

Engine vibrates when moving off or engine vibrates at idle, jolting when starting off, shift quality

Topic number	LI01.10-P-067097
Version	4
Function group	01.10 Complete engine
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Reason for change	Removed unavailable Xentry selection from remedy section
Reason for block	

Complaint:

Engine vibrates when moving off or engine vibrates at idle, jolting when starting off, shift quality.

Cause:

Leaks in the engine/intake manifold or in the exhaust in the vicinity of the O2 sensors may result in jolting of the vehicle/transmission when starting off.

Remedy:

Engine diagnosis:

XENTRY access ME CU -> Special processes -> Read out performance data of injectors

- Multiplicative mixture adaptation (partial-load range Bank1 / Bank2 "fra and fra2"), compare the values with each other.

If value > 1.3%, check intake side of engine for leaktightness. Work procedure A.

If value < 0.8%, check engine on exhaust side upstream and downstream of O2 sensors for unmetered air. Figure 6.

- Additive mixture adaptation (idle speed range Bank1 / Bank2 "ora and ora2"), compare the values with each other.

If value > 1.3%, check intake side of engine for leaktightness. Work procedure A.

- Check values ASH0 to ASH7 (mechanically assigned according to firing order M157/152, 1-5, 4-2, 6-3, 7-8).

The differences between the cylinders should not be >70.

If value >70, check engine mechanically. Work procedure B.

Note: A software update resets all the learned values in the performance data of the injectors.

For this reason, the performance data must always be read out before performing a software update in the engine control unit.

XENTRY TIPS

If the lines ASH0 to ASH7 in the performance data table are not complete,

this may be due to an old software version in the engine control unit.

In this case, the engine control unit must be flashed first, and

then a cold start and an adaptation test drive must be performed as per the instructions "Engine adaptation".

In XENTRY -> Engine adaptation -> ECU -> Help for control unit -> Test drive for adaptation

Work procedure A

Check the engine for leaktightness using the usual workshop equipment, a low-pressure loss tester (W611 589 02 2100) or a diagnostic flue gas tester (W000 588 18 2100) with the necessary adapters.

Special tool:

Diagnostic flue gas tester, e.g. Bosch SMT 300 Black or Smoke Wizard GLD-40 Black.

Low-pressure loss tester W611589022100 + adapter W270 589 01 6300+ W270 589 01 6303, or

Diagnostic smoke tester W000588182100 + test fluid A0009894700 + adapter W270 589 01 6300+ W270 589 01 6303

M157

Intake system:

Low-pressure loss tester W611589022100 + adapter W278589009100, or

Diagnostic smoke tester W000588182100 + test fluid A0009894700 + adapter W278589009100

For test procedure, see the guided test in XENTRY "Check intake system for leaks"

Flue gas introduced via adapter W278589009100 or

via connecting point of purge valve (Y58/1)

A flowmeter reading <0.7 mm is OK.

Note: When the diagnostic flue gas tester has been connected, its function must be checked as follows:

Switch on the tester, open the oil filler cap and check whether flue gas escapes.

Then close the oil filler cap again and start the test.

If there is no leak in the system, the ball in the flowmeter indicates <0.7 mm. If the reading is > 0.7 mm and the ball in the flowmeter is bouncing up and down, this is an indication of a leak.

Exhaust system:

For test procedure, see the guided test in XENTRY "Check exhaust system for leaks"

M152

Intake system:

Low-pressure loss tester W611589022100 + adapter W152589009100, or

XENTRY TIPS

Diagnostic smoke tester W000588182100 + test fluid A0009894700 + adapter W152589009100

For test procedure, see the guided test in XENTRY "Check intake system for leaks".

The flue gas is to be introduced via the adapter W278589009100 or

via the connecting point of purge valve (Y58/1).

A flowmeter reading <0.7 mm is OK.

Note:

When the diagnostic flue gas tester has been connected, its function must be checked as follows: Switch on the tester, open the oil filler cap and check whether flue gas escapes.

Then close the oil filler cap again and start the test.

If there is no leak in the system, the ball in the flowmeter indicates <0.7 mm.

If the reading is > 0.7 mm and the ball in the flowmeter is bouncing up and down, this is an indication of a leak.

The test must be performed with the engine cold -> Engine off

At operating temperature, min. 90 °C oil temperature -> Engine off

Exhaust system:

For test procedure, see the guided test in XENTRY "Check exhaust system for leaks"

Low-pressure loss tester W611589022100 + adapter W270 589 01 6300+ W270 589 01 6303, or

Diagnostic smoke tester W000588182100 + test fluid A0009894700 + adapter W270 589 01 6300+ W270 589 01 6303

Potential leaks

1.1 Check charge air cooler housing (Figure 1.1, item A)

1.2 Check throttle valve connection

- Check positioning of throttle valve molded seal (Figure 1.2, item B)

- Check positioning of connecting hose (Figure 1.2, item C)

1.3 Check intake manifold for cracks

1.4 Check molded seal between intake manifold and cylinder head

- Surface damaged (Figure 1.4, item D)

- Positioning of seal (Figure 1.4, item E)

1.5 Check charge air line at turbocharger connection on intake side

- Hose clamp loose (Figure 1.5, item F)

- Positioning of clamp outside notch (Figure 1.5, item G)

Repair leakage according to findings.

XENTRY TIPS

1.6 Oil separator of crankcase ventilation system

- Molded seal between oil separator and cylinder head cover damaged (Figure 1.6, item H)
- Molded seal between housing cover and cylinder head damaged (Figure 1.6, item L)

Work procedure B

Engine mechanical test:

- Perform compression and pressure loss test.
- Inspect cylinder with a light probe, check cylinder barrel for score marks, check combustion chamber for oil residues.

Create a PTSS case and attach documents/pictures for assessment:

- Injector performance data
- Pictures/findings from engine test
- Initial quick test
- Engine control unit log

Attachments	
File	Description
Ladluftkühler.jpg	Figure 1.1, item A
Verbindungsstelle Drosselklappe.jpg	Figure 1.2, item B/C
Formdichtung zwischen Saugrohr und Zylinderkopf .jpg	Figure 1.4, item D/E
Ladeluftleitung an der Verbindungsstelle Turbolader.jpg	Figure 1.5, item F/G
Motorentlüftung.jpg	Figure 1.6, item H/L
Abgasanlage.jpg	Figure 6

Symptoms
Power generation / Engine management / Engine running / Surges
Power generation / Engine management / Engine running / Runs rough/shakes
Power transmission / Automatic transmission / Function / Shifts
Power transmission / Automatic transmission / Function / Shuddering during start-off
Power transmission / Automatic transmission / Function / Shifting is rough
Power generation / Engine management / Engine performance / No/poor output
Power transmission / Automatic transmission / Function / Poor shift quality

Parts						
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A 278 141 02 80			Flange seal, intake manifold to cylinder head	8	For M157	X
A 278 094 15 91			Boot, charge air line to turbo-charger	1	For M157	X

XENTRY TIPS

A 278 094 12 91			Boot, charge air line to charge air cooler	1	For M157	X
A 006 997 26 90			Hose clamp	2	For M157	X
A 001 995 54 10			Hose clamp	2	For M157	X
A 272 141 26 80			Gasket, electronic accelerator adjusting motor to charge air cooler	1	For M157	X
A 278 094 06 82			Charge air hose to charge air distribution line	1	For M157	X
A 001 995 34 10			Hose clamp for fastening charge air hose	2	For M157	X
A 157 090 03 14			Charge air cooler	1	For M157	X
A 152 141 00 80			Flange seal, intake manifold to cylinder head	8	For M152	X
A 278 018 00 35			Oil separator	1	M157	X
A 278 018 02 80			Molded seal, oil separator	1	M157	X
A 278 010 04 31			Housing cover	1	M157	X
A 276 018 00 80			Molded seal, housing cover	1	M157	X