

Hints From The Classic Car Garage

The value of the shop manual - Brakes

Jim Schild

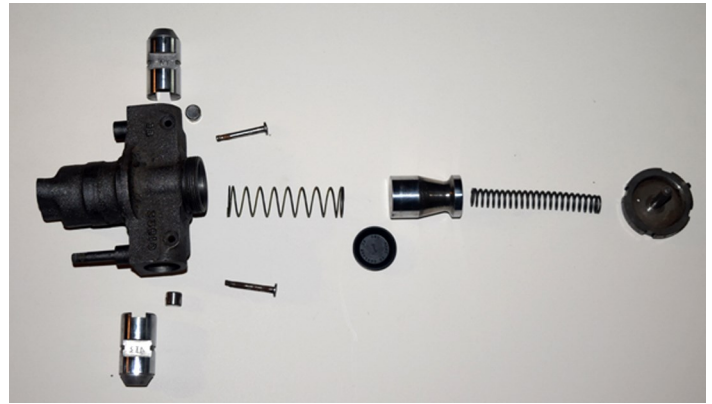
I am often amazed over my 50 plus years working with automobiles, the number of owners and even so-called “mechanics” who do not use or follow the instructions and information found in the manufacturer’s workshop or service manuals published for every car ever built. There are a number of important reasons that a proper manual should always be a part of any work done on your Classic Car. One, is that the specifications provided are those of the manufacturer and likely to be accurate for your particular model and year. Aftermarket manuals are often generalized or cover only certain more popular models and years and the information may not be correct for your car.

Another reason is that sometimes, our Classic Cars may have operating mechanisms and parts that may be nothing like those found on “lesser” automobiles. For example, the brakes on a Ford (NC) may not be even similar to those on a Cadillac, Packard, Hispano-Suiza or Rolls-Royce of the same era. The owner or technician who assumes that all automobiles are much the same will find themselves in for some surprises when beginning work on Classics.

One example is the brake system on an early post-WWII Rolls-Royce or Bentley. Where most automobiles will have either mechanical brakes or hydraulic brakes, the EPW Rolls-Royce and Bentley have both on the same chassis. The rear brakes are mechanical and the front brakes are hydraulic. Differences go even further when one finds that earlier chassis numbers of the pre-1949 Classic models have Girling front brakes and later ones have Lockheed front brakes. The operating systems are different between those two and the Girling brakes are different than any found on an American car of the same era.

The Girling system has considerably more parts than the Lockheed or similar system and many of those parts are made of precision machined high quality hardened steel rather than the simple stampings of other makes. Additionally, Girling front wheel cylinders operate laterally rather than longitudinally as they do in most other cars. The brake shoes are operated by a mechanism with dual machined steel rollers and ramps rather than mere hydraulic pistons. Although the rear brakes are mechanical, they operate with

a similar design. Both front and rear brake shoes are controlled by precision adjustment rods and nuts with locks rather than just pushing by the stamped wheel cylinder couplers as in other cars. These rods hold the brake shoes in exact location and adjustment for a more precise operation.



The parts of a Post WWII Rolls-Royce and Bentley Girling hydraulic brake wheel cylinder. Many of these parts are precision machined hardened steel.

One of the more interesting features of all Rolls-Royce brake systems since the Silver Ghost and well past the Classic era is the unique clutch-type servo brake assist. The servo used on Classic Rolls-Royce was originally designed by Hispano-Suiza and licensed by Rolls-Royce because of its superior operation and design. It is driven at 1/10th driveshaft speed from the right rear of the transmission. When the foot brake pedal is depressed, it moves a rod which directly operates the rear brakes, at the same time operating the servo with another rod which then assists the rear brakes and fully operates the master cylinder (under the right front seat) to operate the front brakes. The front brakes do not function unless the car is moving and the tail-shaft of the transmission is turning. The faster it rotates the more power is applied to both front and rear brakes. This function makes brake pedal pressure very easy, especially at high speed. This system could easily be confusing to someone who might be inspecting the brakes without being aware of their operation. The workshop and service manu-

als explain these parts and operations very well but without them you may have a problem making them work properly.

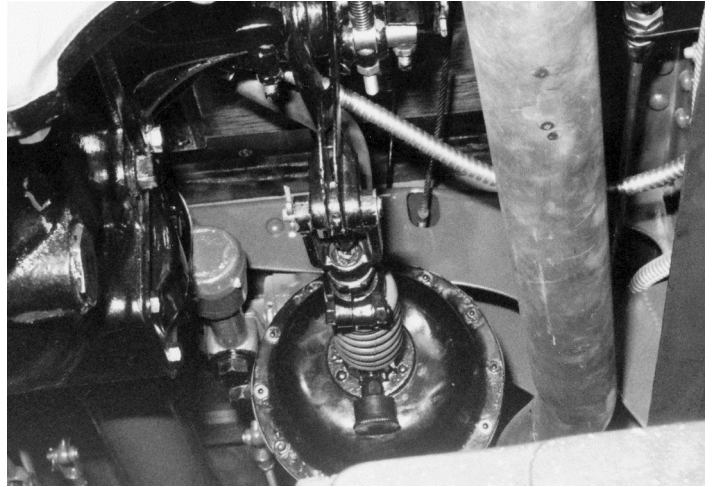
Unusual brake systems are not only the realm of Rolls-Royce and Bentley. Many Classic Cars have brake system requirements that may seem unusual to the modern technician who may be more familiar with a Model A Ford or a Chevrolet or even more modern cars. Although other cars also have specified techniques and sequences for brake set up and adjustment, those on Classic Cars can be much more critical to successful operation because of the precision and complexity. An example I am familiar with is that of the 1928 to 1931 Cadillac and La Salle. The Cadillac and La Salle have fully mechanical brake systems with very large brake drums but the brake operating system and adjustment is significantly different from that of lesser automobiles of the time.



Some of the more than 115 parts that make up the right front wheel and brake system of a 1931 Cadillac. Many of these parts would be unfamiliar to a modern mechanic not accustomed to working on Classic Cars.

Before any adjustment of the brake shoes can be accomplished, it is necessary to check and make adjustments to all of the brake rods and cables in correct order. The front and rear brakes also have cam lever adjustments that are verified by checking the exact length of springs on the brake cam lever. There are also stops that must be checked during this adjustment and if these are not all checked and adjusted in order the brake shoe adjustment will be meaningless. Without the exact specifications and instructions provided in the Cadillac Shop Manual, proper brake adjustment and operation would be impossible. Also, in the example of the Cadillac and La Salle, the adjustments may be different between the Cadillac and La Salle and between the 1928, 1929 or 1930 and 1931 as the designs vary.

Along with these differences in adjustments, some Classic Cars of the early 1930s also had vacuum-servo assisted brakes. These may include Cadillac, Lincoln, Packard, Chrysler, Duesenberg, Pierce-Arrow and Buick. All of these systems, although similar, are of varying design and construction. The manufacturer's shop or service manuals provide illustrations and instructions of each system so that repairs, rebuilding and maintenance may be accomplished properly.



This is a view of the vacuum brake booster assembly on a 1931 Cadillac V-16 looking from the front to the rear on the driver's side of the car.



1930 Stutz Model M Speedster, Photo by the owner, Titus Diljeet, New Delhi, India.