-23 and remove the magneto.

c. *Cleaning and Inspection.*

(1) Clean the parts with dry, compressed air.

(2) Inspect for cracks, breaks, deterioration, and other damage.

(3) Replace a damaged or defective part.

d. Installation.

(1) Refer to figure 4-23 and install the magneto.

(2) Install the flywheel housing (para 4-11).

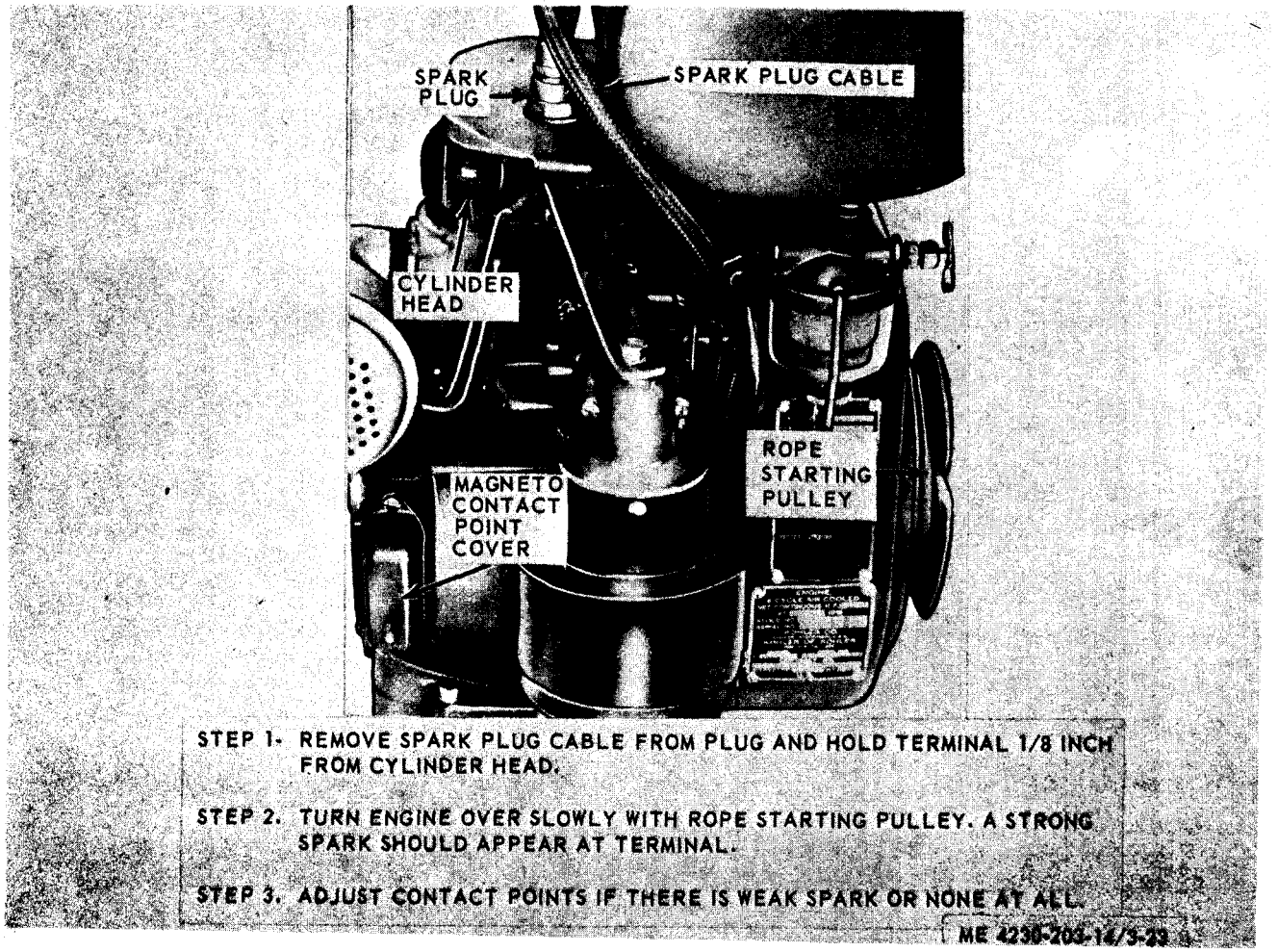


Figure 4-22. Testing magneto ignition spark.

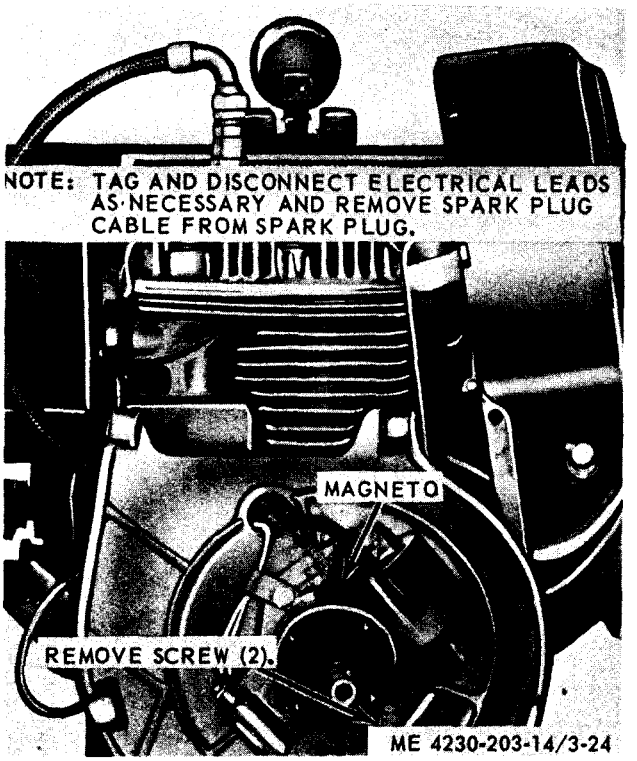


Figure 4-23. Magneto removal and installation.

Section X. AIR COMPRESSOR

4-26. General

The air compressor is a direct drive, twin-diaphragm, air-seal type. The blower scroll and screen, which cover the blower wheel and blower shroud, cools the air compressor when the unit is operating. The two air cleaners filter the air entering the air compressor. On the outward or compression stroke, the inlet valves close and the air trapped between the diaphragm and compressor head is compressed and then forced through the outlet valve in the head and into the manifold.

4-27. Air Pressure Gage

a. Removal. Refer to figure **4-24** and remove the air pressure gage.

b. Cleaning and Inspection.

(1) Clean the gage with a clean, dry cloth.

(2) Inspect the gage for cracks, breaks, cracked or broken glass, and other damage.

(3) Replace a damaged or defective air pressure gage.

c. ***Installation.*** Refer to figure **4-24** and install the air pressure gage.

Figure 4-24. Air pressure gage removal and installation.

4-28. Pop-off Relief Valve

a. Removal Refer to figure 4-25 and remove the pop-off relief valve. Model CDR 70000 has two (2) relief valves, model CDR **70000B** has one (1) relief **valve.**

b. Cleaning and Inspection.

(1) Clean the valve with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective pop-off relief valve.

c. ***Installation.*** Refer to figure 4-25 and install the pop-off relief valve.

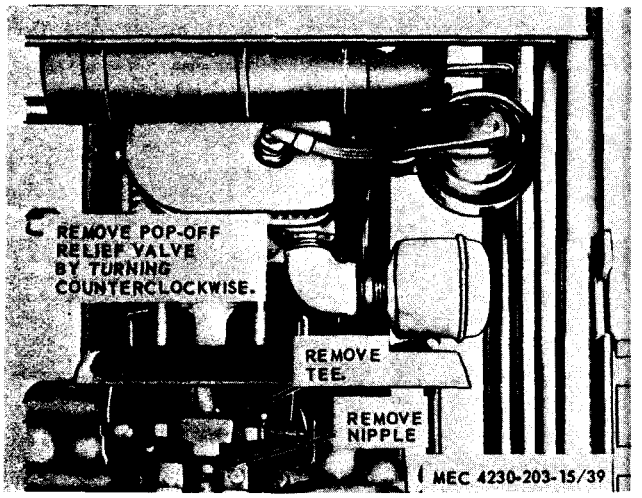


Figure 4-.25. Pop-off relief valve, removal and installation.

4-29. Compressor Air Cleaners

a. Removal. Refer to figure 4-26 and remove the compressor air cleaners.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for tears, breaks, and other damage.

(3) Replace a damaged or defective compressor air cleaner.

c. ***Installation.*** Refer to figure 4-26 and install the compressor air cleaners.

4-30. Blower Wheel

a. Removal.

(1) Remove the blower screen.

(2) Refer to figure 4-27 and remove the blower wheel.

b. (Waning and Inspection.

(1) Clean the wheel with solvent and dry thoroughly.

(2) Inspect **for** cracks, breaks, bent fins, and other damage.

(3) Replace a damaged or defective blower wheel. Tighten **capscrew** to 35-40 **ft-lb.**

c. Installation.

(1) Refer to figure 4-27 and install the blower wheel.

(2) Install the blower screen.

Figure 4-26. Compressor air cleaner, removal and installation.

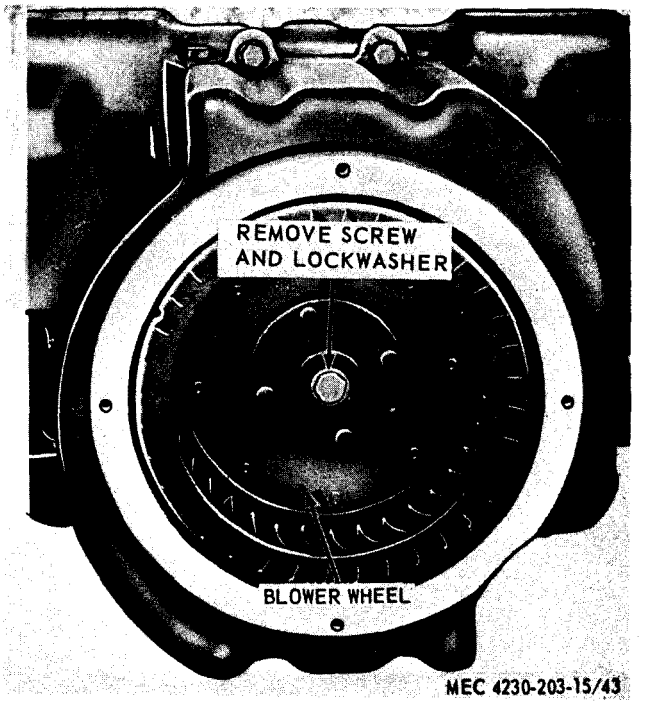


Figure 4-27. Blower wheel removal and installation.

4-31. Blower Scroll

a. Removal. Refer to figure 4-28 and remove the blower screen. Remove blower wheel (para 4-30) and remove scroll.

WARNING

Do not remove the blower screen to perform maintenance while the unit is operating.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, broken or damaged mesh, and other damage.

(3) Rqlace a damaged or defective blower scroll and screen.

c. *Installation.* Installation if reverse of removal, a above.

4-32. Counterbalance

a. Removal.

(1) Remove the blower scroll (para 4-31).

(2) Refer to figure 4-29 and remove the counterbalance.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, damaged threaded areas, and other damage.

(3) Replace a damaged or defective counterbalance.

c. *Installation.*

(1) Refer to figure 4-29 and install the counterbalance. It must be installed in the same position from which removed.

(2) Install the blower scroll. (para 4-31).

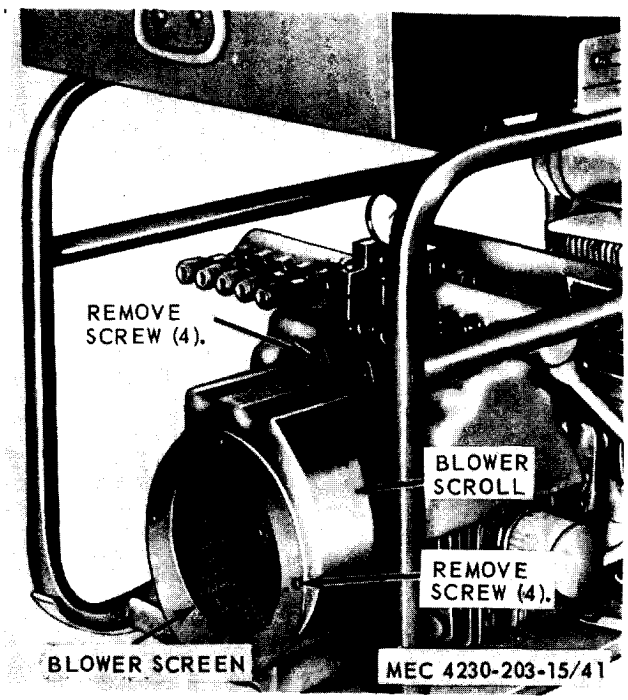


Figure 4-28. Blower .scroll and screen, removal and installation.

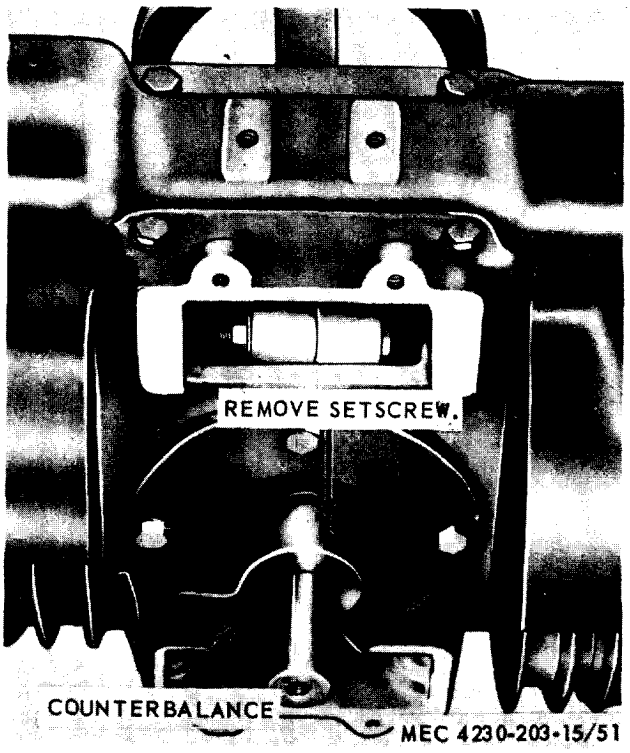


Figure 4-29. Counterbalance, removal and installation.

4-33. Manifold

a. Removal.

(1) Remove the pop-off relief valve (para *4-28).*

(2) Remove the air pressure gage *(fig. 4-24).*

(3) Refer to figure *4-30* and remove the manifold, clamps, brackets, and connectors. On model CDR 70000B the blower shroud must also be removed to perform this operation (fig. 4-30 *(2)*).

b. ***Cleaning and Inspection.***

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, damaged threads, and other damage.

(3) Replace a damaged or defective manifold, clamp, bracket, and connector.

c. ***Installation.***

(1) Refer to figure 4-30 and install the manifold, clamps, bracket, and connectors.

(2) Install the air pressure gage.

(3) Install the pop-off relief valve (para 4-28).

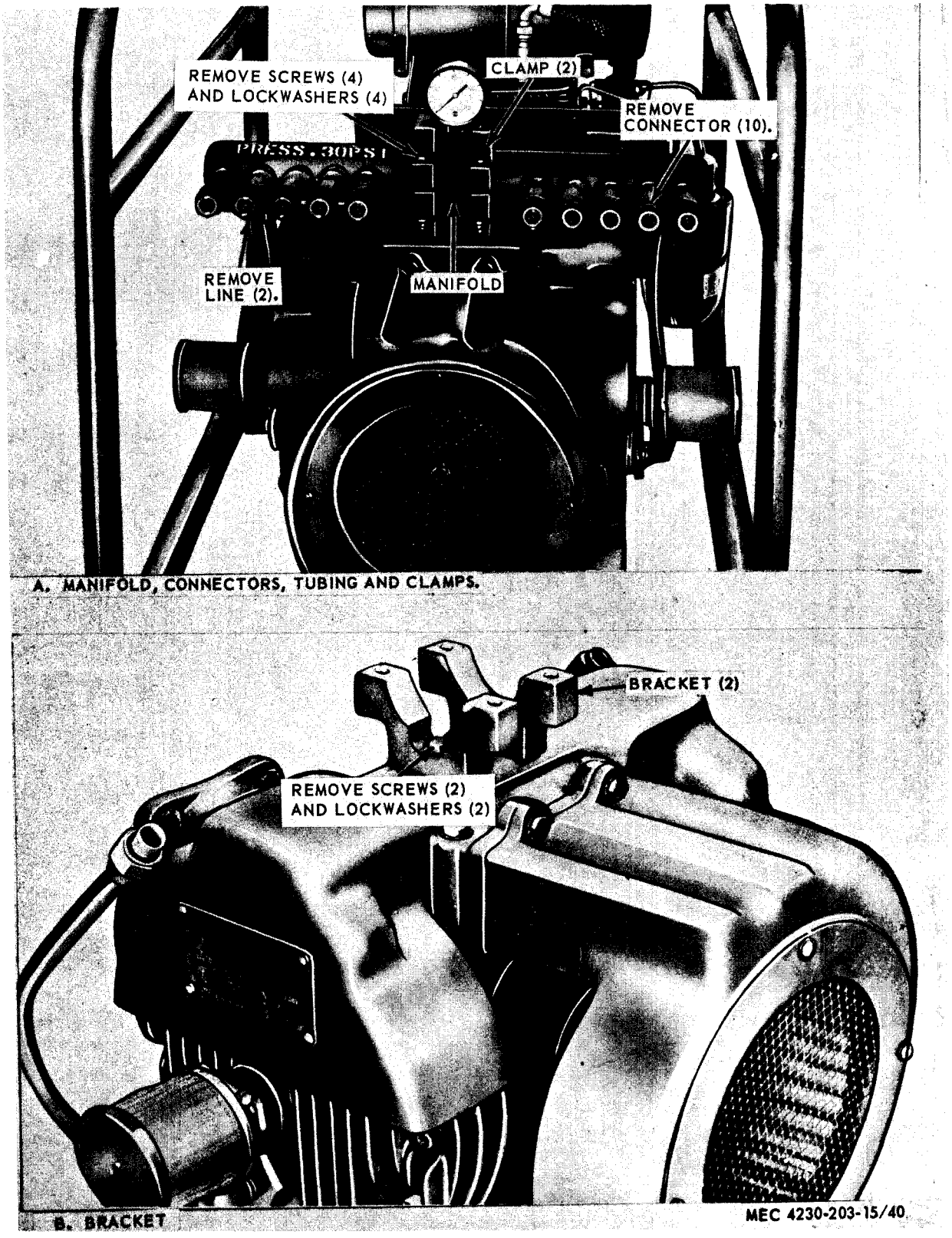


Figure *4-30. Manifold (model CDR 70000) removal and installation. (Sheet 1 of 2).*

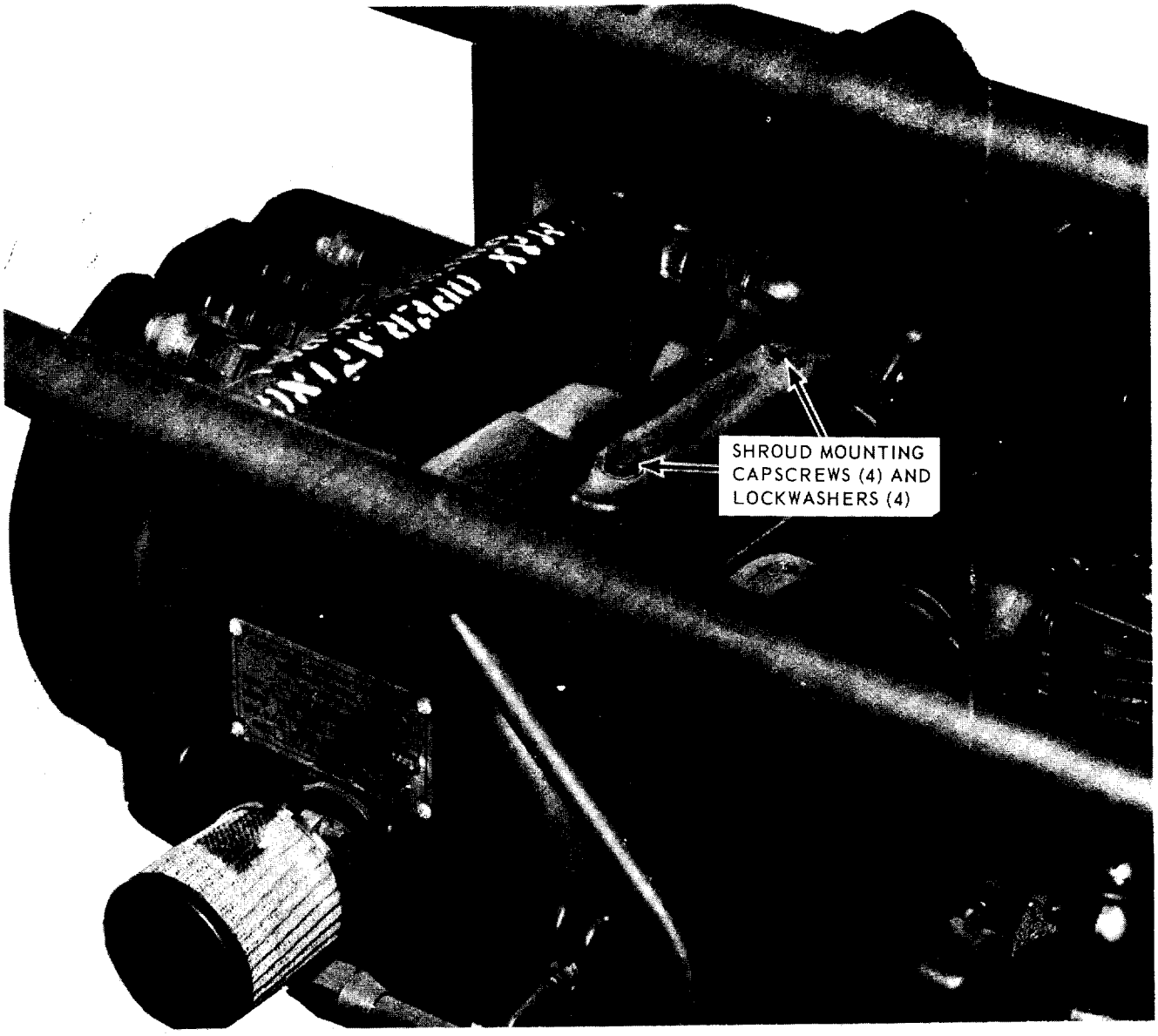


Figure 4-30. Manifold (model CDR 70000B) removal and installation (sheet 2 of 2).

4-34. Blower Shroud (Model CDR 70000)

a. Removal.

(1) Remove the blower scroll and screen (para 4-31).

(2) Remove the manifold, clamps, bracket, tubing, and connectors (para 4-33).

(3) Refer to figure 4-31 and remove the blower shroud.

b. Cleaning and Inspection.

(1) Clean the shroud with solvent and dry thoroughly .

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective blower shroud.

c. Installation.

(1) Refer to figure 4-31 and install the blower shroud.

(2) Install the manifold, clamps, bracket, tubing and connectors (para 4-33).

(3) Install the blower scroll and screen (para 4-31).

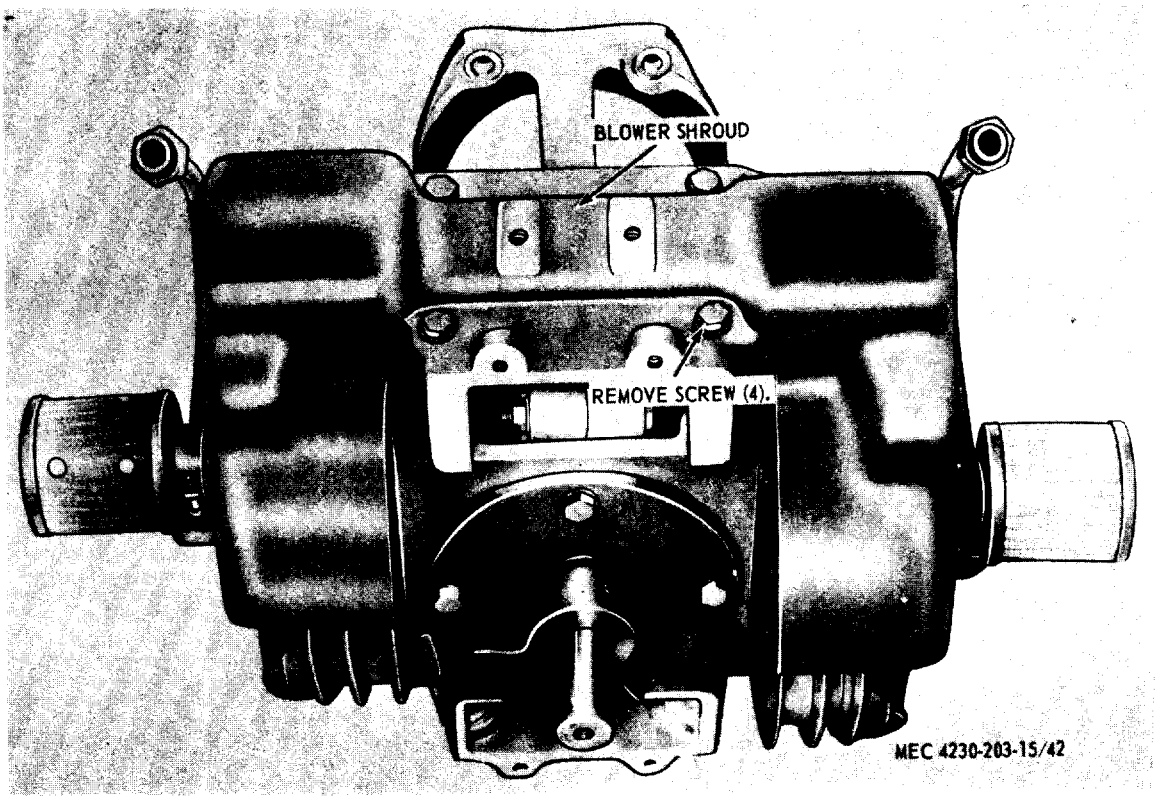


Figure 4-31. Blower shroud removal and installation.

4-35. Compressor Outlet Valve

a. Removal.

(1) Remove the manifold tubing.

(2) Refer to figure 4-32 and remove the compressor outlet valve.

b. Disassembly. Refer to figure 4-33 and disassemble the compressor outlet valve.

c. *Cleaning, Inspection, and Repair.*

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, spring distortion, and other damage.

(3) Rplace a damaged or defective part.

d. Reassembly. Refer to figure 4-33 and reassemble the compressor outlet valve.

e. *Installation.*

(1) Refer to figure 4-32 and install the compressor outlet valve.

(2) Install the manifold tubing.

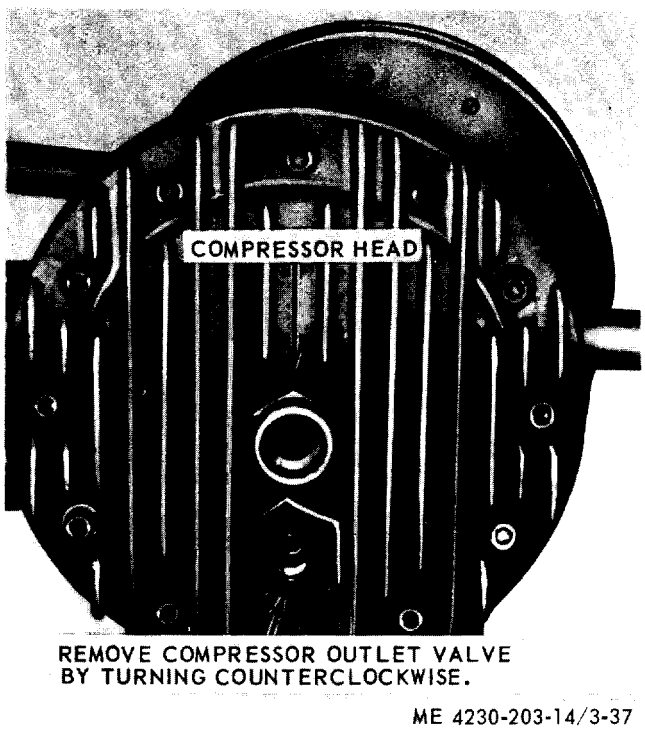
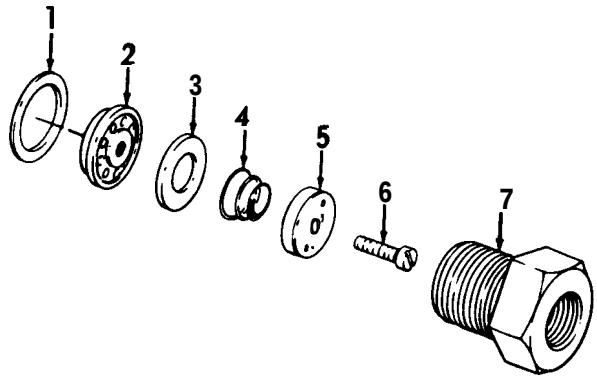


Figure 4-32. Compressor outlet valve removal and installation.



1 Gasket
2. Body
3 Disk
4 Spring
5 Guide
6 Screw
7 Valve retainer

Figure 4-.%9. Compressor *outlet valve, exploded view.*

4-36. Compressor Heads

a. Removal

(1) Remove the manifold tubing.

(2) Remove the blower shroud (**para** 4-34).

(3) Remove the compressor air cleaners.

(4) Remove the outlet valves (**para** 4-35).

(5) Refer to figure 4-34 and remove the compressor heads.

NOTE

On some assemblies, shims are added between compressor head and housing. These shims must bereinstalled on the same cylinder from which removed to insure working clearance between piston and compressor head.

b. Cleaning and Inspection.

(1) Clean the heads with solvent and dry thoroughly.

(2) Inspect the heads for cracks, breaks, wear, scoring, and other damage.

\ (3) Replace a damaged or defective compressor head.

c. ***Installation.***

(1) Refer to figure 4-34 and install the compressor heads and shims if applicable.

(2) Install the outlet valves (para 4-35).

(3) Install the compressor air cleaners.

(4) Install the blower shroud (para 4-34).

(5) Install the manifold tubing.

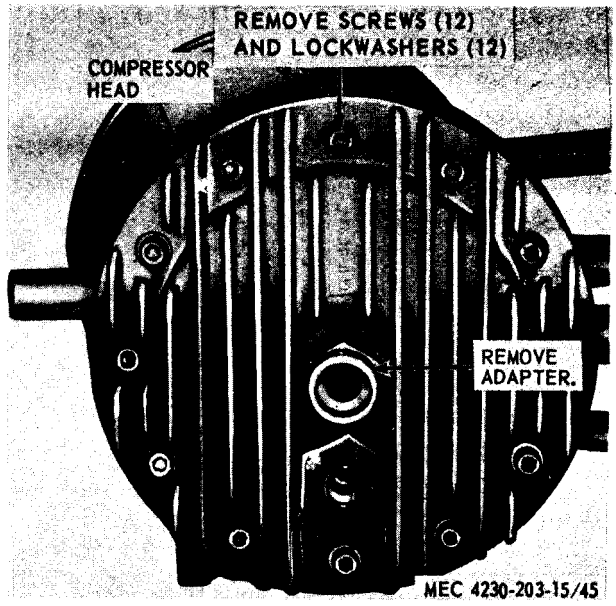


Figure* 4-34. Compressor *heads removal and installation.

4-37. Compressor Inlet Valve

a. Removal.

(1) Remove the compressor heads (**para** 4-36).

(2) Refer to figure 4-35 and remove the compressor inlet valve.

b. Cleaning and Inspection

(1) Clean the valve with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, wear, and other damage.

(3) Replace a damaged or defective compressor inlet valve.

c. ***Ins tallation.***

(1) Refer to figure 4-35 and install the compressor inlet valve.

(2) Install the compressor heads (**para** 4-36).

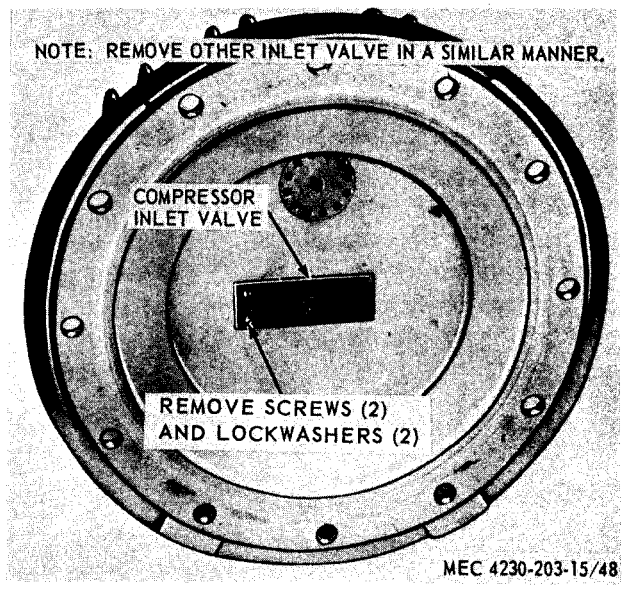


Figure* 4-35. *Compressor inlet valve removal and installation.

4-38. Compressor Diaphragms and Retaining Plates

a. Removal.

(1) Remove the compressor heads (para 4-36).

(2) Refer to figure 4-36 and remove the compressor diaphragms and retaining plates.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks,. wear, and other damage.

(3) Replace a damaged or defective compressor diaphragm and retaining plate.

c. Installation.

(1) Refer to figure 4-36 and install the compressor diaphragms and retaining plates.

(2) Install the compressor heads (para 4-36).

4-39. Air Compressor

a. Removal. Refer to figure 4-37 and remove the air compressor.

b. Installation. Refer to figure 4-37 and install the air compressor.

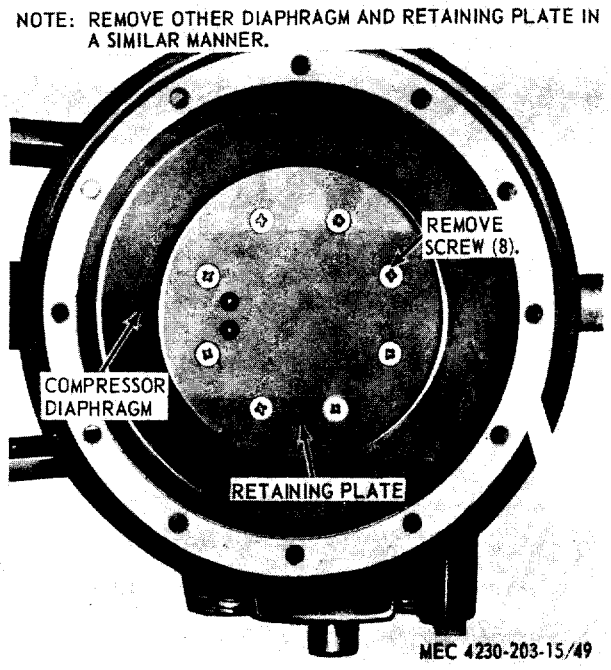


Figure 4-36. ***Compressor diaphragms and retaining plates removal and installation.***

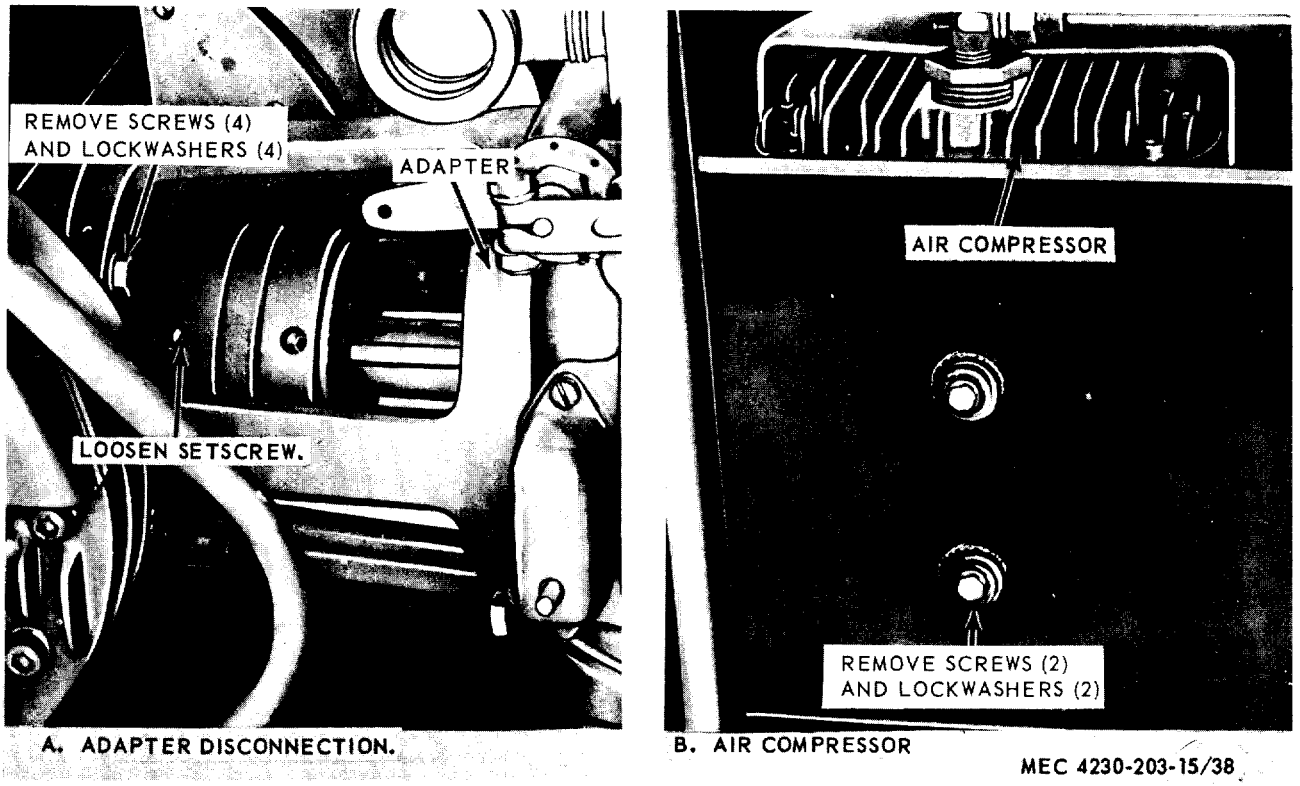


Figure 4-37. Air compressor removal and installation.

4-40. Coupling and Adapter

a. Removal.

(1) Remove the compressor (para 4-39).

(2) Refer to figure 4-38 and remove the coupling and adapter.

b. Cleaning and Inspection.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective coupling and adapter.

c. *Installation.*

(1) Refer to figure 4-38 and install the coupling and adapter.

(2) Install the compressor (para 4-39).

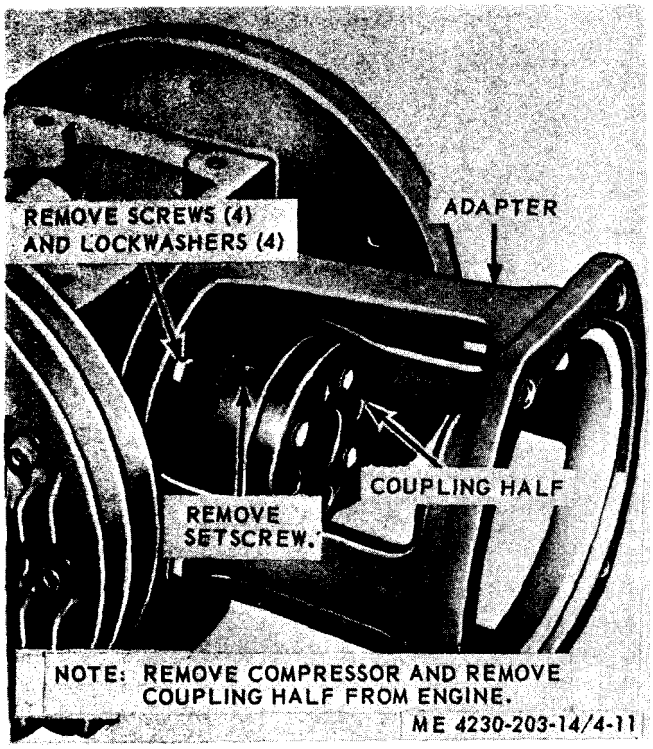


Figure 4-38. Coupling and adapter removal and installation.

4-41. Frame

a. Removal.

(1) Remove the engine (para 4-14).

(2) Remove the air compressor (para 4-39).

b. Cleaning and Inspection.

(1) Clean the frame with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, broken welds, and other damage.

(3) Replace a damaged frame.

c. *Installation.*

(1) Install the air compressor (para 4-39).

(2) Install the engine (para 4-14).

Section XL FUMIGATION COMPONENTS

4-42. General

This section contains information on the maintenance of the dusting guns and the hose assemblies.

4-43. Hose Assemblies

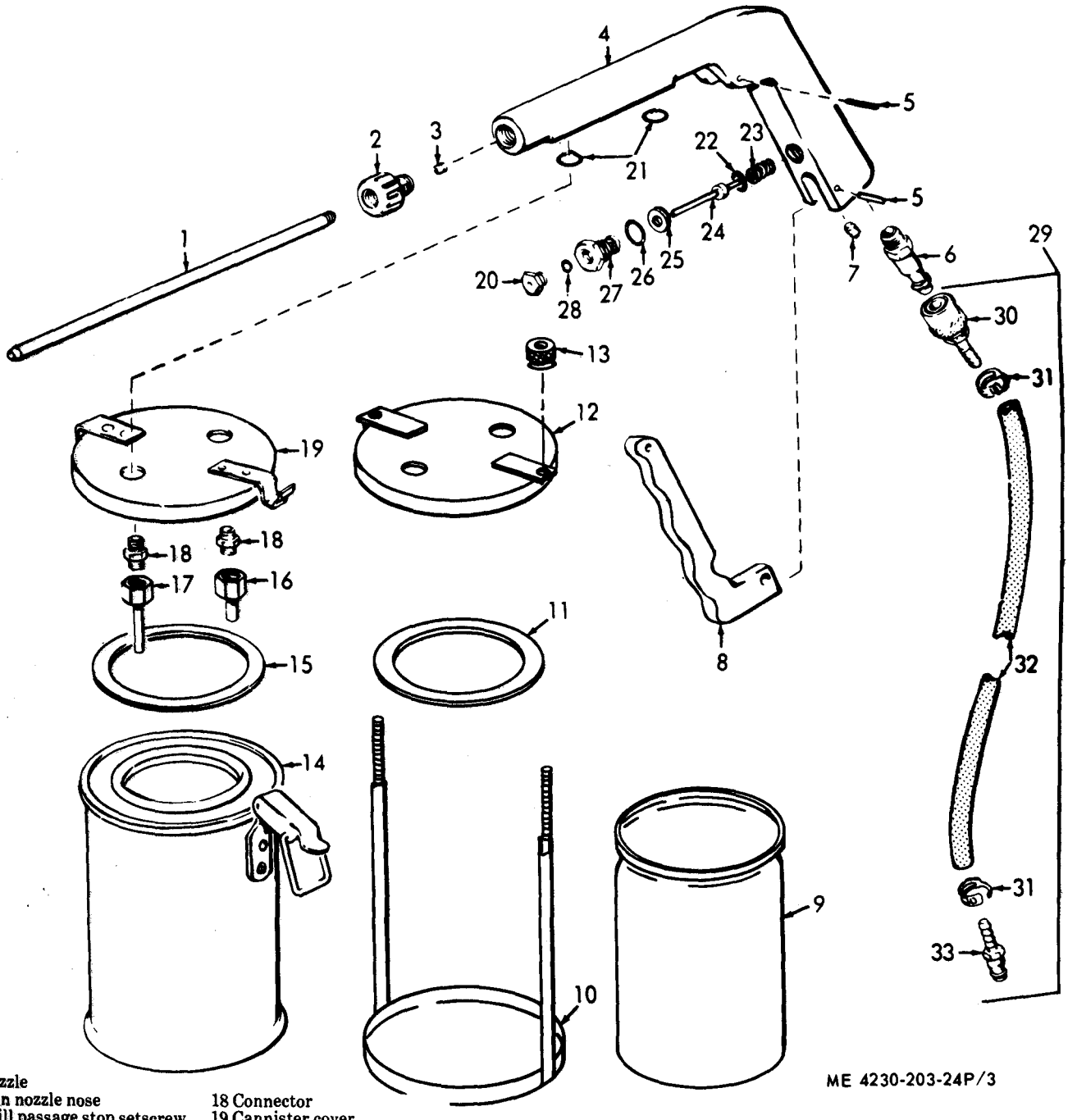
a. Disassembly. Open the hose clamps (31, fig. 4-39) and slide the hose ends from the quick-disconnect coupling (30) and the nipple (33).

b. Assembly.

(1) Cut a piece of hose 25 feet long from bulk stock.

(2) Slide hose clamps over ends of hose.

(3) Insert ends of hose over connector ends of quick-disconnect and nipple. Tighten hose clamps securely over connector ends.



1 Nozzle
2 Gun nozzle nose
3 Drill passage stop setscrew
4 Handle
5 Trigger pin
6 Nipple
7 Valve retaining setscrew
8 Trigger
9 Container
10 Container mounting strap
11 Cover gasket
12 Container cover
13 Knurled nut
14 Cannister
15 Cannister cover gasket
16 Inlet tube assembly
17 Outlet tube assembly
18 Connector
19 Cannister cover
20 Valve cap
21 "O" ring
22 "O" ring
23 Valve spring
24 Valve stem
25 "O" ring
26 "O" ring
27 Valve body
28 "O" ring
29 Hose assembly
30 Quick-disconnect coupler
31 Hose clamp
32 Hose
33 Nipple

Figure 4-39. Dusting gun and hose assemblies.

4-44. Dusting Gun

There are two types of canisters used with the dusting guns. One type (14, fig. 4-39) has a latch-type fastener for attaching the cannister to the cover (19). The other container (9) is attached to the cover (12) by use of knurled nuts (13) that secure the container mounting strap (10) to the cover.

a. *Disassembly.*

(1) Remove the cannister or container from the cover.

(2) Remove but do not discard the gasket. If the gasket is usable, it may be reused upon assembly.

(3) Unscrew nozzle (1) and nozzle nose (2) from handle (4).

(4) Loosen tube nuts and remove inlet tube assembly (16) and outlet tube assembly (17).

(5) Unscrew connectors (18) and remove the cover and "O rings (21).

(6) Remove roll pin (5) and remove trigger (8) from handle.

(7) Unscrew valve retaining setscrew (7) from handle.

(8) Unscrew valve body (27) and remove "O" ring (26). The valve stem and "O rings (22 and 25) should come out of the handle with the assembly. Remove spring (23) from handle.

(9) Unscrew valve cap (20) from valve body and disassemble valve.

(10) Remove drill passage plug setscrew (3) from handle (part number CFD 70163).

b. Cleaning and Inspection.

(1) Use a round soft bristle brush to clean the air passages in the gun. If dusting powder has become caked in the passages, wash handle with warm water and brush to remove caked powder. Blow dry with compressed air.

(2) Inspect valve stem, cap, and valve for wear. Replace parts if leakage cannot be stopped by installing new "O rings.

(3) Inspect handle for stripped or missing threads, especially in the valve area. Replace handle if threads cannot be repaired.

c. *Assembly* Assemble dusting gun in reverse order of disassembly *a* above. Use new or serviceable "O rings and gaskets. After reassembly apply 25 pounds air pressure to gun and check for leakage past the valve. If leakage occurs, replace "O" rings and tighten valve cap.

CHAPTER 5
DIRECT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, TOOLS, AND EQUIPMENT

No special tools or equipment are required by direct and general support maintenance personnel for maintenance of the delousing outfit. Direct and general support maintenance repair parts are listed and illustrated in TM 10-4230-203-24P.

Section II. TROUBLESHOOTING

This section contains a listing, table 5-1, for trouble-shooting those malfunctions which are within the scope of direct and general support maintenance as allocated by the maintenance allocation chart.

Table 5-2. Troubleshooting

Malfunction	Probable cause	Corrective action
1. Engine hard to start or fails to start.	Compression poor due to defective valves.	Repair or replace valves (para 5-1).
2. Engine misses or runs erratically.	*a.* Governor defective	*a.* Repair governor (para 5-5).
	b. Compression poor due to defective valves or piston rings	*b.* Repair or replace valves (para 5-1) or piston rings (para 5-2).
3. Engine will not idle smoothly.	*a.* Defective valves or springs	*a.* Repair or replace valves or springs (para 5-1).
	b. Worn piston rings or cylinder block	*b.* Replace piston rings (para 5-2) or cylinder block (para 5-6).
4. Engine lacks power	*a.* Defective valves or springs	*a.* Repair or replace valves or springs (para 5-1).
	b. Worn piston rings or cylinder block.	*b.* Replace piston rings (para 5-2) or cylinder block (para 5-6).
5. Engine noisy	*a.* Piston, rings, or piston pin worn	*a.* Replace piston, rings, or piston pin (para 5-2).
	b. Connecting rod or main bearing worn.	*b.* Replace bearing.
6. Engine exhaust smoky	Piston and/or rings defective.	Replace piston and/or rings (para 5-2).
7. Compressor noisy	*a.* Piston bearings worn	*a.* Replace bearing (para 5-9).
	b. Piston worn or defective.	*b.* Replace piston (para 5-9).
	c. Crankshaft bearing defective.	*c.* Replace bearing (para 5-10).
8. Compressor builds up air pressure slowly	Defective piston	Replace piston (para 5-9).
9. Compressor over-heats	Crankshaft bear-ings defective	Rplace bearing (para 5-10).

Section III. ENGINE MAINTENANCE

5-1. Intake and Exhaust Valves

a. Removal

(1) Remove the cylinder head (para 4-19).

(2) Remove the valve inspection cover (para 4-16).

(3) Refer to figure 5-1 and remove the intake and exhaust valves.

b. Cleaning and Inspection.

(1) Clean the valves with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, distortion, and other damage.

(3) Replace a damaged or defective part.

c. Grinding Valves and Seat Inserts.

(1) Using a valve face grinder, reface the valves to an angle of 45°.

(2) Install a pilot of correct size in the valve stem bore of the valve guide. Face the stone on the valve reseating outfit to the angle of 45°. Place the grinder and stone assembly over the pilot in the valve stem bore of the valve guide and grind just enough to make a smooth seat.

(3) Inspect the valve seats for concentricity with a dial indicator.

d. Installation.

(1) Refer to figure 5-1 and install the intake and exhaust valves.

(2) Refer to figure 5-2 and adjust the valves.

(3) Install the valve inspection cover (para 4-16).

(4) Install the cylinder head (para 4-19).

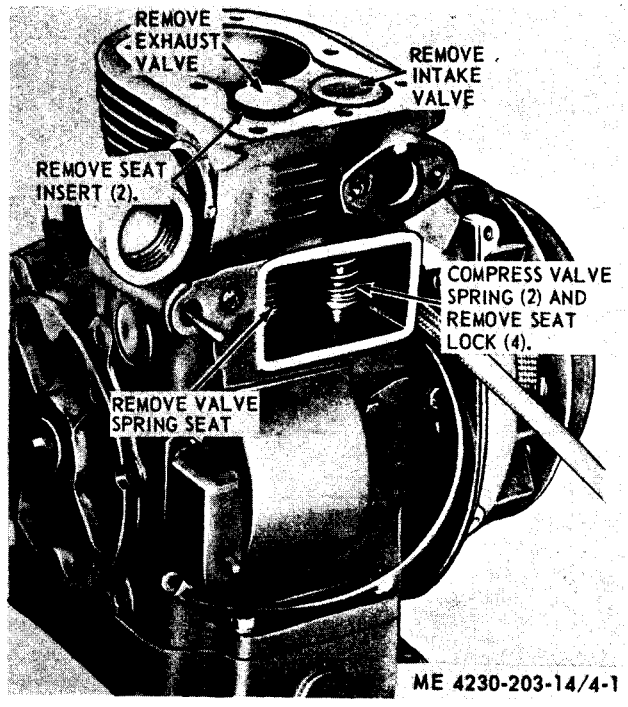


Figure 5-1. Intake and exhaust valves removal and installation.

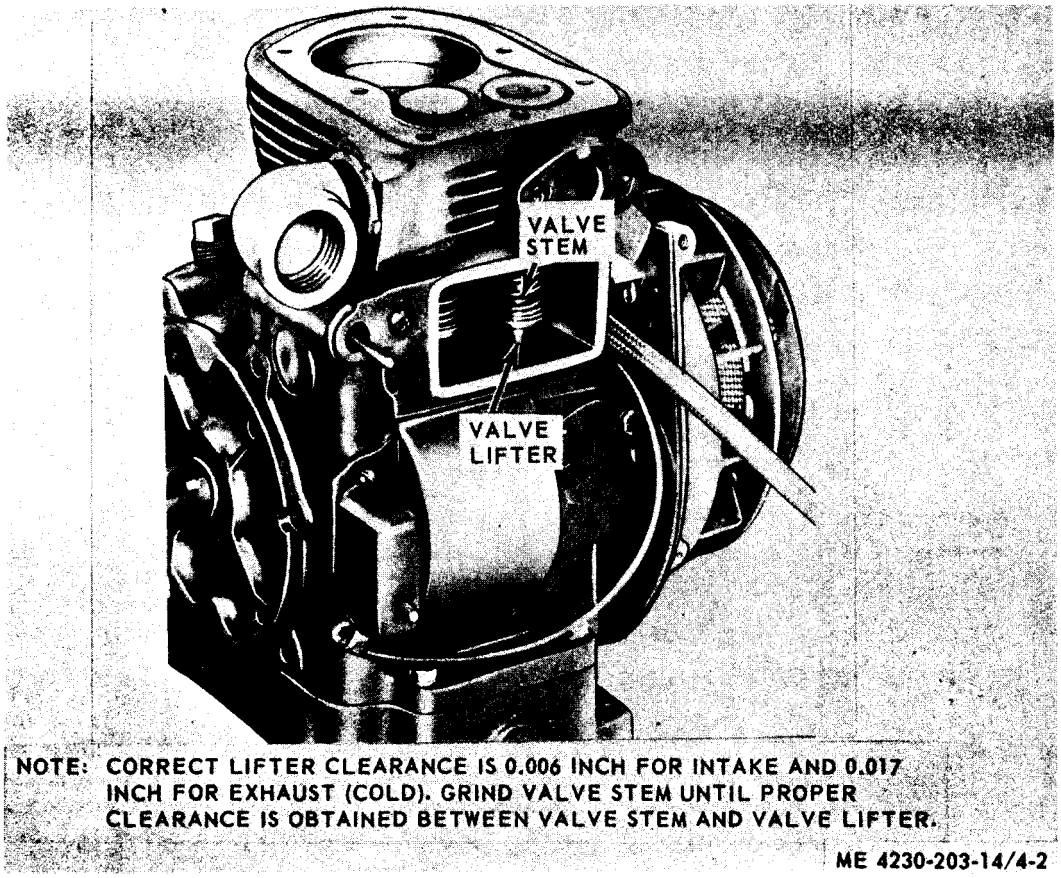


Figure 5-2. Valve adjustment.

5-2. Connecting Rod and Piston

a. Removal

(1) Remove the cylinder head (para 4-19).

(2) Remove the engine oil pan (para 4-20).

(3) Refer to figure 5-3 and remove the connecting rod and piston.

b. Disassembly Refer to figure 5-4 and disasemble the connecting rod and piston.

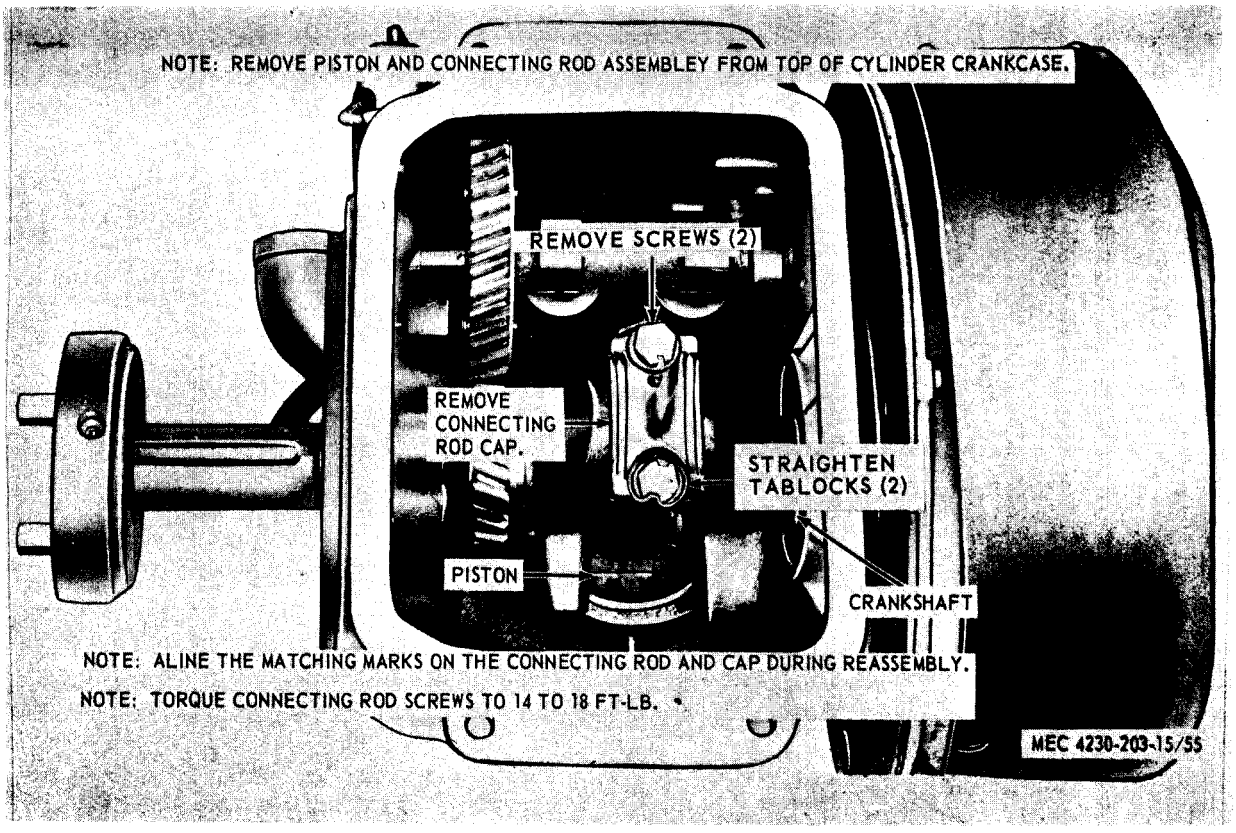
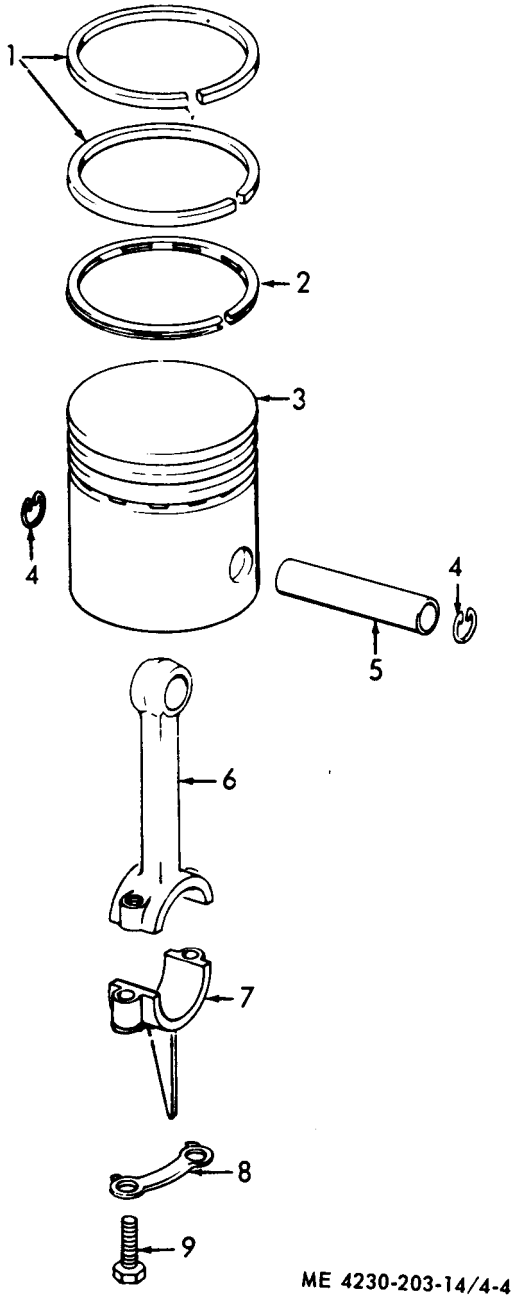


Figure 5-3. Connecting rod and piston removal and installation.



1 Compression ring (2 rqr)
2 Oil ring
3 Piston
4 Retaining ring (2 rqr)
5 Piston pin
6 Connecting rod
7 Oil dipper and rod cap
8 Lock
9 Bolt (2 rqr)

Figure 5-4. Connecting rod and piston, exploded view.

c. Cleaning, Inspection, and Repair.

(1) Clean all carbon deposits from the top and ring grooves of the piston.

(2) Wash all oil, sludge, and gum deposits from the piston, piston pins, connecting rod, oil dipper, and locks with solvent and dry thoroughly.

(3) Inspect the piston, piston pin, connecting rod, oil dipper and locks for cracks, breaks, and other damage. Replace a damaged or defective part.

(4) Insert the piston, without the rings, in the cylinder block bore with the piston skirt up. Check the piston to cylinder clearance by inserting a feeler gage between the piston and cylinder bore. Refer to table 1-1 for correct clearance.

(5) Check the piston pin holes in the piston with a new standard size piston pin. If the new piston pin requires no effort to install it in the piston, the piston pin holes in the piston are worn and the piston must be replaced. The correct piston pin fit will require light tapping with a soft hammer to install the pin in the piston.

(6) Measure the piston pin for wear and out-of-round with a micrometer, taking readings on the piston pin at several different points to determine the point of greatest wear, or out-of-round. Refer to table 1-1 for piston pin size.

(7) Measure the inside diameter of the piston pin at the small end of the connecting rod. The outside diameter of the standard serviceable piston pin is 0.0625 inch. If the difference between the two readings is more than 0.002 inch, the connecting rod must be replaced.

d. Reassembly. Refer to figure 5-4 and reassemble the connecting rod and piston.

e. Installation.

(1) Refer to figure 5-3 and install the connecting rod and piston.

(2) Install the engine oil pan (para 4-20).

(3) Install the cylinder head (para 4-19).

5-3. Bearing Plate

a. Removal.

(1) Remove the engine (para 4-14).

(2) Remove the magneto (para 4-25).

(3) Refer to figure 5-5 and remove the bearing plate.

b. Cleaning and Inspection.

(1) Clean the bearing plate with solvent and dry thoroughly.

(2) Inspect the plate for cracks, breaks, and other damage.

(3) Replace a damaged or defective bearing plate.

c. Installation.

(1) Refer to figure 5-5 and install the bearing plate.

(2) Install the magneto (para 4-25).

(3) Install the engine (para 4-14).

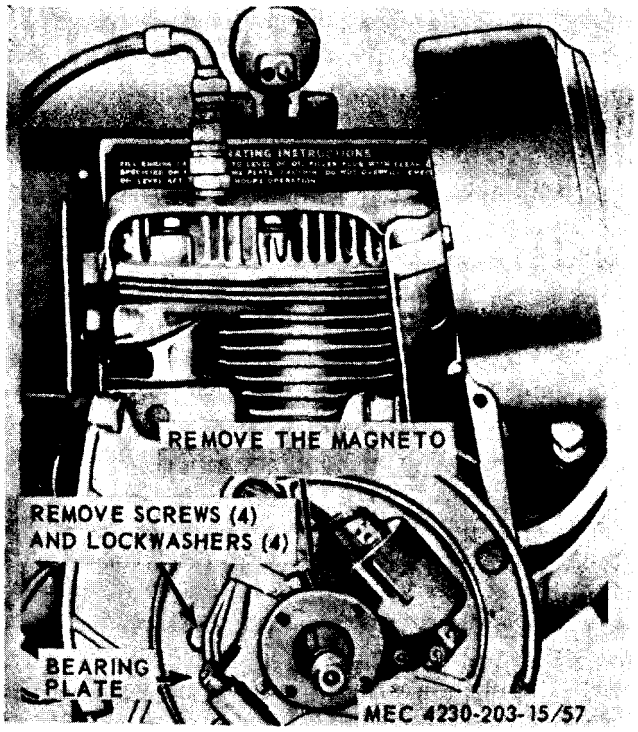


Figure 5-5. Bearing plate removal and installation.

5-4. Crankshaft

a. Removal and Disassemble.

(1) Remove the connecting rod and piston (para 5-2),

(2) Remove the bearing plate (para 5-3).

(3) Refer to figure 5-6 and remove and disassemble the crankshaft.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, burs, scoring, and other damage.

(3) Measure the crankpin journal. Refer to table 1-1 for wear limits.

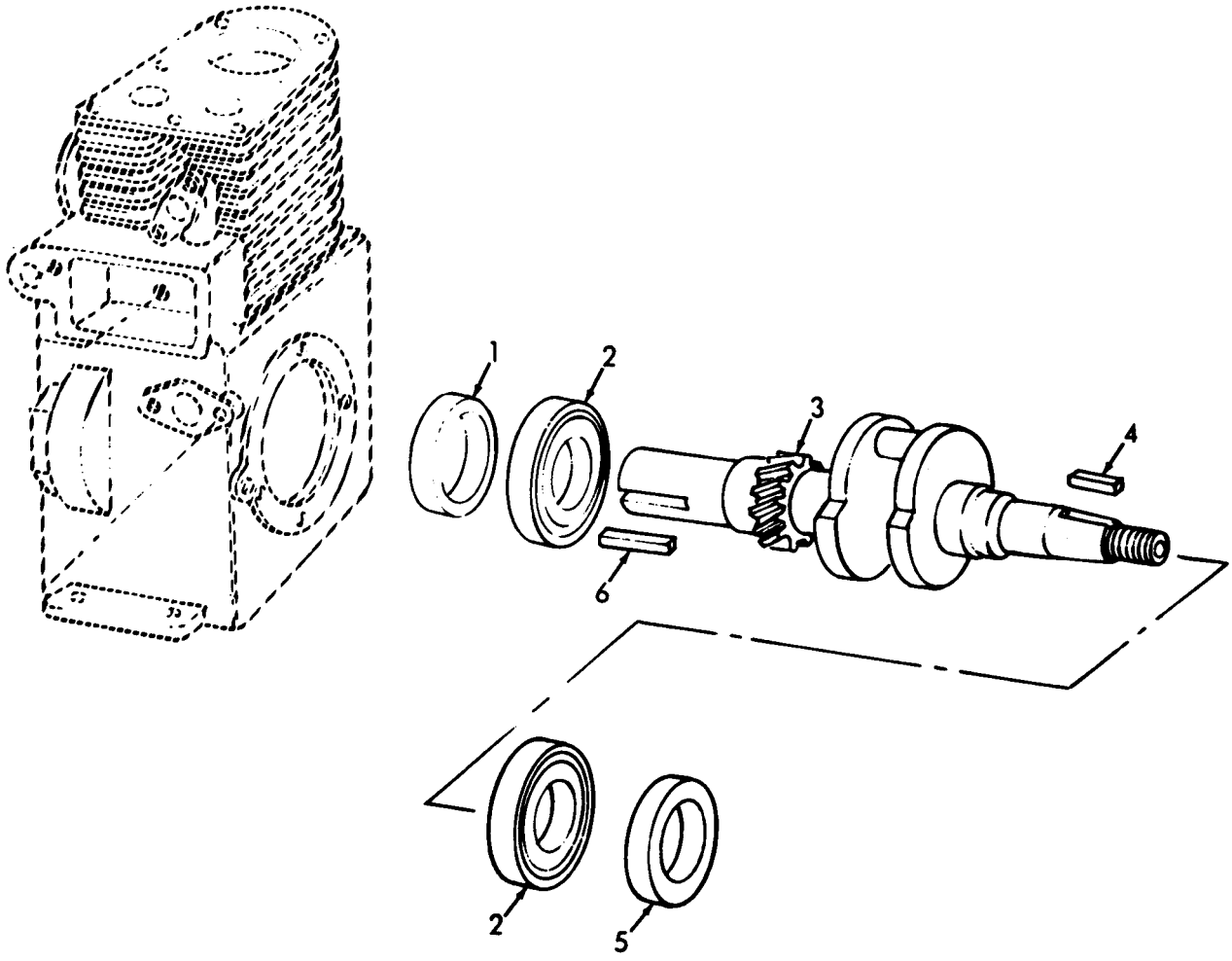
(4) Replace a damaged or defective part.

c. *Reassembly and Installation.*

(1) Refer to figure 5-6 and reassemble and install the crankshaft.

(2) Install the bearing plate (para 5-3).

(3) Install the connecting rod and piston (para 5-2).



1 Seal
2 Bearing
3 Crankshaft
4 Key
5 Seal
6 Key

Figure 5-6. Crankshaft, removal and installation.

5-5. Camshaft, Tappets, and Governor Gear Assembly

a. Removal and Disassembly.

(1) Remove the governor linkage (para 4-8).

(2) Remove the crankshaft (para 5-4).

(3) Refer to figure 5-7 and remove and disassemble the camshaft and governor gear assembly.

b. Cleaning, Inspection, and Repair.

(1) Clean all parts with solvent and dry thoroughly.

(2) Inspect the camshaft gear for excessive wear and damage. Replace the camshaft if the shaft or gear is worn, burred, or cracked.

(3) Inspect the valve lifters for cracks, breaks, and other damage. Replace a damaged or defective valve lifter.

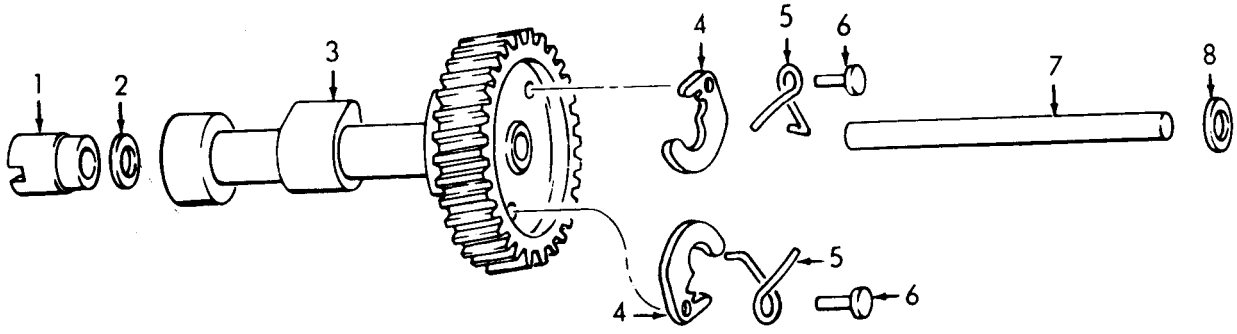
(4) Inspect the gear and governor assembly for broken, bent, cracked, or worn parts. Replace a damaged or defective part.

c. Reassembly and Installation.

(1) Refer to figure 5-7 and install the camshaft and governor gear assembly.

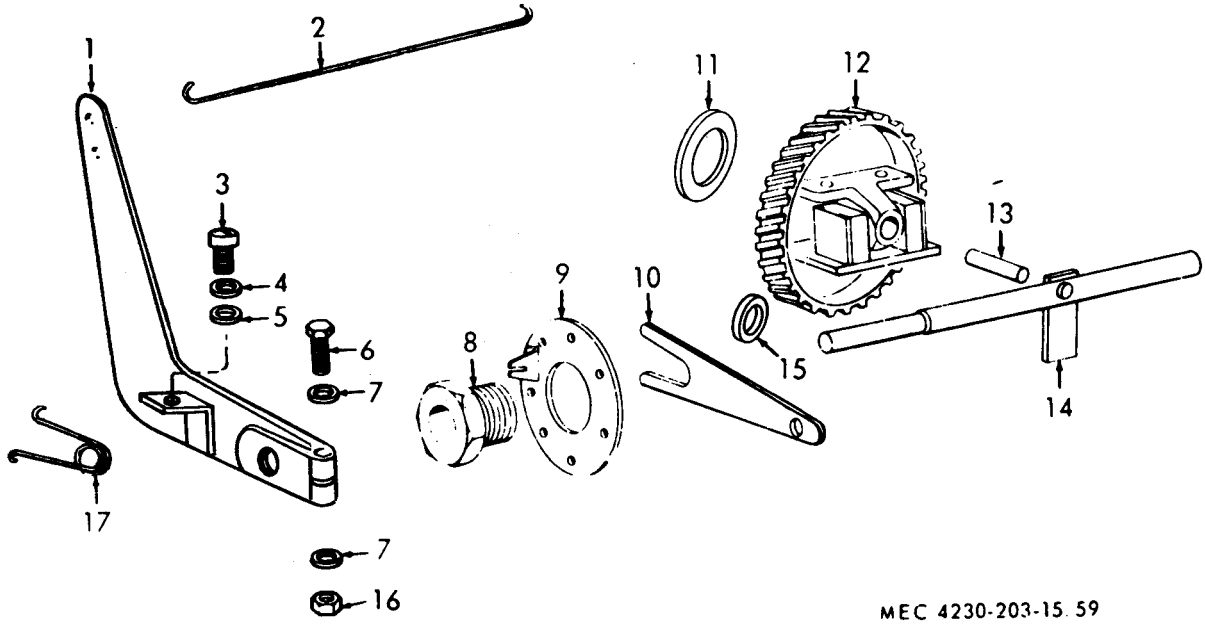
(2) Install the crankshaft (para 5-4).

(3) Install the governor linkage (para 4-8).



1 Cam
2 Washer
3 Camshaft
4 Flyweight (2 rqr)
5 Spring (2 rqr)
6 Pin (2 rqr)
7 Pin
8 Washer

A. Camshaft and gear



1 Lever
2 Linkage
3 Screw, machine
4 Washer, lock
5 Washer, flat
6 Screw, cap, hex-hd
7 Washer, flat
8 Bushing
9 Disk
10 Bracket
11 Washer, brass
12 Gear and governor
13 Shaft
14 Shaft assembly
15 Washer, flat
16 Nut, hex
17 Spring

B. Governor and linkage

Figure 5-7. Camshaft, gear, and governor assembly removal, disassembly.

5-6. Cylinder-Crankcase

a. Removal.

(1) Remove the engine (para 4-14).

(2) Remove the instruction mounting plate.

(3) Remove the fuel tank (para 4-6).

(4) Remove the carburetor (para 4-7).

(5) Remove the starting rope pulley (para 4-17).

(6) Remove the flywheel (para 4-18).

(7) Remove the oil fill plug and gage and the oil drain.

(8) Remove the governor control and linkage (para 4-8).

(9) Remove the magneto (para 4-25).

(10) Remove the intake and exhaust valves (para 5-1).

(11) Remove the bearing plate (para 5-3).

(12) Remove the crankshaft (para 5-4).

(13) Remove the camshaft and governor assembly (para 5-5).

b. Cleaning, Inspection, and Repair.

(1) Clean the crankcase with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective crankcase.

c. ***Installation.*** Installation is reverse of removal procedure.

Section IV. AIR COMPRESSOR

5-7. Air Compressor Base

a. Removal.

(1) Remove the air compressor (para 4-39).

(2) Refer to figure 5-8 and remove the air compressor base.

b. Cleaning and Inspection.

(1) Clean the base with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective air compressor base.

C. Installation.

(1) Refer to figure 5-88 and install the air compressor base.

(2) Install the air compressor (para 4-39).

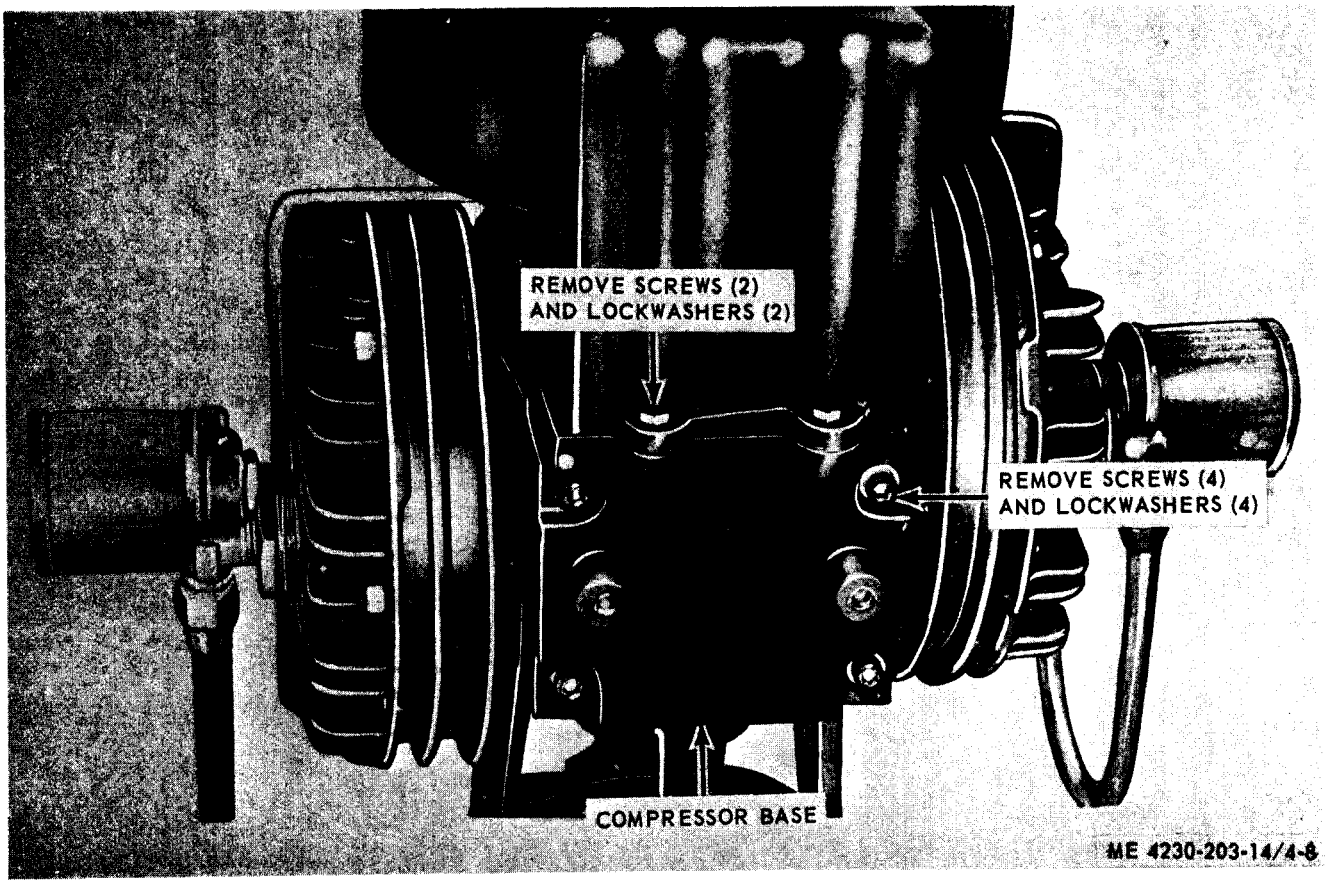


Figure 5-8. Air compressor base, removal and installation.

5-8. Compressor Piston and Bearing Cap

a. Removal.

(1) Remove the air compressor (para 4-39).

(2) Remove the compressor heads (para 4-36).

(3) Remove the compressor base (para 5-7).

(4) Refer to figure 5-9 and remove the compressor piston bearing caps.

(5) Remove diaphragms and pistons from block.

b. Disassembly. Refer to figure 5-10 and disassemble the compressor piston and bearing caps.

c. Cleaning, Inspection, and Repair.

(1) Clean all parts except the diaphragm with solvent and dry thoroughly.

(2) Clean the diaphragm with soap and warm water.

(3) Inspect for cracks, breaks, wear, scoring, deterioration, and other damage.

(4) Replace a damaged or defective part.

d. Reassembly. Refer to figure 5-10 and reassemble the compressor piston and bearing caps.

e. Installation.

(1) Refer to figure 5-9 and install the compressor piston and bearing caps.

(2) Install the air compressor base (para 5-7).

(3) Install the compressor heads (para 4-36).

(4) Install the air compressor (para 4-39).

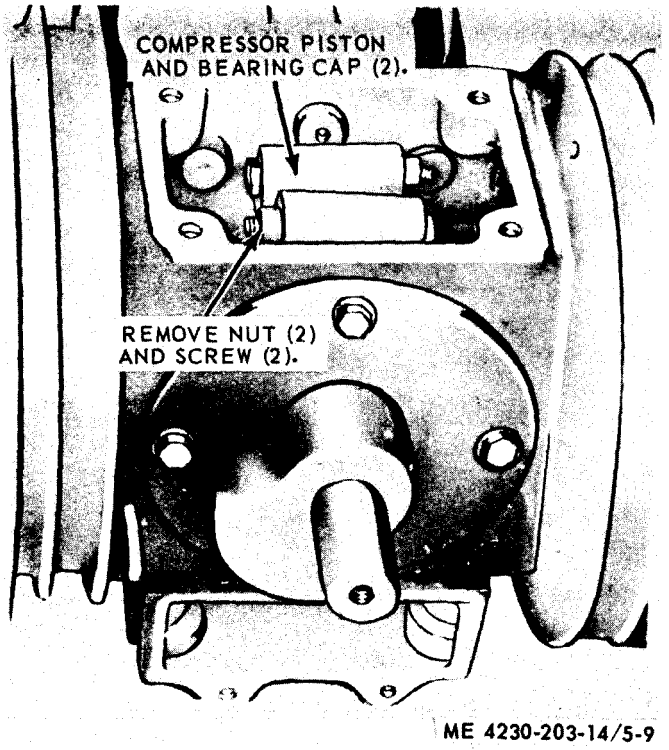


Figure 5-9. *Compressor piston bearing cap removal and installatio.*

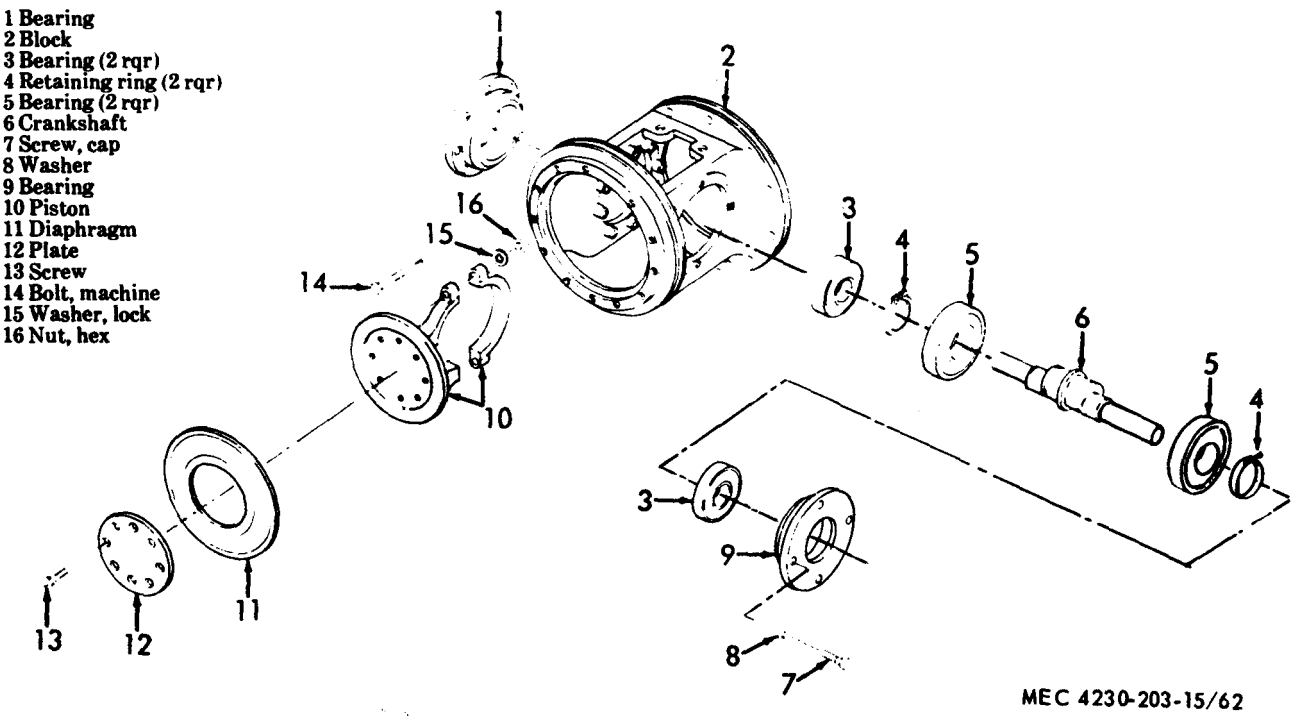


Figure 5-10. Compressor piston, crankshaft, and bearing, exploded view.

5-9. Compressor Crankshaft and Bearing

a. Removal and Disassembly.

(1) Remove the coupling (para (4-40).

(2) Remove the compressor pistons and bearing caps (para 5-8).

(3) Remove the bearing plate (fig. 5-11).

(4) Refer to figure 5-10 and remove and disassemble the compressor crankshaft and bearings.

b. Cleaning, ***Inspection, and Repair.***

(1) Clean all parts except sealed bearings with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, wear, scoring, and other damage.

(3) Replace a damaged or defective part.

e. ***Reassembly and Insallation.***

(1) Refer to figure 5-10 and reassemble and install the compressor crankshaft and bearings. Make sure sealed bearings are properly lubricated and turn with minimum friction.

(2) Install the compressor pistons and bearing caps (para 5-8).

(3) Install the coupling (para 4-40).

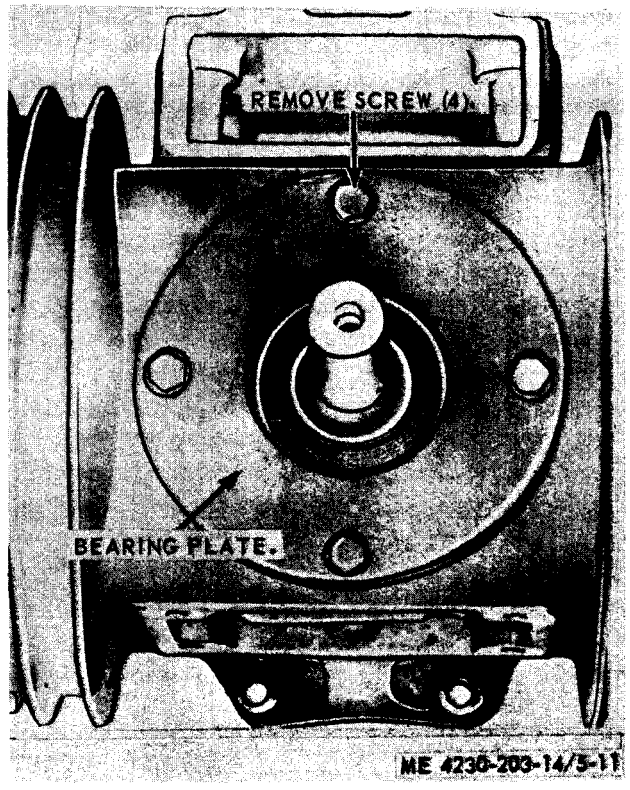


Figure 5-11. Bearing plate removal and installation.

5-10. Air Compressor Block

a. Removal.

(1) Remove the compressor heads (para 4-36).

(2) Remove the blower scroll (para 4-31).

(3) Remove the compressor crankshaft and bearings (para 5-9).

b. Cleaning and Inspection.

(l) Clean the block with solvent and dry thoroughly.

(2) Inspect for cracks, breaks, and other damage.

(3) Replace a damaged or defective air compressor block.

e. Installation.

(1) Install the compressor crankshaft and bearings (para 5-9).

(2) Install the blower scroll (para 4-31).

(3) Install the compressor heads (para 4-36).

APPENDIX A
REFERENCES

A-1. Fire Protection

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

A-2. Lubrication

C9100IL	Fuels, Lubricants, Oils, and Waxes
LO 10-4230-203-15	Lubrication Order

A-3. Painting

TM 9-213	Painting Instructions for Field Use

A-4. Cleaning

C6800IL	Chemicals and Chemical Products
SB 725-7930-1	Hard and Soft-Water Cleaning Compounds

A-5. Maintenance

TM 3-220	Chemical, Biological and Radiological (CBR) Decontamination
TM 38-750	The Army Maintenance Management System
TM 10-4230-203-24P	Organizational, Direct and General Support Maintenance Repair Parts and Special Tools List

A-6. Shipment and Storage

TB 740-93-2	Preservation of USAMEC Mechanical Equipment for Shipment and Storage
TM 38-230-1	Preservation and Packing of Military Equipment
TM 740-90-1	Administrative Storage of Equipment

A-7. 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, Column (1). A group number is assigned to each assembly. 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, Column (2). This column contains a brief description of the components of each assembly group.

c. Maintenance Functions, Column (3). 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
F — Direct support maintenance
H — General support 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, and to add fuel, lubricants, cooling agents, and air.

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

E - Align. 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 equipment used in precise measurement. Consists of the comparison 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 like items.

I - Repair. Those maintenance operations necessary to restore an item to serviceable condition through correction of material damage or a specific failure. Repair may be accomplished at each level of maintenance.

J - Overhaul. Normally, the highest degree of maintenance performed by the Army in order to minimize time work in process is consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition.

K - Rebuild. The highest degree of materiel maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance level. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.

d. Tools and Equipment, Column (4). This column is provided for referencing by code the special tools and test equipment required to perform the maintenance functions.

(e) Remarks, Column (5). 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. The 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) Functions group	(3) Maintenance functions A Inspect	B Test	C Service	D Adjust	E Align	F Calibrate	G Install	H Replace	I Repair	J Overhaul	K Rebuild	(4) Tools and equipment	(5) Remarks
01	BOX AND FRAME ASSEMBLY; BOX, PARTS	..	..	...	...	...	...	...	)	O				
02	GUN ASSEMBLY, DUSTING	..	..	C	C	...	...	...		O				
03	ENGINE, GASOLINE	O	O	C	...	...	...	...	)	O	H	..	...	A
04	FUEL TANK AND BRACKET	..	..	C	...	...	...	...	)	F				
05	FUEL FILTER	..	..	C	...	...	...	...	..	O				
06	AIR CLEANER	..	..	C	...	...	...	...	..	O				
07	CARBURETOR	..	..	O	O	...	...	...	..	O	O			
08	FLYWHEEL, BLOWER HOUSING, AND BAFFLES	O	..	...	...	...	...	...	..	O				
09	IGNITION COMPONENTS													
	Spark Plug	..	..	...	O	...	...	...	)					
	Points, Ignition	..	..	..	O	...	...	...	)					
12	VALVES	..	..	..	...	...	...	...	;	F				
	Tappets and Rotator	..	..	..	F	...	...	...	;					
15	COMPRESSOR AND DRIVE COUPLIN G	C	..	..	...	...	...	...	)	F	H	..	...	B
18	COMPRESSOR CYLINDER HEAD	..		..	...	...	...	...	)	F				

Section III. REMARKS

Reference code	Remarks
A-B	Test includes engine operation for compression check.
B-A	Inspection of compressor includes gage pressure and checking for leaks.

APPENDIX C
BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

C-1. Scope

This appendix lists items which accompany the delousing outfit or are required for installation, operation, or operator's maintenance.

C-2. General

This Basic Issue Items List is divided into the following sections:

a. Basic Issue Items - Section II. A list of items which accompany the delousing outfit and are required by the operator for installation, operation, or maintenance.

b. Maintenance and Operating Supplies - Section III. A listing of maintenance and operating supplies required for initial operation.

C-3. Explanation of Columns

The following provides an explanation of columns in the tabular list of Basic Issue Items, section II.

a. Source, Maintennace,and Recoverability Codes (SMR).

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

Code	*Explanation*
P	Repair parts which are stocked in or supplied from the GSA/DSA or Army supply system and authorized for use at indicated maintenance level.

(2) Maintenance code indicates the lowest level of maintenance authorized to install the listed item. The maintenance level code is:

Code	*Explanation*
C	Operator

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

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 any additional description of the item required.

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

e. Quantity Incorporated in Unit. This column is not applicable.

f. Quantity Furnished With Equipment. This column indicates the quantity of an item furnished with the equipment.

g. Illustration. This column is not applicable.

C-4. Explanation of Columns in the Tabular List of Maintenance and Operating Supplies—Section III

a. Component Application. This column identifies the component application of each maintenance or operating supply item.

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 item-name and brief description.

d. Quantity Required for Initial Operation. This column indicates the quantity of each maintenance or operating supply item required for initial operation of the equipment.

e. Quantity Required for 8 Hours Operation. This column indicates the estimated quantities required for an average 8 hours of operation.

f. Notes. This column indicates informative notes keyed to data appearing in a preceding column.

Section II. BASIC ISSUE ITEMS

(1) SMR code	(2) Federal stock number	(3) Description	(4) Unit of meas	(5) Qty inch in unit	(6) Qty furn with equip	(7) Illustration (A) fig no.	(7) Illustration (B) item no.
PC	7520-559-9618	CASE, Maintenance and Operation Manuals	EA		1		
PC		DA Lubrication Order LO 10-4230-203-15	EA		1		
PC		DA TM 10-4230-203-14	EA		1		
PC		DA TM 10-4230-203-24P	EA		1		
PC	4240-368-6149	RESPIRATOR, Dust (M4)	EA		10		

Section III. MAINTENANCE AND OPERATING SUPPLIES

(1) Component application	(2) Federal stock number	(3) Description	(4) Quantity required f/initial operation	(5) Quantity required F/8 hrs operation	(6) Notes
BLOCK ASSEMBLY	9150-265-9433(2)	Lubricating Oil, OE 30	2½ pts (1)	(3)	(1) Quantity of oil to fill engine oil system includes: 2½ pts — Block assembly 5/16 pts — Air cleaner
AIR CLEANER	9150-265-9433(2)	Lubricating Oil, OE 30	5/16 pts (1)	(3)	
FUEL TANK	9130-160-1818(2)	Gasoline, Automotive	1¼ gal. (4)	(5)	(2) See C9100IL for additional data and requisition procedure. (3) See current LO for grade application and replacement intervals. (4) Tank capacity. (5) Average fuel consumption in 0.25 gal. per hour.

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General United States Army,
Chief of Staff.

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CoA, 3d ENGINEER BN
FT. LEONARD WOOD MO 63108

DATE: 16 DEC 74

PUBLICATION NUMBER	DATE	TITLE
TM5-6115-200-20 AND P	1 APR 72	GENERATOR SET 10 KW NSN 6115-00-231-7286

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.
6	2-1 a		
81		4-3	
125	line 20		

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 pointing at a bolt. In the key to fig. 4-3, item 16 is called a shim. Please correct one or the other.

I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered so the NSN is wrong. Please give me a good NSN

SAMPLE

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PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.

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TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

TEAR 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

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DEPARTMENT OF THE ARMY

Commander
US Army Troop Support and Aviation
Materiel Readiness Command
ATTN: DRSTS-MTPS
4300 Goodfellow Boulevard
St. Louis, MO 63120

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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, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

DATE

PUBLICATION NUMBER	DATE	TITLE
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BE EXACT. . .PIN-POINT WHERE IT IS

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