# From The Shadow's Corner

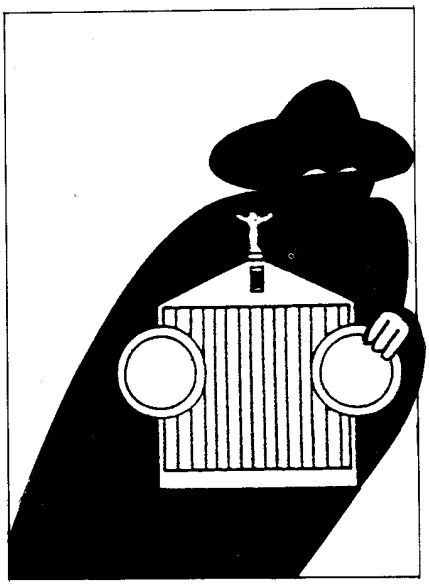
*by Cal West*

Hello again from the Shadow's Corner. Once again I am LATE in submitting this, so I will endeavor to keep this article short. I will attempt to confine this article to three topics.

The first topic—I am constantly receiving inquiries about vibrations in Silver Shadows. So let me share with you some experience on curing vibrations. Excluding the more common types of vibrations from out of balance or out of round tires, the biggest source of vibration from Shadows comes from the rear axles. All Silver Shadows have an independent rear suspension with twin equal length drive shafts. These shafts have a conventional "Spicer" universal joint at the wheel end and a "Detroit" type joint (or ball and trunion joint) on the differential end. These drive shafts when in good condition and running in a straight line from the differential to the wheel are more than adequate. However, when worn and deflected at an angle they will cause all types of vibrations.

The axles are causing the vibration. However, this is only the "symptom" of the problem. The actual problem in most cases is the rear standing height of the Shadow.

Now let me explain. If your Shadow were standing on a ramp and you were able to view the Shadow from the back underneath, when empty the axles should be running slightly deflected downward from the differential to the wheels. The reason for this is that when loaded and under power, the back of the car will lower. The more power that's applied, the lower the back will go. The lower the car the more the drive shafts will be deflected upward from



the differential. The greater the deflection, the greater the probability of vibration.

Now combine this with the fact that under normal driving conditions a certain amount of wear will take place in one spot on the inside of the Detroit pots. This wear is in the form of indentations on the machined bearing surface of the Detroit pot on the thrust side. When the axles are deflected and rotating, the balls within the joint move rapidly in and out of the indentations. This causes the drive shaft to change speeds minutely, showing up in the car as a vibration. Therefore, the more the wear—the more the deflection—the more the vibration.

Since the drive shafts are of equal length, if this has not already been done, they can be changed from left to right giving each Detroit pot a fresh surface. This is only half the problem. The other half of the problem is the standing height. As I have said in my other articles, a Shadow should sit on its springs and not on its leveling system when it rests. This means the standing height is governed by the strength of the springs and not by adjusting the height control. The standing height must be set by someone knowledgeable and with the use of proper spring shims. The springs should be replaced when they require more than the maximum number of shims.

The reason I say it should be done by someone very competent is that the entire standing height of the car needs to be correct. This would include checking and resetting the front as well as the rear. Adjusting the standing height is fairly involved, and I would recommend studying the workshop manual before ever attempting to make any adjustments.

But now back to the drive shafts. With the introduction of the Silver Spirit, a new type of drive shaft was introduced. This drive shaft now uses two "Lobro" constant velocity joints (see figure J2-1). These joints are almost impervious to vibrations. This shaft with its "Lobro" joints has proven to be so good and so trouble free that a replacement kit was designed to retro fit on Silver Shadows. The kit part number is RH 2939, and a normal time of 4.3 hours is required for installation. If your conventional drive shafts have already been switched from left to right and are now ready for overhaul or replacement, the best alternative would be to replace them once and for all with the "Lobro" shafts.

Some special tools are required