

Hudsonotes

Column of Mechanical Miscellany
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Vacumotive Drive was a new name introduced in 1941 for Hudson's optional automatic clutch control system. Perhaps this was done to meet the semantic competition of Packard's "Electromatic Clutch," which operated similarly and was brand-new that year. Earlier Packard vacuum clutches had had no electrical controls.

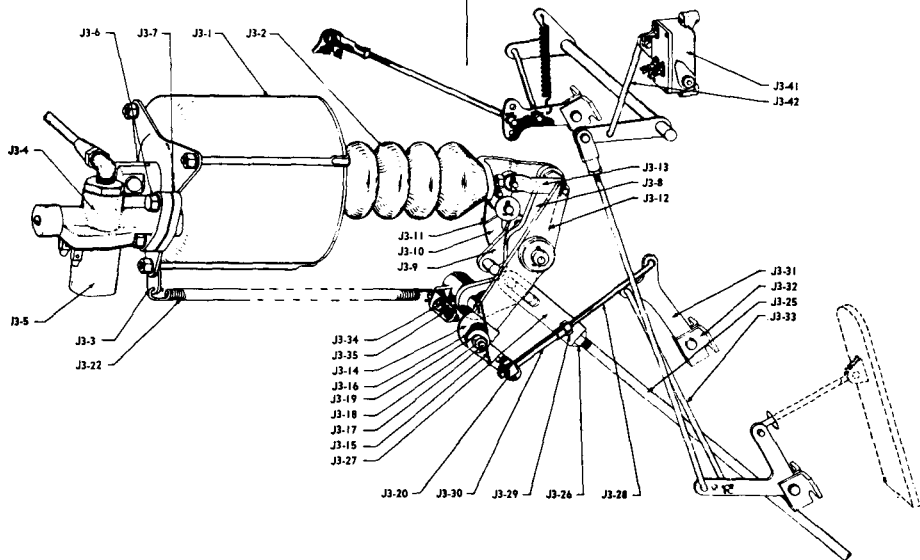
At any rate Hudson needed to make almost no change to its system along with the new name, since most important changes and improvements had already been made several years earlier. Ads frankly stated: "A 'new' Idea That's Old With Hudson."

The company had first introduced vacuum clutch control for the 1932 model year, with several Brand X's following within months. These early units, like Hudson's later ones, were Bendix-built — but they were entirely non-electric in operation, and remained so during 1932-1936. The design featured a stationary valve with three plungers — one for man-

ual shutoff, and two operated by accelerator linkage which thus controlled airflow to both ends of the vacuum clutch cylinder. There was no valve built into piston or piston rod, although the rod did have a relief slot cut along part of its length to allow quick movement up to the point where clutch just began to take hold. (Cylinder was lubricated by injecting shock-absorber fluid through the slot — there was no pipe plug as on later models.)

About the only important change to the system during 1932-36 which I've found shown in available manuals was the addition circa 1933 of an auxiliary pendulum-type valve, called "Cushion Control." Purpose of this valve was to delay firm clutch engagement if car tried to lurch forward too suddenly, but to allow quicker engagement if pickup was too sluggish. The valve was springloaded and had its own adjustment screw.

Another refinement on 1932-33 Hudsons (and some Chrysler products) equipped with both vacuum clutch and transmission freewheeling was a single hand control which would lock out both options simultaneously. But despite this, probably the chief shortcoming of these early automatic clutches was the fact that, unless manually locked out, they would still continue to "freewheel" in all gears and at all car speeds whenever accelerator was released — inconvenient and conceivably even a safety hazard under some conditions. Indeed, these early units have been roundly criticized for it by a few latter-day automotive writers . . . who, however, neglected to state that the problem was soon remedied — by Hudson. For 1937, Hudson and Terraplane vacuum clutches were not much changed mechanically, but an electric solenoid valve was added to control vacuum flow from manifold. This permitted use of a convenient on/off switch on dash



in place of the long control rod to shutoff valve. Along with this a small centrifugal governor switch was added, set to cut off automatic clutch action above 15-18mph. A third, "grounding" switch, at one shift rail of transmission, confined governor control to high gear only, allowing vacuum clutch to function normally at all speeds in the lower gears. And for smooth starts, there was a revised pendulum valve.

It was on the 1938 models, however, that Hudson vacuum clutch parts began to look about the same as those used through 1951. Solenoid valve, governor, and shift-rail switch were of course retained, as was the extra wire interconnecting these with Electric Hand selector switch (on cars so equipped). The big change for '38 was in the vacuum clutch cylinder, which now had a small spool-type valve (non-electric) built into piston, with long control stem inside the hollow piston rod. This stem in turn connected (via special linkage embodying some rather elaborate geometry) to the accelerator linkage, thus taking the place of the two-plunger valve arrangement found on early models. Also, one more electric switch was now added to the accelerator linkage. This three-terminal "accelerator switch" eliminated unnecessary clutch slippage in high gear, and also provided quicker clutch engagement upon extra-hard acceleration in the lower gears, while permitting normal operation at all other times.

Control response was improved by the "flow-through" design of vacuum cylinder (comparable to the "vacuum-suspended" principle often used for power brakes). To prevent excessive clutch slippage on initial starts, when corks and fluid are cold, a "starting compensator" eccentric was fitted to one linkage pivot. With these added devices, the pendulum valve was no

longer found necessary, and was discontinued. This was the system as used 1938-1940. It will be noted from the above description that the 1938-40 Hudson vacuum clutch was extremely similar to the types used 1941 and later. Throttle linkage 1938-41 was somewhat different from that on subsequent cars — for example, some parts were made with multiple holes to permit adjustment and also use on several models — but apart from this, operation and servicing are much the same as for 1942-47 or 1948-51. Cylinder lubrication — an ounce of good quality shock-absorber fluid every 10,000 miles or so through pipe plug hole at rear — is identical; and as with all of this equipment of any year, the various exposed linkage parts also need to be kept well oiled (even at the cost of some underhood tidiness).

The 1937 units were likewise exclusive on Hudson products, and were of a one-year "hybrid" or transition type, so that they are rare today. Evidently this was the first electrically-controlled vacuum clutch system on a U.S. car. Packard, by way of comparison, offered simply a non-automatic, non-electric power-assist type of vacuum clutch (valve-in-piston design) on its Twelves for 1937-39, but did not introduce its automatic clutch with governor and electric controls until 1941 (this time using a plain piston or diaphragm-type power cylinder).

On the other hand the 1932 and 1933-36 Bendix vacuum clutch units were all fairly similar, not only on H-E-T vehicles but on some cars which combined the device with a standard dry-plate clutch: Packard, Chrysler products from Plymouth to Imperial; Buick, and apparently even LaSalle and Cadillac for a time. Detail differences included rod-type instead of cable-type connection to the clutch on some models, and a variety of locations for the manual on/off control.