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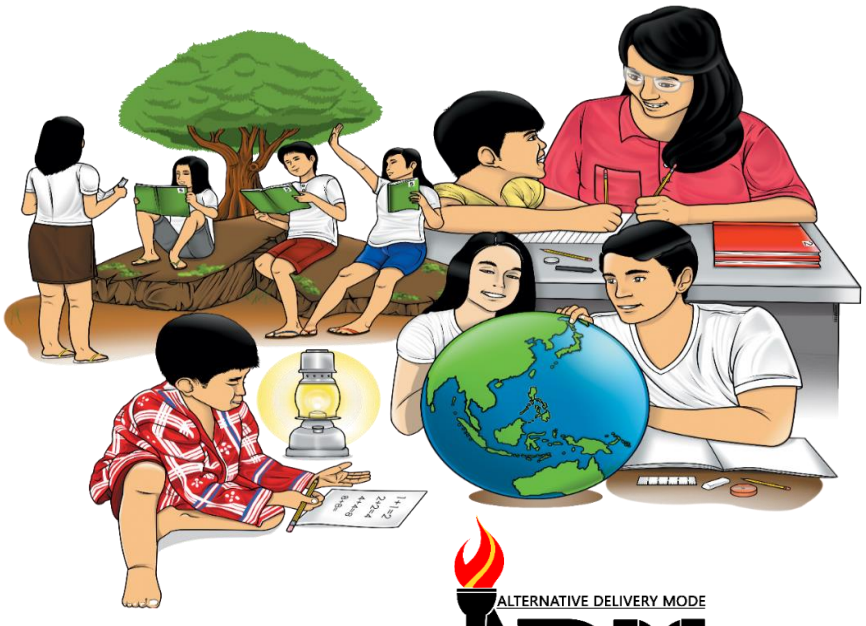
Special Program in Technical Vocational Education

Quarter 1 – Module 5
Servicing Ignition System
(Checking ignition coil, ballast resistor, high tension cable resistance and distributor assembly)

Automotive Servicing NC II



ALTERNATIVE DELIVERY MODE

10

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Automotive Servicing NC II

DepED
DEPARTMENT OF EDUCATION

IA-Automotive Servicing – Grade 10
Alternative Delivery Mode
Quarter 1 – Module 5: Servicing Ignition System
(Checking ignition coil, ballast resistor, high tension cable resistance and distributor assembly)

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLMS is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and test. And read the instructions carefully before performing each task.

If you have questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learner.

For the facilitator:

Hi, as a facilitator you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Kindly, advise the learner's parents or guardians of the same procedure since they will be the primary supporters in the learners' progress. Please, do not forget to remind the learner to use separate sheets in answering all of the activities found in the learning module.

For the learner:

Hello learner, Welcome to the Automotive Servicing NC II Alternative Delivery Mode (ADM) Module on Servicing Ignition System (Checking ignition coil, ballast resistor, high tension cable resistance and distributor assembly). I hope you are

ready to progress in your Grade 10 SPTVE in Automotive with this learning module. This is designed to provide you with interactive tasks to further develop the desired learning competencies prescribed in our curriculum. With this, you are expected to appreciate staking through the information and activity given.

This module has the following parts and corresponding icons:

ICON	LABEL	DETAIL
	What I Need to Know	This contains the learning objectives which you need to accomplish.
	What I know	This evaluates what you know about the lesson you are to learn.
	What's In	This connects the current lesson with a topic necessary in your understanding.
	What's New	This introduces the lesson through an activity.
	What Is It	This contains a brief discussion of the learning module lesson.
	What's More	These are activities to check your understanding of the lesson.
	What I Have Learned	This summarizes the important ideas presented in the lesson.
	What I Can Do	This is a real-life application of what you have learned.
	Assessment	This is a post assessment of what you have learned.
	Additional Activity	This is an activity that will strengthen your knowledge about the lesson.

At the end of this module you will also find:

References	This is a list of all sources used in developing this module.
Answer Sheet	This is where you will write your answers.

TABLE OF CONTENTS

LESSON

5

Checking ignition coil, ballast resistor, high tension cable resistance and distributor assembly

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Don't forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instruction carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain deep understanding of the relevant competencies. You can do it!

What I Need to Know

This module was designed and written to guide you to acquire the learning competencies and develop your skills in Checking the Ignition Coil, Ballast Resistor, High Tension Cable Resistance and Distributor Assembly in IA- Automotive Servicing. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. However, the order in which you read the module can be changed to correspond with the textbook you are now using.

Quarter/Week	Q1/W5
Learning Competency Code	SPTVE_IAAUS9-12SIS-IIc-g-7
Learning Competency	**LO 2. Check Ignition Coil, Ballast Resistor, High Tension Cable Resistance** **LO 3. Check Distributor Assembly.**

Learning Objectives:
After going through this module, you are expected to:

1. familiarize the steps in inspecting and checking ignition coil, ballast resistor high tension cables and distributor assembly;
2. check or test ignition system components,
3. adjust ignition timing and;
4. relate the topic on real-life situation.

What I Know

Pre-Test/Assessment
Multiple choice

Direction: Choose the LETTER of the best answer. Write your answer in the answer sheet.

1. When checking the ignition coil primary resistance using ohmmeter, the resistance should be_____ ohms?
   A. 0.4 to 0.6 B. 0.6 to 0.8 C. 0.8 to 0.10 D. 0.10 to 0.12
2. When checking the ignition coil secondary resistance by using an ohmmeter the resistance should be _____ ohms?
   A. 5000 to 7200 B. 5000 to 7500 C. 7500 to 8000 D. 7500 to 8500
3. When checking ballast resistor for resistance, resistance should be?
   A. 3 ohms B. 5 ohms C. 7 ohms D. 8 ohms
4. When adjusting contact point clearance, the gap should be?
   A. 0.12 in B. 0.14 in C. 0.18 in D. 0.22 in
5. It measures how many times the engine's crankshaft makes one full rotation every minute, and along with it, how many times each piston goes up and down in its cylinder?
   A. RPM B. Speedometer C. Tachometer D. all of the above
6. It pertains to the amount of rotation through which breaker points remain closed to energize the ignition primary coil.
   A. Dwell angle B. Dwell C. Angle D. None of the following
7. It is the measurement, in degrees of crankshaft rotation, of the point at which the spark plugs fire in each of the cylinders. It is measured in degrees before or after Top Dead Center (TDC) of the compression stroke.
   A. Ignition timing B. Ignition system C. Timing D. RPM
8. The tool that is used in checking timing?
   A. Ignition timing B. Ignition system C. Timing light D. RPM
9. If the timing mark is not at the specified location, rotate the _____ until the mark is at the specified location.
   A. Distributor B. Ignition Coil C. Ignition Switch D. all of the above
10. The two places the ignition timing marks can be located?
    A. Camshaft and crankshaft sprocket C. Harmonic balancer and flywheel
    B. Distributor and points D. Water pump pulley and fan belt
11. The contact points position where magnetic field builds up in the coil.
    A. Close B. Open C. Both D. None of the above
12. The contact points position where the magnetic field collapses and voltage is sent to the spark plugs.
    A. Close B. Open C. Both D. None of the above
13. The part of the distributor assembly that directly opens and closes the contact point?
    A. The camshaft C. The distributor shaft
    B. The distributor cam/Camlobe D. A spring

14. A system that is responsible in delivering an electric spark in the engine combustion chamber, at exactly the right time, which will ignite the mixture of petrol and air.

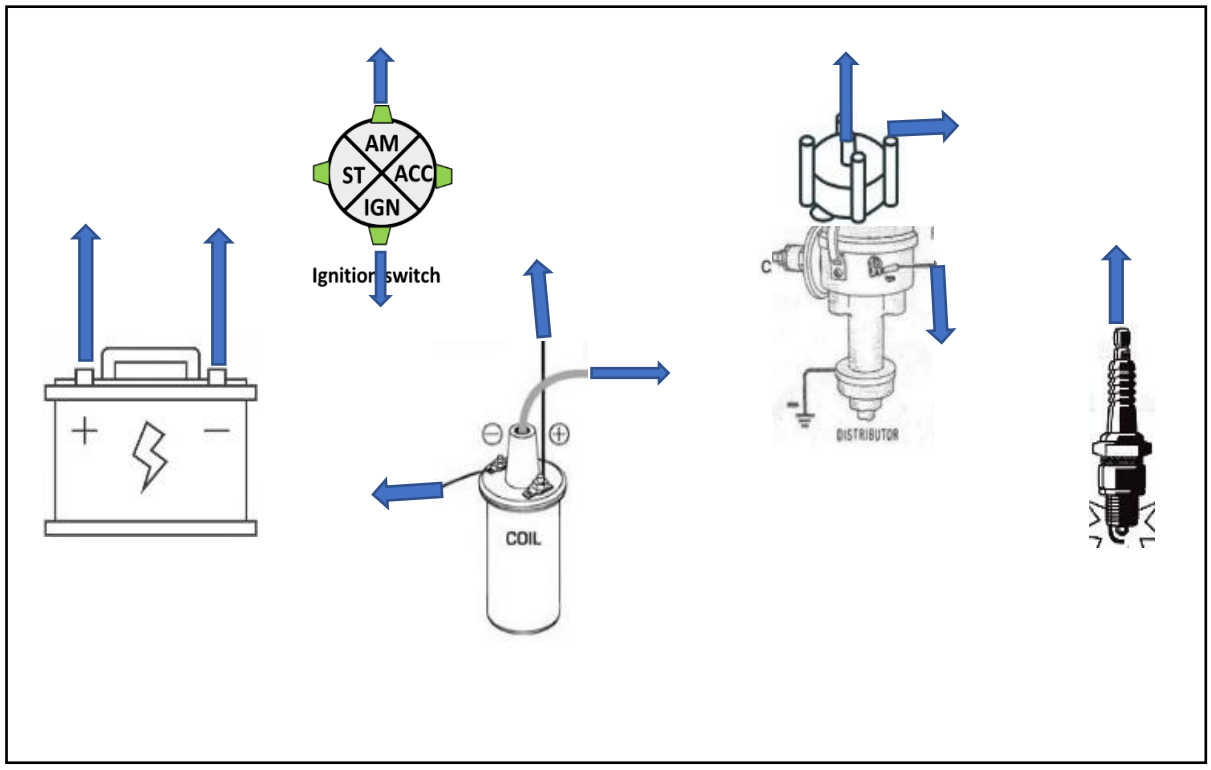
A. Charging system
B. Ignition system
C. Lighting System
D. Starting system

15. When checking ignition timing, the timing light flashes every time the spark plug number _____fires.

A. 1 B. 2 C.3 D. 4

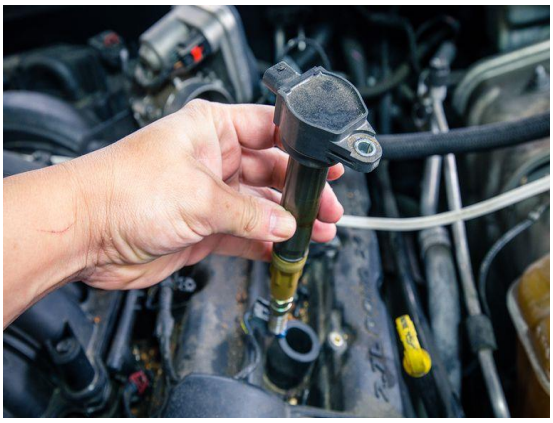
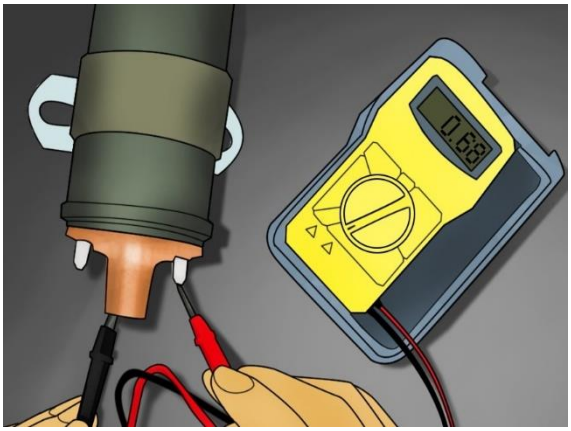
What's In

Directions: Draw and connect the ignition system wiring diagram in the given answer sheet if it fits otherwise, use another paper. Connect ONLY the terminals that has an arrow.



What's New

Direction: In one sentence, describe what the pictures all about. Write your answer in the answer sheet.

What Is It

CHECKING AND TESTING IGNITION SYSTEM COMPONENTS

Previously we have learned that ignition system is the system that is responsible in producing an electric spark to ignite the fuel–air mixture at the right point in time. However, because ignition system is composed of many different components that wears as time goes by that causes malfunction to the engine, checking and testing must be done to ensure the functional capacity of each components.

I-IGNITION COIL

A. Inspect and Test Ignition Coil

1. Prepare the supplies, materials, tools and equipment needed.
2. Locate the ignition coil and disconnect the coil cable from the distributor cap.
3. Have a spark plug then insert it's terminal to the other end of the coil cable which was just disconnected.
4. Get and connect a wire to the threaded portion of the spark plug.
5. Locate the negative terminal of the ignition coil then disconnect the wire that is connected to it.
6. Connect the other end of the wire that is connected on the threaded part of the spark plug to the ignition coil negative terminal.
7. Turn the ignition switch to the ON position.
8. Tap the other end of the ignition coil ground wire jumper on a good grounding point (for example the battery negative terminal) and look for sparks at the spark plug that correspond to the frequency of your tapping of the ground wire.
9. If you have a good spark at the spark plug, the ignition coil is good.

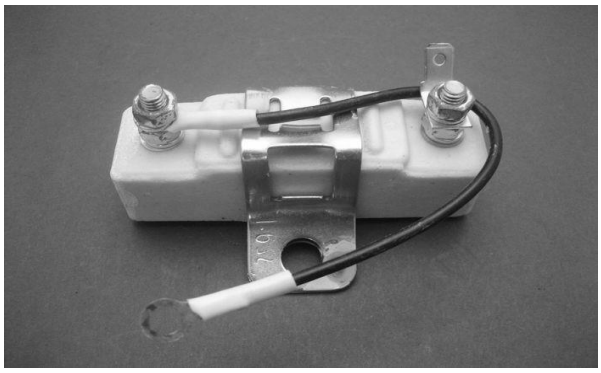
10. If you don't get a good spark, check for approximately 12 VDC from the coil positive terminal (black wire) to ground with the ignition switch in the ON position. You should also get approximately 12 VDC from the coil negative terminal (Green wire) to ground

B- Ignition Coil Resistance Check

In addition to the test above, you may elect to perform an ignition coil resistance check as confirmation of the coil's condition.

1. Check the ignition coil primary coil resistance by connecting an ohmmeter between the positive (Black wire) and negative (Green wire) terminals on the coil. The resistance should be 0.4 to 0.6 ohms.
2. Check the ignition coil secondary coil resistance by connecting an ohmmeter between the coil output terminal and the ignition coil negative terminal. The resistance should be 5000 to 7200 ohms.

II- INSPECT AND TEST BALLAST RESISTOR



Procedures in checking Ballast Resistor

Steps/Procedure:

1. Prepare the supplies, materials, tools and equipment needed.
2. Disconnect primary wires connected to IG terminal or Fuses.
3. Disconnect primary wire connected to primary terminal of ignition coil.
4. Remove ballast resistor where it is connected.

Note: Use ohmmeter to check the conditions of ballast resistor.

5. Connect the positive test probe of the ohmmeter on the terminal of the ballast resistor.
6. Connect the negative test probe of the ohmmeter on the other terminal of the ballast resistor.
7. Check for continuity and standard resistance, (no continuity (defective) standard resistance (5 ohms)
8. If the resistance is to high replace ballast resistor.

III-CHECK HIGH TENSION CABLE RESISTANCE

The high-tension (HT) or secondary circuit carries high-voltage electricity. It runs from the secondary winding of the coil through the distributor to the plugs. Any of these can break down and cause ignition failure.

Ways in Testing High Tension Cables

A. *Testing the high-tension cable leads*
   1. Select the resistance position. Touch a probe to each end of the HT lead and read the resistance on the scale
   2. Detach each lead in turn
   3. Take off the plug cap if it is removable
   4. Measure the lead and work out its resistance, then measure actual resistance with an ohmmeter or multi-meter. If the reading is higher than the figure you worked out, or if it is more than 25,000 ohms, replace the whole set of leads. Some leads have a copper core with small resistance. Interference is suppressed by plug caps with 5,000 - 10,000 ohms' resistance.
   5. Check the caps with an ohmmeter.

B. *Testing for Voltage Leaks*

   Spark plug wires with bad insulation affect engine performance, especially during damp weather on rainy days. This test will check your wires' insulation for voltage leaks.

   1. Connect one end of a jumper wire to a screwdriver metal shank
   2. Connect the other end of the jumper wire to a metal bracket or screw on the engine to ground the screwdriver.
   3. Set the emergency brakes on your vehicle, start the engine, and let it idle.
   4. Now, run the tip of the screwdriver along the length of each spark plug wire, about an inch away from the insulation.
   5. Pay attention to any spark or electric arc jumping off the insulation toward the tip of the screwdriver. Even if you can't see the arc, you'll hear a cracking sound as the spark jumps to the screwdriver, so pay attention to any sounds as well.

NOTE: If a spark or snapping sound during test were detected then replace the wires. However, if wires appear to have no voltage leak then go on to the next two tests.

C. Testing Spark Plug Wire Insulation

Having a spark plug wire with bad insulation may not be as bad as a wire with a broken conductor. Still, this is enough for your ignition system to cause all kinds of engine performance problems, especially during damp weather. This test will help you check your wires for voltage leaks.

1. Connect one end of a jumper wire to a screwdriver shaft and the other end to a metal bracket or screw on the engine to ground the screwdriver.
2. Set the emergency brakes on your vehicle, start the engine, and let it idle.
3. Run the tip of the screwdriver along the length of each spark plug wire, about an inch away from the insulation. Pay attention to any spark or electric arc jumping off the insulation toward the tip of the screwdriver.

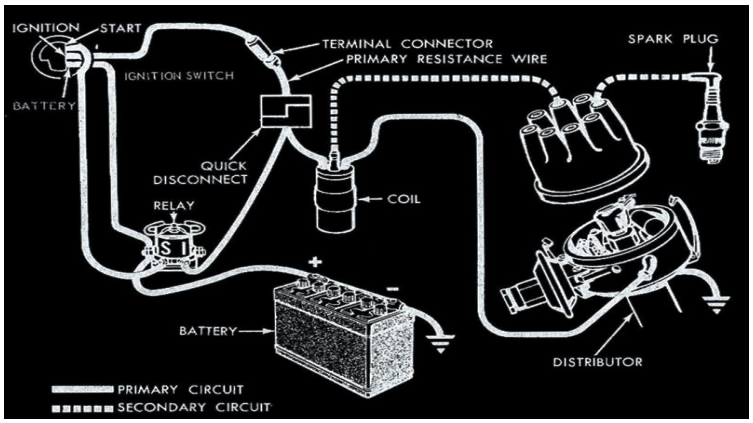
NOTE: If spark during test is detected then replace the wires.

D. Testing Spark Plug Wires Resistance

With this test, you'll check the condition of the conductor that runs through the thick insulation of your spark plug wires. For this test, use a simple analog or digital ohmmeter.

1. Set your meter to the ohms' scale and to a setting that will let you read 50,000 ohms or above.
2. Measure the length of the wire you want to read first using the tape measure, and make a note of the length in feet on a piece of paper.
3. Then, turn on your ohmmeter and connect one lead to a metal connector inside the spark plug wire boot and the other lead to the other connector in the wire.
4. Make a note of the wire's resistance on the piece of paper as well.
5. Lastly, you'll want to multiply the length of the wire in feet by the ohms-per foot specification for your vehicle.

IV-TEST IGNITION SYSTEM WIRING INSTALLATION



A complete check of the ignition system includes the battery and cables, coil, distributor, primary and secondary wiring, and the spark plugs. This section describes the tests for all these units except the battery and the distributor.

Ways in Testing Ignition System Wiring Installation

A. Preliminary Checks

1. Inspect the battery for corrosion due to acid and dirt. If necessary, remove the battery and cables and clean them with a baking soda solution. Be sure the cable connectors and the contacting surfaces on the battery, engine, and relay are clean. Tighten the cables securely upon installation.
2. Corrosion. Inspect the wires for breaks and cracked insulation. Replace all defective wiring.
3. Clean the inside of the distributor cap, and inspect it for cracks, burned contacts, or permanent carbon tracks. Remove dirt or corrosion from the sockets. Inspect the rotor for cracks or a burned tip. Replace the cap and/or rotor if they are defective.

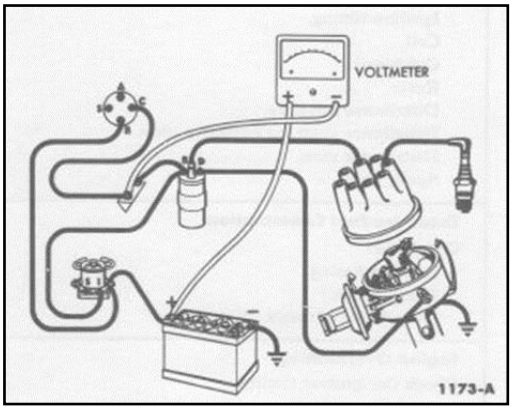
B. Primary Circuit Resistance Test

1. A complete test of the primary circuit consists of checking for excessive voltage drop from the battery to the coil and from the coil to ground.
2. Excessive voltage drop in the primary circuit will lessen the secondary output of the ignition coil, resulting in hard starting and poor performance.

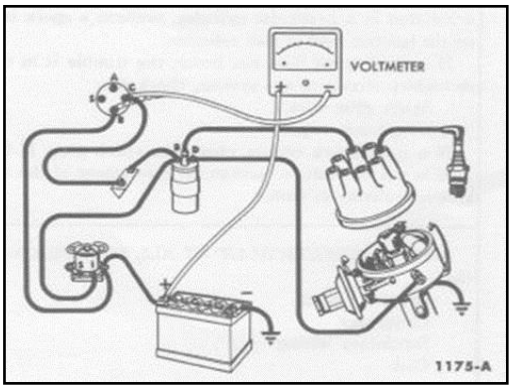
C. Test wiring installation

The following tests are made with the ignition switch on and the distributor points closed.

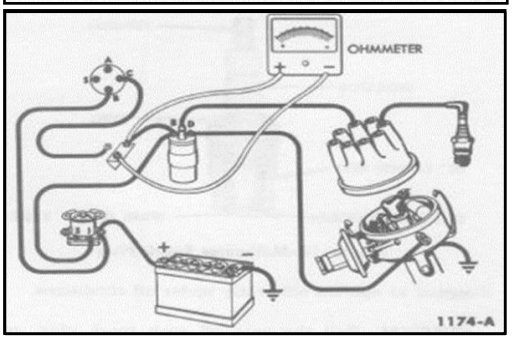
1. Connect the negative lead of a voltmeter to the battery terminal of the resistor and the positive lead to the positive terminal of the battery. If the voltage drop is 0.2 volts or less, the primary circuit from the battery to the coil is satisfactory.



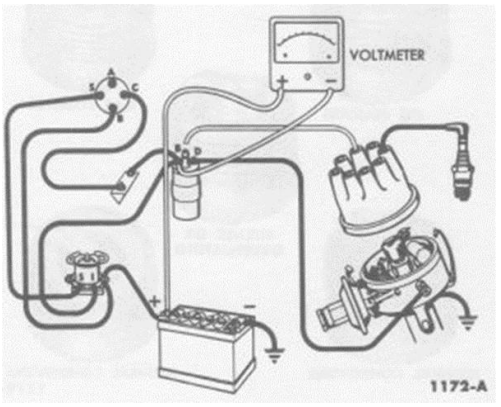
2. If the voltage drop exceeds this limit, leave the positive lead of the voltmeter connected to the positive terminal of the battery and touch the voltmeter negative lead to the coil terminal of the ignition switch (If there is no change in the reading, the circuit is satisfactory. Next, touch the voltmeter negative lead to the battery terminal of the ignition switch. If the reading drops there is excessive resistance in the switch.



3. Check the primary resistor by connecting an ohmmeter across its terminals (Fig. 4). Disconnect the battery wire at the resistor to prevent damage to the ohmmeter. The specified resistance is 1.3-1.4 ohms. If the reading is over or under this limit replace the resistor.



4. Check the resistance in the starting ignition circuit by connecting the voltmeter positive lead to the positive terminal of the battery and the negative lead to the battery terminal of the coil. Disconnect the high tension lead at the coil and Crank the engine while observing the voltage drop. It should not exceed 0.1 volt. If the voltage drop is excessive, clean and tighten the terminals or replace wiring as necessary.



V-DISTRIBUTOR CAP AND ROTOR INSPECTION

1. Grasp the distributor cap and attempt to move it back and forth. If it moves easily, the retaining screws are not properly engaged or the distributor cap gasket is compressed and needs to be replaced.
2. Remove the distributor cap.
3. Inspect the distributor cap for the following and replace as necessary:
    a. Cracks
    b. Carbon tracking
    c. Moisture buildup on inside of cap
    d. Debris
    e. Worn rotor button
    f. Pitted, worn, or charred terminals
4. Inspect the rotor for charring or pitting and replace if necessary.
5. Check the rotor retaining screw is in place. These screws have a tendency to fall out causing the rotor to become misaligned.
6. Ensure the dust cover is securely in place behind the rotor.
   This dust cover is important because it keeps debris from the belt housing area from getting into the distributor cap and causing poor or non-existent spark.

VI-CHECKING DWELL ANGLE AND RPM

Dwell Angle pertains to the amount of rotation through which breaker points remain closed to energize the ignition primary coil.

RPM or Revolutions per Minute is the measures of how many times the engine's crankshaft makes one full rotation every minute, and along with it, how many times each piston goes up and down in its cylinder

Measuring The Dwell Angle

a. Prepare the supplies, materials, tools and equipment needed.
b. If you have just fitted new contact-breaker points, set them to approximately the right gap with a feeler gauge.
c. With the dwell meter connected, start the engine and let it settle to a smooth tick over. If it will not tick over steadily, check the cause(s) and rectify any faults.
d. The meter reading should stay steady at a steady engine speed. If it does not, increase the idling speed slightly until it does (See Preparing for carburetor adjustment).
e. Compare the steady reading on the appropriate scale with the desired dwell angle for your make of car.
f. If it is too high, the contact-breaker gap is too small. If it is too low, the gap is too wide.
g. Before you switch off the engine to adjust the gap, make the following checks. First ask a helper to press the accelerator to increase the engine speed slowly to about 1,000 rpm, then let it drop back to idling speed while you note the reading.
h. The angle should remain about the same, with no more than two or three degrees' deviation.
i. Secondly, increase the engine speed quickly to about 1,500 rpm, then let it drop back to idling speed while you again note the reading.

j. The angle should again remain the same, fluctuating by no more than two or three degrees.
k. Carry out these two tests several times so that you can take an average of any differences in the readings.
l. If the reading constantly fluctuates more than two or three degrees, the distributor-shaft bearing or advance-retard plate may be worn, or the cam itself damaged. Fit a new distributor.
m. Switch off the engine before making any adjustments necessary to the contact breaker gap.

Adjusting Contact Point Gap

Procedure in Adjusting contact point clearance

Steps/Procedure:

Procedures in adjusting contact point when the distributor assembly is install to engine.

1. Prepare the supplies, materials, tools and equipment needed.
2. Turn the engine to correct direction of rotation by the use of correct size box or socket wrench that fit to crankshaft pulley fixing bolt.
3. Position the contact point to be set in highest portion of the cam lobe in distributor shaft.
4. Use proper type, and size of screw driver prior to the screw head kind.
5. Loosen the slightly lock and adjusting screw then, insert the feller gauge with correct size of clearance, follow what is in the manual.
6. Tighten first the adjusting screw with two working screw drivers for it to locks then, lastly tighten the lock screw. If possible, check it thoroughly again by retightening the adjuster and locker screws.
7. Test run then, proceed to next operation sheet.

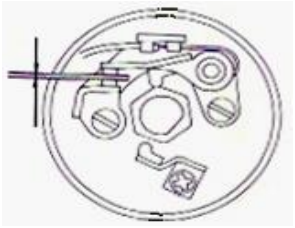
Procedure in adjusting contact point when distributor assembly remove from engine.

1. Prepare the supplies, materials, tools and equipment needed.
2. Position correctly and firmly the distributor assembly in the Bench vise.
3. Position the contact point to be set on the highest part camlobe in distributor shaft.
4. Used proper type, and size of screw driver prior to the screw head kind.
5. Loosen slightly lock and adjusting screw then, insert the feller gauge with correct size of clearance, follow what state in the manual.
6. Tighten first the adjusting screw with two working screw drivers for it, to locks then, lastly tighten the lock screw. If possible, check it thoroughly again by retightening the adjuster and locker screws.
7. Set engine correctly then install the distributor assembly, time it properly, see the steps of initial ignition timing.
8. Test run, then check if dwell angles is within the specified value, by the used of the dwell meter, follow the dwell of 4 cylinders is 51º (50º - 52º)

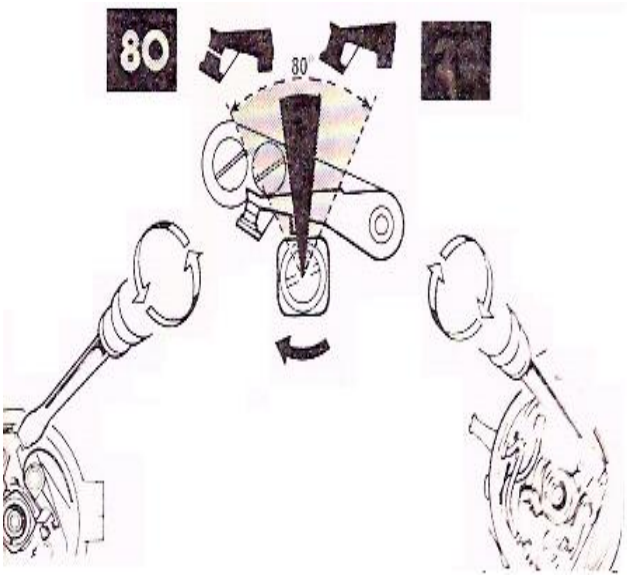
POINT GAP ADJUSTMENT (W/O IGNITER)

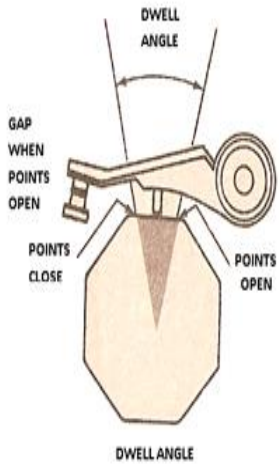
1. If the points are excessively burnt or fitted, replace the breaker points.

2. Adjust point gap.
   Point gap 0.45 mm (0.18 in)



If dwell angle below specified degrees' point gap is too big. But if the dwell angle above specified degrees' point gap is too small, readjust the point clearance to make it with the correct dwell angle, by the used of dwell meter for dwell angle while for the R.P.M used tachometer for setting the correct idling of engine.





A. SAFETY MEASURES OR PROCEDURES IN ADJUSTING CONTACT POINT.

1. When testing a vehicle, never short plug lead to the dipstick, cam/rocker arm cover, battery or other components, which may not be directly earthed. This can cause an explosion of oil fumes or hydrogen.

2. Beware of the danger from rotating components of ignition system.

3. Never bend movable point arm with your hand.

4. Do not use the car, if the contact breaker point is not exactly adjusted to the manufacturer specifications.

5. Do not install local contact point to the car of your customers and replacement of part be checked thoroughly, to avoid any trouble?

6. Use the proper screw driver for right head of bolt screw.

7. In replacing contact points do the same with the condenser or capacitor used the required capacitance or farad.

Note: With the contact points closed, the magnetic field builds up in the coil. As the points open, the magnetic field collapses and voltage is sent to the spark plugs. The part of the distributor assembly that is responsible in opening and closing the contact points is the camlobe.

VII-CHECK AND ADJUST IGNITION TIMING

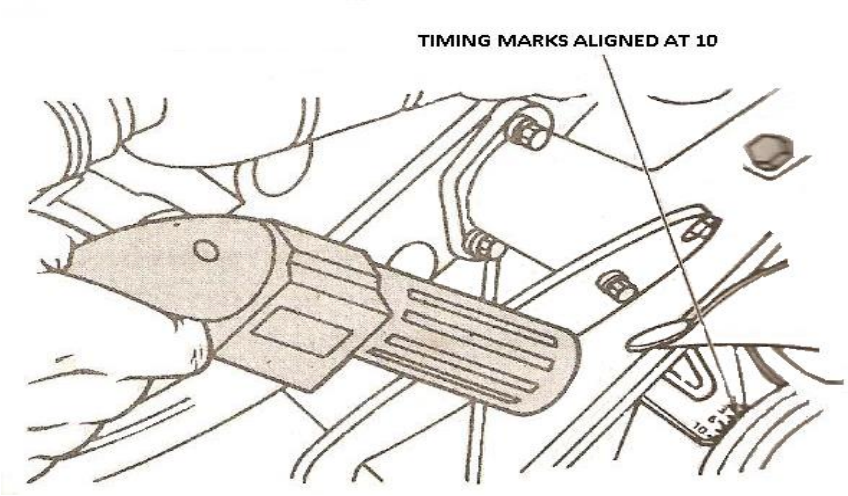
Ignition timing

Ignition timing is the measurement, in degrees of crankshaft rotation, of the point at which the spark plugs fire in each of the cylinders. It is measured in degrees before or after Top Dead Center (TDC) of the compression stroke.

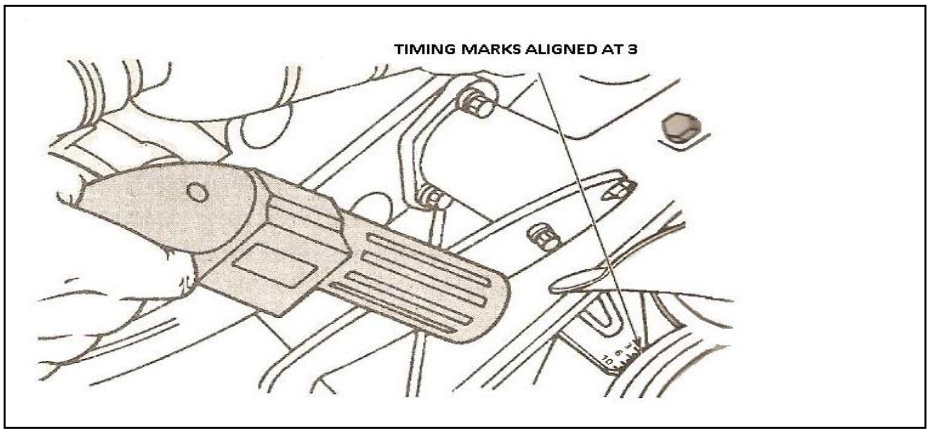
Procedure in performing ignition timing
Procedure in performing the setting base ignition timing. 1. Prepare the supplies, materials, tools and equipment needed. **NOTE**: Use a timing light to check the timing. Follow these steps for ignition timing adjustment. 2. Connect the timing light, and start the engine. 3. The engine must be idling at the manufacturer's recommended rpm end all other timing procedures must be followed. 4. Aim the timing light marks at the timing indicator, and observe the timing marks. Compare this reading to the manufacturer's specifications. For example, if the specification reads 10 degrees before top dead center and the reading found is 3 degrees before top dead center, the timing is retarded or off by 7 degrees. 5. If the timing mark is not at the specified location, rotate the distributor until the mark is at the specified location. 6. Tighten the distributor hold-down bolt to the specified torque, and recheck the timing mark position. 7. Connect the vacuum advance hose and any other connectors, hoses, or components that were disconnected for the timing procedure. 8. Road testing in the highways.

Interpretations of Timing Marks

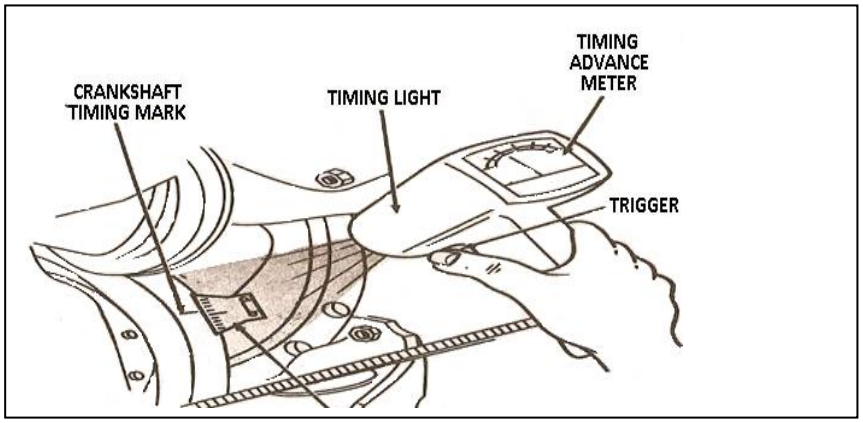
Timing marks illuminated by a timing light and showing 10 degrees BTDC.



Timing marks at 3 degrees BTDC.



The timing light flashes every time the number 1 sparks plug fires.



SAFETY MEASURES IN PERFORMING IGNITION TIMING

1. Do not puncture cables or nipples with test probes. This will ruin the cables of ignition timing light.
2. Do not point laser flashes of stroboscopic light to anybody due to the strong ultraviolet rays, especially to eyes.
3. Keep off your hands to the rotating parts of the engine in performing the test.
4. Remove necklace, rings, and watches or wear suitable working uniform in conducting the ignition timing with stroboscopic light.
5. See to it that the test probes of timing light and other connections are tight, set and connected correctly.
6. Always use the manual as your guide for the adjustment.
7. Be sure your concentration is given fully to the job in performing gasoline ignition timing.

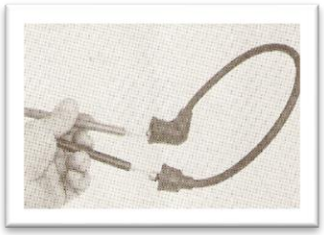
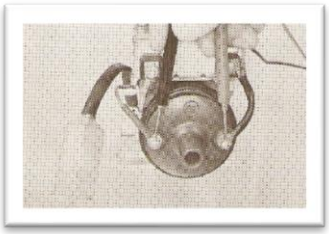
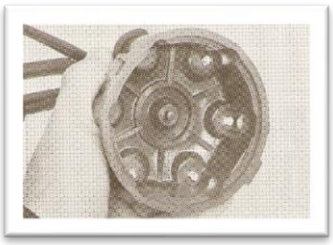
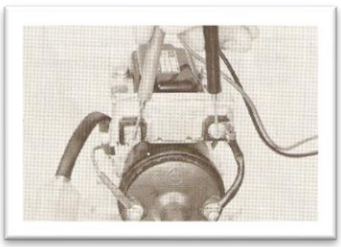
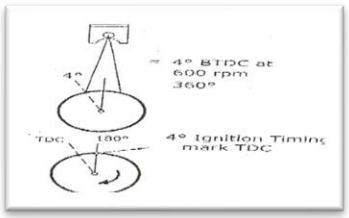
VIII-ELECTRONIC IGNITION TROUBLESHOOTING PROCEDURE

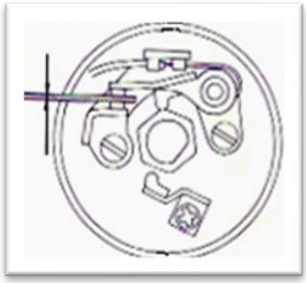
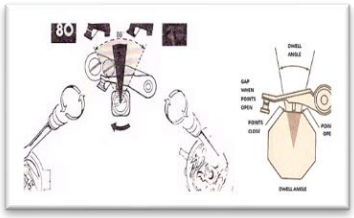
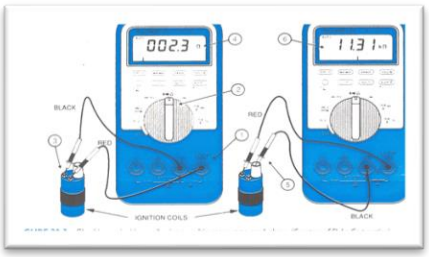
Steps:

- Turn the ignition on (engine off) and, using either a voltmeter or a test light, test for battery voltage available at the positive terminal of the ignition coil.
- If the voltage is not available, check for an open circuit at the ignition switch or wiring.

What's More

Directions: Match the picture from column A to column B. Write your answers in the given answer sheet. Answers may be repeated.

Column A		Column B	
1.		A.	Ignition Coil Testing
2.		B.	Spark Plug Checking
3.		C.	Adjusting Timing
4.		D.	Contact Point Adjusting
5.		E.	Ballast Resistor Checking
6.		F.	Distributor Cap Checking/ Inspecting

7.		G.	Idle adjustment
8.	 Fig. 8-35 Setting the Distributor Points Courtesy of General Motors of Canada Limited	H.	Dwell Angle
9.		I.	Ignition Switch Checking
10.		J.	High Tension Wire Testing

What I Have Learned

In a vehicle, ignition system plays an important role specifically in a vehicle equipped with gasoline engines for a vehicle won't start without it, and also proper maintenance must be applied to its components to ensure its functionality.

Directions: As a child, what are your roles that makes you important in your family and how could you maintain that roles? Write your answers in the given answer sheet.

_____
_____
_____
_____
_____
_____

What I Can Do

Directions: Supposed you have a vehicle that won't start but the battery is in full state of charge. Explain the remedies or procedures that you must apply? Write your answer in the answer sheet.

_____
_____
_____
_____
_____
_____
_____

Post-Assessment

Multiple choice

Direction: Choose the LETTER of the best answer. Write your answer in the answer sheet.

1. The part of the distributor assembly that opens and closes the contact point?
   A. The camshaft C. The distributor shaft
   B. The distributor cam/camlobe D. A spring

2. A system that is responsible in delivering an electric spark in the engine combustion chamber, at exactly the right time, which will ignite the mixture of petrol and air.
   A. Charging system C. Lighting System
   B. Ignition system D. Starting system

3. When checking ignition timing, the timing light flashes every time the spark plug number _____fires.
   A. 1 B. 2 C.3 D. 4

4. When checking the ignition coil primary resistance using ohmmeter, the resistance should be_____ ohms?
   A. 0.4 to 0.6 B. 0.6 to 0.8 C. 0.8 to 0.10 D. 0.10 to 0.12

5.When checking the ignition coil secondary resistance by using an ohmmeter the resistance should be _____ ohms?
   A. 1000 to 2200 B. 3000 to 4500 C. 4000 to 5000 D. 5000 to 7200

6. The two places the ignition timing marks can be located?
   A. Camshaft and crankshaft sprocket C. Harmonic balancer and flywheel
   B. Distributor and points D. Water pump pulley and fan belt

7.The contact points position where magnetic field builds up in the coil.
   A. Close B. Open C. Both D. None of the above

8.The contact points position where the magnetic field collapses and voltage is sent to the spark plugs.
   A. Close B. Open C. Both D. None of the above

9. When checking ballast resistor for resistance, resistance should be?
   A. 5 ohms B. 6 ohms C. 7 ohms D. 8 ohms

10.When adjusting contact point clearance, the gap should be?
   A. 0.6 in B. 0.8 in C. 0.10 in D. 0.18 in

11.It measures how many times the engine's crankshaft makes one full rotation every minute, and along with it, how many times each piston goes up and down in its cylinder?
   A. RPM B. Speedometer C. Tachometer D. all of the above

12.It pertains to the amount of rotation through which breaker points remain closed to energize the ignition primary coil.
   A. Dwell angle B. Dwell C. Angle D. None of the following

13.It is the measurement, in degrees of crankshaft rotation, of the point at which the spark plugs fire in each of the cylinders. It is measured in degrees before or after Top Dead Center (TDC) of the compression stroke.

A. Ignition timing B. Ignition system C. Timing D. RPM

14.The tool that is used in checking timing?

A. Ignition timing B. Ignition system C. Timing light D. RPM

15.If the timing mark is not at the specified location, rotate the _____ until the mark is at the specified location.

A. Distributor B. Ignition Coil C. Ignition Switch D. all of the above

Additional Activity

Direction: Enumerate the procedures in performing Ignition Timing. Write your answers in the answer sheet.
1. 2. 3. 4. 5. 6. 7. 8.

Answer Key

What I Know

1. A
2. A
3. B
4. C
5. A
6. A
7. A
8. C
9. A
10. A
11. A
12. B
13. B
14. B
15. A

What's in

What's New

The pictures are all about Ignition System Components maintenance.

What's More

1. J
2. A
3. F
4. E
5. C
6. C
7. D
8. D
9. H
10. A

Post Assessment

1.B
2.B
3.A
4.A
5.D
6.A
7.A
8.B
9.A
10.D
11.A
12.A
13.A
14.C
15.A

What I Can Do

Answers may vary

What I Have Learned

Answers may vary

Additional Activity

1.Prepare the supplies, materials, tools and equipment needed.
NOTE: Use a timing light to check the timing. Follow these steps for ignition timing adjustment.
2. Connect the timing light, and start the engine.
3. The engine must be idling at the manufacturer's recommended rpm end all other timing procedures must be followed.
4. Aim the timing light marks at the timing indicator, and observe the timing marks. Compare this reading to the manufacturer's specifications. For example, if the specification reads 10 degrees before top dead center and the reading found is 3 degrees before top dead center, the timing is retarded or off by 7 degrees.
5. If the timing mark is not at the specified location, rotate the distributor until the mark is at the specified location.
6. Tighten the distributor hold-down bolt to the specified torque, and recheck the timing mark position.
7. Connect the vacuum advance hose and any other connectors, hoses, or components that were disconnected for the timing procedure.
8. Road testing in the highways.

References

Auto Mechanics Theory and Service by deKryger et.al, The Ignition System, South-Western Publishing Co.USA 1986

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