H. Hargrave

Technical Letter No. 1982

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TO BE NOTED AND INITIALED BY	

PACKARD MOTOR CAR COMPANY

DETROIT, MICHIGAN

To PACKARD DISTRIBUTERS AND DEALERS July 22, 1936
(Attention: Service Managers)

Subject SPARK KNOCK

Gentlemen:

The cause of a spark knock complaint requires a more careful and intelligent analysis than almost any other condition which may develop in the car.

In the first place it must be borne in mind that a slight detonation on heavy, slow speed acceleration is a normal condition, and that the absence of any trace of this noise may indicate so late a spark or so rich a carburetor adjustment that the operation of the motor will be unsatisfactory.

Spark knock may also be present to an objectionable extent in a motor whose adjustments are absolutely correct. The variation in the octane value of various fuels will affect the situation more than any single item. If a customer reports excessive spark knock you must make yourself familiar with the fuel which he is using.

A heavy collection of carbon will, of course, cause the same result. When a spark knock is due to carbon deposits it is necessary either to clean the carbon or to recommend to the driver that a fuel having a higher octane rating be used. A large percentage of the so-called regular gasolines now contain a small quantity of Tetra Ethyl Lead and many drivers feel that they are using Ethyl gasoline in the sense of a premium fuel simply because they see the sign on the fuel pump indicating the presence of Tetra Ethyl Lead.

We hope that by this time our customers, as well as our service stations, are thoroly educated on the necessity of filling the radiator to the top of the spout. Many customers who have had cars with outside filler spouts have felt that if the water could be seen in the bottom of the spout the radiator was full. This, of course, is not true where the spout is under the bonnet.

Two of the items which are most important in controlling spark knock are the spark timing and the carburetor mixture. A rich mixture and a late spark will almost always cure detonation but these two items are extremely important from a standpoint of economy, and if you try to reduce detonation in either of these two ways you are faced with a probable increase in fuel consumption.

The recommended spark timing in the 120B is 7° ahead of center, and it is advisable to hold the setting fairly close to this figure. During hot weather or with a carbonized motor the timing may be slightly retarded but it should not be reduced to a point where the advance is less than 5°. Anything under this figure is apt to affect fuel consumption and motor performance very definitely.

While almost everyone realizes the connection between spark knock and spark advance many do not know the effect of a lean mixture. A low float level in the carburetor will cause a very pronounced result. You will often find pronounced detonation when accelerating on a half throttle which disappears completely when the throttle is fully open because this brings in the high speed jets and enriches the mixture.

In those cases where the customer is anxious to reduce detonation even at the expense of economy, the float level can first be checked. This should be done with the motor idling, because the pump pressure will raise the level to a higher point than when the motor is stopped.

As a next step the #48 jets in the 120B can be increased to #50. This will increase the fuel consumption at low speeds almost one mile to the gallon, but at medium and high speeds the difference becomes negligible.

If an owner is a consistently hard driver, cooler spark plugs may be substituted for the standard products. If you are using the A.C. it may be changed from K-7 to K-5, and if you are using the Champion, you may change from J-8 to J-10. You will find that the cooler plugs will give excellent performance under very hard driving conditions without the possibility of pre-ignition which may be present in the hotter plugs.

In cleaning carbon, careful attention should be given to the cylinder head, and the sharp edge around the combustion chamber should be rounded off smoothly with a bearing scraper. A sharp projection in the head itself may cause pre-ignition just as definitely as an overheated spark plug or a projecting carbon deposit.

We have found that in some cases where the customer complains of detonation it is because he has been asked by the service station to authorize a complete carbon and valve job. He realizes that cleaning carbon may be in order but he feels that he is being unnecessarily penalized when he is forced to pay for a valve job which is not required.

Yours very truly,

PACKARD MOTOR CAR COMPANY

T A Stalker

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(2500)

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