Member

Posts: 5232

Modifying the OEM fuel petcock to remove vacuum function

« **on:** January 25, 2012, 04:19:20 PM »

Quote

2000 Tourer

Calgary, Alberta

I thought I'd put this all in one post for easy reference.

Why would you modify the OEM fuel petcock to remove vacuum function? Can you relate to these symptoms?

Someone is riding down the highway and the bike starts to sputter just like it does when you need to switch to reserve, only he hasn't ridden that far yet. He switches to reserve and is able to go a little farther before the bike starts to slow down again. When he pulls over and idles on the side of the highway, the engine recovers and he is good to go for a couple more miles, then the problem repeats.

If this problem started soon after doing work involving your fuel tank or the various hoses connected to it, it is possible that you have kinked the tank's vent hose. You can test this by opening the fuel filler, then closing it with something between the tank and the cap to prevent the cap from sealing, such as a soda straw, plastic coffee stir stick, or a zip tie used for wire bundles. Another possible cause is a problem with the vacuum hose that runs to the fuel valve, such as a disconnection or leak.

Barring those issues, the problem is caused by a small tear in the vacuum diaphragm within the fuel petcock. Think of the vacuum operated valve as a second shut-off downstream from the manual valve (although they are actually one assembly). The vacuum shut-off is normally held closed by a spring. When the engine is running, engine vacuum overcomes the force of the spring and pulls open the valve, allowing fuel to flow. If there is a small tear in the vacuum diaphragm, there is only enough vacuum to partly open the valve. This may not be a problem when the fuel tank is full, because the weight of the gas overhead means more fuel pressure, which helps to overcome the spring, and fuel can flow. Once the fuel is down to a lower level, there is no longer enough fuel pressure to help overcome the spring, and the valve starts to close.

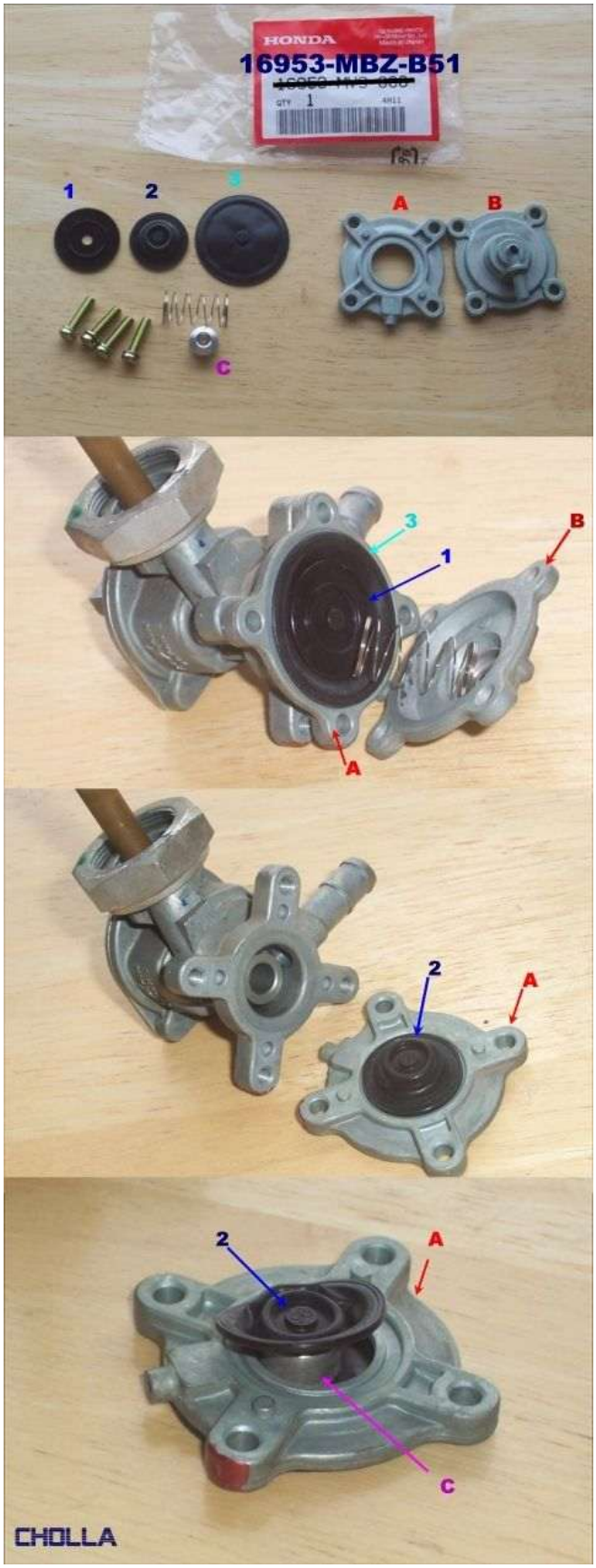
Normally, this problem is solved by installing the rebuild kit, called "COVER SET,rooster" part number 16953-MBZ-B51, which goes for $28-40 at US dealerships, and was $45 at my local Canadian dealership in 2009. If you don't want to spend the money right away, or you want to be able to ride while you are waiting for the kit, you can do the modification described below.

What the modification does is move the spring so it holds OPEN the vacuum valve so fuel is always allowed to flow. **Please note that this modification will do NOTHING to**

prevent hydro-lock. In fact, if your vacuum shutoff is working properly right now, keeping it intact is BETTER than eliminating it. If you get in the habit of manually turning your valve off all the time regardless of the function of the vacuum shutoff, you eliminate one of several possible causes of hydro-lock. If you perform this modification, you NEED to practise this habit.

The following instructions assume that you have access to the back of the fuel valve. When I did it I had the valve removed from the tank already, so I don't know how hard it is to do with the valve in place. If the valve is on the bike, be sure it is in the off position. In either case, ensure there are no sources of ignition and your work area is well-ventilated. The four photos are from someone else's online instructions (~~I forget where I got them, so let me know and I'll add the link~~ see note at bottom*) for installing the rebuild kit, but should help you picture the parts. The hand-drawn sketches are by me.

1. Remove the vacuum hose, four screws, and the cover.
2. Remove the spring (to be used later) and the black plastic disk (#1 in photos) that separates the spring from the large diaphragm (#3).
3. Push the middle of the small diaphragm (#2) so that it is away from the valve body hole that it is designed to seal against.
4. Reassemble, being careful to have the edges of the diaphragms in their proper positions, and with the spring in position between the small diaphragm and the valve body.
5. Devise a method to plug the vacuum hose so you don't lean out your fuel mixture or, in the event of a leak in the small diaphragm (#2), risk having fuel travel through the vacuum hose to the engine, possibly causing hydro-lock.
6. The leftover black plastic disk can be used as a shim to stop something on your Harley from rattling.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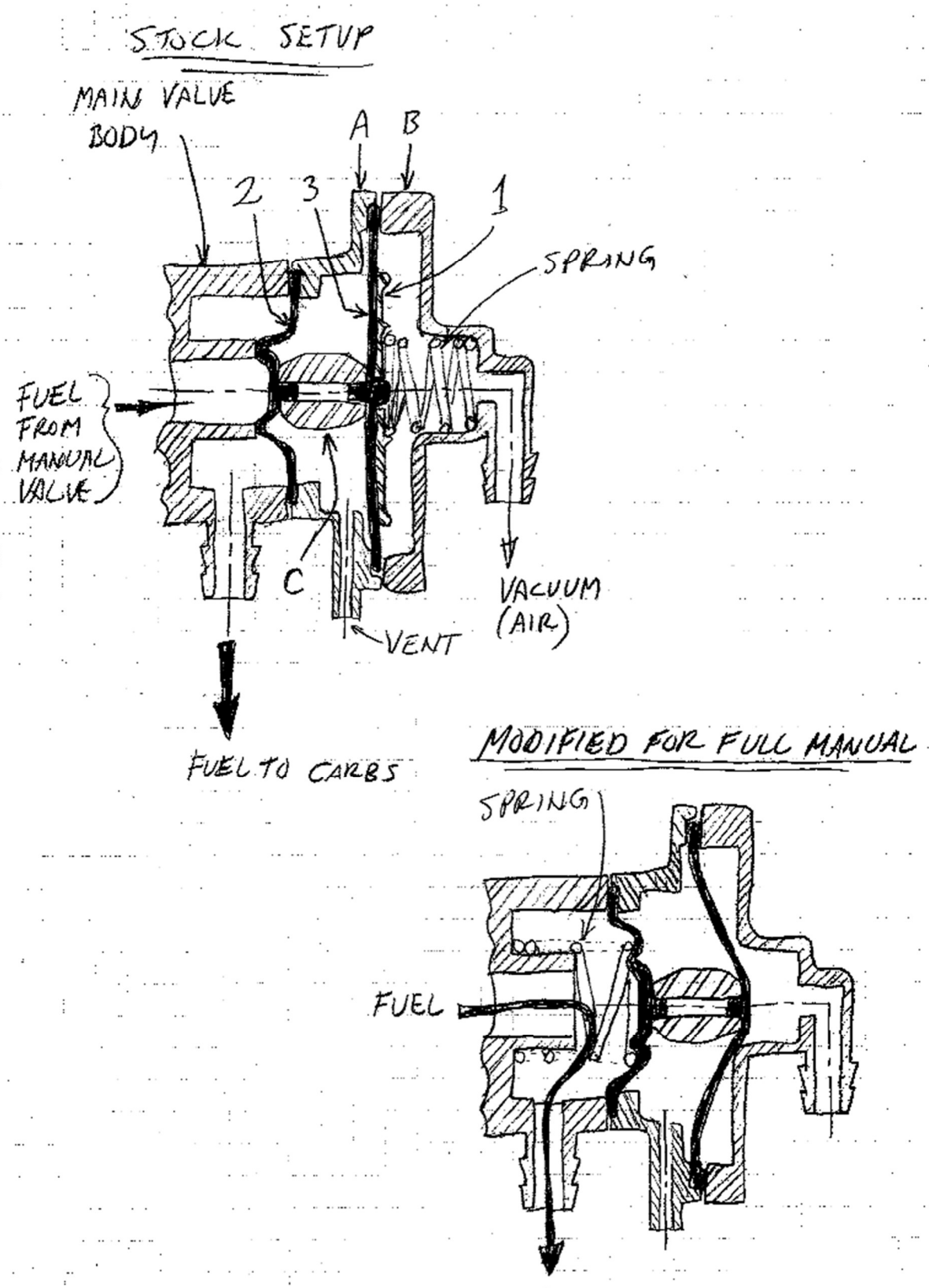
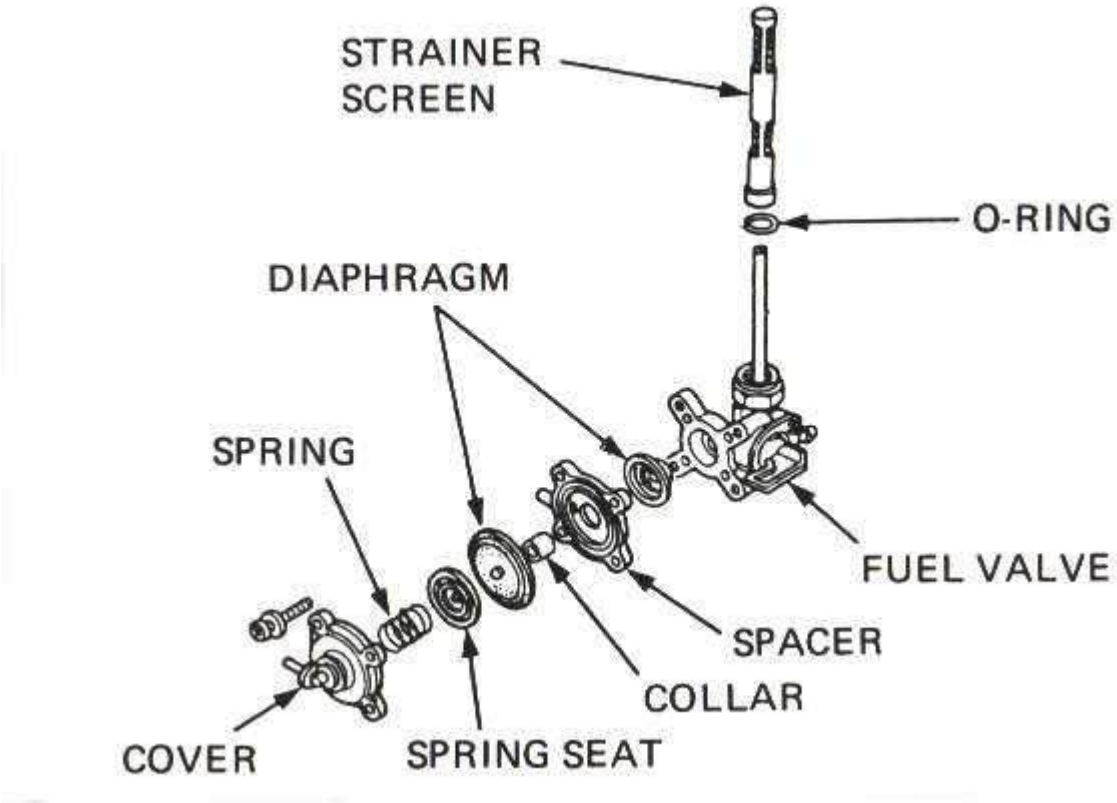


Another visual of the normal assembly of a similar valve:



*After using the clue provided by NITRO, below, I have found that the photos were provided on October 2, 2008 by Cholla on the VOAI message board, linked to here: http://valkyrie-owners.com/SMFORUM/index.php?topic=7055.0

« *Last Edit: December 06, 2012, 11:45:27 AM by Gryphon Rider* »

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