TM 9-4910-463-10

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S MANUAL

TESTER, ENGINE DISTRIBUTOR, BENCH TYPE, 115-VOLTS, 60-CYCLE, SINGLE-PHASE, FOR TESTING 6, 12, AND 24-VOLT DISTRIBUTORS (ALLEN ELECTRIC AND EQUIPMENT COMPANY MODEL 30-89) (4910-392-2939)

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

HEADQUARTERS, DEPARTMENT OF THE ARMY

JANUARY 1966

TM 9-4910-463-10
CHANGE No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *15 January 1973*

Operator's Manual

TESTER, ENGINE DISTRIBUTOR: BENCH TYPE, 115-VOLTS, 60 CYCLE, SINGLE PHASE, FOR TESTING 6, 12, AND 24-VOLT DISTRIBUTORS (ALLEN ELECTRIC AND EQUIPMENT COMPANY MODEL 30-89) (4910-392-2939)

This Change is current as of 22 November 1972.

TM 9-4910-463-10, 3 January 1966, is changed as follows:

Page 2. Add the following paragraph below "SECTION I" and above "DESCRIPTION."

Reporting of Errors

You can improve this manual by calling attention to errors and by recommending improvements, using DA Form 2028 (Recommended Changes to Publications), or by a letter, and mail direct to Commander, US Army Weapons Command, ATTN: AMSWE-MAS, Rock Island, IL 61201. A reply will be furnished directly to you.

Page 2. Add the following paragraph as last paragraph under "DESCRIPTION."

The items in the following table, formerly included in the Basic Issue Items List on pages 12 and 13, are now designated as components or parts of the end item configuration. Manufacturers' codes for these items are:

01216 . . . . . Allen Electric and Equipment Co.
74545 . . . . . Hubbell Harvey Inc.

Part	FSCM/Part Number
ADAPTER, "A": vacuum fitting	01216:15958
ADAPTER CONNECTOR: 2 connector mating ends, stght shape, 5 contacts, 1 female, U-hollow, 2 female, flat at one end, 2 male, flat at other end, non-locking, 1.078 long by 1.438 diameter inches	22527:9-525-10
ADAPTER DISTRIBUTOR: primary	01216:A600150
ADAPTER, DRIVER: Splined	01216:9752
ADAPTER, "K": vacuum fitting	01216:1109
ADAPTER "P": vacuum fitting	01216:1241
ADAPTER "Q: vacuum fitting	01216:1242
ADAPTER SLEEVE:	01216:9877-1
ADAPTER, SLEEVE	01216:10960
BUSHING, DISTRIBUTOR:	**01216:2740-2**
GAUGE TENSION: spring	01216:13686
HOSE VACUUM: panel to distributor	01216:16062
WASHER, FLAT non-metallic	01216:7544
WIRE JUMPER: clip lead	01216:A6875

Page 12 and 13. APPENDIX I is rescinded.

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

Active ***Army:***

DCSLOG (3)
CNGB (1)
COE (3)
TSG (1)
USA Arty Bd (1)
USARADBD (1)
USAARENBD (2)
USACDCTA (2)
AMC (5)
WECOM (10)
MECOM (2)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Cored (2) except
  USAREUR (10)
USASETAF (6)
USARSO (5)
USARYIS (5)
LOGCOMD (3)
Armies (3) except
  seventh (5)
  Eighth (5)
Div (2)
AVSCOM (2)
Ft Monmouth (2)
Ft Story (1)
USMA (2)
USAQMS (2)
USAARMS (4)
USAFAS (2)
Army Dep (3) except
  LEAD (5)
APG (1)
DPG (1)
YPG (1)
Arsenals (2) except
  Detroit (5)
  Rock Island (5)
Springfield Armory (1)
Brooklyn Army Tml (1)
ARMISH (3)
TC Tng comd, Ft Eustis (2)
TC Stg Sta, Camp Kilmer (1)
TC Stg Sta, Ft Hamilton (1)
TC Stg Sta, Ft Dix (1)
TC Stg **Sta, Ft** Devens (1)
TC Stg **sta,** Camp AP Hill (1)
TC Stg Sta, Ft Bragg (1)
TC Stg Sta? Ft Benning (l)
Ft Knox FLDMS (10)
Units org under fol TOE - 2 ea.
  7-100
  9-7
  9-9
  9-127
  9-167
  9-197
  9-357
  10-445
  10-448
  17-100
  29-1
  29-11
  29-15
  29-16
  29-17
  29-21
  29-25
  29-26
  29-27
  29-35
  29-36
  29-37
  29-55
  29-56
  29-65
  29-75
  29-79
  29-105
  29-109
  37-100
  57-100

ARNG: State AG (3).

USAR: Same as Active Army except allowance is one (1) copy each.

For explanation of abbreviations used, see AR 310-50.

U.S. Government PRINTING OFFICE: 1972-769614/371
810-557

TABLE OF CONTENTS

OPERATING INSTRUCTIONS
ENGINE DISTRIBUTOR TESTER
FSN: 4910-392-2939
Allen Model No. 30-89

SECTION I

DESCRIPTION

The Distributor Tester (Syncrograph) is designed to allow the serviceman to duplicate "on-the-car" operation fo the distributoer in order to make sure it conforms to specifications after repairs have been made.

It will indicate the Cam Angle, Centrifugal and Vacuum Advance mechanism operation, Synchronization of dual breaker points, engine and distributor RPM and so forth.

The Cam Angle Meter indicates the distributor cam angle on a direct reading scale of 0-60 degrees for 4, 6, and 8 lobe distributors.

The Vacuum Gauge is calibrated from 0 to 25 inches of mercury on 0.1 inch divisions for accurate measurements.

The Tachometer employs two scales (500 and 2500) calibrated in Distributor RPM. Engine RPM and Degree readings for 4 cycle engines are double the distributor RPM and degree readings.

The Protractor Scale is calibrated in 360 Distributor Degrees of rotation.

SECTION II

MOUNTING DISTRIBUTOR

1. Adjust distributor support arm height in relation to distributor shaft length. Place distributor in support arm with drive end of distributor shaft in chuck jaws.

2. Tighten chuck jaws on distributor shaft (or gear) using chuck wrench provided. Align distributor in support arm, then tighten support arm clamp. Turn chuck assembly by hand to make sure alignment of distributor in chuck and support arm is correct. Securely tighten both Chuck and Support Arm Jaws.
   NOTE: Sleeve adapters are furnished for mounting distributors having separate vacuum control units. The correct sleeve adapter should be clamped in the Support Arm, then the distributor placed in the Adapter and secured in the Chuck. An adjustable bracket is attached to the Support Arm for use in holding the separate vacuum units.

SECTION III

DISTRIBUTOR TESTING - Mechanical

1. Plug power cord into AC outlet. 115 Volt 60 cycle ONLY.

2. Connect the Tester "Clip Lead" to distributor primary terminal on

"primary lead" wire. For sealed distributors, connect "Clip Lead" to primary adapter (A600150) inserted in distributor cap (by removing plug in top of cap) using a jumper lead, connect the distributor primary power terminal to the primary adapter.

When checking a sealed distributor with. the cap removed, connect Tester "Clip Lead" to the point side of tail and connect jumper lead from "Clip Lead" to the other side of coil. If jumper is not used, a double image will appear at degree ring.

3. Turn Motor Switch to RIGHT or LEFT as required to rotate the distributor shaft in the correct direction. Turn the Selector Switch to the SYNC position. NOTE: Motor Switch Position (right or left) refers to the shaft rotation as viewed from the breaker plate end of the distributor.

4. Adjust SPEED CONTROL to vary the distributor RPM through the full speed range as stated in the specifications.
   There should be ONE SINGLE FLASH for each cam lobe (4, 6, or 8 flashes). Erratic or faint flashes preceding the regular flashes as the RPM is increased can be caused by:
   a. Weak breaker arm spring tension
   b. Breaker arm binding on" pivot pin.
   c. Jumper not used (sealed distributors).

5. Adjust Speed Control to operate distributor at 1250 Distributor RPM. Move Protractor Scale so that ZERO DEGREE mark on the scale lines up with one of the neon flashes. All of the flashes should be evenly spaced from each other around the scale as follows:

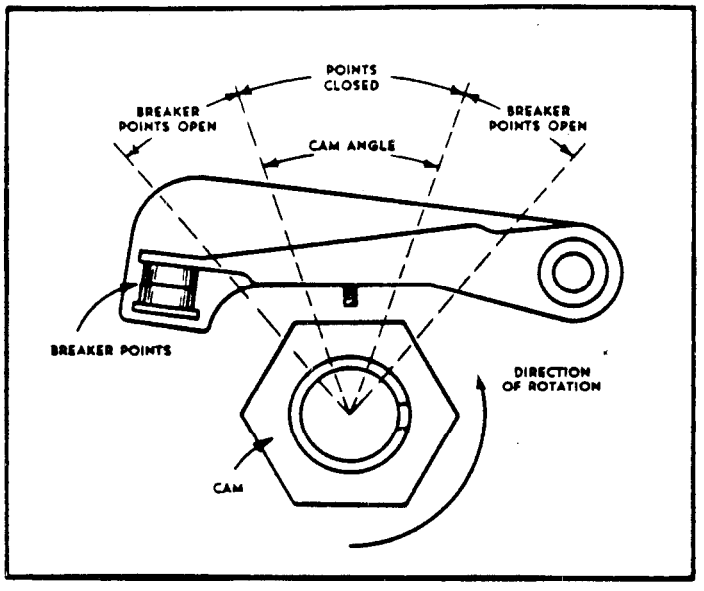
   4 cylinder engine - flashes 90° apart
   6 cylinder engine - flashes 60° apart
   8 cylinder engine - flashes 45° apart

   The recommended maximum variation is plus or minus 1 degree or a total of 2 degrees variation for each cam lobe. See manufacturers specifications for maximum variations. A greater variation or erratic or wandering flashes may be caused by the following:
   a. Worn cam.
   b. Worn distributor shaft or bushings.
   c. Bent distributor shaft.
   d. Chuck jaws not tightened on distributor shaft.

SECTION IV

CAM ANGLE (Dwell) TEST

1. Turn Selector Switch to the CAM position. Operate the distributor at approximately 1000 RPM.
   NOTE: If distributor is equipped with dual breaker points, block one set of points "open" with insulating material while the remaining set of points are being checked.



CAM ANGLE OR DWELL

Degrees of Cam Rotation Through Which Contact Points Remain Closed.

Figure No. 1

2. Adjust breaker point gap to conform to manufacturer's specifications.

3. Repeat the above procedure for the blocked open points.

SECTION V

CENTRIFUGAL ADVANCE MECHANISM TEST

Figure No. 2 illustrates the distributor firing pattern for an eight cylinder engine. Note the even spacing of the neon flashes against the 45 degree (8 cylinder) markings on the protractor scale which is obtained when the distributor is in proper operating condition.

Lack of synchronization, excessive cam wear, worn bearings, or weak breaker arm spring tension causing contact point chatter are all disclosed by uneven or intermittent flashes around the protractor scale.

Centrifugal and Vacuum spark advance mechanisms are tested by the number of degrees the neon flashes advance around the scale from the zero reference mark, as distributor speed or vacuum is increased.

1. Turn TEST SELECTOR to the SYNC position.

2. Operate the distributor as slow as possible, and move the protractor scale so that one of the flashes is at zero degrees.

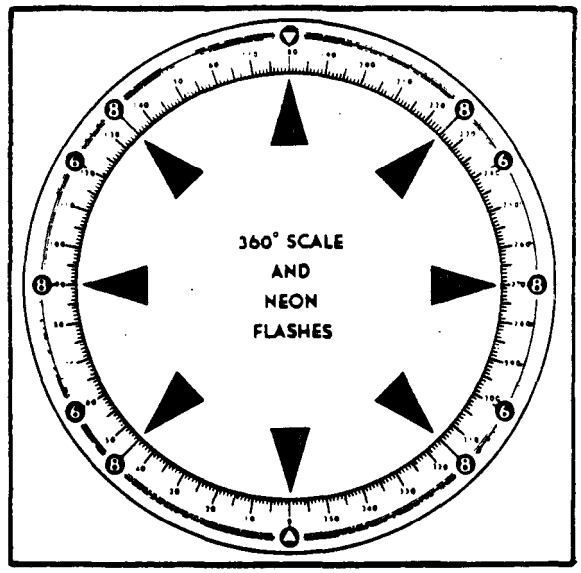


Figure No. 2

8 Lobe Distributor

Firing Pattern

SECTION V Cont.

3. Increase distributor speed to correspond with the lowest speed shown in the specifications. Note the number of degrees the neon flash has rewed from the zero degrees, and compare with specifications. Check advance degrees at all the speeds shown in the specifications. If the centrifugal advance does not conform with the specifications to within plus or minus 1 degree, unless otherwise stated, it may be due to the following:

   a. Improper weight spring tension
   b. Faulty or dirty advance weight mechanism
   c. Excessive end play of distributor shaft

SECTION VI

VACUUM ADVANCE TEST

1. Attach vacuum adapter fitting to vacuum unit and attach vacuum hose between distributor vacuum control and vacuum outlet located at upper left of the front panel. Check zero setting of the vacuum gauge and if necessary, adjust the small knob at lower edge of dial rim, so that the vacuum gauge hand rests on zero.

2. Turn the VACUUM SUPPLY switch to the ON position.

3. Adjust the VACUUM CONTROL knob until the vacuum gauge registers the amount indicated in the specifications.

4. Operate the distributor at speeds indicated in the specifications and check the degrees of advance and compare with the specifications. If the readings obtained do not agree with the specifications at each test point within plus or minus 1 degree, unless otherwise specified, the vacuum control should be adjusted or replaced in accordance with manufacturer's instructions.

5. As a final check, reduce distributor speed to 200 Distributor RPM. Remove all vacuum by turning the VACUUM switch to the off position.

The spark advance should return to zero.

6. Turn the TEST SELECTOR switch to the CAM position.

7, Operate the distributor at approximately 1250 Distributor RPM.

8. Vary the applied vacuum from zero to the maximum vacuum specified for the distributor being tested and back to zero again, while watching the CAM ANGLE meter for any change in the cam angle reading. A change greater than 2 degrees may be caused by the following:
   a. Worn breaker plate
   b. Worn breaker plate bearings
   c. Worn bearing race in distributor housing
   d. Worn bushings in distributor housing,

9. Check the vacuum advance diaphram for leakage by pinching the vacuum hose while observing vacuum gauge. No change in vacuum should occur if the diaphram is not leaking.

SECTION VII

SYNCHRONIZING DOUBLE BREAKER ARMS

1. Turn the TEST SELECTOR switch to SYNC position, and operate distributor at approximately 1250 Distributor RPM.

2. Move the PROTRACTOR SCALE so that one of the flashes caused by the stationary points is at the zero degree mark.

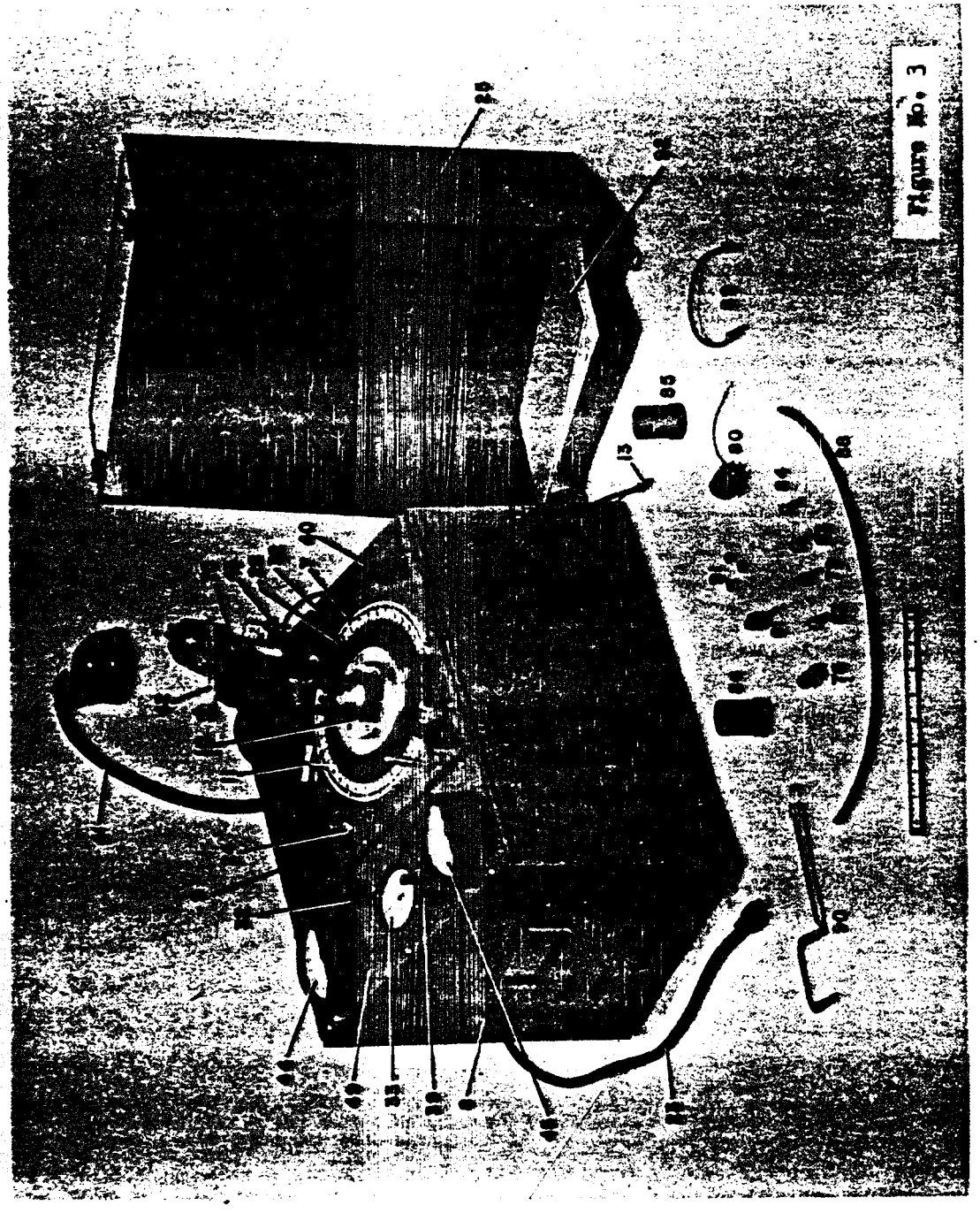
3. If the distributor is the type having half as many lobes on the cam as there are cylinders in the engine, adjust the adjustable breaker plate assembly until the flashes caused by the adjustable points are in correct relationship, in accordance with the specifications,

4. If the distributor is the type having the same number of lobes on the cam as there are cylinders in the engine, insert a piece of bakelite or fibre between the stationary contact points. Adjust the adjustable breaker place assembly until the flashes caused by the adjustable points occur at the same plate on the protractor scale, or are in the correct relationship in accordance with specifications.

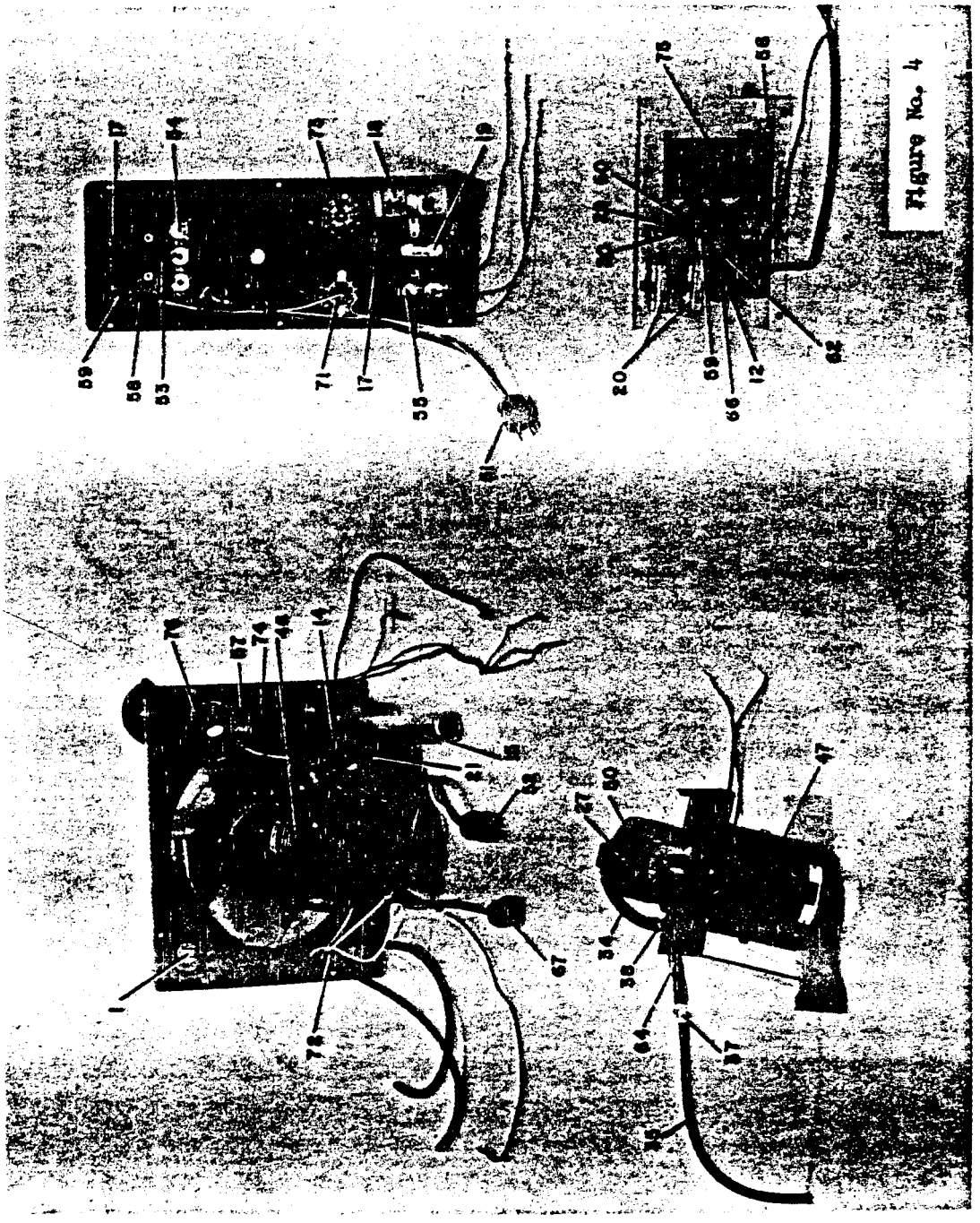
5. If the distributor has two primary terminals, use the one connected to the stationary points for setting one of the flashes to the zero degree mark on the protractor scale. Then move the lead to the terminal connected to the adjustable points. Adjust the adjustable breaker plate assembly until the flashes caused by the adjustable points occur at the same place on the protractor scale as the stationary points, or in accordance with specifications.

6. Recheck ignition timing when installing distributor on the vehicle.

SECTION VIII
PARTS LOCATION PHOTO



SECTION VIII
PARTS LOCATION PHOTO



ENGINE DISTRIBUTOR TESTER
F.S.N. 4910-392-2939
Allen Model 30-89

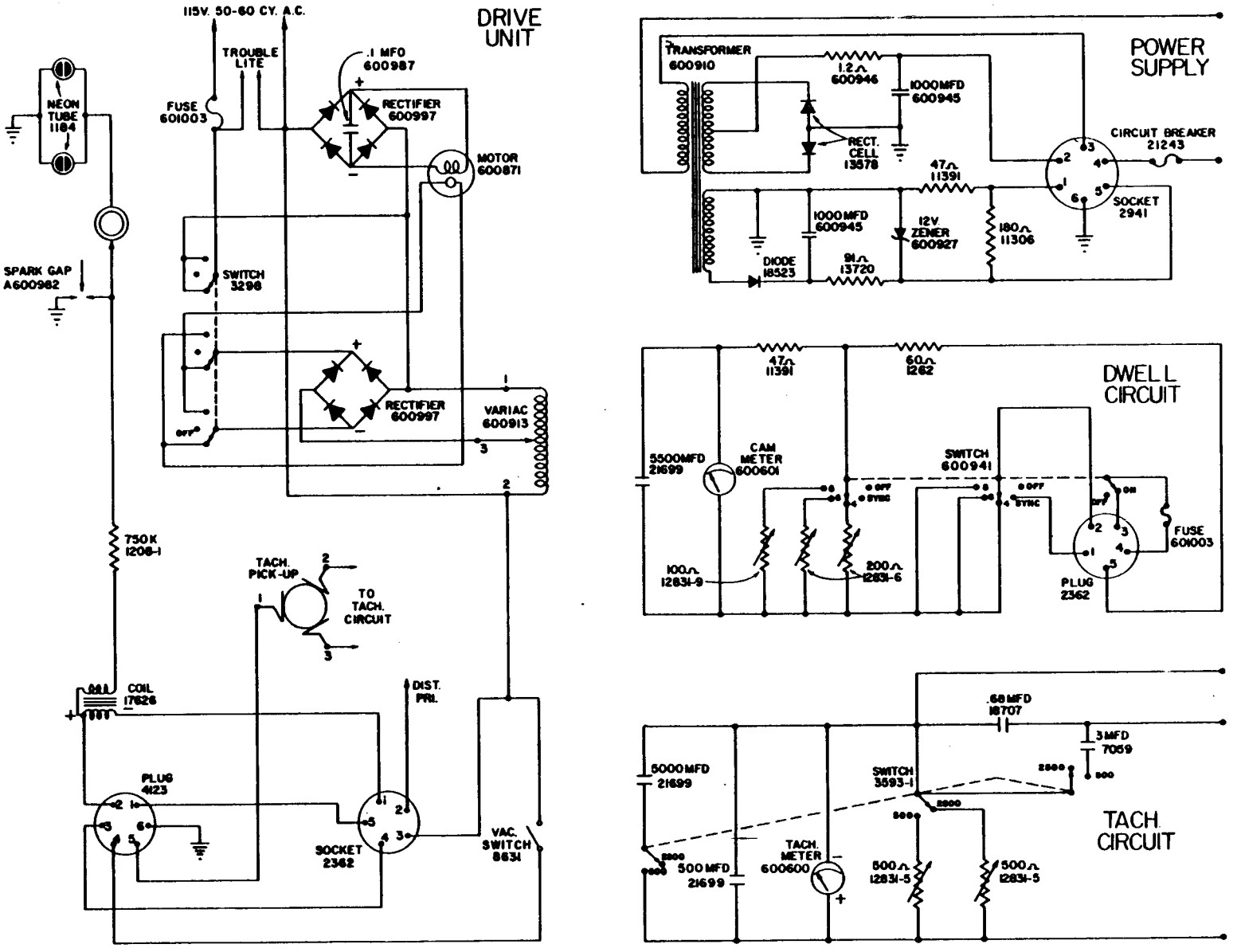
PARTS LIST

1.	Bleeder Valve		A13664
*2.	Brush	(4)	9540
*3.	Brush & Gap Ass'y		BA600982
*4.	Brush Holder		A11453-1
*5.	Bulb 60 Watt		601004
*6.	Bushing	(2)	13628
7.	Bushing, nylon	(4)	17136
8.	Case Assembly		DA600961
9.	Casting Screened		A601000
10.	Chuck & Disc Ass'y		CA17102
11.	Chuck Wrench		A16124
12.	Circuit Breaker		21243
13.	Clip		2385
14.	Coil 12 Volt		17626
15.	Column & Bushing Ass'y		A601010
*16.	Commutator		11458-5
17.	Condenser 500-500 MFD	(2)	21699
18.	Condenser 3 MFD		7059
19.	Condenser .68 MFD		18707
20.	Condenser 1000 MFD		600945
21.	Condenser .1 MFD		600987
*22.	Condenser	(2)	600917
23.	Cord, A.C.		16449-2
24.	Coupling Vacuum		13665-1
25.	Cover Assembly		CA600972
*26.	Crank Head Assembly		A600957
27.	Cylinder	(2)	B600956
28.	Degree Ring		BA13725
29.	Diode		18523
30.	Diode, Zener 12 Volt		600927
*31.	Fuse 5 amp		601003
32.	Fuse Holder	(2)	1566
33.	Gauge, Vacuum		8408-4
34.	Hose		8354
35.	Hose		16062-3
*36.	Hose		16062-7
37.	Hose Cross		8395-3
38.	Hose Tee		13666
39.	Knob		2379-4
40.	Knob		13487-1
41.	Lamp		600986
42.	Lock Arm		A7164
43.	Lock Screw		A600985

PARTS LIST Cont.

44.	Meter-Dwell		600601
45.	Meter-Tach		600600
46.	Motor, Drive		B600871
47.	Motor, Pump		600908
*48.	"O" Ring	(2)	600960
49.	Panel (Instrument)		BA600932
50.	Piston Assembly		A600953
51.	Plug 5 prong		2360
52.	Plug 6 prong		4123
53.	Potentiometer 200 ohm	(2)	12831-6
54.	Potentiometer 100 ohm		12831-9
55.	Potentiometer 500 ohm		12831-5
56.	Rectifier Cell		13578
57.	Rectifier, Silicon	(2)	600997
58.	Resistor 60 ohm 1/2 W.		1262
59.	Resistor 47 ohm 1 W.	(2)	11391
60.	Resistor 180 ohm 1 W.		11306
*61.	Resistor 91 ohm 1/2 W.		13720
62.	Resistor 1.2 ohm		600946
*63.	Resistor 750K 2 W.		1208-1
64.	Restrictor		A14865
*65.	Reducer		16063
66.	Socket 6 prong		2941
67.	Socket 5 prong		2362
*68.	Spring	(3)	11456
*69.	Strain Relief		8892-3
70.	Support Arm		A600990
71.	Switch		600941
72.	Switch - Vacuum -		8631
73.	Switch		3593-1
74.	Switch, Motor		3298
75.	Transformer		600910
76.	Transformer, Variable		600913
*77.	Valve	(2)	16387
78.	Adapter		9752
79.	Adapter "A"		15958
80.	Adapter, A.C.		16061
81.	Adapter, Dist. Primary		A600150
82.	Adapter "K"		1109
83.	Adapter “P”		1241
84.	Adapter “Q”		1242
85.	Adapter, Sleeve		9877-1
86.	Adapter, Sleeve		10960
*87.	Bushing		2740-2
88.	Hose		16062
89.	Jumper		A6875
90.	Spring Tension Gauge		13686
91.	Washer	(3)	7544
92.	Operating Instruction		25378

*Parts Not Illustrated



ENGINE DISTRIBUTOR TESTER

ALLEN MODEL 30-89 SCHEMATIC

F.S.N. 4910-392-2939

APPENDIX I

BASIC ISSUE ITEM LIST

Section I. INTRODUCTION

1. General

This appendix is a list of basic issue items. It is composed of those items which make up the major end item of equipment and the operator's tools and equipment that are issued with the equipment and are required for stockage.

2. Requisitioning a part to which FSN has not been assigned

When requisitioning a C source (local procurement) item identified only by a manufacturer's part number, it is mandatory that the following information be furnished the supply officer:

a. Manufacturer's code number (5 digit number preceding the colon in the descriptive column).

b. Manufacturer's part number (the number, and sometimes letters, following the colon (a. above)). Dashes, commas, or other marks must be included exactly as listed.

c. Nomenclature exactly as listed herein, including dimensions if necessary.

d. Name of manufacturer of end item (from cover of TM or manufacturer's name plate).

e. Federal stock number of end item (from TM).

f. Manufacturer's model number (from TM or name/data plate, preferably name/data plate),

g. Manufacturer's serial number (from name/data plate).

h. Any other information such as type, frame number, and electrical characteristics, if applicable.

i. 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:

(1) In blocks 4, 5, and 6, list manufacturer's code and manufacturer's part number (as listed in description column).

(2) In Remarks field, list noun name (repair part), and item application (FSN of end item), manufacturer, model number (end item), serial number (end item), and any other pertinent information such as frame number, type, etc.

3. Explanation of Columns

a. Source, Maintenance, and Recoverability Code (Col. 1).

(1) *Materiel numerical codes (col. 1a).* This column is not required.

(2) *Source (col. 1b).* This column indicates the selection status and source for the listed item. Source code used in this list is:

Code	*Explanation*
C--------	Obtain through local procurement. If not obtainable from local procurement, requisition through normal supply channels with a supporting statement of non-availability from local procurement.

(3) *Maintenance level (col. 1c).* This column indicates the category of maintenance authorized to install the listed item. Maintenance level code used in this list is:

Code	*Explanation*
O/C -------	Operator or crew maintenance.

(4) *Recoverability (col. 1d).* This column indicates whether unserviceable items should be returned for recovery or salvage. When no code is indicated, the item will be considered expendable. Recoverability code used in this list is:

Code	*Explanation*
R- -------	Items which are economically repairable at direct and general support maintenance activities and are normally furnished by supply on an exchange basis.

b. Federal Stock Number (col. 3). Self explanatory.

c. *Description (Col. 3).* This column indicates the Federal item name (shown in capital letters) and any additional description required for supply operations. The manufacturer's code and part number are also included for reference.

Code	*Explanation*
01216 ----------	Allen Electric and Equipment Co.
74545 ----------	Hubbell Harvy Inc.

d. Unit of Issue (Col. 4), *Quantity Authorized (Col. 5), and Illustrations (Col. 6).* Self explanatory.

4. Errors, Comments, and/or Suggestions

Reports of errors, comments, and/or suggestions are encouraged. They should be submitted on

DA Form 2028 and forwarded direct to: Commanding General, Headquartera, U.S. Army Weapons Command, ATTN: AMSWE-SMM-P, Rock Island Arsenal, Rock Island, Ill., 61202.

Section II. BASIC ISSUE ITEMS LIST

(1) Source, maintenance, and recoverability code				(2)	(3)	(4)	(5)	(6) Illustration	
(a) Materiel code	(b) Source	(c) Maintenance level	(d) Recoverability	Federal stock No.	Description	Unit of issue	Quantity authorized	(a) Figure No.	(b) Item No.
					MAJOR COMBINATION				
	-----	-----	R	4910–392–2939	The following item is to be requisitioned for initial use only. TESTER, ENGINE DISTRIBUTOR: bench type, 115-volt, 60-cycle, single-phase, for testing 6-, 12-, and 24-volt distributors (01216: 30–89).	ea	-----	3	
					COMPONENTS OF MAJOR COMBINATION				
					None authorized.				
					SPARE PARTS				
					None authorized.				
					TOOLS AND EQUIPMENT FOR:				
					TESTER, ENGINE DISTRIBUTOR (01216: 30–89).				
	C	O/C	-----	----------	ADAPTER, "A": vacuum fitting (01216: 15958)	ea	1	3	79
	C	O/C	-----	5935–552–4372	ADAPTER, CONNECTOR: 2 connector mating ends straight shape, 5 contacts, 1 female, U-hollow, 2 female, flat at one end, 2 male flat at other end, non-locking, 1.078 long by 1.438 diameter inches (74545: 5273 L).	ea	1	3	80
	C	O/C	-----	----------	ADAPTER, DISTRIBUTOR: primary (01216: A600150).	ea	1	3	81
	C	O/C	-----	----------	ADAPTER, DRIVER: splined (01216: 9752)	ea	1	3	78
	C	O/C	-----	----------	ADAPTER, "K": vacuum fitting (01216: 1109)	ea	1	3	82
	C	O/C	-----	----------	ADAPTER, "P": vacuum fitting (01216: 1241)	ea	1	3	83
	C	O/C	-----	----------	ADAPTER, "Q": vacuum fitting (01216: 1242)	ea	1	3	84
	C	O/C	-----	----------	ADAPTER, SLEEVE: (01216: 9877–1)	ea	1	3	85
	C	O/C	-----	----------	ADAPTER, SLEEVE: (01216: 10960)	ea	1	3	86
	C	O/C	-----	----------	BUSHING, DISTRIBUTOR: (01216: 2740–2)	ea	1	---	
	C	O/C	-----	----------	GAUGE, TENSION: spring (01216: 13686)	ea	1	3	90
	C	O/C	-----	----------	HOSE, VACUUM: panel to distributor (01216: 16062).	ea	1	3	88
	C	O/C	-----	----------	WASHER, FLAT: non-metallic (01216: 7544)	ea	3	3	91
	C	O/C	-----	----------	WIRE, JUMPER: (clip lead) (01216: A6875)	ea	1	3	89

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *3 January 1966*

TM 9–4910–463–10 is published for the information and use of all concerned.

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:
J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

DCSLOG (1)
CNGB (1)
CofEngrs (3)
TSG (1)
CofSptS (1)
CC–E (1)
USAARTYBD (1)
USARADBD (1)
USAARMBD (2)
USAAWNBD (1)
USACDCTA (2)
USACDCOA (1)
USAMC (5)
USASMC (6)
USAWECOM (75)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (2) except
  USASETAF (6)
  USARSO (5)
  USAREUR (10)
  USARYIS (5)
LOGCOMD (3)
Armies (3) except EUSA (5)
Div (2)
Ft Monmouth (2)
Ft Story (1)
Army Dep (3) except LEAD (5)
USMA (2)
USAQMS (2)
USAARMS (4)
USAAMS (2)
USAMEC (2)
USAEPG (1)
APG (1)
Dugway PG (1)
Yuma PG (1)
Arsenals (2) except
  Detroit (5)
  Rock Island (5)
Springfield Armory (1)
Ft Knox Fld Maint Shops (10)
Brooklyn Army Tml (1)
USAAVCOM (2)
TC Tng Comd, Ft Eustis (2)
TC Stg Sta, Cp Kilmer (1)
TC Stg Sta, Ft Hamilton (1)
TC Stg Sta, Ft Dix (1)
TC Stg Sta, Ft Devens (1)
TC Stg Sta, Cp Leroy Johnson (1)
TC Stg Sta, Cp AP Hill (1)
TC Stg Sta, Ft Bragg (1)
TC Stg Sta, Cp Pickett (1)
TC Stg Sta, Ft Benning (1)
ARMISH (3)
Units organized under following TOE's (2 copies each):

7–100	29–25
9–7	29–26
9–9	29–27
9–127	29–35
9–167	29–36
9–197	29–37
9–357	29–55
10–445	29–56
10–448	29–65
17–100	29–75
29–1	29–79
29–11	29–105
29–15	29–109
29–16	37–100
29–17	57–100
29–21	

NG: State AG (3).
USAR: Same as Active Army except allowance is one copy to each unit.
For explanation of abbreviations used, see AR 320–50.

U.S. GOVERNMENT PRINTING OFFICE: 1986–491–385/40463

PIN: 008515-000

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