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GM 6.5L Injector Installation Tips

- **Caution: Disconnect both negative battery cables before beginning.**

- Connect the batteries to a charger. It would be even better to use a trickle charge over night. Fresh batteries are important for extended cranking that will take place while priming your injectors. Low voltage kills starters.

- Clean area around injectors prior to removal. It is very important to keep dirt or foreign material from entering the fuel system. Clean around the turbocharger and remove it to gain access to rear injectors on passenger side. (On models equipped with a turbocharger.)

- **Caution:** Do not bend the high-pressure lines.

- Remove rubber injector return line hoses and high-pressure injection lines from injectors. Injection lines should be covered with plastic bags or aluminum foil.

- To remove injectors use a 30mm deep broached socket. This style of socket is the same size all the way up on the inside. **Caution:** If you do not use the proper socket, you may damage the return connectors.

- With all injectors removed, look into the injector recesses to see if any of the copper gaskets are left. (We have seen new vehicles come in with two gaskets on one injector. This is not a good thing.) Clean the gasket seating area with a round steel brush. (The type used for cleaning ¾" copper plumbing fittings works well.) Start by cleaning with brush alone. Blow the holes out with compressed air. When you have it fairly clean, spray your brush with brake clean and clean again. Use a flashlight and a mirror on rear cylinders to verify your progress. Final cleaning should be done with a rag wet with brake clean. Wipe the seat area clean and dry it with another rag. You will know you're done when the rag comes out clean. Plan on about 5 minutes per hole. The copper gasket is responsible for two things. First, it seals hot combustion gases from escaping around the injector. Second, the gasket forms a conduit to transfer heat from the injector to the engine head. This is why it is so important to have a clean mounting surface free of carbon deposits. If the gasket does not seal properly the injection nozzle will overheat. If that happens the nozzle will last as little as a couple thousand miles.

- Now you can install the new injectors. Lightly coat the threads at the bottom of the injector with an anti-seize compound, this will make it easier to remove next time. With the copper gaskets on the injectors, install each one and torque to 59 ft. lbs.

- Screw the line nuts onto the injectors. **Caution:** Do not cross thread. * Use nothing on the threads. Take them down to hand tight, and then back them off 1 turn. If you removed any injection line clamps make sure to replace them. If any are missing, order them from your local GM dealer. If they are left off, the lines can break from vibration.

- Cut six pieces of the braided return hose. Put the two black caps on the back injectors. Connect the return hose from one injector to another. The remaining hose will connect each bank of injectors to the metal piping that goes back to the tank. **Note:** If your injectors had small metal pinch clamps, they are not needed for any injector connections including the rubber caps. The hose and return plugs may be different than what you took off. The hose has a heat resistant braided cover that keeps the hose from overheating, drying out or cracking. Eliminating the clamps keeps the heat off the ends of the hose. Metal clamps hold heat and dissipate it to the hose.

- With everything back together, but the turbo still removed; you can crank the engine to bleed the lines of air. Please read the caution below before you start.

- **Caution:** Oil will flow from the turbo oil supply line while engine is cranking or is running. The oil supply line for the turbo must be inserted into the oil return tube. This is the two-bolt flange that connects to the bottom of the turbo. You should have someone hold the line or secure it with a Tywrap. Care must be taken not to get burned by hot exhaust gases or have the oil supply line fall out of the return. When bleeding the lines do not crank the engine for more than 20 seconds at a time as overheating of your starter may occur. Wait two minutes between cranking to allow the starter to cool. If cranking speed is noticeably slowed stop and wait for batteries to come up to full charge. Be prepared for the engine to start at any time. Even with multiple lines loose it can still start. When you are looking for leaks, spray the tops of the injectors with brake clean and wipe with a dry towel or use compressed air, but only with the engine shut off. The engine will run on brake clean vapors, possibly over speeding.

- Reconnect the batteries and connect a battery charger until the engine starts.

- With the injection lines backed off one turn at each injector you can start cranking the engine 20 seconds at a time as you bleed the lines of air. Each time you finish cranking, look at the tops of the injectors. When you see fuel around the injection line on top of the line nut, that injector is ready to be tightened up. Note: The ends of the injection line are tapered, as well as the top of the injector. Do not over tighten. Go hand tight and then just snug. If there are no leaks it is done. If you do see a leak, loosen the nut and then retighten just a little more this time. * After priming the injectors run the engine for 5 minutes or so. Pay particular attention to the injectors that will be inaccessible once the turbo is reinstalled. Any leaks need to be cared for now.

- If everything looks good, install the turbo. Replace the oil return gasket at the bottom of the turbo and install the metal exhaust manifold to turbo gasket. (Both supplied)

- Next start the engine and check for oil leaks at the turbo. Let the engine run for 10 minutes to make sure no oil or fuel leaks develop.

- If no leaks are evident. Shut the engine off. Liberally spray the tops of all injectors and any oil around the turbo. Blow everything off with compressed air or use a clean dry cloth. It is preferable to use enough brake clean as to give all the connections a dry white residue from the brake clean with no sign of oil. With everything spotless start it up look for leaks one last time before you drive it. Drive the vehicle for at least 15 minutes with numerous hard accelerations. Make sure the engine reaches normal operating temperature. This will make leaks show up that you might not see in your driveway. When you return home pop the hood and inspect the area around the turbo for oil leaks. Check the injector connections for fuel leaks. If a leak is noted, snug the line*, clean the connection with brake clean and blow it off with compressed air. This will make any leak evident when you restart the engine.

Glow Plug Maintenance
Glow plugs should be replaced whenever fuel injectors are replaced. This is because the glow plug is in the same pre-chamber with the injector. If the injector starts to fail, it takes some time for a performance issue to show up. By the time it is noticed the injector may have had a poorly atomized spray pattern for some time. This causes excessive heat for the glow plug, shortening its life.

Use this procedure to test glow plugs. They may be checked in place with an ohmmeter. They should be tested with the engine cold as their resistance changes with heat. Remove the connectors at the top of each glow plug. Make sure you zero your meter or take into account the internal resistance of your meter and leads. Put one lead on a good ground on the engine and the other at the base of a glow plug to verify your ground. Then touch the terminal on top of each glow plug. You must get a reading between .1 and 2.0 ohms. If they all test within specs. It would be a good idea to remove one glow plug from each head for inspection. Glow plugs should be uniform in element length and should not have any bumps on the sides from overheating. Replace them if they do. If you have more than 100,000 miles you should replace them as a preventive maintenance item. If more than one tests bad with less than 100,000 they should be replaced as a set, otherwise you might be replacing one a month for seven months after the first one. They may not all be bad at once but with one bad the rest will follow.

Glow plugs are easy to change while the turbo is out of the way and everything is cleaned up. Just remember, you need not put anything on the threads. You use a 10mm socket to remove them. If you have difficulty removing a glow plug call us. With all the plugs removed, install the new ones. Snug only, do not over tighten. The spec is 10 ft. lbs.

If glow plugs are replaced for reasons other than scheduled maintenance the glow plug control system should be diagnosed for proper operation.

We stock Bosch glow plugs they are thermally regulated. Other brands will burn up if supplied with current for more than 10 seconds. Bosch glow plugs do not overheat due to the current limiting technology that allows their plugs to run continuously. This protects them should a glow plug control system malfunction. Due to this technology Bosch is able to warrant their glow plugs for 3 years unlimited mileage. This is better than any other glow plug warranty.

To purchase Bosch glow plugs for the 6.5L application make a payment to ebay@swdiesel.com through PayPal. Include 12.50 ea. Plus $8.62 shipping. In the note to seller indicate you are purchasing “Bosch 6.5L Glow Plugs” the shipping charge is for ground freight to USA call for other shipping. These will get a reduced or free freight charge if shipping with other goods.

These guidelines are meant to supplement information in your service manual. Call if you need further information.

***If you have any problem with alignment of the injection lines, threading the line nuts on the injectors or stopping leaks. Call us for assistance.**

Technical
800-658-5806 M-F 7a.m. to 5:30p.m.
After hours 602-793-4373

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