

Beginning a new tech series . . .

## Making Drivemaster Work

Hudson's improbable assortment of vacuum/electric controlled drive options is as much a part of the Hudson mystique as are Super Six F-heads, pinned piston rings, dual brake linkage, cork clutch discs, stepdown roadability, Hornet race triumphs or anything else you can name. But restorers generally have tended to fight shy of it, perhaps due partly to its usual service reputation even when new...Yet the models so equipped are truly a delight to drive and there surely ought to be more good specimens back on the road today.

by George A. Schmidt

"YOU GUYS ARE NUTS!" said one former Hudson dealer when he heard about recent plans to add a Drive-Master to an otherwise-respectable '50S8Cv. restoration job.

And probably a majority of ex-dealers and mechanics would agree with him.

Hudson's Drive-Master system was very easy and pleasant to drive, and it represents a unique bit of automotive evolution. It was also a first-class servicing headache.

The system was designed as an external bolt-on: Vacuum Clutch plus added units for automatic gear shifting, attached to a standard transmission. Thus it called for no major evisceration a la Hydra-Matic in case of trouble; nor was it likely to strand anyone at roadside, since the car's clutch pedal and hand shift lever were also retained for use when wanted.

But everyday reliability left something to be desired, and the factory-approved repair procedures, calling for outright parts-changing where possible, did not offer very practical remedies for most of the mysterious minor indispositions which usually showed up.

These troubles were mainly electrical, it appears, with balky linkage adjust-

ments a close second. Moreover, they were usually of the sort which demanded more miscellaneous time, testing, tinkering, trial-and-error, et cetera (with comebacks in between) than most shops could reasonably spare.

From a hobbyist's viewpoint, however, these same troubles, though sometimes tedious, are not likely to overtax the tinkering talents and tools of today's typical Hudson enthusiast. They can be dealt with effectively right at home, so that it is possible to have a perfectly functioning Drive-Master with surprisingly little inconvenience and expense. Even the parts problem is not a major issue, since outright breakage or hopeless wearing-out of components is rare.

What's more, the system is still an excellent answer for any family irretrievably divided on the question of stick-*vs.*-automatic: Drive-Master can be changed instantly from one to the other by the simple turn or push of a button.

Mechanically, of course, the system is a direct descendent of the Hudson/Bendix Electric Hand preselector-type mechanism, with the addition of one important feature: an extra governor circuit which triggers the next shift at the proper speed--but then allows the shift actually to

take place only when signalled to do so by the driver's momentarily raising his foot from accelerator. Since the unit was often combined with overdrive (this combination finally being given its own name: Super-Matic Drive), another release of the accelerator at slightly higher car speed will then result in the shift to overdrive gear. It is thus an outstandingly drivable arrangement: automatic, yet never insistent upon shifting at its own whim instead of the driver's--and the factory made a particular selling point of this fact.

Although a considerable variety of automatic clutches, preselector and semi-automatic gearshifts, etc. have been built through the years (and still are, in Europe), it was Hudson who carried this particular line of development--the automatic operation of a manual-type clutch and gearbox entirely at the driver's will, with reversion to partial or full manual control also instantly available--farther than anyone else. Drive-Master was first introduced just before the war ('42 model year) and continued in similar form through summer '47--a form which would also fit '41's if desired. The vacuum-clutch portion of the system likewise continued available as a separate option, as it had been since the early 1930's. For stepdown installation both portions of the system were changed somewhat as to mounting, linkage, etc., though with nearly identical working parts; and in that form the system was offered 1948-51. During the last two years there was even a version for shortnosed (Pacemaker) models, although the Vacuumotive Clutch as a separate option was dropped. The system will also fit any through mid-'52 which retain the single carburetor and '51 (single-lever) gearbox.

Curiously (to say the least) there have been magazine articles which purported to trace "the history of automatic transmissions," giving due credit to nearly everything from the '04 Sturtevant and '12 Owen Magnetic on up . . . without even mentioning the Drive-Master.

Obviously it is time for Hudsonuts to unite in setting the record straight. And

while they might possibly be able to do this with words alone, a well-restored Drive-Master or Super-Matic model--entirely drivable and convenient even in today's traffic--is certainly a more substantial and convincing way of proving the point.

This article, then, is dedicated to helping restore as many of these models as possible to the road where they can be enjoyed--and seen, of course. It is based upon the stepdown years, but will apply in many instances to the others as well.

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1. IF VACUUM CLUTCH SYSTEM isn't working properly, it should be put into at least reasonably smooth working order before the gearshift section is considered. See manuals and also the article in previous issues of WTN (June-August 1974).

2. IF CAR DID NOT ORIGINALLY HAVE Drive-Master, this makes an entirely legitimate add-on, using the parts (brackets, linkage, etc.) from another stepdown of similar wheelbase and number of cylinders. Although such parts are no longer found in junkyards as readily as they once were, it seems there are a number of Hudsonuts who, while removing the system as "impractical" from a car of their own, did not throw it away but carefully saved all the pieces.

Fortunately for those alarmed at the thought of installing a complete Drive-Master, this is one job which can very well be done by halves (i.e., Vacuumotive Drive only) if preferred. In any case it is best to install the vacuum-clutch portion first and try it out, preferably for an interval of general driving.

With Vacuumotive Drive available as either a factory or dealer option, Hudson gearboxes '41 through early '52 were built to accept it quite easily. The upper end of clutch coupling lever carries an extra hole for vacuum pull rod; and at one side of main gearbox (upper left rear corner) there is a small hole--usually closed by welch plug--for installing the l-terminal shift rail switch and ball. On an overdrive

## white triangle news

transmission this is the only change necessary (governor already has spare terminal for clutch); but most plain 3-speeds require also that tailshaft housing be replaced with one which includes mounting hole for governor. Governor itself can be either single (clutch/overdrive) or double (Drive-Master) type. If double, note that outermost terminal is still for overdrive use, while clutch terminal can readily be found among the other four because (with governor assembled but not turning) it is the only terminal GROUNDED electrically to outer governor shell.

The gearshift portion of Drive-Master can then be added later. (Transmission ratios on some '48-'9's may not be ideally spaced for this purpose, but they will be usable--particularly if car's rear-axle gears are the sort meant for overdrive models: 4.55 to 1). Clutch corks, pressure springs, etc. should of course be in fair condition to work with Drive-Master--but need not be brand-new and perfect. As to whether Drive-Master wore out the corks faster than standard pedal use, there seems to have been divided opinion. Poorly adjusted, or with certain gearings not well suited, to the constant second gear starts, it probably did accelerate wear-- but usually one's driving habits (not mention fluid changes) were the deciding factor. It is always possible, of course (even with Drive-Master turned on) to start out it LOW gear simply by making the first shift manually; and this is something of a clutch saver, especially under hard use.

A car originally factory- or dealer-equipped with Vacuumotive Drive is of course much the simplest for conversion to Drive-Master, although some owners may decide against it for the reason that these separate Vacuumotive Clutches are actually rarer--among stepdowns, at least--than complete Drive-Masters. Advertising emphasis, too, was strongly on the complete system (and/or overdrive) by 1948-49.

3. IF DRIVE-MASTER COMPONENTS haven't been used for a long time, they will doubtless need a thorough external cleanup, followed by 1-oz. doses of shock-absorber fluid for BOTH vacuum cylinders--gearshift as well as clutch control. All five solenoid valves should

respond one by one when their prongs are touched by jumper from battery. (Ground the clutch valve by one prong; the others by their mounting bolts.) The upper two valves, at least (clutch and throttle lock) may also need careful internal cleaning plus a touch of silicone for best results.

Next be sure that both rubber diaphragms are OK, especially the transfer (lower) one. (Diaphragms are interchangeable, though springs and other parts are not.) Governor should also be cleaned internally and each circuit checked with a test lamp (see clutch article); but the main transmission switch (box with many arms and a 10-prong socket) usually need not be opened at this time.

With gearshift components in place, the next step is to check that car can still be shifted manually in the normal way, with no problems (beyond the slight extra stiffness or sloppiness unavoidable due to complex linkage). Spring behind rubber transfer diaphragm must hold transfer key firmly in the "manual shift" position. Adjust rod length if necessary. (Sometimes when rest of Drive-Master was removed from a car, this key was merely tied down with a piece of wire).

These Hudson transmissions have only one shift bellcrank at the side, and this crank looks alike on all models. . . . but is not. The standard bellcrank (except on Pacemaker) has its center slot cut at an angle quite different from that used on Drive-Master models. Also, the "cross-over" cable (leading from rod inside shift column to gearbox) looks alike on all, but the Drive-Master type is longer (to clear obstacles), and its lever at gearbox end has extra tab welded on to hold transfer switch rod. Along with this, the small spring inside upper end of gearshift column should be somewhat stiffer for reliable use with Drive-Master.

One extra "intermediate" shift bellcrank, on large Drive-Master models, has its bracket attached to steering gear (by two longer-than-standard mounting bolts, with spacers). This bellcrank, unlike the type used with plain standard shift, unfortunately has no grease fitting--only a small easily-missed oil hole--and hence is usually found in a dismal state of wornout wobbliness. Before reusing it, the two worn bronze bushings should be driven

out of hub and replaced with one of proper size obtained from a supplier of generator and starter parts. (Cut bushing to length, and be sure to redrill and enlarge oil hole.) This will take up most of the wear. If small rubber bushings at arm ends are also damaged they can usually still be replaced via an AMC dealer (apparently some late Ramblers, et al. used same size). Part number is 301006.

The three levers clustered at Drive-Master "transfer hub" also have replaceable bronze bushings, of course (see manual), but these, due to their size, plus a grease fitting, almost never give trouble.

The arm at bottom end of gearshift column on all early stepdowns (Drive-Master or not) was joined to the shift linkage by a small ball-and-socket joint (adjustable, if worn). Some later models, however, used a large pin and rubber grommet at this point instead, and on these the pin must be driven out in order to mount the balljoint in its place so that Drive-Master linkage will fit. Or if necessary, a second hole (as found on earlier arms) can be drilled for a somewhat better fit.

Finally, lubricate linkage and test on road to be sure that the car's conventional hand shift still works perfectly despite all the extra parts involved.

4. IF NAMES AND ABBREVIATIONS are confusing, please note that HDM stands for Hudson Drive-Master, VD merely for Vacuum Drive (clutch), SMD for Super-Matic Drive (the HDM/overdrive package), OD of course for overdrive, HWC for Weather Control (heater), DI for direction indicator (signals), and so on.

When looking through older material it will be seen that the "Vacumotive" name was not introduced until 1941, despite the fact that Hudson's vacuum clutch system had been available in some form at least since 1932. It appears that the components were mostly Bendix-built, even though few of them carry any name except "Bragg-Kliesrath"--which, however, was long a part of the Bendix organization. The inscription, "Licensed under Dewandre Patents . . ." refers to a Belgian firm known for its early work with vacuum-operated accessories--even including vacuum power steering.

Electric Hand gearshifting, of course, was introduced in 1935, and a year later the front-drive Cord copied this system (again with components made by Bendix). Several other Brand X's also offered "vacuum shift," but simply as a power-assist for the standard hand gearshift lever. In 1937-38 the Hudson combination package of Electric Hand with vacuum clutch was marketed under its own special name: "Selective Automatic Shift." It was this combination about which the lady in the ad (see May '74 WTN) smiled so happily. However, both of these accessories were also available separately if preferred.

Drive-Master, on the other hand, was designed to work only in conjunction with the vacuum clutch, and hence could not be ordered without it. Also, like overdrive (but unlike Vacumotive) it was only available factory-installed--a fact probably not much regretted by dealers.

The "DRIVE-MASTER" name in chromed cast letters was displayed on trunk lids 1942-47; but stepdown versions were unmarked.

5. IF DRIVE-MASTER SYSTEM QUILTS suddenly, the cause is almost always electrical. Look for blown fuse (10-amp. long or 14-amp. short type), and then for whatever blew it: usually damaged insulation. Fuse protection is especially important, of course, when old original wiring harnesses (the only sort likely to be found for this special equipment) are being re-used. The separate Vacuum Drive installations did not always include a fuse, but it's a most legitimate addition: 10-amp. size, and holder, inserted in wire between dash control and ignition switch.

If only a part of the system quits, there may be a connector plug or a linkage piece off, or a wire broken. If a vacuum leak is at fault, there will be telltale hiss and engine stumble (do not drive with this condition; lean mixture can damage engine).

However, these sudden failures are rare. Most Drive-Master troubles are of the gradual or intermittent sort caused by slight wear or maladjustment, poor electrical contact, etc.

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NEXT MONTH: Switches and contacts.