Imquattro's (Nate P's) Cam Positions Sensor Replacement DIY

http://picasaweb.google.com/persing/CamPositionSensorReplacement#

My car was actually home (light came one while driving and I suspected the CPS so I didn't turn it of till we got home). Wouldn't restart, pulled codes and found 2113 code. So expecting sun and possibly rain, I set up the shelter for some fixin'!

Just some tools I brought home from work. Used less than 50% of them, but it's better to have more than enough no?

Although it seems drastic, removing the crossmember is really easy and makes this job a cinch. Remember to just unthread the hood cable from the latches. Just fold the whole crossmember back. No need to remove the cable.

Next, remove the power steering pulley belt cover. Remember to remove the small bolt on the back above the alternator, and then the cover just rotates up and off the front.

Gently (these get very brittle!) remove the injector cover. This will give you access to the CPS connector's plug.

The plug directly above the serpentine belt tensioner is the CPS's plug.

I like to lock the tensioner into place. I use a 17mm wrench and rotate it clockwise while a 5mm allen wrench will be placed through the holes to lock it into place.

Here is the tensioner locked into place. You can see the allen wrench as it passes through the tensioner into the tensioner body. The serpentine belt is now loose.

Next, remove the tensioner. A 6mm allen works well for this. You can see the rad-fan shroud is a bit chewed up here... that's due to a mid-vacation serpentine belt replacement w/o all the necessary tools.

Timing belt & camshaft sprocket now accessible. The reason you had to do all the removal of the crossmember, belt cover, and belt tensioner was to remove the upper cam belt cover.

I don't find it necessary to set it to TDC. The cam sprocket only goes on one way. Just make some locating marks on the lower pulley and lower timing belt cover.

Temporary locating marks on the pulley and lower cover.

A quick wrap on the 24mm wrench does the trick. I say quick because I don't have a sprocket spanner to hold the sprocket in place and I don't want the belt to rotate counter clockwise. Quick wraps on the end of the wrench jars the bolt loose w/o moving the belt/camshaft.

Bolt loose. See, there isn't much to it, but don't lose the washer behind the bolt!

You can see the tooth in the sprocket and the groove in the camshaft. The upside down 06 located at about 5:30 in the sprocket is the offending sensor. Zip tie the belt securely to the sprocket and make some locating marks on the lower belt cover and main pulley for safety sake. Pull the camshaft pulley straight off the shaft. There is no need to loosen the timing belt tensioner.

So... what's wrong w/ this picture?

The sensor is SUPPOSED to have two projections. One broke off and was located on the backside of the vane plate (on the backside of the sprocket).

In my hand was what had broken off the CPS and had magnetically attached itself to the back of the sprocket vane plate.

Next, remove the CPS bracket. The sensor is attached to it.

Gently fish out the pigtail and connector. CPSendectomi almost complete. If you're using a OE replacement CPS that comes w/ a pigtail and bracket, you can install it now and reverse the removal process. For those of us who are using a BBHME301 (Shaft Position Monitoring Sensor BBHME301 (replaced CYHME301)) sourced from http://www.bbautomacao.com/products.asp?cat=14 then it's time to go inside to remove the old sensor from the bracket, solder in a new one, and reconnect it to the bracket.

The old sensor is held on by two rivets/dowels. Simply drill the heads off (from the back). Loosen the screw that secures the cable and the sensor falls off.

Cinch up the sheath on the cable (we'll be using this portion over).

Here's the new sensor. They come with equal lengths of wire, but it's best to stagger them (ask Wahhab) as they can bunch and press through the heat shrink and short out the sensor. So I've stagger cut the wires and the heat shrink is in place ready to be slid over connections and heated.

Stagger cut the wires coming from the connector's pigtail. I like to double wrap, flux, and then solder my wires.

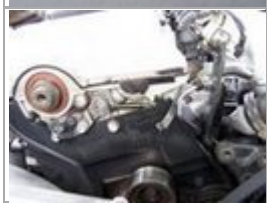
Here are the wires all stagger cut, spliced, soldered, and heatshrink sealed. Slide the old cover down over the wires and then pull down the cinched up cover.

To reattach the sensor to the bracket simply (and GENTLY!) line up the dowels w/ the holes, press the bracket flat to the back of the sensor and using a #2 phillips screwdriver, press down. The dowels are very thin and deform nicely. I do an X and then another X 90degrees offset.

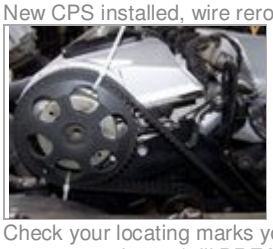
Here's what is should look like. Only additional comment would be at add a drop of JB Weld to the back of the sensor before spreading the posts. This will further strengthen the bond to the mount.

Make sure the sensor is tightly flush against the mounting bracket.

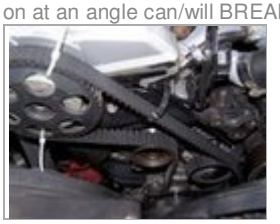
Final product.



New CPS installed, wire rerouted and plug installed on bracket. Make sure the wire isn't pinched anywhere.



Check your locating marks you made and the slip the sprocket back onto the camshaft. Make SURE you slide it straight on. Going on at an angle can/will BREAK the CPS!

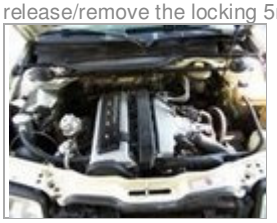


Note marks, Yup, everything's good.

Reinstall the camshaft sprocket bolt. I always use Blue #242 Loctite on the threads. Plug in the sensor (car won't start if you do, and you'll be pretty ticked off).

Reinstall the upper timing belt cover.

Make sure the serpentine belt is correctly routed and in the appropriate grooves. Reinstall the tensioner, use the 17mm wrench to release/remove the locking 5mm allen.



Replace the upper crossmember. Use the marks left by the old bolts for proper alignment. Don't forget the radiator support bolts. !!!DON'T FORGET TO RE-SECURE THE HOOD LATCH CABLE!!!!

Install & secure the injector cover. Test your work! (clear codes -remove ECU fuse for 10 sec-) Turn the key! In this picture, the engine's running smoothly! Yeah! (You did remember to re-attach the hood cable right?)