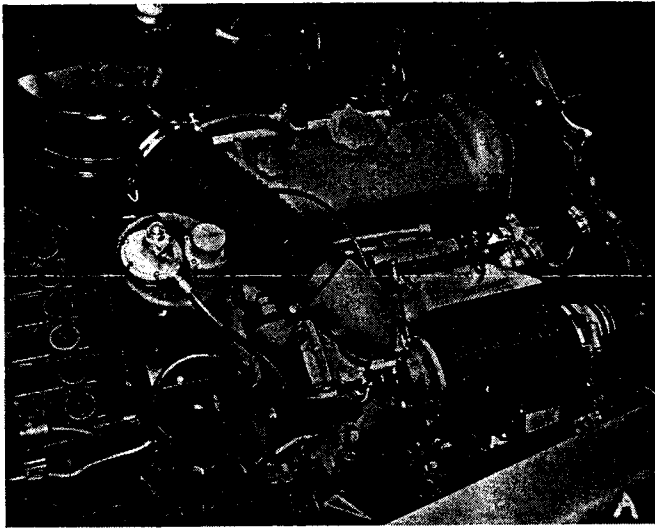


ROAD TEST OF THE JUDSON SUPERCHARGED 190 SL

by KEN BARTLETT



The Mercedes-Benz Star's ambition has always been to try and get the news first. With this in mind, a constant stream of correspondence has been flowing between the Judson Research and Manufacturing Company and 29 Brookside Terrace. As a result we are able to bring you the first actual driver's report of the Judson Supercharged 190 SL to be published anywhere. Mr. Charles Judson was good enough to bring the car up to N. J. twice, giving me ample time to drive the car and to ask questions. I am most grateful to Mr. Judson, not only for his cooperation in making this test possible but for not losing patience with my persistence.

Normally the amount of air-fuel mixture that is burned in an engine is determined by the downward intake stroke of the piston simply sucking the mixture in. A supercharger reverses all this by creating a positive pressure and forcing the mixture into the cylinders. More air-fuel mixture is burned and more power is produced. The Judson is a sliding vane type of supercharger as opposed to Roots and centrifical types, and for a high-revving sports car engine, has many advantages over these other methods.

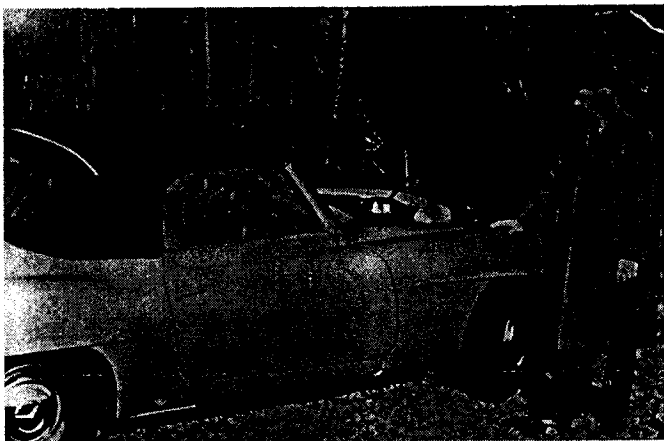
The Judson is basically a drum with a shaft placed off-center. A series of vanes rotate with this shaft

and are arranged so they can slide in and out, maintain contact with the outer edge of the drum. If you then visualize an intake, with carburetor, on the portion of the drum where the chamber formed between the vanes is largest, and an outlet where they are smallest, you have an over-simplification of a sliding vane supercharger. As the air is picked up at the intake it is not only "blown" it is compressed. Because of this compression and the close fit of the vanes, this type of supercharger is not only very efficient but probably the most effective at low RPM.

The unit is completely new, designed and tailored for use on the 190 SL engine and has been well over a year in development. The workmanship is so good that it could well have been built by the factory itself and the whole thing looks right at home. Practically everything you can see is cast aluminum. The shaft of the supercharger runs on New Departure high-speed ball bearings and the carburetor is a recalibrated Holley of the type used on the Ford 6. The supercharger is supplied with everything needed for its installation right down to the last bolt and comes with complete illustrated instructions.

As to the actual installation, while it is not an hour's job for the amateur, it could probably be accomplished by any owner used to doing a good deal of his own work. First, the air manifold and carburetors must be removed along with the radiator. A new pulley is installed on the crankshaft and a spacer placed beneath the fan. The radiator is reinstalled about an inch further forward using brackets provided in the kit. The supercharger itself is then bolted to the intake manifold and the top oiler is attached to the fire wall just in front of the battery. The primary purpose of the top oiler is internal lubrication of the supercharger. The balance of the installation consists of details such as connecting throttle linkage and the gas line. The stock air cleaner is retained and the fuel pump need not be changed as its flow has been found to be more than adequate.

Now that we have the Judson Supercharger installed on the car, let's take it out on the road. The car really goes! Taking off in first gear gives you the feeling that you are in a 300 SL instead of a 190. There is no lag and wheel spin can be induced without difficulty. This supercharger is noiseless at all times and those who may remember the scream of SS's and 540 K's will find this something new in "blown" Mercedes'. If you have a 190 SL with the not uncommon flat spot in acceleration, this is a sure cure. There is no interruption of the power flow anywhere, and the engine is actually smoother with almost no trace of torsional vibration. The balance of the car is not effected since the Judson weighs only 24 lbs. and this added weight is partially offset by the removal of the Solexes and the air manifold. Handling(if effected at all, is improved because real POWER is available when needed. Having the car on familiar roads was a real advantage. One hill that I am forced to climb daily in third gear in my unsupercharged car, was easily negotiated in fourth. Throttle response is instantaneous and the power available gives you the feeling of being in the next lower gear.



Mr. Judson and His 190SL

To provide you with some more factual data a Perfrometer was installed in my unsupercharged 190 SL and on the Judson Supercharged car. This instrument will give you a reading of the rate of acceleration and was described in some detail in the Feb. issue of "Road and Track." For the purpose of this article the figures were read directly from the dial and no attempt was made to translate them into G's or any other form and they will serve only to show you the relative improvement in acceleration.

My 190 SL used in this test is a '57 and could be considered moderately fast having taken second place in the acceleration runs at South Bend last summer. Judson's car was an early 1956 and it had the old gear box with the high ratio third gear. Since this higher

Ken Takes to the Road



gear will give less acceleration, the readings for third gear in the two cars will not be comparable. The actual reading for the supercharged car in third gear was 22 but in the chart I have substituted an estimate of the reading that could be expected from a car with a later gear box, based on the performance improvement in the remaining three gears.

Car	First	Second	Third	Fourth
Unsupercharged	32	25	19	11.5
Judson Supercharged	45	33	26	17.5

From this chart you can see that the response of the supercharged car in any gear is approximately equal to the response of the unsupercharged car in the next lower gear, and that the driving impressions mentioned previously are truly correct. It is also apparent that the manufacturers claim of a 40% or better increase in horsepower is valid. Maximum readings occur at about 2300 RPM indicating that the torque curve of the engine must really be something to see. From 4800 to 6000 RPM goes so quickly in first and second gears that the power seems continuous. I did try a few runs in third gear and found that the performance edge of the supercharged engine seems to fall off at these high engine speeds. What is happening is that the cam, which is quite wild, is so efficient at these speeds that it is actually scavenging some of the boost pressure out the exhaust. While this appears on the surface to be a fault it has some advantages. It provides good fuel atomization, probably helps exhaust valve cooling and lowers boost pressure at these very high engine speeds. Performance at these revs is still better than stock, but this appears to be one of the problems connected with adding a supercharger to an engine not basically designed for it. It does lead to some very

interesting speculation about the results that would be achieved when the unit is installed on the lower compression ratio, milder cammed 190 sedan, and about the possibilities of installing the supercharger and the 190 sedan cam on the 190SL. For the record no kits are being made for the sedan at this time, and the cam switch is an idea and not a recommendation.

Our test car was equipped with a manifold vacuum and pressure gauge. At idle the gauge showed 18 inches of manifold vacuum and when the throttle was floored it showed 5 lbs. of boost pressure. With a closed or partially open throttle and the engine not under load, the car runs on manifold vacuum as if it were not supercharged. When accelerating or climbing a grade the boost pressure comes on and the engine is supercharged.

Since supercharging is producing a boost pressure only when demanded, gas mileage will be effected in direct proportion to the use you make of this extra horse power. Fuel flow checks show that with average driving it can be expected to drop about 2 miles per gallon. While we were unable to take measurements, it is fairly safe to guess that a 0 to 60 time of $9\frac{1}{2}$ seconds could be turned in. Mr. Judson's figures give 0 to 60 in 9.8 and the standing quarter mile in 14. Top speed will be increased but not in proportion to the acceleration times since you are limited here only by the engine speed and rear axle ratio.

At about this point you may be saying to yourself, this is fine but what will it do to my engine's reliability? This unfortunately is a question no one can honestly answer until many thousands of miles of experience have been logged on actual installations. The Judson Company has sold over 50,000 superchargers of this type for use on VW's, Renaults, and MG's and certainly have the knowledge to assure that the supercharger itself will be trouble free. Two things I can point out are that the already too small clutch of the 190 SL will probably suffer from the increased torque that it must take, and that the factory will probably not honor the warranty on supercharged engines. In his own defense, Mr. Judson points out that the Judson is a a low boost supercharger and the bad name of supercharging has been made by units using very high pressures; the boost is used only on demand; and of all the engines for which they have designed superchargers, the 190 SL is far and away the most rugged. He fully expects that

it will take the additional stresses with little or no trouble since they will be below the designed safety limits of the parts involved.

If you have tried or are about to try "hopping up your 190 SL" in any form, or, if you would like added performance, this is for you. The stock 190 SL engine develops over 1 HP per cubic inch which is real sports car output. This is, in fact, just about the most powerful two litre production engine you can buy. Until this time there has been nothing we know of in the way of cams, carburetors or ordinary "hop up" procedures that will work. The engine has defied all normal attempts, and those that may have effected a slight edge have caused idle trouble and/or low end power losses. The Judson idles at 800 RPM, pulls better than stock throughout the whole speed range and its increases are not academic, they can really be felt. It is the only modification I can recommend that you try on your engine if you want increased performance.

Personally I thoroughly enjoyed my two days with the car. It is a new experience in 190 SL driving and really transforms it into a sporting machine. Not only would I install one on my car, but I am looking forward to the time that I can. In all fairness it must be said that the true story of engine durability with the supercharger installed will be some time in the telling, but driving it is habit forming and tends to make little details like this unimportant.

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