Second of a four-part series . . . By George A. Schmidt

Making Drivemaster Work

WITH HUDSON FAMOUS for so many different special-interest mechanical features through the years, some of them may easily tend to be overlooked. We know about Twin-H-Power, stepdown floors, "crab" tread, safety brake linkage, cork clutches, pinned piston rings, splash oiling . . . perhaps we even know enough about 1910 Hudson combustion-chamber design to manage a patient smile when we read that British engineer Harry Ricardo "discovered" c. 1920 that the proper spark plug location for control of knock is directly over the hot exhaust valve.

But mention of Hudson's Drive-Master gearshift system can still draw either a blank or else some comments of a kind which the WTN Editor, despite his **acquaintance with Navy vocabulary, flatly refuses to print.**

The reason, of course, lies not in design or drivability but in the chronic repair problems which too often plagued this equipment and drove even faithful Hudsonuts to profanity and Powerglide.

Nevertheless, a second look at this unique Hudson option reveals that, being built entirely as a set of external add-ons, it is actually far more amenable to patient home tinkering and repair than is any ordinary automatic transmission; and at the same time, it does not disable the car for standard stickshift use.

It thus has real possibilities for today's interested Hudson hobbyist.

6. IF YOU HAVE NO MANUAL — factory, Motor's, or reprint — covering Drive-Master service, it is wise to obtain one before going further. Sometimes appropriate pages can be photocopied, or a book borrowed from library (local or Club). Early editions, even if written for '42-'47's, generally offer the best amount of detail, but any manual will furnish much valuable information, not all of which can be given here in the space available. Particularly, the illustrations found in manual or parts book are helpful since they not only show the parts correctly assembled, but also identify them by their factory names — which considerably simplifies any discussion of the subject.

And probably in a few cases at least, the Drive-Master, if correctly mounted, given its vacuum and electric connections, and then checked and adjusted as per official factory specs, will work correctly (surprise!!) without further tinkering. Even if it does not, the factory specs are still the best starting point before any need for additional work is considered.

This article, on the other hand, has been written chiefly as a supplement to help in clearing up whatever problems may remain.

7. IF STARTER BUTTON DOESN'T WORK, and starter solenoid and motor are OK, trouble may be in the circuit which is similar to so-called "safety switch" hookup found on some late moels (to prevent starter from operating unless clutch is depressed).

On Drive-Master, this is one of the many chores assigned to main "transmission switch" assembly. That assembly — bolted to transmission on pre-stepdowns, but thereafter to a bracket — consists of a cast shell with four different switches inside, made for Hudson by Stewart-Warner (no, not Rube Goldberg). Lowermost in this shell is the "clutch switch", which is linked by a long rod to the bottom end of clutch coupling lever at bellhousing. Whenever clutch is depressed (by foot or vacuum), this switch arm is pulled rearward to "ON" position. It has several circuits, one of them being for the starter, and that circuit is wired through the two BOTTOM prongs on large 10-prong harness plug at front of switch case.

Assuming the trouble is not due merely to linkage rod dropping off, plug should be pulled and these two prongs temporarily shorted. Now, if starter button still doesn't work, check the wiring to find probable break (Ignition must be turned on, but Drive-Master need not be.) Trouble may also be inside the clutch switch itself, though in that case there are likely to be other telltale symptoms as well (see following paragraphs).

8. IF DRIVE-MASTER SOMETIMES WAITS TO SHIFT until it is "helped" by foot on clutch pedal, with an extra inch or so of push required even though vacuum clutch can be felt working, it is often merely because the vacuum-clutch stroke is too short. Stroke can be lengthened by making sure there is not to much free play at vacuum pull rod clevis (near firewall), and then lengthening (loosening) threaded-sleeve link by 1 or 2 turns. If this causes excess slutch slippage, counter-adjust as needed at cushion-point and throttle screws (see vacuum-clutch article in June '74 WTN).

Sometimes, however, the stroke is found to be already at or near maximum . . . and in any case, if vacuum clutch has been working satisfactorily in all other respects — proper smoothness, no dragging or gear clashing, fairly uniform performance from cold to warm, etc. — it is not always wise to try rejuggling these adjustments very much. Test-drive vacuum clutch (both warm & cold) while shifting by hand; and if stroke length seems OK, with no hint of clashing or hard shifts, the Drive-Master "clutch switch" or its rod may need attention instead.

If this switch does not turn "on" each time clutch is disengaged (at about ⅔ pedal or vacuum stroke), neither Drive-Master nor starter circuit will work.

Switch action can be disturbed by normal wearing-down of clutch disc. Both the pedal linkage and the vacuum pull-rod clevis have threaded adjustments to allow for such wear, of course (which should be checked every 5-10 thousand miles); but the small rod at bottom for the clutch switch has non. True, the switch cam (inside case) is mounted to its shaft by a friction spring, so that it is partially self-adjusting — but eventually as corks wear thin they will crowd the rod and switch arm much too far forward to work correctly. At last switch may never be pulled far enough back to turn "on" at all — especially if small spring (from rear end of rod to a clip on gearbox) is also missing.

Road test with spring in place. If trouble remains, rod must be made slightly shorter. Remove it, and bend carefully to decrease effective length (without causing it to bind or strike other parts). Replace and test again. The job may be easier if a bending tool (Kent Moore?), like those used at the time to adjust Hydra-Matic linkage, is available. If possible, keep one spare rod unaltered for comparison; this will also be useful in case a new, thicker replacement clutch disc is later installed.

Occasionally, even with rod at optimum length, clutch switch — or one of the others in box — may fail to work reliably. According to factory, there were to be NO internal repairs made to any part of transmission-switch assembly; it was simply to be replaced by a complete new unit (!) at $20-odd. However, the assembly itself is of fairly good "teardown" quality construction, using screw fasteners rather than cheap riveting, crimping, etc.; and hence the repairs can usually be made after all. Back during the 1940's there just had not been as much progress toward making the automobile a 1-piece throwaway as at present.

With swtich assembly off car, rear cover can be removed and clutch switch seen at bottom (smaller) end of shell. Move clutch switch lever by hand and note that cam has only about 45 deg. of travel, with contacts "on" for about 20 deg. and "off" for the other 25, any movement beyond that being taken by slippage of friction spring on shaft. If the switch (due to wear, usually) requires too much travel before it makes contact, the result will be a delayed-shift (or no-shift) problem of the kind already described; and sometimes even the starter may refuse to work unless clutch pedal is shoved all the way down to floorboard.

The remedy is to make contacts stay "on" during a greater proportion of total cam movement — say half or a bit more (perhaps 22½ deg. approximately, to begin with).One way of doing this is to move the contacts slightly. Their insulated block is held by tw external screws and washers — often factory-sealed (red lacquer); but provided with slotted holes in the case. Now replace contact block in position a bit LOWER than original (if necessary, ti may also be set very slightly CLOSER to the cam) and tighten screws; then try switch by hand to see if there's any apparent difference. Finally reassemble and test on road.

Before closing switch case, however, inspect ALL contact points, cleaning any dirty ones with solvent and lintless cloth or airblast; but be very careful not to bend any of the flat springs on which some points are mounted. If really necessary an ignition "point file" can even be used, followed by rewashing. This is also the time to LUBRICATE all three switch cams lightly (a nonrunny grease such as Lubriplate is safest, applied with toothpick or small tool). In addition, the clutch switch shaft and bearing, plus their identical twins on "transfer switch" at top, should be greased (remove outer capscrews and levers for access).

Although none of this work is difficult, it can be repetitious since occasionally three or four adjustments of clutch switch and rod must be tried before results are satisfactory. However, it beats having to buyh a whole new transmission-switch assembly from your friendly Hudson dealer . . . especially at this late date.

9. IF DRIVE-MASTER SOMETIMES DOESN'T WAIT to shift even until the accelerator is released, but insists instead upon kicking driver's foot off throttle, operating vacuum clutch, and slamming into the next gear as soon as car reaches minimum "shifting speed" (about 10-15 mph. on most models), the problem again involves clutch switch and rod — but is precisely opposite of that in #8, above. This can happen if rod is accidentally bent (shorter), or if rod drops off and leaves clutch switch stuck in the "on" position. It can also happen after system has been set up to work OK with an old, worn clutch — and then a brand-new, thick cork disc is installed. In that case, assuming that pedal linkage and vacuum pull rod are both correctly adjusted and that the new clutch itself is working satisfactorily, the clutch switch rod must be removed and restraightened (lengthened) to its stock original length, as nearly as possible. Replace it and test car on road. Then, if problem persists (even after corks have been run-in and compressed by 500-1000 miles of normal driving), the clutch switch can be opened and the insulated contact block carefully readjusted in its slots — this time slightly UPWARD.

Sometimes a quick temporary fix for this same problem can be made simply by removing small spring from rear end of clutch switch rod.

When desired to prevent an automatic downshift as soon as car drops below the "shifting speed" (12 mph. approx.), it should be necessary only to keep foot lightly on accelerator (just short of affecting engine speed). If the system forcibly downshifts in spite of

this, make a slight further adjustment to switch rod and/or contacts as outlined above.

10. IF CLUTCH SWITCH ROD is occasionally forced off, bending its clip, the usual reason (unless rod is damaged) is that, because of normal clutch disc wear, the rod no longer fits properly. Rod (according to manuals) is nonadjustable; nevertheless in this case it must be adjusted, by means of careful bending — usually a bit shorter. See #8 above. Rod uses size 7L clip in front; cotter pin at rear.

Earlier Drive-Masters ('41-'47) of course used a shorter clutch switch rod, running forward—not rearward—from switch. If ever necessary to adjust one of these, bear in mind that any lengthening or shortening of rod must be done exactly OPPOSITE to the directions given in the foregoing paragraphs.

11. IF DRIVE-MASTER TRIES TO SHIFT AT PROPER TIME, locking throttle and tugging hard at gears which refuse to budge, the usual cause, again, is a too-short stroke of vacuum clutch, with disengagement not being complete. This can readily be checked by driving with only the vacuum clutch in use, gears being shifted by hand and the overdrive (if any) locked out. If hand shifts are likewise hard or impossible (or noisy), try them again using clutch pedal (no vacuum). If shifts then are OK, vacuum clutch evidently needs to be adjusted for a longer stroke (see #8 preceding; also Vacumotive Clutch article Aug. '74). If hand shifts are still hard when clutch pedal is used, the trouble could be in shift linkage or pedal linkage, but more likely inside gearbox (during bitter cold weather, of course, it could simply be thickened lubricant). There is also possibility of vacuum gearshift cylinder sticking (see below).

12. IF VACUUM GEARSHIFT CYLINDER tends to stick, first be sure trouble is not with linkage, vacuum line, solenoid valve, etc. If these are all OK, remove cylinder from bracket, add some mild solvent (paint thinner) to both ends, and work piston in and out by hand, turning cylinder every way to distribute liquid. When it is free through entire stroke, drain (and repeat if necessary); then substitute 1 oz. shock-absorber fluid (2 tbsp., one for each end). It should be regular-grade; not heavy-duty type for cold weather use unless wear is bad. Give cylinder another good workout by hand before replacing on car.

At present there is less risk of cold-weather sticking than when cylinders were new and tight, but proper lubrication is still a must. Seldom is condition poor enough to require outright replacement, although new piston felt and other internal parts could be had at one time. In any case, do not over-oil, as this could drive fluid into the solenoid valves, with consequent need for a highly inconvenient cleanout job.

Experience shows that in subzero weather, driver may have to make the first shift or two by hand (carefully, on account of complex linkage); but Drive-Master will usually take over from there. Shifts will be quicker, of course, if factory recommendations for thinner winter gear oils are followed. However, the thin gear lube is not really necessary if an electric engine heater is regularly used overnight, since at least some of the heat slowly finds its way through the entire iron mass — even as far back as the overdrive.

13. IF DRIVE-MASTER SHIFTS TOO SLOWLY even at normal temperatures, it can be quite irritating in traffic . . . especially when there happens to be a Brand X in the adjoining lane. The engine, of course (valves in particular), needs to be in fairly good tune, or vacuum supply may be insufficient. Check also for minor obstructions or leaks around vacuum lines. Most Drive-Master hoses, if kinked or cracked, can be satisfactorily replaced with neoprene "fuel line" hose in the same size. It is oilproof and not easily collapsed. Small-diameter heater hose can also be used for the main vacuum line coupling (manifold to clutch), though this may require slightly larger clamps.

With vacuum lines OK, however, the problem remains that factory was more-than-conservative in regulating the quickness of Drive-Master shifts. It was done by restricting air flow through certain brass fittings. Of the four elbows on gearshift (triple) solenoid valve, two are standard; but the two leading to the ends of the gearshift cylinder are specially made with extremely small internal holes.

Although the designers indubitably had their reasons for this, one is tempted at present to do a bit of "souping up" for quicker action in traffic. If the two restricted brass elbows are drilled out somewhat — or replaced by standard ones — shifts will be made considerably faster. Elbows can be enlarged to as much as 3/8" inside, though it would be safer as a first step to change only one of them, leaving the other unmodified or at most opened to perhaps 1/8", and then retesting on road several times before enlarging any further.

Also, while the quick shifts do improve drivability, two cautions should be noted. Hudson gearboxes mid-'49 through early '52 were fitted with a heavier and more elaborate synchromesh layout, and these seem able to take the fast shifts (by hand or vacuum) quite painlessly. But earlier units, '41 through early '49, could possibly become quick candidates for major dentistry if so treated, especially if original synchronizers are already somewhat worn. Try making fast high-to-second downshifts manually at various car speeds, listening for any grunts of protest from below, before attempting to alter Drive-Master.

Then too, the extra-quick shifts may tend to cause extra trouble with the Drive-Master "neutral switch" which is part of the transmission-switch assembly.

NEXT MONTH: The neutral switch.