

JACKAROO TIP

Low Power & Black Smoke

Vacuum Hose Replacement

If your 4JX1 Jackaroo is suffering low power under acceleration and blows some black smoke then check that the vacuum hoses to the Exhaust Gas Recirculation Valve (EGR), Manifold Absolute Pressure sensor (MAP) and Vacuum Switching Valve (VSV) are OK. Over time these hoses become hard and brittle, typically where they attach to other hot parts. Vibration leads to the hoses cracking and allowing a loss of vacuum to the sensors. A visual inspection is not really conclusive and as a matter of course **all** hoses should be replaced. Note that there are two different diameters used. Suitable replacement hose can be purchased for a few dollars at your local motor parts store. Replace each, one at a time to ensure that you put it back in the correct place. With the engine running, check that there is vacuum in the lines by removing a hose and noting any change in engine revs. You should also be able to feel the vacuum with your finger on the exposed end of the hose.

Background

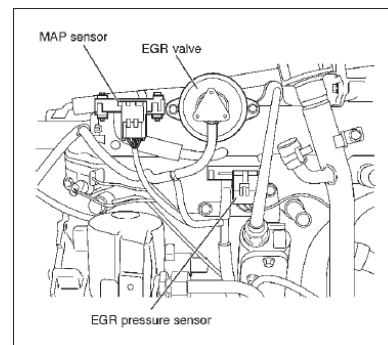
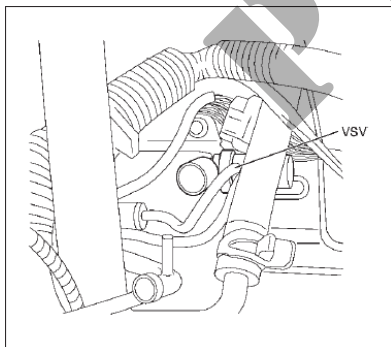
The MAP sensor is critical to ensuring the correct fuel air mix. The sensor itself is generally found to be reliable for many years and the vacuum hose is the only problem. If the MAP sensor is not operating, the fuel mix may be too rich or too lean (depending on the engine temperature). Too rich and there will be black smoke! Generally NO fault code will be displayed if the MAP sensor has no vacuum. Fault code 34 will only show if there is an electrical failure of the MAP sensor.

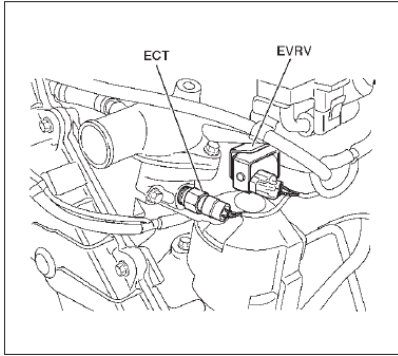
The EGR valve is intended to capture fumes from within the engine and direct them into the inlet manifold. The EGR valve has been found to gradually seize up over time. This can be checked by "blipping" the throttle /accelerator and noting movement of the exposed shaft in the valve moving back and forth. If it doesn't move then remove the EGR valve and operate the shaft by hand while cleaning it. The diaphragm in the EGR valve is generally OK but if after cleaning and a vacuum is confirmed and the shaft still doesn't move then suspect the diaphragm. Generally NO fault code will be displayed if the EGR valve has no vacuum.

The Electric Vacuum Regulating Valve (EVRV). Generally NO fault code will be displayed if the EVRV valve has no vacuum. Fault code 32 or 71 will only show if there is an electrical failure of the EVRV.

The Vacuum Switching Valve (VSV). Generally NO fault code will be displayed if the VSV valve has no vacuum. Fault code 31 or 71 will only show if there is an electrical failure of the VSV.

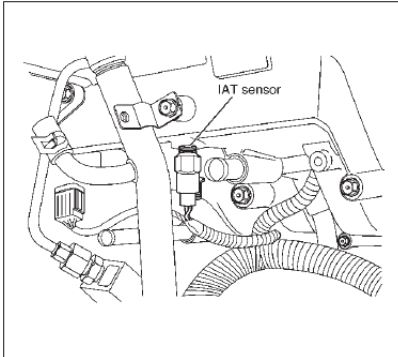
The following diagrams extracted from the Isuzu Repair Manual show the locations of the valves and sensors and the vacuum hose connections.





Another source of black smoke and over rich mixture is the slow operation of the Inlet Air Temperature sensor (IAT). This sensor is located on the underside of the inlet manifold and over time it gets covered in carbon and becomes ineffective particularly as the engine warms up.

When dirty, the sensor tends to register cooler inlet air than actual and hence the ECM computer provides a richer mixture than that needed thus causing black smoke.



Action. Remove the sensor and check for carbon build up. Typically, cleaning the IAT will give some improvement but ideally the manifold should be removed and cleaned internally to remove the carbon around the sensor. Generally NO fault code will be displayed if the IAT sensor is dirty. Fault code 23 will only show if there is an electrical failure of the IAT sensor.

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