

DIY - Changing the SAI Check Valve

Updated: 4-18-15

Procedure to replace the SAI Check Valve.

Pictures that help illustrate the procedure can be found here:

https://picasaweb.google.com/bruce.c...CJuMvK_UnKK3GQ

What's New

Added sealing ring to SAI check valve. Replaced 1/2 inch breaker bar with a 1/2 inch ratchet and pipe extension. Added head protection on lid latch. Added instruction to disconnect injector wire harness and move. Added rear service cover. Replaced long P2 phillips screwdriver with socket and locking extension. Added instruction to disconnect knock sensor and move.

Materials Needed

SAI Check Valve 993-113-250-03
Sealing Ring 900-123-118-30
Copper Anti-Seize Paste (Liqui-Moly LM 508)
Rear service cover
Knee pad
Nitrile gloves

Tools Needed

10mm socket 1/4 inch drive
1/4 inch drive ratchet
7mm deep socket 1/4 inch drive
10 inch locking extension 1/4 inch drive
6 inch nut spinner handle 1/4 inch drive
7mm flexible nut driver
special tool (modified 27mm crowfoot)
10 inch long 3/8 drive extension
3/8 to 1/2 inch drive adapter
10 inch long 1/2 inch drive extension
1/2 inch drive ratchet
pipe extension for 1/2 inch ratchet
2x3 inch inspection mirror

Steps to remove and install the SAI check valve:

Setup

Note mileage

Open the engine lid and press the latch down to turn off the compartment light

Place rear service cover

Place knee pad on ground

Place tennis ball on lid latch to protect from head injury.

Removal

Remove the air cleaner assembly and MAF sensor.

10mm socket 1/4 inch drive and ratchet

7mm deep socket + locking extension + nut spinner handle

Loosen the hose clamp securing hose to shut-off valve on top of SAI check valve and move it up and tighten so it will not get lost.

Pull hose off valve and move out of the way.

Disconnect the injector connectors. Remove the plastic clips securing the wire harness to the fuel rail. Pull the wire harness under the right bank air tube and move out of the way.

Disconnect the knock sensor for the right bank and move out of the way.

Position crowfoot under the check valve using the 3/8 extension in the rear most position.

Remove the 3/8 inch extension and snap-on the 1/2 inch extension with 3/8 inch adapter to the crowfoot.

Attach the 1/2 inch ratchet and slip the pipe extension over the handle for extra leverage and break the valve loose.

If anti-seize paste was used previously, the valve can now be removed by hand.

Take care to not lose the sealing ring under the check valve.

Installation

Apply some copper anti-seize paste to the threads.

Place the sealing ring carefully onto the check valve port of the SAI manifold.

Install the check valve by hand until snug.

Using the crowfoot special tool tighten the valve an additional 1/8 turn.

Install the hose on top of the valve and position the hose clamp for easy access.

Check the vacuum line connection between the shut-off valve and the change-over valve. It will come off. Use a mirror and flashlight to confirm.

Reconnect the injector wire harness and connectors. Refit the plastic clamps securing the wire harness to the fuel rail.

Spray clean the MAF sensor with MAF sensor cleaner and refit.

Refit the air cleaner assembly.

Refit the knock sensor connector.

Finish Up

Remove rear service cover and lid latch protection.

Pull the engine lid latch release before closing the lid.

Update the log.