

WATER PUMP RESTORATION AND REBUILD

by Denny Williams
Photos by Denny Williams

This month's "Tech Shop" article will explain how to rebuild the water pump for a small block V-8 and will explain what was original on 1955-1957 Chevys.

The original water pumps had a flat plate on the backside of the pump which was secured to the pump assembly with six slotted pan-head-type screws. (See Photo #1.) The original water pump did not have a plug or fitting in the top of the pump housing as is common in later model water pumps.

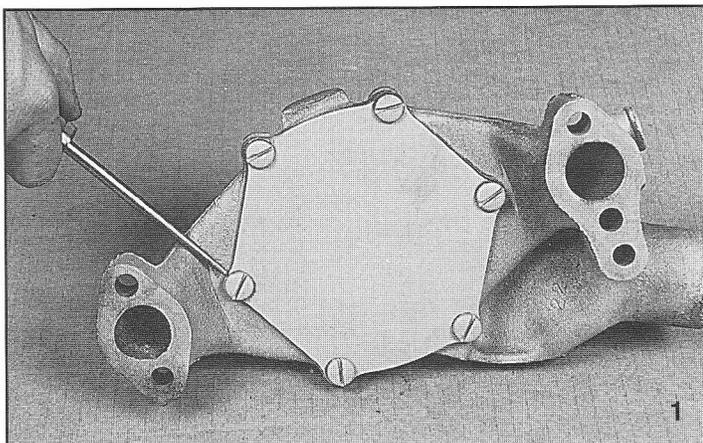
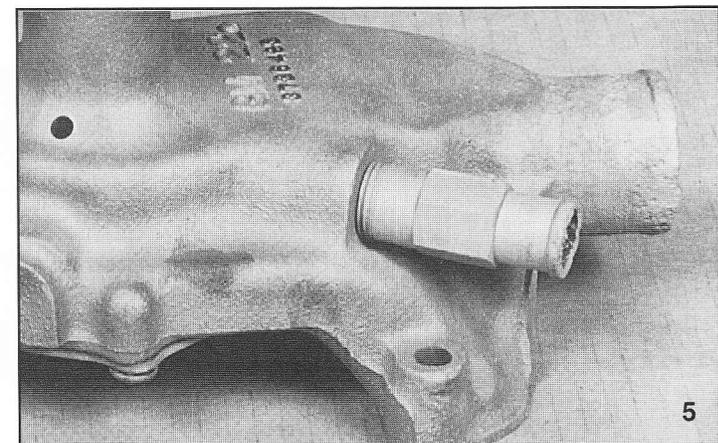
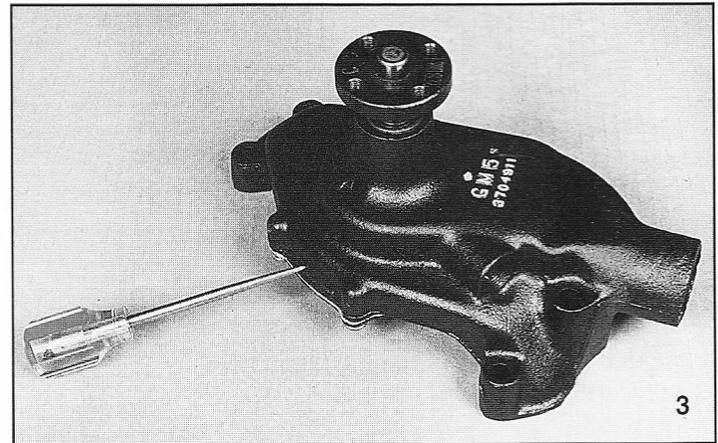
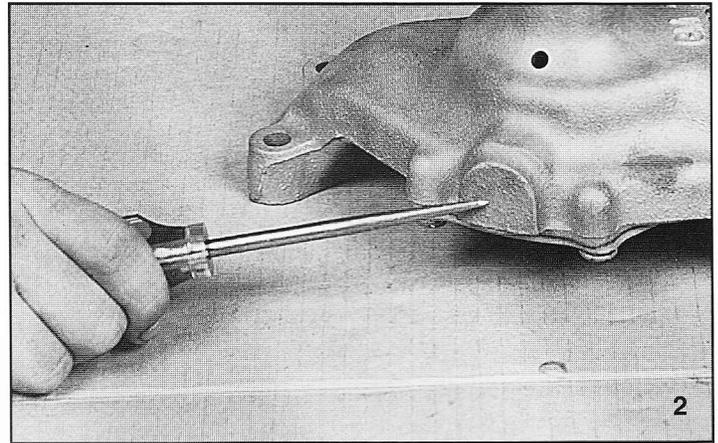
Some of the original water pumps had a boss on top that appeared as if it could have been drilled and tapped for a plug or fitting. (See Photo #2.) The 1955 water pump was cast 3704911 and did not have a boss on top. (See Photo #3.) The 1956 water pump was also cast 3704911 and did have a boss on top. (See Photo #2.) I should mention that the casting number 9 may look like an 8 in many of the casting numbers found on GM parts, such as: water pumps, exhaust manifolds, engine blocks, etc. The 1955/1956 "911" water pumps had a 5/8-inch water outlet.

The original 1957 V-8 water pump had a casting number of 3736493. (See Photo #4.) The 1957 "493" pump has a 3/4-inch water outlet. (See Photo #5.) This pump has a cast boss that appears like it was made for a top plug. (See Photo #2.)

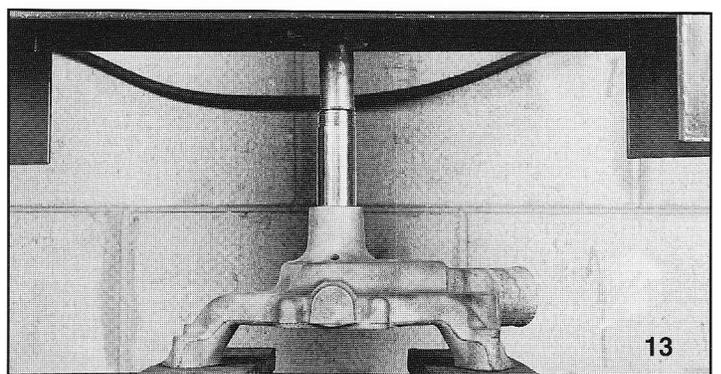
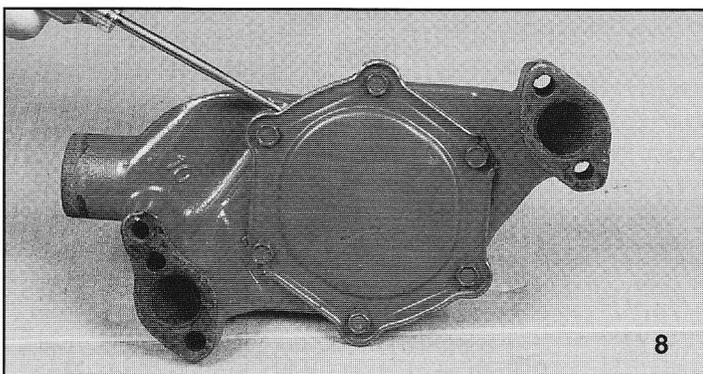
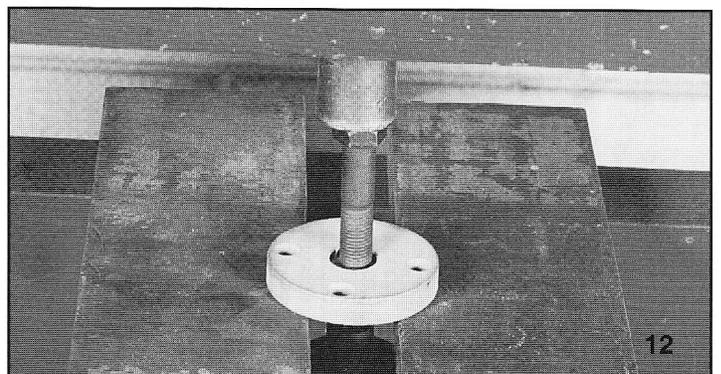
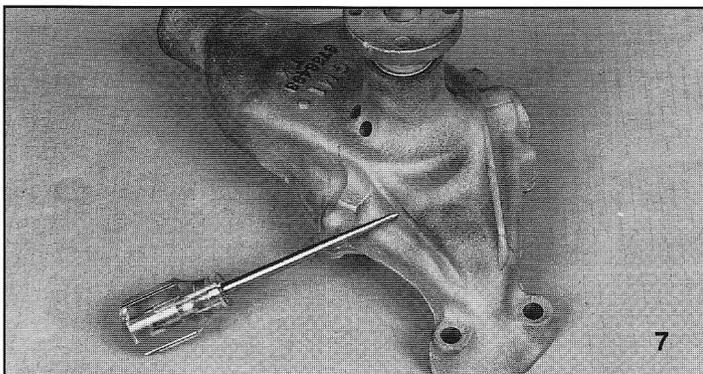
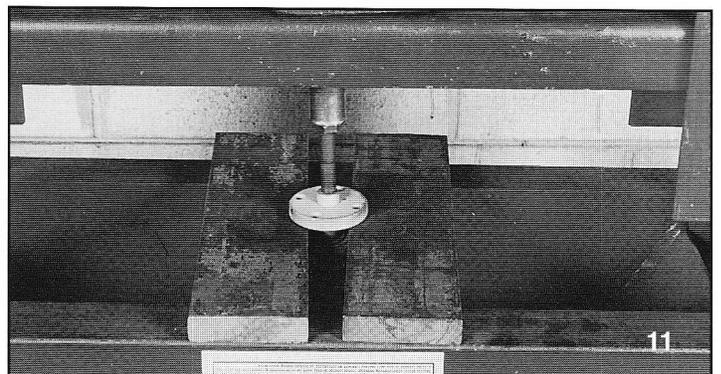
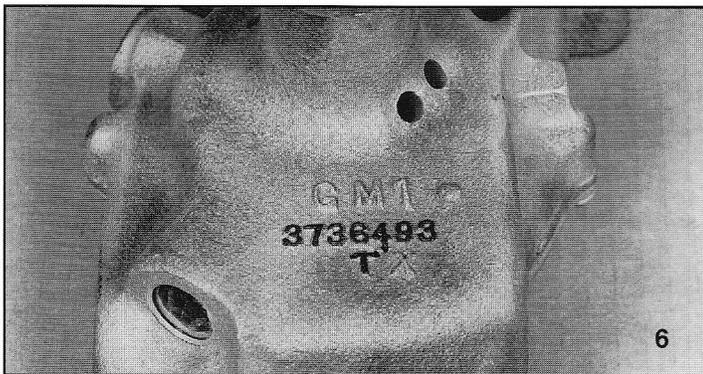
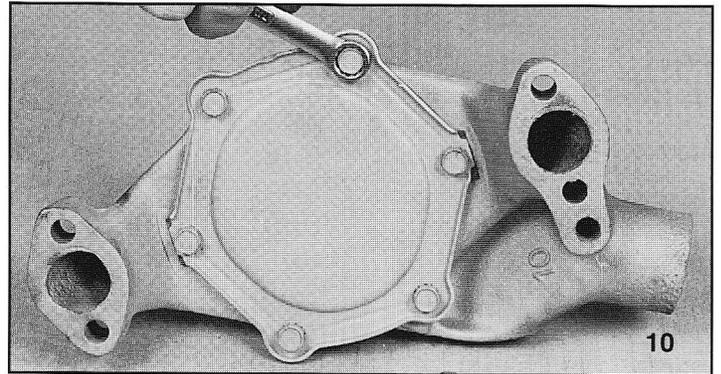
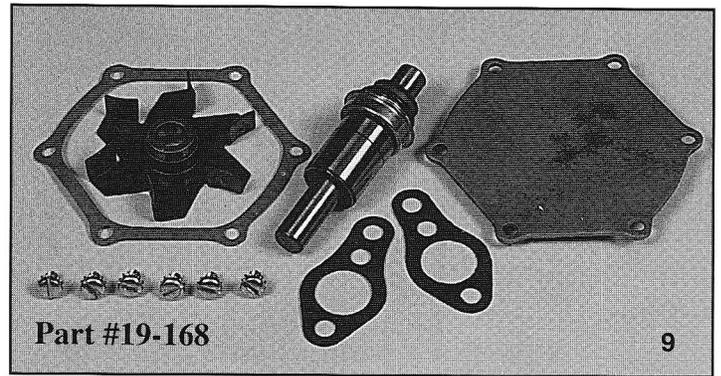
Water pumps were cast in Flint, Michigan for Flint engines and in Tonowanda, New York for Tonowanda engines. The only difference between the "411" Flint and Tonowanda 1955/1956 water pumps is the cast "T" in the Tonowanda pumps. There are two differences between the "493" Flint and Tonowanda 1957 water pumps - the Tonowanda pumps have a cast "T" and some ribs or ridges on the driver's side of the pump. (See Photos #6 & #7.)

When the original water pumps were rebuilt, a non-flat plate was used to compensate for the different impeller/bearing/seal assembly that was used to rebuild the water pump. (See Photo #8.) It is important to have an original water pump for a car if you are in one of the restored original classes. Shafer's Classic Reproductions makes an excellent water pump rebuilding kit with a flat rear plate. This kit also includes a special impeller which allows the use of the flat plate. The kit has the correct slotted pan-head-type machine screws used to secure the flat plate to the backside of the water pump housing. Thus you can restore a water pump back to original using this kit. This kit is available as Part #19-168. (See Photo #9.)

If you are going to use this kit to rebuild a water pump, you will need to have access to an arbor press. Make sure to take the proper safety precautions when using the press. Many of the disassembly photos in this article are of a 1961-1968 "3782608" water pump, and most of the assembly photos are of the 1957 "493" pump. (The only difference between these two pumps is basically the casting area at the top of the pump.)



1. Select the correct core to be rebuilt for the year of your Bow Tie.
2. Using a flat-bladed screwdriver or a wrench, remove the six screws or bolts which secure the rear plate to the water pump housing. (See Photo #10.)
3. Support the fan hub in the arbor press so that you will be able to press the water pump shaft assembly out of the fan hub. I used a 7/16-inch Grade 8 bolt to press the water pump shaft out of the fan hub. (See Photos #11 & #12.)
4. Support the water pump assembly in the press with the flat surfaces of the water pump resting on the flat plates of the press. Select a deep-well socket that can be used to press the impeller/shaft assembly out of the water pump housing. (See Photo #13.) I used a 7/8-inch deep-well socket. By using the socket you will not be applying pressure on the shaft of the water pump, but you will be applying the pressure to the bearing/race assembly. Slowly press the impeller/shaft assembly out of the water pump housing. (See Photo #14.)
5. You can now completely clean the water pump housing and prepare it for the rebuilding process. Clean all of the gasket material from the water pump housing. Bead blast the housing. You will not be using the old impeller/bearing/shaft assembly, so this assembly does not need to be cleaned. (See Photo #15.)
6. Inspect the water pump housing to make sure that it does not have any cracks and that it will make a good water pump once it has been rebuilt and restored.



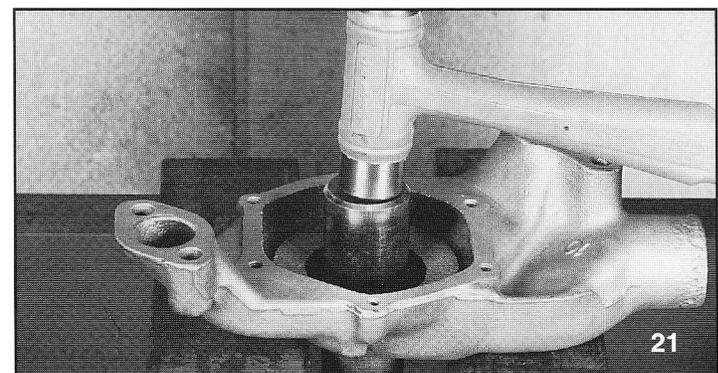
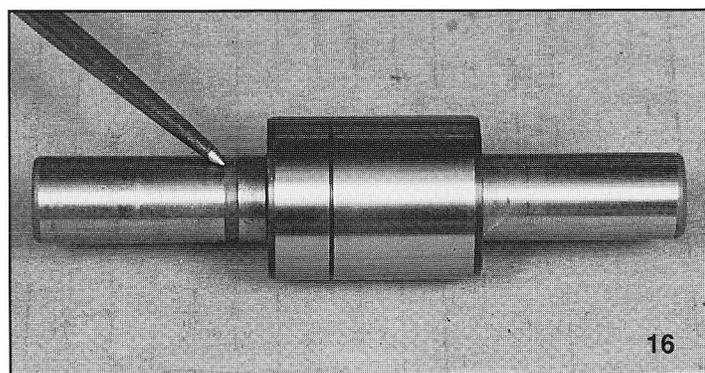
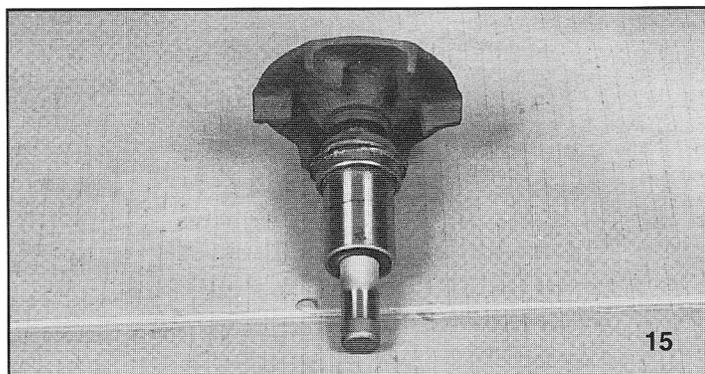
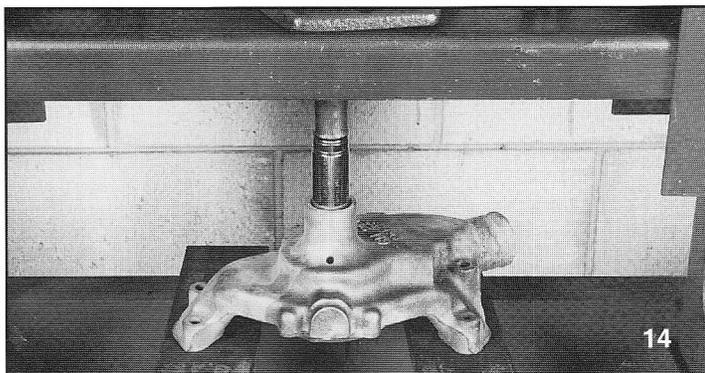
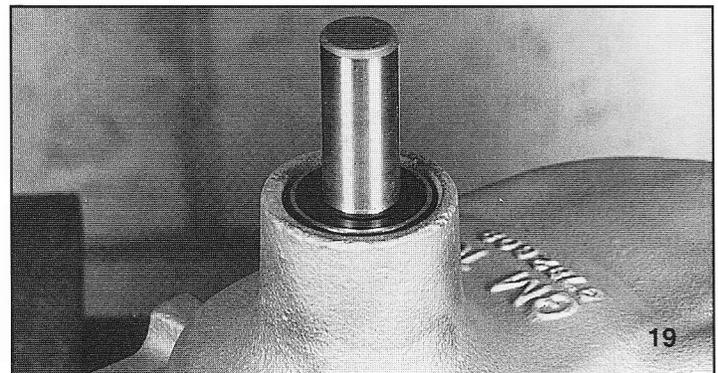
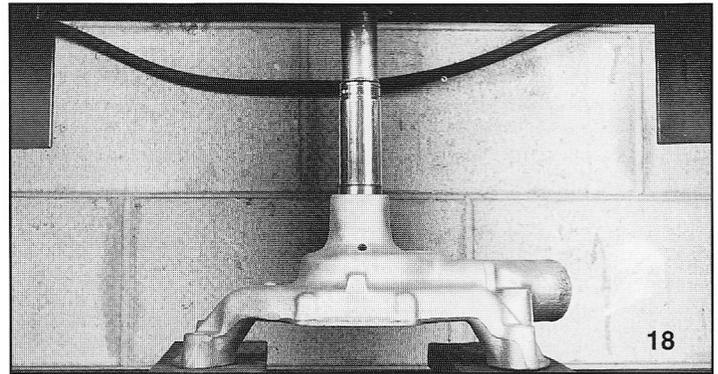
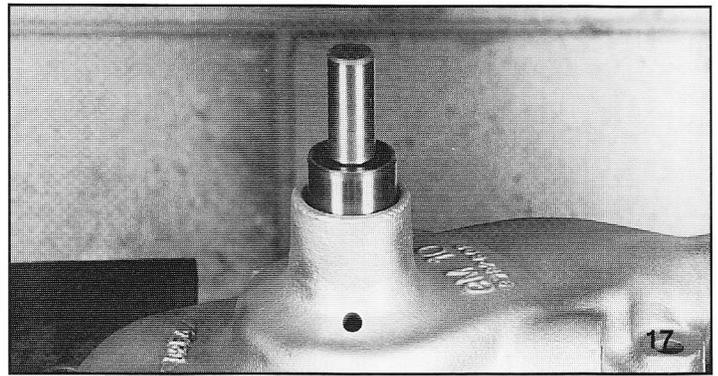
7. The longer end of the shaft is grooved and this part of the shaft will go inside of the water pump housing. (See Photo #16.) Position the water pump housing onto the flat plates of the press and place the new bearing/shaft assembly into the water pump housing. (See Photo #17.)

8. Using a 7/8-inch deep-well socket so that pressure will be applied to the bearing race, press the shaft/bearing assembly into the water pump housing. (See Photo #18.) When installed, the bearing/race assembly should be flush with the water pump housing. (See Photo #19.)

9. From the backside of the water pump housing, position the new seal over the shaft. (See Photo #20.) Select a socket which will apply pressure to the seal's outer flange. I used a 1 1/4-inch socket. Use a hammer and the socket to "tap" the seal assembly into place. (See Photo #21.) This seal should "bottom out" against the flange in the water pump housing. (See Photo #22.) Turn the water pump assembly over and check that the shaft-bearing assembly is still in the correct position. (See Photo #19.)

10. Correctly position the fan hub on the flat plates of the press. This will place the flat surface of the fan hub against the plates. (See Photo #23.) Position the water pump assembly so that the water pump shaft can be pressed into the fan hub. (See Photo #24.)

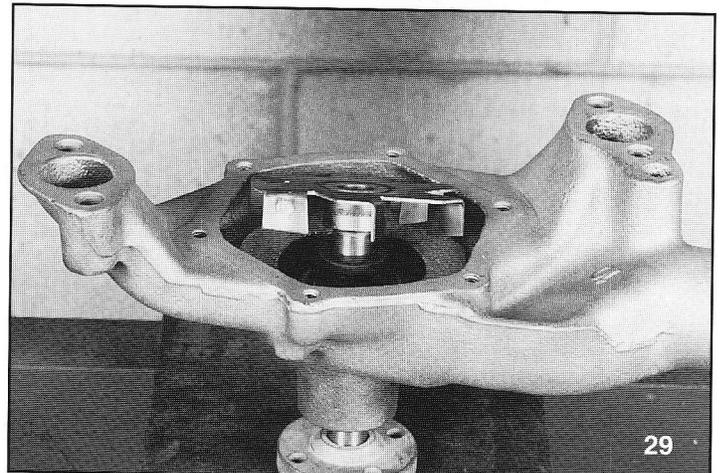
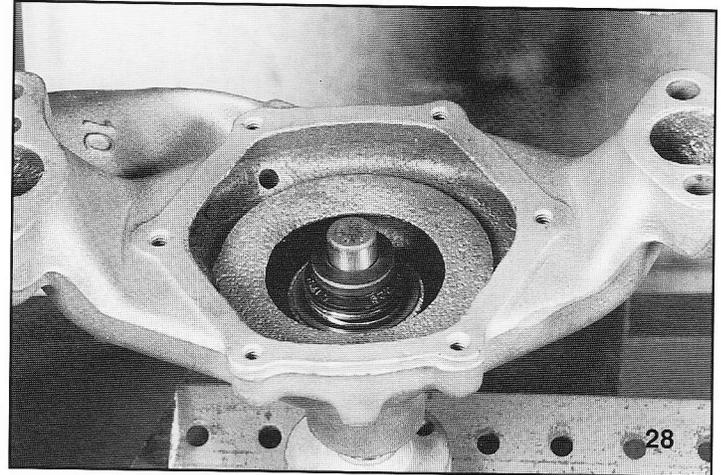
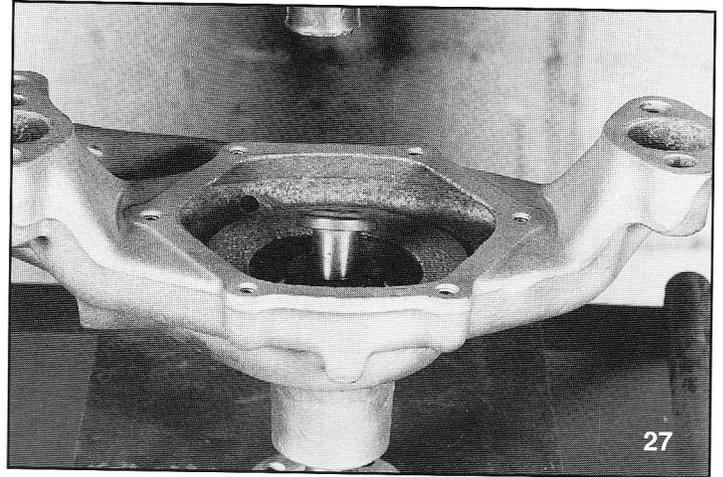
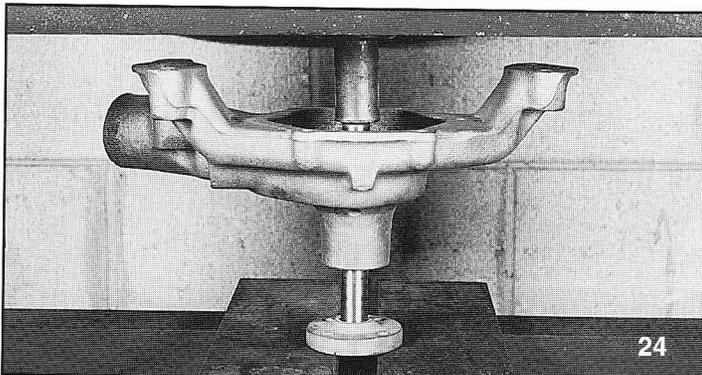
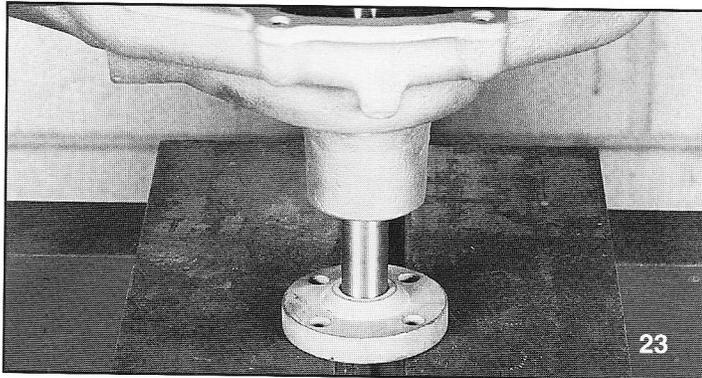
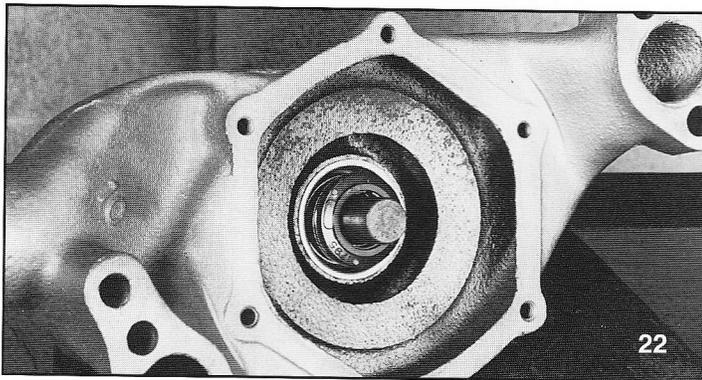
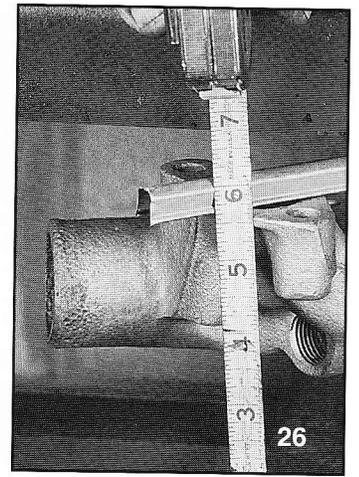
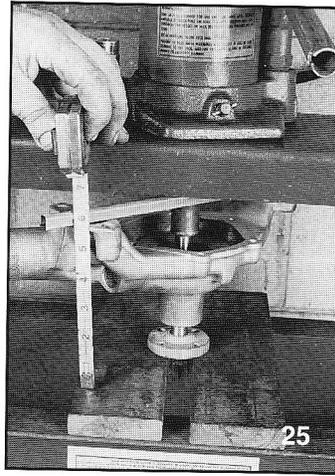
11. Slowly begin to press the water pump shaft into the fan hub. The water pump shaft will protrude through the fan hub a little more than a 1/4-inch. I suggest that once you get close to this measurement that you measure the distance from the flat surface of the fan hub to the flat surface of the water pump assembly which will be in



contact with the engine block. The correct distance is 5 5/8-inches with 1/16-inch tolerance. You can easily measure this dimension by setting something flat across the water pump and then measuring the distance between the plate on the press and the straight-edge. (See Photos #25 & #26.)

12. Position the small metal/rubber seal which is provided in the kit over the end of the shaft. The rubber part of the seal will be facing towards the back of the pump. (See Photo #27.) This seal can be pushed into position with your fingers. Once it is in position on the shaft it will appear as in Photo #28.

13. Carefully position the new impeller over the end of the shaft. (See Photo #29.) I used an 11/16-inch deep-well socket which will apply pressure to the center part of the impeller. Begin to press the new impeller into position. (See Photo #30.) Notice how the water pump assembly is positioned on a single plate on the press. This will allow you to press the impeller onto the shaft without changing anything else inside the pump. Slowly press the impeller into position so that the impeller blades do not come in contact with the water pump housing. There will probably be anywhere from .010-inches to .0135-inches clearance between the impeller and the water pump housing. Spin the water pump shaft to check that the impeller blades are clearing the pump housing.



14. Apply a small amount of gasket sealant to the water pump housing and then position the gasket onto the water pump housing. (See Photo #31.) The gasket is basically a 6-sided gasket with four sides that are fairly straight and with two sides which are somewhat rounded. The two sides which are somewhat rounded will be opposite to each other. The somewhat rounded sides of the gasket will go at what is the top and the bottom of the water pump once it is positioned onto the engine. (See Photo #32.)

15. Apply a small amount of gasket sealant onto the gasket and then position the flat plate onto the gasket. The shape of the flat plate is similar to the gasket and so the plate can be positioned in two correct ways. The rounded sides which are opposite to each other will go on the top and bottom of the water pump. (See Photo #33.)

16. Using a flat-bladed screwdriver, install and tighten the six slotted pan-head machine screws which secure the flat plate onto the water pump housing. (See Photo #34.) Again check to make sure that the water pump shaft can turn freely without binding or scraping. Clean any excess gasket material from the plate area.

17. The pump is now ready for paint and installation. Spray the entire pump assembly with lacquer thinner; this should eliminate any oil that might be present. If you are just restoring the pump, paint the pump and then install it onto the engine. If you are restoring an engine you can spray the backside of the pump assembly with engine color paint. (See Photo #35.) After the pump has been installed onto the engine, the front of the water pump can be sprayed along with the entire engine with engine color paint.

18. When finished, you will have a great looking and working original restored water pump. (See Photo #36.)

