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## **BD Cummins 1988-93 VE Fuel Pin Kit**

**P/N# 1040178**






Click here to: [Check out the installation video on YouTube!](#)  
Or type into YouTube: Install video on BD part # 1040178 VE Fuel Pin & Governor Spring Kit

***PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION***

***Please note this product has not been evaluated by the EPA or CARB so it is therefore illegal to use on road or off road. RACE USE ONLY.***

# **KIT CONTENTS:**

Please check to make sure that you have all the parts listed in this kit before you start the disassembly of your vehicle.

| <b>1040178 Kit Contents</b>   |   |   |   |
|---|---|---|---|
| <b>1505015 Fuel Pin</b>   |   |   |   |
|    |   |   |   |
| <i>Fuel Pin</i>   |   |   |   |
| <b>Qty: 1</b>   |   |   |   |
|   |   |   |   |
| <b>1505016</b>  | <b>1505017</b>  | <b>1505020</b>  | <b>1505021</b>  |
|  |  |  |  |
| <i>M6 x 1.0 Jam Nut</i>   | <i>1.9mm Nylon Bushing</i>  | <i>Throttle Shaft Oring</i>   | <i>Gov Spring</i>   |
| <b>Qty: 1</b>   | <b>Qty: 1</b>   | <b>Qty:1</b>  | <b>Qty: 1</b>   |

## Welcome

Thank you for purchasing the Dodge Fuel Pin. This fuel pin is design for the 1988-93 Dodge Cummins with the VE pump. You will notice the quality of the fuel pin surpasses all others in the aftermarket. The pin is made from Chromoly steel, hardened to factory specification and then precision ground.

Supplied in the kit is a Bosch 1.9mm bushing to give you even more power. This combination is designed to give you roughly additional 30HP and 80 ftlbs of torque. With the governor spring installed you will increase your available power band by roughly 500 RPM and increase HP by another 10HP over the fuel pin.

## Recommended Upgrades

| Description                      | Part #            |
|----------------------------------|-------------------|
| 40hp Injectors                   | 1040170 / 1040171 |
| Quick spool 16cm Exhaust housing | 1045911           |
| Pyro and Boost Gauge             | Call              |
| 1989-93 Dodge Torque Converter   | 1060210X          |

## Required Tools

- Ratchet
- Blade Screw Driver
- 6,10,13mm deep socket
- Thread lock (blue)
- 10,12,13,17mm wrench
- Metric rounded tip allen key set (5mm)
- Needle Nose Pliers
- Small Hammer
- Pick Tool

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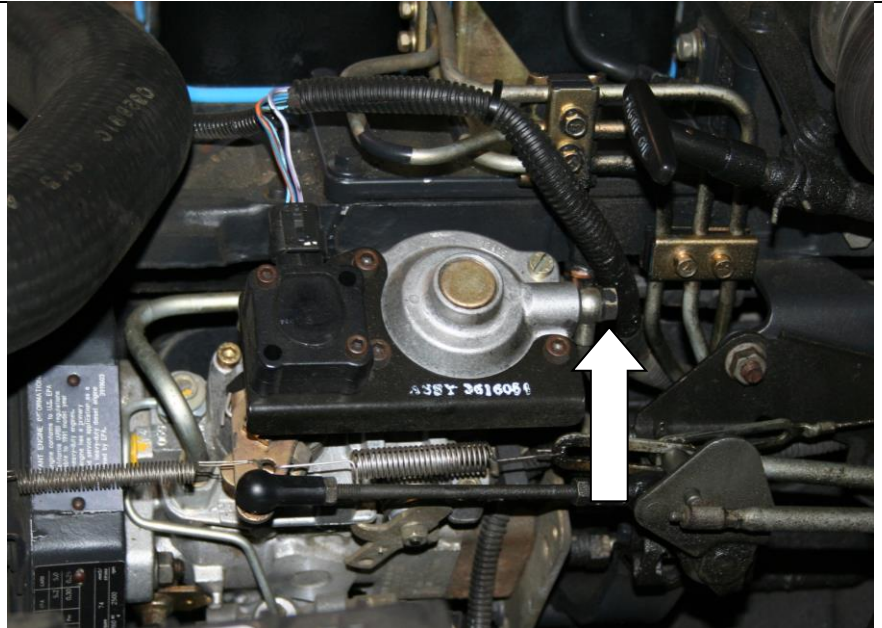
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## INSTALLATION

1. Clean off the top of the injection pump & the area around it. ***It is critical that no debris gets inside the pump.***

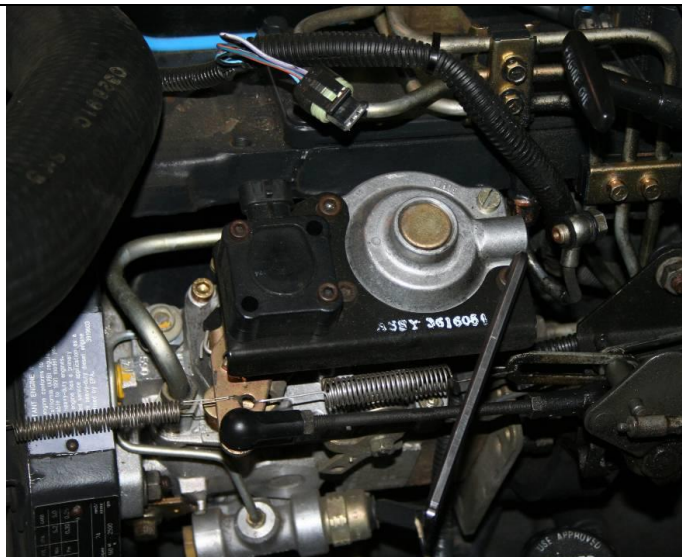


2. Remove the banjo bolt on the back of the Air/Fuel Control (AFC) housing using a 12mm wrench. Set the 2 banjo washers aside for reuse later.



3. Remove the (3) APPS sensor / AFC Cover bolts and bracket.

NOTE: Manual transmission vehicles are not equipped with the App's sensor and bracket.



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4. Remove the last slotted screw securing the AFC cover to the pump, remove cover.

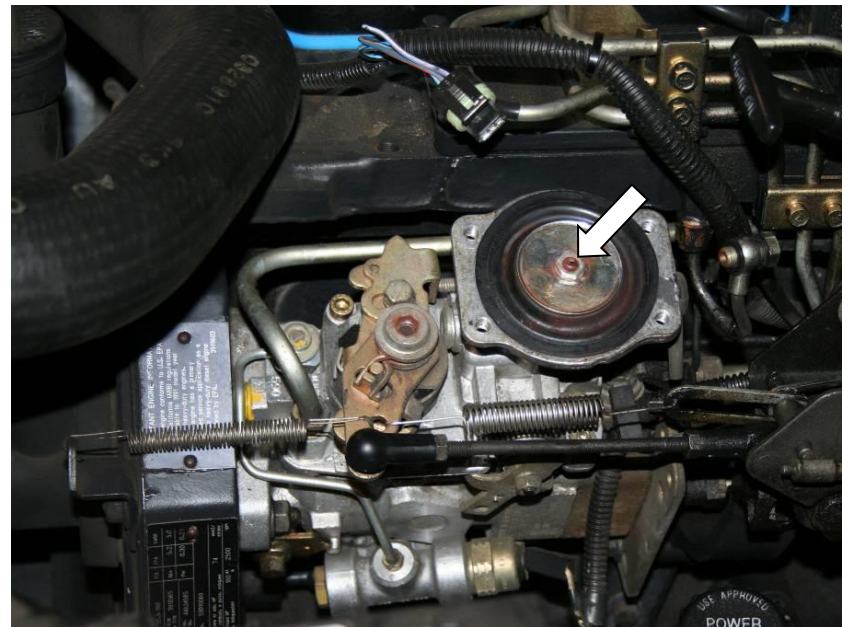


5. Carefully remove the AFC diaphragm by lifting it up out of the pump.

If it sticks, use pliers to grip the small nut in the middle and give it a gentle tug upwards.

*Do not tear the diaphragm.*

This area must be kept clear of any debris.



6. Locate and discard the white OEM nylon bushing. It may be stuck to the underside of the diaphragm, or in the bottom of the AFC chamber.



7. Carefully note which way is “up” on the rubber diaphragm (the ridge on the diaphragm faces down). Remove the factory fuel pin from the diaphragm using two 10mm wrenches (or a wrench and a socket). There is a pair of flat spots near the top of the fuel pin that accommodate a wrench. *Again, be careful not to damage the diaphragm.*

8. Swap the BD Fuel Pin onto the diaphragm and secure it with some blue thread lock and the supplied nut.

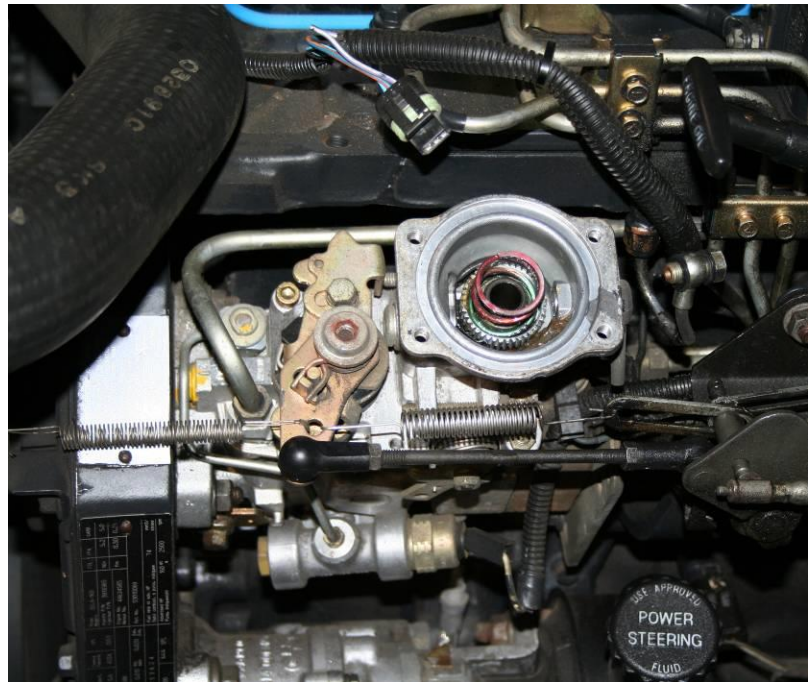
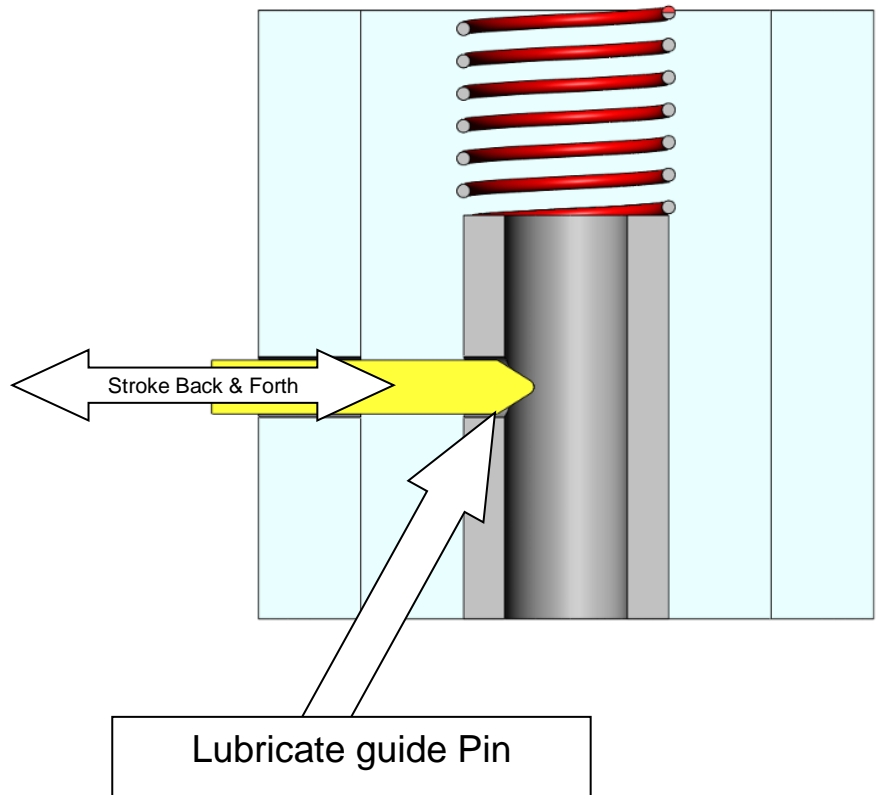
**NOTE:** There is usually a small o-ring under the nut on the new fuel pin. This is for the throttle shaft (if you’re changing the governor spring), it does not go on the fuel pin; we just put it there to keep it safe during shipping.



9. Before reinstalling the fuel pin and diaphragm inspect the AFC chamber and make sure the guide pin is clean & will retract all the way into the housing. You may need to stroke the throttle linkage back and forth slightly. Lubricate the guide pin with some diesel fuel.

**DO NOT STROKE THE LINKAGE TO FULL THROTTLE AS THE GUIDE PIN MAY FALL OUT.**

Use a suitable tool to push the guide pin back into its hole so that the fuel pin can be inserted.



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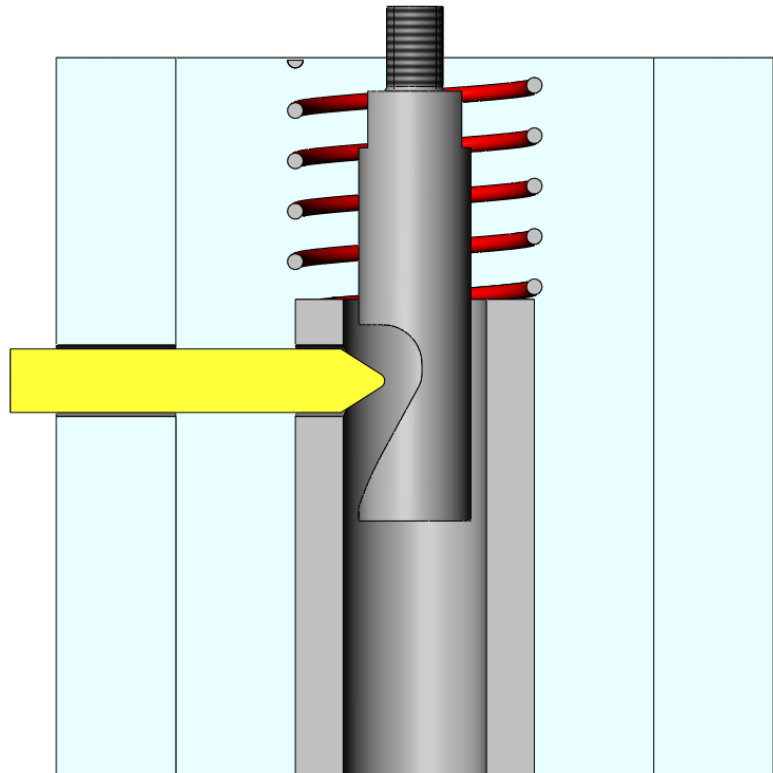
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- 10.** Place the supplied black nylon bushing onto the fuel pin so that it is up against the underside of the diaphragm. Lubricate the fuel pin with a small amount of clean diesel fuel and install it into the pump with the machined notch facing towards the front of the vehicle (the guide pin rides on this surface).



- 11.** To ensure that the machined notch is correctly positioned lift the fuel pin slightly and bring the throttle linkage to full throttle while gently turning the fuel pin & diaphragm back & forth slightly. You should feel a spot of no resistance through the center point of the turn as the guide pin comes out of contact with the fuel pin: this center point is the desired fuel pin position.



**Profile must face directly forward.**

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**12.** Reinstall the AFC top cover.

If you are going to change the governor spring as well, proceed to Governor Spring installation.

**If not**, reinstall the 12mm banjo bolt on the back of the AFC housing and also the APPS sensor and bracket, if equipped.

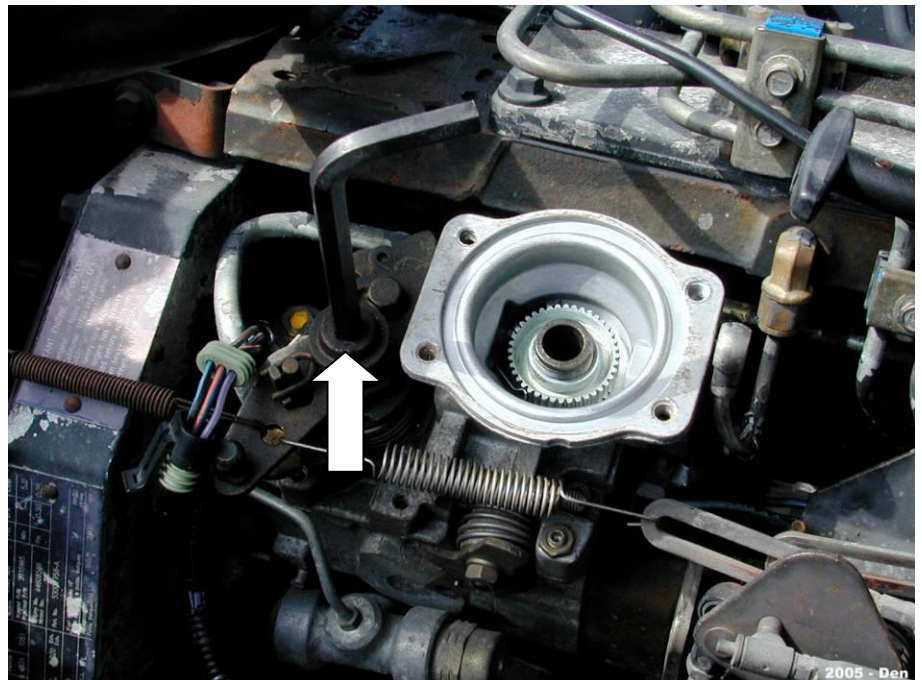


**13.** Start the vehicle, check for fuel leaks and road test.

### ***Governor Spring Installation***

**Please note that the governor spring installation is quite complex and should only be done by a trained technician.**

1. Disconnect the throttle return spring going to the bracket on the timing cover. Disconnect one of the ball joints on the throttle lever rod. Use an 8mm allen wrench to remove the nut securing the throttle lever to the pump. The linkage will usually rotate to full throttle, then the nut will come loose. Remove the throttle lever and save the small metal washer and large plastic washer that are underneath.



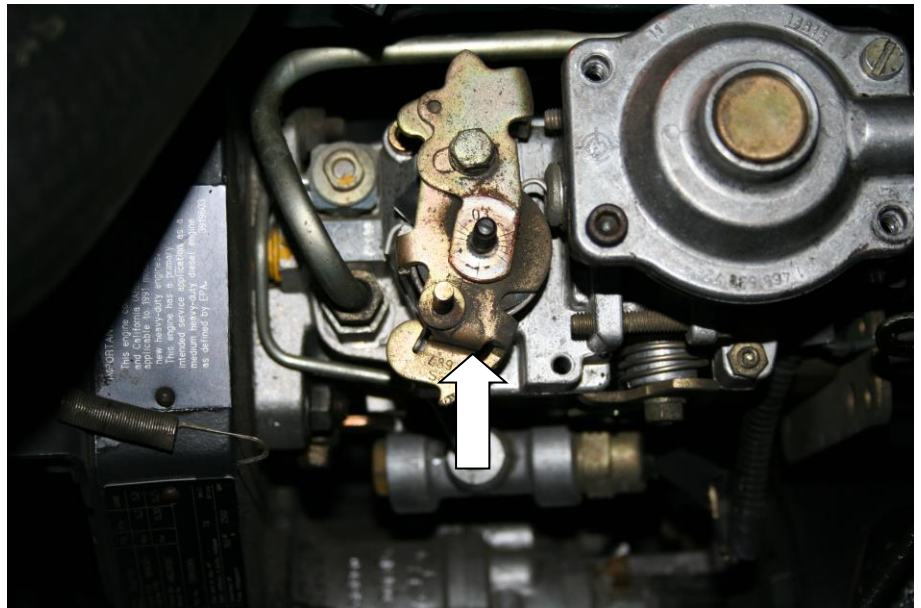
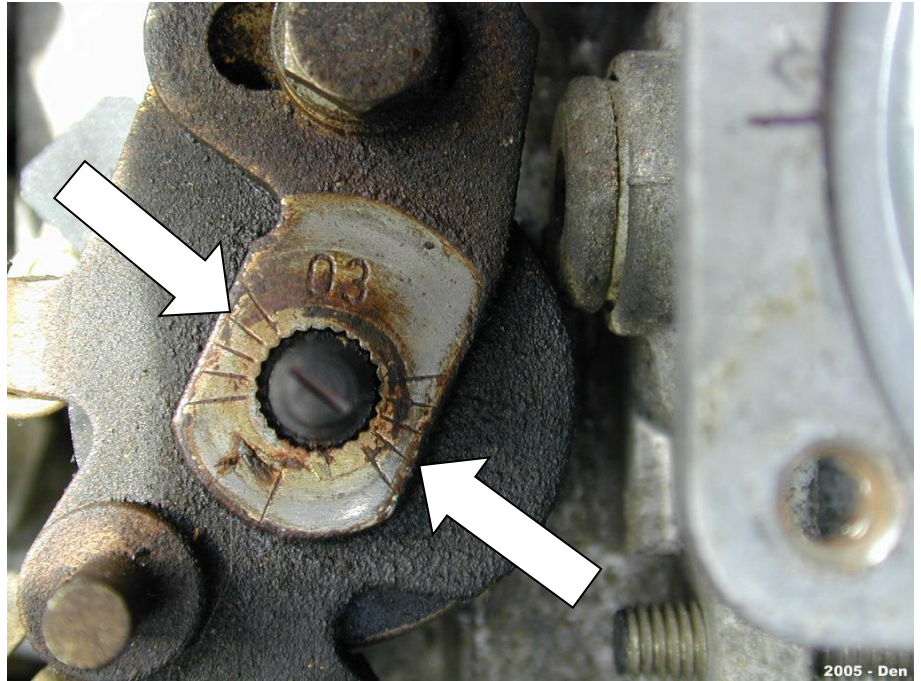
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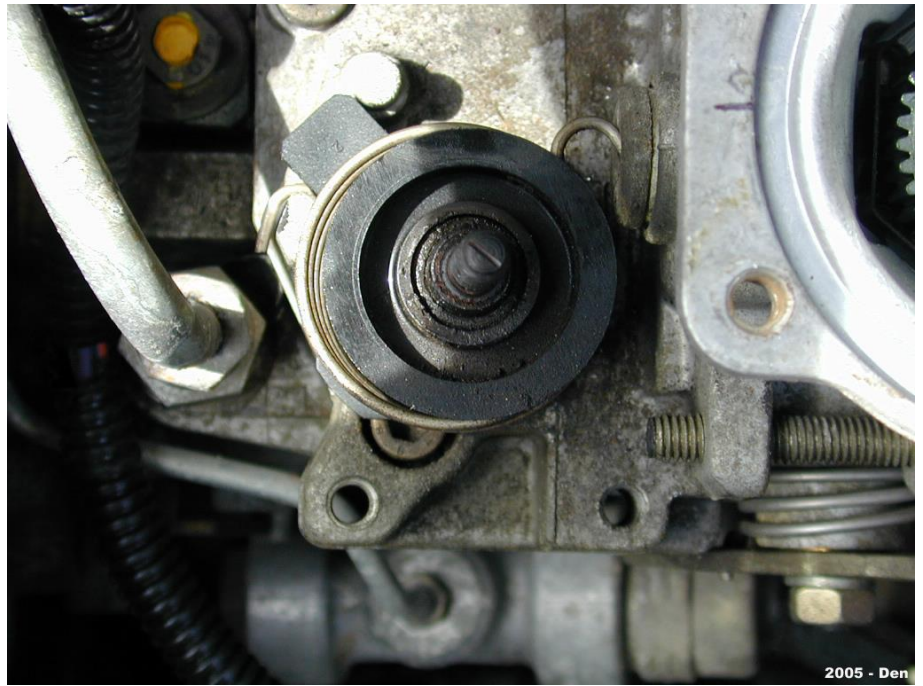
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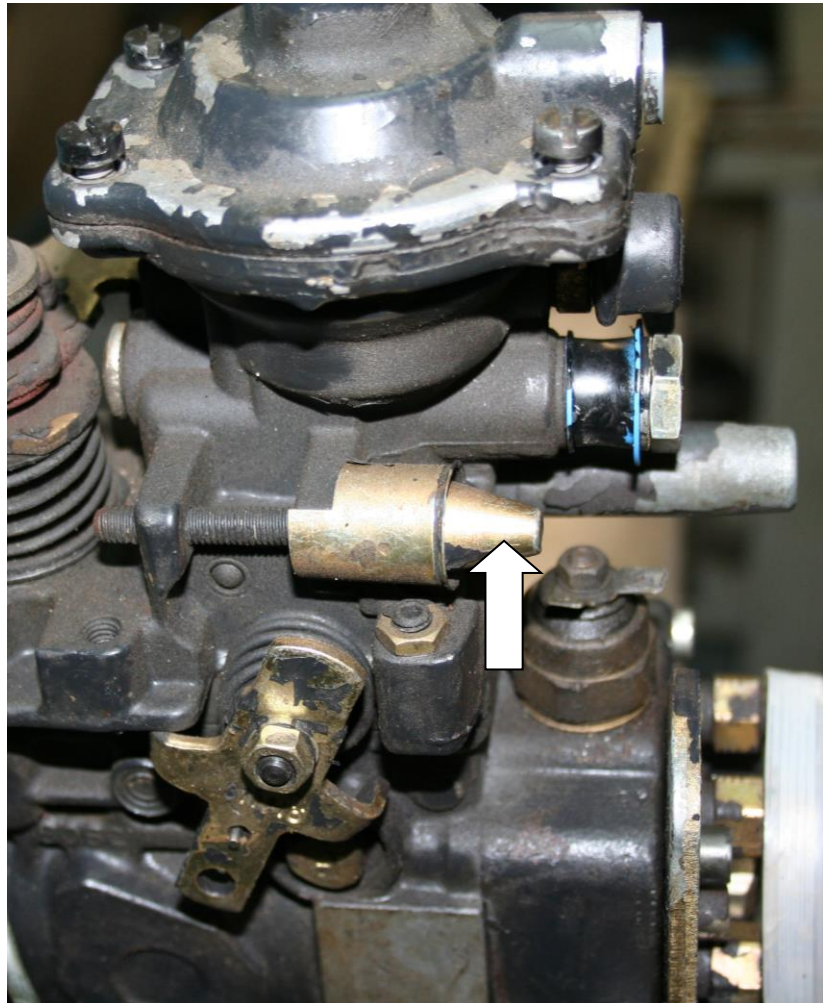
2. Before removing the pump lever, clean the area around the throttle shaft stud so that you can see the hash marks in the pump lever. Carefully note the alignment of the hash marks with the slot on the top of the throttle shaft. The lever **MUST** go back in the same position. 99% of the time the slot is aligned with the 2<sup>nd</sup> set of hash marks (as in the photo to the right). Remove the pump lever.



3. Remove the throttle shaft spring assembly and its 2-piece plastic cage. Lift everything off in one piece as they have to go back on in the same order.



4. Remove the tamper-proof cap on the high idle screw. Simply grab it with pliers (it will crush when you do this) and pull towards the rear of the vehicle. You may need to give the pliers a tap with a small hammer.



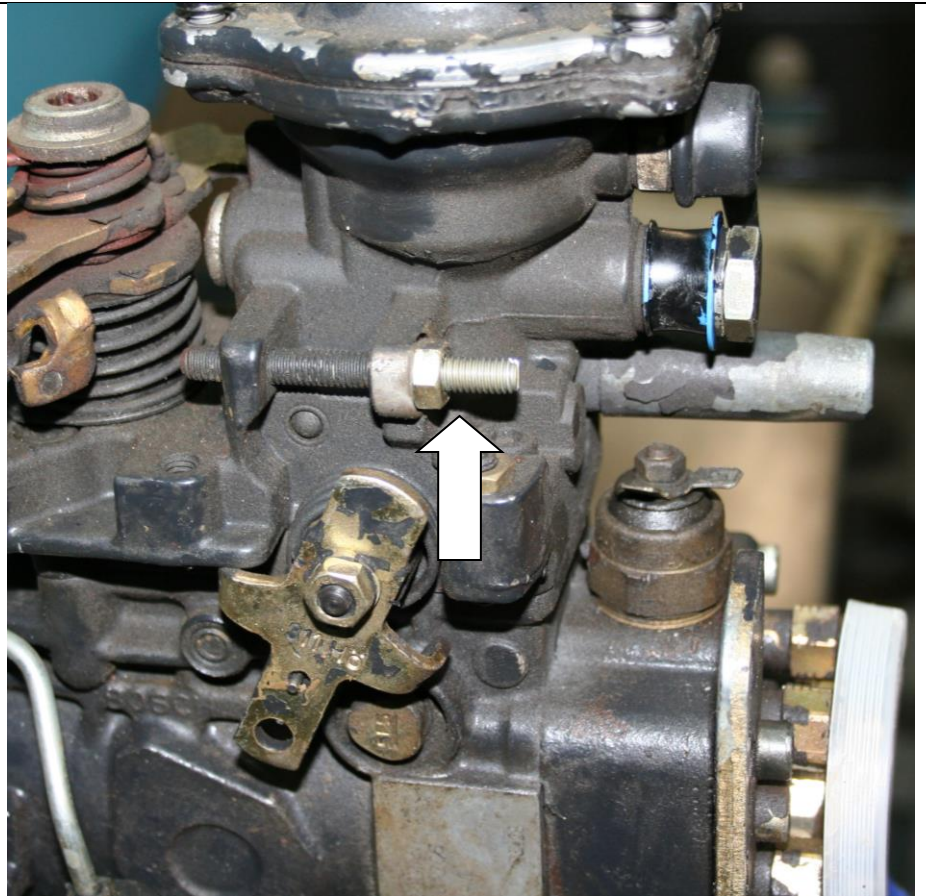
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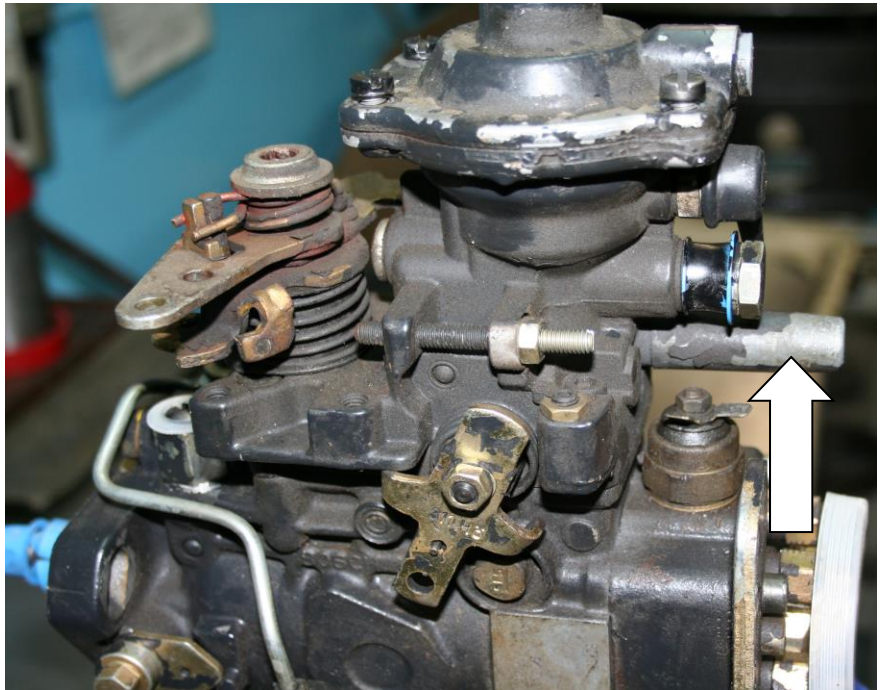
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5. Using a 10mm socket, remove the jam nut that secures the remainder of the tamper proof cap. Throw away the tamper proof cap pieces.



**Picture shows cap and extra jam nut removed.**

6. Next remove the tamper-proof cap on the main fuel screw. You will have to grip tight using pliers or vice grips and then use a small hammer to tap the pliers towards the rear of the vehicle. A flat blade screwdriver can sometimes be used to pry the cap off also. Once you've got the cap off you can throw it away.



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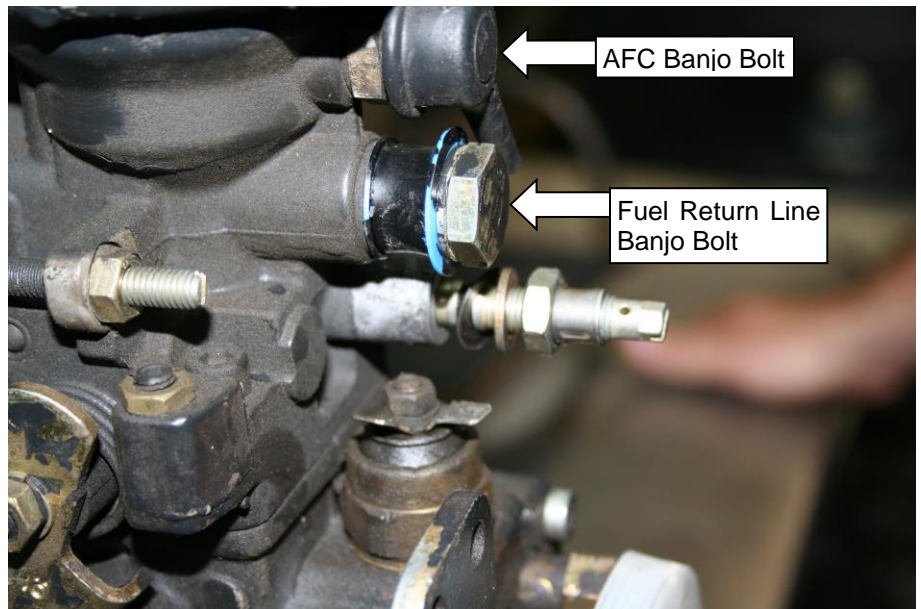
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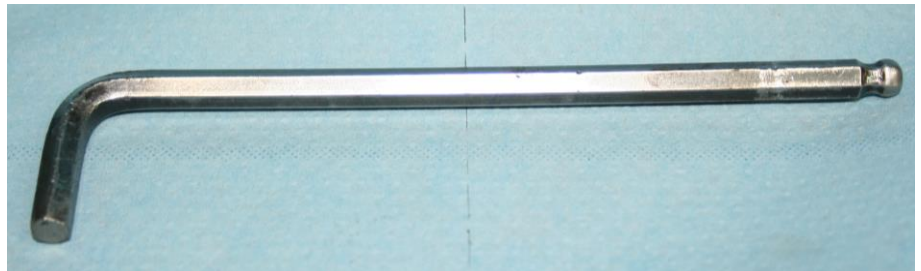
7. Use a 13mm deep socket to loosen the check nut on the main fuel screw then use a 6mm socket or small flat blade screwdriver to turn the screw out until the o-ring is visible.



8. Use a 17mm wrench to remove the banjo bolt from the fuel return line; this is on the back of the pump **below the AFC banjo**. You will probably get some fuel spilling out when you do this. Keep the banjo washers as they will be reused.



9. You will require a 5mm allen wrench with a ball end for the next step.

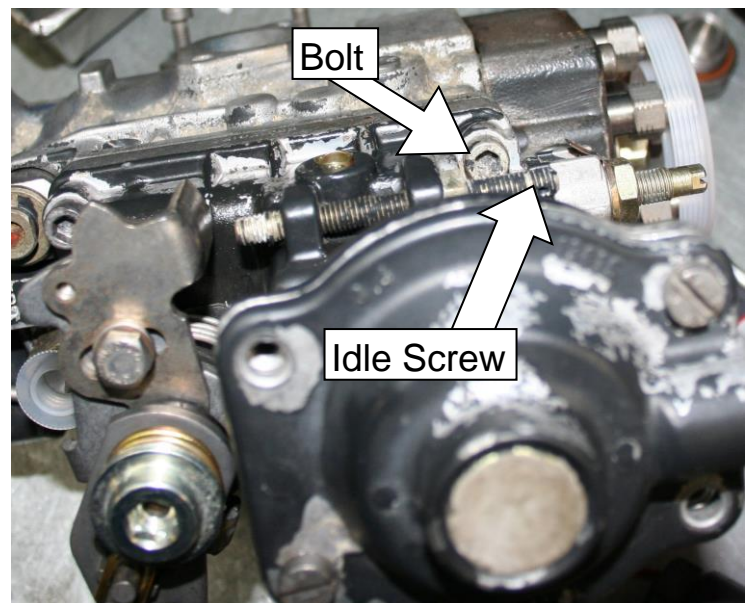
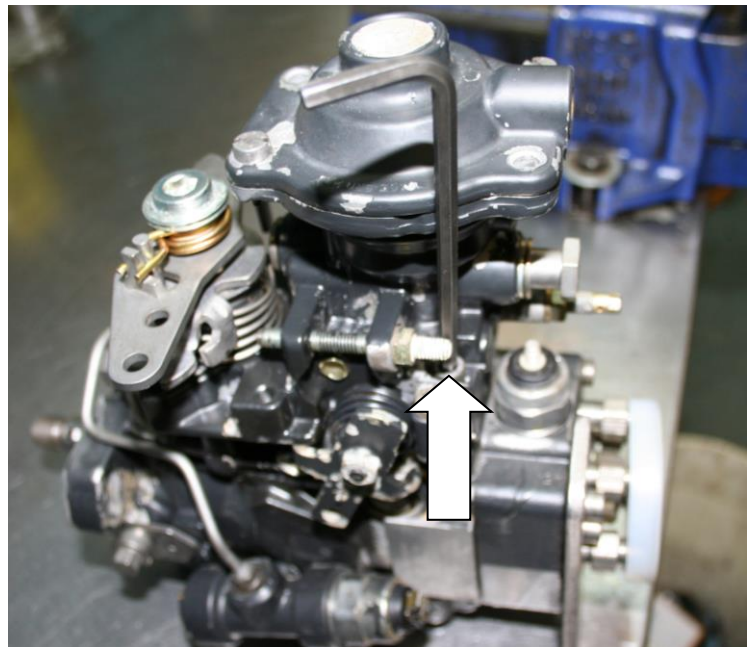
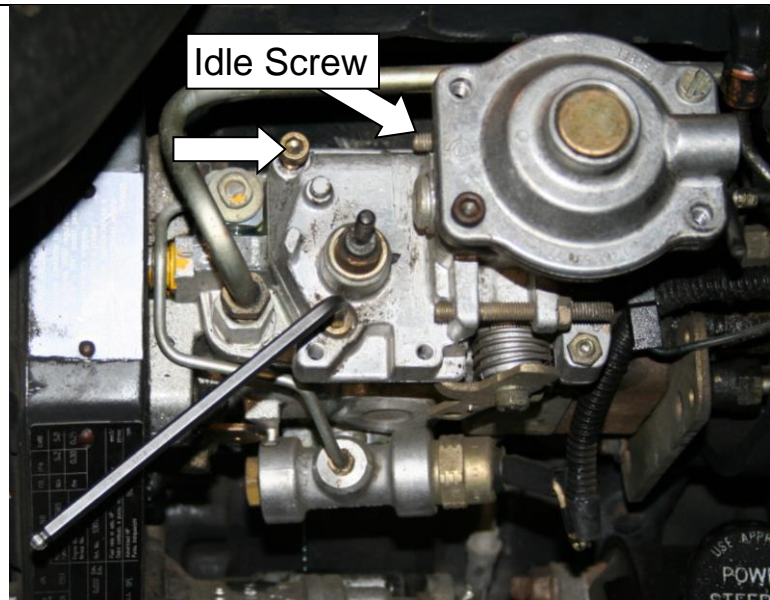


- 10.** Remove the 4 allen head bolts securing the top cover to the injection pump.

The inboard rear one is difficult to access. You may need to move the idle speed screw in order to get this bolt out. Make a note of how many threads are showing on the end of the idle screw so you can set it back to this position.

Use a 10mm wrench to loosen the check nut securing the idle screw (access is difficult) and thread the screw towards the front of the vehicle until the other end is no longer in the way of the pump cover bolt.

The pump cover bolts are quite tight so you will likely need to use an extension on the allen wrench to loosen them.



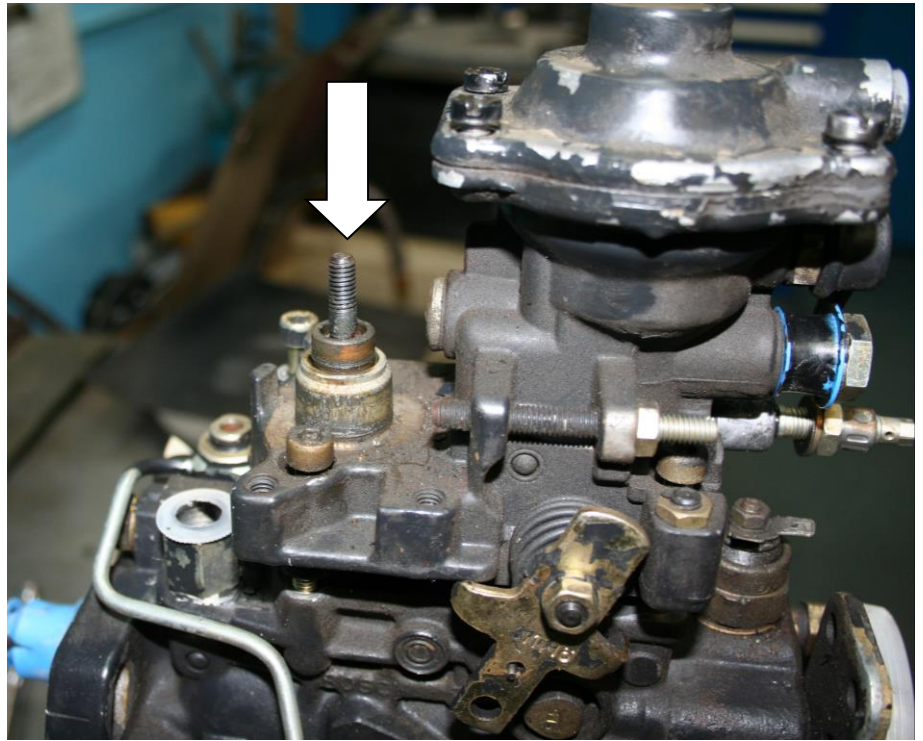
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**11.** With the 4 bolts removed pull up on the cover while pushing down on the throttle shaft; you will get some fuel spilling out when you do this. The throttle shaft is connected inside the pump to the governor spring and its linkage, which is delicate. Once you've pushed the shaft through the cover as far as you can, reach under the cover with your fingers & grab the underside of the shaft while you pull the cover the rest of the way off.



- 12.** With the cover off you can now see the governor spring. Carefully inspect its linkage for any cracks or broken pieces; any repairs will need to be done by a professional. Unhook the throttle shaft from the governor spring and replace the throttle shaft o-ring with the one supplied in the kit. A small pick is handy for this, but be careful not to damage the new o-ring (#1505020).





**13.** To change the governor spring simply unhook it from the small spring-loaded stud inside the pump and hook the BD spring in place.

**CAUTION:** the spring-loaded stud will fall off without the governor spring to hold it in place. **NOTE:** THE INJECTION PUMP MUST BE KEPT CLEAN DURING THIS PROCESS.



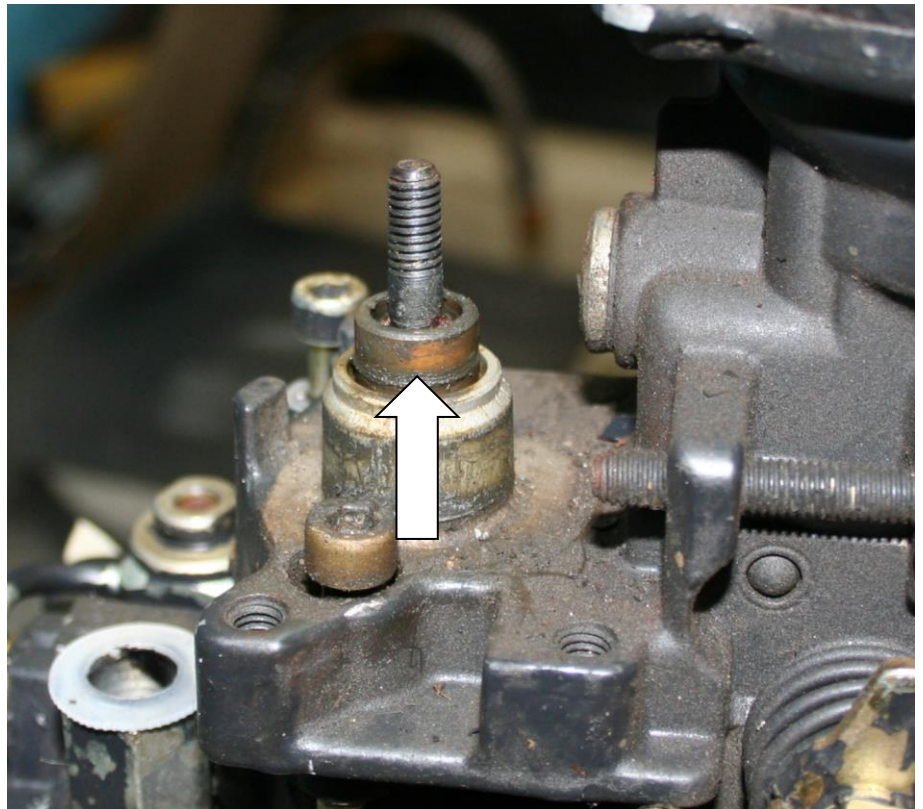
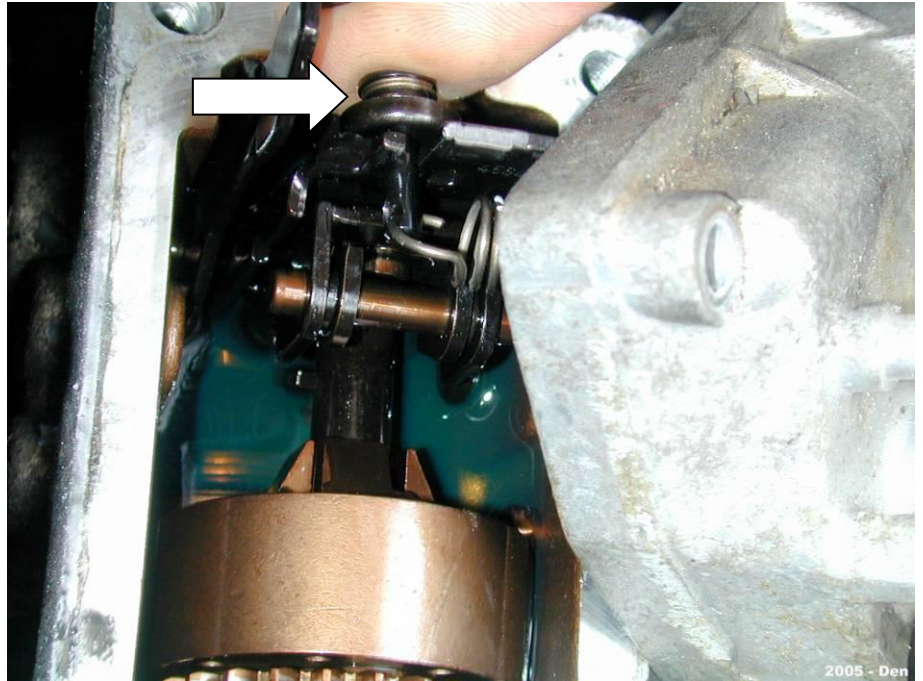
**14.** Lubricate the throttle shaft o-ring with some clean diesel.

Reconnect the throttle shaft to the governor spring and push the shaft back up through the top cover.

Hold the governor spring assembly (Stud & Lever) slightly towards the front of the vehicle with your fingers so that you can place the top cover down over it.

Once the cover is back in place reinstall the 4 allen head bolts.

If you disturbed the idle screw you can set it back into position now.



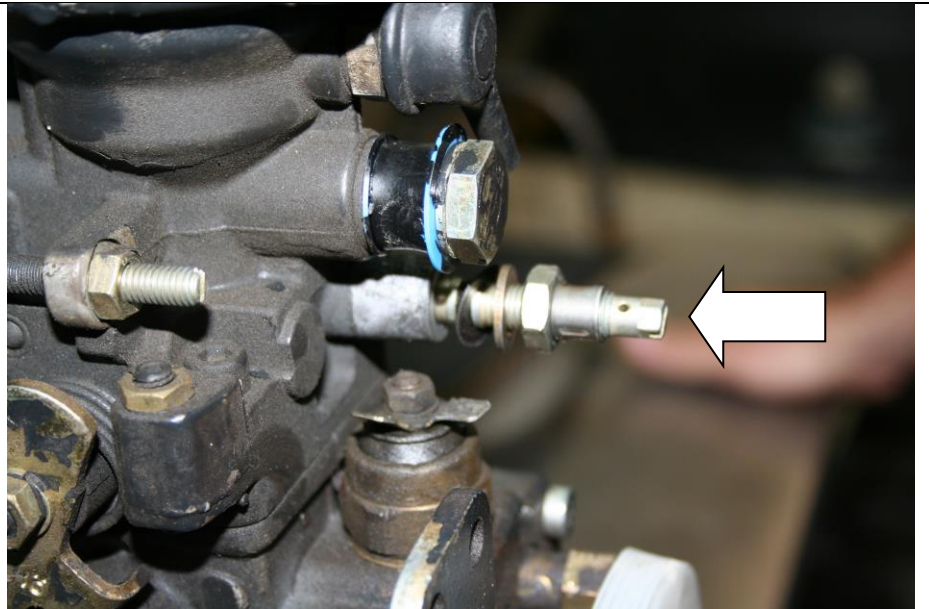
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**15.** Now reinstall the main fuel screw back into its previous position, then reinstall the fuel return and AFC banjo bolts.

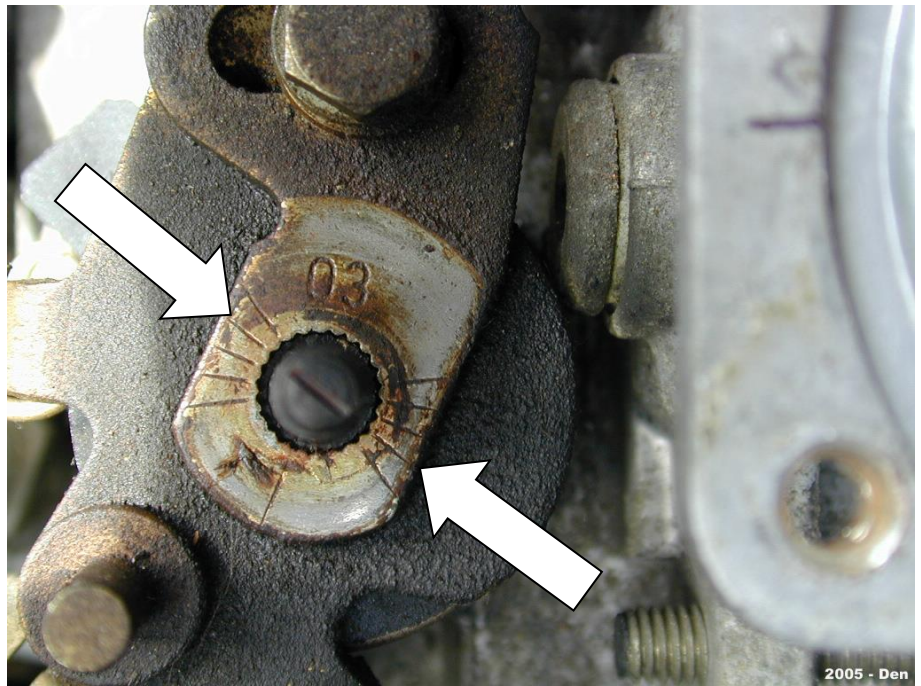


**16.** Reinstall the throttle shaft spring assembly. Hook the bottom of the spring onto its stud and the plastic piece will hold it in place. Pull up on the throttle shaft to get it into position.

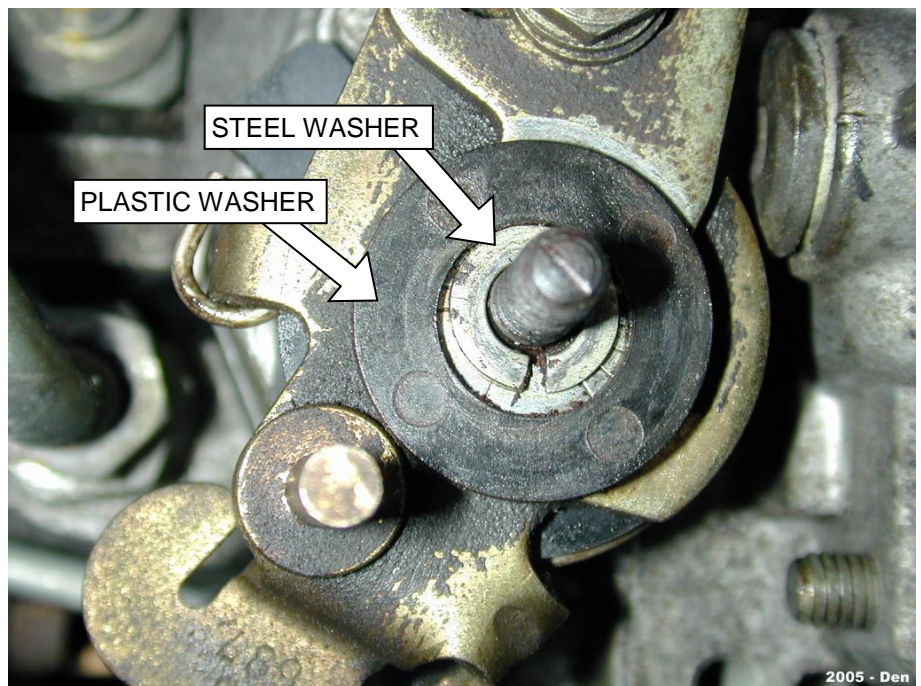


**17.** Reinstall the pump lever. Use pliers or a piece of wire to hold the throttle return spring in place so you can hook it into the lever.

**18.** Double check that the throttle shaft is aligned with the same hash marks as it was before.

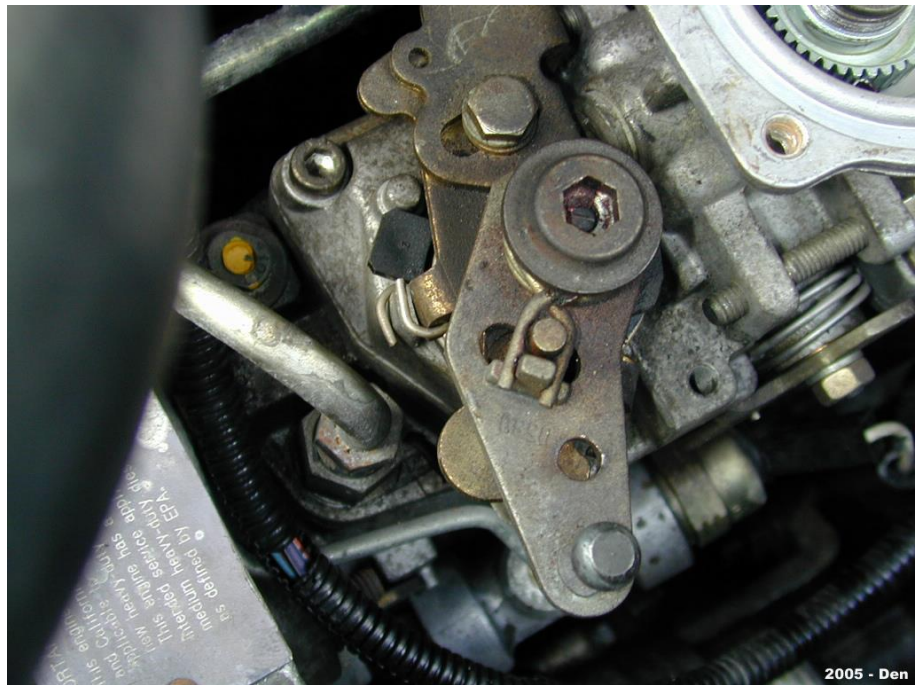


**19.** Reinstall the small metal washer & large plastic washer on the throttle shaft. Make sure the plastic washer goes around the steel washer.



**20.** Clean and grease the throttle lever bolt and reinstall the throttle lever, throttle rod, and return spring. Reinstall the APPS sensor and linkage if so equipped. Start the vehicle, check for fuel leaks and road test.

NOTE: If you disturbed the idle screw you may need to reset the idle speed once the engine is up to operating temperature.



### ***Troubleshooting***

**If you have any technical difficulties, concerns, comments, or complaints, please phone our Technical Support hotline at (800) 887-5030 between 8:30am-5:00pm PST (Pacific Standard Time) Monday to Friday, or post a message on the BD Discussion Forums located at:**

<http://forum.bd-power.com/>



Visit our Internet forums at <http://www.dieselperformance.com> and share your comments or technical support questions with some of the industry's leading experts in the diesel field.



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