THE SKINNER OIL RECTIFIER

MAINTENANCE INSTRUCTIONS

The design of the Skinner Oil Rectifier is such that frequent adjustments and attention are unnecessary. The only moving parts are those of the valve mechanism, which are operating in oil constantly, reducing the possibility of any wear.

How Often Should the Rectifier be Cleaned and Why? The Rectifier must be removed from the motor and cleaned once every 10,000 miles. The reason for cleaning is the fact that carbon will accumulate on the outside and inside of the Rectifier top, due to the exhaust gases thus forming an insulation against the heat passing through to the oil.

How to Remove the Rectifier: Disconnect the three pipes from the unit and remove the four nuts from the studs holding the Rectifier in its casing. This will allow the Rectifier to be dropped down vertically and removed.

How to Disassemble the Rectifier: Refer to the cut. Remove the two sets of screws, "B", around the center casting "E." This allows the Rectifier to be separated into its three parts ready for cleaning.

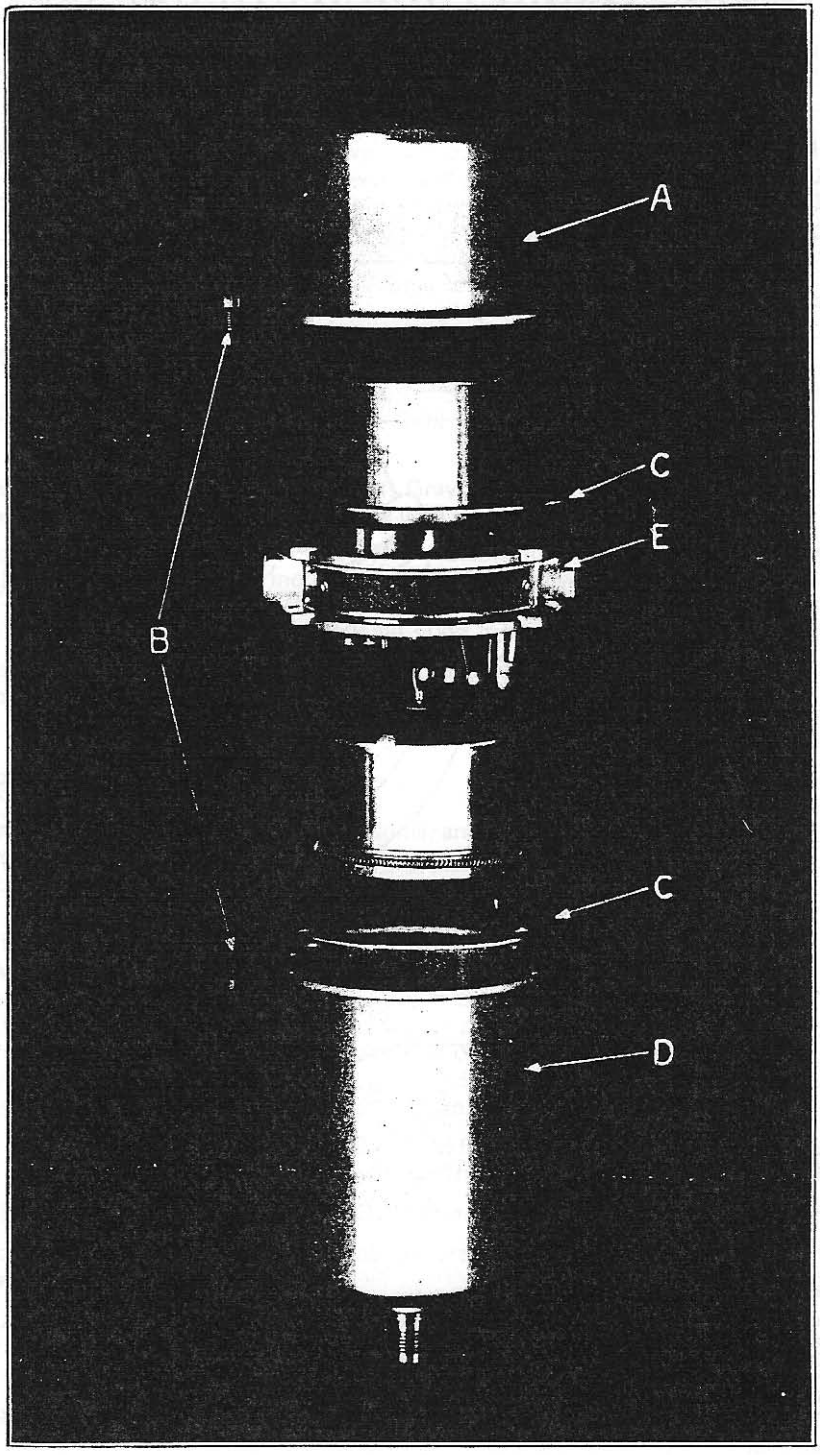
How to Clean the Rectifier: The top stamping "A" should be thoroughly cleaned with a putty knife, both outside and inside, to remove the carbon accumulations. It is then advisable to wash it out with gasoline. The steel baffle attached to the top of the center casting should also be treated in the same manner. When cleaning the center casting "E," it is advisable to wash it with gasoline, using a stiff brush in order not to injure the valves, valve seats, or float mechanism. *A leaky valve will cause faulty operation of the Rectifier.* Be careful to avoid bending the thermostat blade, or forcing it out of its proper position, otherwise this valve may not be aligned with its seat. The thermostat adjustment is made at the factory *and must not be changed.* The bottom stamping which comprises the float chamber, "D," should be washed out thoroughly with gasoline so as to remove any sediment or metal pieces which may have accumulated in the bottom.

The pipe between the Rectifier and the intake manifold and the connecting fittings must also be cleaned out. The pipe itself can best be cleaned by burning out the carbon with oxygen by aid of a welding outfit. If this pipe tends to carbon up unduly, it is an indication that the Rectifier is running too hot and a plate should be installed between the exhaust manifold and Rectifier casing according to Service Bulletin No. 400.

Assembly: In reassembling the Rectifier, it is advisable to use new gaskets, "C," to insure air-tight joint (Part No. 4573). These gaskets may be obtained from the SKINNER AUTOMOTIVE DEVICE CO., INC.. When installing the Rectifier on the motor it is necessary that all connections be tight, as a leak at any point in the system is liable to stop the operation of the Rectifier.

Heat Regulation on Rectifier: On the side of the exhaust manifold is a lever operating a butterfly valve which governs the amount of heat shunted around the head of the Rectifier; notches in the casting permit the adjustment of this lever. For summer operation the valve should be in the closed position with lever flat. For winter driving the lever should be moved up, the amount of opening depending upon the climate and character of operation. It will seldom be found necessary to open the valve to its maximum position in order to keep out dilution, and care should be taken not to run the car at excessive speeds with the heater valve open wide, as the Rectifier may be overheated.

How to Check for Trouble: Allow the engine to idle at a speed of about 800 R. P. M., and remove any one of the cap screws holding the oil manifold to the cylinder block. If a good suction is not obtained, it is conclusive evidence that there is some restriction in the piping between this point and the intake manifold. If this condition is apparent, the restriction should be located and removed. If no restrictions are found, the pipe leading from the bottom of the Rectifier should be disconnected and the engine allowed to run for a period of one-half hour or longer, if possible. A container should be placed underneath the Rectifier in order to catch the oil which should be tripped out intermittently. If the Rectifier does not trip while the engine is running, the trouble is undoubtedly in the unit itself. In this case, it should be replaced with a replacement Rectifier and the defective one returned to the makers, SKINNER AUTOMOTIVE DEVICE COMPANY, INC., 2225 Dalzelle, Cor. 14th, Detroit, Michigan. Their guarantee covers a ninety-day period, during which time the unit will be replaced free of charge, except transportation unless it has been mutilated. After the ninety-day period, a charge of $2.50, plus transportation, will be made for an exchange unit.



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All Willys-Knight six cylinder models beginning with the 1925 Great Six Model 66 and the 1927 Light Six Model 70-A (some 1926 Model 70's were retrofitted with rectifiers) came equipped with the Skinner Oil Rectifier. This unit might be considered to be one of the first polution control devices, and if the unit on your car is not working properly, the polution produced will be quite obvious.

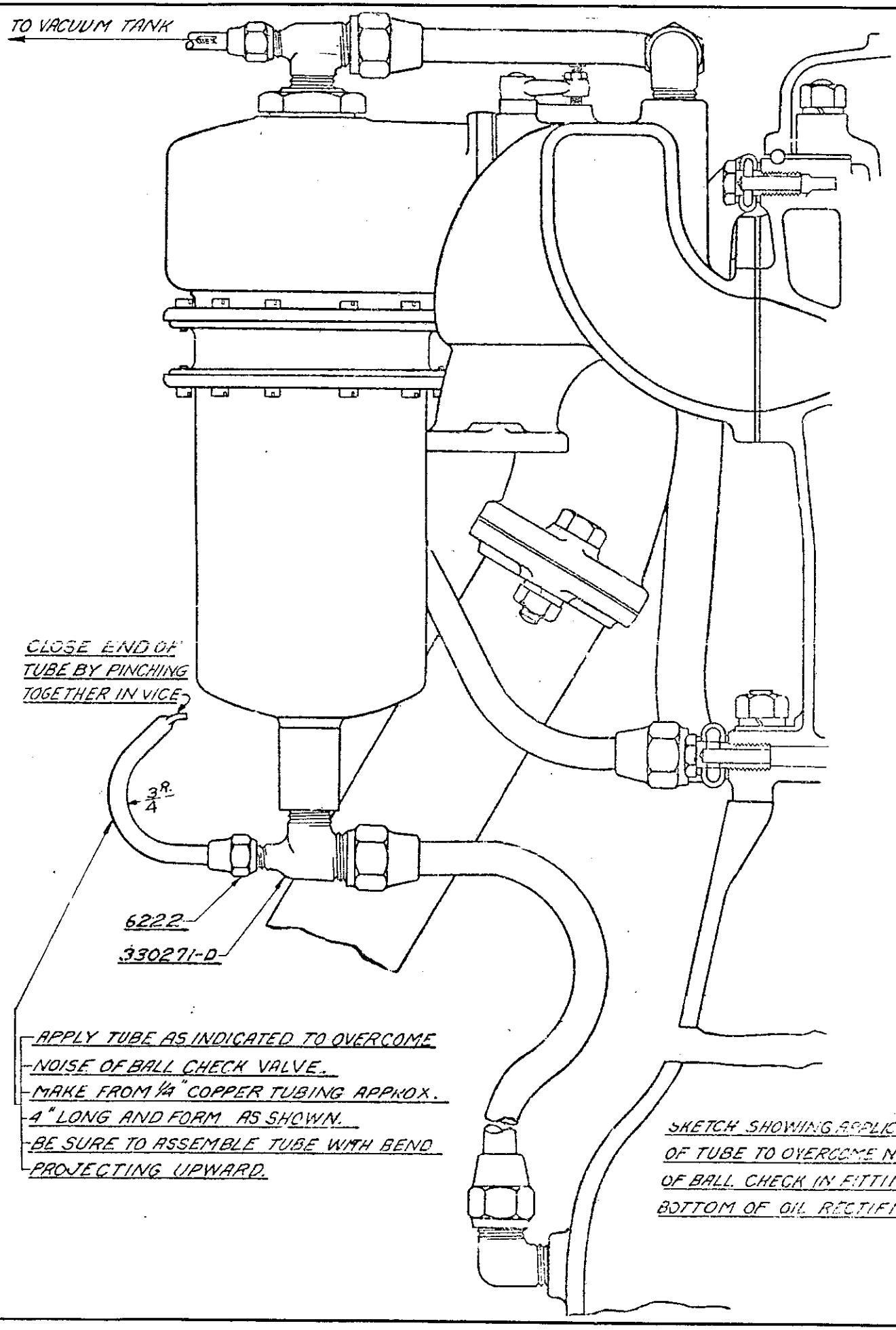
According to the manufacturer, the primary purpose of the rectifier was to eliminate oil dilution in the crankcase by preventing the mixture of gasoline, water, and sulphuric acid with the lubricating oil. Surplus gasoline, water, sulphuric acid, and lubricating oil are sucked from the cylinder walls by the vacuum produced in the intake manifold and are deposited in the rectifier where the lighter elements are distilled off by the heat of the exhaust. Surplus gasoline, which would otherwise pass to the crankcase, diluting the oil, is converted into combustible gas; water is converted to steam; and sulphuric acid in the form of a gas are drawn into the combustion chamber from the rectifier. The purified lubricating oil is returned from the rectifier to the crankcase.

The Skinner Rectifier was manufactured by the Skinner Automotive Device Co., Inc., of Detroit. Mr. Skinner was at one time an honorary member of WOKR and rebuilt units for some members, but he passed away a few years ago. The Skinner Company serviced rectifiers on an exchange basis when they were in business, but today this task must generally be performed by the owner.

Reproduced on pages 18 and 19 are maintenance instructions issued by Willys–Overland in 1928. The sketch on page 20 is from a 1925 Willys–Overland Service Letter and shows a method of overcoming a buzzing noise in the rectifier caused by vibration of the check ball in the bottom fitting when the float mechanism trips. The ell fitting at the bottom of the rectifier should be replaced with a tee fitting and a ¼ inch copper tube as indicated. The addition of this tube forms an air cushion which prevents the check ball from vibrating.

The rectifier must be kept in near perfect working order at all times to prevent smoking problems with Willys-Knight 6's. The rectifier is not the only cause of bad smoking, but it is generally the first place to look for trouble. The oil pressure relief valve should also be kept in good working order and correct adjustment. Cleaning and adjusting the rectifier does little good unless the oil lines to and from the unit are thoroughly cleaned. All oil galleys on Willys-Knight six cylinder engines should be cleaned in a like manner.

The cork gasket in the rectifier can be cut out at home. The copperclad gasket can sometimes be found at flea markets, and occasionally members of the club have some available. The old copper-clad gasket can be sent to Gasket Manufacturing Co., 18001 South Main St., Gardena, California 90247, which can make new ones if required.



SKETCH SHOWING APPLICATION OF TUBE TO OVERCOME NOISE OF BALL CHECK IN FITTING AT BOTTOM OF OIL RECTIFIER.