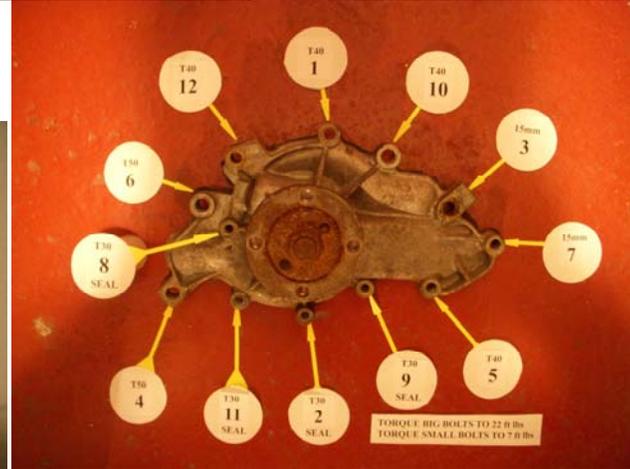




Tech Articles

By: Ray Dyreson

A Simple Water Pump



The water pump on a Fiero works hard to circulate coolant around the whole car. It lives in a hostile area filled with hot chemicals but soldiers on for years. Eventually though you begin to hear a low pitch rumble or you see a little green drip by the right rear tire. Soon you must get to know the water pump up close and personal.

Changing a Fiero water pump looks deceptively simple. Even the factory manual makes it look like a two beer job. From the 1986 Helm Shop Manual the procedure for removing a V6 pump involves removing or disconnecting:

- Negative battery cable
- Engine coolant
- Drive belts
- Radiator and heater hose
- Water pump attaching bolts
- Water pump

If only it were that simple. I will try to fill in some details between the above instructions for both 4 and 6-cylinder engines. Remove the negative and the positive battery cables followed by the battery. Perhaps if someone bet me I couldn't get a water pump off with the battery in I could, but it would have to be a pretty big bet. Draining the coolant can be done in several ways. The left and right side coolant pipes have drain plugs in them just ahead of the rear wheels. GM planned to have us use a 3/16" Allen hex socket to remove these and drain the coolant from these low points. If only it were that simple. I have rarely gotten one to come out without heat and/or damage. Four cylinders have a drain plug on the front of the block you can't get to, and 6-cylinders have a drain plug on each side.

You can use these. The radiator has a drain screw but it will just drain the radiator. The last method is to remove the hose between the right side coolant pipe and the engine. This is best done with the right rear wheel and inner fender liner removed, which you should do anyway. Before draining, decide what you are going to do with the coolant. Three common causes for water pump failure are acidic coolant, belt too tight and old age. Unless you recently changed it, I would replace the coolant. Use the old ethylene glycol green coolant, not the new "long life" kind. You may test the original coolant if you wish using Ph factor strips. By the color change you can determine the Ph. It should be 8.0 or more. Before draining, remember to remove the thermostat cap on the engine and pull out the thermostat. Dispose of the coolant properly and don't let pets or children near it.

Now differences between 4 and 6-cylinders come in. Which is easier? If only it were that simple. Each has variations by year and with A/C or not. Remove the V-belt on an '84-'86 4-cylinder engine without A/C and the multi V belt on all '86-'88 6-cylinders by loosening and swinging the alternator. On '87-'88 4-cylinders the automatic belt tensioner needs to be retracted to release the belt. These tensioners are failure prone, expensive and rare (image 1). '84-'86 4-cylinders with A/C will need the A/C V-belt removed also.

The GM instructions say to remove the water pump attaching bolts. If only it were that simple. The pulley is in the way of some of the bolts. If you have a 2.8L, the pulley bolts on. Use a 13mm 6 point wrench to remove the bolts while holding the pulley from turning by fitting a long square cross section screw driver against two of the four bolts while loosening another one. You gain more working space by removing the EGR solenoid and the brackets that support the wire harness just below it. The 4-cylinder has a pressed on pulley. '84-'86 engines without A/C has a single groove, '84-'86 engines with A/C have a dual "V" groove and '87-'88 engines have a "multi V" type. You will need special tools to remove and reinstall this pulley or take the pump to an auto shop and have them switch it. The Kent Moore remover is part number J-25034B and the installer is part number J-25033B. Other tools are available from MAC, Snap-on, Lisle, etc., and are often listed as being used for power steering pump pulleys. If you have the tool, put in on the pulley and remove it? If only it were that simple. There is not enough room for tools and hands as they must go under the welded on battery tray. Here again I might be able to win a bet to remove the pulley with the pump on the car but the winnings would get spent on bandages for my hands. Instead, using an offset wrench loosen each bolt behind the pulley and back them out while pulling the pump back to make more room as the bolts come out. This is for non A/C cars. If only it was that simple with engines with A/C. These engines have a bracket covering some of the bolts. Take out the front bracket bolts and loosen the rear one to swing the bracket away. Don't lose the spacers. Now remove the pump with the pulley attached. Note that you do not have to remove the 90-degree adaptor behind the water pump. Most new pumps come without a pulley. If you do get a rare one with the pulley already pressed on, remember there are three different ones. On 6-cylinder engines remove the twelve mounting bolts. '85-'86 cars use hex heads while '87-'88 use three different torx heads and a 15mm hex. They are three different diameters and various lengths. Have the new pump sitting nearby and as you remove each bolt drop it in the same hole in the new pump. When the old pump is off transfer the bolts to it and they will get reinstalled in the new pump in the correct positions one at a time (image 2).

A heater hose needs to be removed from a pipe on the pump of '85-'86 6-cylinders only. '87-'88 6-cylinders will have a pipe plug in that hole. The new pump will usually come with a new pipe but not the plug. Transfer the old plug if you have a '87-'88.

Now you are onto cleaning the gasket-sealing surface. Peel off any loose, old gasket material that stayed on the engine, then use spray gasket remover such as Permatex #80646 to soften the rest (image 3). A gasket scraper can be too aggressive and damage the surface. I use hand held, single edge razor blades. Tie a string or wire around the blade in case you drop it. A razor blade can fall into the hose opening at the bottom of a V6 timing cover and sink to the bottom. Don't ask me how I know this. Use proper size taps to clean the threads of the water pump boltholes. The threads must be clean and dry, especially on the V6. Put a thin film of glycol resistant RTV sealant on both sides of the gasket. I recommend Permatex # 22071. Get a new pump, not a rebuilt unit. Also buy a new gasket as the ones supplied with the pump are often poor quality and damaged. For the V6, be sure the new pump has a metal, NOT a plastic impeller. For 4-cylinders put the bolts through the pump and hang the gasket on them. Tighten the bolts on the pump behind the pulley using the offset wrench. The V6 is a little harder as the gasket is bigger and floppier and there is less room to work. I use two guide stud pins to hold the gasket on and position the pump. The ones I use are 10mm X 1.5 X 90mm exhaust manifold studs with a small hex drive on the end from some V8 (image 4). You could cut the head off a 10mm bolt to use too. Screw the two guides into a front and rear 10mm hole and slide the RTV coated gasket onto them. Now slide the pump onto the guide studs. Here is where a potential leak problem comes in. GM thought it would be good if four of the boltholes went into the coolant passages. Some say this was reduced to one in 1988. Apply RTV sealant to the bolt threads in holes # 2,4,8,9 and 11. I don't take a chance and seal all twelve. Torque the bolts in the order shown (image 5). Unlike the 4-cylinder where torque is not critical, on the 6-cylinder it is important. Borrow torque wrenches if you have to. A 3/8" drive one for the 22 ft/lbs and a 1/4" for the 7 ft/lbs (84 in/lbs). Now bolt on the pulley using the square screwdriver to hold it from turning.

Put on the belt and tighten it, except on '87-'88 4-cylinders with the auto tensioner. With the radiator cap off and the heater lever on "HOT" add coolant into the thermostat housing until it runs out the top of the radiator. Put the radiator cap on and continue to add coolant to the thermostat opening until it overflows. Then push in the

thermostat and install the cap. Reinstall the battery and wiring etc. and start it up. Check for leaks and run it until the radiator fan cycles on and off. Not as simple as the books say but not as bad as I may have made it sound.

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