

Hudsonotes

Column of Mechanical Miscellany
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Help for Hydra-Matics

WHEN HUDSON first offered the General Motors-built 4-speed Hydra-Matic automatic transmission, in 1951, as an alternative to manual shift and Drive-Master, it was not a new device. It had first appeared in 1940 and '41 as an option on Oldsmobile and Cadillac. In the later years it was used on some models of Hudson, Nash, Kaiser-Frazer, Lincoln, and (as built under license) Rolls-Royce, as well as on GM products. Production capacity was adequate for all of these, until a fire in 1953 wrecked the factory at Livonia, Michigan. For most of 1954 production, other transmissions were found: this was the year of Borg-Warner-equipped Hudsons, Dynaflo-equipped Cadillacs, Pontiacs with Powerglide, and the like.

By 1955, plant capacity had been rebuilt, and the American Motors-built Hudson and Nash were again available with Hydra-Matic—as were the 1956 models, except for those using the Packard V-8 engine, which came only with its own Ultramatic transmission.

During its 24-year span of manufacture, the Hydra-Matic transmission underwent a variety of production changes, including aluminum replacing iron parts in several instances. A predecessor version of this gearbox (1938-39) was built without a fluid coupling, and so used a conventional clutch pedal; but by the 1940's, magazine ads were proclaiming, "Goodbye, Mr. Clutch!" Changes for 1948 included fewer internal clutch discs, a larger front pump, and a reverse blocker device (to prevent engagement of reverse gear or of parking pawl while car is moving). Drivers today are sometimes surprised to note that the shift quadrant for these transmissions has no separate "P" or Park position: the parking pawl engages when lever is placed in "R" (reverse) position with car standing still and engine stopped.

For 1951, one change was to have reverse gear engaged by hydraulic pressure rather than by mechanical means as before. In that year, Hudson offered Hydra-Matic on Hornet and Commodore models, and Drive-Master or Super-Matic on Super and Pacemaker. Manual shift and overdrive were available on all models.

The "Dual Range" version of Hydra-Matic was introduced for 1952 and could be ordered on any Hudson model, although a few early '52's used the conventional older type Hydra-Matic. There were only minor changes (mostly at front servo) for 1953, and a few others (front pump seal, etc.) for 1954. In the post-Hudson years, a

more important change was the addition of a second fluid coupling for smoother shifts. This basic transmission design remained in production through 1964, and was then replaced by GM's 3-speed "Turbo Hydra-Matic."

CORRECT FLUID LEVEL is important for all Hydra-Matics. It was to be checked every 1000-2000 miles, and should be checked oftener when car is old or if there is any suspicion of leakage. This is perhaps more easily forgotten on models before 1955, since they do not have the familiar long dipstick and filler tube for transmission projecting up into engine compartment. On these cars it is necessary either to work from underneath vehicle, or to roll back front floor mat and remove small snap-in floor cover from right side of transmission hump, for access to the transmission dipstick. Fluid level should be checked only with engine and transmission warm, and with engine idling and hand lever in neutral (as they should also be for a few minutes beforehand). Early-production Hudsons with Hydra-Matic may "whir" audibly even though fluid level is satisfactory; later models are usually quiet unless it is low. Owners of stepdown models who object to reaching under floor for dipstick can use a 1955-56 type Hydra-Matic oil pan, with its longer dipstick underhood.

Fluid originally specified was Type A, available from GM and Hudson dealers and elsewhere. On earlier models, plain #20 oil was permissible for temporary use in an emergency. In post-Hudson years, when "Dexron" type fluid appeared, it was suggested as a possible corrective for these old transmissions, to help smooth out shifts which had become somewhat harsh with age (though it would not correct slippage problem). Today the Dexron-II type fluid which is available is recommended for nearly all automatic transmissions, and performs very well in these 4-speed Hydra-Matics. Type F fluid (intended for some Ford models) should be avoided here, as it will cause harsh shifting and possible damage.

SPEAKING ABOUT HYDRAMATICS at the '81 Milwaukee tech session was A. J. Souza, who has worked on many of them. Main topic of discussion was the importance of correct external adjustments, particularly to linkage. Linkage which is loose, worn, or out of adjustment will cause erratic or uncertain shifts, often at wrong vehicle speeds, even when transmission is in perfect condition. Gus also pointed out that if rubber mounts are defective, so that engine and transmission will not stay exactly in place, accurate adjustment of linkage is impossible. On these older automatics, which have no vacuum modulator or similar device to help control shifts, linkage adjustments (and state of engine tune) are especially critical. Manuals state that about three-fourths of all Hydra-Matic shifting problems can be corrected externally.

Also found in manuals is a table showing the correct shift points for various cars with Hydra-Matic. Most Hudson models, Gus points out, should shift from 1st to 2nd gear at 5-7 MPH, from 2nd to 3rd at 10-15 MPH, and from 3rd into high gear (4th) at 16-18 MPH, with car on a level road and with only light throttle. If the shift points are too high, it means that there is too much throttle pressure against shift linkage, and the rod leading from accelerator pedal linkage down to transmission will need to have its threaded adjustment lengthened slightly. If the shifts occur too soon, before car is moving fast enough, this rod will need to be shortened slightly. Although the factory recommended special gauges and tools for adjusting Hydra-Matic, and these should be used if available, this is one adjustment which can be made at home without them.

The internal difference between a Hydra-Matic on Hudson and one on a Brand X of about the same year, Gus notes, is mainly a matter of springs and other parts designed to match shift pressures with horsepower of the engine being used. Oldsmobile is about the same as Hudson.

As with most automatic transmissions, damage is more often caused by overheating than by wear alone, especially under severe use (or abuse). Unlike many later automatics, the Hydra-Matic was built with a rear oil pump which, when car was moving, supplemented the pressure from front oil pump; and which could also be used alone (by pushing car) to operate transmission and thus turn over the engine for an emergency start. The problem with this useful feature is that the rear pump alone cannot supply oil circulation for cooling purposes, and if car must be pushed or towed any distance without engine and front pump running, the result (even with hand lever in neutral) will be damage—and sometimes complete destruction—of the transmission due to excess heat. Gus Souza emphasized that if a Hydra-Matic car is to be towed more than a few miles at speeds above 15-20 MPH, the driveshaft *must* be disconnected (at rear U-joint) to avoid transmission damage.

WHEN INSTALLING, or re-installing, a Hydra-Matic transmission on engine, it is always advisable to use a new replacement front seal, as this is otherwise a frequent source of leaks. Another critical point is the flywheel-to-crankshaft joint, which requires careful use of a reliable sealing compound. Although several quality products have been offered especially for use here, Gus reports that standard #1 Permatex cement will usually also serve the purpose. The gasket for torus cover, however, should be put on only with rubber cement, he cautions; and care should be taken not to get sealants of any kind inside transmission.

Transmission fluid changes were recommended every 10,000-25,000 miles, but Gus says there is not much reason to change until fluid shows evidence of oxidation and aging due to heat—mainly a brown

instead of pink color, and a burnt or acrid smell. He also reminds us that the filter screen inside transmission oil pan should be cleaned along with each change of fluid.

Since these transmissions do not have fluid lines running forward to the radiator for extra cooling, they are cooled only by internal circulation of fluid, and through the metal outer shell of transmission. Fluid capacity is accordingly oversize: about three gallons in all (less on Jet and Rambler), including several quarts inside the fluid coupling. There is a separate drain plug for the coupling, plus one at rear of transmission oil pan.

When filling an empty transmission, insert about half the fluid (6-7 quarts); then start and idle engine to help fill fluid coupling, and finally add rest of fluid to bring level to the "Full" mark.

Aftermarket "additives" for transmission fluid have probably been offered in nearly as many varieties, since the 1940's, as the ones for engine oil. Intended purpose of these additives is usually to stop a leak or perhaps to reduce friction and smooth out shifts (or both). The one which Gus recommends is Casite Smooth-Seal, which will soften old transmission seals sufficiently to help control leaks.

CONVERSION FROM Hydra-Matic to standard stickshift (with or without overdrive) is simpler on Hudson than on many Brand X's, and can be done using all stock parts, which bolt readily in place. On step-down models the manual transmission may be either the 1941-51 (single lever) or 1952-54 (conventional 2-lever) type, each with its appropriate shift linkage. To avoid

a needless cutting and welding job, one component which should especially be salvaged from a 1951-54 stickshift Hudson is the frame crossmember (#3) at bellhousing. This, unlike earlier versions, is a bolt-on part, and will fit in place of the special frame crossmember used with Hydra-Matic. Driveshaft (front section only) must also be replaced, using one from a stickshift model of similar wheelbase.

Another conversion familiar to members of the racing fraternity for many years is the stock 4-speed Hydra-Matic which has been rebuilt to make it into a "Racing Hydro." These special conversion jobs for Hudson and other Hydra-Matic cars, still available from Gus Souza and others, can be varied somewhat to fit the needs of individual drivers, cars, and racing conditions, often with complete manual control of the four speeds.

NEXT ON PROGRAM, after the Hydra-Matic tech session, was your columnist, offering a few comments about Drive-Master, Super-Matic, and Vacuum Clutch. It was mentioned that this equipment, besides adding to a car's special-interest appeal, also adds much to convenience and driving fun, and in this respect has some advantages over either a plain stickshift or a full automatic. It was further suggested that—from a hobbyist's viewpoint, at any rate—this Hudson equipment does not truly deserve its old reputation for troublesomeness, and can in fact be made quite reliable for everyday use.

Problems with Drive-Master, it was noted, are usually electrical; and reliable operation often does require careful internal repair

work (not approved by factory) on several of the components. Governors, for example, like those for overdrive, must sometimes be washed free of oil inside, and the contacts cleaned and checked to be sure they will snap over to both the "off" and "on" positions (much like a household light switch), without sticking somewhere at midpoint.

Contacts inside the main transmission-switch box may also give trouble, especially at clutch switch (bottom of box) and transfer switch (top), most often because, due to mechanical wear, they do not remain "on" for enough of the switch cam's arc of travel. Remedy is to enlarge (slot out) holes in the aluminum switch case so that entire contact block assembly of switch can be adjusted or moved slightly to a position which will permit correct operation of switch contacts by cam. Occasionally solenoid valves will stick or become sluggish: these too can be carefully taken apart and cleaned out (and perhaps lubricated with a touch of silicone).

Regular Drive-Master lubrication includes oiling of all linkage joints (with every grease job), and shock-absorber fluid for the two vacuum cylinders every few thousand miles. While the tips given here are not all-inclusive, they will probably cover at least half of the Drive-Master complaints which occur.

When the system is being installed (or restored) on a car, it is suggested that the overdrive (if included) be put in good working order first; then the vacuum clutch control; and finally the Drive-Master gearshift section. This applies to both 1942-47 and 1948-51 models.

