TM 9-4910-696-14&P

TECHNICAL MANUAL

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

F O R

LIGHT, IGNITION TIMING MKB MANUFACTURING CORPORATION (NSN 4910-00-937-5724)

HEADQUARTERS, DEPARTMENT OF THE ARMY

APRIL 1981

WARNING

Due to the stopping or freezing action of the light flash, care must be taken to avoid touching the engine fan blade or other moving parts while the engine is running. Action of the light will cause these parts to appear to slow down and/or stop while they are still in rapid motion.

Technical Manual
No. 9-4910-696-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *9 April 1981*

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LIGHT, IGNITION TIMING (NSN 4910-00-937-5724)

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, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299. A reply will be furnished directly 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 ignition timing light is issued.

Manufactured by: MKB Manufacturing Corporation
92 Brook Avenue
Deer Park, NY 11729

Procured under Contract No. DAAA09-78-C-4291

This technical manual is an authentication of the manufacturers' commercial literature and does not conform with the format and content specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

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 - 26584

2 - Manufacturer’s Part Number exactly as listed herein.

3 - Nomenclature exactly as listed herein, including dimensions, if necessary.

4 - Manufacturer’s Model Number -

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 - 26584 followed by a colon and manufacturer’s Part Number for the repair part.

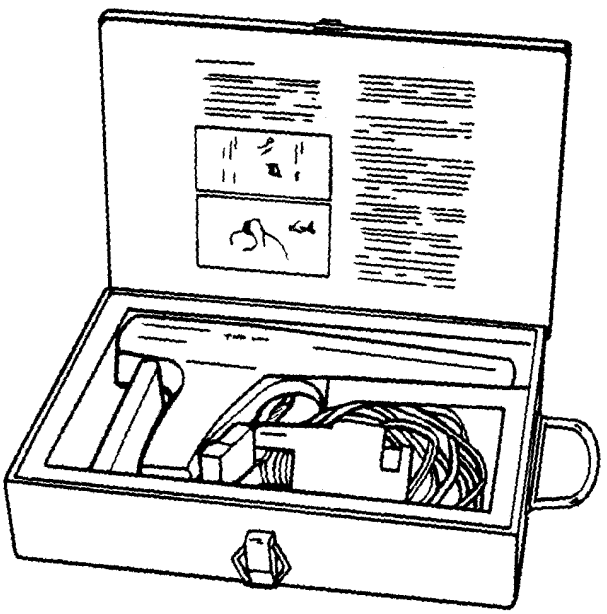
(b) Complete Remarks field as follows:

Noun: (nomenclature of repair part)
For: NSN: 4910-00-937-5724
Manufacturer: MKB Manufacturing Corporation

Model :
Serial: (of end item)

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

DC POWER TIMING LIGHT



The DC power timing light, in modern pistol grip styling, is a compact, durable test instrument. The light is equipped with a special high-intensity xenon lamp which allows timing of engines even in bright surroundings. It is designed to operate between 11 volts and 16 volts and is equipped with special protective circuitry to prevent damage if subjected to higher voltages. The light is provided with a spring loaded trigger and long fuel and oil resistant hookup leads. The transistorized circuitry incorporates the latest electronics advances and assures a long, trouble free life.

Engine timing is the term applied to the relationship of piston travel and moment of spark in a gasoline engine. Timing requirments vary from engine to engine, and before attempting timing adjustments, the engine manufacturer's specifications must be obtained. It should be noted, however, that due to the many variables involved, such as temperature, humidity, elevation, fuel octane rating, and engine conditions published timing data must be considered as approximate and some tolerance is permissible.

PREPARATION FOR TIMING

1. Since timing requirements vary, you will need to know from the engine manufacturer's specifications, the following information:

   a. Location and correct setting of timing mark on engine. See Fig. 1.
   b. Correct distributor point gap and dwell angle degrees setting.
   c. Location of the number 1 cylinder (spark plug). (Refer to manufacturer's specifications for location of spark plug to be used for timing. On most engines it is #1 plug.)
   d. Correct spark plug gap setting.

2. Apply chalk to the rotating and stationary timing marks as an aid in seeing marks while engine is running.
3. Make certain all spark plugs have been cleaned and properly gapped.
4. Check and, if necessary, adjust distributor point gap or dwell angle to specifications.
5. Start and run engine until normal operating temperature is reached.
6. Adjust engine idle speed to specifications and stop engine.
7. Disconnect distributor vacuum advance line. Seal line with tape or insert sharpened end of a lead pencil into line.
8. Remove timing light from case. Connect the DC power timing light to the engine as shown in Fig. 2.

CAUTION: The inductive clip has electrical components that will break if shocked; it must not be dropped or abused, but treated with care.

NOTE: If engine is not equipped with a battery, an external battery is required. Connections are the same except a jumper wire must be added between the negative terminal of the external battery and a good ground on the vehicle engine.

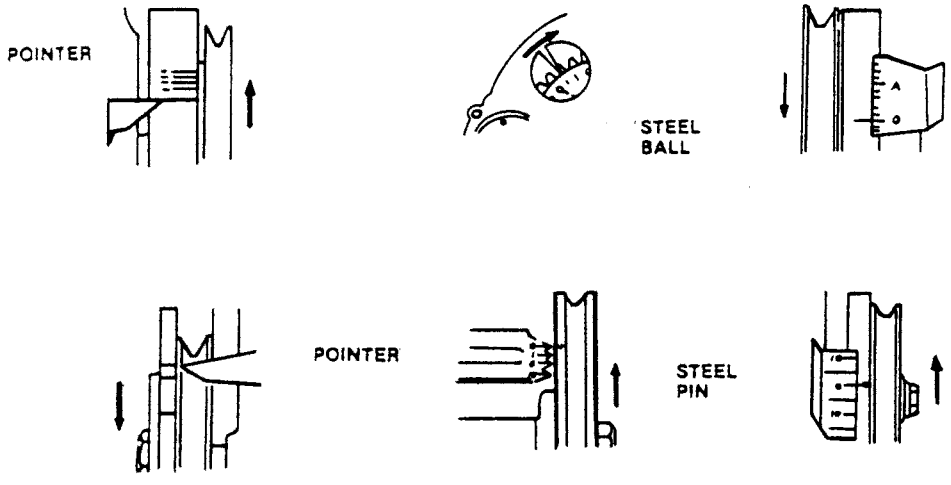


FIGURE 1. TYPICAL TIMING MARKS

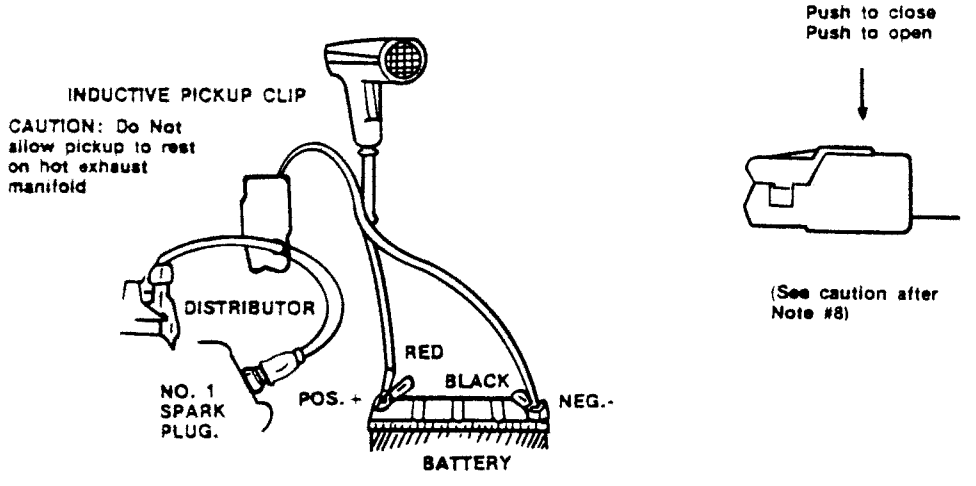


FIGURE 2. TIMING LIGHT CONNECTIONS

TIMING PROCEDURE

1. Start and run engine at idle speed.

WARNING: Due to the stopping or freezing action of the light flash, care must be taken to avoid touching the engine fan blade or other moving parts while the engine is running. Action of the light will cause these parts to appear to slow down and/or stop while they are still in rapid motion.

2. Direct flash from timing light onto engine timing marks. See Fig. 1 and note the degree value indicated by the timing mark.

3. Loosen distributor locking screw and rotate distributor body left or right until timing marks appear to correspond with manufacturer's specifications. Tighten distributor locking screw, recheck timing - if OK stop engine. If not, reset timing.

4. If you do not proceed with test outlined below, remove timing light and reconnect vacuum lines and replace timing light in case if timing operation is completed.

NOTE: After timing engine, the timing light may be used to check operation of the distributor advance machanism as outlined in the following steps. On some late model cars, certain emission control systems will prevent this check from being performed since advance is dependent upon transmission speed or gear used, or upon engine temperature. Check your manufacturer's shop manual for proper procedures to use for these cars.

5. With timing light connected as for timing procedure, start and run engine at normal idle speed.

6. Gradually increase engine speed while observing timing mark. Timing mark should appear to remain stationary until the automatic advance mechanism cuts in. From this point on, the timing mark will appear to move gradually as engine speed is increased. If timing mark remains stationary, or if movement is in short, sharp jerks, the automatic advance mechanism may be sticking and should be repaired or replaced.

7. Connect vacuum line to distributor vacuum advance fitting. Open and close throttle suddenly to cause rapid increase/decrease in engine speed while observing timing mark.

   If mark disappears or moves rapidly away from stationary mark, vacuum advance is operating normally.

   If mark remains stationary, vacuum advance is defective and should be repaired or replaced.

8. Stop engine. Remove timing light and place in case.

TROUBLESHOOTING TIMING LIGHT

The DC power timing light is a precision instrument which, if used properly, will give many years of service. Observing the following precautions will prevent damage and extend service life.

1. Before starting engine, double check to make certain that all, leads are connected correctly.

2. Switch light ON only when observing timing marks. Life of lamp will be prolonged by intermittent use.

A timing light that fails to perform satisfactorily should be checked as outlined in Table 1, Troubleshooting Procedures.

XENON LAMP REPLACEMENT

An inoperative xenon lamp may be removed and replaced in the field. Removal and replacement are easily accomplished. The lamp is installed in the lower front portion of the timing light and held in place with a removable knob. To remove the lamp, proceed as follows:

1. Grasp the protruding portion of the knob with the fingers, press in, and rotate to the right or left until the knob's locking tab engages the tab opening. Slip knob and lamp assembly down from the housing.

2. Remove the lamp from the knob and insert a replacement lamp.

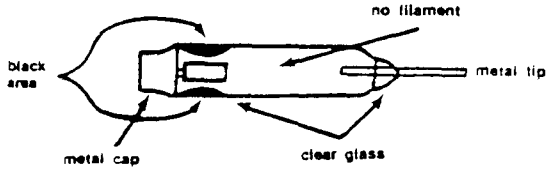
3. Carefully insert the lamp and knob assembly into the timing light housing and press in until locking tab clears surface of housing. Rotate one quarter turn right or left to engage locking tab. Internal spring pressure will hold assembly in position.

CHECKING THE POWER TIMING LIGHT

SYMPTOM	PROBABLE CAUSE	SOLUTION
LIGHT DOES NOT FLASH	Battery clips connected backwards	Reverse the battery clip connections
	Battery clips not making good connection	Make sure grounded clip is connected to a clean ground. Wiggle both clips to assure a good connection.
LIGHT FLASHES ERRATICALLY (misses)	Weak ignition or spark plug gap too close	Try connecting to the spark plug of another cylinder or wire (to check for flash only).
	Battery voltage low	Check condition of battery and charge. Make certain battery voltage is at manufacturer's specifications

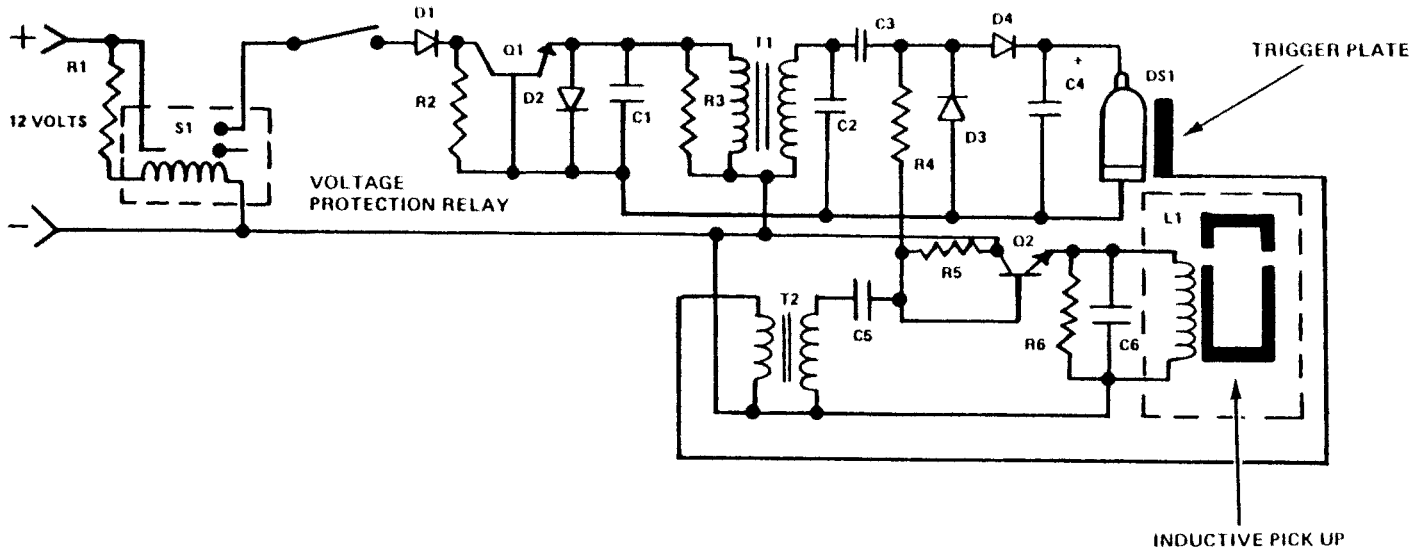
TABLE 1. TROUBLESHOOTING PROCEDURES

A typical xenon lamp for your timing light will look like description below:



Unless lamp is broken, it is not easy to visually determine if lamp is good or bad.

FIGURE 3. TYPICAL XENON LAMP



SCHEMATIC DIAGRAM OF ENGINE TIMING LIGHT

	RESISTORS	
R1	220Ω	1/2 w
R2	33KΩ	1/2 w
R3	220Ω	1/2 w
R4	750KΩ	1/2 w
R5	330KΩ	1/2 w
R6	1KΩΩ	1/2 w

	CAPACITORS	
C1	.022μf	100 v
C2	120 pf	1000
C3	.01 μf	1000 v
C4	20 μf	600 v
C5	.047 μf	250 v
C6	.01 μf	250 v

	DIODES
D1	IN 4004
D2	IN 4004
D3	IN 4007
D4	IN 4007

	TRANSFORMERS
T1	Transformer Power
T2	Transformer Power

	COILS
L1	Coil Inductive Pick-Up

	SWITCHES
S1	14v DC Relay

	LAMPS
DS1	Xenon Lamp

Replaceable Parts:

Xenon lamp, p/n 416

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

*U.S. GOVENMENT OFFICE 1981–750002/1145

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512		191	

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

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

Figure 191, item 3 has the wrong NSN. Supply rejects orders for this item. The NSN shown here is not listed in the AMDF or the MCRL.

Please give us the correct NSN and P/N.

SAMPLE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

John Smith, S. SGT. 793/XXXX

SIGN HERE

John Smith

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TM 9-4910-696-14&P	9 April 1981	Maintenance Manual for Ignition Timing Light

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