

TM 9-4910-623-14&P

TECHNICAL MANUAL

**OPERATOR'S ORGANIZATIONAL, DIRECT SUPPORT
AND GENERAL SUPPORT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS LIST**

FOR

**TESTER, DIESEL INJECTOR NOZZLE
MODEL DT-1300/7008
(KIENE DIESEL ACCESSORIES, INC.)
(NSN 4910-00-255-8641)**

HEADQUARTERS, DEPARTMENT OF THE ARMY

MAY 1980

HEADQUARTERS
Department of the Army
Washington D. C., 5 September 1995

Change
No. 1

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TM 9-4910-623-14&P, dated 15 May 1980 is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the margin of the page. Illustration changes are indicated by a pointing hand adjacent to the illustrations.

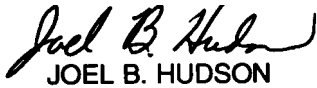
<u>Remove Pages</u>	<u>Insert Pages</u>
i and ii	i and ii
1 and 2	1 and 2
9 thru 15	9 thru 13

3. File this change sheet in back of the publication for reference purposes.

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or know of a way to improve the procedure let us know. Mail your letter, DA Form 2028 (Recommended changes to Publications and Blank Forms) or DA Form 2028-2, located the the back off this manual direct to:

Director, Armament And Chemical Acquisition and Logistics
Activity, ATTN.: AMSTA-MASL, Rock Island, IL 61299-7630
A reply will be furnished to you.

NOTE

This manual is published for the purpose of identifying an authorized commercial manual for the use of the personnel to whom this tester is issued.

Manufactured by: Kiene Diesel Accessories, Inc.
325 South Fairbanks Street
Addison, IL 60101

Procured under Contract No. DAAA09-76-D-6003

This technical manual is an authentication of the manufacturers' commercial literature and does not conform with the format and content specified in AR 25-30, The Army Integrated Publishing and Printing Program. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

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INSTRUCTIONS FOR REQUISITIONING PARTS

NOT IDENTIFIED BY NSN

When requisitioning parts not identified by National Stock Number, it is mandatory that the following information be furnished the supply officer.

- 1 - Manufacturer's Federal Supply Code Number - 33559
- 2 - Manufacturer's Part Number exactly as listed herein.
- 3 - Nomenclature exactly as listed herein, including dimensions, if necessary.
- 4 - Manufacturer's Model Number - Model DT-1300/7008
- 5 - Manufacturer's Serial Number (End Item)
- 6 - Any other information such as Type, Frame Number, and Electrical Characteristics, if applicable.
- 7 - If DD Form 1348 is used, fill in all blocks except 4, 5, 6, and Remarks field in accordance with AR 725-50.

Complete Form as Follows:

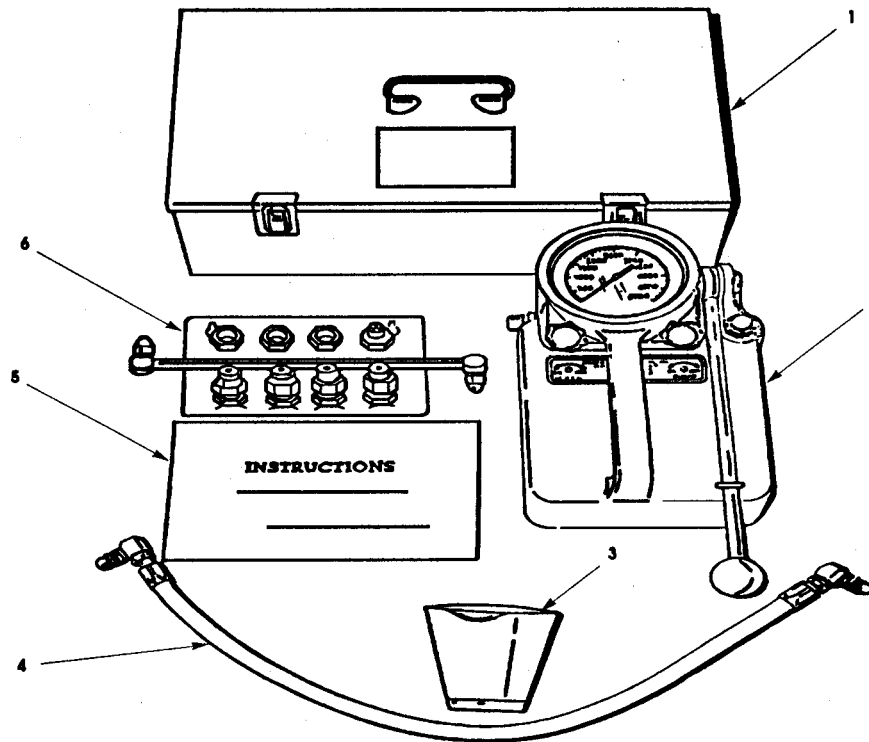
- (a) In blocks 4, 5, 6, list manufacturer's Federal Supply Code Number - 33559 followed by a colon and manufacturer's Part Number for the repair part.
- (b) Complete Remarks field as follows:
Noun : (nomenclature of repair part)
For: NSN : 4910-00-255-8641
Manufacturer: Kiene Diesel Accessories, Inc.

Model: DT-1300/7008
Serial: (of end item)

Any other pertinent information such as Frame Number,
Type, Dimensions, etc.

Section I. INTRODUCTION AND DESCRIPTION

1. Introduction. This manual contains descriptive information, operation, and service instructions for diesel fuel injector nozzle tester (model DT-1300) accessories (fig 1).
2. Purpose. The tester is designed to measure the opening pressure of fuel injector nozzles and to check the fuel spray pattern being dispersed from the Nozzle tip holes. In addition, the tester can check fuel leakage of nozzles and fuel injection pump heads.
3. Description. The tester and accessories are contained in a metal carrying case. The tester housing is of cast aluminum, providing lightweight transportability. This housing contains a reservoir for holding calibration fluid. A handle is provided to pump the fluid from the reservoir to a nozzle under test. The two valves are used while checking nozzle opening pressure and for performing leak test. A pressure gage, with a range of 0 to 5000 psi, is provided to measure the opening and leakage pressures. The pump output capacity is 1300mm³(1.3 cc) per stroke at 7500 psi.
4. Identification of Components and Accessories. Table 1 and figure 1 identify components furnished with the tester: nozzle tester (model DT-1300) and accessories.



1. Case

2. Tester

3. Cup

4. Tube

5. Manual

6. Connector set
(case not shown)

Figure 1. Diesel fuel injector nozzle tester and assessories

TABLE 1. LIST OF COMPONENTS AND ACCESSORIES (FIG 1)

ITEM NO.	PART NO.	DESCRIPTION	QTY
1		CARRYING CASE	1
2	DT-1300	TESTER, DIESEL FUEL INJECTOR NOZZLE	1
3		CUP, COLLECTOR	1
4		TUBE, FLEXIBLE CONNECTION	1
5		MANUAL, INSTRUCTION	1
6	7551255	CONNECTOR SET CONSISTING OF:	1
	7551257	NUT, G-1	1
	7551258	NUT, G-2	1
	7551259	ADAPTER, G-3	1
	7551260	ADAPTER, G-4	1
	7551261	CONNECTOR, G-5	1
	7551262	CONNECTOR, G-6	1
	7551263	CONNECTOR, G-7	1
	7551264	TUBE ASSEMBLY, G-8	1

Section II. PREPARATION FOR USE AND TRANSPORTING

5. Preparation for Use. The tester is shipped without fluid in the reservoir. Prior to operation, the reservoir must be filled with calibration fluid 6850-00-974-3738 or equivalent.

NOTE

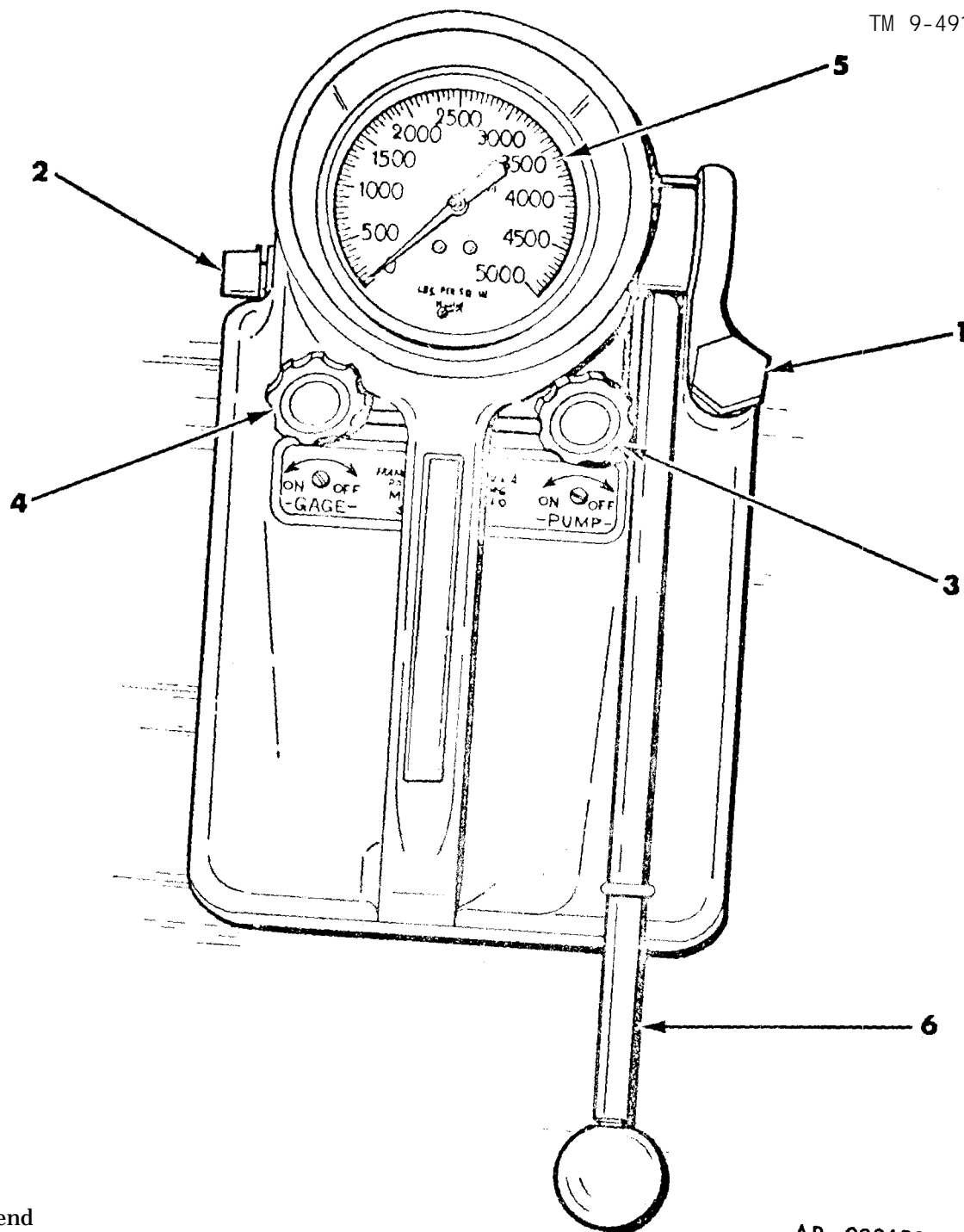
The following procedure is required whenever fluid is added to the tester.

- a. To fill the reservoir, remove filler plug (1, fig 2) and fill with approximately 1/2 gallon of fluid.
 - b. Once the reservoir is filled, replace filler plug loosely and remove plastic cap from the discharge connection (2).
 - c. Open pump valve (3) two or three turns counterclockwise.
 - d. Operate pump handle until air is purged from the tester system. This is evident by fluid being omitted from the discharge connector.
6. Transporting. Before transporting, close pump valve (3), gage valve (4), and filler plug (1) to avoid leakage.

Section III. OPERATING CONTROLS AND COMPONENTS

7. Operating Controls (Fig 2).

- a. Pump Valve. The pump valve (3) controls the fluid flow to devices under test. Turning the valve clockwise until it seats shuts the tester off, thus giving a leakage reaction of the device under test. Turning the valve two or three turns counterclockwise allows fluid to be pumped to devices under test.



Legend

1. Plug
2. Connection.
3. Pump Valve
4. Gage valve
5. Gage
6. Handle

AR 909628

Figure 2. Operating controls and components.

b. Gage Valve. The gage valve (4) permits the pressure gage (5) to measure the pressure being delivered to devices under test. To apply pressure to a device without overloading the pressure gage, the valve should be turned clockwise until it seats. This protects the gage from hydraulic shock. When measuring pressure, the valve must be turned counterclockwise one turn off its seat. To release the pressure, turn valve counterclockwise until pressure reads 0 on the pressure gage.

8. Measuring Devices and Other Components (Fig 2).

a. Pressure Gage. The pressure gage (5) is used to check delivery pressure of fuel injector nozzles and to monitor pressure drop while performing leakage test. The gage range is 0 to 5000 psi in increments of 50 psi.

b. Handle. The pump handle (6), when operated in a pumping motion with the pump valve (3) turned counterclockwise two or three turns allows fluid to be delivered under pressure to device under test.

c. Filler Plug. The filler plug (1) has to be removed so that the reservoir can be filled with calibration fluid. Filler plug must be left loose while the tester is in operation to allow air to enter the fluid reservoir.

d. Discharge Connection. Fluid is disposed from this connection (2) through proper connectors, tube assembly, etc, to the device under test.

Section IV. TESTING

9. General Procedures for Testing Fuel Injector Nozzles.

WARNING

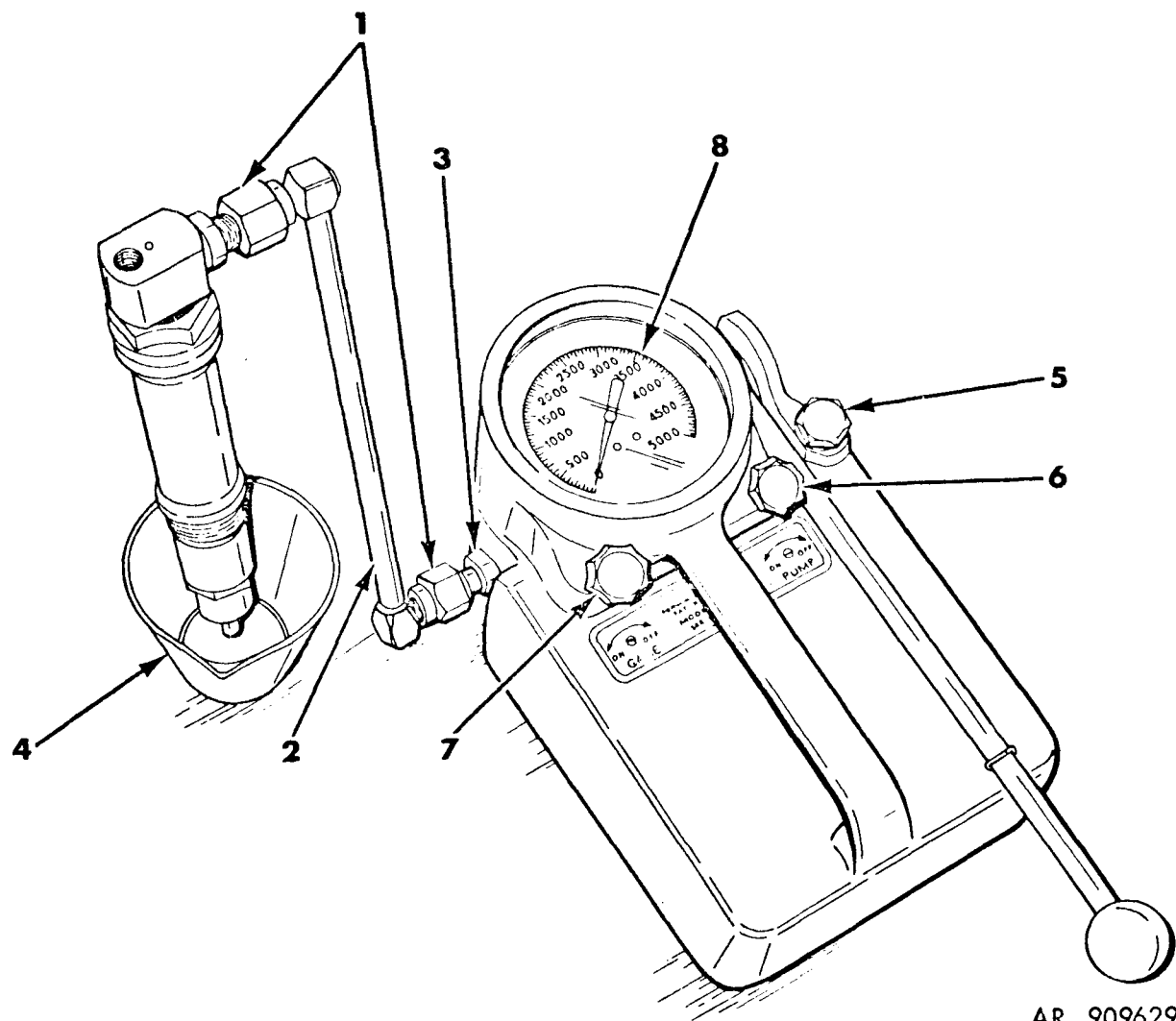
Before-using the tester, the operator should be familiar with the following instructions. The tester is capable of developing high pressures. Improper use can result in damage to the instrument or injury to the operator.

CAUTION

When working with high pressures and precision parts, be sure all connecting components are clean before attaching to any device being tested. Clean components by pumping fluid through the connector components.

Avoid continual testing in the upper 1/5 of the gage scale without gage valve closed. It can cause excessive hydraulic shocks and result in reduced gage life.

- a. Preparation for Testing. See paragraph 5.
- b. Sample Hookup of Fuel Injection Nozzle.
 - (1) Using proper nuts, adapters, or connectors (1, fig 3) and tube assembly (2), connect and adapt assembly to the discharge connection (3).
 - (2) Connect fuel injection nozzle to upper connector (1).
 - (3) Place collector cup (4) under nozzle tip.
 - (4) Loosen filler cap (5) and turn pump valve (6) counterclockwise two or three turns.
 - (5) Purge the nozzle under test by operating the handle with a pumping motion.
 - (6) Open gage valve (7) counterclockwise one turn.
 - (7) Operate pump handle and note when gage (8) shows a drop in pressure. This is the delivery pressure of the fuel being dispersed from the injector nozzle tip. (Refer to appropriate manual on the nozzle under test for its delivery.)
 - (8) Upon completion of the test, open gage valve (7) counterclockwise until pressure is released from nozzle and tester.
 - (9) Remove injector and connector assembly from tester and nozzle.



AR 909629

Legend

1. Connector
2. Tube assembly
3. Connection
4. Collector cup
5. Filler cap
6. Pump valve
7. Gage valve
8. Gage

Figure 3. Fuel injector nozzle under test.

10. General Procedures for Leakage Test.

a. Preparation for Testing. See paragraph 5.

b. Leakage Test.

- (1) Using proper connectors, nuts, adapters, and the flexible connector tube (4, fig 1), adapt the connection assembly to the device under test.
- (2) Loosen filler cap (5, fig 3) and turn pump valve (6) counterclockwise two or three turns.
- (3) Purge the nozzle under test by operating the handle with a pumping motion.
- (4) Open the gage valve (7) counterclockwise one turn.
- (5) Operate pump handle and note when gage (8) reaches the pressure recommended for recording the leakage test. (Refer to the appropriate manual on the device under test for the recommended pressure to be used for the leakage test.)
- (6) Turn pump valve clockwise until the valve is seated.
- (7) Record the time and pressure drop as described in the manual on the device under test.
- (8) Upon completion of the test, open gage valve (7) counterclockwise until the pressure is released from the device and tester.
- (9) Remove the connector assembly from the device and tester.

Section V. MAINTENANCE

11. Replacement of Pressure Gage (Fig 4).

a. Removal.

- (1) Before interchanging gages, release existing pressures on gages by turning gage valve fully counterclockwise.
- (2) Place fingers in semicircular opening under gage housing and push gage (1) and adapter assembly (2) up and out.

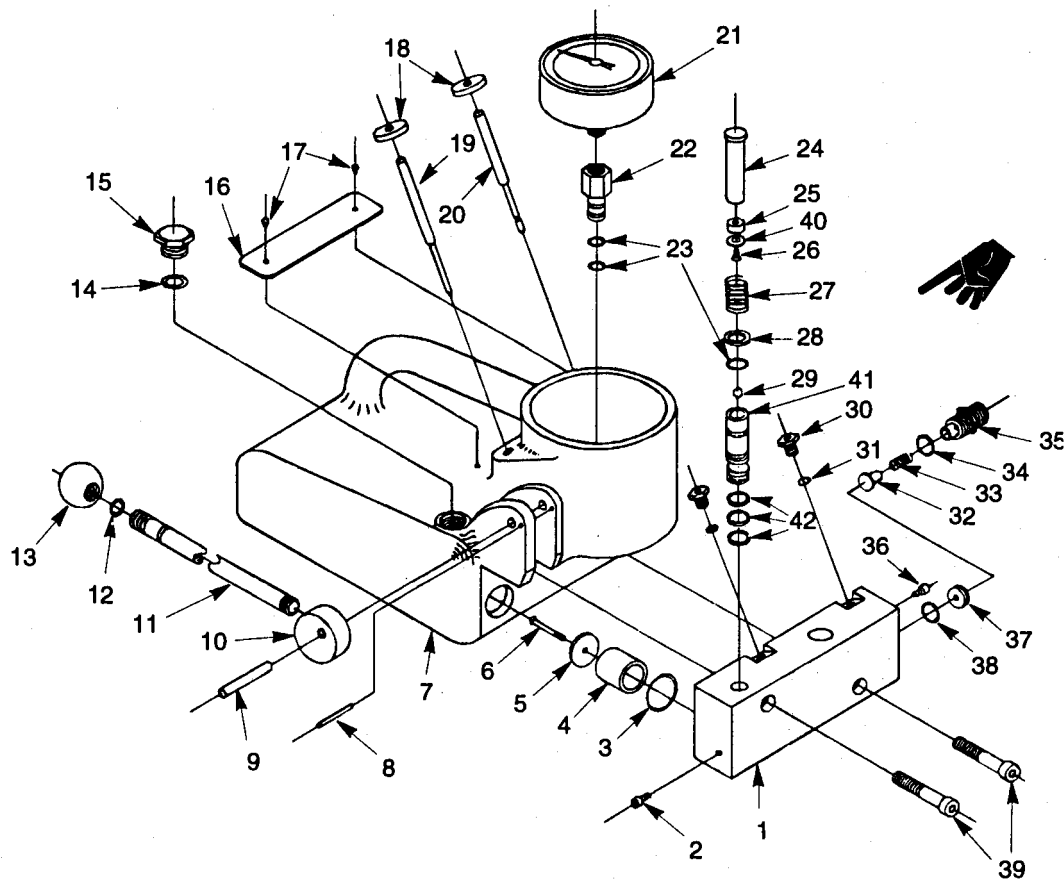


Figure 4. Diesel fuel injector nozzle tester - exploded view.

PARTS LIST

ITEM NO.	PART NAME	ITEM NO.	PART NAME	ITEM NO.	PART NAME
1	DTP-31-1 Pump Block	15	DTP-25 Filler Plug	29	DTP-09* Ball
2	DTP-26 Soc Hd Scr	16	DTP-36 Name Plate	30	DTP-10 Gland Nut
3	DTP-33* 'O' Ring	17	DTP-37 Screw-Drive	31*	DTP-1t 'O' Ring
4	DTP-34* Filter	18	DPG-38 Knob	32	DTP-12* Valve
5	DTP-35 Washer	19	DTP-39 Valve - Pump	33	DTP-13* Spring
6	DTP-16 Screw	20	DTP-0 Valve - Gage	34	DTP-14* 'O' Ring
7	DTP-17 Pump Housing	21	DTP-41 Gage	35	DTP-15* Connector
8	DTP-18 Pin-Roll	22	DTP-02 Gage Adaptor	36	DTP-26 Soc Hd Scr
9	DTP-19 Dowel	23	DTP-3* 'O' Ring	37	DTP-27* Seat
10	DTP-20 Cam	24	DTP-4 Piston	38	DTP-43 'O' Ring
11	DTP-21 Handle	25	DTP-5* Seal - Piston	39	DTP-29 Soc Hd Scr
12	DTP-22* 'O' Ring	26	DTP-6* Screw - Pan Hd	40	DTP-47 Washer
13	DTP-23 Knob	27	DTP-47* Spring	41	DTP-46 Sleeve - Pump
14	DTP-24* 'O' Ring	28	DTP-48* Washer	42	DTP-45 'O' Ring

*components that are included in the DT-1300 RK Repair Kit.

REPAIR SERVICE: For complete factory repair and reconditioning service, at nominal charge, send your KIENE instrument to manufacturer.

b. Installation. Press new gage (21) and adapter assembly (22) into gage housing on the top.

12. Replacement of Filter (Fig 4).

a. Removal.

- (1) Unscrew two socket head screws (39).

WARNING

When removing pump block (1), apply pressure downward on piston (24) to prevent it from springing out of the block.

- (2) Pull pump block (1) away from pump housing (7).

- (3) Remove filter (4)

b. Installation.

- (1) Install new filter (4).

- (2) Push pump block (1) into pump housing (7).

- (3) Install two socket head screws (39).

13. Lubrication. Lubricate the surface of cam (10) and dowel (9) with SAE 10 oil every 10 to 20 hours of tester use.

14. Troubleshooting.

a. This section contains the troubleshooting information for locating and correcting most of the operating troubles which may develop in the diesel fuel injector nozzle tester. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine the corrective actions for you to take. You should perform the tests/inspections and corrective actions in the order listed.

b. This supplement cannot list all possible malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious) or is not corrected by listed corrective action, notify your supervisor.

Table 2. Troubleshooting

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

1. Fluid Is Not Being Dispersed From the ischarge.Connection.

Step 1. Check for low level of fluid in tester.

Fill tester with fluid.

Step 2. Check to see that pump valve is fully closed in the clockwise position.

Turn pump valve counterclockwise two turns.

Step 3. Check for dirty filter.

Replace filter.

Step 4. Check for stuck or dirty piston.

Clean piston and piston hole. Take care not to mar surface.

Step 5. Check for stuck valve.

Clean valve.

2. No Pressure Readings Are On The Pressure Gage.

Step 1. Check to see that the gage valve is fully closed in the clockwise position.

Open valve clockwise one turn.

Step 2. Check for plugged gage adapter.

Remove gage and then remove obstruction.

Step 3. Check for inoperable gage.

Replace gage.

INSTRUCTIONS

CAUTION

Prior to putting this new tester into use, familiarize yourself with the following instructions. Since the tester is capable of developing very high pressures, improper use could result in damage to instrument or injury to operator.

1. Thread HANDLE (Fig. 4, Item 11) into CAM (Item 10).
2. PUMP VALVE (Item 19)
 - a. Turning valve clockwise until it seats shuts the tester off thus giving a true leakage reading of the device being tested.
 - b. Turn valve two or three turns counter-clockwise off its seat, for normal pump operation.
3. GAGE VALVE (Item 20)
 - a. To apply pressure to a device without overloading gage, turn the valve clockwise until it seats. This position is used to protect gage from hydraulic shock.
 - b. To test any device, using the gage, turn valve counter-clockwise to a neutral position, approximately one turn off its seat.
 - c. To release pressure on the test system, continue turning gage valve counter-clockwise until pressure is released. Screw valve in (clockwise) again in preparation for the next test.

CAUTION

Continuous testing in the upper 1/5 of gage scale, and severe hydraulic shocks without gage valve closed could result in reduced gage life. Avoid when possible.

4. QUICK-CHANGE GAGE (Item 21)

Before interchanging gages, release existing pressure on gage to avoid damage to instrument. Place fingers in semi-circular opening under gage housing and push GAGE (Item 21) and GAGE ADAPTER (Item 22) up and out. To install another gage merely reverse procedure, pressing gage in from the top.
5. PUMP OUTPUT CAPACITY - 1300 mm³ (1.3 cc) per stroke at 7500 psi
6. FILTER (Item 4)

The tester is equipped with a very fine (3 to 5 Microns) filter which will remove any dirt that maybe in the fluid. The use of clean fluid will insure longer service and life of filter.
7. FILLER PLUG (Item 15) must be left loose while tester is in operation to allow air to enter fluid reservoir.
8. Before transporting, close pump and gage valves and filler plug to avoid leakage.
9. Remove FILLER PLUG (Item 15) and fill with fluid desired for testing. Reservoir capacity - Approximately 1/2 gallon
10. Operate pump handle until air is purged from the system as evidenced by fluid emitting from Discharge Connection (Item 35). This step is also necessary in the event the tester runs completely out of fluid.

CAUTION

When dealing with high pressures and precision parts the introduction of dirt is very harmful. Be sure all connecting apparatuses are clean before attachment to device to be tested. The simplest and best way to do this is to pump fluid through them with the tester.

11. CAM (Item 10) surface and DOWEL (Item 9) should be lubricated with SAE 10 oil every 10 to 20 hours of tester use.
12. Keeping above instructions in mind will assure trouble-free operation and efficient service in a widevariety of tests.

SECTION VI. PARTS LIST

15. PARTS LIST. REFER TO TABLE 3 FOR A LIST OF THE COMPONENTS SHOWN IN

FIGURE 4.

TABLE 3. PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION
1	DT-1	GAGE
2	DT-2	ADAPTER, GAGE
3	DT-29	SCREW, SOCKET HEAD
4	DT-31	BLOCK, PUMP
5	DR-34	FILTER
6	DT-4	PISTON
7	DT-17	HOUSING, PUMP
8	DT-20	CAM
9	DT-19	DOWEL
10	DT-32	SCREW, SOCKET HEAD
11	DT-33	O-RING
12	DT-35	WASHER
13	DT-16	SCREW, PHILLIPS HEAD
14	DT-18	PIN, ROLL
15	DT-21	HANDLE
16	DT-22	O-RING
17	DT-23	KNOB
18	DT-24	O-RING
19	DT-25	PLUG, FILLER
20	DT-36	NAMEPLATE
21	DT-37	SCREW, DRIVE

TABLE 3. PARTS LIST--CONTINUED

ITEM NO.	PART NO.	DESCRIPTION
22	DT-38	KNOB
23	DT-39	VALVE, PUMP
24	DT-40	VALVE, GAGE
25	DT-3	O-RING
26	DT-5	SEAL, PISTON
27	DT-6	SCREW, PAN HEAD
28	DT-7	SPRING
29	DT-8	WASHER
30	DT-9	BALL
31	DT-10	NUT, GLAND
32	DT-11	O-RING
33	DT-12	VALVE
34	DT-13	SPRING
35	DT-14	O-RING
36	DT-15	CONNECTOR
37	DT-26	SCREW, SOCKET HEAD
38	DT-27	SEAT
39	DT-28	O-RING
40	DT-30	DOWEL

By Order of the Secretary of the Army:

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The connection should be No. 7 and the pump valve
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