

TM 9-4910-610-14 & P

**DEPARTMENT
OF THE ARMY TECHNICAL MANUAL**

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

FOR

**TESTER, COMPRESSION
(KIENE DIESEL ACCESSORIES, INC)
(4910-00-808-4300)**

**HEADQUARTERS,
DEPARTMENT OF THE ARMY**

DECEMBER 1977

REPORTING OF ERRORS

You can help improve this manual by calling attention to errors and by recommending improvements and by stating your reasons for the recommendations. Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) should be mailed directly to Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299. A reply will be furnished directly to you. For your convenience, preaddressed DA Form 2028's are included as final pages of this manual.

Operator, Organizational, Direct Support and General Support Maintenance Manual Including Repair Parts List for:

Tester, Compression, Model C-400

(4910-00-808-4300)

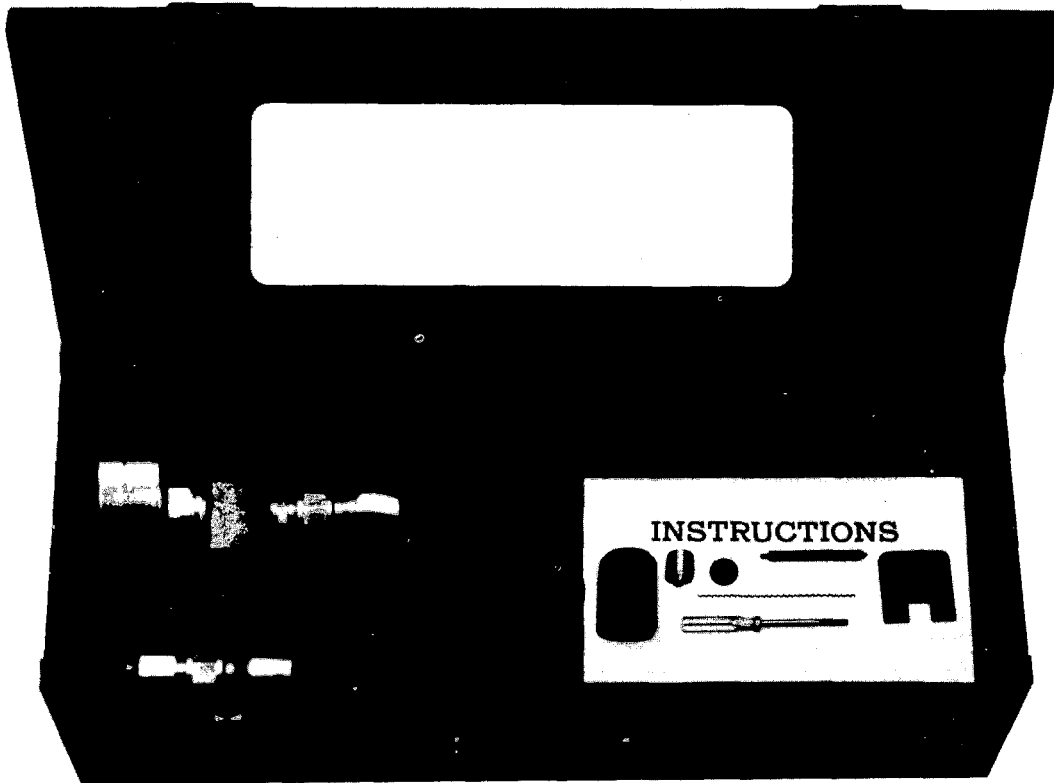
NOTE

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

Manufactured by: Kiene Diesel Accessories
Addison, IL 60101

Procured under Contract No: **DAAA09-76-M-6020**

INSTRUCTIONS Model C-400 COMPRESSION TESTER



The instrument is packed in the carrying case with the flexible hose disconnected. Unscrew the Jacking Out Nut, C-13 off the valve assembly. The instrument is then ready for use. It is connected to the engine cylinder by means of a suitable adaptor.

There are adaptors designed for all types and sizes of diesels. Spark plug adaptors are available for compression testing gas engines. Gages are furnished in whatever range necessary.

COMPRESSION TESTING: This adapter is either a fuel injector dummy or a spark plug dummy, whichever is easiest in application and best suited for the purpose. Remove the fuel injector or spark plug from the cylinder to be indicated; shut off or by-pass the fuel from the cylinder: **TURN THE ENGINE OVER A FEW REVOLUTIONS TO BLOW OUT CARBON OR ANY OTHER FOREIGN MATTER FROM THE PORT BEFORE CONNECTING THE ADAPTOR AND THE INSTRUMENT;** run engine at manufacturer's recommended speed for compression testing. Actual compression will be registered by the gage pointer after a few revolutions.

Unions are provided on the flexible hose and an elbow is fitted to **CONNECTOR R I N G 4**. Changing the flexible hose lead from the valve assembly is made easy with the unions and there is no need to disturb the pipe joints on **CONNECTOR RING**. An up lead or angle lead can be made quickly from the valve assembly to clear such possible obstructions as throttle gear, strainers, purifiers, rocker arms, valve gear, etc. In a few instances of difficult application because of congested space, the **CAP NUT 5** and the **CONNECTOR RING 4** are removed from the valve body assembly. The adaptor and valve body assembly are then fitted to the engine port. Making up the **CONNECTOR RING 4** and the **CAP NUT 5** does not require much overhead space.

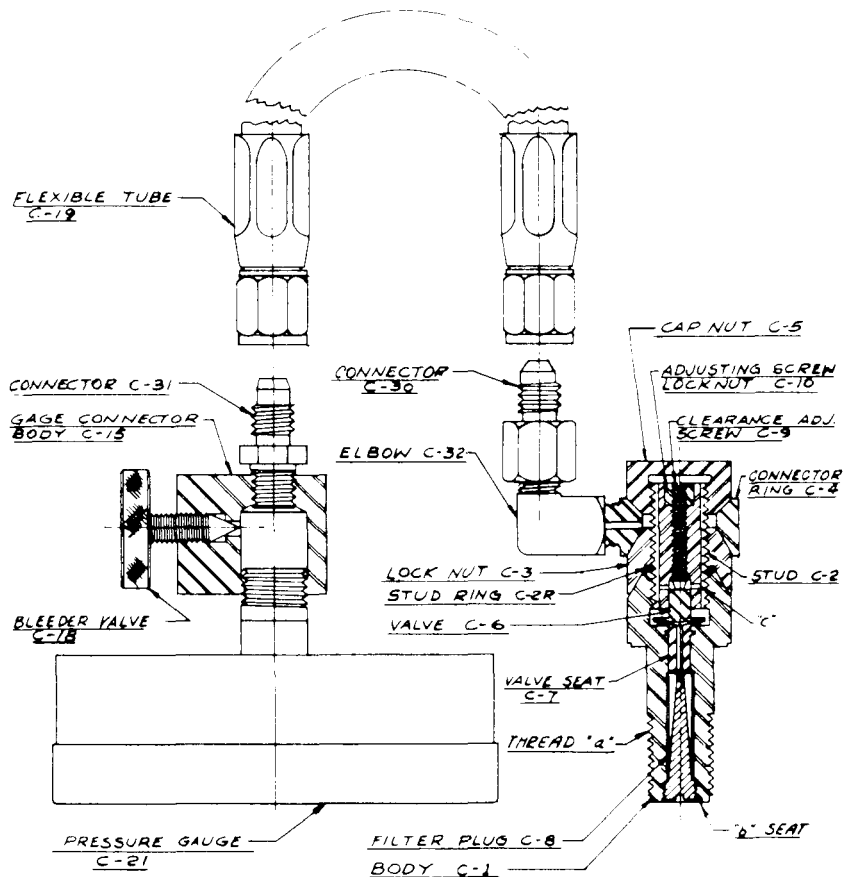
MAINTENANCE: Length of good service to be expected from the instrument depends on severity of conditions to which it is subjected. Continued exposure to fouling cylinders will soon foul the instrument with carbon and varnish deposits and cleaning will be necessary at more frequent intervals. Best practice under such conditions is to use the instrument for as short a period of time as is needed to obtain satisfactory readings. Frequency of the need for cleaning can be reduced considerably by blowing a good grade of lubricant through the instrument. Any safe detergent oil can be squirted in at the FILTER PLUG C-8 or into the adaptor before connecting the instrument to engine. Open BLEEDER VALVE C-18 and allow engine pressure to blow oil through the length of instrument. This accomplishes a good lubricating job and tends to prevent the hard formations of carbon. It is especially good practice to do this lubrication when testing the last cylinder and before the instrument is put aside for any long period of time.

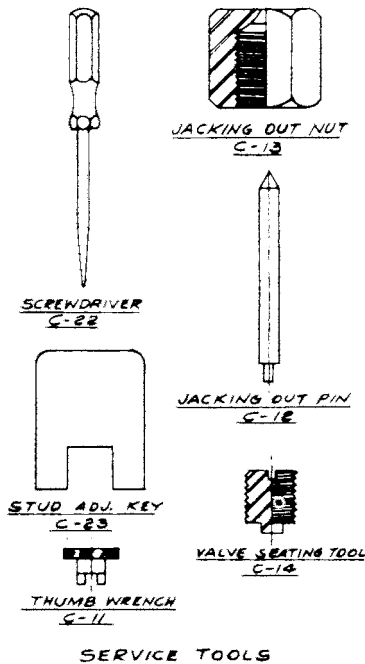
EVIDENCE OF DEFECTIVE OPERATION AND RECOMMENDED CORRECTIONS: At the factory, the instrument is tested over the gage range. It is gas tight and correct within one percent before being shipped. If the gage pointer follows the cycle pressures of the cylinder indicated, cause maybe due to excessive valve-clearance, seizure of the valve or excessive leakage through some joint of the instrument. If instrument does not retain pressure when cut off from the cylinder indicated, excessive clearance is the cause and should be remedied as under "ADJUSTMENT" on valve setting.

A seized valve can frequently be freed by opening and closing the BLEEDER VALVE 18 a few times while instrument is subjected to engine pressure. This also can be tried to loosen carbon or any other foreign matter which may have lodged between valve and seat. If either of the foregoing conditions cannot be corrected in this manner, the instrument must be taken apart for cleaning.

Should the instrument not hold pressure for a reasonable length of time after it is cut off from the engine pressure, source of leakage can be detected by immersing all connections in water. DO NOT IMMERSE THE GAGE BELOW ITS CONNECTION. Examine evidence of leakage for looseness, dirt or damage. A dry joint will often seat imperfectly and can be corrected with an application of graphited grease.

DISASSEMBLY: Hold Body C-1 in vise at hex section: Remove CAP NUT C-5: Remove CONNECTOR RING C-4: Loosen LOCK NUT C-3: Loosen STUD C-2 with KEY C-23: Remove remainder of assembly from vise invert and hold vertically while unscrewing BODY C-1 from STUD C-2 and remove VALVE C-6 with utmost care. VALVE MAY STICK TO VALVE SEAT C-7 in body or in valve bore of STUD C-2. Valve section is too thin to withstand damage from much localized pressure in handling or accidental dropping. FILTER PLUG C-8 is removed by unscrewing from BODY C-1. VALVE SEAT C-7 is removed by inserting the small diameter end of the JACKING OUT PIN C-12 into the stem bore of the VALVE SEAT C-7 and screwing the JACKING OUT NUT C-13 on to the BODY C-1 at thread "a" until the VALVE SEAT C-7 is free.





There is no need to remove the VALVE SEAT C-7 in the process of cleaning. A mixture of oil and BONAMI on a soft swab will remove varnish or tar deposits from seat surface. If the seat surface has been damaged by some foreign matter from neglect to blow adaptor or engine port clear as instructed correction should be tried by rotating true in a lathe or polishing head and using crocus cloth only. Otherwise, if damage is considered serious, it is best to replace the valve seat. The valve seat face angle and the center support regulate the proper seating action of the valve.

REASSEMBLY: A TUBE OF GRAPHITED GREASE IS FURNISHED WITH THE INSTRUMENT AND SHOULD BE USED GENEROUSLY ON ALL THREADS AND JOINTS. Thoroughly clean BODY C-1 and secure in vise at hex section; bring small diameter of JACKING OUT PIN C-12 up through FILTER PLUG bore in BODY to help guide VALVE SEAT down. Valve seat stem is slightly tapered at one end for easy entry into bore of body. Exert light pressure downward at center of valve seat with a matchstick so no damage is done to seat surface. Screw VALVE SEATING TOOL C-14 down to press valve seat in place; unscrew valve seating tool; remove assembly from vise; screw FILTER PLUG C-8 into body.

The STUD RING C-2R is set at the factory. Sufficient clearance is allowed for characteristic c valve adjustment and this STUD RING setting prevents any possible damage to VALVE C-6 when positioning STUD C-2. Thoroughly clean STUD C-2 and make sure that vent at "c" is clear: Hold STUD C-2 with

valve bore up; drop a small quantity of good lubricating oil into bore and insert valve stem. Screw BODY C-1 down on STUD C-2 finger tight. Turn assembly right end up and secure in vise at hex section of body; tighten stud firmly with KEY C-23; lock STUD C-2 to BODY C-1 with LOCK NUT C-3; use screwdriver C-22 and THUMBWRENCH C-11 to adjust valve as under "Valve Adjustment" below. Place CONNECTOR RING C-4 over STUD C-2, sixty degree seat to sixty degree face of the LOCK NUT C-3. Screw CAP NUT C-5 into STUD C-2 to make gas tight seat.

VALVE ADJUSTMENT: Good adjustment for average conditions is made as follows: With LOCK NUT C-3 locking STUD C-2 in BODY C-1 as previously described, turn the CLEARANCE ADJUSTING SCREW C-9 against the VALVE C-6 with light pressure until the valve is felt to be slightly depressed against valve seat. Then unscrew until the pressure is felt to release. From this contact release, unscrew CLEARANCE ADJUSTING SCREW C-9 a little more than 1/8 a turn and lock this setting with ADJUSTING SCREW LOCK NUT C-10. The SCREWDRIVER C-22 and THUMBWRENCH C-11 are furnished for this purpose. The screwdriver fits through the bore of the thumb wrench and holds the adjusting screw in place while lock nut is tightened. The contact release point of the valve from the seat can easily be detected and the adjustment of the valve is not too difficult after a little practice.

THE GAGE: When it is suspected that the gage is in error and a few different pressures are available which are known to be correct check gage against these known pressures. If positive error is found, recalibration is recommended with a dead weight tester.

TO PROLONG LIFE ON THE INSTRUMENT:

BLOW THE INDICATOR ADAPTOR AND ENGINE PORT CLEAR OF ALL FOREIGN MATTER BEFORE ATTACHING INSTRUMENT FOR USE.

LUBRICATE THE INSTRUMENT. DO THIS ESPECIALLY BEFORE LAYING ASIDE FOR ANY LONG PERIOD OF TIME. LUBRICATE OFTEN WHEN USED ON FOULING CYLINDERS.

USE GRAPHITED GREASE ON THREADS AND JOINTS WHEN REASSEMBLING INSTRUMENT.

CHECK THE GAGE IF IT IS ACCIDENTALLY DAMAGED. THIS INSTRUMENT IS ONLY AS ACCURATE AS ITS GAGE.

REPLACEMENT PARTS LIST FOR
MODEL C-400 COMPRESSION TESTER

PART NO.		PART NO.	
C-1	Body	C-13	Jacking Out Nut (Service Tool)
C-2	Stud	C-14	Valve Seating Tool (Service Tool)
C-2R	Stud Ring	C-15	Gage Connector Body
C-3	Lock Nut	C-18	Bleeder Valve
C-4	Connector Ring	C-19	Flexible Tube
C-5	Cap Nut	C-20	Carrying Case
C-6	Valve	C-21	Pressure Gage
C-7	Valve Seat	C-22	Screw Driver
C-8	Filter Plug	C-23	Stud Adjusting Key (Service Tool)
C-9	Clearance Adjusting Screw	C-30	Connector
C-10	Adjusting Screw Lock Nut	C-31	Connector
C-11	Thumb Wrench (Service Tool)	C-32	Elbow
C-12	Jacking Out Pin (Service Tool)		

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PAGE NO.

PARA-GRAPH

FIGURE NO.

TABLE NO.

3

2

Item 10. Change illustration. Reason: Tube end shown assembled on wrong side of lever cam.

109

51

Item 3. The NSN and P/N are not listed on the AMDF nor the MCRL. Request correct NSN and P/N be furnished.

2-8

2-1

Preventive Maintenance Checks and Services. Item 7 under "Items to be inspected" should be changed to read as follows: Firing linkage and firing mechanism pawl.

12

1-6a

Since there are both 20- and 30- round magazines for this rifle, data on both should be listed.

SAMPLE

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