COOLING A HUDSON STEPDOWN ENGINE

Ken Cates - 14 December 2018

Hudson owners who regularly driver their cars are well aware that our cars cooling systems are not on par with those of vehicles manufactured in 2018. But, there are a multitude of actions we can take to make what was designed into our cars better or replace the original equipment with newer technologies.

Fundamental to making our cars withstand the rigors of the driving environment is to perform all recommended maintenance. The cooling systems in use are at a minimum 64 years old in 2018. The age dictates careful inspection and zero timing all parts that need repair or replacement. If the vehicle is NOT experiencing cooling problems, it is time to formulate a maintenance practices plan that will inspect thoroughly and service as required by the maintenance manual.

The coolant in all of our cars has a service life and if the last system flush and coolant replacement is unknown it is wise for the owner to set aside time to accomplish this task. Prior to a complete flush it is important to use a block and radiator flush that will remove as much internal corrosion as possible. One product that works exceptionally well is EVAPO-RUST. This product is added to the cooling system and the vehicle is driven for several days. The cooling system is then drained and flushed with water three times. When doing this flush the drain plugs in the engine block should also be removed. Once the coolant system flush produces clear clean water, drain the system and replace the coolant with the proper amount of 50-50 mix of good quality antifreeze and water. Internal cooling system corrosion is a product of electrolysis. Electrolysis occurs due to electrical currents, these currents can be slowed and potentially stopped by utilizing deionized water with the antifreeze. This should reduce the internal corrosion to a minimum.

When the flush is accomplished it is GOOD PRACTICE to replace the rubber hoses at the same time. Rubber hoses breakdown over time and the byproducts of the rubber deterioration contribute to poor cooling performance.

Hudson engines have a water distribution tube that runs from the back of the water pump to the opposite end of the engine block. This distribution tube must be clean and undamaged. If the engine is overheating or unevenly heating front to back, this tube could be damaged by corrosion or possibly filled with rust. Removal of the water pump is necessary to inspect for these problems. Prior to removing the pump a through temperature scan with an inferred thermometer can pin point problem areas or failures.

The water pump on your Hudson has potentially been replaced in the past. Rebuilt pumps are a source of cooling problems where the rebuilding activity did not hold the pump impeller tolerances to factory standards and reassembled the pump with too much clearance. In this case the pump will cavitate and not pump water at the rate or volumes needed to process water through the block and radiator. Fortunately, the clearances are known and clearly listed in the HUDSON Maintenance manuals. If this problem is suspected, removal inspection and repair if required are necessary. Replacement of the pump is a simple process and obtaining NEW manufacture water pumps with proper clearances is now possible from Dale Cooper a Hudson parts vendor. When replacing a water pump, it is essential to add a water soluble oil to the cooling system to provide ongoing lubrication to the water pump.

The water moving though the cooling system is controlled by the thermostat. Selecting a temperature range to match the environmental temperatures will make a huge difference in the proper operation of your engine. Also your Hudson engine came from the factory with a bellows by-pass thermostat installed. This type of thermostat passed nearly 40 percent of the hot cooling water into a loop in the engine. Replacing the original thermostat with a modern non by-pass thermostat will increase the water flow through the radiator to nearly 95% which will significantly reduce to temperature of the water being returned to the engine block. A cooler water temperature assures maximum fuel economy.

Instruction for modifications which allow for replacement of the by-pass thermostat are included in this information.

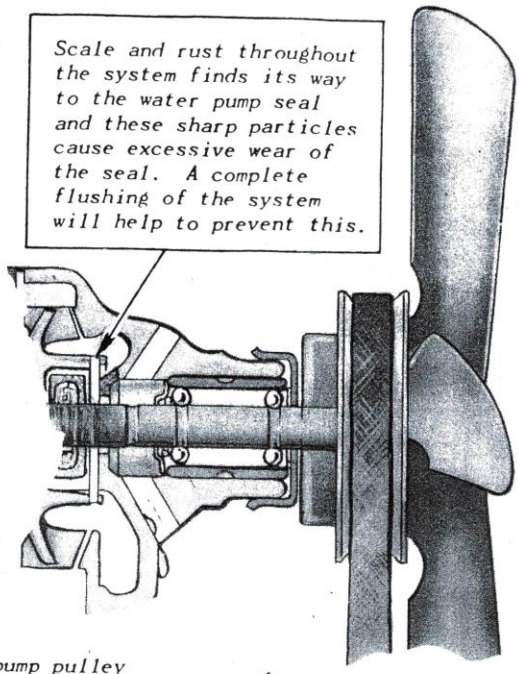
Final thoughts. Your radiator could be 64 years and more old. If this is the fact, replacing it is a wise investment. There are a variety of sources to purchase replacement radiators from re-cored units to new manufacture Aluminum drop in radiators. When selecting a radiator make determine what your driving goals are before making a final purchase decision. Adding air-conditioning, long summer trips to desert of normally hot temperature areas should motivate a decision to purchase a four core replacement radiator.

Also make sure that all of the rubber seals Hudson placed around the radiator are serviceable and doing their interned jobs. Pushing air though the radiator is the goal. If you find that there will be more stop and go driving by all means consider a multiple blade fan and maybe an electric fan at the front of the radiator.

Once you have made these investments of time talent and monies maintain your cooling system by regular service and looking under the hood at least once a week.

WATER PUMP TROUBLES AND REMEDIES

The picture to the right shows the component parts of a water pump and here we wish to stress a few of the more important points to prevent water pump failure.



1. Do not guarantee a new water pump unless the cooling system has been thoroughly flushed before installing the new pump.

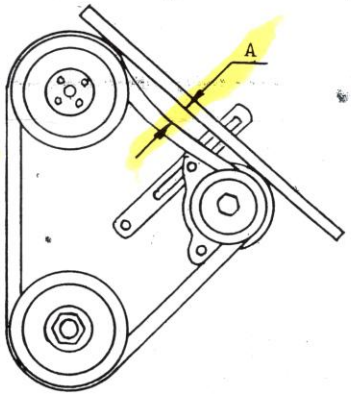
The accumulation of scale and rust in the cooling system causes a new pump to be short lived. This foreign material finds its way to the high grade seal that is used in our pumps and might work as a good abrasive tending to speed the wear of the seal causing a leaky water pump.

Reverse flush the cooling system and do away with the above condition.

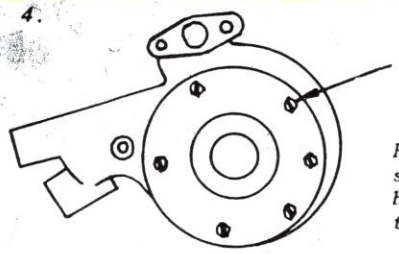
2. It is a good policy to replace the water hoses. Even though they do not appear to be worn on the outside, the inside may be decayed and this decay goes into the cooling system and causes clogging. This decay also causes the hoses to collapse.

3. The fan belt should run true off of the water pump pulley otherwise it will cause excessive wear of the water pump bearing. Fan belts must not be adjusted with any more belt tension than is necessary to drive fan at moderate engine speeds, otherwise if too tight, the pump and generator bearings will wear rapidly. If too loose, the belt will cause noise similar to spark rap at high speed, and will also wear out the belt rapidly.

The fan belt should be able to be flexed inward approximately an inch at a center point between pulleys. See sketch joint A.



4.



Always tighten the screws in the back plate.

Fan blades and pulleys must be on straight and secure. See that all bolts are tight with lock washers, taken from old assembly.

5. Use new gaskets to prevent leaks and be sure all gasket surfaces are clean.

6. Inspect thermostat thoroughly.

7. If you have a squeak, don't blame the water pump until you have checked the generator brushes.

8. If you have followed the above suggestions and eventually the pump squeaks, have a can of water pump soluble solution poured into the cooling system which will stop this after a period of time.

Please follow the above suggestions and we will have more satisfied customers. A satisfied customer means more business for us all.

If for some reason you return a water pump to the factory, if possible, give complete information as to why the pump is being returned.

Water pump information provided by Dale Cooper – ACE AUTO PARTS

Modifying the HUDSON BY-Pass Thermostat housing for more efficient engine cooling

The Hudson Big Block engine were originally equipped with a BY-Pass Bellows Thermostat. This type of thermostat required a large housing with a cast in water by-pass passage. This type of thermostat allows a large amount of the water being circulated in the cooling system to by-pass the radiator. This reduces the effective cooling capability of the radiator. Using a modern non -by-pass thermostat will allow you to regain the lost cooling capacity. To use this type of thermostat a modification to the original equipment thermostat housing is required in order for the modern thermostat to function optimally. This is easily done by pressing a 1-1/4" cup style expansion plug into the by-pass opening of the Hudson bypass thermostat housing. That plug will also require drilling a small 1/16 to 1/8" hole through it. This hole will allow air to bleed through the cooling system. The modern thermostat will also require the same size hole drilled through its lip. The pictured thermostats are shown so the differences in opening sizes between a Stant and a Mr. Gasket thermostat can be seen.

When The Mr. Gasket opens is easily is two times the space of the other thermostat. (in other words more coolant flow)

The Hudson thermostat housing is modified by inserting an expansion plug into the by-pass opening. The pictures show the housing without and with the expansion plug inserted. The plug requires a 1/16 to 1/8" hole drilled into it before installation.

565-023

Brass Cup Expansion Plug 1-1/4 In., Height 0.400

Dorman's Engine Expansion Plugs are available in multiple styles, including Cup Type, Pilot Seal™, Reverse Taper, Concave, Quick-Seal® Rubber and Quick-Seal ® Copper. Our uniquely designed Pilot Seal Expansion Plug ensures a leak-proof fit.

Product Specifications

Closed End Diameter:	1.249 In.
Describe Type:	Expansion Plug Cup Type
Material:	Brass
Open End Diameter (in):	1.257 In.

The use of a multi- blade fan to replace the Hudson factory fan will increase the airflow through the radiator at lower speeds

Hudson sealed the spaces around the radiator with rubber or heavy card/fiber board blocks. These like the replacement piece for the space below the radiator (shown) should be checked for integrity and all that are damaged repaired or replaced.

Balanced Thermostat

1948-1954 Hudson engines

Harry "Rudy" Bennett and the merry band of Hudsonites located in the El Paso Texas area seek to improve the reliability of their Hudson engines on a regular basis. One area this group has focused is the efficiency of the cooling system. As part of their investigations a review of how thermostats effect engine water circulation was conducted. *Rudy said*; we test everything we change in our Hudson. We also are fortunate to have a nearby mountain road to do testing up to 6000 ft as well as a place to do wide open on level ground runs. We couple those tests with lots of in town stops-starts.

Rudy related the results of their thermostat testing as follows…

…We did a lot of testing with Stant and Mr. Gasket brand thermostats. As a result of our testing, Mr. Gasket (MG) brand thermostat allowed more coolant flow than the Stant (S) brand. Comparing the 2 different thermostats we found the center orifice in the MG is much larger than S. Inserting both brands in a hot water bath you will observe the MG thermostat mechanical movement opens wider to allow more coolant flow to the Radiator. Using the MG brand in the 1948-54 Hudson engine will necessitate the use of a spacer. (We use the spacer Walt Mordenti sells, it allows the MG to fully open. Otherwise, if the spacer is not used, the rib in the Hudson head used to support the thermostat will inhibit full opening. Also, we observed this rib may be higher in some heads) Effects of the thermostat change were monitored by placing temperature probes directly on the engine head. Temperature readings with and without the spacer were taken. We discovered the spacer and its thickness have another effect on coolant temperature. The spacer allows for improved coolant circulation which in turn created an even temperature front to back in the cylinder head.

As a result of Rudy's testing, an 8 degree drop in coolant temperature was achieved.

Thermostat Part Number:
Mr. Gasket #4366 is a 160 degree and #4367 is a 180 degree. ***Application:*** MOPAR engines

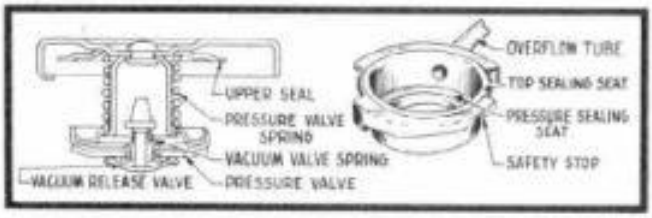
Hudsonly,
Rudy

SEALED COOLING CAP

Through the use of the pressure radiator cap the loss of coolant by evaporization, surging or unnecessary boiling is eliminated. Water pump efficiency is increased and boiling is prevented, except perhaps under extreme conditions such as badly clogged radiator core, loss of solution through leakage or a broken fan belt.

It is imperative the pressure cap be in good condition in order that sealed cooling function as it should. Unfortunately, one cannot always tell by looking at a pressure type cap whether it is operating properly or not. Since the pressure cap is the vital point in the sealed cooling system, it should be given a careful inspection, preferably during the Spring and Autumn seasons when changing coolant solution and flushing the system.

Illustrated below are the sealed collant cap and the sealing seat in the radiator filler neck. See that there are no nicks that might cause a leak in the sealing seats and that the overflow pipe is free of obstruction. The cams on the outturned flange on the filler neck must not be bent. Likewise, examine the cap for possible break or crack in the upper or lower sealing gasket. Sometimes a cap may become fouled with a sludge of grease and rust. Wash the cap in water or cleaner to remove all dirt.



Since the pressure cap is vital to the proper functioning of the system it may become damaged and require replacement. You, of course, know that practically all service stations carry a line of these, as well as hoses, hose connections, fan belts, battery cables, oil filter cartridges, etc. You have a twofold advantage here in that you are interested in Hudson Cars and your replacement parts are designed **FOR HUDSONS.**

Adding an Electrical Cooling fan to a Hudson

There are a variety of reasons for adding an auxiliary electric fan to your Hudson. The following diagram shows one safe way to wire your fan for reliable operation. This diagram will work for either 6 or 12 volt electrical systems. In the case of 6 volt positive ground systems, make sure that your fan will operate with this type of electrical system