TM 9-1828A

WAR DEPARTMENT TECHNICAL MANUAL

ORDNANCE MAINTENANCE

FUEL PUMPS

WAR DEPARTMENT • *9 MARCH 1945*

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WAR DEPARTMENT

Washington 25, D. C., 9 March 1945

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(For explanation of symbols, see FM 21-6.)

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RESTRICTED

CHAPTER 1—INTRODUCTION

1. SCOPE.

a. The instructions contained in this manual are for the guidance of personnel charged with the maintenance and repair of AC mechanical fuel pumps and Carter electric fuel pumps. These instructions are supplementary to field and technical manuals prepared for the using arms. This manual does not contain information which is intended primarily for the using arms, since such information is available to ordnance personnel in 100 series TM's and FM's. It should be noted that the groupings of fuel pump series in the chapters of this book have no significance from the standpoint of pump interchangeability.

b. This manual contains a description of, and procedure for, disassembly, inspection, repair, and assembly of Carter fuel pumps and the following series of AC fuel pumps: B, D, G, IHC Special, O, P, R, S, T, W, AC, AF, AG, AH, AJ, AK, AT, AV, AU, AW, AX, BE, BF, BH, BK, BL, BM, and BN.

c. For fuel pump replacement, refer to the pertinent operators' manual.

2. RECORDS.

a. Forms and records applicable for use in performing prescribed operations are listed below with a brief explanation of each.

(1) W.D., A.G.O. FORM NO. 468, UNSATISFACTORY EQUIPMENT REPORT. This form will be used for reporting manufacturing, design, or operational defects in materiel with a view to improving and correcting such defects, and for use in recommending modifications on materiel. This form will not be used for reporting failures, isolated materiel defects, or malfunctions of materiel resulting from fair wear and tear or accidental damage; nor for the replacement, repair, or the issue of parts and equipment. It does not replace currently authorized operational or performance records.

(2) W.D., A.G.O. FORM NO. 478, MWO AND MAJOR UNIT ASSEMBLY REPLACEMENT RECORD. This form, carried with the vehicle, will be used by all personnel completing a modification or major unit assembly replacement to record clearly the description of work completed, date, vehicle hours and or mileage, and MWO number or nomenclature of unit assembly. Personnel performing the operation will initial in the column provided. Minor repairs, parts, and accessory replacements will not be recorded.

(3) W.D., A.G.O. FORM NO. 10-144 (TALLY SHEET, INCOMING). This form may be used to record all incoming materials or supplies pending negotiation of a final voucher. It may also be used in exchanging vehicles, parts, or tools, or in lieu of shipping ticket.

(4) W.D., A.G.O. FORM NO. 10-145 (TALLY SHEET, OUTGOING). This form may be used to record all outgoing materials or supplies pending negotiations of the final voucher. It may also be used in exchanging vehicles, parts, or tools, or in lieu of shipping ticket.

(5) W.D., A.G.O. FORM NO. 9-71 (LOCATOR AND INVENTORY CONTROL CARD). This form may be used as a bin tag, locator card, or inventory control card in maintaining spare parts stocks. This form is for tactical units only.

(6) W.D., A.G.O. FORM NO. 9-76 (REQUEST FOR JOB ORDER). This form may be used by any officer or authorized person requiring production, repair, alteration, inspection, or any other type of work from another organization, department, or echelon. Not required for second or third echelon repairs.

(7) W.D., A.G.O. FORM NO. 9-77 (JOB ORDER REGISTER). This form will be prepared, in single copy only, when job orders are used by service echelons to furnish a chronological order and record of job order numbers and related information.

(8) W.D., A.G.O. FORM NO. 9-78 (JOB ORDER). This form, properly executed, may be used as an authority for work. No work of any nature will be performed in a service echelon shop keeping a cost accounting-type record system without a properly authenticated job order.

(9) W.D., A.G.O. FORM NO. 9-79 (PARTS REQUISITION). This form will be used as an interdepartmental shop requisition to request parts where job orders are required.

(10) W.D., A.G.O. FORM NO. 9-80 (JOB ORDER FILE). This folder may be used to hold under one cover all shop papers and records incident to a particular job order or to a particular vehicle.

(11) W.D., FORM NO. 9-81 (EXCHANGE PART OR UNIT IDENTIFICATION TAG). This tag, properly executed, may be used when exchanging unserviceable items for like serviceable assemblies, subassemblies, parts, vehicles, and tools.

CHAPTER 2—AC FUEL PUMPS

Section I

OPERATION

3. FUEL PUMP OPERATION (figs. 1 and 2).

a. Installation. The AC mechanical fuel pump is installed on the engine between the fuel tank and the carburetor. The suction side of the pump is connected to the fuel tank and the discharge side to the carburetor by tubing designed to carry the fuel. The purpose of the pump is to suck fuel from the supply tank and push it into the carburetor float bowl as required by the engine.

b. Identification. The pump part number is usually stamped on the edge of the mounting flange. Some high production pumps have the part number cast into the body beneath the diaphragm flange.

c. Operation.

(1) MECHANICAL ACTION. Operation is accomplished through a rocker arm on the pump contacting an eccentric on the engine camshaft. Downward movement of the pump diaphragm, or the suction stroke, is caused by the rotation of an eccentric on the camshaft actuating the pump rocker arm. This pulls the diaphragm downward against the pressure of the diaphragm spring, producing a vacuum in the fuel chamber. This vacuum holds the outlet valve closed and pulls the inlet valve open, making fuel flow from the supply tank through the inlet, the filter screen, and the inlet valve into the fuel chamber. On the return stroke of the rocker arm, the diaphragm spring forces the diaphragm upward, the inlet valve closes, and the outlet valve is forced open, allowing fuel to flow through the outlet to the carburetor.

(2) LINK ACTION. The link is hinged to the rocker arm so that the link and the connected diaphragm can be moved down, but not up, by the rocker arm. The link and the diaphragm are moved upward only by the diaphragm spring. The pump, therefore, delivers fuel to the carburetor only when the fuel pressure in the outlet line is less than the pressure maintained by the diaphragm spring. This condition arises when the float needle valve is not seated and the fuel passage from the pump into the carburetor float chamber is open. When the needle valve in the carburetor float chamber is closed and held in place by the pressure of the fuel on the float, the pump builds

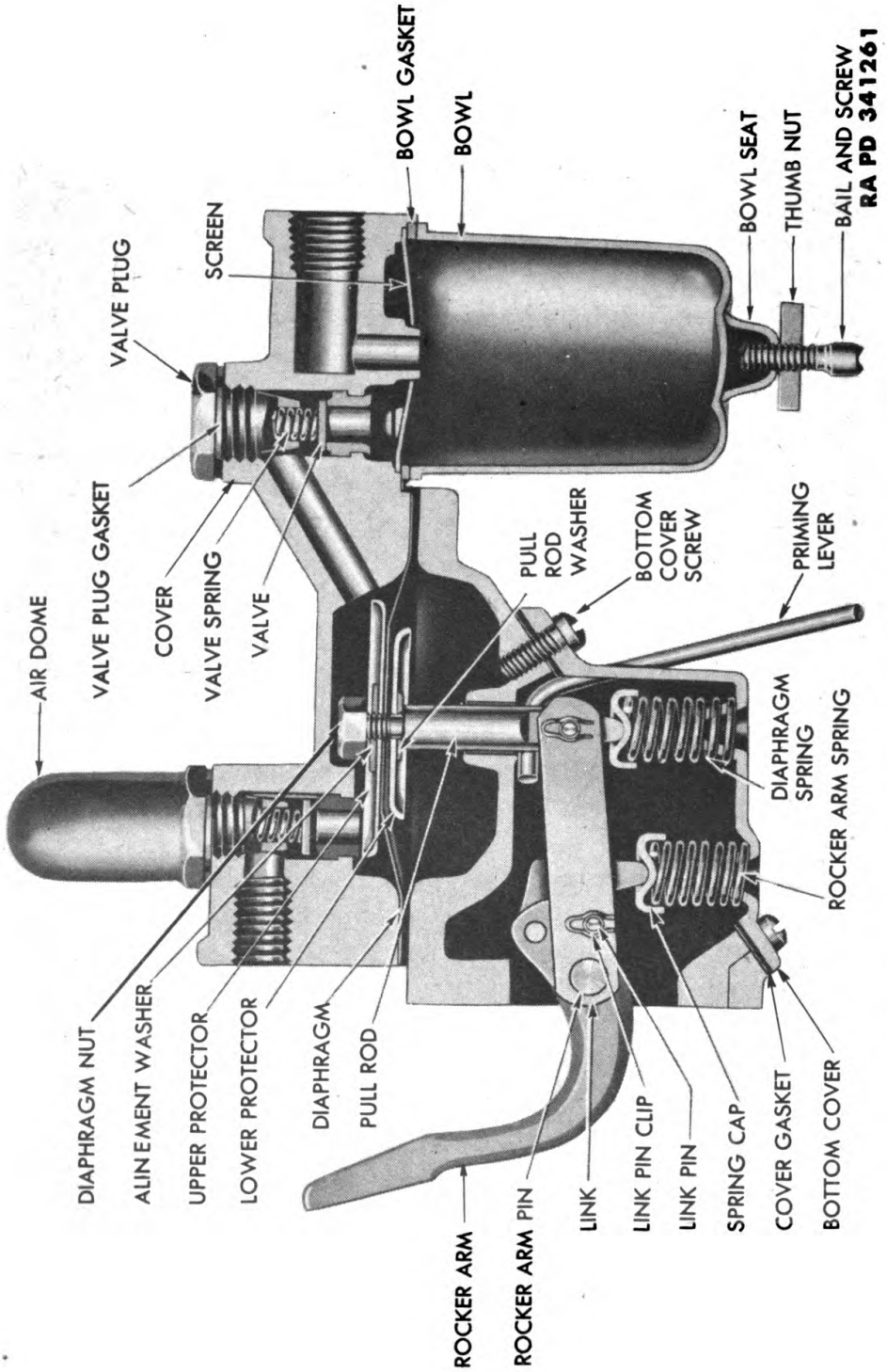

Figure 1—Fuel Pump, Series B—Sectional View

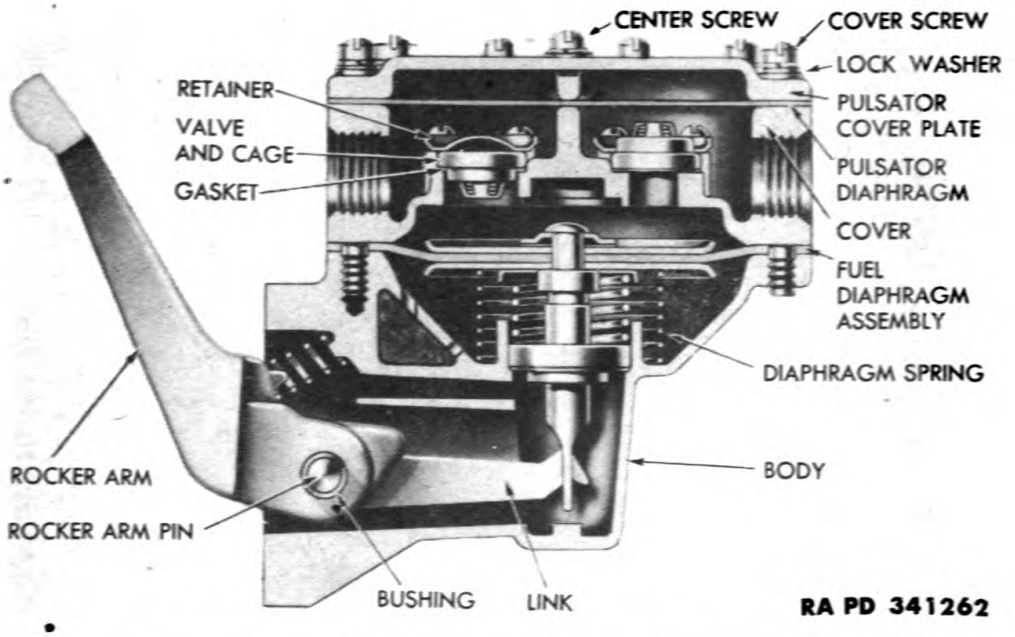

Figure 2—Fuel Pump, Series BF—Sectional View

up pressure until it overcomes the resistance of the diaphragm spring. This pressure results in almost complete stoppage of diaphragm movement until more fuel is needed. The only function of the rocker arm spring is to make the rocker arm follow the camshaft eccentric.

(3) AIR DOME AND PULSATOR. Most fuel pumps are equipped with air domes of integral or separate construction. Examples of integral air domes will be found in series G, R, and AF. Examples of separate construction will be found in series B and D. Fuel pumps such as the BF are equipped with diaphragm pulsators. These air domes and pulsators serve a dual purpose. They minimize flow variations experienced with two-cycle pump stroke and show increased flow characteristics up to 50 percent higher than for a fuel pump not so equipped. Both the air dome and pulsator provide a pocket in which fuel under pressure can compress a certain volume of air. When the pressure is relieved (pump on vacuum stroke) the pocket of compressed air pushes the fuel on to its destination. The pulsator, in addition, employs diaphragm cloth resiliency to store up energy to be used at the off pressure stroke interval.

4. VACUUM PUMP OPERATION (fig. 3).

a. Vacuum Booster. The vacuum suction acts as a booster to the intake manifold suction thus providing uniform operation of the windshield wiper at all engine speeds and loads. Both sections of

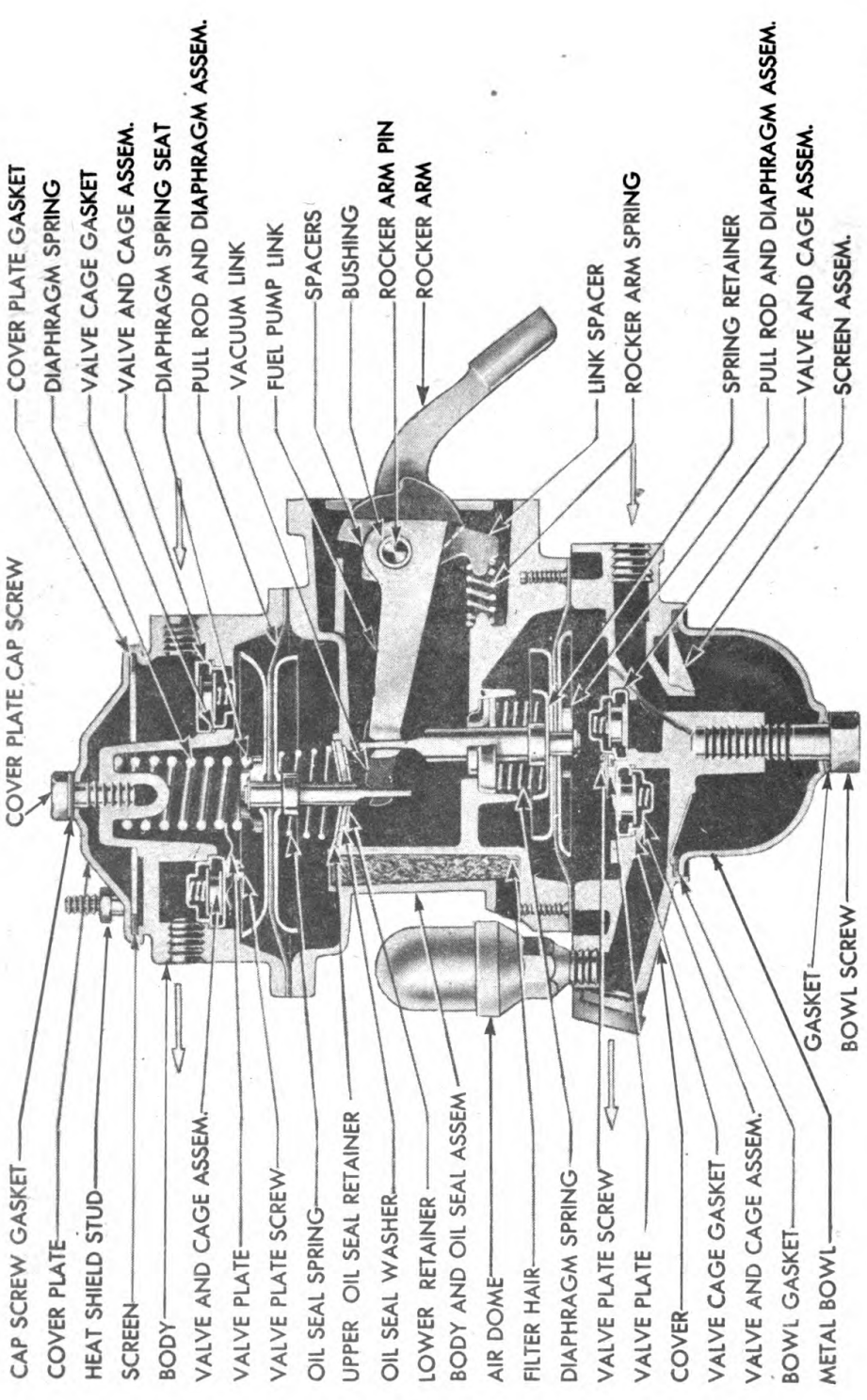

Figure 3—Fuel and Vacuum Pump, Series AJ—Sectional View

the combination pump are actuated by a single rocker arm. The fuel section of a combination fuel and vacuum pump operates the same as a fuel pump alone.

b. Mechanical Action. Power is applied to the rocker arm by an eccentric on the camshaft. Rocker arm movement, through the link and pull rod, pushes the diaphragm into the air chamber against spring pressure (60 to 80 pounds). Pressure created by the diaphragm movement expels air through the outlet port and into the manifold. The return stroke (low point of cam) releases the compressed diaphragm spring, creating a vacuum and driving air through the inlet valve from the windshield wiper.

c. Link Action. When manifold vacuum is greater than that created by the pump, the stronger manifold vacuum pulls the diaphragm into the air chamber against spring pressure thus moving the links out of engagement with the rocker arm. Under this condition the rocker arm continues to move with the cam, but produces only a fluttering effect on the diaphragm. The windshield wiper then operates on manifold vacuum without assistance from the pump. When intake manifold vacuum is low, as on acceleration or at high speed, the vacuum created by the pump will assure adequate operation of the wiper.

Section II

REPAIR PROCEDURE

5. STANDARD ORDNANCE REPAIR KITS (fig. 4).

a. Description. Standard ordnance repair kits must always be used when rebuilding AC fuel pumps. Each kit contains a comprehensive group of parts which have been selected to replace all the internal working parts of the pump. Use of the repair kit obviates the necessity of setting up intricate fixtures to test each part for wear. Their use also assures that all the necessary parts will be at hand when the overhaul operation is performed. Following is the complete list of fuel pumps used in Ordnance vehicles, and the applicable standard Ordnance repair kit. Use the series designation for direct reference to the applicable chapter as shown in the list of contents.

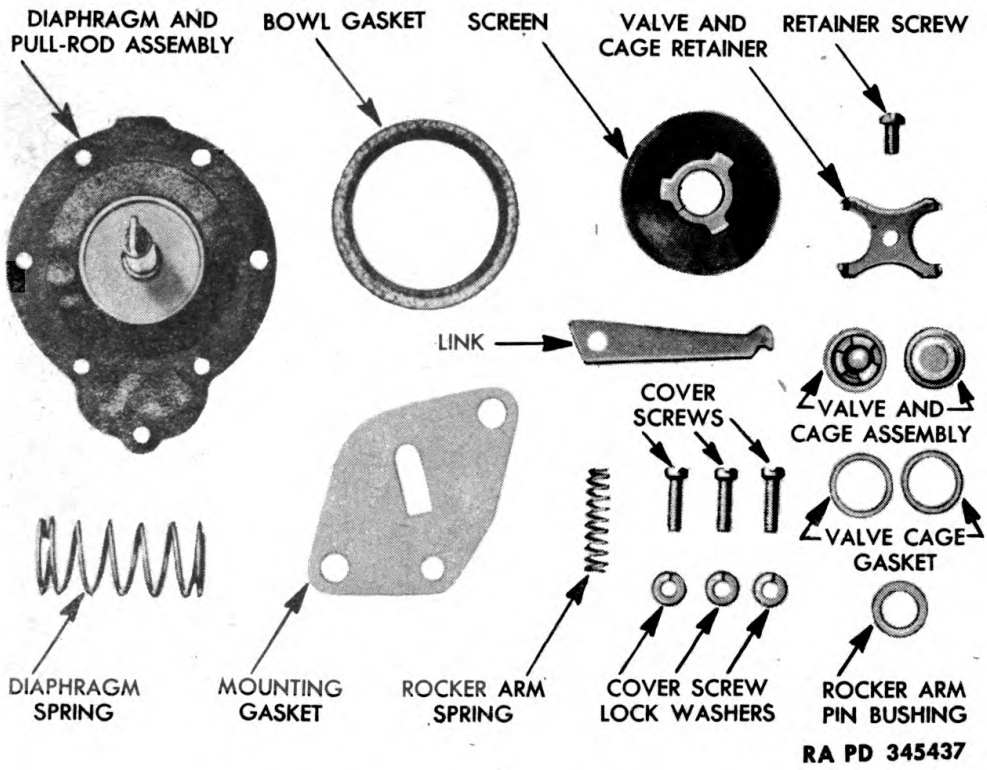

Figure 4—Typical Repair Kit Contents

AC Pump Number	Series	Overhaul Repair Kit	AC Pump Number	Series	Overhaul Repair Kit
855758	B	1538121	1521676	B	1538365
855885	D	1538160	1521679	P	1538871
856052	D	1538160	1521761	D	1538160
856065	D	1538160	1521780	D	1538160
856132	D	1538160	1521786	D	1538166
856195	D	1438160	1521799	B	1538121
856256	B	1538121	1521806	B	1538121
856258	D	1538364	1521809	D	1538160
856262	B	1538121	1521815	D	1538160
1521015	D	1538166	1521822	D	1538160
1521020	D	1538848	1521830	D	1538164
1521117	B	1538121	1521836	B	1538847
1521127	B	1538121	1521845	D	1538160
1521129	IHC SPEC.	1538165	1521846	D	1538160
1521136	B	1538121	1521852	B	1538121
1521139	D	1538160	1521853	B	1538121
1521396	G	1538666	1522114	D	1538161
1521444	G	1538666	1522141	P	1538774
1521459	R	1538846	1522147	D	1538160

Repair Procedure

AC Pump Number	Series	Overhaul Repair Kit
1522182	D	1538166
1522225	D	1538160
1522231	D	1538160
1522232	D	1538764
1522235	D	1538160
1522236	D	1538160
1522265	D	1538160
1522266	B	1538121
1522995	B	1538158
1522998	D	1538160
1523019	D	1538764
1523047	D	1538764
1523055	B	1538365
1523057	D	1538160
1523060	O	1538822
1523062	D	1538764
1523066	R	1538366
1523087	T	1538808
1523089	AF	1538172
1523135	B	1538121
1523164	B	1538158
1523170	D	1538160
1523178	T	1538856
1523307	R	1538276
1523308	D	1538139
1523342	B	1538121
1523343	B	1538121
1523363	AC	1538821
1523366	D	1538160
1523369	D	1538160
1523378	AG	1538770
1523379	D	1538160
1523387	D	1538166
1523389	B	1538121
1523429	AF	1538172
1523621	R	1538844
1523636	D	1538139
1523647	AT	1538177
1523685	D	1538164
1523736	D	1538160
1523754	B	1538121
1523758	B	1538121
1523762	D	1538164
1523767	T	1538808
1523785	B	1538121
1523798	B	1538121
1523812	W	1538367
1523816	AU	1538368
1523832	R	1538773
1523912	AT	1538177
1523914	B	1538158
1523929	R	1538773
1523981	D	1538160
1523985	AH	1538178
1523991	T	1538708
1537007	AH	1538178
1537037	D	1538160
1537041	IHC Spec.	1538165
1537059	R	1538755
1537067	AH	1538178
1537088	AX	1538180
1537101	AF	1538172
1537104	B	1538121
1537105	AV	1538266
1537147	P	1538709
1537166	R	1538707
1537171	D	1538120
1537172	D	1538160
1537188	B	1538121
1537203	D	1538160
1537215	R	1538756
1537227	B	1538121
1537228	AT	1538177
1537245	D	1538160
1537252	D	1538120
1537255	R	1538844
1537267	D	1538166
1537270	AF	1538172
1537272	AF	1538172
1537301	D	1538139
1537320	AF	1538170
1537341	AF	1538857
1537342	AH	1538178
1537347	B	1538121
1537350	R	1538757
1537355	D	1538160
1537362	D	1538160
1537365	AT	1538156
1537383	R	1538176

Chapter Two—AC Fuel Pumps

AC Pump Number	Series	Overhaul Repair Kit	AC Pump Number	Series	Overhaul Repair Kit
1537396	D	1538166	1537759	D	1538166
1537416	AJ	1538181	1537763	B	1538121
1537417	D	1538166	1537765	D	1538166
1537421	R	1538775	1537766	AF	1538360
1537437	AU	1538179	1537774	AU	1538372
1537438	B	1538121	1537808	B	1538121
1537439	B	1538121	1537814	D	1538120
1537445	AW	1538845	1537897	AF	1538170
1537451	W	1538858	1537911	B	1538158
1537453	D	1538164	1537912	D	1538164
1537462	S	1538872	1537914	BE	1538375
1537471	D	1538166	1537919	AF	1538360
1537473	R	1538175	1537924	AH	1538178
1537476	D	1538160	1537927	BF	1538048
1537478	D	1538369	1537957	R	1538370
1537479	D	1538166	1537958	D	1538171
1537507	D	1538160	1537966	AF	1538816
1537515	D	1538168	1537967	AF	1538751
1537520	D	1538166	1537983	D	1538171
1537524	AJ	1538213	1537984	AK	1538371
1537543	AF	1538857	1538059	W	1538879
1537547	R	1538758	1538063	D	1538212
1537550	D	1538120	1538099	AJ	1538211
1537552	R	1538176	1538101	D	1538167
1537561	D	1538162	1538102	R	1538176
1537569	D	1538764	1538138	D	1538369
1537570	D	1538764	1538153	AG	1538239
1537571	AF	1538172	1538185	B	1538771
1537579	AF	1538172	1538190	D	1538162
1537604	D	1538160	1538214	R	1538901
1537632	AF	1538170	1538219	AF	1538360
1537657	IHC Spec.	1538165	1538222	AU	1538372
			1538228	D	1538166
1537662	D	1538160	1538242	AF	1538776
1537666	AT	1538156	1538246	R	1538366
1537700	AH	1538178	1538259	AK	1538371
1537704	D	1538160	1538265	D	1538166
1537712	B	1538121	1538272	D	1538369
1537713	D	1538166	1538274	BH	1538374
1537714	AF	1538172	1538275	B	1538121
1537715	D	1538169	1538280	AU	1538179
1537719	D	1538139	1538285	AC	1538867
1537722	D	1538166	1538286	BF	1538048
1537723	D	1538166	1538299	BF	1538048
1537744	R	1538289	1538312	AF	1538360

Series B, D, and O Fuel Pumps

AC Pump Number	Series	Overhaul Repair Kit	AC Pump Number	Series	Overhaul Repair Kit
1538341	BF	1538048	1538697	AF	1538360
1538376	BH	1538374	1538701	BM	1538719
1538377	D	1538160	1538712	BF	1538725
1538410	BK	1538587	1538731	BM	1538719
1538411	BF	1538902	1538743	BM	1538719
1538412	IHC Spec.	1538373	1538753	BF	1538877
			1538754	BF	1538877
1538449	BM	1538719	1538759	B	1538121
1538450	AX	1538180	1538779	B	1538121
1538528	AF	1538816	1538810	D	1538369
1538616	BF	1538877	1538813	O	1538822
1538638	BN	1538855	1538860	BF	1538877
1538642	BF	1538877	1538875	BM	1538719
1538655	BM	1538765	1538905	D	1538160
1538665	AF	1538172			

b. Cleaning Before Disassembly. Before proceeding with the disassembly, wash the outside of the unit with dry-cleaning solvent, and blow off with compressed air to remove loose grit and grease.

c. Disposal of Used Parts. Check fuel pump number on edge of mounting flange and select proper repair kit using specification list in subparagraph **b** above. All parts in the standard overhaul repair kit must be installed when a fuel pump has been disassembled for overhaul. Open repair kit and exchange the new parts one by one with the old parts, placing the used parts in the empty package for later disposal.

Section III

SERIES B, D, AND O FUEL PUMPS

6. DISASSEMBLY (fig. 6).

a. Identification (fig. 5). Series B, D, and O fuel pumps are of similar construction. Series B and O use small diaphragms of 3¼-inch diameter, while series D uses a 4-inch diameter diaphragm.

b. Separate Body From Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located.

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

c. Disassemble Body.

(1) Remove three body bottom cover screws. Remove bottom cover, cover gasket, rocker arm spring and cap, and diaphragm spring and cap. Remove hand priming lever if held in place by bottom cover.

(2) Remove pull rod nut and remove lock washer, hex washer, upper protector, diaphragm, lower protector, and pull rod washer.

(3) Clamp mounting flange of pump body in vise with riveted end of rocker arm upward and with flange gasket surface against one jaw of vise. File small (upset or riveted) end of rocker arm pin flush with face of washer. Drive out the rocker arm pin from the pump body, driving on the filed end and using a pin punch. Remove the rocker arm pin washer. Remove rocker arm, links, pins, and pull rod assembly from the pump body. Remove pin clips from link pins, and disassemble links and pull rod.

d. Disassemble Cover.

(1) Loosen bail screw nut and remove bowl, bowl gasket, and bowl seat. Spring bail out of retaining holes in top cover, and remove bail screw nut. Remove strainer screen from top cover.

(2) Remove valve plug and gasket from top cover over strainer. Remove inlet valve spring and valve. Remove air dome (or valve plug) and gasket from top cover over diaphragm. Remove outlet valve spring and valve.

7. CLEANING AND INSPECTION.

a. Clean All Parts.

(1) Clean all metal parts in dry-cleaning solvent. Blow out all passages with compressed air. If difficulty is experienced in cleaning parts, use carbon remover solvent.

(2) Check fuel pump number on edge of mounting flange, and select proper repair kit using specification list in paragraph 5. All parts in the standard repair kit must be installed when a fuel pump has been disassembled for overhaul.

b. Inspection.

(1) Make the following inspection of fuel pump parts which are not included in the repair kit:

(a) Top Cover. Discard cover if cracked or broken, or if the diaphragm flange is warped more than 0.010 inch. If warped less than 0.010 inch, flatten with disc grinder. Discard cover if bowl gasket

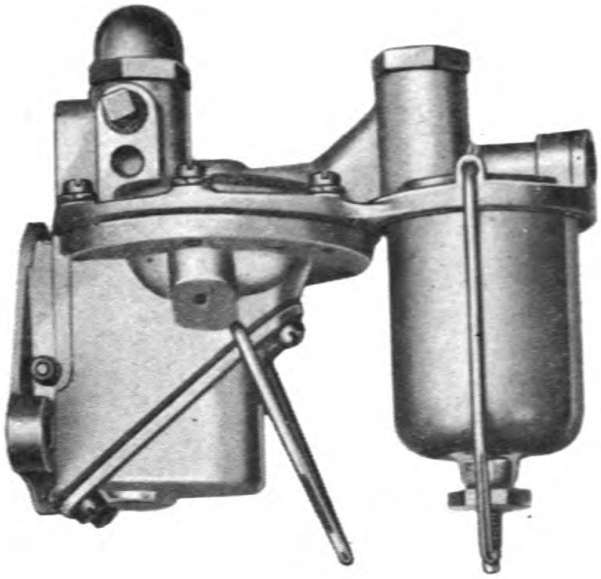

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Figure 5—Fuel Pumps, Series B, D, and O

seat is warped more than 0.010 inch. Discard valve seat insert-type covers when any part of raised valve seat is worn flush with shoulder of valve. Stripped or crossed threads can sometimes be corrected with a thread chaser, or drilled out and retapped to a larger size.

(b) Body. Discard body if diaphragm flange is warped more than 0.010 inch. If warped less than 0.010 inch, refinish with disc grinder. Discard cover if threaded holes in diaphragm flange are stripped or crossed. Bad threads can sometimes be corrected with a thread chaser, or drilled out and retapped to a larger size. Discard body if rocker arm stop is broken.

(c) Rocker Arm. Discard only if obviously worn or broken.

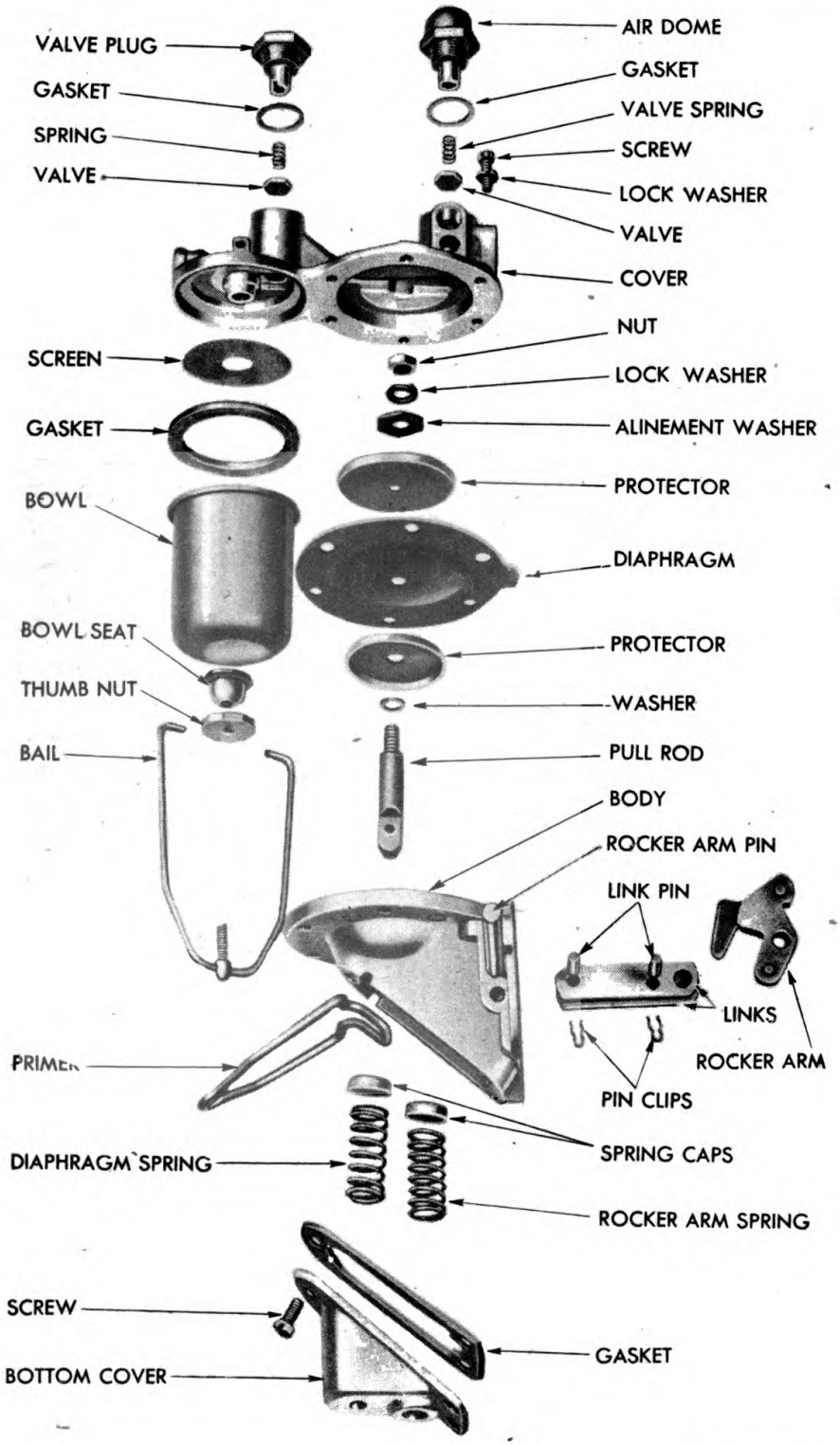
8. ASSEMBLY AND TEST (fig. 6).

a. Assemble Body.

(1) Place pull rod between sheared ends of links, and retain with link pin and two link pin clips. Install link pin through center holes in link, and retain with two link pin clips.

(2) Place pull rod in hole of pump body with sheared edges on links toward body and threaded end of pull rod. Install rocker arm through hole in mounting flange so that hooked end lays between links and over center link pin.

(3) Clamp mounting flange of pump body in vise with gasket surface against one jaw of vise. Aline the holes in rocker arm and link



RA PD 341266

Figure 6—Fuel Pump—Disassembled (Typical Series B, D, and O Construction)

with hole in pump body, and drive in the rocker arm pin. Install the rocker arm pin washer on the pin, and peen over the end of pin. Some arm pins are retained with wire clips.

(4) Lift pull rod out of hole and, if used, install priming lever in body grooves. Open the end around pull rod hole, and reinsert pull rod. Place diaphragm spring over inner boss, and rocker arm spring over outer (recessed) boss in bottom cover. Place spring cap on each spring. Place gasket on bottom cover. Hold pump body by threaded end of pull rod to retain hand primer in place. Place bottom cover and gasket assembly against body with spring caps seated against pull rod and rocker arm. Hold cover in place, and install three bottom cover screws. Tighten securely.

(5) Soak new diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Place engine mounting flange of pump body in vise with diaphragm flange upward. On threaded end of pull rod, loosely assemble a washer, lower protector (dish down), diaphragm, upper protector (dish up), hex washer, lock washer, and nut. Aline diaphragm holes with holes in body flange, and maintain alinement by inserting two or three cover screws. Tighten pull rod nut securely, using another wrench to hold hex washer, thus preventing diaphragm distortion.

b. Assemble Top Cover.

(1) Install gaskets on air dome and valve plug. Place a drop of light oil on valve, and install in valve chamber over diaphragm. Insert valve spring in air dome, and tip into valve chamber. Tighten air dome securely. Place a drop of light oil on valve, and install in chamber over strainer. Insert valve spring in plug, and tip into chamber. Tighten securely.

(2) Install strainer screen and bowl gasket in top cover. Install bowl seat on bail screw, and swing into position after installing bowl. Tighten thumb nut securely with fingers only.

c. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet, and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section IV

SERIES G FUEL PUMPS

9. DISASSEMBLY.

a. Separate Body From Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located (fig. 7).

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body.

(1) Push in on diaphragm and turn 90 degrees in either direction to disengage diaphragm pull rod from link. Remove diaphragm assembly and spring.

(2) Remove diaphragm pull rod nut, thus disassembling lock washer, hex alinement washer, upper protector, diaphragm, lower protector, pull rod gasket, and pull rod.

(3) Remove retaining wire clips from rocker arm pin. Rest edge of pump body flange on edge of vise, and drive rocker arm pin out with drift punch and hammer. Remove rocker arm, spring, and link.

c. Disassemble Cover.

(1) Remove cover plate nut to disassemble cover plate nut gasket, cover plate, cover plate gasket, and screen.

(2) Remove outlet valve plug with screwdriver to disassemble valve spring and valve. Remove inlet valve plug with ⅛-inch drill rod to disassemble valve spring and valve.

(3) Remove drain plug and drain plug spring.

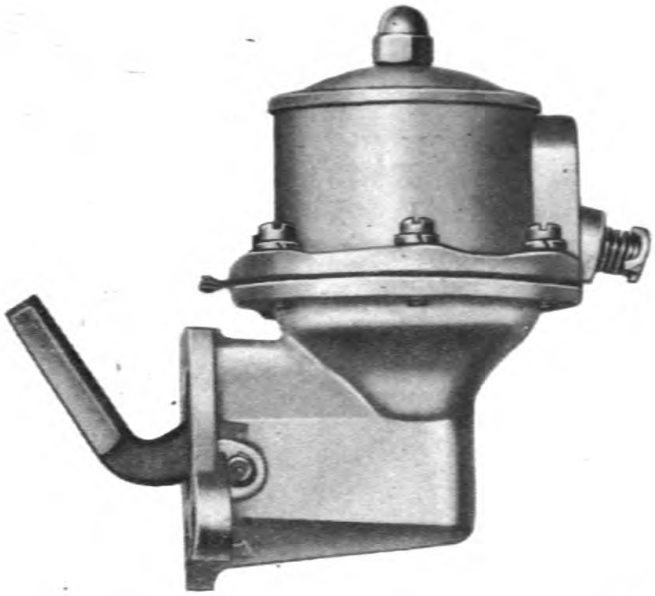
10. CLEANING AND INSPECTION.

a. For cleaning and inspection procedure in this series of pumps, refer to paragraph 7.

11. ASSEMBLY AND TEST.

a. Assemble Body (fig. 8).

(1) Place link in body through rocker arm port. Loop of link should be up. Drive rocker arm pin into body just far enough to pick up one link loop. Install rocker arm with spring in position. Drive pin through rocker arm hole, remaining link loop, and body. Assemble washer on hollow end of pin, and rivet edges of pin over washer.



RA PD 341267

Figure 7—Fuel Pump, Series G

(2) Soak new diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Make an assembly of pull rod, gasket, lower protector (dish down), diaphragm, upper protector (dish up), hex alinement washer, lock washer, and nut. Aline any two holes in diaphragm so they are parallel to flat at bottom of pull rod. Tighten pull rod nut while holding hex washer with another wrench.

(3) Assemble diaphragm spring over pull rod well in body. Insert diaphragm pull rod through spring and well of body. Turn diaphragm so flat of pull rod will enter slot in link. Push down, and secure by turning diaphragm 90 degrees in either direction.

b. Assemble Cover.

(1) Insert valve and spring in outlet position, and retain with slotted-head outlet plug. Tighten with screwdriver. Insert spring and valve in inlet position with stud head inlet valve plug. Tighten with short piece of ⅛-inch drill rod.

(2) Position screen and gasket over inlet valve stud, assemble cover plate, and retain in position with cover plate nut and gasket. Insert drain plug into spring, and screw drain plug securely into cover.

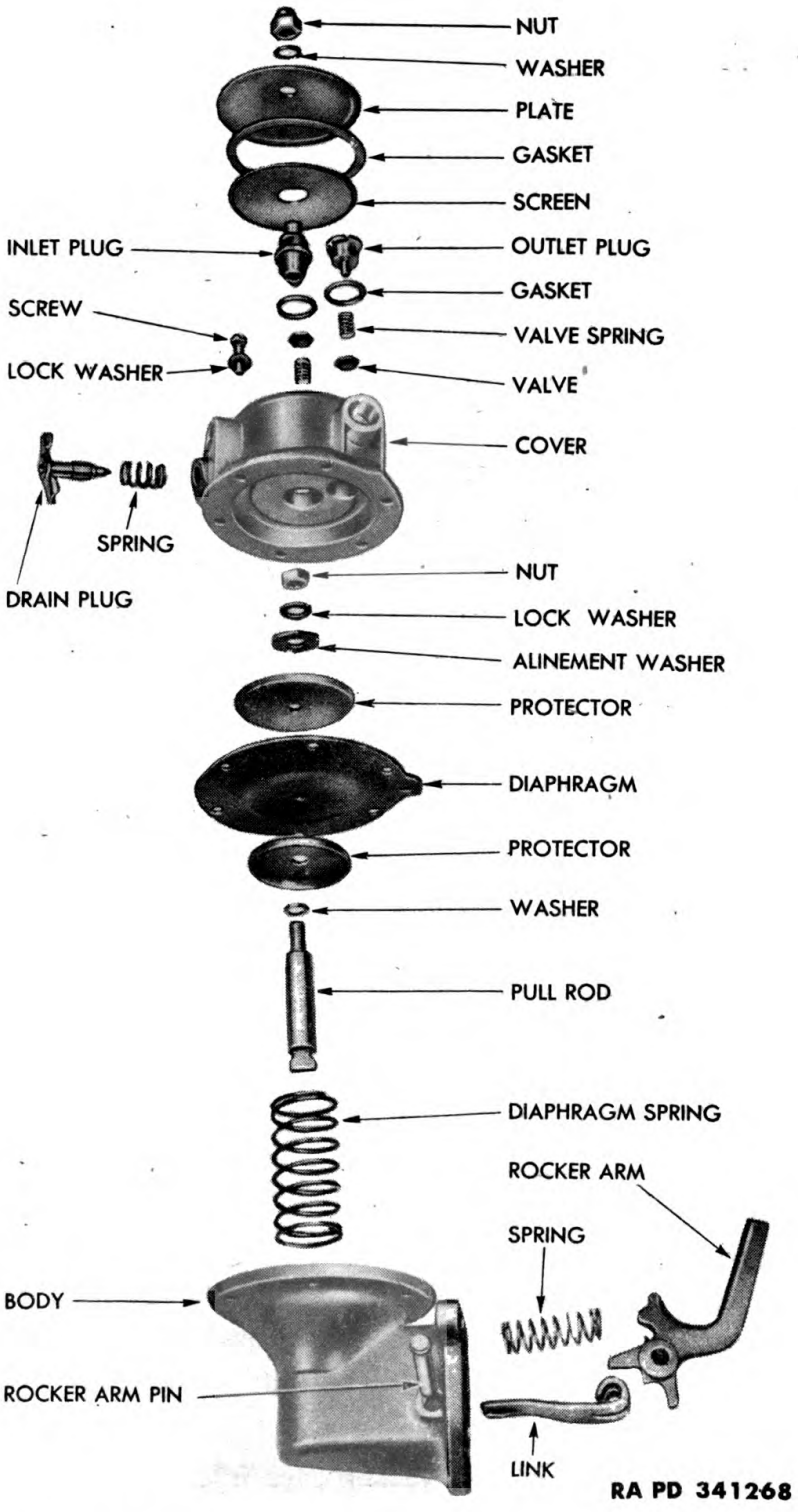


Figure 8—Fuel Pump—Disassembled (Typical Series G Construction)

c. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section V

SERIES IHC SPECIAL FUEL PUMPS

12. DISASSEMBLY.

a. Identification (fig. 9). Series IHC special pumps are provided with high bodies to avoid engine interference with the pump top cover. Example A in figure 9 uses a cover similar to the D series pumps, and example B uses the 6-valve cover for extra volume and pressure characteristics.

b. Separate Body From Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located.

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

c. Disassemble Body.

(1) Remove diaphragm and pull rod assembly by pressing downward on diaphragm and then turning 90 degrees to disengage pull rod from link. Lift out diaphragm spring. Remove oil seal and oil seal retainer.

(2) Before disassembling diaphragm, note carefully the position of tab on diaphragm with relation to flats on pull rod so new diaphragm can be assembled in the same manner.

(3) Place pull rod in vise and remove pull rod nut, lock washer, alinement washer, upper protector washer, diaphragm, lower protector washer, and pull rod gasket in the order named.

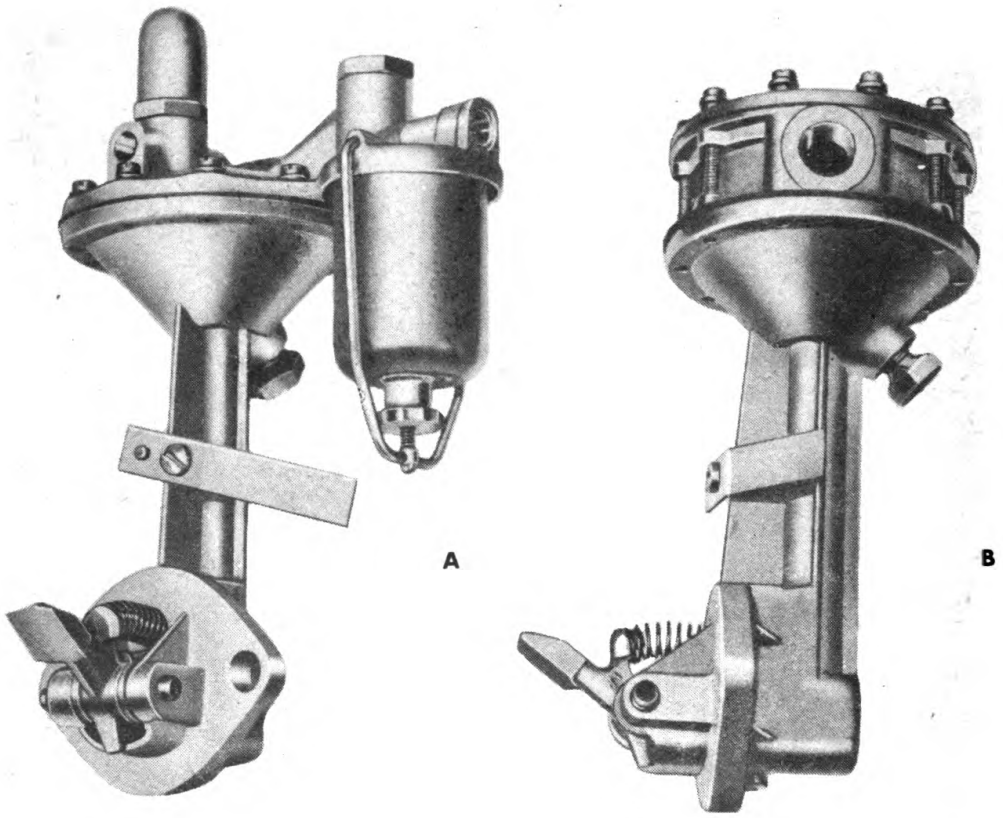


Figure 9—Fuel Pump, Series IHC

(4) Remove retainer clips from rocker arm pin, and drive out pin with drift punch and hammer. This will disassemble rocker arm spring, rocker arm, link, and link spacer washers. Remove priming handle pivot screw to disassemble priming lever and link actuator.

d. Disassemble Cover (A, fig. 9).

(1) Loosen bail screw nut and remove bowl, bowl gasket, and bowl seat. Spring bail out of retaining holes in top cover, and remove bail screw nut. Remove strainer screen from top cover.

(2) Remove valve plug and gasket from top cover over strainer. Remove inlet valve spring and valve. Remove air dome (or valve plug) and gasket from top cover over diaphragm. Remove outlet valve spring and valve.

e. Disassemble Cover (B, fig. 9).

(1) Remove two center cover screws to disassemble pulsator cover plate. Remove three layers of pulsator diaphragm from cover assembly.

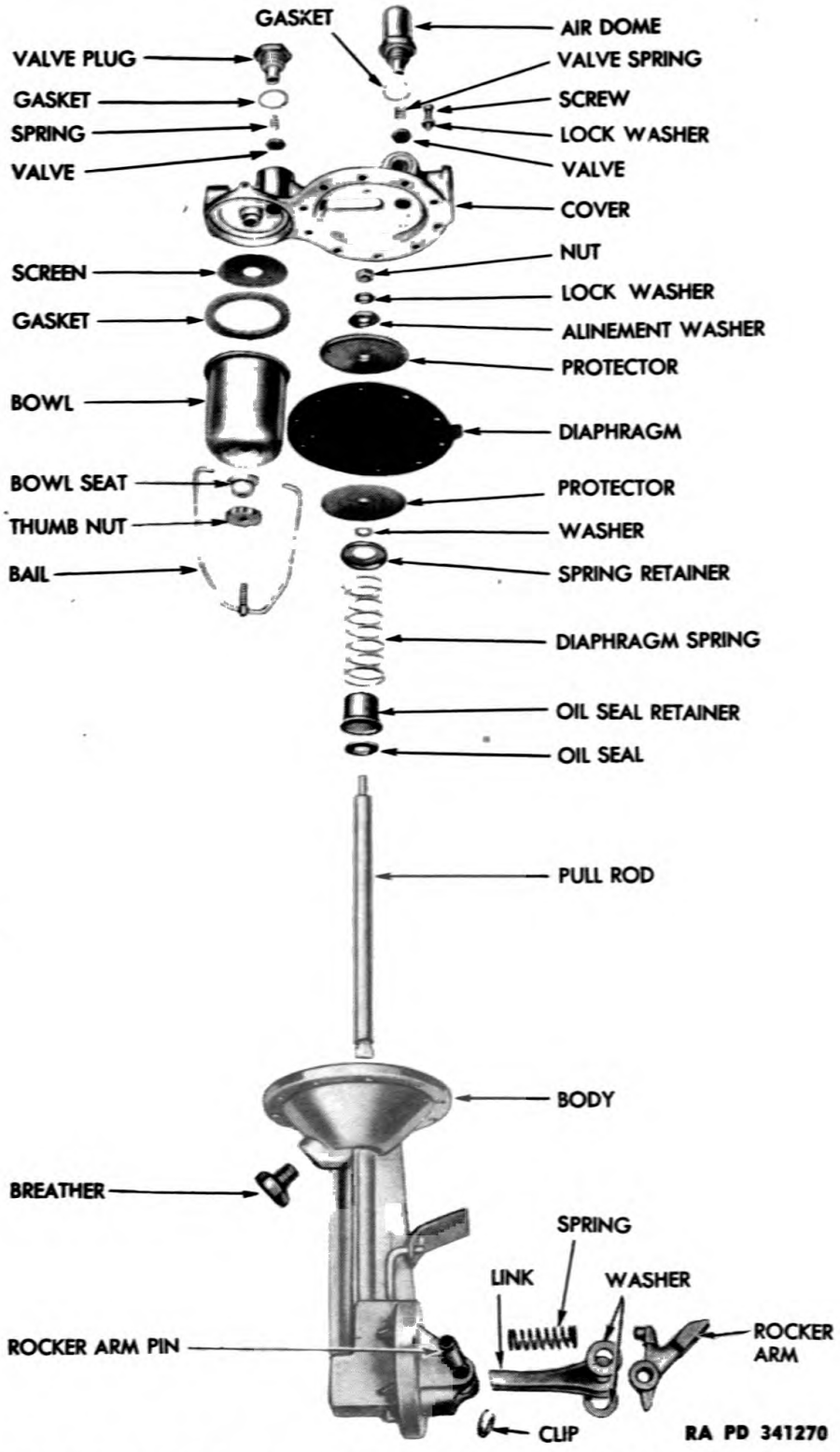


Figure 10—Fuel Pump—Disassembled (Typical Series IHC Special Construction)

(2) Remove eight screws from two valve plates in cover. Lift out two valve plates, six valve and cage assemblies, and two gaskets.

13. CLEANING AND INSPECTION.

a. For cleaning and inspection procedure in this series of pumps, refer to paragraph 7.

14. ASSEMBLY AND TEST.

a. Assemble Body (fig. 10).

(1) Assemble link and rocker arm, and install in pump body. Aline rocker and link holes with holes in body, and drive in rocker arm pin. Retain the pin with a snap ring at each end. Install rocker arm spring.

(2) Soak new diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound.

(3) Place flat end of pull rod in vise, and on the threaded end of rod, assemble a pull rod gasket, lower protector washer (dish down), diaphragm, upper protector (dish up), alinement washer, lock washer, and pull rod nut. Line up tabs of diaphragm with same relation to center line of flats on pull rod as existed before disassembling. Tighten pull rod nut in this position, using a second wrench to hold alinement washer.

(4) Assemble oil seal gasket, gasket retainer, and diaphragm spring in position over well in body. Insert pull rod through oil seal, push diaphragm down against spring pressure, and engage flat end of pull rod in slot of link. Turn diaphragm 90 degrees in either direction to lock in position.

b. Assemble Cover (A, fig. 9).

(1) Install gaskets on air dome and valve plug. Place a drop of light oil on valve, and install in valve chamber over diaphragm. Insert valve spring in air dome, and tip into valve chamber. Tighten air dome securely. Place a drop of light oil on valve, and install in chamber over strainer. Insert valve spring in plug, and tip into chamber. Tighten securely.

(2) Install strainer screen and bowl gasket in top cover. Install bowl seat on bail screw, and swing into position after installing bowl. Tighten thumb nut securely with fingers only.

c. Assemble Cover (B, fig. 9).

(1) Insert two gaskets and six valve and cage assemblies in cover. Inlet valves should have 3-legged spider into cover, and outlet valves should have 3-legged spider facing out of cover. Secure valve and cage assemblies by means of two valve plates and eight retainer screws.

(2) Assemble three layers of pulsator diaphragm on cover over the valve assemblies. Place cover plate on diaphragm, and retain with two center screws and lock washers.

d. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

e. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section VI

SERIES P FUEL PUMPS

15. DISASSEMBLY.

a. Separate Body From Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located (fig. 11).

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body.

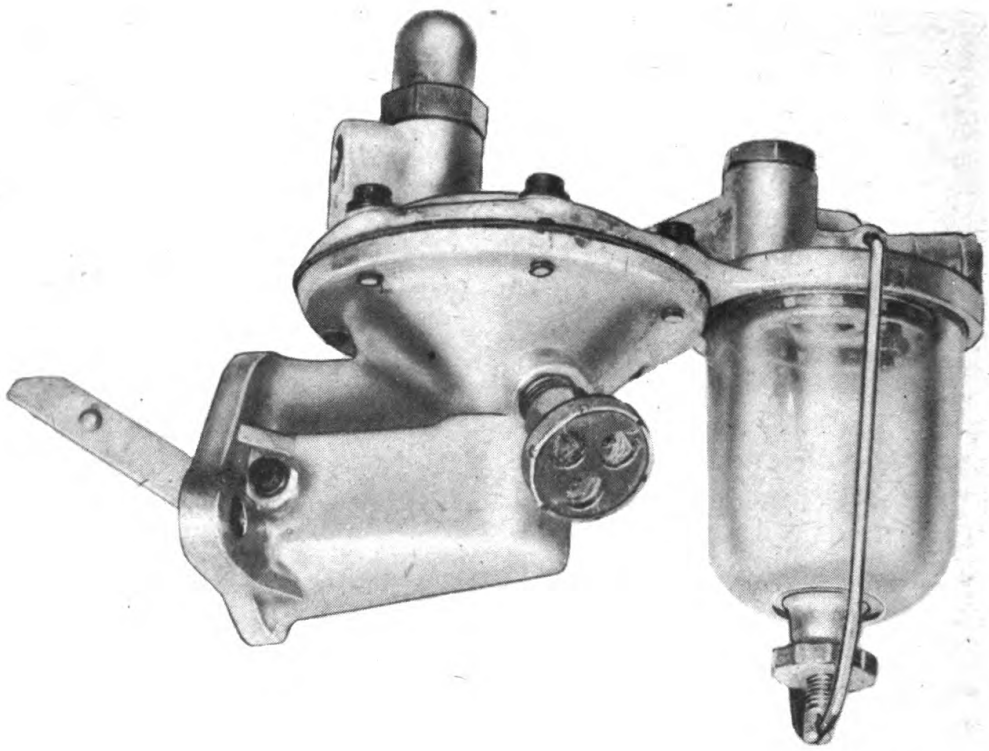
(1) Turn diaphragm assembly 90 degrees in either direction to disengage from link. Remove diaphragm assembly and spring.

(2) Remove rocker arm pin retainer clips, and drive out pin with drift punch and hammer. Remove rocker arm, arm spring, and link from pump body.

c. Disassemble Cover.

(1) Loosen bail screw nut and remove bowl, bowl gasket, and bowl seat. Spring bail out of retaining holes in top cover and remove bail screw nut. Remove strainer screen from top cover.

(2) Remove valve plug and gasket from top cover over strainer. Remove inlet valve spring and valve. Remove air dome (or valve plug) and gasket from top cover over diaphragm. Remove outlet valve spring and valve.



RA PD 341271

Figure 11—Fuel Pump, Series P

16. CLEANING AND INSPECTION.

a. For cleaning and inspection in this series of pumps, refer to paragraph 7.

17. ASSEMBLY AND TEST.

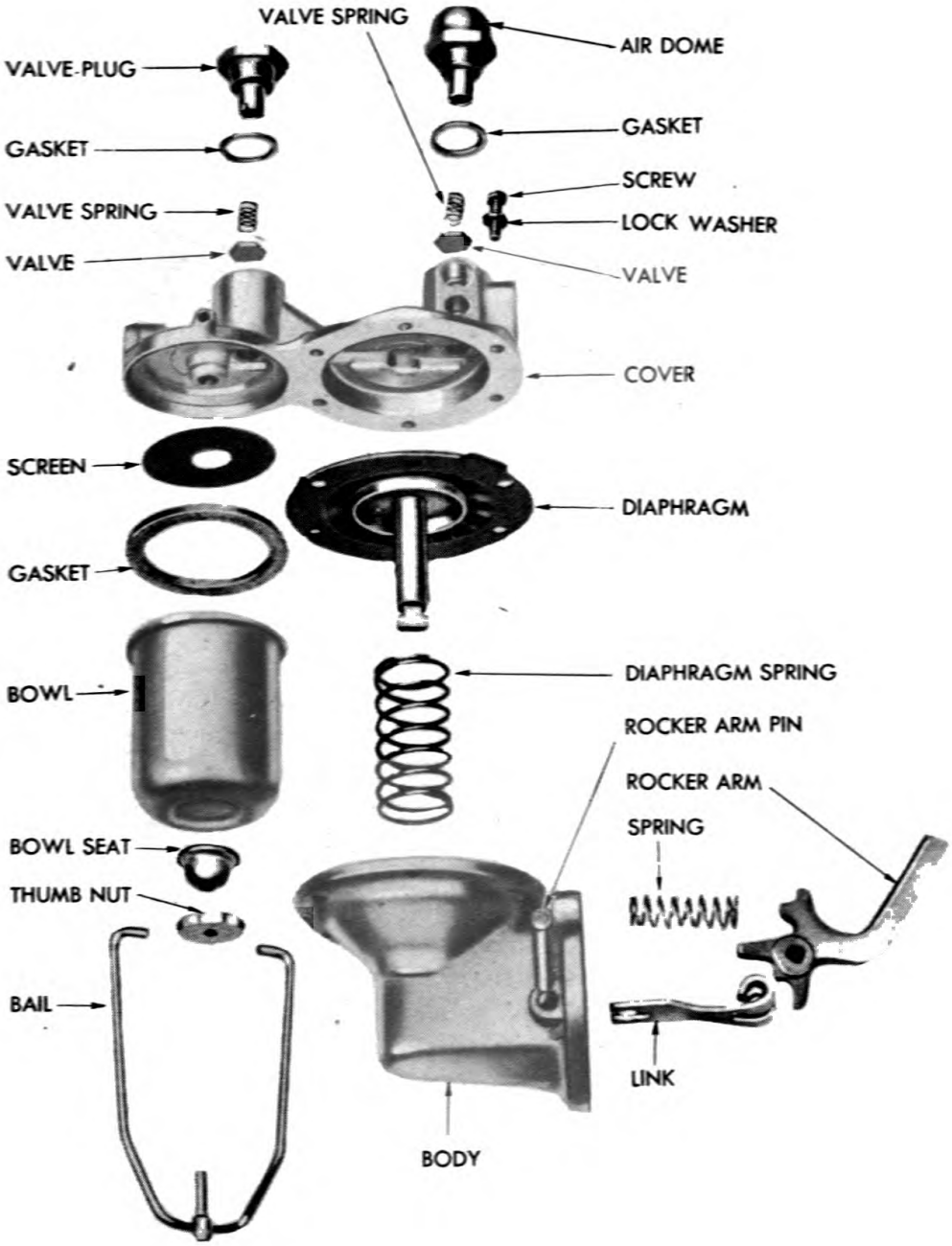
a. Assemble Body (fig. 12).

(1) Install rocker arm, spring, and link in body. Loop for pin in link should be up. Aline holes in rocker arm and link with arm pin hole in body, and drive in rocker arm pin. Install washer over small end of arm pin, and peen over end of pin.

(2) Soak new diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Place diaphragm spring over pull rod boss in body, and insert diaphragm. Insert flat of pull rod through slot in link, and retain diaphragm by turning 90 degrees in either direction.

b. Assemble Cover.

(1) Install gaskets on air dome and valve plug. Place a drop of light oil on valve, and install in valve chamber over diaphragm.



RA PD 341272

Figure 12—Fuel Pump—Disassembled (Typical Series P Construction)

Insert valve spring in air dome, and tip into valve chamber. Tighten air dome securely. Place a drop of light oil on valve, and install in chamber over strainer. Insert valve spring in plug, and tip into chamber. Tighten securely.

(2) Install strainer screen and bowl gasket in top cover. Install bowl seat on bail screw, and swing into position after installing bowl. Tighten thumb nut securely with fingers only.

c. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section VII

SERIES R FUEL PUMPS

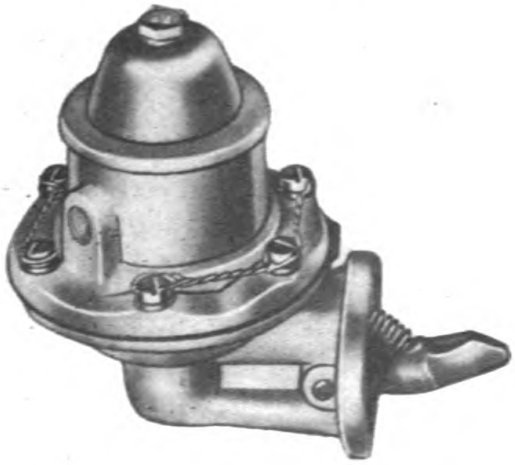
18. DISASSEMBLY.

a. Separate Body From Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located (fig. 13).

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body. Rest pump body on edge of vise, and drive out rocker arm pin with drift punch and hammer. Remove rocker arm, arm spring, and link. Remove link to arm bushing if used. Lift out the diaphragm assembly and diaphragm spring. Some pumps may be equipped with oil seal assembly which is locked in place on the diaphragm pull rod. Disassemble by turning lower retainer until slot lines up with flat of pull rod. Remove lower retainer, two washers, upper oil seal retainer, and retainer spring.



RA PD 341273

Figure 13—Fuel Pump, Series R

c. Disassemble Cover Equipped With Separable Valves.

(1) Remove three screws holding valve plate. Some units will have lock washers under the screws. Lift out valve plate and gasket, two valves and valve springs, and one outlet valve spring retainer.

(2) Remove top cover plate cap screw and gasket. Remove cover plate and gasket. Remove strainer screen from top cover. Unscrew drain plug from side of top cover. Some units use a coil friction spring under the drain plug.

d. Disassemble Cover Equipped With Valve and Cage Assemblies.

(1) Remove two screws holding valve and cage retainer. Lift out valve and cage retainer, two valve and cage assemblies, and gasket.

(2) Remove top cover plate cap screw and gasket, cover plate, gasket, and screen. Remove drain plug from side of top cover. Some units are equipped with a coil tension spring over the drain plug.

19. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of pumps, refer to paragraph 7.

20. ASSEMBLY AND TEST.

a. Assemble Body (fig. 14):

(1) Assemble link and rocker arm. Insert rocker arm bushing if used. Place rocker arm and link in body with link hook down. Aline rocker arm pin hole with hole in body, and drive in rocker arm

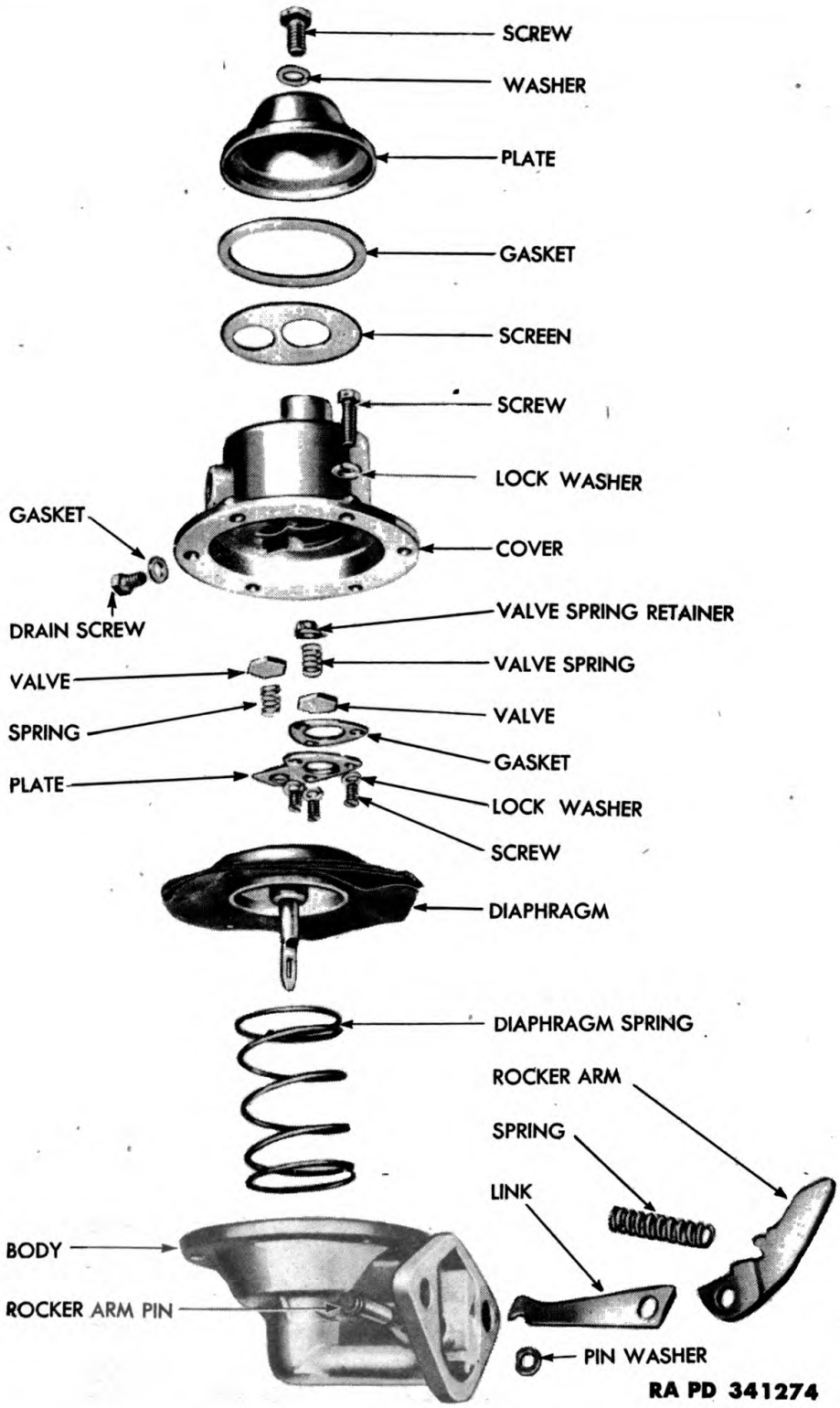


Figure 14—Fuel Pump—Disassembled (Typical Series R Construction)

pin. Install washer on small end of rocker arm pin, and spread end of pin. Install rocker arm spring.

(2) Soak new diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. If used, install oil seal spring, upper oil seal retainer, two oil seal washers, and lower retainer on the diaphragm pull rod. Turn the lower oil seal retainer 90 degrees to lock in place. Place diaphragm spring over pull rod well, and install diaphragm assembly. Hold pump body upside down, and press diaphragm against spring. At the same time, tilt the diaphragm so pull rod angles away from link hook. Bring diaphragm back to level position and the link should engage the pull rod.

b. Assemble Cover Equipped With Separable Valves.

(1) Place 3-legged spring retainer in outlet valve hole, convex side into cover. Place gasket in recess of casting around outlet valve hole. Set valve spring on outlet valve retainer, and valve on spring. Place a valve against inlet valve seat, and a spring on top of valve. Secure valve assembly with valve plate, three screws, and three lock washers.

(2) Install screen, cover plate gasket, cover plate, and cover plate screw with gasket in the order named. Install drain screw with either a gasket or tension spring, depending on construction.

c. Assemble Cover Equipped With Valve and Cage Assemblies.

(1) Install valve and cage gasket and two valve and cage assemblies. Retain with valve retainer and two screws. Outlet valve must have 3-legged spider facing into cover, and inlet valve must have 3-legged spider facing out of cover.

(2) Install screen, cover plate gasket, cover plate, and cover plate screw with gasket in the order named. Install drain screw with either a gasket or tension spring, depending on construction.

d. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

e. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

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Section VIII

SERIES S FUEL PUMPS

21. DISASSEMBLY.

a. Separate Body From Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located (fig. 15).

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body.

(1) Remove three screws from bottom cover and disassemble cover, diaphragm spring, rocker arm spring, two spring caps, and cover gasket. Also remove priming lever if used. Remove clips and pin from diaphragm to link connection, and then lift diaphragm assembly out of body. Remove upper diaphragm spring if used.

(2) Remove clips from rocker arm pin, and drive out rocker arm pin with drift punch and hammer. If rocker arm pin is riveted, then file riveted end flush with washer. Drive out pin with drift punch and hammer. Remove rocker arm and assembled links from body. Disassemble links from pin by removing link pin clips.

c. Disassemble Cover.

(1) Remove cover plate nut to disassemble cover plate nut gasket, cover plate, cover plate gasket, and screen.

22. CLEANING AND INSPECTION.

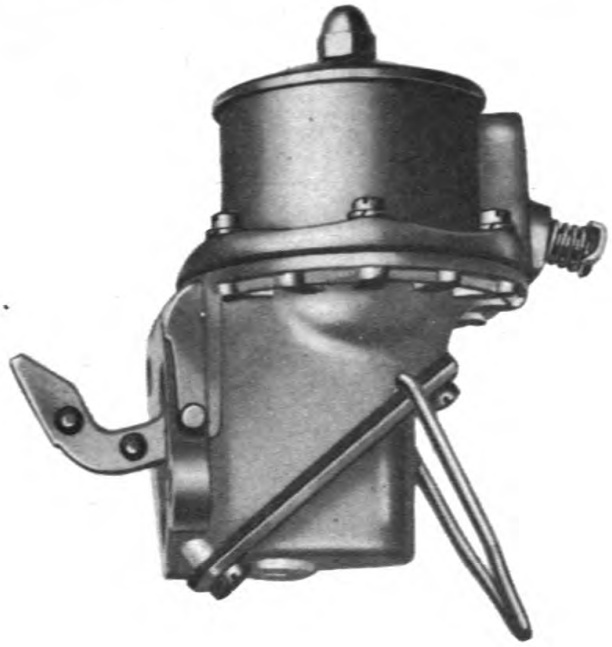
a. For cleaning and inspection on this series of pumps, refer to paragraph 7.

23. ASSEMBLY AND TEST.

a. Assemble Body (fig. 16).

(1) If used, assemble upper spring over diaphragm pull rod, and push pull rod through hole in pump body. Assemble sheared ends of two links to flat of pull rod (sheared link corner toward top of pull rod) and retain with one link pin and two clips. Install link pin through center hole of link, and retain with two clips.

(2) Install rocker arm between links with hooked end over center link pin. Assembly is correct when center link pin is below center line of links. Aline rocker arm pin hole with hole in body,



RA PD 341275

Figure 15—Fuel Pump, Series S

and drive in rocker arm pin. Install washer over counterbored end of pin, and spread pin at counterbore to retain in position.

(3) Place diaphragm spring over inner boss of lower cover, and the rocker arm spring over outer (recessed) boss. Place spring caps over springs and gasket on lower cover. Suspend body with lower cover flange down (install priming lever if used) and place lower cover, with associated parts, against body. Spring caps must seat against bottom of pull rod and hook of rocker arm. Retain lower cover with three screws.

b. Assemble Cover.

(1) Insert valve and spring in outlet position, and retain with slotted-head outlet plug. Tighten with screwdriver. Insert spring and valve in inlet position, and retain with stud head inlet valve plug. Tighten with short piece of ⅛-inch drill rod.

(2) Position screen and gasket over inlet valve stud, assemble cover plate, and retain in position with cover plate nut and gasket. Insert drain plug into spring, and screw drain plug securely into cover.

c. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely

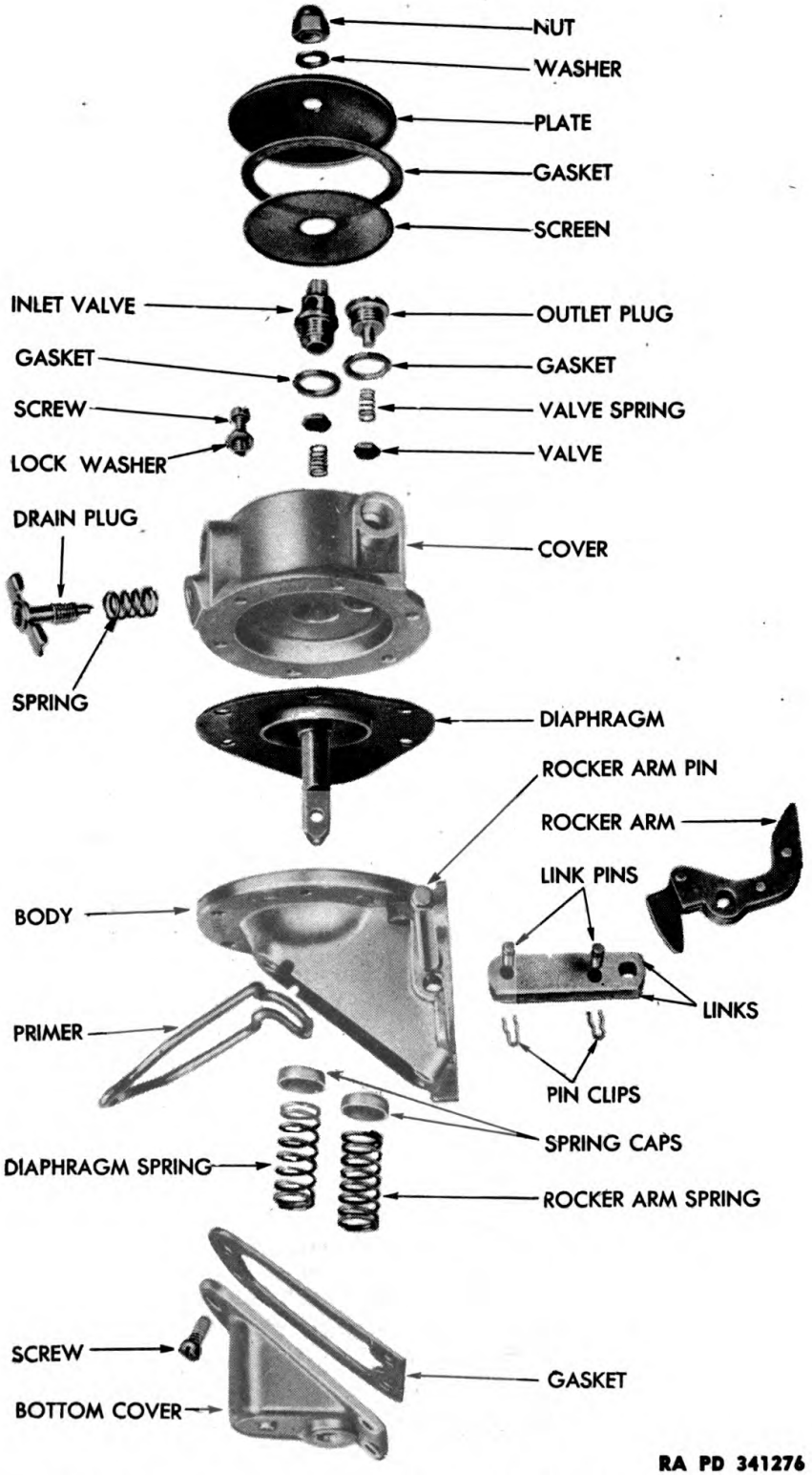


Figure 16—Fuel Pump—Disassembled (Typical Series S Construction)

until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section IX

SERIES T FUEL PUMPS

24. DISASSEMBLY.

a. Separate Body From Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located.

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body.

(1) Turn diaphragm assembly 90 degrees in either direction to disengage from link. Remove diaphragm assembly and spring.

(2) Remove rocker arm pin retainer clip, and drive out pin with drift punch and hammer. If rocker arm is of the riveted type, file riveted end of pin flush with washer, and drive out pin with drift punch and hammer. Remove rocker arm, arm spring, and link from pump body.

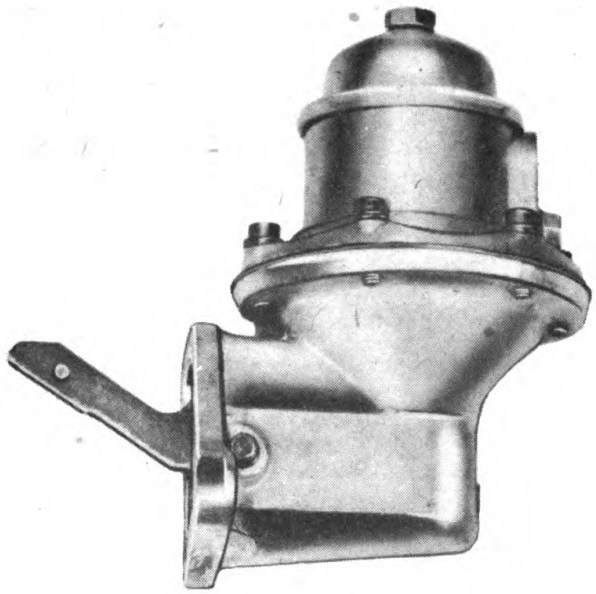
c. Disassemble Cover.

(1) Remove three screws holding valve plate. Some units will have lock washers under the screws. Left out valve plate and gasket, two valves and valve springs, and one outlet valve spring retainer.

(2) Remove top cover plate cap screw and gasket. Remove cover plate and gasket. Remove strainer screen from top cover. Unscrew drain plug from side of top cover. Some pumps use a coil friction spring under the drain plug.

25. CLEANING AND INSPECTION.

a. For cleaning and inspection on this series of pumps, refer to paragraph 7.



RA PD 341277

Figure 17—Fuel Pump, Series T

26. ASSEMBLY AND TEST.

a. Assemble Body (fig. 18).

(1) Install rocker arm, spring, and link in body. Loop for pin in link should be up. Aline holes in rocker arm and link with arm pin hole in body, and drive in rocker arm pin. Install washer over small end of arm pin, and peen over end of pin.

(2) Soak new diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Place diaphragm spring over pull rod boss in body, and insert diaphragm. Insert flat of pull rod through slot in link, and retain diaphragm by turning 90 degrees in either direction.

b. Assemble Cover.

(1) Place 3-legged spring retainer in outlet valve hole, convex side into cover. Place gasket in recess of casting around outlet valve hole. Set valve spring on outlet valve retainer, and a valve on spring. Place a valve against inlet valve seat, and a spring on top of valve. Secure valve assembly with valve plate, three screws, and three lock washers.

(2) Install screen, cover plate gasket, cover plate, and cover plate screw with gasket in the order named. Install drain screw with either a gasket or tension spring, depending on construction.

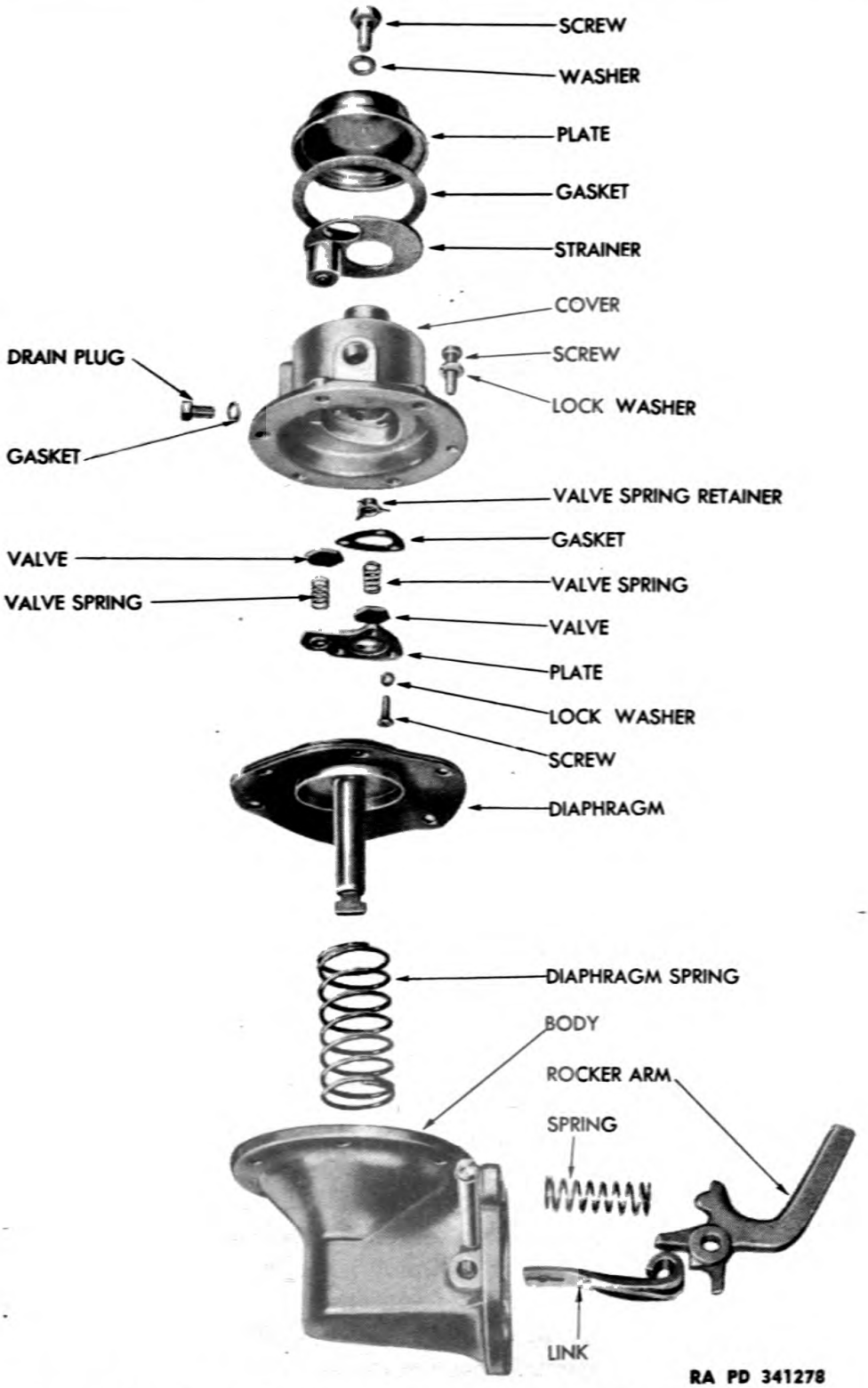


Figure 18—Fuel Pump—Disassembled (Typical Series T Construction)

c. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section X

SERIES W FUEL PUMPS

27. DISASSEMBLY.

a. Separate Body From Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located (fig. 19).

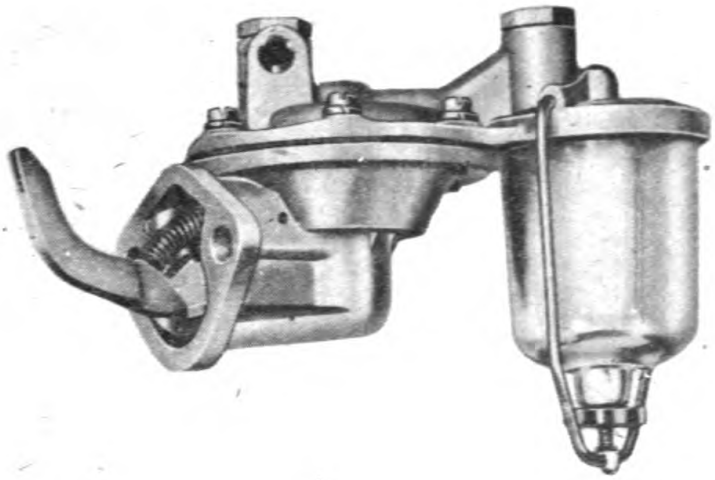
(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body. Rest pump body on edge of vise, and drive out rocker arm pin with drift punch and hammer. Remove rocker arm, arm spring, and link. Remove link to arm bushing if used. Lift out diaphragm spring and assembly. Some pumps may be equipped with oil seal assembly which is locked in place on the diaphragm pull rod. Disassemble by turning lower retainer until slot lines up with flat of pull rod. Remove lower retainer, two washers, upper oil seal retainer, and retainer spring.

c. Disassemble Cover.

(1) Loosen bail screw nut and remove bowl, bowl gasket, and bowl seat. Spring bail out of retaining holes in top cover, and remove bail screw nut. Remove strainer screen from top cover.

(2) Remove inlet valve plug and gasket from top cover over strainer. Remove inlet valve spring and valve. Remove outlet air dome (or valve plug) and gasket from top cover over diaphragm. Remove outlet valve spring and valve.



RA PD 341279

Figure 19—Fuel Pump, Series W

28. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of fuel pumps, refer to paragraph 7.

29. ASSEMBLY AND TEST.

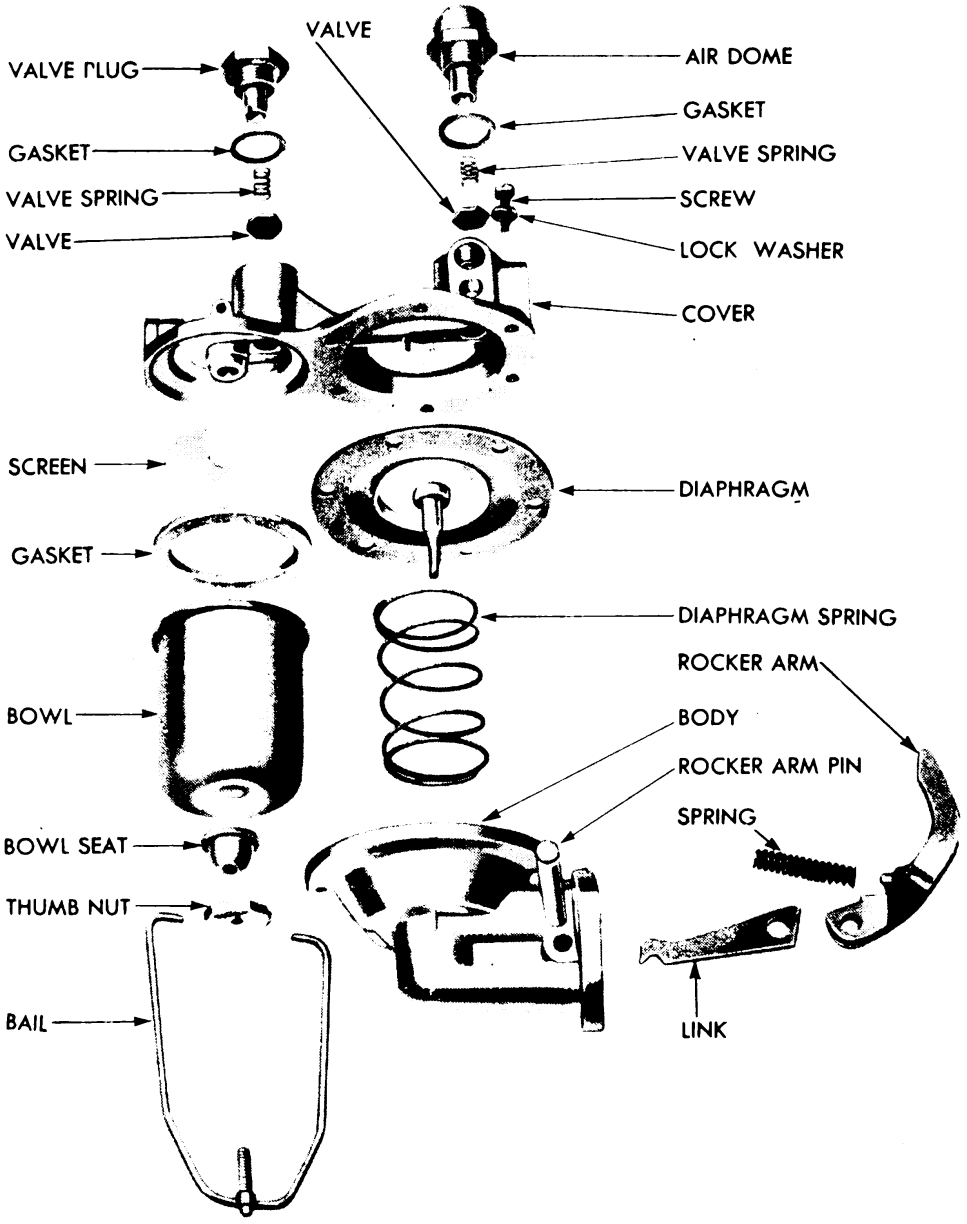
a. Assemble Body (fig. 20).

(1) Assemble link and rocker arm. Insert rocker arm bushing if used. Place rocker arm and link in body with link hook down. Aline rocker arm pin hole with hole in body, and drive in rocker arm pin. Install washer on small end of rocker arm pin, and spread end of pin. Install rocker arm spring.

(2) Soak new diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. If used, install oil seal spring, upper oil seal retainer, two oil seal washers, and lower retainer on the diaphragm pull rod. Turn the lower oil seal retainer 90 degrees to lock in place. Place diaphragm spring over pull rod well, and install diaphragm assembly. Hold pump body upside down and press diaphragm against spring. At the same time, tilt the diaphragm so pull rod angles away from link hook. Bring diaphragm back to level position and the link should engage the pull rod.

b. Assemble Cover.

(1) Install gaskets on air dome and valve plug. Place a drop of light oil on valve, and install in valve chamber over diaphragm. Insert valve spring in air dome, and tip into valve chamber. Tighten air



RA PD 341280

Figure 20—Fuel Pump—Disassembled (Typical Series W Construction)

dome securely. Place a drop of light oil on valve, and install in chamber over strainer. Insert valve spring in plug, and tip into chamber. Tighten securely.

(2) Install strainer screen and bowl gasket in top cover. Install bowl seat on bail screw, and swing into position after installing bowl. Tighten thumb nut securely with fingers only.

c. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section XI

SERIES AC FUEL PUMPS

30. DISASSEMBLY.

a. Separate Body From Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located (fig. 21).

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body.

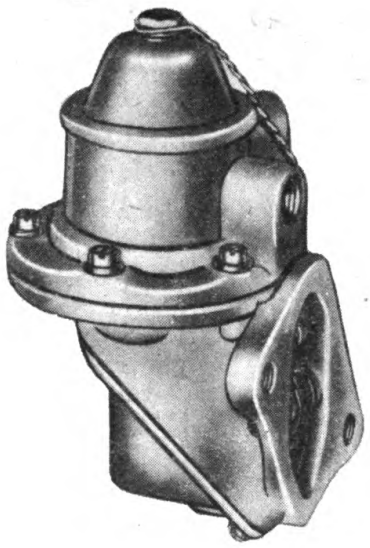
(1) Remove three screws from bottom cover and disassemble cover, diaphragm spring, rocker arm spring, two spring caps, and cover gasket. Also remove priming lever if used. Remove clips and pin from diaphragm to link connection, and then lift diaphragm assembly out of body. Also remove upper diaphragm spring if used.

(2) Remove clips from rocker arm pin, and drive out rocker arm pin with drift punch and hammer. If rocker arm pin is riveted, file riveted end flush with washer. Drive pin out with drift punch and hammer. Remove rocker arm and assembled links from body. Disassemble links from pin by removing link pin clips.

c. Disassemble Cover.

(1) Remove three screws holding valve plate. Some units will have lock washers under the screws. Lift out valve plate and gasket, two valves and valve springs, and one outlet valve spring retainer.

(2) Remove top cover plate cap screw and gasket. Remove cover plate and gasket. Remove strainer screen from top cover. Unscrew drain plug from side of top cover. Some units use a coil friction spring under the drain plug.



RA PD 341281

Figure 21—Fuel Pump, Series AC

31. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of fuel pumps, refer to paragraph 7.

32. ASSEMBLY AND TEST.

a. Assemble Body (fig. 22).

(1) Assemble upper spring (if used) over diaphragm pull rod, and push pull rod through hole in pump body. Assemble sheared ends of two links to flat of pull rod (sheared link corner toward top of pull rod) and retain with one link pin and two clips. Install link pin through center hole of links, and retain with two clips.

(2) Install rocker arm between links with hooked end over center link pin. Assembly is correct when center link pin is below center line of links. Aline rocker arm pin hole with hole in body, and drive in rocker arm pin. Install washer over counterbored end of pin, and spread pin at counterbore to retain in position.

(3) Place diaphragm spring over inner boss of lower cover, and the rocker arm spring over outer (recessed) boss. Place spring caps over springs and gasket on lower cover. Suspend body with lower cover flange down (install priming lever if used) and place lower cover, with associated parts, against body. Spring caps must seat against bottom of pull rod and hook of rocker arm. Retain lower cover with three screws.

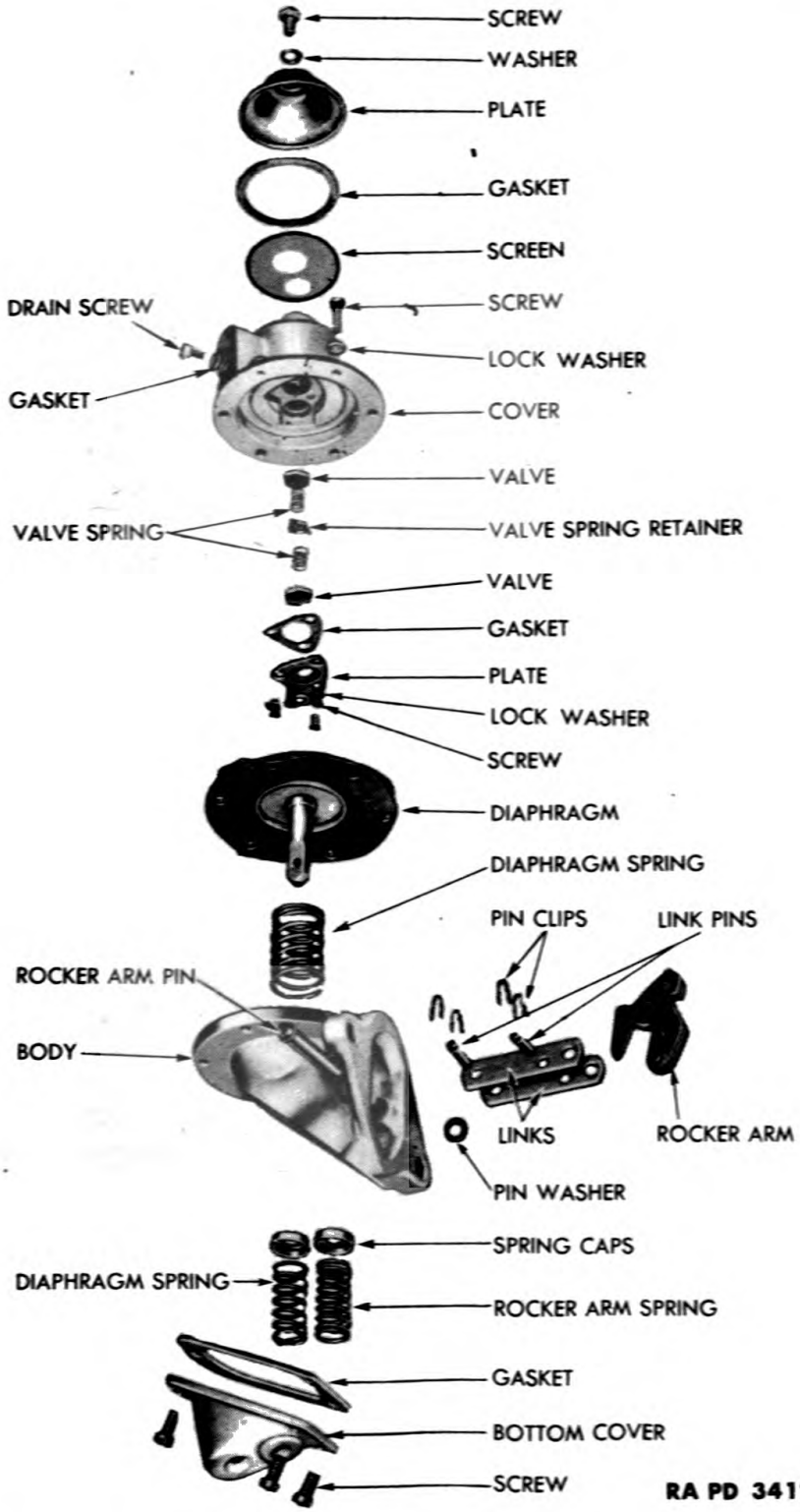


Figure 22—Fuel Pump—Disassembled (Typical Series AC Construction)

b. Assemble Cover.

(1) Place 3-legged spring retainer in outlet valve hole, convex side into cover. Place gasket in recess of casting around outlet valve hole. Set valve spring on outlet valve retainer, and valve on spring. Place a valve against inlet valve seat, and a spring on top of valve. Secure valve assembly with valve plate, three screws, and three lock washers.

(2) Install screen, cover plate gasket, cover plate, and cover plate screw with gasket in the order named. Install drain screw with either a gasket or tension spring, depending on construction.

c. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section XII

SERIES AF FUEL PUMPS

33. DISASSEMBLY.

a. Separate Body From Cover.

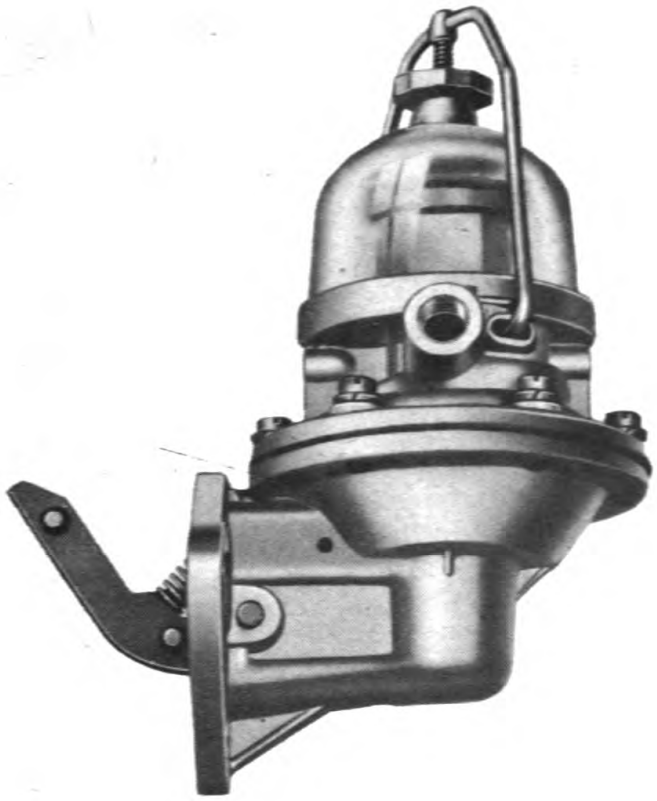
(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located (fig. 23).

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body.

(1) Drive out rocker arm pin with drift punch and hammer. Remove rocker arm, rocker arm spring, and link. Remove diaphragm spring and assembly.

(2) Some pumps are equipped with oil seal assembly which is locked on the diaphragm pull rod. Disassemble by turning lower oil seal retainer until slot lines up with flat of pull rod. Remove lower



RA PD 341283

Figure 23—Fuel Pump, Series AF

retainer, two oil seal washers, upper retainer, and retainer spring. A synthetic rubber oil seal is sometimes used. This seal fits snugly around the pull rod and over the body pull rod well. It is held in place by the diaphragm spring.

c. Disassemble Cover.

(1) Remove two screws holding valve and cage retainer. Lift out valve and cage retainer, two valve and cage assemblies, and gasket.

(2) Loosen bail screw nut, swing bail to the side, and remove bowl and bowl gasket. Spring bail out of its retaining holes in top cover, remove bowl seat, and unscrew bail nut. Remove strainer screen from top cover.

34. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of pumps, refer to paragraph 7.

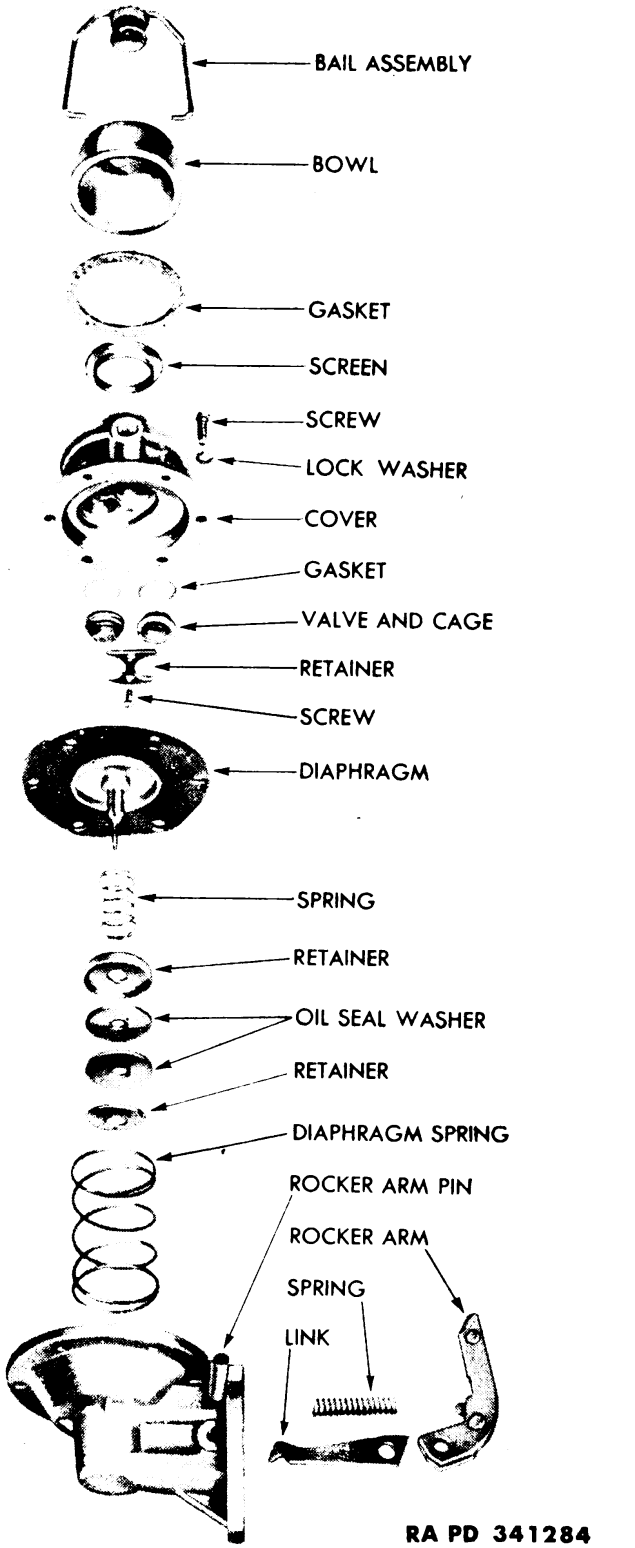


Figure 24—Fuel Pump—Disassembled (Typical Series AF Construction)

35. ASSEMBLY AND TEST.

a. Assemble Body (fig. 24).

(1) Place rocker arm, link, and arm spring in body with link hook down. Aline rocker arm pin hole with hole in body, and drive in rocker arm pin. Install washer on small end of rocker arm pin, and spread end of pin.

(2) Soak new diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. If used, install oil seal spring, upper oil seal retainer, two oil seal washers, and lower retainer on the diaphragm pull rod. Turn the lower oil seal retainer to lock in place. If used, the rubber oil seal is positioned over the body pull rod well, and retained with the diaphragm spring.

(3) Place diaphragm spring over pull rod well, and install diaphragm assembly. Hold pump body upside down, and press diaphragm against spring. At the same time, tilt the diaphragm so the pull rod angles away from link hook. Bring diaphragm back to level position and link should engage the pull rod.

b. Assemble Cover.

(1) Install valve and cage gaskets and two valve and cage assemblies. Retain with valve retainer and two screws. Outlet valve must have 3-legged spider facing into cover, and inlet valve must have 3-legged spider facing out of cover.

(2) Install strainer screen, bowl gasket, and bowl. Install bail nut on bail. Spring bail into retaining holes in cover. Place bowl seat on bail screw, and swing bail into position to retain cover. Tighten bail nut with fingers only.

c. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

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Section XIII

SERIES AG FUEL PUMPS

36. DISASSEMBLY.

a. Separate Body From Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located (fig. 25).

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body.

(1) Remove three screws from bottom cover. Disassemble cover, diaphragm spring, rocker arm spring, two spring caps, and cover gasket. Also remove priming lever if used. Remove clips and pin from diaphragm to link connection, and then lift diaphragm assembly out of body. Also remove upper diaphragm spring if used.

(2) Remove clips from rocker arm pin, and drive rocker arm pin out with drift punch and hammer. If rocker arm pin is riveted, file riveted end flush with washer. Drive out pin with drift punch and hammer. Remove rocker arm and assembled links from body. Disassemble links from pin by removing link pin clips.

c. Disassemble Cover.

(1) Remove two screws holding valve and cage retainer. Lift out valve and cage retainer, two valve and cage assemblies, and gasket.

(2) Loosen bail screw nut, swing bail to the side, and remove bowl and bowl gasket. Spring bail out of its retaining holes in top cover, remove bowl seat, and unscrew bail nut. Remove strainer screen from top cover.

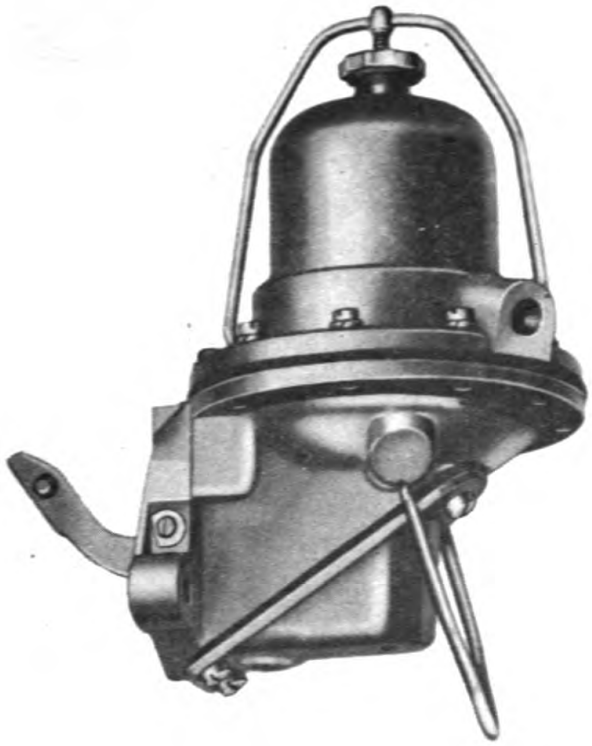
37. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of pumps, refer to paragraph 7.

38. ASSEMBLY AND TEST.

a. Assemble Body (fig. 26).

(1) If used, assemble upper spring over diaphragm pull rod, and push pull rod through hole in pump body. Assemble sheared ends of two links to flat of pull rod (sheared link corner toward top of pull



RA PD 341285

Figure 25—Fuel Pump, Series AG

rod) and retain with one link pin and two clips. Install link pin through center hole of links, and retain with two clips.

(2) Install rocker arm between links with hooked end over center link pin. Assembly is correct when center link pin is below center line of links. Aline rocker arm pin hole with hole in body, and drive in rocker arm pin. Install washer over counterbored end of pin, and spread pin at counterbore to retain in position.

(3) Place diaphragm spring over inner boss of lower cover, and the rocker arm spring over outer (recessed) boss. Place spring caps over springs and gasket on lower cover. Suspend body with lower cover flange down (install priming lever if used) and place lower cover, with associated parts, against body. Spring caps must seat against bottom of pull rod and hook of rocker arm. Retain lower cover with three screws.

b. Assemble Cover.

(1) Install valve and cage gaskets and two valve and cage assemblies. Retain with valve retainer and two screws. Outlet valve must have 3-legged spider facing into cover, and inlet valve must have 3-legged spider facing out of cover.

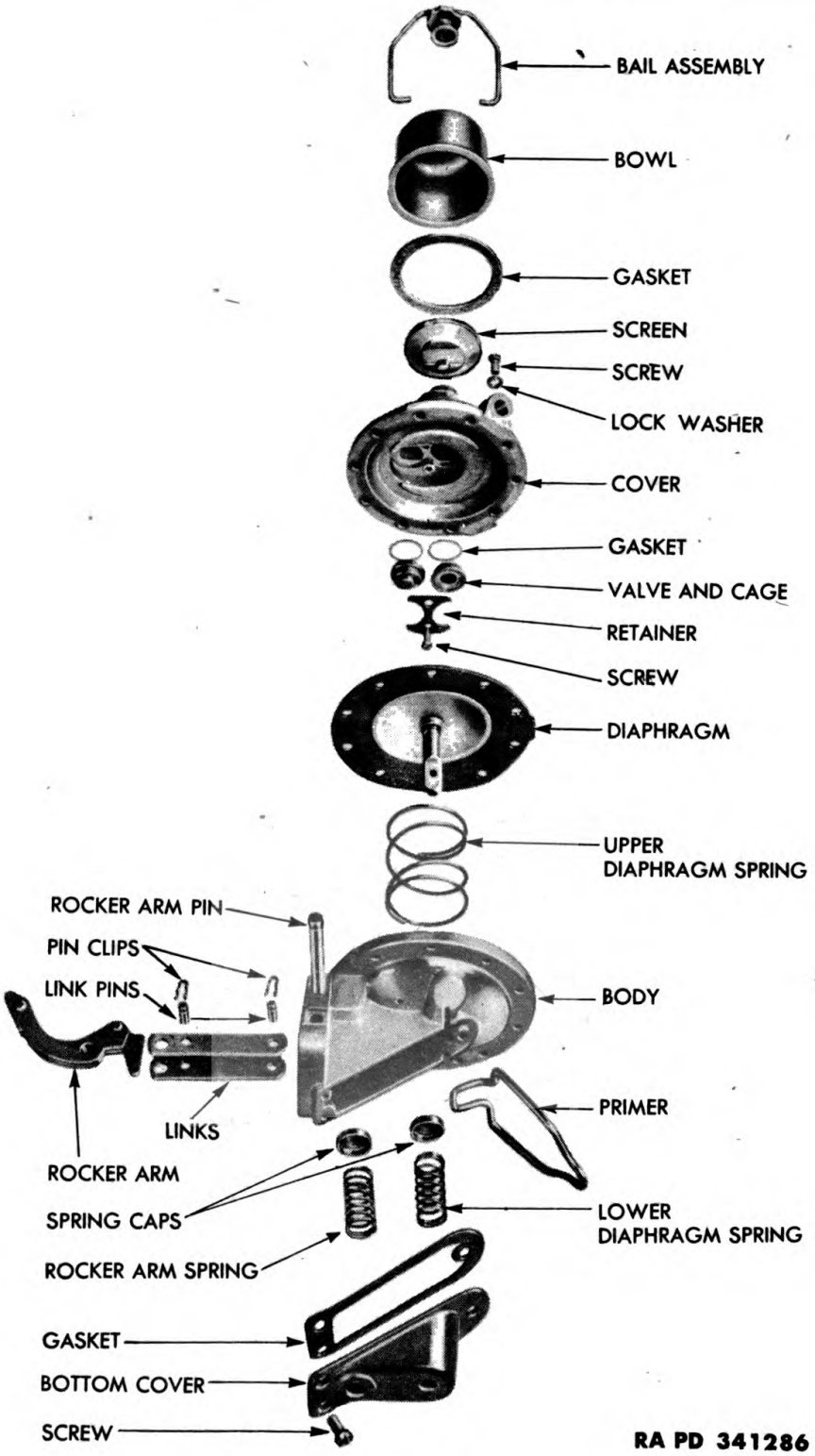


Figure 26—Fuel Pump—Disassembled (Typical Series AG Construction)

(2) Install strainer screen, bowl gasket, and bowl. Install bail nut on bail. Spring bail into retaining holes in cover. Place bowl seat on bail screw, and swing bail into position to retain cover. Tighten bail nut with fingers only.

c. Assemble Cover to Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section XIV

SERIES AH AND AW FUEL PUMPS

39. DISASSEMBLY.

a. Separate Body From Cover.

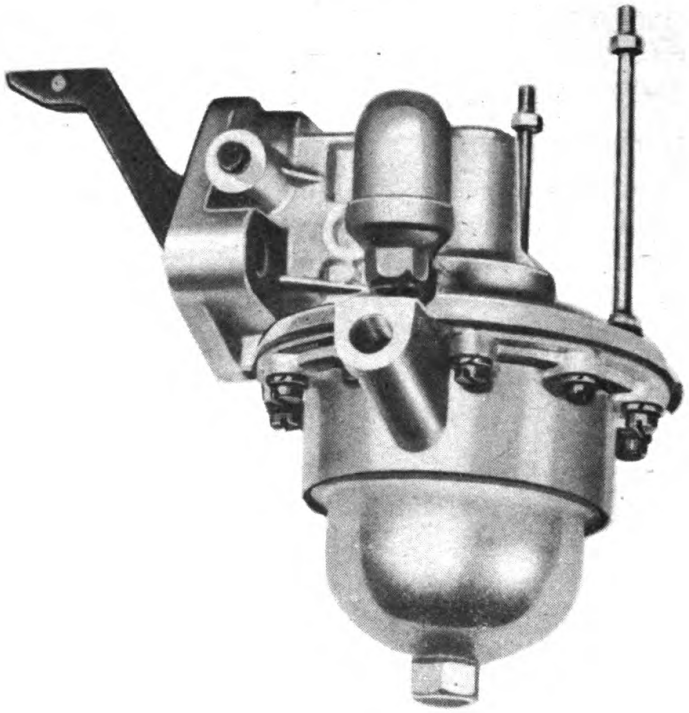
(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located (fig. 27).

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body.

(1) File riveted end of rocker arm pin flush with washer. Drive out rocker arm pin with drift punch and hammer. Wiggle rocker arm to separate link from diaphragm pull rod, and remove assembly from body. Remove rocker arm spacer washers if used. Remove bushing to disassemble link and rocker arm.

(2) Remove diaphragm by pulling straight out. Do not tilt excessively, or staked-in oil seal will be damaged. Lift diaphragm spring and spring retainer from pump body. If used, priming lever is serviced as part of body casting assembly.



RA PD 341287

Figure 27—Fuel Pump, Series AH and AW

c. Disassemble Cover.

(1) Remove valve and cage retainer screw, and lift out retainer, two valve and cage assemblies, and two gaskets.

(2) Remove bowl screw with gasket. Then remove bowl, bowl gasket, and screen.

40. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of pumps, refer to paragraph 7.

41. ASSEMBLY AND TEST.

a. Assemble Body (fig. 28).

(1) Make an assembly of rocker arm and link with bushing. If used, assemble one spacer on each end of bushing. Place assembly of rocker arm and link in body with link hook down. Aline rocker arm pin bushing hole with hole in body. Position rocker arm spring, and temporarily retain assembly with a 4- or 5-inch length of ⅛-inch rod (an 8-penny nail can be used). Locate priming lever (part of body assembly) so that milled flat of priming lever shaft contacts the link.

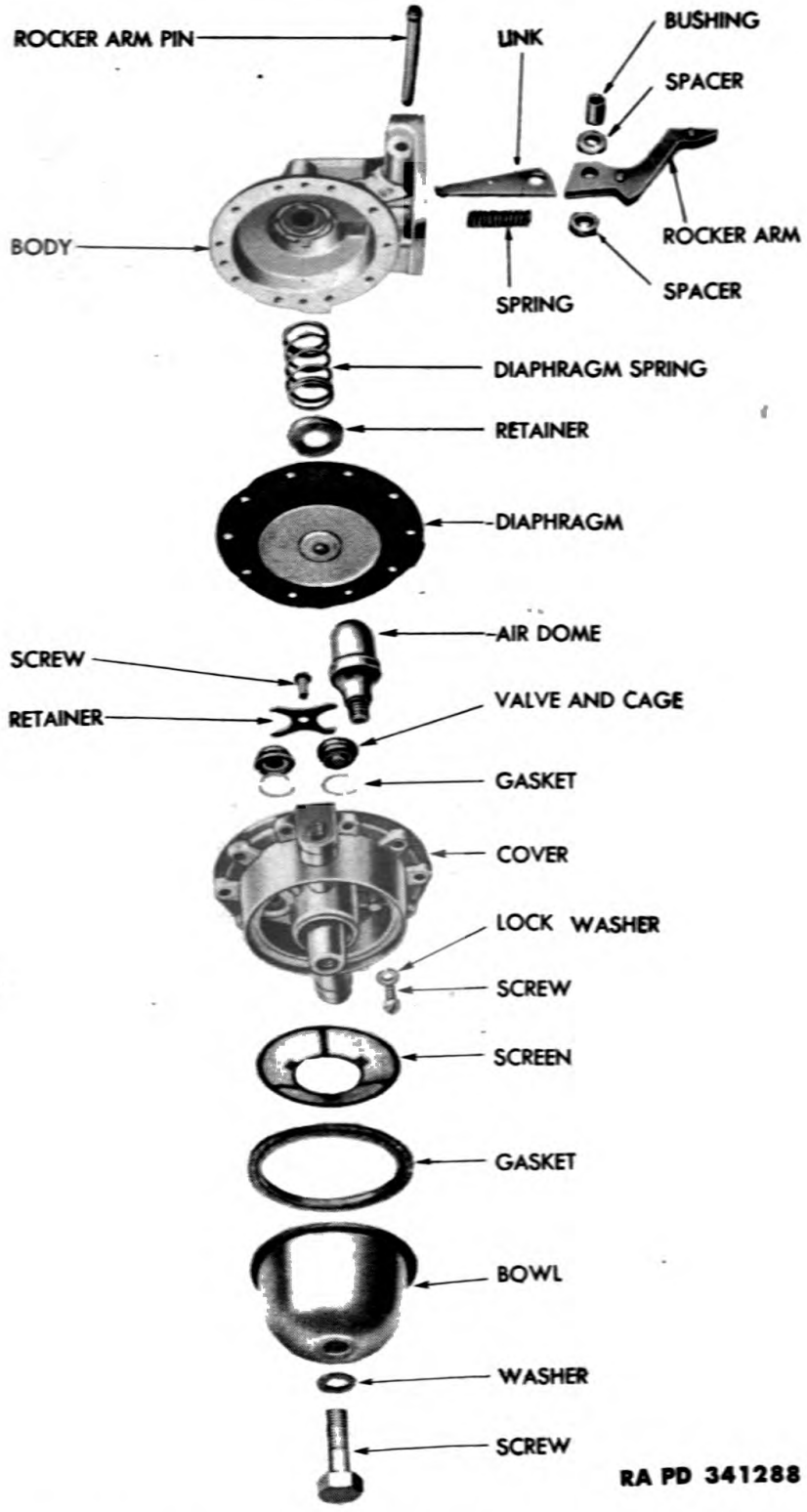


Figure 28—Fuel Pump—Disassembled (Typical Series AH and AW Construction)

(2) Soak diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Place diaphragm spring (with retainer on top) over body pull rod well, and insert diaphragm pull rod through spring and body oil seal. Tip diaphragm assembly so the flat of pull rod will angle slightly away from the hooked end of link. Hold pump upside down so link will fall into engagement with slot in pull rod.

(3) Remove temporary pin. Aline rocker arm and link bushing hole with hole in body, and drive in rocker arm pin. Install washer on small end of rocker arm pin, and spread end of pin.

b. Assemble Cover.

(1) Place valve and cage gasket or two separate gaskets in recesses provided. Place valve and cages on top of gaskets. Inlet valve must have 3-legged spider facing out of cover, and outlet valve must have 3-legged spider facing into cover. Secure valve assemblies with retainer and screw.

(2) Install strainer screen, cover gasket, cover, cover screw gasket, and cover screw in the order named. If used, install air dome in threaded hole in projection of casting for outlet.

c. Assemble Cover to Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

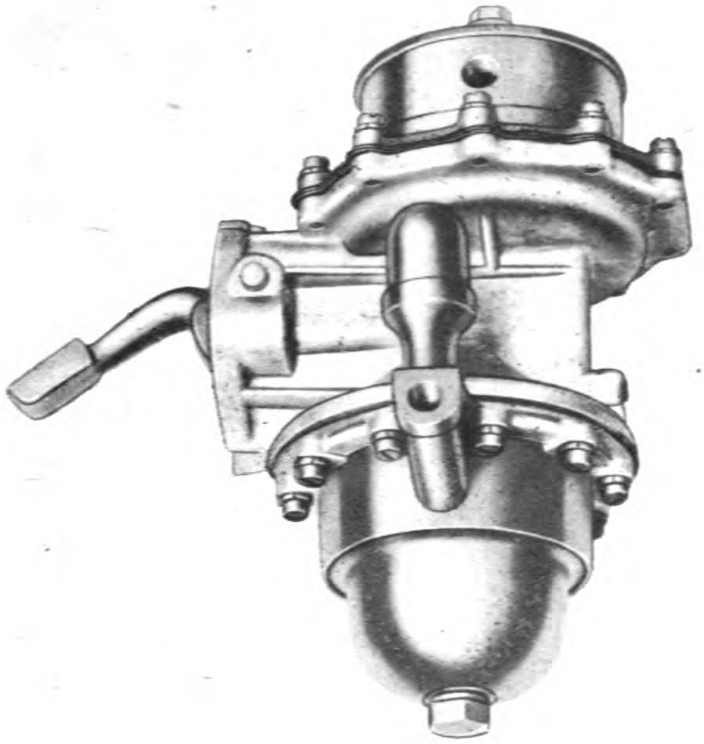
Section XV

SERIES AJ AND AV FUEL AND VACUUM PUMPS

42. DISASSEMBLY (fig. 29).

a. Separate Fuel Cover From Body.

(1) Mark edges of fuel cover and body diaphragm flanges with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative position. Note that the fuel diaphragm flange is symmetrical, and the vacuum diaphragm flange has bulges where the screw holes occur.



RA PD 341289

Figure 29—Fuel and Vacuum Pump, Series AJ and AV

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with a screwdriver handle.

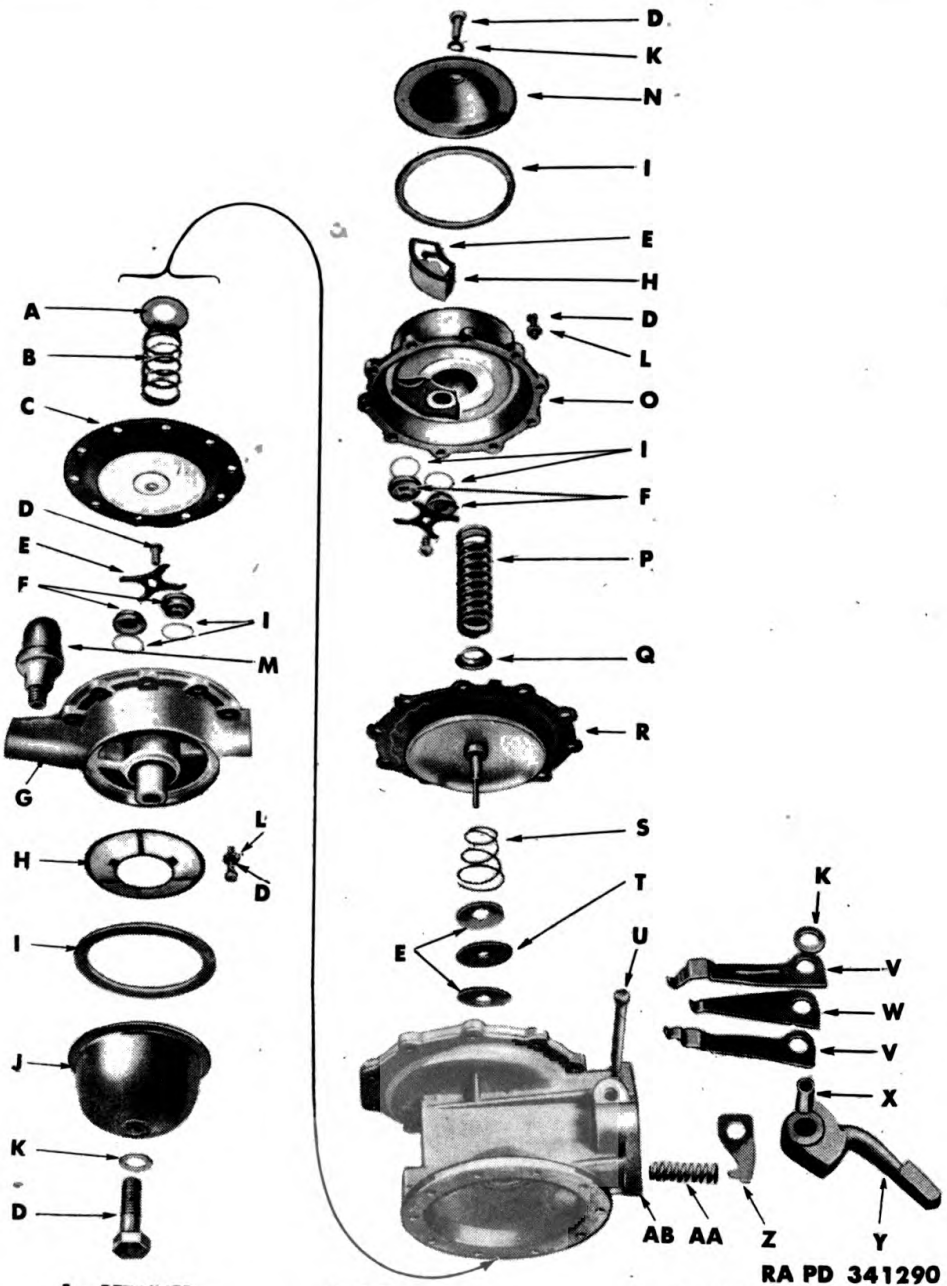
b. Separate Vacuum Cover from Body.

(1) Mark edges of vacuum cover and body diaphragm flanges. Mark at heat shield stud if used. The parts may then be reassembled in the same relative position.

(2) Remove only two cover screws from opposite sides of the cover, and substitute for them two No. 10—32 x 1½-inch fillister head screws. Turn the two long screws all the way down, and then remove the balance of the regular cover screws. Alternately back off the two long screws, a few turns at a time, until the force of the heavy vacuum diaphragm spring is no longer effective. Rap the cover with a screwdriver handle if the flanges stick together. Remove the two long screws, the cover assembly, diaphragm spring, and spring retainer.

c. Disassemble Body.

(1) File riveted end of rocker arm pin flush with steel washer. Drive out rocker arm pin with a drift punch and hammer. Wiggle



A—RETAINER
B—FUEL DIAPHRAGM SPRING
C—FUEL DIAPHRAGM
D—SCREW
E—RETAINER
F—VALVE AND CAGE
G—FUEL COVER
H—SCREEN
I—GASKET
J—BOWL
K—WASHER
L—LOCK WASHER
M—AIR DOME
N—PLATE
O—VACUUM COVER
P—VACUUM DIAPHRAGM SPRING
Q—SPRING RETAINER
R—VACUUM DIAPHRAGM
S—OIL SEAL SPRING
T—OIL SEAL
U—PIN
V—VACUUM LINK
W—FUEL LINK
X—BUSHING
Y—ROCKER ARM
Z—LINK SPACER
AA—SPRING
AB—BODY

Figure 30—Fuel and Vacuum Pump—Disassembled (Typical Series AJ and AV Construction)

rocker arm until links unhook from both diaphragms. Then remove rocker arm spring, rocker arm, and link assembly.

(2) Remove bushing from rocker arm to disassemble rocker arm, two vacuum links, one fuel link, link spacer, and link washers (there may be one or two link washers).

(3) Lift vacuum diaphragm out of body, and remove lower oil seal retainer by turning until slot lines up with flat of pull rod. Remove oil seal washer, upper oil seal retainer, and oil seal spring.

(4) Remove fuel diaphragm by pulling straight out. CAUTION: *Do not tilt excessively or staked-in oil seal will be damaged.* Lift diaphragm spring and spring retainer from pump body.

d. Disassemble Fuel Cover.

(1) Remove valve and cage retainer screw and lift out retainer, two valve and cage assemblies, and two gaskets.

(2) Remove bowl screw with gasket. Then remove bowl, bowl gasket, and screen.

e. Disassemble Vacuum Cover.

(1) Remove valve and cage retainer screw. Lift out retainer, two valve and cage assemblies, and two gaskets.

(2) Remove cover plate screw with gasket. Lift off the cover, cover gasket, screen retainer, and screen.

43. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of pumps, refer to paragraph 7.

44. ASSEMBLY.

a. Assemble Body (fig. 30).

(1) Assemble link spacer over fuel link. Place one vacuum link on each side of the fuel link. The hook ends of the vacuum link should come together so that they surround the fuel link. All link hooks should point in the same direction. Place assembly of links and spacer between lobes of rocker arm with one spacer washer on the outer side of each vacuum link. Slide rocker arm bushing through holes in rocker arm, spacer washers, and links.

(2) Stand the pump body on the bench, fuel flange down. Set rocker arm spring in position with one end over cone cast into the body. Slide rocker arm and link assembly into body. Outer end of

rocker arm spring slips over projection on link spacer, and the open end of all link hooks must point toward vacuum flange. Temporarily retain rocker arm and link assembly with a 4- or 5-inch length of ⅛-inch rod.

(3) Soak diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Turn the pump body over so the fuel diaphragm flange is up. Set the diaphragm spring on the staked-in oil seal, and the retainer on top of the spring. Push diaphragm pull rod through retainer, spring, and oil seal. Flat of pull rod must be at right angles to link. Hook diaphragm pull rod to fuel link. NOTE: *Fuel link is the short, center link.* CAUTION: *Do not tilt diaphragm pull rod excessively as this may damage the oil seal.*

(4) Remove temporary pin, aline rocker arm bushing hole with hole in body, and drive in the rocker arm pin. Place washer over small end of pin, and spread pin end.

b. Assemble Fuel Cover.

(1) Place valve and cage gasket or two separate gaskets in recesses provided. Place valve and cages on top of gaskets. Inlet valve must have 3-legged spider facing out of cover, and outlet valve must have 3-legged spider facing into cover. Secure valve assemblies with retainer and screw.

(2) Install strainer screen, cover gasket, cover, cover screw gasket, and cover screw in the order named. If used, install air dome in threaded hole in projection of casting for outlet.

c. Assemble Fuel Cover to Body.

(1) Install cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Assemble Vacuum Cover.

(1) Place two gaskets and two valve and cage assemblies in cover. Inlet valve must have 3-legged spider facing out of cover, and outlet valve must have 3-legged spider facing into cover. Secure valve and cages with retainer and screw.

(2) Turn cover over, and set screen in recess over valve hole. Set screen retainer on screen. Place cover gasket, cover, cover screw

gasket, and cover screw in position in the order named. Tighten cover screw.

e. Assemble Vacuum Cover to Body.

(1) Soak diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Assemble oil seal on vacuum diaphragm pull rod in the following sequence: oil seal spring, upper retainer, oil seal washer, and lower retainer. Turn lower retainer 90 degrees to lock in position.

(2) Lift the pump body above eye level, facing the vacuum diaphragm flange. The two vacuum links will swing down so that the diaphragm pull rod can be hooked to both links.

(3) While holding vacuum diaphragm in position, the body should be clamped in a vise, vacuum side up. Clamp by one of the mounting flange ears. The vacuum diaphragm must be held level with body flange during the following operations. The diaphragm is held level by inserting a $^{3}/_{32}$-inch piece of metal between rocker arm stop and body This spacer can be made from a piece of steel, $^{3}/_{16}$ inch x $^{3}/_{32}$ inch x 8 inches. Bend one end to form a right angle hook, $^{3}/_{8}$ inch from bend to end.

(4) Place spring retainer on riveted end of diaphragm pull rod, and the spring on retainer. Place vacuum cover over spring, and aline the file marks.

(5) Insert two No. 10—32 x 1½-inch screws in two opposite holes in cover flange. Turn these long screws down, alternating a few turns on each. Insert regular screws with lock washers, and tighten until screws just engage lock washers. Replace two long screws with regular screws and lock washers.

(6) Remove $^{3}/_{32}$-inch spacer from rocker arm position. This allows the heavy vacuum spring to push diaphragm into a flexed position. Tighten all cover screws securely.

f. Test. Fuel and vacuum pumps cannot be bench-tested.

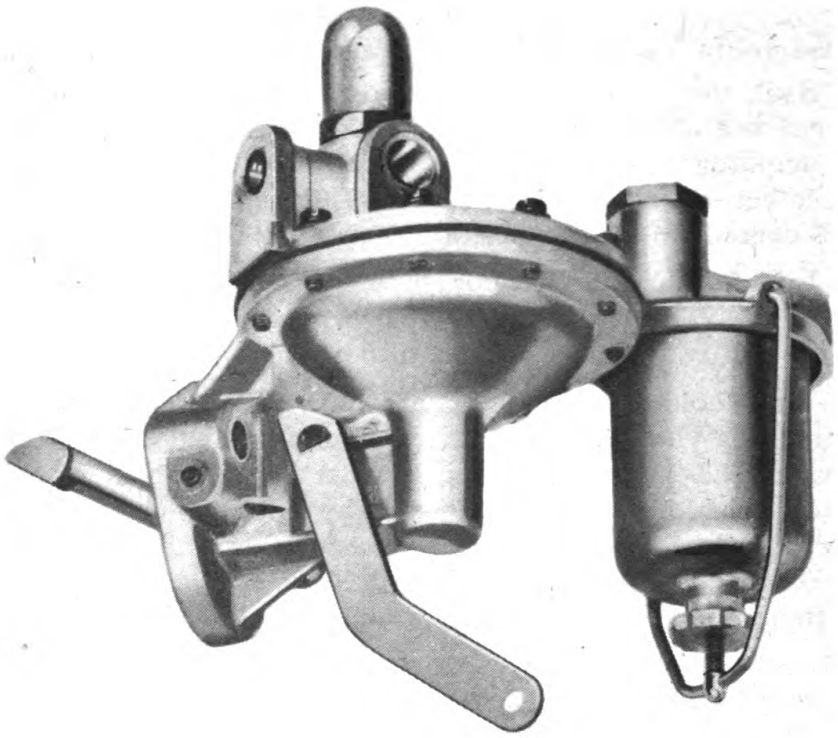
Section XVI

SERIES AK FUEL PUMPS

45. DISASSEMBLY (fig. 31).

a. Separate Body from Cover.

(1) Mark edges of top cover, and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located (fig. 31).



RA PD 341291

Figure 31—Fuel Pump, Series AK

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body. File riveted end of rocker arm pin flush with washer, and drive out pin with drift punch and hammer. Wiggle rocker arm to disengage link from diaphragm pull rod. Remove rocker arm spring, and disassemble rocker arm from link by sliding out the rocker arm bushing. Remove diaphragm and diaphragm spring from body. Remove oil seal if used. Priming lever is part of body assembly.

c. Disassemble Cover.

(1) Loosen bail screw nut and remove bowl, bowl gasket, and bowl seat. Spring bail out of retaining holes in top cover, and remove bail screw nut. Remove strainer screen from top cover.

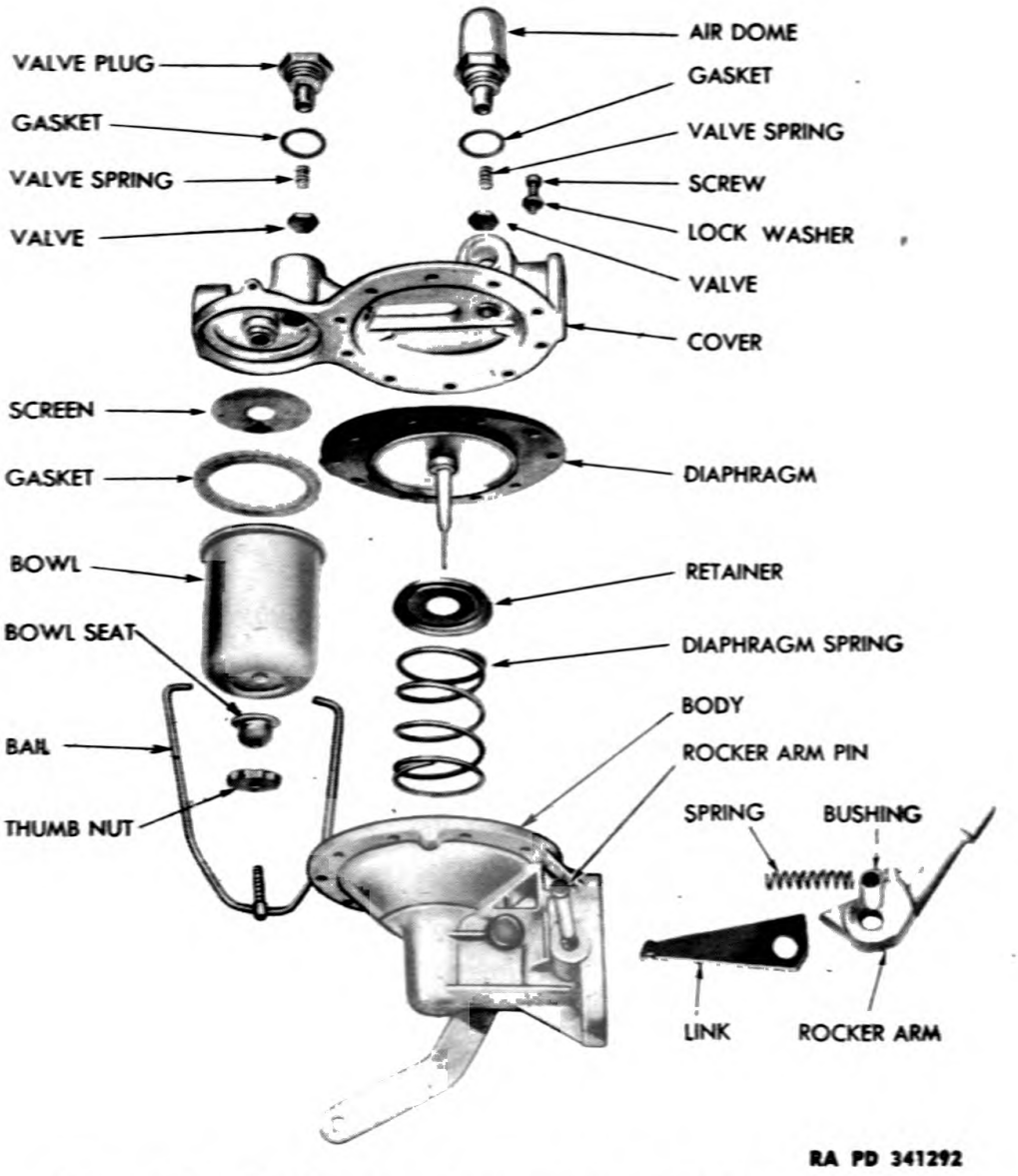


Figure 32—Fuel Pump—Disassembled (Typical Series AK Construction)

(2) Remove inlet valve plug and gasket from top cover over strainer. Remove inlet valve spring and valve. Remove outlet air dome (or valve plug) and gasket from top cover over diaphragm. Remove outlet valve spring and valve.

46. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of pumps, refer to paragraph 7.

47. ASSEMBLY AND TEST.

a. Assemble Body (fig. 32).

(1) Make an assembly of rocker arm and link with rocker arm bushing. Place rocker arm and link in body with link hook down. Insert rocker arm spring. Aline rocker arm pin bushing hole with hole in body, and drive in rocker arm pin. Install washer on small end of pin, and spread end of pin.

(2) Soak diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. If used, place rubber oil seal over body pull rod well, set the diaphragm spring in position, and slide the diaphragm pull rod into body, hooking link to slot in flattened end.

b. Assemble Cover.

(1) Install gaskets on air dome and valve plug. Place a drop of light oil on valve, and install i valve chamber over diaphragm. Insert valve spring in air dome, ar tip into valve chamber. Tighten air dome securely. Place a drop of light oil on valve, and install in chamber over strainer. Insert valve spring in plug, and tip into chamber. Tighten securely.

(2) Install strainer screen and bowl gasket in top cover. Install bowl seat on bail screw, and swing into position after installing bowl. Tighten thumb nut securely with fingers only.

c. Assemble Cover to Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Don't be a dope! **HANDLE MATERIAL RIGHT**

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Section XVII

SERIES AT FUEL PUMPS

48. DISASSEMBLY (fig. 33).

a. Separate Body from Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located.

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body.

(1) File riveted end of rocker arm pin flush with washer. Drive out rocker arm pin with drift punch and hammer. Remove rocker arm and link.

(2) Remove diaphragm by pulling straight out. CAUTION: *Do not tilt excessively or staked-in oil seal will be damaged.* Lift diaphragm spring and spring retainer from pump body.

c. Disassemble Cover.

(1) Remove two screws holding valve and cage retainer. Lift out valve and cage retainer, two valve and cage assemblies, and gasket.

(2) Loosen bail screw nut, swing bail to the side, and remove bowl and bowl gasket. Spring bail out of its retaining holes in top cover, remove bowl seat, and unscrew bail nut. Remove strainer screen from top cover.

49. CLEANING AND INSPECTION.

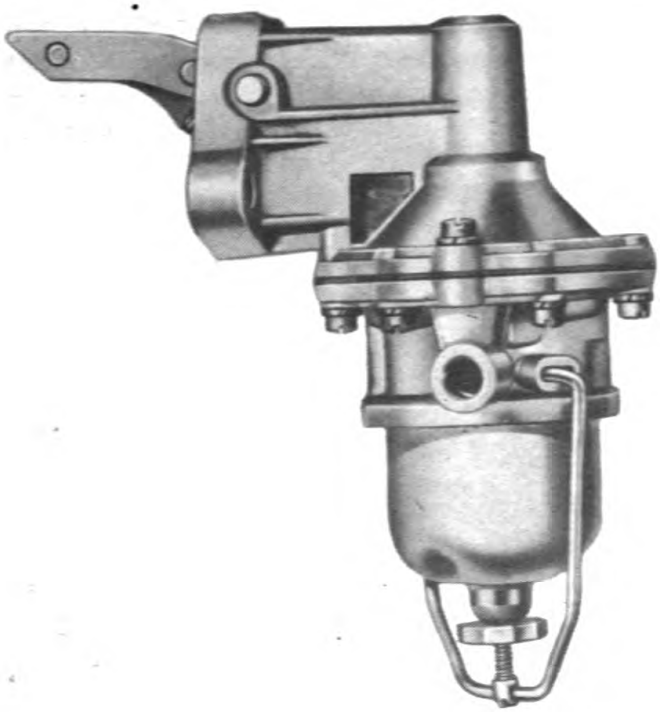
a. For cleaning and inspection of this series of fuel pumps, refer to paragraph 7.

50. ASSEMBLY AND TEST.

a. Assemble Body (fig. 34).

(1) Install rocker arm and link in pump body with link hook down. Position rocker arm spring, and temporarily retain assembly with 4- or 5-inch length of ⅛-inch rod through body rocker arm pin hole.

(2) Soak diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Place diaphragm spring,



RA PD 341293

Figure 33—Fuel Pump, Series AT

with retainer on top, over body pull rod well. Insert diaphragm pull rod through spring and body oil seal. Tip diaphragm assembly so the flat of pull rod will angle slightly away from the hooked end of link. Hold pump upside down so link will fall into engagement with slot in pull rod.

(3) Remove temporary pin. Aline rocker arm and link hole with hole in body, and drive in the rocker arm pin. Install washer on small end of rocker arm pin, and spread end of pin.

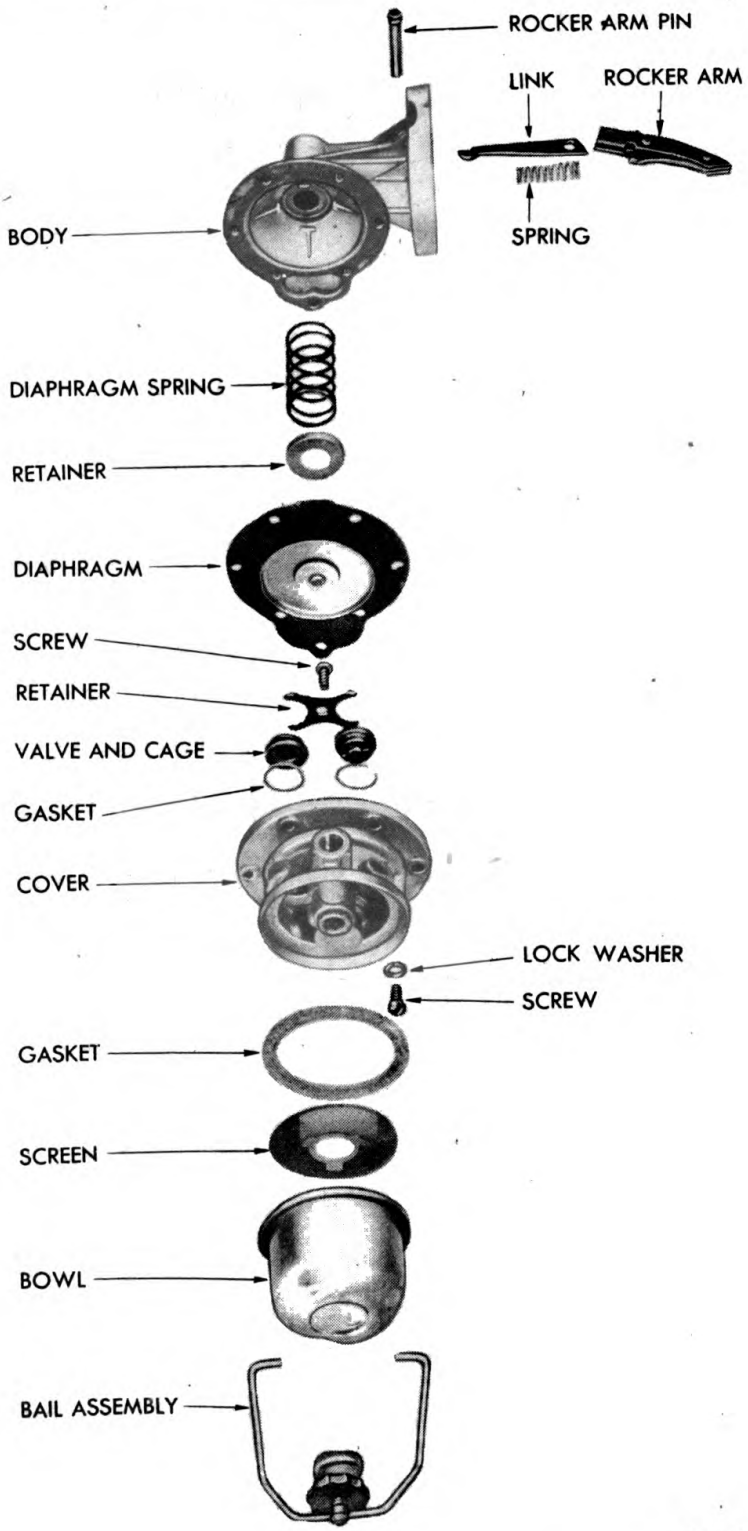
b. Assemble Cover.

(1) Install valve and cage gaskets and two valve and cage assemblies. Retain with valve retainer and screw. Outlet valve must have 3-legged spider facing into cover, and inlet valve must have 3-legged spider facing out of cover.

(2) Install strainer screen, bowl gasket, and bowl. Install bail nut on bail. Spring bail into retaining holes in cover. Place bowl seat on bail screw, and swing bail into position to retain cover. Tighten bail nut with fingers only.

c. Assemble Cover to Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat



RA PD 341294

Figure 34—Fuel Pump—Disassembled (Typical Series AT Construction)

across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section XVIII

SERIES AU FUEL PUMPS

51. DISASSEMBLY (fig. 35).

a. Separate Body from Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located.

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body.

(1) File riveted end of rocker arm pin flush with washer. Drive out rocker arm pin with drift punch and hammer. Wiggle rocker arm to separate link from pull rod, and remove assembly from body. Remove bushing to separate link from rocker arm.

(2) Remove diaphragm assembly, spring retainer, and spring from pump body.

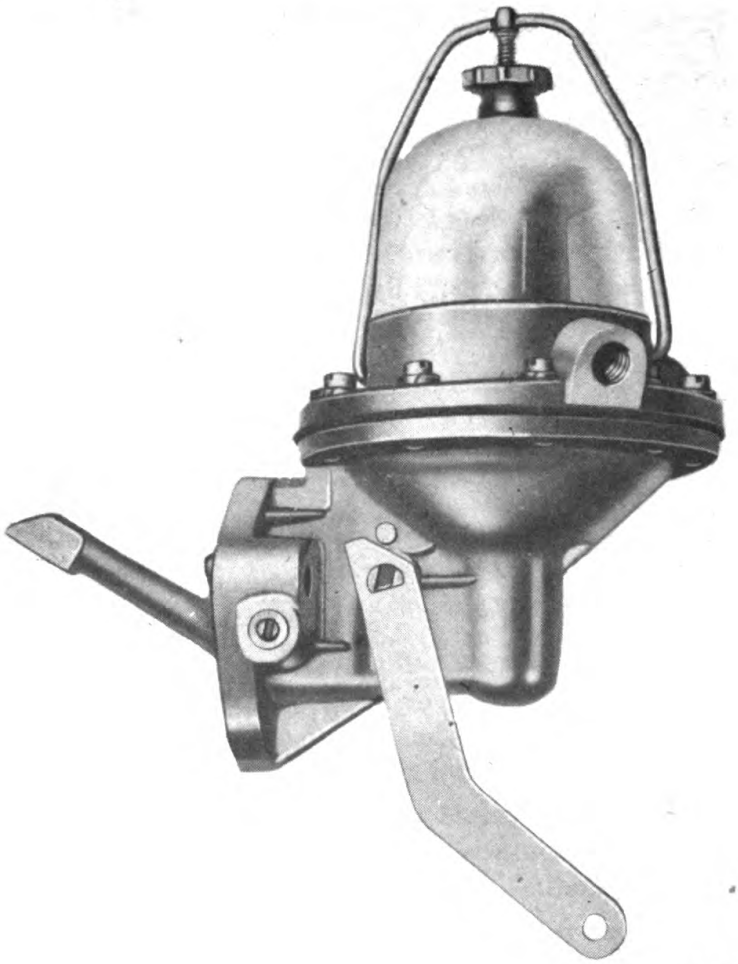
c. Disassemble Cover.

(1) Remove two screws holding valve and cage retainer. Lift out valve and cage retainer, two valve and cage assemblies, and gasket.

(2) Loosen bail screw nut, swing bail to the side, and remove bowl and bowl gasket. Spring bail out of its retaining holes in top cover, remove bowl seat, and unscrew bail nut. Remove strainer screen from top cover.

52. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of fuel pumps, refer to paragraph 7.



RA PD 341295

Figure 35—Fuel Pump, Series AU

53. ASSEMBLY AND TEST.

a. Assemble Body (fig. 36).

(1) Make an assembly of rocker arm and link with bushing. Place assembly of rocker arm and link in body with link hook down. Aline rocker arm pin and bushing with hole in body, and drive in the rocker arm pin. Place washer on small end of rocker arm pin, and spread end of pin.

(2) Soak diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Place diaphragm spring over pull rod well, then place the spring retainer on the spring. Slide the pull rod of the diaphragm assembly through retainer and spring. Hold pump body upside down, and press diaphragm against spring. At the same time, tilt the diaphragm so the pull rod angles away from link hook. Bring diaphragm back to level and link should engage pull rod.

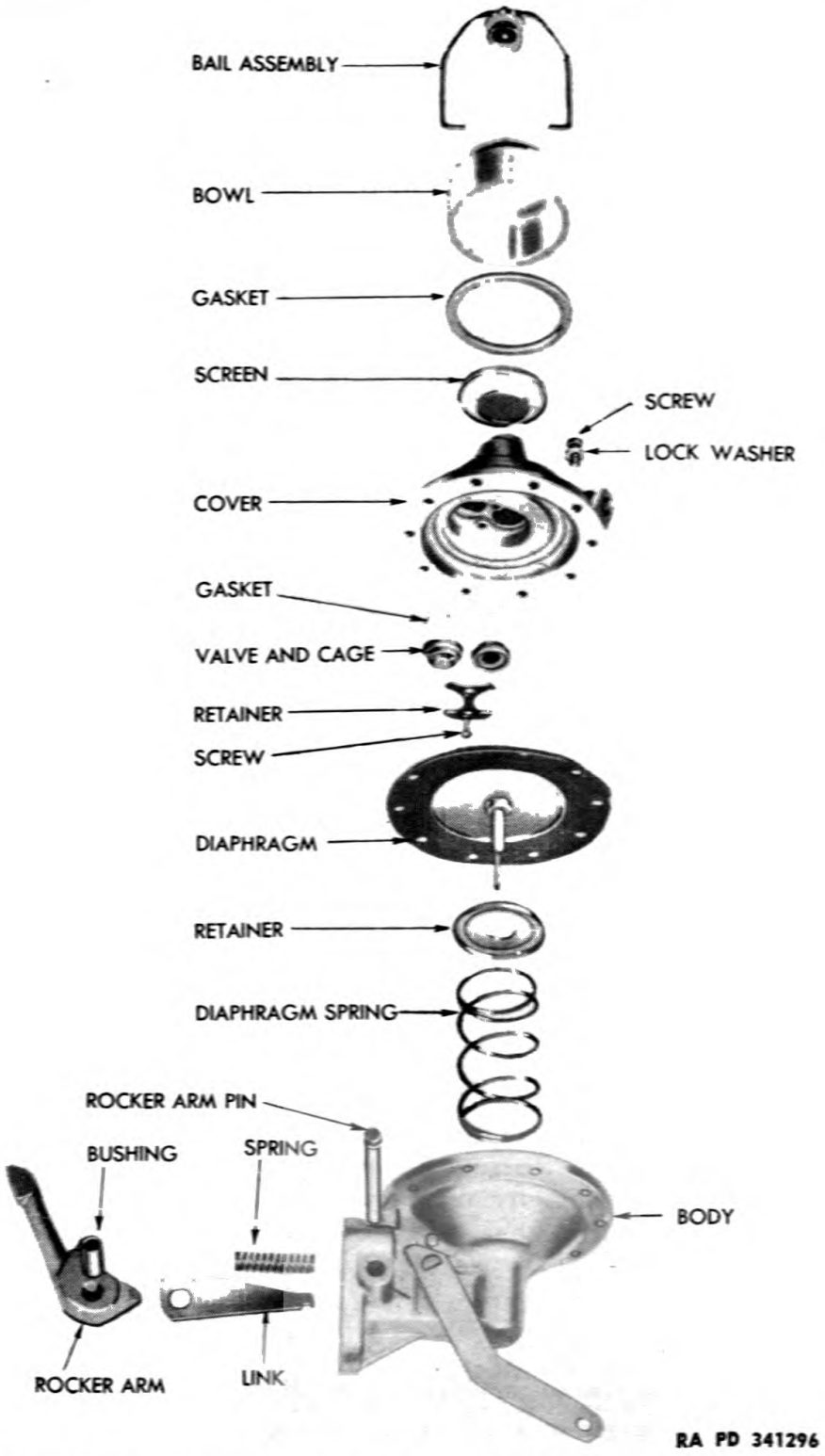


Figure 36—Fuel Pump—Disassembled (Typical Series AU Construction)

b. Assemble Cover.

(1) Install valve and cage gaskets and two valve and cage assemblies. Retain with valve retainer and two screws. Outlet valve must have 3-legged spider facing into cover, and inlet valve must have 3-legged spider facing out of cover.

(2) Install strainer screen, bowl gasket, and bowl. Install bail nut on bail. Spring bail into retaining holes in cover. Place bowl seat on bail screw, and swing bail into position to retain cover. Tighten bail nut with fingers only.

c. Assemble Cover to Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section XIX

SERIES AX FUEL AND VACUUM PUMPS

54. DISASSEMBLY (fig. 37).

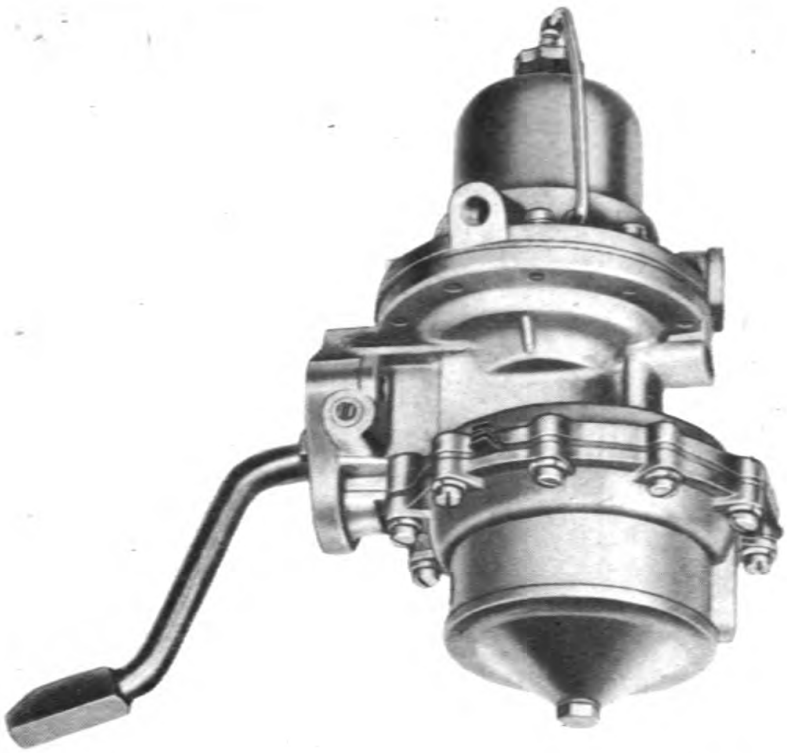
a. Separate Fuel Cover from Body.

(1) Mark edges of fuel cover and body diaphragm flanges with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative position. Note that the fuel diaphragm flange is symmetrical, and the vacuum diaphragm flange has bulges where the screw holes occur.

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with a screwdriver handle.

b. Separate Vacuum Cover from Body.

(1) Mark edges of vacuum cover and body diaphragm flanges. Mark at heat shield stud if used. The parts may then be reassembled in the same relative position.



RA PD 341297

Figure 37—Fuel and Vacuum Pump, Series AX

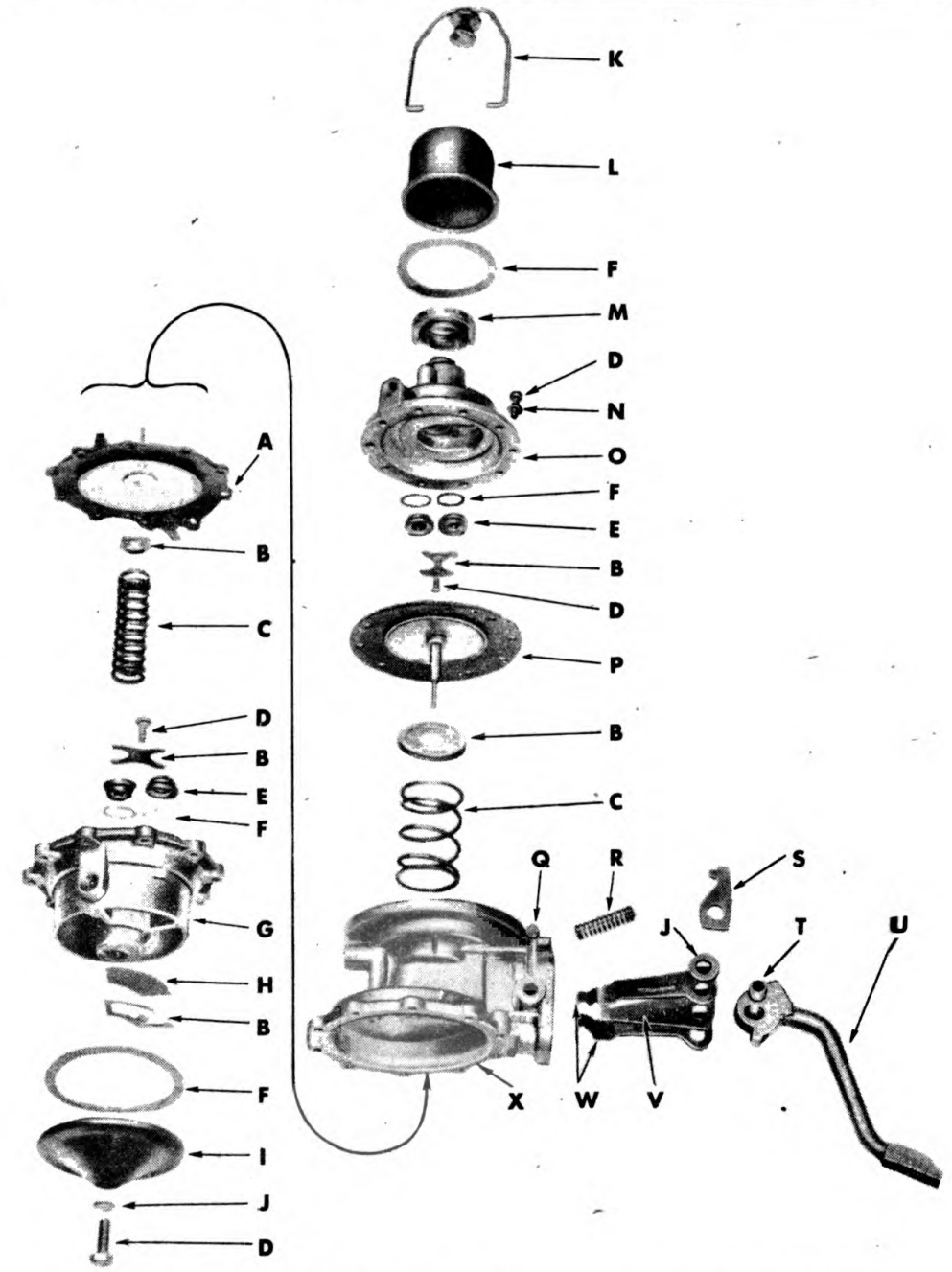
(2) Remove only two cover screws from opposite sides of the cover, and substitute for them two No. 10—32 x 1½-inch fillister head screws. Turn the two long screws all the way down, and then remove the balance of the regular cover screws, Alternately back off the two long screws, a few turns at a time, until the force of the heavy vacuum diaphragm spring is no longer effective. Rap the cover with a screwdriver handle if the flanges stick together. Remove the two long screws, the cover assembly, diaphragm spring, and spring retainer.

c. Disassemble Body.

(1) File riveted end of rocker arm pin flush with steel washer. Drive out the rocker arm pin with a drift punch and hammer. Wiggle rocker arm until links unhook from both diaphragms. Remove rocker arm spring, rocker arm, and link assembly.

(2) Remove bushing from rocker arm to disassemble rocker arm, two vacuum links, one fuel link, link spacer, and link washers (there may be one or two link washers).

(3) Lift vacuum diaphragm out of pump body. Lift fuel diaphragm out of pump body, and remove spring retainer and spring.



A—VACUUM DIAPHRAGM
B—RETAINER
C—DIAPHRAGM SPRING
D—SCREW
E—VALVE AND GAGE
F—GASKET
G—VACUUM COVER
H—SCREEN
I—PLATE
J—WASHER
K—BAIL ASSEMBLY
L—BOWL
M—STRAINER
N—LOCK WASHER
O—COVER
P—FUEL DIAPHRAGM
Q—ROCKER ARM PIN
R—SPRING
S—SPACER
T—BUSHING
U—ROCKER ARM
V—FUEL LINK
W—VACUUM LINK
X—BODY

RA PD 341298

Figure 38—Fuel and Vacuum Pump—Disassembled (Typical Series AX Construction)

d. Disassemble Fuel Cover.

(1) Remove two screws holding valve and cage retainer. Lift out valve and cage retainer, two valve and cage assemblies, and gasket.

(2) Loosen bail screw nut, swing bail to the side, and remove bowl and bowl gasket. Spring bail out of its retaining holes in top cover, remove bowl seat, and unscrew bail nut. Remove strainer screen from top cover.

e. Disassemble Vacuum Cover.

(1) Remove valve and cage retainer screw. Lift out retainer, two valve and cage assemblies, and two gaskets.

(2) Remove cover plate screw with its gasket and lift off the cover, cover gasket, screen retainer, and screen.

55. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of fuel pumps, refer to paragraph 7.

56. ASSEMBLY.

a. Assemble Body (fig. 38).

(1) Assemble link spacer over fuel link. Place one vacuum link on each side of fuel link. The hook ends of the vacuum link should come together so that they surround the fuel link. All link hooks should point in the same direction. Place assembly of links and spacer between holes of rocker arm with one spacer washer on outer side of each vacuum link. Slide rocker arm bushing through holes in rocker arm, spacer washers, and links.

(2) Stand the pump body on the bench, fuel flange down. Set the rocker arm spring in position with one end over the cone cast into the body. Slide rocker arm and link assembly into body. Outer end of rocker arm spring slips over the projection on link spacer, and the open end of all link hooks must point toward vacuum flange. Aline rocker arm bushing hole with hole in body, and drive in rocker arm pin. Place washer over small end of pin, and retain by spreading end of pin.

(3) Soak fuel diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Place fuel diaphragm spring and its retainer over body pull rod well, and install the diaphragm assembly. Retain diaphragm by hooking to fuel link. NOTE: *Fuel link is the short, center link.*

b. Assemble Fuel Cover.

(1) Install valve and cage gaskets and two valve and cage assemblies. Retain with valve retainer and two screws. Outlet valve must

have 3-legged spider facing into cover, and inlet valve must have 3-legged spider facing out of cover.

(2) Install strainer screen, bowl gasket, and bowl. Install bail nut on bail. Spring bail into retaining holes in cover. Place bowl seat on bail screw, and swing bail into position to retain cover. Tighten bail nut with fingers only.

c. Assemble Fuel Cover to Body.

(1) Install cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Assemble Vacuum Cover.

(1) Place two gaskets and two valve and cage assemblies in cover. Inlet valve must have 3-legged spider facing out of cover, and outlet valve must have 3-legged spider facing into cover. Secure valve and cages with retainer and screw.

(2) Turn cover over, and set screen in recess over valve hole. Set screen retainer on screen. Place the cover gasket, cover, cover screw gasket, and cover screw in position in the order named. Tighten cover screw.

e. Assemble Vacuum Cover to Body.

(1) Soak diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound.

(2) Lift the pump body above eye level, facing the vacuum diaphragm flange. The two vacuum links will swing down so that the diaphragm pull rod can be hooked to both links.

(3) While holding vacuum diaphragm in position, the body should be clamped in a vise, vacuum side up. Clamp by one of the mounting flange ears. The vacuum diaphragm must be held level with body flange during the following operations. The diaphragm is held level by inserting a $\frac{3}{32}$-inch piece of metal between rocker arm stop and body. This spacer can be made from a piece of steel $\frac{3}{16}$ inch x $\frac{3}{32}$ inch x 8 inches. Bend one end to form a right angle hook, $\frac{3}{8}$ inch from bend to end.

(4) Place spring retainer on riveted end of diaphragm pull rod, and the spring on the retainer. Place vacuum cover over the spring, and aline the file marks.

(5) Insert two No. 10—32 x 1½-inch screws in two opposite holes in cover flange. Turn these long screws down, alternating a few turns on each. Insert the regular screws with lock washers, and tighten until the screws just engage the lock washers. Replace two long screws with regular screws and lock washers.

(6) Remove $^{3}/_{32}$-inch spacer from rocker arm position. This allows the heavy vacuum spring to push the diaphragm into a flexed position. Tighten all cover screws securely.

f. Test. Fuel and vacuum pumps cannot be bench-tested.

Section XX

SERIES BE FUEL PUMPS

57. DISASSEMBLY (fig. 39).

a. Separate Body From Cover.

(1) Mark edges of top cover and body with a file. Mark at heat shield stud if used. The parts may then be reassembled in the same relative positions, and heat shield stud properly located.

(2) Remove cover screws and lock washers. Also remove heat shield stud if used. Separate cover from body by jarring cover loose with screwdriver handle.

b. Disassemble Body.

(1) Remove cover plate screw to disassemble cover plate and gasket.

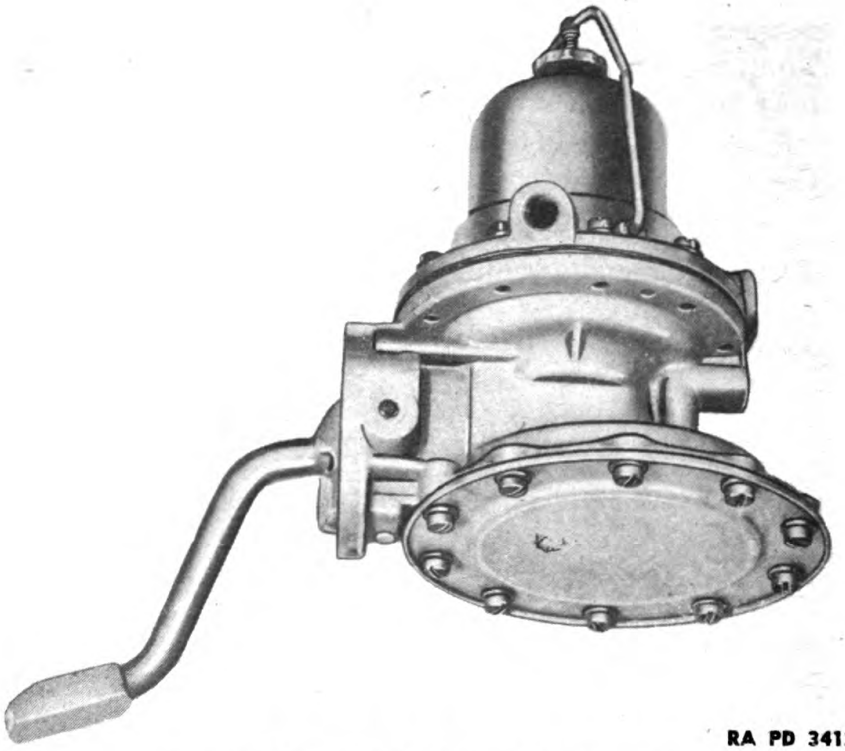
(2) File small end of rocker arm pin flush with washer, and drive out rocker arm pin with drift punch and hammer. Wiggle rocker arm to separate link from pull rod, and remove assembly from body. Remove rocker arm pin bushing to disassemble rocker arm, link, link spacer, and two spacer washers.

(3) Remove diaphragm assembly, spring retainer, and spring.

c. Disassemble Cover.

(1) Remove two screws holding valve and cage retainer. Lift out valve and cage retainer, two valve and cage assemblies, and gasket.

(2) Loosen bail screw nut, swing bail to the side, and remove bowl and bowl gasket. Spring bail out of its retaining holes in the top cover, remove bowl seat, and unscrew bail nut. Remove strainer screen from top cover.



RA PD 341299

Figure 39—Fuel Pump, Series BE

58. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of fuel pumps, refer to paragraph 7.

59. ASSEMBLY AND TEST.

a. Assemble Body (fig. 40).

(1) Assemble link spacer (also serves as arm spring stop) over link. Place one spacer washer on each side of link spacer. Slide assembly between lobes of rocker arm, and retain in position with rocker arm bushing. Place rocker arm and link assembly in body with link hook pointing away from fuel diaphragm flange. Aline rocker arm bushing with hole in pump body, drive in the rocker arm pin, and spread end of pin.

(2) Soak diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Place diaphragm spring over pull rod well, and place spring retainer on spring. Slide the pull rod of the diaphragm assembly through retainer and spring. Hold pump body upside down, and press diaphragm against spring.

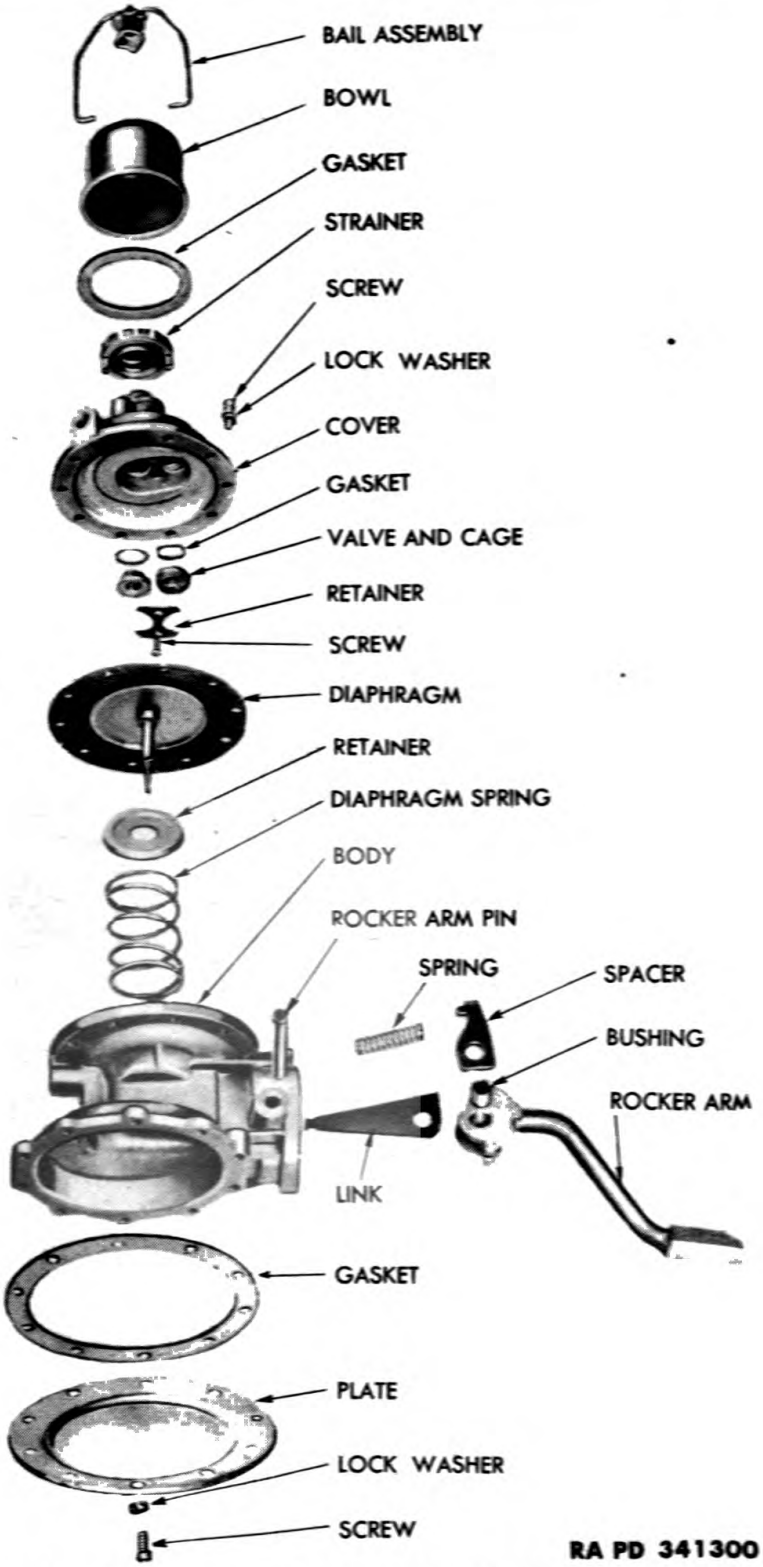


Figure 40—Fuel Pump—Disassembled (Typical Series BE Construction)

At the same time, tilt the diaphragm so pull rod angles away from link hook. Bring diaphragm back to level and link should engage pull rod.

(3) Assemble gasket and cover plate on side of body opposite fuel diaphragm, and retain cover plate with 10 screws.

b. Assemble Cover.

(1) Install valve and cage gaskets and two valve and cage assemblies. Retain with valve retainer and two screws. Outlet valve must have 3-legged spider facing into cover, and inlet valve must have 3-legged spider facing out of cover.

(2) Install strainer screen, bowl gasket, and bowl. Install bail nut on bail. Spring bail into retaining holes in cover. Place bowl seat on bail screw, and swing bail into position to retain cover. Tighten bail nut with fingers only.

c. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section XXI

SERIES BF AND BM FUEL PUMPS

60. DISASSEMBLY (fig. 41).

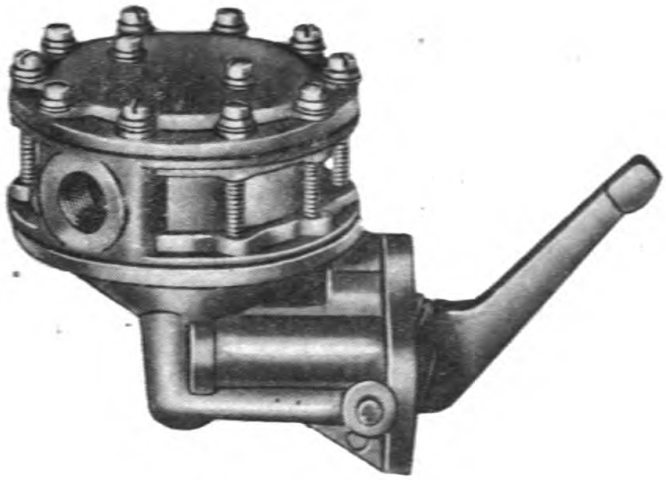
a. Separate Body From Cover.

(1) Mark edges of cover and body with a file. The parts may then be reassembled in the same relative positions.

(2) Remove only outer circle of screws and lock washers. Separate body from cover at diaphragm flange near body. If cover sticks, it can be jarred loose with screwdriver handle.

b. Disassemble Body.

(1) File riveted end of rocker arm pin flush with washer. Drive out rocker arm pin with drift punch and hammer. Wiggle rocker



RA PD 341301

Figure 41—Fuel Pump, Series BF and BM

arm to separate link from diaphragm pull rod, and remove assembly from body. Remove rocker arm spacer washer if used. Remove bushing to disassemble link and rocker arm.

(2) Remove diaphragm by pulling straight out. CAUTION: *Do not tilt excessively or staked-in oil seal will be damaged.* Lift diaphragm spring and spring retainer from pump body. If used, priming lever is serviced as part of body casting assembly.

c. Disassemble Cover With One Center Screw.

(1) Remove three screws from valve plate. Lift out valve plate, gasket, six valve and cage assemblies and, if used, six valve and cage gaskets.

(2) Remove cover center screw, and lift off pulsator cover plate and three layers of pulsator diaphragm.

d. Disassemble Cover With Two Center Screws. Remove two cover center screws and lock washers. Lift off the pulsator cover plate and three layers of pulsator diaphragm. Remove four screws from each of two valve and cage retainers. Remove two retainers, six valve and cage assemblies, and six gaskets.

61. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of fuel pumps, refer to paragraph 7.

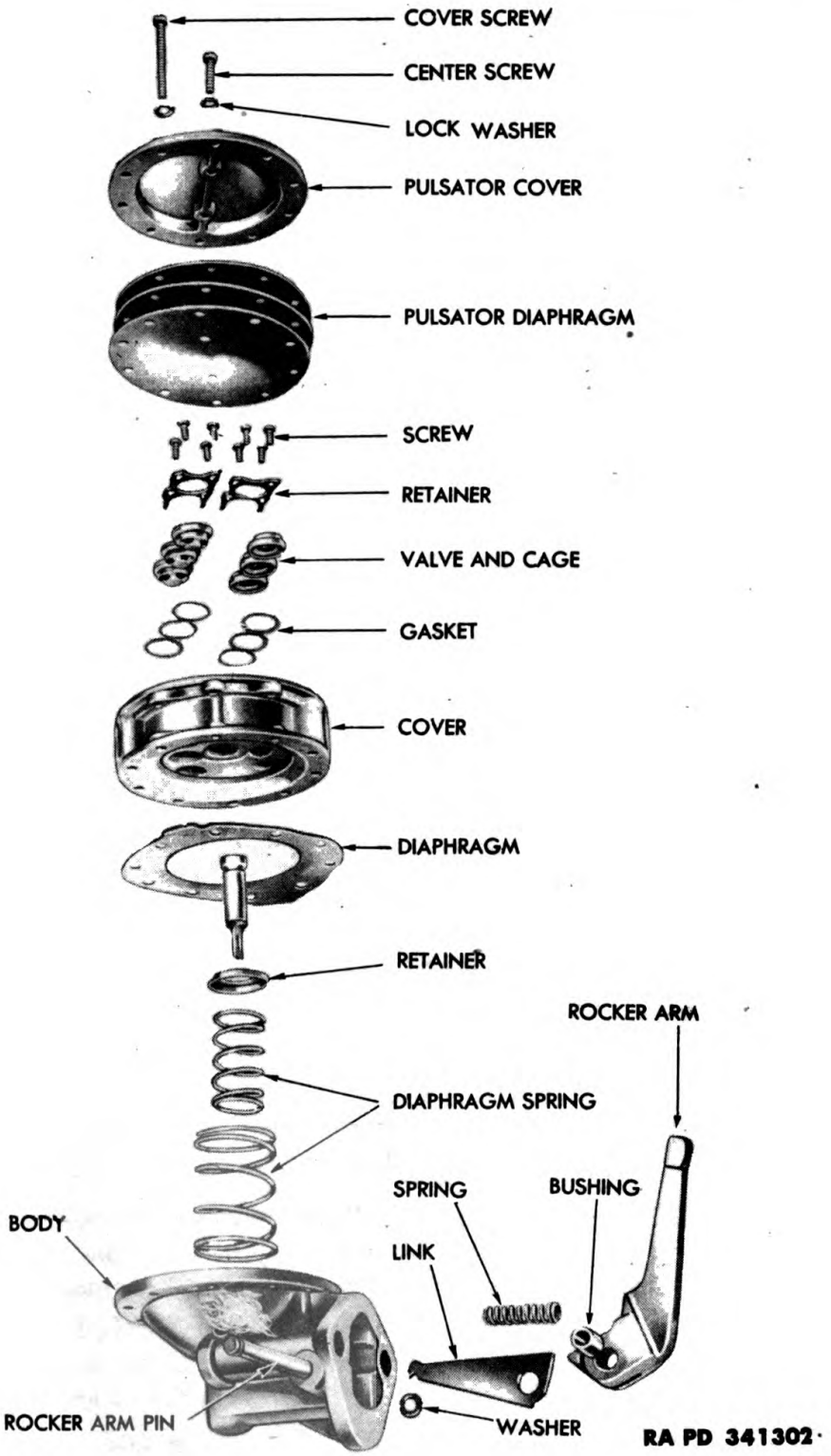


Figure 42—Fuel Pump—Disassembled (Typical Series BF and BM Construction)

62. ASSEMBLY AND TEST.

a. Assemble Body (fig. 42).

(1) Make an assembly of rocker arm and link with bushing. If used, assemble one spacer on each end of bushing. Place assembly of rocker arm and link in body with link hook down. Aline rocker arm pin bushing hole with hole in body. Position rocker arm spring, and temporarily retain assembly with 4- or 5-inch length of $\frac{1}{8}$-inch rod (an 8-penny nail can be used). Locate priming lever (part of body assembly) so that milled flat of priming lever shaft contacts the link.

(2) Soak diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Place diaphragm spring (with retainer on top) over body pull rod well, and insert diaphragm pull rod through spring and body oil seal. Tip diaphragm assembly so the flat of pull rod will angle slightly away from the hooked end of link. Hold pump upside down so link will fall into engagement with slot in pull rod.

(3) Remove temporary pin. Aline rocker arm and link bushing hole with hole in body, and drive in rocker arm pin. Install washer on small end of rocker arm pin, and spread end of pin.

b. Assemble Cover With One Center Screw.

(1) Place six valve and cage gaskets in cover with six valve and cage assemblies on top of gaskets. Outlet valve and cages must have three-legged spider facing into cover, and inlet valves must have three-legged spider facing out of cover. Set gasket over valve and cages, and follow with valve plate which is retained with three screws.

(2) Note position of web across diameter of cover (fig. 43). Install three layers of pulsator diaphragm on cover. Follow with pulsator cover plate which must be positioned so that the web across its diameter matches the cover web. Insert cover center screw with lock washer, and tighten securely.

c. Assemble Cover With Two Center Screws. Place six valve and cage gaskets in cover with six valve and cage assemblies on top of gaskets. Inlet valve and cages must have 3-legged spider facing into cover, and outlet valve must have 3-legged spider facing out of cover. Retain each set of three valve and cage assemblies with one retainer and four screws. Place three layers of pulsator diaphragm on cover, and follow with pulsator cover plate. Aline two center screw holes, and insert two screws with lock washers through cover plate, pulsator diaphragm, and into pump cover. Tighten screws securely.

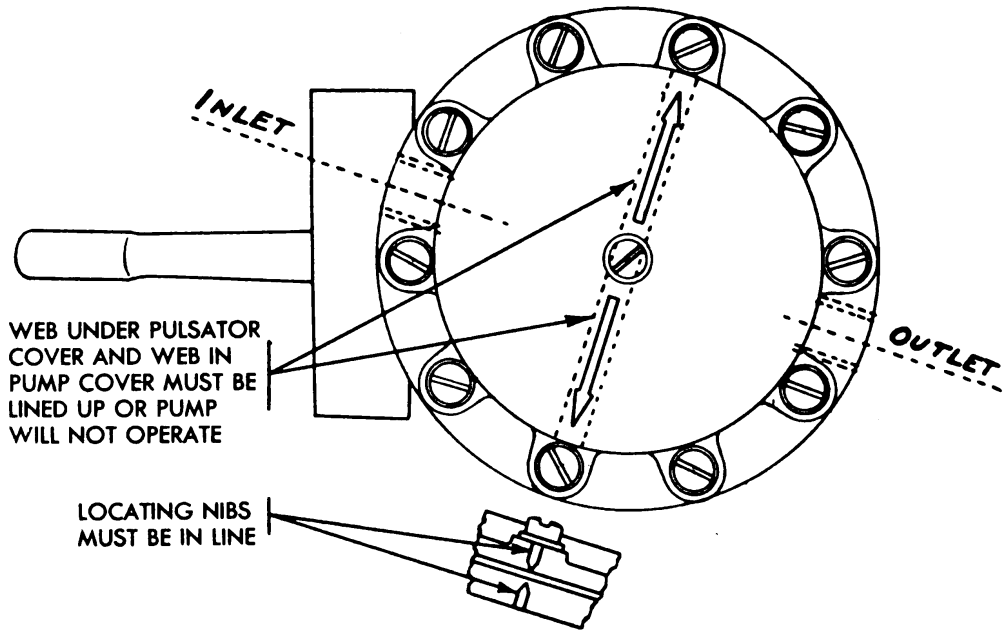


Figure 43—Showing Correct Assembly of Cover With One Center Screw

d. Assemble Cover to Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

e. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

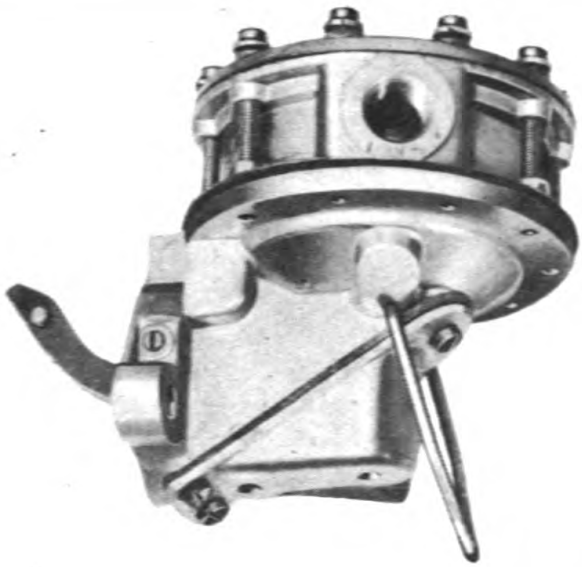
Section XXII

SERIES BH FUEL PUMPS

63. DISASSEMBLY (fig. 44).

a. Separate Body From Cover.

(1) Mark edges of cover and body with a file. The parts may then be reassembled in the same relative positions.



RA PD 341304

Figure 44—Fuel Pump, Series BH

(2) Remove only the outer circle of screws and lock washers. Separate body from cover at diaphragm flange near body. If cover sticks, it can be jarred loose with screwdriver handle.

b. Disassemble Body.

(1) Remove three screws from bottom cover. Disassemble cover, diaphragm spring, rocker arm spring, two spring caps, and cover gasket. Also remove priming lever if used. Remove clips and pin from diaphragm to link connection, and then lift diaphragm assembly out of body. Also remove upper diaphragm spring if used.

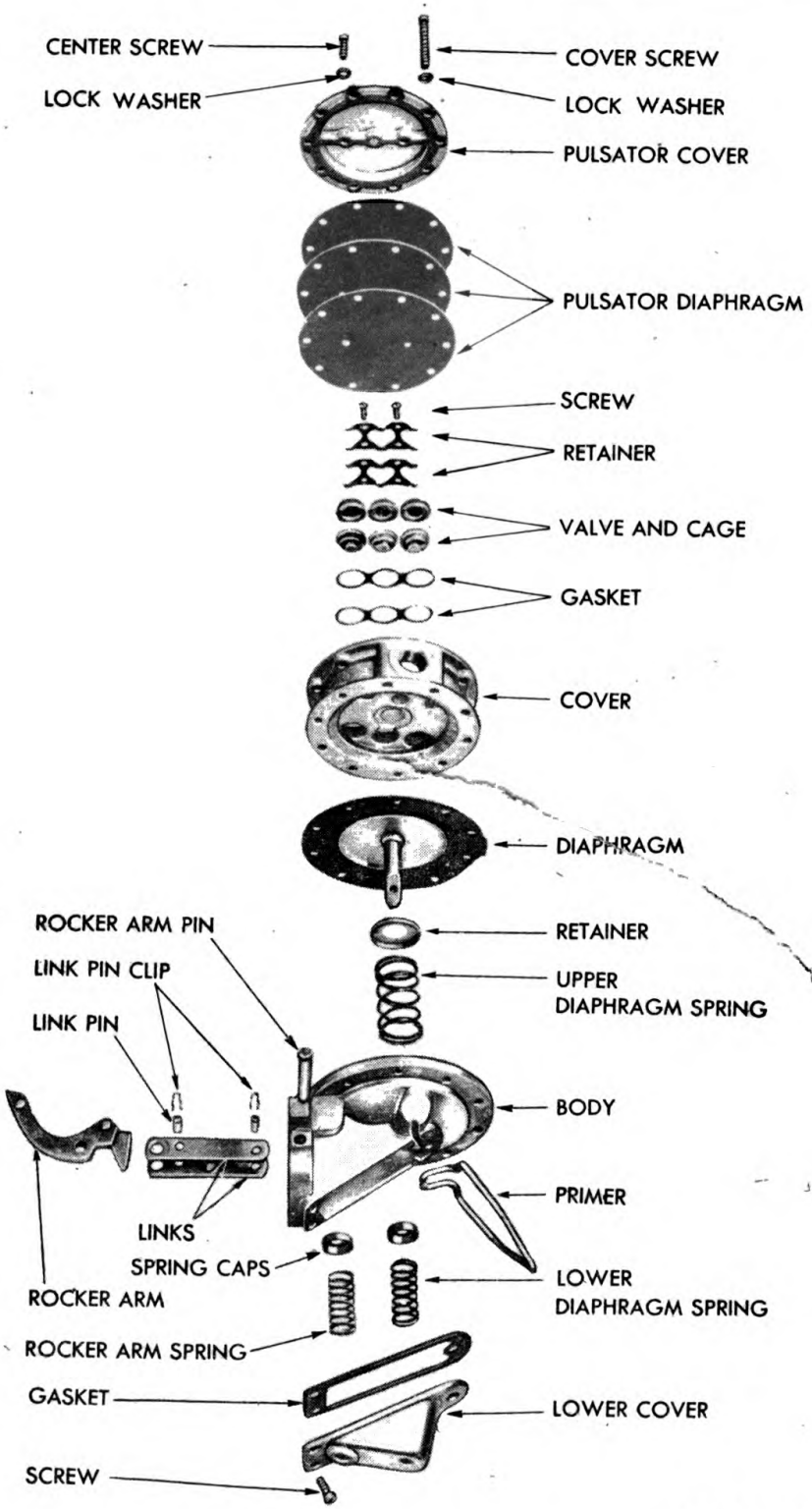
(2) Remove clips from rocker arm pin, and drive out rocker arm pin with drift punch and hammer. If rocker arm pin is riveted, file riveted end flush with washer. Drive out pin with drift punch and hammer. Remove rocker arm and assembled links from body. Disassemble links from pin by removing link pin clips.

c. Disassemble Cover With One Center Screw.

(1) Remove three screws from valve plate. Lift out valve plate, gasket, six valve and cage assemblies and, if used, six valve and cage gaskets.

(2) Remove cover center screw, and lift off pulsator cover plate and three layers of pulsator diaphragm.

d. Disassemble Cover With Two Center Screws. Remove two cover center screws and lock washers. Lift off the pulsator cover



RA PD 341305

Figure 45—Fuel Pump—Disassembled (Typical Series BH Construction)

plate and three layers of pulsator diaphragm. Remove four screws from each of two valve and cage retainers. Remove two retainers, six valve and cage assemblies, and six gaskets.

64. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of fuel pumps, refer to paragraph 7.

65. ASSEMBLY AND TEST.

a. Assemble Body (fig. 45).

(1) If used, assemble upper spring over diaphragm pull rod, and push pull rod through hole in pump body. Assemble sheared ends of two links to flat of pull rod (sheared link corner toward top of pull rod), and retain with one link pin and two clips. Install link pin through center hole of links, and retain with two clips.

(2) Install rocker arm between links with hooked end over center link pin. Assembly is correct when center link pin is below center line of links. Aline rocker arm pin hole with hole in body, and drive in rocker arm pin. Install washer over counterbored end of pin, and spread pin at counterbore to retain in position.

(3) Place diaphragm spring over inner boss of lower cover, and the rocker arm spring over outer (recessed) boss. Place spring caps over springs and gasket on lower cover. Suspend body with lower cover flange down (install priming lever if used) and place lower cover, with associated parts, against body. Spring caps must seat against bottom of pull rod and hook of rocker arm. Retain lower cover with three screws.

b. Assemble Cover With One Center Screw.

(1) Place six valve and cage assemblies in cover. Outlet valve and cages must have 3-legged spider facing into cover, and inlet valves must have 3-legged spider facing out of cover. Set gasket over valve and cage assemblies, and follow with valve plate which is retained with three screws.

(2) Note position of web across diameter of cover (fig. 43). Install three layers of pulsator diaphragm on cover. Follow with pulsator cover plate which must be positioned so that the web across its diameter matches the cover web. Insert cover center screw with lock washer, and tighten securely.

c. Assemble Cover With Two Center Screws. Place six valve and cage gaskets in cover with six valve and cage assemblies on top of gaskets. Inlet valve and cages must have 3-legged spider facing into cover, and outlet valve must have 3-legged spider facing out of

cover. Retain each set of three valve and cage assemblies with one retainer and four screws. Place three layers of pulsator diaphragm on cover, and follow with pulsator cover plate. Aline two center screw holes, and insert two screws with lock washers through cover plate, pulsator diaphragm, and into pump cover. Tighten screws securely.

d. Assemble Cover To Body.

(1) Install top cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install top cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

e. Test. Test operation of pump valves by attaching pressure gage to outlet and operating priming lever or rocker arm a few strokes. Pressure should not fall off rapidly.

Section XXIII

SERIES BK AND BN FUEL AND VACUUM PUMPS

66. DISASSEMBLY (fig. 46).

a. Separate Fuel Cover From Body.

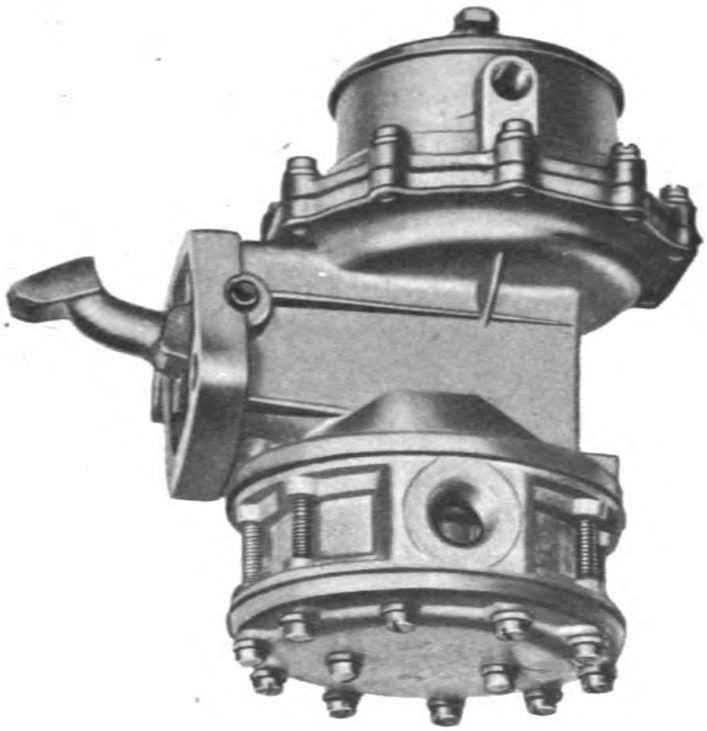
(1) Mark edges of cover and body with a file. The parts may then be reassembled in the same relative positions.

(2) Remove only the outer circle of screws and lock washers. Separate body from cover at diaphragm flange near body. If cover sticks, it can be jarred loose with screwdriver handle.

b. Separate Vacuum Cover From Body.

(1) Mark edges of vacuum cover and body diaphragm flanges. Mark at heat shield stud if used. The parts may then be reassembled in the same relative position.

(2) Remove only two cover screws from opposite sides of the cover, and substitute for them two No. 10—32 x 1½-inch fillister head screws. Turn the two long screws all the way down, and then remove the balance of the regular cover screws. Alternately back off the two long screws, a few turns at a time, until the force of the heavy vacuum diaphragm spring is no longer effective. Rap the cover



RA PD 341306

Figure 46—Fuel and Vacuum Pump, Series BK and BN

with a screwdriver handle if the flanges stick together. Remove the two long screws, the cover assembly, diaphragm spring, and spring retainer.

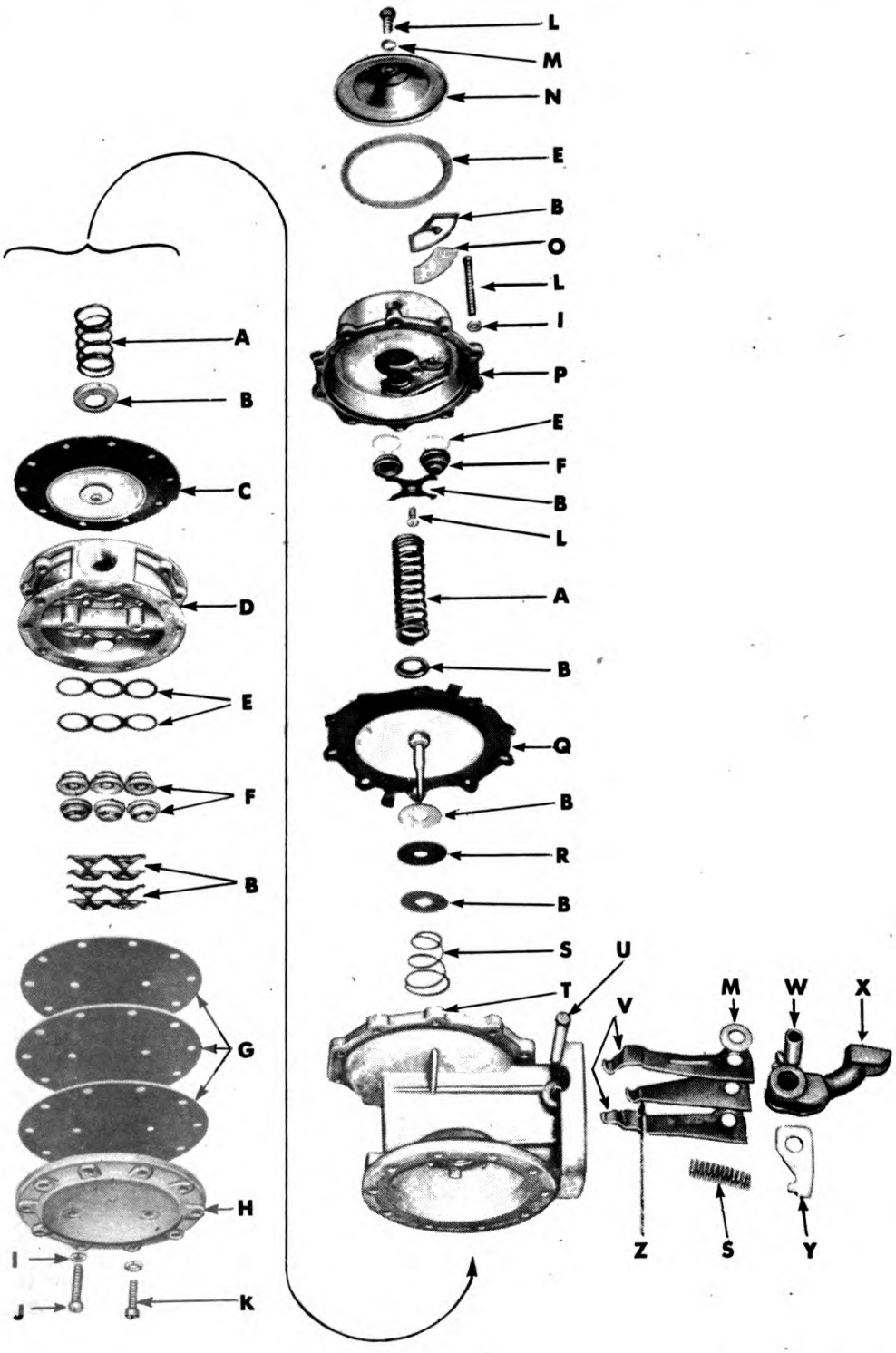
c. Disassemble Body.

(1) File riveted end of rocker arm pin flush with the steel washer. Drive out the rocker arm pin with a drift punch and hammer. Wiggle rocker arm until links unhook from both diaphragms. Remove rocker arm spring, rocker arm, and link assembly.

(2) Remove bushing from rocker arm to disassemble rocker arm, two vacuum links, one fuel link, link spacer, and link washers (there may be one or two links).

(3) Lift vacuum diaphragm out of body, and remove lower oil seal retainer by turning until slot lines up with flat of pull rod. Remove oil seal washer, upper oil seal retainer, and oil seal spring.

(4) Remove fuel diaphragm by pulling straight out. CAUTION: *Do not tilt excessively or staked-in oil seal will be damaged.* Lift diaphragm spring and spring retainer from pump body.



RA PD 341307

Figure 47—Fuel and Vacuum Pump—Disassembled (Typical Series BK and BN Construction)

A—DIAPHRAGM SPRING
B—RETAINER
C—FUEL DIAPHRAGM
D—FUEL COVER
E—GASKET
F—VALVE AND CAGE
G—PULSATOR DIAPHRAGM
H—PULSATOR COVER
I—LOCK WASHER
J—COVER SCREW
K—CENTER SCREW
L—SCREW
M—WASHER
N—PLATE
O—SCREEN
P—VACUUM COVER
Q—VACUUM DIAPHRAGM
R—OIL SEAL
S—SPRING
T—BODY
U—ROCKER ARM PIN
V—VACUUM LINK
W—BUSHING
X—ROCKER ARM
Y—SPACER
Z—FUEL LINK

RA PD 341307B

Legend for Figure 47—Fuel and Vacuum Pump—Disassembled (Typical Series BK and BN Construction)

d. Disassemble Fuel Cover. Remove two cover center screws and lock washers. Lift off the pulsator cover plate and three layers of pulsator diaphragm. Remove four screws from each of two valve and cage retainers. Remove two retainers, six valve and cage assemblies, and six gaskets.

e. Disassemble Vacuum Cover.

(1) Remove valve and cage retainer screw. Lift out retainer, two valve and cage assemblies, and two gaskets.

(2) Remove cover plate screw with its gasket. Lift off the cover, cover gasket, screen retainer, and screen.

67. CLEANING AND INSPECTION.

a. For cleaning and inspection of this series of fuel pumps, refer to paragraph 7.

68. ASSEMBLY.

a. Assemble Body (fig. 47).

(1) Assemble link spacer over fuel link. Place one vacuum link on each side of fuel link. NOTE: *Fuel link is the short, center link.* The hook ends of the vacuum links should come together so that they surround the fuel link. All link hooks should point in the same direction. Place assembly of links and spacer between lobes of rocker arm with one spacer washer on the outer side of each vacuum link. Slide rocker arm bushing through holes in rocker arm, spacer washers, and links.

(2) Stand the pump body on the bench, fuel flange down. Set the rocker arm spring in position with one end over the cone cast into the body. Slide rocker arm and link assembly into body. Outer end of rocker arm spring slips over the projection on link spacer, and the open end of all link hooks must point toward the vacuum flange. Temporarily retain rocker arm and link assembly with a 4- or 5-inch length of ⅛-inch rod.

(3) Soak diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Turn the pump body over, so the fuel diaphragm flange is up. Set the diaphragm spring on the staked-in oil seal and the retainer on top of the spring. Push diaphragm pull rod through retainer, spring, and oil seal. Flat of pull rod must be at right angles to link. Hook diaphragm pull rod to fuel link. CAUTION: *Do not tilt diaphragm pull rod excessively as this may damage the oil seal.*

(4) Remove temporary pin, aline rocker arm bushing hole with hole in body, and drive in the rocker arm pin. Place washer over small end of pin, and retain by spreading end of pin.

b. Assemble Fuel Cover. Place six valve and cage gaskets in cover with six valve and cage assemblies on top of gaskets. Inlet valve and cages must have 3-legged spider facing into cover, and outlet valve must have 3-legged spider facing out of cover. Retain each set of three valve and cage assemblies with one retainer and four screws. Place three layers of pulsator diaphragm on cover, and follow with pulsator cover plate. Aline two center screw holes, and insert two screws with lock washers through cover plate, pulsator diaphragm, and into pump cover. Tighten screws securely.

c. Assemble Fuel Cover to Body.

(1) Install cover on body, making sure that file marks on cover and body line up. Push on rocker arm until diaphragm is flat across body flange. Install cover screws and lock washers loosely until screws just engage lock washers. Push rocker arm in full stroke, and tighten cover screws securely. Release rocker arm.

(2) Diaphragm must be held in flexed position while tightening cover screws, or pump will deliver too much pressure.

d. Assemble Vacuum Cover.

(1) Place two gaskets and two valve and cage assemblies in cover. Inlet valve must have 3-legged spider facing out of cover, and outlet valve must have 3-legged spider facing into cover. Secure valve and cage assemblies with retainer and screw.

(2) Turn cover over, and set screen in recess over valve hole. Set screen retainer on screen. Place the cover gasket, cover, cover

screw gasket, and cover screw in position in the order named. Tighten cover screw.

e. Assemble Vacuum Cover to Body.

(1) Soak diaphragm in clean kerosene. Fuel oil may be used, but do not use shellac or sealing compound. Assemble oil seal on vacuum diaphragm pull rod in the following sequence: oil seal spring, upper retainer, oil seal washer, and lower retainer. Turn lower retainer 90 degrees to lock in position.

(2) Lift the pump body above eye level, facing the vacuum diaphragm flange. The two vacuum links will swing down so that the diaphragm pull rod can be hooked to both links.

(3) While holding the vacuum diaphragm in position, the body should be clamped in a vise, vacuum side up. Clamp by one of the mounting flange ears. The vacuum diaphragm must be held level with the body flange during the following operations. The diaphragm is held level by inserting a $^{3}/_{32}$-inch piece of metal between rocker arm stop and body. This spacer can be made from a piece of steel $^{3}/_{16}$ inch x $^{3}/_{32}$ inch x 8 inches. Bend one end to form a right angle hook, $^{3}/_{8}$ inch from bend to end.

(4) Place spring retainer on riveted end of diaphragm pull rod, and the spring on the retainer. Place vacuum cover over spring, and aline the file marks.

(5) Insert two No. 10—32 x 1½-inch screws in two opposite holes in cover flange. Turn these long screws down, alternating a few turns on each. Insert the regular screws with lock washers, and tighten until screws just engage lock washers. Replace two long screws with regular screws and lock washers.

(6) Remove $^{3}/_{32}$-inch spacer from rocker arm position. This allows the heavy vacuum spring to push diaphragm into a flexed position. Tighten all cover screws securely.

f. Test. Fuel and vacuum pumps cannot be bench-tested.

CHAPTER 3—ELECTRIC FUEL PUMPS

Section I

DESCRIPTION

69. DESCRIPTION.

a. General. Carter electric fuel pumps are of the centrifugal type. To operate properly, pump must be located so it is completely submerged in fuel. The lubricant for the armature shaft bearings is fuel. Essentially, the pump is a direct-current shunt-wound electric motor which drives an impeller.

b. Identification (fig. 48). Model P-571S is designed to operate on 24 volts, direct current, with a negative ground. Model P-576S is designed to operate on 12 volts, direct current, with a negative ground. Both pumps are identical in appearance. The model number is stamped on the upper part of the field housing as shown in figure 48. The positive brush is approximately 30 percent silver, which allows replacement of the silver lost from the commutator by electrolysis. It is essential to operate the pump with the correct polarity in order to have the pump impeller rotate in the right direction and to allow the positive brush to replace the silver lost from the commutator by electrolysis. In order to deliver the correct fuel pressure, the pumps must be operated at the voltage for which they were designed.

c. Description (fig. 49). The pump consists of two principal parts: the cable assembly which includes the terminal bracket, and the pump. The pump is generally mounted in the bottom of the fuel tank and is supported on the carrier bosses. Fuel enters through the outside strainer and is discharged through a pipe connected to the discharge port.

70. CONSTRUCTION.

a. General. Five principal assemblies, with their attaching parts, comprise the pump.

(1) CABLE ASSEMBLY. The cable assembly (C, fig. 50) includes the terminal bracket which is attached to the top of the fuel tank on the inside. The assembly provides an exterior connection for the feed wire carrying the electric current.

(2) FIELD HOUSING, BEARING, AND COIL ASSEMBLY (K, fig. 50). This assembly consists of the upper armature shaft bearing and the

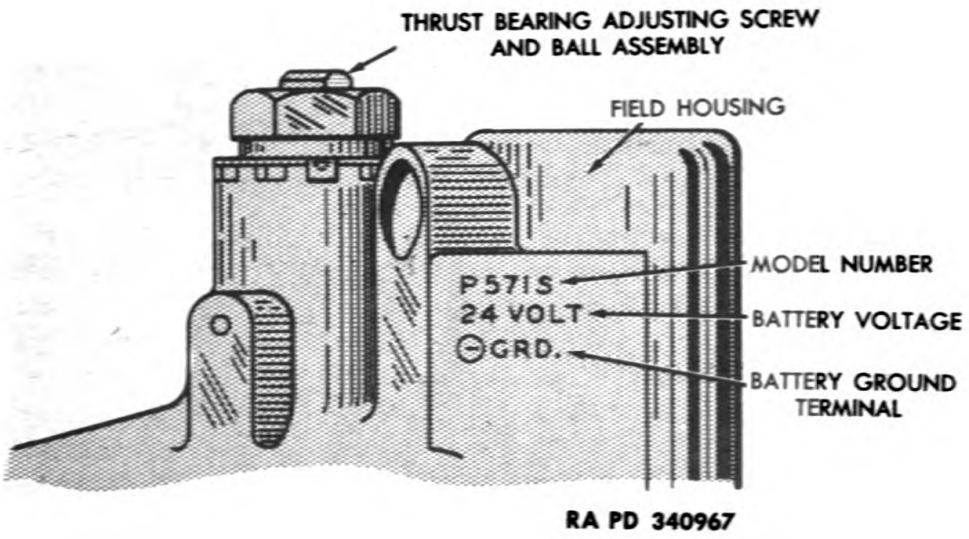


Figure 48—Voltage and Polarity Identification

field and pole piece assembly. Both of these assemblies are staked into the die-cast housing, and neither assembly can be removed from the housing without injuring the housing. In the case of a worn upper armature shaft bearing or a defective field coil, the entire field housing with upper armature shaft bearing and field coil assembly must be replaced with a serviceable unit.

(3) ARMATURE ASSEMBLY (M, fig. 50). The windings of the armature are protected by pressed-on, die-cast shells. The silver commutator and armature shaft bearing journals are superfinished. If the commutator is worn or any of the windings are defective, the entire assembly must be replaced with a serviceable unit, since any disassembly will affect the dynamic balance of the assembly.

(4) PUMP BODY ASSEMBLY (T, fig. 50). The pump body assembly houses the lower armature shaft bearing and the positive and negative brushes. The lower armature shaft bearing is staked securely into the body and cannot be replaced without injuring the body. A brush assembly consists of a brush with the brush spring slipped over the pigtail before a metal disk is soldered to the end of the pigtail. Positive and negative brushes are not interchangeable since they are of different materials. The positive brush is insulated from the body by means of a brush insulator made of plastic.

(5) UPPER AND LOWER VOLUTE PLATES AND IMPELLER AND BALL ASSEMBLY. The upper volute plate (Y, fig. 50) has a tapped hole for connecting the fuel line to the pump. The upper and lower

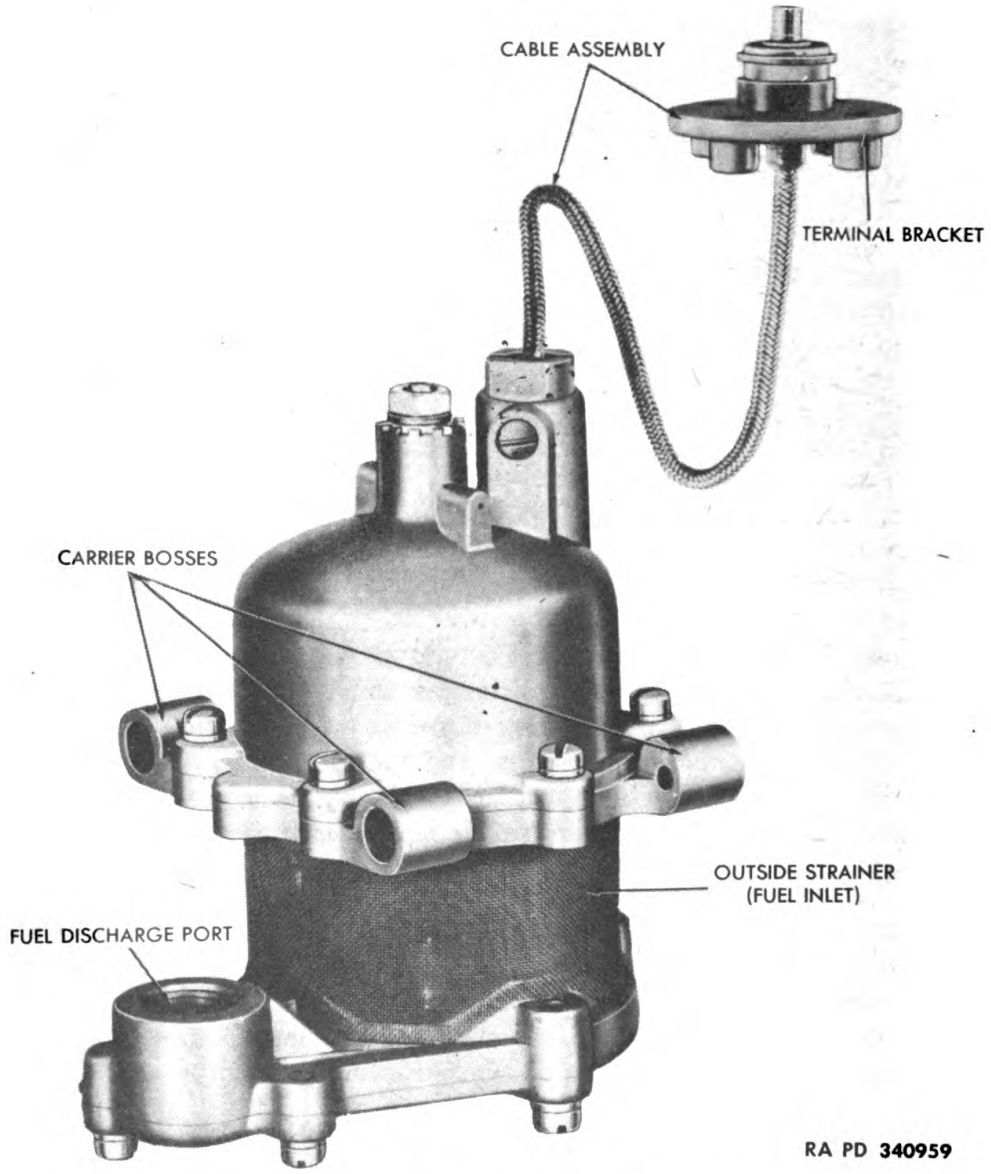


Figure 49—Carter Electric Fuel Pump

volute plates are die-cast, and are attached to each other by means of six screws with no gasket between the adjacent surfaces. The impeller and ball assembly (Z, fig. 50) is dynamically balanced, and is driven by a groove in the end of the armature shaft which engages a tongue in the impeller. A hardened ball is staked to the impeller to act as a thrust bearing, and bears against a hardened plate which is staked to the lower volute plate.

71. FLOW OF FUEL THROUGH PUMP.

a. General. The dotted arrows in figures 51 and 52 trace the flow of fuel through the pump. An internal fuel circulation system through the pump is necessary to provide adequate cooling and lubrication for the armature shaft bearings.

b. Circulation. Fuel enters the pump through the outside strainer (M, fig. 51), and flows to the impeller (J, fig. 51) which in turn forces fuel into the circular passage (K, fig. 51) formed by the upper and lower volutes (H and I, fig. 51). This circular passage connects to the discharge port (G, fig. 52) through which most of the fuel is discharged. However, a vertical passage (G, fig. 51) connects the circular passage to the interior of the field housing (B, fig. 51). A restriction (E, fig. 51) in this vertical passage controls the amount of fuel passing through the inside strainer (D, fig. 51) into the field housing. A restriction (N, fig. 51) in the field housing fuel outlet passage (L, fig. 51) serves to keep the interior of the field housing under pressure. This pressure forces a portion of fuel through the upper armature shaft bearing (A, fig. 51) back into the tank. The remaining fuel passes through the annulus (P, fig. 51) formed by the armature (B, fig. 52) and the pump body (M, fig. 52), passes by the commutator (O, fig. 52), and returns to the tank through the commutator pocket drain passages (L, fig. 52).

72. TEST OF PUMP IN VEHICLE.

a. To test the performance of fuel pump in the vehicle, proceed as follows:

(1) Open battery master switch. Disconnect fuel line at suction side of engine driven fuel pump, or at carburetor if no engine driven fuel pump is present. Connect gage (41-G-500) to fuel line.

(2) Close master battery switch. Operate each pump separately. If no undue noise or vibration is felt, and the fuel pressure on the gage is not less than 4½ pounds for a 24-volt pump and 3¾ pounds for a 12-volt pump, the pump is satisfactory. If the above requirements are not met, the fuel pump must be overhauled. This test assumes the vehicle batteries are fully charged, the wiring is in good condition, and the fuel tanks are at least half full of fuel. During the test, it is very important that all fuel line valves connecting the pump of the tank under test with other fuel tanks remain closed. Otherwise, fuel may circulate from one tank to another and a true reading would not be obtained.

Figure 50—Pump Parts

Description

A—CABLE TERMINAL SCREW
B—CABLE TERMINAL SCREW LOCK WASHER
C—CABLE ASSEMBLY
D—FIELD HOUSING ATTACHING SCREWS
E—CABLE LOCK SCREW
F—CABLE LOCK SCREW INTERNAL-TOOTHED LOCK WASHER
G—THRUST BEARING ADJUSTING SCREW LOCK NUT
H—THRUST BEARING ADJUSTING SCREW LOCK NUT LOCK WASHER
I—ADJUSTING SCREW LOCK
J—THRUST BEARING ADJUSTING SCREW AND BALL ASSEMBLY
K—FIELD HOUSING, BEARING, AND COIL ASSEMBLY
L—PIGTAIL ATTACHING SCREW (FOR FIELD)
M—ARMATURE ASSEMBLY
N—FIELD HOUSING GASKET
O—INSIDE STRAINER ATTACHING SCREW
P—INSIDE STRAINER FRAME
Q—INSIDE STRAINER
R—NEGATIVE BRUSH SCREW PLUG
S—NEGATIVE BRUSH ASSEMBLY
T—PUMP BODY ASSEMBLY
U—POSITIVE BRUSH ASSEMBLY
V—POSITIVE BRUSH SCREW PLUG
W—OUTSIDE STRAINER ATTACHING SCREWS
X—OUTSIDE STRAINER
Y—UPPER VOLUTE PLATE
Z—IMPELLER AND BALL ASSEMBLY
AA—LOWER VOLUTE PLATE
BB—VOLUTE PLATE ATTACHING SCREW AND LOCK WASHER ASSEMBLY

RA PD 340608

Legend for Figure 50—Pump Parts

A—UPPER ARMATURE SHAFT BEARING
B—FIELD HOUSING
C—ARMATURE
D—INSIDE STRAINER
E—RESTRICTION
F—PUMP BODY
G—VERTICAL PASSAGE
H—UPPER VOLUTE
I—LOWER VOLUTE
J—IMPELLER
K—CIRCULAR PASSAGE
L—FIELD HOUSING FUEL OUTLET PASSAGE
M—OUTSIDE STRAINER
N—RESTRICTION
O—COMMUTATOR
P—ANNULUS
Q—THRUST BEARING ADJUSTING SCREW AND BALL ASSEMBLY

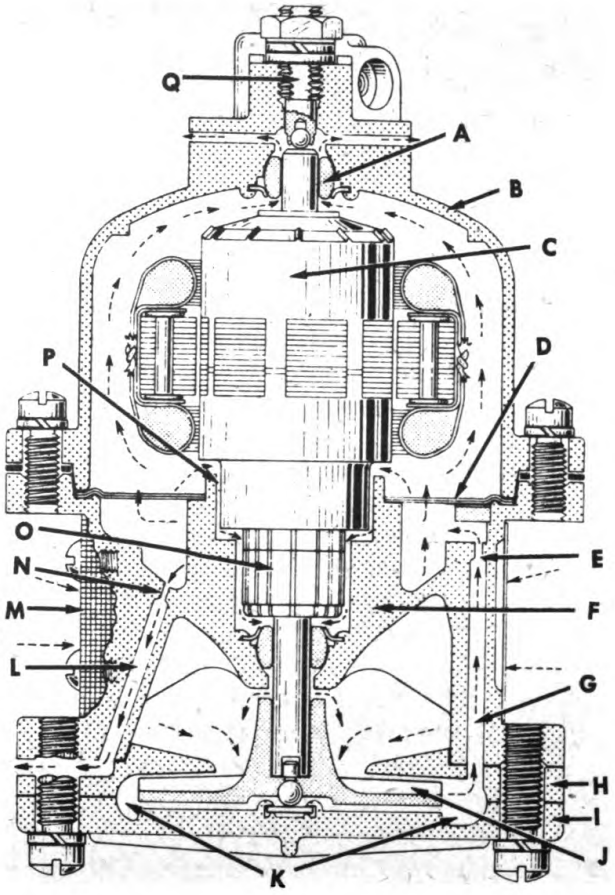


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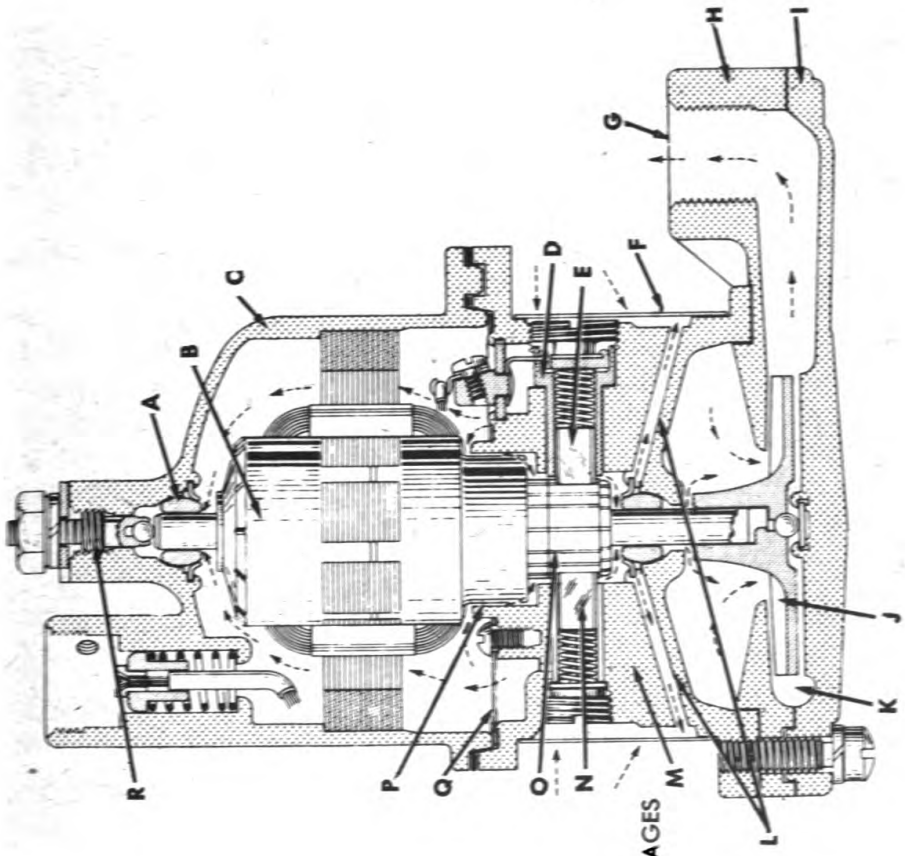
Figure 51—Fuel Circulation Diagram—Sectional View (Perpendicular to Fuel Discharge Port)



A—UPPER ARMATURE SHAFT BEARING
B—ARMATURE
C—FIELD HOUSING
D—BRUSH INSULATOR
E—POSITIVE BRUSH
F—OUTSIDE STRAINER
G—FUEL DISCHARGE PORT
H—UPPER VOLUTE
I—LOWER VOLUTE
J—IMPELLER
K—CIRCULAR PASSAGE
L—COMMUTATOR POCKET DRAIN PASSAGES
M—PUMP BODY
N—NEGATIVE BRUSH (GROUND)
O—COMMUTATOR
P—ANNULUS
Q—INSIDE STRAINER
R—THRUST BEARING ADJUSTING SCREW AND BALL ASSEMBLY

Figure 52—Fuel Circulation Diagram—Sectional View (Through Fuel Discharge Port)

Section II

DISASSEMBLY

73. DISASSEMBLY (fig. 50).

a. Detach Cable Assembly from Pump. Remove lock screw in field housing which locks cable nut to field housing. Unscrew cable nut, and detach cable assembly from pump assembly.

b. Remove Outside Strainer. Remove four screws from pump body which attach strainer, and remove strainer.

c. Remove Impeller. Remove four long and two short screws with lock washers which attach upper and lower volutes to pump body. Remove lower volute. If impeller is stuck on armature shaft, use two screwdrivers and, working from opposite sides and with a twisting movement, remove impeller from armature shaft. Remove upper volute plate from pump body.

d. Remove Brush Assemblies. Remove the larger of the screw plugs from the side of the pump body. Lift out brush and brush insulator. This is the positive brush. Remove screw plug and brush assembly from opposite side of pump body. This is the negative brush which is grounded.

e. Remove Armature. Remove thrust bearing adjusting screw lock nut, lock washer, lock, and thrust bearing adjusting screw and ball assembly from field housing in the order mentioned. If exterior of pump indicates presence of gum and the armature shaft cannot be rotated by hand, apply three or four drops of a cleaning solution consisting of alcohol, acetone, or a 50-50 mixture of both to each of the upper and lower armature shaft bearings. CAUTION: *Do not allow the cleaning solution to contact the brushes, windings of the field coil or armature, because the cleaning solution will damage the insulation of the windings.* It may take about 5 or 10 minutes for the cleaning solution to soften the gum deposit. Remove the six screws with lock washers which attach the field housing, bearing, and coil assembly to the pump body. Separate the field housing far enough from the pump body to remove the screw attaching the field pigtail to the pump body. Separate field housing assembly with gasket from pump body. Remove armature.

f. Remove Inside Strainer. Remove three screws which attach the strainer frame and inside strainer to field housing, bearing, and coil assembly. Remove strainer frame and inside strainer.

74. CLEANING, INSPECTION, AND REPAIR.

a. Cleaning. Clean all parts in dry-cleaning solvent, using a soft brush to remove sediment. Blow through all passages (figs. 51 and 52) with compressed air to make sure they are open. Clean commutator slots with cardboard. CAUTION: *To avoid damage to commutator, do not use a metal tool.* If parts are gummed, use cleaning solution (par. 72 e) to wash them. Do not allow the cleaning solution to contact field coils or armature windings.

b. Inspection.

(1) ARMATURE AND UPPER AND LOWER ARMATURE SHAFT BEARINGS. The manufacturer's dimensions of the bearing journals of the armature shaft are 0.2420 to 0.2424 inch. Manufacturer's dimensions for the inner diameter of the armature shaft bearings are 0.2427 to 0.2432 inch. The manufacturer's clearances between armature shaft journal and bearing are 0.0003 to 0.0012 inch. If armature shaft bearing journals and commutator are in good condition, test windings (subpar. c (2) below). If armature shaft bearing journals or commutator are unserviceable for any reason, use a new or serviceable armature assembly. NOTE: *The armature assembly is in dynamic balance. Do not attempt to disassemble it for repairs.* If upper armature shaft bearing is unserviceable, use a new or serviceable field housing, bearing, and coil assembly. If the lower armature shaft bearing is unserviceable, use a new or serviceable pump body assembly.

(2) FIELD HOUSING, BEARING, AND COIL ASSEMBLY. For inspection of upper bearing, refer to subparagraph (1) above. If field housing, coils, and threads in tapped holes appear to be in good condition, test coils as outlined in subparagraph c (3) below. If field housing or coils are damaged, use a new or serviceable field housing, bearing, and coil assembly. If damaged threads in tapped holes cannot be made serviceable, use a serviceable assembly.

(3) PUMP BODY ASSEMBLY. Inspect insulated, staked-in block to which the field pigtail is attached. If it is not tight and in good condition, use a new or serviceable pump body assembly. If brush insulator is not in good condition, replace. If possible, repair damaged threads in tapped holes of pump body; otherwise use a new or serviceable pump body assembly. For inspection of lower armature shaft bearing, refer to subparagraph b (1) above. If pump body assembly is damaged, warped, or otherwise unserviceable, use a new or serviceable pump body assembly.

(4) VOLUTES AND IMPELLER. Contacting surfaces of volute castings must be flat since no gasket is used between upper and lower volutes. If possible, repair damaged threads of discharge port;

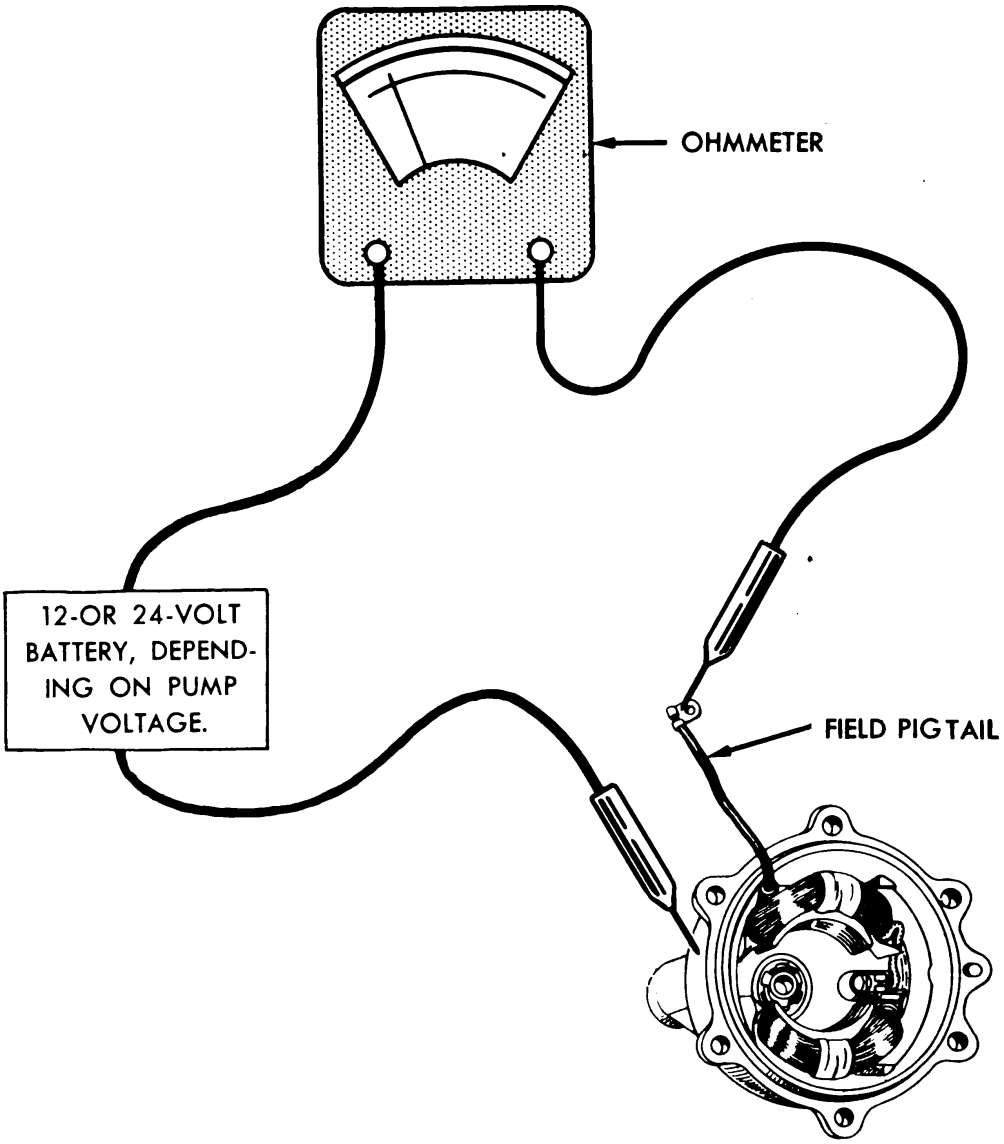


Figure 53—Testing Field Coil With Ohmmeter

otherwise use a new or serviceable upper volute. If impeller or volutes are not in good condition, use new or serviceable parts.

(5) CABLE ASSEMBLY. If cable assembly appears to be in good condition, test as in subparagraph c (3) below. If cable assembly is damaged or unserviceable and damaged threads cannot be repaired, use a new or serviceable assembly.

(6) MISCELLANEOUS PARTS.

(a) Gaskets. Use new gaskets.

(b) Strainers. If old strainers are defective, use new strainers.

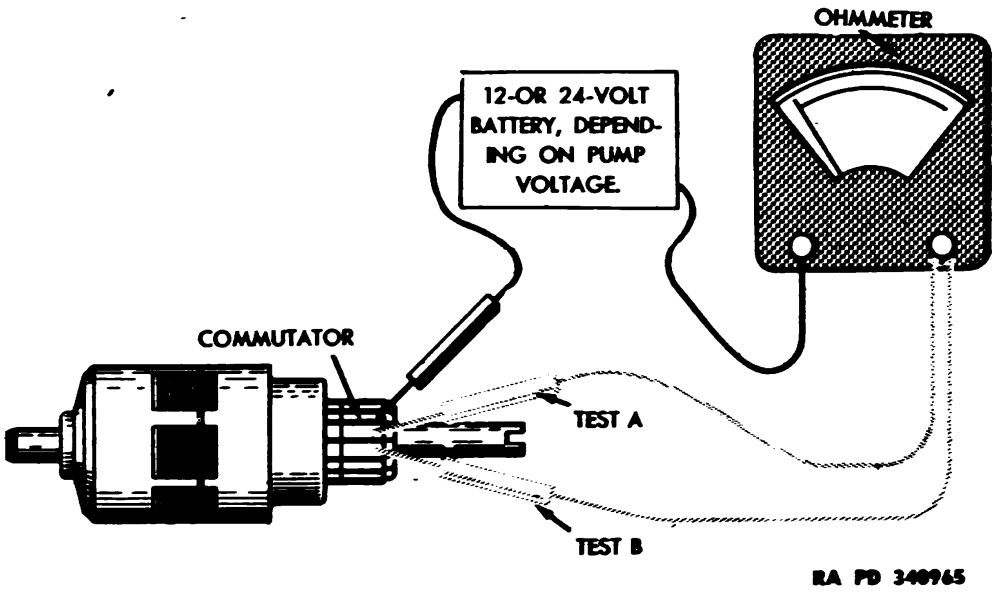


Figure 54—Testing Armature

(c) Brush Assemblies. The minimum permissible brush length is $\frac{3}{16}$ inch. Use new or serviceable brush assemblies if any doubt exists as to whether the brush length at the next overhaul will be less than $\frac{3}{16}$ inch.

(d) Screws, Lock Washers, and Strainer Frame. Use new or serviceable parts as required.

(e) Thrust Bearing Adjusting Screw and Ball Assembly. If threads are damaged or contact surface of ball is flat, use a new or serviceable assembly.

c. Test.

(1) FIELD COIL. Test field coil as illustrated in figure 53. If resistance of coil is not within limits stated below, use a new or serviceable field housing, bearing, and coil assembly. Field coil for 12-volt pump should test 25 to 30 ohms, for 24-volt pump the coil should test 102 to 112 ohms.

(2) ARMATURE.

(a) Test Armature for Ground. Use a 12- or 24-volt test lamp, depending on pump voltage, and fasten one lead of test lamp to armature shaft. Touch each commutator bar in turn with the other lead. If the lamp lights when any bar is connected to the test lead, the armature is grounded and unserviceable. Do not attempt to repair a grounded or shorted armature since the armature is in dynamic balance and cannot be disassembled for repairs.

(b) Measure Resistance of Each Armature Winding.

1. Test A. Measure the resistance of the windings between adjacent commutator bars as illustrated in figure 54. If resistance is not within limits stated below, use a new or serviceable armature assembly. Windings between alternate commutator bars for 12-volt pumps should test 1.35 to 1.70 ohms, for 24-volt pumps the resistance should be 4.6 to 5.95 ohms.

2. Test B. Measure the resistance of the windings between alternate commutator bars as shown in figure 54. If resistance is not within limits stated below, use a new or serviceable armature assembly. Windings between adjacent commutator bars for 12-volt pump should test 0.70 to 1.00 ohms, for 24-volt pumps the resistance should be 2.5 to 3.3 ohms.

(3) CABLE ASSEMBLY. Use a 24-volt test lamp and test cable assembly wire for continuity of circuit and for ground. If circuit is grounded or not continuous, use a new or serviceable cable assembly.

Section III

ASSEMBLY AND TEST

75. ASSEMBLY (figs. 50, 51, and 52).

a. Install Armature in Pump Body. Position inside strainer and frame on pump body and attach with three screws. Install armature assembly in pump body, commutator and first, making sure armature shaft enters lower armature bearing.

b. Attach Volutes and Impeller to Pump Body. Position upper volute plate on pump body, making sure semicircular bosses on volute fit into corresponding recesses in pump body. Install impeller on armature shaft, rotating impeller and holding armature until tongue in impeller engages slot in armature shaft. Position lower volute plate on upper volute plate, and attach volutes to each other and to pump body with six screws and lock washers.

c. Attach Field Housing to Pump Body. Position field housing gasket on pump body. Slide field housing over armature, allowing enough room to secure field pig tail to terminal block of pump body with screw and lock washer. NOTE: *Position pig tail so it is between field coil and field housing, and is not rubbing armature.* Attach field housing to pump body with six screws and lock washers.

d. Install Brushes. Install brush insulator in positive brush pocket (the positive brush pocket is the pocket which has the larger tapped hole for the screw plug). Select brush having the fiber

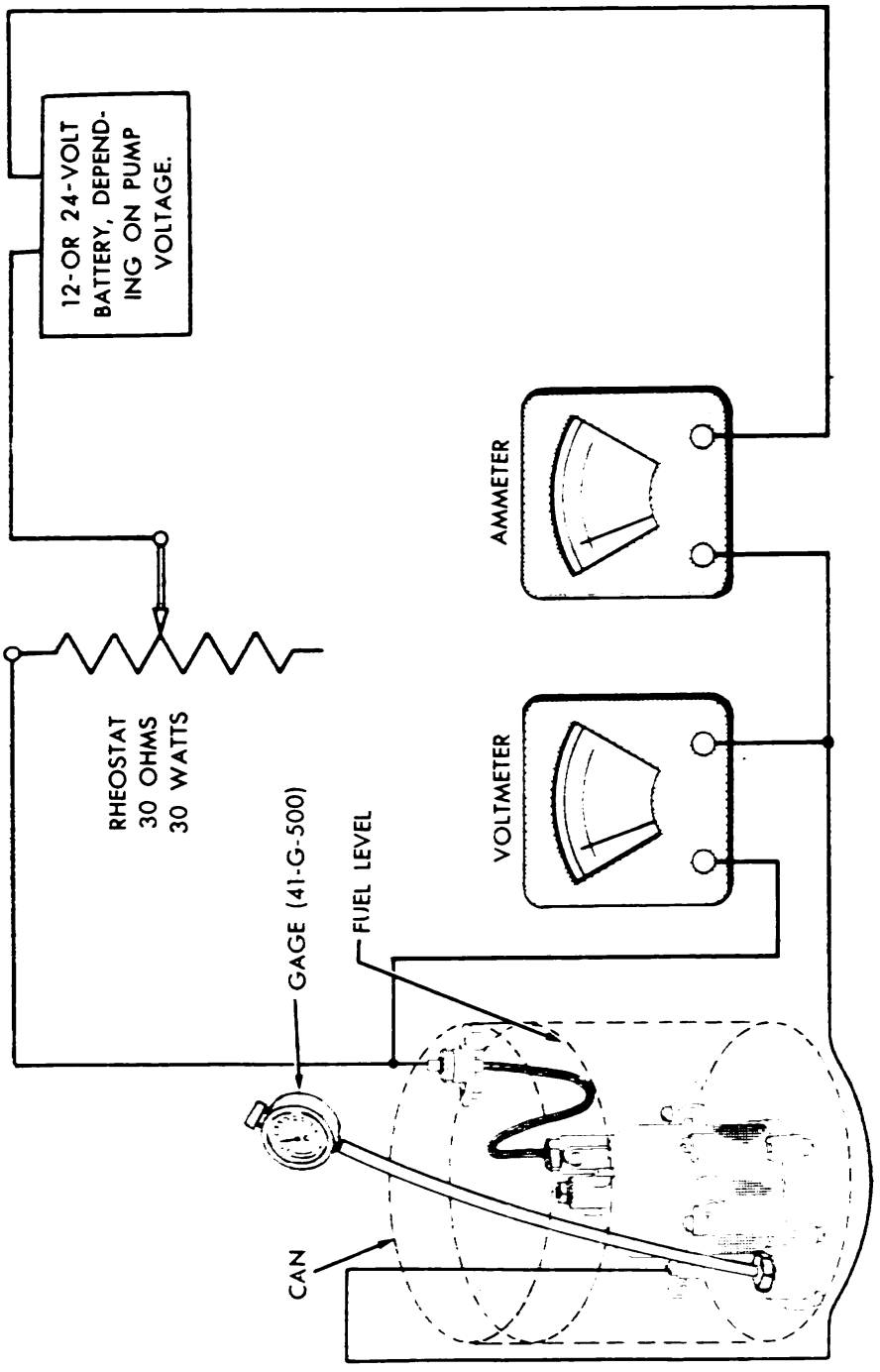


Figure 55—Testing Assembled Pump

insulator terminal, and face positive brush pocket. Install positive brush in pocket with the number stamped on side of brush toward left side of hole. Install screw plug. Install negative brush with number stamped on side of brush toward left side of hole. Install screw plug. Jar pump assembly with heel of hand to position self-alining bearings with armature shaft.

e. Install Outside Strainer. Position outside strainer on pump body, take up all slack in strainer, and attach to pump body with screws.

f. Install Thrust Bearing Adjusting Screw and Ball Assembly and Adjust Armature End Play. Install thrust bearing adjusting screw and ball assembly in field housing and turn down finger-tight against end of armature shaft. Place adjusting screw lock (external-pronged washer). If prongs of lock do not fall into recesses of casting, loosen adjusting screw until prongs fall into nearest recesses, and then loosen adjusting screw one more notch. Install lock washer and lock nut.

g. Install Cable Assembly. Attach cable assembly to field housing with nut on cable. Install lock screw and lock washer to secure cable nut.

76. TEST OF PUMP OUT OF VEHICLE.

a. Attach gage (41-G-500) to fuel discharge port of pump (fig. 55). Submerge entire pump in a can of dry-cleaning solvent after connecting it to source of power. Operate pump. If no undue vibration is observed and pump performs within limits stated below, the pump is satisfactory. If pump does not meet specifications below, disassemble pump and correct difficulty.

12-VOLT PUMP

Voltmeter Reading	Ammeter	Pressure (3¾ pounds)
12.00 volts	1.7 to 2.00 amperes	7½ inches of mercury

24-VOLT PUMP

Voltmeter Reading	Ammeter	Pressure (4½ pounds)
24.00 volts	.95 to 1.10 amperes	9 inches of mercury

CHAPTER 4—APPENDIX

Section I

STORAGE IN DAMP CLIMATES

77. REQUIRED PACKING.

a. For storage in damp climates, the individual fuel pumps will be packed in corrugated paper containers.

b. Each corrugated paper container shall include the amount of silica gel required as shown by the following table:

Outside Area of Container	Silica Gel Required Plus One-half the Weight of Dunnage
125 to 175 sq in.	4 oz
175 to 250 sq in.	6 oz
250 to 350 sq in.	8 oz
350 to 450 sq in.	10 oz
450 to 500 sq in.	12 oz
500 to 600 sq in.	14 oz

NOTE: *Add to the above quantities for each container, ½ the weight of dunnage required to pack the fuel pump in carton.*

c. Seal container and wrap in Ordnance grade C, type 1. cloth.

d. Dip wrapped container in Ordnance AXS-1015 wax sealer.

Section II

REFERENCES

78. PUBLICATIONS INDEXES.

a. The following publications indexes should be consulted frequently for latest changes to or revisions of the publications given in this list of references and for new publications relating to materiel covered in this manual:

Introduction to Ordnance Catalog (explaining SNL system)	ASF Cat. ORD 1 IOC
Index (index to SNL's)	ASF Cat. ORD 2 OPSI
Index to Ordnance Publications (listing FM's, TM's, TC's, and TB's of interest to ordnance personnel, FSMWO's, OPSR, BSD, S of SR's, OSSC's, and OFSB's, and including alphabetical listing of ordnance major items with publications pertaining thereto)	OFSB 1-1
List of Publications for Training (listing MTP's, MR's, TR's, FM's, TM's, TB's, SB's, WDLO's, and FT's)	FM 21-6
List of administrative and supply publications (listing MR's, MWO's, SB's, RR's, and War Department Pamphlets)	WD Pamphlet 12-6
List of Training Films, Film Strips, and Film Bulletins (listing TF's, FS's, and FB's by serial number and subject)	FM 21-7
Military Training Aids (listing graphic training aids, models, devices, and displays)	FM 21-8

79. STANDARD NOMENCLATURE LISTS.

a. Maintenance.

Cleaning, preserving and lubricating materials; recoil fluids, special oils, and miscellaneous related items	SNL K-1
Lubricating equipment, accessories and related equipment	SNL K-3
Ordnance maintenance sets	SNL N-21

Pipe and hose fittings	SNL H-6
Piping, tubing and hose	SNL H-7
Soldering, brazing and welding materials, gases and related items	SNL K-2
Tools, maintenance, for repair of automotive and semi-automotive vehicles	
Tool-sets (special) automotive and semi-automotive	SNL G-27 (Section 1)
Tool-sets (common) specialists' and organizational	SNL G-27 (Section 2)
Tool-sets, for ordnance service command shops	SNL N-30

80. EXPLANATORY PUBLICATIONS.

a. Fundamental Principles.

Automotive brakes	TM 10-565
Automotive electricity	TM 10-580
Automotive power transmission units	TM 10-585
Basic maintenance manual	TM 38-250
Chassis, body, and trailer units	TM 10-560
Diesel engines and fuels	TM 10-575
Driver selection and training	TM 21-300
Driver's manual	TM 10-460
Electrical fundamentals	TM 1-455
Fuels and carburetion	TM 10-550
Military motor vehicles	AR 850-15
Motor vehicle inspections and preventive maintenance services	TM 9-2810
Precautions in handling gasoline	AR 850-20
Radio fundamentals	TM 11-455
Sheet metal work, body, fender, and radiator repairs	TM 10-450
Standard military motor vehicles	TM 9-2800

b. Maintenance and Repair.

Cleaning, preserving, sealing, lubricating and related materials issued for ordnance materiel	TM 9-850
Fuels, lubricants, cleaners and preservatives	TM 9-2835

Ordnance maintenance: Carburetors (Carter)	TM 9-1826A
Ordnance maintenance: Carburetors (Stromberg)	TM 9-1826B
Ordnance maintenance: Carburetors (Zenith)	TM 9-1826C
Ordnance maintenance: Electrical equipment (Auto-Lite)	TM 9-1825B
Ordnance maintenance: Electrical equipment (Delco Remy)	TM 9-1825A
Ordnance maintenance: Hydraulic brakes (Wagner-Lockheed)	TM 9-1827C
Ordnance maintenance: Power brake systems (Bendix-Westinghouse)	TM 9-1827A
Ordnance maintenance: Speedometers, tachometers and recorders (Stewart-Warner)	TM 9-1829A
Ordnance maintenance: Vacuum brake systems (Bendix BK)	TM 9-1827B

c. Protection of Materiel.

Camouflage	FM 5-20
Decontamination	TM 3-220
Decontamination of armored force vehicles	FM 17-59
Defense against chemical attack	FM 21-40
Explosives and demolitions	FM 5-25

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