SB-10044146-4865

Title	Oil consumption, low or uneven idle, "Low oil Level" or "Oil level low" in DIM	**Status**	Released
Ref No	US24643.1.5 en-US	**Status Date**	2012-04-10
Issuer	-	**Issue Date**	2012-04-10
Partner	3 US 7510 Volvo Cars North America	**Reference**	TJ 24382, SMB 21-005, CPI 11-2011

Func Group 2100

Func Desc engine

Attachment

File Name	File Size
Attachment TJ 24643.pdf	0.3910 MB

Vehicle Type

Type	Eng	Eng Desc	Sales	Body	Gear	Steer	Model Year	Plant	Chassis range	Struc Week Range
124	90	B6304T4					2011-9999		-	0-0
124	94	B6324S4					2011-2012		0134000-0155858	201020-201142
124	95	B6324S5					2011-9999		-	0-0
124	96	B6324S2					2010-2010		-	0-0
124	98	B6324S					2007-2010		-	0-0
124	99	B6304T2					2008-2010		-	0-0
134	90	B6304T4					2011-9999		-	0-0
135	96	B6324S2					2010-2010		-	0-0
135	98	B6324S					2008-2010		-	0-0
136	90	B6304T4					2011-9999		-	0-0
136	94	B6324S4					2011-2012		0094000-0128131	201020-201142
136	95	B6324S5					2011-9999		-	0-0
136	96	B6324S2					2010-2010		-	0-0
136	98	B6324S					2008-2010		-	0-0
136	99	B6304T2					2008-2010		-	0-0
156	90	B6304T4					2011-9999		-	0-0
156	94	B6324S4					2011-2012		0135000-0274550	201020-201142
156	95	B6324S5					2011-9999		-	0-0
156	96	B6324S2					2010-2010		-	0-0
156	98	B6324S					2010-2010		-	0-0
156	99	B6304T2					2010-2010		-	0-0
275	95	B6324S5					2011-9999		-	0-0
275	98	B6324S					2007-2010		-	0-0

CSC Customer Symptom Codes

Code	Description
AZ	Lubrication and oil system/Excessive oil consumption
BU	Lubrication and oil system/Incorrect fluid level

DTC Diagnostic Trouble Codes

Text
CSC = Customer Symptom Code

DTC = Diagnostic Trouble Code

DIM = Driver Information Module
PZEV = Partial Zero Emissions Vehicle
ECM = Engine Control Module

Note! If using a printed copy of this Technical Journal (TJ), first check for the latest online version.

NOTE! THIS DOCUMENT SUPERSEDES THE FOLLOWING TECHNICAL JOURNALS:

TJ 24411 dated 2011-04-13

TJ 24643 dated 2011-08-09

TJ 22113 dated 2010-06-30

The TJ has been reorganized to prevent incorrect diagnosis. Piston kit replacements have been added to prior approval. PLEASE UPDATE YOUR FILES.

DESCRIPTION:

This TJ describes the measures to be taken if a customer complains about low oil level, excessive oil consumption, white smoke from the exhaust, oil smell, or the yellow warning symbol and the "Engine oil level low" text message in the Driver Information Module (DIM) on a vehicle with the short Inline 6-cylinder (Si6) engine. The chassis range is not tied to any specific symptom or product modification and is left open-ended for this TJ since the diagnostic information is useful for all vehicles with the Si6 engine.

With this TJ, Volvo Cars of North America is applying its prior approval process for any claims submitted during the diagnosis of oil consumption on an Si6 engine in a Model Year (MY) 2010, MY 2011, or MY 2012 XC90, XC70, XC60, S80, S60, or V70. The Prior Approval Department must be contacted for all warranty engine and cylinder head replacements and warranty cam cover reseals for the Si6 engine in a Model Year (MY) 2010, MY 2011, or MY 2012 XC90, XC70, XC60, S80, S60, or V70 vehicle. This applies to all Si6 engines (engine codes 90, 94, 95, 96, 98, 99).

The Prior Approval Department must be contacted for authorization codes for the following operation numbers and/or part numbers:
21110-0

21014-0
21144-2
Piston kit PNs: 9487401, 9487402, 9487403

This includes cam cover reseal, cylinder head replacement, piston replacement, and engine replacement. If any questions arise contact the prior approval department.

Authorization codes for the labor operation codes above will only be available via the Prior Approval Dept. Prior Authorization is not required for customer pay repairs and/or diagnosis related to this TJ, however this TJ offers fault tracing information for these cases. The technician should refer to the Prior Approval application on VRC2.

Technicians who need to claim the labor operation above to make a repair on the vehicles in the TJ header should contact the Prior Approval Dept before making any repairs by submitting the online form on VRC2.

This is not a parts restriction process. Parts availability questions should be directed to the Parts Retailer Services Department

VOLVO STANDARD TIMES GUIDE (VSTG) INFO:

Operation number 21110-0 - Cylinder head replace - See VSTG
Operation number 28106-2 - Spark plugs kit replacing - See VSTG

Operation number 36004-2 - Software, control module downloading - See VSTG
Operation number 99583-2 - Control engine oil consumption - 1.6 hrs*
Operation number 99584-3 - Control engine oil consumption - 0.8 hrs*

*Claim these two labor operation numbers if the oil consumption check is performed.

Operation number 99400-2 - General check/adjust acc. to TJ -0.1 hrs**

**Claim this labor operation number if the cam cover is removed for inspection. Do not use 99400-2 together with 21110-0.
Operation number 21144-2 - Gasket valve cover replace - See VSTG***
***Do not use 21144-2 with 21110-0.

Operation number 08273-6 - LOF and replace dipstick acc to TJ 24643 - 0.5 hrs***
***Operation number 08273-6 is only to be used when following this TJ (not when replacing the dip stick for other reasons).
Operation number 08275-6 - Oil level, correct in service lane - 0.1 hrs****
****Operation number 08275-6 is only to be used when the oil is topped off in the service lane and the customer chooses not to stay for proper diagnosis. Do not use 08275-6 with any other operation number in

this TJ.
- Claims may be submitted under the new car warranty when there is a documented customer complaint using claim type: 01

- Labor times are valid at the time of release and are subject to change.

To view TJ attachment continue to next page:

Volvo Car Customer Service		
	TJ Instruction	
	TJ No 24643	
		Date April-12 Issue 04
Title	Excessive oil consumption, low or uneven idle, Low oil Level message in DIM	

Table of Contents

Overview

For all repairs, be sure the parts are available before beginning the repair in order to ensure customer satisfaction.

This engine type is very sensitive to overfilling because it is hard to check the oil level with the dipstick in an easy way. This is because the engine oil needs time to settle in the oil sump and also because the dipstick can be turned around causing the indicated level to be different. The car must be parked on level ground when measuring the oil. The engine should be driven at normal operating temperature on the road (not idling) for 30 minutes. The engine must then be left for 15 minutes before noting the oil level.
It is also important to note that the dipstick changed in Model Year (MY) 2007 and MY 2011 vehicles. The different part numbers (P/N) for oil dipsticks have chassis breaks in the VIDA parts catalog. Refer to the catalog to identify the correct P/N. **For vehicles with engine code 94 see page 3 concerning the dipstick. When refilling the engine with oil its imperative that the correct fill amount be used.**

Before diagnosing an oil consumption complaint, always check for external leakage on and around the engine, especially around the cylinder head / cam cover / timing cover area. If external leakage is present, repair instructions in VIDA shall be used. If no external leakage can be detected, proceed to follow the steps in this TJ.

If a customer complains about high oil consumption, poor idle quality, white smoke from the exhaust, oil smell, and/or a DIM message "Low oil level" or "Oil level low" ***AND*** low oil level is confirmed on the dipstick (unless just topped up), then proceed as described below. If the "Low oil level" or "Oil level low" message is on in the DIM but the oil level on the dipstick is not low, refer to TJ 24382.

VOLVO

Gathering information from the customer and testing for oil consumption

Note! To confirm an actual oil consumption condition, there is an oil consumption test in VIDA that can be used as a guide for this, but it is important to note that the customer does not have to be used for testing. This will only result in a repeat repair. The reason for this is based solely on customer satisfaction. This is why this step is so important. If the "Low oil level" or "Oil level low" message is on AND the oil level is low or the customer had to add oil (and it is now not overfilled), but there are no external oil leaks, it can be assumed that oil consumption exists without using the customer to run the full oil consumption test. For the full oil consumption test, refer to VIDA> REPAIR> Cleaning, Inspection, and adjustment> Engine with mountings and equipment> Lubricating and oil system> General> Oil consumption test. See VIDA for oil capacities and oil consumption limits.

If a customer chooses not to stay for proper oil consumption diagnosis, then Operation number 08275 must be used whenever oil is added in order to correct a low oil level. For example, if the customer comes in to the service lane and the service advisor adds oil and sends the customer on his/her way, this must be documented properly! A repair order must be created and Operation number 08275 must be used. Do not use Operation number 08275 if the vehicle is in for proper oil consumption diagnosis according to this TJ. There are other operation numbers in this TJ for accurately tracking these vehicles. When claiming Operation number 08275, the warranty text must include how much oil was added and how many miles the vehicle has been driven since the last time oil was changed or added. It is very important to retain accurate records of oil consumption and/or oil level checks on the customer's vehicle and these records must contain details including mileage between adding oil and how much oil was added. If a customer or an independent repair facility adds oil before arriving at the Volvo dealership, the customer needs to be as accurate as possible about when and how much oil was added.

If the test shows normal consumption values it is very important to explain to the customer how to check the oil level, how much to add, and what is the correct type of oil. If oil consumption is confirmed, proceed to follow the steps in this TJ.

Step 1. Engine 94 (MY 2011-2012 Si6 PZEV) only

This step is only valid for engine 94, which was introduced in model year 2011. The customer may experience unexpected engine oil usage for the distance covered, e.g. 5,000 miles, the yellow warning symbol may be lit and the "Engine oil level low" message may be displayed in the DIM. The spark plugs may be equally dark (see Photo 1 below).

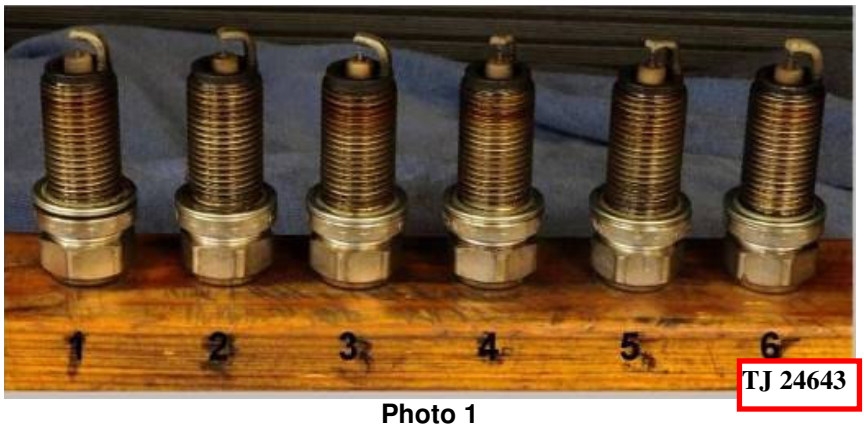

Photo 1

A new piston and oil control ring was introduced into production at engine date 301011B21530 (DDMMYYxxxxx). Follow the steps below for the service solution for engines built up to this date.

Print out DTCs using VIDA. Remove all spark plugs and compare the deposits / colors of each plug. If some plugs have a lot more soot than others, see Steps 3 and 4. If plugs match Photo 1, follow the steps below. Regardless of what the plugs look like, the latest ECM/TCM Upgrade should be performed (after the proper repair is carried out) before releasing the vehicle to the customer.

- Perform an ECM Upgrade according to VIDA. Note that after this download the customer may notice a slight difference in transmission shifting since the ECM and TCM Upgrades get downloaded together.
- Replace the engine oil dip stick with P/N 31251037
- Exchange the engine oil and refill to a volume 0.6 L (0.6 qts) higher, making the total oil fill volume 7.4 L (7.8 qts). Confirm that the oil level is up to the MAX mark on the new dip stick.
- Install a decal P/N 31349543 showing the new engine oil volume. Clean with isopropanol P/N 1161721 and apply the sticker according to the Photos 2 and 3.

Photo 2. XC70 / S80

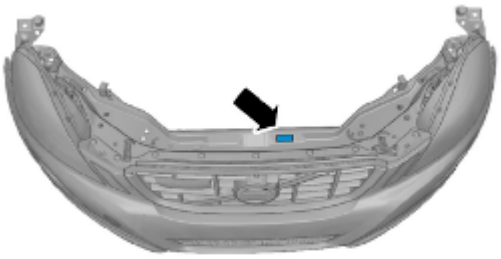

Photo 3. XC60

If a vehicle with engine 94 returns with oil consumption after downloading the latest ECM software, then check cylinder leakdown according to VIDA. If it is confirmed that the oil is being consumed via the piston rings, a new piston kit has been created to be used as a service fix. The new piston kit uses a new oil control ring which will not fit in the original piston ring land.

Piston kit PNs are in the VIDA parts catalog. Replace the pistons and piston rings according to VIDA.

Pistons Kits are on prior approval. For all components that are on prior approval, the online form must be filled out. For piston replacement be ready to show that there are no other reasons for the oil consumption.

Step 2. Spark plugs (all engine types)
Print out DTCs using VIDA. Remove all spark plugs and compare the deposits / colors of each plug. If Engine Control Module (ECM) DTC P030000 and/or ECM P030600 are present and if spark plug # 6 and in some cases also # 5 show significantly more deposits and have more soot than the other cylinders, it is very likely that the engine, at some point, has been overfilled with oil or is consuming oil via the Positive Crankcase Ventilation (PCV) system. The DTCs indicate that oil has been consumed in the engine causing misfires (above mentioned DTCs).

Perform a cylinder leakage test according to VIDA to determine whether the oil consumption is coming from an area other then the cam cover. If a leakage test proves that there is cylinder leakage from an area other then the cam cover, follow the information in the oil consumption test page in VIDA.

If the cylinder leakage tests are OK and if the spark plug from cylinder # 6 has more soot than the others, proceed to Step3. If the cam cover was not properly sealed from the factory, then this could be indicated by the #6 plug having the most soot, and then the soot level decreasing gradually towards the #1 plug.
If the cylinder leakage tests are OK, and if both spark plug from cylinder # 6 does not have more soot than the others, but there is another plug that has more soot than others, proceed to Step 4.

Spark plug soot level for Prior Approval: Level of soot on plugs (0 = no soot, 5 = excessive soot), see Photo 4 for reference. A rating of "0" would correspond to a brand new spark plug. You will be asked to provide this information and a picture of the spark plugs when submitting the online form to the Prior Approval Department.
Cylinder #1) ___ #2 ___ #3 ___ #4 ___ #5 ___ #6 ___

Photo 4. Photo examples for soot level reference

Step 3. Cam cover
Remove the cam cover and inspect the sealing surface. Refer to Photos 5 and 6 below.

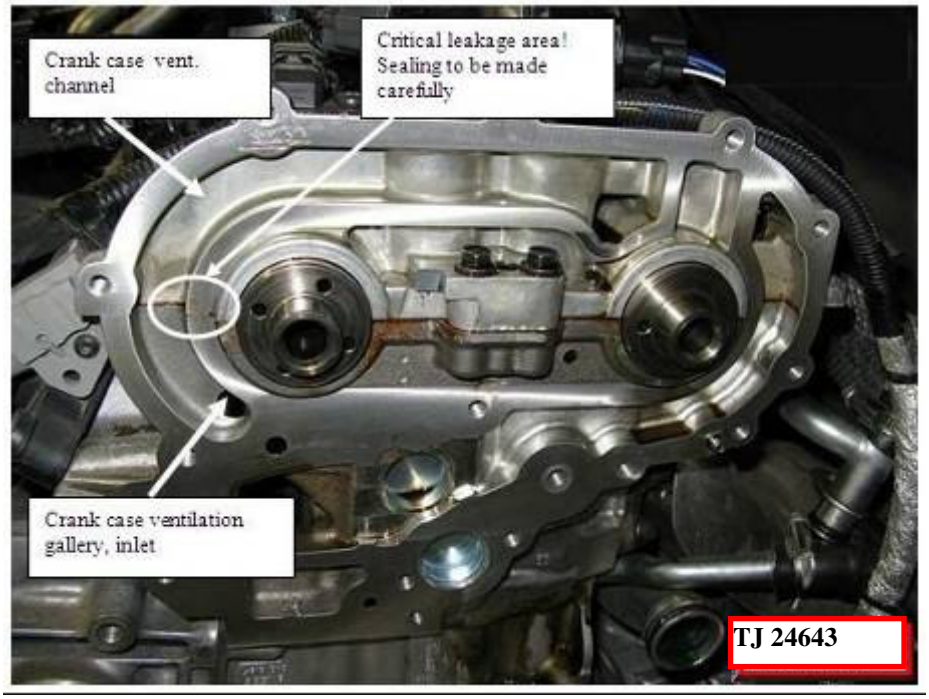

Photo 5. For reference only, not a valid check

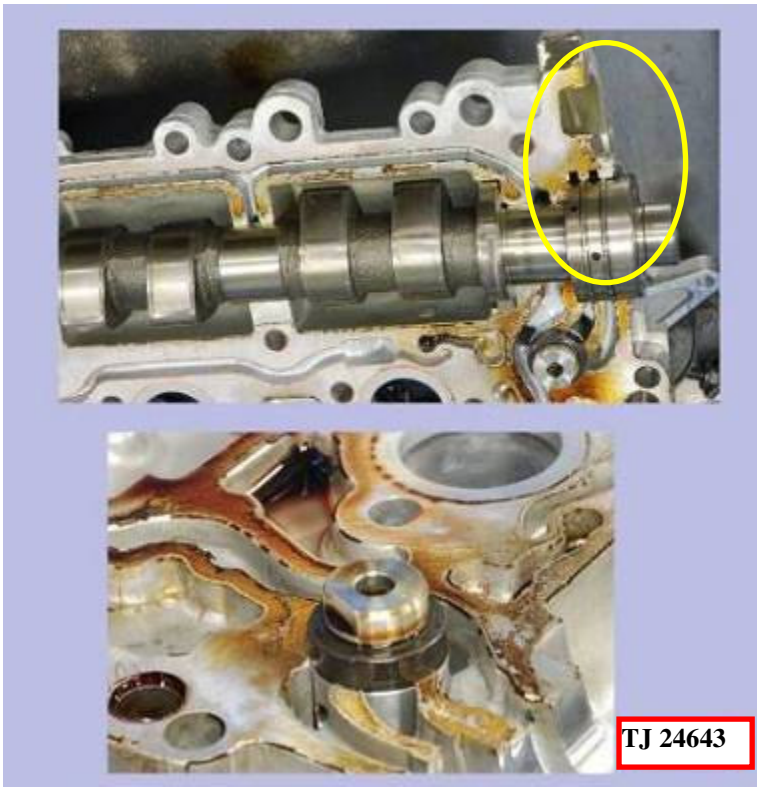

Photo 6. Check method for cam cover sealing surface

If the sealing surface is discolored by oil as shown in the photos, it is most likely that there is a leak between the cam cover and the cylinder head in the area facing the PCV channel connecting the breather box and the PCV gallery. If this is the case, the valve guides should still be checked according to Step 4 before continuing. After checking according to Step 4 (as long as the same cam cover and cylinder head will be re-installed), the cam cover must be resealed according to VIDA. **To get claim approval, contact the Prior Approval Department.**

If the sealing surface is not discolored by oil as shown in the photos, continue diagnosis elsewhere in the engine. The cam cover should be resealed according to VIDA prior to re-installation, as long as the same cam cover and cylinder head will be re-installed.

The cam cover seal was improved at engine production date 15041000001 (DDMMYYxxxxx)**.** The production date, in this case April 15, 2010. The engine serial number can be found using VIDA "Vehicle Details".

If the discolored sealing surface is found on engines built after the engine production date, please inform the Prior Approval Department when you contact them for claim approval. Make sure you have the engine serial number when contacting prior approval.

Step 4. Valve guides

Note! It is very important to realize that there may be the presence of engine oil in the intake ports without an actual valve guide leakage. Using Automatic Transmission Fluid (ATF) for color differentiation is an effective way to verify if there is or if there is not a leak between the valve guide and the cylinder head. Cylinder head replacements should NOT be based on assumptions.

Valve guide leakage has been seen on vehicles with an engine build date before 040511B01272. Valve guide leakage is most commonly found when a customer complains of excessive white smoke from the exhaust. However, these tests should be performed on all engines with oil consumption to be sure the valve guides are OK. These tests check if there is oil leakage between the cylinder head casting and the inlet valve guides.

Look at the spark plugs in Photo 7 below. If the valve guide is leaking in a cylinder, the corresponding spark plug will have more soot than the others. In the example in Photo 7, cylinder 2 is consuming oil.

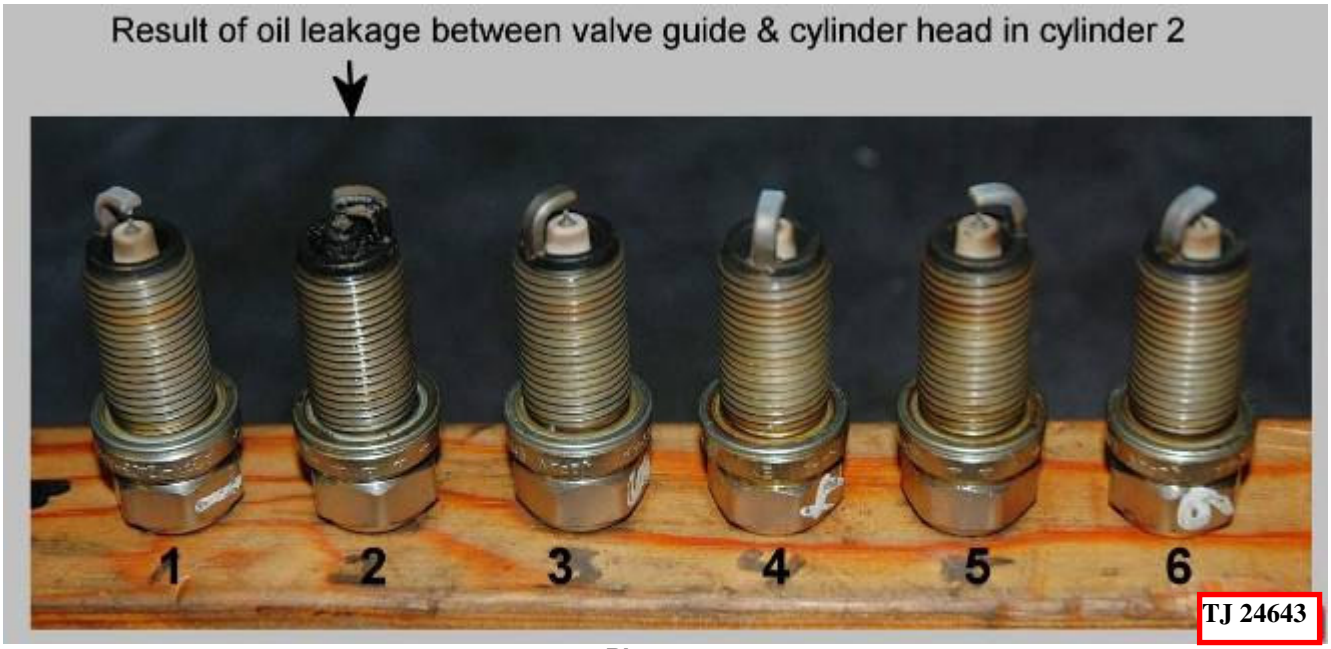

Photo 7

Remove the cam cover and test each valve guide using ATF. The test below should be performed:

Note! Use safety glasses! Remove the valve tappets. Plug all but one intake port, all injector ports, and the PCV inlet. Starting with the intake port that corresponds to the spark plug with the most soot, apply air pressure to one intake port at a time using a plug similar to those found on emissions testers. See Photos 8 and 9, left. Look at the base of the valve spring and check for ripples or bubbling in the ATF as you apply light

air pressure. If the ATF ripples or bubbles, then replace the cylinder head. **To get claim approval, contact the Prior Approval Department.**

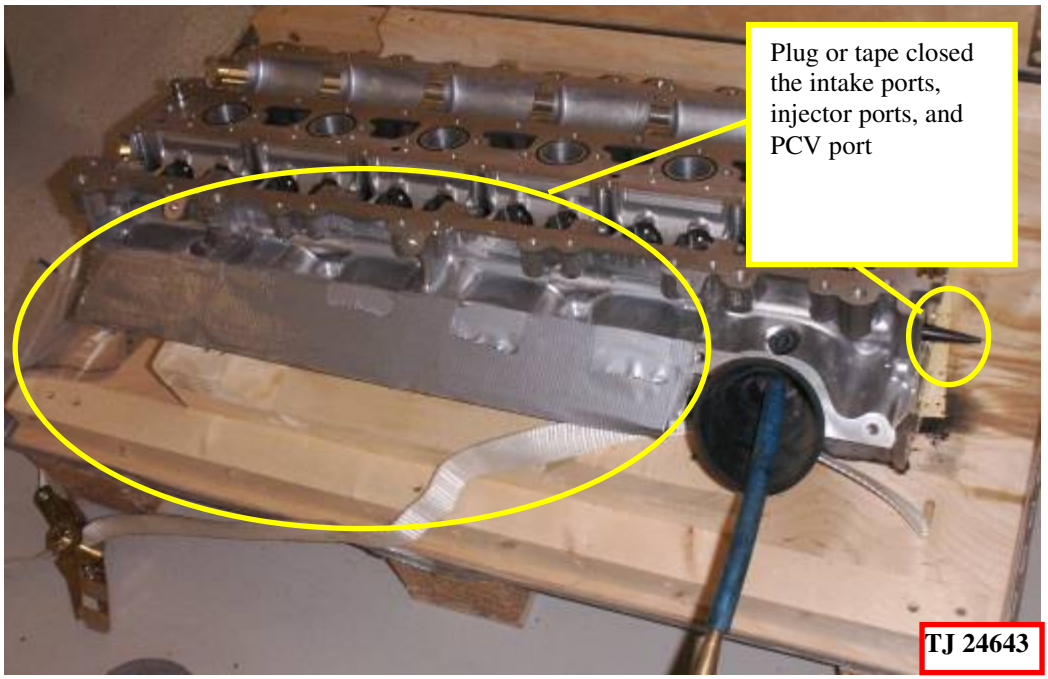

Photo 8. Note that the cylinder head is removed in this photo but this test should be performed on the vehicle.

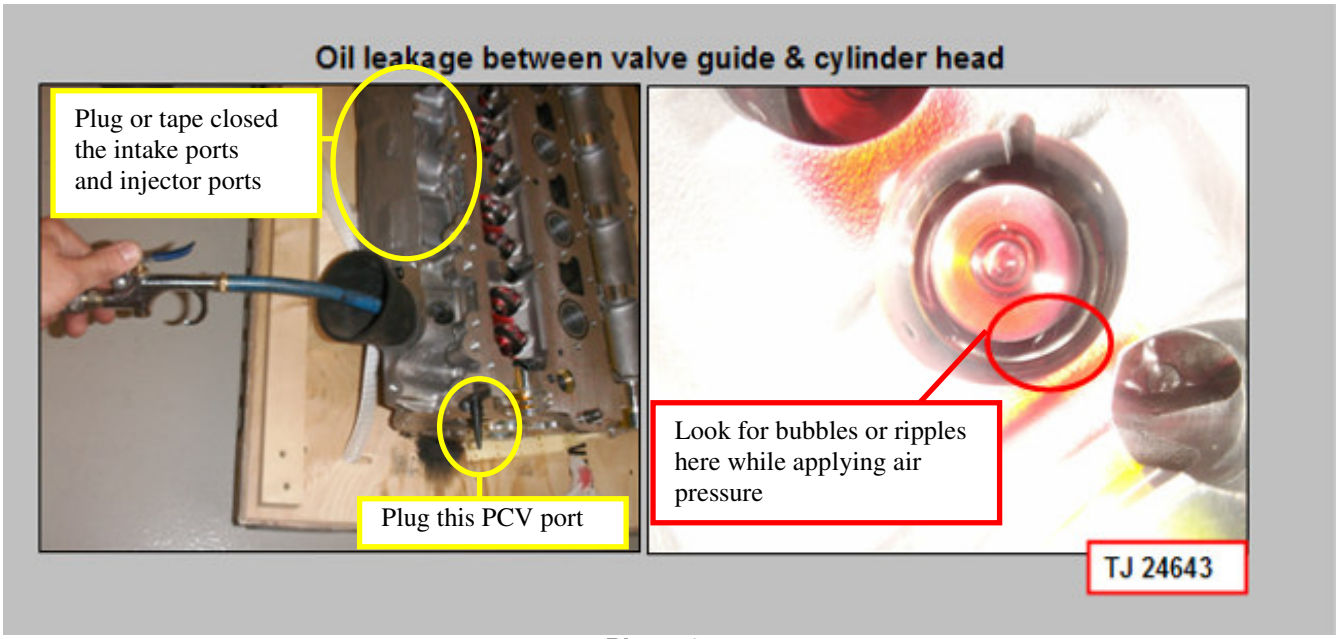

Photo 9

Step 5. Engine 96 (MY 2010 PZEV) only

If all diagnostic steps have been followed on a vehicle with engine 96 and the root cause of oil consumption has not been found, then it is possible that the engine will need new piston rings.

Check cylinder leakdown according to VIDA. If it is confirmed that the oil is being consumed via the piston rings, a new piston kit has been created to be used as a service fix. The new piston kit uses a new oil control ring which will not fit in the original piston ring land.

Piston kit PNs are in the VIDA parts catalog. Replace the pistons and piston rings according to VIDA.

Pistons Kits are on prior approval. For all components that are on prior approval, the online form must be filled out. For piston replacement be ready to show that there are no other reasons for the oil consumption.