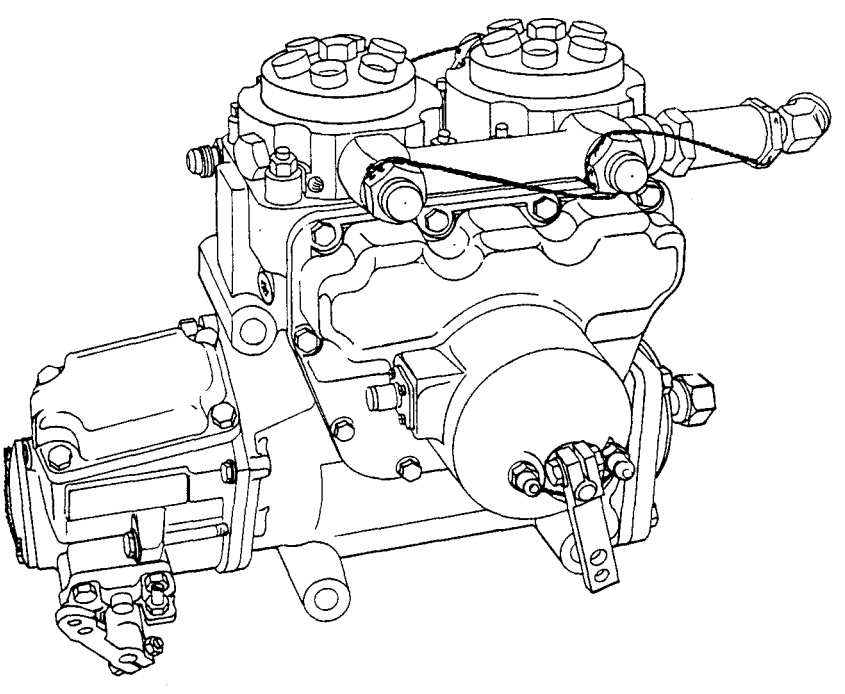
TECHNICAL MANUAL
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

(INCLUDING DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST)



PUMP,
FUEL METERING AND DISTRIBUTING
AMERICAN BOSCH MODEL PSB-12BT

NSN 2910-01-073-0124

HEADQUARTERS, DEPARTMENT OF THE ARMY

JUNE 1984

TA245127

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

WARNING

Compressed air used for cleaning purposes will not exceed 30 psi. Use only with effective chip guarding and personal protective equipment (goggles/ shield, gloves, etc).

WARNING

When testing for fuel leakage, cover pump head assembly fuel outlet ports to prevent fuel from squirting. Fuel is under pressure and can cause injury.

WARNING

Pump will be hot after testing on test stand. Allow time for pump to cool before removing it from the test stand.

WARNING

The spring seat assembly in the pump housing is under spring tension and must be removed slowly to prevent injury.

WARNING

Be certain locks are properly seated in retaining ring groove before releasing all spring tension.

WARNING

The governor cap is spring loaded. Maintain pressure on governor cap when removing screws to prevent injury.

WARNING

Be certain retaining ring is properly seated in retaining ring groove before removing compressor.

END ITEM APPLICATION
For
Pump, Metering and Distributing,
American Bosch Model PSB-12BT

I. ENGINES - AVDS-1790-2C 2815-00-410-1203

AVDS-1790-2D 2815-00-410-1204

AVDS-1790-2A 2815-00-856-9005

		TM NO. SERIES
A. VEHICLES		
1. Tank Combat, Full Tracked:	105-MM Gun, M48A5	9-2350-258
2. Tank Combat, Full Tracked:	105-MM Gun, M60-M60A1	9-2350-215
3. Tank Combat, Full Tracked:	105-MM Gun, M60A1 (RISE)	9-2350-257
4. Tank Combat, Full Tracked:	105-MM Gun, M60A3	9-2350-253
5. Armored Vehicle Launched Bridge:	M48A2 AVLB	5-5420-200
6. Armored Vehicle Launched Bridge:	M60A1 AVLB	5-5420-202
7. Armored Vehicle Launched Bridge:	M48A5 AVLB	5-5420-226
8. Vehicle, Combat Engineer, Full Tracked:	M728	9-2350-222

II. ENGINE - AVDS-1790-2DR 2815-00-124-5387

B. VEHICLE		
Recovery Vehicle, Full Tracked:	Medium M88A1	9-2350-256

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *27 June 1984*

Direct Support and General Support Maintenance Manual
(Including Direct Support, General Support, and Depot
Maintenance Repair Parts and Special Tools List)

PUMP, FUEL METERING AND DISTRIBUTING

AMERICAN BOSCH MODEL PSB-12BT

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Tank-Automotive Command, Warren, MI 48090, ATTN: DRSTA-MB. A reply will be furnished to you.

TABLE OF CONTENTS

* This manual supersedes TM 9-2910-212-34, 7 November 1972, including all changes.

HOW TO USE THIS MANUAL

You must familiarize yourself with the entire maintenance procedures before beginning the maintenance task.

This manual describes the procedures to be followed to repair the American Bosch Model PSB-12BT Metering and Distributing Fuel Pump. Use this manual to repair the pump by first becoming familiar with the pump components and their operation. It is divided into four chapters and four appendixes.

Chapter 1 covers general introductory information and description of the pump, including operation, major pump components, lubrication system, and fuel system.

Chapter 2 lists and illustrates the tools required to repair the pump. This chapter also covers cleaning, preliminary inspection of the pump, troubleshooting procedures, and testing and calibration after repair.

Chapter 3 covers instructions for disassembly, cleaning, inspection, repair and assembly of the pump. Each task lists the tools and supplies required. Special tools and replacement parts are listed and illustrated in Appendix B. Expendable supplies and materials are listed in Appendix C. Machining instructions for replacement of the camshaft sleeve bearing are given in Appendix D. Additional manual references will be found in Appendix A.

Repair of the pump is accomplished by disassembling the pump into subassemblies. The subassemblies are then disassembled, cleaned, inspected, repaired, and assembled into subassemblies. The subassemblies are then assembled to complete repair of the pump. The pump must be tested and calibrated following repairs.

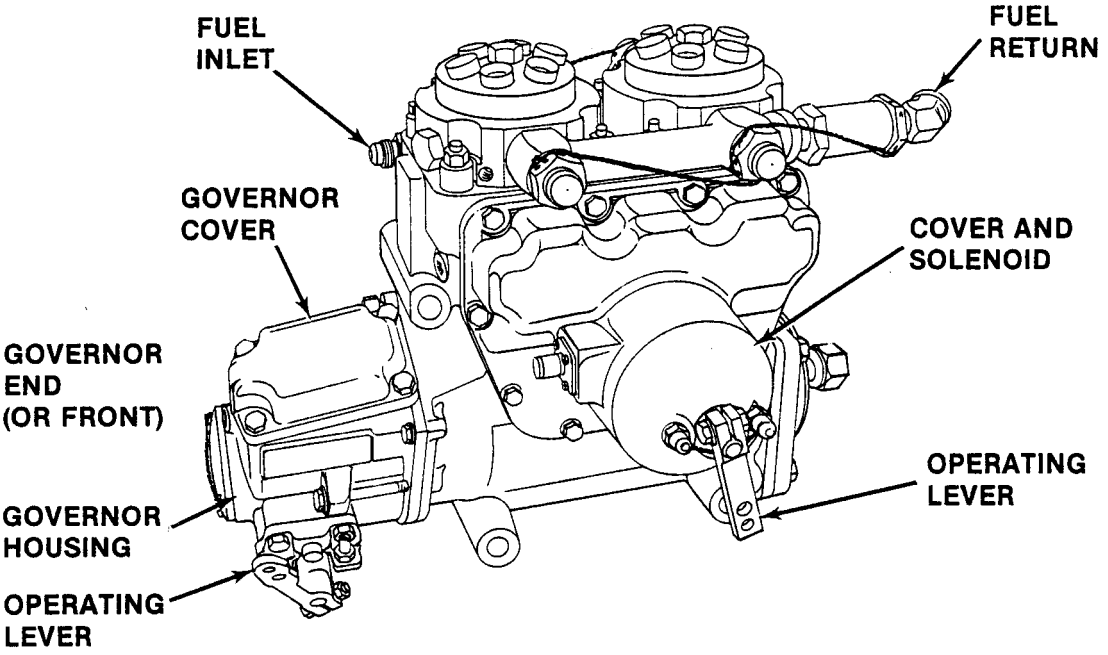
You will note that throughout the disassembly portion of this chapter, you are instructed to remove and discard certain items. These discarded items are furnished in various pump kits and sets, and all parts in the kit or set must be used during assembly. The only exception to the usage rule will be where parts are duplicated in another kit or set. In such cases, the duplicate parts shall be discarded.

Chapter 4 covers procedures for testing, calibration, preservation, and packaging after repair. The pump must be tested and calibrated after repairs are made. After the pump has been tested and calibrated, it must be preserved and packaged prior to being stored or returned to service.

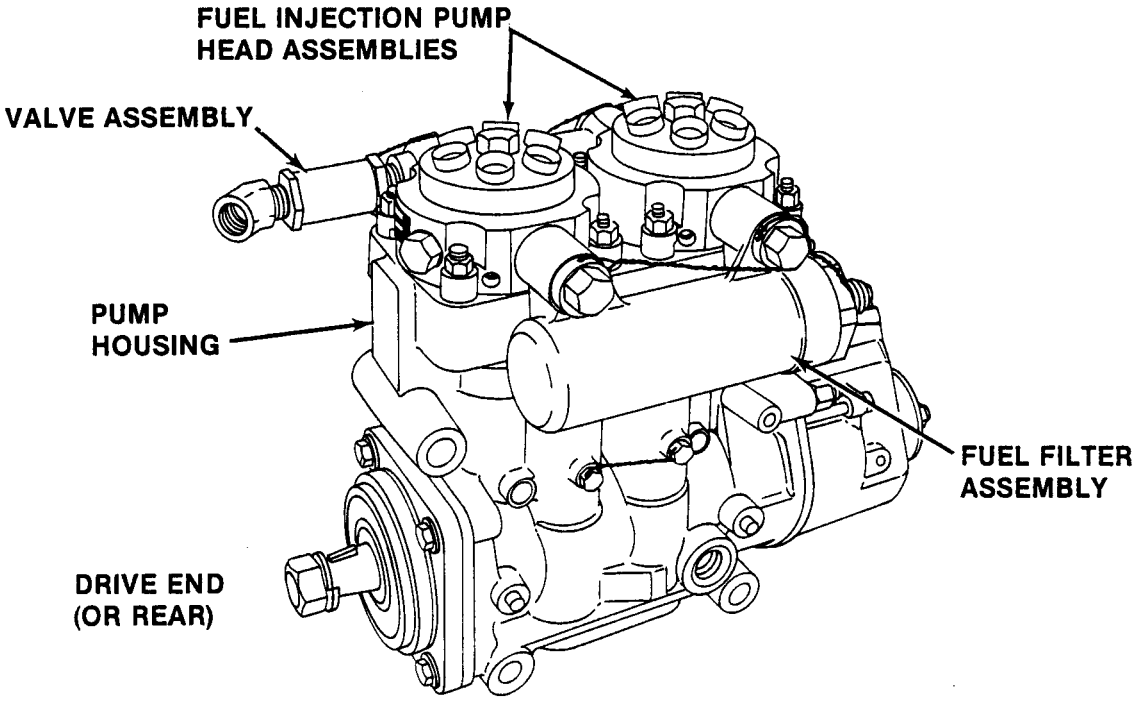
The four Appendixes are:

- Appendix A, References
- Appendix B, Repair Parts and Special Tools Lists
- Appendix C, Expendable Supplies and Materials List
- Appendix D, Machining Specifications

All referencing within this publication is by page number or to other technical manuals.



FUEL METERING AND DISTRIBUTING PUMP - RIGHT FRONT VIEW.



FUEL METERING AND DISTRIBUTING PUMP - LEFT REAR VIEW. TA245296

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE.

a. Type of Manual. This technical manual contains instructions for Direct and General Support Maintenance of the American Bosch, United Technologies Automotive Group Model PSB-12BT metering and distributing fuel pump.

b. Identification. Model PSB-12BT fuel (injection) pump is designed for use on all Model AVDS-1790 series engines used in army vehicles, and is identified as part number 11684129-1.

c. Purpose of Equipment. Fuel injection pumps are engine driven fuel distributing mechanisms. Their purpose is to accurately deliver metered amounts of fuel, under high pressure, to the cylinders in the correct firing cycle.

1.2. MAINTENANCE FORMS, RECORDS, AND REPORTS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System.

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

EIR's can and must be submitted by anyone who is aware of an unsatisfactory condition with the equipment design or use. It is not necessary to show a new design or list a better way to perform a procedure, just simply tell why the design is unfavorable or why a procedure is difficult. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at U.S. Army Tank-Automotive Command, Warren, MI 48090, ATTN: DRSTA-MP. We'll send you a reply.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-4. DESCRIPTION.

a. General. The following terms will be used to identify pump areas and components (refer to page vi):

- Governor end shall be called the front.
- Drive end shall be called the rear.
- Left and right sides of the pump will be determined when viewing the pump from the front.
- Head assemblies are numbered 1 and 2 viewed from the rear.

b. Operation. The constant stroke, distributing plunger, sleeve assembly controlled type fuel injection pump (refer to page 1-6):

- Contains two plungers.
- Actuated by a camshaft and tappet assembly.
- Camshaft includes gearing for fuel distribution function.
- Plungers operate in multi-outlet head assemblies.
- Pump is designed to be driven at crankshaft speed on four-cycle engines.
- Fuel delivery is controlled by a centrifugal type governor weight and spider assembly which is driven directly from the camshaft.
- Fuel delivery is timed in relation to required injection period of the engine firing cycle.

c. Purpose. The pump is designed to deliver accurately metered quantities of high pressure fuel to the engine cylinders.

d. Major Pump Components (pages 1-6 and 1-7):

(1) Pump housing:

- One-piece aluminum casting.
- Has passages for lubricating oil flow pages 1-10 and 1-11).
- Lubricating oil is supplied by the engine.

(2) Electrical/manual solenoid:

- Mounted in cover and solenoid.
- Can be operated electrically or manually.
- Shuts off fuel flow to engine.

(3) Fuel injection pump head assemblies include:

- Heads.
- Fuel plungers.
- Plunger sleeves.
- Plunger drive spur gears.
- Fuel delivery valves.
- Plunger springs.

(4) Head assemblies have:

- Centrally ground and lapped bores with fitted plungers.
- Counterbored and threaded upper ends for plunger bore screw.
- Fuel discharge passages extending symetrically from plunger bore.
- Inclined passages from plunger bore to fuel delivery valves.
- Inclined passages from fuel delivery valve to plunger annulus.
- Tapped openings for inlet and outlet bleeder valve stems.

EQUIPMENT DESCRIPTION AND DATA - Continued

- Drilled passages from inlet/outlet openings to fuel supply sump (page 1-10).
- Supply sump located at center of plunger bore.
- Sump accommodates plunger sleeve (page 1-10).
- Additional passages for lubricating oil.

(5) Fuel plunger, plunger sleeve and head assembly:
- Are matched components.
- Plunger is lapped to head and plunger sleeve.
- Plunger has parallel flats at lower end.
- Parallel flats lock plunger to spur gear through plunger guide.
- Guide will shear if plunger freezes preventing damage to other internal parts.
- Plunger spring and spring seats are held on plunger by plunger locks.

(6) Fuel filter assembly:
- Contains a 10 micron filter element.
- Element is replaceable.
- Mounted to head assemblies by drilled bleeder valve stems and cap nuts.

(7) Bleeder housing and valve assembly:
- Returns excess fuel to vehicle fuel tanks through hose and tube system.
- Bleeder valve is spring loaded.
- Maintains constant fuel pressure in head assemblies.
- Valve has 0.062 in. (1.57 mm) orifice allowing air to be bled off even if valve is closed.
- Mounted to head assemblies by drilled bleeder valve stems and cap nuts.

(8) Camshaft has:
- Two three-lobe cams.
- Two spiral gears.
- Spiral gears are machined as part of camshaft.

(9) Tappet assemblies:
- Consists of guide assembly, roller and roller pin.
- Cam lobe action is transmitted by tappet roller to guide assembly.
- Tappet assembly transmits cam lobe action to fuel plunger.

(10) Gear shaft assemblies:
- Composed of quill shaft, bushing assembly, and camshaft driven helical gear.
- Transmit camshaft rotary motion to fuel plungers for fuel distribution.
- Plungers rotate at one half camshaft speed.

(11) Governor housing components composed of:
- Weight and spider assembly.
- Sleeve assembly.
- Inner and outer governor springs.
- Fulcrum lever assembly.
- Operating linkages.

EQUIPMENT DESCRIPTION AND DATA — Continued

- Operating lever assembly.
- Governor weight and spider assembly is an integral part of fuel injection pump assembly.

(12) Weight and spider assembly:
- Pressed on camshaft extension.
- Has two moveable weight assemblies.
- Weights are pinned to opposite sides of friction drive spider.
- Weights swing freely on weight pins.

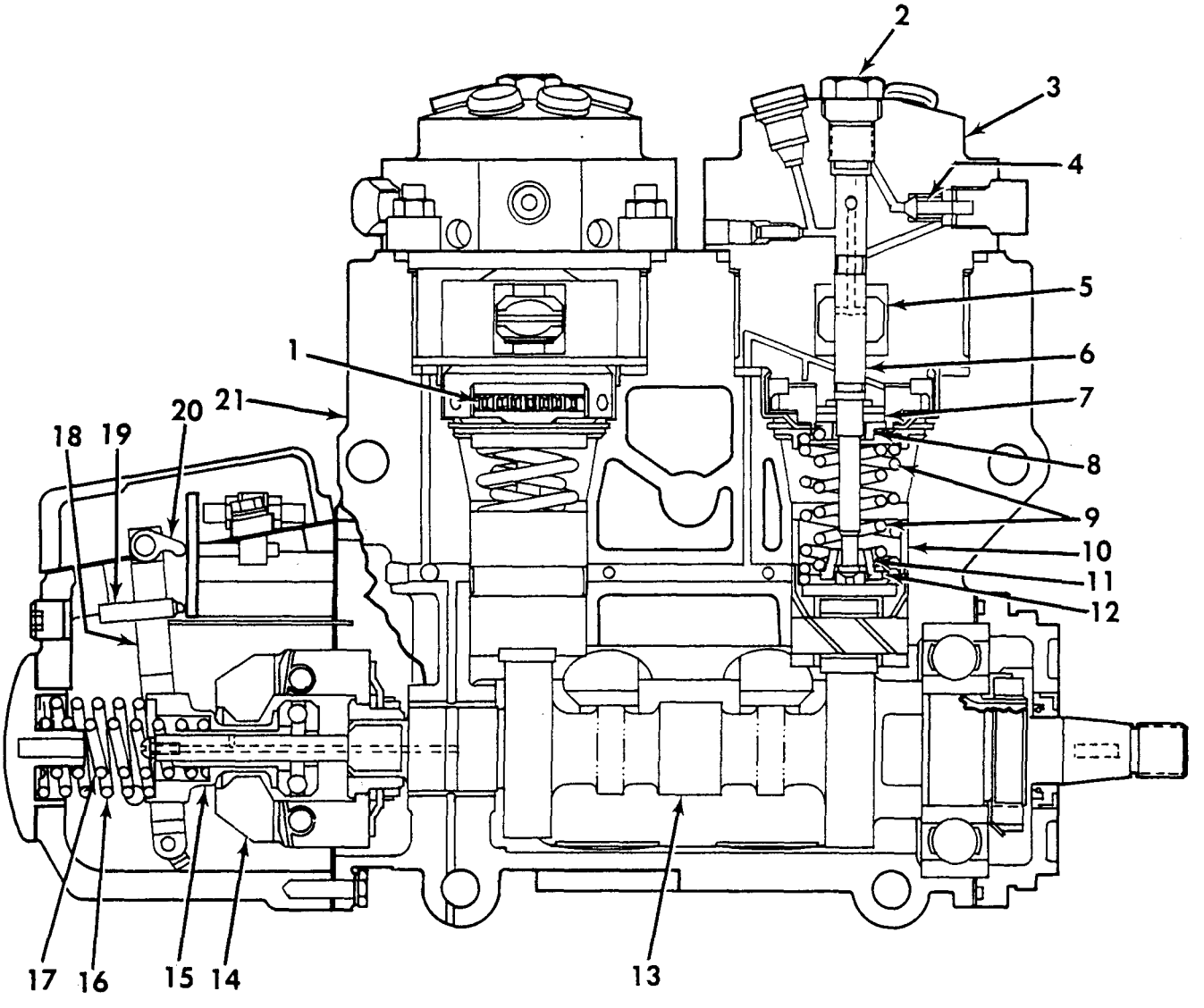
(13) Sleeve assembly:
- Moves freely on camshaft extension.
- Governor weights act against thrust bearing on inner end of sleeve.
- Inner and outer springs act against outer end of sleeve.
- Slots on sides of sleeve receive the fulcrum lever pivot pins.

(14) Fulcrum lever assembly:
- Has smoke limit cam and droop screw.
- Is controlled by the operating lever assembly and sleeve assembly.
- Fulcrum lever action is transmitted to smoke limit cam and droop screw.
- Control rod assembly transmits fulcrum lever action to fuel control lever assembly.

(15) Fuel control lever assembly:
- Pivots on fuel control lever screw.
- Transmits control rod action to fuel control unit assemblies through yoke assembly.

(16) Fuel control unit assemblies:
- Control position of fuel plunger sleeve in relation to plunger spill port.
- Spill port and sleeve relationship determine amount of fuel pumped each stroke.

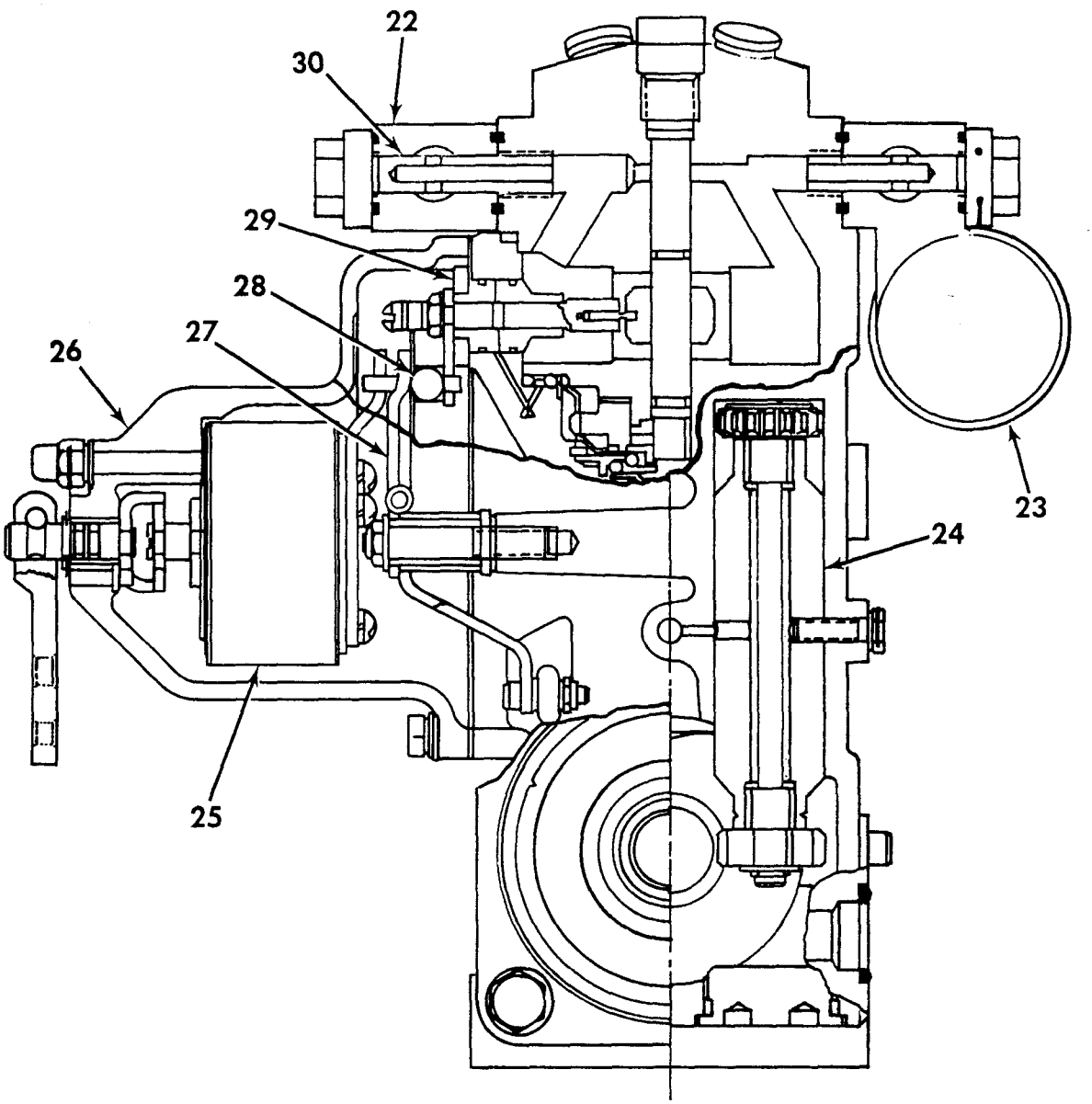
EQUIPMENT DESCRIPTION AND DATA — Continued



1 Plunger drive spur gear
2 Plunger bore screw
3 Head assembly
4 Fuel delivery valve
5 Plunger sleeve
6 Fuel plunger
7 Plunger guide
8 Upper spring seat
9 Plunger springs
10 Tappet assembly
11 Plunger lock
12 Lower spring seat
13 Camshaft
14 Governor weight and spider assembly
15 Sleeve assembly
16 Governor outer spring
17 Governor inner spring
18 Fulcrum lever assembly
19 Droop screw
20 Smoke limit cam
21 Pump housing

Major Pump Components (Sheet 1 of 2).
(Cutaway through Governor Housing, Camshaft, and Head Assembly) TA24518

EQUIPMENT DESCRIPTION AND DATA — Continued



22 Bleeder housing and valve assembly
23 Fuel filter assembly
24 Gear shaft assembly
25 Electrical solenoid
26 Cover and solenoid
27 Fuel control lever
28 Fuel control yoke assembly
29 Fuel control unit assembly
30 Bleeder valve stem

Major Pump Components (Sheet 2 of 2).

(Cutaway through Cover and Solenoid, Head Assembly, and Gear Shaft Assembly)

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EQUIPMENT DESCRIPTION AND DATA — Continued

e. Lubrication System (pages 1-10 and 1-11):

- Pressurized engine oil is delivered to the fuel injection pump through an external hose.
- Pump housing has one main horizontal oil passage to lubricate tappet assemblies and gear shaft assemblies.
- One vertical passage provides lubrication for head assembly components.
- Another vertical passage provides lubrication for camshaft journal and governor weight and spider assembly components.
- Camshaft lobes, ball bearing and gear shaft drive gear are splash lubricated.
- Overflow oil drains from oil outlet on left side of pump.

f. Fuel System (pages 1-10 and 1-11):

(1) Fuel flow:

- Continuous flow of filtered fuel enters pump through filter assembly.
- Inlet flow branches in two directions.
- One branch flows through sump, fuel outlet housing, and bleeder valve assembly.
- One branch flows through plunger fuel ports to pressure chamber when plunger is at bottom of stroke.
- Constant flow of fuel also acts as coolant for pump heads.

(2) Fuel pumping and distribution:

- Provided by camshaft.
- Camshaft rotates at engine speed.
- Camshaft action lifts and rotates plungers.
- During two revolutions of camshaft each plunger completes six strokes and one revolution.
- During lower portion of stroke, plunger pressure chamber is filled through fuel port.
- During upper portion of stroke fuel port is closed off and fuel is compressed.
- Compressed fuel opens fuel delivery valve and fuel flows to plunger annulus and distributing slot.
- Distributing slot alines with outlet port and fuel is delivered to engine cylinder.
- Continued upward movement of plunger uncovers fuel spill port.
- Fuel flows from pressure chamber to fuel sump relieving pressure.
- Delivery valve closes and pumping cycle is completed.

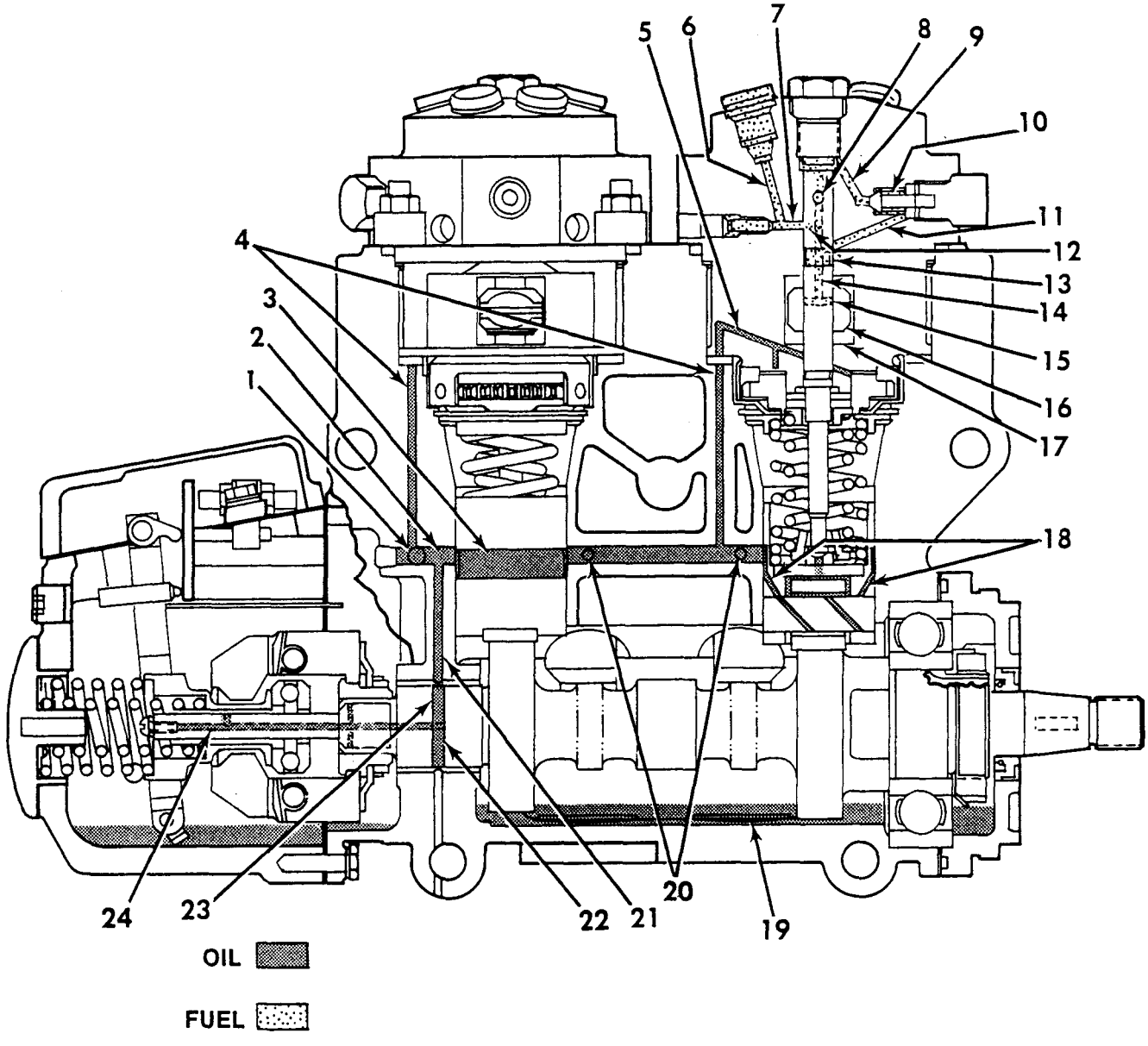
(3) Fuel metering control:

- Position of plunger sleeve determines quantity of fuel delivered for each stroke.
- With plunger sleeve raised effective stroke of plunger is longer and more fuel is delivered.

EQUIPMENT DESCRIPTION AND DATA — Continued

- Lowering plunger sleeve reduces effective stroke and less fuel is delivered.
- Lowering sleeve to extreme position uncovers both the fill port and spill port and no fuel can be delivered.
- Position of plunger sleeve is controlled by the governor weight and spider assembly.
- Increase in camshaft speed causes governor weight assemblies to move outward.
- Outward weight movement forces governor sleeve against governor springs.
- Spring tension balances governor weight action at any given speed after sleeve assembly has shifted.
- Governor sleeve assembly is connected to plunger sleeve through fulcrum lever and linkage.
- For any given engine speed there is a corresponding governor sleeve assembly and plunger sleeve position.
- Adjustable smoke limit cam in linkage path between governor and plunger sleeve limits maximum fuel delivery to specified limits to prevent overfueling.

EQUIPMENT DESCRIPTION AND DATA — Continued

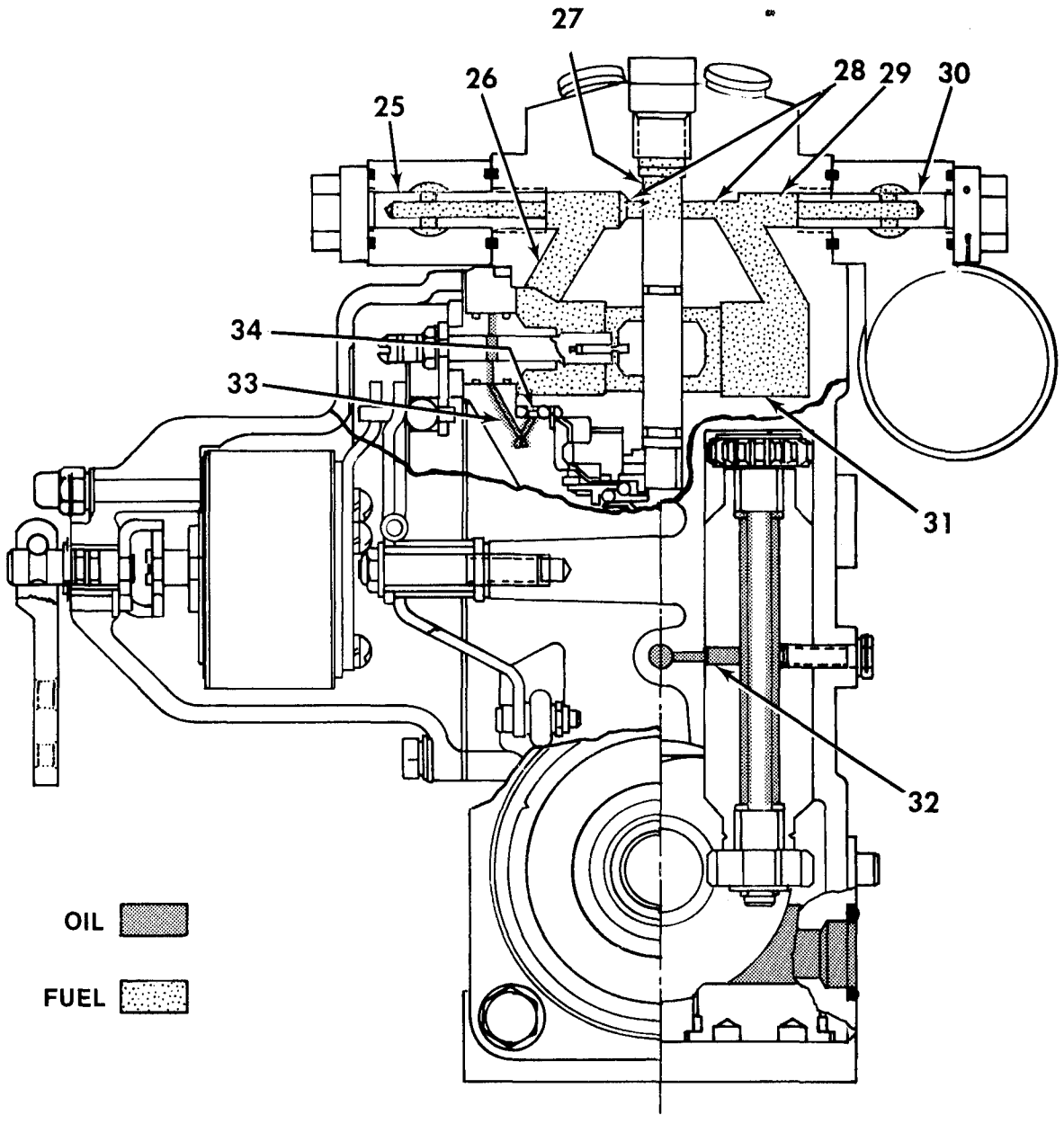


1	Horizontal oil passage	13	Plunger annulus
2	Main horizontal oil passage	14	Plunger vertical fuel passage
3	Tappet assembly annulus	15	Plunger horizontal fuel passage
4	Upper vertical oil passage	16	Plunger sleeve
5	Hydraulic head oil passage	17	Fuel supply sump
6	Vertical outlet fuel passage	18	Tappet assembly oil passage
7	Horizontal outlet fuel passage	19	Oil sump
8	Fuel port	20	Gear shaft oil passage
9	Delivery valve upper fuel passage	21	Lower vertical oil passage
10	Fuel delivery valve	22	Camshaft journal oil passage
11	Delivery valve lower fuel passage	23	Camshaft bushing annulus
12	Plunger distributing slot	24	Camshaft oil passage

Fuel and Oil Flow Diagram (Sheet 1 of 2). TA245183

(Cutaway through Governor Housing, Camshaft, and Head Assembly)

EQUIPMENT DESCRIPTION AND DATA — Continued



25	Bleeder valve stem	30	Bleeder valve stem
26	Fuel outlet passage	31	Hydraulic head spill port
27	Plunger bore pressure chamber	32	Gear shaft oil passage
28	Fuel port	33	Pump housing oil passage
29	Fuel inlet passage	34	Spacer

Fuel and Oil Flow Diagram (Sheet 2 of 2).

(Cutaway through Cover and Solenoid, Head Assembly, and Gear Shaft Assembly)

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EQUIPMENT DESCRIPTION AND DATA — Continued

1.5. DIFFERENCES BETWEEN MODELS.

a. General. Early and late model pumps are similar in design. However, late models incorporate cold weather start components to permit easier engine starts in cold weather. Early model pumps, not so equipped, will be modified at time of overhaul by requisitioning Injection Pump Cold Weather Start Modification Kit, Part No. 12275776.

b. Cold Start Components. The new components were incorporated to provide more fuel when starting the engine in cold temperatures. Silicone lubricant was also added to provide smoother operation of the fuel control units and the electrical solenoid internal lever. New cold start components are:

- Fulcrum lever with droop screw.
- Operating lever assembly spring plate.
- Fuel control levers.
- Fuel control unit spacers.

c. Manual Coverage. This manual covers pumps that have cold start components.

EQUIPMENT DESCRIPTION AND DATA — Continued

1-6. EQUIPMENT DATA.

a. General.

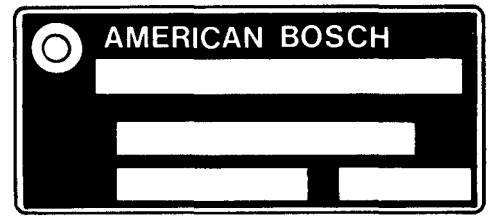
Manufacturer	American Bosch, United Technologies Automotive Group
Model	PSB-12BT
Army Part No	11684129-1
Governor speed range	700 to 2660 rpm
Rotation (viewed from the rear)	Counterclockwise
Fuel injection sequence	1R, 2L, 5R, 4L, 3R, 1L, 6R, 5L, 2R, 3L, 4R, 6L
Fuel outlet ports	5/8-18UNF
Lubrication oil inlet port	1/8-27 NPTF
Bleeder valve operating pressure	30-38 psi (207-262 kPa)
Length overall	16.60 in. (42.2 cm)
Width overall	12.63 in. (32.1 cm)
Height overall	12.05 in. (30.6 cm)

b. Mounting Data.

Number of mounting holes	4
Diameter of mounting holes	0.562 in. (14.3 mm)

1-7. IDENTIFICATION PLATE.

a. Location. The metering and distributing fuel pump has three identification plates. The pump identification plate is located on the right side of the governor housing. The fuel injection pump head assembly identification plates are located on the side of each head assembly.

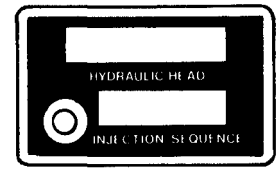


Pump Identification Plate

b. Data.

(1) The pump identification plate includes the pump type, Army part number, governed speed rpm, and serial number.

(2) The head identification plate includes injection sequence, vendor pump head assembly part number, and an arrow that indicates which cylinder bank is serviced by that head. The front head (No. 2 head) arrow points to the right which indicates the engine right bank of cylinders is being served by that head. The rear head (No. 1 head) serves the left bank of cylinders.



Head Assembly Identification Plate

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CHAPTER 2

MAINTENANCE INSTRUCTIONS

Section 1. TOOLS AND EQUIPMENT

2-1. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

2-2. SPECIAL TOOLS AND TEST EQUIPMENT.

a. Special Tools. Refer to Appendix B for special tools required.

b. Test Equipment. Test equipment used in repair of the fuel injection pump consists of the following:

Description	National Stock Number	Part Number	Illustration
Fuel Injection Pump Test Stand	4910-00-817-7431	11020200	Page 2-16
Nozzle Tester	4910-00-255-8641	65-000 (05083)	Page 2-17

2.3. FABRICATED TOOLS.

a. General. The tools described below can be fabricated locally.

b. Remover and Replacer. The remover and replacer (page 2-2) is used to remove or install camshaft sleeve bearing.

c. Holding Plate. The holding plate (page 2-2)is used to mount the pump upright in a vise.

d. Steel Rod. The steel rod (page 2-3) is used with the turning and holding wrench to rotate the camshaft.

e. Tube. The tube (page 2-3) is used to determine the No. 1 outlet port closing point in each head assembly.

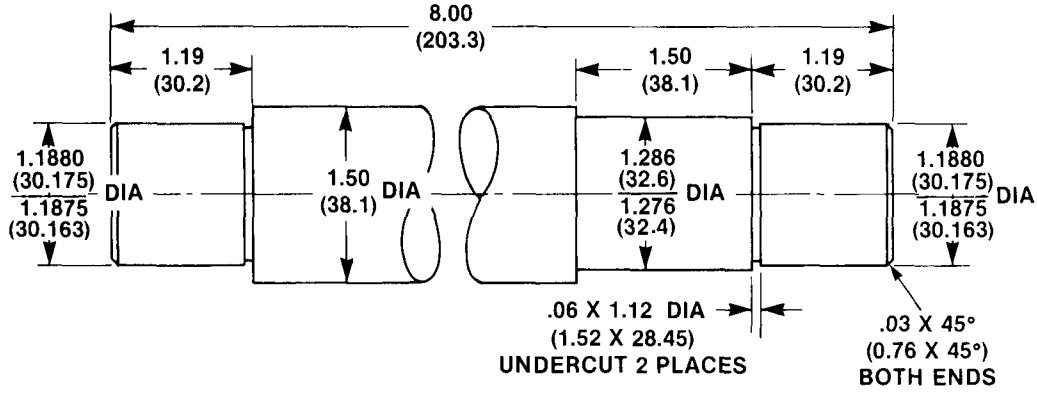
f. Cover. The cover (page 2-3) is used for yoke assembly adjustment.

g. Steel Bars. The steel bars (page 2-4) are used to hold the camshaft while removing or installing camshaft ball bearing retaining nut.

h. Holding Bar. The holding bar (page 2-4) is used to hold the governor hub while removing or installing the governor adjusting nut.

i. Protractor. The protractor (page 2-4) is used to position the smoke limit cam.

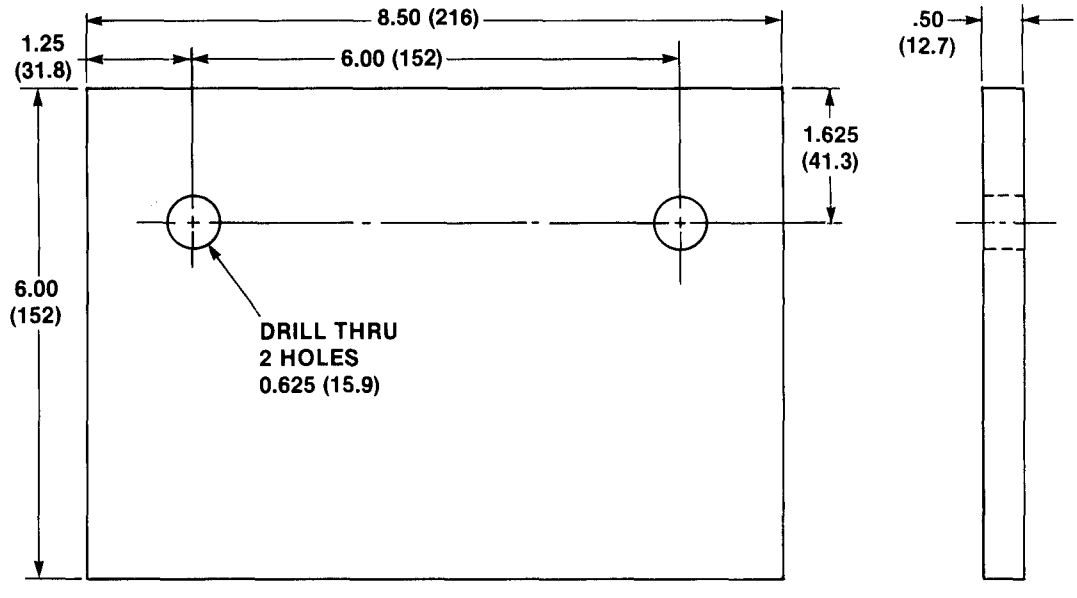
j. Holding Plate. The holding plate (page 2-5) is used to mount the nozzle tester on the test stand.



MATERIAL:
SAE 1020 THRU 1025
CARBURIZE, HARDEN AND GRIND
BLACK OXIDE FINISH

ALL DIMENSIONS ARE IN
INCHES WITH METRIC (MM)
FOLLOWING IN PARENTHESES

REMOVER AND REPLACER



MATERIAL:
SAE 1020 THRU 1025
CARBURIZE, HARDEN AND GRIND
BLACK OXIDE FINISH

ALL DIMENSIONS ARE IN
INCHES WITH METRIC (MM)
FOLLOWING IN PARENTHESES

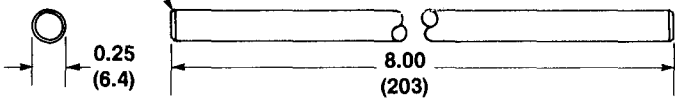
ATTACHING HARDWARE:
2 BOLTS MS90725-400
2 LOCKWASHERS MS35338-48
2 FLAT WASHERS MS27183-18
2 NUTS MS51967-14

HOLDING PLATE

TA245294

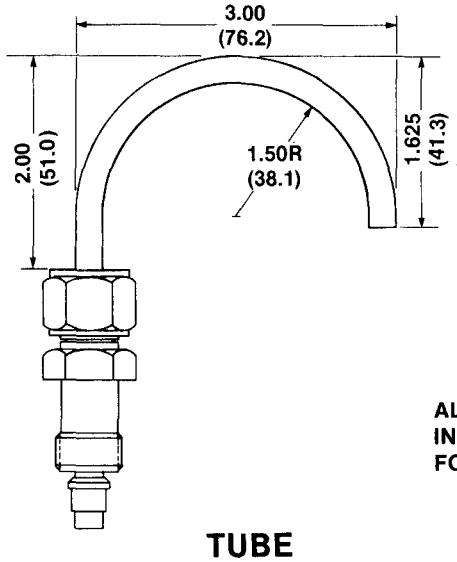
TOOLS AND EQUIPMENT — Continued

MATERIAL:
SAE 1020 THRU 1025
CARBURIZE, HARDEN
BLACK OXIDE FINISH



ALL DIMENSIONS ARE IN
INCHES WITH METRIC (MM)
FOLLOWING IN PARENTHESES

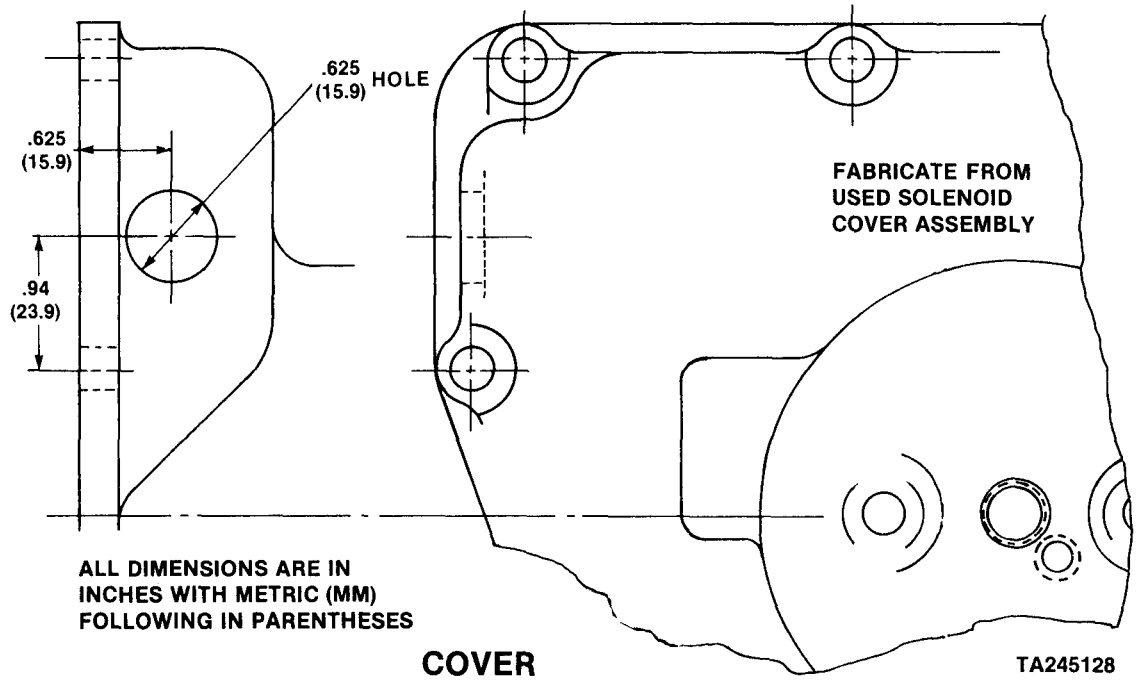
STEEL ROD



FABRICATE FROM
PUMP END OF USED
PUMP INJECTOR TUBE

ALL DIMENSIONS ARE IN
INCHES WITH METRIC (MM)
FOLLOWING IN PARENTHESES

TUBE

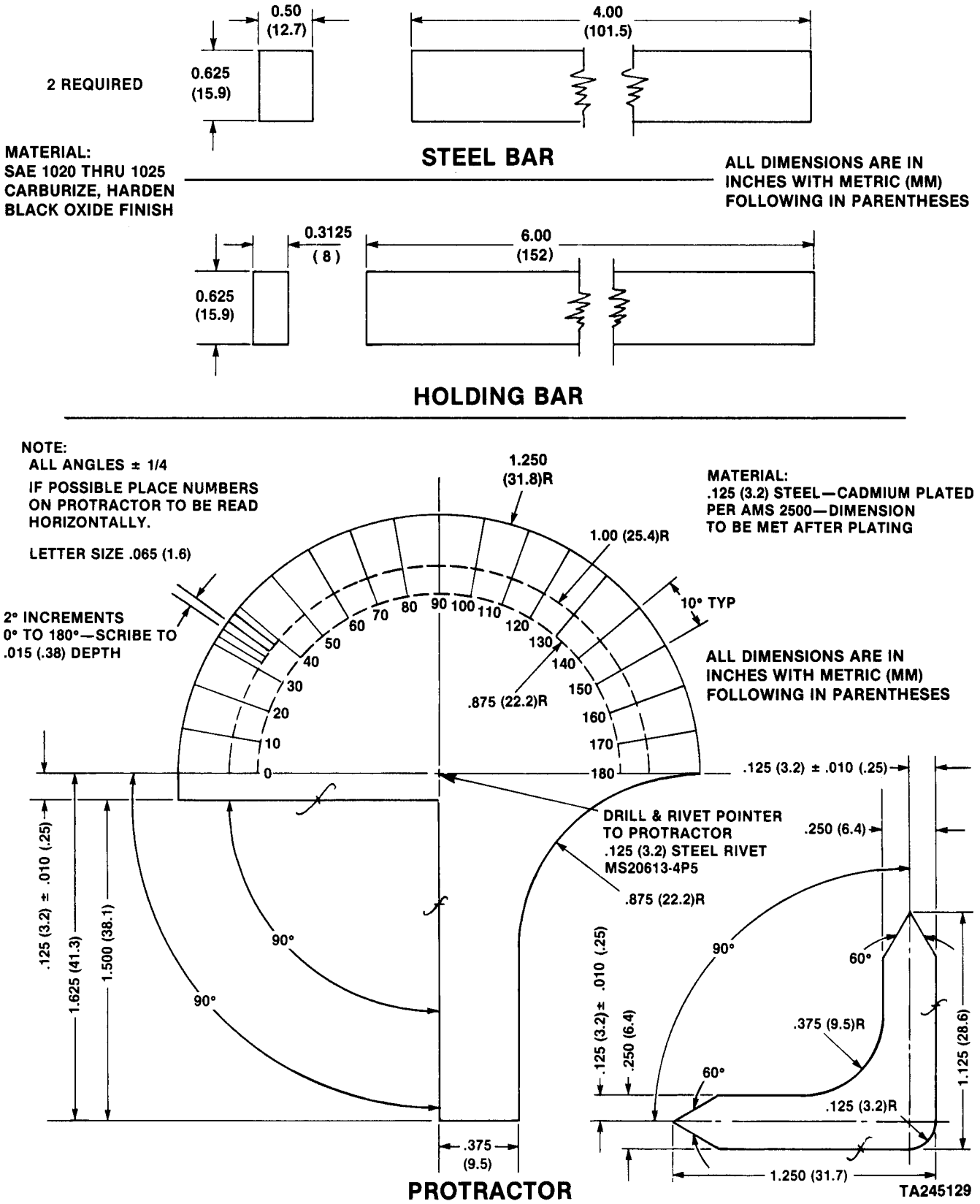


ALL DIMENSIONS ARE IN
INCHES WITH METRIC (MM)
FOLLOWING IN PARENTHESES

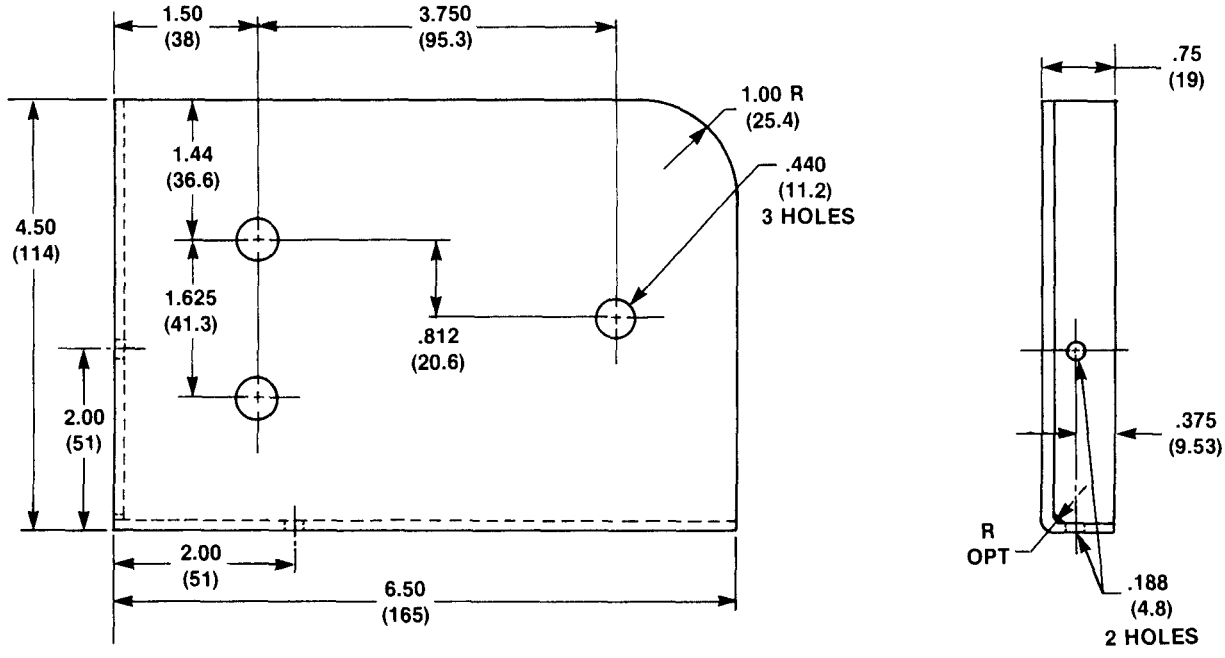
COVER

TA245128

TOOLS AND EQUIPMENT — Continued



TOOLS AND EQUIPMENT — Continued



MATERIAL:
SAE 1010 THRU 1025
.125 (3.2) THICK

ALL DIMENSIONS ARE IN
INCHES WITH METRIC (MM)
FOLLOWING IN PARENTHESES

HOLDING PLATE

2-4. REPAIR PARTS.

Repair parts are listed and illustrated in Appendix B of this manual.

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Section II. INSPECTION, TROUBLESHOOTING, TESTING, AND CALIBRATION UPON RECEIPT

2-5. INSPECTION.

Upon receipt, clean the pump (page 2-6). Mount pump in vise and tighten the hardware (page 2-8). Next, if the pump malfunction is known, see troubleshooting (page 2-11) to find the corrective action. If the malfunction is not known, inspect the pump by checking the operating lever and camshaft operations (page 2-9). If malfunctions are found during this inspection, you will be referred to the repair task required. If the operating lever and camshaft work properly, you'll be referred to a series of tests on the Fuel Injection Pump Test Stand (page 2-16). If malfunctions are found during this testing, you will be referred to the appropriate repair task or to troubleshooting (page 2-11).

CLEAN PUMP

TOOLS:

Workbench
Bristle brush
Plastic scraper

SUPPLIES:

Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Tape (Item 9, Appendix C)

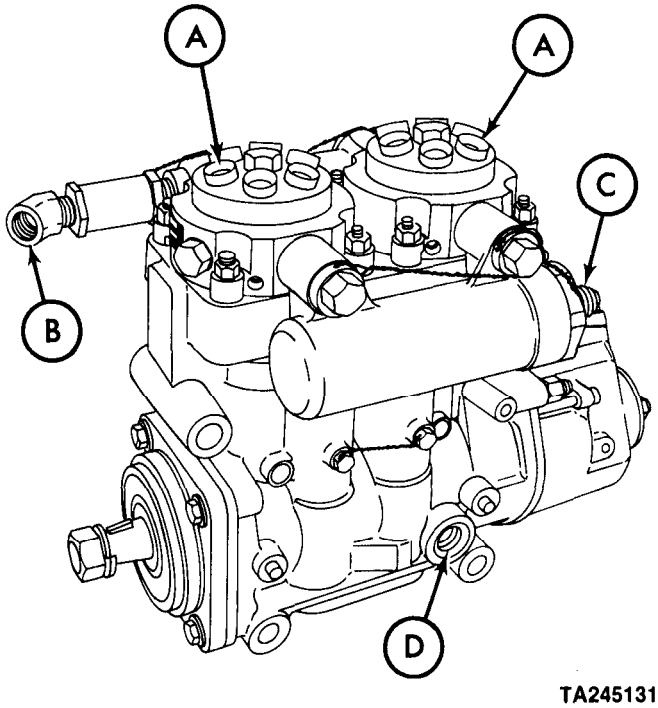
1. Place pump on workbench. Using tape, cover head assembly fuel outlet ports (A).

2. Using tape, cover threaded openings (B), and (C), and oil drain hole (D).

CAUTION

Use solvent, bristle brush, or plastic scraper only.

3. Using plastic scraper and bristle brush, remove dirt and debris from exterior surfaces.



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INSPECTION — Continued

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

4. Remove any remaining foreign material using a clean cloth moistened in solvent.

WARNING

Compressed air used for cleaning purposes will not exceed 30 psi. Use only with effective chip guarding and personal protective equipment (goggles/ shield, gloves, etc).

5. Blow dry with compressed air, or wipe dry with a clean cloth. Remove all grease and/or oil, particularly around gaskets and mating surfaces, so fuel or oil leakage can be detected during testing.

End of Task

INSPECTION — Continued

TIGHTEN HARDWARE

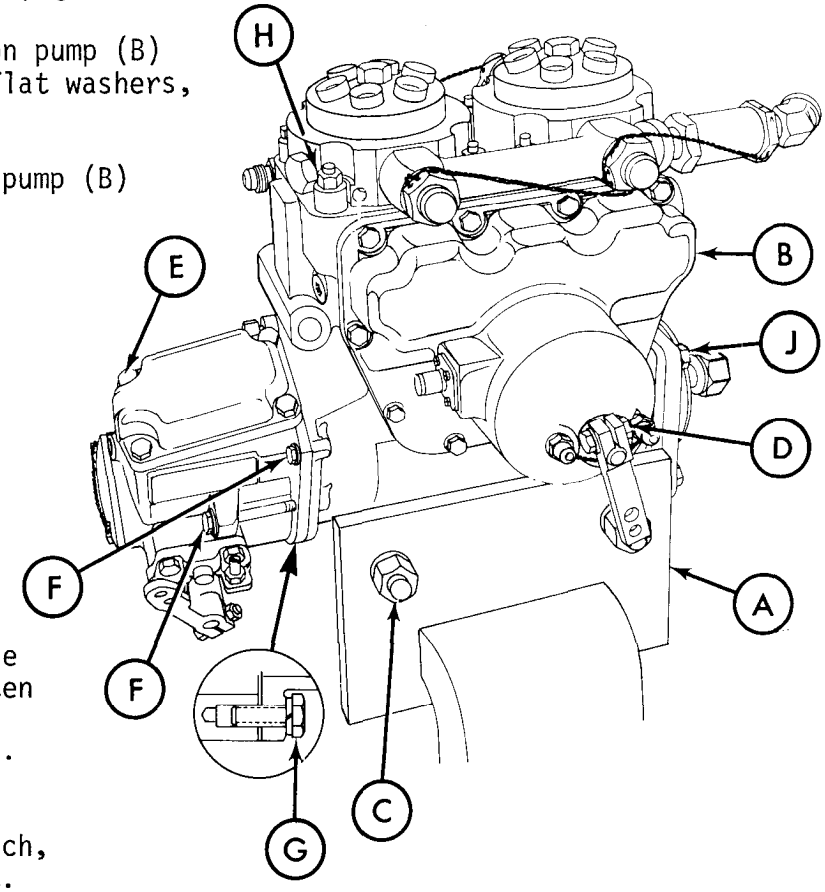
TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Torque wrench capable of torquing 50 to 75 lb-in. (5.5 to 8.5 N·m)
Torque wrench capable of torquing 18 to 20 lb-ft (24.5 to 27 N·m)
Holding plate (fabricated tool), page 2-2

SUPPLIES:

None.

1. Position holding plate (A) on pump (B) and secure with two bolts, flat washers, lockwashers, and nuts (C).
2. Place holding plate (A) and pump (B) in vise.
3. Using 7/16 in. socket and torque wrench, tighten solenoid operating lever nut (D) to 70 to 75 lb-in. (8 to 8.5 N·m).
4. Using 7/16 in. socket and torque wrench, tighten four governor cover machine bolts (E) to 50 to 60 lb-in. (6 to 7 N·m).
5. Using 7/16 in. socket, torque wrench, and extension, tighten four governor housing capscrews (F) to 50 to 60 lb-in. (6 to 7 N·m).
6. Using 7/16 in. open end wrench, tighten screw (G) snug-tight.
7. Using 1/2 in. deep well socket, torque wrench, and extension, tighten eight head assembly nuts (H) to 18 to 20 lb-ft (24.5 to 27 N·m).
8. Using 9/16 in. socket and torque wrench, tighten four bearing plate screws (J) to 18 to 20 lb-ft (24.5 to 27 N·m).



End of Task

TA245132

INSPECTION — Continued

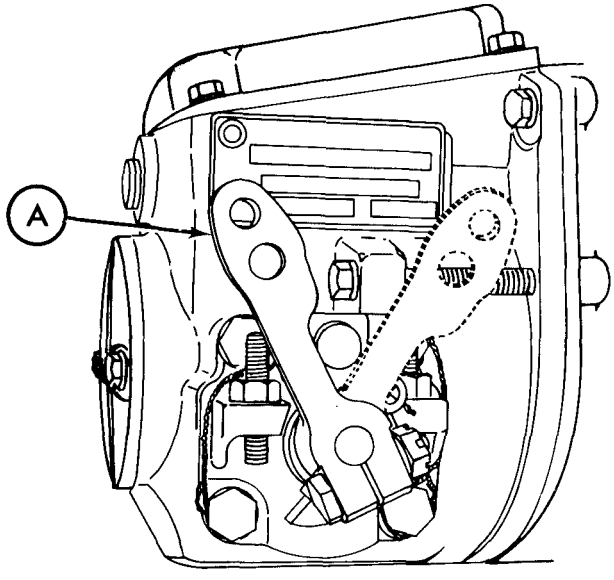
CHECK OPERATING LEVER AND CAMSHAFT ROTATION

TOOLS:

1 1/16 in. deep well socket
3/8 to 1/2 in. drive adapter
Turning and holding wrench (special tool)
Steel rod (fabricated tool), page 2-3

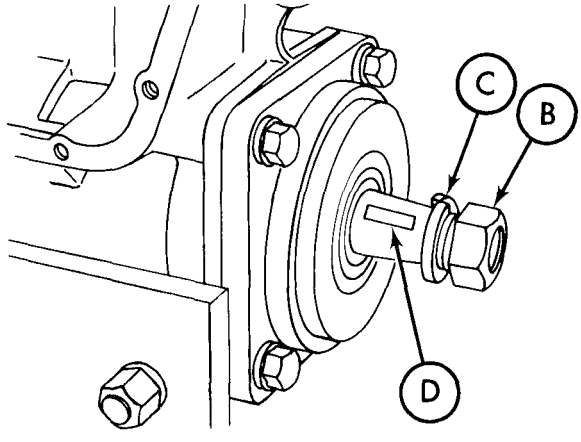
SUPPLIES:

None.



1. Move operating lever assembly (A) to insure that linkages and controls are free and not binding.

2. If operating lever is free, proceed to step 3. below. If operating lever does not operate properly, the governor housing and associated parts must be repaired (page 3-55).



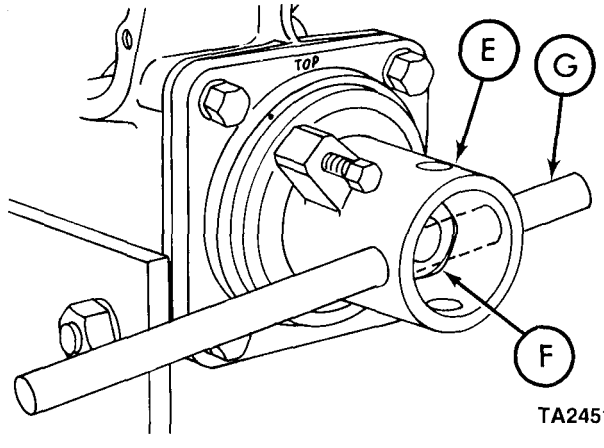
3. Remove nut (B) and lockwasher (C).

4. Aline keyway with Woodruff key (D) and install turning and holding wrench (E) and secure with lockwasher and nut (F). Using 1 1/16 in. deep well socket, adapter, and ratchet handle, tighten nut (F).

5. Using steel rod (G) and turning and holding wrench (E), rotate camshaft to insure that there are no broken parts or binding of camshaft or associated parts.

6. If camshaft and associated parts are free, proceed with steps 8. and 9., and test pump (page 2-16).

7. If camshaft and associated parts do not operate properly, proceed with steps 8. and 9., and repair pump, (page 3-2).



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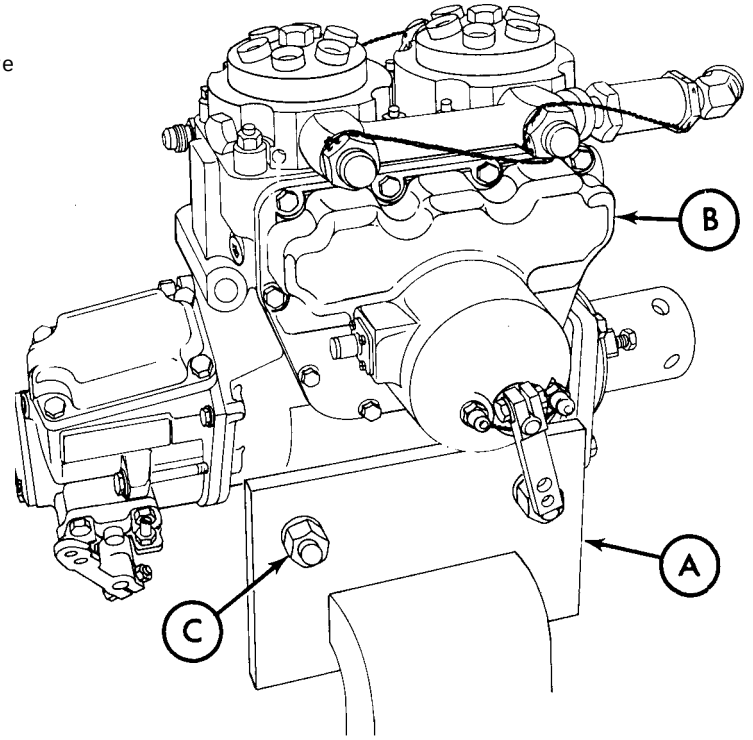
INSPECTION — Continued

8. Remove holding plate (A) and pump (B) from vise.

9. Remove nuts, lockwashers, flat washers, and bolts (C) and remove holding plate (A) from pump (B).

End of Task



TA245134

Section III. TROUBLESHOOTING

2-6. GENERAL.

These troubleshooting instructions are to be used when test procedures indicate that a malfunction is apparent.

Table 2-1. Troubleshooting

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
1. NO FUEL OUTPUT	
Step 1. Test for internal fuel leakage (page 2-18).	
	a. Internal fuel leakage, repair fuel injection pump (page 3-2).
	b. No internal fuel leakage, go to step 2.
Step 2. Inspect for stuck plungers. Remove both plunger bore screws (page 3-40). Hold small wood dowel (or eraser end of wood pencil) against top of each plunger in turn. Rotate camshaft (page 2-9) and feel for plunger movement.	
	a. Plungers do not move up and down, repair head assembly (page 3-40).
	b. Plungers move up and down, go to step 3.
Step 3. Check for sheared plunger guides. While rotating camshaft (page 2-9), look in plunger bores to see if plungers rotate.	
	a. Plungers do not rotate, repair head assembly (page 3-40).
	b. Plungers rotate, go to step 4.

TROUBLESHOOTING — Continued

Table 2-1. Troubleshooting - Continued

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
Step 4. Check for damage to internal linkage. Remove governor cover (page 2-43). Move governor operating lever back and forth. Look for corresponding movement of internal linkage.	
a. Internal linkage does not move in relation to actuating lever.	Remove governor (page 3-4). Repair governor (page 3-32). Install governor (page 3-89).
b. Internal linkage moves in relation to actuating lever.	Failure of camshaft or tappets is indicated as cause of no fuel delivery. Repair fuel injection pump (page 3-2).
2. FUEL OUTPUT DIFFERS BETWEEN HEAD ASSEMBLIES	
Step 1. Check adjustment of fuel control yoke (page 2-46).	
a. Fuel control yoke out of adjustment.	Adjust fuel control yoke (page 2-47).
b. Fuel control yoke properly adjusted, go to step 2.	
Step 2. Test for internal fuel leakage (page 2-18).	
a. Internal fuel leakage.	Repair fuel injection pump (page 3-2).
b. No internal fuel leakage indicates a damaged fuel control unit.	Remove head assemblies (page 3-2). Repair head assemblies (page 3-40). Install head assemblies (page 3-83). Test fuel injection pump (page 2-16).
3. FUEL LEAKS INTO LUBRICATION SYSTEM	
Check head assemblies for fuel leakage (page 2-18). Remove head assemblies (page 3-2). Remove and inspect preformed packings. Inspect head assemblies (page 3-40).	
a. Preformed packings damaged. Head assemblies cracked.	Replace preformed packings (page 3-2). Replace head assemblies (page 3-2). Install head assemblies (page 3-83). Test fuel injection pump (page 2-16).

TROUBLESHOOTING — Continued

Table 2-1. Troubleshooting - Continued

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
	b. Preformed packings not damaged, or head assemblies not cracked, indicates worn plungers. Remove head assemblies (page 3-2). Repair head assembly(s) (page 3-40). Install head assemblies (page 3-83). Test fuel injection pump (page 2-16).
4. FUEL LEAKS AT FUEL CONTROL UNIT	
Check for damaged fuel control unit preformed packings. Remove cover and solenoid (page 3-4). Remove fuel control yoke (page 3-6). Remove fuel control unit (page 3-7) and inspect preformed packings for damage.	
	a. Preformed packings damaged. Replace preformed packings (page 3-54). Install fuel control unit (page 3-98). Install fuel control yoke (page 3-100). Install cover and solenoid (page 3-109).
	b. Preformed packings not damaged indicates worn fuel control unit. Disassemble and repair fuel control unit (page 3-52). Install fuel control unit (page 3-98). Install fuel control yoke (page 3-100). Install cover and solenoid (page 3-109).
5. FUEL LEAKS AROUND HEAD ASSEMBLIES	
Step 1. Check for proper torque of head assembly hold-down nuts (page 2-8).	
	a. Nuts loose, torque nuts (page 2-8).
	b. Nuts tight, go to step 2.
Step 2. Check for damaged preformed packings. Remove head assembly (page 3-2). Remove and inspect preformed packings for damage.	
	a. Preformed packings damaged. Install new preformed packings (page 3-93 or 3-95). Install head assembly (page 3-93).
	b. Preformed packings not damaged indicates damaged fuel injection pump housing or cracked hydraulic head(s). Repair fuel injection pump (page 3-2), and repair housing as required (page 3-19).

TROUBLESHOOTING — Continued

Table 2-1. Troubleshooting - Continued

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
6. UNEVEN FUEL DISTRIBUTION	
Check for worn or sticking fuel plunger. Remove head assembly (page 3-2). Disassemble and inspect head assembly (page 3-40).	
a. Plunger worn or sticking in bore.	Remove head assembly (page 3-2). Repair head assembly (page 3-40). Install head assembly (page 3-93).
b. Plunger not worn or sticking indicates uneven wear on camshaft lobes.	Repair fuel injection pump (page 3-2).
7. EXCESSIVE VIBRATION	
Step 1. Check runout of governor end of camshaft. Remove cover and solenoid and disconnect governor control rod assembly (page 3-4). Remove governor housing (page 3-5). Check runout of camshaft extension (page 3-90).	
a. Runout over 0.003 in. (0.08 mm).	Straighten camshaft extension (page 3-90). Replace governor housing and connect governor control rod assembly (page 3-104). Install cover and solenoid (page 3-109).
b. Runout is within 0.003 in. (0.08 mm),	go to step 2.
Step 2. Check governor weight and spider assembly for wear or damage. Remove governor weight and spider assembly (page 3-4). Disassemble and inspect governor weight and spider assembly (page 3-32).	
a. Weight and spider parts worn or damaged.	Repair or replace parts as required. Assemble weight and spider assembly (page 3-34). Install weight and spider assembly (page 3-89). Install governor housing and connect governor control rod assembly (page 3-103). Install cover and solenoid (page 3-109).
b. Weight and spider parts not worn or damaged,	go to step 3.

TROUBLESHOOTING — Continued

Table 2-1. Troubleshooting - Continued

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
Step 3. Check for worn or damaged camshaft ball bearing. Disassemble fuel injection pump (page 3-2), and inspect camshaft ball bearing (page 3-27).	a. Camshaft ball bearing worn or damaged. Replace camshaft ball bearing (page 3-28). Assemble fuel injection pump (page 3-83). b. Camshaft ball bearing not worn or damaged. Replace camshaft sleeve bearing (pages 3-21 and 3-22). Assemble fuel injection pump (page 3-83).
8. PUMP WILL NOT SHUT OFF ELECTRICALLY	
Check for manual fuel linkage shut-off. Remove governor cover (page 2-43). Move manual operating lever toward governor. Watch for movement of fulcrum lever away from stop plate (page 2-45).	a. Fulcrum lever moves away from stop plate. Remove cover and solenoid (page 3-4). Remove and discard electrical solenoid (page 3-73). Install new solenoid (page 3-73). Install cover and solenoid (page 3-109). Install governor cover (page 3-108). b. Fulcrum lever does not move away from stop plate, internal damage is indicated. Disassemble pump (page 3-2) and repair governor housing and associated parts (page 3-55).

TESTING

2-7. TESTING.

The pump must be mounted on the test stand to determine its condition. The tasks will include a Test for Fuel Leakage or Delivery Valve Malfunction in Heads (page 2-18), Test for Bleeder Valve operation (page 2-30), and a Test for Flow Timing in Pump Head Assemblies (page 2-32). The pump must be calibrated (page 2-40) following the tests.

If the pump fails any of the tests, the test stand must be shut down (page 2-63) and the pump removed from the stand in preparation for repair (page 3-2).

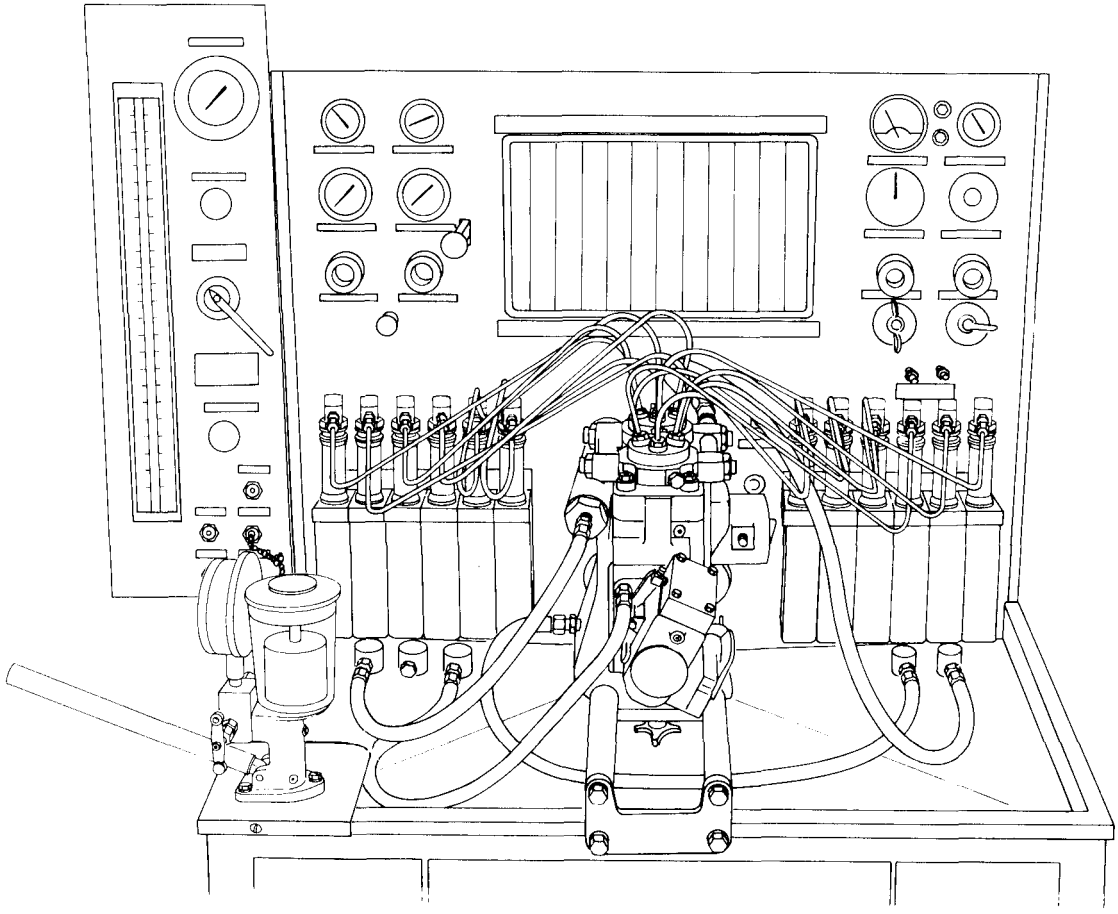
MOUNT PUMP

Refer to TM 9-4910-387-14-1 for instructions to mount pump on test stand, and Appendix B in this manual for necessary parts.

End of Task

NOTE

All references to camshaft rotation are designated as either left or right while facing the test stand.



Pump and Tester Installed on Stand. TA245135

TESTING — Continued

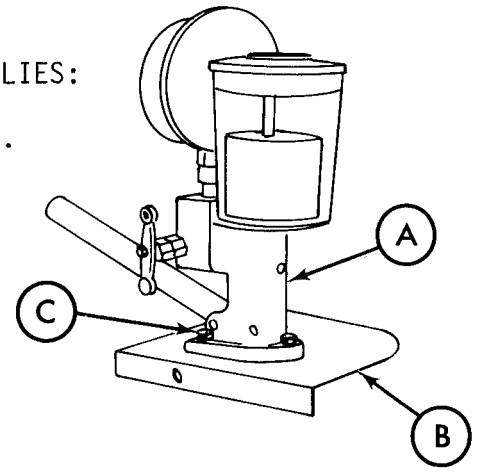
MOUNT NOZZLE TESTER

TOOLS:

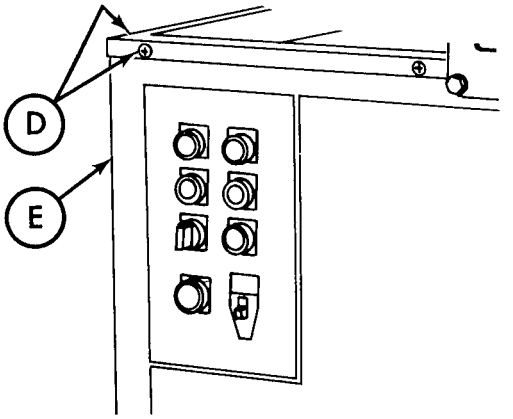
Tool Kit, Automotive Fuel and Electrical System Repair
Mounting plate (fabricated tool) page 2-5

SUPPLIES:

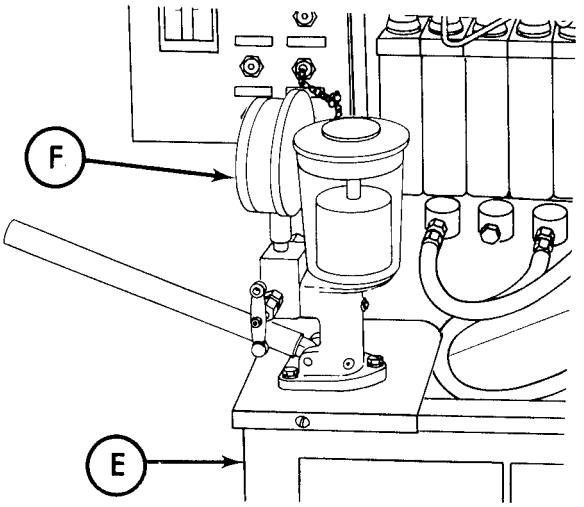
None.



1. Install nozzle tester (A) on holding plate (B) and secure with three 3/8 x 7/8 in. bolts, flat washers and nuts (C).



2. Remove two test stand rail screws (D) from left front corner of test stand (E).



3. Install holding plate and tester (F) on left front corner rails of test stand (E). Secure with screws removed in step 2 above.

End of Task

TA245136

TESTING—Continued

TEST FOR FUEL LEAKAGE OR DELIVERY VALVE MALFUNCTION IN HEADS

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
1 1/8 in. socket
3/8 to 1/2 in. drive adapter
Nozzle tester
Turning and holding wrench (special tool)
Steel rod (fabricated tool), page 2-3
Collector cup
Spring tester
Torque wrench capable of torquing 15 to 30 lb-ft (20 to 40 N•m)
Filter socket (special tool)
1 in. outside micrometer

SUPPLIES:

Clean cloth (Item 4, Appendix C)
1/4-18 dryseal NPTF pipe plug
Delivery valve spring (if required)
Preformed packing (8), from
Gasket and Preformed Packing Set, Part No. 5702632

Parts Kit, Part No. 5704356
Parts Kit, Part No. 5702739

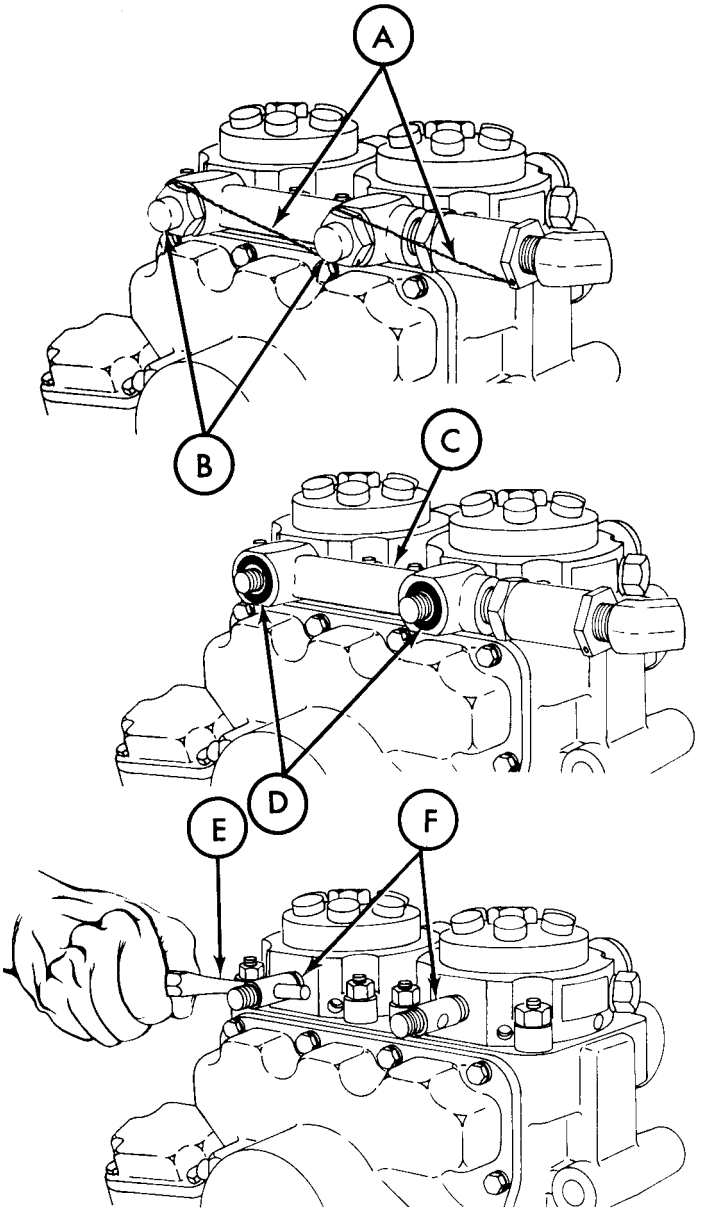
NOTE

Test for fuel leakage or delivery valve malfunction will be performed first on head assembly No. 1, then on head assembly No. 2.

1. Using diagonal cutting pliers, cut and remove wire (A). Using 1 1/8 in. socket and ratchet handle, remove two nuts (B).

2. Remove housing and valve assembly (C). Remove and discard two preformed packings (D) from each side of housing.

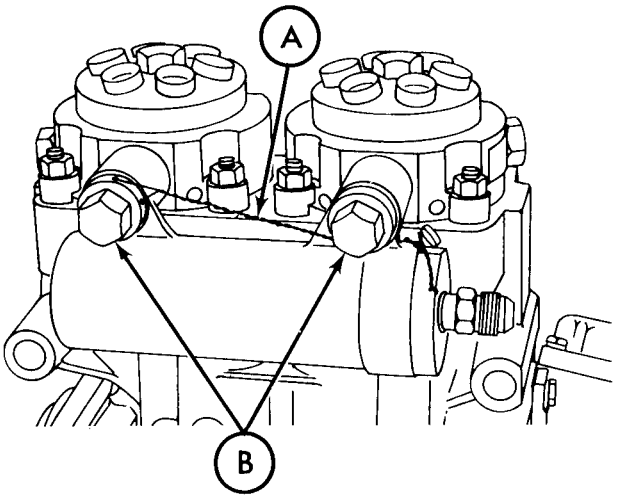
3. Using a drift (E), remove two bleeder valve stems (F).



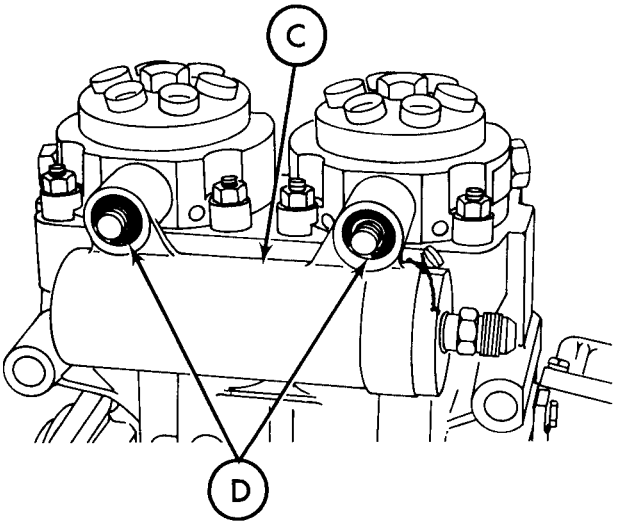
TA245137

TESTING—Continued

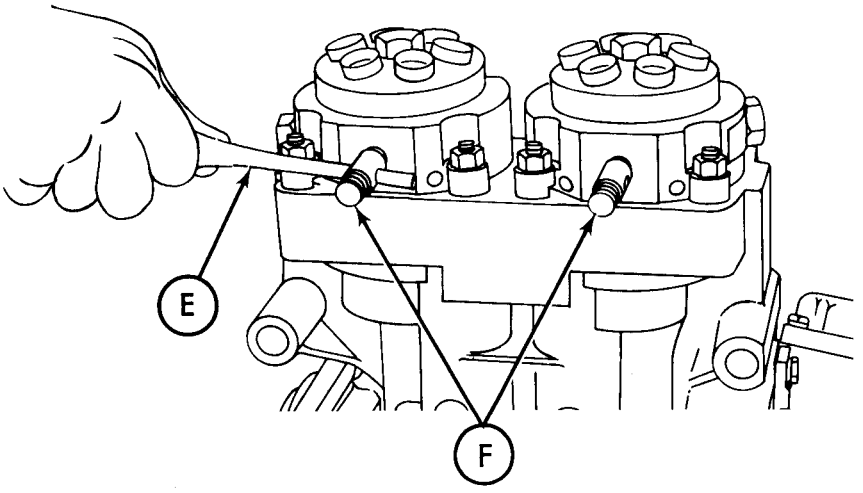
4. Using diagonal cutting pliers, cut and remove wire (A). Using 3/4 in. socket and ratchet handle, remove two nuts (B).



5. Remove filter assembly (C). Remove and discard two preformed packings (D) from each side of filter assembly.



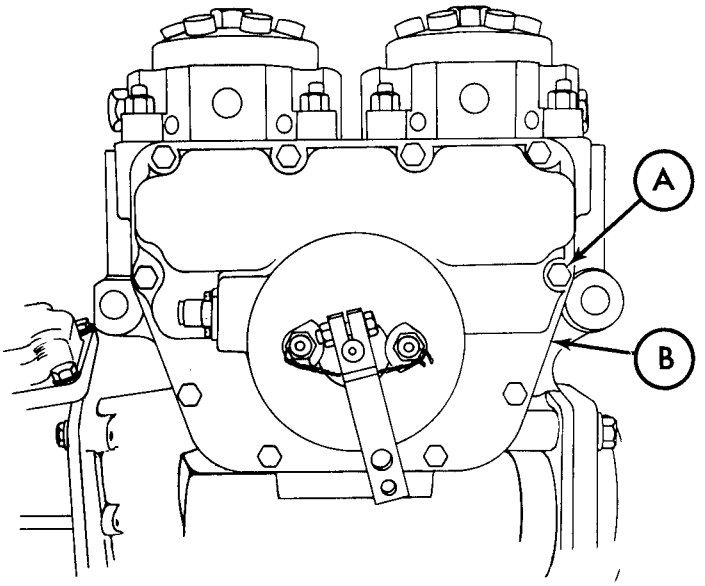
6. Using a drift (E), remove two bleeder valve stems (F).



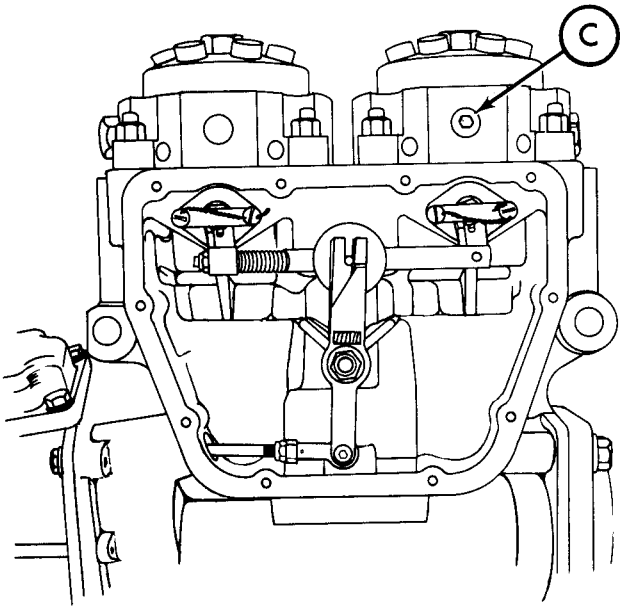
TA245138

TESTING — Continued

7. Using 7/16 in. socket, ratchet handle, and extension, remove 10 machine bolts and lockwashers (A) from cover and solenoid. Remove cover and solenoid (B).

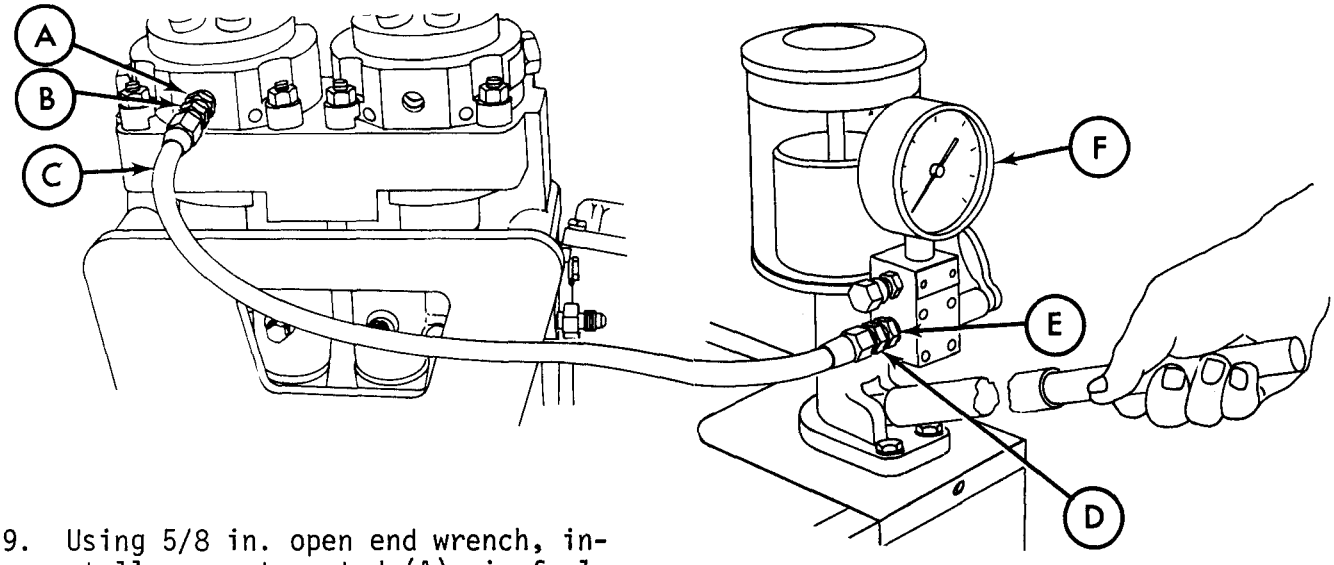


8. Install 1/4-18 dryseal NPTF pipe plug (C) in fuel outlet port on right side of head assembly No. 1.



TA245139

TESTING — Continued



9. Using 5/8 in. open end wrench, install connector stud (A), in fuel inlet port on left side of head assembly No. 1.

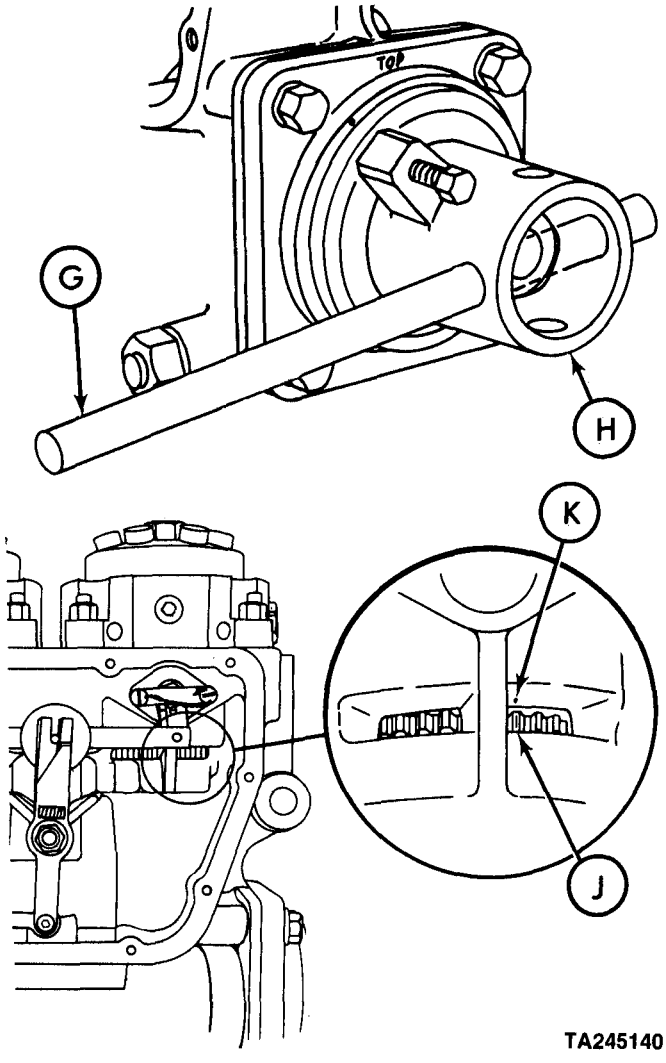
10. Install connector (B) on hose (C).

11. Install other end of connector (B) on stud (A).

12. Install connector (D) on hose (C).

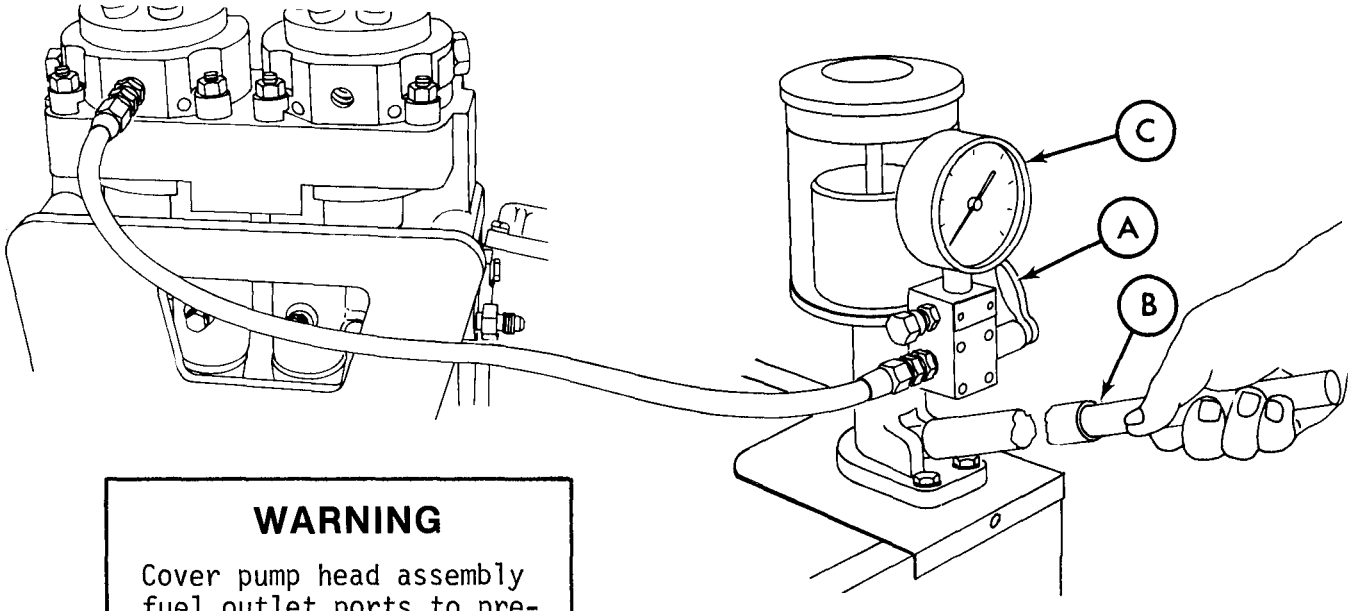
13. Install other end of connector (D) on lower connector (E) on tester (F).

14. Using steel rod (G), rotate camshaft with turning and holding wrench (H) to aline plunger drive spur gear slotted tooth (J) with punch mark (K) on underside of housing deck.



TA245140

TESTING — Continued



WARNING

Cover pump head assembly fuel outlet ports to prevent fuel from squirting.

CAUTION

Do not allow fuel pressure to exceed 425 psi (2930 kPa).

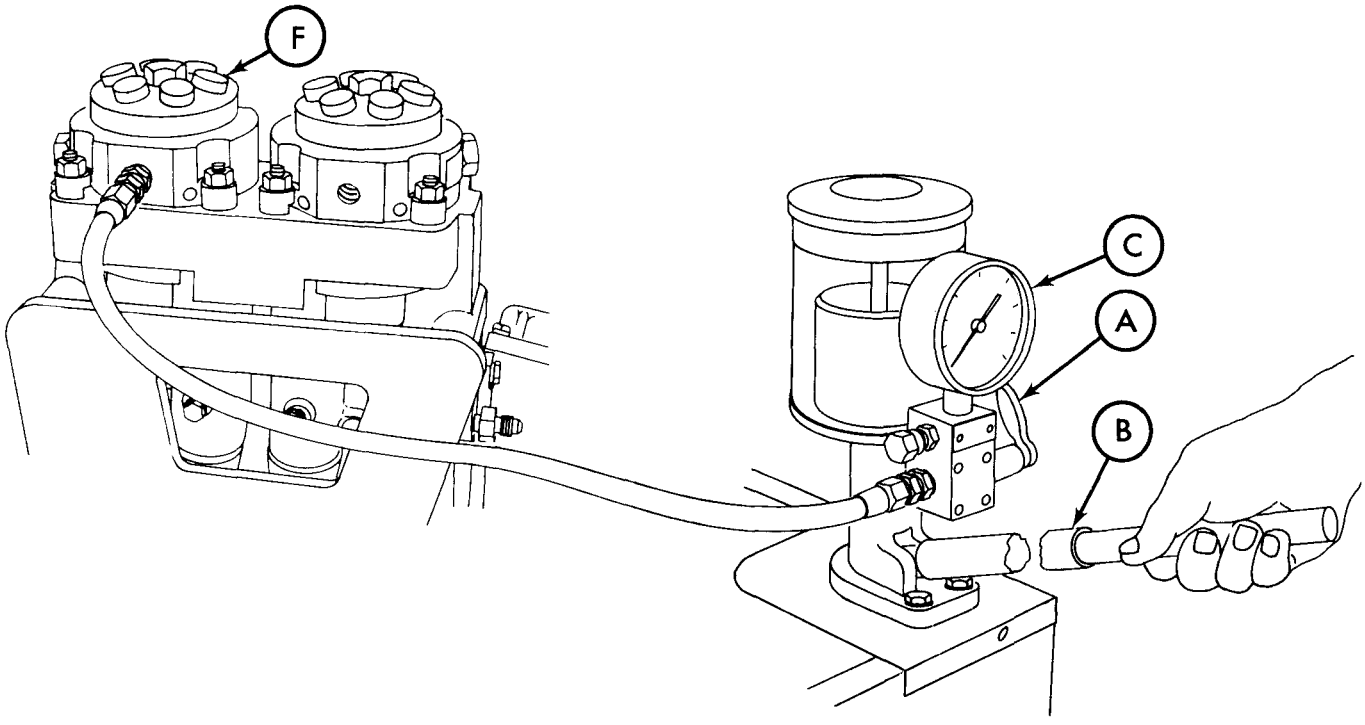
15. Open pressure valve (A). Operate nozzle tester pump handle (B) until pressure of 400 psi (2758 kPa) is registered on the tester gage (C). Pressure will drop slowly.

16. When pressure drops to 350 psi (2413 kPa), close pressure valve (A) and time rate of drop to 250 psi (1724 kPa). If pressure drops to 250 psi (1724 kPa) or below within 25 seconds, there is an internal leak. Repair fuel injection pump (page 3-2).

17. If pressure does not drop to 250 psi (1724 kPa) within 25 seconds, proceed to step 18.

TA245141

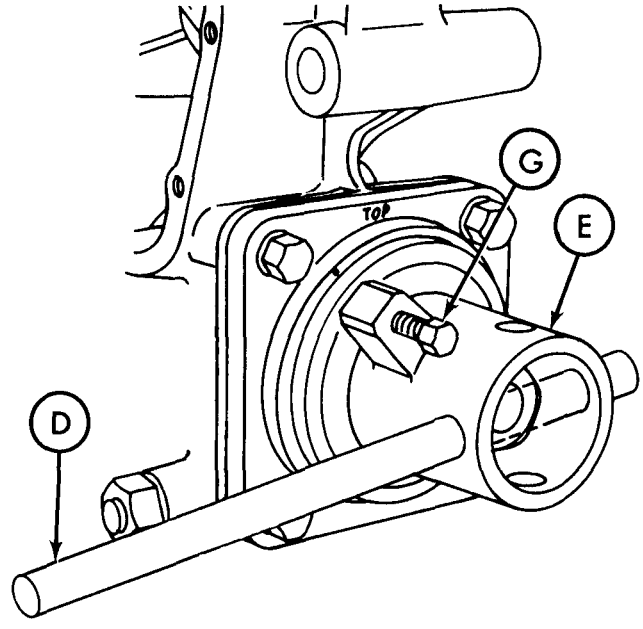
TESTING — Continued



18. Open pressure valve (A) and operate nozzle tester pump handle (B) until a pressure of 425 psi (2930 kPa) is registered on the gage (C).

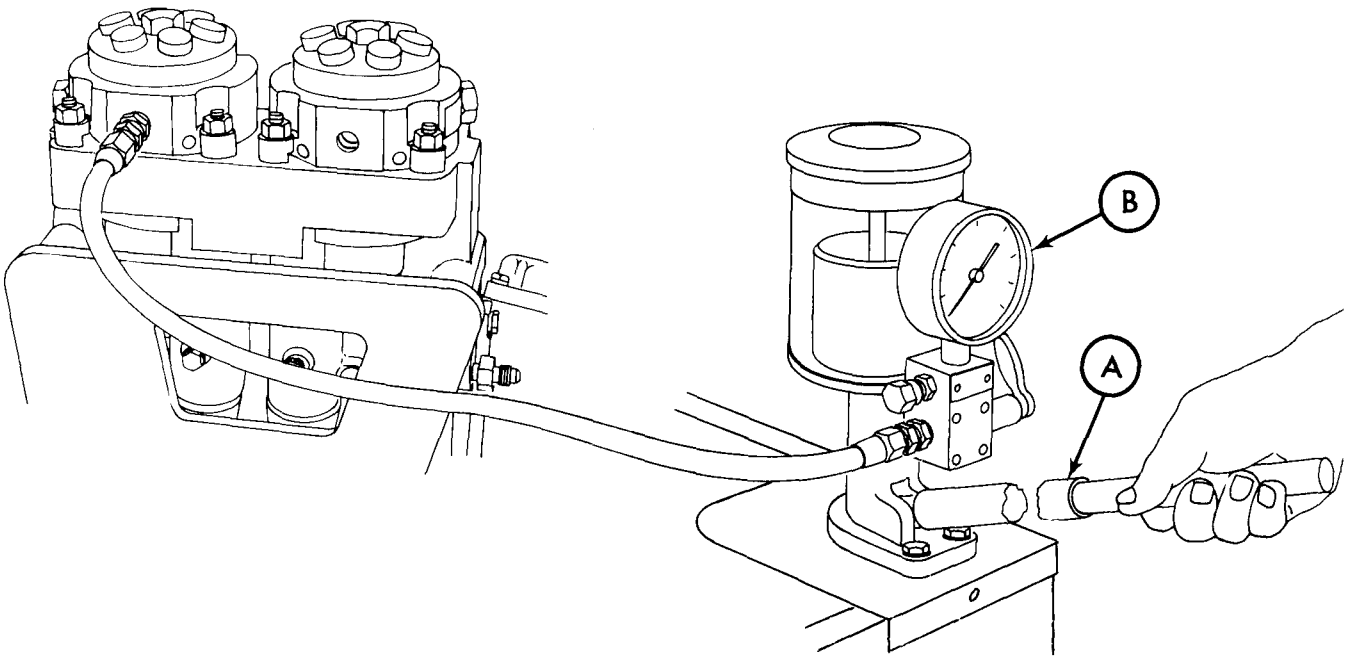
19. Using steel rod (D), rotate camshaft with turning and holding wrench (E) until fuel flows from one of six outlets (F) of the head assembly.

20. Using 7/16 in. box end wrench, lock camshaft in position by tightening the locking screw (G).



TA245142

TESTING — Continued

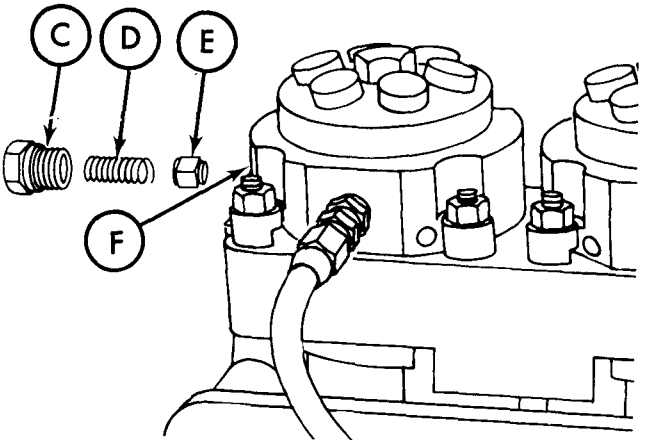


NOTE

The fuel delivery pressure valve should open between 250 and 400 psi (1724 and 2758 kPa). This will be indicated by a sudden drop in pressure, and a fuel spurt from the outlet port.

21. Slowly operate tester pump handle (A) while noting pressure buildup registered on tester gage (B). If delivery valve does not open between 250 and 400 psi (1724 and 2758 kPa), perform following inspection:

    a. Using 3/4 in. socket and ratchet handle, remove delivery valve screw (C), spring (D), and valve (E). Inspect delivery valve (E) and valve seat (F) in head for foreign material or improper seating.



TA245143

TESTING — Continued

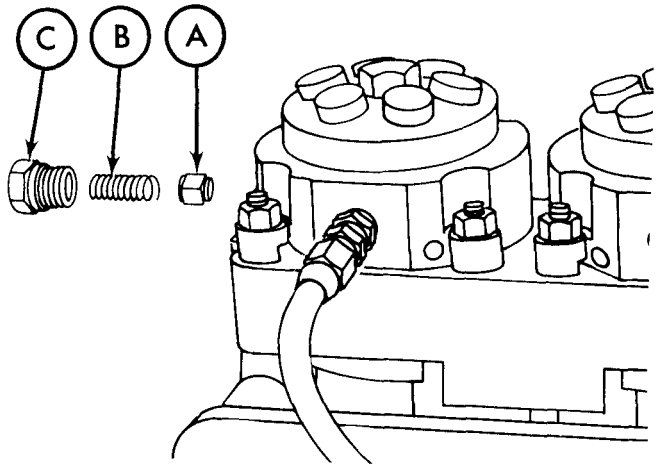
NOTE

If delivery valve or valve seat is defective, head assembly must be replaced (page 3-2).

b. Inspect spring as follows:

(1) Using one in. micrometer, measure length of delivery valve spring. Replace spring if free length is not 0.780 to 0.954 in. (19.8 to 24.2 mm) (page 3-50).

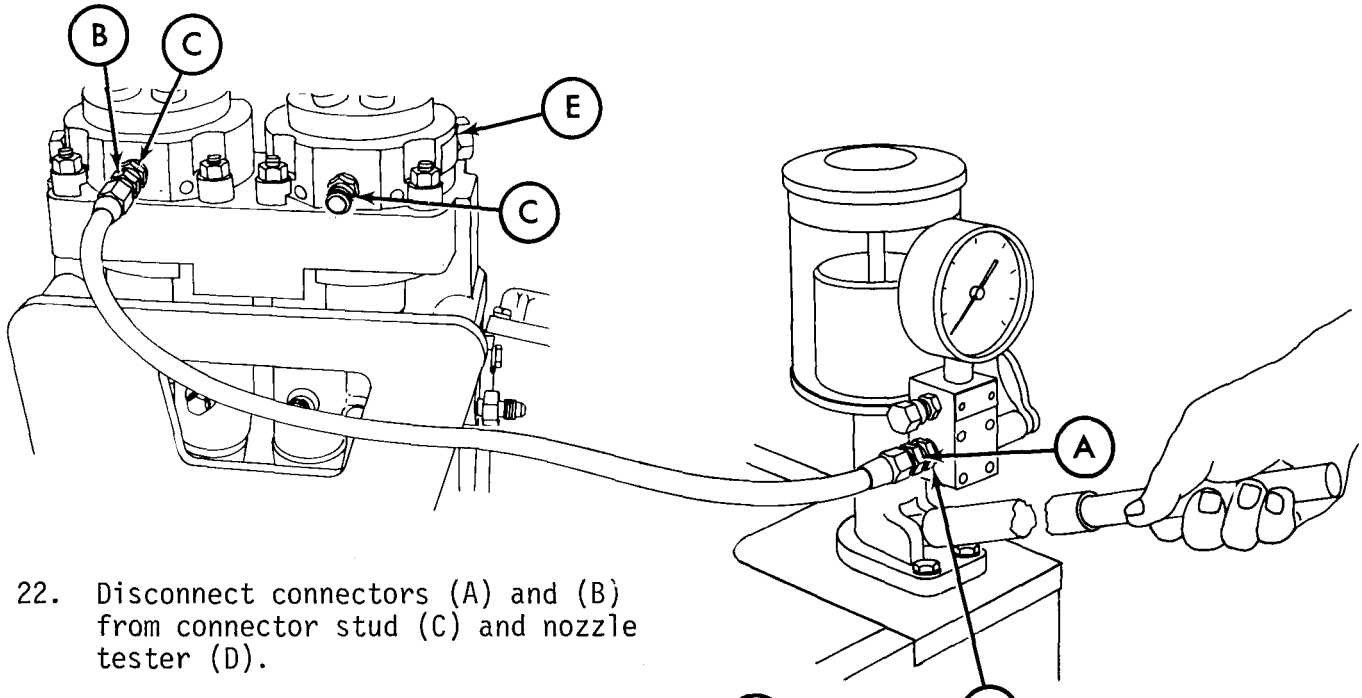
(2) Spring load must be 5.3 to 5.7 pounds (2.4 to 2.6 kg) when compressed to 0.760 in. (19.3 mm) length. Replace spring if it does not meet all requirements (page 3-50).



c. Install delivery valve (A) and valve spring (B) in head assembly. Using 3/4 in. socket and torque wrench, install fuel delivery valve screw (C). Torque tighten screw to 50 to 55 lb-ft (68 to 75 N•m).

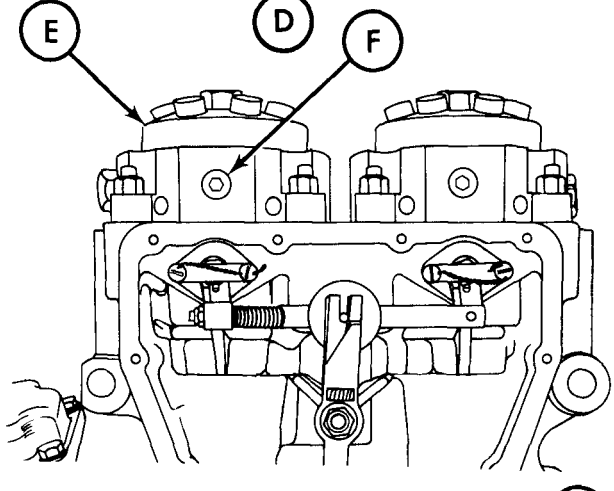
TA245297

TESTING — Continued



22. Disconnect connectors (A) and (B) from connector stud (C) and nozzle tester (D).

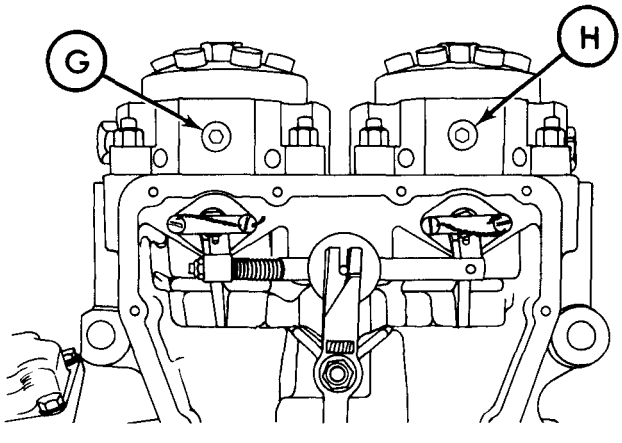
23. Using 5/8 in. open end wrench, remove connector stud (C) from fuel inlet port on left side of head assembly No. 1 and install connector stud in inlet port of head assembly No. 2 (E).



24. Install 1/4-18 dryseal NPTF pipe plug (F) in outlet port of head assembly No. 2 (E).

25. Repeat Fuel Leakage and Delivery Valve Tests (page 2-18) for head assembly No. 2. If no fuel leakage or delivery valve malfunction is found, proceed to step 26.

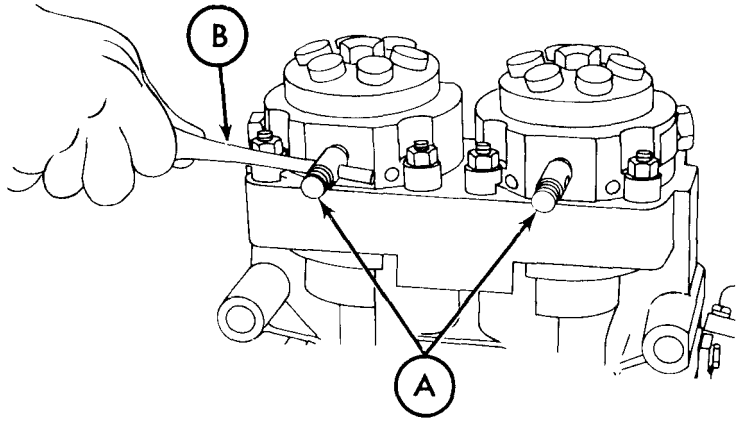
26. Remove pipe plugs (G) and (H).



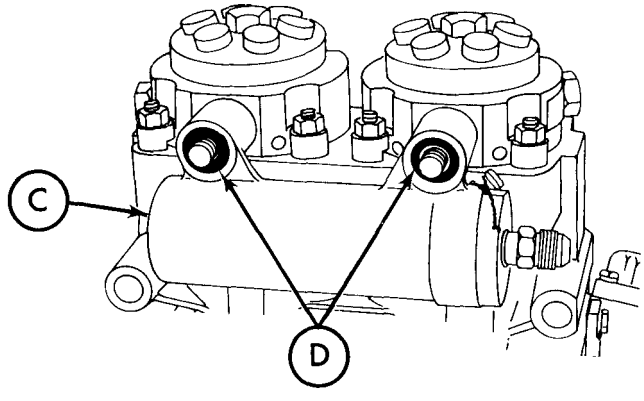
TA245144

TESTING — Continued

27. Install two bleeder valve stems (A). Using a drift (B), tighten stems.

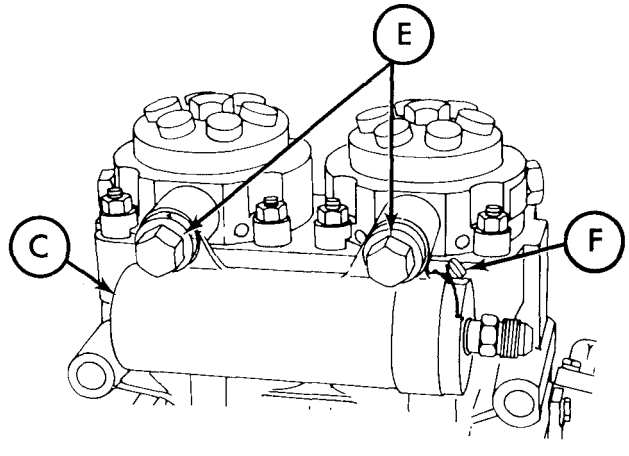


28. Install filter assembly (C) using two new preformed packings (D) on each side of housing.



29. Secure filter assembly (C) with two cap plain nuts (E) using 3/4 in. socket and ratchet handle. Using 3/4 in. socket and torque wrench, torque tighten nuts to 15 to 18 lb-ft (20 to 24 N•m).

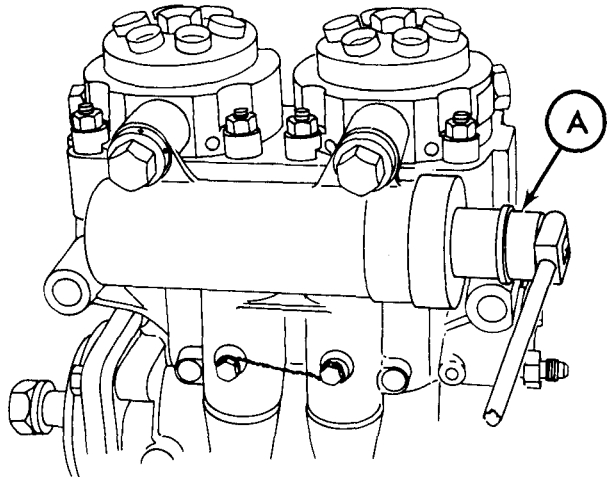
30. Using diagonal cutting pliers, cut and remove seal (F).



TA245145

TESTING — Continued

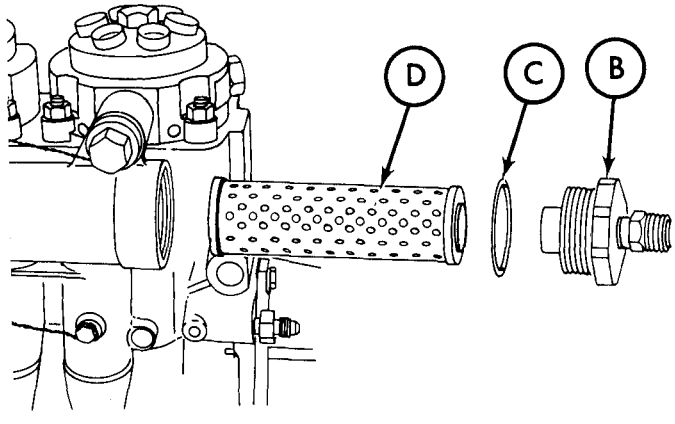
31. Using fuel filter socket (A) and ratchet handle, remove fuel inlet housing cap (B). Remove and discard preformed packing (C) and filter (D).



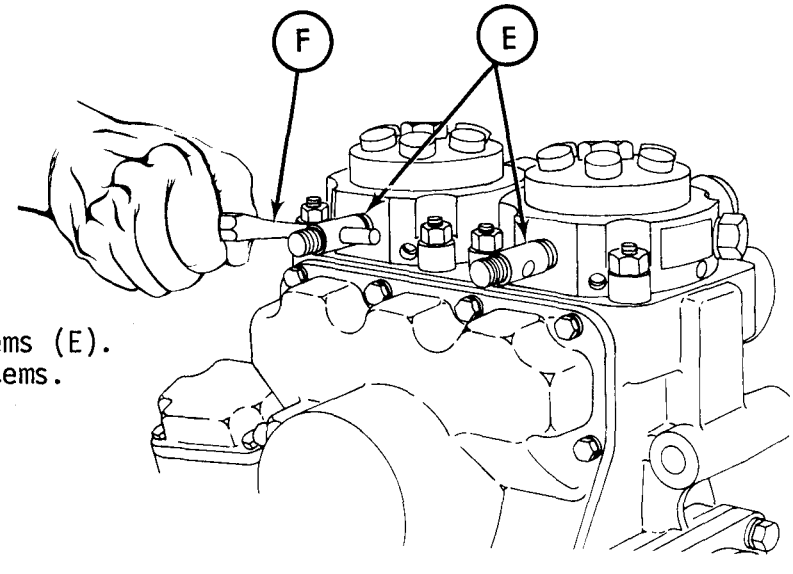
32. Clean cavity with clean lint-free cloth.

33. Install new filter (D) with pilot end toward front of pump. Install new preformed packing (C).

34. Install cap (B) and torque tighten to 25 to 30 lb-ft (34 to 40 N·m) using filter socket (A) and torque wrench.



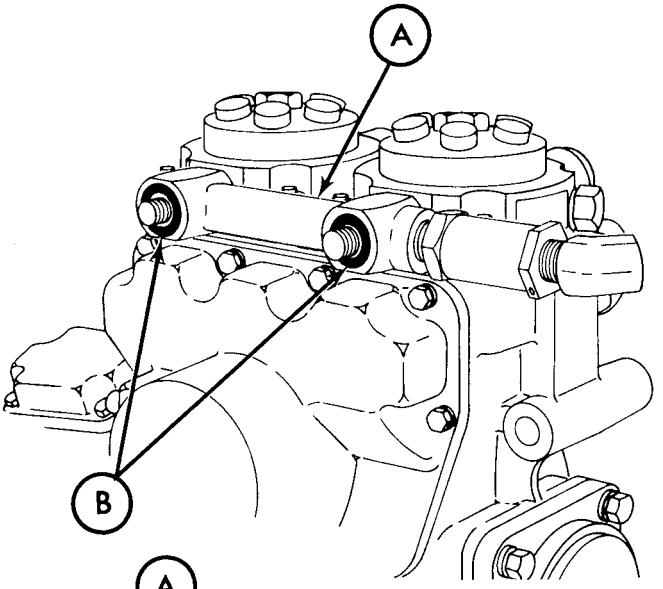
35. Install two bleeder valve stems (E). Using a drift (F), tighten stems.



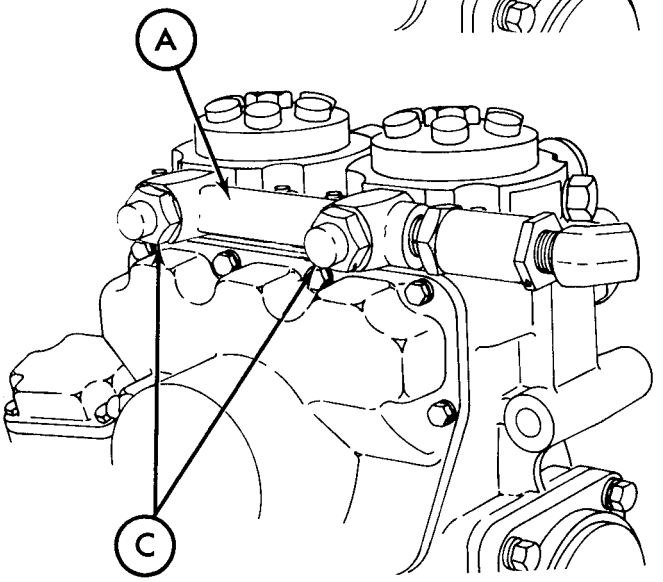
TA24514

TESTING — Continued

36. Install housing and valve assembly (A) using two new preformed packings (B) on each side of housing.

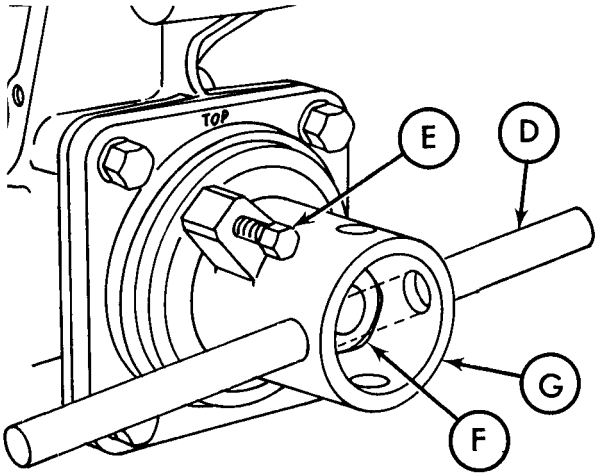


37. Using 1 1/8 in. socket and ratchet handle, secure housing and valve assembly (A) with two nuts (C). Using 1 1/8 in. socket and torque wrench, torque tighten nuts to 15 to 18 lb-ft (20 to 24 N•m).



38. Remove steel rod (D). Using 7/16 in. box end wrench, loosen turning and holding wrench locking screw (E). Using 1 1/16 in. deep well socket and ratchet handle, remove plain nut and lockwasher (F). Using plastic insert hammer, remove wrench (G). Retain lockwasher and nut for hub installation.

End of Task



TA245147

TESTING — Continued

TEST BLEEDER VALVE

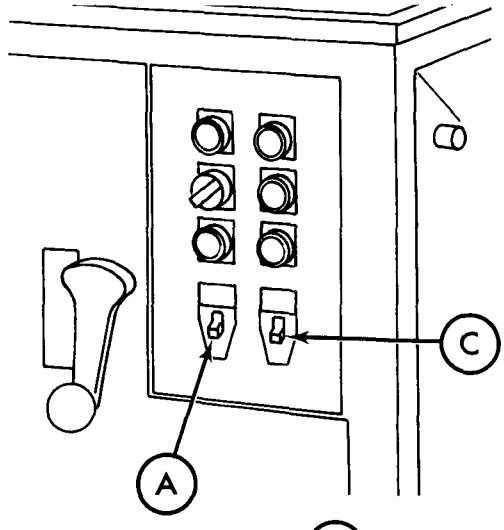
TOOLS :

Tool Kit, Automotive Fuel and Electrical System Repair
1 1/8 in. open end wrench
Spring tester
2 in. outside micrometer

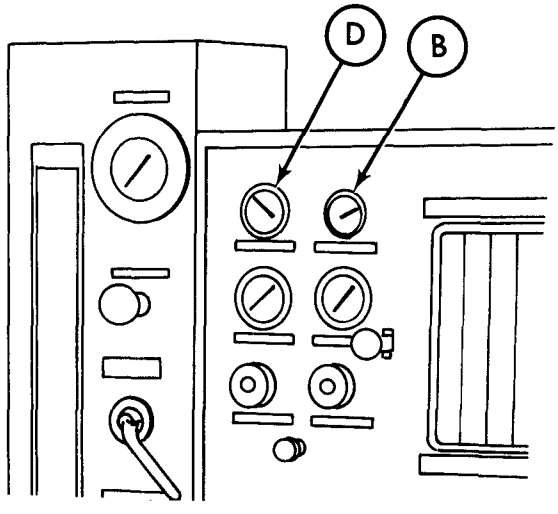
SUPPLIES:

Bleeder valve spring (if required)

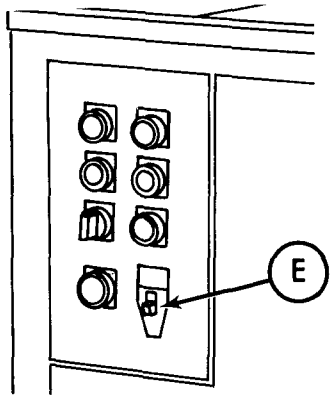
1. Turn LUBE HEAT switch (A) ON to heat lubricating oil. Oil temperature must be 150°F (65.5°C) minimum on the LUBE OIL TEMPERATURE gage (B) before starting test stand.



2. Turn FUEL HEAT switch (C) ON to heat fuel. Fuel temperature must be 115°F (46°C) minimun for Gulf 45 calibrating fluid, or 100°F (37.7°C) minimum for DF No. 2 fuel, on the FUEL TEMPERATURE gage (D) before starting test stand.



3. Turn AUXILIARY MOTOR switch (E) ON to start the fuel, lubricating oil, and vacuum pumps.



TA245148

TESTING — Continued

4. Turn FUEL REGULATOR valve (A) to register 10 psi (69 kPa) on FUEL PRESSURE gage (B). Turn FUEL REGULATOR (A) to slowly increase fuel pressure. Watch for a quick fluctuation of FUEL PRESSURE gage (B) needle indicating the bleeder valve has unseated. This should occur between 40 and 50 psi (276 and 345 kPa). If valve unseats, valve is operable and task ends here. If valve does not unseat between 40 and 50 psi (276 and 345 kPa), turn AUXILIARY MOTOR switch (C) OFF.

5. Using 7/8 in. open end wrench, disconnect fuel return hose (D) at nipple (E). Using 1 1/8 in. open end wrench, remove retainer (F) (with elbow and nipple), ring spacer (G), spring (H), and bleeder valve (J).

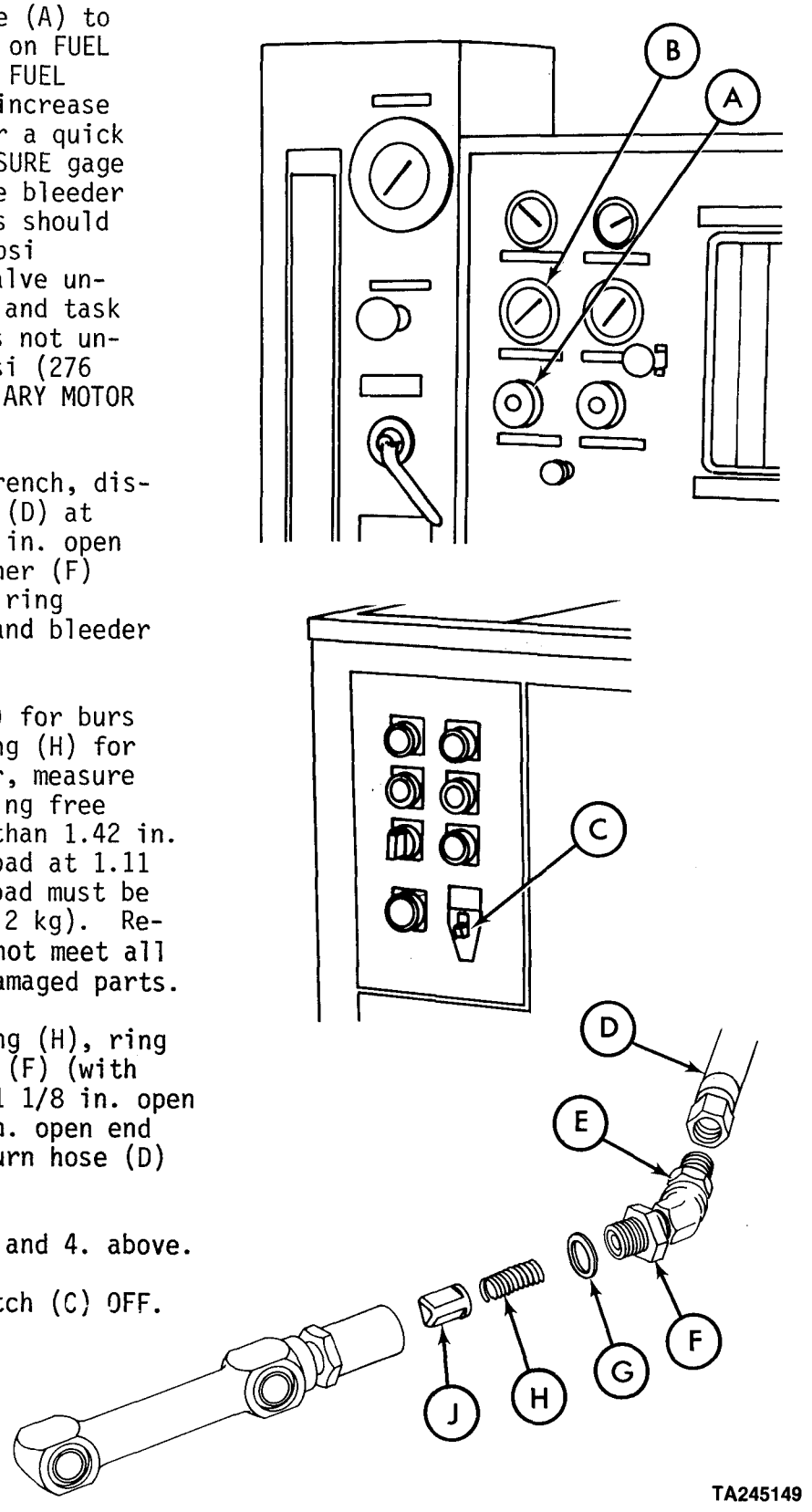
6. Inspect bleeder valve (J) for burs or damage. Inspect spring (H) for damage. Using micrometer, measure spring free length. Spring free length must not be less than 1.42 in. (36 mm). Check spring load at 1.11 in. (28.2 mm). Spring load must be 22.5 ± 0.5 lbs (10.2 ± 0.2 kg). Replace spring if it does not meet all requirements. Replace damaged parts.

7. Assemble valve (J), spring (H), ring spacer (G), and retainer (F) (with elbow and nipple) using 1 1/8 in. open end wrench. Using 7/8 in. open end wrench, connect fuel return hose (D) and nipple (E).

8. Repeat tests in steps 3. and 4. above.

9. Turn AUXILIARY MOTOR switch (C) OFF.

End of Task



TA245149

TESTING — Continued

TEST FLOW TIMING IN PUMP HEAD ASSEMBLIES

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Tube (fabricated tool), page 2-3
Cover (fabricated tool), page 2-3
5/8 in. plastic plug
3/16 in. socket head screw key

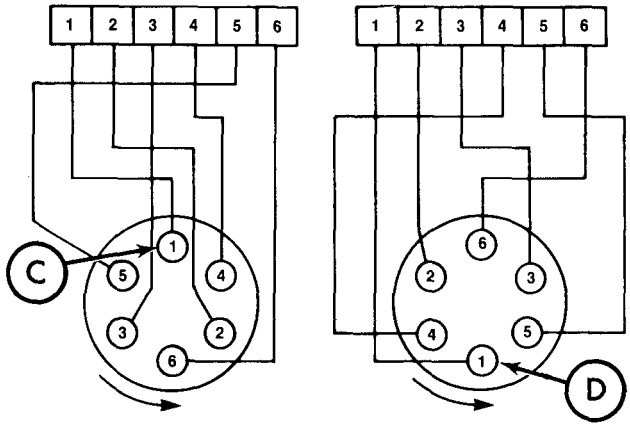
SUPPLIES:

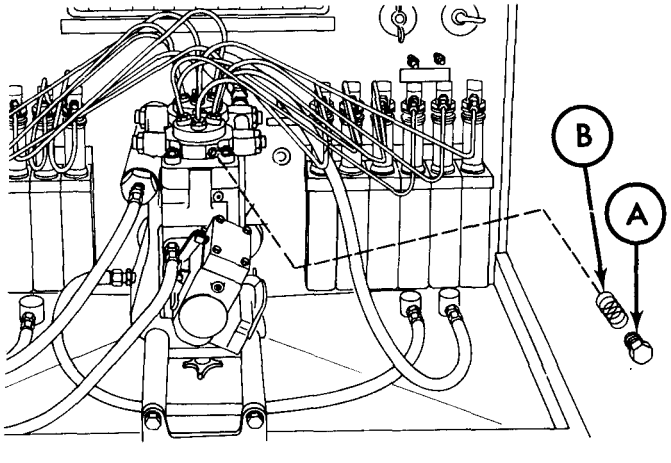
Governor cover gasket, from Gasket and Preformed Packing Set, Part No. 5702632,
or,
Parts Kit, Part No. 5705050,
or,
Parts Kits, Part No. 5705051

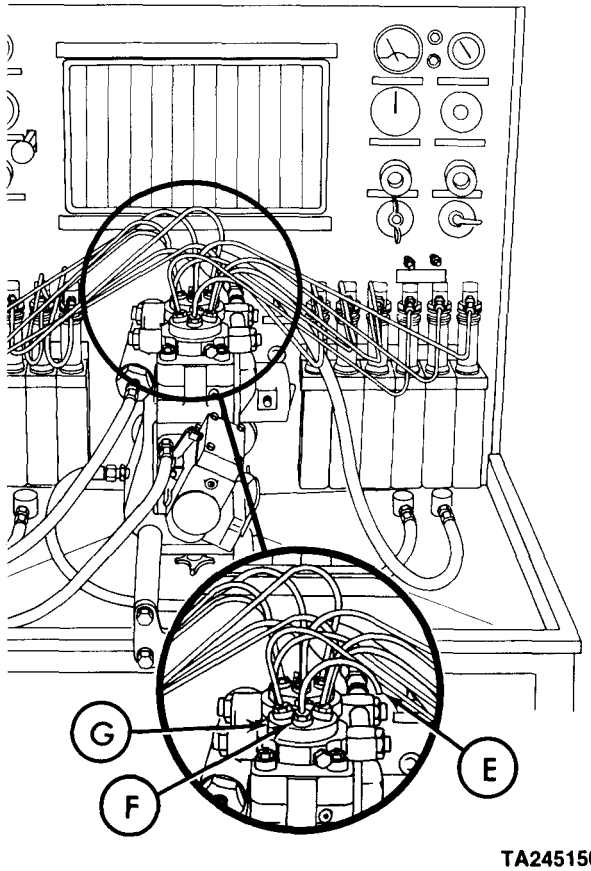
1. Using 3/4 in. box end wrench, remove delivery valve screw (A) from each head assembly. Remove delivery valve spring (B) from each head assembly. Install delivery valve screw (A) in each head assembly using 3/4 in. box end wrench.

2. Disconnect fuel delivery tube assemblies from No. 1 outlet ports (C) and (D) on each head assembly.

3. Install tube (E) in outlet port No. 1 (F) of No. 2 head assembly (G).



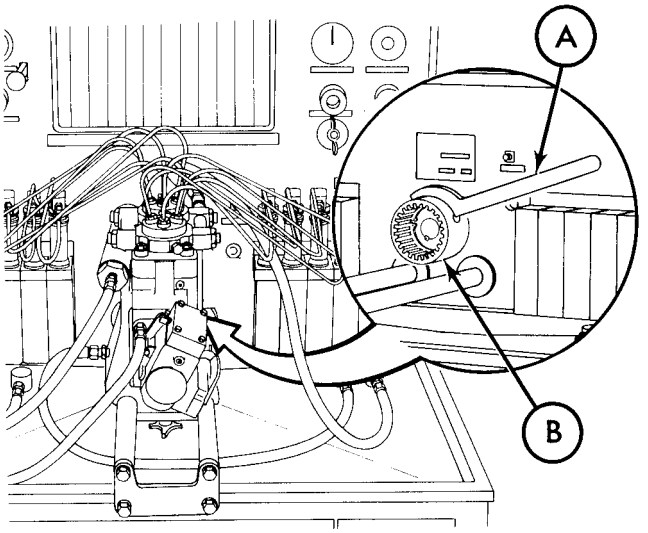


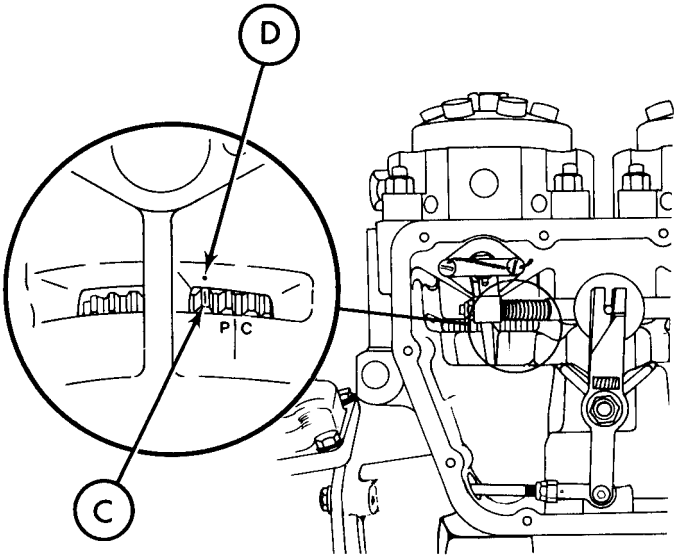


TA245150

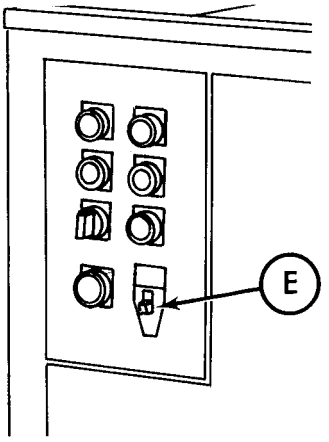
TESTING — Continued

4. Using spanner wrench (A) rotate test stand drive coupling (B) until plunger drive gear slotted tooth (C) alines with punch mark (D) on underside of housing deck.





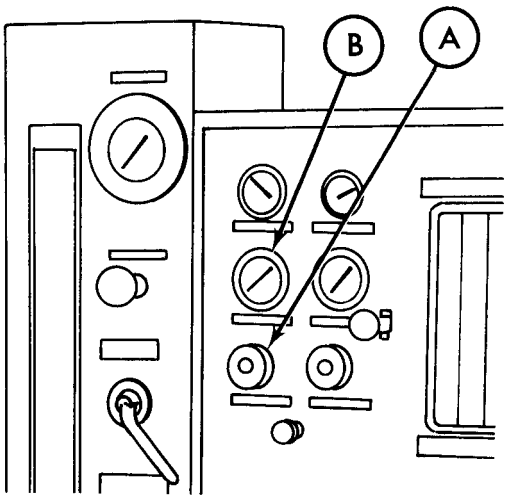
5. Turn AUXILIARY MOTOR switch (E) ON.



TA245151

TESTING — Continued

6. Turn FUEL REGULATOR valve (A) ON until FUEL PRESSURE gage (B) registers between 3 and 7 psi (21 and 48 kPa).



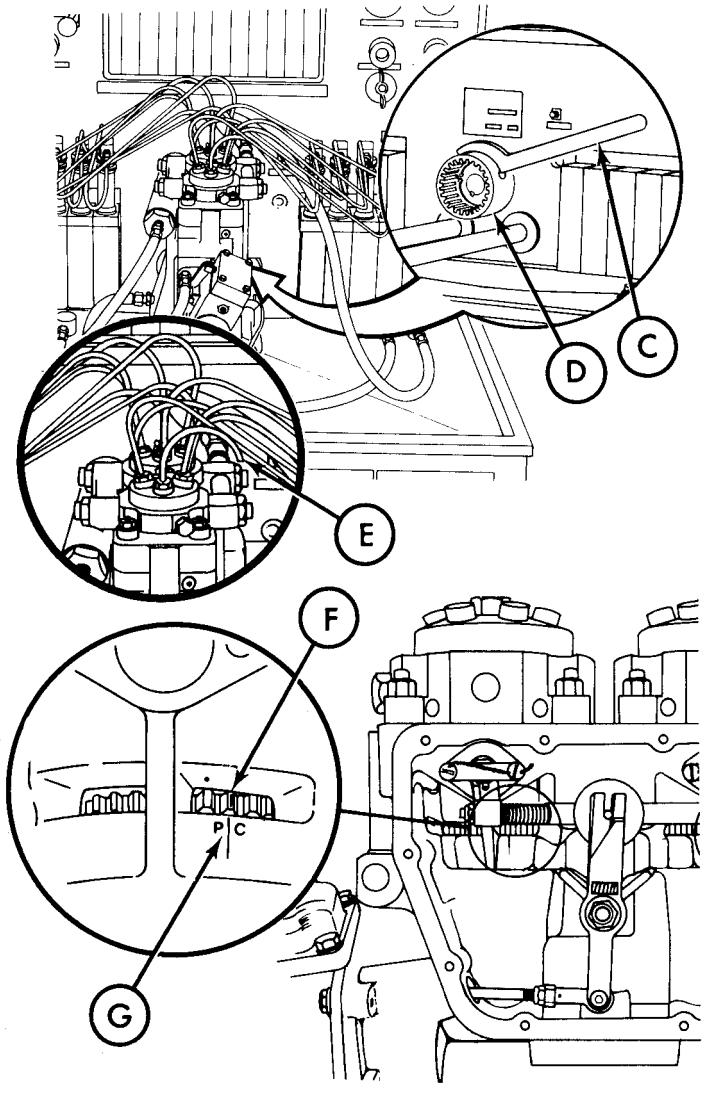
7. Using spanner wrench (C), rotate test stand drive coupling (D) slowly to the left until fuel flows from tube (E).

8. Continue turning coupling slowly to the left until fuel just stops flowing from tube (E).

NOTE

If coupling is turned past the point where fuel just stops flowing, rotate coupling 45° to the right. Turn coupling to the left until fuel just stops flowing from tube.

9. The spur gear slotted tooth (F) will now be alined with the port closing (PC) mark (G).



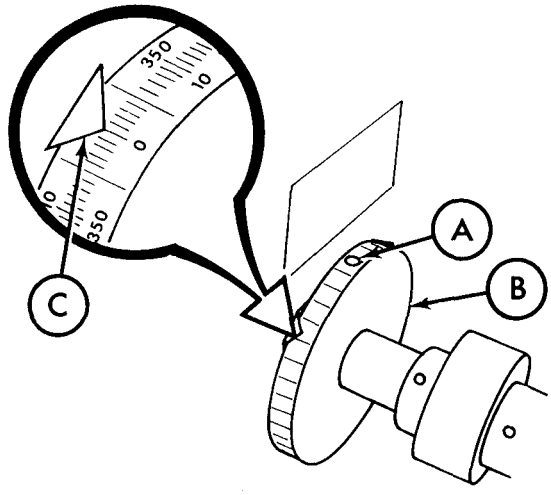
TA245152

TESTING — Continued

10. Using 3/16 in. socket head screw key, loosen screw (A).

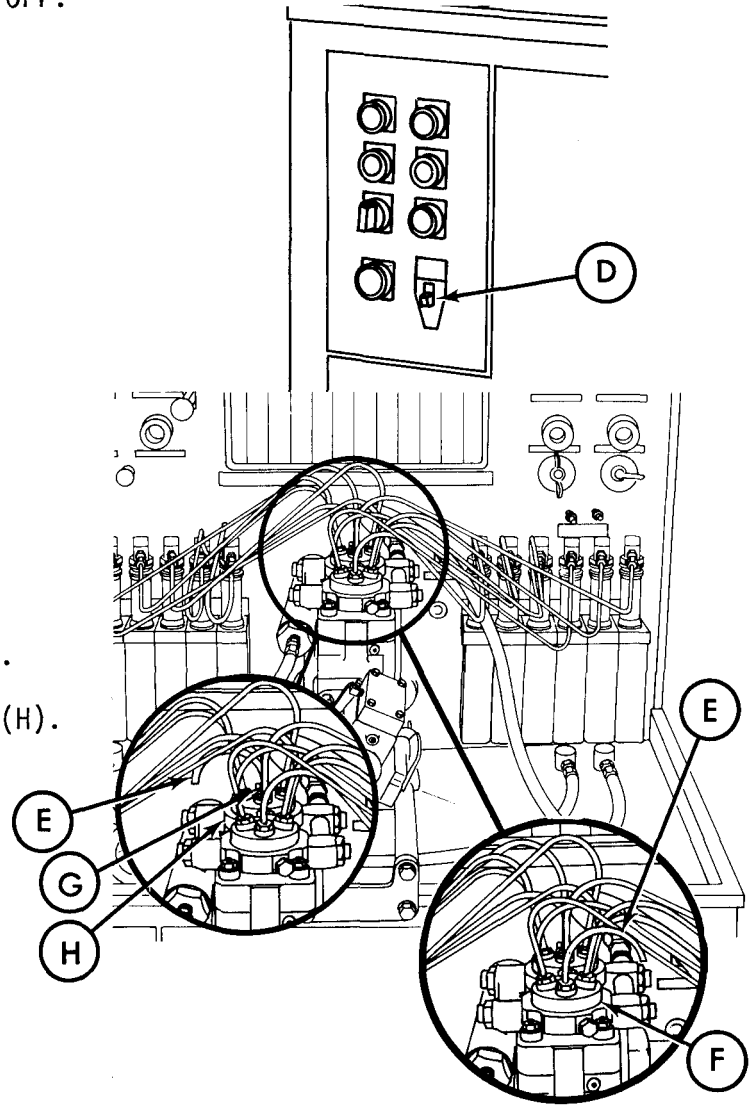
11. Rotate degree wheel (B) and aline 0° mark on wheel with pointer (C).

12. Using 3/16 in. socket head screw key, tighten screw (A).



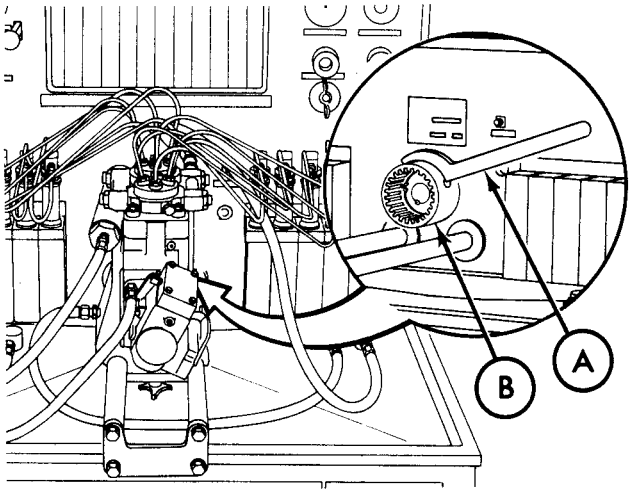
13. Turn AUXILIARY MOTOR switch (D) OFF.

14. Remove tube (E) from outlet port No. 1 in No. 2 head assembly (F). Install tube (E) in No. 1 outlet port (G) of No. 1 head assembly (H).

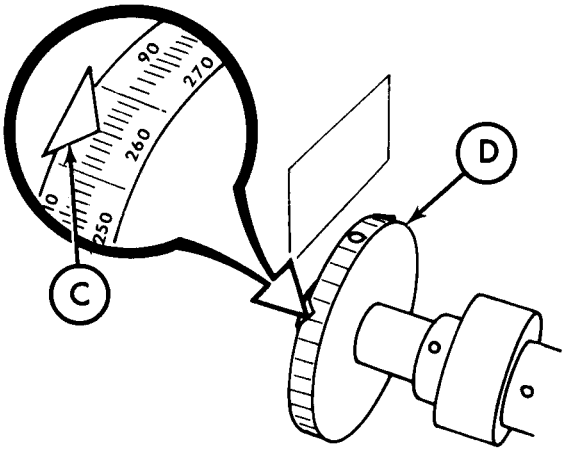


TA245153

TESTING—Continued

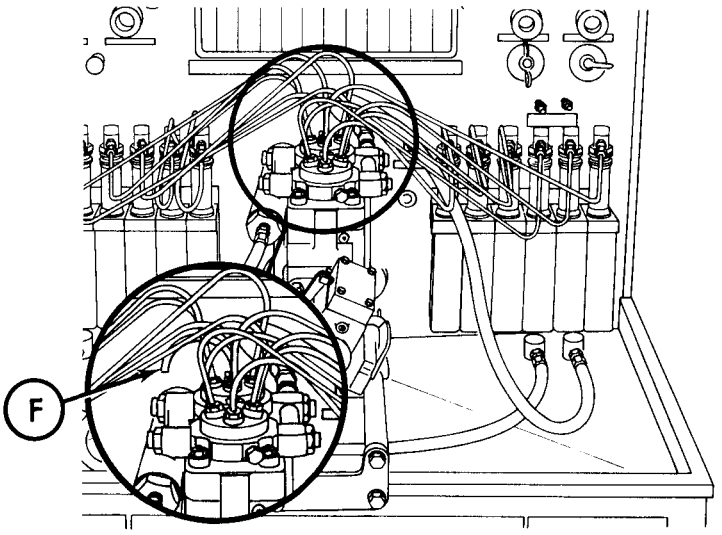


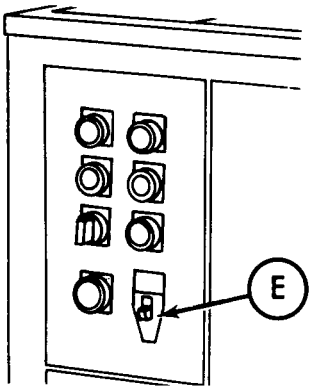
15. Using spanner wrench (A) rotate test stand drive coupling (B) to the left until pointer (C) is alined with 260° mark on degree wheel (D).



16. Turn AUXILIARY MOTOR switch (E) ON.

17. Using spanner wrench (A), rotate test stand drive coupling (B) slowly to the left until fuel flows from the tube (F).

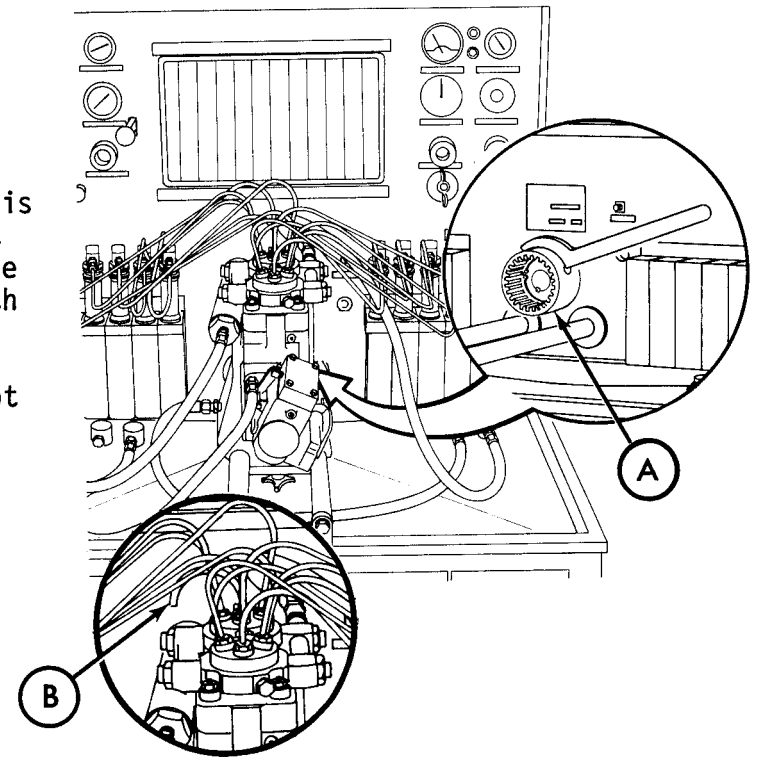




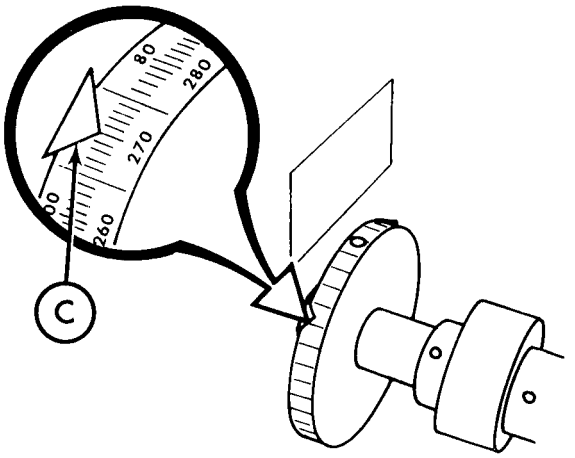
TA245154

TESTING — Continued

18. Continue turning coupling (A) slowly to the left until fuel stops flowing from tube (B). This is port closing for No. 1 outlet port in No. 1 head assembly. The pointer (C) should be alined with 270° ± 0.5°. If it is, the two head assemblies are in phase. Proceed to step 20. If it is not in phase, proceed to step 19.



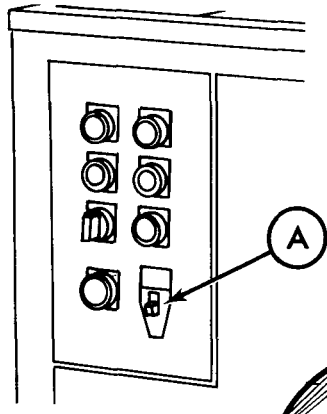
19. If the pointer (C) is not alined with 270° ± 0.5°, the two head assemblies are not in phase and the pump has not been assembled properly. Disassemble pump (page 3-2) and assemble pump (page 3-83).



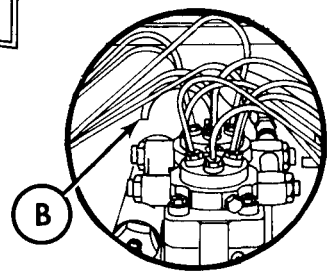
TA245155

TESTING — Continued

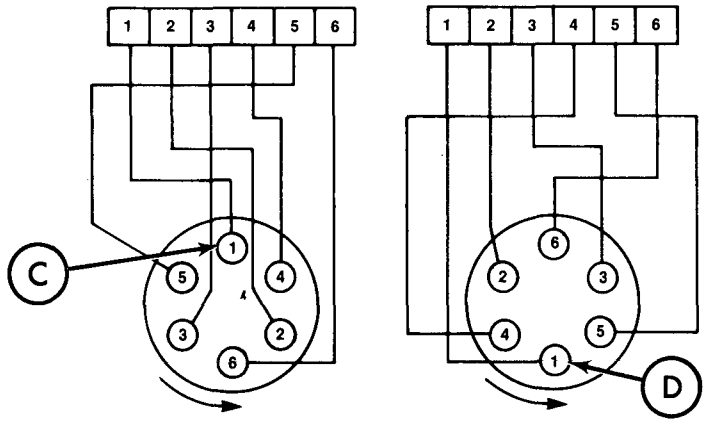
20. Turn AUXILIARY MOTOR switch (A) OFF



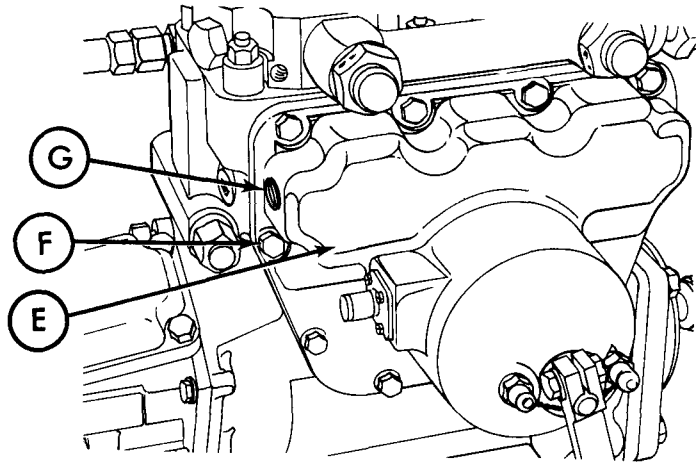
21. Remove tube (B) from pump head.



22. Connect fuel delivery tube assemblies to No. 1 outlet ports (C) and (D) on each head assembly.



23. Using 7/16 in. socket, ratchet handle, and extension, install cover (E) and secure with 10 lockwashers and machine bolts (F). Install plastic plug (G) in hole.



TA245156

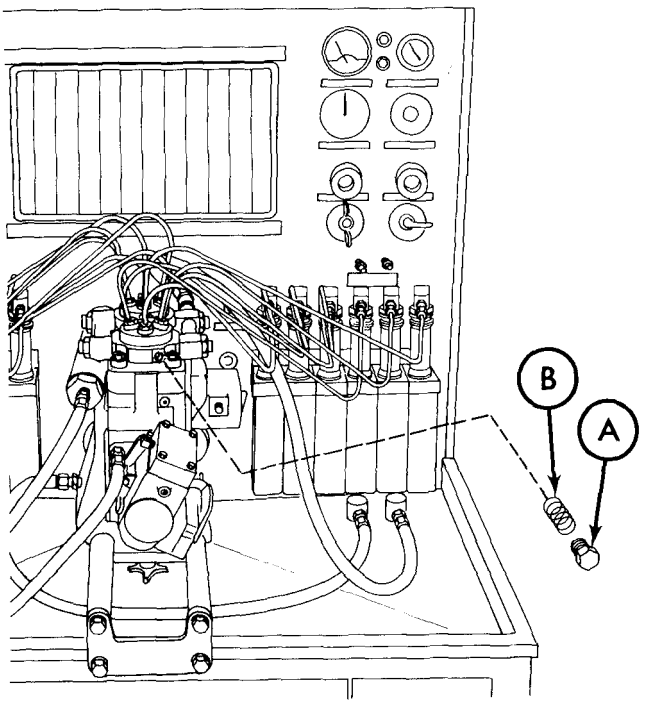
TESTING — Continued

24. Using 3/4 in. box end wrench, remove delivery valve screw (A) from each head assembly. Install delivery valve spring (B) in each head assembly and secure with delivery valve screw (A).

CAUTION

Make certain delivery valve spring is centered in screw recess before tightening screw.

25. Using 3/4 in. socket and torque wrench, torque tighten screws (A) to 50 to 55 lb-ft (68 to 75 N•m).



End of Task

TA245157

CALIBRATION

2-8. CALIBRATION.

PERFORM PRECALIBRATION PROCEDURE

TOOLS: None.

SUPPLIES: None

The pump must be calibrated before returning to use to insure that it will perform properly. Do the following procedures in the order given to calibrate the pump.

Start and warm up test stand and pump in the following manner:

1. Install throttle spring (A) between stud (B) on pump mounting bracket and pump operating lever assembly (C) to hold lever in full throttle position.

2. Turn AUXILIARY MOTOR switch (D) ON.

3. Turn LUBE OIL REGULATOR valve (E) until LUBE OIL PRESSURE gage (F) registers between 30 and 35 psi (207 and 241 kPa).

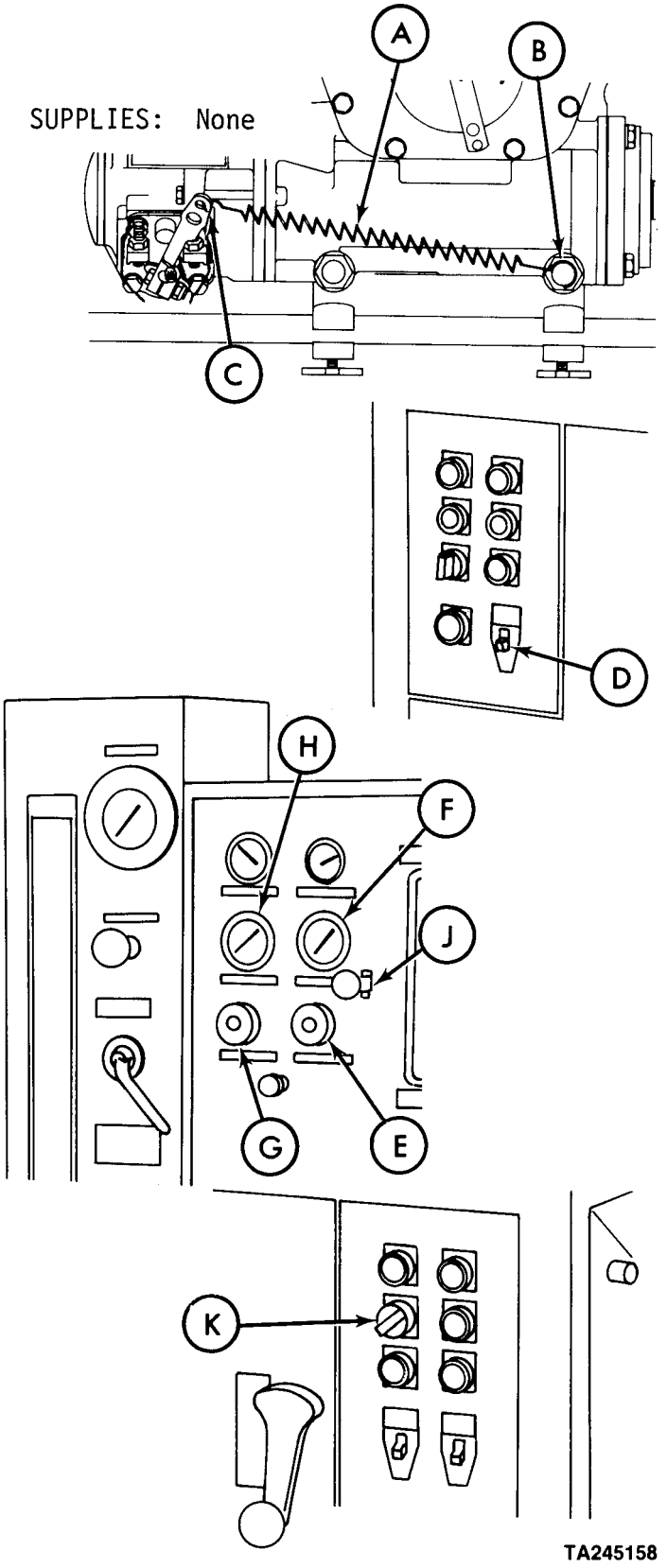
4. Turn FUEL REGULATOR, valve (G) ON until FUEL PRESSURE gage (H) registers between 55 and 65 psi (379 and 448 kPa).

5. Push in fuel dumping lever (J) to empty burettes. Pull fuel dumping lever out.

6. Turn 50O-1OOO-OFF count switch (K) to 1000 position.

NOTE

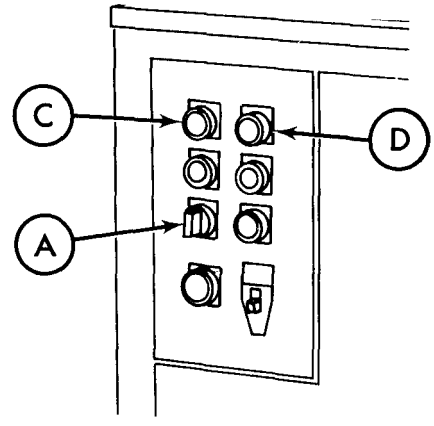
A count of 1000 on the test stand is equal to 500 pump strokes.



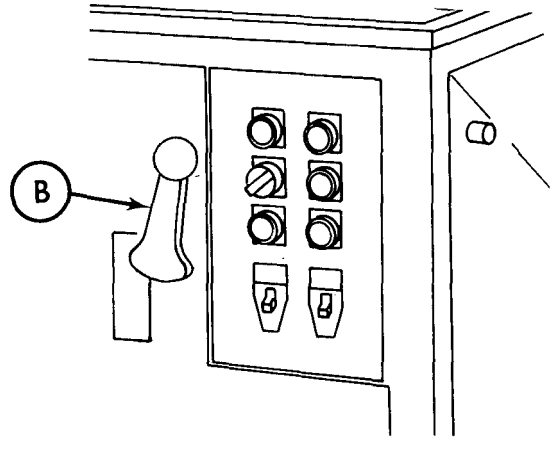
TA245158

CALIBRATION — Continued

7. Turn FORWARD-OFF-REVERSE switch (A) to FORWARD position.



8. Turn HIGH-LOW RANGE speed shifting crank (B) to HIGH RANGE position.

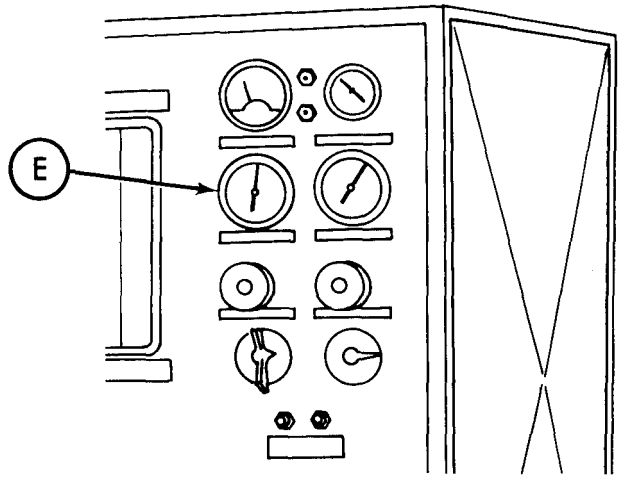


9. Press START button switch (C).

10. Press FAST button switch (D) and hold until 600 rpm registers on TACHOMETER (E).

NOTE

Oil temperature must be a minimum of 150°F (65.5°C) and fuel temperature a minimum of 115°F (46°C) for Gulf 45 calibrating fluid, or 100°F (37.7°C) for DF No. 2 fuel before starting calibration testing.



11. Operate test stand at 600 rpm until fuel and oil reach required temperature.

12. Proceed to adjust main fuel flow for No. 1 head assembly.

End of Task

TA245159

CALIBRATION — Continued

ADJUST MAIN FUEL FLOW FOR NO. 1 HEAD ASSEMBLY

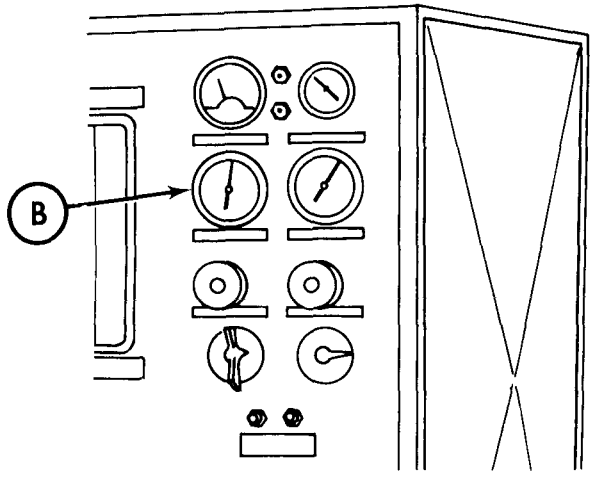
TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair

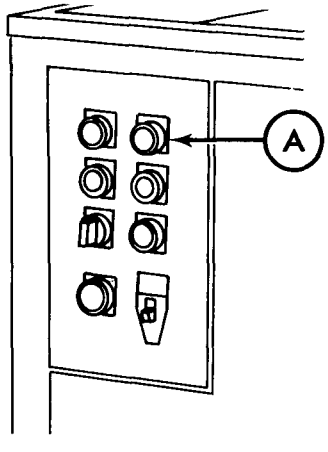
SUPPLIES:

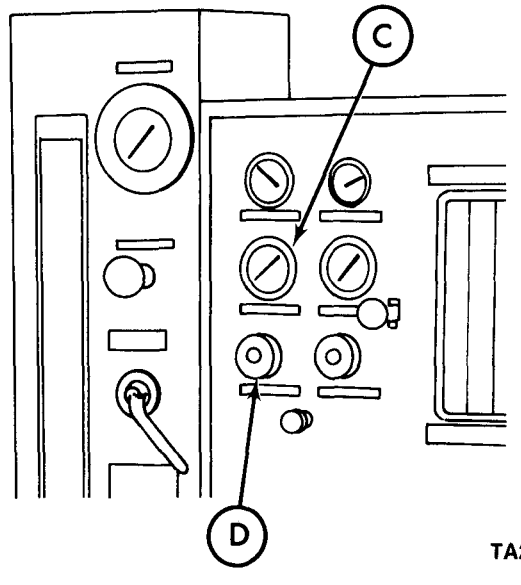
Lockwashers (4), from Parts Kit, Part Nos. 5705050 or 5705051
Governor cover gasket, from Gasket and Preformed Packing Set, Part No. 5702632,
or
Parts Kit, Part No. 5705050,
or
Parts Kit, Part No. 5705051
Pencil
Paper

1. Press FAST button switch (A) and hold until 2440 rpm registers on TACHOMETER (B).



2. Check FUEL PRESSURE gage (C). Adjust FUEL REGULATOR valve (D) to obtain 55 to 65 psi (379 to 448 kPa).





TA245160

CALIBRATION — Continued

3. Press START-COUNT button switch (A).

NOTE

With start of count operation, fuel will flow into burettes. Flow will stop when count reaches 1000.

4. Push fuel dumping lever (B) in to empty burettes. Pull fuel dumping lever out.

5. Repeat steps 3. and 4. a minimum of three times to purge air from lines and accumulators.

6. Press START-COUNT button switch (A).

7. When count stops, record amount of fuel in cc's in each of the six right side burettes (C), see sample form (page 2-44).

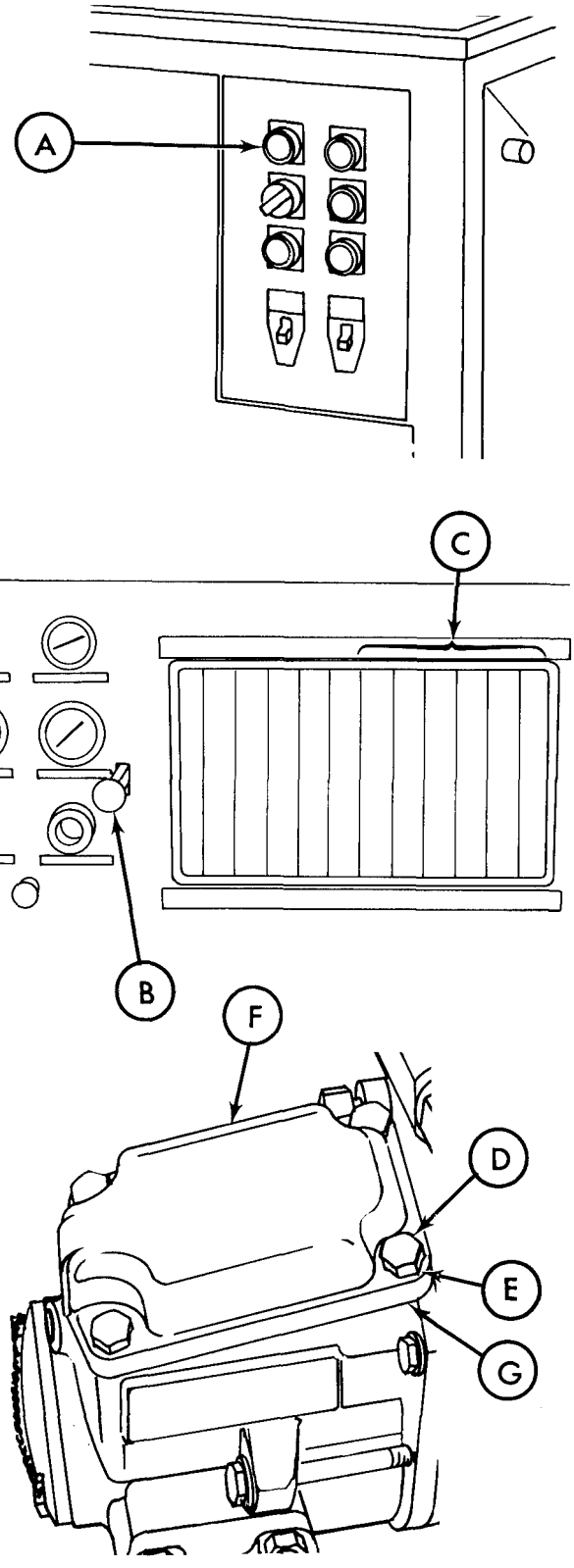
8. Add the amounts recorded and divide by six to compute the average fuel delivery for each No. 1 head assembly outlet.

9. Push fuel dumping lever (B) in to empty burettes. Pull fuel dumping lever out.

10. Repeat steps 6. through 9. two times.

11. Add the three average fuel deliveries from steps 8. and 10., and divide by three. The result should be 100.5 to 102 cc's. If result is 100.5 to 102 cc's, task is complete. If the average fuel delivery is above or below this amount, proceed to step 12.

12. Using a 7/16 in. box wrench, remove four machine bolts (D) and lockwashers (E). Remove governor cover (F) and gasket (G). Discard gasket and lockwashers.



TA245161

CALIBRATION — Continued

LEFT BANK BURETTES (NO. 1 HEAD ASSEMBLY)				RIGHT BANK BURETTES (NO. 2 HEAD ASSEMBLY)			
OUTLET PORT NO.	QTY (CC's) 1	2	3	OUTLET PORT NO.	QTY (CC's) 1	2	3
1	100.6			1			
2	100.5			2			
3	100.9			3			
4	102.1			4			
5	100.5			5			
6	100.7			6			
TOTALS	605.3	606.1	602.5	TOTALS			

SAMPLE: COMPUTING AVERAGE FUEL FLOW

Divide totals by six to compute average fuel delivery for port outlet (each burette).

Add three average totals and divide by 18 to compute average fuel delivery.

$$\frac{605.3}{6} = 100.9$$

$$\frac{1813.9}{18} = 100.8$$

TA245162

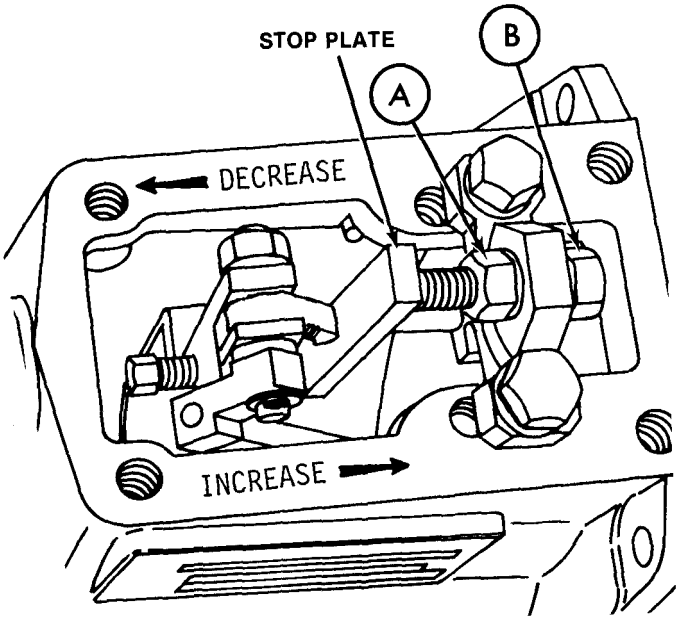
CALIBRATION — Continued

13 l. Using 7/16 in. open end wrench, loosen stop plate nut (A) and tighten nut (B) to increase fuel delivery. Loosen nut (B) and tighten nut (A) to decrease fuel delivery.

NOTE

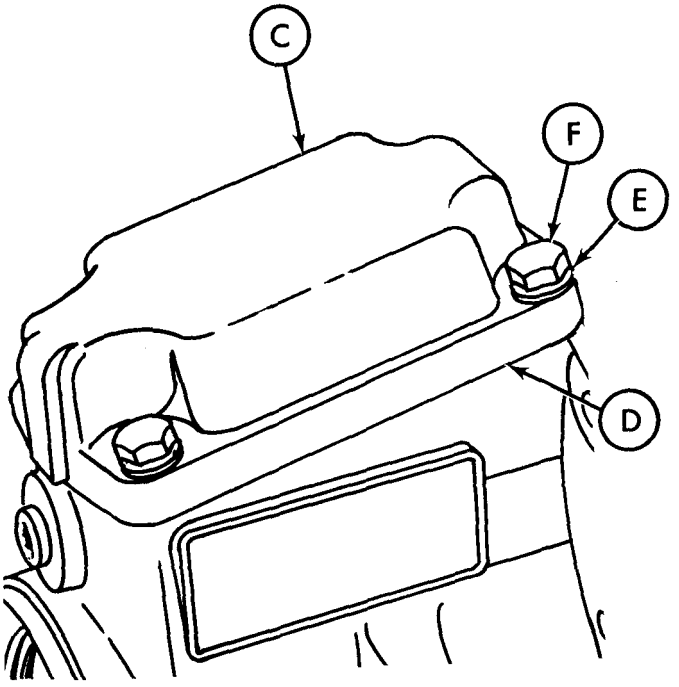
Turning the nuts one flat will change the fuel delivery four cc's for 1000 count.

14. Repeat steps 6. through 10, and 12. to obtain an average fuel delivery of 100.5 to 102 cc's in each burette.



15. Using 7/16 in. socket and torque wrench, install governor cover (C) using new gasket (D), four new lockwashers (E), and four machine bolts (F). Torque bolts to 50 to 60 lb-in. (6 to 7 N•m).

End of Task



TA245163

CALIBRATION — Continued

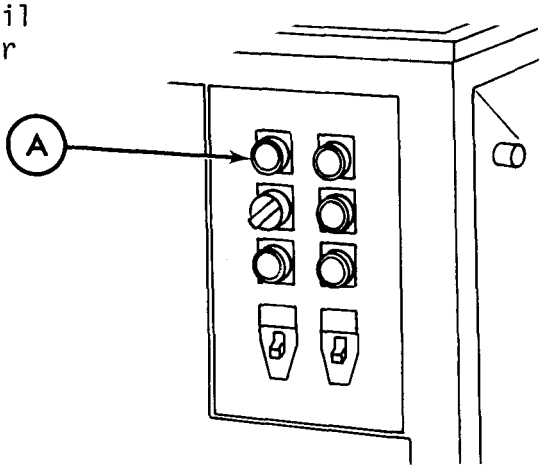
BALANCE FUEL FLOW FROM HEAD ASSEMBLIES

TOOLS:

3/8 in. fixed nut driver

SUPPLIES:

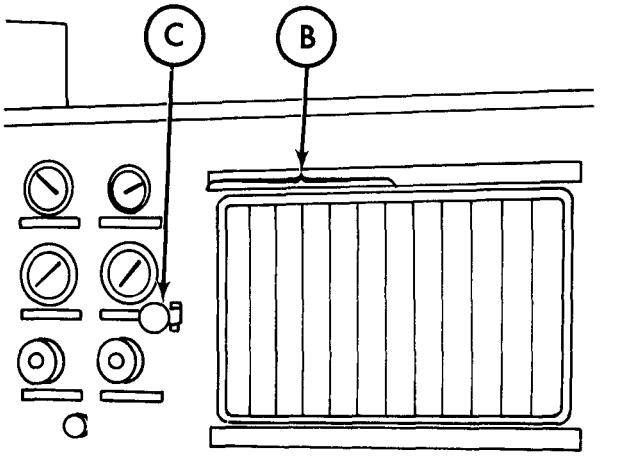
Pencil
Paper



1. Press START-COUNT button switch (A).

2. When count stops, record amount of fuel in cc's in each of the six left side burettes (B).

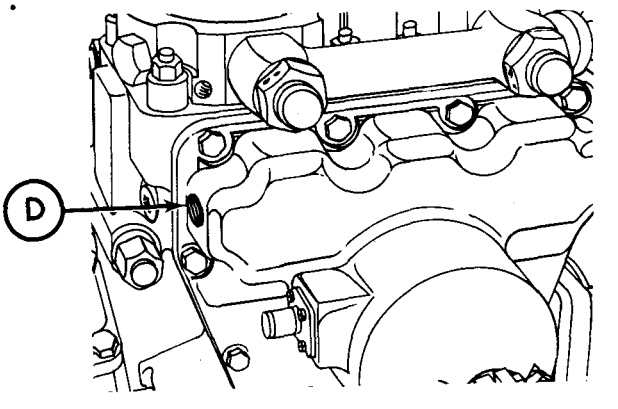
3. Add the amounts recorded and divide by six to compute the average fuel delivery for each No. 2 head assembly outlet.



4. Push fuel dumping lever (C) in to empty burettes. Pull fuel dumping lever out.

5. Repeat steps 1. through 3.

6. Add the two average fuel deliveries from steps 3. through 5. and divide by two. The result must equal the average fuel delivery for No. 1 head assembly. If No. 2 head assembly fuel delivery is above or below No. 1 head assembly, proceed to step 7.



7. Remove plastic plug (D) from cover.

TA245164

CALIBRATION — Continued

8. Using 3/8 in. fixed nut driver (A), turn yoke self-locking nut (B) clockwise to decrease or counter-clockwise to increase fuel delivery of No. 2 head assembly.

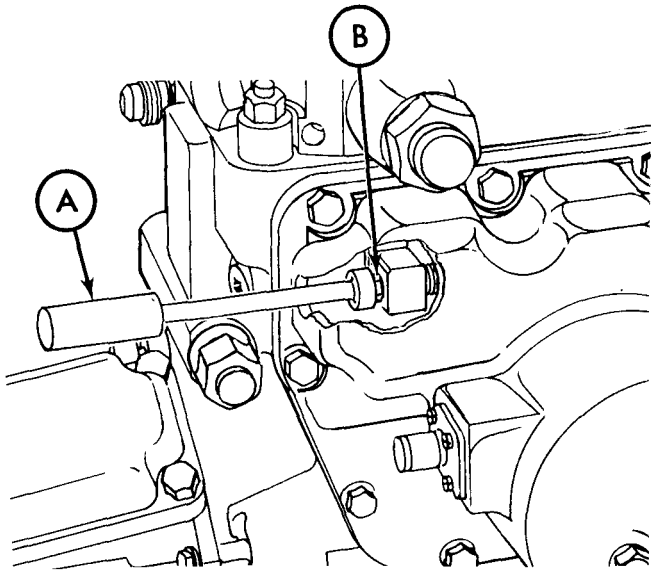
NOTE

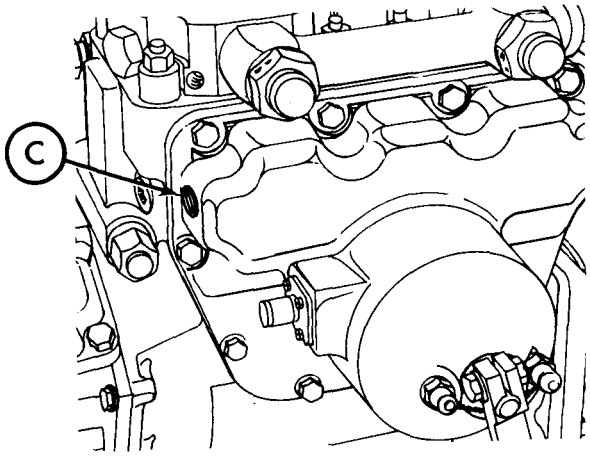
One complete turn (360°) equals approximately 6 cc's.

9. Repeat steps 1. through 4., and 8. until average fuel delivery from both head assemblies is balanced.

10. Install plastic plug (C).

End of Task





TA245165

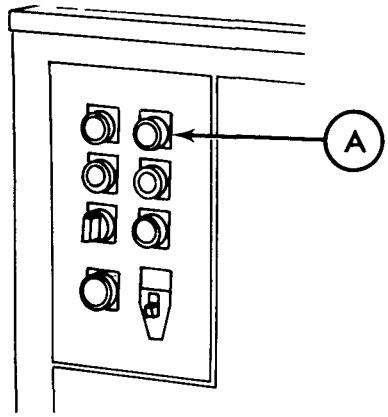
CALIBRATION — Continued

ADJUST HIGH IDLE FUEL FLOW AND FUEL CUT-OFF

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair

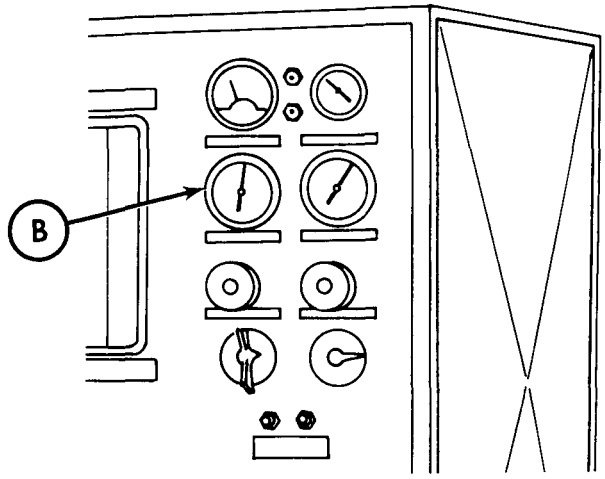
SUPPLIES: None.



1. Press FAST button switch (A) and hold until 2620 rpm registers on TACHOMETER (B).

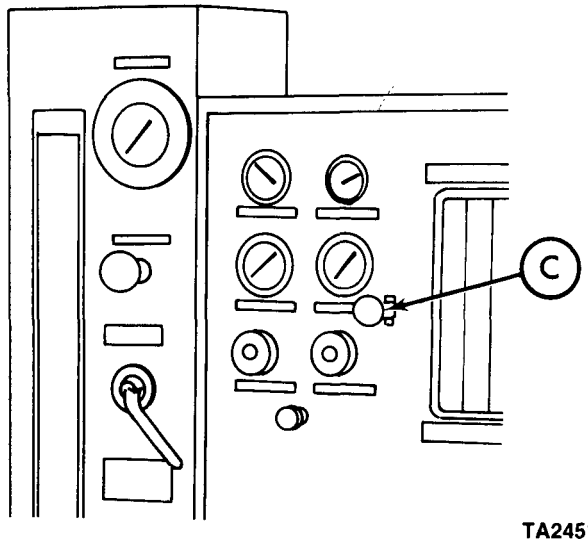
NOTE

Fuel pressure must be 58 psi (400 kPa) minimum. Adjust FUEL PRESSURE valve if necessary.



2. Push fuel dumping lever (C) in to empty burettes.

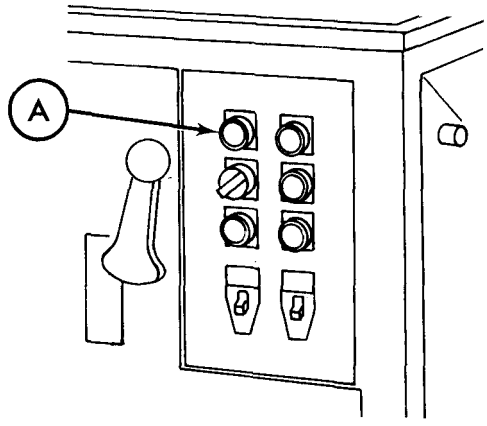
3. Pull fuel dumping lever (C) out.



TA245166

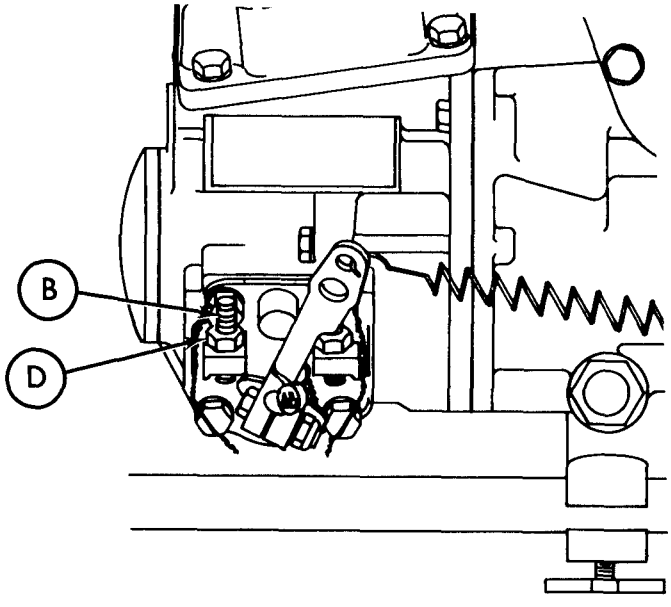
CALIBRATION — Continued

4. Press START COUNT button switch (A). When fuel flow stops, check fuel level in burettes. If average flow is within 54 to 57 cc range for 1000 count, in each burette, proceed to step 5. If flow is outside this range, adjust the high speed adjusting screw (B) using 7/16 in. open end wrench and screwdriver to obtain 54 to 57 cc range.



N O T E

Turn screw clockwise to decrease flow.
Turn counterclockwise to increase flow.

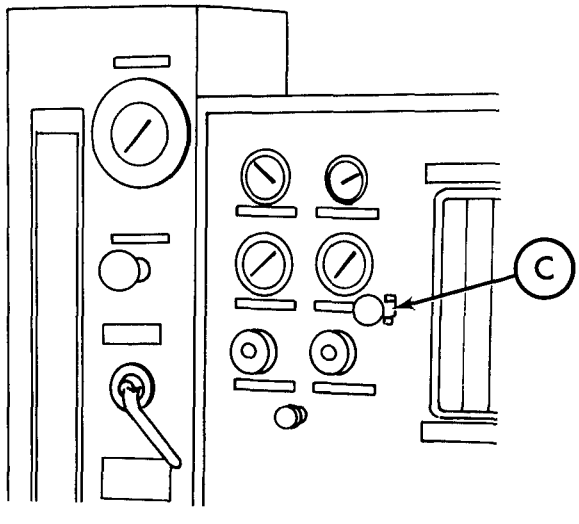


5. Push fuel dumping lever (C) in to empty burettes.

6. Pull fuel dumping lever (C) out.

7. Repeat steps 4. through 6. above until average flow in each burette is within 54 to 57 cc's.

8. Tighten lock nut (D).



TA245167

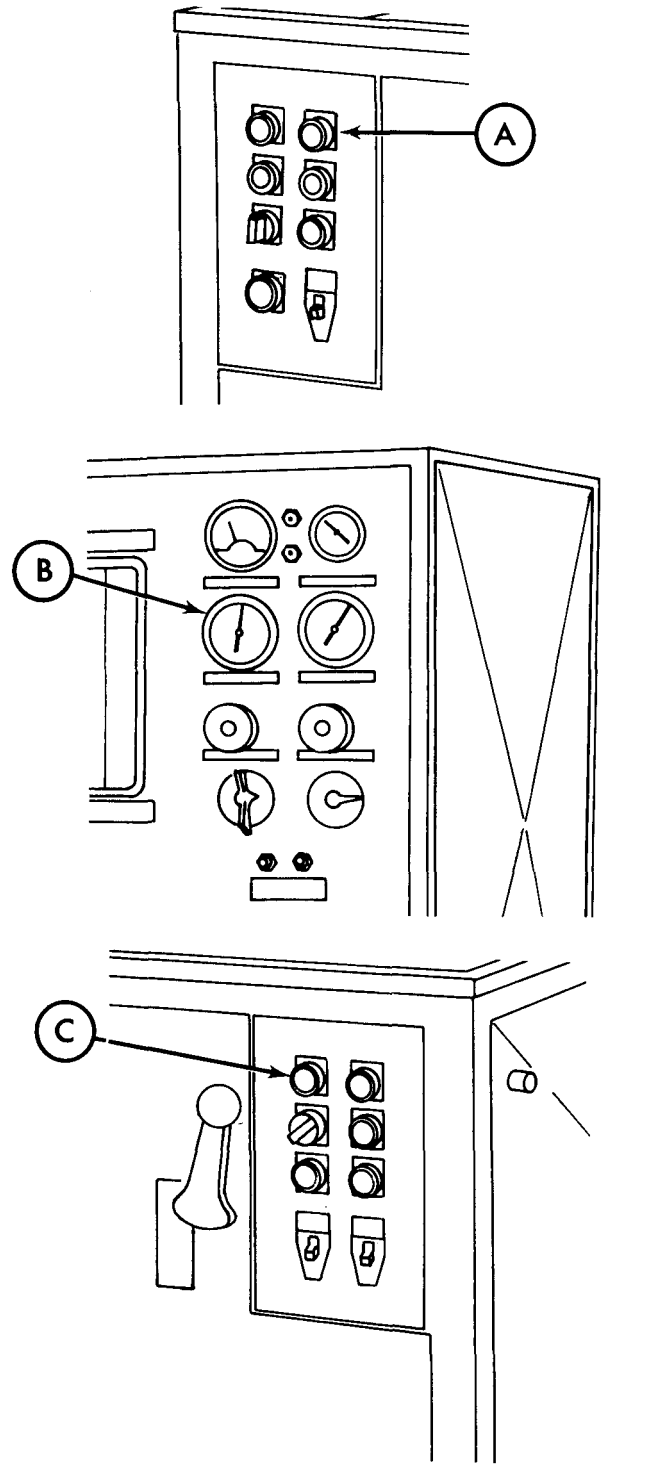
CALIBRATION — Continued

9. Press FAST button switch (A) and hold until 2750 rpm registers on TACHOMETER (B).

10. Press START COUNT button switch (C).

11. There should be no flow at 2750 rpm. If fuel continues to flow into burettes, governor inner spring shim dimensions are incorrect. Disassemble pump (page 3-2) and install shims (page 3-104).

End of Task



TA245168

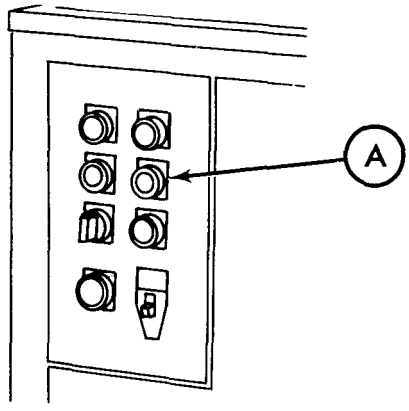
CALIBRATION — Continued

ADJUST DROOP SCREW

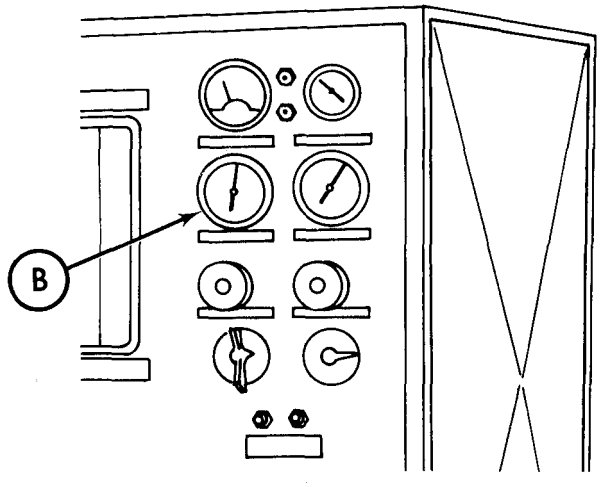
TOOLS:

1/8 in. socket head screw key
1/4 in. socket head screw key

SUPPLIES: None.

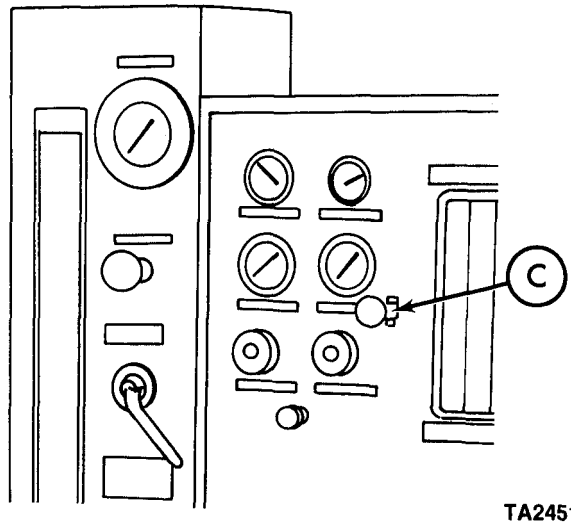


1. Press and hold SLOW button switch (A) to reduce speed to 1800 rpm on TACHOMETER (B).



2. Push fuel dumping lever (C) in to empty burettes.

3. Pull fuel dumping lever (C) out.

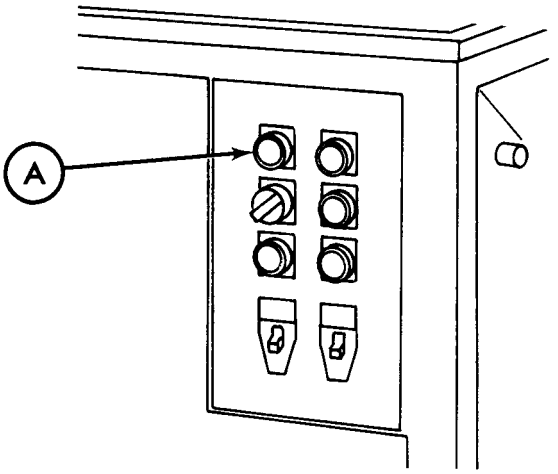


TA245169

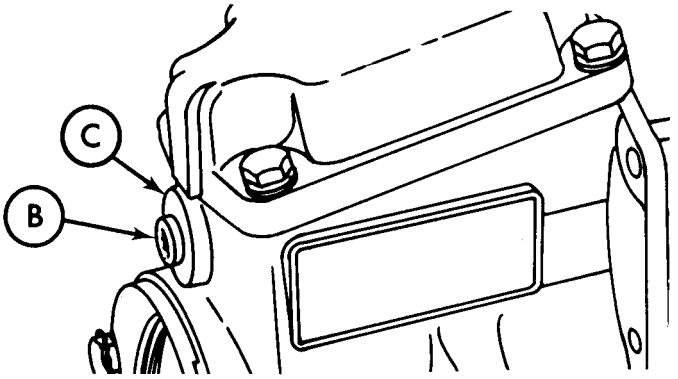
CALIBRATION—Continued

4. Press START COUNT button switch (A).

5. When fuel flow stops, check fuel level in burettes. If fuel flow is 99 to 101 cc's in each burette, proceed to step 12. below. If fuel flow is outside these limits, the droop screw must be adjusted. Proceed to step 6.



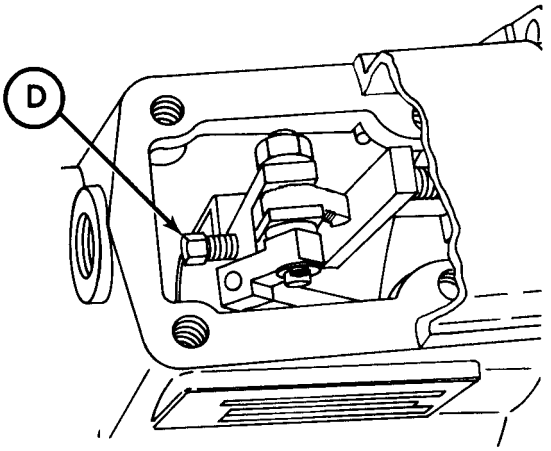
6. Using 1/4 in. socket head screw key, remove pipe plug (B) from governor housing (C).



7. Using 1/8 in. socket head screw key, adjust droop screw (D) to obtain 99 to 101 cc's in each burette at 1800 rpm.

NOTE

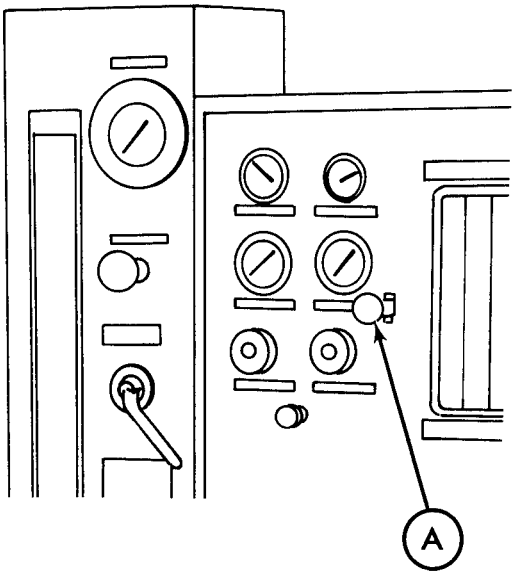
Turn the droop screw clockwise to decrease fuel flow. Turn droop screw counterclockwise to increase fuel flow.

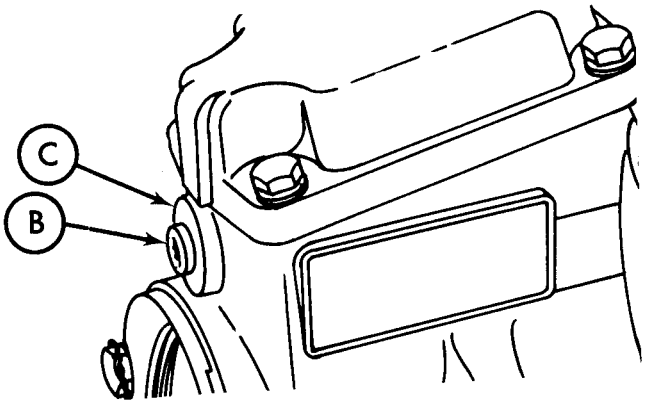


TA245170

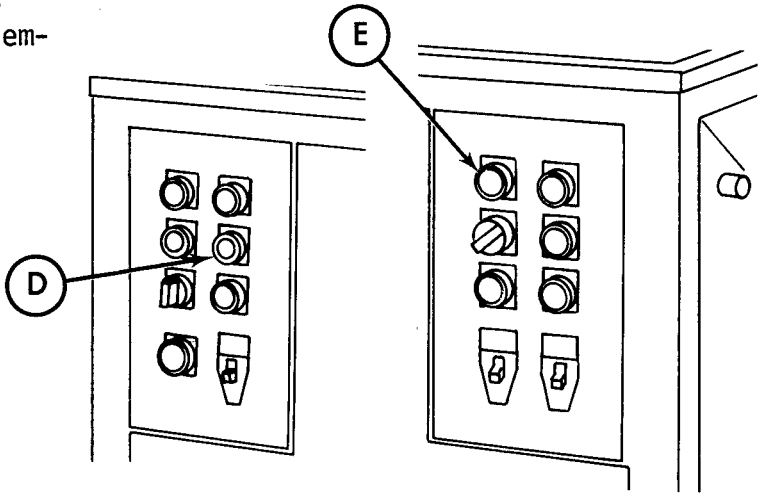
CALIBRATION — Continued

8. Push fuel dumping lever (A) in to empty burettes.
9. Pull dumping lever (A) out.
10. Repeat steps 4. and 5., and 8. through 10. to obtain 99 to 101 cc's in each burette at 1800 rpm.
11. Using 1/4 in. socket head screw key, install pipe plug (B) in housing (C).





12. Press and hold SLOW button switch (D) to reduce speed to 1000 rpm.
13. Press START COUNT button switch (E).
14. Fuel delivery should be 80 to 85 cc's in each burette. If it is, proceed to step 15. If fuel delivery is not within limits, the plunger is worn and the head assembly must be replaced (page 3-2).

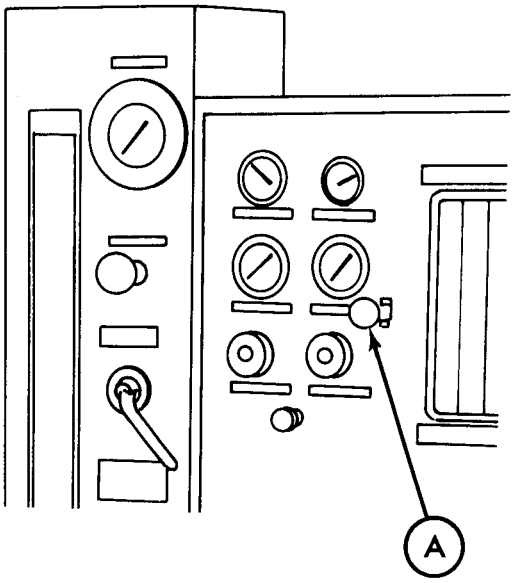


TA245171

CALIBRATION — Continued

15. Push fuel dumping lever (A) in to empty burettes.

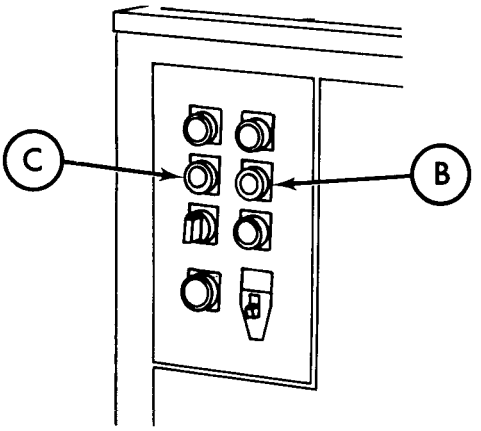
16. Pull fuel dumping lever (A) out.



17. Press and hold SLOW button switch (B) to reduce speed to minimum.

18. Press STOP button switch (C).

End of Task



TA245172

CALIBRATION—Continued

CHECK CRANKING FUEL FLOW

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair

SUPPLIES:

Cover and solenoid gasket, from Gasket and Preformed Packing Set, Part No. 5702632

CAUTION

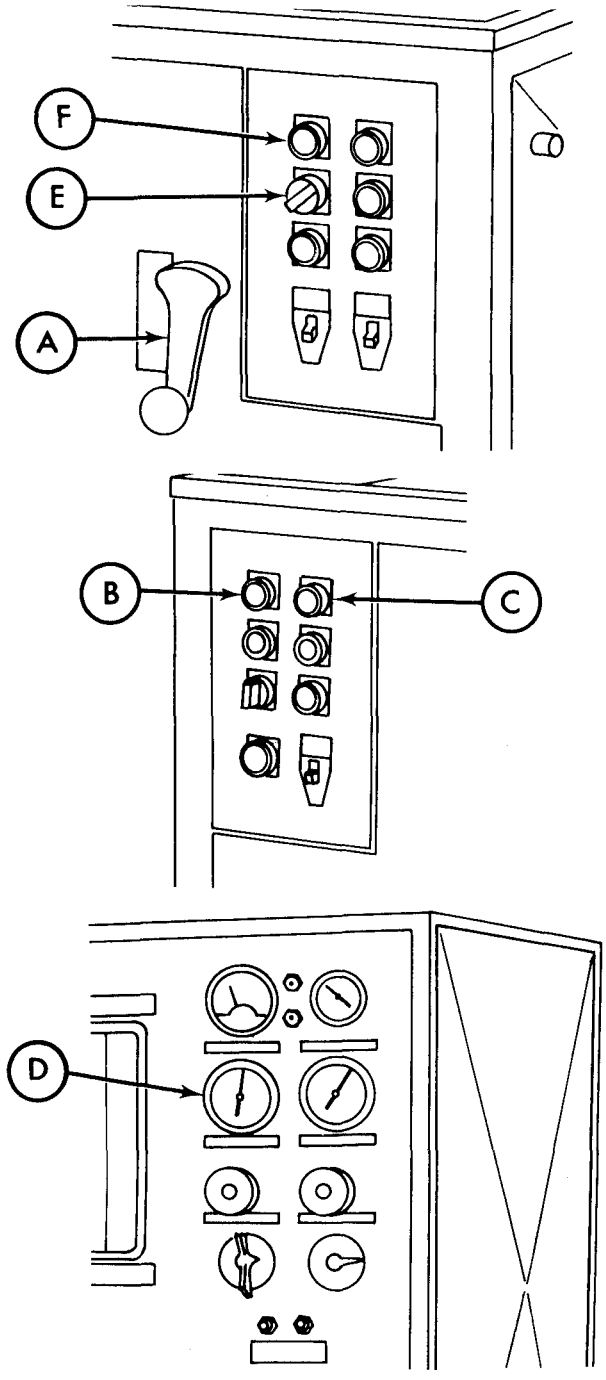
Do not turn shifting crank from low to high range, or high to low range while stand is running. Always shut stand down before shifting speed range to prevent gear damage.

1. Turn HIGH-LOW RANGE speed shifting crank (A) to LOW RANGE.
2. Press START button switch (B). Press and hold FAST button switch (C) until 150 rpm registers on the TACHOMETER (D).
3. Turn 500-1000-OFF count switch (E) to 500 position.
4. Press START COUNT button switch (F).

NOTE

At end of 500 count run, fuel delivery must be 32.75 cc's minimum in each burette.

5. If fuel delivery is 32.75 cc's or more, proceed to step 7. If fuel flow is less than 32.75 cc's in each burette, governor inner and outer spring shim dimensions are incorrect. Disassemble pump (page 3-2) and install shims (page 3-104).
6. If inner and or outer shims are changed, repeat calibration procedure (page 2-40).

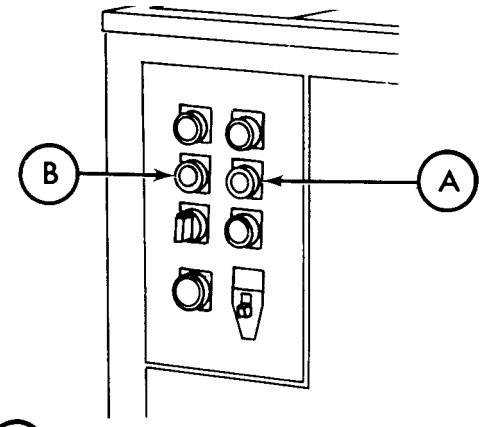


TA245173

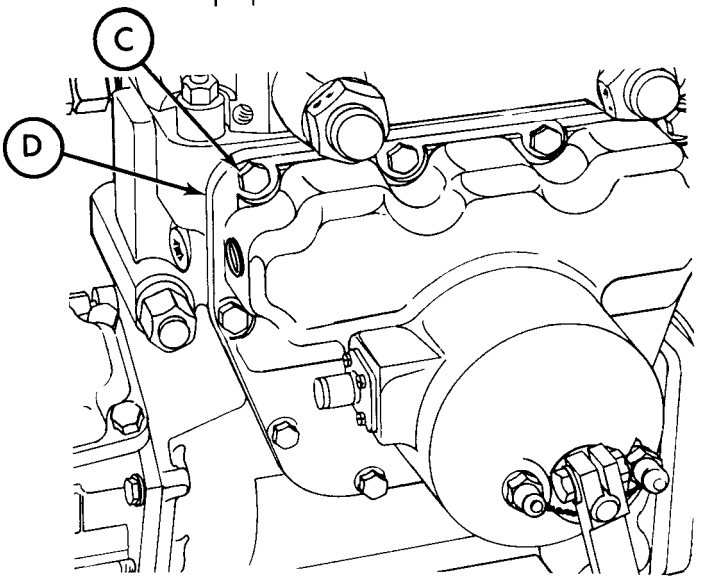
CALIBRATION — Continued

7. Press and hold SLOW button switch (A) to reduce speed to minimum.

8. Press STOP button switch (B).

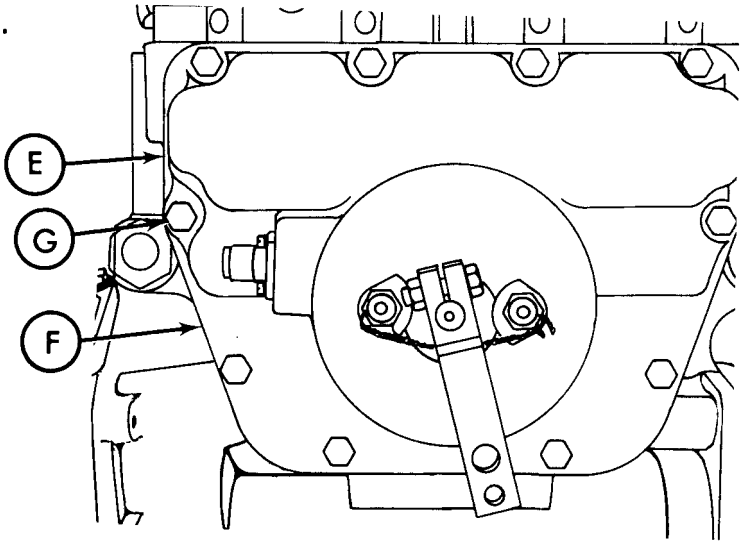


9. Using 7/16 in. socket, ratchet handle, and extension, remove 10 machine bolts and lockwashers (C). Remove cover (D).



10. Install cover and solenoid (E) using new gasket (F). Using 7/16 in. socket, ratchet handle, and extension, secure cover with 10 lockwashers and machine bolts (G)..

End of Task



TA245174

CALIBRATION—Continued

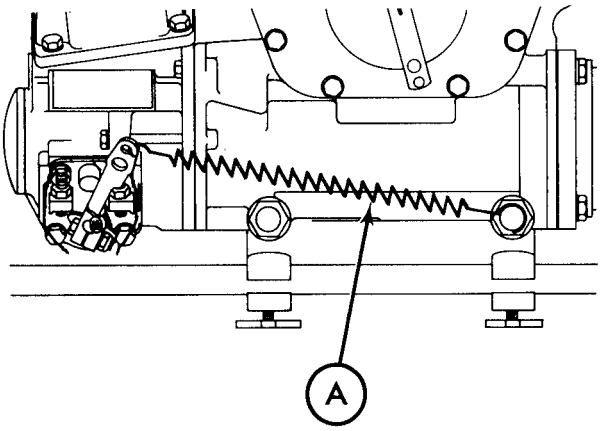
ADJUST IDLE SPEED

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair

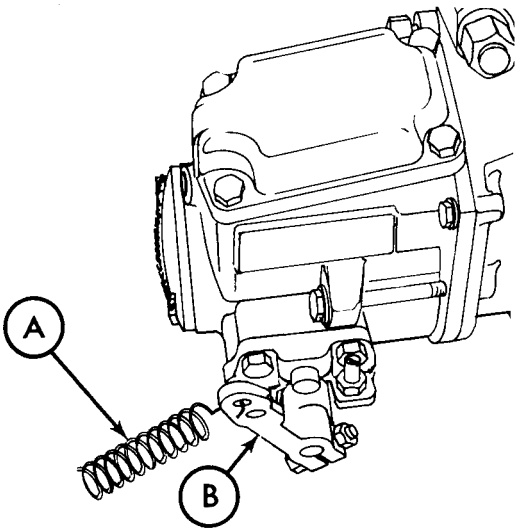
SUPPLIES: None.

1. Remove throttle spring (A).

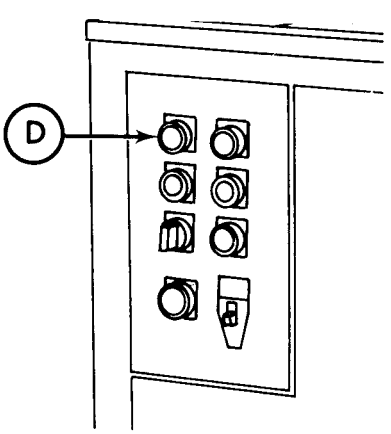


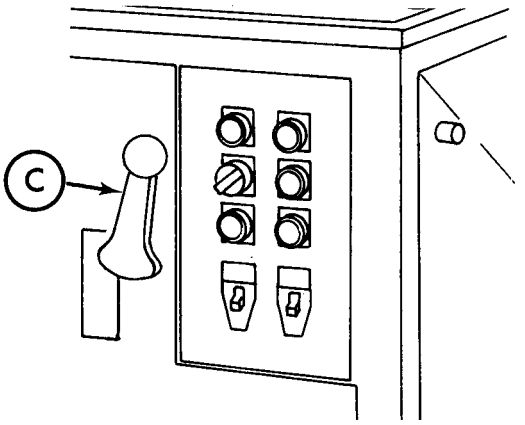
2. Install throttle spring (A) on operating lever assembly (B), with lever in idle position, and secure other end to test stand to hold lever assembly in idle position.

3. Turn HIGH-LOW RANGE speed shifting crank (C) to HIGH RANGE.



4. Press START button switch (D).



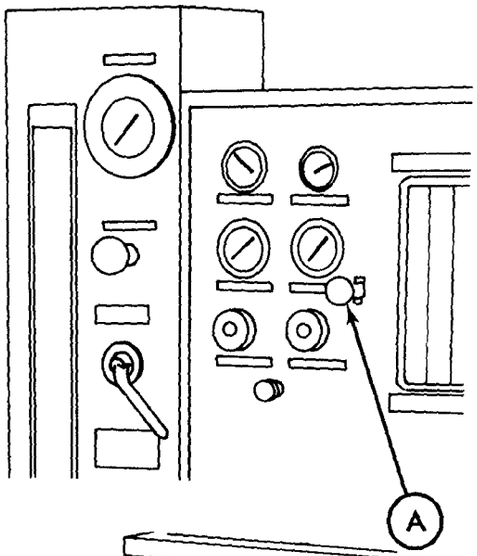


TA245175

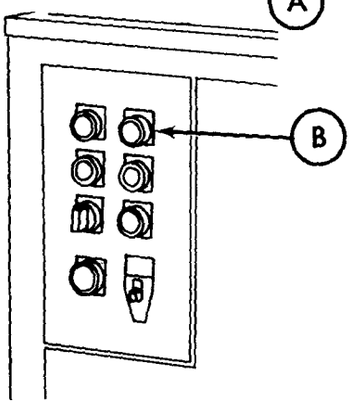
CALIBRATION—Continued

5. Push fuel dumping lever (A) in to empty burettes.

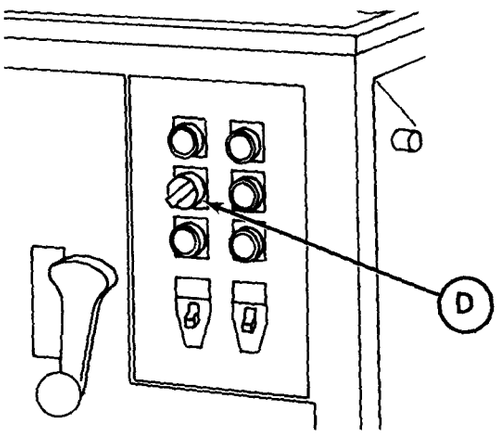
6. Pull fuel dumping lever (A) out.

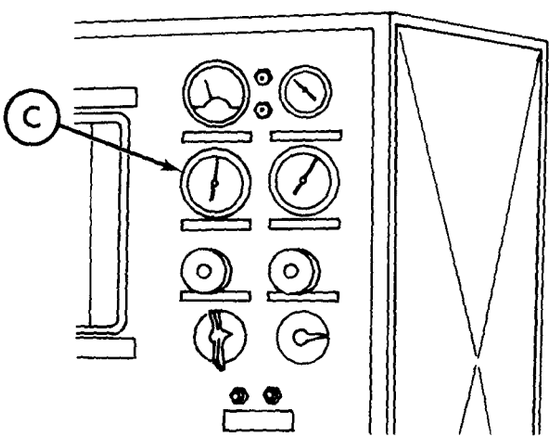


7. Press FAST button switch (B) and hold until 650 rpm registers on TACHOMETER (C).



8. Turn 500-1000-OFF count switch (D) to 1000.





TA245176

CALIBRATION — Continued

9. Press START COUNT button switch (A).

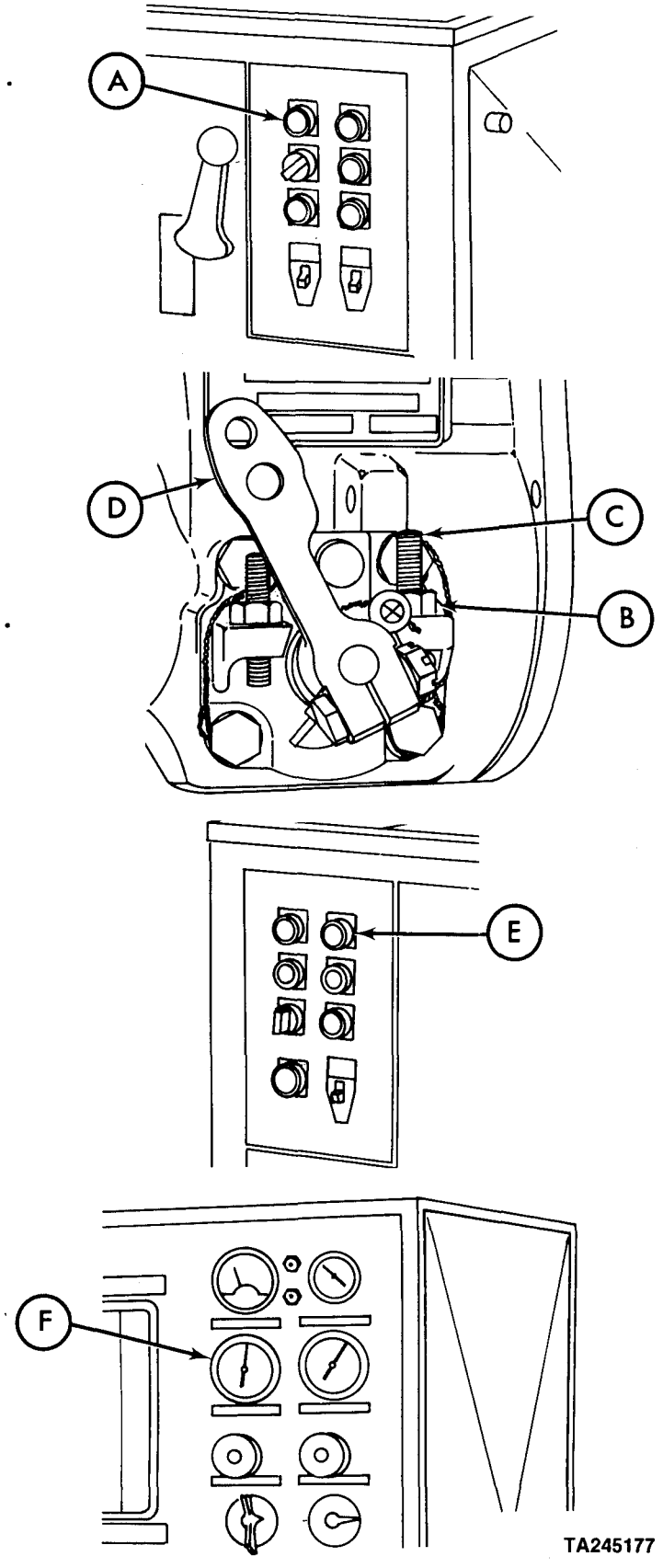
10. Flow rate must be 24 to 26 cc's in each burette at end of count.

11. If flow rate is within 24 to 26 cc range, proceed to step 14. If flow rate is not within the 24 to 26 cc range, proceed to step 12.

12. Using 7/16 in. open end wrench, loosen lock nut (B). Using screwdriver, turn adjusting screw (C) clockwise to increase fuel flow. Turn screw counterclockwise to decrease fuel flow. Tighten lock nut.

13. If flow rate is not within the 24 to 26 cc range, repeat step 12 until flow rate is within 24 to 26 cc range. Proceed to step 14.

14. At 650 rpm, hold pump operating lever (D) in idle position. Press and hold FAST button switch (E) to increase speed to 1000 rpm on TACHOMETER (F).

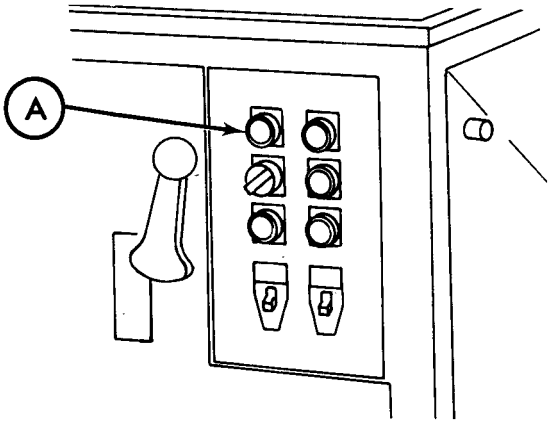


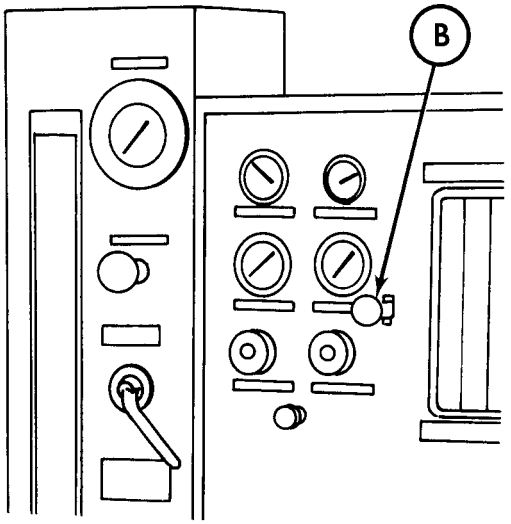
TA245177

CALIBRATION—Continued

15. Press START COUNT button switch (A). There should be no fuel flow.

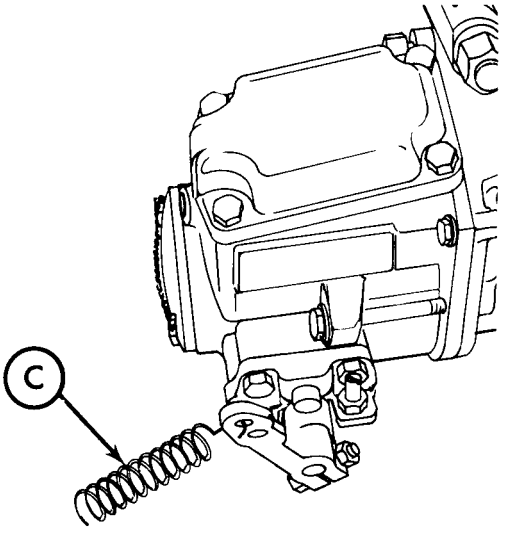
16. Slowly reduce speed. Fuel flow should resume between 750 and 700 rpm.





17. Push fuel dumping lever (B) in to empty burettes.

18. Pull fuel dumping lever (B) out.



19. Remove throttle spring (C).

End of Task

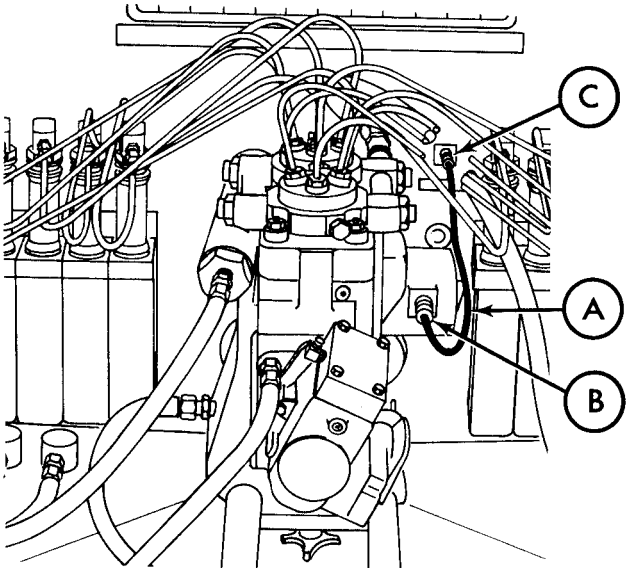
CALIBRATION—Continued

CHECK ELECTRIC AND MANUAL FUEL SHUT-OFF

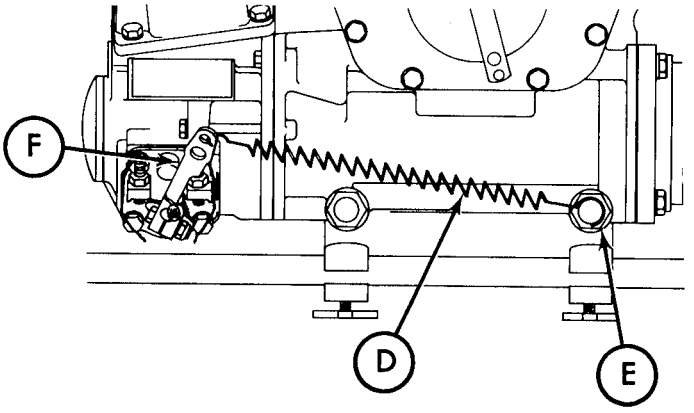
TOOLS: None.

SUPPLIES: None.

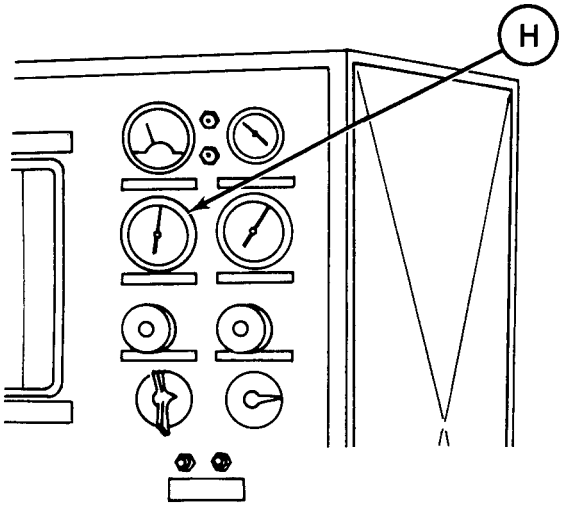
1. Connect solenoid fuel shut-off cable (A) to solenoid electrical receptacle connector (B) and to connector (C) on test stand.

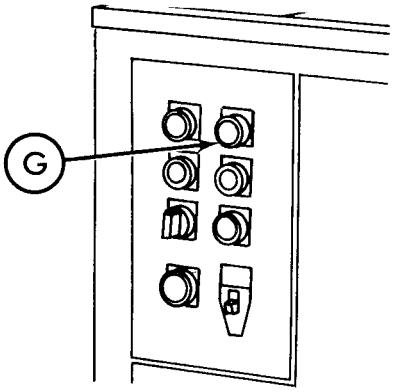


2. Install throttle spring (D) between stud (E) on pump mounting bracket and pump operating lever assembly (F) to hold lever in full throttle position illustrated.



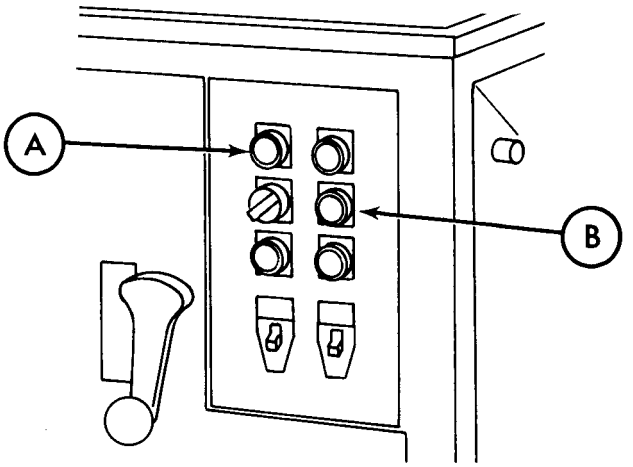
3. Press FAST button switch (G) and hold until 2440 rpm registers on TACHOMETER (H).



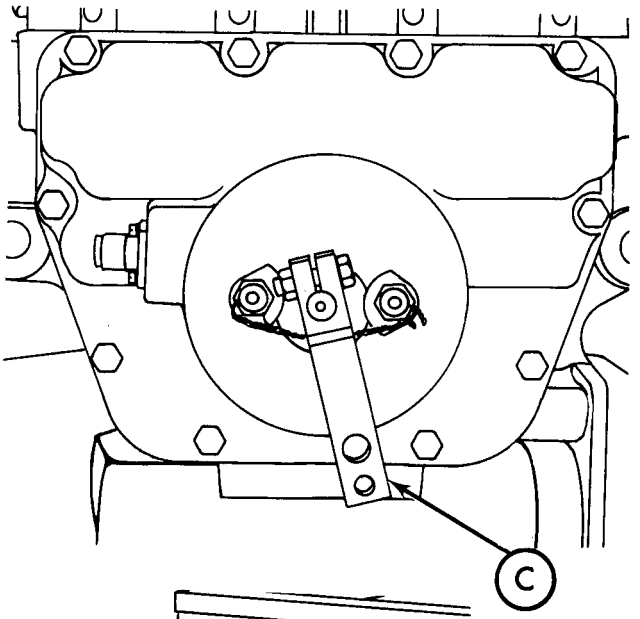


TA245179

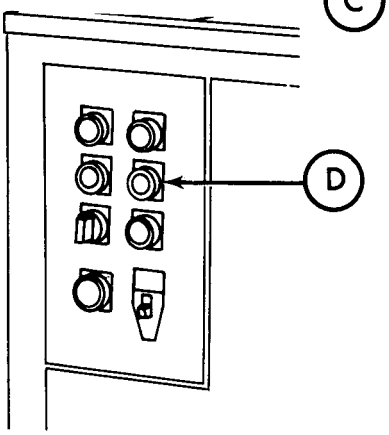
CALIBRATION—Continued



4. Press START COUNT button switch (A). After fuel begins to flow into burettes, push 24 VDC button switch (B). Fuel flow into burettes should cut off cleanly. Release switch. Fuel flow should resume. If fuel does not cut off cleanly, the electrical solenoid is faulty and must be replaced (page 3-73).



5. After fuel begins to flow into burettes, move manual remote control lever (C) toward front of pump until it contacts the internal stop. Fuel flow should cut off cleanly. If not, the solenoid must be replaced (page 3-73).



6. Press and hold SLOW button switch (D) to reduce speed to minimum.

End of Task

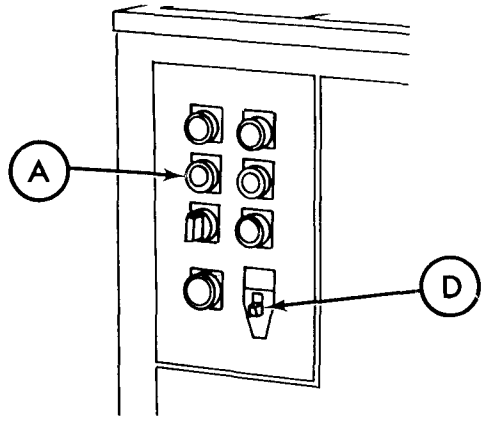
TA245180

CALIBRATION—Continued

SHUT DOWN STAND AND REMOVE PUMP

TOOLS: None.

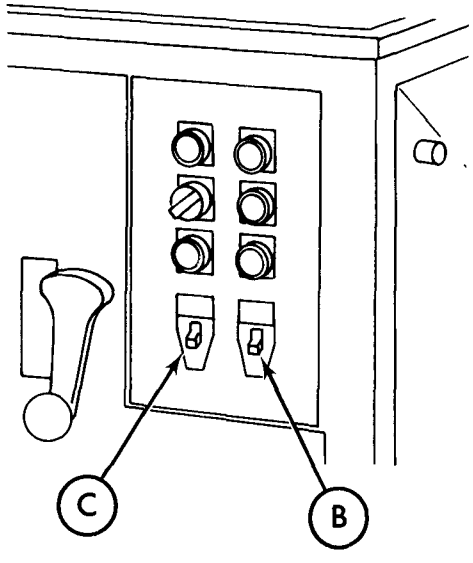
SUPPLIES: None.



1. Press STOP button switch (A).
2. Turn FUEL HEAT switch (B) OFF.
3. Turn LUBE HEAT switch (C) OFF.
4. Turn AUXILIARY MOTOR switch (D) OFF.

WARNING

Pump will be hot after test. Allow time for pump to cool before removing it from the test stand.



5. Remove pump from test stand (refer to TM 9-4910-387-14-1).

End of Task

TA245181

CALIBRATION—Continued

INSTALL LOCK WIRE AND TAPE

TOOLS:

None.

SUPPLIES:

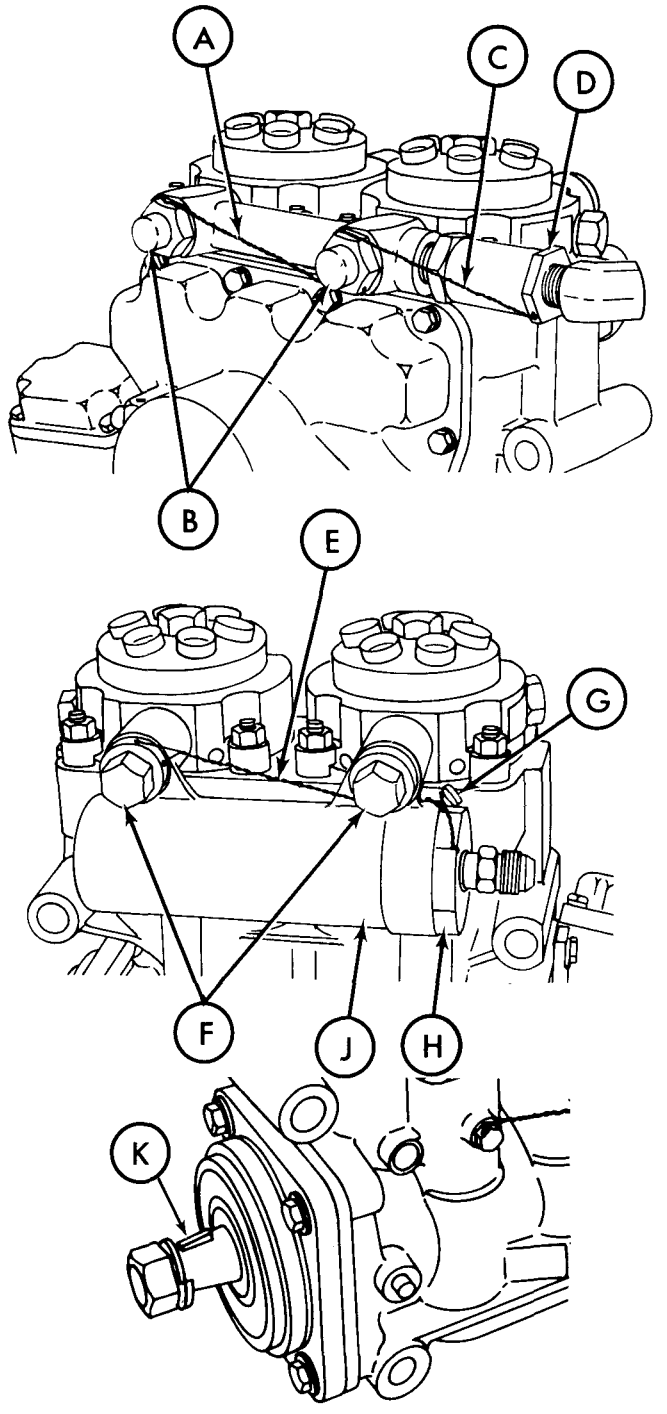
Wire (Item 10, Appendix C)
Seal

1. Install twisted lock wire (A) to secure fuel outlet housing nuts (B).
2. Install twisted lock wire (C) to secure bleeder valve retainer (D) to nut (B).
3. Install twisted lock wire (E) to secure filter assembly nuts (F).
4. Install seal (G) to secure filter assembly cap (H) to filter assembly housing (J).
5. Apply tape over Woodruff key (K) and around camshaft to retain key.

NOTE

If pump has been adjusted to meet all test and calibration requirements, repair is not required. The pump can be returned to service after preparation in accordance with Chapter 4, Section II.

End of Task



TA245182

CHAPTER 3

MAINTENANCE OPERATIONS

Section I. GENERAL

3-1. PURPOSE.

a. General. This chapter provides instructions for disassembly, cleaning, inspection, repair, and reassembly of the metering and distributing fuel pump. You will be referred to the appropriate task in this chapter after you perform Inspection (page 2-6), Testing (page 2-16), or Troubleshooting (page 2-11). The step-by-step procedures are accompanied by illustrations which are keyed to the instructions.

Refer to TM 9-2350-215-1-4 for instructions on how to secure parts with lockwire.

b. Torque Values. All torque values specified are wet (lubricated) values.

c. Mount Pump. Refer to page 2-8 for pump mounting instructions.

Section II. REPAIR PARTS

3-2. KITS AND SETS.

Requestion the following Parts Kits, Gasket Set, and Shim Set for reassembly of the pump.

Part Name	Part Number	National Stock Number
Gasket and Preformed Packing Set	5702632	5330-00-786-5239
Shim Set: Governor Springs	5702638	5365-00-786-5238
Parts Kit: Fuel Inlet Filter	5702739	2910-00-801-1154
Parts Kit: Fuel Control	5702765	2910-00-221-4809
*Parts Kit: Fluid Pressure Filter	5704356	2910-00-134-4733
Parts Kit, Metering and Distributing	5704369	2910-00-407-2618
Parts Kit: Operating Shaft	5705050	2910-01-043-8182
Parts Kit: Governor Control	5705051	2910-01-050-2520

*This kit should not be requisitioned unless the fuel filter assembly or attaching parts are damaged. Refer to page B-8 for identification.

Section III. DISASSEMBLY INTO SUBASSEMBLIES.

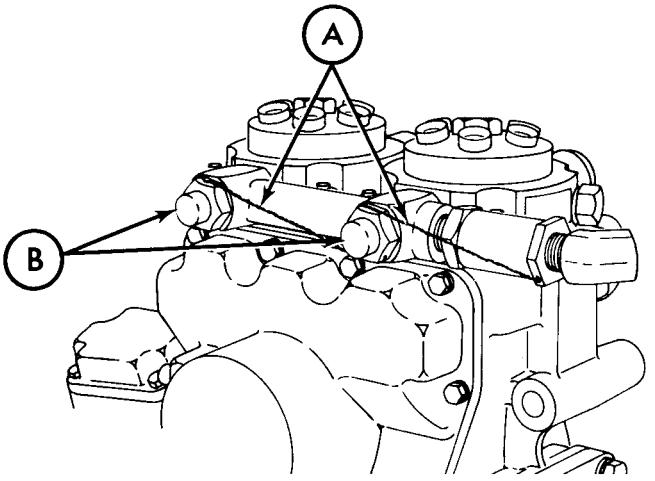
REMOVE HOUSING AND VALVE ASSEMBLY AND BLEEDER VALVE STEMS

TOOLS:

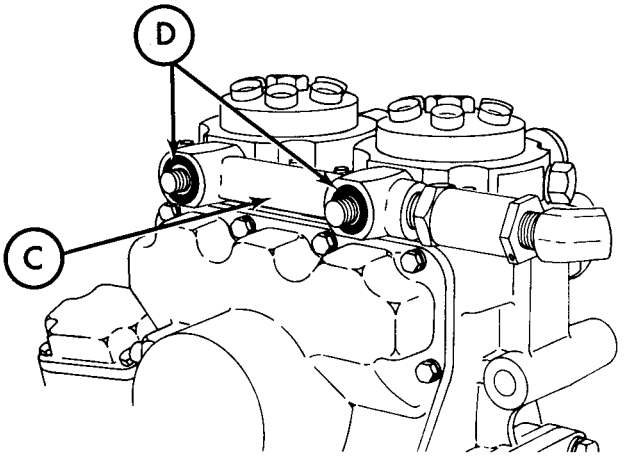
Tool Kit, Automotive Fuel and Electrical System Repair
3/8 to 1/2 in. drive adapter
1 1/8 in. socket

REMOVAL:

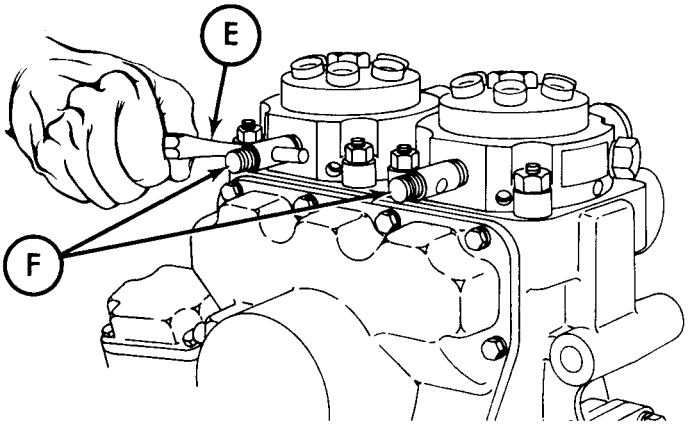
1. Using diagonal cutting pliers, cut and remove wire (A).
2. Using 1 1/8 in. socket and ratchet handle, remove two nuts (B).



3. Remove housing and valve assembly (C).
4. Remove and discard two preformed packings (D) from each side of housing.



5. Using a drift (E), remove two bleeder valve stems (F).



TA245188

End of Task

DISASSEMBLY INTO SUBASSEMBLIES — Continued

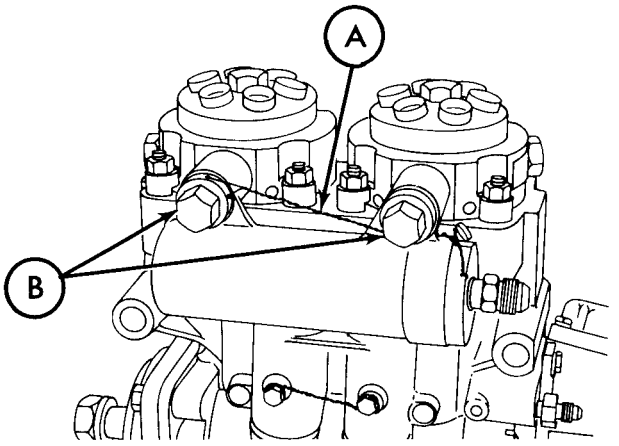
REMOVE FILTER ASSEMBLY AND BLEEDER VALVE STEMS

TOOLS:

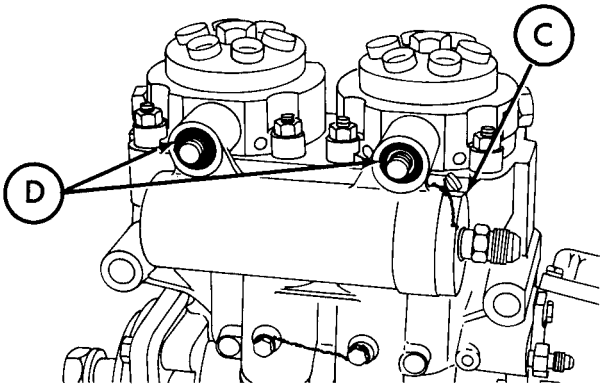
Tool Kit, Automotive Fuel and Electrical System Repair
3/8 to 1/2 in. drive adapter
1 1/8 in. socket

REMOVAL:

1. Using diagonal cutting pliers, cut and remove wire (A). Using 3/4 in. socket and ratchet handle, remove two nuts (B).

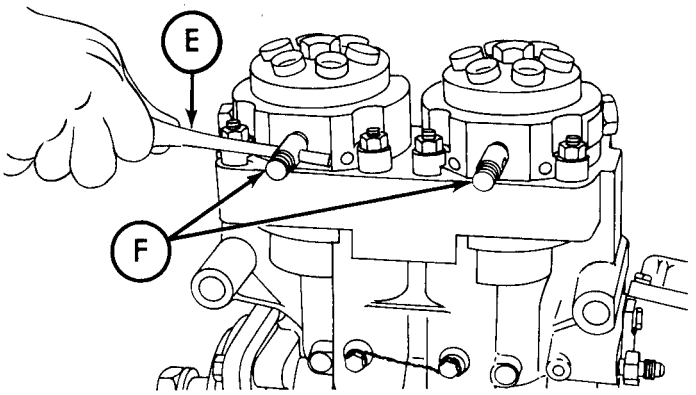


2. Remove filter assembly (C). Remove and discard two preformed packings (D) from each side of manifold housing.



3. Using a drift (E), remove two bleeder valve stems (F).

End of Task



TA245189

DISASSEMBLY INTO SUBASSEMBLIES—Continued

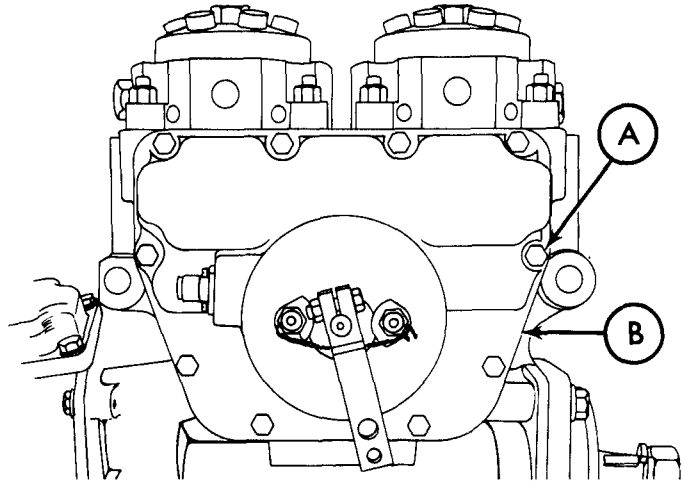
REMOVE COVER AND SOLENOID, AND DISCONNECT GOVERNOR ROD ASSEMBLY

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
5/32 in. socket head screw key

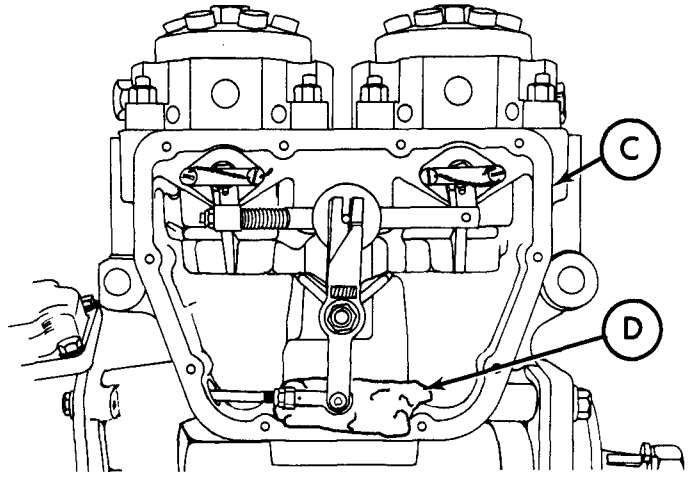
REMOVAL:

1. Using 7/16 in. socket, ratchet handle, and extension, remove 10 bolts and lockwashers (A). Remove cover and solenoid (B).



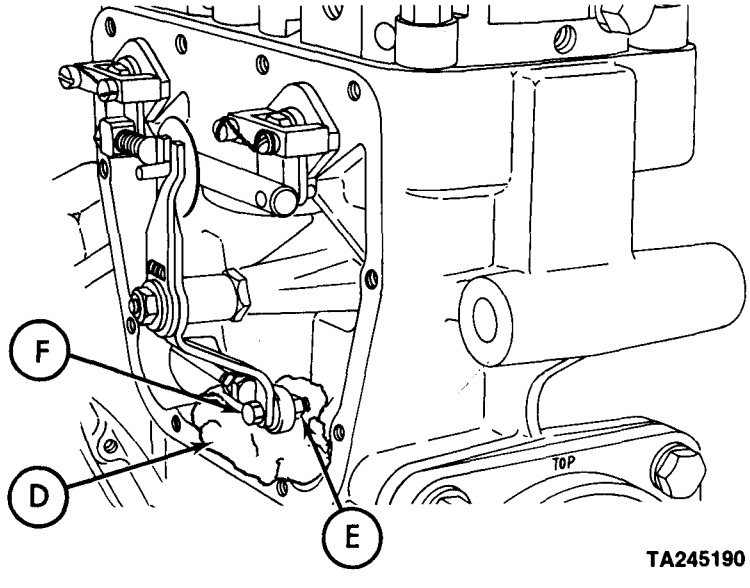
2. Remove and discard gasket (C).

3. Place a clean cloth (D) below the bearing on rod assembly to prevent dropping parts into pump oil sump.



4. Use 3/8 in. open end wrench to hold self-locking nut (E). Using 5/32 in. socket head screw key, remove capscrew (F) and nut (E). Remove cloth (D).

End of Task



TA245190

DISASSEMBLY INTO SUBASSEMBLIES—Continued

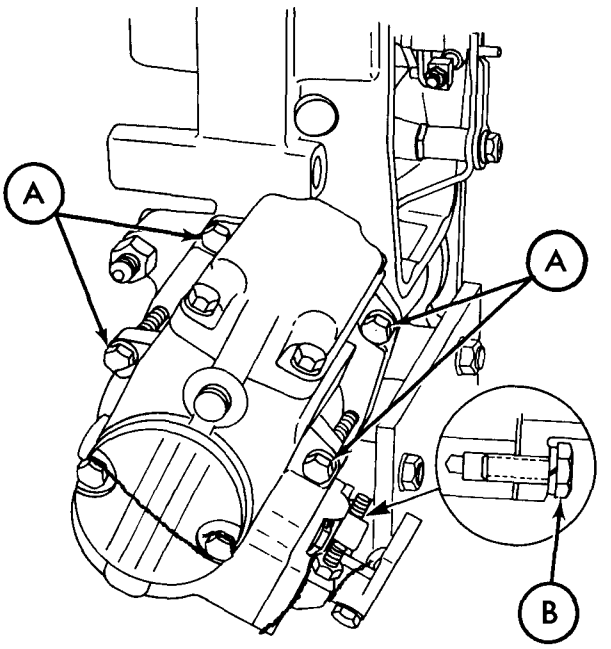
REMOVE GOVERNOR HOUSING

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair

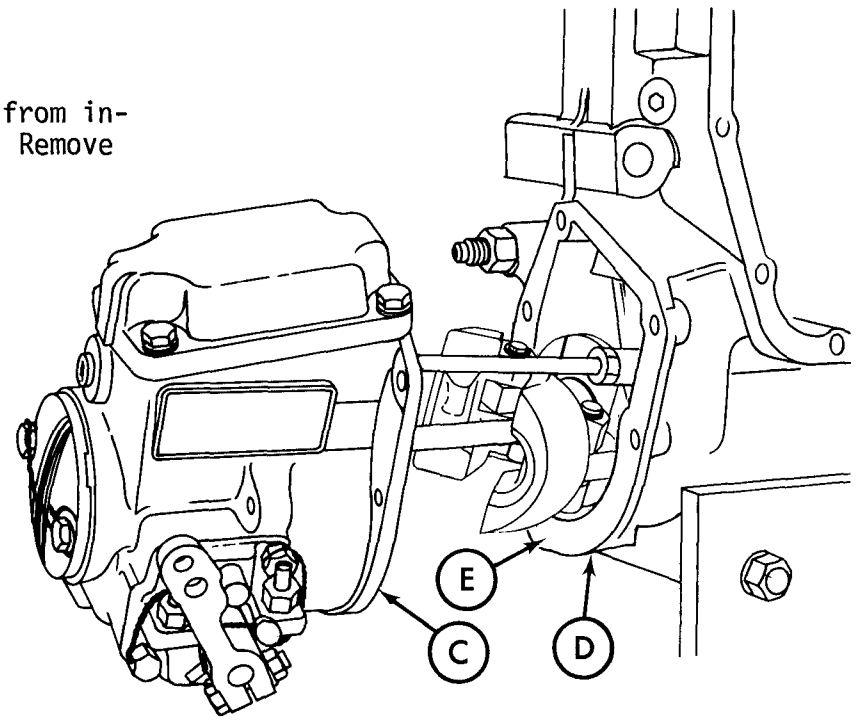
REMOVAL:

1. Using 7/16 in. open end wrench, remove four screws and lockwashers (A).
2. Using 7/16 in. open end wrench, remove one screw and lockwasher (B) from the bottom of governor housing. This screw threads into governor housing (the opposite direction from the other four screws).
3. Discard lockwashers.



4. Pull governor housing (C) from injection pump housing (D). Remove and discard gasket (E).

End of Task



TA245191

DISASSEMBLY INTO SUBASSEMBLIES—Continued

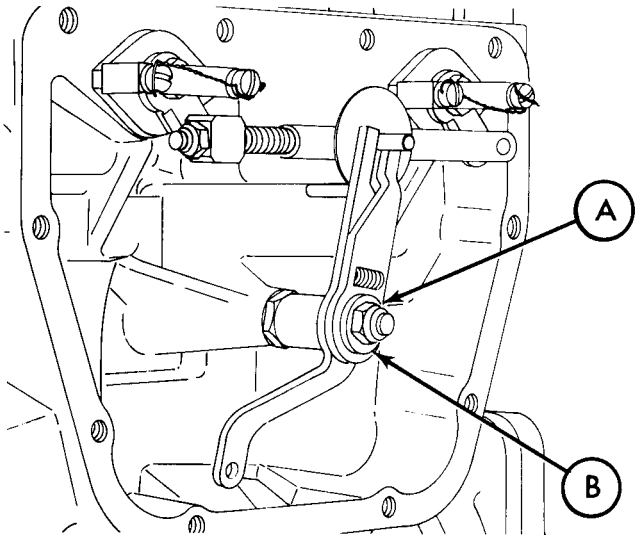
REMOVE LEVER ASSEMBLY AND YOKE ASSEMBLY

TOOLS:

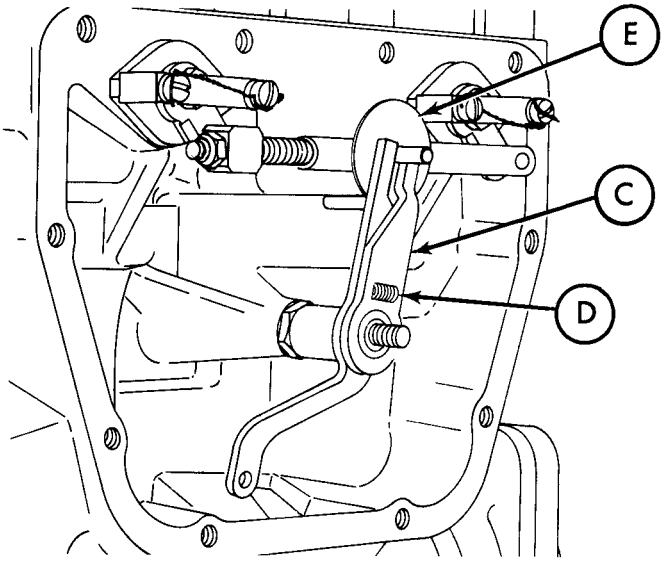
Tool Kit, Automotive Fuel and Electrical System Repair

REMOVAL:

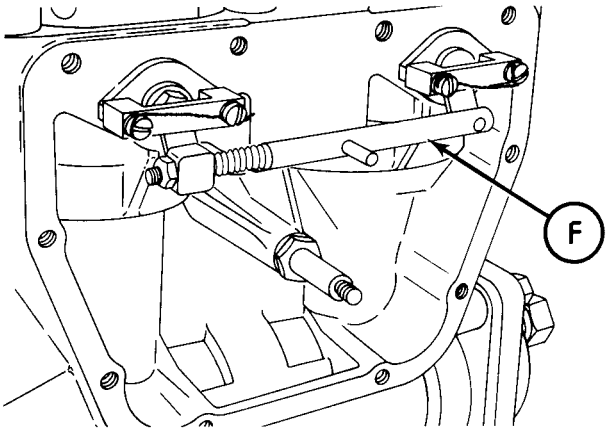
1. Using 7/16 in. wrench, remove nut (A) and flat washer (B). Discard nut and washer.



2. Remove lever assembly (C) and spring (D). Discard levers and spring.
3. Remove and discard yoke spacer (E).



4. Remove and discard yoke assembly (F).



End of Task

TA245192

DISASSEMBLY INTO SUBASSEMBLIES—Continued

REMOVE CONTROL UNIT ASSEMBLIES

TOOLS:

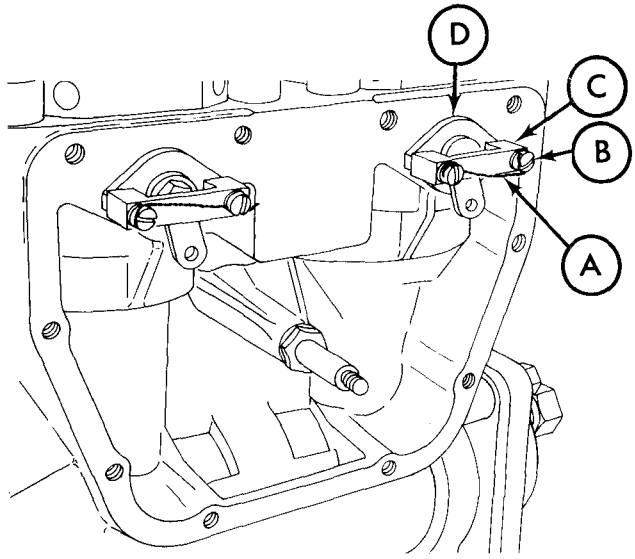
Tool Kit, Automotive Fuel and Electrical System Repair

SUPPLIES:

Tape (Item 9, Appendix C)
Pencil

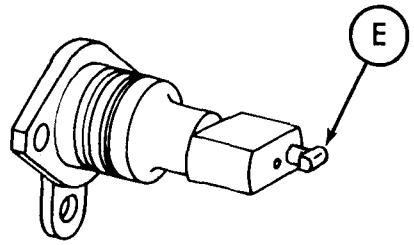
REMOVAL:

1. Using diagonal cutting pliers, cut and remove wire (A).
2. Using screwdriver, remove two screws (B) and retainer (C).



3. Remove control unit assembly (D). Tape shoulder pin (E) to control unit to prevent loss. Tag control unit assembly (D) with a number 1 or 2 for identification.
4. Repeat steps 1. through 3. for the remaining retainer and control unit assembly.

End of Task



TA245193

DISASSEMBLY INTO SUBASSEMBLIES—Continued

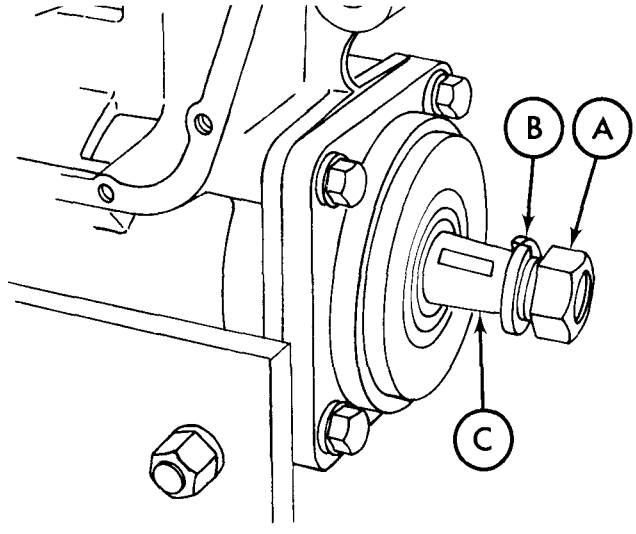
REMOVE HEAD ASSEMBLY NO. 2

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
3/8 to 1/2 in. drive adapter
Steel rod (fabricated tool), page 2-3
1 1/16 in. deep well socket
Turning and holding wrench (special tool)

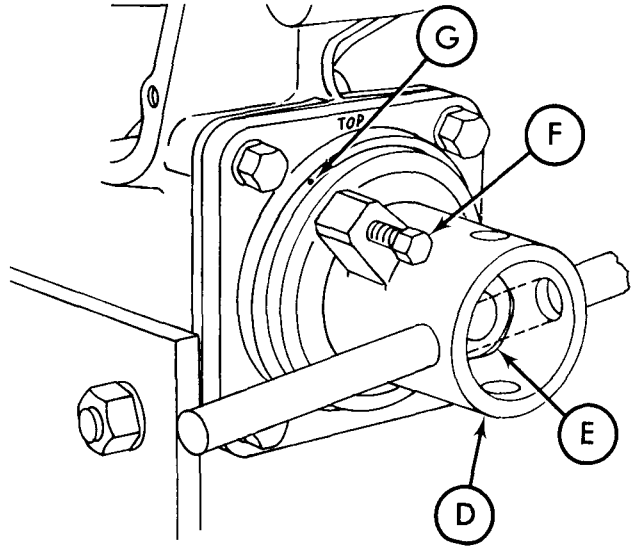
REMOVAL:

1. Remove nut (A) and lockwasher (B) from camshaft (C).



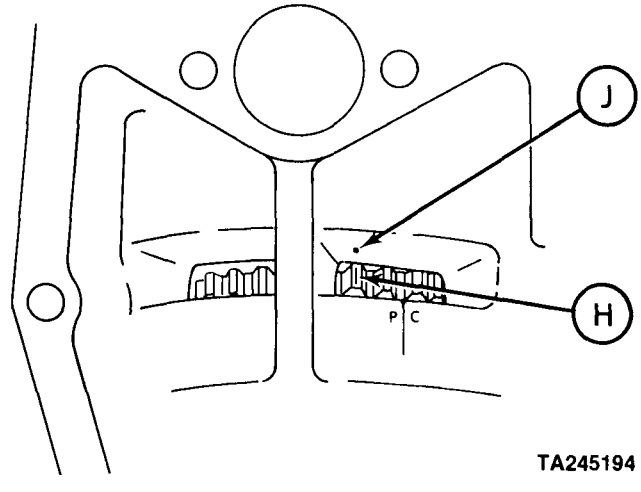
2. Aline keyway slot in camshaft turning and holding wrench (D) with Woodruff key in camshaft, and install wrench on camshaft. Using 1 1/16 in. deep well socket and ratchet handle, secure wrench (D) with lockwasher and plain nut (E).

3. Using steel rod, turn wrench (D) counterclockwise to aline locking screw (F) on wrench with No. 2 punch mark (G) on plate.



4. Check position of slotted tooth (H) on spur gear. The slotted gear tooth should be alined with punch mark (J) in pump housing. If tooth is not alined with punch mark, rotate wrench counterclockwise one complete turn to aline the slotted tooth.

5. Using 7/16 in. box end wrench, tighten locking screw (F).

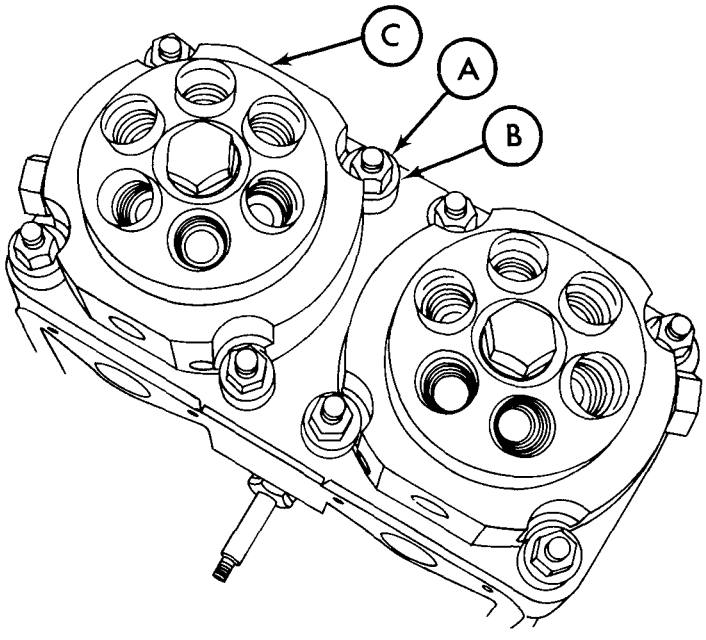


TA245194

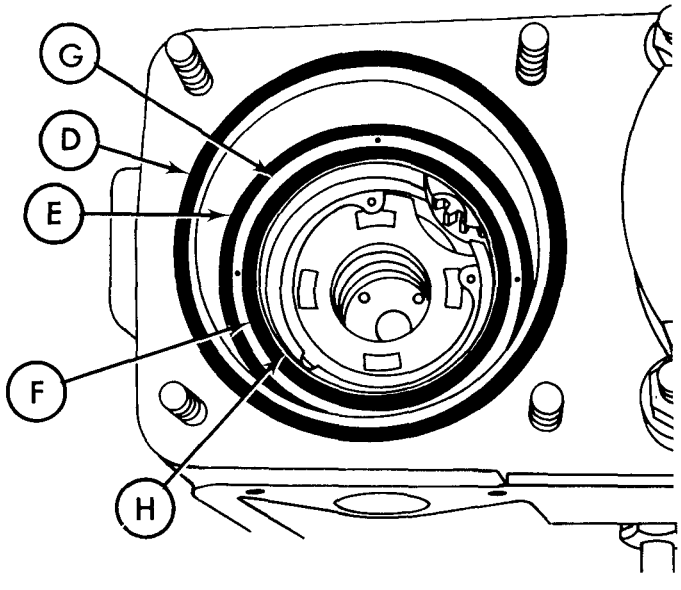
DISASSEMBLY INTO SUBASSEMBLIES—Continued

NOTE

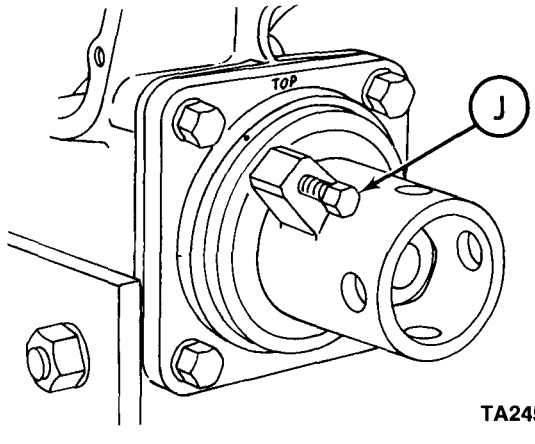
The pump head assemblies are spring-loaded. Maintain pressure while removing nuts. Remove nuts alternately and evenly.



6. Using 1/2 in. deep well socket, ratchet handle, and extension, remove four nuts (A).
7. Remove four spacers (B).
8. Remove pump head assembly (C) from pump housing.



9. Remove and discard preformed packings (D), (E), and (F). Remove ring spacer (G). Remove spacer ring (H).



10. Using 7/16 in. box end wrench, loosen locking screw (J).

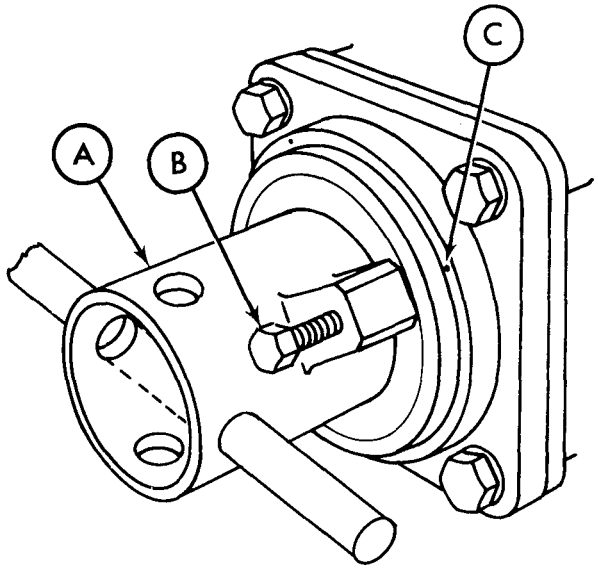
End of Task

TA245195

DISASSEMBLY INTO SUBASSEMBLIES—Continued

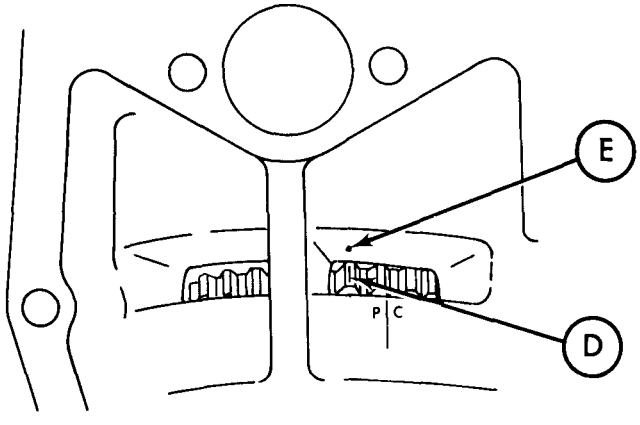
REMOVE HEAD ASSEMBLY NO. 1

Tool Kit, Automotive Fuel and Electrical System Repair
3/8 to 1/2 in. drive adapter
Steel rod (fabricated tool), page 2-3
1 1/16 in. deep well socket



REMOVAL:

1. Using steel rod, turn wrench (A) clockwise 1/4 turn (90°) until locking screw (B) is alined with No. 1 punch mark (C) on plate.

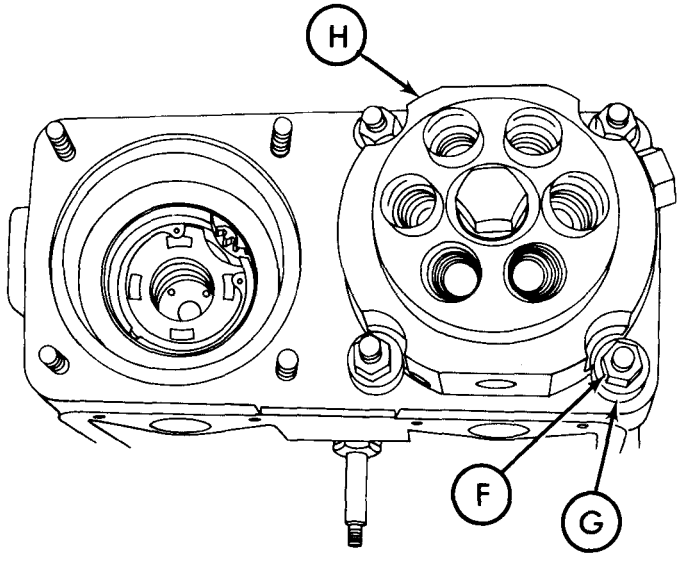


2. Note position of slotted tooth (D) on spur gear. The slotted tooth will be alined with punch mark (E) in the pump housing.

3. Using 7/16 in. box end wrench, tighten locking screw (B).

NOTE

The pump head assemblies are spring-loaded. Maintain pressure while removing nuts. Remove nuts alternately and evenly.



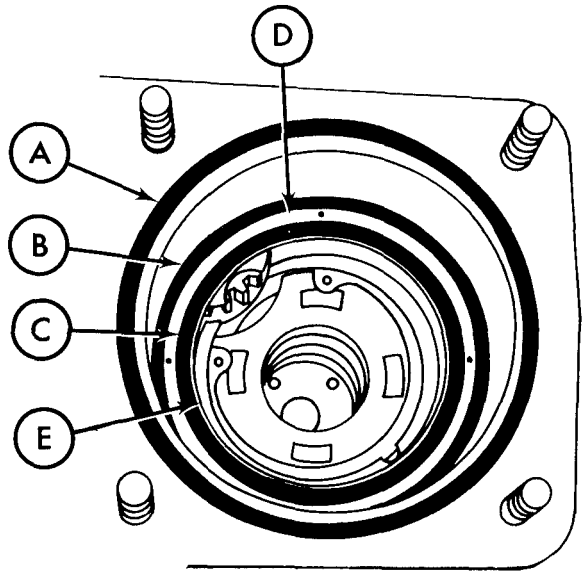
4. Using 1/2 in. deep well socket, ratchet handle, and extension, remove four hexagon plain nuts (F).

5. Remove four spacers (G).

6. Remove pump head assembly (H) from pump housing.

TA245196

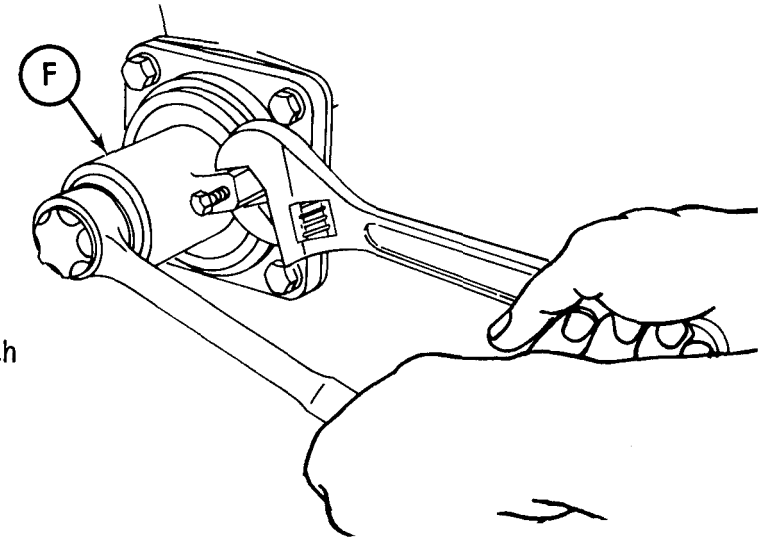
DISASSEMBLY INTO SUBASSEMBLIES—Continued



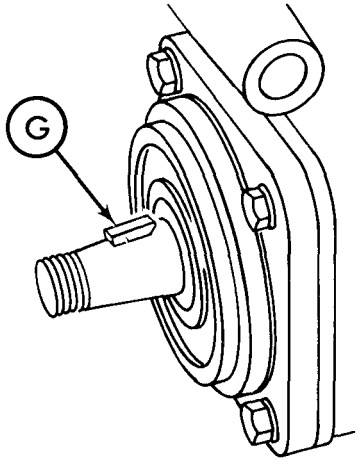
7. Remove and discard preformed packings (A), (B), and (C).

8. Remove ring spacer (D) and spacer ring (E).

9. Using adjustable wrench, 1 1/16 in. deep well socket, and ratchet handle, remove camshaft nut and lockwasher.



10. Remove wrench (F) by tapping with a plastic insert hammer.



11. Remove Woodruff key (G) from camshaft.

TA245197

DISASSEMBLY INTO SUBASSEMBLIES—Continued

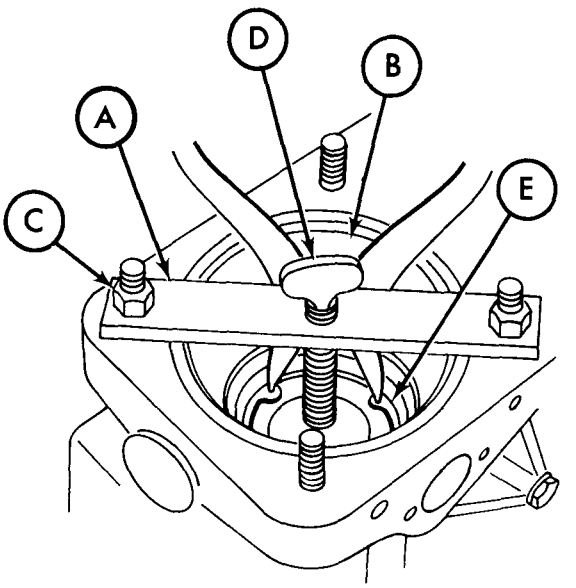
REMOVE TAPPET ASSEMBLIES

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Internal retaining ring pliers (with 0.070 in. dia tips)
Spring seat compressor (special tool)

NOTE

Insure that holes in tappet spring seat retaining ring (E) are accessible after the compressor is installed.



REMOVAL:

1. Place spring seat compressor (A) over head assembly No. 2 bore (B). Secure compressor to pump housing with two head assembly hold-down nuts (C) finger tight.

2. Turn compressor thumb screw (D) slowly clockwise until retaining ring (E) is free. Using internal retaining ring pliers, remove retaining ring (E). Discard retaining ring.

WARNING

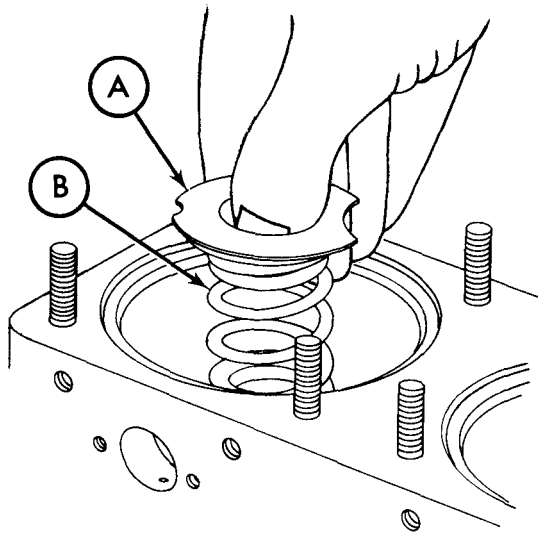
The spring seat assembly is under spring tension and must be removed slowly to prevent injury. Center the spring seat to make sure it does not catch in retaining ring groove during removal.

3. Loosen thumb screw (D) by turning counterclockwise. Remove nuts (C) and compressor (A).

TA245198

DISASSEMBLY INTO SUBASSEMBLIES—Continued

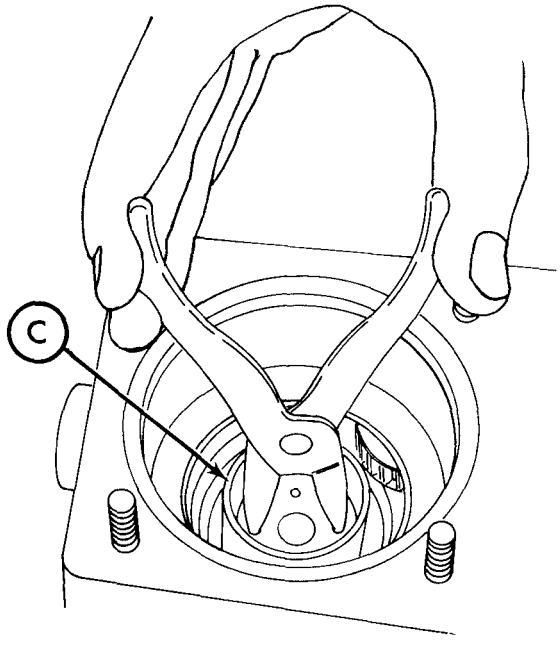
4. Remove tappet spring seat (A) and spring (B).



5. Using internal retaining ring pliers, remove tappet assembly (C).

6. Repeat steps 1. through 5. to remove tappet from head assembly No. 1 bore.

End of Task



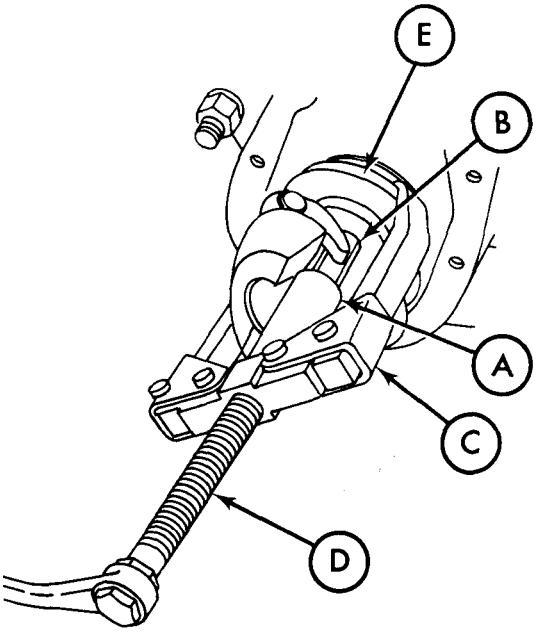
TA245199

DISASSEMBLY INTO SUBASSEMBLIES—Continued

REMOVE GOVERNOR WEIGHT AND SPIDER ASSEMBLY

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Mechanical puller (special tool)
Remover and replacer (special tool)



REMOVAL:

CAUTION

Use extreme care when positioning mechanical puller and remover and replacer to prevent damage to the camshaft extension and the governor weight and spider assembly.

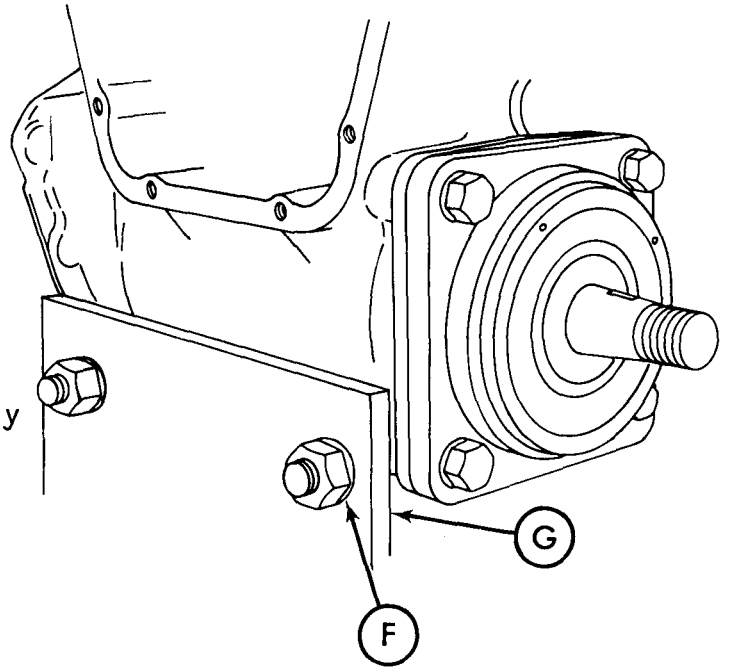
1. Position remover and replacer (A) so it is seated against the camshaft (B).

NOTE

If the remover and replacer does not clear the weight and spider assembly fingers, rotate the camshaft until the tool can be properly seated.

2. Install mechanical puller (C) and, using a 9/16 in. box end wrench, turn puller screw (D) slowly clockwise until weight and spider assembly (E) is removed.

3. Remove pump and holding plate from vise. Remove two nuts, lockwashers, flat washers (F) and bolts, and remove holding plate (G).



End of Task

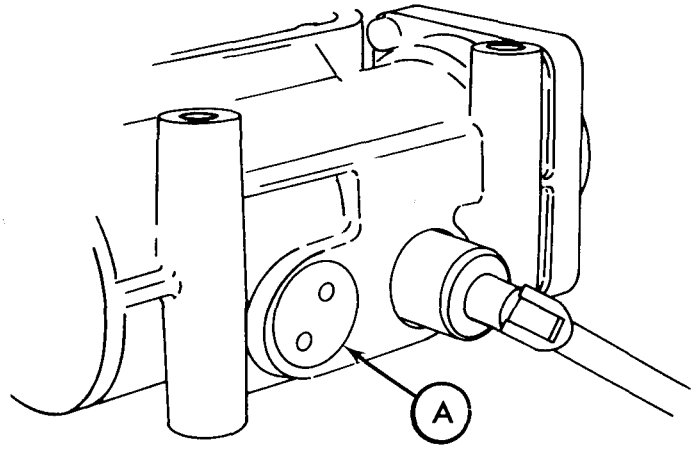
TA245200

DISASSEMBLY INTO SUBASSEMBLIES—Continued

REMOVE GEAR SHAFT ASSEMBLIES

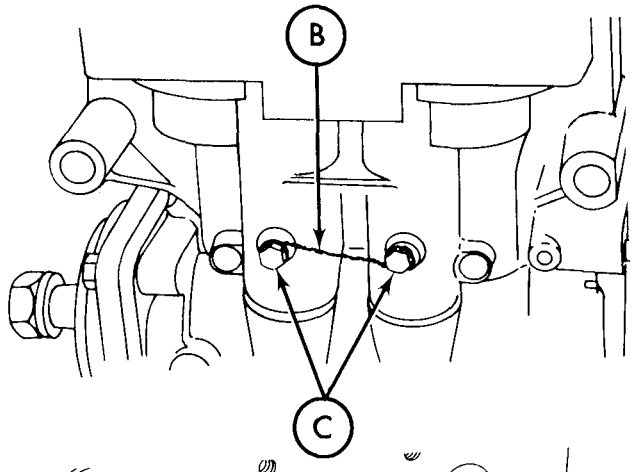
TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Wrench socket (special tool)
9 in. handle with 1/2 in. drive (breaker bar)



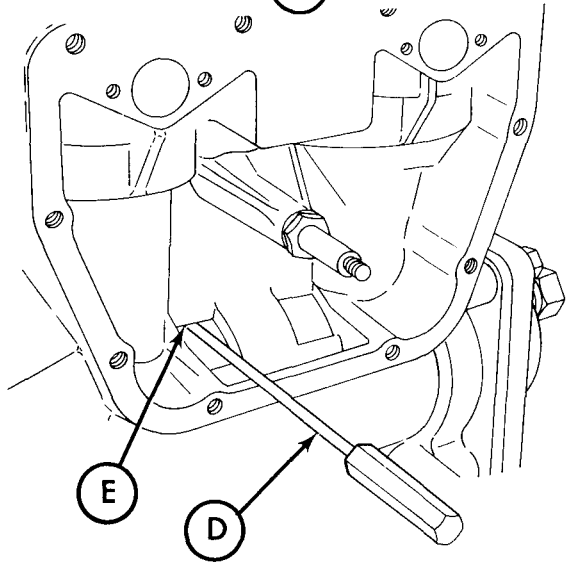
REMOVAL:

1. Using wrench socket and handle, remove two gear shaft assembly plugs (A). Remove and discard two preformed packings.



2. Using diagonal cutting pliers, cut and remove wire (B).

3. Using 7/16 in. box end wrench, remove two machine bolts and flat washers (C). Discard flat washers.



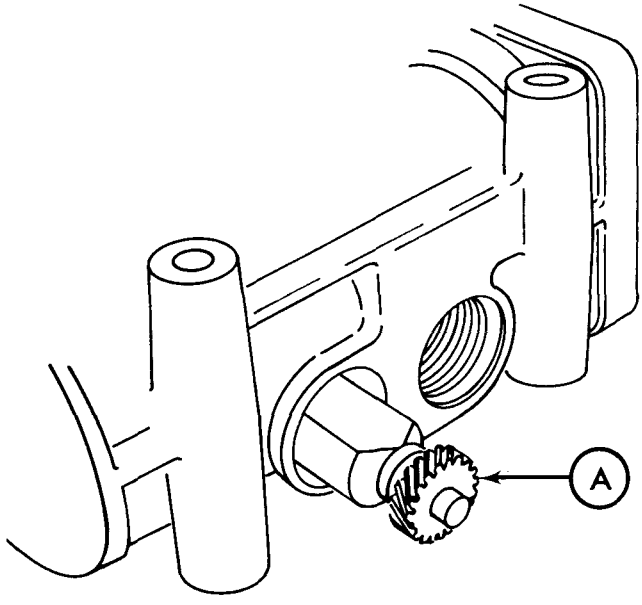
4. Using flat tip screwdriver (D), position flat side of gear shaft assembly (E) toward front of pump.

DISASSEMBLY INTO SUBASSEMBLIES—Continued

5. Remove No. 2 (governor end) gear shaft assembly (A).

6. Remove No. 1 drive end gear shaft assembly by repeating steps 1. through 5.

End of Task



TA245202

DISASSEMBLY INTO SUBASSEMBLIES—Continued

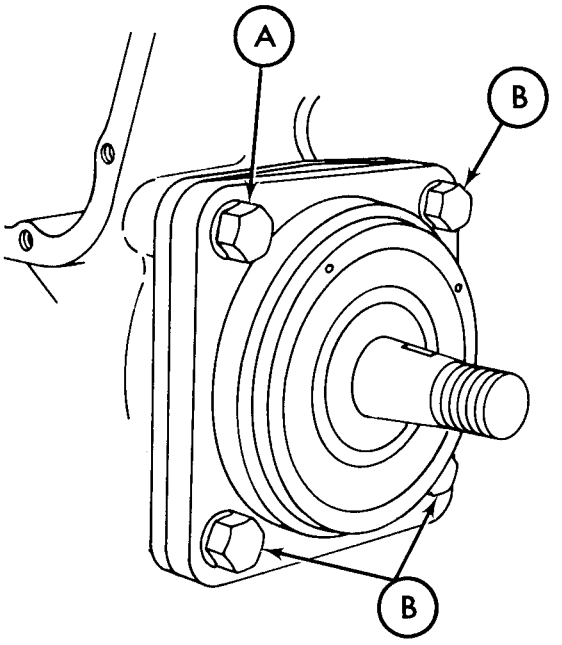
REMOVE RETAINING PLATE AND CAMSHAFT

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair

REMOVAL:

1. Using 9/16 in. socket wrench and ratchet handle, remove shoulder screw and lockwasher (A).
2. Remove the remaining three machine screws and lockwashers (B).



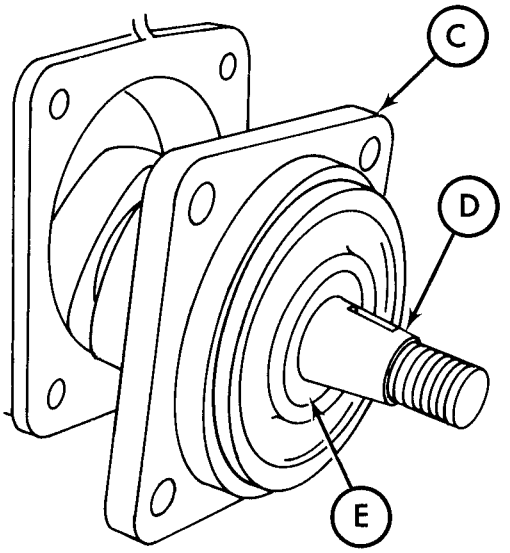
CAUTION

Remove camshaft with care to prevent damage to governor end of camshaft.

3. Remove retaining plate (C) and camshaft (D) as an assembly.

NOTE

Retaining plate may have to be tapped with a plastic hammer in order to be removed.



4. Remove camshaft (D) from retaining plate seal (E).

End of Task

TA245203

Section IV. REPAIR OF SUBASSEMBLIES

3-3. GENERAL.

a. Description of Tasks. The repair task for each subassembly includes DISASSEMBLY, CLEANING, INSPECTION, REPAIR, AND ASSEMBLY, as applicable. You will be referred to the appropriate task in this chapter after you perform Inspection (page 2-6), Testing (page 2-16), or Troubleshooting (page 2-11).

Following repair of any subassembly (ies), the pump must be tested (page 2-16), and calibrated (page 2-40) prior to reissue.

b. Cleanliness. Cleanliness is important. Extreme care must be exercised to insure that the work area, tools, clothes, and hands are clean. Pump parts have close tolerances. Dirt is abrasive, and will cause severe damage to moving parts.

c. Use of Gasket Sets, Shim Sets, and Parts Kits. The kits and sets listed on page 3-1 are required for repair of the pump. When kits and sets are used, use all parts in each kit or set. When all the kits are used, there will be some duplication of parts, particularly gaskets and preformed packings. Duplicate parts, not used during repair, should be discarded.

REPAIR OF SUBASSEMBLIES—Continued

INJECTION PUMP HOUSING

TOOLS:

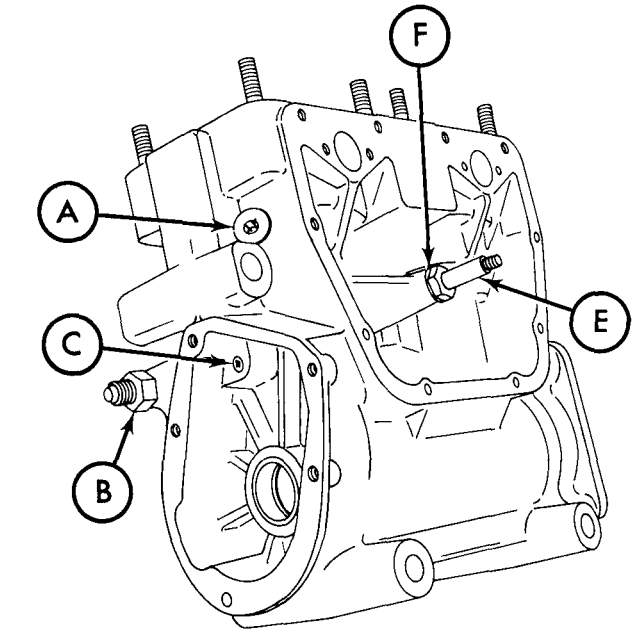
Tool Kit, Automotive Fuel and Electrical System Repair
Bristle brush
Fine mill file
2 in. outside micrometer
Telescope gage, 0.7500 to 1.2500 in. (special tool)
Telescope gage, 1.250 to 2.1250 in. (special tool)
5/32 in. socket head screw key
1/4 in. socket head screw key
Magnifying glass, 5 power
No. 10-24NC-2B thread tap
1/4-20UNC-2B thread tap
5/16-18NC-2B thread tap
3/8-16UNC-2B thread tap
Wood blocks
Arbor press and press plates
Remover and replacer (fabricated tool), page 2-2
Wire probes

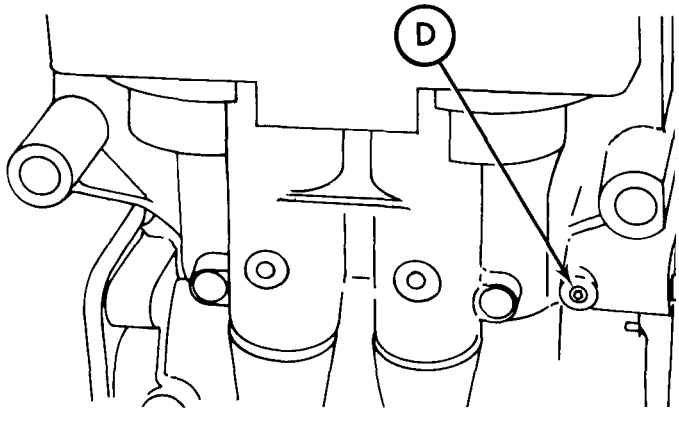
SUPPLIES:

Solvent (Item 7, Appendix C)
Engine oil (Item 3, Appendix C)
Clean cloth (Item 4, Appendix C)
Lever screw from Parts Kit, Part No. 5702765
Ring spacer from Gasket and Preformed Packing Set, Part No. 5702632
Sleeve bearing (if required)

DISASSEMBLY:

1. Using 1/4 in. socket head screw key, remove timing screw plug (A).
2. Remove and discard ring spacer.
3. Using 11/16 in. box end wrench, remove oil inlet adapter (B).
4. Using 5/32 in. socket head screw key, remove two pipe plugs (C) and (D).
5. Using 5/8 in. deep well socket, remove and discard lever screw (E). Remove flat washer (F).





TA245204

REPAIR OF SUBASSEMBLIES—Continued

CLEANING:

WARNING

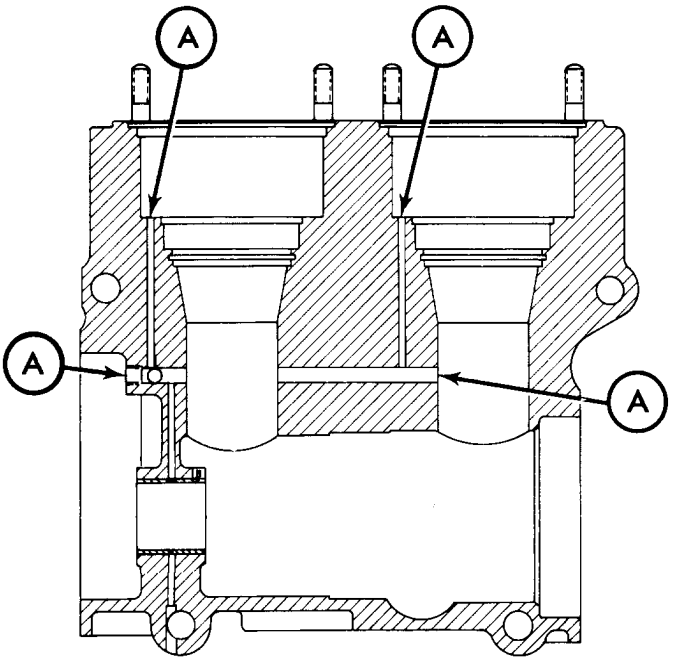
Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

1. Immerse housing in solvent. Clean housing using bristle brush. Clean oil passages (A) with probes.

WARNING

Compressed air used for cleaning purposes will not exceed 30 psi. Use only with effective chip guarding and personal protective equipment (goggles/ shield, gloves, etc).

2. Blow dry with compressed air.

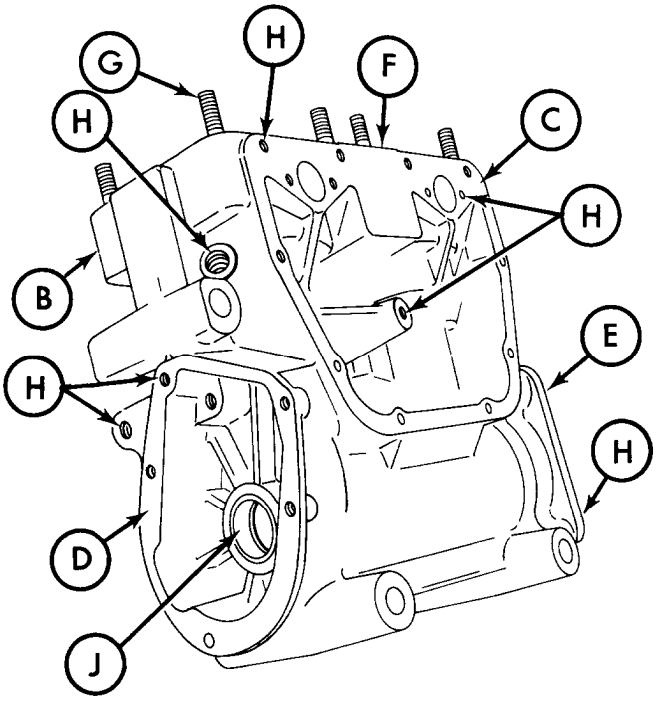


INSPECTION:

1. Inspect housing (B) for cracks using a strong-light and magnifying glass. Look for raised metal, distorted or warped mounting flanges (C), (D), (E), and (F). Replace housing if cracked, or if mounting flanges are distorted.

2. Inspect housing (B) for missing, broken, loose, or damaged studs (G). Inspect tapped holes (H) for thread damage. Replace housing if studs are damaged, loose or missing.

3. Inspect camshaft sleeve bearing bore (J) for scratches, scoring, or looseness. Measure bore diameter (J) using telescope gage and micrometer. Replace damaged bearing. Replace bearing if diameter exceeds 1.1920 in. (30.28 mm).



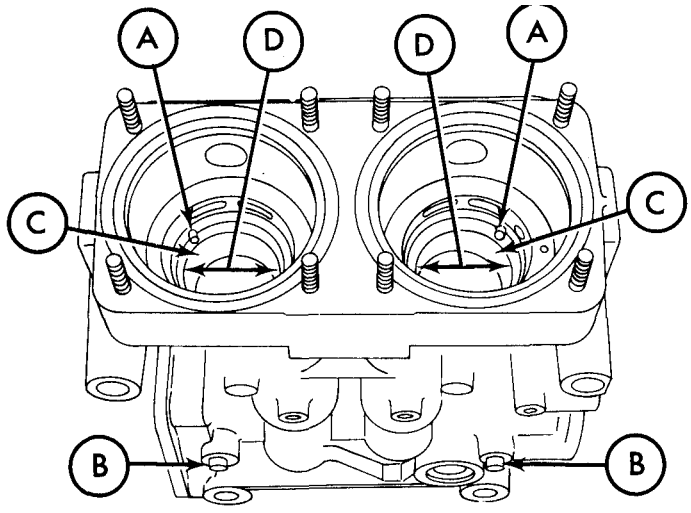
TA245205

REPAIR OF SUBASSEMBLIES—CONTINUED

4. Inspect tappet roll pins (A) for looseness. Replace housing if roll pins are loose or missing.

5. Inspect for loose or damaged dowel pins (B). Replace housing if dowel pins are loose or missing.

6. Inspect tappet bores (C) for scratches or scoring. Measure bores (D) using telescope gage and micrometer. Replace housing if tappet bore diameter exceeds 1.6300 in. (41.40 mm).



REPAIR:

1. Smooth small nicks or raised metal with a fine mill file.

2. Repair minor straight thread damage in tapped holes using a thread tap.

3. Replace worn or damaged sleeve bearing as follows:

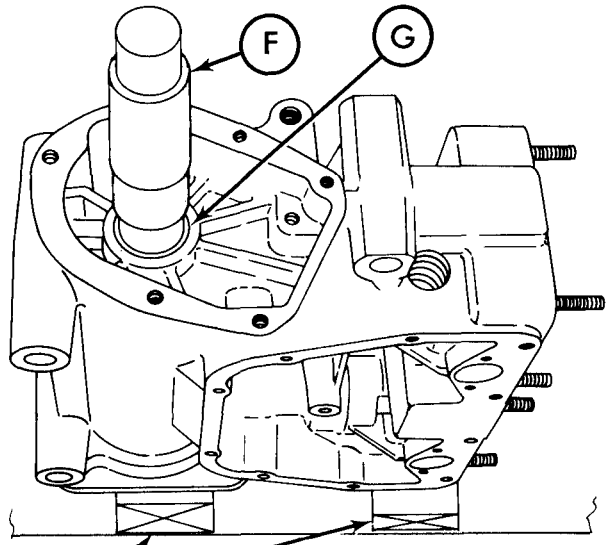
   a. Using wood blocks (E) to support housing, place housing on an arbor press with governor end up.

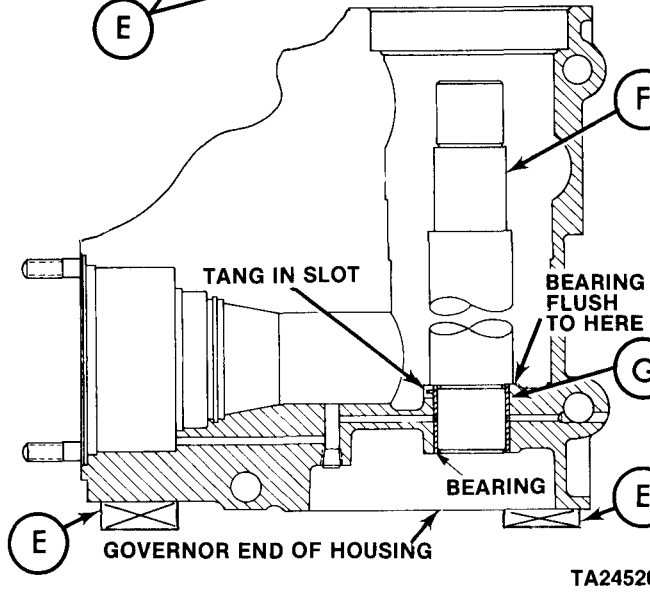
   b. Using remover and replacer (F), press sleeve bearing (G) from bore. Discard bearing.

   c. Remove remover and replacer (F). Using wood blocks (E) to support housing, place housing on arbor press with the governor end down.

   d. Place new bearing (G) over bore, with tang alined with slot in bearing boss.

   e. Using remover and replacer (F), press bearing into bore. The bearing must be flush with boss inner face.





TA245206

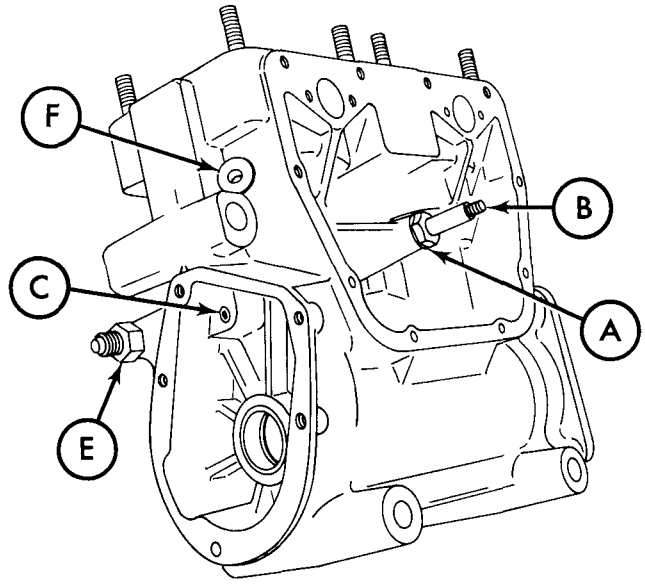
REPAIR OF SUBASSEMBLIES—Continued

f. Bearing must be line bored. Have a machinist line bore the bearing in accordance with specifications provided in Appendix D.

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

g. Clean housing using solvent. Wipe dry with a clean, lint-free cloth.

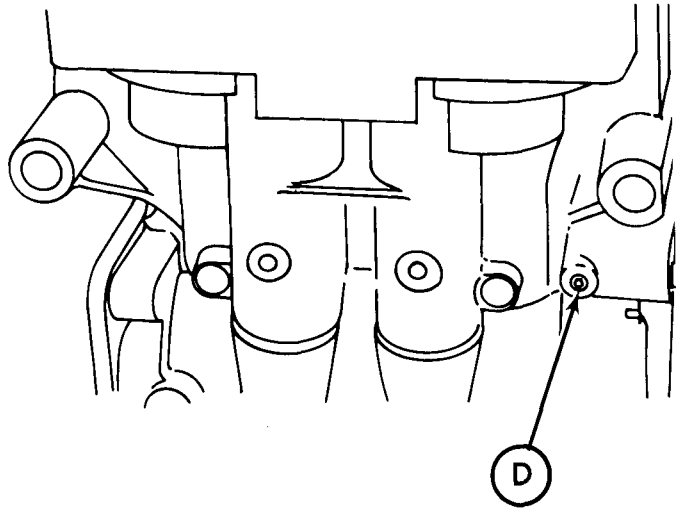


ASSEMBLY:

NOTE

Coat all parts with a light film of engine oil.

1. Install flat washer (A).
2. Using 5/8 in. deep well socket, install new lever screw (B).
3. Using 5/32 in. socket head screw key, install two pipe plugs (C) and (D).
4. Using 11/16 in. box end wrench, install oil inlet adapter (E).
5. Using 1/4 in. socket head screw key, install timing screw plug (F) with new ring spacer.



End of Task

TA245207

REPAIR OF SUBASSEMBLIES—Continued

RETAINING PLATE

TOOLS:

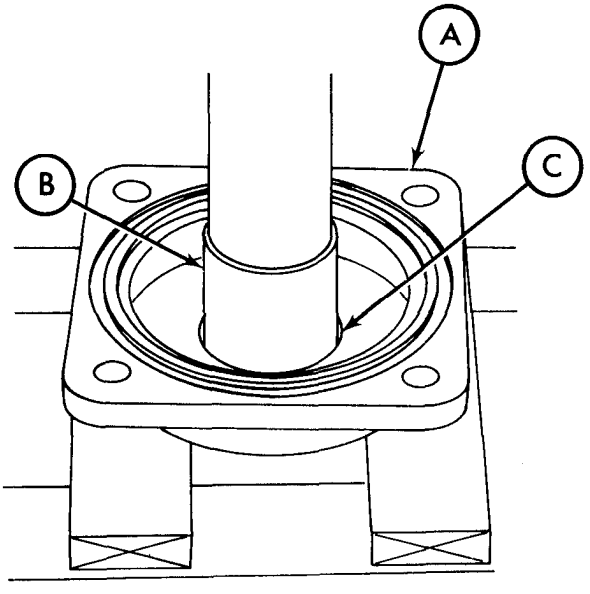
Magnifying glass, 5 power
Arbor press and press plates
1 1/2 in. pressing arbor
Fine mile file
Bristle brush

SUPPLIES:

Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)
Seal, from Gasket and Preformed Packing Set, Part No. 5702632

DISASSEMBLY:

1. Place retaining plate (A) on arbor press.
2. Using a 1 1/2 in. diameter pressing arbor (B), press seal (C) from plate. Discard seal.



CLEANING:

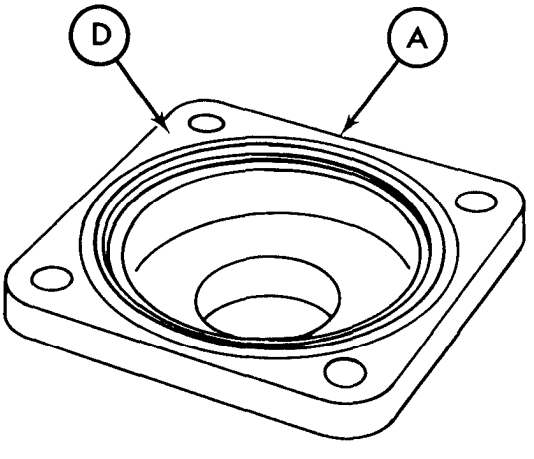
WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

1. Clean plate using bristle brush moistened with solvent.
2. Wipe dry with clean lint-free cloth.

INSPECTION:

1. Inspect plate (A) for cracks using strong light and magnifying glass.
2. Look for raised metal, distorted, or warped mounting flange (D).
3. Replace plate if cracked, or if mounting flange is distorted.



REPAIR:

a. Smooth small nicks or raised metal with a fine mill file.
b. No other repairs are authorized.

TA245208

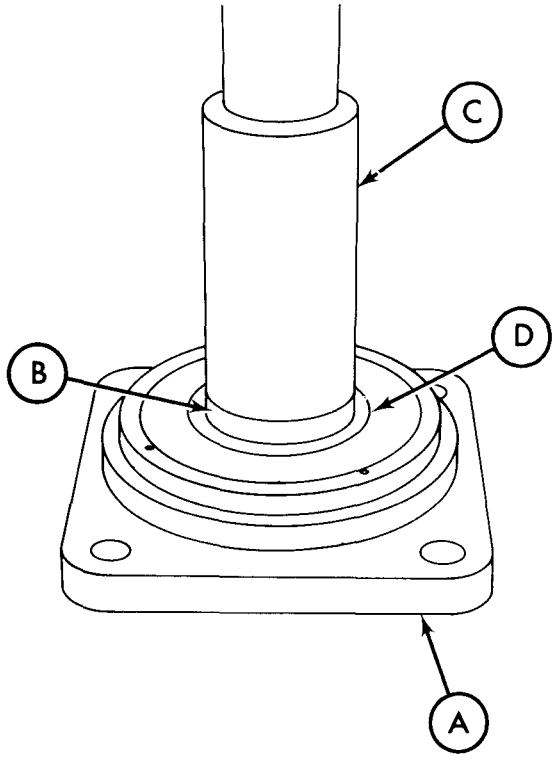
ASSEMBLY:

NOTE

Coat plate with a light film of engine oil.

1. Place plate on arbor press with mounting flange (A) down.
2. Place new seal (B) over bore with metal face up.
3. Using 1 1/2 in. diameter pressing arbor (C), press seal until flush with top surface of plate (D).

End of Task



TA245209

REPAIR OF SUBASSEMBLIES—Continued

CAMSHAFT AND ASSOCIATED PARTS

TOOLS:

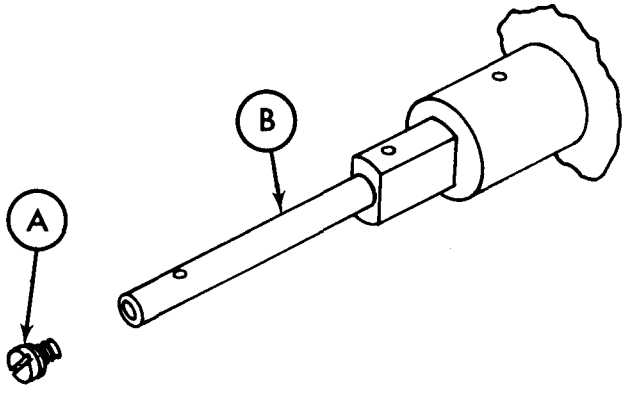
Fine mill file
2 in. outside micrometer
Magnifying glass, 5 power
Wire probe
Arbor
Spanner wrench
Machinist's vise with vise jaw caps
Steel bar (2) (fabricated tool), page 2-4

SUPPLIES:

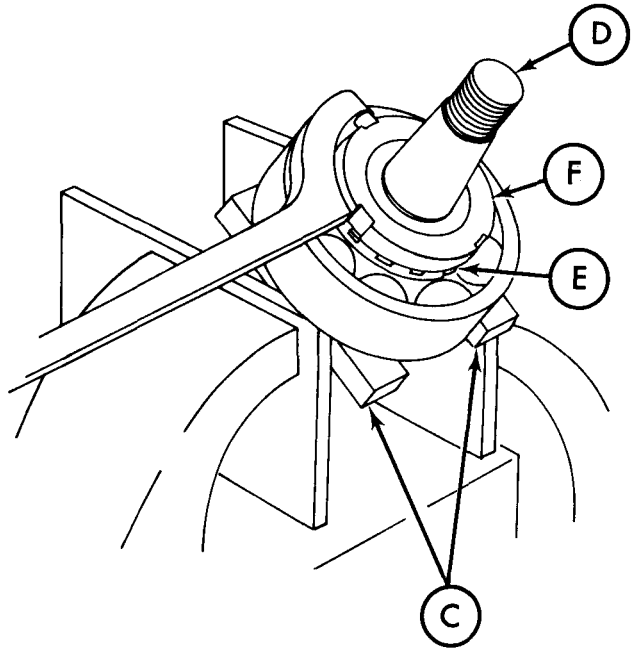
Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)
Key washer

DISASSEMBLY:

1. Remove screw (A) from camshaft (B).

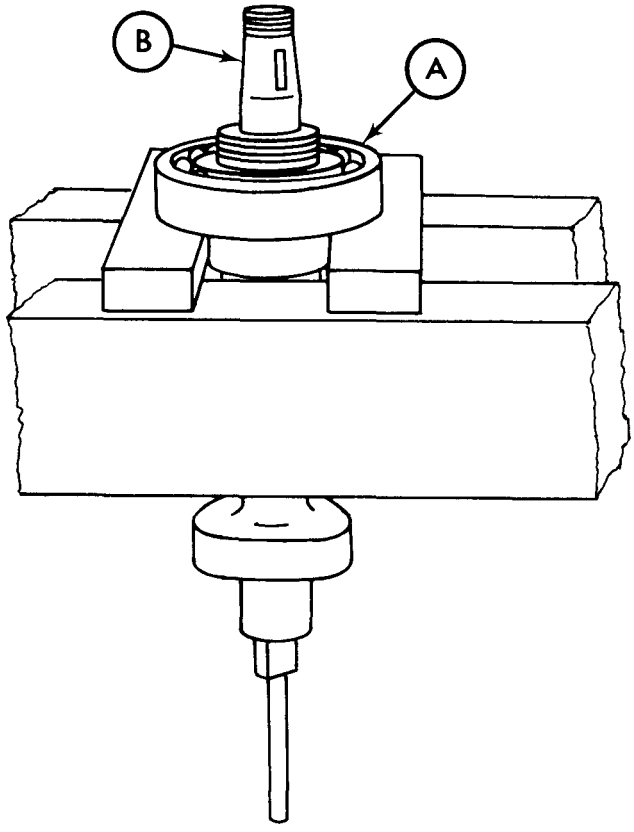


2. Using two steel bars (C), place camshaft (D) in vise.
3. Using drift, straighten tabs of key washer (E).
4. Using spanner wrench, remove nut (F). Remove and discard key washer (E).



TA245210

5. Place camshaft on arbor press with press plates supporting ball bearing (A). Using arbor, press camshaft (B) from bearing.



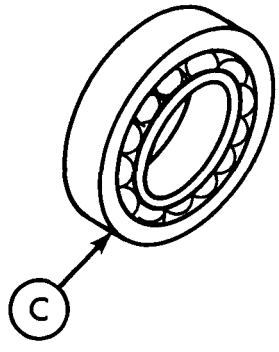
CLEANING:

1. Clean ball bearing (C) in accordance with TM 9-214. Wrap clean bearing in a clean oiled cloth.

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

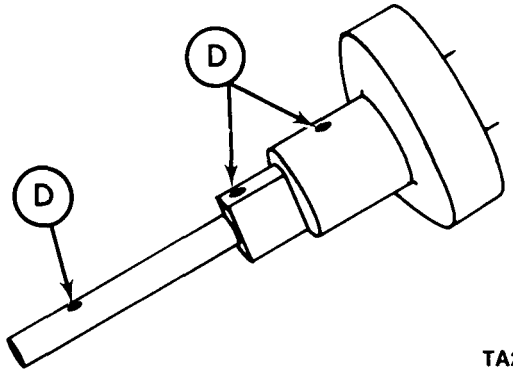
2. Clean all parts using solvent. Clean camshaft oil holes (D) with probe and solvent.



WARNING

Compressed air used for cleaning purposes will not exceed 30 psi. Use only with effective chip guarding and personal protective equipment (goggles/ shield, gloves, etc).

3. Blow dry with compressed air, or wipe dry with clean, lint-free cloth.



TA245211

REPAIR OF SUBASSEMBLIES—Continued

INSPECTION:

1. Inspect camshaft for cracks, scratches or scoring.

   a. Using magnifying glass and strong light, inspect cams (A), bearing journals (B) and (C), and gears (D) for damage.

   b. Inspect threads (E) for damage. Replace camshaft if threads are damaged.

2. Measure camshaft bearing journal (C) using micrometer. Replace camshaft if journal diameter is less than 1.1860 in. (30.12 mm).

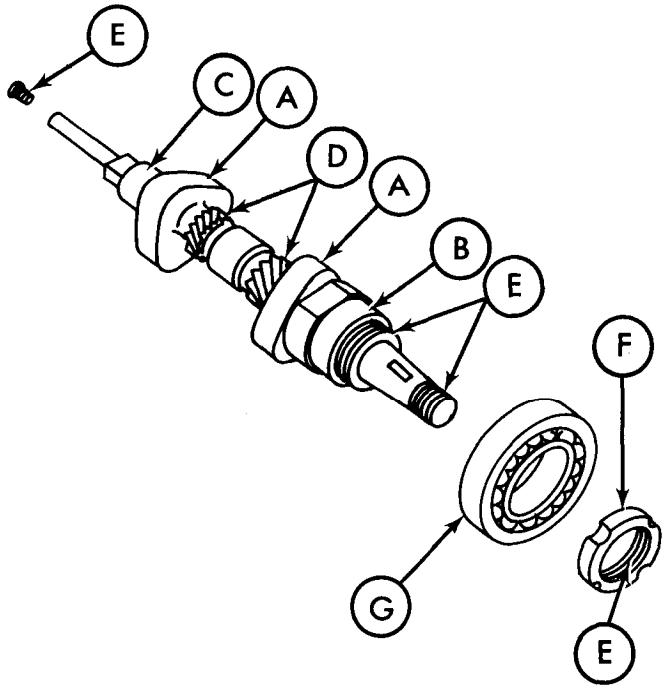
3. Inspect nut (F) for damage. Replace damaged nut.

4. Refer to TM 9-214 for inspection of ball bearing (G). Replace damaged bearing.

REPAIR:

1. Smooth small nicks or raised metal on areas other than bearing journal and cams using a fine mill file.

2. No other repairs are authorized for these parts.



TA245212

REPAIR OF SUBASSEMBLIES—Continued

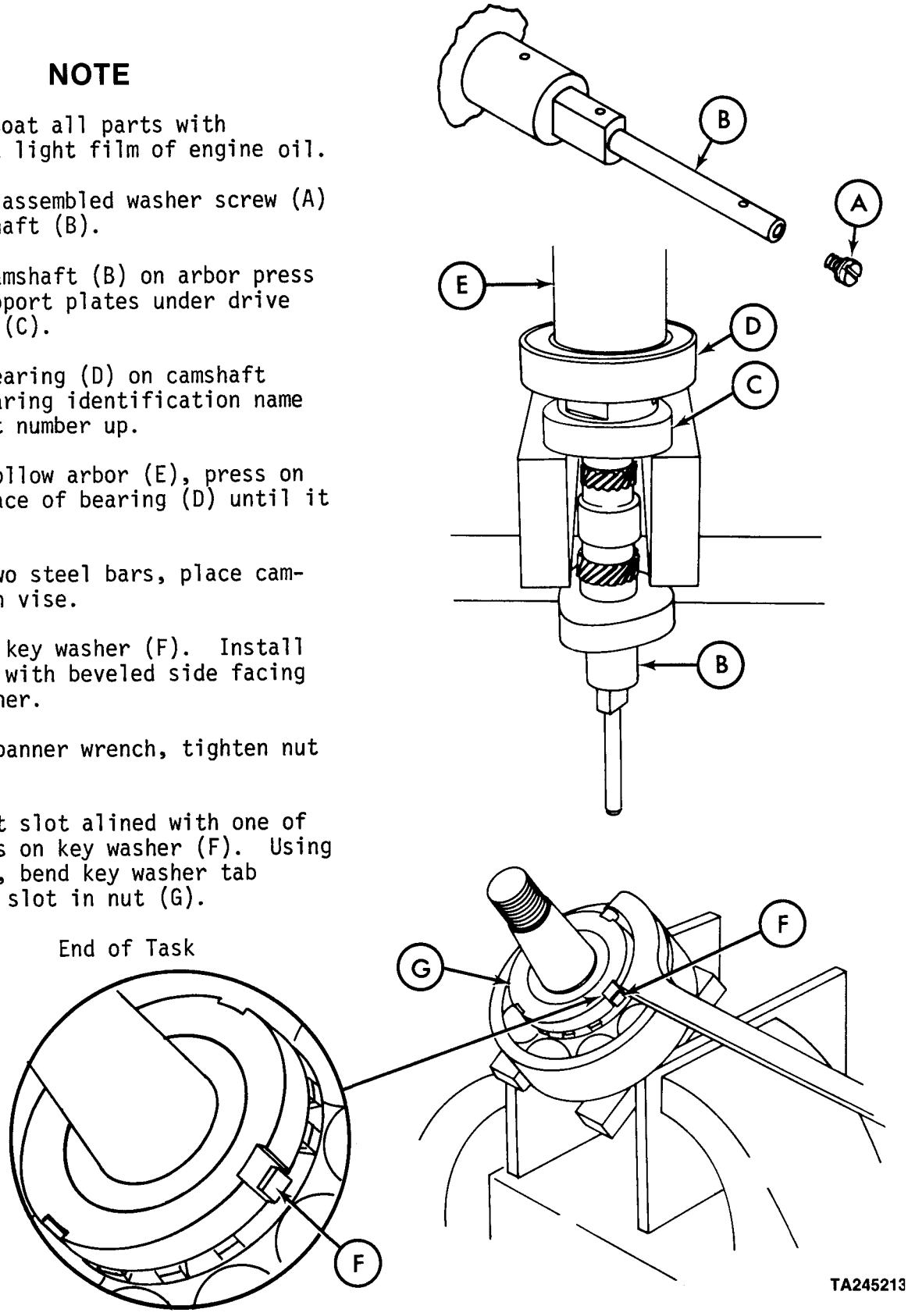
ASSEMBLY:

NOTE

Coat all parts with a light film of engine oil.

1. Install assembled washer screw (A) in camshaft (B).
2. Place camshaft (B) on arbor press with support plates under drive end cam (C).
3. Place bearing (D) on camshaft with bearing identification name and part number up.
4. Using hollow arbor (E), press on inner race of bearing (D) until it bottoms.
5. Using two steel bars, place camshaft in vise.
6. Install key washer (F). Install nut (G) with beveled side facing key washer.
7. Using spanner wrench, tighten nut (G).
8. Find nut slot alined with one of the tabs on key washer (F). Using a drift, bend key washer tab against slot in nut (G).

End of Task



TA245213

REPAIR OF SUBASSEMBLIES—Continued

GEAR SHAFT ASSEMBLIES AND PLUGS

TOOLS:

Fine mill file
Telescope gage, 0.3125 to 0.5000 in. (special tool)
1 in. outside micrometer
Magnifying glass, 5 power
External retaining ring pliers
Arbor press and press plates
Arbor

SUPPLIES:

Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)
Retaining ring

DISASSEMBLY:

1. Using retaining ring pliers, remove and discard retaining ring (A).

NOTE

Gear shaft assembly may or may not have a ring spacer.

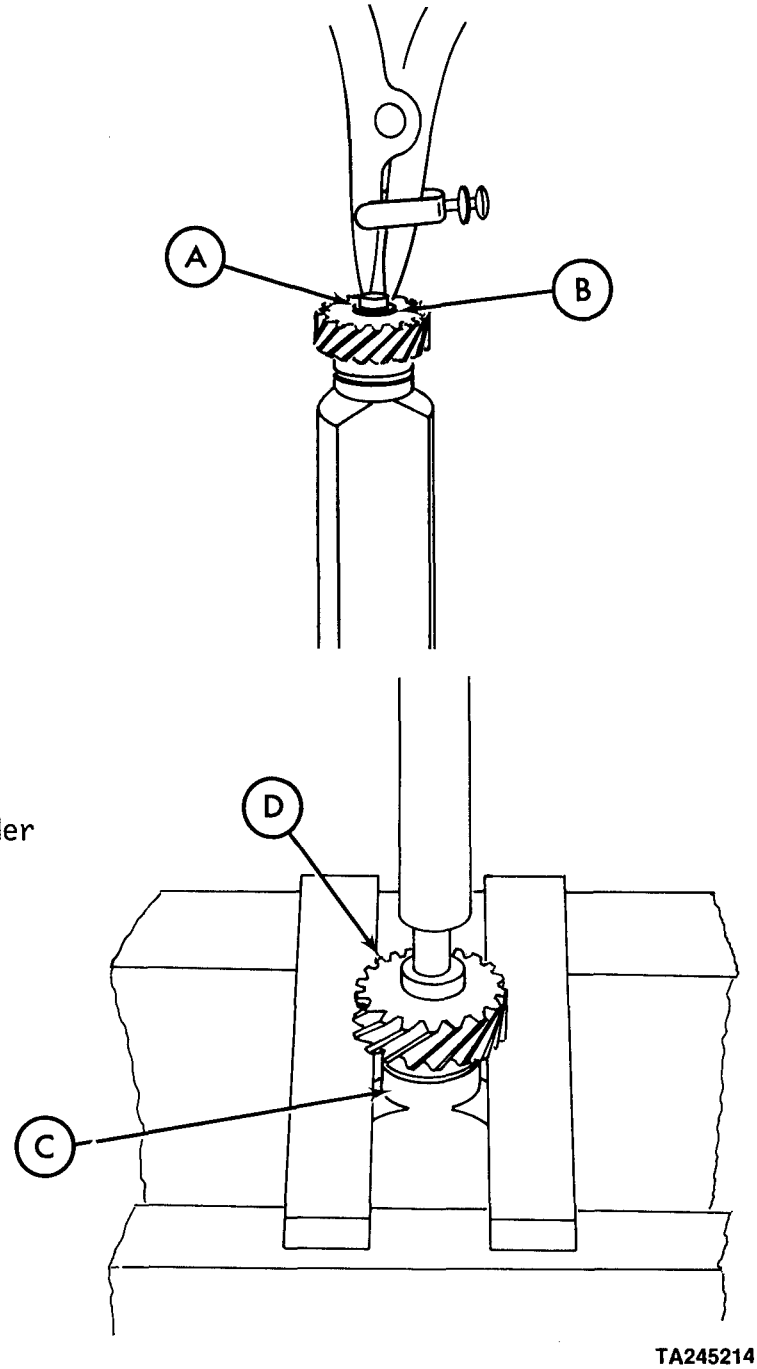
2. Remove retaining ring spacer (B).

NOTE

The driven helical gear is identified as the gear at grooved end of bushing assembly.

3. Place gear shaft assembly (C) on arbor press with press plates under driven gear (D).

4. Using arbor, press shaft from gear (D).



TA245214

REPAIR OF SUBASSEMBLIES—Continued

5. Remove Woodruff key (A) from shaft (B).

6. Remove shaft (B) from bushing assembly (C).

CLEANING:

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

1. Clean all parts using solvent.

2. Wipe dry using clean lint-free cloth.

INSPECTION:

NOTE

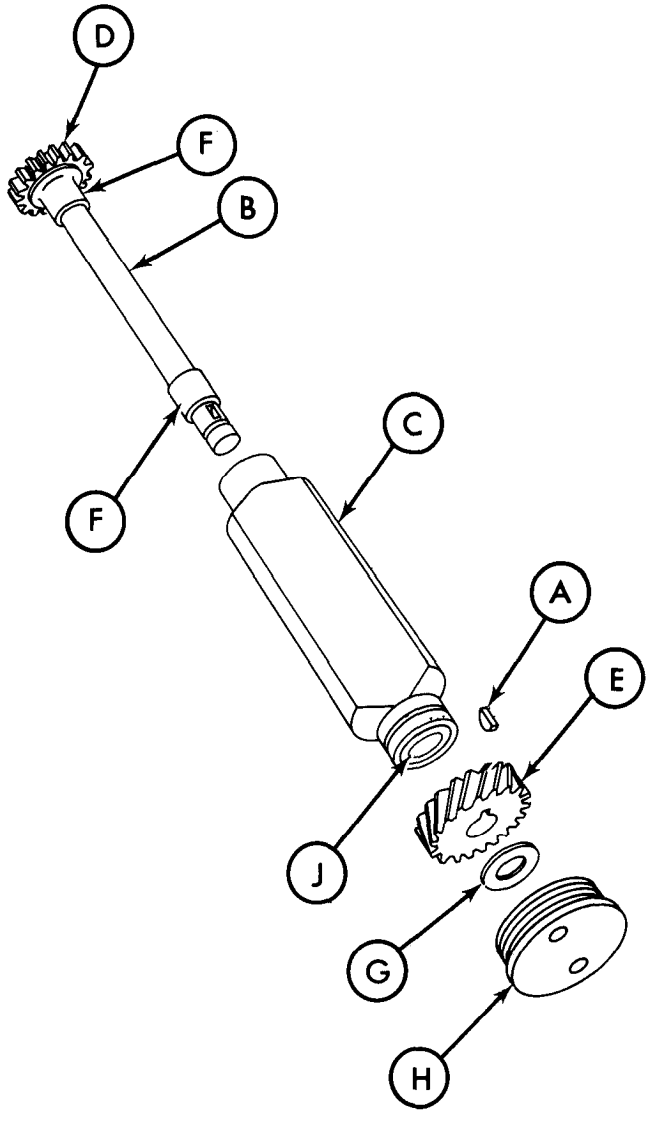
Ring spacer may or may not be present.

1. Inspect shaft (B), bushing assembly (C), and gears (D) and (E) for cracks, scratches or scoring using a magnifying glass and strong light. Inspect bearing journals (F), gears (D) and (E), key (A), and spacer (G) for damage. Replace gear shaft assembly if any parts are damaged.

2. Measure shaft bearing journal diameters (F) using a micrometer. Replace gear shaft assembly (B) if journal diameter is less than 0.4370 in. (11.1 mm).

3. Inspect key (A) for damage. Inspect plug (H) for damaged threads. Replace damaged key or plug.

4. Measure bushing sleeve bearing bore diameter (J) using telescope gage and micrometer. Replace gear shaft assembly if bore diameter exceeds 0.440 in. (11.18 mm).



TA245215

REPAIR OF SUBASSEMBLIES—Continued

REPAIR:

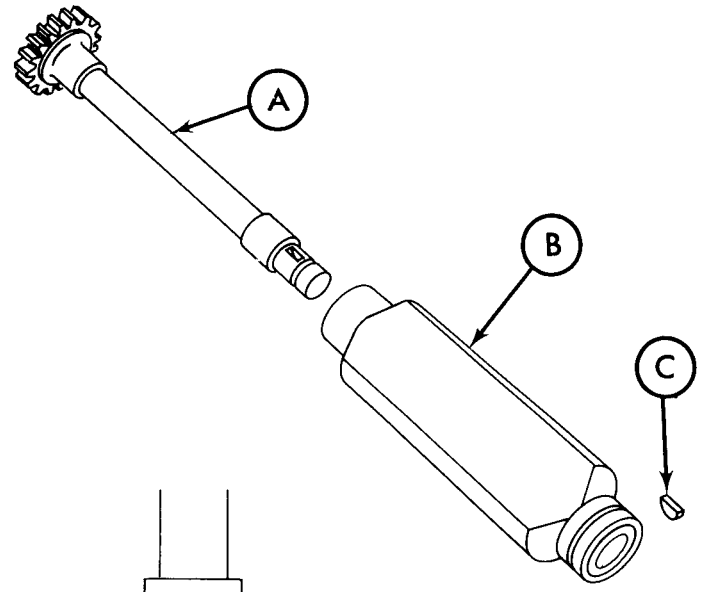
1. Smooth small nicks or raised metal using a fine mill file.
2. No other repairs are authorized for these parts.

ASSEMBLY:

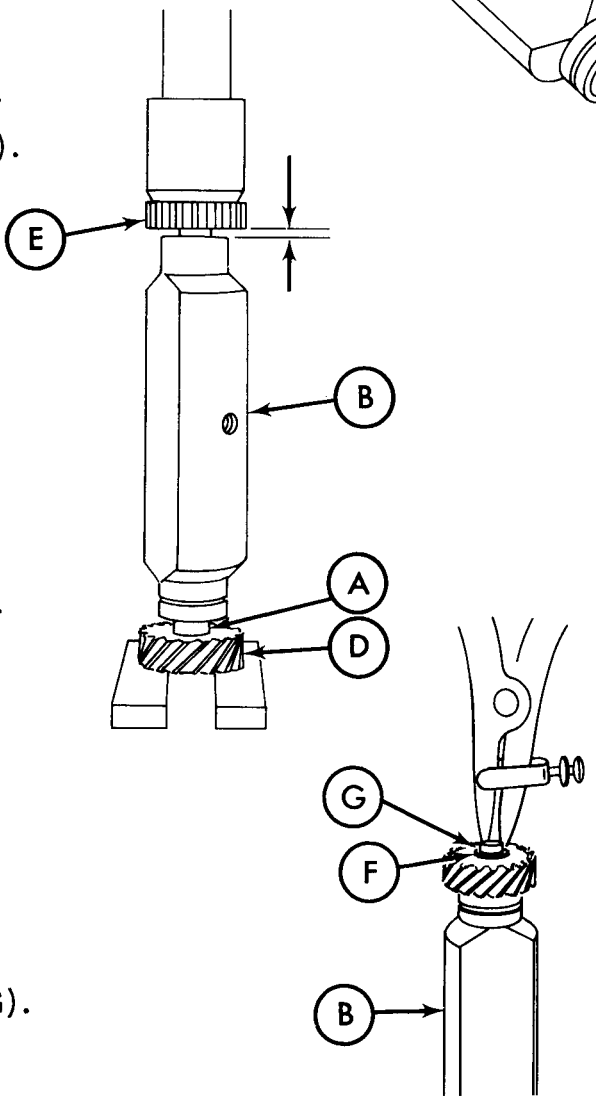
NOTE

Coat all parts with a light film of engine oil.

1. Install shaft (A) in plain (ungrooved) end of bushing assembly (B).
2. Install Woodruff key (C) in shaft (A).



3. Place driven gear (D) on arbor press with identifying surface face down. Aline key (C) with keyway in driven gear (D).
4. Using arbor press, press shaft (A) into gear (D). Using a feeler gage, maintain 0.0010 to 0.0085 in. (0.025 to 0.216 mm) clearance between drive gear (E) and bushing (B).



5. Install spacer (F) on shaft, if applicable. Using retaining ring pliers, install new retaining ring (G).

End of Task

TA245216

REPAIR OF SUBASSEMBLIES — Continued

GOVERNOR WEIGHT AND SPIDER ASSEMBLY

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Manual control lever (special tool)
Magnifying glass, 5 power
1 in. outside micrometer
1 in. inside micrometer
Arbor press and press plates
Arbor
Machinist's vise with vise jaw caps
Holding bar (fabricated tool), page 2-4
Torque wrench capable of torquing 80 to 85 lb-ft (108 to 115 N·m)
Fine mill file
Spring scale, 0 to 10 lbs
1 3/8 in. socket
3/8 to 1/2 in. drive adapter
Socket wrench handle (breaker bar)

SUPPLIES:

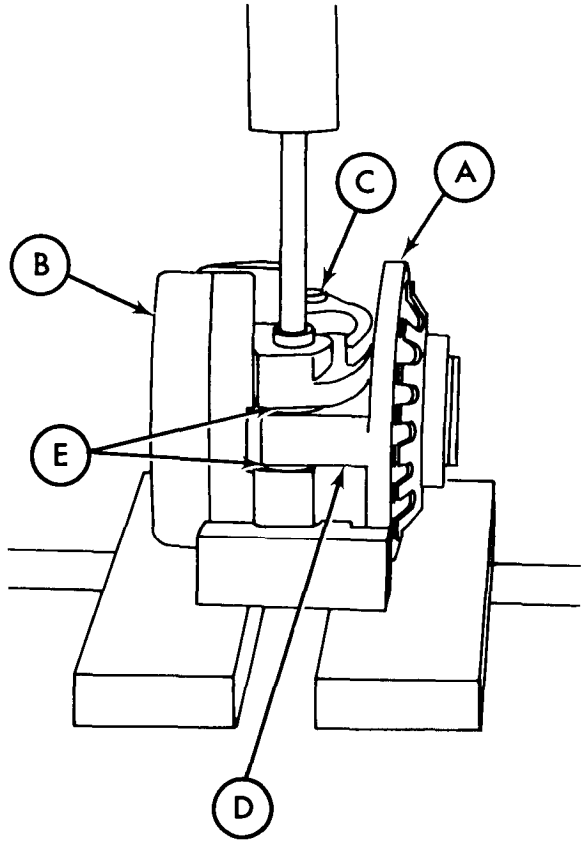
Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)
Metering and Distributing Parts Kit, Part No. 5704639
Flat washers (as required)
Pencil
Paper

DISASSEMBLY:

1. Place weight and spider assembly (A) on arbor press with press plates supporting the weight assemblies (B).

2. Using an arbor, press weight pins (C) from spider (D) and weights (B).

3. Remove weights (B) and flat washers (E). Discard flat washers.

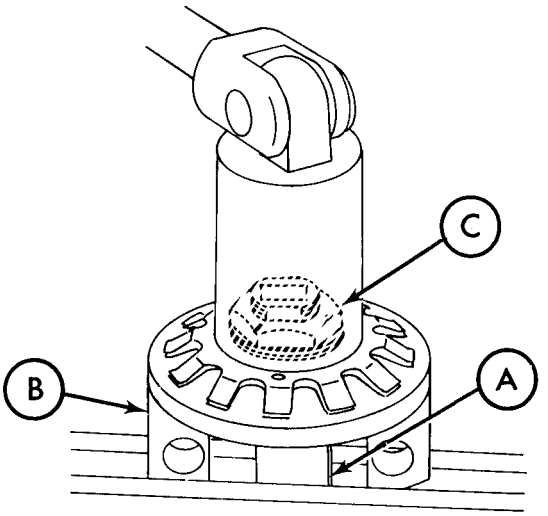


TA245217

REPAIR OF SUBASSEMBLIES — Continued

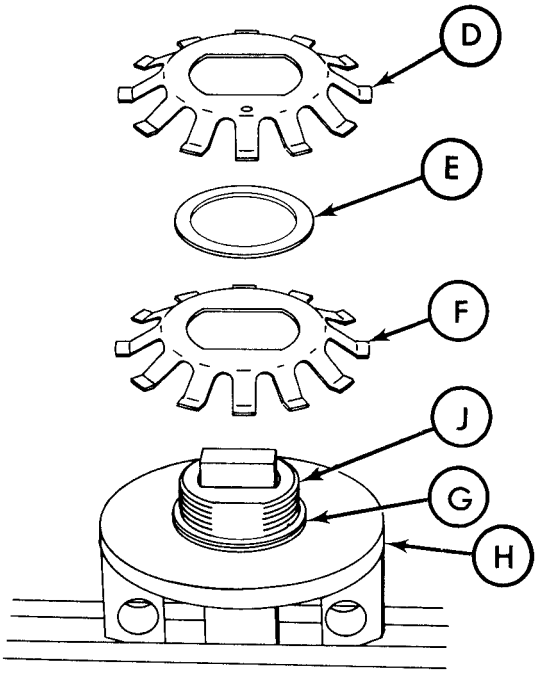
4. Place holding bar (A) in vise. Place spider (B) over bar.

5. Using 1 3/8 in. socket and handle, remove adjusting nut (C).



6. Remove outer disk (D), ring spacer (E), and inner disk (F).

7. Remove ring spacers (G). Using outside micrometer, measure and record total thickness of spacers. Discard spacers.



8. Remove spider (H) from hub (J).

TA245218

REPAIR OF SUBASSEMBLIES—Continued

CLEANING:

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

1. Clean all parts using solvent.
2. Wipe dry with clean lint-free cloth.

INSPECTION:

1. Inspect nut (A), spider (B), hub (C), weights (D), and pins (E) for cracks, scratches, scoring, or raised metal using magnifying glass and strong light.
2. Inspect threads on nut (A) and hub (C). Inspect face (F) of spider (B) for evidence of wear pattern. Replace parts if cracked or if threads are damaged. Replace spider if wear pattern is evident.

REPAIR:

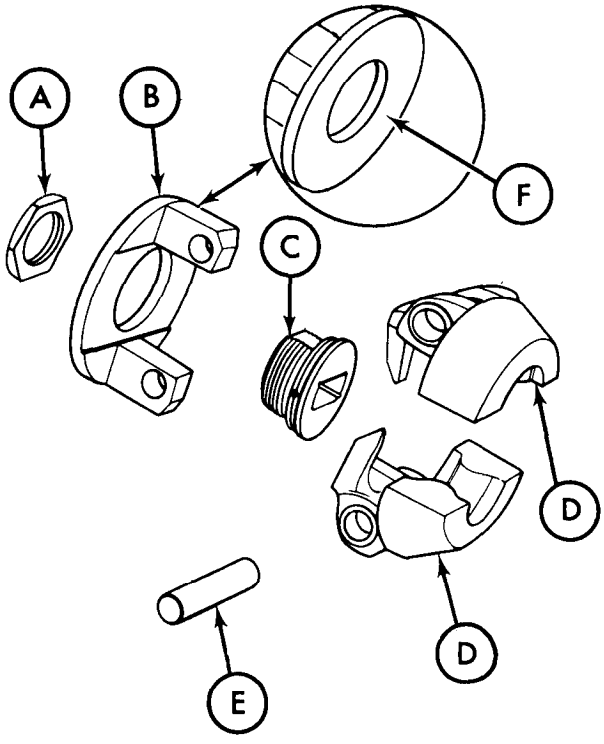
1. Smooth small nicks or raised metal using a fine mill file.
2. No other repairs are authorized for these parts.

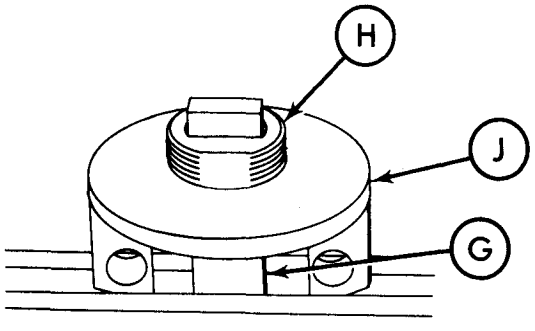
ASSEMBLY:

NOTE

Coat all parts with a light film of engine oil.

1. Place holding bar (G) in vise.
2. Place hub (H) on bar (G). Place spider (J) on hub (H).





TA245219

NOTE

Ring spacers are available in seven different thicknesses ranging from 0.005 to 0.065 in. (0.127 to 1.65 mm).

3. Install new spacers (A), of the same thickness (recorded at disassembly) as the ones removed.

NOTE

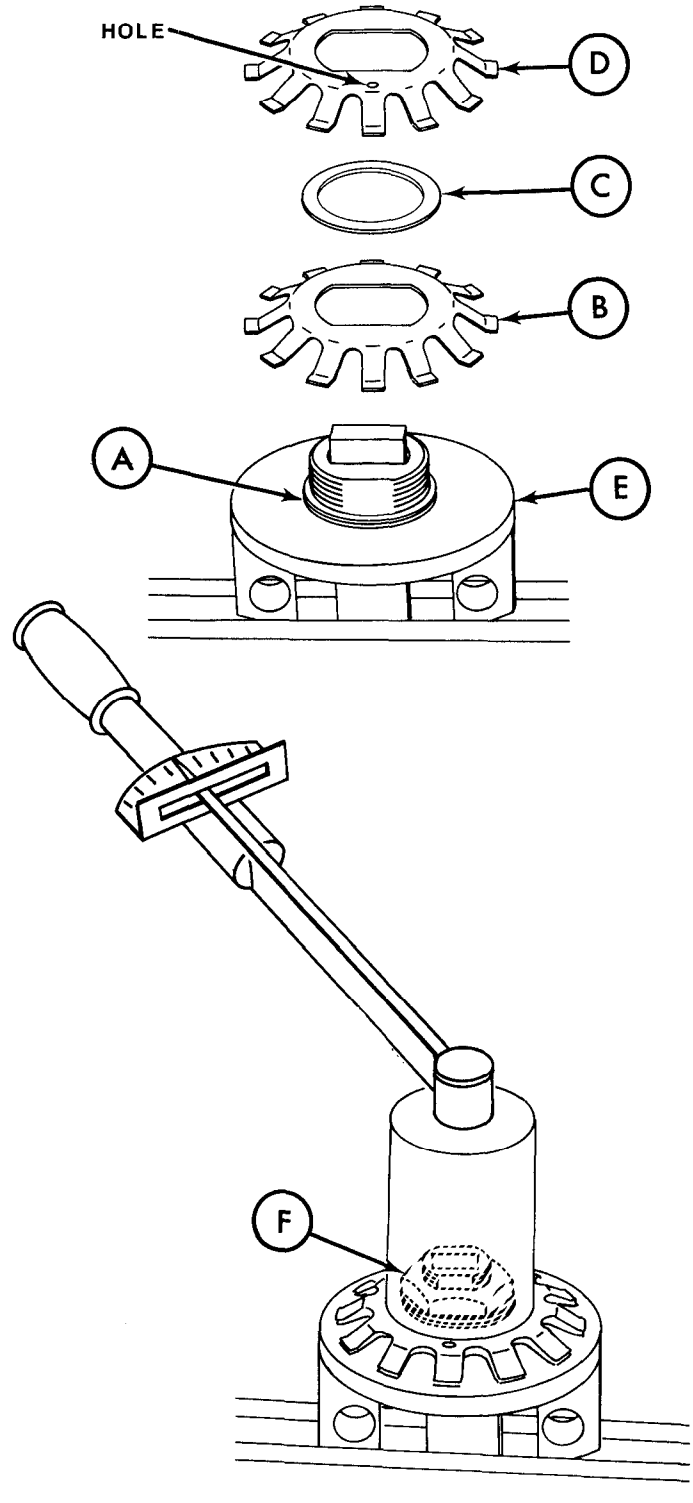
The outer disk can be identified by the 1/8 in. (3.18 mm) hole.

4. Install inner disk (B) on spider (E).

5. Install new 0.035 in. (0.89 mm) thick ring spacer (C) on inner disk (B).

6. Install outer disk (D) over ring spacer (C).

7. Using 1 3/8 in. socket, torque wrench, and adapter, install adjusting nut (F). Torque tighten to 80 to 85 lb-ft (108 to 115 N·m).



TA245220

REPAIR OF SUBASSEMBLIES—Continued

8. Using outside micrometer, measure and record thickess of legs (A) on spider.

9. Using inside micrometer, measure and record recess (B) between weight extensions of weights (C) and (D).

10. Subtract leg dimension from weight recess dimension. The resulting dimension is total clearance between spider and weight.

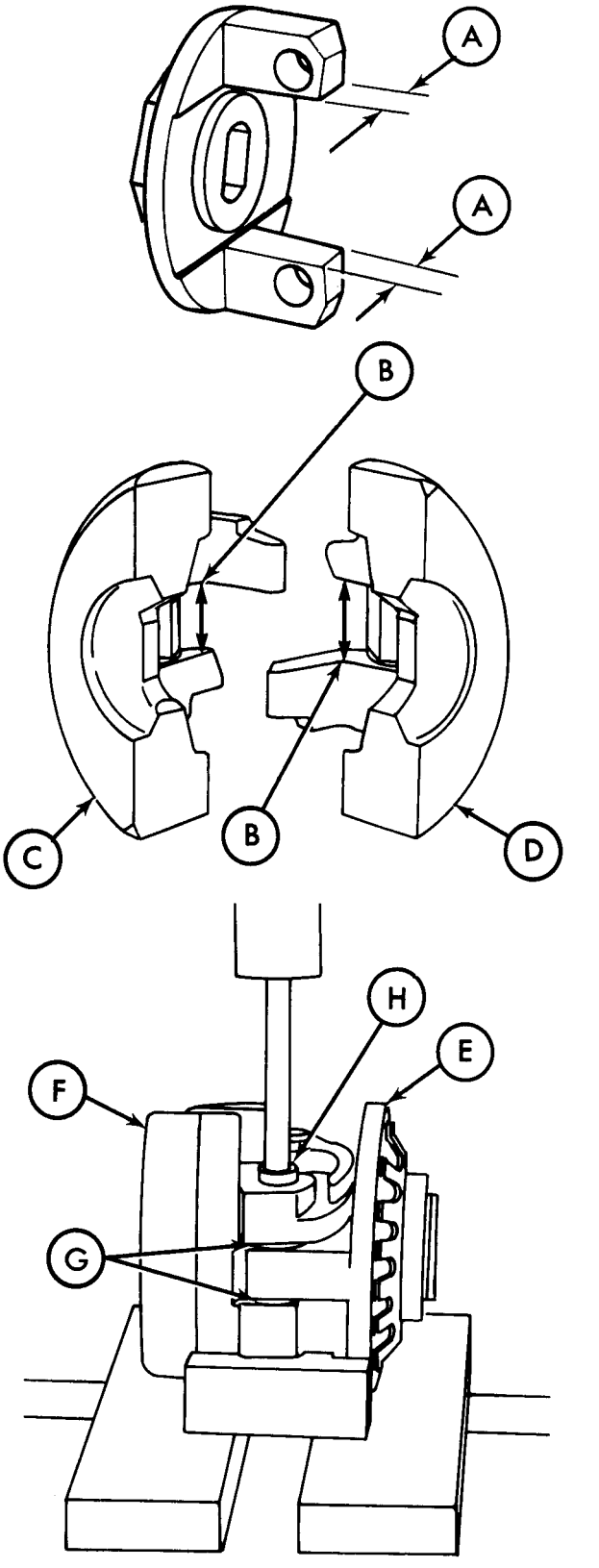
11. Select new flat washers to obtain thickness of 0.004 to 0.006 in. (0.10 to 0.15 mm) less than resulting total clearance determined in step 10. above.

12. Place spider assembly (E) on arbor press.

13. Position weight (F) on spider (E), and slide one preselected flat washer (G) on each side of spider leg. Aline flat washers so that weight pins (H) can be pressed through spider and weights.

14. Using an arbor, install pin (H) and press pin until it is centered on weights (equal extension both sides).

15. Repeat steps 12. through 14. to install remaining pin and washer.



TA245221

REPAIR OF SUBASSEMBLIES—Continued

16. Place holding bar (A) in vise. Place governor weight and spider assembly (B) on bar.

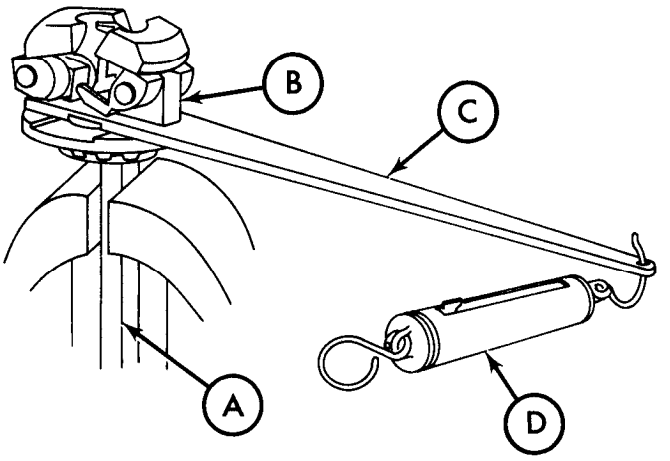
17. Using manual control lever (C) and spring scale (D), turn spider (B) one complete revolution (360°) with a steady pull. Scale reading must be between 4.5 and 6 lbs (2.04 and 2.72 kg).

18. If scale reading is more than 6 lbs (2.72 kg), reassemble governor using a thicker ring spacer (page 3-35).

19. If reading is less than 4.5 lbs (2.04 kg), reassemble governor using a thinner spacer (page 3-35).

20. Repeat steps 15. through 18. until correct scale reading is obtained.

End of Task



TA245222

REPAIR OF SUBASSEMBLIES—Continued

TAPPET ASSEMBLIES AND SPRINGS

TOOLS:

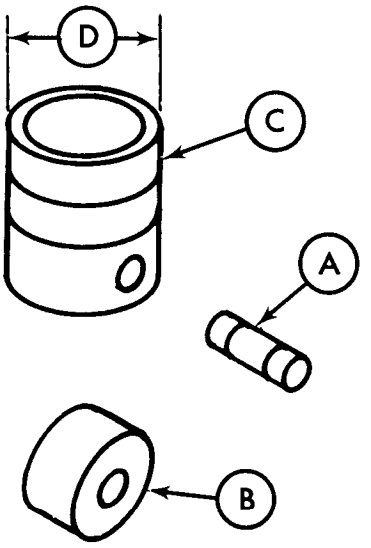
Spring tester
Magnifying glass, 5 power
2 in. outside micrometer
3 in. outside micrometer
Fine mill file

SUPPLIES:

Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)

DISASSEMBLY:

1. Remove roller pin (A).
2. Separate tappet assembly roller (B) from tappet guide assembly (C).



CLEANING:

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

1. Clean all parts using solvent.
2. Wipe dry with clean lint-free cloth.

INSPECTION:

1. Inspect pins (A), rollers (B), and guides (C) for cracks, scratches or scoring using magnifying glass and strong light. Inspect for wear, which will be indicated by ridges. Replace if ridges are found.
2. Using micrometer, measure diameter of tappet guide (D). Replace guide if diameter is less than 1.6225 in. (41.21 mm).

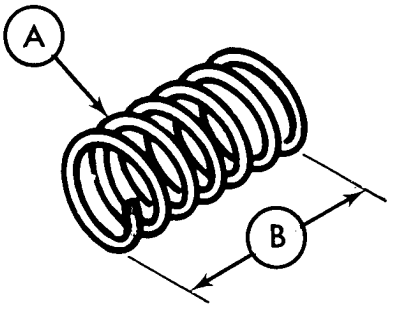
TA245223

REPAIR OF SUBASSEMBLIES—Continued

3. Inspect spring (A) for cracks or nicks. Replace spring if nicked or scratched.

4. Using micrometer, measure free length of spring (B). Free length must be 2.500 to 2.558 in. (63.50 to 64.97 mm).

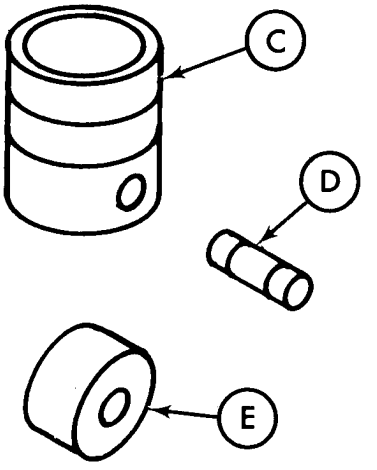
5. Check spring load. Spring load must be 54 to 65.4 lbs (24.5 to 30 kg) at 2.105 in. (53.47 mm) length, and 96.2 to 106.2 lbs (44 to 48 kg) at 1.830 in. (46.48 mm) length. Replace spring if it does not meet all specified data.



REPAIR:

1. Smooth small nicks or raised metal on guide assembly (C), pin (D), and roller (E) using a fine mill file.

2. No other repairs are authorized for these parts.



ASSEMBLY:

NOTE

Coat all parts with a light film of engine oil.

1. Install roller (E) in guide (C).

2. Aline bores and install pin (D).

End of Task

TA245224

REPAIR OF SUBASSEMBLIES—Continued

FUEL INJECTION PUMP HEAD ASSEMBLIES

TOOLS:

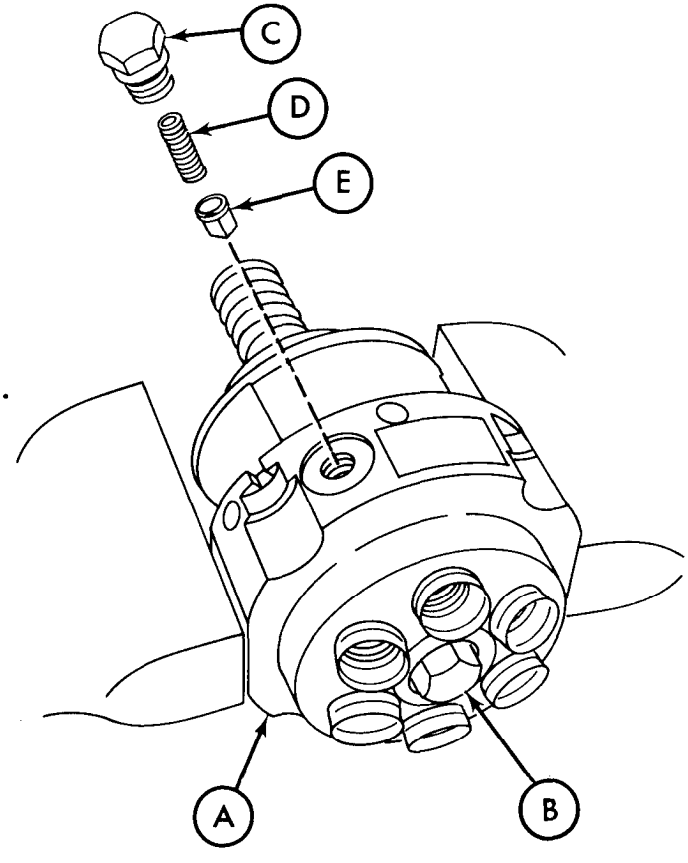
Tool Kit, Automotive Fuel and Electrical System Repair
Spring tester
Magnifying glass, 5 power
Wire probes
Hole gage, 0.200 to 0.300 in. (special tool)
Bristle brush
Positioning fixture (special tool)
1 in. outside micrometer
3 in. outside micrometer
No. 38 twist drill (0.1015 in.)
Torque wrench capable of torquing 50 to 55 lb-ft (68 to 75 N·m)
Arbor press and press plates
Remover and replacer (special tool)
Machinist's vise with vise jaw caps

SUPPLIES:

Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)

DISASSEMBLY:

1. Place head assembly (A) in vise. Using 3/4 in. socket and ratchet handle, remove plunger bore screw (B).
2. Using 3/4 in. socket and ratchet handle, remove fuel delivery valve screw (C).
3. Remove spring (D) and delivery valve (E).



TA245225

REPAIR OF SUBASSEMBLIES—Continued

4. Place head assembly (A) on positioning fixture (B).

5. Using two flat tip screwdrivers, remove button retaining ring spring (C). Remove plunger button (D).

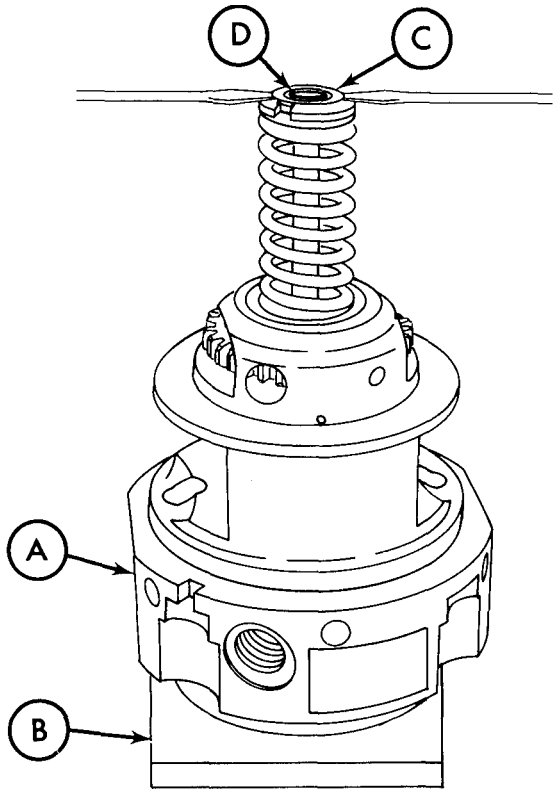
6. Place head assembly (A) and positioning fixture (B) on arbor press.

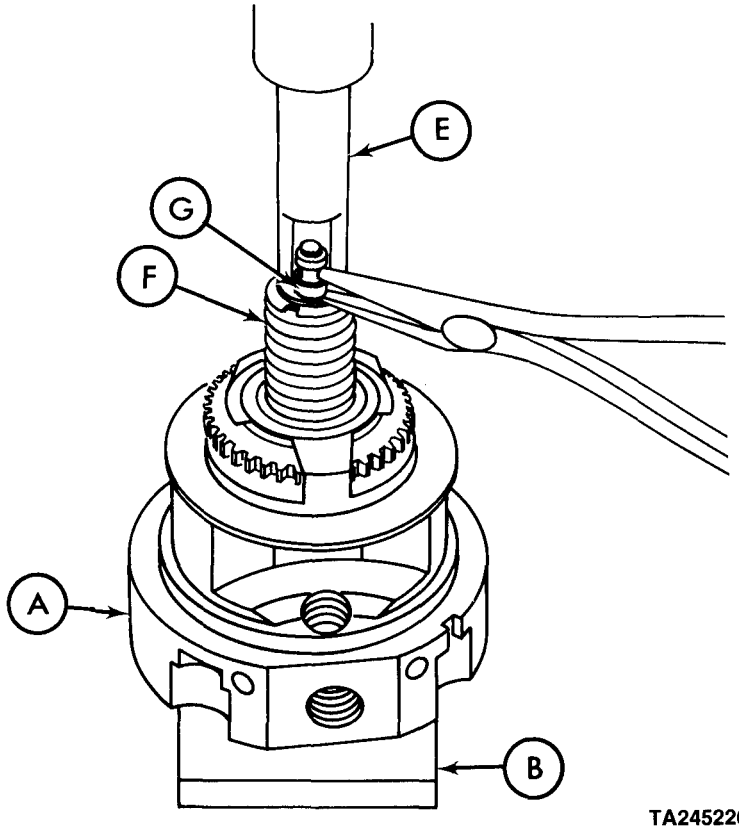
7. Using remover and replacer (E), compress spring (F) and remove two plunger locks (G) using needle nose pliers.

WARNING

Release spring tension gradually to avoid injury.

8. Slowly release tension on spring (F). Remove head assembly (A) and positioning fixture (B) from arbor press.





TA245226

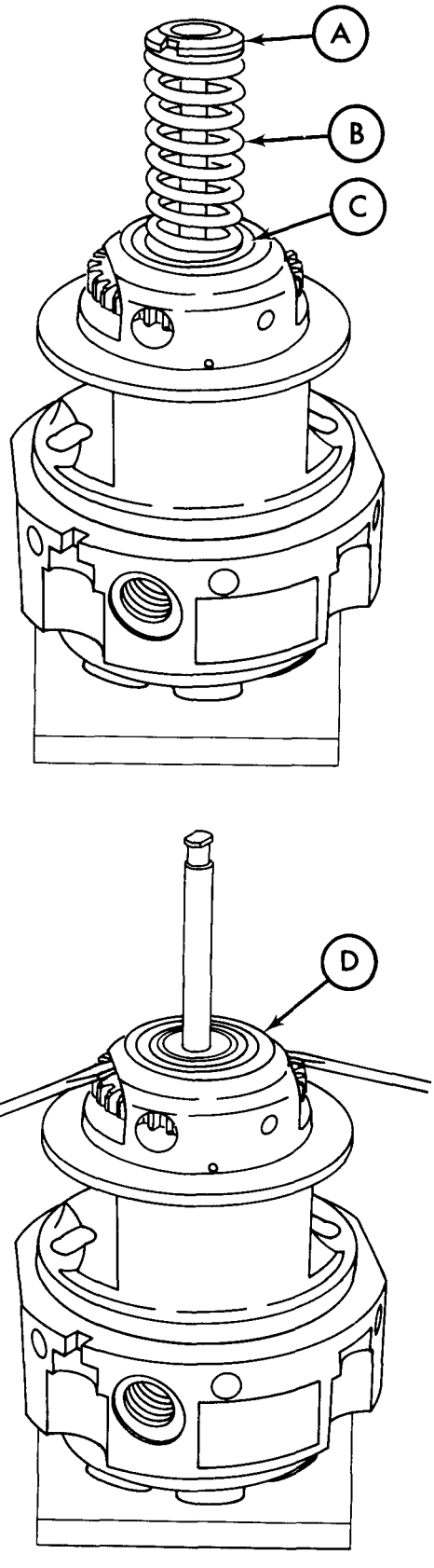
REPAIR OF SUBASSEMBLIES—Continued

9. Remove lower spring seat (A), spring (B) and upper spring seat (C).

10. Using two wide tip screwdrivers, remove gear retainer (D).

11. Remove plunger guide (E), spur gear (F), thrust washer (G) and plunger (H).

12. Remove plunger sleeve (J).



TA245227

REPAIR OF SUBASSEMBLIES—Continued

CLEANING:

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

1. Immerse head in solvent. Clean head using bristle brush. Clean fuel passages (A) and oil passages (B) using probes.

WARNING

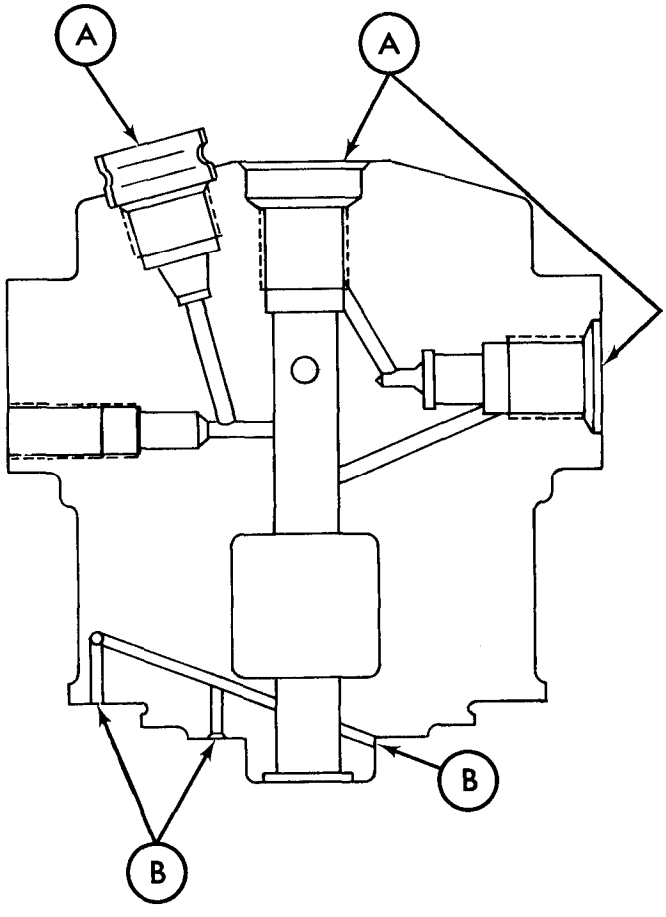
Compressed air used for cleaning purposes will not exceed 30 psi. Use only with effective chip guarding and personal protective equipment (goggles/ shield, gloves, etc).

2. Blow dry with compressed air.

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

3. Clean remaining head parts using solvent. Wipe dry using clean lint-free cloth.



TA245228

INSPECTION:

1. Inspect head (A) for cracks using magnifying glass and strong light. Inspect threads (B), (C), and (D) for damage. Inspect dust sleeves (E) for looseness.

2. Inspect delivery valve (F) and seat (G) for signs of wear or scoring.

3. Inspect spring (H) for nicks or cracks. Using 1 in. micrometer, measure free length of spring. Free length must be 0.780 to 0.954 in. (19.8 to 24.2 mm). Check spring load. Spring load must be 5.3 to 5.7 lb (2.4 to 2.6 kg) when compressed to 0.760 in. (19.3 mm) length.

4. Inspect delivery valve screw (J) for thread damage.

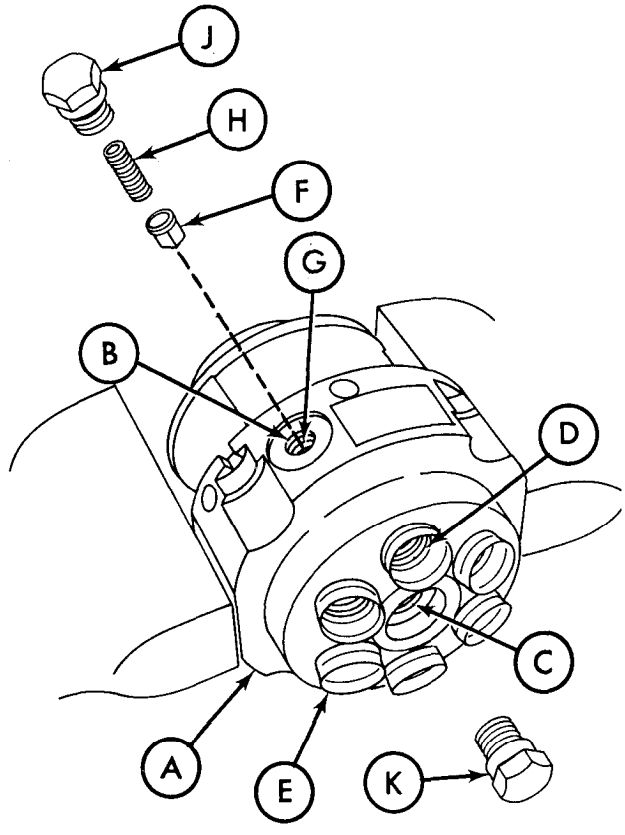
5. Replace head if dust sleeves (E) are loose or if head is cracked. Replace head if delivery valve seat (G) or valve (F) shows evidence of scoring or improper seating. Replace head if threads are damaged.

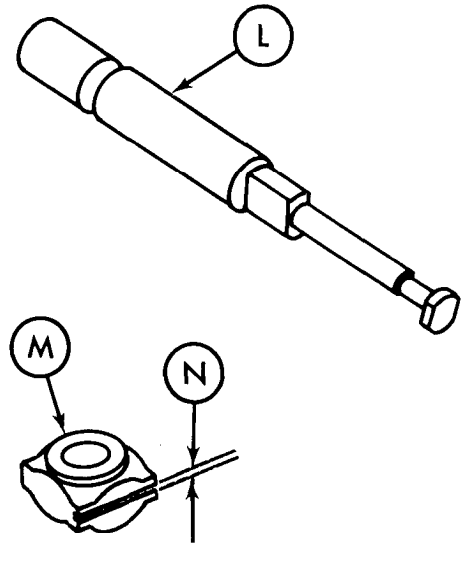
6. Replace plunger bore screw (K) and delivery valve screw (J) if damaged.

NOTE

Damage to any one component will be cause to replace all three components.

7. Inspect plunger (L) and sleeve (M) for cracks, scoring, or scratches using magnifying glass and strong light. Measure width of slot (N) in sleeve using shank of a new No. 38 twist drill. Replace head and sleeve if drill shank can be inserted in slot. Replace plunger and sleeve if cracked or damaged.

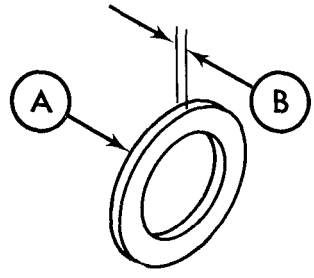




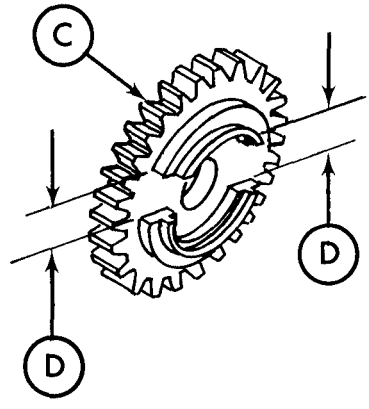
TA245229

REPAIR OF SUBASSEMBLIES—Continued

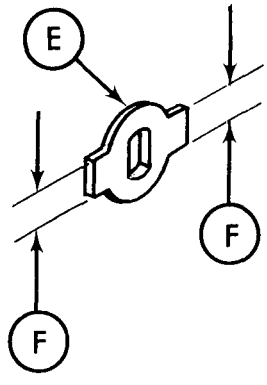
8. Inspect thrust washer (A) for cracks, scoring, or signs of overheating. Using micrometer, measure thickness of washer. Replace washer if thickness (B) is less than 0.0200 in. (0.51 mm), or if there is evidence of scoring or overheating.



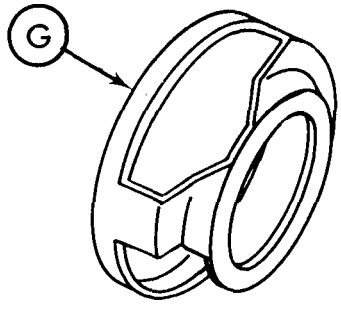
9. Inspect spur gear (C) for cracks, raised metal, or gear tooth damage using magnifying glass and strong light. Measure width of plunger guide slots (D) in gear using hole gage and micrometer. Replace gear if dimension exceeds 0.2830 in. (7.19 mm). Replace gear if cracked or if there is evidence of gear tooth damage.



10. Inspect plunger guide (E) for cracks, burs, nicks, or raised metal using magnifying glass and strong light. Measure width of tangs (F) using a micrometer. Replace guide if dimension is less than 0.2780 in. (7.06 mm). Replace guide if cracked or damaged.



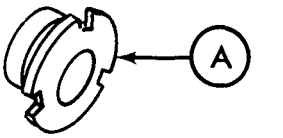
11. Inspect gear retainer (G) for cracks or raised metal. Replace retainer if cracked.

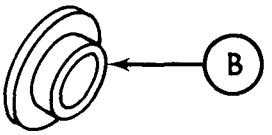


TA245230

REPAIR OF SUBASSEMBLIES—Continued

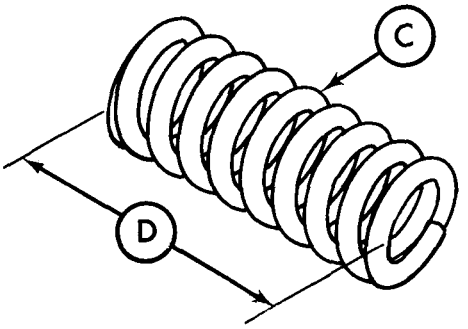
12. Inspect lower spring seat (A) and upper spring seat (B) for cracks, raised metal, or scoring using magnifying glass and strong light. Replace seats if cracked or scored.

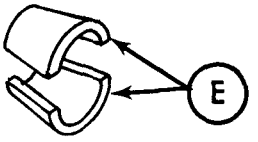




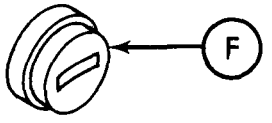
13. Inspect plunger spring (C) for cracks or nicks. Replace spring if nicked or scratched.

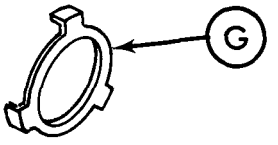
14. Using micrometer, measure free length of spring (D). Free length must be 2.18 to 2.66 in. (55.4 to 67.6 mm). Check spring load. Spring load must be 64.0 to 71.6 lbs (29 to 32 kg) at 2.014 in. (51.16 mm) length. Replace spring if it does not meet all specified data.

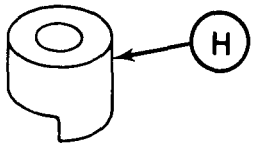




15. Inspect plunger locks (E), plunger button (F), ring spring (G) and four spacers (H) for cracks, scoring, raised metal and deformation. Replace parts if cracked, scored or deformed.







TA245231

REPAIR OF SUBASSEMBLIES—Continued

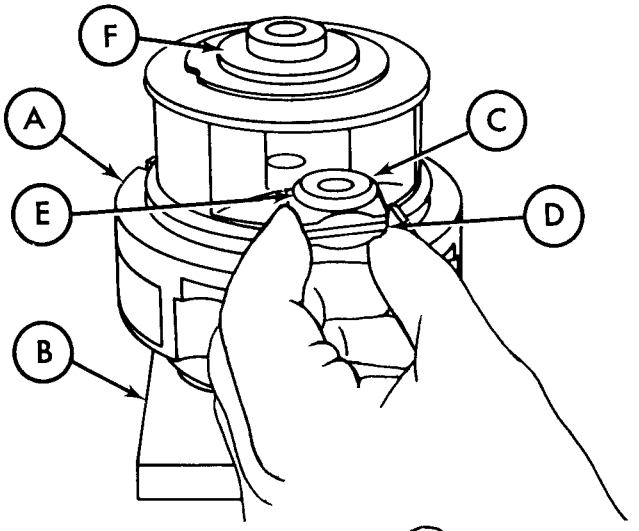
REPAIR: No repair procedures authorized for head components.

ASSEMBLY:

NOTE

Coat all parts with a light film of engine oil.

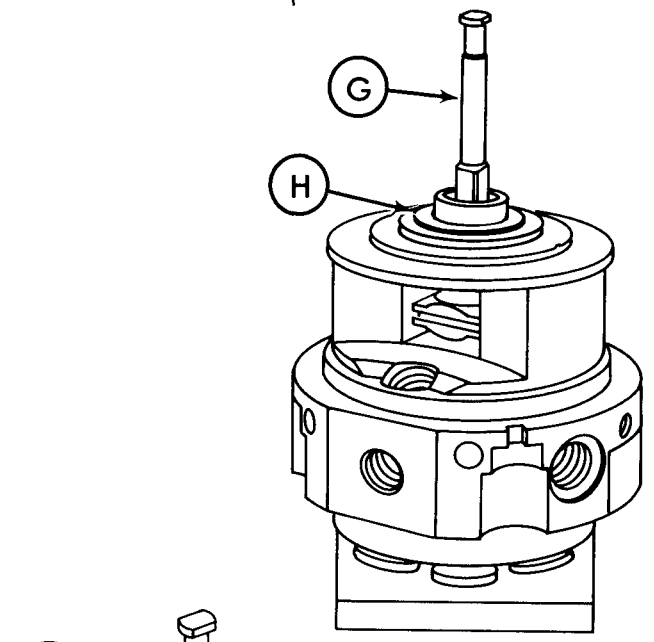
1. Place head (A) on positioning fixture (B).

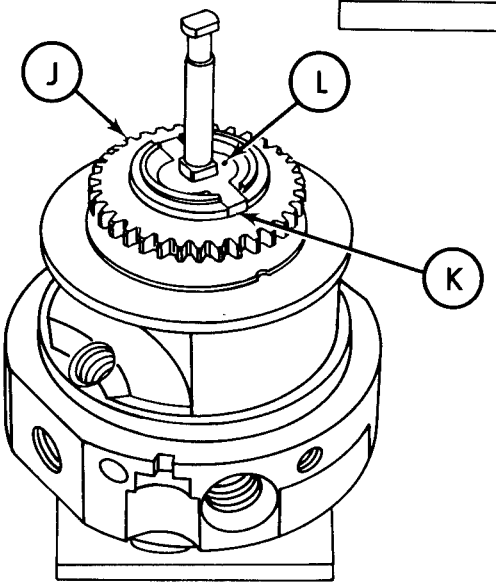


2. Install plunger sleeve (C) in head cavity with slot side of sleeve (D) facing you, and the groove (E), (below the beveled edge) toward the spur gear bearing surface (F).

3. Aline plunger sleeve bore with plunger bore in head and install plunger (G).

4. Install thrust washer (H), spur gear (J), and plunger guide (K) with drill point (L) up.



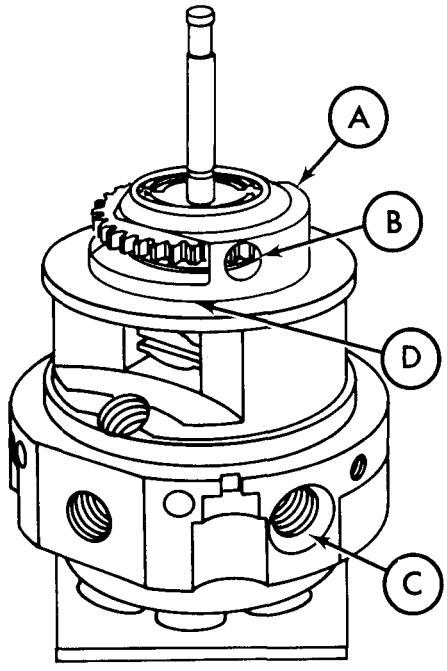


TA245232

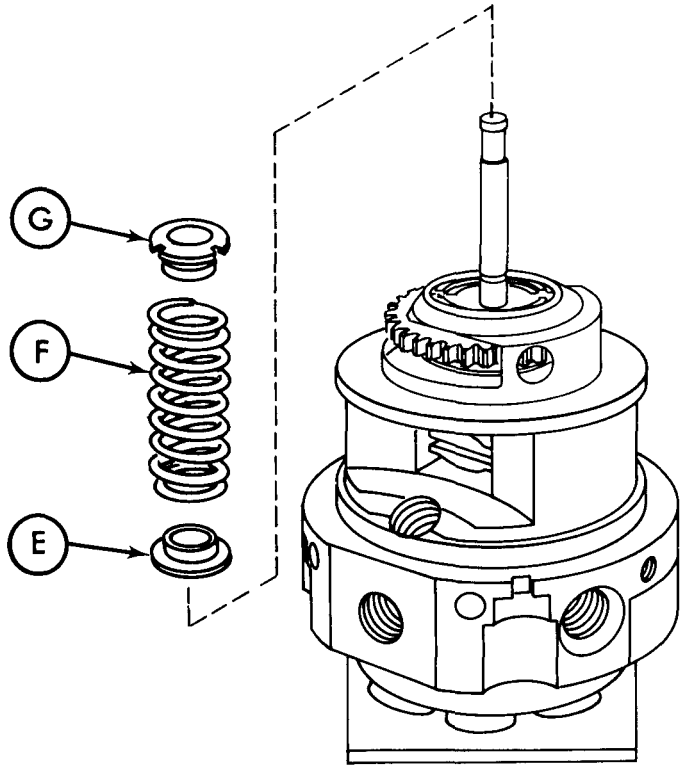
REPAIR OF SUBASSEMBLIES—Continued

5. Install gear retainer (A) with timing hole (B) alined with delivery valve bore (C) and dimples alined with notches in head. Tap retainer into place with plastic insert hammer.

6. Locate original stake marks (D) in three places around bottom edge of retainer. Using solid center punch and hammer, restake retainer in same three places.



7. Install upper spring seat (E), spring (F), and lower spring seat (G).



TA245233

REPAIR OF SUBASSEMBLIES—Continued

8. Place head assembly (A) and positioning fixture (B) on arbor press. Position remover and replacer (C) on lower spring seat (D).

9. Compress spring (E) far enough to install two plunger locks (F) using needle nose pliers.

WARNING

Release spring tension slowly to avoid injury. Be certain locks are properly seated before releasing all spring tension.

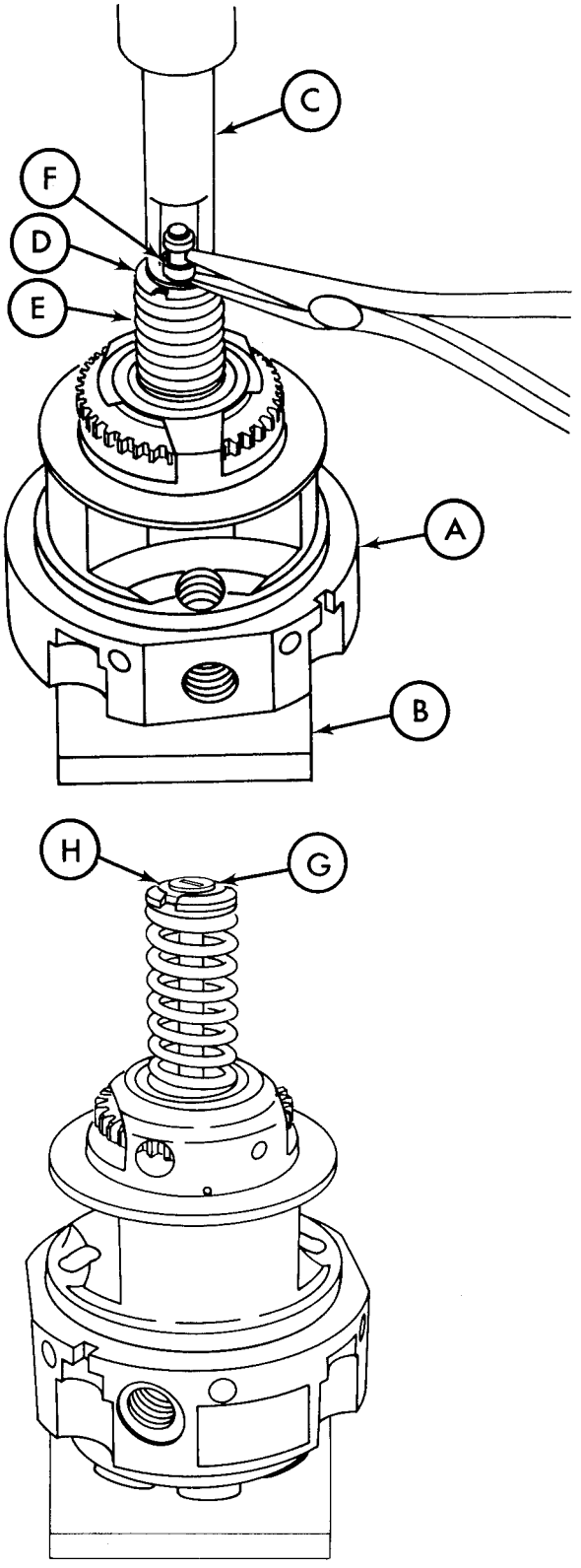
10. Slowly release spring tension while observing that plunger locks (F) are properly seated.

11. Remove head assembly (A) and fixture (B) from press.

12. Install plunger button (G) and ring spring (H).

NOTE

It may be necessary to tap the ring spring lightly with a plastic insert hammer to seat the spring.



TA245234

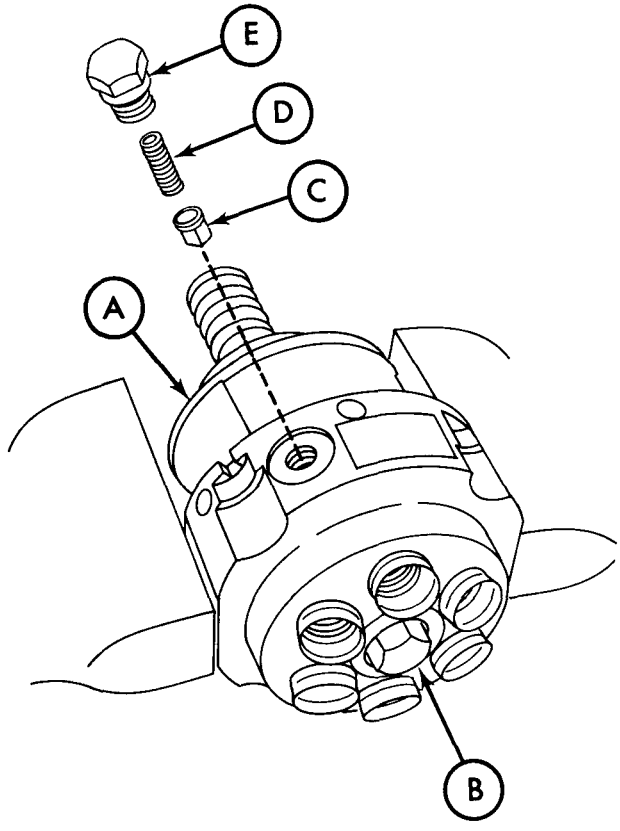
REPAIR OF SUBASSEMBLIES—Continued

13. Place head assembly (A) in vise.

14. Using 3/4 in. socket and torque wrench, install plunger bore screw (B). Torque tighten screw to 50 to 55 lb-ft (68 to 75 N·m).

15. Install delivery valve (C) and valve spring (D) in head assembly. Using 3/4 in. socket and torque wrench, install fuel delivery valve screw (E). Torque tighten screw to 50 to 55 lb-ft (68 to 75 N·m).

End of Task



TA245235

REPAIR OF SUBASSEMBLIES—Continued

HEAD ASSEMBLY RING SPACER, SPACER RING, AND TAPPET SPRING SEAT

TOOLS: None.

DISASSEMBLY: None.

CLEANING:

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

1. Clean all parts using solvent.
2. Wipe dry with clean lint-free cloth.

INSPECTION:

1. Inspect ring spacer (A), spacer ring (B), and spring seat (C) for cracks or scoring using magnifying glass and strong light.
2. Replace parts if cracked or scored.

REPAIR: No repair procedures authorized.

ASSEMBLY: None.

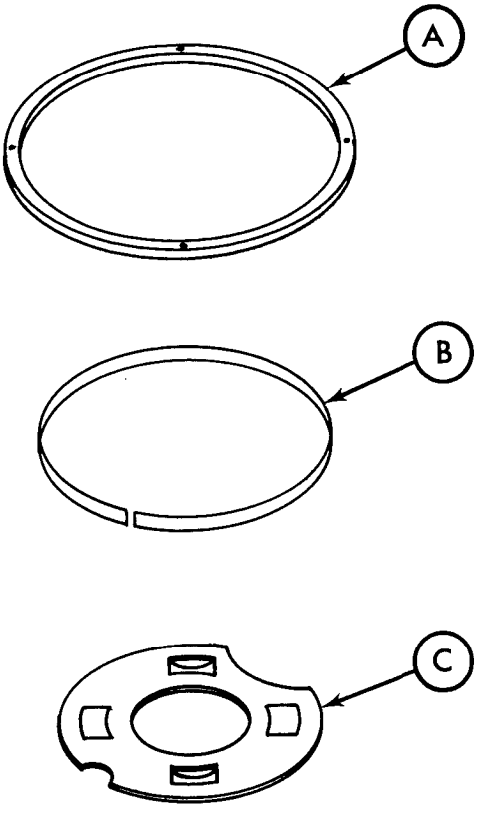
NOTE

Coat all parts with a light film of engine oil.

End of Task

SUPPLIES:

Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)



TA245236

REPAIR OF SUBASSEMBLIES—Continued

FUEL CONTROL UNIT ASSEMBLIES AND ASSOCIATED PARTS

TOOLS:

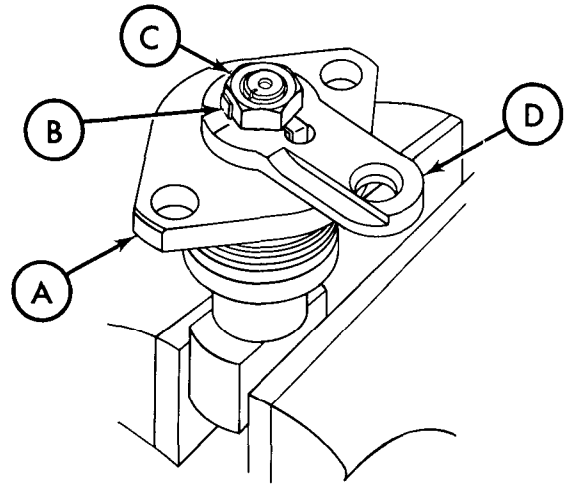
Took Kit, Automotive Fuel and Electrical System Repair
1 in. outside micrometer
Torque wrench capable of torquing to 60 to 65 lb-in. (6.8 to 7.3 N·m)
Telescope gage, 0.3125 to 0.5000 in. (special tool)
Hole gage, 0.125 to 0.200 in. (special tool)
Machinist's vise with vise jaw caps

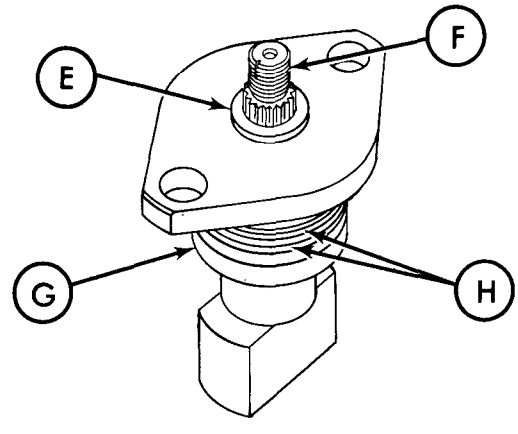
SUPPLIES:

Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)
Key washer and spacer, from Parts Kit, Part No. 5702765
Preformed packing (2) from Gasket and Preformed Packing Set, Part No. 5702632
or
Parts Kit, Part No. 5702765

DISASSEMBLY:

1. Place fuel control unit (A) in vise.
2. Using drive pin punch and hammer, straighten tabs of key washer (B).
3. Using 7/16 in. socket and ratchet handle, remove jam nut (C).
4. Remove and discard key washer (B).
5. Using screwdriver, carefully pry off control lever (D).
6. Remove control unit (A) from vise.
7. Remove and discard spacer (E).
8. Remove control shaft (F) from bushing (G).
9. Remove and discard two preformed packings (H).





TA245237

CLEANING:

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

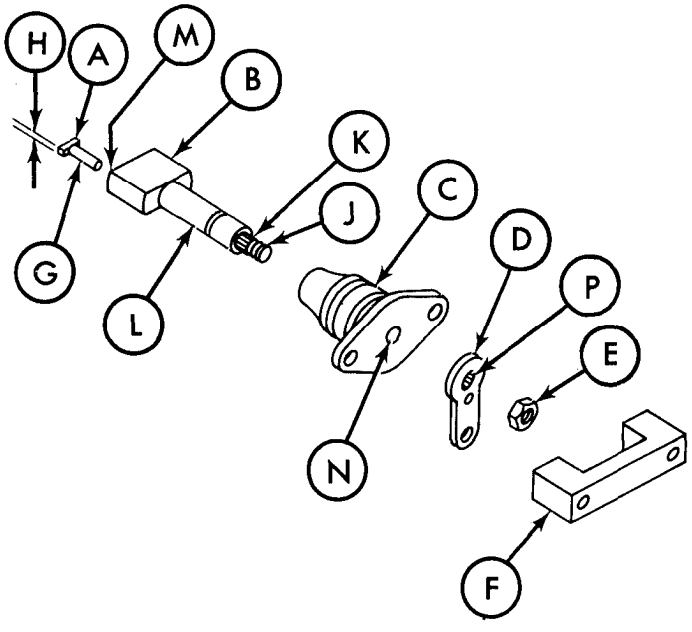
1. Clean all parts in solvent.
2. Wipe dry with clean lint-free cloth.

REPAIR OF SUBASSEMBLIES—Continued

INSPECTION:

1. Inspect shoulder pin (A), control shaft (B), bushing (C), control lever (D), jam nut (E), and retainer (F) under magnifying glass and strong light for cracks, scoring, or raised metal. Replace parts if cracked or scored.

2. Using micrometer, measure pin diameter (G). Replace pin if diameter is less than 0.1235 in. (3.14 mm). Using micrometer, measure thickness of pin flats (H). Replace pin if dimension is less than 0.0990 in. (2.51 mm).



NOTE

Keep pin with control unit to prevent loss or damage.

3. Inspect shaft threads (J) and spline (K) for galling. Replace shaft if threads or spline are damaged.

4. Inspect shaft (L) for cracks, scoring, or scratches using magnifying glass and strong light. Inspect for wear which will be indicated by ridges. Replace shaft if cracked, scored, scratched, or if ridges are found.

5. Using hole gage and micrometer, measure pin hole (M). Replace shaft if hole diameter exceeds 0.1260 in. (3.20 mm).

6. Using telescope gage and micrometer, measure bushing shaft bore (N). Replace bushing if bore diameter exceeds 0.323 in. (8.20 mm).

7. Inspect spline (P) in control lever. Replace lever if spline is damaged.

TA245238

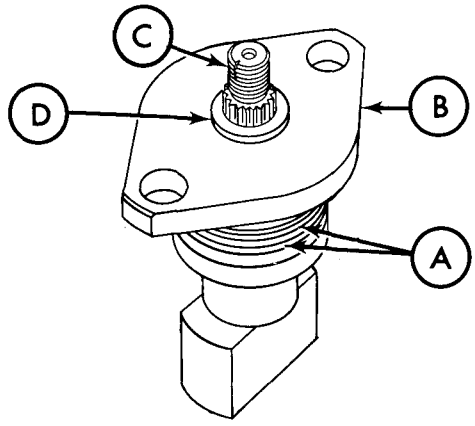
REPAIR: No repair procedures authorized for these parts.

ASSEMBLY:

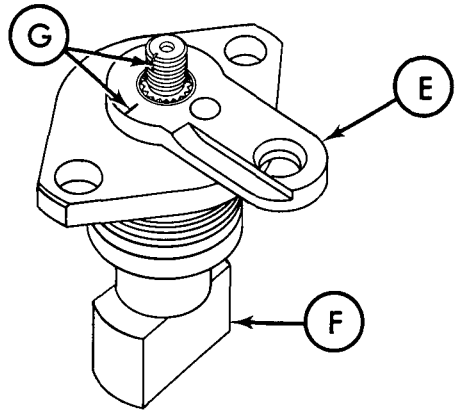
NOTE

Coat all metal parts with a light film of engine oil.

1. Install two new preformed packings (A) on bushing (B). Install control shaft (C) in bushing. Install new spacer (D) on shaft.



2. Position control lever (E) 90° from centerline of flat area (F) on control shaft. Make sure alinement marks (G) on lever and shaft match. Press lever to shoulder on shaft.

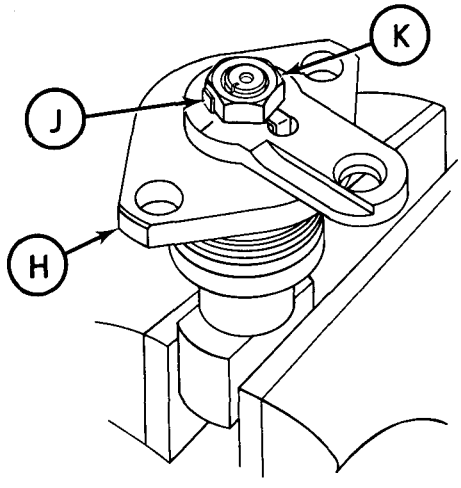


3. Place partially assembled control unit (H) in vise.

4. Install new key washer (J) and jam nut (K). Using 7/16 in. socket and a torque wrench, torque tighten nut to 60 to 65 lb-in. (6.8 to 7.3 N·m).

5. Using drive pin punch and hammer, bend tabs of key washer (J) against nut flats.

End of Task



TA245239

REPAIR OF SUBASSEMBLIES — Continued

GOVERNOR HOUSING AND ASSOCIATED PARTS

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Hand cold chisel
1/4 in. socket head screw key
Machinist's vise with vise jaw caps
Arbor press and press plates
Magnifying glass, 5 power
1 in. outside micrometer
2 in. outside micrometer
3 in. outside micrometer
Spring tester
Fine mill file
Torque wrench capable of torquing 50 to 60 lb-in. (6 to 7 N·m)
Machinist's steel rule capable of measuring 7 35/64 in. (19.2 cm)
Flat wide nose pliers
Protractor (fabricated tool), page 2-4

SUPPLIES:

Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)
Sealant (Item 2, Appendix C)
Lubricant (Silicone, low temp, Item 1, Appendix C)
Wire (Item 11, Appendix C)
Seal
Gasket and Preformed Packing Set, Part No. 5702632
Parts Kit, Part No. 5705050
Parts Kit, Part No. 5705051
Pencil
Paper

DISASSEMBLY:

NOTE

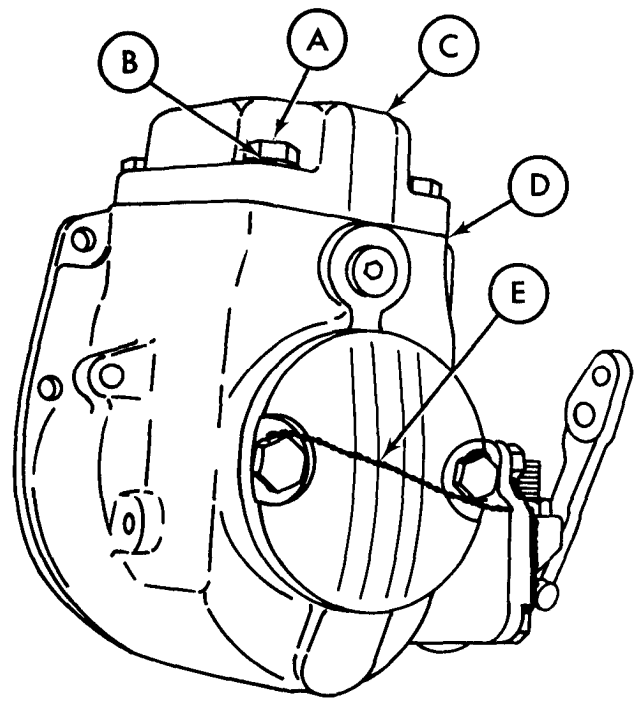
Retain all unused kit parts. They will be used to repair other components.

1. Using 7/16 in. socket and ratchet handle, remove four machine bolts (A).
2. Remove and discard four lockwashers (B).
3. Remove governor cover (C).
4. Remove and discard gasket (D).

WARNING

The governor cap is spring loaded. Maintain pressure on governor cap when removing screws.

5. Using diagonal cutting pliers, cut and remove wire (E).



TA245240

6. Using 7/16 in. socket and ratchet handle, remove two screws and lockwashers (A).

7. Remove governor cap (B).

8. Remove inner shims (C) and outer shims (D).

9. Using 1 in. micrometer, measure thickness of inner and outer shims (C) and (D). Record thickness of each shim pack. Discard shims.

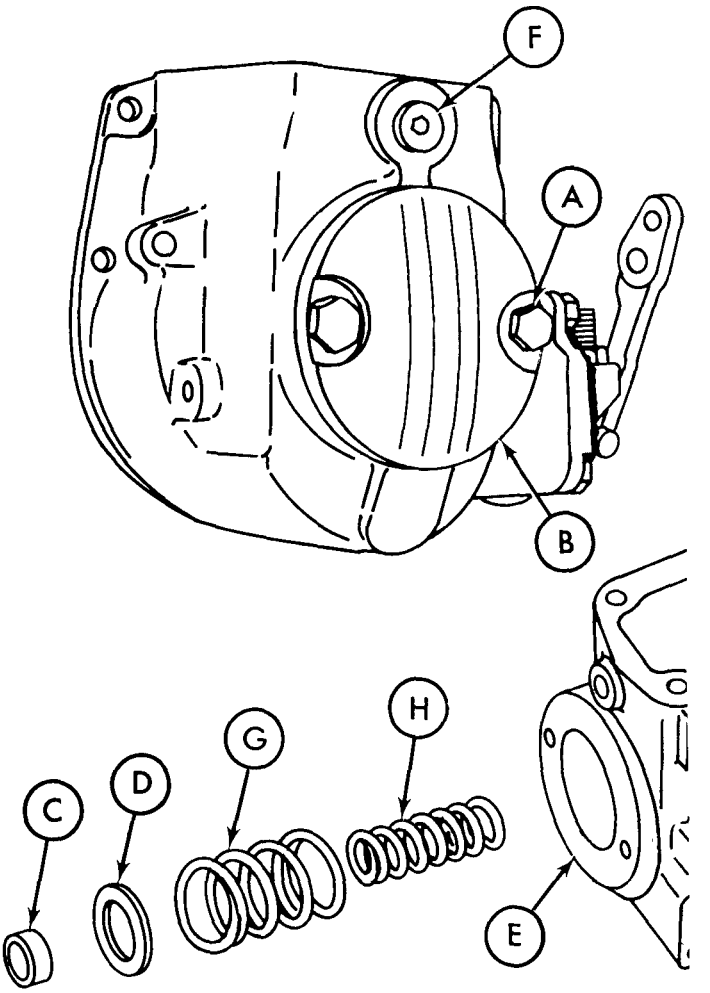
NOTE

Record of shim pack thicknesses will aid in selecting new shims during assembly.

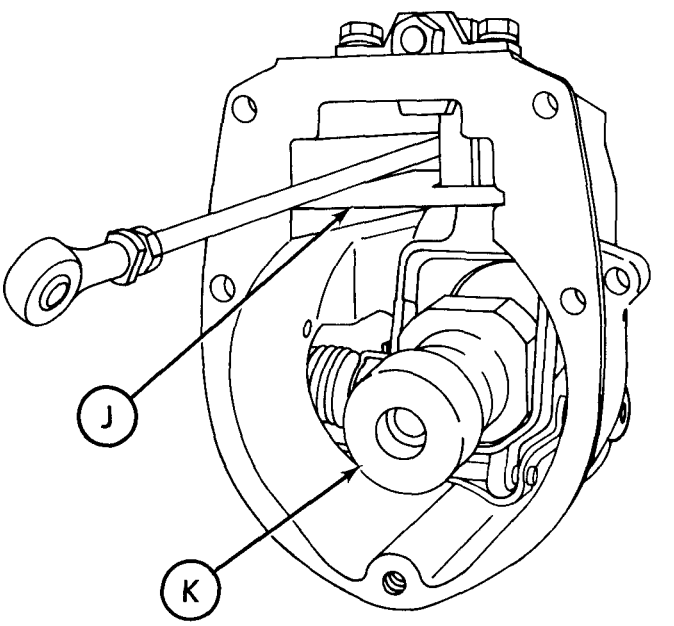
10. Remove and discard gasket (E).

11. Using 1/4 in. socket head screw key, remove pipe plug (F).

12. Remove outer spring (G) and inner spring (H).



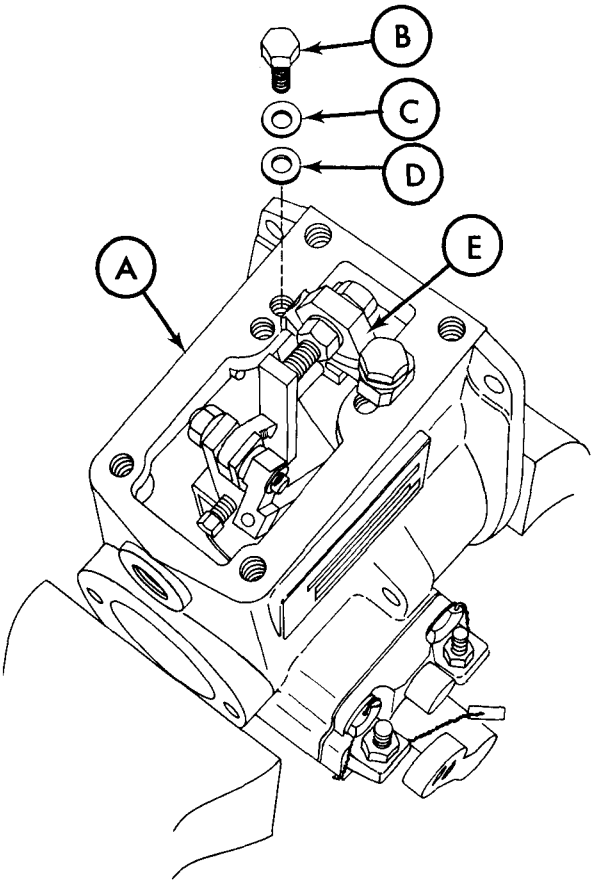
13. Remove oil baffle (J) and sleeve assembly (K).



REPAIR OF SUBASSEMBLIES—Continued

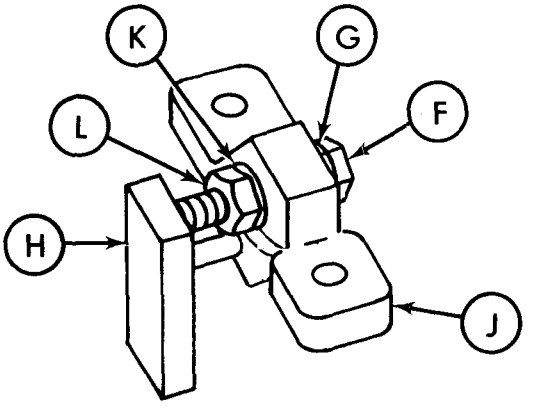
14. Place housing assembly (A) in vise.

15. Using 7/16 in. socket and ratchet handle, remove two screws (B), lockwashers (C), and flat washers (D). Remove assembled stop plate bridge (E).



16. Using two 7/16 in. open end wrenches, remove hexagon plain nut (F) and lockwasher (G) from stop plate assembly (H). Remove stop plate (H) from stop plate bridge (J).

17. Remove lockwasher (K) and nut (L).

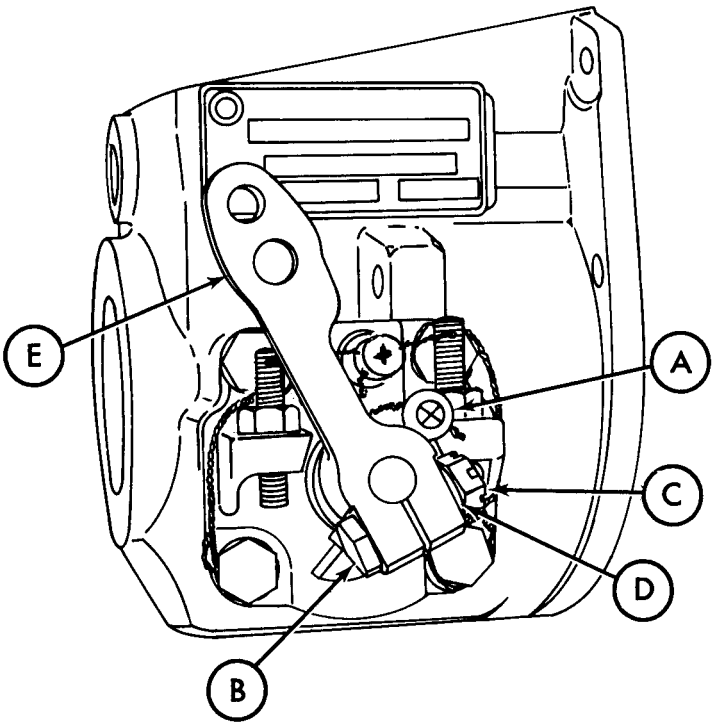


TA245242

18. Using diagonal cutting pliers, cut and remove seal (A).

19. Using 7/16 in. socket and ratchet handle, hold screw (B) and remove nut (C).

20. Remove lockwasher (D), screw (B), and operating lever (E). Discard lockwasher (D).

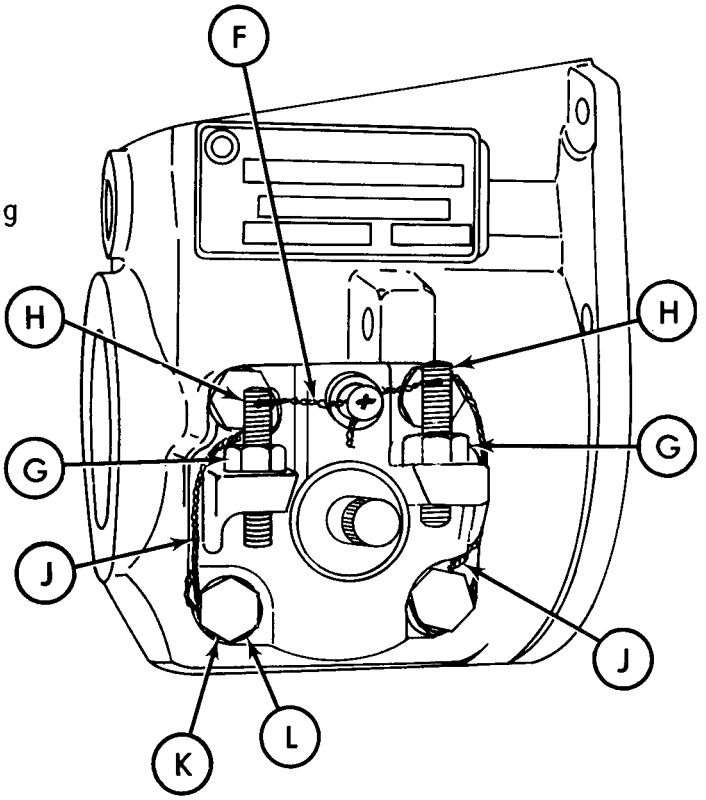


21. Using diagonal cutting pliers, cut and remove seal (F).

22. Using 7/16 in. open end wrench and screwdriver, loosen two adjusting screw nuts (G). Remove two adjusting screws (H) and nuts. Discard nuts and screws.

23. Using diagonal cutting pliers, cut and remove two wires (J).

24. Using 7/16 in. socket and ratchet handle, remove and discard four capscrews (K) and lockwashers (L).

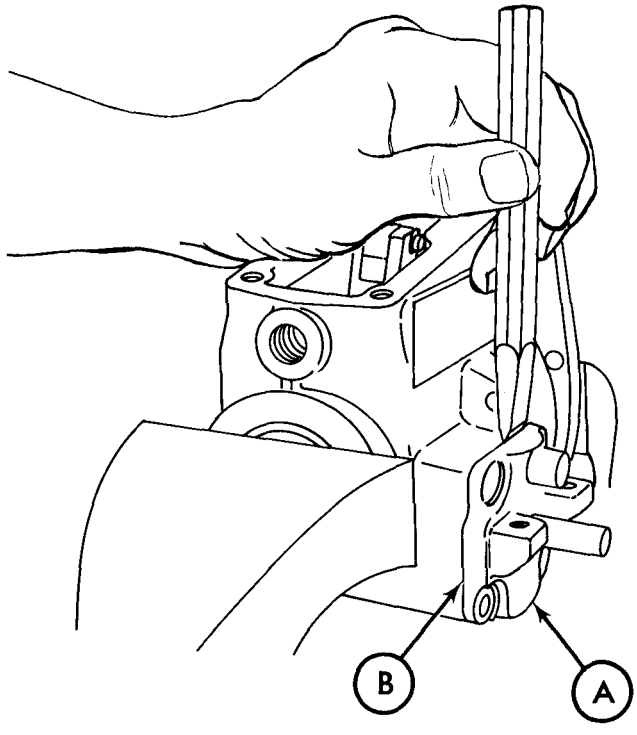


TA245243

REPAIR OF SUBASSEMBLIES—Continued

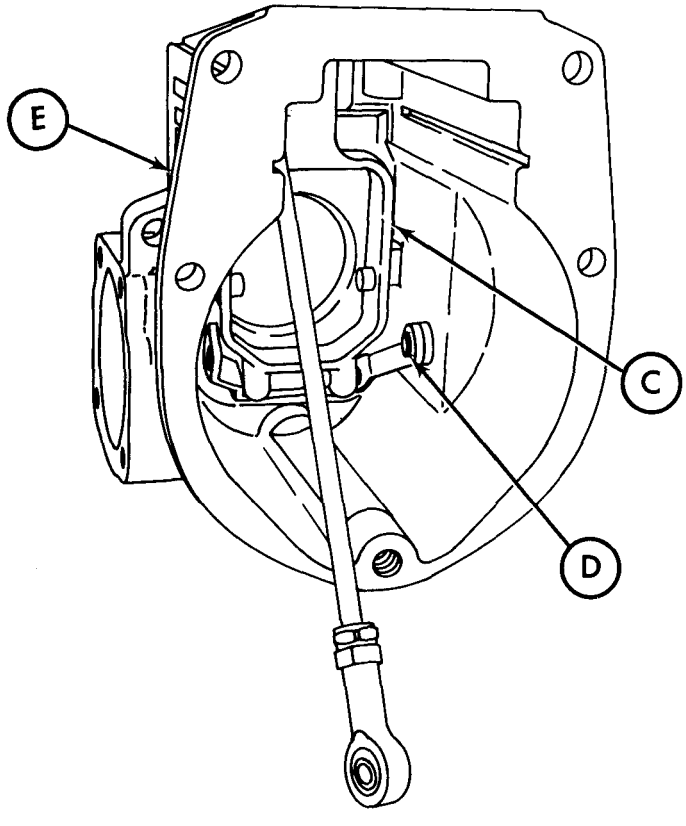
25. Using hand cold chisel, and hammer, loosen, remove, and discard assembled bearing plate (A).

26. Remove and discard gasket (B).



27. Remove fulcrum lever assembly (C) from pivot pin (D) and remove fulcrum lever and control rod from housing.

28. Remove governor housing (E) from vise.



TA245244

29. Using needle nose pliers, remove and discard cotter pin (A).

30. Remove flat washer (B) and control rod (C) from fulcrum lever screw (D).

31. Using 5/16 in. open end wrench, hold rod end bearing flat (E) and loosen self-locking nut (F) using 3/8 in. open end wrench. Remove bearing. Using 3/8 in. open end wrench, remove nut from rod (C).

32. Using 7/16 in. socket and ratchet handle, remove nut (G), lockwasher (H), and smoke limit cam (J) from fulcrum lever screw (D).

33. Retain bearing (E), fulcrum lever screw (D), and nut (G). Discard all other parts.

CLEANING:

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

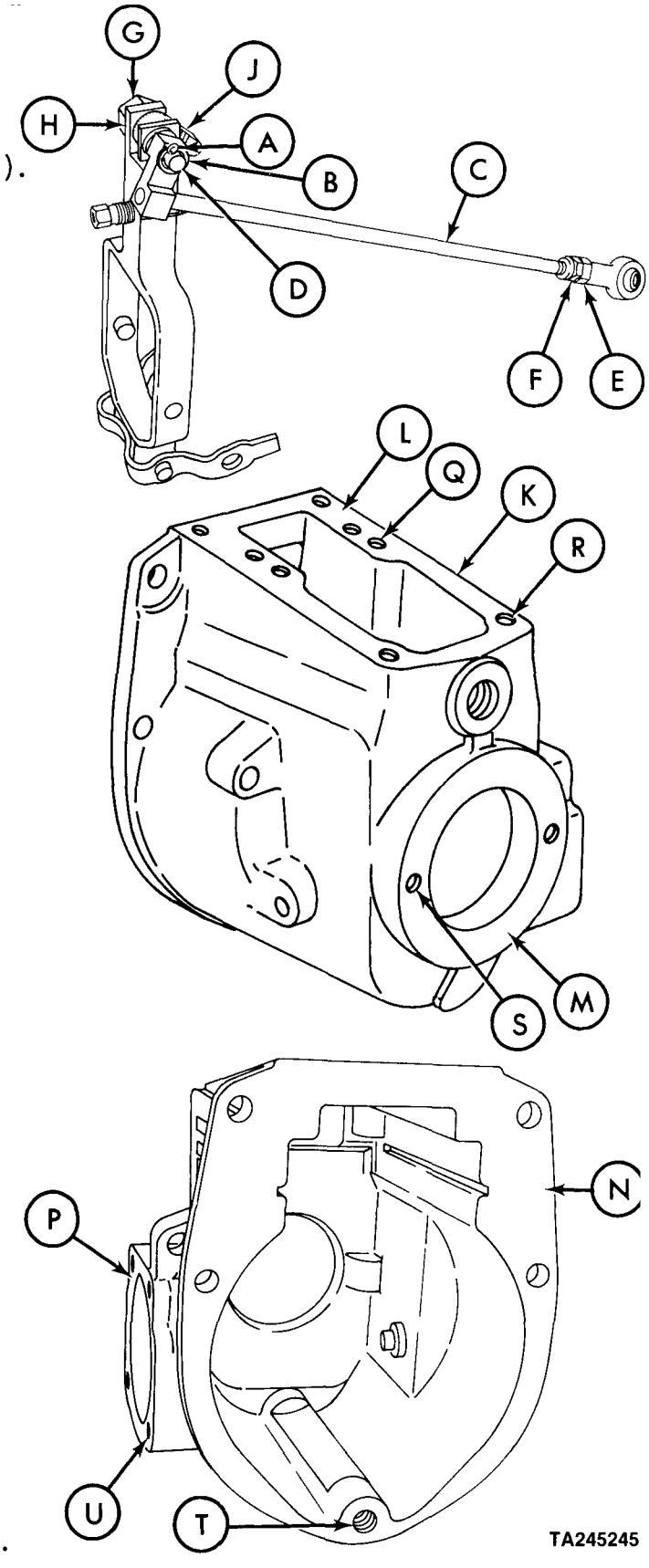
1. Clean all parts using solvent.

2. Wipe dry with clean lint-free cloth.

INSPECTION:

1. Inspect governor housing (K) for cracks using magnifying glass and strong light. Look for raised metal, distorted or warped mounting flanges (L), (M), (N), and (P). Replace housing if cracked or if mounting flanges are distorted.

2. Inspect tapped holes (Q), (R), (S), (T), and (U) for thread damage. Replace housing if threads are damaged.



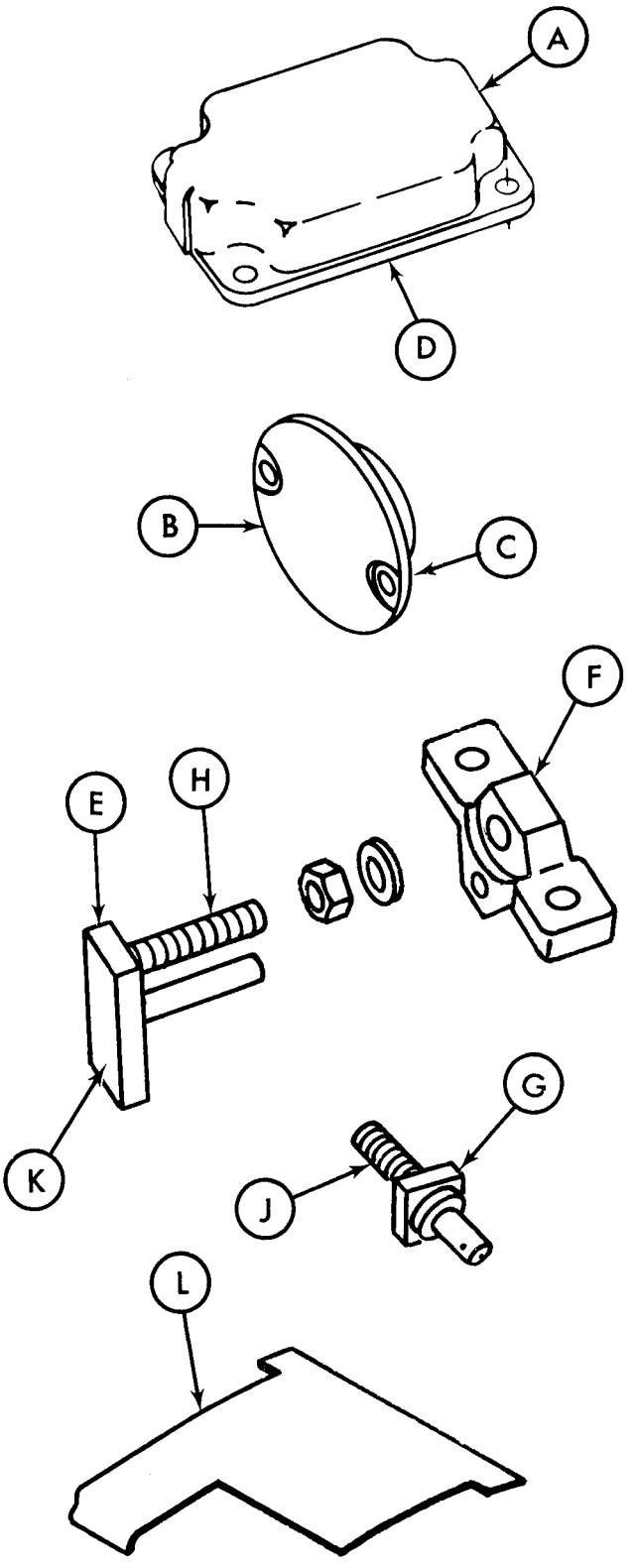
TA245245

REPAIR OF SUBASSEMBLIES—Continued

3. Inspect governor cover (A) and cap (B) for cracks using magnifying glass and strong light. Look for raised metal, distorted or warped mounting flanges (C) and (D). Replace cover or cap if cracked, or if mounting flanges are distorted. If cover, cap, or mounting flanges are nicked or have raised metal, see Repair, page 3-63.

4. Inspect stop plate (E), bridge (F), and screw (G) for cracks using magnifying glass and strong light. Replace plate or bridge if cracked. Inspect threads (H) on stop plate and (J) on screw for damage. Inspect wear face (K) for wear pattern or roughness. Replace stop plate (E) if wear face or threads are damaged. Replace screw (G) if threads are damaged.

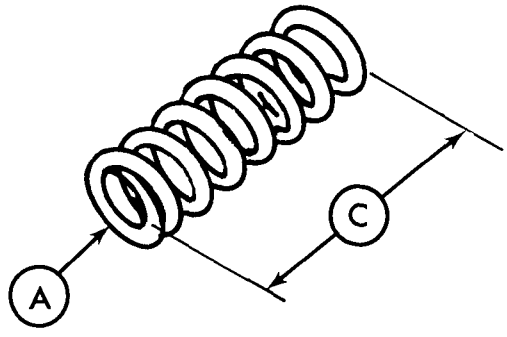
5. Inspect baffle (L) for cracks using magnifying glass and strong light. Replace baffle if cracked.



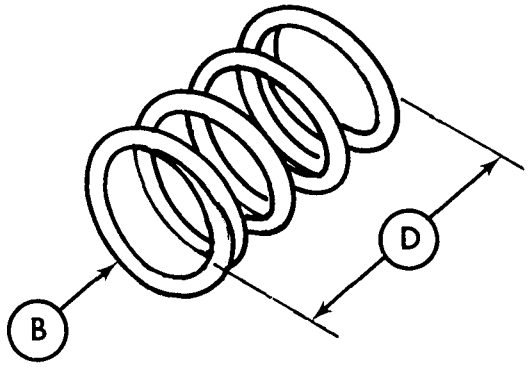
TA245246

6. Inspect governor inner spring (A) and outer spring (B) for cracks or nicks. Replace springs if cracked or nicked.

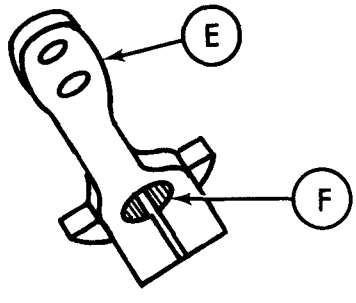
7. Using 3 in. micrometer, measure free length of inner spring (A). Free length (C) must be 1.9530 to 2.0470 in. (49.6 to 52 mm). Check spring load. Spring load must be 50 to 55 lb (22.7 to 25 kg) at 1.80 in. (45.7 mm) length. Replace spring if it does not meet specified data.



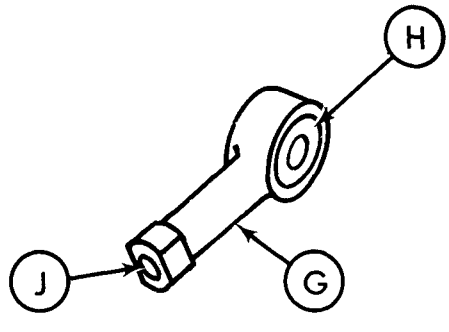
8. Using 2 in. micrometer, measure free length of outer spring (D). Free length (D) must be 1.5150 to 1.6090 in. (38.5 to 40.9 mm). Check spring load. Spring load must be 6.00 to 6.50 lb (2.72 to 2.95 kg) at 1.40 in. (35.6 mm) length. Replace spring if it does not meet specified data.



9. Inspect operating lever (E) for cracks using magnifying glass and strong light. Replace lever if cracked. Inspect spline (F) for damage. Replace lever if spline is damaged.



10. Inspect rod end bearing (G) for cracks and freedom of ball (H). Ball must move freely in race without end play. Inspect threads (J) for damage. Replace bearing if cracked. Replace bearing if threads are damaged or if ball does not move freely in race. Replace bearing if ball has end play.

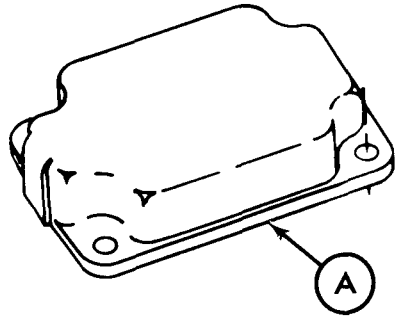


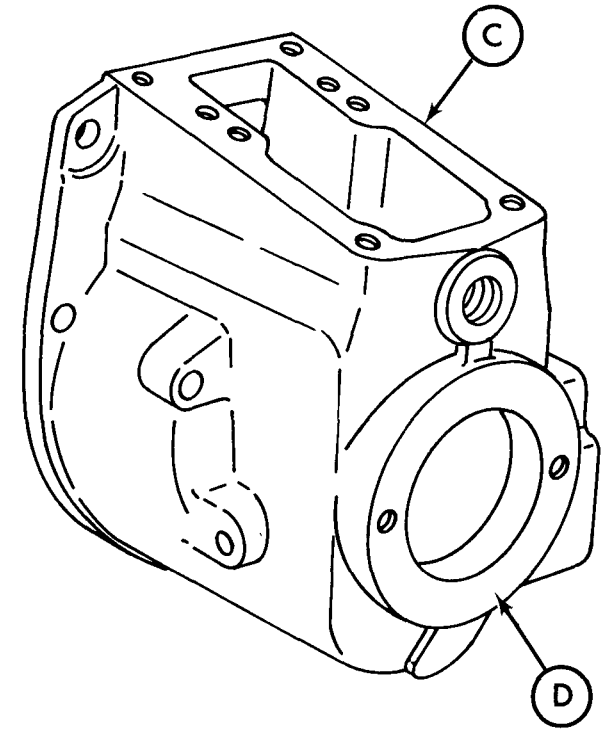
TA245247

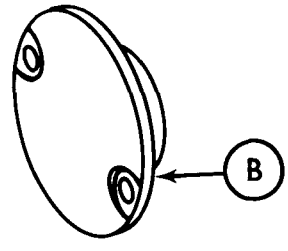
REPAIR OF SUBASSEMBLIES—Continued

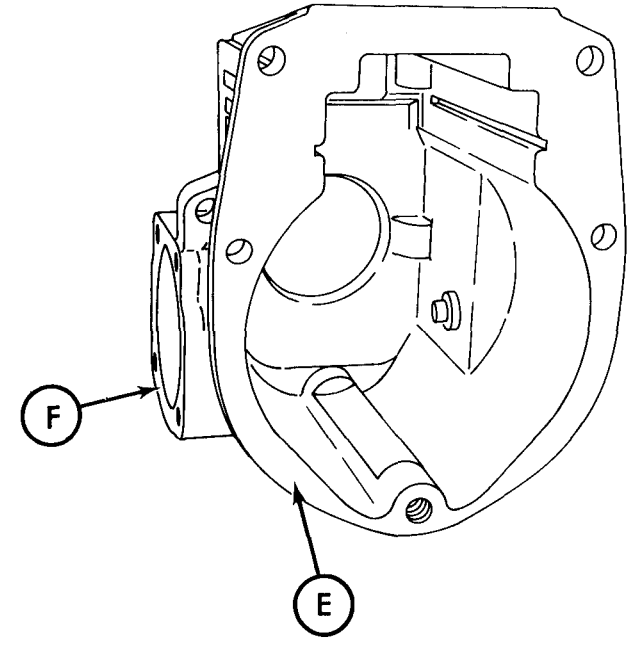
REPAIR:

1. Smooth small nicks or raised metal on mounting flange of governor cover (A), governor cap (B), and governor housing flanges (C), (D), (E), and (F), using a fine mill file.





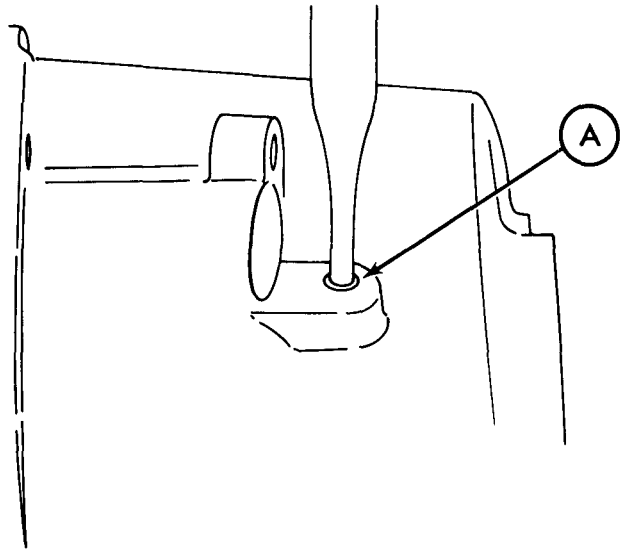




TA245248

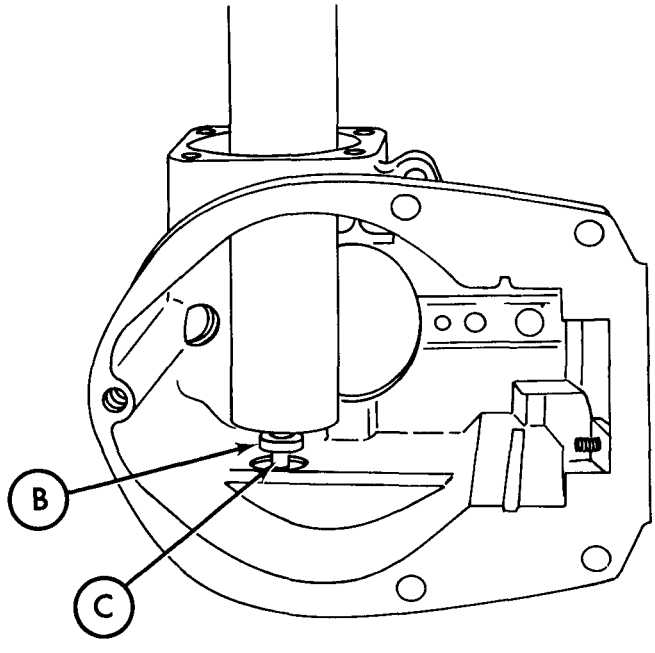
REPAIR OF SUBASSEMBLIES—Continued

2. Place housing on arbor press. Using a drive pin punch, remove pivot pin (A).



3. Turn housing over on arbor press. Position a new pivot pin (B) over pin bore with long shaft (C) down. Press pin until shoulder bottoms on housing.

4. No repairs authorized for the remaining parts.



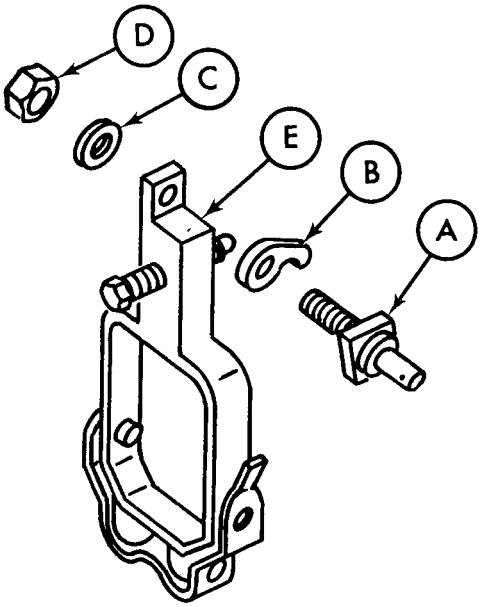
TA245249

ASSEMBLY:

NOTE

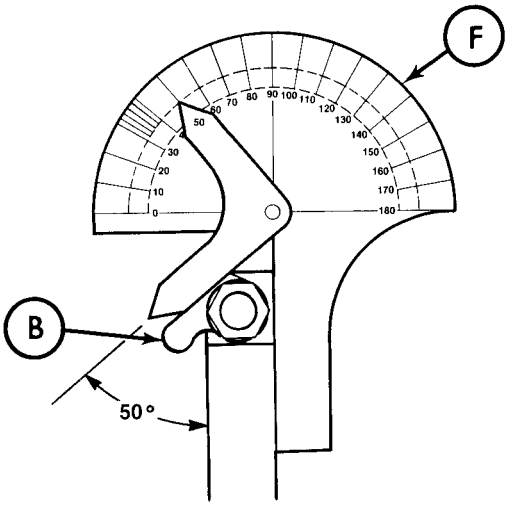
Coat all metal parts with a light film of engine oil.

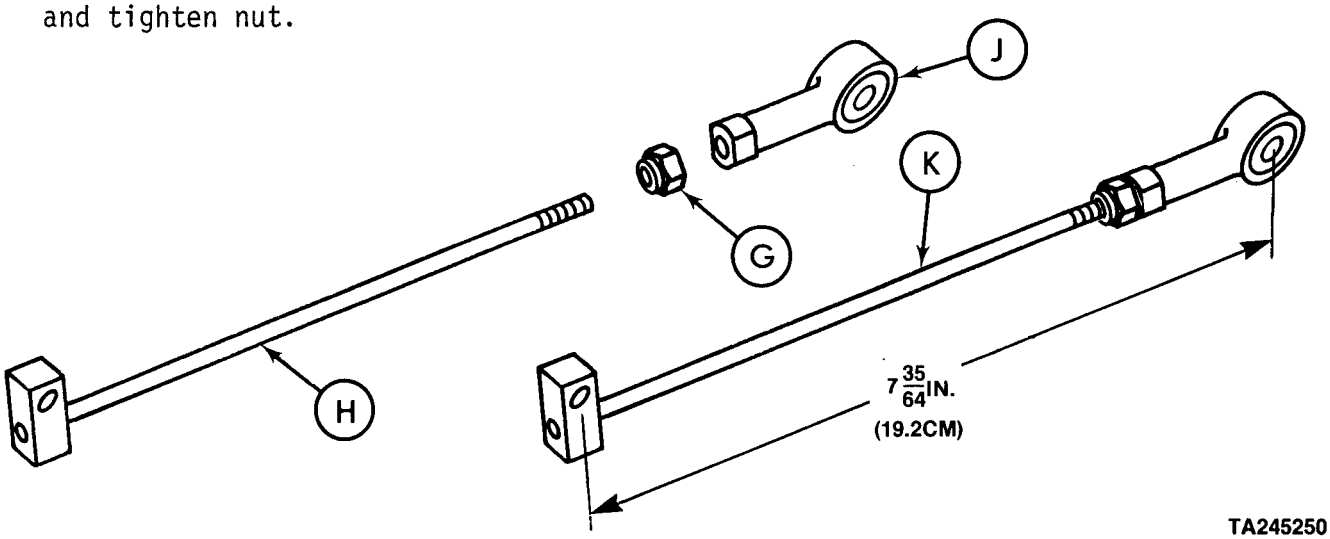
1. Install fulcrum lever screw (A), new cam (B), new lockwasher (C), and new nut (D) loosely on new fulcrum lever (E).



2. Using protractor (F), position cam (B) 50° from vertical. Using torque wrench and 7/16 in. socket, tighten nut to 50 to 60 lb-in. (6 to 7 N·m).

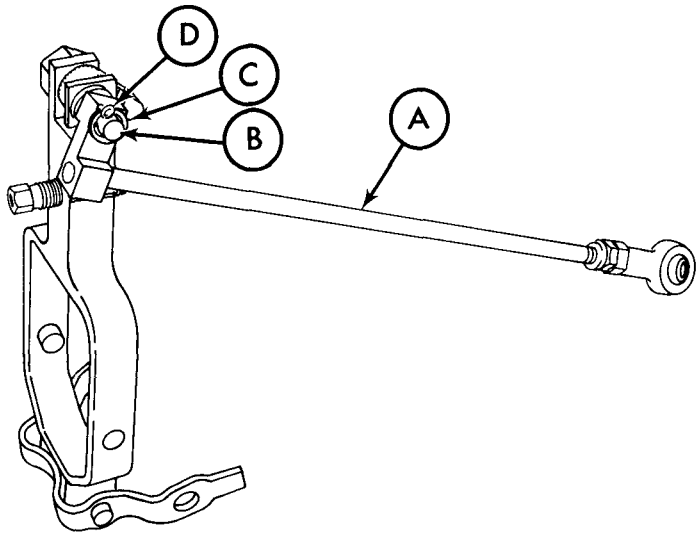
3. Using 3/8 in. open end wrench, install new nut (G) on new rod (H). Install bearing (J) on rod (H). Adjust length of rod assembly (K) to 7 35/64 in. (19.2 cm). Hold bearing flats with 5/16 in. open end wrench, and tighten nut.



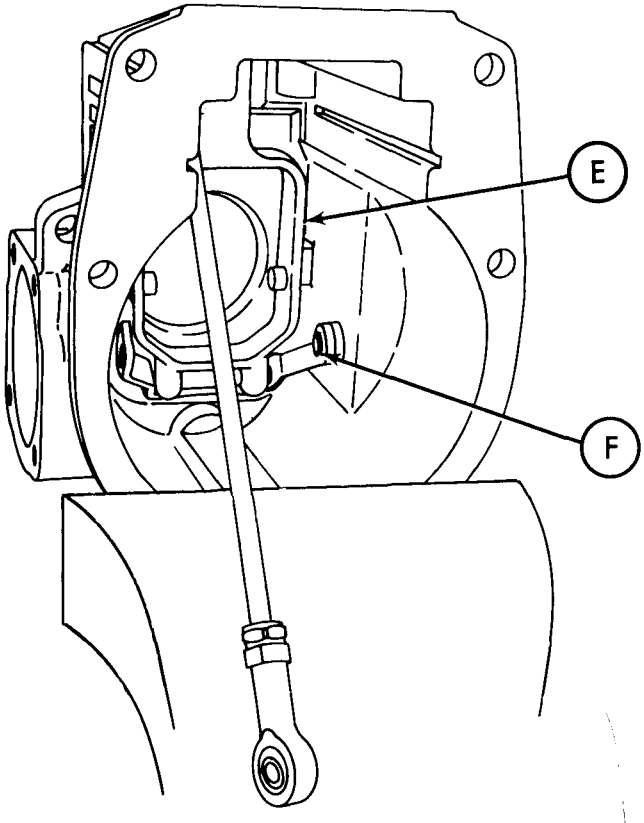


TA245250

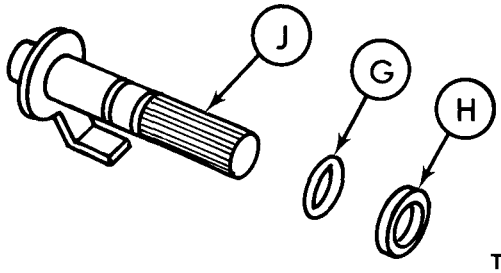
4. Install rod assembly (A) on fulcrum screw (B) and secure with new flat washer (C) and new cotter pin (D). Bend legs of cotter pin (D) around screw (B).



5. Place governor housing in vise. Install fulcrum lever and rod assembly (E) in housing. Be certain arm of lever is installed on pivot pin (F).



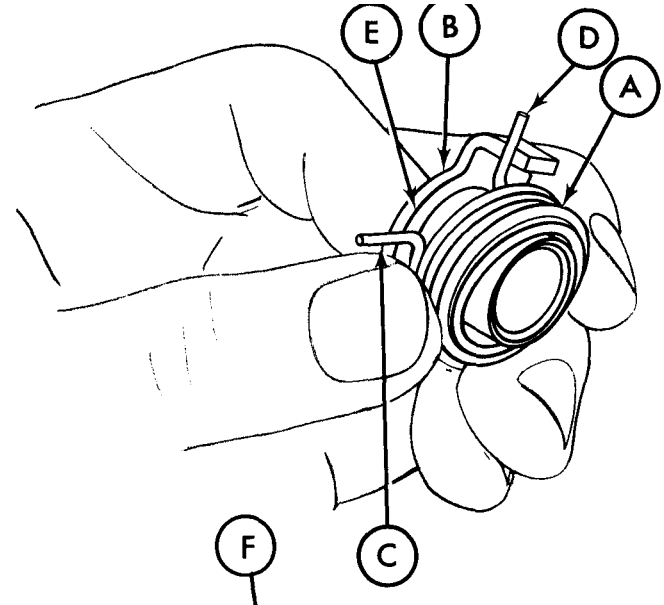
6. Install new gasket (G) and new preformed packing (H) on new operating shaft assembly (J).



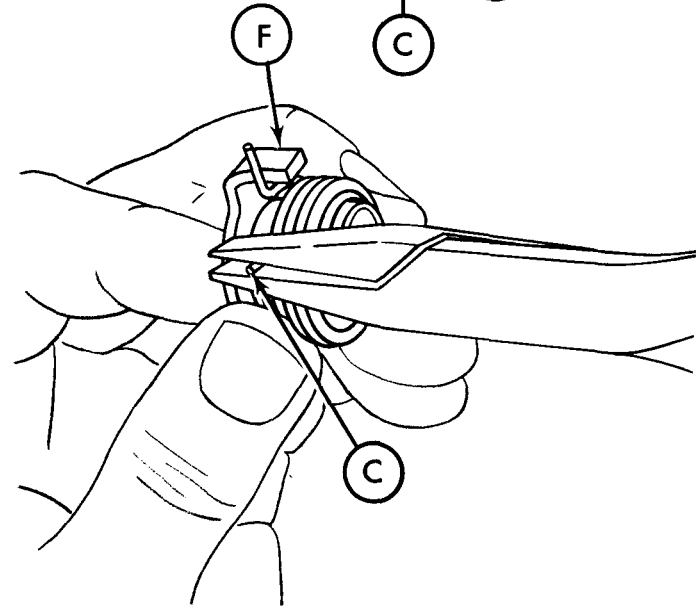
TA245251

REPAIR OF SUBASSEMBLIES—Continued

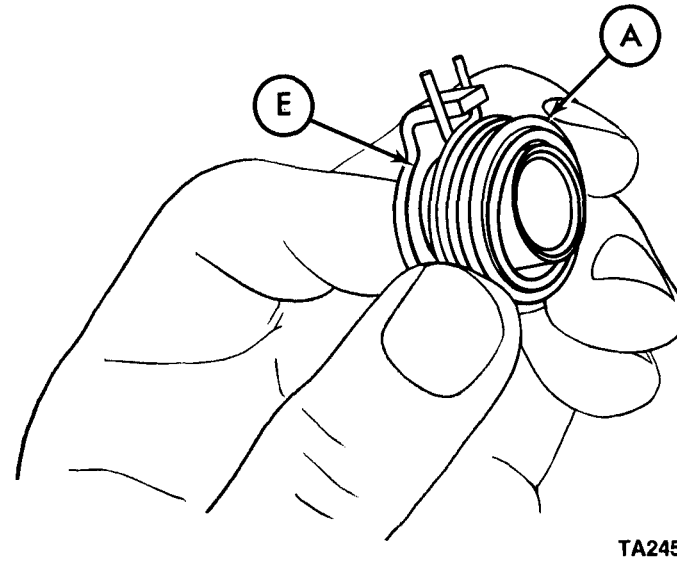
7. Install new spring (A) on new spring plate (B) with spring ends (C) and (D) facing spring plate flange (E). Position right hand spring end (D) on left side of tang.



8. Using flat wide nose pliers, twist left hand spring end (C) to right side of tang (F).



9. Push spring (A) against spring plate flange (E).



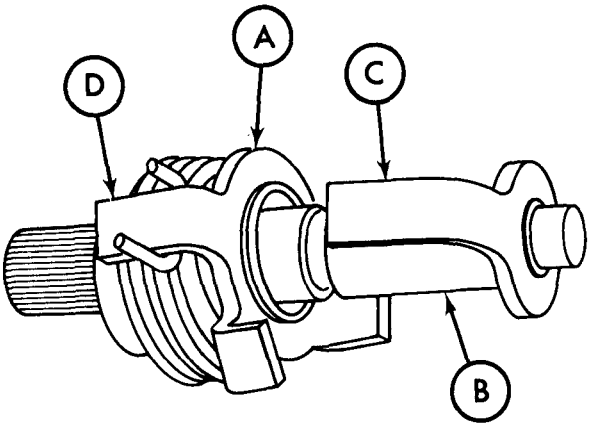
TA245252

REPAIR OF SUBASSEMBLIES—Continued

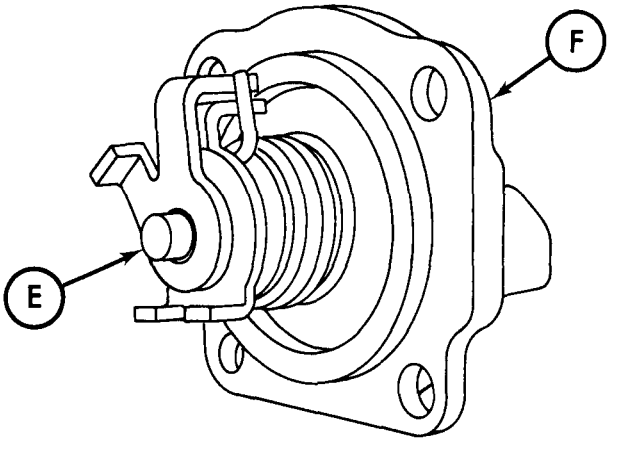
10. Install spring plate assembly (A) on operating shaft (B) making sure tangs (C) and (D) aline. Push shaft (B) until tang (C) covers tang (D).

NOTE

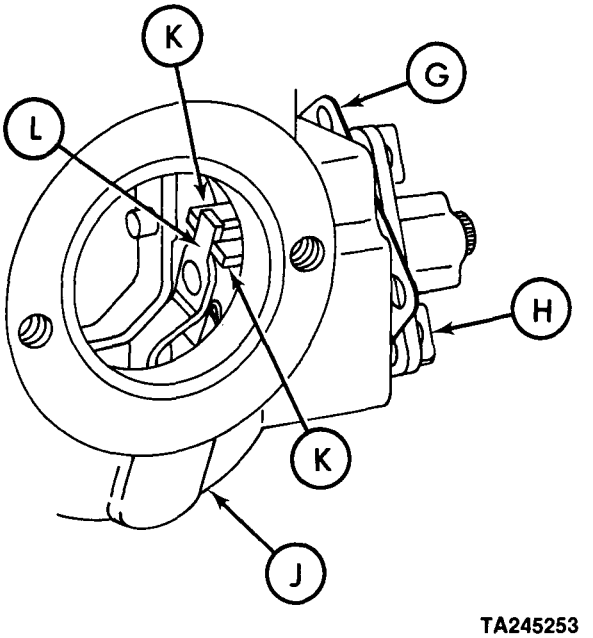
Spring ends must hold tangs securely.



11. Install assembled shaft, spring plate and spring (E) on new bearing plate (F).



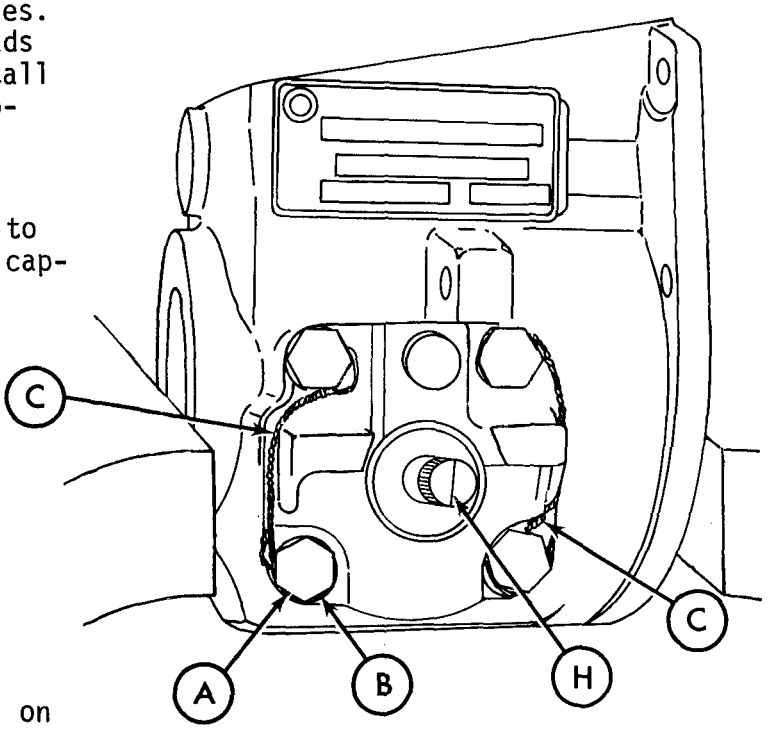
12. Coat both sides of new gasket (G) sparingly with sealant. Install gasket on bearing plate (H). Install bearing plate assembly on governor housing (J) with spring plate prongs (K) engaged with fulcrum lever arm (L).



TA245253

13. Aline bearing plate mounting holes. Apply sealant sparingly to threads of four new capscrews (A). Install four new lockwashers (B) and capscrews (A).

14. Using torque wrench and 7/16 in. socket, tighten capscrews to 50 to 60 lb-in. (6 to 7 N·m). Secure capscrews with twisted wire (C).

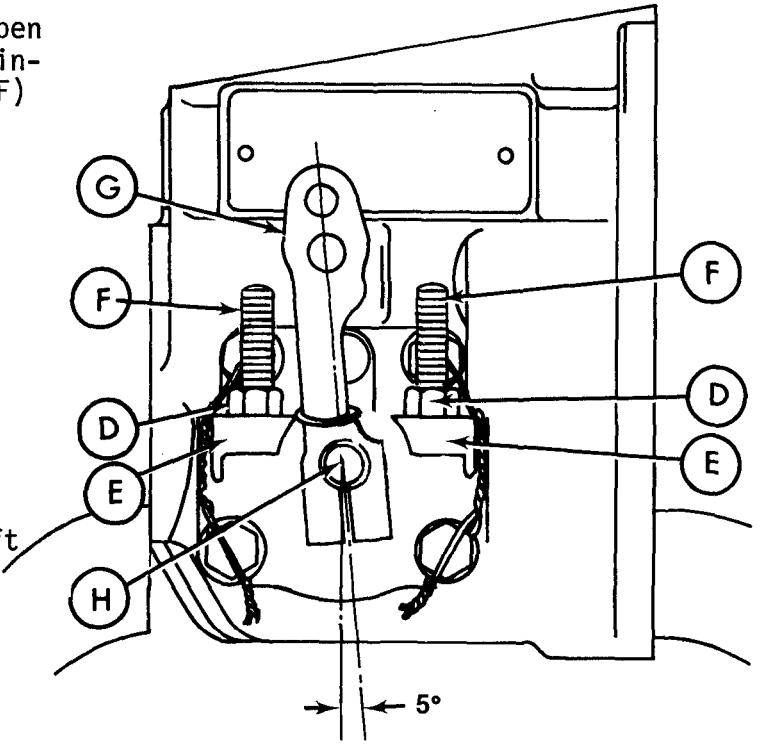


15. Place two new adjusting nuts (D) on lugs (E) and aline with holes in lugs. Hold nuts with 7/16 in. open end wrench. Using screwdriver, install two new adjusting screws (F) until bottom of screws are flush with bottom of lugs (E).

NOTE

Final adjustments on the adjusting screws will be made in Chapter 4.

16. Position operating lever (G) on shaft (H) with slot in lever (G) one spline tooth (5°) to the left of alinement mark on shaft (H).

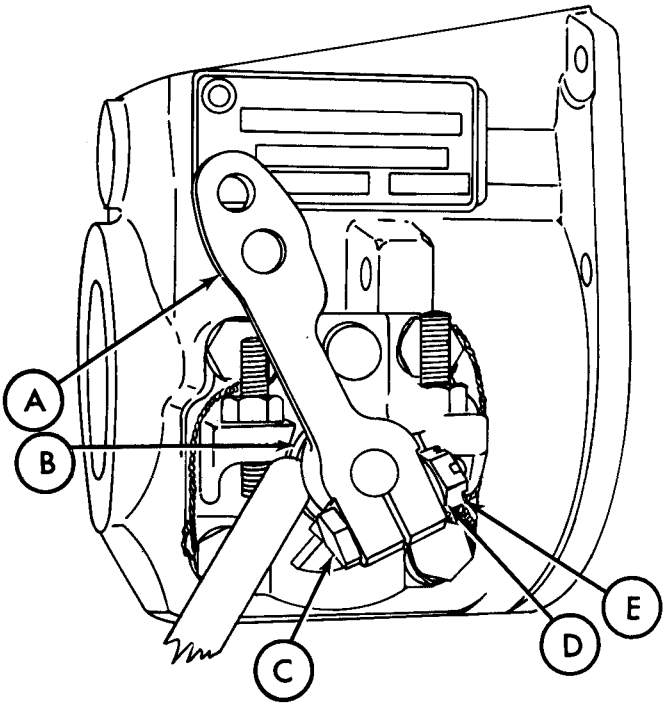


TA245254

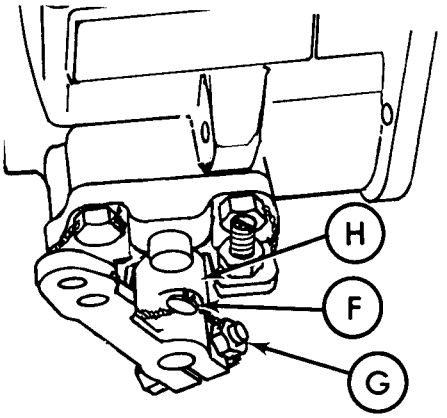
REPAIR OF SUBASSEMBLIES—(Continued)

17. Push lever (A) on shaft and maintain 0.004 in. (0.10 mm) clearance between lever (A) and bearing plate (B) using a feeler gage. Install screw (C), new lockwasher (D), and nut (E) using two 7/16 in. open end wrenches, to snug the operating lever on the shaft.

18. Using 7/16 in. open end wrench, 7/16 in. socket, and torque wrench, torque tighten nut (E) to 70 to 80 lb-in. (8 to 9 N·m). Check operating lever for binding. If lever is binding, recheck clearance, step 17 above.

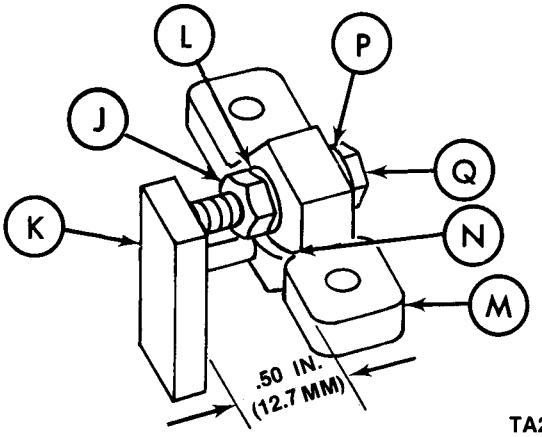


19. Install new seal (F) through nut and screw (G) and around lever shaft (H). Crimp seal using pliers.



20. Install nut (J) on stop plate (K) and turn until it is about 1/2 in. (12.7 mm) from stop plate. Install lockwasher (L) against nut.

21. Install bridge (M) on stop plate (K) with counterbore (N) toward stop plate and secure finger tight with lockwasher (P) and nut (Q).



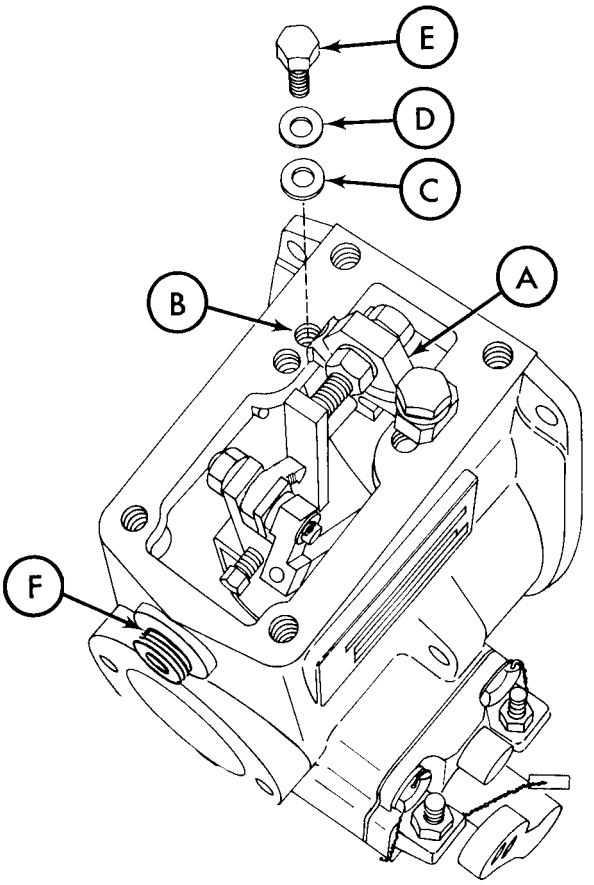
TA245255

REPAIR OF SUBASSEMBLIES—(Continued)

22. Position stop plate bridge (A) over tapped holes (B).

23. Install two flat washers (C), lockwashers (D), and screws (E), and torque tighten screws to 50 to 60 lb-in. (6 to 7 N·m) using 7/16 in. socket and torque wrench.

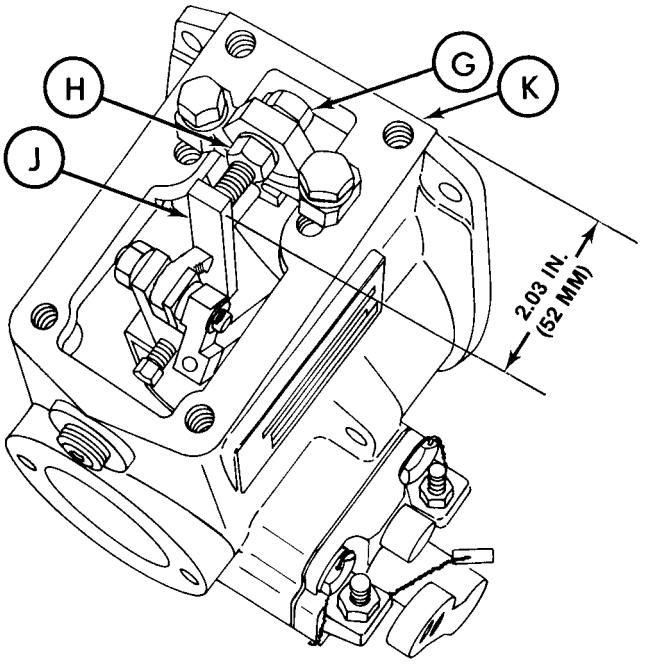
24. Using 1/4 in. socket head screw key, install pipe plug (F) in governor housing.



25. Loosen nuts (G) and (H). Position stop plate (J) 2.03 in. (52 mm) from governor housing mounting flange (K). Tighten nuts finger tight.

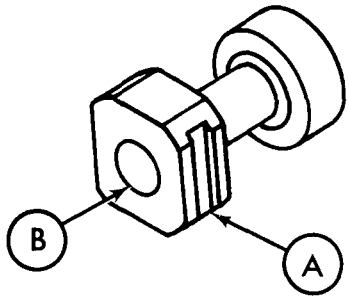
NOTE

Final stop plate adjustment will be made in Chapter 4.



TA245256

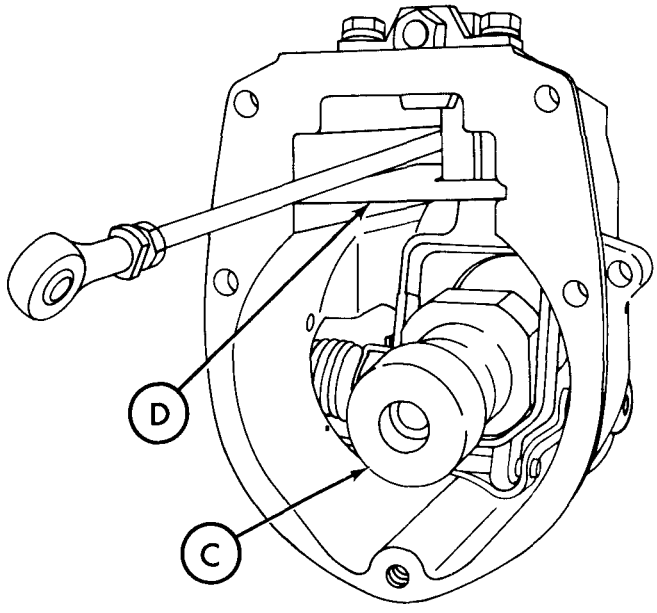
26. Apply lubricant sparingly to sliding sleeve at pin grooves (A) and bore (B).



27. Install sliding sleeve (C) and engage fulcrum lever pins. Install oil baffle (D).

NOTE

Make sure rod is above baffle plate during assembly.

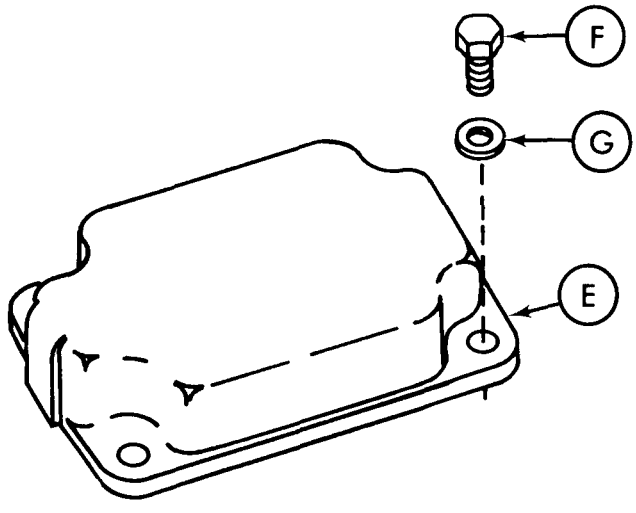


28. Put cover (E), machine screws (F), and lockwashers (G) aside for later assembly.

NOTE

Governor springs, shims, and cap will be installed during Assembly from Subassemblies, page 3-104.

End of Task



TA245257

REPAIR OF SUBASSEMBLIES—(Continued)

COVER AND SOLENOID

TOOLS:

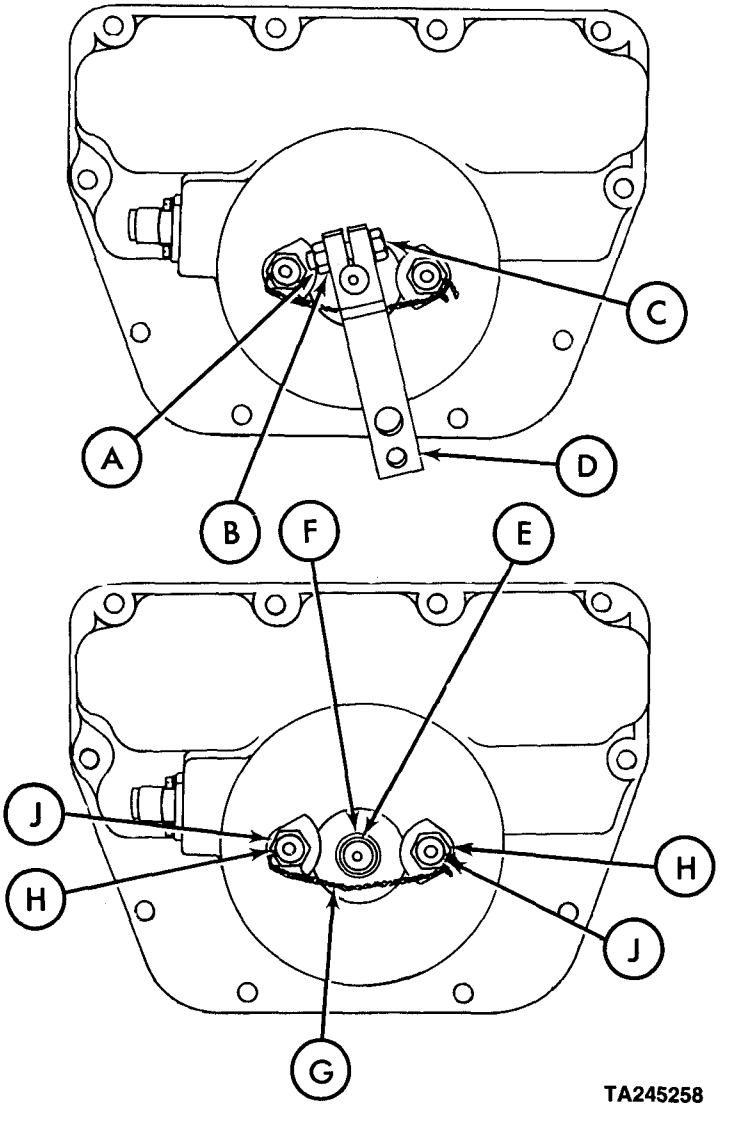
Tool Kit, Automotive Fuel and Electrical System Repair
Ohmmeter
Telescope gage, 0.3125 to 0.5000 in. (special tool)
Magnifying glass, 5 power
Soldering iron
1 in. outside micrometer
24 volt power source
Fine mill file
Torque wrench capable of torquing 40 to 75 lb-in. (5 to 9 N·m).
Protractor

SUPPLIES:

Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)
Solder (Item 6, Appendix C)
Wire (Item 11, Appendix C)
Screw
Preformed packing and gasket from Gasket and Preformed Packing Set, Part No. 5702632
or
Parts Kit, Part No. 5705050.
Lockwasher from Parts Kit, Part No. 5705050

DISASSEMBLY:

1. Using 7/16 in. socket, and ratchet handle, remove plain nut (A).
2. Remove lockwasher (B), machine bolt (C), and operating lever (D). Discard lockwasher.
3. Using screwdriver, remove retaining ring (E). Remove flat washer (F).
4. Using diagonal cutting pliers, cut and remove wire (G).
5. Using 7/16 in. socket and ratchet handle, remove two cap nuts (H) and flat washers (J).



TA245258

REPAIR OF SUBASSEMBLIES—(Continued)

6. Pull electrical solenoid (A) from cover (B) far enough to expose electrical lead solder joint at terminal (C). Using soldering iron, unsolder lead at terminal. Remove solenoid (A).

7. Remove shut-off lever assembly (D) from cover (B).

8. Remove and discard preformed packing (E) and gasket (F).

9. Remove and discard four assembled washer screws (G). Remove electrical receptacle connector (H) and gasket (J). Discard gasket.

CLEANING:

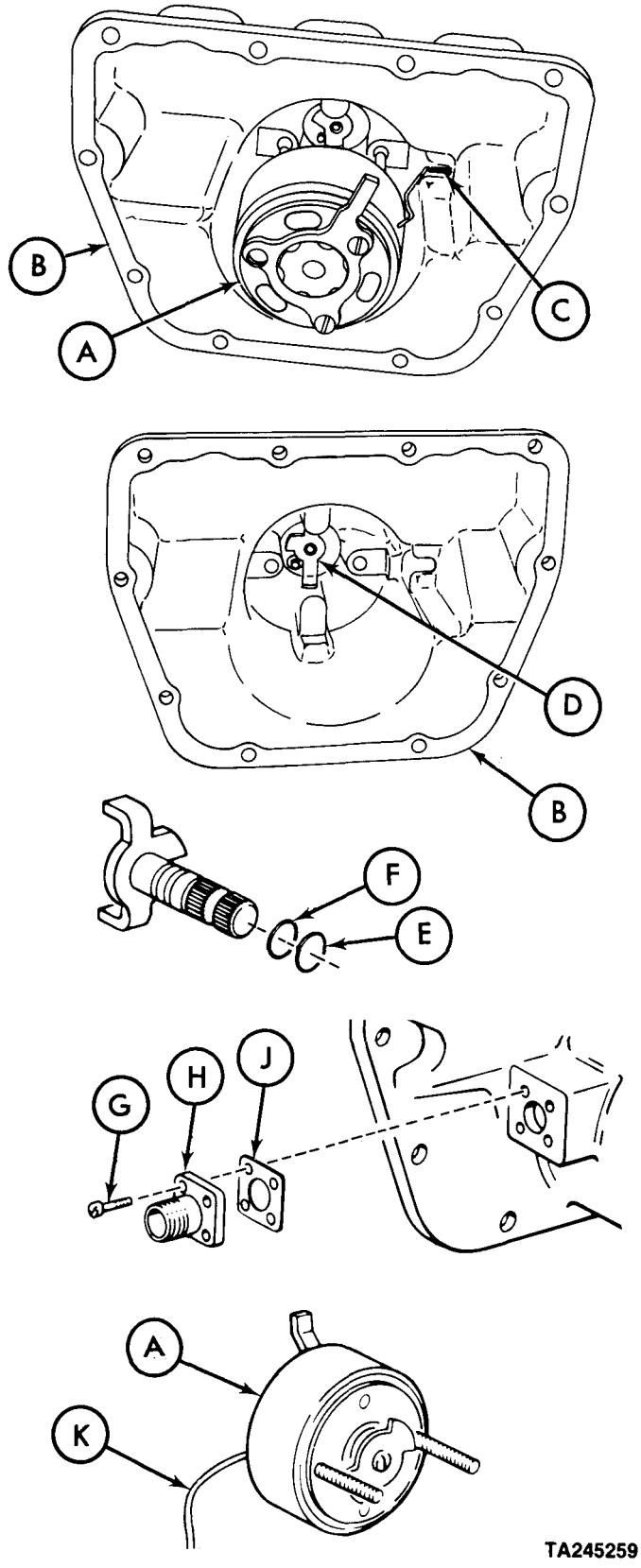
WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

CAUTION

Do not immerse solenoid in solvent.

1. Clean solenoid (A) using clean lint-free cloth mositened with solvent, being careful not to contact electrical lead (K).



TA245259

REPAIR OF SUBASSEMBLIES—(Continued)

2. Wipe dry with clean lint-free cloth. Clean electrical lead (A) using clean lint-free cloth.

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

3. Clean remaining parts using solvent. Wipe dry using clean lint-free cloth.

INSPECTION:

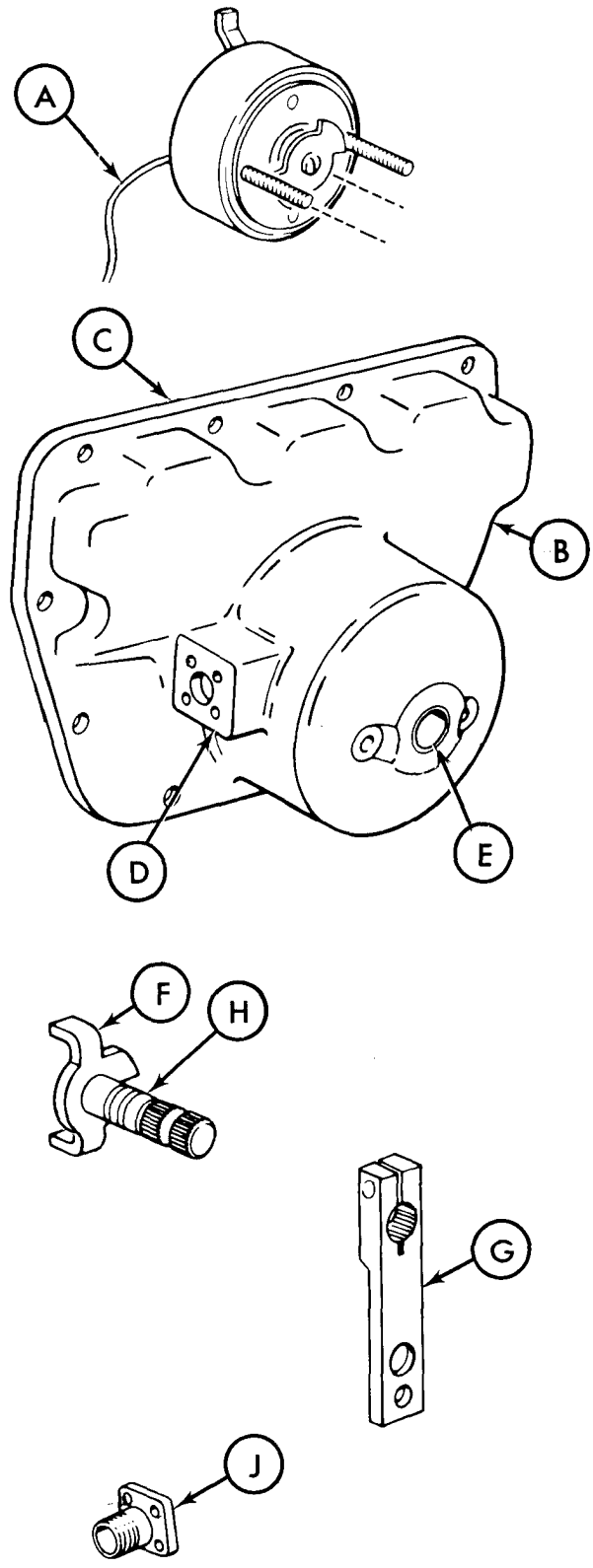
1. Inspect cover (B) for cracks using magnifying glass and strong light. Look for raised metal and warped or distorted mounting flanges (C) and (D). Replace cover if cracked, warped or distorted.

2. Measure bore diameter (E) using telescope gage and micrometer. Replace housing if bore exceeds 0.3775 in. (10 mm).

3. Inspect shut-off lever (F) and operating lever (G) for cracks, raised metal, or damaged spline. Replace lever(s) if cracked or if splines are damaged. Measure lever shaft diameter (H) using micrometer. Replace lever if diameter is less than 0.3745 in. (9.50 mm).

4. Inspect connector (J) for cracks, damaged threads or loose pin. Replace connector if cracked, or if threads are damaged or pin is loose.

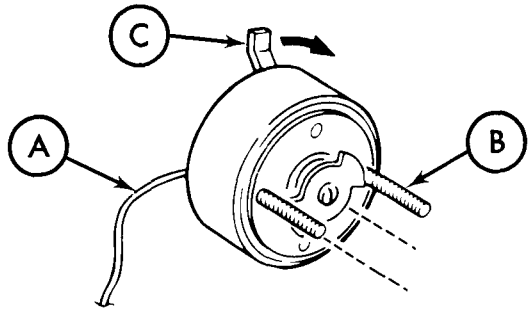
5. Using an ohmmeter, check connector (J) for continuity. Replace connector if check is negative.



TA245260

REPAIR OF SUBASSEMBLIES—(Continued)

6. Apply 24 volt power source to solenoid electrical lead (A) and connect ground lead to mounting stud (B). When energized, the solenoid lever (C) should move clockwise and return to rest position when power source is turned off. Replace solenoid if it does not operate freely.



REPAIR:

1. Smooth small nicks or raised metal using a fine mill file.

2. No other repairs are authorized for these parts.

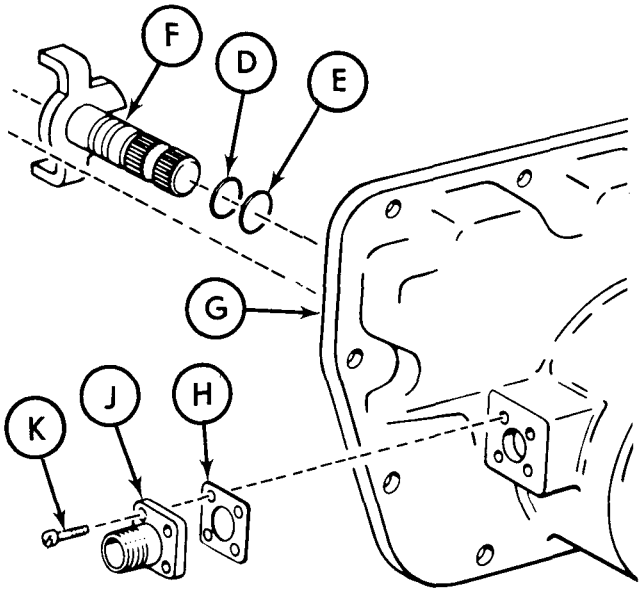
ASSEMBLY:

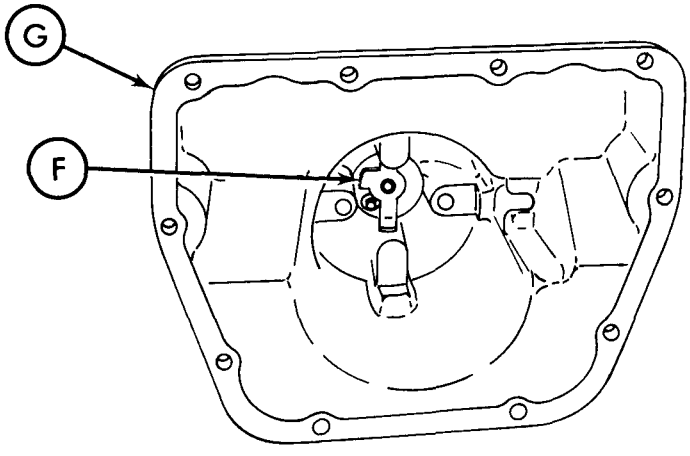
NOTE

Coat all metal parts with a light film of engine oil.

1. Install new gasket (D) and preformed packing (E) in grooves on shutoff lever (F). Install the assembled lever (F) in solenoid cover (G).

2. Install new gasket (H), connector (J) and secure with four new assembled washer screws (K).





TA245261

REPAIR OF SUBASSEMBLIES—(Continued)

3. Using soldering iron, solder electrical lead to terminal (A). Install solenoid (B) in cover.

4. Install two flat washers (C) and cap nuts (D). Using 7/16 in. socket and torque wrench, torque tighten nuts to 40 to 50 lb-in. (5 to 6 N·m).

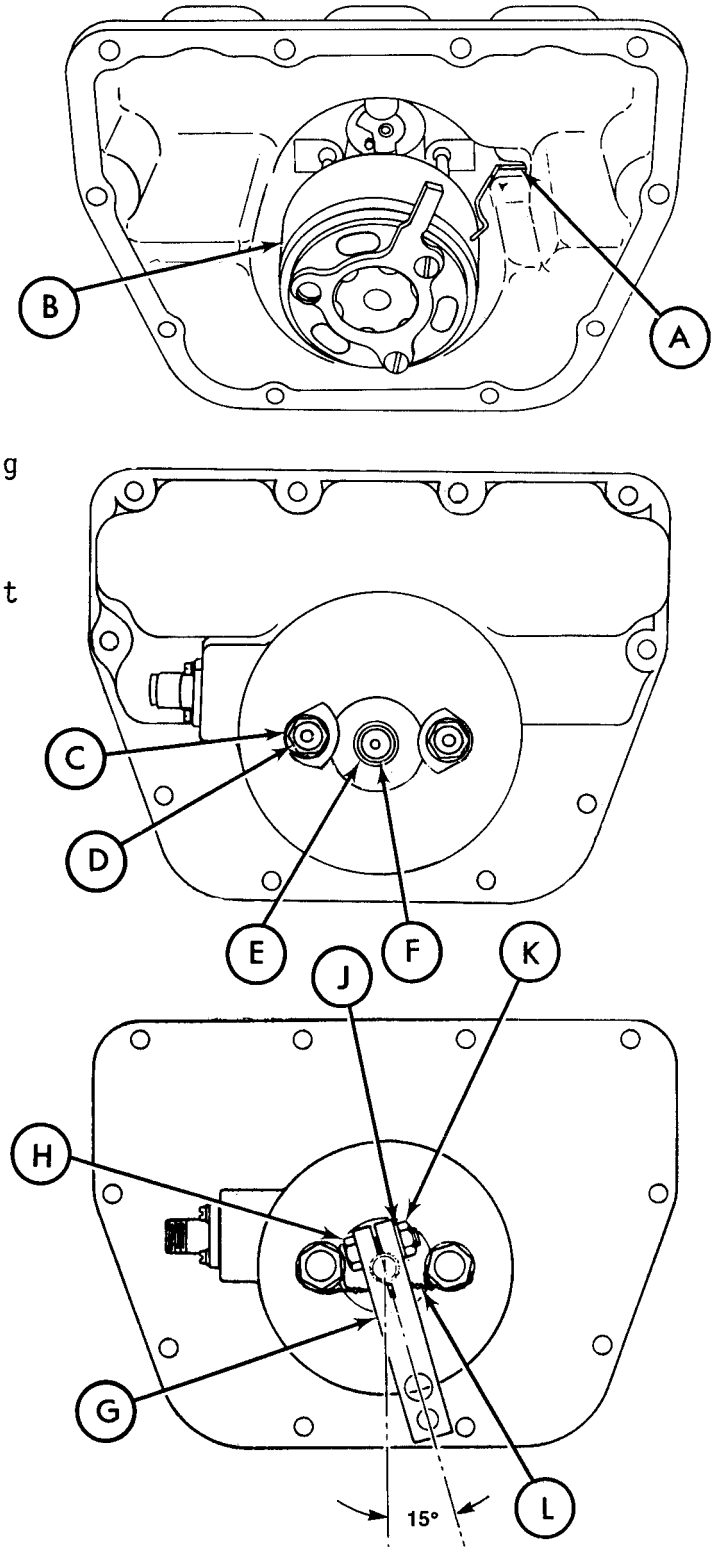
5. Install flat washer (E). Using flat side of screwdriver, install retaining ring (F).

6. Using protractor, position operating lever (G) on shaft with centerline of lever 15° to the right of vertical, with the lever in the down position (with solenoid in rest position). Push lever against retaining ring.

7. Install machine bolt (H), new lockwasher (J), and nut (K) to secure lever. Using 7/16 in. socket and torque wrench, torque tighten nut to 70 to 75 lb-in (8 to 8.5 N·m)

8. Secure cap nuts (D) with wire (L).

End of Task



TA245262

FUEL FILTER ASSEMBLY, BLEEDER VALVE STEMS, AND ASSOCIATED PARTS

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Fuel filter socket (special tool)
Fine mill file
Torque wrench capable of torquing 25 to 30 lb-ft (34 to 40 N·m)
Magnifying glass, 5 power
Machinist's vise with vise jaw caps

SUPPLIES:

Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)
Sealant (Item 8, Appendix C)
Wire (Item 10, Appendix C)
Parts Kit, Part No. 5702739

DISASSEMBLY:

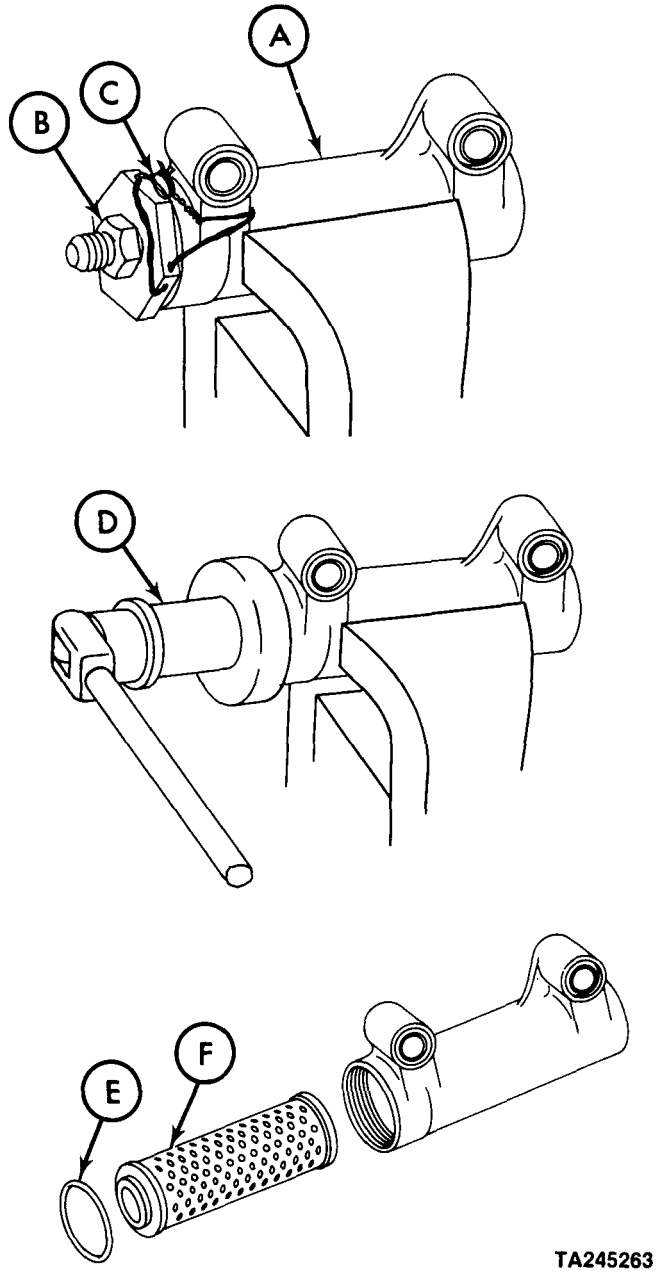
1. Place filter assembly (A) in vise.
2. Using 13/16 in. deep well socket, remove adapter (B).
3. Using diagonal cutting pliers, cut and remove seal (C).
4. Using fuel filter socket (D) and handle, remove cap.
5. Remove filter from vise. Remove and discard preformed packing (E) and filter (F).

CLEANING:

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

1. Clean all parts in solvent.
2. Wipe dry with clean lint-free cloth.



TA245263

REPAIR OF SUBASSEMBLIES—(Continued)

INSPECTION:

1. Inspect cap plain nuts (A), bleeder valve stems (B), cap (C) and adapter (D) for cracks or damaged threads. Replace parts if cracked of if threads are damaged.

2. Inspect housing (E) for cracks or damaged threads using magnifying glass and strong light. Inspect preformed packing grooves (F) for burs or raised metal. Discard housing if cracked or if threads are damaged.

REPAIR:

1. Smooth small burs or raised metal using a fine mill file.

2. No other repairs are authorized for these parts.

ASSEMBLY:

NOTE

Coat cap and outside of housing and adapter with a light film of engine oil.

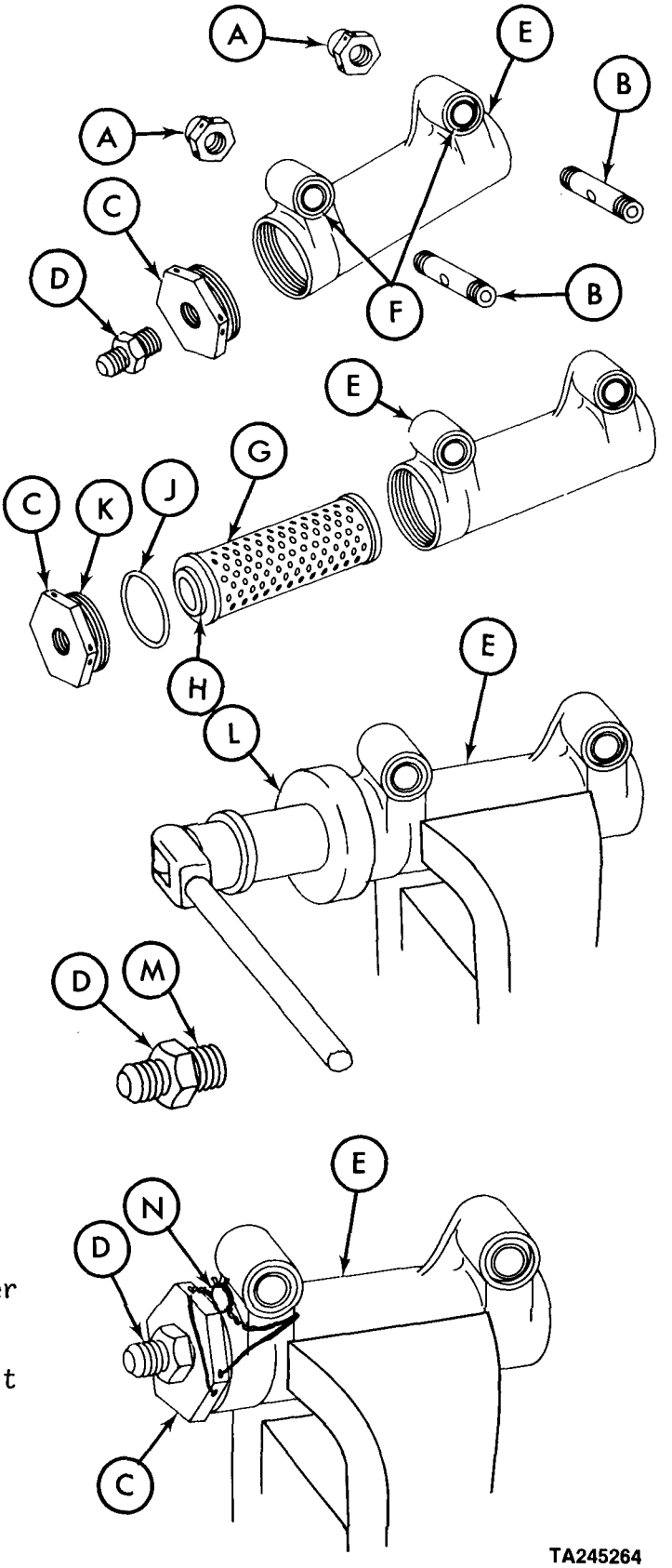
1. Install new filter (G) in housing (E) with pilot (H) toward front. Install new preformed packing (J). Apply light coat of sealant to cap threads (K) and install cap (C).

2. Place housing (E) in vise. Using fuel filter socket (L) and torque wrench, torque tighten cap (C) to 25 to 30 lb-ft (34 to 40 N·m).

3. Apply light coat of sealant to adapter pipe threads (M) and install adapter (D) in cap (C) and tighten using 13/16 in. deep well socket and ratchet handle.

4. Secure cap (C) to housing (E) with seal (N).

End of Task



TA245264

REPAIR OF SUBASSEMBLIES—(Continued)

FUEL OUTLET HOUSING, VALVE ASSEMBLY, AND BLEEDER VALVE STEMS

TOOLS:

1 1/8 in. open end wrench
1 in. inside micrometer
1 in. outside micrometer
2 in. outside micrometer
Spring tester
Fine mill file

SUPPLIES:

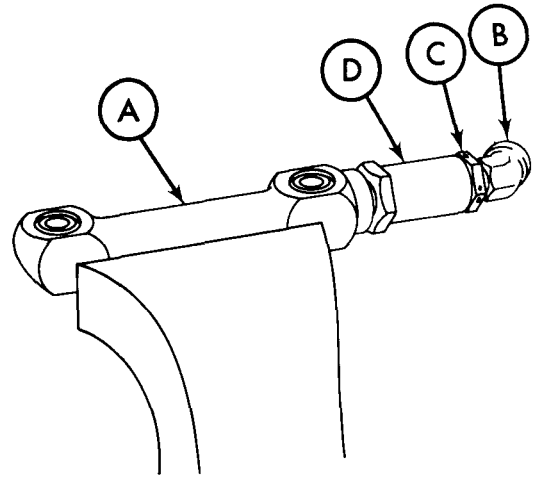
Solvent (Item 7, Appendix C)
Clean cloth (Item 4, Appendix C)
Engine oil (Item 3, Appendix C)
Sealant (Item 8, Appendix C)

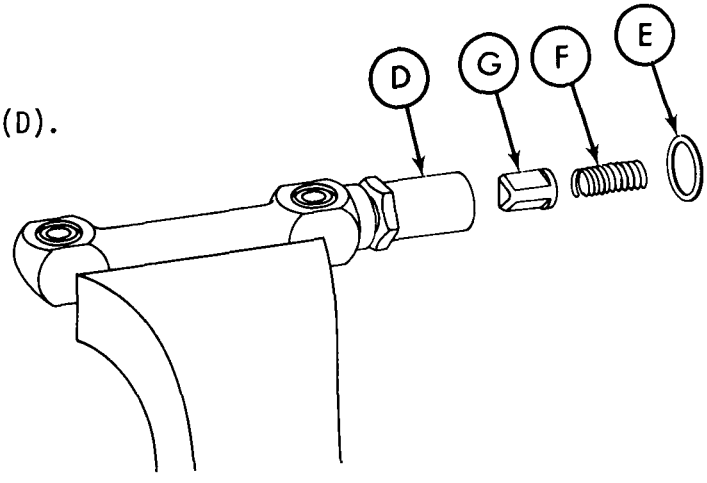
DISASSEMBLY:

CAUTION

Retainer is spring-loaded. Be careful when removing retainer.

1. Place bleeder valve housing (A) in vise. Scribe alinement marks on elbow (B) and retainer (C).
2. Using 1 1/8 in. open end wrench to hold housing (D), remove elbow (B) and retainer (C).
3. Remove ring spacer (E), spring (F), and bleeder valve (G). Using 1 1/8 in. open end wrench, remove housing (D).





CLEANING:

WARNING

Cleaning solvent is flammable. Use only in well ventilated areas. Keep away from flame, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when using to prevent skin irritation.

1. Clean all parts in solvent.
2. Wipe dry with clean lint-free cloth.

TA245265

REPAIR OF SUBASSEMBLIES—(Continued)

INSPECTION:

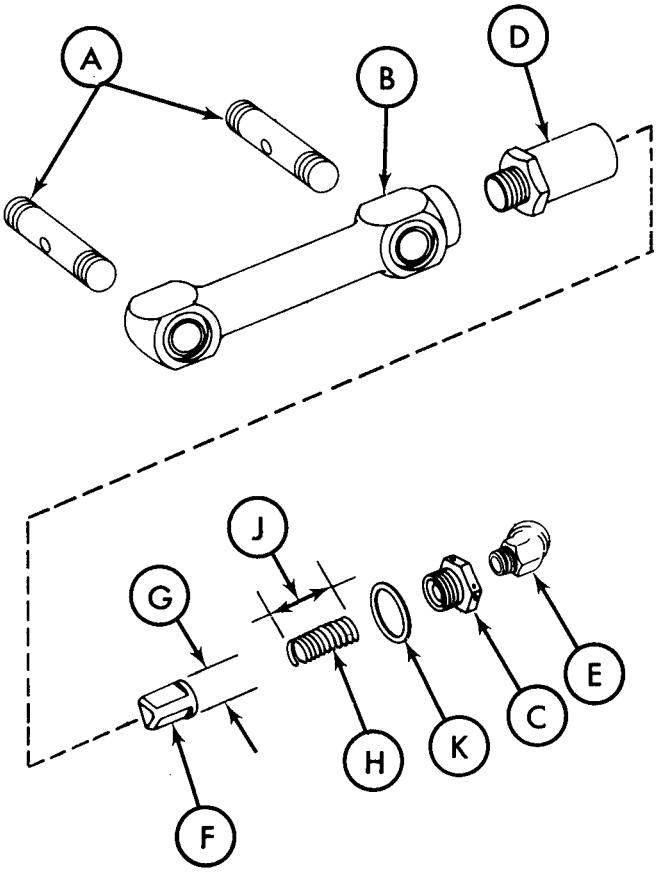
1. Inspect stems (A), valve housing (B), retainer (C), housing (D), and elbow (E) for cracks or damaged threads. Replace parts if cracked or if threads are damaged.

2. Measure valve bore diameter in housing (D) using inside micrometer. Replace housing if out-of-round or if bore diameter exceeds 0.7520 in. (19.1 mm).

3. Inspect valve (F) for cracks, scoring or burs. Using micrometer, measure outside diameter (G) of valve. Replace valve if damaged or if diameter is less than 0.7480 in. (18.9 mm).

4. Inspect spring (H) for nicks and cracks. Replace if nicked or cracked. Measure free length of spring using micrometer. Replace spring if free length (J) is less than 1.42 in. (36 mm). Check spring load. Spring load at 1.11 in. (28.2 mm) must be 22.5 lb ± 0.5 lb (10.2 kg ± 0.2 kg). Replace spring if it does not meet all requirements.

5. Inspect spacer (K) for cracks or scoring. Replace spacer if cracked or scored.



REPAIR:

1. Smooth small burs or raised metal using a fine mill file.

2. No other repairs are authorized for these parts.

TA245266

REPAIR OF SUBASSEMBLIES—(Continued)

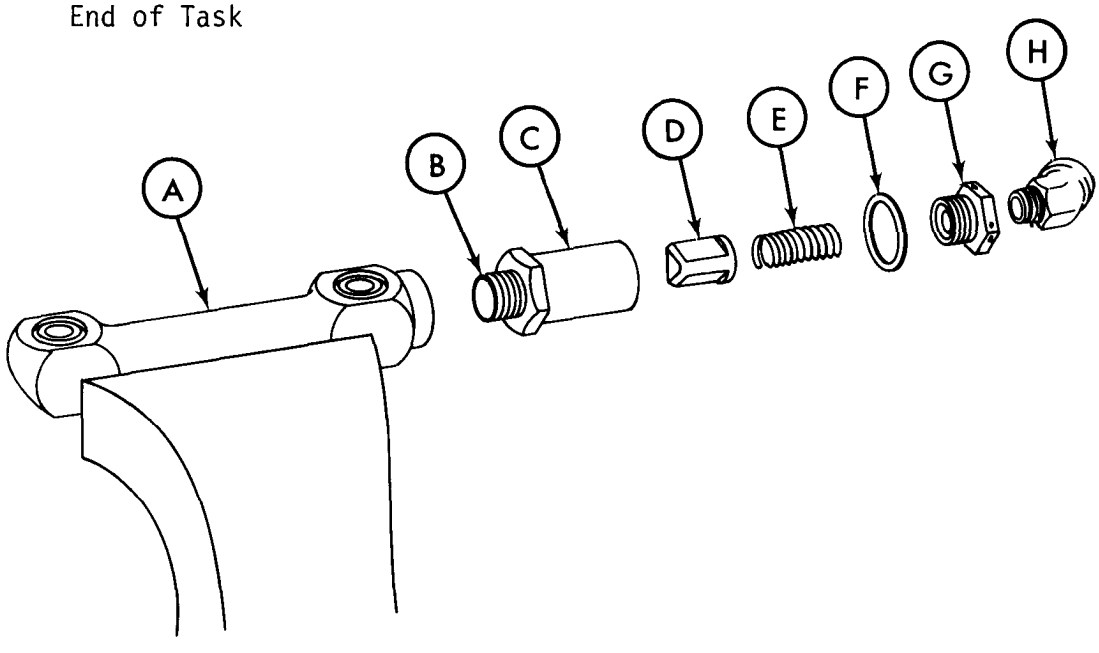
ASSEMBLY:

NOTE

Coat exterior surfaces of both housings and retainer with light film of engine oil.

1. Place housing (A) in vise.
2. Apply light coat of sealant to housing threads (B) and install valve housing (C). Tighten housing using 1 1/8 in. open end wrench.
3. Install valve (D), spring (E), spacer (F), and retainer (G). Tighten retainer using 1 1/8 in. open end wrench.
4. Apply light coat of sealant to elbow threads and install elbow (H). Tighten elbow until scribe marks are alined.

End of Task



TA245267

Section V. ASSEMBLY FROM SUBASSEMBLIES

3-4. G E N E R A L

a. Description of Tasks. The assembly task for each subassembly includes those procedures necessary to assemble the pump.

Following assembly of the pump, it must be tested (page 2-16) and calibrated (page 2-40) prior to issue.

b. Cleanliness. Fuel injection pumps are precision products. Extreme care must be exercised to insure that the work area, tools, clothes and hands are clean. Dirt is abrasive and will cause severe damage to moving parts.

INSTALL CAMSHAFT AND ASSOCIATED PARTS

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Holding plate (fabricated tool), page 2-2
Machinist's vise with vise jaw caps

SUPPLIES:

None.

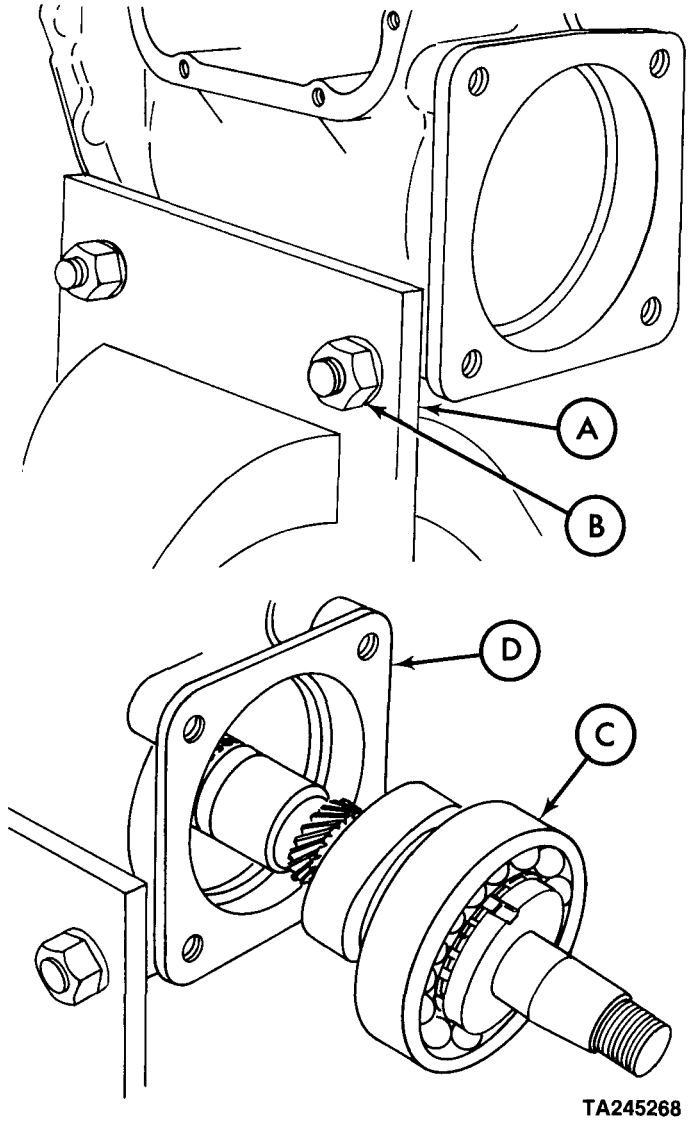
INSTALLATION:

1. Place holding plate (A) on pump housing front mounting holes. Using 1/2 in. box end wrench, secure with two bolts, flat washers, lockwashers, and nuts (B).

2. Place holding plate (A) (and housing) in vise.

3. Install assembled camshaft and bearing (C) in housing (D). Push camshaft and bearing in place by hand.

End of Task



TA245268

ASSEMBLY FROM SUBASSEMBLIES—Continued

INSTALL RETAINING PLATE (WITH SEAL)

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Torque wrench capable of torquing 18 to 20 lb-ft (24.5 to 27 N·m)

SUPPLIES:

Engine oil (Item 3, Appendix C)
Preformed packing, from Gasket and Preformed Packing Set, Part No. 5702632

INSTALLATION:

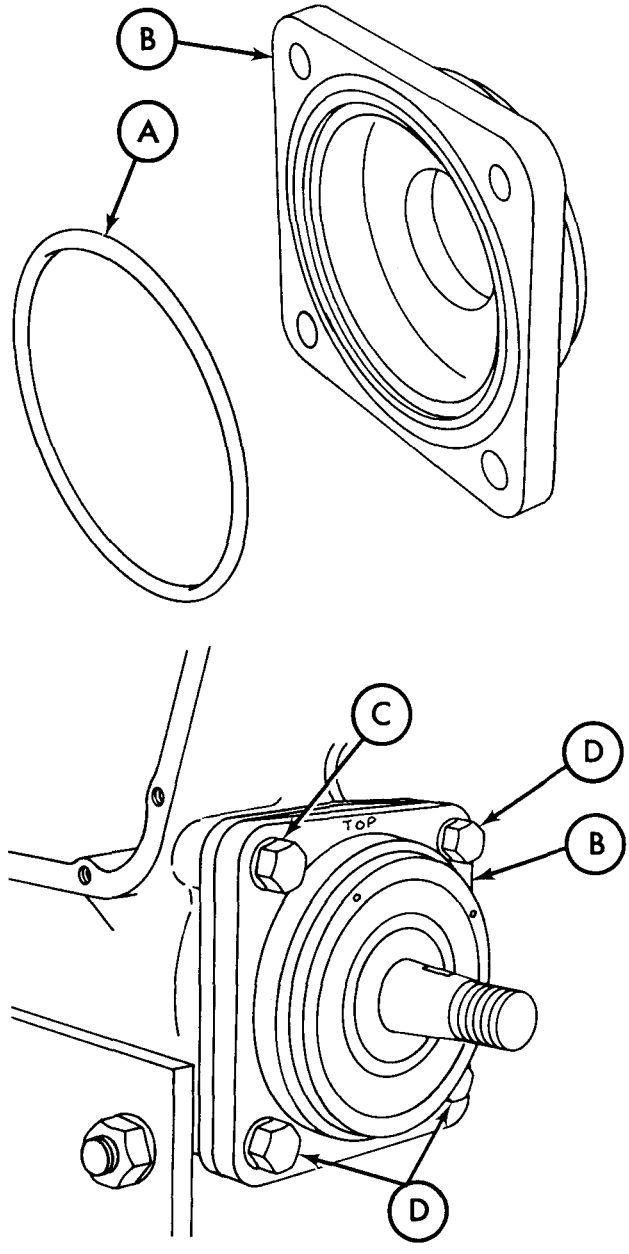
1. Install new preformed packing (A) in groove in bearing retaining plate (B).
2. Install plate (with seal) (B) on pump with word "TOP" in upper position.

NOTE

Coat shouldered bolt, standard bolts, and lockwashers with a light film of engine oil.

3. Install one shouldered bolt and lockwasher (C) in upper left bolt hole. Install three standard bolts and lockwashers (D) in remaining holes.
4. Tighten bolts evenly and torque tighten to 18 to 20 lb-ft (24.5 to 27 N·m) using 9/16 in. socket, extension, and torque wrench.

End of Task



TA245269

ASSEMBLY FROM SUBASSEMBLIES—Continued

INSTALL GEAR SHAFT ASSEMBLIES

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
1 1/16 in. deep well socket with 1/2 in. drive
3/8 to 1/2 in. drive adapter
Wrench socket (special tool)
Torque wrench capable of torquing 80 to 95 lb-ft (108 to 129 N·m)
Turning and holding wrench (special tool)
Steel rod (fabricated tool), page 2-3

SUPPLIES:

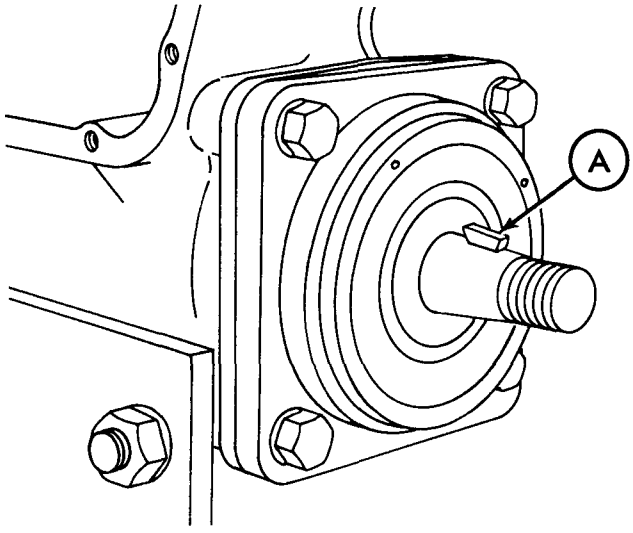
Engine oil (Item 3, Appendix C)
Preformed packing (2) and Flat washer (2) from Gasket and Preformed Packing Set, Part No. 5702632
Wire (Item 11, Appendix C)

INSTALLATION:

NOTE

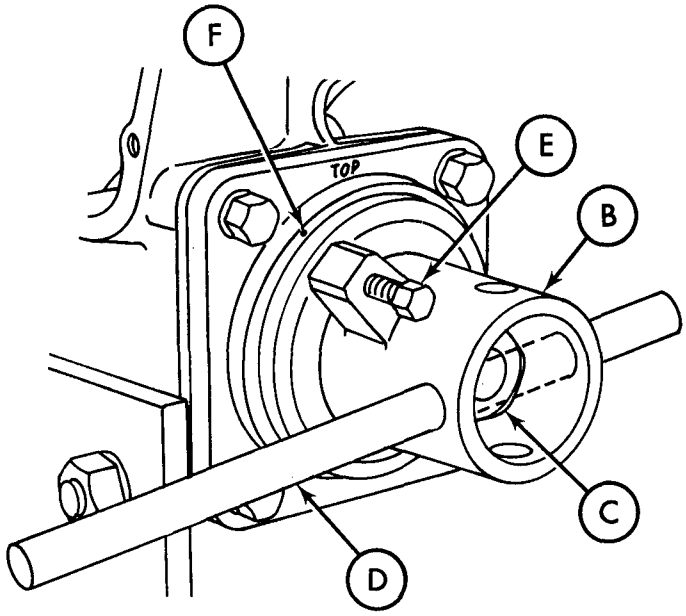
Coat all loose metal parts with light film of engine oil.

1. Install Woodruff key (A) in camshaft.



2. Aline keyway slot in camshaft turning and holding wrench (B) with Woodruff key (A) and install wrench on camshaft. Using 1 1/16 in. deep well socket, ratchet handle, and adapter, secure wrench with lockwasher and plain nut (C).

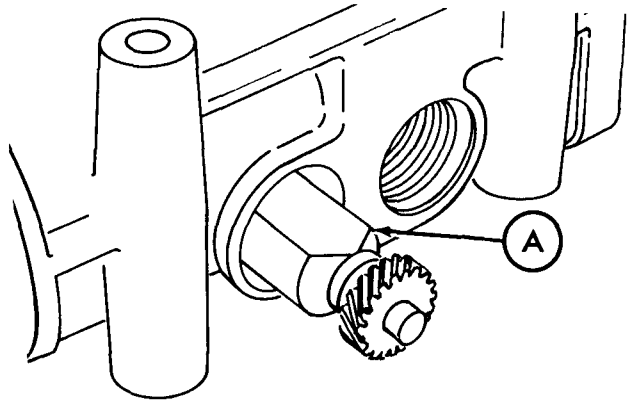
3. Using steel rod (D), turn wrench (B) counterclockwise to aline locking screw (E) on wrench with No. 2 punch mark (F) on bearing retaining plate. Using 7/16 in. box end wrench, tighten locking screw (E).



TA245270

ASSEMBLY FROM SUBASSEMBLIES—Continued

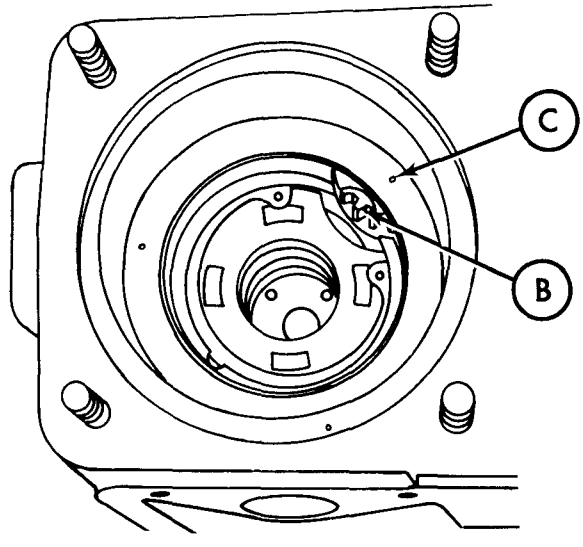
4. Install fixed gear end of gear shaft assembly for No. 2 head assembly in housing, with flat side of bushing (A) toward right side of pump.



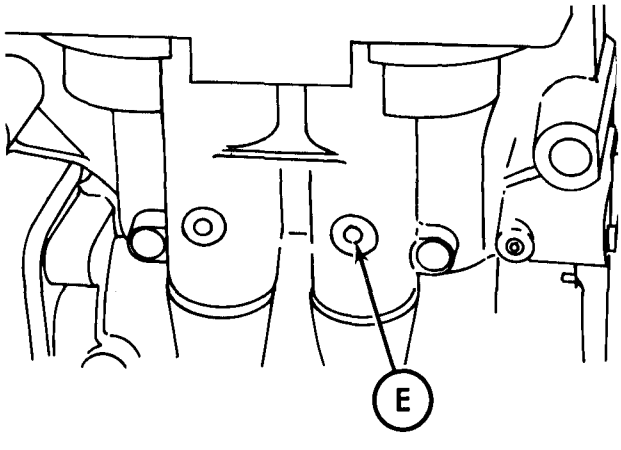
NOTE

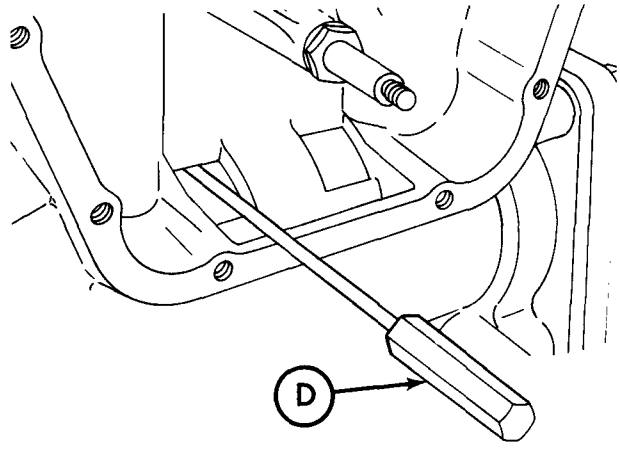
It may be necessary to remove the holding plate before installing gear shafts.

5. While viewing gear shaft from top of pump, aline exposed tooth (B) with punch mark (C) in the head assembly opening.



6. While maintaining this gear position (B), use screwdriver (D) to rotate gear shaft bushing until threaded hole in bushing is alined with attaching hole (E) in rear of pump housing.

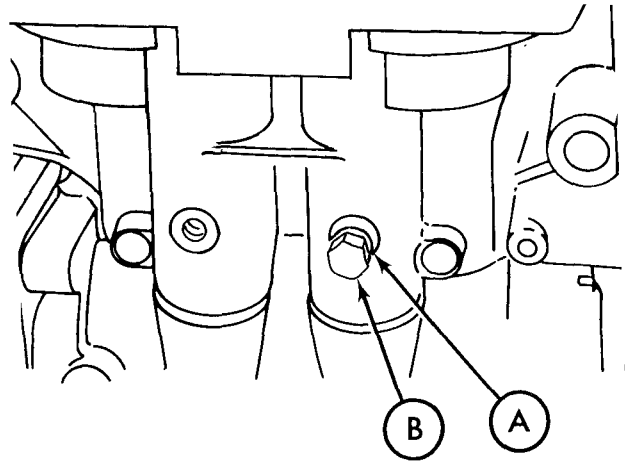




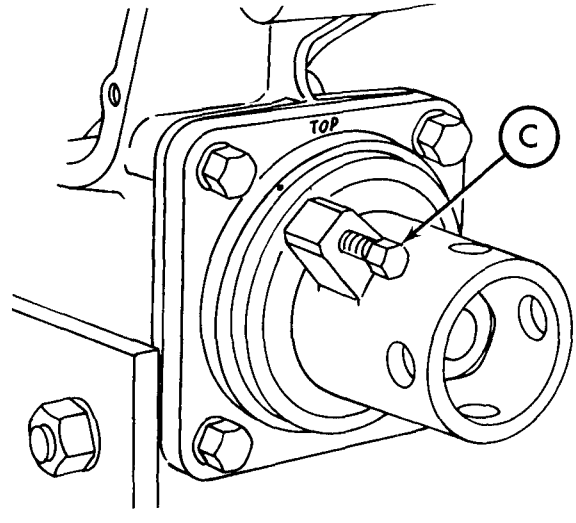
TA245271

ASSEMBLY FROM SUBASSEMBLIES—Continued

7. Install new flat washer (A) and machine bolt (B) finger tight.



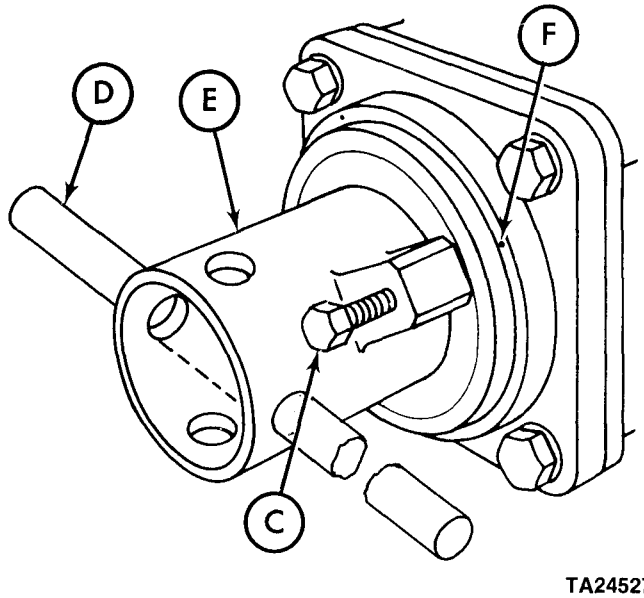
8. Using 7/16 in. box end wrench, loosen locking screw (C).



9. Using rod (D), turn wrench (E) clockwise 1/4 turn (90°) until locking screw (C) is alined with No. 1 punch mark (F) on bearing retaining plate.

10. Using 7/16 in. box end wrench, tighten locking screw (C).

11. Install gear shaft assembly for No. 1 head assembly by repeating steps 4. through 7. above.

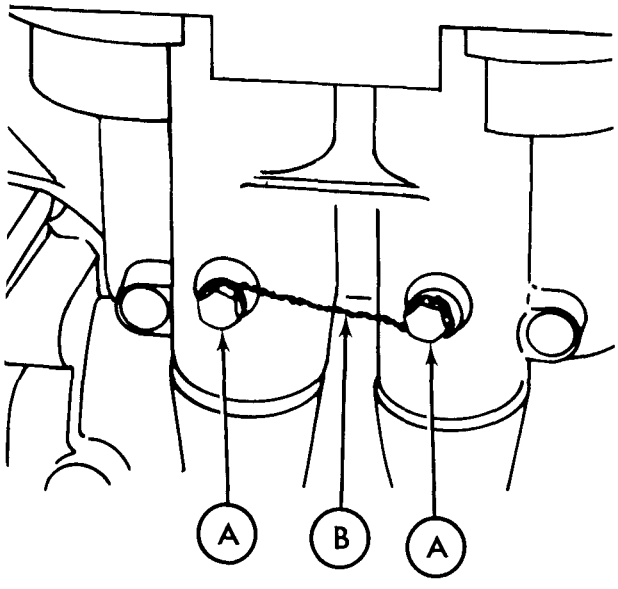


TA245272

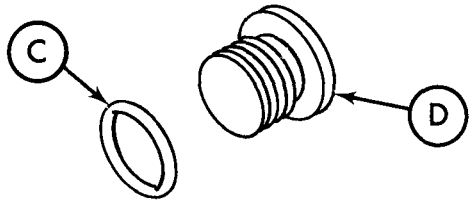
ASSEMBLY FROM SUBASSEMBLIES—Continued

12. Using 7/16 in. socket and torque wrench, tighten bolts (A) to 80 to 90 lb-in. (90 to 102 N·m).

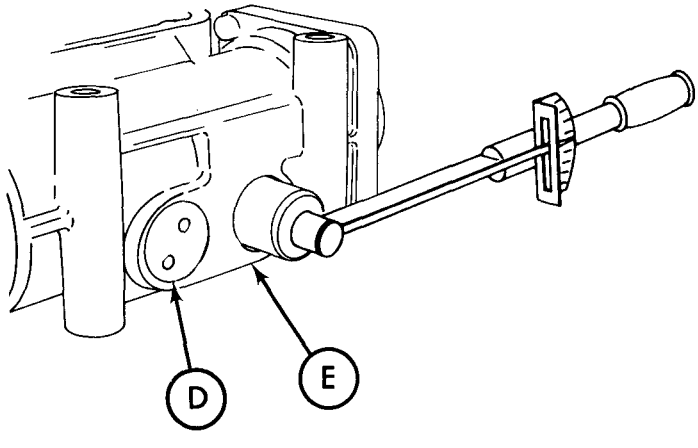
13. Secure bolts (A) with twisted wire (B).



14. Install new preformed packing (C) on both quill shaft plugs (D) and install in bottom of pump housing (E).



15. Using face wrench socket and torque wrench, tighten plugs (D) to 90 to 95 lb-ft (122 to 129 N·m).



TA245273

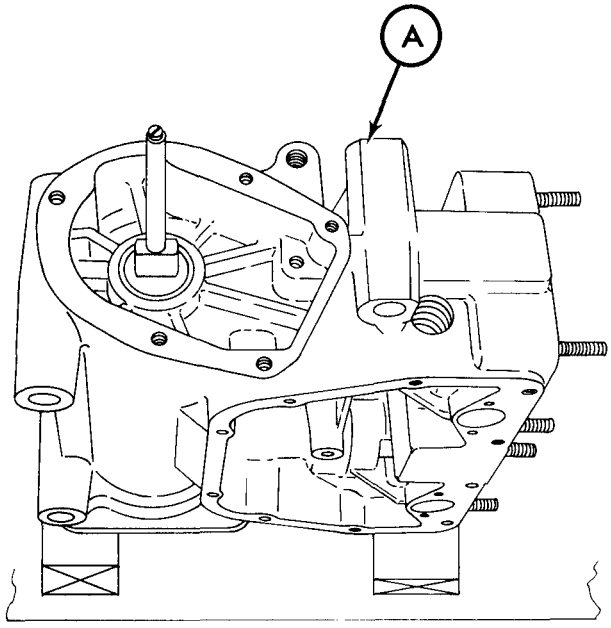
ASSEMBLY FROM SUBASSEMBLIES—Continued

INSTALL GOVERNOR WEIGHT AND SPIDER ASSEMBLY

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Remover and replacer (special tool)
Machinist's vise with vise jaw caps
Dial indicator with magnetic base
Arbor press and press plates
Holding plate (fabricated tool), page 2-2

SUPPLIES: None.

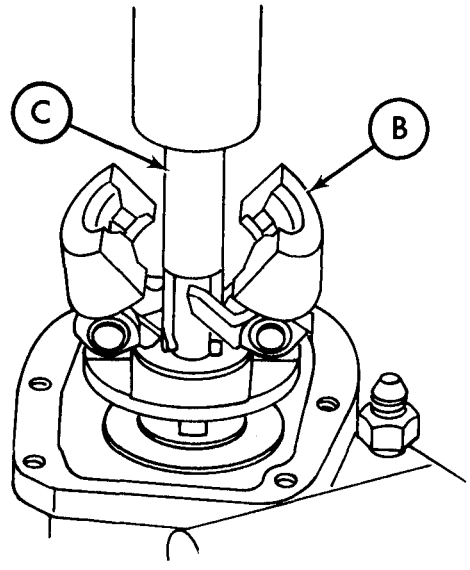


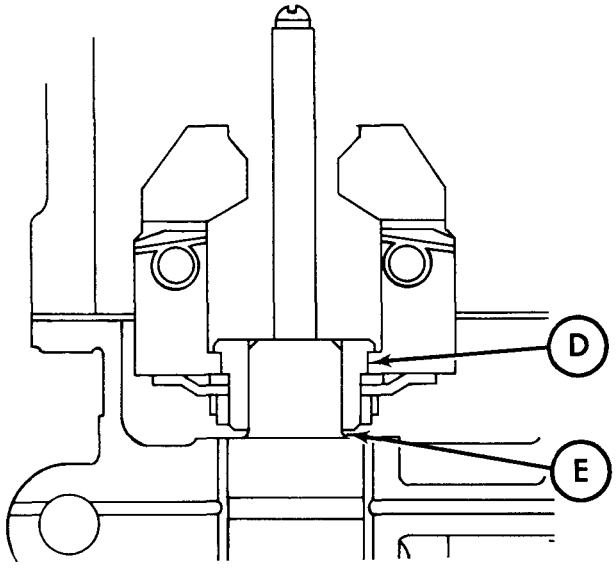
INSTALLATION:

1. Using press plates, position pump housing (A) on arbor press with rear (camshaft drive) end down. Position plates on each side of camshaft.

2. Position weight and spider (B) on governor end of camshaft.

3. Using remover and replacer (C), press weight and spider on governor end of camshaft until governor hub (D) contacts camshaft shoulder (E).





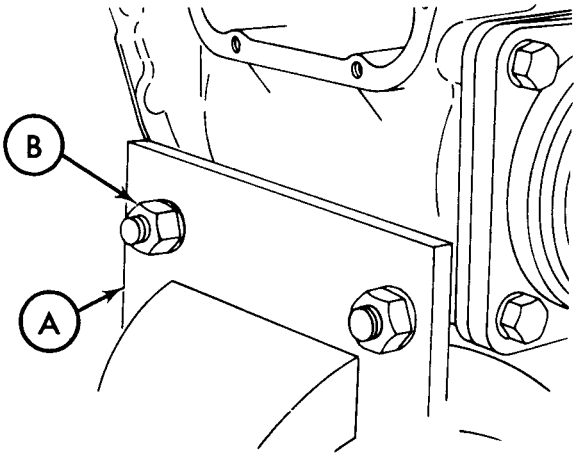
TA245274

ASSEMBLY FROM SUBASSEMBLIES—Continued

4. Place holding plate (A) on pump housing front mounting holes.

5. Install two bolts, flat washers, lockwashers, and nuts (B). Using 1/2 in. box end wrench, tighten nuts.

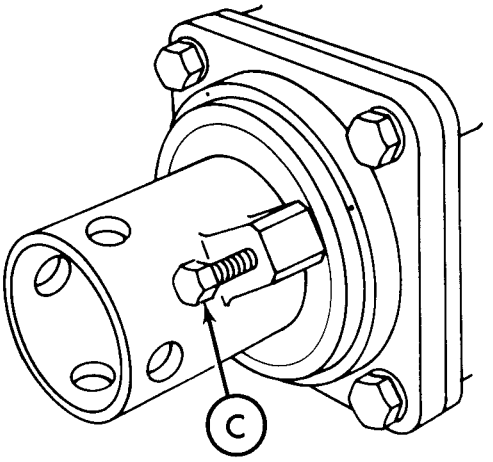
6. Place holding plate (and housing) in vise.

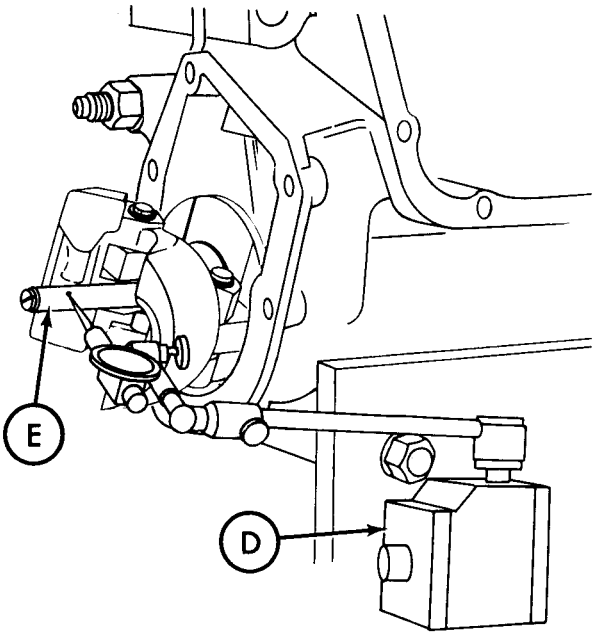


7. Using 7/16 in. box end wrench, loosen locking screw (C).

8. Mount dial indicator (D) on holding plate, with indicator against governor end of camshaft (E). Adjust dial to zero.

9. Rotate camshaft and note dial reading. Proceed with assembly procedure if runout does not exceed 0.003 in. (0.08 mm). If runout is up to 0.004 in. (0.10 mm), try to straighten shaft by tapping gently with plastic insert hammer. If shaft cannot be straightened to 0.003 in. (0.08 mm) or less, replace camshaft (page 3-2).





TA245275

NOTE

Do not attempt to straighten camshaft if runout exceeds 0.004 in. (0.10 mm).

End of Task

ASSEMBLY FROM SUBASSEMBLIES—Continued

INSTALL TAPPET ASSEMBLIES AND ASSOCIATED PARTS.

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Internal retaining ring pliers with 0.070 in. diameter tips
Spring seat compressor (special tool)

SUPPLIES:

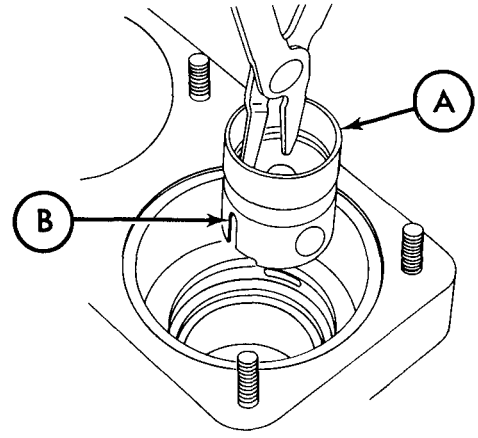
Engine oil (Item 3, Appendix C)
Retaining rings (2)

INSTALLATION:

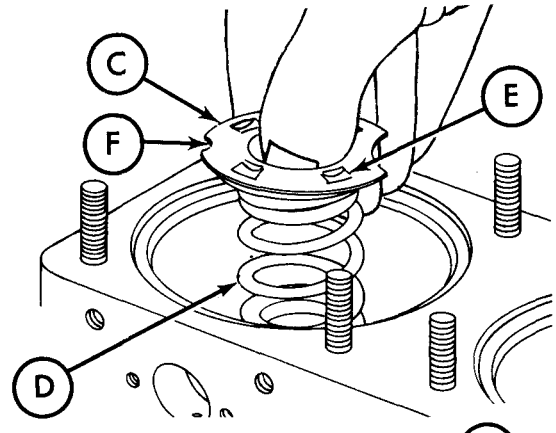
NOTE

Coat all loose parts with a light film of engine oil.

1. Using internal retaining ring pliers, install tappet assembly (A) for No. 2 head assembly in housing with guide slot (B) alined with tappet guide pin.

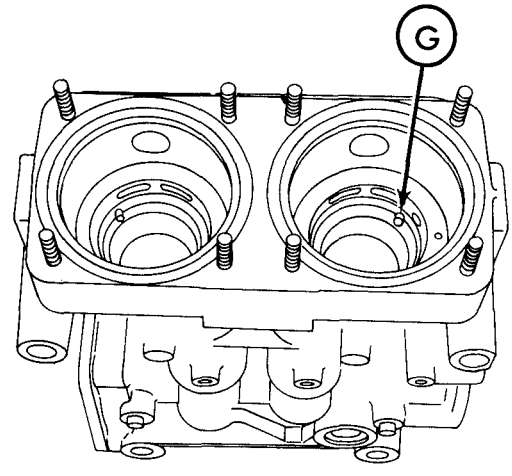


2. Position spring seat (C) over spring (D) with spring locators (E) down (facing spring).



3. Aline notch (F) in spring seat with tappet roll pin (G).

4. Install spring (D) and seat (C). Center seat on spring.



TA245276

ASSEMBLY FROM SUBASSEMBLIES—Continued

5. Place spring seat compressor (A) over head assembly bore.

6. Secure compressor (A) to pump housing with two head assembly hold-down nuts (B) finger tight.

NOTE

Spring seat may bind or catch in retaining ring groove. Use screwdriver to center and guide spring seat as required.

WARNING

Be certain retaining ring is properly seated in groove before removing compressor.

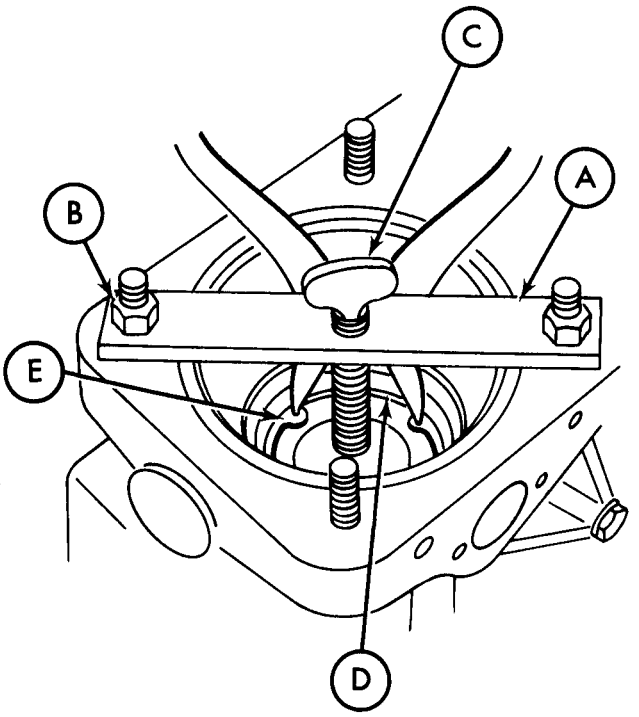
7. Turn compressor thumbscrew (C) slowly clockwise until seat retaining ring groove (D) is fully exposed.

8. Using internal retaining ring pliers, install new retaining ring (E). Be certain retaining ring is properly seated in retaining ring groove.

9. Loosen thumbscrew (C) by turning counterclockwise. Remove nuts (B) and compressor (A).

10. Install tappet assembly, spring, seat, and new retaining ring for No. 1 head assembly by repeating steps 1. through 9. above.

End of Task



TA245277

ASSEMBLY FROM SUBASSEMBLIES—Continued

INSTALL HEAD ASSEMBLIES

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Turning and holding wrench (special tool)
Torque wrench capable of torquing 18 to 20 lb-ft (24.5 to 27 N·m)
Steel rod (fabricated tool), page 2-3
3/8 to 1/2 in. adapter

SUPPLIES:

Engine oil (Item 3, Appendix C)
Tape (Item 9, Appendix C)
Preformed packings (6) from Gasket and Preformed Packing Set, Part No. 5702632

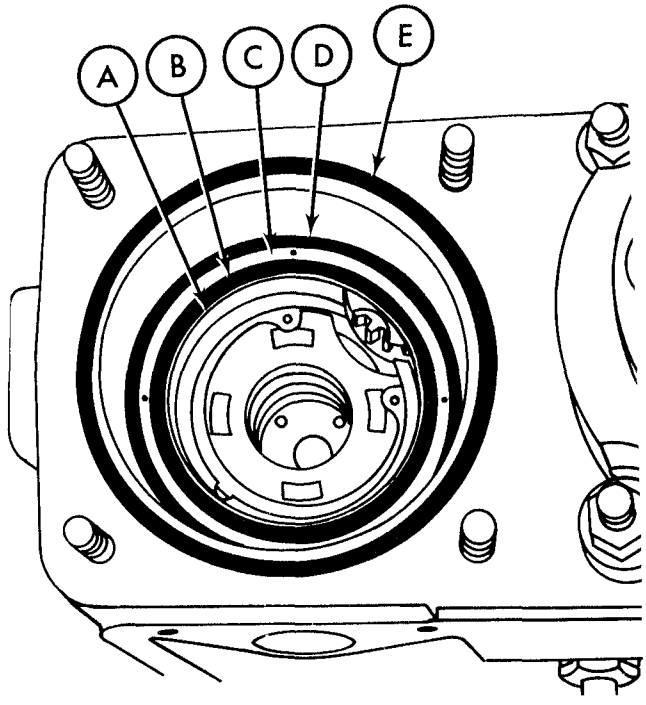
INSTALLATION:

NOTE

Coat all loose metal parts with a light film of engine oil.

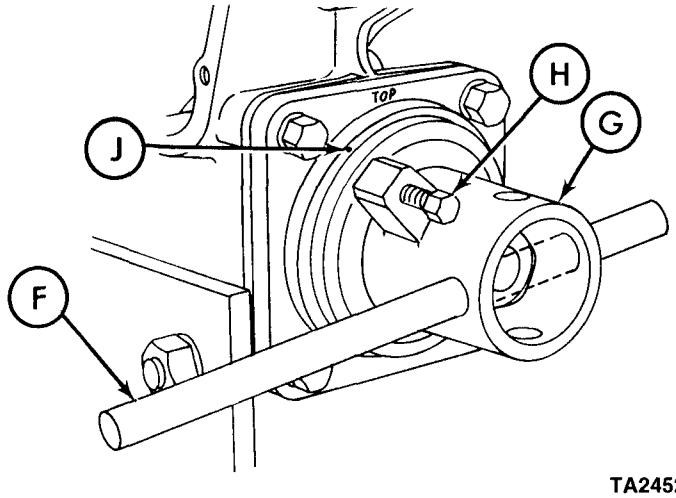
1. Install spacer ring (A), new preformed packing (B), ring spacer (C), new preformed packings (D), and (E) in bore for head assembly No. 2.

2. Using steel rod (F) and turning and holding wrench (G), turn camshaft counterclockwise to aline locking screw (H) with No. 2 punch mark (J) on bearing retaining plate.



NOTE

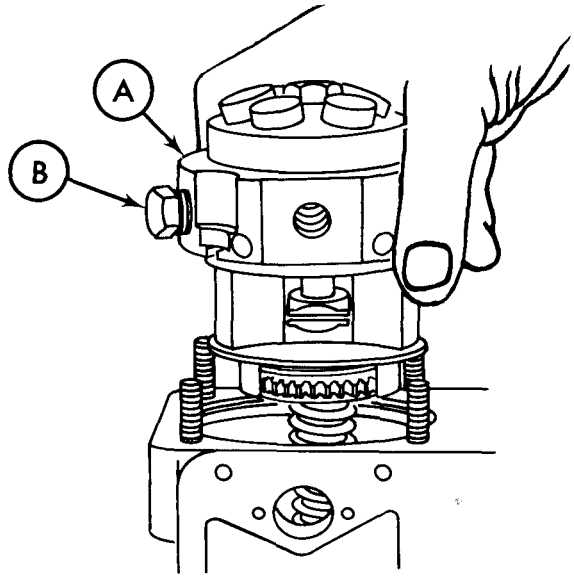
Alinement of turning and holding wrench locking screw with NO. 2 punch mark on bearing retaining plate is an approximate alinement point. It may be necessary to rotate camshaft slightly in either direction to get head to seat against spring pressure.



TA245278

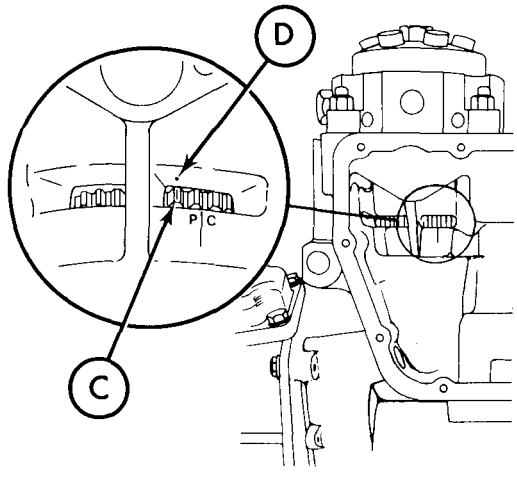
ASSEMBLY FROM SUBASSEMBLIES—Continued

3. Install head assembly (A) in housing with delivery valve screw (B) toward front, and slotted tooth (C) on plunger drive gear alined with punch mark (D) on underside of housing deck.



CAUTION

Using hand pressure, make sure that pump head assembly seats on pump housing deck (not on gears) before installing spacers and nuts. Improper seating will damage gear shaft.

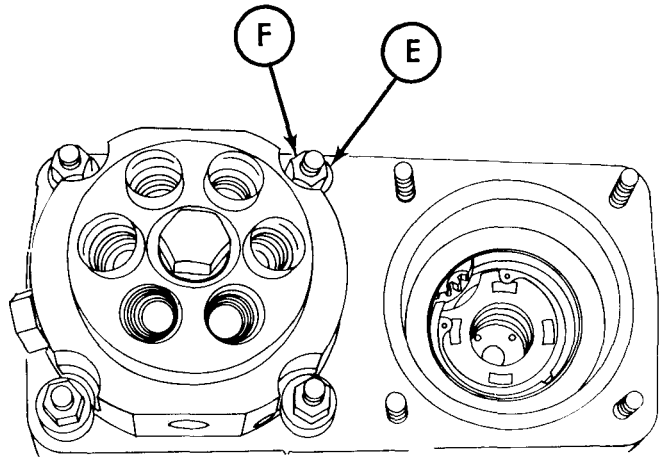


4. Install four spacers (E) and hexagon plain nuts (F) finger tight.

5. Using 1/2 in. deep well socket and torque wrench, alternately tighten nuts (F) to 18 to 20 lb-ft (24.5 to 27 N·m).

CAUTION

Nuts must be tightened alternately to avoid cocking head assembly in housing bore.



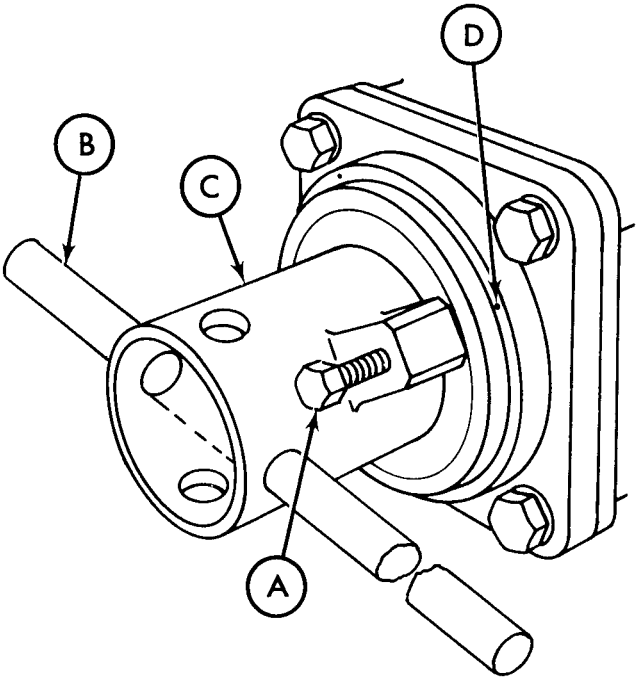
TA245279

ASSEMBLY FROM SUBASSEMBLIES—Continued

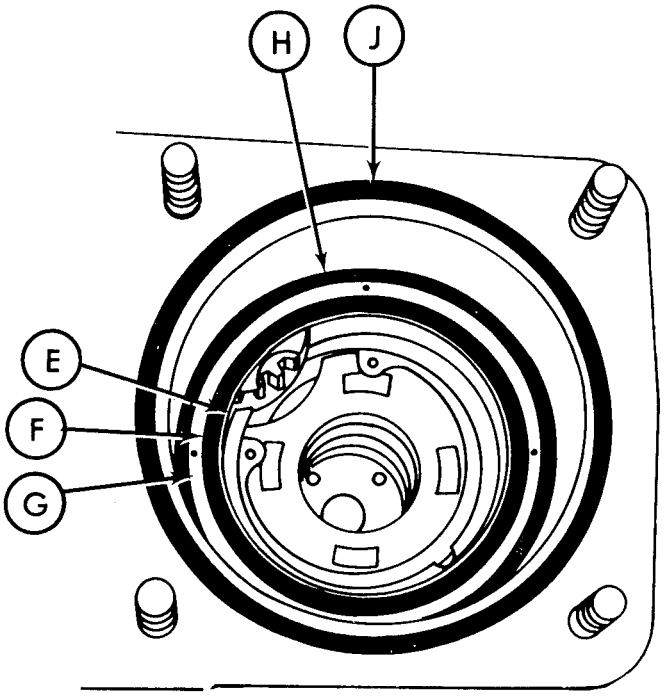
6. Using 7/16 in. box end wrench, loosen locking screw (A).

7. Using steel rod (B) and turning and holding wrench (C), turn camshaft clockwise 1/4 turn (90°) until locking screw (A) is alined with No. 1 punch mark (D) on bearing retaining plate.

8. Using 7/16 in. box end wrench, tighten locking screw (A).



9. Install spacer ring (E), new preformed packing (F), ring spacer (G), new preformed packings (H) and (J) in bore for head assembly No. 1.

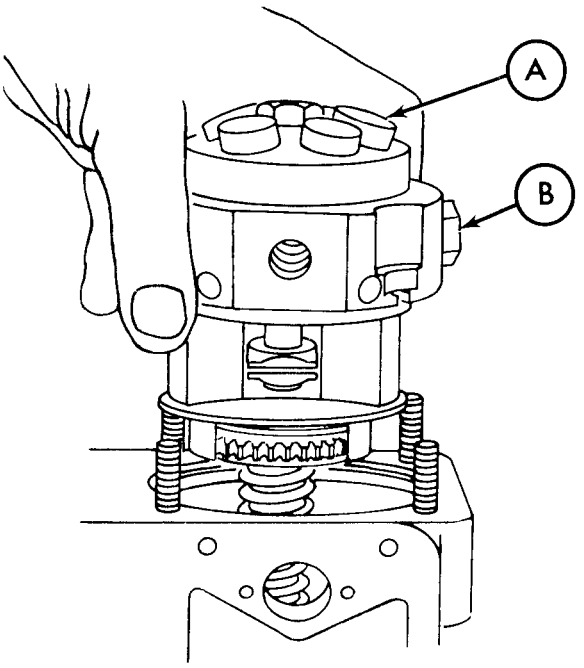


TA245280

ASSEMBLY FROM SUBASSEMBLIES—Continued

NOTE

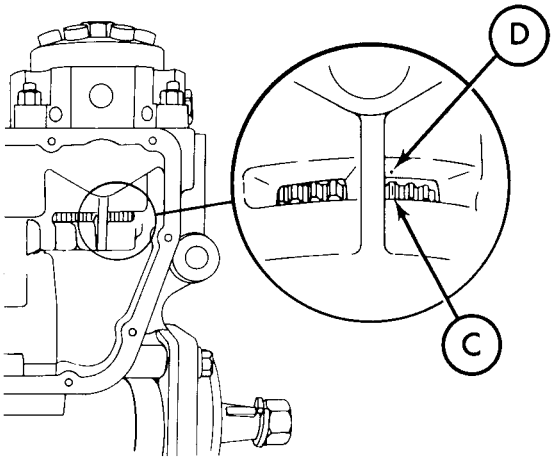
Alinement of turning and holding wrench locking screw with No. 1 punch mark on bearing retaining plate is an approximate alinement point. It may be necessary to rotate camshaft slightly in either direction to get head to seat against spring pressure.



10. Install head assembly (A) in housing with delivery valve screw (B) toward the rear, and slotted tooth (C) on plunger drive gear alined with punch mark (D) on underside of housing deck.

CAUTION

Using hand pressure, make sure that pump head assembly seats on pump housing deck (not on gears) before installing spacers and nuts. Improper seating will damage gear shaft.

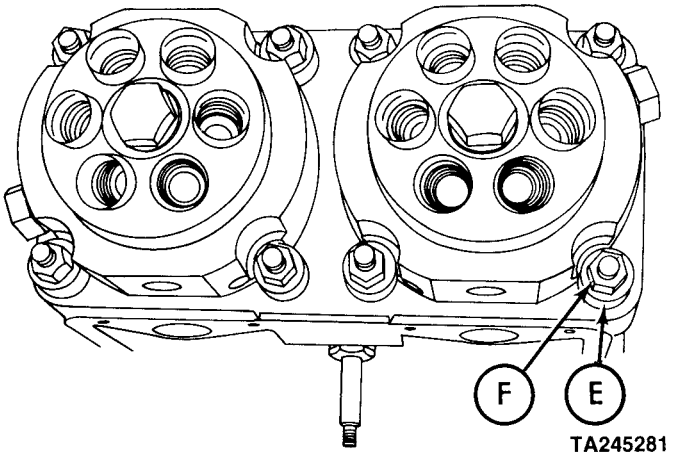


11. Install four spacers (E) and hexagon plain nuts (F) finger tight.

CAUTION

Nuts must be tightened alternately to avoid cocking head assembly in housing bore.

12. Using 1/2 in. deep well socket and torque wrench, alternately tighten nuts (F) to 18 to 20 lb-ft (24.5 to 27 N·m)



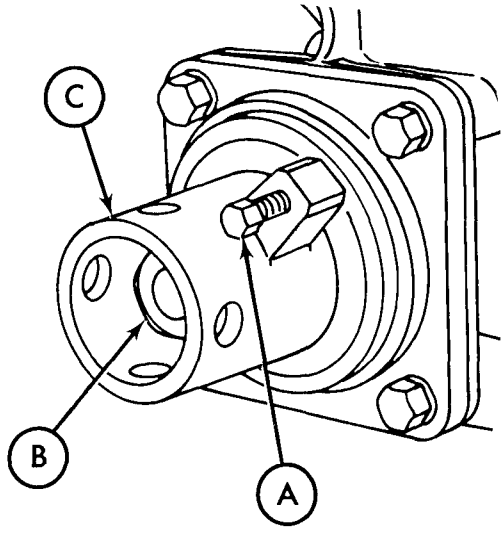
TA245281

ASSEMBLY FROM SUBASSEMBLIES—Continued

13. Using 7/16 in. box end wrench, loosen turning and holding wrench locking screw (A).

14. Using 1 1/16 in. deep well socket, ratchet handle, and adapter, remove plain nut and lockwasher (B). Retain lockwasher and nut.

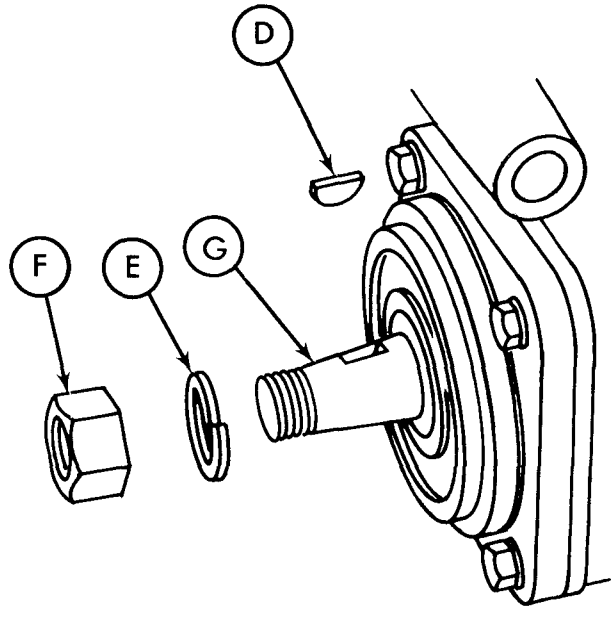
15. Using plastic insert hammer, remove wrench (C).



16. Install Woodruff key (D) in camshaft keyway and secure with tape.

17. Install lockwasher (E) and nut (F) on camshaft (G). Tighten finger tight.

End of Task



TA245295

ASSEMBLY FROM SUBASSEMBLIES—Continued

INSTALL FUEL CONTROL UNIT ASSEMBLIES

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair

SUPPLIES:

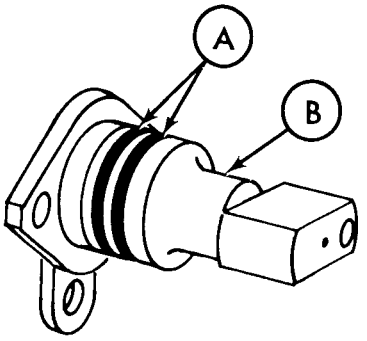
Engine oil (Item 3, Appendix C)
Wire (Item 11, Appendix C)
Preformed packing (4) from Gasket and Preformed Packing Set, Part No. 5702632
or
Parts Kit, Part No. 5702765

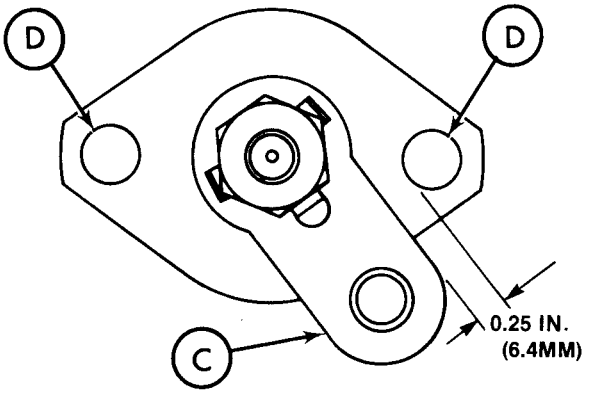
INSTALLATION:

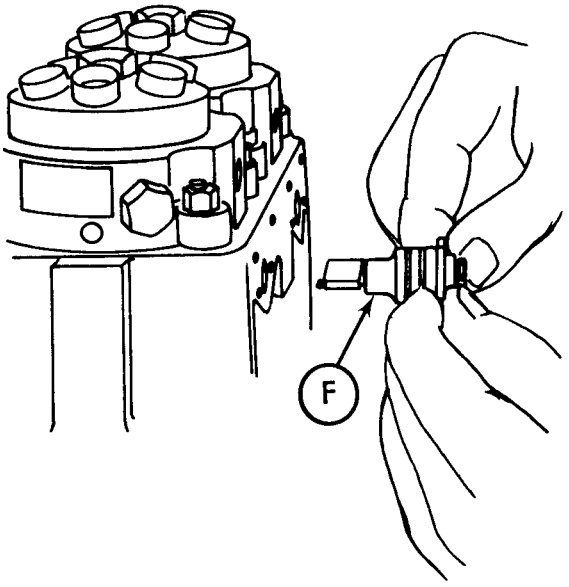
NOTE

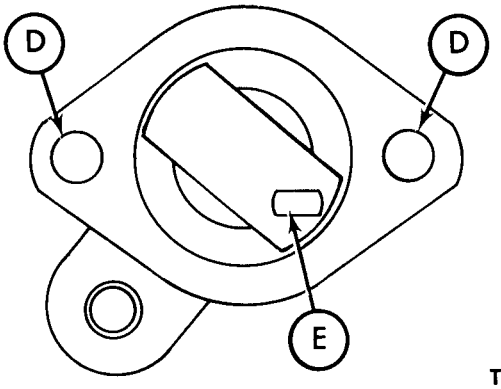
Coat all loose metal parts with a light film of engine oil.

1. Install two new preformed packings (A) on bushing (B).
2. Aline control lever (C) in relation to unit securing holes (D) in bushing flange.
3. Position shoulder pin (E) so that flats are parallel with center line of mounting holes (D).
4. Install control unit assembly (F) in opening for head assembly No. 2.





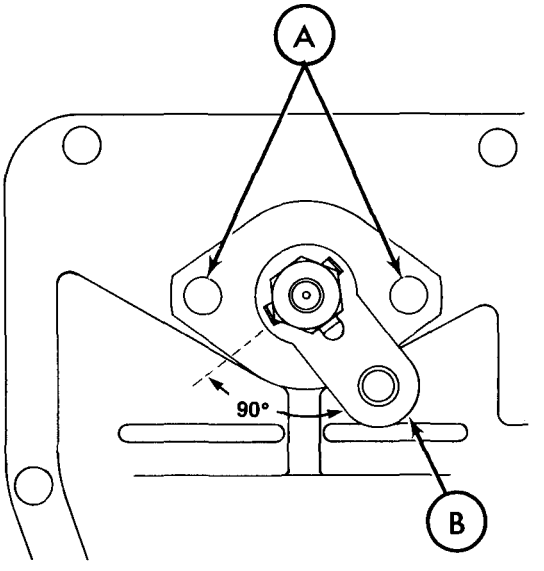




TA245282

ASSEMBLY FROM SUBASSEMBLIES—Continued

5. To insure that shoulder pin is seated in plunger sleeve slot, aline holes (A) in bushing flange with mounting holes in housing and hold securely against housing. Rotate lever (B) 90° and release. Lever should return to original position. If lever does not return to original position, remove unit, repeat steps 2. through 4., and repeat this procedure.



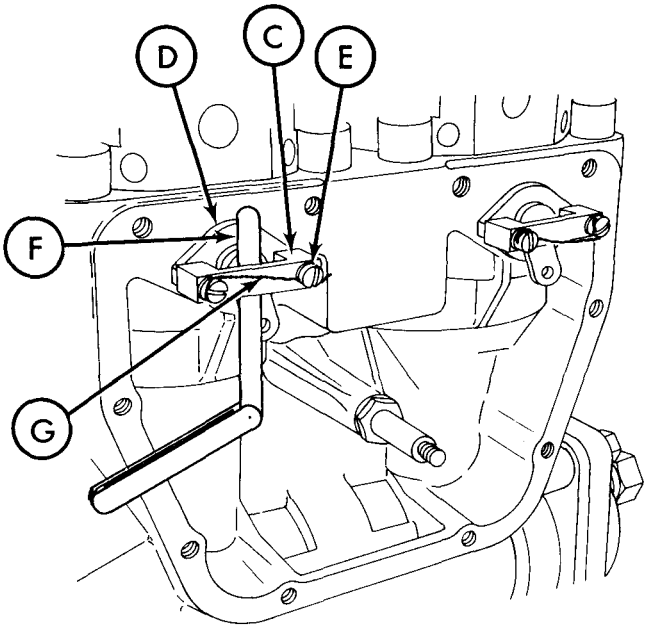
6. Install retainer (C) over control unit (D). Using screwdriver, secure retainer with two lockwashers and screws (E).

7. Using feeler gage (F), check clearance between control shaft and retainer. Clearance between control shaft and retainer must be 0.006 to 0.017 in. (0.15 to 0.43 mm). If measurement is outside these limits, replace retainer and check measurement again.

8. Install fuel control unit for head assembly No. 1 by repeating steps 1. through 7. above.

9. Secure screws (E) with twisted wire (G).

End of Task



TA245283

ASSEMBLY FROM SUBASSEMBLIES—Continued

INSTALL YOKE AND FUEL CONTROL LEVERS

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Torque wrench capable of torquing 50 to 60 lb-in. (6 to 7 N·m)

SUPPLIES:

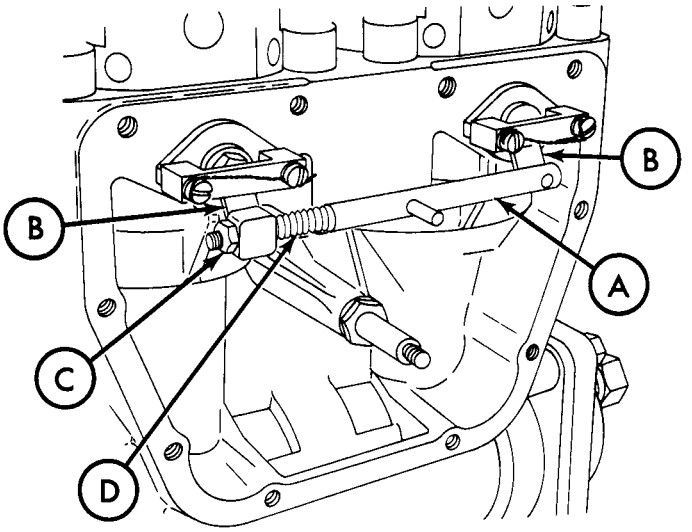
Engine oil (Item 3, Appendix C)
Lubricant (Silicone, low temp, Item 1, Appendix C)
Yoke assembly and yoke spacer from Parts Kit, Part No. 5705051
Fuel control lever assembly, flat washer, and nut from Parts Kit, Part No. 5702765.

INSTALLATION:

NOTE

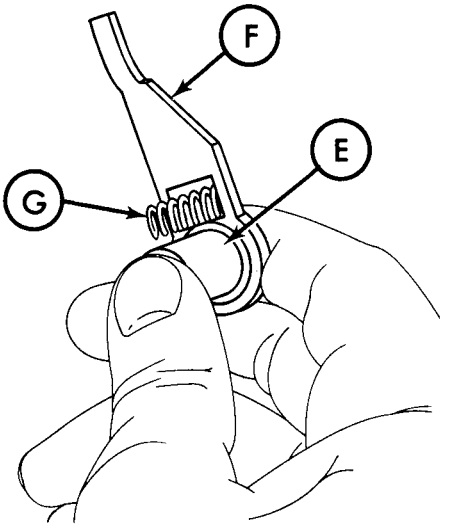
Coat all loose parts with a light film of engine oil.

1. Install new yoke assembly (A) by inserting pins in fuel control levers (B), with adjusting nut (C) and spring (D) toward front of pump.



2. Apply lubricant to lever pivot shaft (E).

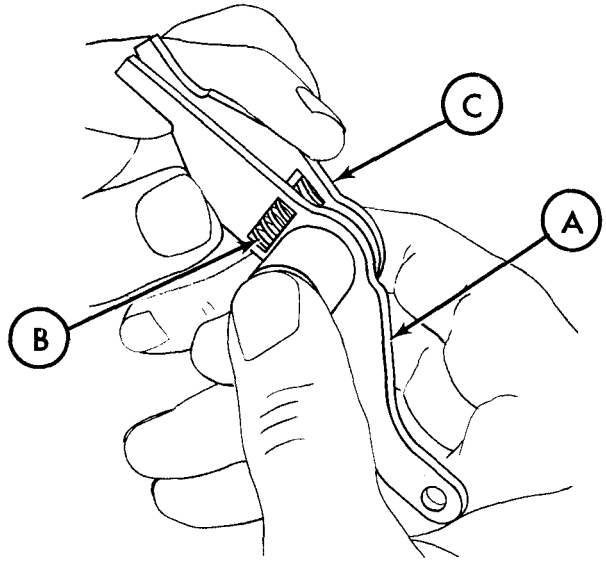
3. Hold outer lever (F) with upper extension as shown. Place spring (G) in recess.



TA245284

ASSEMBLY FROM SUBASSEMBLIES—Continued

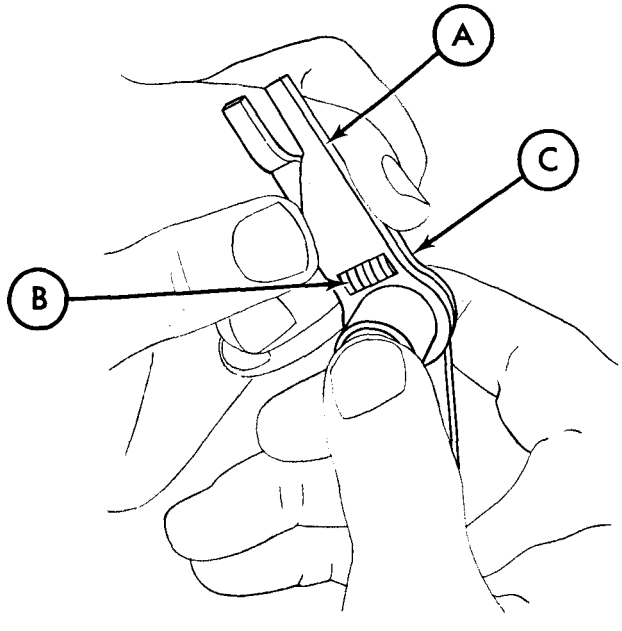
4. Place inner lever (A) over spring (B) and outer lever (C).

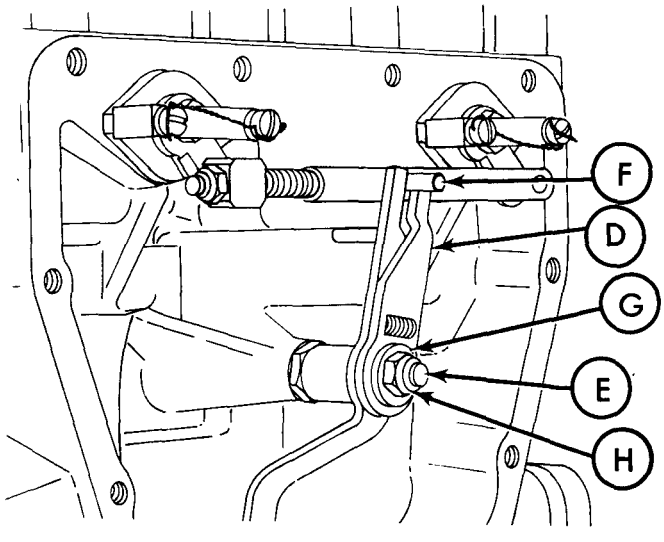


5. Press outer lever (C) against inner lever (A) while turning outer lever counterclockwise to force spring (B) into recess of outer lever. Push levers together.

6. Install assembled levers (D) on fuel control lever screw (E), with yoke pin (F) between two lever extensions.

7. Secure levers with new flat washer (G) and nut (H). Using 7/16 in. socket and torque wrench, tighten nut to 50 to 60 lb-in. (6 to 7 N·m).

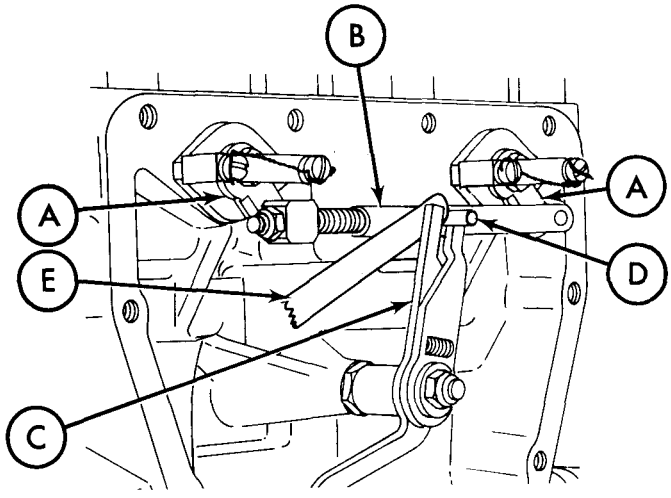




TA245285

8. Move fuel control levers (A) away from pump while holding yoke (B) toward pump. Measure distance between inner lever (C) and yoke at yoke pin (D) using a feeler gage (E).

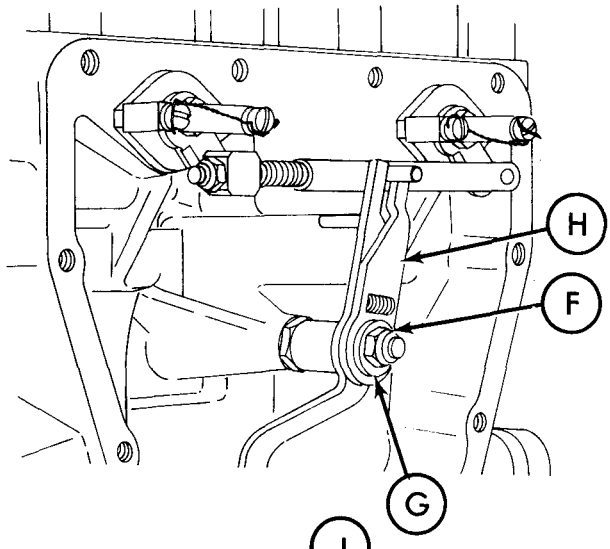
9. Clearance must be 0.015 in. (0.38 mm) to 0.030 in. (0.76 mm). If clearance is within limits, task is complete. If clearance is not within limits, proceed with step 10. below.



NOTE

Spacers are available in 0.015 in. (0.38 mm) and 0.030 in. (0.76 mm) thicknesses.

10. If clearance is greater than 0.030 in. (0.76 mm), remove nut (F), washer (G), and levers (H).



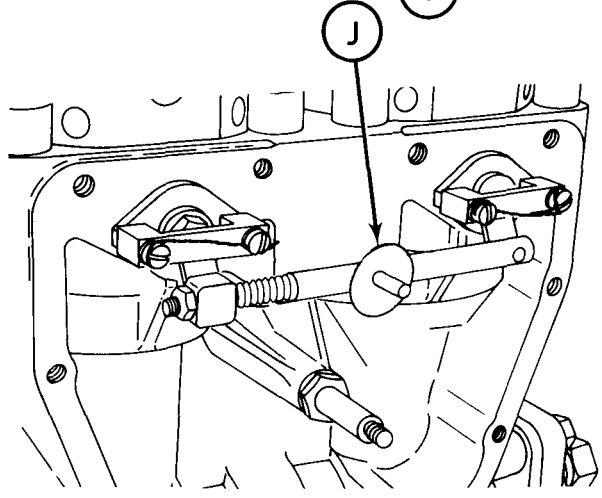
NOTE

Apply lubricant to both side of spacer(s).

11. Install required spacer (J) to bring clearance within limits.

12. Repeat steps 6. and 7. above.

End of Task



TA245286

ASSEMBLY FROM SUBASSEMBLIES—Continued

INSTALL GOVERNOR HOUSING

TOOLS:

Tool Kit, Automotive Fuel and Electrical System Repair
Spring gage (special tool)
Torque wrench capable of torquing 50 to 60 lb-in. (6 to 7 N·m)
Depth gage
Thickness gage
1 in. outside micrometer

SUPPLIES:

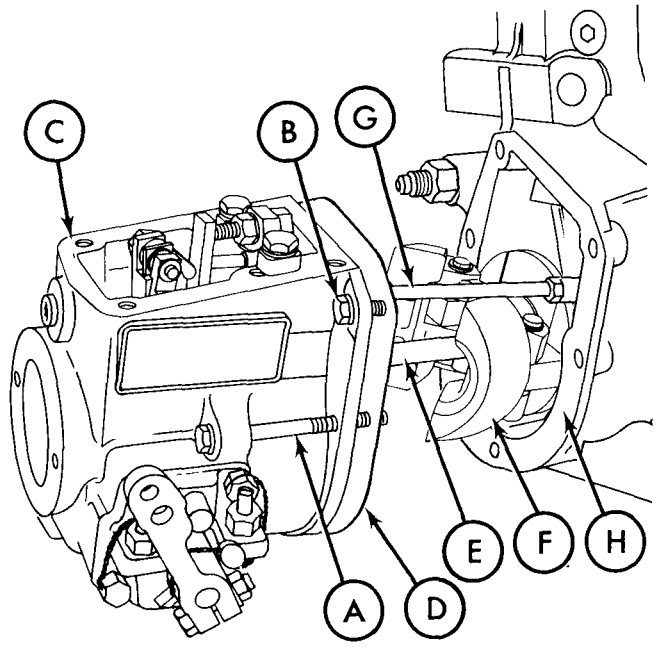
Engine oil (Item 3, Appendix C)
Clean cloth (Item 4, Appendix C)
Sealant (Item 8, Appendix C)
Wire (Item 11, Appendix C)
Shim Set, Part No. 5702638

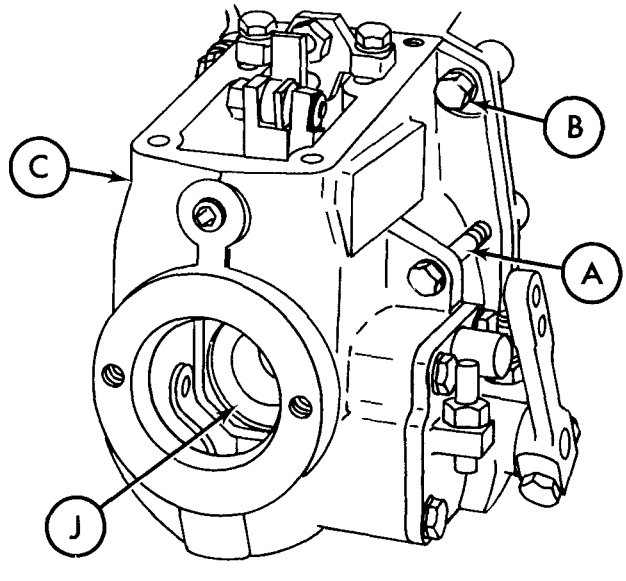
INSTALLATION:

NOTE

Coat all loose parts with a light film of engine oil.

1. Insert two long screws and new lockwashers (A) and two short screws and new lockwashers (B) in governor housing (C).
2. Coat both sides of new gasket (D) sparingly with sealant. Install gasket over the screws.
3. Turn camshaft (E) until governor weight (F) split line is vertical, and spread weights apart.
4. Insert governor control rod (G) through opening in pump housing (H).
5. Aline screws (A) and (B) with mating holes. Push governor housing assembly (C) toward pump housing (H) while guiding sleeve assembly on end of camshaft (E), and governor weights (F) over sleeve.
6. Tighten four screws (A) and (B) finger tight. Look through top of governor housing to be certain weights (F) are seated on sleeve (J).



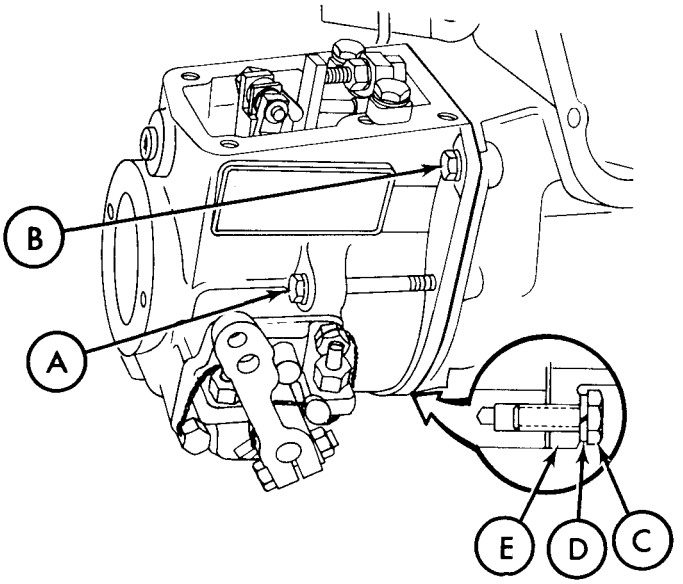


TA245287

ASSEMBLY FROM SUBASSEMBLIES—Continued

7. Using 7/16 in. socket, extension, and torque wrench, tighten four screws (A) and (B) to 50 to 60 lb-in. (6 to 7 N·m).

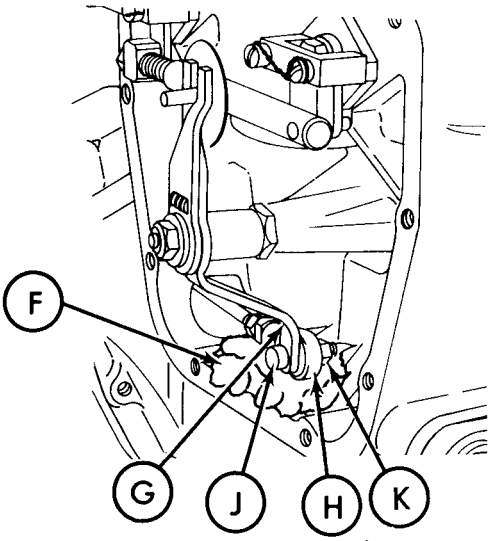
8. Install screw (C) and lockwasher (D) through pump housing flange (E) to governor housing and tighten snug-tight using 7/16 in. open end wrench.



9. Place a clean lint-free cloth (F) below inner fuel control lever (G) to prevent parts from dropping into pump oil sump.

10. Aline control rod assembly bearing (H) with inner fuel control lever (G).

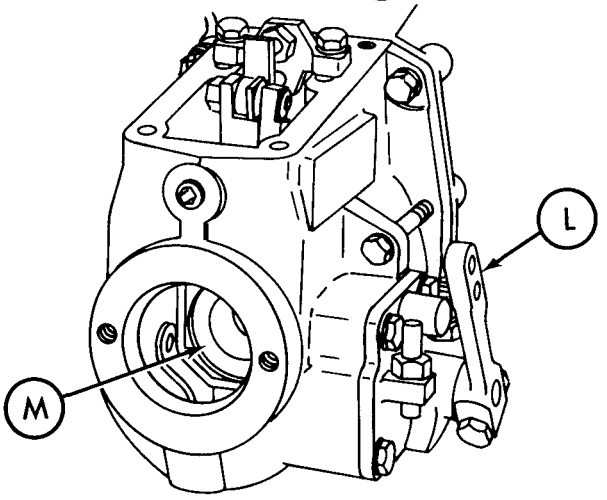
11. Install capscrew (J) and self-locking nut (K). Using 3/8 in. open end wrench to hold nut, tighten screw using 5/32 in. socket head screw key.



12. Remove cloth (F).

13. Move operating lever (L) toward front of pump as far as possible.

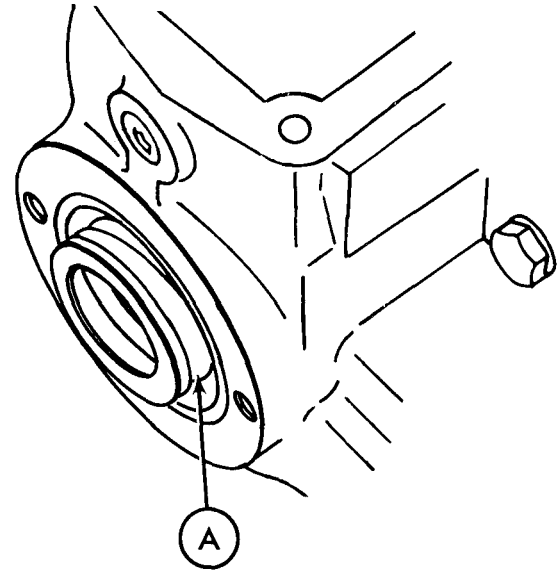
14. Push sleeve (M) in as far as possible.



TA245288

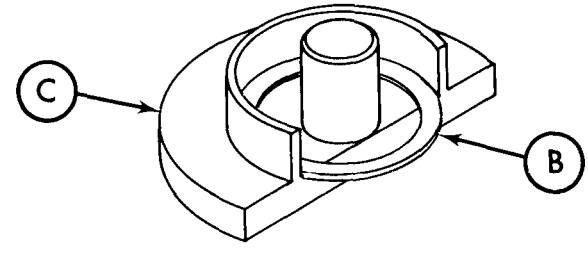
ASSEMBLY FROM SUBASSEMBLIES—Continued

15. Place outer spring (A) on sleeve.

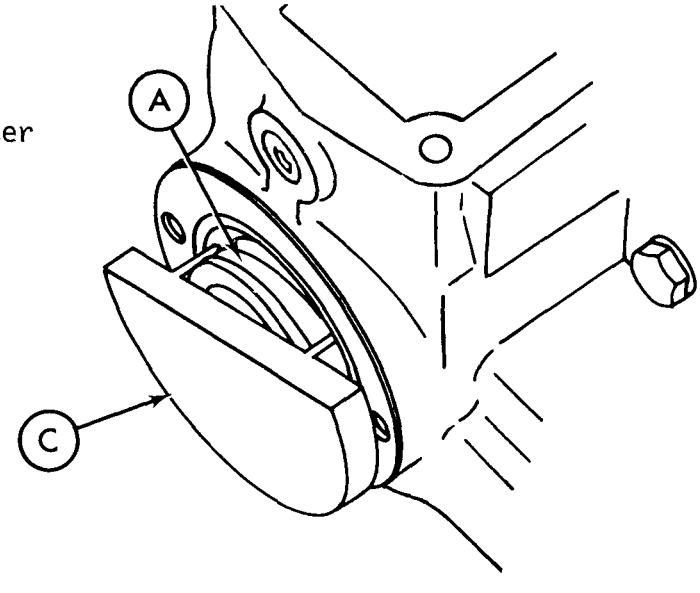


16. Select new outer shims (B) of the same thickness as those removed (and discarded, page 3-56).

17. Place outer shims (B) in spring gage (C).



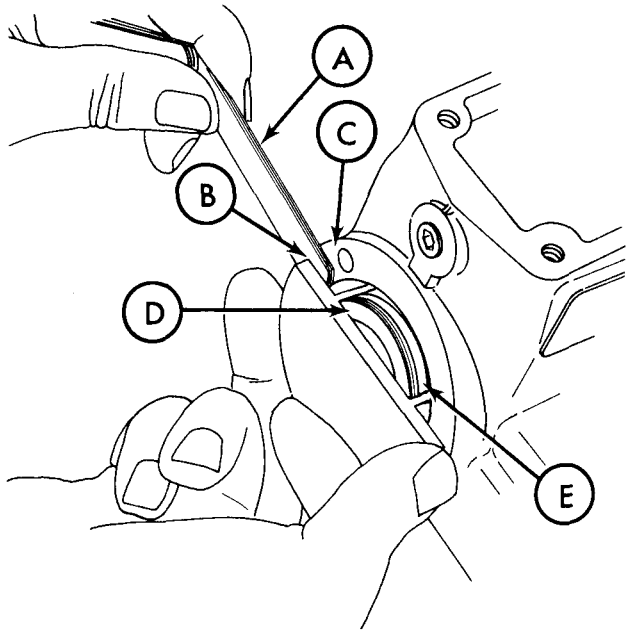
18. Place spring gage (C) over outer spring (A).



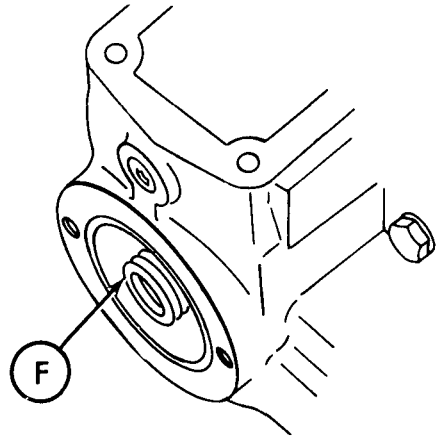
TA245289

ASSEMBLY FROM SUBASSEMBLIES—Continued

19. Using thickness gage (A), measure distance between underside of gage (B) and cap seating surface (C).
    (a) Add or remove shims (D) to obtain 0.070 in. (1.77 mm) to 0.080 in. (2.00 mm).
    (b) Remove and retain outer shims (D) and spring (E).

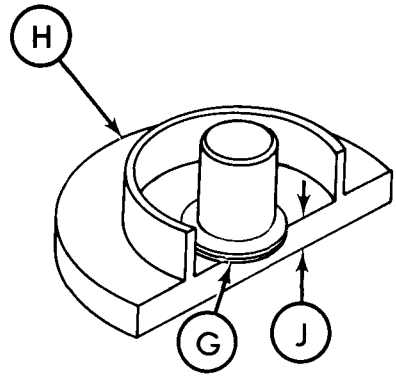


20. Place inner spring (F) on sleeve.



21. Select new inner shims (G), of the same thickness as those removed (and discarded, page 3-56), and place in spring gage (H).

22. Using micrometer, measure and record dimension (J).



TA245290

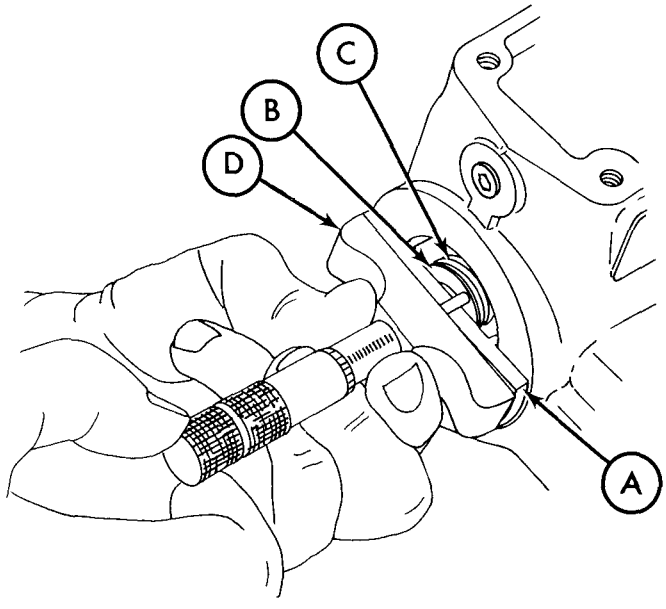
ASSEMBLY FROM SUBASSEMBLIES—Continued

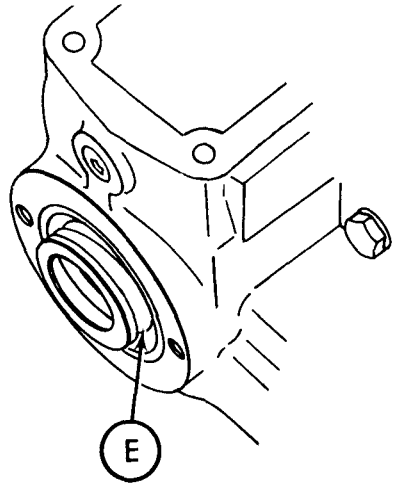
23. Place spring gage (A), with shims (B), on inner spring (C).

24. Using depth gage (D), measure distance between underside of gage (A) and shims (B).

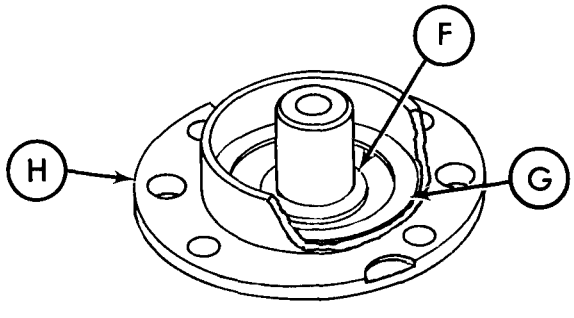
25. Add or remove shims (B) to obtain 0.110 in. (2.8 mm) to 0.130 in. (3.3 mm) plus dimension (J) from page 3-106.

    Example: If thickness gage dimension (J, page 3-106) is 0.162 in. (4.1 mm), then the desired dimension would be 0.110 in. (2.8 mm) to 0.130 in. (3.3 mm) plus 0.162 in. (4.1 mm);
    or
    0.272 in. (6.9 mm) to 0.292 in. (7.4 mm).





26. Remove gage (A) and install outer spring (E) in governor housing. Install inner shims (F) and outer shims (G) in governor cap (H).



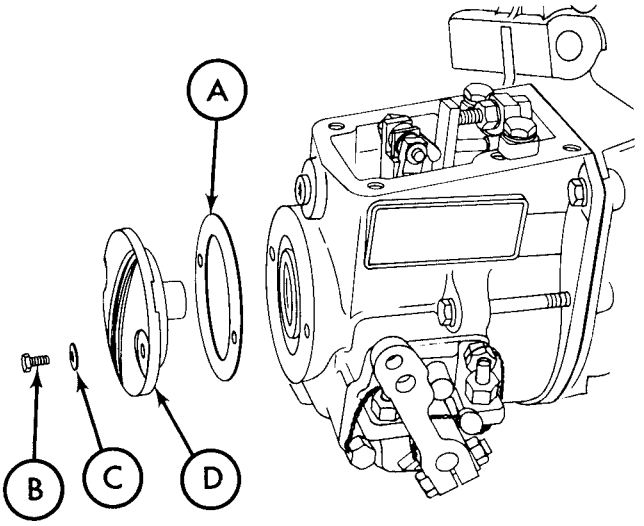
TA245291

ASSEMBLY FROM SUBASSEMBLIES — Continued

26. Coat one side of cap gasket (A) with sealant.

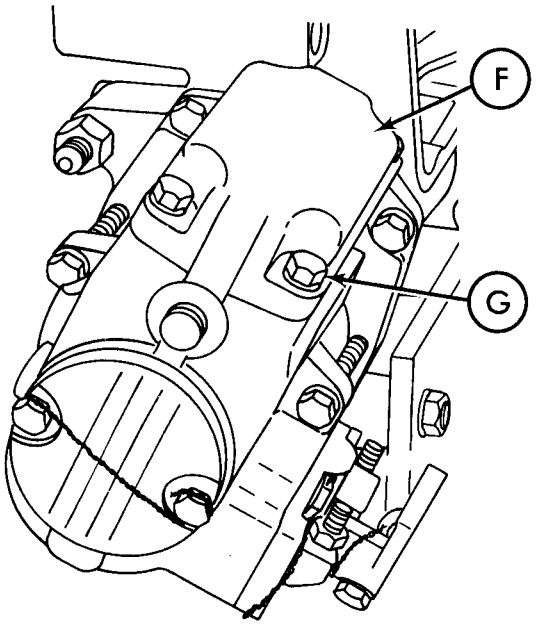
27. Insert screws (B) with lockwashers (C) through cap. Place gasket (A) on screws with sealant toward cap (D).

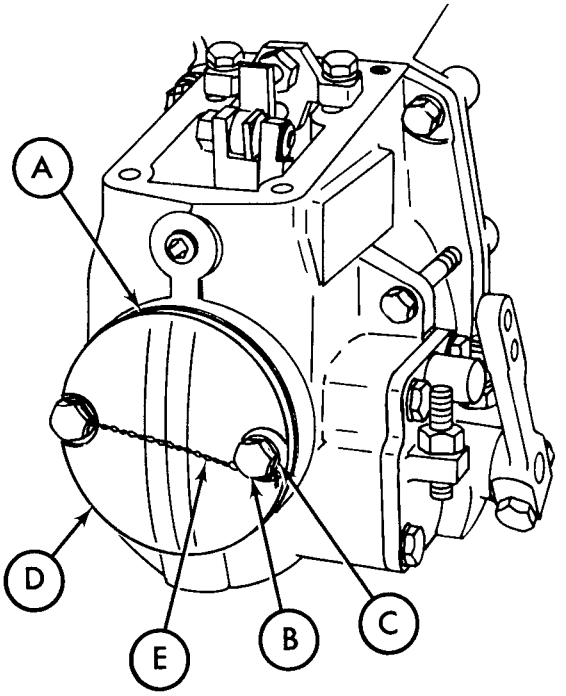
28. Install cap (D) and gasket (A) on housing. Secure with two screws (B) and lockwashers (C). Torque screws to 50 to 60 lb-in. (6 to 7 N·m). Secure screws with twisted wire (E).



29. Install governor cover (F). Install four new lockwashers and machine bolts (G) and tighten finger tight.

End of Task





TA245292

ASSEMBLY FROM SUBASSEMBLIES—Continued

INSTALL COVER AND SOLENOID

TOOLS:

None.

SUPPLIES:

None.

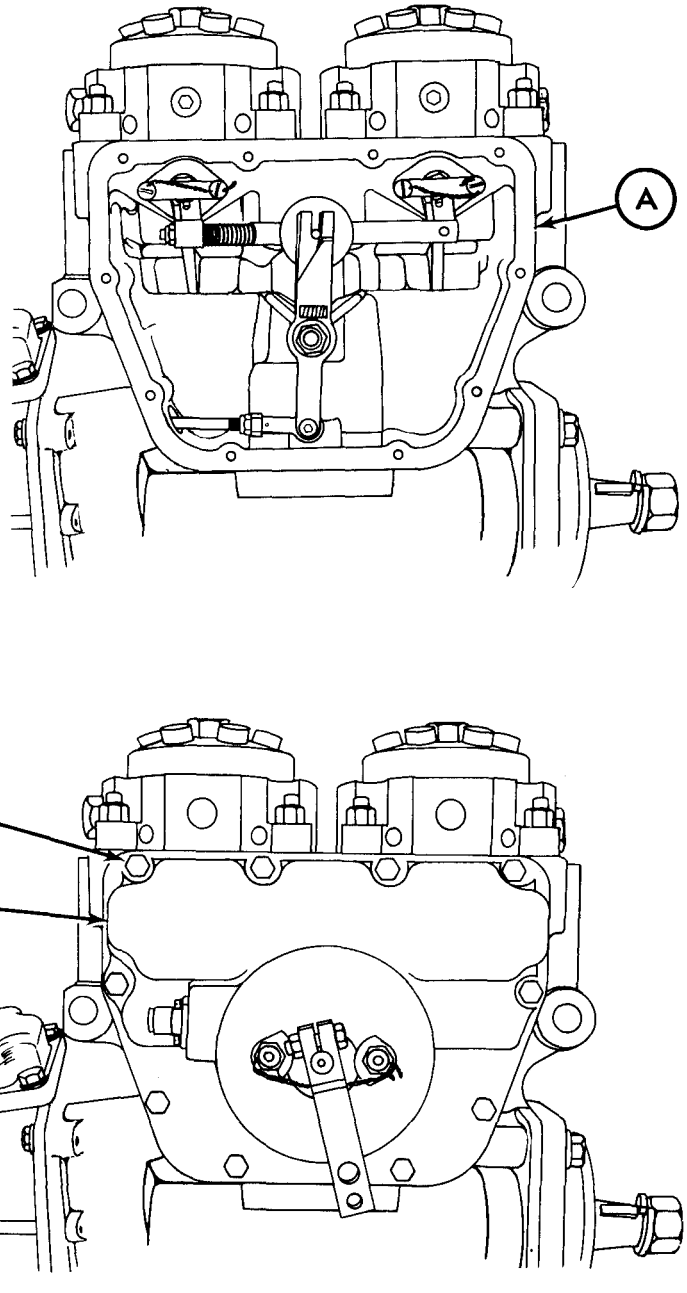
INSTALLATION:

1. Install new gasket (A).
2. Install cover and solenoid (B) and secure with 10 lockwashers and machine bolts (C). Tighten bolts finger tight since they will be removed during testing.

NOTE

The fuel outlet bleeder housing and valve assembly, fuel inlet filter assembly, and bleeder valve stems will be installed after the Fuel Leakage and Delivery Valve Tests have been performed. The pump must be tested (page 2-16) and calibrated (page 2-40) following any repair, refer to Chapter 4.

End of Task



TA245293

CHAPTER 4

TESTING, CALIBRATION, PRESERVATION, AND PACKAGING AFTER REPAIR

Section I. TESTS AND CALIBRATION

4-1. GENERAL.

Following any repair, the following tests and calibration procedures must be performed in the order listed to be certain pump can be returned to service.

4-2. TESTING (PAGES 2-16 THROUGH 2-39).

4-3. CALIBRATION (PAGES 2-40 THROUGH 2-64).

End of Task

Section II. PRESERVATION AND PACKAGING

4-4. PRESERVATION.

TOOLS:

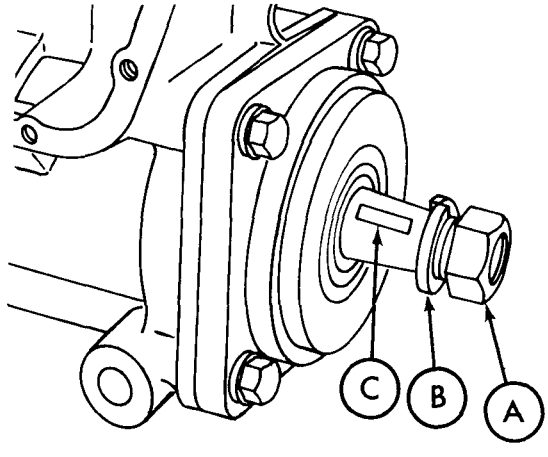
Tool Kit, Automotive Fuel and Electrical System Repair
Turning and holding wrench (special tool)
Steel rod (fabricated tool), page 2-3
3/8 to 1/2 in. drive adapter

SUPPLIES:

Lubricating oil (VV-L-800) (Item 5, Appendix C)

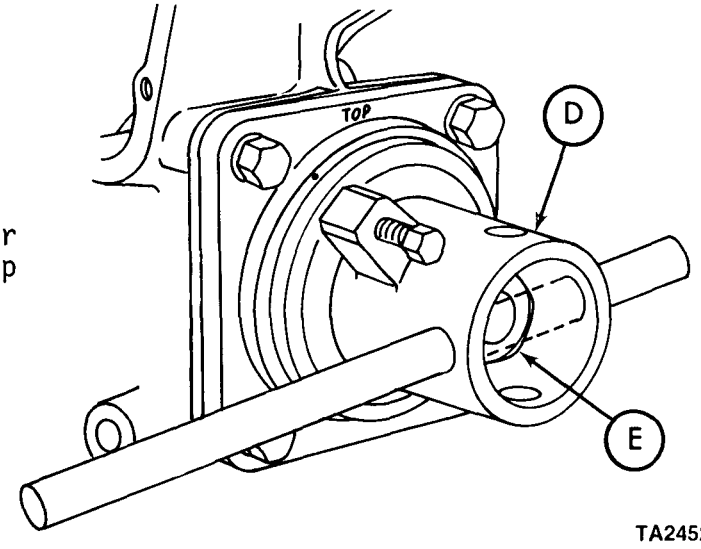
PRESERVE PUMP

1. Remove nut (A) and lockwasher (B).
2. Remove tape from Woodruff key (C).



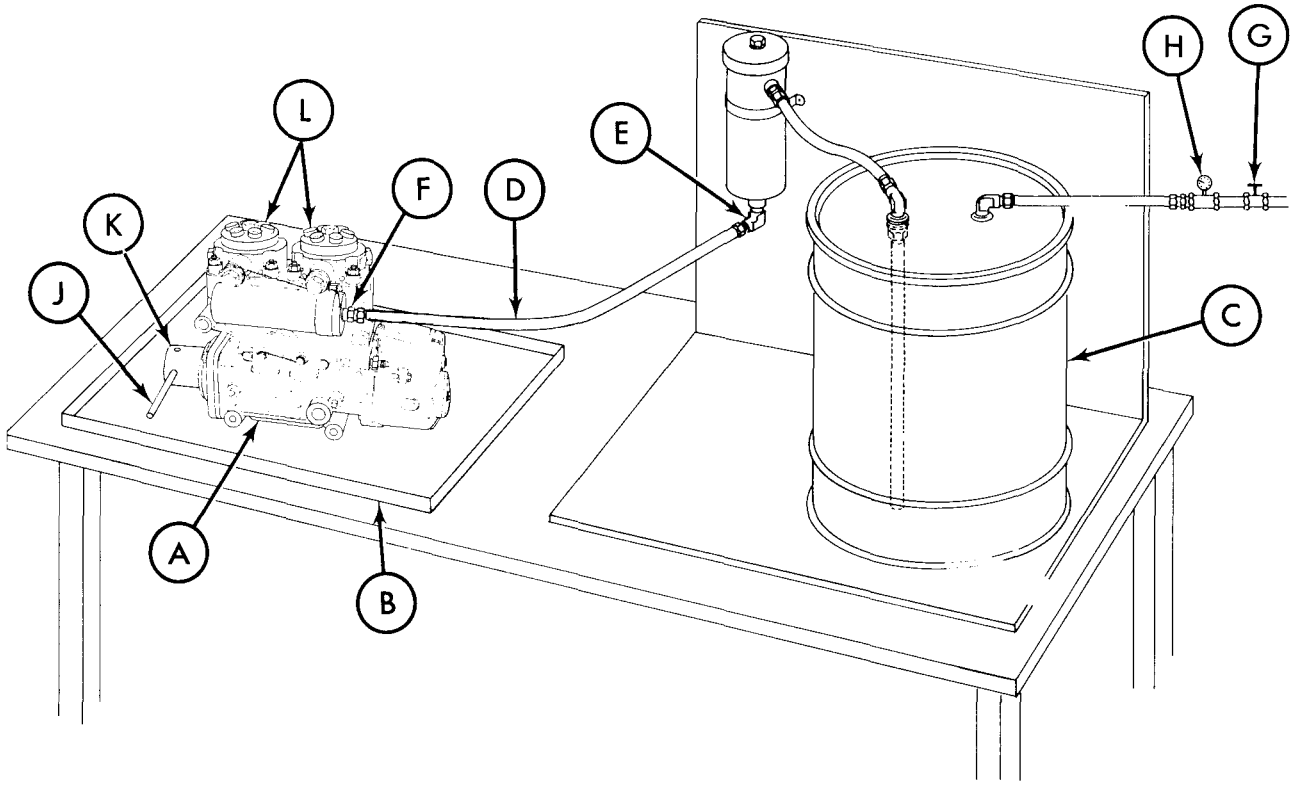
3. Aline keyway with Woodruff key and install turning and holding wrench (D). Secure wrench with lockwasher and nut (E). Using 1 1/16 in. deep well socket, adapter and ratchet handle, tighten nut.

End of Task



TA245298

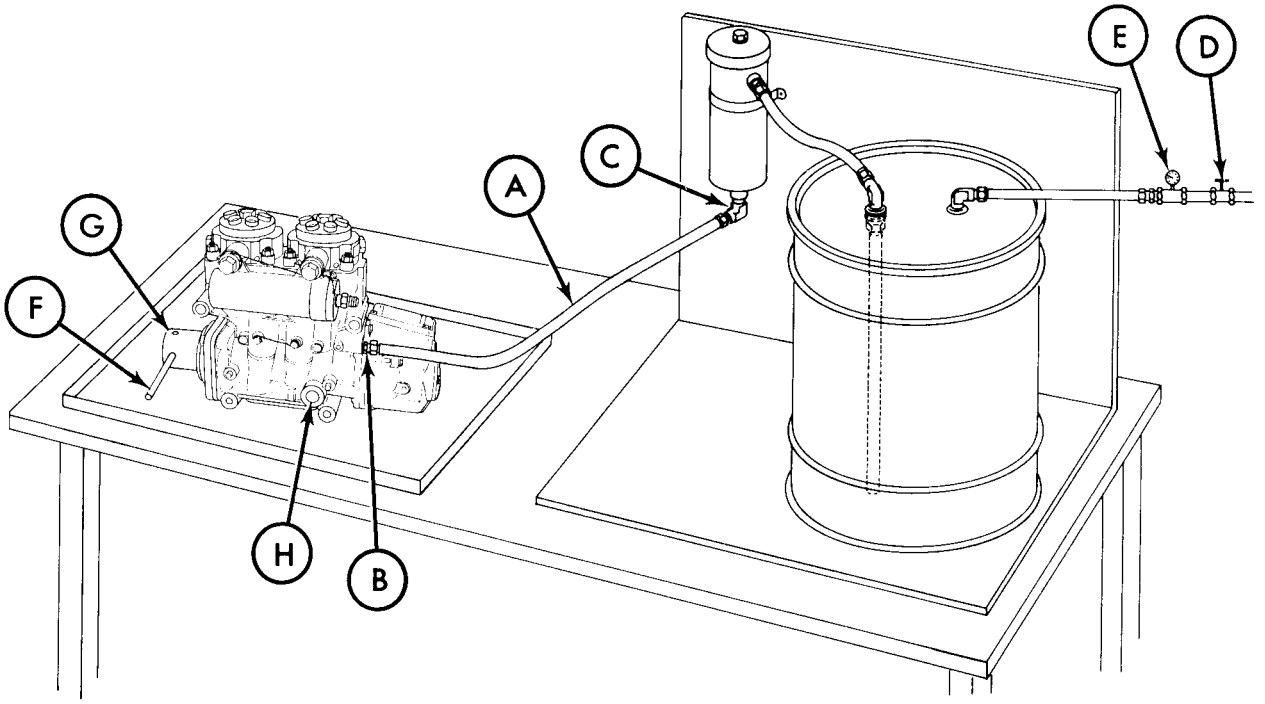
PRESERVATION—Continued



4. Place pump (A) on drip tray (B) as illustrated.
5. Fill reservoir (C) with 10 gallons of lubricating oil.
6. Connect 3/8 in. oil outlet hose (D) to oil filter outlet elbow (E) and pump fuel filter inlet adapter (F).
7. Open shut-off valve (G) and adjust air pressure to 2 to 4 psi (14 to 28 kPa) on the air pressure regulator (H).
8. Using steel bar (J) and turning and holding wrench (K), turn camshaft to the right and observe oil discharge from pump head assembly outlet ports (L). Continue to turn camshaft until oil has been discharged from all 12 outlet ports.
9. Close shut-off valve (G).
10. Disconnect 3/8 in. oil outlet hose (D) from pump fuel filter inlet adapter (F), and filter outlet elbow (E).

TA245299

PRESERVATION—Continued



11. Connect 1/4 in. oil outlet hose (A) to oil inlet adapter (B), and filter outlet elbow (C).

12. Open shut-off valve (D) and adjust air pressure to 2 to 4 psi (14 to 28 kPa) on air pressure regulator (E).

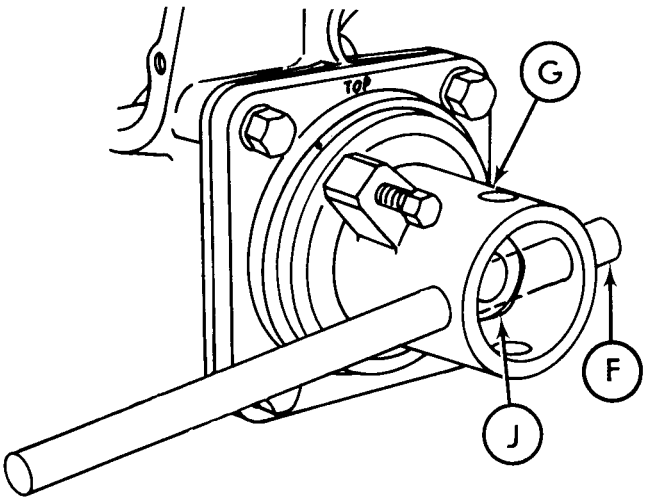
13. Using steel rod (F) and turning and holding wrench (G), turn camshaft to the right four revolutions and observe oil draining from oil return port (H).

14. Close shut-off valve (D).

15. Disconnect 1/4 in. hose (A) from oil inlet adapter (B) and elbow (C).

16. Remove steel rod (F) from turning and holding wrench (G).

17. Using 1 1/16 in. deep well socket, adapter, and ratchet handle, remove plain nut and lockwasher (J). Using plastic insert hammer, remove turning and holding wrench (G).



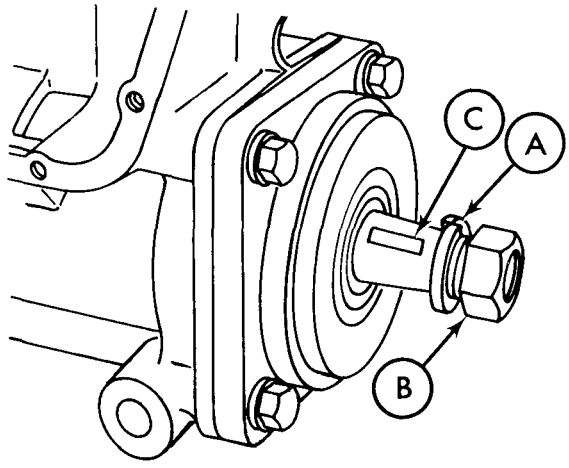
TA245300

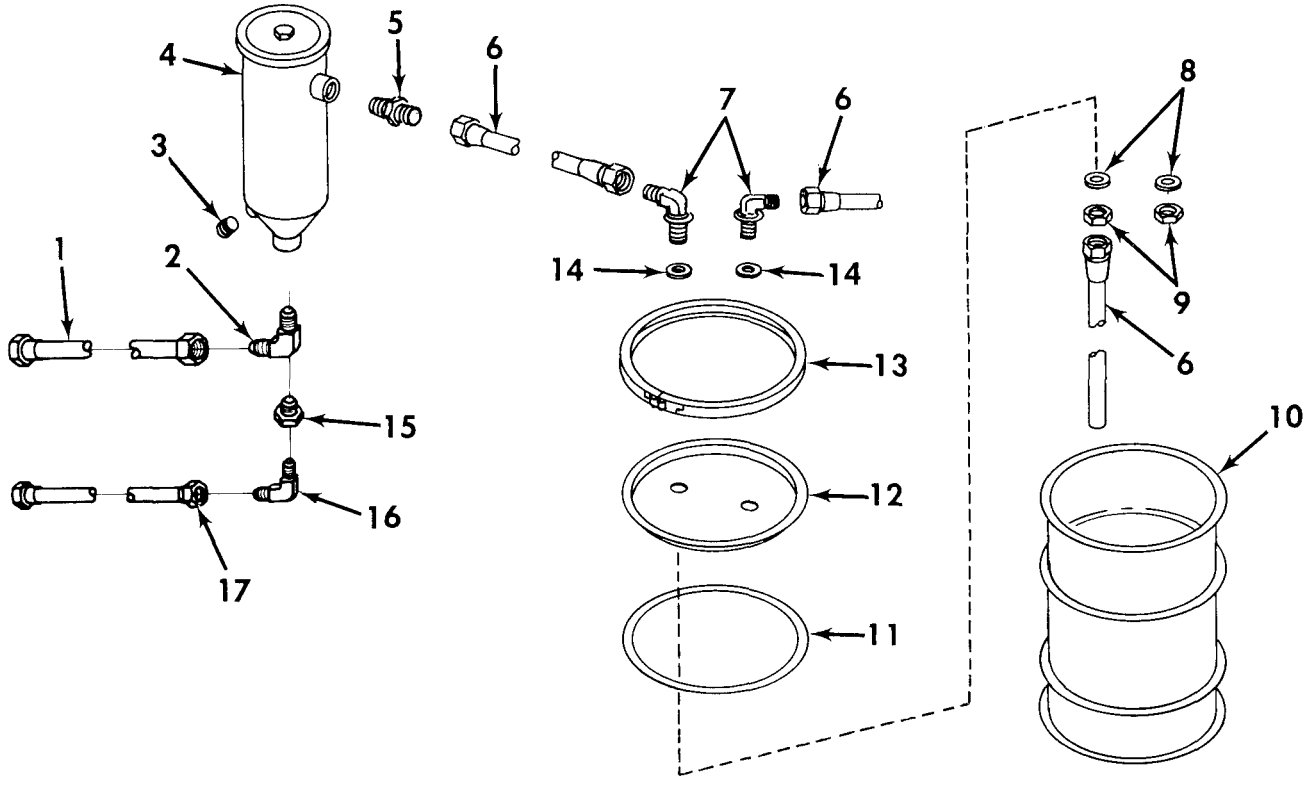
PRESERVATION—Continued

18. Install lockwasher (A) and nut (B). Install Woodruff key (C) in keyway slot.

19. Turn pump over two times slowly to permit residual oil to drain from pump.

20. Apply a light film of lubricating oil to all exterior surfaces of pump.





1. Hose assembly
2. Elbow
3. Pipe plug
4. Pressure fluid filter
5. Adapter
6. Hose assembly
7. Bulkhead elbow
8. Lockwasher
9. Plain nut
10. Drum
11. Gasket
12. Cover
13. Lock ring
14. Flat washer
15. Bushing (used with item 16)
16. Elbow
17. Hose assembly

Preservation Bench Components.

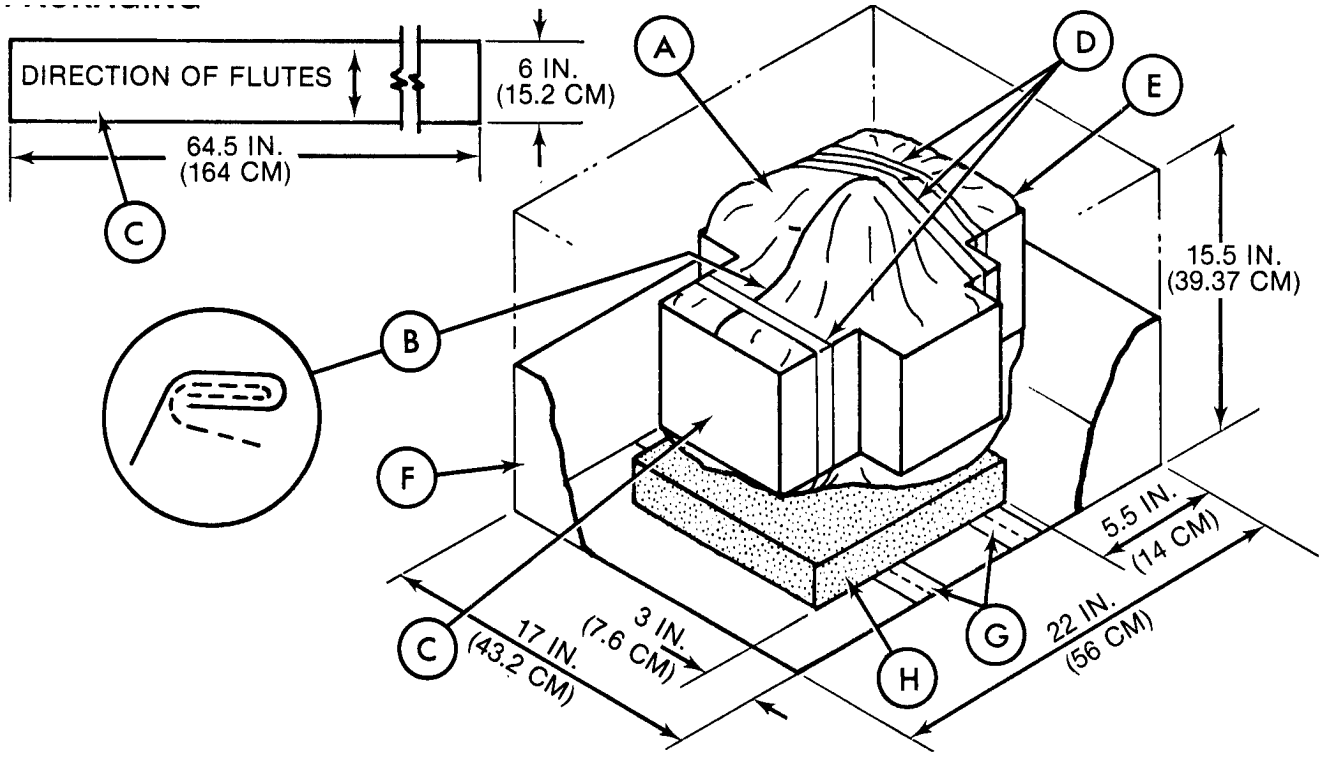
TA245301

PRESERVATION BENCH BILL OF MATERIALS

Item	Description	Part No.	Quantity
1.	Hose Assembly, 3/8 in. id, 33 in. long	MS28741-8-0330	1
2.	Elbow, 90°, 3/8-18 NPTF to 3/4-16UNF-2A flare	MS51504-B8	1
3.	Plug, pipe, 1/4-18 NPTF (filter drain)	MS49005-4	1
4.	Filter, Fluid, Pressure	11610297	1
5.	Adapter, 3/8-18 NPTF to 3/4-16UNF-2A flare	MS51500-B8	1
6.	Hose Assembly, 3/8 in. id, 16 in. long	MS28741-8-0160	3
7.	Elbow, Bulkhead, 90°, 3/8 in.	MS24394-8	2
8.	Washer, Lock	MS35335-40	2
9.	Nut, Plain	AN924-8	2
10.	Drum, 16 gal	MS27683-1	1
11.	Gasket	MS27683-90	1
12.	Cover	MS27683-60	1
13.	Lock Ring	MS27683-80	1
14.	Washer, Flat	MS27183-23	2
15.	Bushing, 3/8 to 1/4 in. NPTF	* MS51847-2	1
16.	Elbow, 90°, 1/4-18 NPTF to 7/16-20UNF-2A flare	* MS51504-B4-4	1
17.	Hose Assembly, 1/4 in. id, 33 in. long	MS28741-5-0330	1

*Used with 1/4 in. hose assembly only (item 17).

End of Task



4-5. PACKAGING (REUSABLE BOX)

TOOLS:

Hand saw, cross cut, medium blade
Pocket knife

SUPPLIES:

Steel strapping (Item 12, Appendix C)
Strapping seals (Item 13, Appendix C)

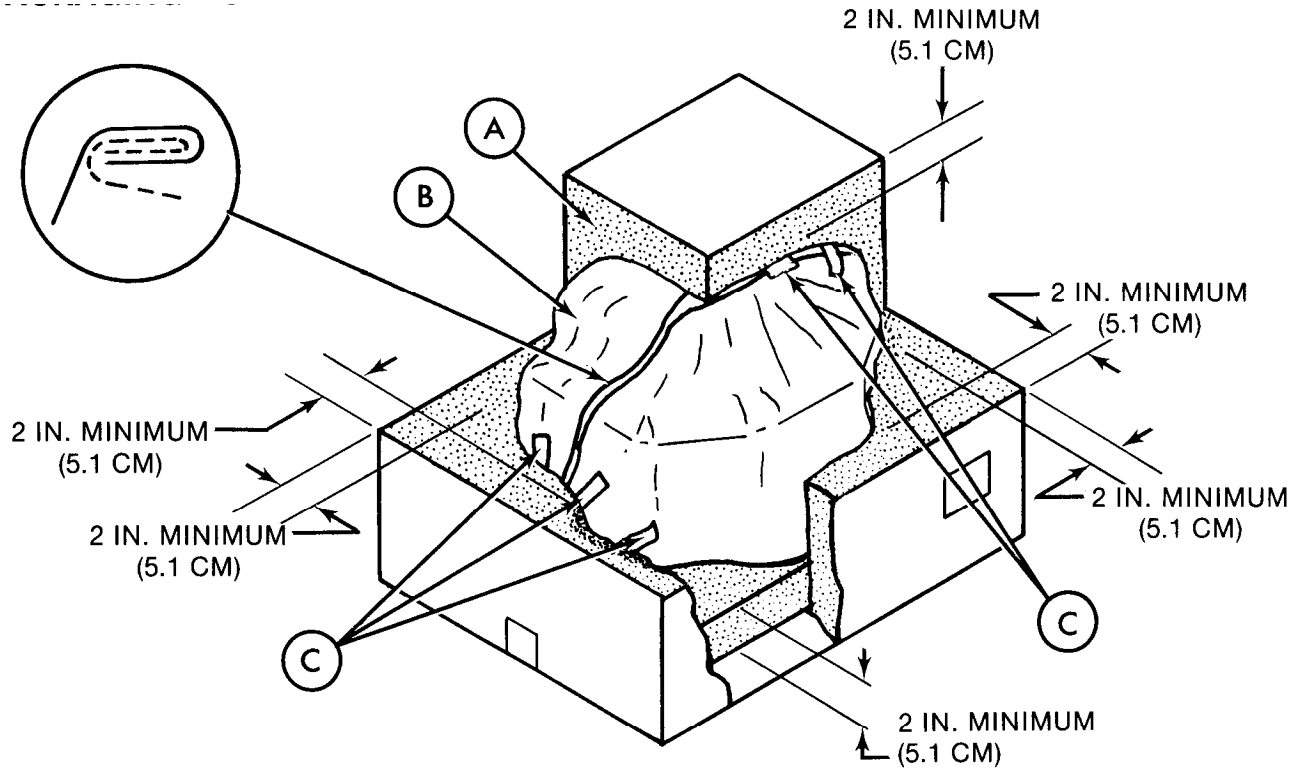
1. Secure Woodruff key to camshaft by wrapping with intimate wrap, MIL-B-121, Type II, Grade A, Class 2, and taping with 1/2 in. wide tape, PPP-T-97, Type II.

2. Intimate wrap (A), MIL-B-121, Type I, Grade C, Class 1, shall be applied with face (wax-free) surface toward pump. Wrap shall be applied in such a manner to conform to contour of pump, and shall be tightly applied. Overlaps (B) shall be rolled and pressed to assure that foam does not enter wrap or contact pump.

3. Cushioning sleeve (C), PPP-F-320, Type CF, Grade V3c, Class W/R, shall be positioned around intimate wrap. Ends shall be overlapped and securely joined with tape, PPP-T-97, Type II, or by staples and clinched. The sleeve shall be positioned and secured so that cut line, page 4-9, will be located at the approximate center of the width of the sleeve. The sleeve shall be secured in place with tape (D), PPP-T-97, Type II. Adequate tension shall be applied to tape to draw sleeve tight against the package (E).

4. The outer wrap, (B) page 4-8, UU-P-268, Type I, Grade B, shall be applied in the same manner as intimate wrap. Overlaps shall be rolled and pressed. Apply tape PPP-T-97, Type II, along seam. Folds at each end of package shall be secured with tape, (C) page 4-8, PPP-T-97, Type II, to prevent foam penetration.

TA245302



5. Fiberboard box (F) page 4-7, PPP-B-636, Style RSC, Type CF, Grade V3c, Class W/R, shall have bottom inner flaps taped to outer flaps (G) page 4-7.

6. Support block (H) page 4-7, MIL-P-21929, Class 1, shall be laminated to bottom of box. A commercial grade of adhesive conforming to Specification MMM-A-1058 (adhesive, rubber base in pressurized containers) shall be used for lamination.

7. Polyurethane foam (A), MIL-P-21929, Class 1, shall be fire-resistant.

   a. Physical properties:

      (1) Compressive strength, parallel to direction of rise 30 psi (207 kPa) minimum; perpendicular to direction of rise, 15 psi (103 kPa) minimum.

      (2) Unicellularity, percent open cells, 10% maximum.

      (3) Density, pounds per cubic foot 2.0 + 0.2, - 0.1 (grams per cubic centimeter, 0.032 + 0.003, - 0.002).

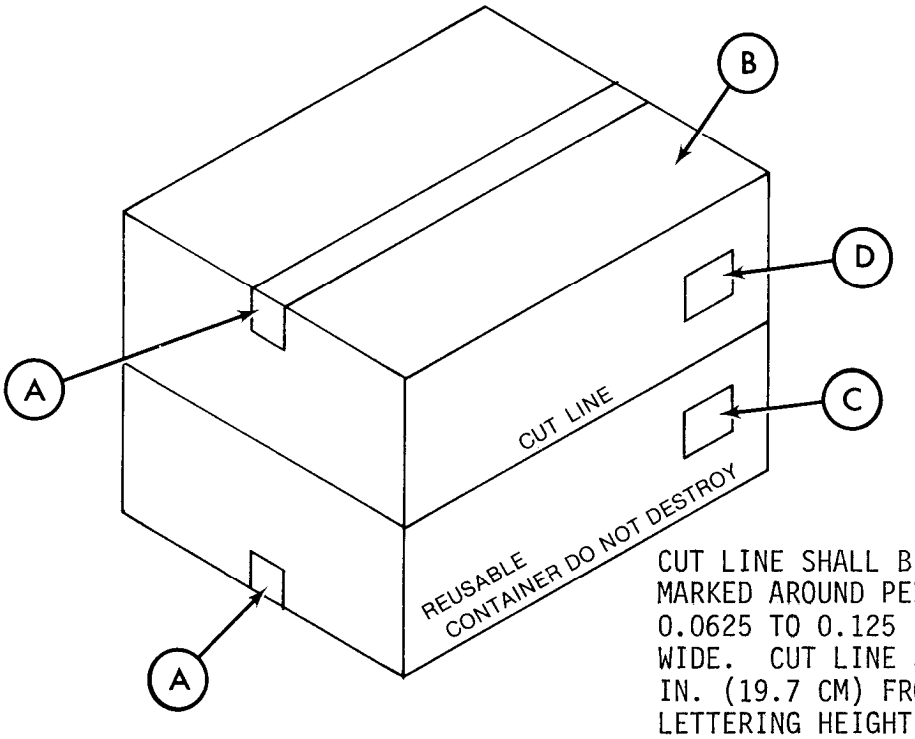
   b. Chemical properties:

      (1) Toxicity. Foam shall be formulated to produce minimum toxic effects consistent with performance. Toluene diisocyanate (TDI) type foam and foam with similar toxic side affects shall not be used.

      (2) Foam systems. Foam formulation shall be of the two component system with a mix ratio by weight or volume, as applicable, of 1:1 equal parts according to manufacturer's recommendation. Foam shall be capable of being hand or machine mixed and poured in accordance with manufacturer's instructions.

TA245303

PACKAGING—Continued



CUT LINE SHALL BE ONE CONTINUOUS LINE MARKED AROUND PERIMETER OF CONTAINER, 0.0625 TO 0.125 IN. (1.59 TO 3.18 MM) WIDE. CUT LINE SHALL BE LOCATED 7.75 IN. (19.7 CM) FROM BOTTOM OF CONTAINER. LETTERING HEIGHT OF ALL MARKING SHOWN ABOVE (OTHER THAN LABEL) SHALL BE 0.75 IN. (19 MM).

8. Place a restraining device around the box. Place package on support block (H), page 4-7, in the box with minimum clearance of 2 in. (5.1 cm) all around the package. Mix the two chemical components as prescribed by manufacturer to completely surround package and fill all voids. Box distortion exceeding 0.25 in. (6 mm) for each 12 in. (30.5 mm) of surface length shall be cause for rejection.

9. Seal flaps using pressure sensitive tape (A), PPP-T-60, Type III, Class 1.

10. Identify box (B) with National Stock Number, Part Number, and Part Name.

11. The following opening instructions label (C) shall be provided. Information to be shown on label shall be as follows:

OPENING INSTRUCTIONS:

a. Box shall be opened by cutting along cut line using either of the following methods:

(1) Make initial cut with a hand saw. Cut through remainder of polyurethane foam with hand saw or knife;

(2) Or use a hand saw for whole operation.

CAUTION
Do not jam blade through sleeve.

b. Using either method, make cut continuous around perimeter

TA245304

PACKAGING—Continued

of box. When using hand saw, cut through box and into foam using sabre saw cutting technique until blade reaches protective sleeve.

c. After cutting, remove top half of box. To aid removal, use two flat steel strips or angle irons 3 in. (76 mm) wide and long enough to extend at least 12 in. (30.5 cm) beyond initial separation. Exert pressure at both ends simultaneously.

d. Remove pump from lower half of box carefully. Do not fracture foam.

12. The following reuseability instruction label (D) page 4-9, shall be provided. Information to be shown on label shall be as follows:

REUSEABILITY INSTRUCTIONS:

a. Box shall be reused for shipments of pump, NSN 2910-01-073-0124, scheduled for repair or rebuild.

b. Prepare for shipment as follows:

(1) Place pump in cavity of bottom section of box.

(2) Position top section of box over pump.

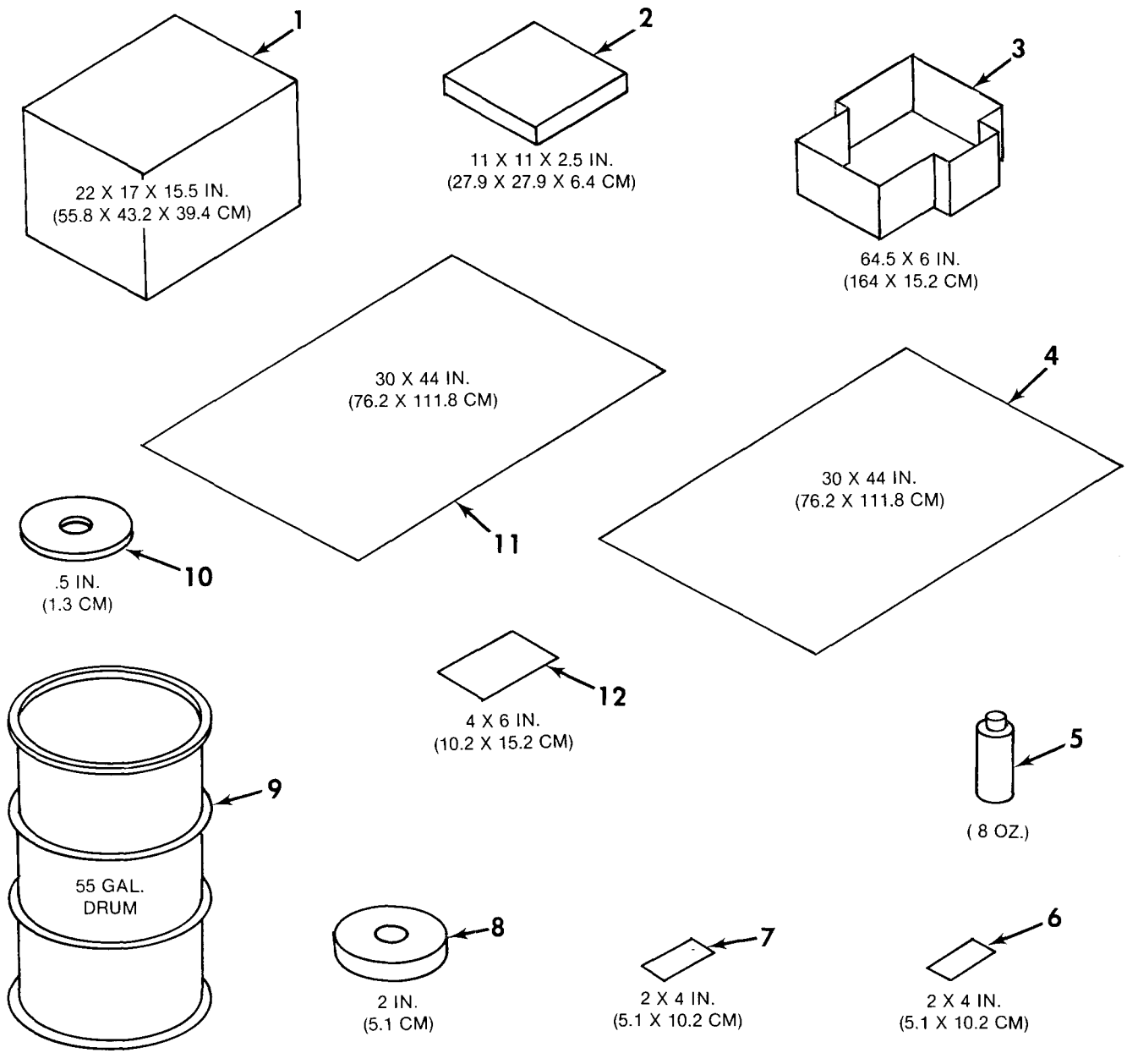
CAUTION

Fill void areas with cellulose wadding, NSN 8135-00-855-6969. If large voids exist due to foam removal, do not reuse.

(3) Secure top to bottom by placing two steel straps around sides, top and bottom of box. Position adjacent to inside edges of skids. Tighten straps and secure with strap seals.

(4) Remove or obliterate obsolete marking and apply appropriate marking.

PACKAGING—Continued



1. Fiberboard box
2. Support block
3. Cushioning fiberboard sleeve
4. Outer wrap
5. Adhesive
6. Reusability label
7. Opening label
8. Pressure sensitive tape
9. Polyurethane foam
10. Pressure sensitive tape
11. Intimate wrap
12. Intimate wrap

Packaging Components.

TA245305

PACKAGING—Continued

PACKAGING BILL OF MATERIALS

Item Number		Size	Specification Data	Qty.
1.	Box, Fiberboard	22 x 17 x 15 1/2 in. (55.8 x 43.2 x 39.4 cm)	PPP-B-636, Style RSC, Type CF, Grade V3c, Class W/R	1 ea
2.	Support Block	11 x 11 x 2 1/2 in. (27.9 x 27.9 x 6.4 cm)	MIL-P-21929, Class 1	1 ea
3.	Sleeve, Cushioning Fiberboard	6 x 64 1/2 in. (15.2 x 164 cm)	PPP-F-320, Type CF, Grade V3c, Class W/R	1 ea
4.	Wrap, Outer	44 x 30 in. (111.8 x 76.2 cm)	UU-P-268, Type I, Grade B, Min Basis Wt. 40 Lbs.	1 ea
5.	Adhesive		MMM-A-1058	As Req'd
6.	Label, Reusability	As Required	MIL-STD-129	1 ea
7.	Label, Opening	As Required	MIL-STD-129	1 ea
8.	Tape, Pressure Sensitive	2 x 28 in. (5.1 x 71.1 cm)	PPP-T-60, Type III, Class 1	2 ea
9.	Foam, Polyurethane		MIL-P-21929, Class 1	7.50 Lbs
10.	Tape, Pressure Sensitive, Filament Reinforced	1/2 in. (1.3 cm) wide by length as required	PPP-T-97, Type II	1 ea
11.	Wrap, Intimate	44 x 30 in. (111.8 x 76.2 cm)	MIL-B-121, Type I, Grade C, Class 1	1 ea
12.	Wrap, Intimate	4 x 6 in. (10.2 x 15.2 cm)	MIL-B-121, Type II, Grade A, Class 2	1 ea

End of Task

APPENDIX A

REFERENCES

Section I. GENERAL INFORMATION

A-1. PURPOSE.

The information contained in this appendix has been prepared as a reference list of those army publications pertinent to the operation and maintenance of the vehicle/weapons systems incorporating the material supported by this publication.

A-2. ARRANGEMENT OF LISTINGS.

The publications listings contained in each section of this appendix are arranged in numerical order by publication number.

A-3. REQUISITIONING OF PUBLICATIONS.

Copies of the publications referenced, which are required in the performance of your mission, may be requisitioned from Commander, U.S. Army AG Publications Center, 1655 Woodson Road, St. Louis, MO 63144.

Section II. TECHNICAL AND REFERENCE MANUALS

A-4. PUBLICATION INDEXES.

The following indexes should be consulted frequently for latest changes or revisions or references given in this Appendix and for new publications relating to material covered in this Technical Manual:

DA PAM 310-1	Index of Administrative Publications
DA PAM 310-2	Index of Blank Forms
DA PAM 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals, Supply Bulletins, and Lubrication Orders
DA PAM 310-6	Index of Supply Catalogs and Supply Manuals
DA PAM 310-7	Index of Modification Work Orders

REFERENCES—Continued

A-5. MAINTENANCE FORMS AND RECORDS.

DA Form 2028	Recommended Changes to Publications
DA Form 2404	Equipment, Inspection, and Maintenance Worksheet
DA Form 2407	Maintenance Requests
TM 38-750	The Army Maintenance Management System (TAMMS)
DD Form 1397	Processing and Reprocessing for Shipment, Storage and Issue of Vehicles and Spare Engines
SF 368	Quality Deficiency Report

A-6. REGULATIONS.

AR-385-40	Accident Reporting and Records

A-7. TECHNICAL MANUALS.

FM 9-207	Operation and Maintenance of Ordnance Materiel in Cold Weather (0° to -65°F) (-18° to -54°C)
TM 9-214	Inspection, Care, and Maintenance of Antifriction Bearings
TM 9-247	Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel
TM 9-2815-200-35	Direct Support, General Support and Depot Maintenance Manual (Including Repair Parts and Special Tools Lists) for Engine, AVDS-1790-2A
TM 9-2815-220-34	Direct Support and General Support Maintenance Manual for Engines, AVDS-1790-2C, AVDS-1790-2D and AVDS-1790-2DR
TM 9-2815-220-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Engines, AVDS-1790-2C, AVDS-1790-2D and AVDS-1790-2DR

REFERENCES—Continued

TM 9-2350-215-20-1-4	Organizational Maintenance, Tank Combat, Full-Tracked: 105-MM gun, M60A1 and M60A1/AOS (Hull)

A-8. TEST ACCESSORIES.

TM 9-4910-387-14&P	Operator, Organizational, Direct Support, and General Support Maintenance Manual (Including Repair Parts and Special Tools List) for Tester, Fuel Injection: Single End Drive, 150 to 3,300 RPM (4910-00-817-7431) with Adapter Kit, Fuel Injector: (4910-00-763-7495)

A-9. SUPPLY CATALOGS.

SC 5180-95-CL-B08	Tool Kit, Automotive Fuel and Electrical System Repair: (5180-00-754-0655) (W32456)
SC 5180-90-CL-N26	Tool Kit, General Mechanic's: Automotive (5180-00-177-7033) (W33004)

APPENDIX B

REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

B-1. SCOPE.

This appendix lists repair parts and special tools required for the performance of direct and general support maintenance of the American Bosch Fuel Metering and Distributing Pump. It authorizes the requisitioning and issue of repair parts as indicated by the source and maintenance codes.

Part Number	Engine Application
11684129-1	Models AVDS-1790-2A, AVDS-1790-2C, AVDS-1790-2D, and AVDS-1790-2DR

B-2. GENERAL.

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

Section II. Repair Parts List. A list of repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in numeric sequence, with the parts in each group listed in figure and item number sequence. Expendable supplies and materials are listed in Appendix C in National item identification number (NIIN) sequence.

b. Section III. Special Tools List. A list of special tools authorized for the performance of maintenance.

c. Section IV. National Stock Number and Part Number Index. A list, in National item identification number (NIIN) (last nine numerals) sequence, of all National stock numbers (NSN) appearing in the listings, followed by a list in alphameric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

B-3. EXPLANATION OF COLUMNS.

a. Illustration. This column is divided as follows:

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

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

b. Source, Maintenance, and Recoverability (SMR) Codes.

(1) Source Code. Source codes indicate the manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

Code	Definition
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purpose because essentiality dictates that a minimum quantity be available in the supply system.
PC	Item procured and stocked and which otherwise would be coded PA except that it is deteriorative in nature.

REPAIR PARTS AND SPECIAL TOOLS—Continued

PD Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional initial issues or outfittings. Not subject to automatic replenishment.

PE Support equipment procured and stocked for initial issue or outfitting to specified maintenance repair activities.

PF Support equipment which will not be stocked but which will be centrally procured on demand.

PG Item procured and stocked to provide for sustained support for the life of the equipment. It is applied to an item peculiar to the equipment which, because of probable discontinuance or shutdown of production facilities, would prove uneconomical to reproduce at a later time.

KD An item of a depot overhaul/repair kit and not purchased separately. Depot kit defined as a kit that provides items required at the time of overhaul or repair.

KF An item of a maintenance kit and not purchased separately. Maintenance kit defined as a kit that provides an item that can be replaced at organizational or intermediate levels of maintenance.

KB Item included in both a depot overhaul/repair kit and a maintenance kit.

MO Item to be manufactured or fabricated at organizational level.

MF Item to be manufactured or fabricated at the direct support maintenance level.

MH Item to be manufactured or fabricated at the general support maintenance level.

MD Item to be manufactured or fabricated at the depot maintenance level.

AO Item to be assembled at organizational level.

AF Item to be assembled at direct support maintenance level.

AH Item to be assembled at general support maintenance level.

AD Item to be assembled at depot maintenance level.

XA Item is not procured or stocked because the requirements for the item will result in the replacement of the next higher assembly.

XB Item is not procured or stocked. If not available through salvage, requisition.

XC Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.

XD A support item that is not stocked. When required, item will be procured through normal supply channels.

NOTE

Cannibalization or salvage may be used as a source of supply for any items coded above except those coded XA.

(2) Maintenance Code. Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance:

REPAIR PARTS AND SPECIAL TOOLS—Continued

Code	Application/Explanation
C	Crew or operator maintenance performed within organizational maintenance.
O	Support item is removed, replaced, used at the organizational level.
F	Support item is removed, replaced, used at the direct support level.
H	Support item is removed, replaced, used at the general support level.
D	Support items that are removed, replaced, used at depot, mobile depot, or specialized repair activity only.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes.

Code	Application/Explanation
O	The lowest maintenance level capable of complete repair of the support item is the organizational level.
F	The lowest maintenance level capable of complete repair of the support item is the direct support level.
H	The lowest maintenance level capable of complete repair of the support item is the general support level.
D	The lowest maintenance level capable of complete repair of the support item is the depot level.
L	Repair restricted to (enter applicable designated specialized repair activity), Specialized Repair Activity.
Z	Nonreparable. No repair is authorized.
B	No repair is authorized. The item may be reconditioned by adjusting, lubricating, etc., at the user level. No parts or special tools are procured for the maintenance of this item.

(3) Recoverability Code. Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Recoverability Codes	Definition
Z	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.
O	Reparable item. When uneconomically reparable, condemn and dispose at organizational level.
F	Reparable item. When uneconomically reparable, condemn and dispose at the direct support level.
H	Reparable item. When uneconomically reparable, condemn and dispose at the general support level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.
L	Reparable item. Repair, condemnation, and disposal not authorized below depot/specialized repair activity level.

A Item requires special handling or condemnation procedures because of specific reasons (i. e., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. National Stock Number. Indicates the National stock number assigned to the item and which will be used for requisitioning.

d. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When a stock numbered item is requisitioned, the item received may have a different part number than the part being replaced.

Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. Description. Indicates the Federal item name and, if required, a minimum description to identify the item. Items that are included in kits and sets are listed below the name of the kit or set with the quantity of each item in the kit or set indicated in the quantity incorporated in unit column. When the part to be used differs between serial numbers of the same model, the effective serial numbers are shown as the last line of the description. In the Special Tools List, the initial basis of issue (BOI) appears as the last line in the entry for each special tool, special TMDE, and other special support equipment. When density of equipments supported exceeds density spread indicated in the basis of issue, the total authorization is increased accordingly.

g. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr, etc). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. Quantity Incorporated in Unit. Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable, (e.g., shims, spacers, etc).

B-4. SPECIAL INFORMATION.

a. Repair Parts Kits. Repair parts kits appear as the last entries in the repair parts listing for the figure in which its parts are listed as repair parts.

b. Special Tool Sets. Special tool sets are stocked for initial issue. Tool set components are requisitioned as individual items. Stockage of tools that are duplicated in tool sets for other vehicles assigned or supported are not required beyond actual need.

REPAIR PARTS AND SPECIAL TOOLS—Continued

B-5. HOW TO LOCATE PARTS.

a. When National Stock Number or Part Number Is Unknown:

(1) First. Using the table of contents, determine the functional subgroup within which the item belongs. This is necessary since illustrations are prepared for functional subgroups, and listings are divided into the same groups.

(2) Second. Find the illustration covering the functional subgroup to which the item belongs.

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

(4) Fourth. Using the Repair Parts Listing, find the figure and item number noted on the illustration.

b. When National Stock Number or Part Number Is Known:

(1) First. Using the index of National Stock Numbers and Part Numbers, find the pertinent National stock number or part number. This index is in NIIN sequence followed by a list of part numbers in alphameric sequence, cross-referenced to the illustration figure number and item number.

(2) Second. After finding the figure and item number, locate the figure and item number in the repair parts list.

Section II. REPAIR PARTS LIST

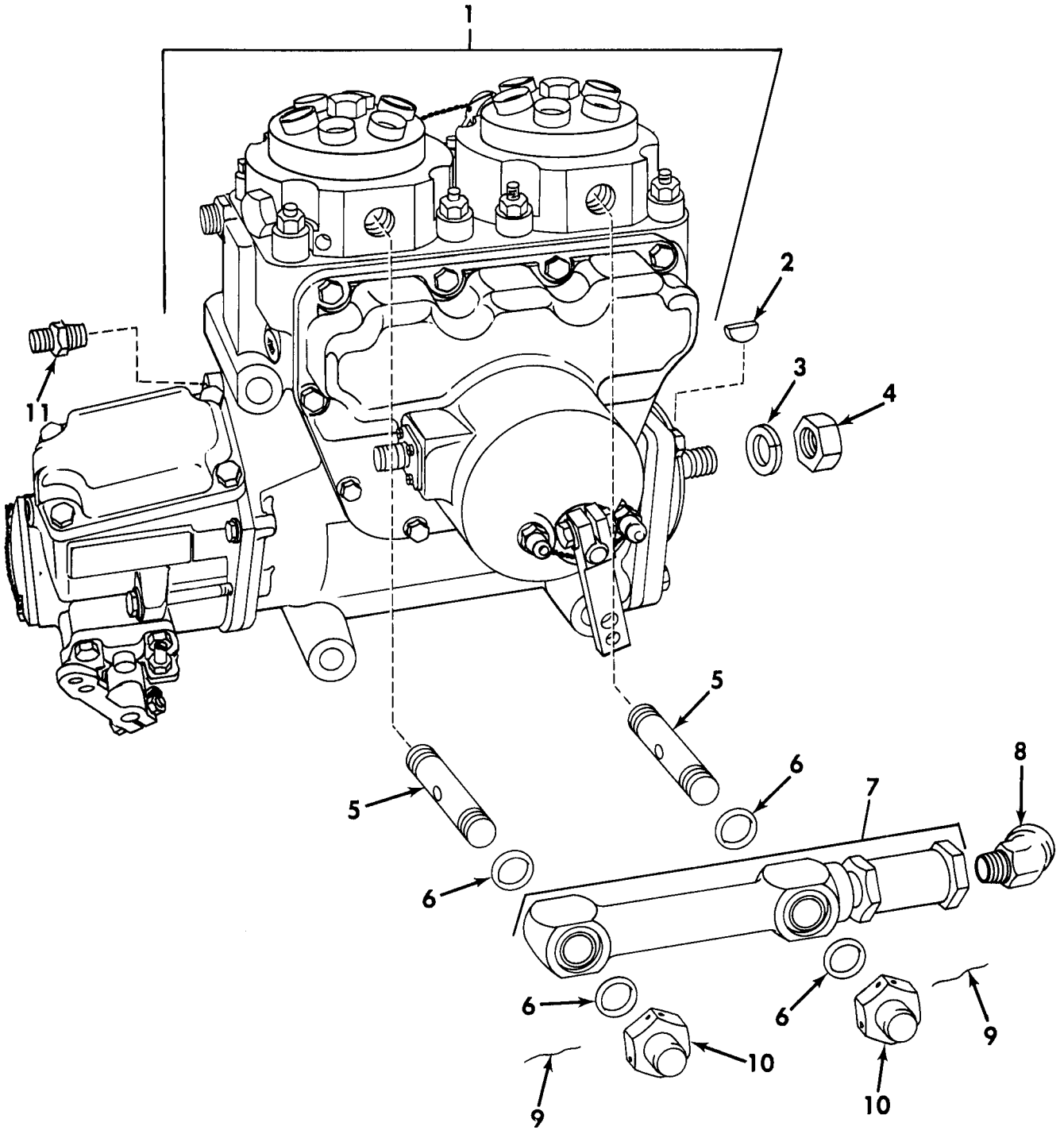


Figure 1. Bleeder Housing, Valve Assembly, and Associated Parts.

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REPAIR PARTS LIST-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 03 FUEL PUMP		
						GROUP 0302 BLEEDER HOUSING,VALVE ASSEMBLY		
						AND ASSOCIATED PARTS		
1	1	XAFHD		19207	11668626-1	PUMP,FUEL,METERING	EA	1
1	2	PAFZZ	5315-00-282-0341	19207	8761412	KEY,WOODRUFF PUMP DRIVE COUPLING TO PUMP DRIVE SHAFT	EA	1
1	3	PAFZZ	5310-00-584-7888	96906	MS35338-51	WASHER,LOCK PUMP DRIVE SHAFT	EA	1
1	4	PAFZZ	5310-00-655-9590	19207	7340058	NUT,PLAIN,HEXAGON PUMP DRIVE SHAFT	EA	1
1	5	PAFZZ	2910-00-678-4724	19207	7320493	STEM,BLEEDER VALVE PUMP HEAD TO BLEEDER VALVE HOUSING	EA	2
1	6	PAFZZ	5330-00-579-3156	96906	MS28775-116	PACKING,PREFORMED FUEL RETURN HOUSING TO STEMS (2),CAP NUTS (2) PART OF KIT P/N 5702632	EA	4
1	7	PFFFF	2910-00-475-3463	19207	11684115	HOUSING AND VALVERETURN AND BLEEDER,SEE FIGURE 2 FOR PARTS BREAKOUT	EA	1
1	8	PAFZZ	4730-00-595-1868	81336	454098	ELBOW,PIPE FUEL RETURN	EA	1
1	9	MFFZZ		96906	MS20995NC40-12	WIRE,NONELECTRICAL BLEEDER VALVE TO CAP NUT AND CAP NUT TO CAP NUT,FABRICATE FROM WIRE,NONELECTRICAL 9525-00-990-7799 2 PIECE 12 INCHES LONG REQUIRED	EA	2
1	10	PAFZZ	5310-00-655-9593	19207	7340055	NUT,PLAIN,CAP FUEL RETURN TO STEM	EA	2
1	11	PAFZZ	4730-00-800-2830	19207	10865239	ADAPTER,STRAIGHT,PI OIL INLET HOSE	EA	1

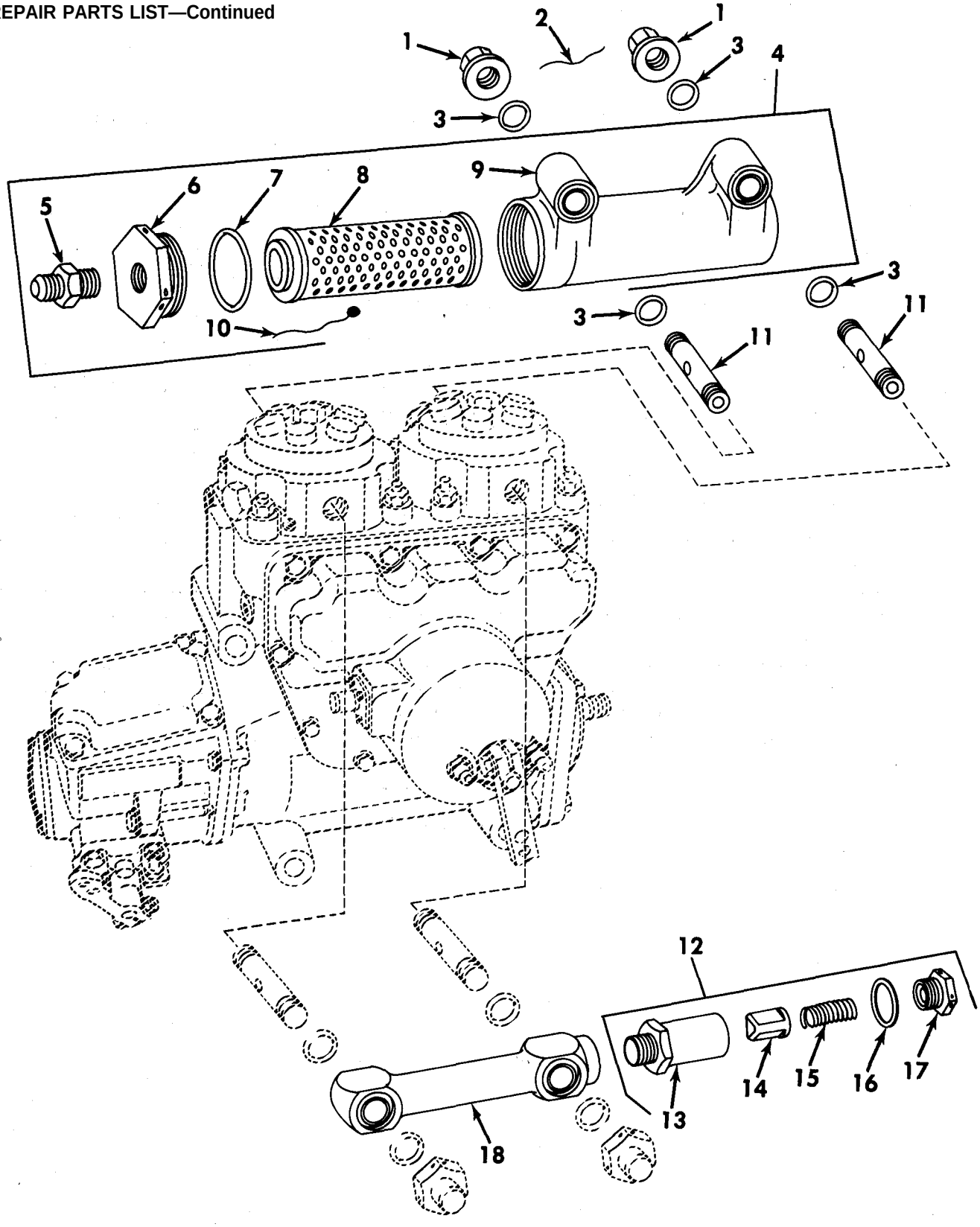


Figure 2. Filter Assembly, Bleeder Valve Assembly, and Associated Parts.

TA245307

REPAIR PARTS LIST-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 0302 FILTER ASSEMBLY,BLEEDER VALVE		
						ASSEMBLY AND ASSOCIATED PARTS		
2	1	KFHZZ		01843	NT888	NUT,CAP FILTER ASSEMBLY TO STEMS PART OF KIT P/N 5704356	EA	2
2	2	MHHZZ		96906	MS20995NC40-12	WIRE,NONELECTRICAL CAP NUT TO CAP NUT,FABRICATE FROM WIRE, NONELECTRICAL 9525-00-990-7799 1 PIECE 12 INCHES LONG REQUIRED	EA	1
2	3	PAHZZ	5330-00-579-3156	96906	MS28775-116	PACKING,PREFORMED FILTER ASSEMBLY TO STEMS (2),CAP NUTS (2) PART OF KIT P/N 5704356,5702632	EA	4
2	4	KFHZZ		01843	FE882A	FILTER ASSEMBLY FUEL INLET PART OF KIT P/N 5704356	EA	1
2	5	PAFZZ	4730-00-402-5143	19207	10951334	ADAPTER,STRAIGHT,PI FUEL FILTER INLET	EA	1
2	6	XAFZZ		01843	CP883	CAP FILTER INLET HOUSING	EA	1
2	7	PAFZZ	5330-00-819-5111	96906	MS28778-24	PACKING,PREFORMED FUEL INLET HOUSING CAP PART OF KIT P/N 5702739	EA	1
2	8	KFFZZ		19207	10951481	FILTER CARTRIDGE PART OF KIT P/N 5702739	EA	1
2	9	XHAZZ		01843	HG8817	HOUSING,MANIFOLD FUEL INLET	EA	1
2	10	PAFZZ	5340-00-902-0426	96906	MS51938-6	SEAL,ANTIPILFERAGE FILTER INLET HOUSING CAP PART OF KIT P/N 5705050	EA	1
2	11	PAHZZ	2910-00-678-4724	19207	7320493	STEM,BLEEDER VALVE PUMP HEAD TO FILTER ASSEMBLY	EA	2
2	12	PFFFF	4820-00-613-6297	19207	11684114	VALVE,SAFETY RELIEF BLEEDER	EA	1
2	13	XAFZZ		19207	10951144	HOUSING BLEEDER VALVE	EA	1
2	14	XAFZZ		19207	10951143	VALVE,BLEEDER	EA	1
2	15	PADZZ	5360-00-510-4117	19207	11684113	SPRING,HELICAL,COMP BLEEDER VALVE	EA	1
2	16	PFFZZ	5365-00-655-9589	19207	7340054	SPACER,RING RETAINER	EA	1
2	17	PAFZZ	2910-00-678-4727	19207	8682456	RETAINER,FUEL INJEC BLEEDER VALVE SPRING	EA	1
2	18	XAFZZ		19207	10935512	HOUSING FUEL RETURN	EA	1
2		PAFZZ	2910-00-801-1154	19207	5702739	PARTS KIT FUEL INLET FILTER,COMPOSED OF:	EA	1
2	7					PACKING,PREFORMED	EA	1
2	8					FILTER	EA	1
2		PAHZZ	2910-00-134-4733	19207	5704356	PARTS KIT,FLUID PRE COMPOSED OF	EA	1
2	1					NUT,CAP	EA	2
2	3					PACKING,PREFORMED	EA	4
2	4					FILTER ASSEMBLY	EA	1

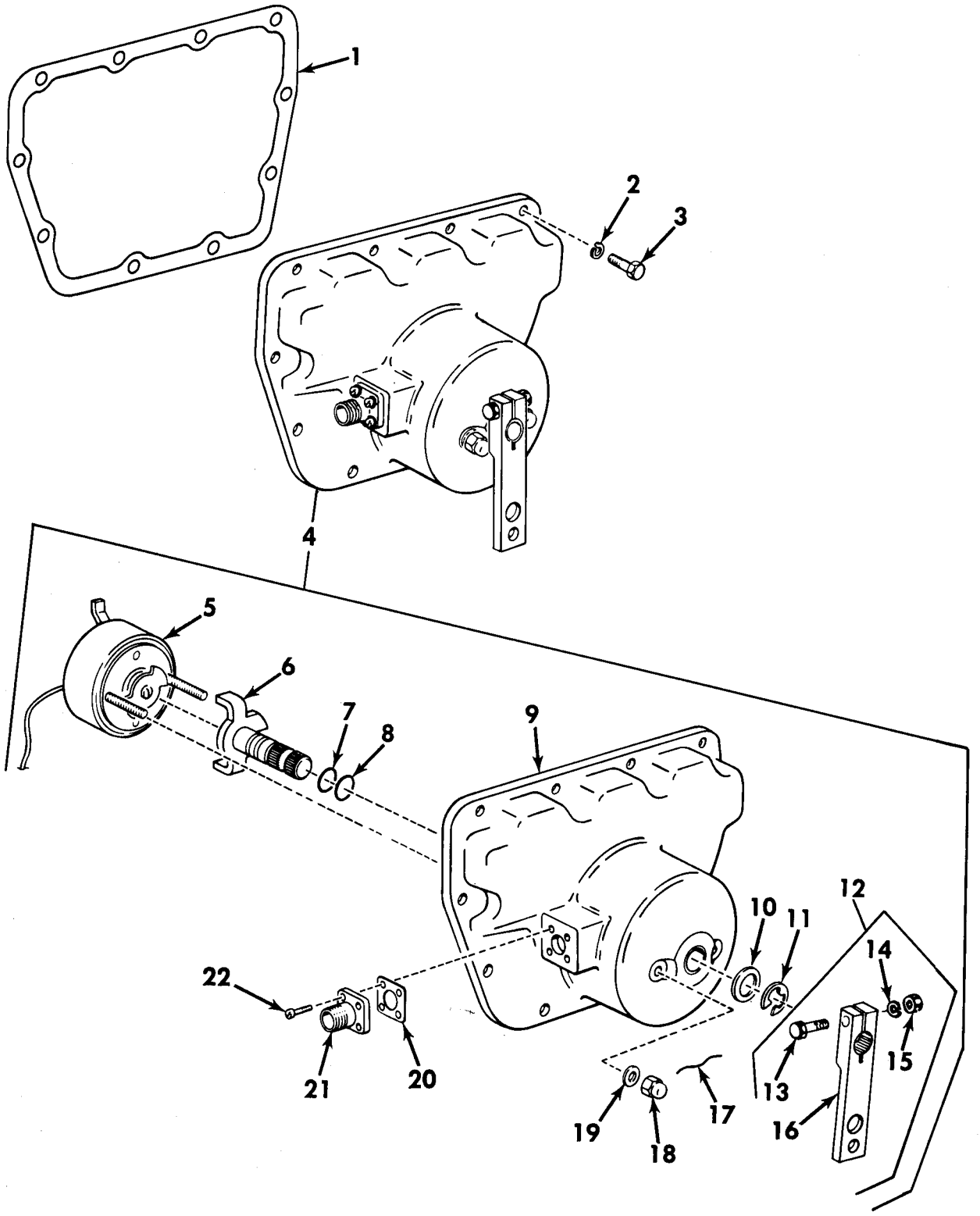


Figure 3. Cover and Solenoid Assembly.

TA245308

REPAIR PARTS LISTS-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 0302 COVER AND SOLENOID ASSEMBLY		
3	1	PAHZZ	5330-00-786-0190	19207	7383455	GASKET SOLENOID COVER ASSEMBLY PART OF KIT P/N 5702632	EA	1
3	2	PAHZZ	5310-00-582-5965	19207	11657469-3	WASHER,LOCK SOLENOID COVER ASSEMBLY	EA	10
3	3	XDHZZ	5306-00-816-5803	19207	7383456	BOLT,MACHINE SOLENOID COVER ASSEMBLY	EA	10
3	4	PFHZZ	2910-00-466-7473	01843	CV8816A	COVER AND SOLENOID MANUAL SHUT-OFF	EA	1
3	5	PFHZZ	2920-00-449-0107	01843	S0882A	SOLENOID,ELECTRICAL	EA	1
3	6	PFHZZ	2910-00-467-2582	01843	LE8849A	LEVER ASSEMBLY,SHUT MANUAL	EA	1
3	7	PAHZZ	5330-00-310-6559	01843	GA76195	GASKET MANUAL FUEL SHUT-OFF SHAFT LEVER PART OF KIT P/N 5705050,5702632	EA	1
3	8	PAHZZ	5330-00-583-3473	01843	GA1144	PACKING,PREFORMED SHAFT LEVER PART OF KIT P/N 5705050 5702632	EA	1
3	9	XAHZZ		01843	CV8817A	COVER ASSEMBLY	EA	1
3	10	PAHZZ	5310-00-166-1412	66640	27D123	WASHER,FLAT SHAFT LEVER	EA	1
3	11	PAHZZ	5365-01-012-7353	01843	RG886	RING,RETAINING SHAFT LEVER	EA	1
3	12	PFHHH	3040-00-466-7469	01843	LE8838A	LEVER,REMOTE CONTRO MANUAL SHUT-OFF	EA	1
3	13	PFHZZ	5306-00-366-8857	01843	SC7961	BOLT,MACHINE MANUAL SHUT-OFF LEVER	EA	1
3	14	PAHZZ	5310-00-582-5965	19207	11657469-3	WASHER,LOCK MANUAL SHUT-OFF LEVER PART OF KIT P/N 5705050	EA	1
3	15	PAHZZ	5310-00-971-7989	96906	MS35691-5	NUT,PLAIN,HEXAGON MAUAL FUEL SHUT-OFF LEVER	EA	1
3	16	XAHZZ		01843	LE8839	LEVER,OPERATING MANUAL SHUT-OFF	EA	1
3	17	PFHZZ	2990-00-977-2591	01843	WI763	WIRE BEARING PLATE SOLENOID CAP NUT	EA	1
3	18	XAHZZ		19207	7748699	NUT,CAP SOLENOID	EA	2
3	19	PFHZZ	5310-00-253-8721	82254	CFN70306	WASHER,FLAT SOLENOID CAP NUT	EA	2
3	20	PAHZZ	5330-00-827-5635	19207	7383426	GASKET CONNECTOR RECEPTACLE PART OF KIT P/N 5702632	EA	1
3	21	PAHZZ	5935-00-810-8094	96906	MS3102R8S1P	CONNECTOR,RECEPTACLE	EA	1
3	22	PAHZZ	5305-00-810-8093	21450	420429	SCREW,ASSEMBLED WAS CONNECTOR RECEPTACLE	EA	4

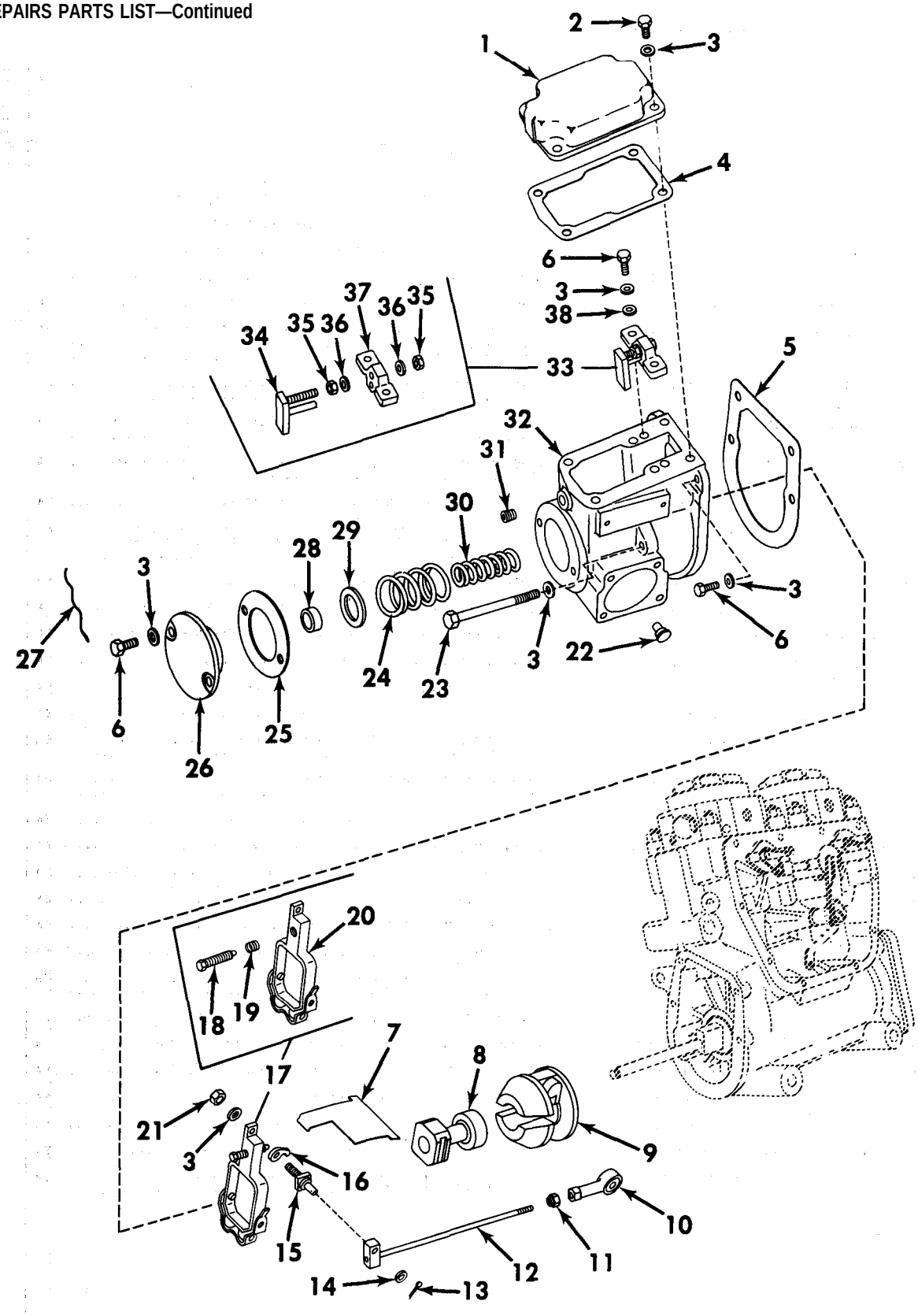


Figure 4. Governor Housing, Fulcrum Lever, Sleeve Assembly, Weight and Spider Assembly, and Associated Parts. TA245309

REPAIR PARTS LISTS-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 0302 GOVERNOR HOUSING,FULCRUM LEVER		
						SLEEVE ASSEMBLY,WEIGHT AND SPID		
						ASSEMBLY,AND ASSOCIATED PARTS		
4	1	XAHZZ		01843	CV9032C	COVER,GOVERNOR	EA	1
4	2	XDHZZ	5306-00-816-5803	19207	7383456	BOLT,MACHINE GOVERNOR COVER TO HOUSING	EA	4
4	3	PAHZZ	5310-00-582-5965	19207	11657469-3	WASHER,LOCK GOVERNOR HOUSING TO INJECTION PUMP HOUSING (5),SMOKE LIMIT CAM TO FULCRUM LEVER (1) PART OF KIT P/N 5705051	EA	6
4	3	PAHZZ	5310-00-582-5965	19207	11657469-3	WASHER,LOCK GOVERNOR COVER TO HOUSING PART OF KIT P/N 5705050,5705051	EA	4
4	3	PAHZZ	5310-00-582-5965	19207	11657469-3	WASHER,LOCK GOVERNOR CAP TO HOUSING (2),STOP PLATE BRIDGE TO HOUSING (2)	EA	4
4	4	PAHZZ	5330-00-310-6556	19207	7383459	GASKET GOVERNOR COVER PART OF KIT P/N 5705050.5705051, 5702632	EA	1
4	5	KFHZZ		19207	7748558	GASKET GOVERNOR HOUSING PART OF KIT P/N 5702632	EA	1
4	6	XAHZZ		21450	454724	SCREW GOVERNOR HOUSING TO INJECTION PUMP HOUSING (3), GOVERNOR CAP TO GOVERNOR HOUSING (2),STOP PLATE BRIDGE TO GOVERNOR HOUSING (2)	EA	7
4	7	XAHZZ		01843	BA881	BAFFLE,OIL GOVERNOR HOUSING	EA	1
4	8	KFHZZ		19207	7748546	SLEEVE ASSEMBLY GOVERNOR PART OF KIT P/N 5705051	EA	1
4	9	PAHHZ	2990-00-562-1146	19207	7383464	WEIGHT AND SPIDER A SEE FIGURE 6 FOR PARTS BREAKOUT	EA	1
4	10	PAHZZ	3120-00-845-5726	19207	7748622	BEARING,PLAIN,ROD E GOVERNOR CONTROL ROD	EA	1
4	11	PAHZZ	5310-00-902-6676	96906	MS21083N3	NUT,SELF-LOCKING,HE GOVERNOR CONTROL ROD	EA	1
4	12	KFHZZ		19207	10951322	ROD CONTROL ASSEMBL PART OF KIT P/N 5705051	EA	1
4	13	KFHZZ		21450	137128	PIN,COTTER CONTROL ROD TO FULCRUM LEVER PART OF KIT P/N 5705051	EA	1
4	14	KFHZZ		19207	7748547	WASHER CONTROL ROD TO FULCRUM LEVER PART OF KIT P/N 5705051	EA	1
4	15	XAHZZ		01843	SC8814	SCREW SMOKE LIMIT CAM	EA	1
4	16	KFHZZ		19207	10885781	CAM,SMOKE LIMIT PART OF KIT P/N 5705051	EA	1
4	17	KFHZZ		01843	LE8856A	FULCRUM LEVER ASSEM GOVERNOR PART OF KIT P/N 5705051	EA	1
4	18	PAHZZ		01843	SC8830	DROOP SCREW	EA	1
4	19	PAHZZ		01843	IT1011	INSERT,SCREW THREAD HELICAL CORD	EA	1
4	20	XAHZZ		01843	LE8855A	FULCRUM LEVER	EA	1
4	21	PAHZZ	5310-00-971-7989	96906	MS35691-5	NUT,PLAIN,HEXAGON SMOKE LIMIT CAM PART OF KIT P/N 5705051	EA	1
4	22	KFHZZ		19207	7748545	PIN,PIVOT FULCRUM LEVER BRACKET PART OF KIT P/N 5705051	EA	1
4	23	XAHZZ		19207	8744247	SCREW GOVERNOR HOUSING TO INJECTION PUMP HOUSING	EA	2
4	24	PAHZZ	5360-00-830-3882	01843	SP7951-13	SPRING,HELICAL,COMP GOVERNOR,OUTER	EA	1
4	25	PAHZZ	5330-00-640-9587	01843	GA902	GASKET GOVERNOR CAP PART OF KIT P/N 5705051,5702632	EA	1
4	26	XAHZZ		01843	CP901C	CAP,GOVERNOR	EA	1
4	27	PFHZZ	2990-00-977-2591	01843	WI763	WIRE BEARING PLATE GOVERNOR CAP	EA	1
4	28	KFHZZ		19207	7748535	SHIM 0.020 INCH THICK,GOVERNOR INNER SPRING PART OF KIT P/N 5702638	EA	1

REPAIR PARTS LIST-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
4	28	KFHZZ		19207	7748536	SHIM 0.042 INCH THICK,GOVERNOR INNER SPRING PART OF KIT P/N 5702638	EA	1
4	28	KFHZZ		19207	7748537	SHIM 0.058 INCH THICK,GOVERNOR INNER SPRING PART OF KIT P/N 5702638	EA	1
4	28	KFHZZ		19207	7748538	SHIM 0.083 INCH THICK,GOVERNOR INNER SPRING PART OF KIT P/N 5702638	EA	1
4	28	KFHZZ		19207	7748539	SHIM 0.177 INCH THICK,GOVERNOR INNER SPRING PART OF KIT P/N 5702638	EA	1
4	28	KFHZZ		19207	7748540	SHIM 0.276 INCH THICK,GOVERNOR INNER SPRING PART OF KIT P/N 5702638	EA	1
4	29	KFHZZ		19207	7748550	SHIM 0.020 INCH THICK,GOVERNOR OUTER SPRING PART OF KIT P/N 5702638	EA	1
4	29	KFHZZ		19207	7748551	SHIM 0.042 INCH THICK,GOVERNOR OUTER SPRING PART OF KIT P/N 5702638	EA	1
4	29	KFHZZ		19207	7748552	SHIM 0.058 INCH THICK,GOVERNOR OUTER SPRING PART OF KIT P/N 5702638	EA	1
4	29	KFHZZ		19207	7748553	SHIM 0.083 INCH THICK,GOVERNOR OUTER SPRING PART OF KIT P/N 5702638	EA	1
4	29	KFHZZ		19207	7748554	SHIM 0.156 INCH THICK,GOVERNOR OUTER SPRING PART OF KIT P/N 5702638	EA	1
4	29	KFHZZ		19207	7748555	SHIM 0.030 INCH THICK,GOVERNOR OUTER SPRING PART OF KIT P/N 5702638	EA	1
4	30	PAHZZ	5360-00-785-6358	19207	7383460	SPRING,HELICAL,COMP INNER,GOVERNOR	EA	1
4	31	PAHZZ	4730-00-954-1281	96906	MS49005-4	PLUG,PIPE GOVERNOR HOUSING ACCESS	EA	1
4	32	XHAZZ		01843	HG8822A	HOUSING,GOVERNOR	EA	1
4	33	PAHZZ	2910-00-064-6267	19207	10885779	BRIDGE,STOP PLATE	EA	1
4	34	XAHZZ		01843	PL79123A	PLATE ASSEMBLY,STOP	EA	1
4	35	PAHZZ	5310-00-971-7989	96906	MS35691-5	NUT,PLAIN,HEXAGON STOP PLATE	EA	2
4	36	PAHZZ	5310-00-582-5965	19207	11657469-3	WASHER,LOCK STOP PLATE	EA	2
4	37	XAHZZ		01843	BK7938C	BRIDGE,STOP PLATE	EA	1
4	38	PAHZZ	5310-00-515-3030	19207	5153030	WASHER,FLAT STOP PLATE BRIDGE TO GOVERNOR HOUSING	EA	2
4		PAHZZ	5365-00-786-5238	19207	5702638	SHIM SET GOVERNOR SPRINGS,COMPOSED OF:	EA	1
4	28					SHIM	EA	1
4	28					SHIM	EA	1
4	28					SHIM	EA	1
4	28					SHIM	EA	1
4	28					SHIM	EA	1
4	29					SHIM	EA	1
4	29					SHIM	EA	1
4	29					SHIM	EA	1
4	29					SHIM	EA	1
4	29					SHIM	EA	1
4	29					SHIM	EA	1

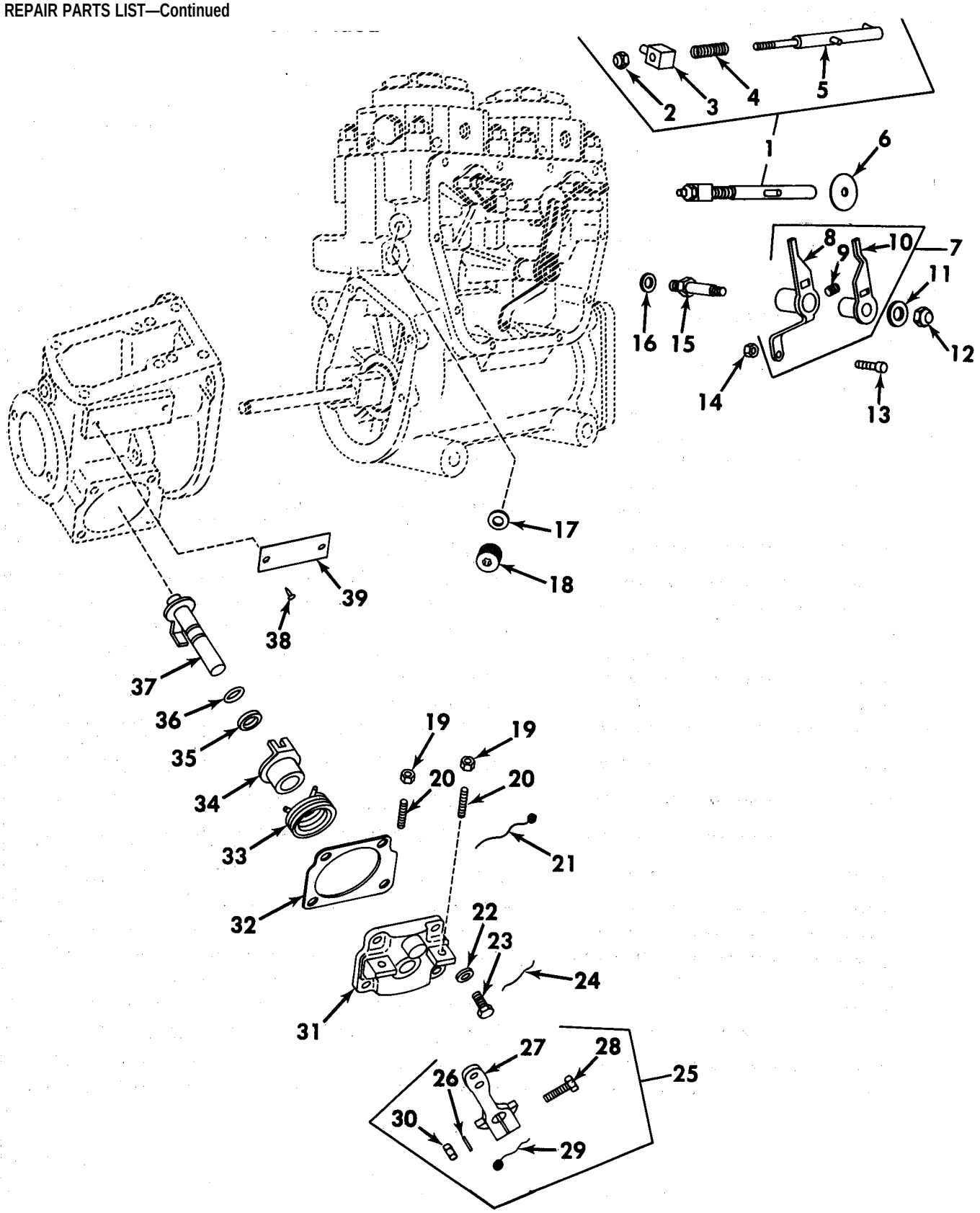


Figure 5. Yoke Assembly, Lever Assembly, Operating Lever Assembly, and Associated Parts.

TA245310

REPAIR PARTS LIST-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 0302 YOKEASSEMBLY,LEVER ASSEMBLY		
						OPERATING LEVER ASSEMBLY,AND		
						ASSOCIATED PARTS		
5	1	KFHZZ		19207	7383458	YOKE ASSEMBLY FUEL CONTROL PART OF KIT P/N 5705051	EA	1
5	2	XAHZZ		01843	NT1218	NUT YOKE TO ROD	EA	1
5	3	XAHZZ		01843	PN8821	PIN,YOKE	EA	1
5	4	PAHZZ	2910-00-529-6945	01843	SP9014	SPRING YOKE	EA	1
5	5	XAHZZ		01843	RD883A	ROD,YOKE	EA	1
5	6	KFHZZ		01843	SR8811-1	SPACER YOKE PART OF KIT P/N 5705051	EA	1
5	6	KFHZZ		01843	SR8811-2	SPACER YOKE PART OF KIT P/N 5705051	EA	1
5	7	KFHZZ		01843	LE8853A	LEVER ASSEMBLY,FUEL PART OF KIT P/N 5705765	EA	1
5	8	XAHZZ		01843	LE8852	LEVER,FUEL CONTROL	EA	1
5	9	PAHZZ	5360-00-785-6341	01843	SP8823	SPRING,HELICAL,COMP	EA	1
5	10	XAHZZ		01843	LE8851	LEVER,FUEL CONTROL	EA	1
5	11	KFHZZ		01843	WA1806	WASHER FUEL CONTROL LEVER SPACING PART OF KIT P/N 5702765	EA	1
5	12	PAHZZ	5310-00-176-6677	01843	NT1161	NUT,PLAIN,SINGLE BA FUEL CONTROL LEVER PART OF KIT P/N 5702765	EA	1
5	13	PAHZZ	5305-00-983-6652	96906	MS16998-29	SCREW,CAP,SOCKET HE GOVERNOR CONTROL ROD TO LEVER	EA	1
5	14	PAHZZ	5310-00-902-6676	96906	MS21083N3	NUT,SELF-LOCKING,HE GOVERNOR CONTROL ROD TO LEVER	EA	1
5	15	KFHZZ		01843	SC8825	SCREW FUEL CONTROL LEVER PART OF KIT P/N 5702765	EA	1
5	16	XAHZZ		01843	WA22-10BL	WASHER FUEL CONTROL LEVER SCREW	EA	1
5	17	PAHZZ	5365-00-245-5420	19207	7336789	SPACER,RING TIMING SCREW PLUG PART OF KIT P/N 5702632	EA	1
5	18	XHAZZ		01843	PG886	PLUG,TIMING SCREW	EA	1
5	19	PAHZZ	5310-00-768-0319	56906	MS51968-2	NUT,PLAIN,HEXAGON IDLE AND FULL SPEED ADJUSTING SCREW PART OF KIT P/N 5705050	EA	2
5	20	KFHZZ		19207	11621586	SCREW IDLE AND FULL SPEED ADJUSTING SCREW PART OF KIT P/N 5705050	EA	2
5	21	PAHZZ	5340-00-902-0426	96906	MS51938-6	SEAL,ANTIPILFERAGE IDLE AND FULL SPEED ADJUSTING SCREW NUT PART OF KIT P/N 5705050	EA	1
5	22	PAHZZ	5310-00-582-5965	19207	11657469-3	WASHER,LOCK BEARING PLATE TO GOVERNOR HOUSING PART OF KIT P/N 5705050	EA	4
5	23	KFHZZ		19207	11621881	SCREW,CAP,HEXAGON H BEARING PLATE TO GOVERNOR HOUSING PART OF KIT P/N 5705050	EA	4
5	24	PFHZZ	2990-00-977-2591	01843	WI763	WIRE BEARING PLATE	EA	2
5	25	PAHZZ	2910-00-871-5429	19207	10910348	LEVER ASSEMBLY,OPER	EA	1
5	26	PAHZZ	5310-00-582-5965	19207	11657469-3	WASHER,LOCK OPERATING LEVER PART OF KIT P/N 5705050	EA	1
5	27	XAHZZ		01843	LE9083A	LEVER,OPERATING	EA	1
5	28	XAHZZ		01843	SC9043	SCREW OPERATING LEVER	EA	1
5	29	PAHZZ	5340-00-902-0426	96906	MS51938-6	SEAL,ANTIPILFERAGE OPERATING LEVER UNIT PART OF KIT P/N 5705050	EA	1
5	30	PAHZZ	5310-00-655-9484	10001	43N71918-10	NUT,PLAIN,CASTELLAT OPERATING LEVER	EA	1
5	31	KFHZZ		01843	BG8823	BEARING PLATE OPERATING SHAFT PART OF KIT P/N 5705050	EA	1

REPAIR PARTS LIST-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
5	32	PAHZZ	5330-00-406-7316	19207	11610208	GASKET OPERATING SHAFT BEARING PART OF KIT P/N 5705050, 5702632	EA	1
5	33	PAHZZ	5360-00-785-6345	19207	7383472	SPRING,HELICAL,TORS OPERATING LEVER PART OF KIT P/N 5705050	EA	1
5	34	KFHZZ		01843	PL8832A	PLATE ASSEMBLY,SPRI OPERATING LEVER PART OF KIT P/N 5705050	EA	1
5	35	PAHZZ	5330-00-583-3473	01843	GA1144	PACKING,PREFORMED OPERATING SHAFT PART OF KIT P/N 5705050,5702632	EA	1
5	36	PAHZZ	5330-00-310-6559	01843	GA76195	GASKET OPERATING SHAFT PART OF KIT P/N 5705050,5702632	EA	1
5	37	KFHZZ		01843	SH8834A	SHAFT ASSEMBLY,OPER PART OF KIT P/N 5705050	EA	1
5	38	PAHZZ	2910-00-886-5371	01843	SC150-2	RIVET,DRIVE IDENTIFITCATION PLATE	EA	2
5	39	XAHZZ		01843	NP904	PLATE,IDENTIFICATION	EA	1
5		PAHZZ	2910-01-043-8182	19207	5705050	PARTS KIT,FUEL INJE OPERATING LEVER,COMPOSED OF:	EA	1
2	10					SEAL,ANTIPILFERAGE	EA	1
3	7					GASKET	EA	1
3	8					PACKING,PREFORMED	EA	1
3	14					WASHER,LOCK	EA	1
4	3					WASHER,LOCK	EA	4
4	4					GASKET	EA	1
5	19					NUT,PLAIN,HEXAGON	EA	2
5	20					SCREW	EA	2
5	21					SEAL,ANTIPILFERAGE	EA	1
5	22					WASHER,LOCK	EA	4
5	23					SCREW,CAP,HEXAGON H	EA	4
5	26					WASHER,LOCK	EA	1
5	29					SEAL,ANTIPILFERAGE	EA	1
5	31					BEARING PLATE	EA	1
5	32					GASKET	EA	1
5	33					SPRING,HELICAL,TORS	EA	1
5	34					PLATE ASSEMBLY,SPRI	EA	1
5	35					PACKING,PREFORMED	EA	1
5	36					GASKET	EA	1
5	37					SHAFT ASSEMBLY,OPER	EA	1
5		PAHZZ	2910-01-050-2520	19207	5705051	PARTS KIT,FUEL INJE FUEL CONTROL,COMPOSED OF:	EA	1
4	3					WASHER,LOCK	EA	6
4	3					WASHER,LOCK	EA	4
4	4					GASKET	EA	1
4	8					SLEEVE ASSEMBLY	EA	1
4	12					ROD CONTROL ASSEMBL	EA	1
4	13					PIN,COTTER	EA	1
4	14					WASHER	EA	1
4	16					CAM,SMOKE LIMIT	EA	1
4	17					FULCRUM LEVER ASSEM	EA	1
4	21					NUT,PLAIN,HEXAGON	EA	1
4	22					PIN,PIVOT	EA	1
4	25					GASKET	EA	1
5	1					YOKE ASSEMBLY	EA	1
5	6					SPACER	EA	1
5	6					SPACER	EA	1

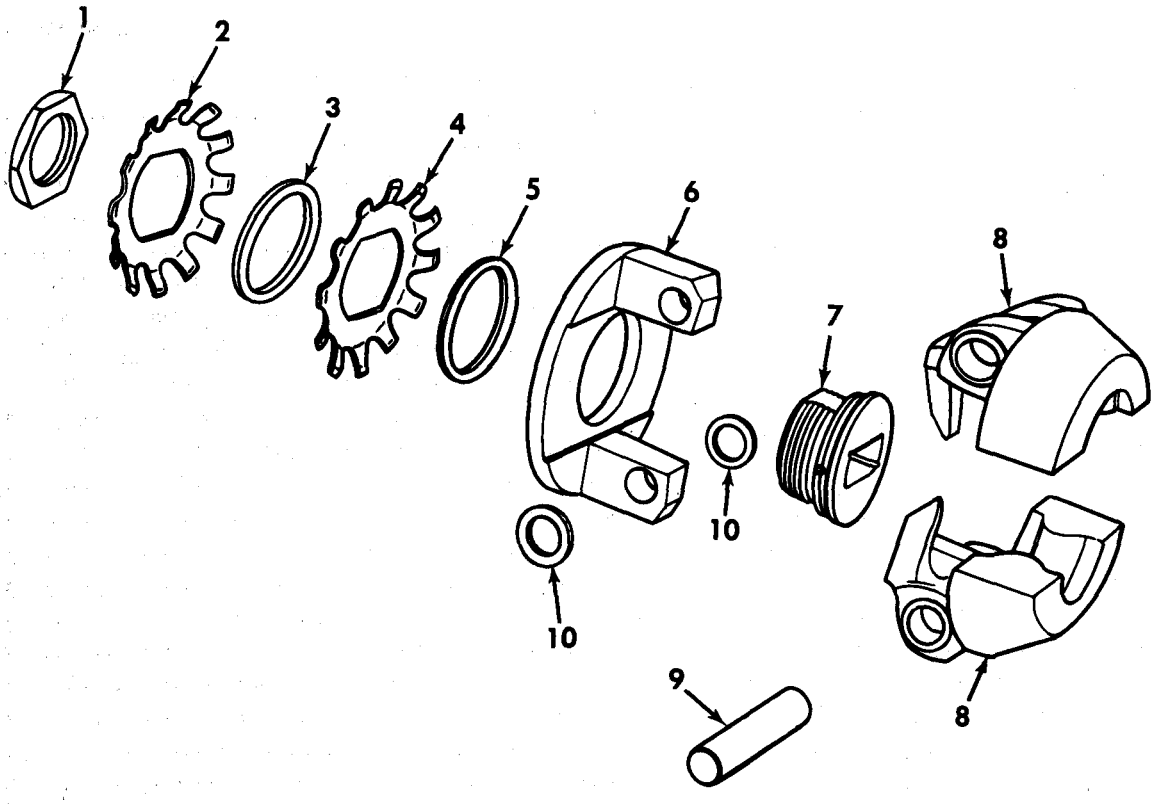


Figure 6. Weight and Spider Assembly.

TA245311

REPAIR PARTS LIST-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 0302 WEIGHT AND SPIDER ASSEMBLY		
6	1	XAHZZ		01843	NT1261	NUT,ADJUSTING HUB	EA	1
6	2	KFHZZ		01843	DC797	DISK OUTER PART OF KIT P/N 5704369	EA	1
6	3	PAHZZ	5365-00-274-9575	01843	SR794-1	SPACER,RING 0.035 INCH THICK PART OF KIT P/N 5704369	EA	1
6	4	KFHZZ		01843	DC796	DISK INNER PART OF KIT P/N 5704369	EA	1
6	5	PAHZZ	5365-00-274-9575	01843	SR794-1	SPACER,RING 0.035 INCH THICK PART OF KIT P/N 5704369	EA	1
6	5	KFHZZ		01843	SR794-2	SPACER,RING 0.049 INCH THICK PART OF KIT P/N 5704369	EA	1
6	5	KFHZZ		1843	SR794-3	SPACER,RING 0.065 INCH THICK PART OF KIT P.N 5704369	EA	1
6	5	KFHZZ		01843	SR794-4	SPACER,RING 0.020 INCH THICK PART OF KIT P/N 5704369	EA	1
6	5	KFHZZ		01843	SR794-5	SPACER,RING 0.015 INCH THICK PART OF KIT P/N 5704369	EA	1
6	5	KFHZZ		01843	SR794-6	SPACER,RING 0.010 INCH THICK PART OF KIT P/N 5704369	EA	1
6	5	KFHZZ		01843	SR794-7	SPACER,RING 0.005M INCH THICK PART OF KIT P/N 5704369	EA	1
6	6	XHAZZ		01843	HP9025	SPIDER FRICTION DRIVE	EA	1
6	7	XAHZZ		01843	HB9036	HUB FRICTION DRIVE	EA	1
6	8	XAHZZ		01843	WT9027A	WEIGHT ASSEMBLY GOVERNOR	EA	2
6	9	XAHZZ		01843	PN7986	PIN,WEIGHT	EA	2
6	10	PAHZZ	5310-00-038-0751	01843	WA1448-1	WASHER,FLAT 0.036 INCH THICK,GOVERNOR WEIGHT PIN	EA	1
6	10	PAHZZ	5310-00-038-0752	01843	WA1448-2	WASHER,FLAT 0.038 INCH THICK,GOVERNOR WEIGHT PIN	EA	1
6	10	PAHZZ	5310-00-038-0753	01843	WA1448-3	WASHER,FLAT 0.040 INCH THICK,GOVERNOR WEIGHT PIN	EA	1
6	10	PAHZZ	5310-00-166-1412	66640	27D123	WASHER,FLAT 0.044 INCH THICK,GOVERNOR WEIGHT PIN	EA	1
6	10	PAHZZ	5310-00-038-0755	01843	WA1448-5	WASHER,FLAT 0.048 INCH THICK,GOVERNOR WEIGHT PIN	EA	1
6		PAHZZ	2910-00-407-2618	19207	5704369	PARTS KIT,METERING WEIGHT AND SPIDER,COMPOSED OF:	EA	1
6	2					DISK	EA	1
6	3					SPACER,RING	EA	1
6	4					DISK	EA	1
6	5					SPACER,RING	EA	1
6	5					SPACER,RING	EA	1
6	5					SPACER,RING	EA	1
6	5					SPACER,RING	EA	1
6	5					SPACER,RING	EA	1
6	5					SPACER,RING	EA	1
6	5					SPACER,RING	EA	1

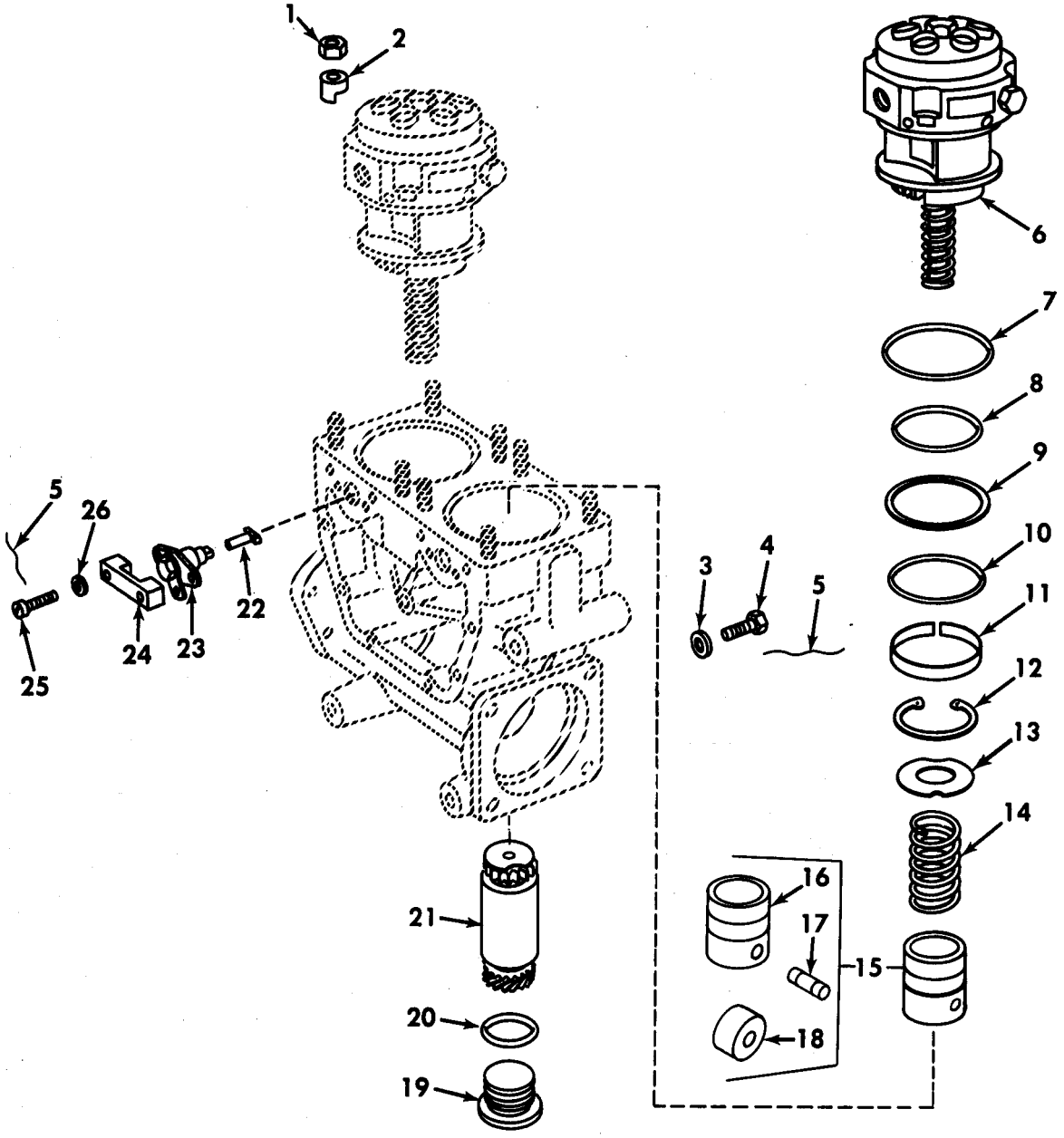


Figure 7. Head Assembly, Tappet Assembly, Gear Shaft Assembly, Control Unit Assembly, and Associated Parts.

TA245312

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 0302 HEAD ASSEMBLY,TAPPET ASSEMBLY		
						GEAR SHAFT ASSEMBLY,CONTROL UNIT		
						ASSEMBLY AND ASSOCIATED PARTS		
7	1	PAHZZ	5310-00-880-7746	96906	MS51968-5	NUT,PLAIN,HEXAGON PUMP HEAD TO PUMP HOUSING	EA	8
7	2	PAHZZ	5340-00-435-5315	02978	SV888	SPACER PUMP HEAD TO PUMP HOUSING	EA	8
7	3	PAHZZ	5310-00-599-5616	01843	GA7616	WASHER,FLAT QUILL GEAR SHAFT RETAINING BOLT PART OF KIT P/N 5702632	EA	2
7	4	XDHZZ	5306-00-816-5803	19207	7383456	BOLT,MACHINE QUILL GEAR SHAFT RETAINING	EA	2
7	5	PFHZZ	2990-00-977-2591	01843	WI763	WIRE BEARING PLATE GEARSHAFT ASSEMBLY (1) CONTROL UNIT ASSEMBLY (2)	EA	3
7	6	PAHHZ	2910-00-722-3536	19207	7748811	HEAD ASSEMBLY,FUEL SEE FIGURE B FOR PARTS BREAKOUT	EA	2
7	7	PAHZZ	5330-00-608-6432	96906	MS28775-237	PACKING,PREFORMED HEAD ASSEMBLY PART OF KIT P/N 5702632	EA	2
7	8	PAHZZ	5330-00-576-9733	96906	MS28775-234	PACKING,PREFORMED HEAD ASSEMBLY PART OF KIT P/N 5702632	EA	2
7	9	PAHZZ	5365-00-785-6355	19207	7383422	SPACER,RING HEAD ASSEMBLY	EA	2
7	10	PAHZZ	5330-00-982-4259	96906	MS28775-230	PACKING,PREFORMED HEAD ASSEMBLY PART OF KIT P/N 5702632	EA	2
7	11	XHAZZ		01843	RG882	RING,SPACER HEAD ASSEMBLY	EA	2
7	12	PAHZZ	5365-00-804-2774	96906	MS16625-1212	RING,RETAINING TAPPET SPRING	EA	2
7	13	XDHZZ	2910-00-247-6774	01843	GU887	SEAT,TAPPET SPRING OUTER	EA	2
7	14	PAHZZ	5360-00-785-6360	19207	7383421	SPRING,HELICAL,COMP TAPPET	EA	2
7	15	PAHZZ	2910-00-785-6350	19207	7034680	TAPPET ASSEMBLY,FUE	EA	2
7	16	XAHZZ		01843	GU888A	GUIDE ASSEMBLY	EA	2
7	17	XAHZZ		01843	PN8824	PIN,ROLLER	EA	2
7	18	XAHZZ		01843	RL883A	ROLLER	EA	2
7	19	XAHZZ		01843	PG887	PLUG,QUILL SHAFT	EA	2
7	20	PAHZZ	5330-00-584-0263	96906	MS28775-218	PACKING,PREFORMED QUILL SHAFT PLUG PART OF KIT P/N 5702632	EA	2
7	21	PAHZZ	2910-00-785-6351	19207	7383477	GEARSHAFT ASSEMBLY QUILL,SEE FIGURE 9 FOR PARTS BREAKOUT	EA	2
7	22	PAHZZ	5315-00-785-6352	19207	7383418	PIN,SHOULDER,HEADLE CONTROL UNIT	EA	2
7	23	PAHZZ	2910-00-786-0191	19207	7383467	CONTROL UNIT ASSEMB FUEL,SEE FIGURE 10 FOR PARTS BREAKOUT	EA	2
7	24	XAHZZ		01843	RN887	RETAINER CONTROL UNIT ASSEMBLY	EA	2
7	25	XAHZZ		01843	SC8817	SCREW CONTROL UNIT RETAINER	EA	4
7	26	PAHZZ	5310-00-751-8778	01843	WA6-5BL	WASHER,LOCK CONTROL UNIT RETAINER	EA	4

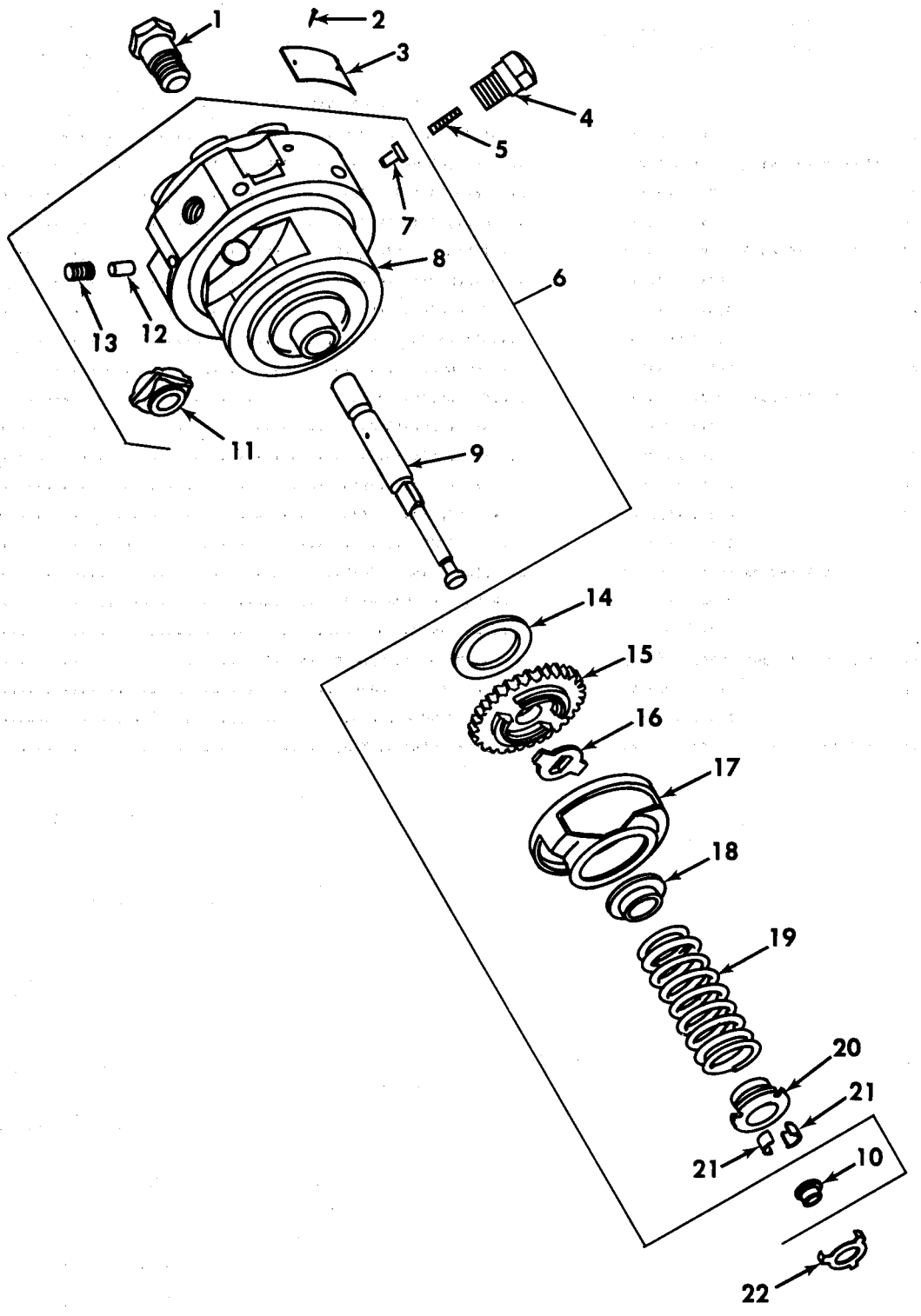


Figure 8. Hydraulic Assembly Head.

TA245313

REPAIR PARTS LIST-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 0302 HYDRAULIC HEAD ASSEMBLY		
8	1	XAHZZ		01843	SC8813	SCREW,PLUNGER BORE	EA	2
8	2	PAHZZ	2910-00-886-5371	01843	SC150-2	RIVET,DRIVE IDENTIFICATION PLATE	EA	4
8	3	XAHZZ		01843	NP906	PLATE,IDENTIFICATION	EA	2
8	4	XAHZZ		01843	SC8815	SCREW,DELIVERY VALV	EA	2
8	5	PAHZZ	5360-00-785-6339	19207	7383425	SPRING,HELICAL,COMP DELIVERY VALVE	EA	2
8	6	XAHZZ		01843	HD8822A	HEAD,HYDRAULIC ASSE	EA	2
8	7	XAHZZ		01843	VA885	VALVE,DELIVERY	EA	2
8	8	XAHZZ		01843	HD8815	HEAD,HYDRAULIC	EA	2
8	9	XAHZZ		01843	PC885	PLUNGER	EA	2
8	10	PAHZZ	2910-00-785-6342	19207	7383432	BUTTON,PLUNGER	EA	2
8	11	XAHZZ		01843	SV887	SLEEVE,PLUNGER	EA	2
8	12	XAHZZ		01843	PG889	PLUG,SEALING	EA	12
8	13	XAHZZ		01843	SC1961	SET SCREW SEALING PLUG	EA	12
8	14	XAHZZ		01843	WA1804	WASHER,THRUST SPUR GEAR	EA	2
8	15	XAHZZ		01843	GE882	GEAR,SPUR	EA	2
8	16	PAHZZ	2910-00-786-0186	19207	7383430	GUIDE,PLUNGER FUEL	EA	2
8	17	XAHZZ		01843	RN889	RETAINER,SPUR GEAR	EA	2
8	18	XAHZZ		01843	GU889	SEAT,SPRING UPPER	EA	2
8	19	PAHZZ	5360-00-785-6340	19207	7383431	SPRING,HELICAL,COMP TAPPET	EA	2
8	20	XAHZZ		01843	GU8810	SEAT,SPRING LOWER	EA	2
8	21	XAHZZ		01843	HP885	LOCK,PLUNGER	EA	4
8	22	PAHZZ	2910-00-785-6364	19207	7383433	SPRING,RING,BUTTON	EA	2

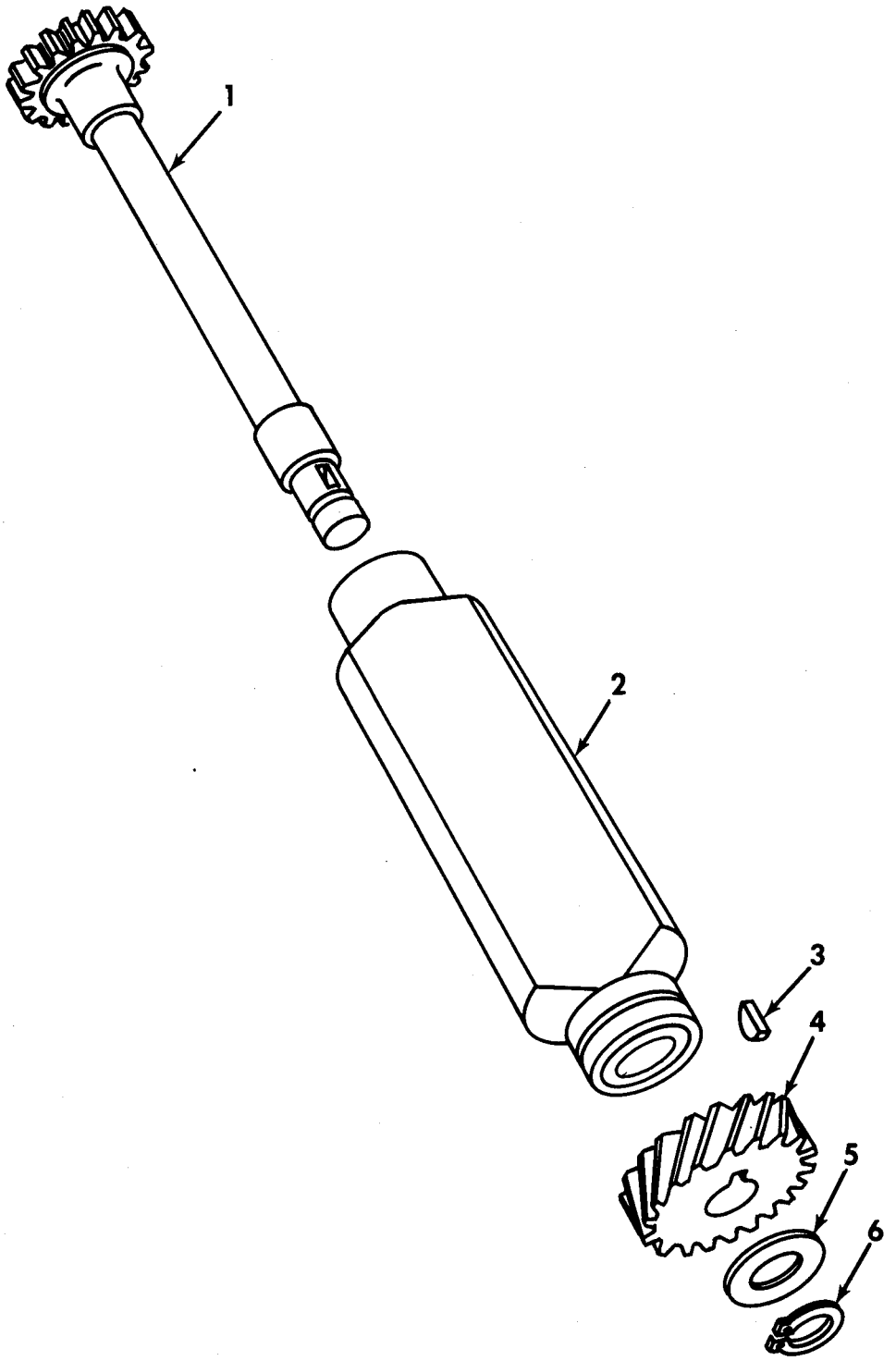


Figure 9. Gear Shaft Assembly.

TA245314

REPAIR PARTS LIST-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 0302 GEAR SHAFT ASSEMBLY		
9	1	XAHZZ		01843	SH8821A	SHAFT	EA	2
9	2	XAHZZ		01843	BG8813A	BUSHING ASSEMBLY	EA	2
9	3	PAHZZ	5315-00-687-5218	19207	7744772	KEY,WOODRUFF	EA	2
9	4	XAHZZ		01843	GE881	GEAR,HELICAL	EA	2
9	5	XAHZZ		01843	SR888	SPACER,RETAINING RI	EA	2
9	6	PAHZZ	5365-00-715-1152	96906	MS16624-1037	RING,RETAINING QUILL SHAFT GEAR	EA	2

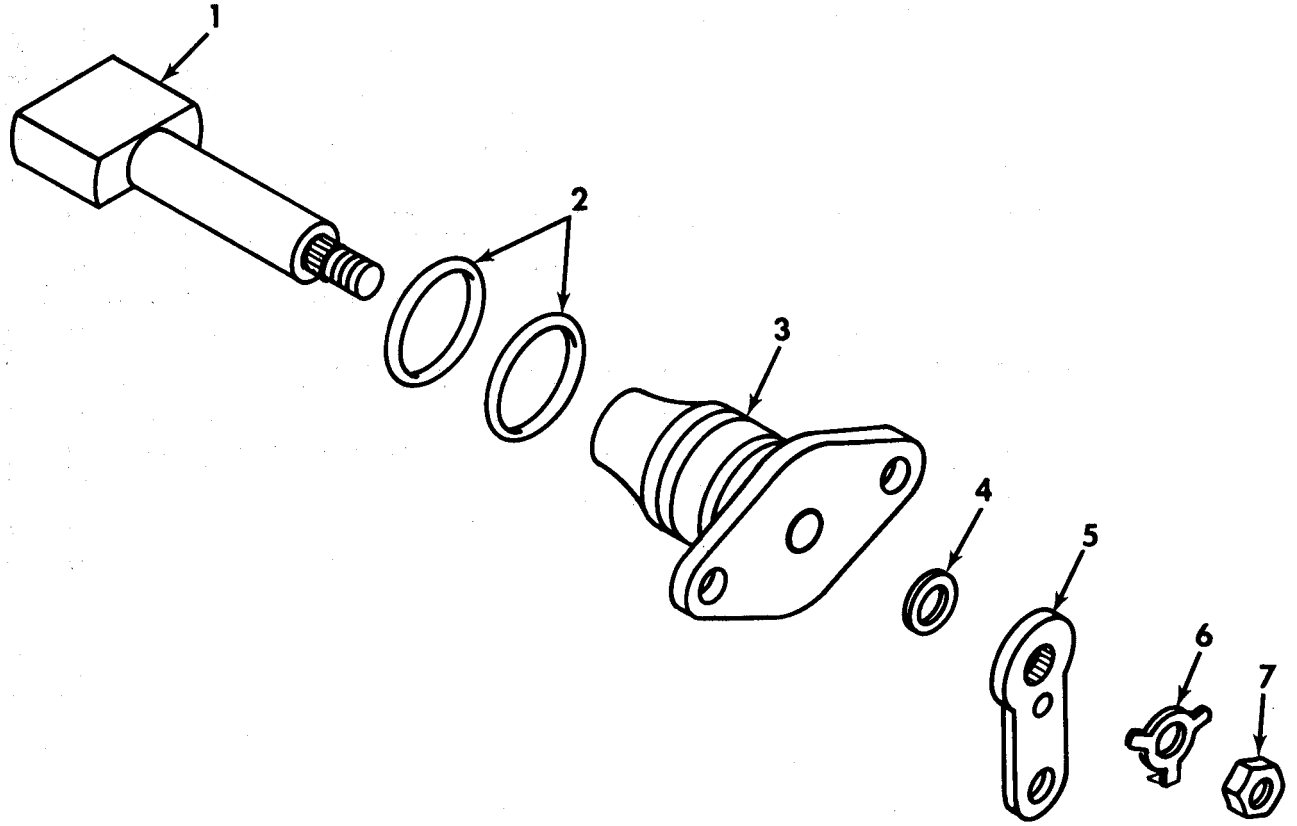


Figure 10. Control Unit Assembly.

TA245315

REPAIR PARTS LIST-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 0302 CONTROL UNIT ASSEMBLY		
10	1	XAHZZ		01843	SH8823	SHAFT	EA	2
10	2	PAHZZ	5330-00-618-1920	96906	MS28775-017	PACKING,PREFORMED CONTROL UNIT PART OF KIT P/N 5702765. 5702632	EA	4
10	3	XAHZZ		01843	BG8810	BUSHING	EA	2
10	4	KFHZZ		01843	SR8813	SPACER CONTROL UNIT LEVER PART OF KIT P/N 5702765	EA	2
10	5	XAHZZ		01843	LE8831	LEVER,CONTROL UNIT	EA	2
10	6	PAHZZ	5310-01-022-8861	01843	WAI648	WASHER,KEY CONTROL UNIT LEVER TO SHAFT PART OF KIT P/N 5702765	EA	2
10	7	XAHZZ		01843	NT1264	NUT,JAM CONTROL UNIT LEVER TO SHAFT	EA	2
10		PAHZZ	2910-00-221-4809	19207	5702765	PARTS KIT,METERING FUEL CONTROL UNIT,COMPOSSED OF:	EA	1
5	7					LEVER ASSEMBLY,FUEL	EA	1
5	11					WASHER	EA	1
5	12					NUT,PLAIN,SINGLE BA	EA	1
5	15					SCREW	EA	1
10	2					PACKING,PREFORMED	EA	4
10	4					SPACER	EA	2
10	6					WASHER,KEY	EA	2

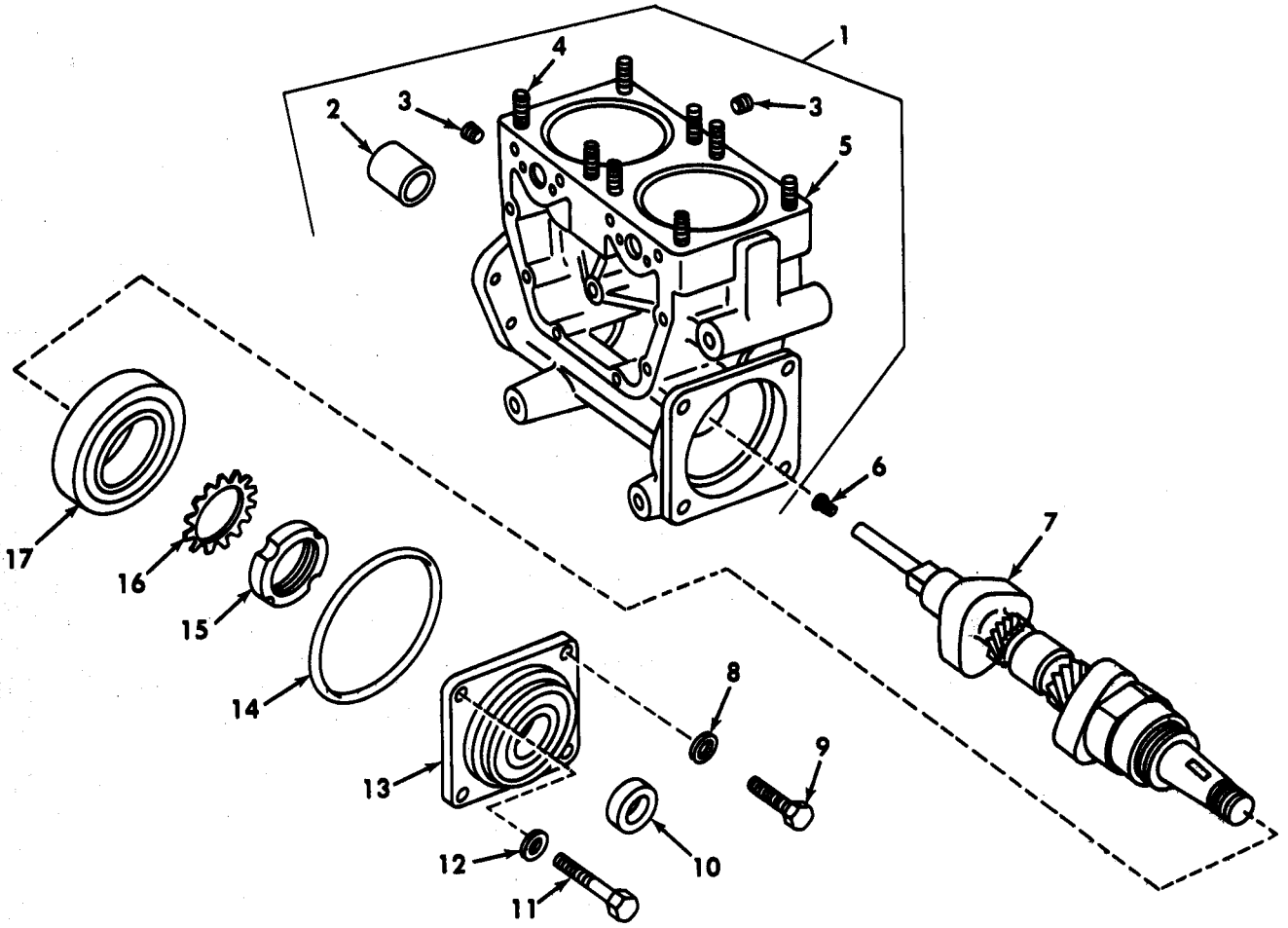


Figure 11. Housing, Camshaft, Plate, and Associated Parts.

TA245316

REPAIR PARTS LIST-CONTINUED

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 0302 HOUSING,CAMSHAFT,PLATE,AND ASSOCIATED PARTS		
11	1	PFHHH	4320-01-146-1911	01843	HG8815A	HOUSING,LIQUID PUMP	EA	1
11	2	PAHZZ	3120-00-133-6755	19207	11662505	BEARING,SLEEVE CAMSHAFT	EA	1
11	3	PAHZZ	4730-00-044-4683	01843	PG1068	PLUG,PIPE OIL GALLERY	EA	2
11	4	XDHZZ	5307-00-596-8378	01843	SD881	STUD INJECTION PUMP HOUSING	EA	8
11	5	XAHZZ		01843	HG8820C	HOUSING,INJECTION P	EA	1
11	6	PAHZZ	5305-00-281-6384	01843	SC1149	SCREW,ASSEMBLED WAS CAMSHAFT	EA	1
11	7	PAHZZ	2910-00-785-6344	19207	7034677	CAMSHAFT,PUMP FUEL	EA	1
11	8	PAHZZ	5310-00-637-9541	12603	23E06	WASHER,LOCK BEARING RETAINING PLATE TO PUMP HOUSING	EA	3
11	9	PAHZZ	5305-00-269-3213	96906	MS90725-62	SCREW CAP,HEXAGON H BEARING RETAINING PLATE TO PUMP HOUSING	EA	3
11	10	PAHZZ	5330-00-812-6435	19207	7034679	SEAL,PLAIN ENCASED CAMSHAFT PART OF KIT P/N 5702632	EA	1
11	11	XAHZZ		01843	SC8818	SCREW BEARING RETAINING PLATE TO PUMP HOUSING	EA	1
11	12	XAHZZ		01843	WA5-14BL	WASHER BEARING RETAINING PLATE TO PUMP HOUSING	EA	1
11	13	XAHZZ		01843	PL8823	PLATE,BEARING RETAI CAMSHAFT	EA	1
11	14	PAHZZ	5330-00-618-1603	96906	MS28775-240	PACKING,PREFORMED BEARING RETAINING PLATE PART OF KIT P/N 5702632	EA	1
11	15	PAHZZ	5310-00-208-3447	96906	MS172244	NUT,PLAIN,ROUND BEARING RETAINING	EA	1
11	16	PAHZZ	5310-00-566-8871	96906	MS172209	WASHER,KEY BEARING RETAINING NUT	EA	1
11	17	PAHZZ	3110-00-554-5968	21450	700562	BEARING,BALL ANNULA CAMSHAFT	EA	1
11		PAHZZ	5330-00-786-5239	19207	5702632	GASKET AND PREFORME COMPOSED OF:	EA	1
1	6					PACKING,PREFORMED	EA	4
2	3					PACKING,PREFORMED	EA	4
3	1					GASKET	EA	1
3	7					GASKET	EA	1
3	8					PACKING,PREFORMED	EA	1
3	20					GASKET	EA	1
4	4					GASKET	EA	1
4	5					GASKET	EA	1
4	25					GASKET	EA	1
5	17					SPACER,RING	EA	1
5	32					GASKET	EA	1
5	35					PACKING,PREFORMED	EA	1
5	36					GASKET	EA	1
7	3					WASHER,FLAT	EA	2
7	7					PACKING,PREFORMED	EA	2
7	8					PACKING,PREFORMED	EA	2
7	10					PACKING,PREFORMED	EA	2
7	20					PACKING,PREFORMED	EA	2
10	2					PACKING,PREFORMED	EA	4
11	10					SEAL,PLAIN ENCASED	EA	1
11	14					PACKING,PREFORMED	EA	1

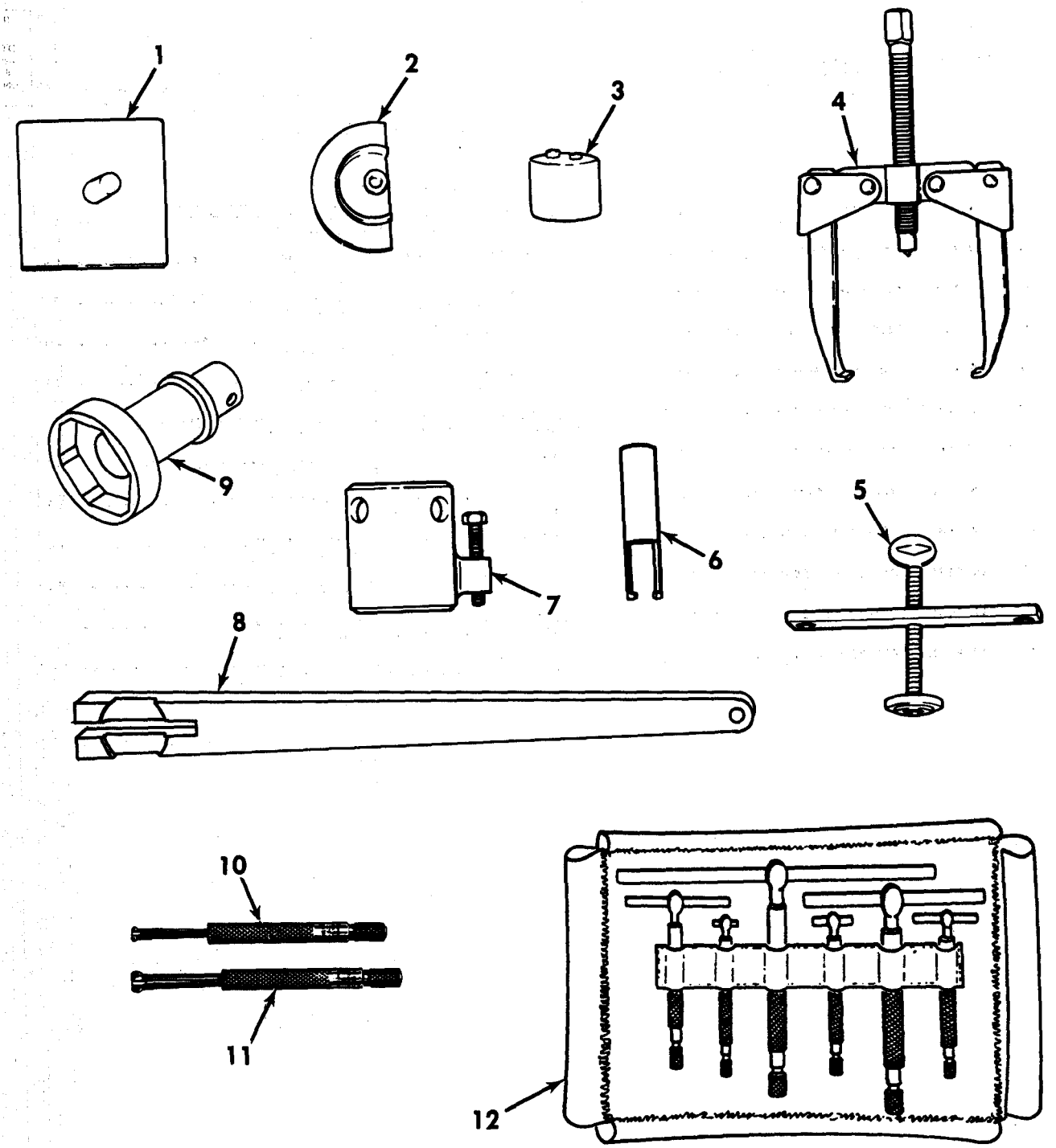


Figure 12. Special Tools.

TA245317

SECTION III. SPECIAL TOOLS LIST.

(1) Illustration (a) Fig No.	(b) Item No.	(2) SMR Code	(3) National Stock Number	(4) FSCM	(5) Part Number	(6) Description / Usable On Code	(7) U/M	(8) Qty Inc In Unit
						GROUP 26 SPECIAL TOOLS AND TEST		
						EQUIPMENT		
						GROUP 2604 SPECIAL TOOLS		
12	1	PEHZZ	4910-00-793-5039	19207	10882859	FIXTURE,POSITIONING FUEL INJECTION PUMP HEAD B01 1 AUTH PER LETTERED COMPANY	EA	
12	2	PEHZZ	4910-00-793-5040	19207	10882854	GAGE,SPRING,GOVERNO GOVERNOR INNER SPRING CAP B0I 1 AUTH PER LETTERED COMPANY	EA	
12	3	PEHZZ	5120-00-793-5045	19207	10882851	SOCKET,WRENCH,FACE QUILL SHAFT PLUG B0I 1 AUTH PER LETTERED COMPANY	EA	
12	4	PEHZZ	5120-00-793-5048	19207	10882818	PULLER,MECHANICAL GOVERNOR WEIGHT AND SPIDER B0I 1 AUTH PER LETTERED COMPANY	EA	
12	5	PEHZZ	5120-00-793-5049	19207	10882862	COMPRESSOR,SPRING S TAPPET B0I 1 AUTH PER LETTERED COMPANY	EA	
12	6	PEHZZ	5120-00-793-5055	19207	10882856	REMOVER AND REPLACE PLUNGER LOCKS AND GOVERNOR B0I 1 AUTH PER LETTERED COMPANY	EA	
12	7	PEHZZ	5120-00-793-5057	19207	10882894	WRENCH,TURNING AND CAMSHAFT B0I 1 AUTH PER LETTERED COMPANY	EA	
12	8	PEHZZ	5120-00-615-8843	19207	10882857	LEVER,MANUAL CONTRO GOVERNOR FRICTION DRIVE B0I 1 AUTH PER LETTERED COMPANY	EA	
12	9	PEHZZ	5120-01-034-1698	19207	12254213	SOCKET,SOCKET WRENC FUEL INLET HOUSING CAP B0I 1 AUTH PER LETTERED COMPANY	EA	
12	10	PEHZZ	5210-00-221-2080	57163	829A	GAGE,SMALL HOLE 0.125 TO 0.200 B0I 1 AUTH PER LETTERED COMPANY	EA	
12	11	PEHZZ	5210-00-221-2081	57163	829B	GAGE,SMALL HOLE 0.200 TO 0.300 B0I 1 AUTH PER LETTERED COMPANY	EA	
12	12	PEHZZ	5210-00-473-9350	37163	79L	GAGE,SET,TELESCOPIN B0I 1 AUTH PER LETTERED COMPANY	EA	

NATIONAL STOCK NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER

STOCK NUMBER	FIGURE NO.	ITEM NO.	STOCK NUMBER	FIGURE NO.	ITEM NO.
5310-00-038-0751	6	10	2910-00-678-4724	1	5
5310-00-038-0752	6	10	2910-00-678-4724	2	11
5310-00-038-0753	6	10	2910-00-678-4727	2	17
5310-00-038-0755	6	10	5315-00-687-5218	9	3
4730-00-044-4683	11	3	5365-00-715-1152	9	
2910-00-064-6267	4	33	2910-00-722-3536	7	6
3120-00-133-6755	11	2	5310-00-751-8778	7	26
2910-00-134-4733	2		5310-00-768-0319	5	19
5310-00-166-1412	3	10	5360-00-785-6339	8	5
5310-00-166-1412	6	10	5360-00-785-6340	8	19
5310-00-176-6677	5	12	5360-00-785-6341	5	9
5310-00-208-3447	11	15	2910-00-785-6342	8	10
5210-00-221-2080	12	10	2910-00-785-6344	11	7
5210-00-221-2081	12	11	5360-00-785-6345	5	33
2910-00-221-4809	10		2910-00-785-6350	7	15
5365-00-245-5420	5	17	2910-00-785-6351	7	21
2910-00-247-6774	7	13	5315-00-785-6352	7	22
5310-00-253-8721	3	19	5365-00-785-6355	7	9
5305-00-269-3213	11	9	5360-00-785-6358	4	30
5365-00-274-9575	6	3	5360-00-785-6360	7	14
5365-00-274-9575	6	5	2910-00-785-6364	8	22
5305-00-281-6384	11	6	2910-00-786-0186	8	16
5315-00-282-0341	1	2	5330-00-786-0190	3	1
5330-00-310-6556	4	4	2910-00-786-0191	7	23
5330-00-310-6559	3	7	5365-00-786-5238	4	
5330-00-310-6559	5	36	5330-00-786-5239	11	
5306-00-366-8857	3	13	4910-00-793-5039	12	1
4730-00-402-5143	2	5	4910-00-793-5040	12	2
5330-00-406-7316	5	32	5120-00-793-5045	12	3
2910-00-407-2618	6		5120-00-793-5048	12	4
5340-00-435-5315	7	2	5120-00-793-5049	12	5
2920-00-449-0107	3	5	5120-00-793-5055	12	6
3040-00-466-7469	3	12	5120-00-793-5057	12	7
2910-00-466-7473	3	4	4730-00-800-2830	1	11
2910-00-467-2582	3	6	2910-00-801-1154	2	
5210-00-473-9350	12	12	5365-00-804-2774	7	12
2910-00-475-3463	1	7	5305-00-810-8093	3	22
5360-00-510-4117	2	15	5935-00-810-8094	3	21
5310-00-515-3030	4	38	5330-00-812-6435	11	10
2910-00-529-6945	5	4	5306-00-816-5803	3	3
3110-00-554-5968	11	17	5306-00-816-5803	4	2
2990-00-562-1146	4	9	5306-00-816-5803	7	4
5310-00-566-8871	11	16	5330-00-819-5111	2	7
5330-00-576-9733	7	8	5330-00-827-5635	3	20
5330-00-579-3156	1	6	5360-00-830-3882	4	24
5330-00-579-3156	2	3	3120-00-845-5726	4	10
5310-00-582-5965	3	2	2910-00-871-5429	5	25
5310-00-582-5965	3	14	5310-00-880-7746	7	1
5310-00-582-5965	4	3	2910-00-886-5371	5	38
5310-00-582-5965	4	3	2910-00-886-5371	8	2
5310-00-582-5965	4	3	5340-00-902-0426	2	10
5310-00-582-5965	4	36	5340-00-902-0426	5	21
5310-00-582-5965	5	22	5340-00-902-0426	5	29
5310-00-582-5965	5	26	5310-00-902-6676	4	11
5330-00-583-3473	3	8	5310-00-902-6676	5	14
5330-00-583-3473	5	35	4730-00-954-1281	4	31
5330-00-584-0263	7	20	5310-00-971-7989	3	15
5310-00-584-7888	1	3	5310-00-971-7989	4	21
4730-00-595-1868	1	8	5310-00-971-7989	4	35
5307-00-596-8378	11	4	2990-00-977-2591	3	17
5310-00-599-5616	7	3	2990-00-977-2591	4	27
5330-00-608-6432	7	7	2990-00-977-2591	5	24
4820-00-613-6297	2	12	2990-00-977-2591	7	5
5120-00-615-8843	12	8	5330-00-982-4259	7	10
5330-00-618-1603	11	14	5305-00-983-6652		13
5330-00-618-1920	10	2	5365-01-012-7353	3	11
5310-00-637-9541	11	8	5310-01-022-8861	10	6
5330-00-640-9587	4	25	5120-01-034-1698	12	9
5310-00-655-9484	5	30	2910-01-043-8182	5	
5365-00-655-9589	2	16	2910-01-050-2520	5	
5310-00-655-9590	1	4	4320-01-146-1911	11	1
5310-00-655-9593	1	10			

REPAIR PARTS LIST-CONTINUED

PART NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER

FSCM	PART NUMBER	FIGURE NO.	ITEM NO.	FSCM	PART NUMBER	FIGURE NO.	ITEM NO.
01843	BA881	4	7	01843	NT1264	10	7
01843	BG8810	10	3	01843	NT888	2	1
01843	BG8813A	9	2	01843	PC885	8	9
				01843	PG1068	11	3
01843	BG8823	5	31	01843	PG886	5	18
01843	BK7938C	4	37				
82254	CFN70306	3	19	01843	PG887	7	19
				01843	PG889	8	12
01843	CP883	2	6	01843	PL791123A	4	34
01843	CP901C	4	26	01843	PL8823	11	13
01843	CV8816A	3	4	01843	PL8832A	5	34
01843	CV8817A	3	9	01843	PN7986	6	9
01843	CV9032C	4	1	01843	PN8821	5	3
01843	DC796	6	4	01843	PN8824	7	17
01843	DC797	6	2	01843	RD883A	5	5
01843	FE882A	2	4	01843	RG882	7	11
01843	GA1144	3	8	01843	RG886	3	11
01843	GA1144	5	35	01843	RL883A	7	18
01843	GA7616	7	3	01843	RN887	7	24
01843	GA76195	3	7	01843	RN889	8	17
01843	GA76195	5	36	01843	SC1149	11	6
01843	GA902	4	25	01843	SC150-2	5	38
01843	GE881	9	4	01843	SC150-2	8	2
01843	GE882	8	15	01843	SC1961	8	13
01843	GU8810	8	20	01843	SC7961	3	13
01843	GU887	7	13	01843	SC8813	8	1
01843	GU888A	7	16	01843	SC8814	4	15
01843	GU889	8	18	01843	SC8815	8	4
01843	HB9036	6	7	01843	SC8817	7	25
01843	HD8815	8	8	01843	SC8818	11	11
01843	HD8822A	8	6	01843	SC8825	5	15
01843	HG8815A	11	1	01843	SC8830	4	18
01843	HG8817	2	9	01843	SC9043	5	28
01843	HG8820C	11	5	01843	SD881	11	4
01843	HG8822A	4	32	01843	SH8821A	9	1
01843	HP885	8	21	01843	SH8823	10	1
01843	HP9025	6	6	01843	SH8834A	5	37
01843	IT1011	4	19	01843	SO882A	3	5
01843	LE8831	10	5	01843	SP7951-13	4	24
01843	LE8838A	3	12	01843	SP8823	5	9
01843	LE8839	3	16	01843	SP9014	5	4
01843	LE8849A	3	6	01843	SR794-1	6	3
01843	LE8851	5	10	01843	SR794-1	6	5
01843	LE8852	5	8	01843	SR794-2	6	5
01843	LE8853A	5	7	01843	SR794-3	6	5
01843	LE8855A	4	20	01843	SR794-4	6	5
01843	LE8856A	4	17	01843	SR794-5	6	5
01843	LE9083A	5	27	01843	SR794-6	6	5
96906	MS16624-1037	9		01843	SR794-7	6	5
96906	MS16625-1212	7	12	01843	SR8811-1	5	6
96906	MS16625-1212	7	12	01843	SR8811-1	5	6
96906	MS16998-29	5	13	01843	SR8811-2	5	6
96906	MS172209	11	16	01843	SR8813	10	4
96906	MS172244	11	15	01843	SR888	9	5
96906	MS20995NC40-12	1	9	01843	SV887	8	11
96906	MS20995NC40-12	2	2	02978	SV888	7	2
96906	MS21083N3	4	11	01843	VA885	8	7
96906	MS21083N3	5	14	01843	WAI448-1	6	10
96906	MS28775-017	10	2	01843	WAI448-2	6	10
96906	MS28775-116	1	6	01843	WAI448-3	6	10
96906	MS28775-116	2	3	01843	WAI448-5	10	6
96906	MS28775-218	7	20	01843	WAI648	10	6
96906	MS28775-230	7	10	01843	WAI804	8	14
96906	MS28775-234	7	8	01843	WAI806	5	11
96906	MS28775-237	7	7	01843	WA22-10BL	5	16
96906	MS28775-240	11	14	01843	WA5-14BL	11	12
96906	MS28778-24	2	7	01843	WA6-5BL	7	26
96906	MS3102R8S1P	3	21	01843	WI763	3	17
96906	MS35338-51	1	3	01843	WI763	4	27
96906	MS35691-5	3	15	01843	WI763	5	24
96906	MS35691-5	4	21	01843	WI763	7	5
96906	MS35691-5	4	35	01843	WT9027A	6	8
96906	MS49005-4	4	31	19207	10865239	1	11
96906	MS51938-6	2	10	19207	10882818	12	4
96906	MS51938-6	5	21	19207	10882851	12	3
96906	MS51938-6	5	29	19207	10882854	12	2
96906	MS51968-2	5	19	19207	10882856	12	6
96906	MS51968-5	7	1	19207	10882857	12	8
96906	MS90725-62	11	9	19207	10882859	12	1
01843	NP904	5	39	19207	10882862	12	5
01843	NP906	8	3	19207	10882894	12	7
01843	NT1161	5	12	19207	10885779	4	33
01843	NT1218	5	2	19207	10885781	4	16
01843	NT1261	6	1	19207	10910348	5	25

FSCM	PART NUMBER	FIGURE NO.	ITEM NO.	FSCM	PART NUMBER	FIGURE NO.	ITEM NO.
19207	10935512	2	18	19207	7748539	4	28
19207	10951143	2	14	19207	7748540	4	28
19207	10951144	2	13	19207	7748545	4	22
				19207	7748546	4	8
19207	10951322	12	4	19207	7748547	4	14
19207	10951334	5	2	19207	7748550	4	29
19207	10951481	8	2	19207	7748551	4	29
19207	11610208	32	5	19207	7748552	4	29
19207	11621586	20	5	19207	7748553	4	29
19207	11621881	23	5	19207	7748554	4	29
19207	11657469-3	2	3	19207	7748555	4	29
19207	11657469-3	14	3	19207	7748558	4	5
19207	11657469-3	3	4	19207	7748622	4	10
19207	11657469-3	3	4	19207	7748699	3	18
19207	11657469-3	3	7748811	19207	7748811	7	6
19207	11657469-3	36	4	37163	79L	12	12
19207	11657469-3	22	5	57163	829A	12	10
19207	11657469-3	26	5	57163	829B	12	11
19207	11662505	2	11	19207	8682456	2	17
19207	11668626-1	1	1	19207	8744247	4	23
19207	11684113	15	2	19207	8761412	1	2
19207	11684114	12	2				
19207	11684115	7	1				
19207	12254213	9	12				
21450	137128	13	4				
12603	23E06	8	11				
66640	27D123	10	3				
66640	27D123	10	6				
21450	420429	22	3				
10001	43N71918-10	30	5				
81336	454098	8	1				
21450	545724	6	4				
19204	5153030	38	4				
19207	5702632		11				
19207	5702638		4				
19207	5702739		2				
19207	5702765		10				
19207	5704356		2				
19207	5704369		6				
19207	5705050		5				
19207	5705051		5				
21450	700562	17	11				
19207	7034677	7	11				
19207	7034679	10	11				
19207	7034680	15	7				
19207	7320493	5	1				
19207	7320493	11	2				
19207	7336789	17	5				
19207	7340054	16	2				
19207	7340055	10	1				
19207	7340058	4	1				
19207	7383418	7	22				
19207	7383421	7	14				
19207	7383422	7	9				
19207	7383425	8	5				
19207	7383426	3	20				
19207	7383430	8	16				
19207	7383431	8	19				
19207	7383432	8	10				
19207	7383433	8	22				
19207	7383455	3	1				
19207	7383456	3	3				
19207	7383456	4	2				
19207	7383456	7	4				
19207	7383458	5	1				
19207	7383459	4	4				
19207	7383460	4	30				
19207	7383464	4	9				
19207	7383467	7	23				
19207	7383472	5	33				
19207	7383477	7	21				
19207	7744772	9	3				
19207	7748535	4	28				
19207	7748536	4	28				
19207	7748537	4	28				

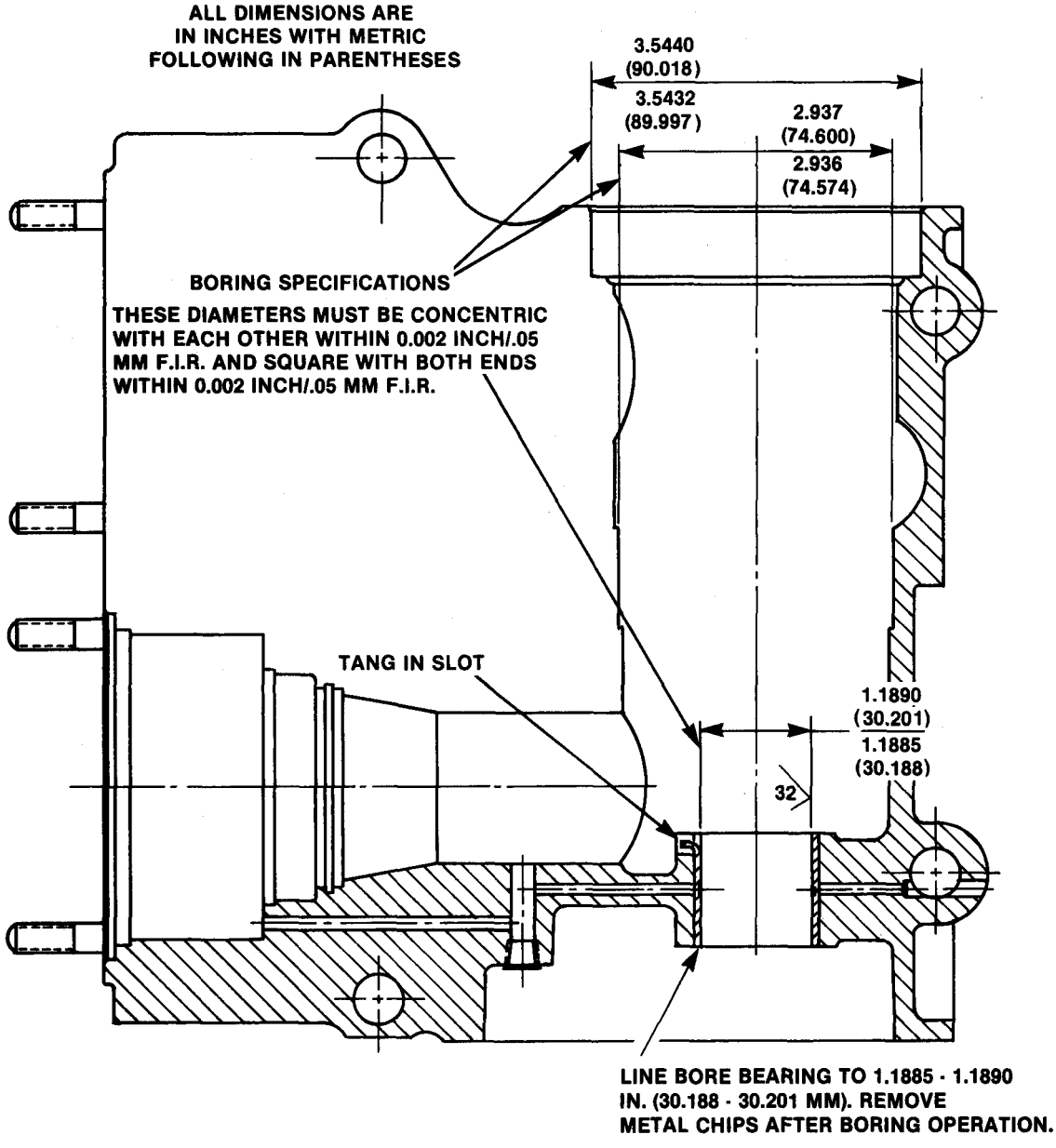
APPENDIX C
EXPENDABLE SUPPLIES AND MATERIALS LIST

THIS APPENDIX LISTS EXPENDABLE SUPPLIES AND MATERIAL YOU WILL NEED TO REPAIR THE AMERICAN BOSCH MODEL PSB-12BT FUEL METERING AND DISTRIBUTING PUMP.

ITEM	NSN	DESCRIPTION	UNIT OF MEASURE
1	9150-00-082-5636	LUBRICATING OIL: 1 QT CAN, MIL-S-81087 (81349)	QT
2	8030-00-088-7818	SEALING COMPOUND: 8 OZ TUBE, MIL-S-7916 (81349)	OZ
3	9150-00-189-6727	LUBRICATING OIL: GRADE 10, 1 QT CAN, MIL-L-2104 (81349)	QT
4	7920-00-205-1711	RAG, WIPING, COTTON SYNTHETIC: 50 LB BALE, DDD-R-30 (81348)	LB
5	9150-00-231-6689	LUBRICATING OIL: 1 QT CAN, VV-L-800 (81348)	QT
6	3439-00-243-1882	SOLDER, LEAD ALLOY: A LB SPOOL, 0.125 IN. DIAMETER, QQ-S-571 (81348)	SPOOL
7	6850-00-281-1985	DRYCLEANING SOLVENT: 1 GAL CAN, P-D-680, TYPE II (81348)	GAL
8	8030-00-291-1787	SEALING COMPOUND: TYPE II, 1 PT, MIL-S-45180 (81349)	PT
9	7510-00-852-8179	TAPE,ADHESIVE: TYPE II, 36 YD ROLL, 1 IN. WIDE, MIL-T-22085 (81349)	ROLL
10	9525-00-990-7799	WIRE, NONELECTRICAL: 1 LB SPOOL (234 FEET PER POUND), MS20995NC40 (96906)	SPOOL
11	2990-00-977-2591	WIRE, BEARING PLATE: 17 IN. LG, W1763 (01843)	EA
12	8135-00-281-4069	STRAPPING, STEEL: 100 TO 110 LB COIL, 17.1 FT PER LB, QQ-S-781 (81348)	COIL
13	8135-00-239-5293	SEAL, STRAPPING: 1 7/8 IN. LG, 5000 PER BOX,QQ-S-781 (81348)	BOX

APPENDIX D

MACHINING SPECIFICATIONS



Boring Dimensions for New Bearing.

TA245318

GLOSSARY

Section I. ABBREVIATIONS

C	Celsius
DIA or dia	Diameter
cm	Centimeters
DF	Diesel fuel
F	Fahrenheit
Kg	Kilograms
kPa	Kilopascals
MM or mm	Millimeters
N Ž m	Newton-Meters
SAE	Society of Automotive Engineers
TMDE	Test, Measurement, and Diagnostic Equipment

Section II. SYMBOLS

°	Degrees
±	Plus or minus
%	Percent

ALPHABETICAL INDEX

Subject, Page Number

ALPHABETICAL INDEX—Continued

Subject, Page Number

F

G

H

ALPHABETICAL INDEX—Continued

Subject, Page Number

ALPHABETICAL INDEX—Continued

By Order of the Secretary of the Army:

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

Official:

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

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To be distributed in accordance with DA Form 12-37, Direct and General Support Maintenance requirements for Recovery Vehicle, Medium, M881, Tank, Combat, Full Tracked: 105 MM, M60; Miscellaneous Combat Vehicle, Combat, Engineer, Full Tracked, M728; Tank, Bridge Launcher, AVLB; Tank, Combat, Full Track, 105MM Gun, M60A1 (RISE); Tank, Combat, Full Tracked: 105MM Gun, M48A5 and M60A3 Tank Turret.

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PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 9-XXXX-XXX-XX	DATE OF TM	TITLE OF TM

BE EXACT. PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	
2-6	2-5			UNDER "SUPPLIES", SOLVENT SHOULD BE CHANGED TO ITEM 13 IN APPENDIX C.
3-1	3-1			THE FIRST PARAGRAPH IN THE SECOND COLUMN SHOULD BE CHANGED TO READ: REFER TO TM 9-2350-253-1-3 FOR INSTRUCTIONS ON HOW TO SECURE PARTS WITH LOCKWIRE.
3-26	1			STEP 1 UNDER "CLEANING" SHOULD BE CHANGED TO READ: CLEAN NEEDLE BEARING (C) IN ACCORDANCE WITH TM9-214. WRAP CLEAN BEARING IN A CLEAN CLOTH. CHANGE ILLUSTRATION OF BEARING (C) TO SHOW A NEEDLE BEARING.

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TM 9-2910-212-34&P	27 JUN 84	DS and GS Maintenance Manual, Including RPSTL, For AiResearch Turbosupercharger, Model T18C01

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

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

WEIGHTS

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

LIQUID MEASURE

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

SQUARE MEASURE

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

CUBIC MEASURE

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

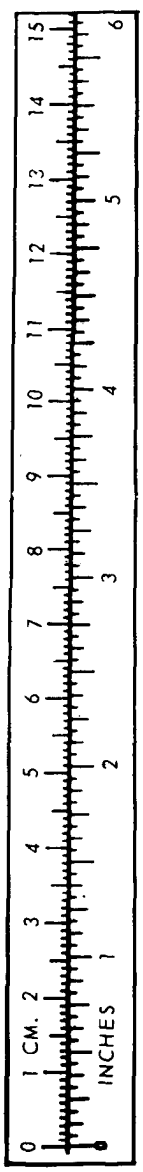
TEMPERATURE

$5/9\ (^0F - 32) = {}^0C$
212^0 Fahrenheit is equivalent to 100^0 Celsius
90^0 Fahrenheit is equivalent to 32.2^0 Celsius
32^0 Fahrenheit is equivalent to 0^0 Celsius
$9/5\ C^0 + 32 = F^0$

APPROXIMATE CONVERSION FACTORS

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

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



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