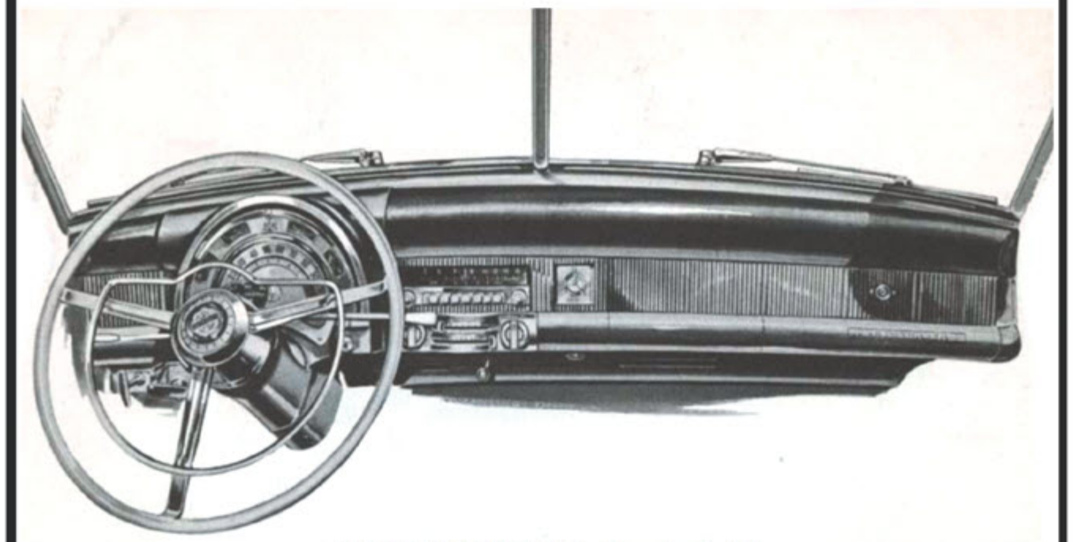
ELIMINATES *"wheel fight"* ON ROUGH ROADS!

On rough roads, thru sand or deep snow, on the soft shoulders, you will be amazed how easily, how effortlessly, how safely you can handle the car with Chrysler Power Steering. There is no "wheel-fight," because the hydraulic mechanism blanks out the wheel deflections, keeps the car on an even keel with your hands merely resting on the steering wheel—taking it easily and safely—Power Steering does the work—*all the time*—not merely when you are parking the car.

SAVES WEAR AND TEAR ON YOUR HEART AND YOUR DISPOSITION!

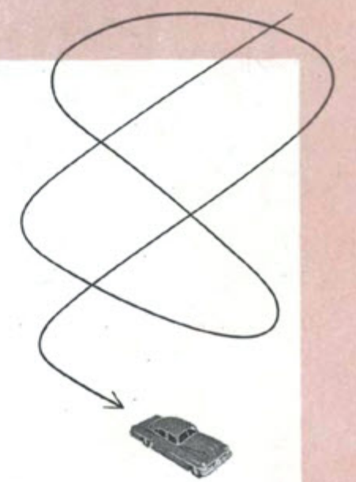
Many of the fifty thousand, and more, Chrysler owners who have driven Power Steering more than half a billion miles since it was first introduced early in 1951, are doctors. And many of these men have found out, from experience, what power steering means to those who must, of necessity, take it easy, from the standpoint of both physical and mental exertion. Chrysler Power Steering, with its effortless, relaxing, instant, certain, all-the-time control of the car, saves wear and tear on the heart and the disposition. It makes driving a relaxation—a pleasure to be enjoyed.



AMAZING! *is right!*

...and right here is the place for you to Learn the Difference!

Quite naturally, since Chrysler first pioneered and perfected Power Steering, others, as usual, are following. And again, there is much "painting of the lily." We suggest, inasmuch as *you* are the one who is doing the buying and are the *only one* who is to be satisfied, that you find out for yourself. At your convenience, your Chrysler Dealer will be delighted to let you drive a Chrysler with Power Steering so that you can, out on the road and in traffic, Learn the Difference between Chrysler *FULL-TIME* Power Steering and the new, *part-time* power steering mechanism—which is actually little more than a booster for parking—that is now being offered by other motor car manufacturers.



BUILDING AN OLD CAR LIBRARY-

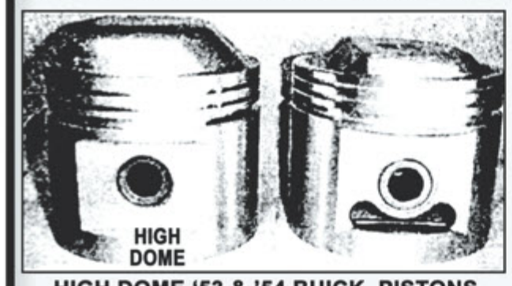
"Research Before You Restore"

BY Bill Johnson — PUBLISHER

Before buying a car, I always buy as much relevant literature as possible. This includes owner's, motors, body and parts manuals and color chips. I also search for drive reports, service bulletins and factory updates. Much of the above is available in print and on CD's from vintage book stores and online.

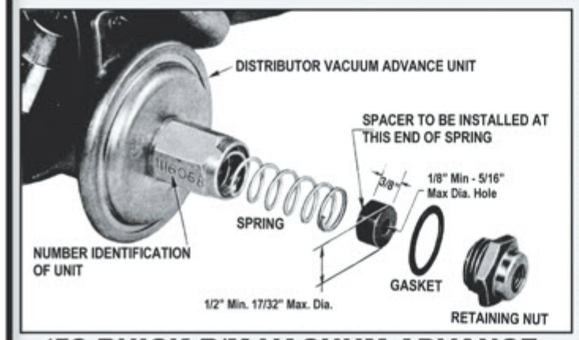
One of the reasons for putting together my library, was I had gotten tired of buying useless parts that were *supposed* to work and *didn't*; parts that will end up on eBay one day because I didn't have all the correct information before buying them. Ultimately, it is my responsibility to know exactly what I need, and if one part *really* does fit "all" applications. I am always skeptical when someone tells me "don't worry about it–I know what you need." I remember being told that when I bought a set of classic-styled radiator hose clamps for my '48 Packard Custom 8. When I got them, they looked great! But they didn't fit–they were too small. Belatedly, I checked my parts book, which listed the correct size. I had wasted time and money by *not looking them up first.* In 40+ years of restoring, one lesson I have learned is DO YOUR OWN RESEARCH!

Among my favorite books for research are the Flat Rate/Part Number Books. I have a four-volume set covering cars from the eras we restore: 1927-1970. These books show not only part numbers, but pictures, sizes and dimensions for such parts as brake linings, seals, bearings, wheel cylinders, etc. They were invaluable during our mechanical restoration on our '53 Roadmaster 2 dr. Hardtop. The engine was a real challenge in that it was a first-year engine and changes were made throughout the year. I bought the 1952 and 1953 factory manuals (you need them both) to study before I bought the car, but found that Buick's "Product Service Bulletin" manual was where I found all of the upgrades to make the car run at its best. When the first '53 Roadmasters and Supers rolled off the assembly line, they were fitted with high dome pistons.* The '53's first issue pistons measured 2.578" This measures from the center of the piston pin to the top of the piston dome, compared with a measurement of 2.180" on the '54 pistons–a difference of .398"! Our '53 had its original 322 V8 engine, but when we took it apart, it had low-dome '54 pistons and heads, and curiously, the block had never been bored, leaving us to believe it



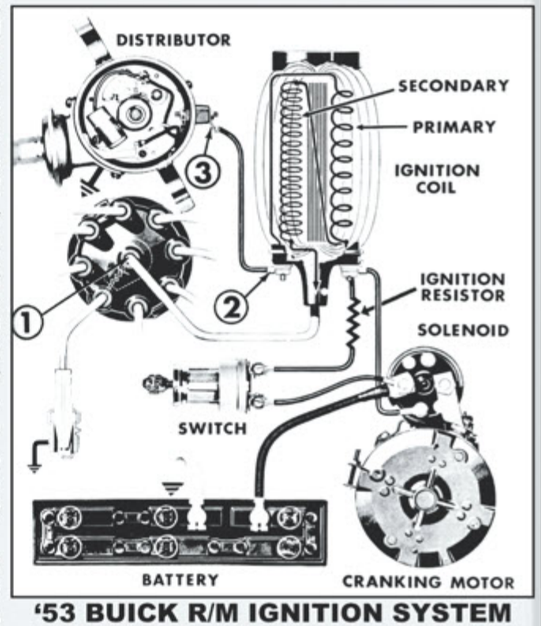
HIGH DOME '53 & '54 BUICK PISTONS

was a late year change, or a dealer change. But why did Buick change piston designs? Again, back to the books. We found a drive report by a legendary test driver/reporter of the day. It showed him making a cross-country test run in a '53 Buick Super V8. He gave high praise to the car's overall performance, but stated there was "pinging and spark rap during acceleration." This was published in a well-read magazine of the time and could have led to the piston design change, but further reading in Buick's "Product Service Bulletin" manual, they reported mild to moderate spark rap with a pinging sound during acceleration, and listed the first issue vacuum advance as a possible cause. Buick's remedy was to issue a new vacuum advance with a 3/8" long spacer between the vacuum advance unit spring and the spring retaining nut on the distributor. This was done to lower the maximum spark advance. It also stated that the spacer was to be used in vacuum advance #1116068 and not to be used under any circumstances in vacuum advance #1116083. These kinds of details clearly matter on performance. I recently saw a GM Delco-Remy NOS vacuum advance on eBay listed for '53-'56 Buicks "all." Before I ordered it, I would want to know what the part number is and if it is a #1116083, to make sure the spacer had not been added. Another problem that could have been prevented on our '53 was <u>not</u> to run the engine without an ignition (ballast) resistor.** The previous owner said he had just tuned the car and had gone through the entire ignition system. When we were checking the car in, we were inside with the key on, when suddenly we saw smoke! A fire had started at the coil, which is of course, right next to the glass bowl AC fuel filter at the carburetor. Fortunately, we got the fire out before doing much damage, but not before melting some wiring, blowing up the coil and melting the distributor cap! We took a deep breath, then checked our wiring diagram and saw that the ignition resistor had been left out of the ignition system. We added one (they're only about $10 for a NORS one) but the real cost was replacing everything else. A review of the wiring schematic when we brought the car in would have prevented the entire problem. I now have read all 180 pages in the "Product Service Bulletin" for '53 Buicks, and I can tell you, it is easier to read about the changes the factory made, than for me to work them out in the shop!



'53 BUICK R/M VACUUM ADVANCE

I recently read a Packard story about a collector who bought a beautifully restored 1930's Packard Super 8. Now, Packard straight 8's originally used slotted



'53 BUICK R/M IGNITION SYSTEM

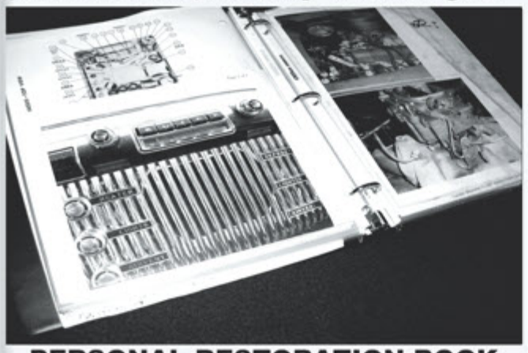
Continued

pistons and the factory manual clearly states, when building the engine face the slot *toward* the cam side. Unfortunately, the engine builder didn't do that. So, on the collector's first tour, the engine seized. Two of the pistons melted, creating other massive damage to the engine. When they tore down the engine, the problem was that the piston slots were turned *away* from the cam–a problem that could have been prevented by reading the engine section of the Packard Shop Manual.

As time passes, many of the mechanics who worked on our cars back in the day are no longer living or not still working, leaving a major void in the knowledge needed to make these cars run at their best. I've heard people try to justify incorrect repairs by saying, "It's supposed to drive that way–it's just an old car!" Or even, "They ALL ran hot!" I drove '40's and '50's cars when they were still being regularly seen on the roads, and '60's muscle cars when they were new. They were all we had back then. They were our daily drivers. They were dependable and drove and handled really well, and we drove them everywhere with very few breakdowns. Yes, there were a few cars that were troublesome, but not many. Then and now, my '46 Packard Standard 8 is a pleasure to drive. It has a light feel to the manual steering, and with its Lockheed braking system, it stops quickly with very little pedal pressure.

Another car we set to factory specs is my '51 Chevy Fleetline 2 door. It is one of the easiest, tightest cars I have ever driven. It starts every time, all of the gauges are where they ought to be, it's very easy to negotiate traffic in town or on the highway. But we have spent time to get it right. Books can help us make that happen, but the most important book in your collection is the book you make on your car! I use a loose-leaf notebook with plastic sleeves. Start with pictures taken at the beginning, middle and end of the restoration, with all notes, cross-over part numbers, contact names and phone numbers, and everything relevant to the build. I also keep the type gasoline and stabilizer, brake fluid, oil (detergent or non-detergent), and current antifreeze test readings. This helps to keep from making the same mistakes over and over, and if I sell the car later on, the new owner will know what parts were used and how to maintain the car.

Let's keep these cars that we love so much on the road and running right. See you next month, and keep 'em driving!



PERSONAL RESTORATION BOOK

**Terrill Machine (254-893-2610) has '53 high dome and later Buick low dome pistons.*

***Ignition Resistor: designed to step down the voltage About 15% to protect the points from premature wear.*

BOOKS TO CONSIDER FOR YOUR LIBRARY

- Manuals (Owner's, Factory, Parts, I.D., Body, Flat Rate/Parts)
- Color Chips
- Newsletters
- Product Bulletins
- Motors/Chiltons books
- Crash Sheets
- Drive Reports
- Production Figures
- Car Spotter's Guide
- Dykes Automotive Encyclopedia
- Marque History

BOOK SOURCES:
Lloyd's Literature: 1-800-BY-A-BOOK

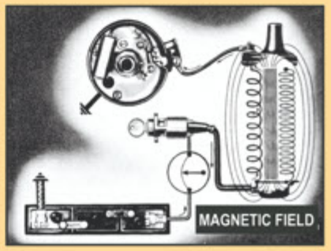
DRIVING OLD CARS

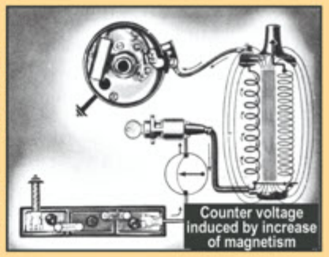
IGNITION SYSTEMS IN OLD CARS, Pt. II

by Bill Johnson — Publisher

Last month's article began diagnosing a problem with my 1946 Packard Standard 8, 282 CID straight 8 (see southernwheels.com, archives section). The problem is loss of power at full throttle with backfiring through the tail pipe. This month, I will continue the overview of the ignition system from the Packard Service Training Program booklet, with my personal notes added. This is relevant for most old cars with points, plugs and condenser systems, and specific for 19th (1941), 20th (1942) and 21st (1946-47) Series Packards. Our '46 is an Autolite, 6 volt, positive ground. We are assuming a good battery, spark plugs and distributor.

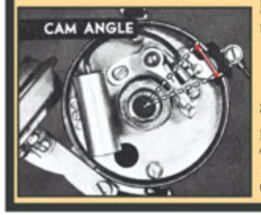
The ignition system of Packard cars consists of the following essential units:
A- A battery and generator as the source of power
B- An ignition switch to control the starting and stopping of the engine.
C- An ignition coil to step up the voltage
D- A distributor to direct the spark to the proper spark plugs at the correct time.
E. Ignition cables to carry the current to the spark plugs.
F. Spark plugs to ignite the mixture.



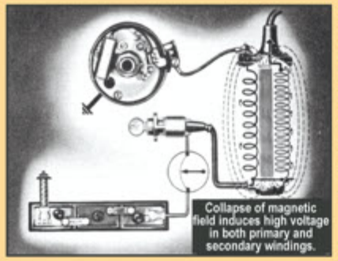


SEQUENCE OF OPERATION:

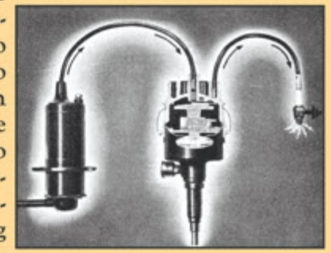
With the ignition key turned on, closing the distributor contact points completes the ignition primary circuit. The current flows from the battery, through the ammeter, the ignition switch, the primary winding of the coil, and the contact points to ground. This flow of current through the primary winding creates a magnetic field around the coil and through the core. The current flow and magnetic field, however, do not increase to their peak instantly. It takes a small fraction of a second, called the build-up time, for the current flow and the magnetic field to reach their peak. This is due to the counter voltage induced in the winding by the increase of magnetism. The battery voltage, which forces the current through the primary winding, is opposed by the counter voltage.



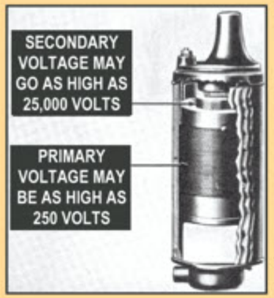
Coil characteristics are so balanced with build-up time that, even at top engine speed when the contact points remain closed for the minimum time, the coil will build up sufficiently for good ignition. The amount of cam rotation between the closing and opening of the contacts controls the build-up time, and is known as the *cam angle* or dwell angle.

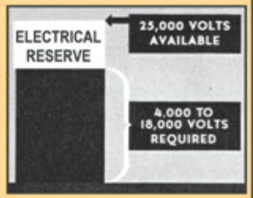


When the distributor contacts open breaking the primary circuit, the current attempts to continue to flow and tends to cause an arc across the points. The condenser prevents the arc by absorbing the sudden shock of the current caused by the opening of the contacts. Therefore, the magnetic field around the primary winding, induced by current flow, quickly collapses. It is this sudden collapse of the magnetic field that induces a high voltage in both the primary and secondary windings.

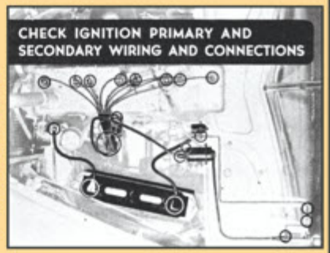


The voltage induced in the secondary winding causes current to flow through the coil to distributor cable, the distributor cap center contact and rotor to the brass contact lined up with the rotor at this time, then through the spark plug cable to the spark plug and across the gap of the spark plug electrodes to ground. The voltage induced is proportional to the turns of wire in the windings and the resistance at the spark plug gap. The induced voltage in the primary winding may be as high as 250 volts; and, consequently, the induced voltage in the secondary winding may go as high as 25,000 volts.





The voltage necessary to cause an arc at the spark plug gap is somewhere between 4,000 and 18,000 volts. The extra voltage represents the electrical reserve built into the ignition system. The voltage required to fire the plug varies with conditions including engine compression, engine speed, mixture ratios, spark plug gap, temperature, and many other conditions. These conditions must be taken into consideration when diagnosing ignition troubles and servicing the ignition system.



SERVICING THE IGNITION SYSTEM

Although good ignition is one of the requirements for good engine performance, it must also be remembered that good carburetion and good compression are equally essential. The ignition system is often blamed for engine failures and poor performance when the source of the trouble might be either the carburetor and fuel system or compression. To make a correct diagnosis, the procedure for checking the ignition system is outlined as follows:

1. Check the ignition primary and secondary wiring and connections. Replace any leads that are frayed, have broken strands, or have defective or deteriorated insulation. Clean and tighten all connections.

2. Check the distributor vacuum advance on the Six and Eight by rotating the complete distributor in the direction opposite that of the normal rotation (counter clockwise) of the breaker cam. To loosen the distributor, back off the screw on the spark retard/advance plate where the vacuum advance connects to

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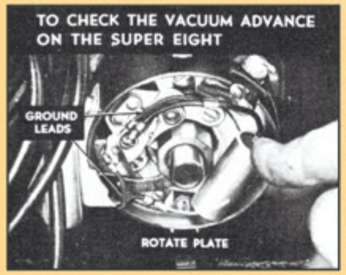


the distributor. The distributor should turn freely and the vacuum advance spring should return the distributor to its original position. Another test is to disconnect the vacuum line at the carburetor and connect a vacuum/brake bleeder gauge. Pull vacuum, and the needle should stay steady at 20". If it falls, the vacuum advance diaphragm is bad.

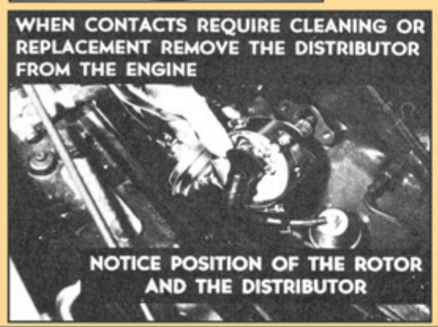
On the Super Eight distributor, rotate the breaker plate clockwise to check the vacuum advance operation. The plate should rotate without binding. It should not wobble, and should return to its original position when it is released. On this type unit, be sure to check carefully the ground leads, known as "pigtail" leads, for fraying, broken strands, or broken terminal connections.

The centrifugal advance can be checked by rotating the breaker cam in the direction of its normal rotation. It should rotate freely and the centrifugal advance springs should return the cam and rotor to their original position without binding.

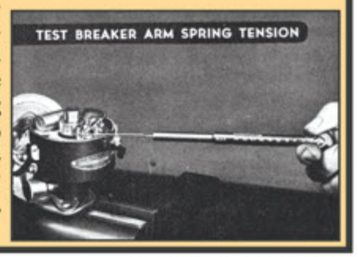
These quick checks indicate whether the advance mechanisms are working or not. However, for accurate testing of these units, the distributor should be removed and tested with a reliable distributor tester and instruments under various speeds and vacuum conditions.

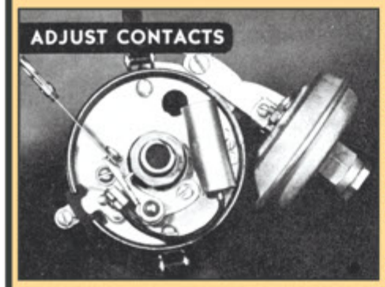
3. While the distributor cap is off, wipe out the cap with a soft cloth. Inspect the cap and rotor for chips, cracks and carbon paths which would allow secondary current leakage to ground. Examine the contacts by holding them apart with the finger or thumb. Contacts that have been in service will not appear to be smooth and bright. This does not necessarily mean that they are not operating satisfactorily. On the contrary, they may be making contact over a greater area than could be obtained with new contacts. Clean the contact points with a fine-cut file. Blow out all dust particles. Make sure none remain on the contact surfaces. If the contacts are burned or pitted, they should be replaced.

Caution: *Never use emery cloth or sandpaper* to clean the contacts as the particles of these abrasives will be embedded in the contact surfaces and cause the contacts to burn. Use a point file instead.

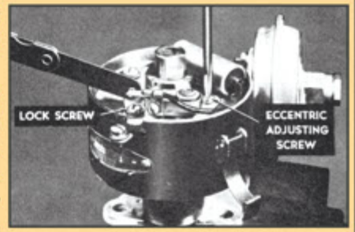


4. Test breaker arm spring tension using the spring scale. The spring tension should be 19 to 23 ounces on the Delco-Remy distributor and 17 to 20 ounces on the Au-to-Lite distributors. The correct tension may be obtained by shifting the breaker arm spring in its slot.

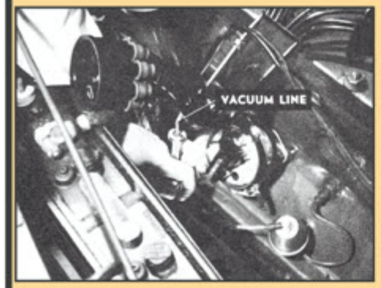




5. When the contacts require cleaning or replacement, remove the distributor from the engine, since the job can be done more easily and more accurately on the bench. Notice the position of the rotor and the distributor before removing it, so that it can be easily installed in the same approximate position and will require only a slight adjustment to complete the timing.

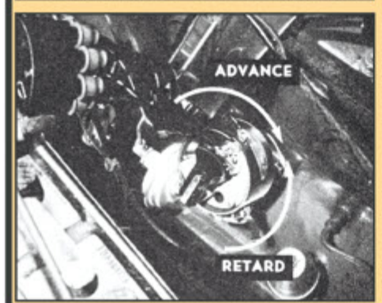


After the contacts are cleaned or replaced, adjust them by setting the cam angle using a feeler, to the correct opening of .020 inch on the Six distributor, and .017 inch on the Eight and Super Eight distributors. Be sure all contacts are aligned and have maximum contact area.

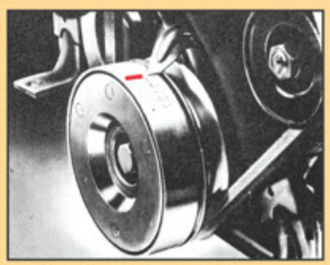


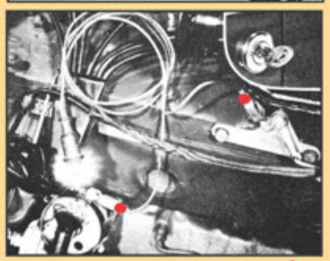
On the late-type distributors, the stationary contact is adjustable by loosening the lock screw and turning the eccentric screw for adjustment. The earlier type contacts are adjusted by loosening the lock nut and turning the contact in or out.

Whenever a synchroscope or some other good distributor tester is available, check the operation of the centrifugal advance throughout the entire distributor speed range. There are several reliable makes of synchroscopes and testers, any of which will test distributors satisfactorily.



6. After the distributor is tested accurately and the condenser is reinstalled, install the distributor on the engine with the rotor and distributor in the same position they were when the distributor was removed. Make sure the distributor is all the way down in its mounting and that the hold-down clamp or screw is tight. Be sure the vacuum line is tightened securely. Turn the grease cup in one turn. The ignition timing should then be adjusted correctly.





7. With the distributor cap removed and using the timing marks on the vibration damper to check crankshaft rotation, rotate the crankshaft in the direction of normal rotation until #1 piston comes up on the compression stroke with the intake and exhaust valves closed, and the marks on the vibration damper align with the pointer. Loosen the clamp screw and rotate the distributor base clockwise to advance the timing, or rotate it counterclockwise to retard the timing, until the breaker contacts just start to open with the rotor aligned with the #1 electrode of the distributor cap. Be sure to tighten the clamp screw when timing is completed.

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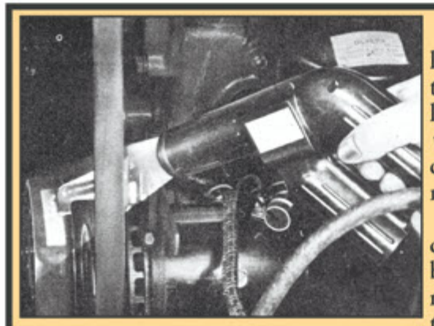
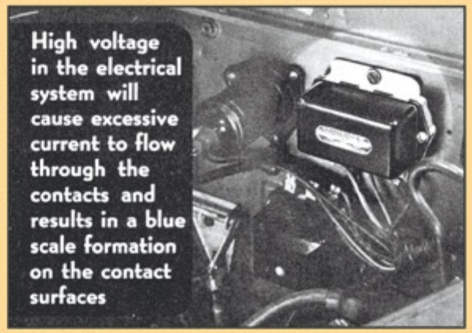
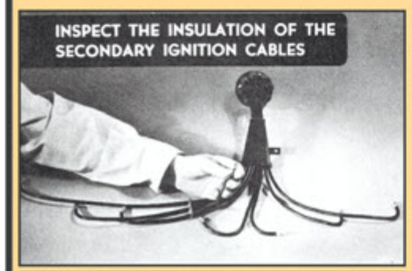


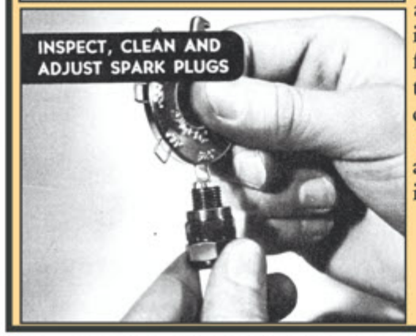
The timing may be checked by means of a test lamp connected from the distributor primary terminal to ground. When the ignition switch is turned on, the light *will not burn* when the contacts are closed, and *will go on* just as the contacts break. Press the distributor cam lightly against the direction of normal rotation to remove all backlash.

An ignition timing light which operates on the current from the distributor to the #1 spark plug may be used to adjust ignition timing. By putting a chalk mark on the pointer and the correct timing mark on the vibration damper, the stroboscopic effect of the timing light with the engine idling will cause these two chalk marks to appear to line up when the ignition timing is correct. Caution: Be sure that the engine is idling no faster then 450 to 500 rpm when setting the timing with a timing light. An engine that is operating above 500 rpm may cause the centrifugal advance to come into operation and give inaccurate timing setting. With the correct timing, there may be a slight trace of spark ping when accelerating with wide open throttle from ten to thirty miles per hour in high gear.

8. Oil on the contact surfaces is the most common cause of burned contacts. The carbon formed by the burning of the oil will embed in the contact surfaces. This will cause the contact points to arc, and, consequently, to burn. Clean or replace the contact points and adjust the gap. Locate and eliminate the source of the oil. Do not over lubricate the breaker cam surface or the cam wick.







9. High voltage in the electrical system will cause excessive current to flow through the contacts. This results in a blue scale formation on the contact surfaces. When this condition is found, all electrical connections of the ignition circuit should be tightened and the voltage regulator should be checked and reset if necessary.

10. Inspect the insulation of the secondary ignition cables and the primary wiring for cracks, worn insulation, frayed insulation, and brittleness. Check the wires and cables for broken strands. Examine the terminals and connections for corrosion and looseness. Replace the wiring and clean, repair or replace the terminals if necessary.

11. The spark plugs should be inspected, cleaned and adjusted or replaced if necessary. Gap should be .028 inch and is adjusted by bending side electrode only.

Keep 'em driving!

Test Specifications

Packard 19th, 20th & 21st Series

Distributor Contact Gap, Cam Angle, Condenser and Timing Data

PACKARD MODEL	DISTRIBUTOR MAKE	DISTRIBUTOR MODEL NO.	CONTACT GAP	CAM ANGLE	SPRING TENSION	CONDENSER CAPACITY	TIMING SETTING	
Some 1900	Delco-	1110092	.020"	35°	19-23 oz	.28-.32 mfd	6°+0°-1-1/2°	btdc
2000,2010,2100	Remy	1110132	.020"	35°	19-23 oz	.28-.32 mfd	6°+0°-1-1/2°	btdc
Some 1900,2000, 2010,2100,2130	Auto-Lite	IGC4505	.020"	38°	17-20 oz	.28-.32 mfd	6°+0°-1-1/2°	btdc
1901	Auto-Lite	IGP4502	.017"	27°	17-20 oz	.20-.25 mfd	7°+0°-1-1/2°	btdc
1951,2001,2011, 2101,2111	Auto-Lite	IGP4502A	.017"	27°	17-20 oz	.20-.25 mfd	7°+0°-1-1/2°	btdc
1903,1906, 2003,2006	Auto-Lite	IGT4102	.017"	27°	17-20 oz	.20-.25 mfd	6°+0°-1-1/2°	btdc
2103,2106,2126	Auto-Lite	IGT4203	.017"	27°	17-20 oz	.20-.25 mfd	6°+0°-1-1/2°	btdc

Distributor Centrifugal Governor Control Data, Distributor RPM and Degrees Advance

PACKARD MODEL	DISTRIBUTOR MAKE	DISTRIBUTOR MODEL NO.	RPM	ZERO ADV.	RPM	ADV.	RPM	ADV.	RPM	ADV.	FULL RPM	FULL ADV.
Some 1900	Delco-	1110092	---	--	300	1-1/2°	700	5°	----	--	1600	10°
2000,2010,2100	Remy	1110132	---	--	300	1-1/2°	700	5°	----	--	1600	10°
Some 1900,2000, 2010,2100,2130	Auto-Lite	IGC4505	300	0°	590	3°	780	5°	1150	7°	1600	9-1/2°
1901	Auto-Lite	IGP4502	250	0°	525	3°	800	5°	1210	9°	1550	11-1/2°
1951,2001,2011, 2101,2111	Auto-Lite	IGP4502A	325	0°	600	3°	800	5-1/4°	1175	8°	1550	10-3/4°
1903,1906, 2003,2006	Auto-Lite	IGT4102	250	0°	475	3°	700	6°	1300	9°	1800	11-1/2°
2103,2106,2126	Auto-Lite	IGT4203	250	0°	475	3°	700	6°	1300	9°	1800	11-1/2°

Distributor Vacuum Advance Data

PACKARD MODEL	DISTRIBUTOR MAKE	DISTRIBUTOR MODEL NO.	IN. HG.	ADV.	IN. HG.	ADV.	IN. HG.	ADV.	IN. HG.	ADV.	IN. HG.	ADV.
Some 1900	Delco-	1110092	6"	0°	9"	2°	12"	4°	15"	6°	17"	7-1/2°
2000,2010,2100	Remy	1110132	6"	0°	9"	2°	12"	4°	15"	6°	17"	7-1/2°
Some 1900,2000, 2010,2100,2130	Auto-Lite	IGC4505	6"	0°	9"	2°	11-7/8"	4°	14-7/8"	6°	17"	7-1/2°
1901	Auto-Lite	IGP4502	10"	0°	11-1/8"	1°	13-1/2"	3°	15-7/8"	5°	17"	6°
1951, 2001, 2011, 2101, 2111	Auto-Lite	IGP4502A	10"	0°	11-1/8"	1°	13-1/2"	3°	15-7/8"	5°	17"	6°
1903, 1906, 2003, 2006	Auto-Lite	IGT4102	7"	0°	8-1/8"	1°	12"	3°	13-1/2"	4°	16"	5-1/2°
2103, 2106, 2126	Auto-Lite	IGT4203	7"	0°	8-1/8"	1°	12"	3°	13-1/2"	4°	16"	5-1/2°

OLD CAR

MATCH GAME

(Answers on Page One)

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☐	2. 322.0 V-8	B-CHEVY
☐	3. 265.0 V-8	C-CADILLAC
☐	4. 239.4 V-8	D-PACKARD
☐	5. 226.0 Six	E-OLDSMOBILE
☐	6. 336.7 V-8	F-PONTIAC
☐	7. 260.0 V-8	G-BUICK
☐	8. 287.2 V-8	H-LINCOLN
☐	9. 303.7 V-8	I-PLYMOUTH
☐	10. 331.1 V-8	J-DODGE
		K-CHRYSLER
		L-NASH

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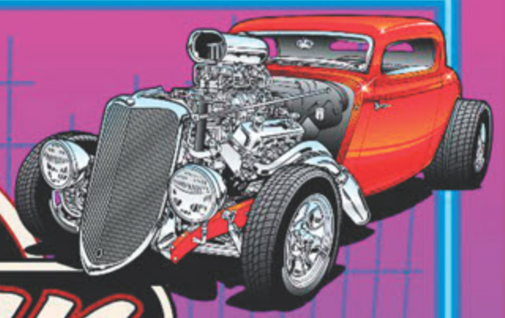

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