Poolside

02-17-2005 07:28 PM

Cam-chain tensioner replacement - Photo Journal

Last Saturday a friend and I changed the cam chain tensioner on his 2001 GS. Enjoy the photo journal.

To begin, here is some information that will address a few common preliminary concerns.

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The method of replacing the cam chain tensioner described here does not require a throttle cable readjustment.

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The engine crankshaft does not have to be at TDC or BDC or any particular orientation.

But, the 'tension side' of the cam chain should be tight. And the 'slack side' of the cam chain should be slack. This only means that before you start the job, rotate the crankshaft a small amount in the direction it normally turns.

Turning the crankshaft by hand is easy to do. Put the bike on the centerstand and put the gearbox in top gear. Using your hands, rotate/bump the wheel forward until you feel some bit of engine compression, then stop.

Good. The cam chain slack is now on the tensioner side. The chain slack is on the tensioner side when the engine is running.

The chain slack is normally on the tensioner side. But, sometimes when the engine stops, the crankshaft rotates backward a small amount, 'slackening' the tension side. Turning the crankshaft a small amount returns the chain slack to the tensioner side.

****

The original tensioner has a spring. And when unscrewing the tensioner, when the last thread is reached, the spring will push the tensioner body up from the bore.

The spring tension is gentle. Gentle as in about 2 pounds. About twice the spring tension of a retractable pen.

Also, no parts can fly across the room. The tensioner body will lightly contact the bottom side of the control arm, and stop. At that point the tensioner body will be only 2/3 of the way out of the bore. That is as far as it can go under its own power.

Getting the tensioner the rest of the way out of the bore will probably consume the greatest percentage of the total job time. It would be nice if the tensioner 'sprang' out of the bore, that would eliminate the only time consuming part of the job.

****

No tensioner parts can fall into the engine from the tensioner bore. Not even if it falls in 'just the right way'.

At some point your hands will be working in a limited space while fiddling around trying to get the tensioner spring out from under the tensioner body. Go at this with abandon, no tensioner parts can fall into the engine from the tensioner bore.

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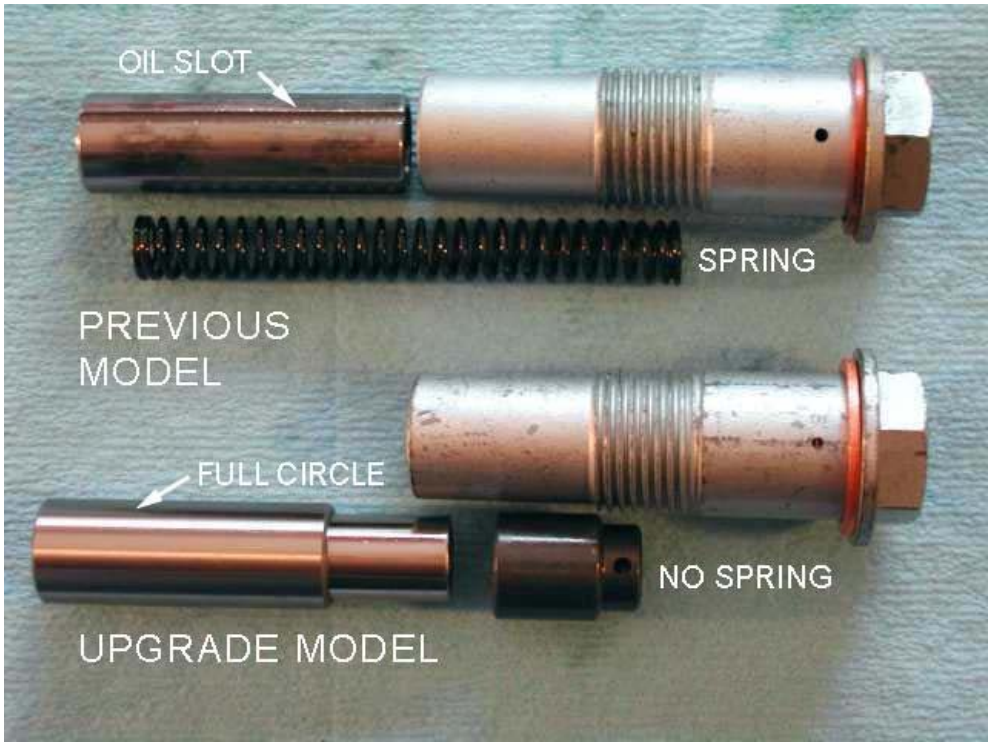
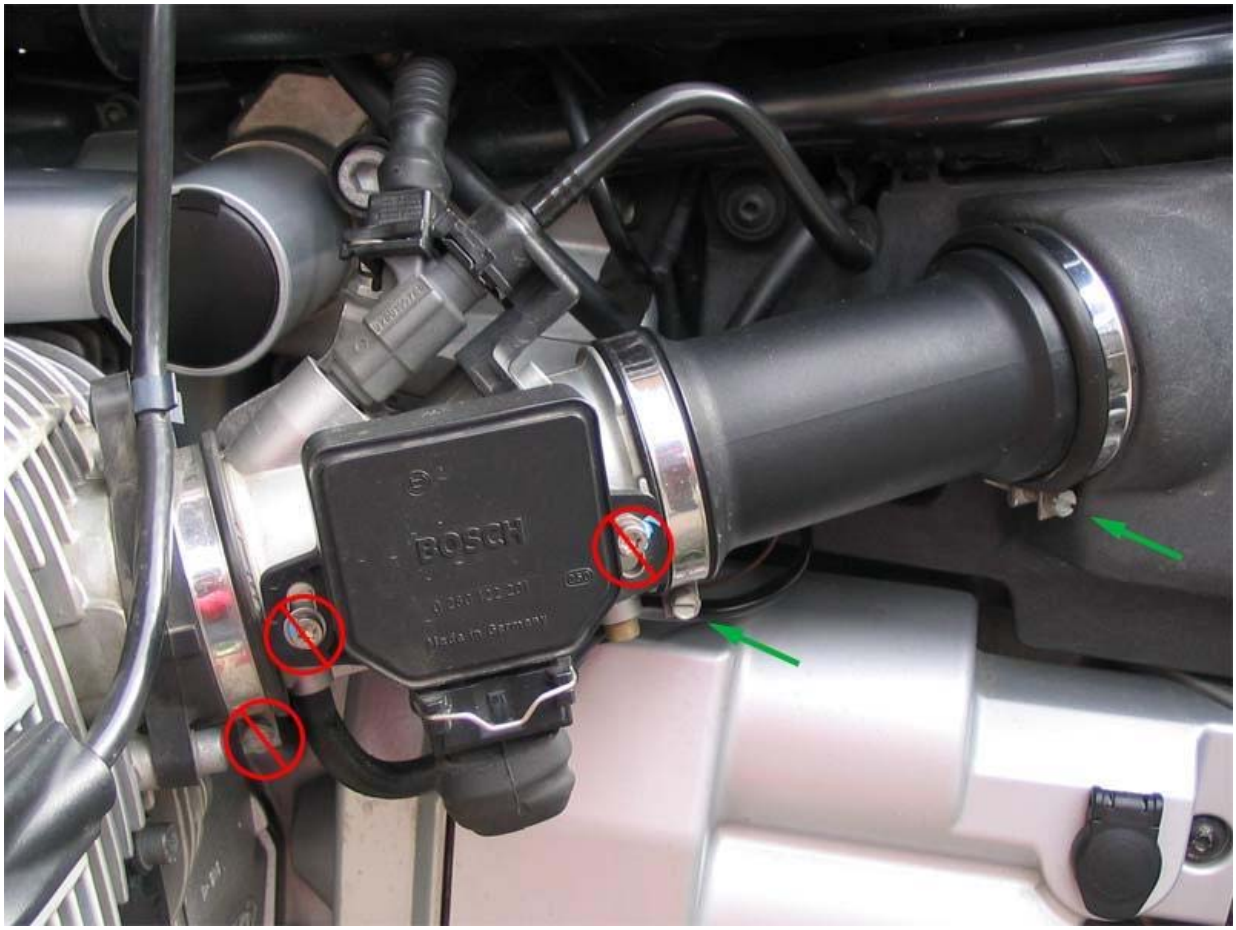
Here are the old and new tensioners.



Start by loosening these two intake tube clamps. Do not loosen the tube clamp that is located next to the cylinder head.


BOSCH
Made in Germany

These steps are straightforward enough.

Your throttle body o-ring may look like it has stretched. This one looks pretty good. The o-ring absorbs hydrocarbon crankcase vapors and swells. If it has, the intake tube will tear the o-ring when slid back over the throttle body.

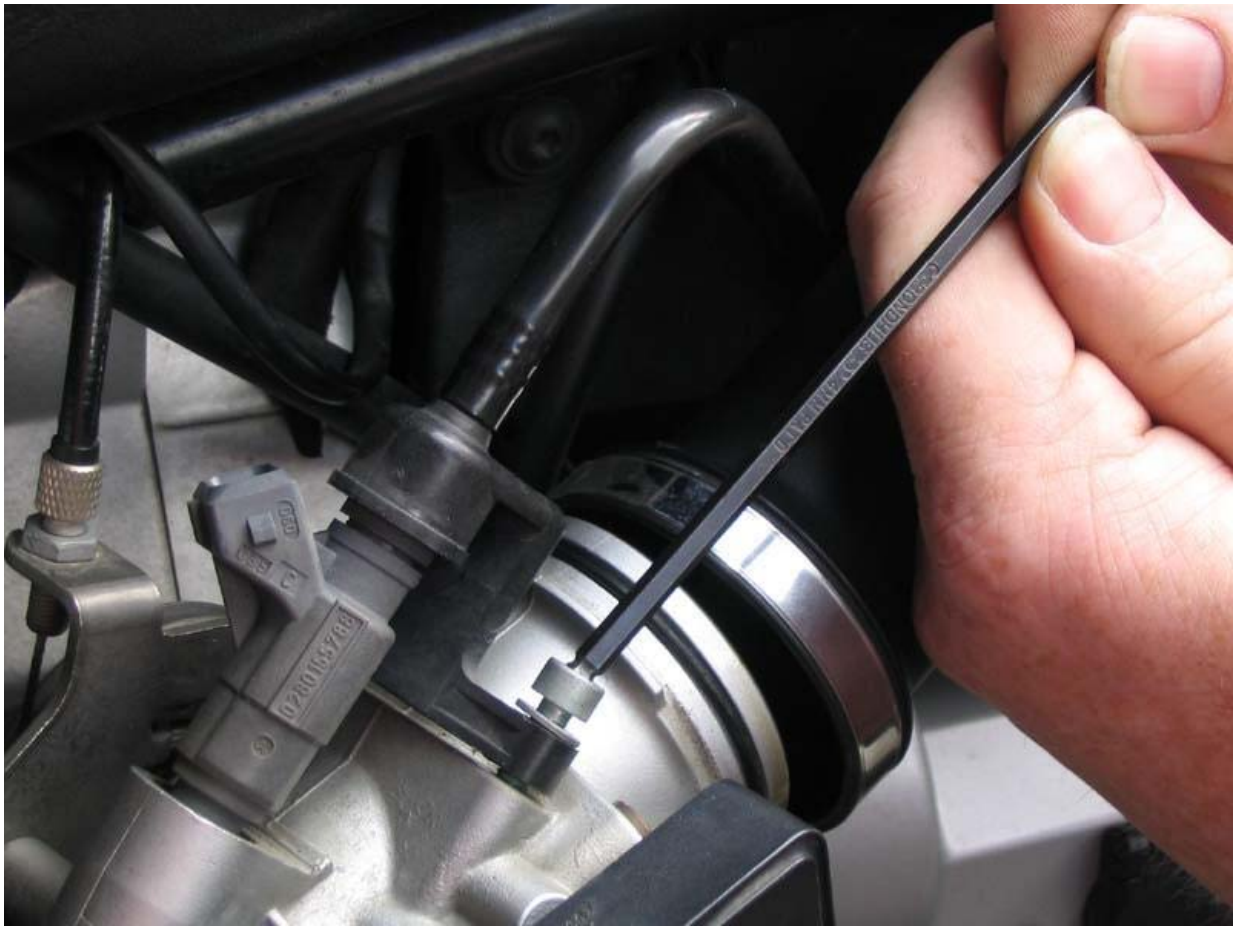
This phenomenon is identical to what happens to the o-rings on the fuel tank quick disconnects.

BMW O-ring p/n 13 54 1 341 797 ___ 52mm x 2mm ___ $3.10

Unplug the fuel injector electrical connector.

Remove the fuel line retainer spring clip.

Remove the two fuel line screws.



Pop off the injector fuel line.

Look at that, the o-ring stayed with the fuel line end cup.

Pull out the fuel injector.

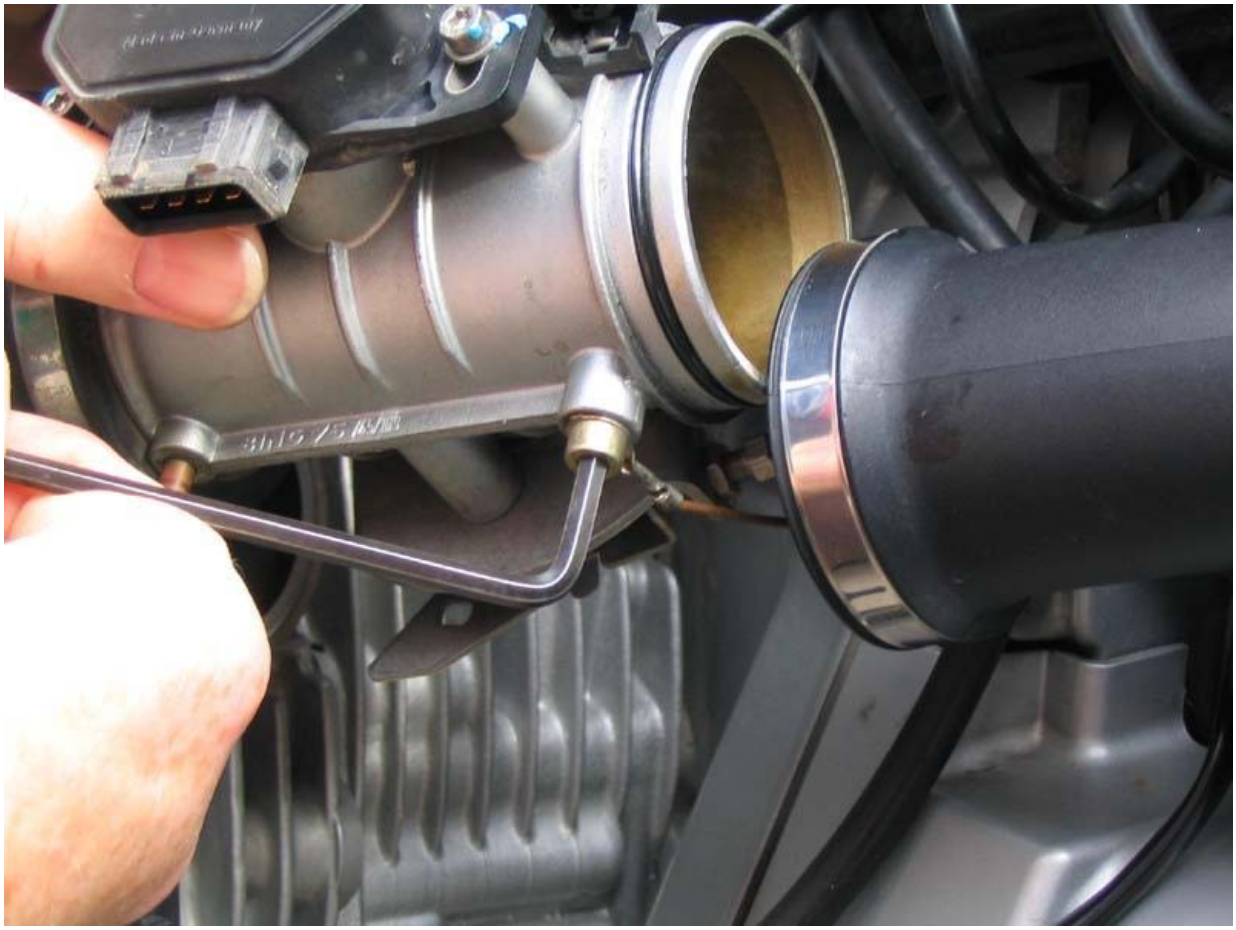
Put the o-ring back on the injector.

Disconnect the Throttle Position Sensor (TPS) electrical connector.


BOSCH

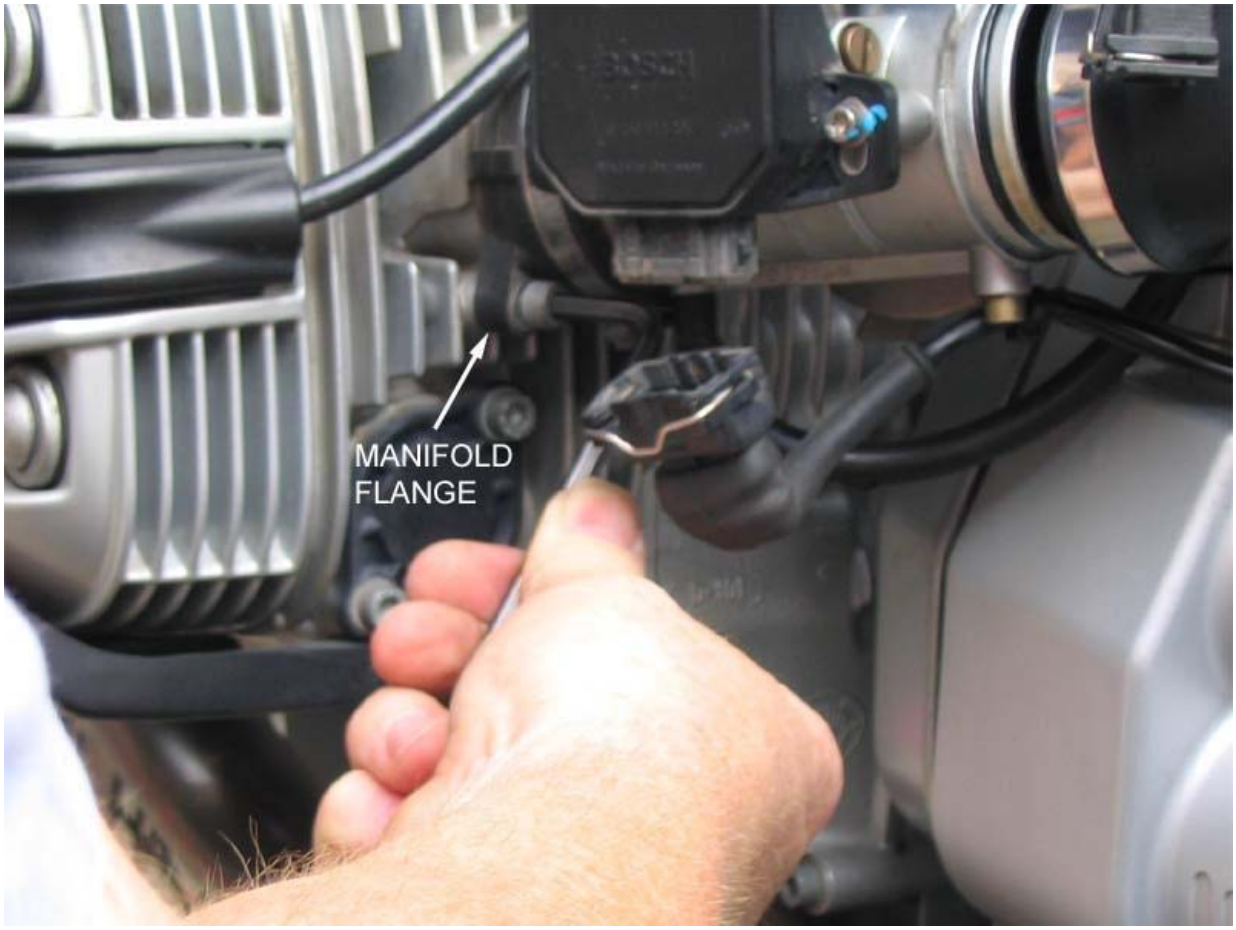
Cut the zip-tie for the TPS cable.

Remove the throttle body ground lead.



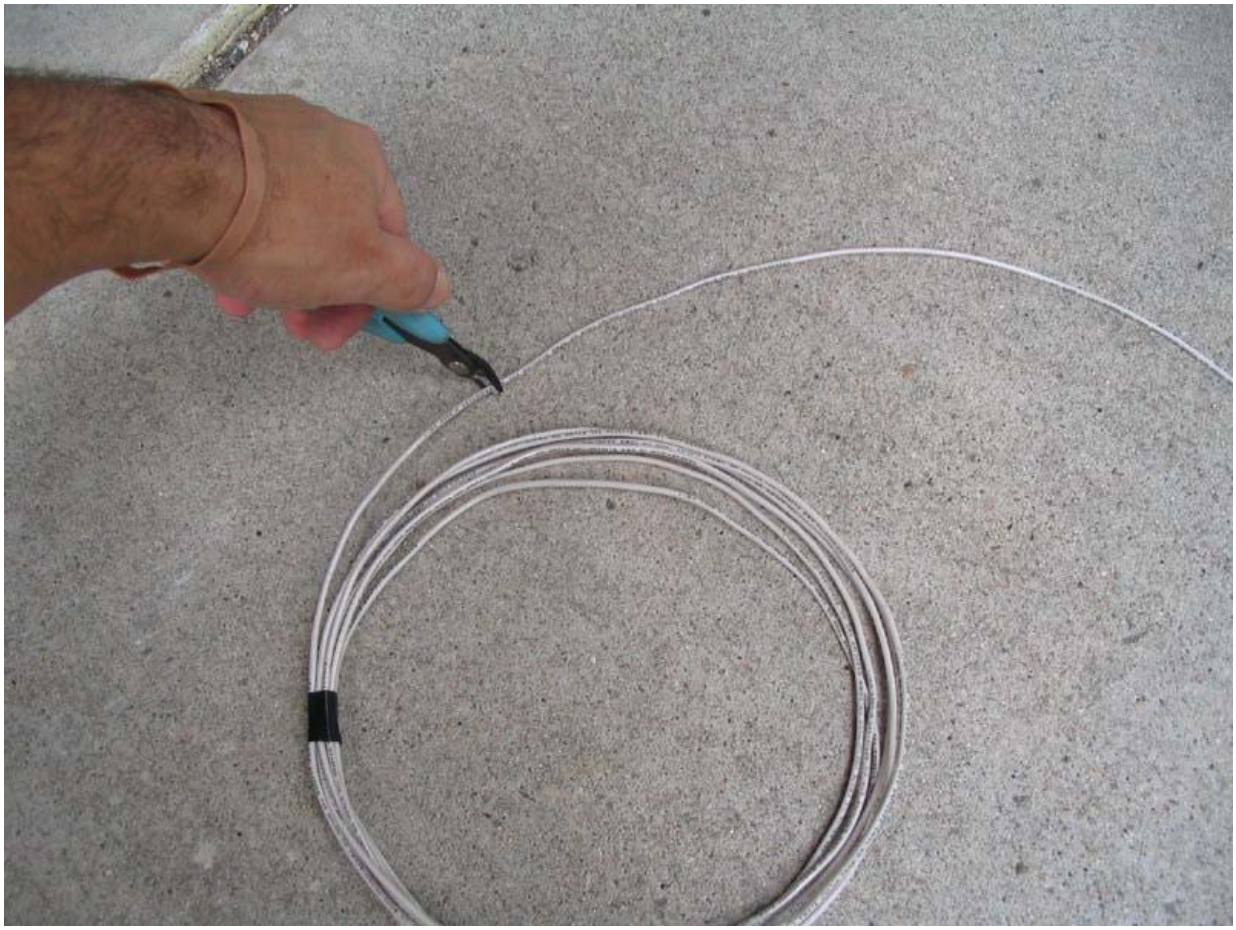
Remove the two intake manifold flange screws.


MANIFOLD
FLANGE

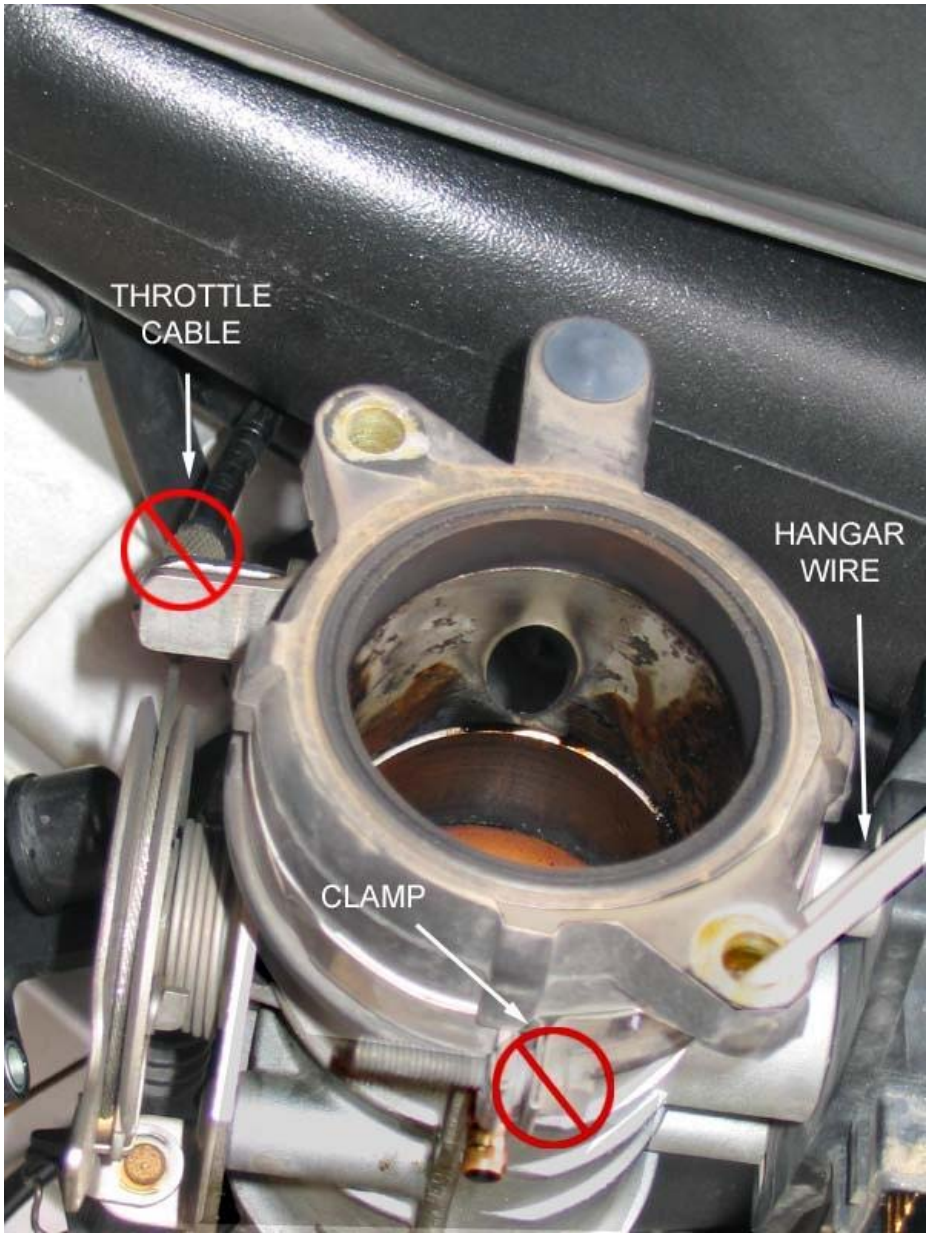


Here is a look at the end of the intake manifold 'flange'.

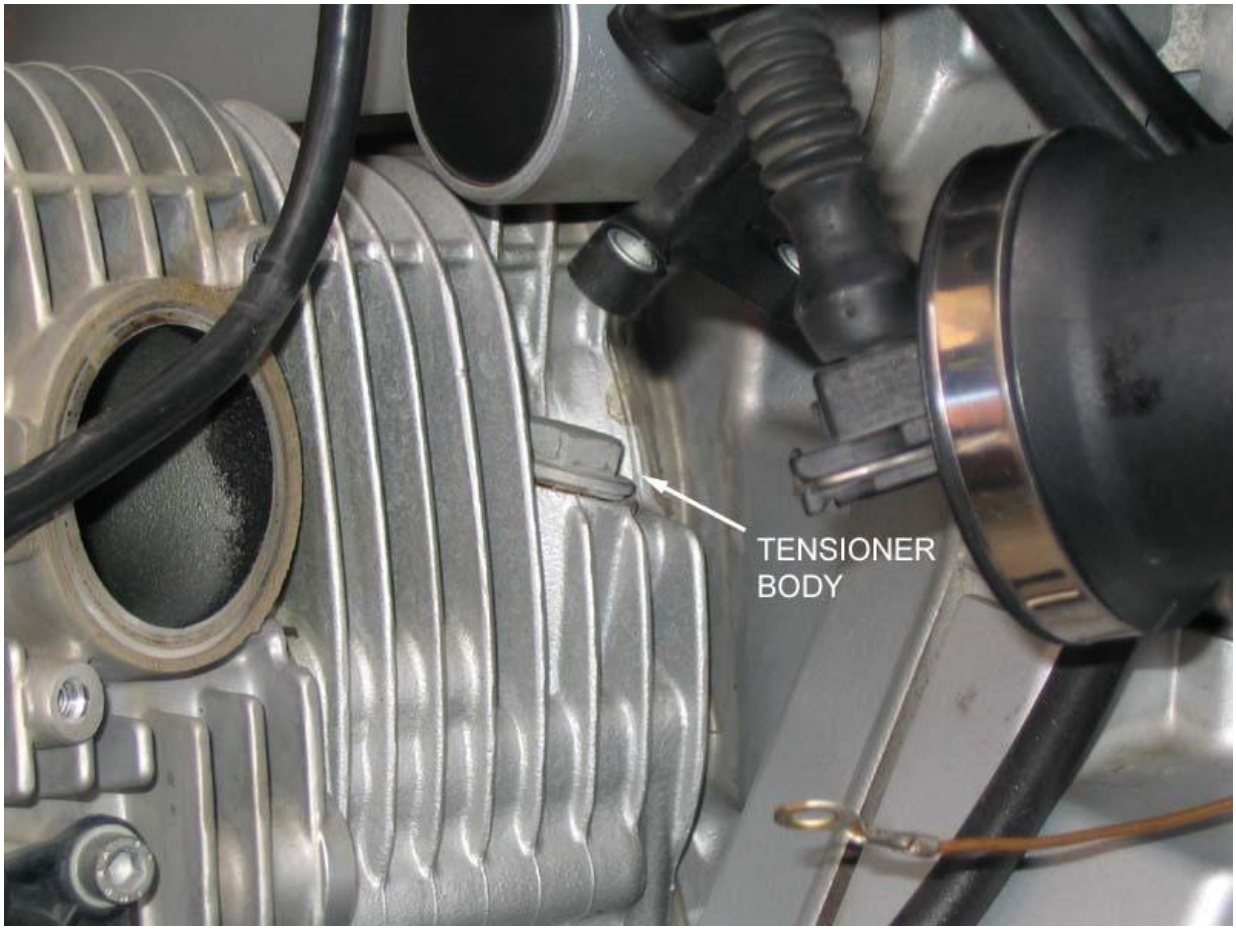
You will need another special tool.



Make a hangar out of the wire and suspend the throttle body and intake manifold out of the way.



Without stopping to stage photos, it takes about 10 minutes to get to this point.



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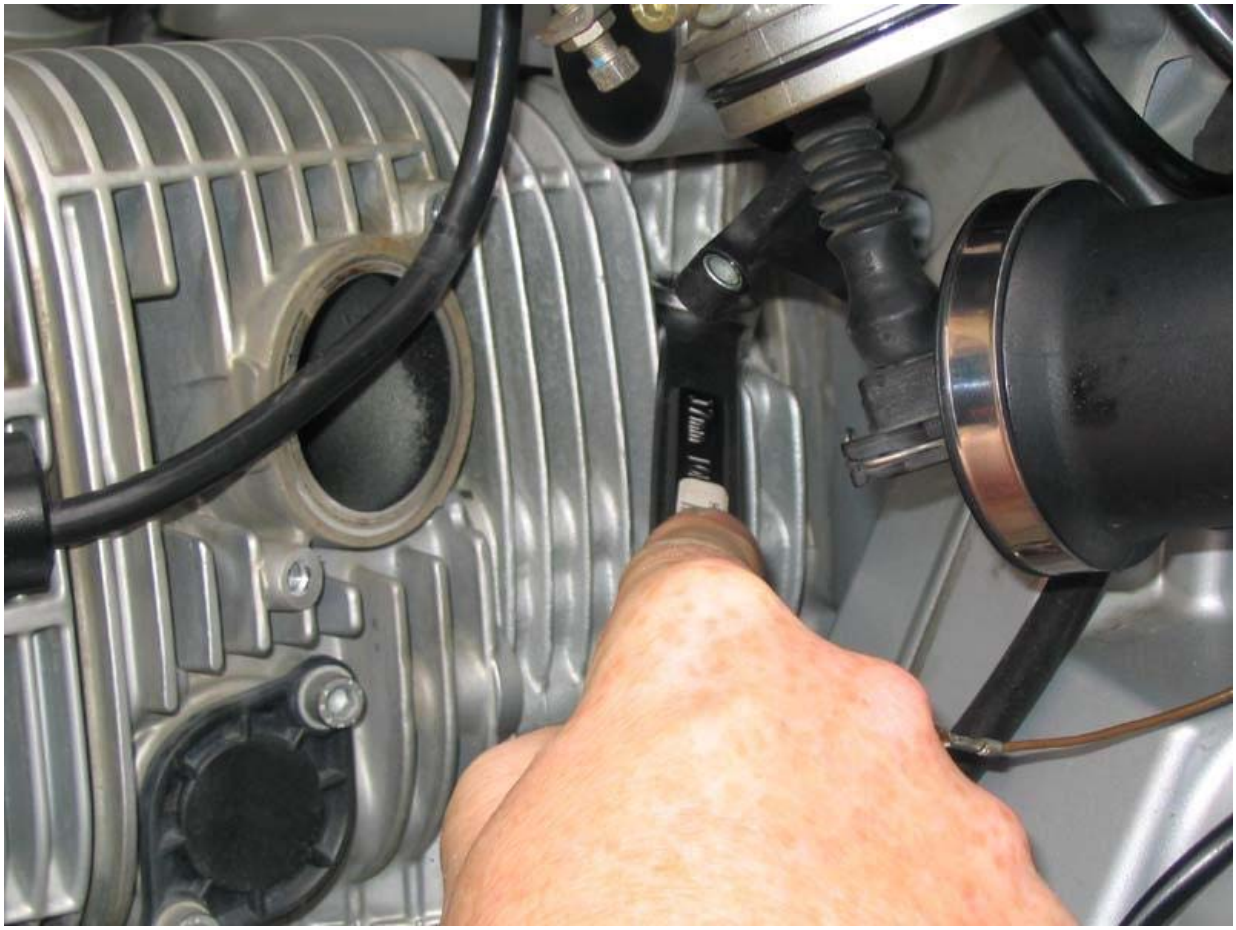
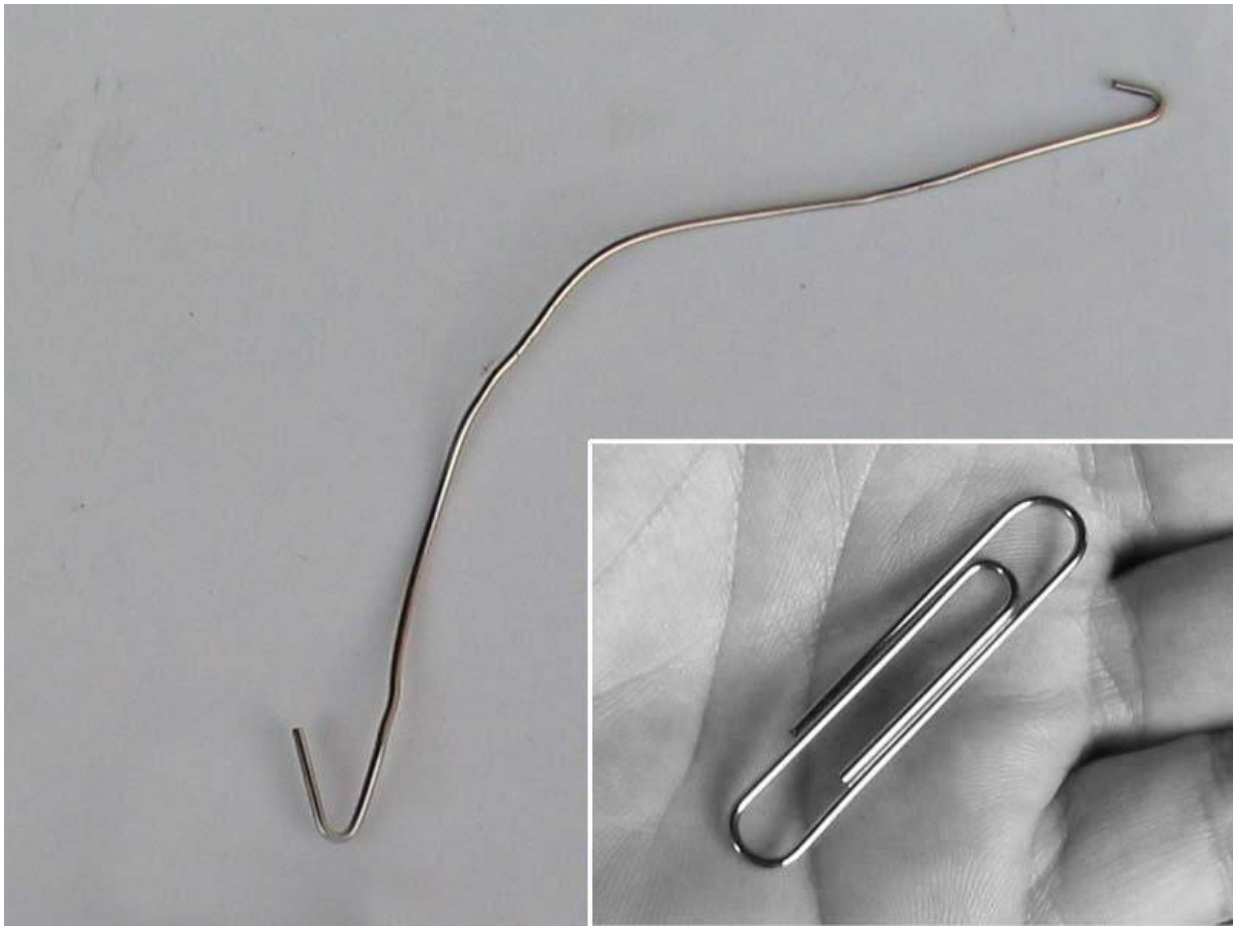
SECOND SET - SECOND SET - SECOND SET

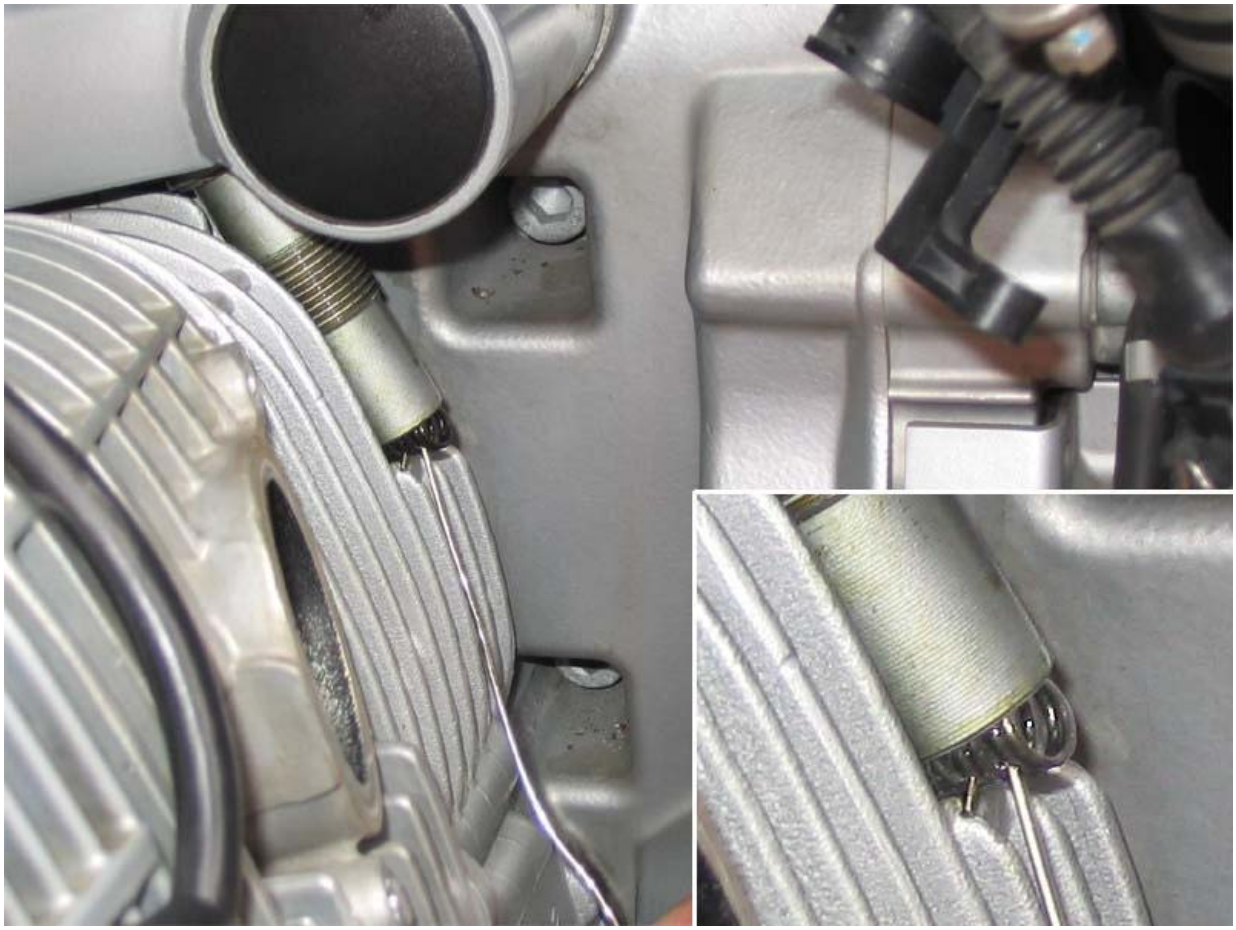
17mm combination wrench works well enough to loosen the tensioner.



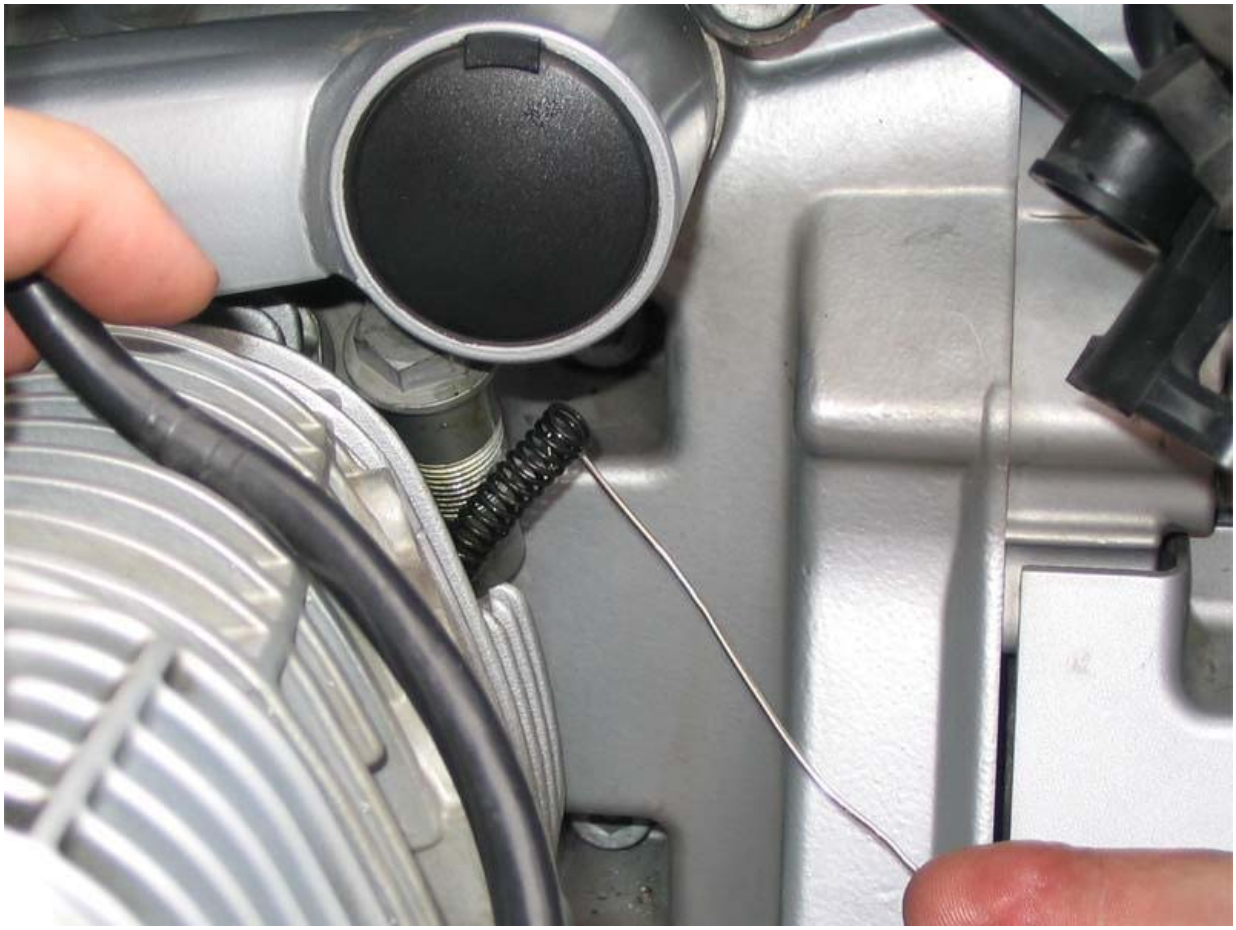
Get you a big paperclip and make one of these.



Use the small hook to grab the top, or near the top, of the spring



First pull down on the spring, and then out from under the tensioner body.



Here is the spring removal sequence. You may get lucky and get it the first time.

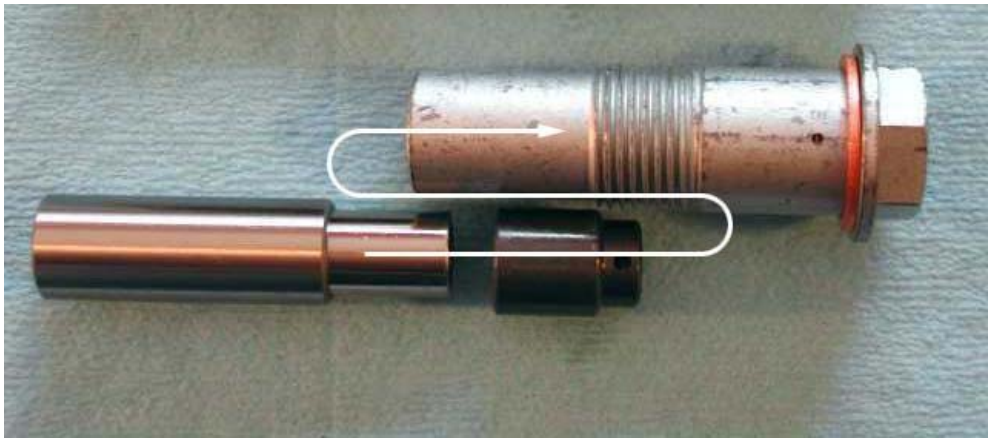
Use the other end of the paper clip tool to retrieve the piston. Make the paperclip 'vee' large enough so that it is a force fit and will grasp the piston from the inside.

Old parts going to the archive.

Now it is time to install the new tensioner. Start by dropping the piston into the cylinder bore. (There is no picture of this step.)

The large piston can be dropped into the bore . . . plunk. The old piston did not fall into the engine, and neither will the new one. Just drop it in.

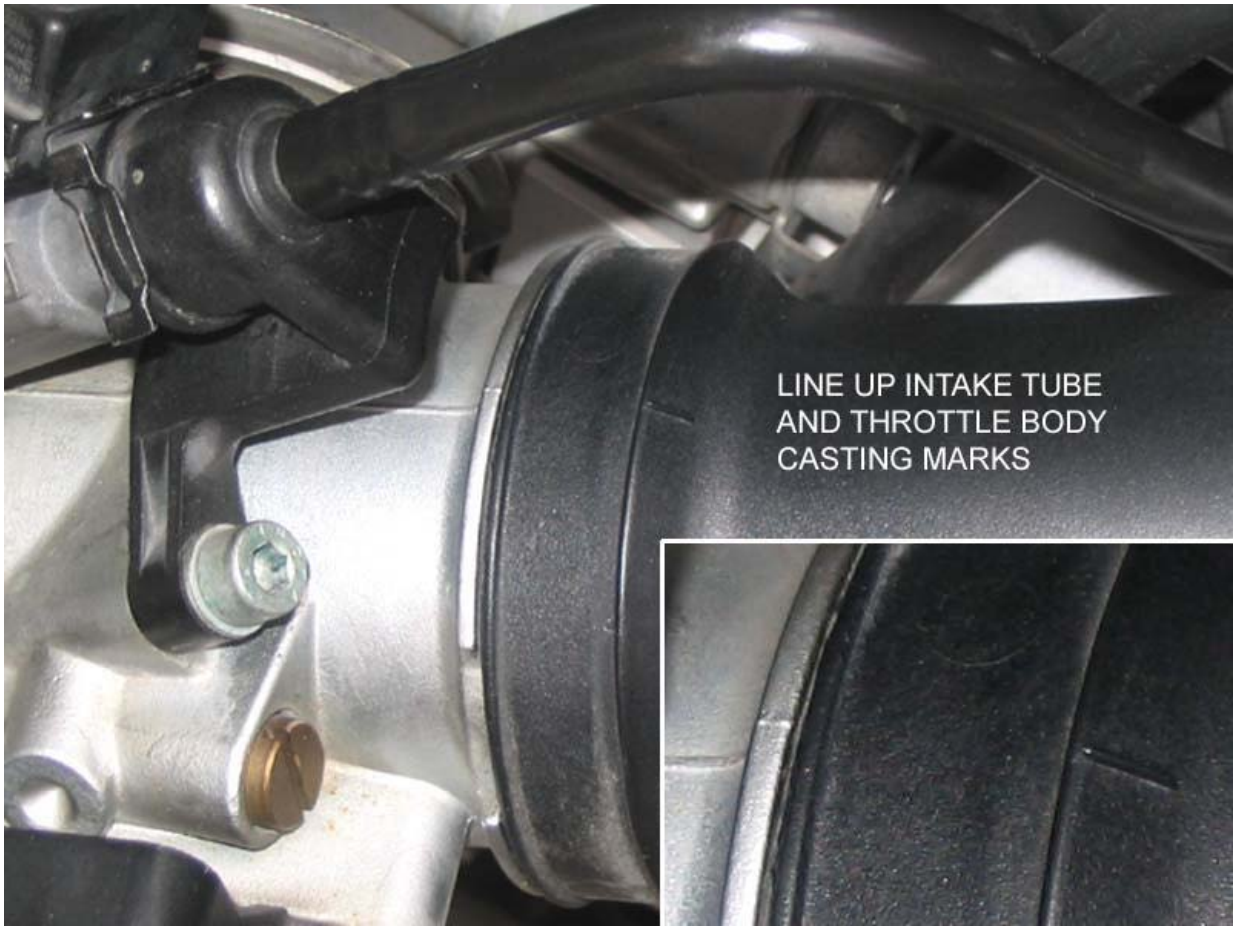
This is how the components fit together.



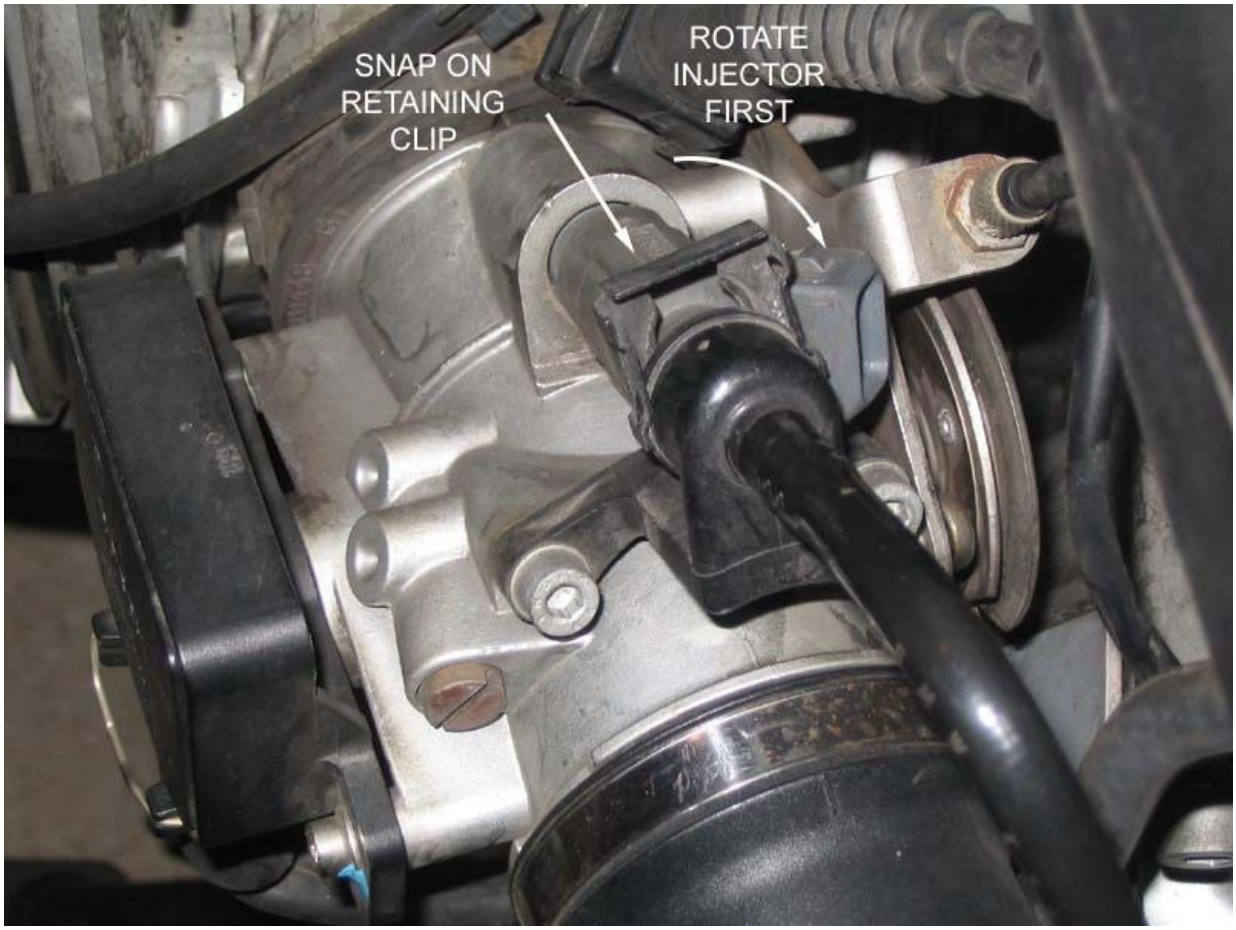
The smaller floating piston can also be dropped into the bore, but unless the smaller piston lands right, it will be sideways or upside down in the bore. To make assembly easier, a coat of grease on the smaller piston will hold it in the tensioner body.

Slam dunk. Remember, the top of the tensioner body must go up and behind the suspension arm before it can be guided into the bore.

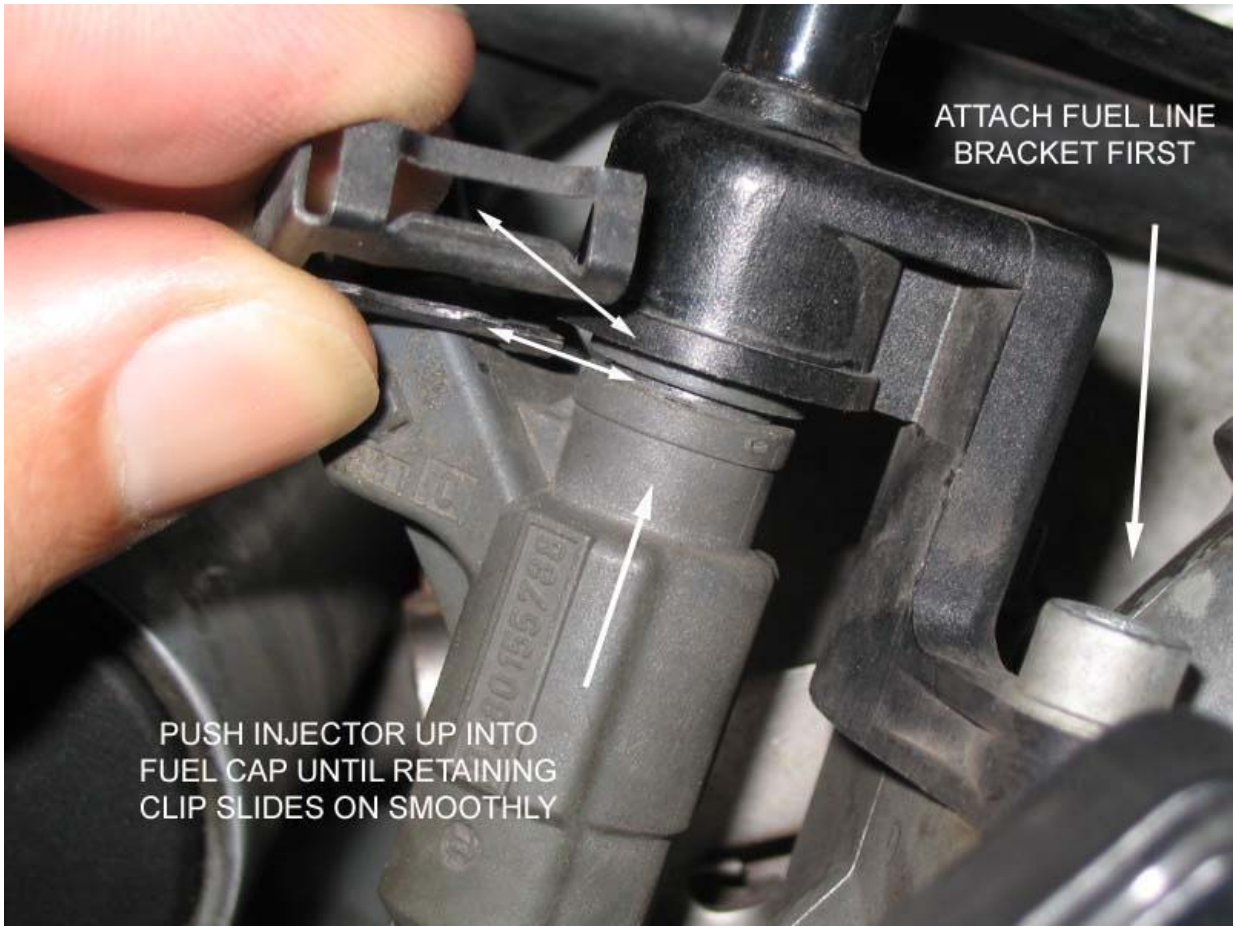
These casting marks are for component alignment.



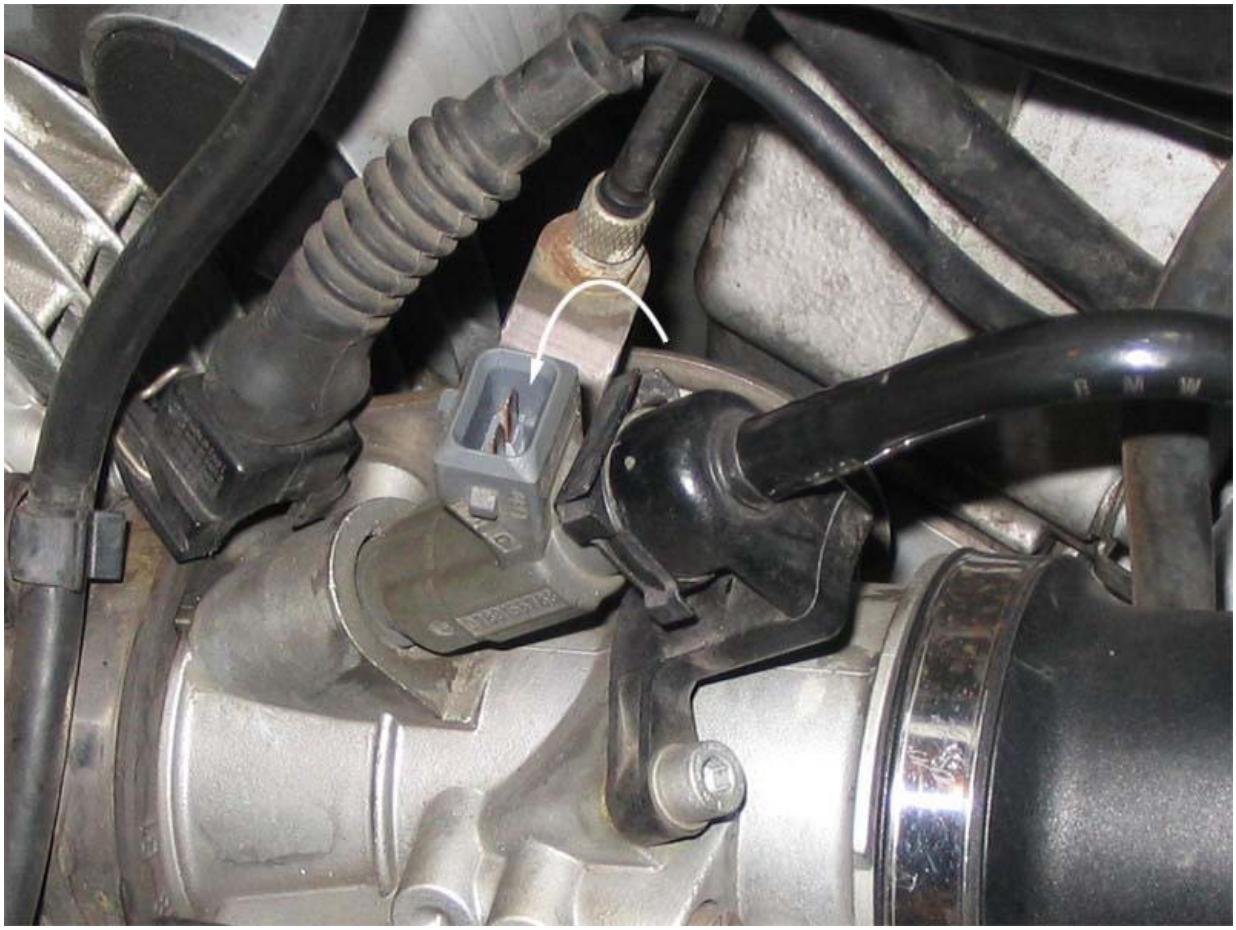
Rotate the fuel injector body out of the way, and snap on the retaining clip.



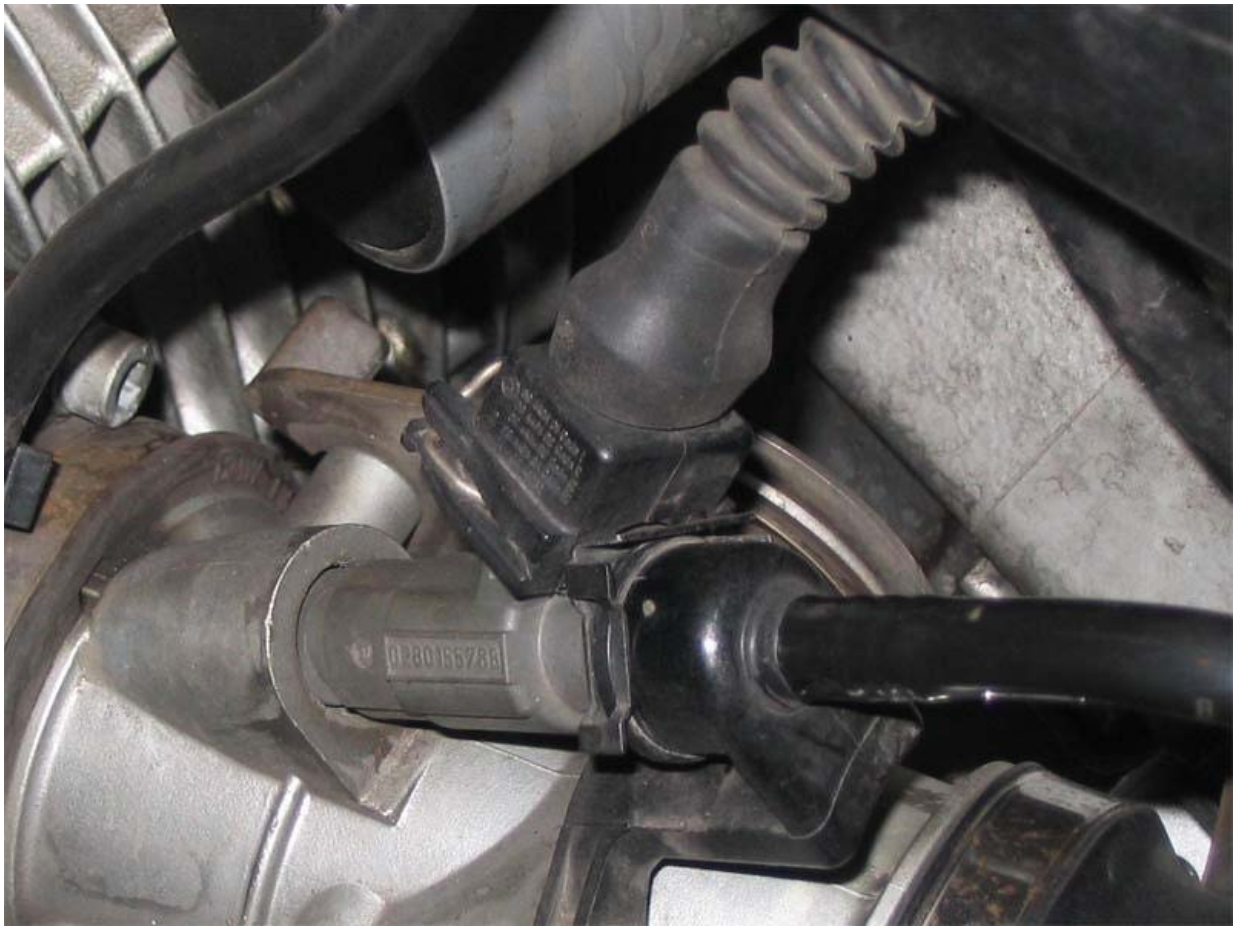
The fuel injector retaining clip must slide on smoothly with a nice 'detent click' when fully seated. If the retaining clip does not slide on smoothly, the problem is the injector is not pushed far enough into the fuel cap.

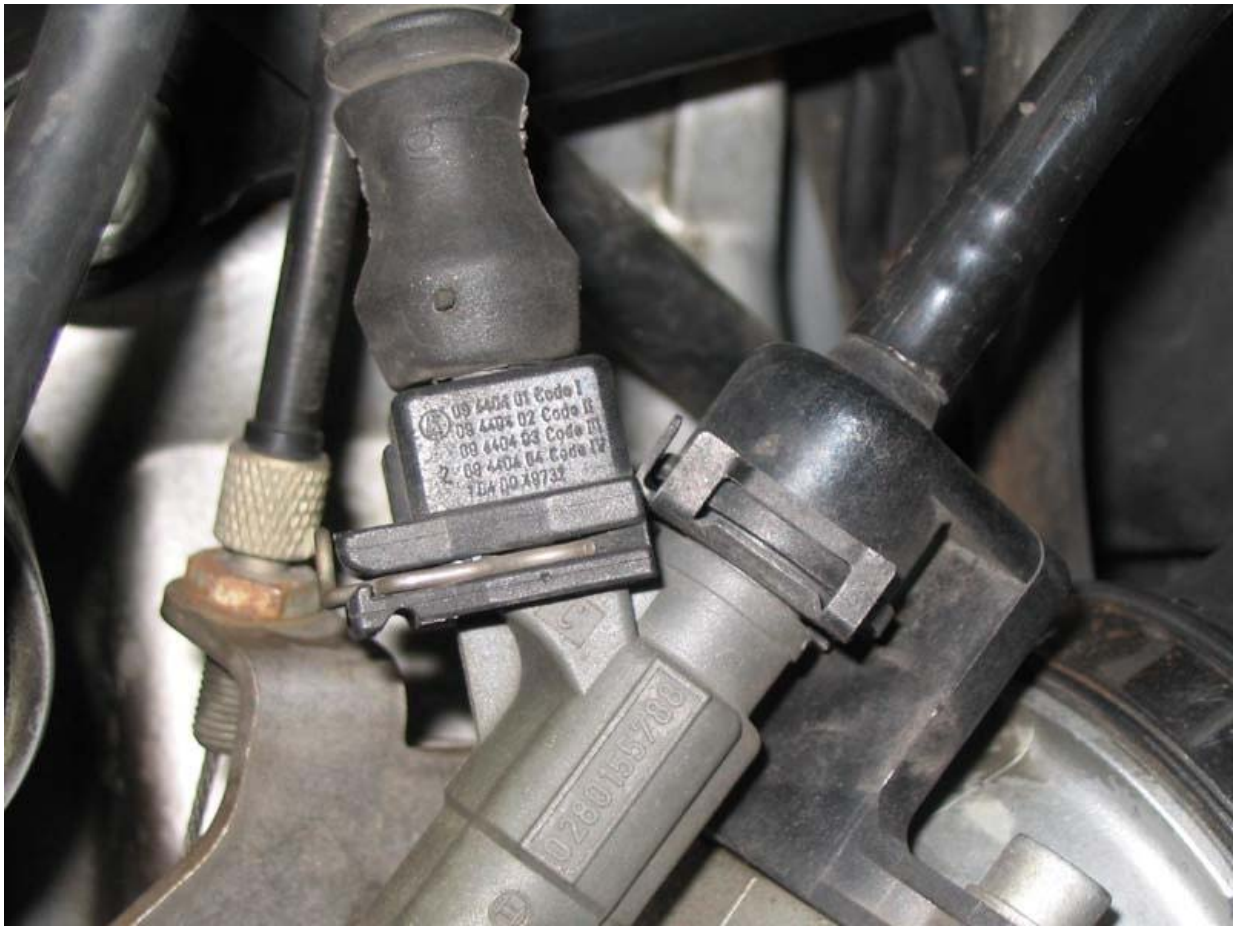


Rotate the injector body so that it is in front of the retaining clip.



Plug in the electrical connector. When oriented correctly, the electrical connector blocks the injector retaining clip.





Job complete. A-a-a-h-h - h - h. The first start up was nearly silent.

Thanks for the props everyone. Happy wrenching.

- Jim

philschl

02-17-2005 07:42 PM

How-To uninstall a throttle body...

Nice one, Jim!

I need to take off my right TB for rebushing the butterfly shaft, so thanks for the picturesque step-by-step instruction!

Phil

configurationspace

02-17-2005 07:42 PM

Wow, Poolside. That's beautiful. I might just change my cam chain tensioners so I can use all this wonderful information.

johnjen

02-17-2005 10:27 PM

Jim this is really great. My only concern is that bike looks way to clean. How can such a clean machine need new tensioners? :D

JJ

Andrew

02-18-2005 12:33 AM

Upgrade

At some point, I would like to hear about the differences between old and "upgrade" versions of the tensioner. What advantage to change? Is the new part the only part that BMW sells?

EDIT...

Sorry, didn't see the other threads. :doh

http://www.advrider.com/forums/show...48&postcount=16

HarveyMushman

02-18-2005 02:37 AM

You da man, Jim. :thumb

HarveyMushman

02-20-2005 08:13 PM

You still da man, Jim, but where's the rest? :D

kbasa

02-20-2005 08:16 PM

This is wonderful. Really.

rc46

02-20-2005 08:29 PM

Me god, that thing is filthy. Is that old varnished gas in the TB? Whats with all that carbon in the intake? Is that comon with boxers? I have rebuilt top ends on countless japanese bikes and never seen that much crud, even at 100K. :dunno

BTW, thanks for doing this. It will be a great reference for all.:thumb

Arch

02-20-2005 08:30 PM

Yep! Rockin' how-to, Jim! Duly bookmarked. :thumb

eap

02-20-2005 09:02 PM

great work!:thumb

configurationspace

02-20-2005 09:32 PM

Yay! Poolside! Yay!

Rad

02-20-2005 10:56 PM

Somethun tells me this might just end up in that hall with the other smarty stuff :nod

That would have nut'n to do with the fact that I have an 01 GS with a tick'n on the left side :lol3

johnjen

02-20-2005 11:27 PM

we're work'n on fixing up the Hall of Wisdom so we can get reports in there faster...

and this is a choice morsel indeed.

JJ

powderhound5

02-21-2005 12:00 AM

[QUOTE=Poolside]
Last Saturday a friend and I changed the cam chain tensioner on his 2001 GS.[QUOTE]

This is better plan . My cam chain guide and tensioner snapped at 6,00 RPM behind Mt. St. Helens in August. I was passing a car (never did get that pass finished).

The bike was an 03 GS Adc. 50,000 miles on it , BMW did a total engine swap - it was knarly inside.

That took from early August till mdi December.

In that time I rode a new LT to Mexico and back and got knocked down at Reg Pridmore totaling the LT and now have a Wing.

I guess my cam chain guide/ tensioner problem was not the one in a million BMW thought it was.

P5

eap

02-21-2005 08:55 AM

Quote:

> Originally Posted by **johnjen**
> *we're work'n on fixing up the Hall of Wisdom so we can get reports in there faster...*
>
> *and this is a choice morsel indeed.*
>
> *JJ*

BTW - where is the Hall of Wisdome nowadays. I've wanted to pull up the OVAD for a buddy but don't see it anywhere...

johnjen

02-21-2005 01:33 PM

That's a good question...

Oh Baldy, paging Mr. Baldy...

JJ

Team Dennis

02-21-2005 02:03 PM

Moved to the bottom of the page next to the donate button.

eap

02-21-2005 04:18 PM

> Quote:
> Originally Posted by **Team Dennis**
> *Moved to the bottom of the page next to the donate button.*

Oh there it is:confused .Down at the frign bottom of the page, GDMHK always moving things around :huh thanks,

configurationspace

02-21-2005 08:28 PM

Woohoo! Poolside! :smile6

Poolside

02-22-2005 01:50 AM

Ok, I just added the last set of pictures to the original post. Have at it.

- Jim

kixtand

02-22-2005 09:39 AM

Excellent

Just when you thought things could not get any better, they do. Top notch post.

Kix

Rad

02-22-2005 12:59 PM

Wow! Just saw yur second set of Pics and directions :thumb

I love the "Alley oop" :lol3

Thanks

Who can do a pdf of this so we can get it in da Hall?

kbasa

02-22-2005 01:10 PM

Quote:

> Originally Posted by **Rad**
> *Wow! Just saw yur second set of Pics and directions :thumb*
>
> *I love the "Alley oop" :lol3*
>
> *Thanks*
>
> *Who can do a pdf of this so we can get it in da Hall?*

Done. Where would you like me to send it, Rad? It's about 1.9MB. Send me a PM and I'll mail it to ya.

slowbike smallpenis

02-22-2005 01:10 PM

Thanks Jim, any chance of dropping down Jervis Bay way and running thru it again? :thumb

Rad

02-22-2005 02:48 PM

Quote:

> Originally Posted by **kbasa**
> *Done. Where would you like me to send it, Rad? It's about 1.9MB. Send me a PM and I'll mail it to ya.*

Thanks

I will pm ya

scooteraug02

02-22-2005 03:27 PM

Jim, thanks for the photos.

Isn't that new tensioner about $150 each?
Is there a torque value for tightening the tensioner?
Is there one on the other side on the bottom, easy to get to?
Both need to be replaced?
Do you think all GS 1150s need the new tensioner? Is it one of those parts that will have a problem sooner or later?
Just curious, I followed some earlier posts about the tensioner fixing noisey engines.

Is this normal goop on a BMW throttle body?

configurationspace

02-22-2005 04:20 PM

I believe this is only for the left-side tensioner. Nobody seems to have troubles with the right-side one. :dunno

In the BMW service manual under Engine -> Timing chain -> Chain tensioner they have 32Nm listed. They also mention you should replace the seal every time you remove the tensioner. I can't seem to get a complete P/N for the gasket/seal. It's ?? ?? ? 963 308. I don't know what the first 5 digits are, the MAX BMW fiche doesn't want to give them to me.

philschl

02-22-2005 04:34 PM

am also keen to learn about the ins and outs of TB goop.
am starting a new thread on the topic...

kbasa

02-22-2005 05:13 PM

PDF now available

Steve Pickford

02-23-2005 12:05 AM

Quote:

> Originally Posted by **configurationspace**

> *I believe this is only for the left-side tensioner. Nobody seems to have troubles with the right-side one. :dunno*
>
> *In the BMW service manual under Engine -> Timing chain -> Chain tensioner they have 32Nm listed. They also mention you should replace the seal every time you remove the tensioner. I can't seem to get a complete P/N for the gasket/seal. It's ?? ?? ? 963 308. I don't know what the first 5 digits are, the MAX BMW fiche doesn't want to give them to me.*

When I replaced the l/h tensioner last December, it came with a new seal/washer included? No idea if this is standard or just the (German) Dealer using his initiative?

I also torqued mine up to 32Nm. I'll ask my dealer later for the part number as I'm in there anyway collecting GSA screen parts.

Steve Pickford

02-23-2005 05:10 AM

Copper Washer for the Cam Chain Tensioner:

BMW Part No: 07119 963 308 - cost in the UK is a mighty 12p (22cents) & VAT so I guess that's the right part.

Should you not be able to get the BMW part for whatever reason, try an automotive store, the dimensions are:

Outside Diameter: 21.9mm
Internal Diameter: 18.3mm
Thickness: 1.3mm (still had my old parts inc. the washer. This may have compressed a little after being torqued up but not by more than 0.05 to 0.1mm max).

HarveyMushman

02-23-2005 11:30 AM

See that hex-head bolt under Jim's index finger, to the left of the roundel in the engine case? What's it for? Why does oil weep from the one on my bike?

kbasa

02-23-2005 12:04 PM

Quote:

Originally Posted by **HarveyMushman**

See that hex-head bolt under Jim's index finger, to the left of the roundel in the engine case? What's it for? Why does oil weep from the one on my bike?

I think it holds the lower cam chain guide. It also provides the channel for all the oil to drain back out of the left head and back down to the crankcase, if I'm not mistaken.

BMW Rider

02-23-2005 12:21 PM

Fabulous job, Poolside. :thumb

"Egggggggggs-cellent!"

All times are GMT -8. The time now is 12:01 PM.