

# Hudsonotes

Column of Mechanical Miscellany  
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## Topless Troubles

**POWER CONVERTIBLE TOPS** on most U.S. cars made their appearance just before World War II. If there were any examples in production before 1939 (Plymouth, vacuum-operated) and 1941 (Hudson and others with hydro-electric type operation, plus some Brand X's using a motor-driven screw type arrangement), they do not seem to be listed in repair manuals.

All of the hydro-electric top mechanisms used a pump, fluid reservoir, and electric motor combined into a single unit, along with a pair of hydraulic cylinders which were double-acting (with hydraulic fluid fed alternately to both ends of cylinder). The 1941-47 Hudson system was unusual in that it featured a reversible-type motor and pump (with two solenoids and sets of field windings, plus added control wiring), thus eliminating the need for many extra feet of hydraulic tubing. Fluid reservoir was located above motor/pump assembly.

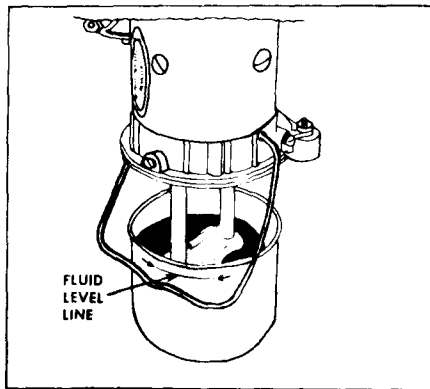
The other systems of this type were named "Hydro-Lectric," and were found on a large number of ragtop models, including the 1948-54 Hudson stepdowns. These systems used a simpler "one-way" motor and hydraulic pump, along with a reversing valve built in combination with the electric control switch under dash. Motor section of the pump assembly is extremely similar in construction to a starting motor, and can be serviced in the same way when necessary. On Hudson's version, the pump is by Dura Corp., and the motor, although bearing a Dura nameplate, is recognizably an Auto-Lite product (as is the reversible motor used on earlier models). The Hydro-Lectric pump unit is mounted vertically, with motor on top and fluid reservoir beneath.

Impeller of pump is in two parts: an internal and an external gear, with a crescent-shaped space between them. Fluid is admitted to this space through one passage in pump and expelled through another. Detailed instructions for pump servicing, with illustrations, may be found in MOTOR's Manual ('52 edition).

Unlike many later hydraulic convertible top systems, which are filled with oil

(generally automatic-transmission fluid), the Hudson-era hydro-electric systems all required filling with hydraulic brake fluid. These systems were made with synthetic-rubber seals in pump and at cylinders which are long-lived when correct fluid is used, but which would quickly be swelled and ruined by contact with a mineral-base oil.

**TROUBLES WITH** the hydro-electric top mechanism seem to be more often the result of prolonged disuse (and sometimes moisture and corrosion) than of heavy use or actual wear. Hudson owner manuals recommended that convertible top be operated at least once a month year around. Although this can place abnormal strains on the top fabric if done in cold weather, there is good reason at least to operate the motor and pump briefly at monthly intervals.



Check fluid level in reservoir.

An occasional problem when this is not done, especially if fluid level is low, is the sticking of outer pump impeller in its bore, sometimes requiring disassembly of pump to free it. In extreme cases, after years of dryness and disuse, it may be necessary to soak outer edge of impeller (but never any of the rubber parts) with a solvent such as lacquer thinner for many hours before it can be turned. Armature and shaft from motor can safely be used as a hand wrench to help twist impeller loose. Penetrating oil containing a mineral oil should be avoided here if possible, since it would be most difficult to remove thoroughly from pump parts and internal passages later. After impeller is loosened, extra-fine steel wool (#0000) can be used to clean and smooth the surfaces which were sticking, but any steel-wool bits and dirt particles, along with all waxy deposits from old brake fluid, should be carefully removed from pump parts, reservoir, etc.

After long disuse, the two piston rods

on hydraulic power cylinders or rams should also be checked, and any rough or rusty spots smoothed with steel wool (medium fine) before top is lowered and the rods forced down past their seals into the cylinders; otherwise seals will probably be damaged. Exposed rods may also be lubricated lightly with brake fluid or perhaps with castor oil (never with a mineral-base oil).

The main disadvantage to the use of brake fluid in a convertible top system is of course its high cost, especially at present. Capacity of the aluminum reservoir on a stepdown Hudson is about three quarts (slightly less required on models without hydraulic power windows), in addition to the fluid which remains in cylinders, lines, and pump. Fluid level may be checked with top either up or down, but power windows should be opened wide. There is no filler cap on 1948-54 models, but reservoir is held on simply with a large wire bail. Be sure rubber gasket is in place when replacing reservoir.

The original factory recommendation that hydraulic fluid in system be entirely changed each year is somewhat impractical, given today's prices, and at any rate is probably less important with modern brake fluids. Also, it was originally suggested mainly for use under severe conditions of moisture, dust, temperature extremes, etc., when yearly changes might be necessary to prevent internal corrosion of parts, since these systems (like Hudson and other older-model hydraulic brakes) are vented to the outside air. Some later GM convertibles reduced the problem by changing to a sealed-type system.

On a Hudson convertible the long hydraulic lines are often covered with a protective braided loom, especially where they run along frame rail at rocker panel. In some cases, however, the loom retains moisture, causing accelerated rusting and eventual leakage. When working on an old convertible, check the lines in this area with especial care. If replacement lines are available only in shorter lengths, the pieces can be joined with additional brass unions as required; this may also make installation slightly easier. A protective wrapping of cloth friction tape may be preferred to original-type braided loom for the new lines, but some protective material should be used, especially where lines pass under retaining straps or clips. No special "bleeding" procedure is necessary with these systems, as any air bubbles will find their way to reservoir as soon as top has been raised and lowered a few times.

**MOTOR SERVICING** on these pump units is seldom needed except for occasional light lubrication. White lubricant (lithium grease) can be used on both upper and lower motor bearings when re-assembling, but end of shaft which projects past seal into pump chamber must be kept totally free of oil or grease. Upper motor bearing can also be given a very few extra drops of oil (medium-heavy) once or twice a year through small oil hole at top. If ever necessary, the two copper motor brushes and bronze bushing for upper bearing can be replaced exactly as on a starter motor.

Main feed wire to motor is usually extra-heavy #0 gauge (same as battery cable), so there is practically no resistance loss, but connections at both ends should be shiny and tight, as should the ones at braided ground strap and on the smaller control wire to solenoid switch. This solenoid is like the one for starter except that it may have no external pushbutton and cap.

The motor/pump assembly on most stepdown convertibles is mounted on three vibration-absorbing rubber cushion studs which are exact miniatures of those used to support center bearing of driveshaft underneath car. Occasionally these small cushion studs, too, fail when steel and rubber portions pull apart. A fairly satisfactory temporary repair can be made by roughing up both surfaces (use grinding wheel) and then bonding them back together with epoxy cement. Allow to set for a few days before re-installing.

Unwanted creaks and grunts, along with excessive friction which may cause slow or uncertain operation of top, can be prevented if all pivot points or bearings of the convertible top frame and its operating levers are lubricated sparingly, with a few drops of heavy motor oil, once or twice a year (use penetrating oil first if necessary). Use care to avoid dripping oil on cloth top, and wipe excess oil from metal parts at once and again a day or two later.

Additional repair and adjustment information for the power tops used on Hudson convertibles, both 1941-47 and 1948-54 types, can be found in the MOTOR's and in the National Automotive Service Data manuals.

In addition to the above, the Hudson Body Service Manual for the 1948-54 models, contains a complete section on convertibles, which would be invaluable to the restorer. Jack Clifford, 1670 Sunflower Ave., Costa Mesa, CA 92626, has reprints of the original manual.