



Technical Service Bulletin

No.JTB00146v4
28 April 2009

Reissue

Please replace the previous edition of this bulletin.

This bulletin supersedes TSB JTB00146v3/2009 dated 01 April , which should either be destroyed or clearly marked to show it is no longer valid (e.g. with a line across the page).

Subject/Concern : Diesel Particulate Filter (DPF) P2459, P244B, P2453, P2455 DTCs Stored

Models :		
S-TYPE	2.7L Diesel Only	2.7L Diesel Only VIN- range : N32679-N91220
XJ Range	2.7L Diesel Only	2.7L Diesel Only VIN- range : H00332 Onwards
XF	2.7L Diesel Only	2.7L Diesel Only VIN- range : R00001 Onwards

Markets : Diesel Only

Section : 303-00

Summary :

The vehicle is in restricted performance, with the red and or amber warning lamps displayed, with the possibility off Diagnostic Trouble Codes (DTCs) P2459/P244B/P2453/P2455 stored in the Engine Control Module (ECM).

This version has been issued for a change in the Causal Part.

Cause : Diesel Particulate Filter (DPF) soot loading has reached a level to trigger a DTC and warning lamps/restricted performance. Various potential causes.**Suggested Customer Concern Code - D50.**

NOTE : The Diagnostic Procedure outlined below, shows the common causes of DPF concerns and should be considered during investigations.

Action : Should a customer express concern, follow Service Instruction Procedure A (all vehicles), B (P2459 Only) and C (P244B, P2453 or P2455) outlined below.

NOTE : A quantity of 6 liters of engine oil may also be required; the oil should be sourced locally, quoting ZZZ001 and claiming an allowance equivalent to £30 sterling max.

Parts Required :		
Description	Part Number	Quantity
Hose	XR8 53345	1
DPF - S-TYPE	XR8 56857E	1
DPF - XJ Range	C2C 40890	1
DPF - XF - Prior VIN R38331	C2Z 9182	1
DPF - XF - From VIN R38332	C2Z 11766	1
Oil Filter	C2S 29685	1
Intake manifold port deactivation diaphragm repair kit	C2C 41091	1

Labour Time :

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Operation Description	Operation No.	Time
Intake manifold port deactivation diaphragms - Renew - S-TYPE	19.70.39	1.1 hours
Intake manifold port deactivation diaphragms - Renew - XJ and XF	19.70.39	0.8 hours
Procedure A - DPF vacuum pipes and vacuum check	17.91.63	0.2 hours
Procedure B - Configure existing ECM - XF	86.99.13	0.3 hours
Procedure B - Configure existing ECM - S-TYPE and XJ Range	86.99.13	0.5 hours
Procedure C - Check differential pressure, reprogram ECM and complete particulate filter re-generation	17.91.60	1.7 hours
Procedure C - Check differential pressure, reprogram ECM and complete particulate filter re-generation - XF	17.91.60	1.7 hours
Procedure C - Check differential pressure, reprogram ECM and renew DPF - S-TYPE	17.91.62	2.2 hours
Procedure C - Check differential pressure, reprogram ECM and renew DPF - XJ	17.91.62	2.0 hours
Procedure C - Check differential pressure, reprogram ECM and renew DPF - XF	17.91.62	2.0 hours
Renew engine oil and filter - S-TYPE	12.60.06	0.6 hours
Renew engine oil and filter - XJ	12.60.06	0.5 hours
Renew engine oil and filter - XF	12.60.06	0.6 hours

Repair/Claim Coding :	
Causal Part :	C2C 40890
ACES Condition Code :	42
Defect Code :	

Table 1 - Software Part Numbers

NOTE : MT = Manual Transmission, AT = Automatic Transmission, CC = Cruise Control, ACC = Adaptive Cruise Control

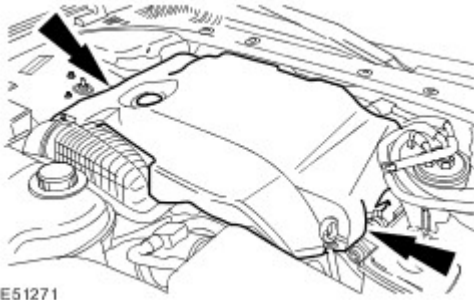
Service Release DVD114-P3 Date 8th August 2008	Service Release DVD114-P3 Date 8th August 2008	Service Release DVD115-P5 Date 21st November 2008
S-TYPE, MT, CC, 6R83 14C205 JHR	XJ Range, AT, CC, 8W93 12K532 KDC	XF, AT, CC, 8X23-12K532-KBK
S-TYPE, AT, CC, 6R83 14C205 JBYD	XJ Range, AT, ACC, 8W93 12K532 LBC	XF, AT, ACC, 8X23-12K532-LBK

S-TYPE, AT, ACC, 6R83 14C205 JBZD		
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Service Instruction

Procedure A - Check Port Deactivation Valves and Vacuum Pipe

- 1 . Remove the filler cap.
 - 1 . Remove the engine cover.
 - 2 . Refit the filler cap.



- 2 . Undo and remove the two fixings on the rear engine cover.



- 3 . **NOTE :** Right-hand side shown, left-hand side similar.

Inspect vacuum pipe routing to both left and right-hand valves, check for crushed (between the camshaft cover and the engine cover), damaged or kinked lines.



- 4 . If the vacuum hose is damaged or kinked (remove the same vacuum pipe from the supplied new vacuum hose assembly).
 - 1 . Install the new vacuum hose, ensuring it is correctly routed (see graphic E105798 in step 5).
- 5 . If the vacuum hose is trapped between the cam cover and the engine cover (not damaged or kinked), route at the back of the camshaft cover (see graphic E105798).

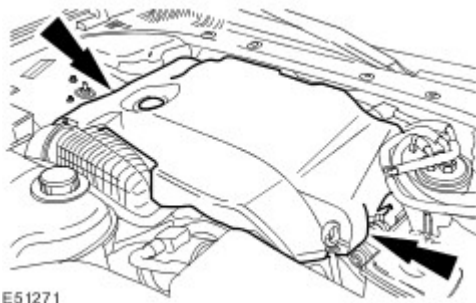


- 6 . Check the operation of both port deactivation valves by removing the vacuum pipe 'T' (see graphic E105799) piece in the centre 'V' and drawing a vacuum (25 cm of Mercury, using a suitable vacuum gun) onto the valves.
 - 1 . If the vacuum leaks away rapidly, identify which bank has failed by individually applying a vacuum to the port deactivation valves. Ensure that both pipes from the 'T' pipe are connected correctly to the valve heads.



If there is no leak at the port deactivation valves, carry out steps 7 and 8 and return the vehicle to customer. If a leak is detected at the port deactivations valve(s), carry on from step 8.

- 7 . Install the rear engine cover and install fixings.
- 8 . Remove the filler cap.
 - 1 . Install the engine cover.
 - 2 . Refit the filler cap.



- 9 . If the port deactivation valve(s) has a leak, install new intake port deactivation diaphragms. Both diaphragms **must** be replaced using the repair kit (see Global Technical Reference GTR workshop manual, section 303-04 - Swirl Plate Actuator Diaphragms).

Service Instruction

Procedure B- With P2459 Stored in the Engine Control Module Only

- 1 . Connect a midtronic battery conditioner/power supply to the vehicle.
- 2 .



CAUTION : This procedure requires IDS DVD117 Patch 9 loaded or later.

NOTE : Before starting a session (from operating warning page), make sure that 'Bar' is selected as the unit of pressure in 'user preferences'.

Connect IDS to the vehicle and begin a new diagnostic session by entering the correct VIN for the current vehicle, and then selecting the correct engine variant. Follow on screen instructions. Press 'tick' to continue.

- 3 . When prompted 'Do you wish to read diagnostic trouble codes?' select 'YES' and press 'tick' to continue.
- 4 . **NOTE :** Procedure B is for DTC P2459 only.

If DTC P244B, P2453, P2455, or P244A are stored go to Procedure C.

- 5 . Follow on screen instructions and rectify and clear all DTCs.
- 6 . XJ/S-TYPE - Navigate to 'Content Model' and select the 'Vehicle Configuration' tab.
 - 1 . XF - When the 'Content Model' is displayed select 'Vehicle Configuration' tab.
- 7 . XJ/S-TYPE - Select 'Special Applications' from the 'Vehicle Configuration' menu.
 - 1 . XF - Select 'Module Information' from the 'Vehicle Configuration' menu.
- 8 . XJ/S-TYPE - From the drop down menu select 'Vehicle control module Identification'. Press 'tick' to continue.
 - 1 . XF - From the drop down menu select 'Network Integrity Test'. Press 'tick' to continue.
- 9 . Follow all on-screen instructions until IDS displays the Current software level to the current installed software level.
- 10 . Record the current software level.
- 11 . **NOTE :** If the calibration is the latest level then the vehicle is operating normally. P2459 is stored because the customer drive cycle is not sufficient to regenerate the DPF. This issue can not be claimed against Warranty. Inform the customer that the vehicle needs to be driven in line with the guidelines in the driver handbook in order to regenerate the DPF.

If the calibration is at the level in Table 1 or later then the vehicle:

- 1 . Abort the IDS routine, exit the session and disconnect IDS and the midtronic battery conditioner/power supply. Return the vehicle to the customer.
- 12 . If the calibration level is not equal to one in the table 1, then continue with the process.
- 13 . Follow all on-screen instructions to update the ECM calibration and complete this task.
- 14 . Select the 'Vehicle Configuration' tab.
- 15 . XJ/S-TYPE - Select 'Set-up and configuration'.
 - 1 . XF - Select 'Special applications.
- 16 . XJ/S-TYPE - Select 'Engine Management'.
 - 1 . XF - Select 'Powertrain'.
- 17 . **NOTE :** Important: After the 'oil service counter' has been reset it will still be necessary to change the engine oil and filter.

Select 'Reset oil service counter'.

- 18 . Follow all on-screen instructions to complete this task.
- 19 . When the task is completed, exit the current session.
- 20 . Disconnect IDS and the battery charger/power supply.
- 21 . Check the service history of the vehicle.
- 22 . If the vehicle mileage since the last full service is less than 12,500 miles (20,000 km), replace the engine oil and filter under Warranty.
- 23 . If the vehicle mileage since the last full service is 12,501 miles (20,001 km) or greater, then the oil and filter need to be replaced (the customer must pay for this work to be done).

Service Instruction

Procedure C - With P244B or P2453 or P2455 Stored (potentially with P2459)

- 1 .  **CAUTION : This procedure requires IDS DVD117 Patch 9 loaded or later.**

NOTE : If IDS is already connected (from Procedure B step 4), carry on from step 3.

Connect a Midtronic battery conditioner/power supply to the vehicle.

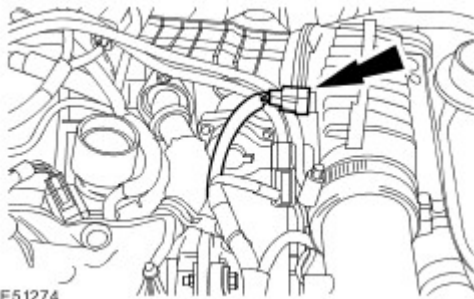
- 2 . **NOTE :** Before starting a session (from operating warning page), make sure that 'Bar' is selected as the unit of pressure in 'user preferences'.

Connect IDS to the vehicle and begin a new diagnostic session by entering the correct VIN for the current vehicle, and then selecting the correct engine variant. Press 'tick' to continue.

- 3 . **NOTE :** Record all the DTCs that are logged.

When prompted 'Do you wish to read diagnostic trouble codes?', select 'YES' and press 'tick' to continue.


- 4 . Follow on-screen instructions to check, rectify, and clear any DTCs, then press 'tick' to continue.
- 5 . Disconnect the air temperature sensor connector (see E51274).



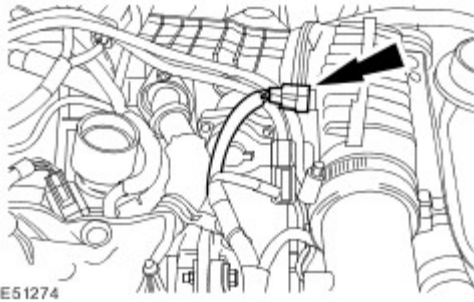
- 6 . Re-cycle the ignition and check that for XJ and S-TYPE DTC P0098 is stored, for XF DTC P007D-17 is stored.
- 7 . **NOTE :** Ensure the engine oil level is between minimum and maximum.

Start vehicle and run the engine until the coolant temperature is above the blue region on the temperature gauge.

- 8 . Open IDS data logger. Log the following three channels from: '303-00 Engine system':

- 9 . Select 'Engine speed' (powertrain control module).
- 10 . Select 'Pre diesel particulate filter temperature sensor' (powertrain control module).
- 11 . Select 'Differential pressure across particle filter' (powertrain control module).
- 12 . Select 'Particle filter condition' (Total mass of particulate soot).
- 13 . Select 'Particle filter condition' (Distance since last regeneration).
- 14 . Select 'Particle filter condition' (Number of partial regenerations).
- 15 . Select 'Particle filter condition' (Number of failed regenerations).
- 16 . Increase the engine rpm to 2500rpm and hold until the channel 'Pre diesel particulate filter temperature sensor' reads over 120 degrees C.
- 17 . Allow the engine to idle for at least 30 seconds.
- 18 . Increase the engine rpm to 4000rpm+/-50rpm, read and record the channel 'Differential pressure across particle filter'.
- 19 .  **CAUTION : Ensure the ignition is 'OFF'.**

Connect the air temperature sensor connector (see E51274).



- 20 . **NOTE :** Record (on job card) and rectify all DTCs that are logged.

When prompted 'Do you wish to read diagnostic trouble codes?', select 'YES' and press 'tick' to continue.

- 21 . Follow on-screen instructions and clear DTCs, then press 'tick' to continue.

A - If the value is below 90mBar at 4000rpm+/-50rpm, and if there are a total of 4 or less partial and failed regenerations, go to step 38.

B - If the value is 90mBar to 110mBar and if there are a total of 4 or less partial and failed regenerations, carry out Appendix 1.

C - If the value is between 111mBar and 170mBar, and if there are a total of 4 or less partial and failed regenerations the car and must be driven using gentle acceleration to reach a suitable road (to help prevent 'restricted performance' being displayed), and then carry out Appendix 1.

D - If the value is above 171mBar at 4000rpm+/-50rpm, or if there are a total of 4 or more partial or failed regenerations carry out Appendix 2.

Appendix 1

- 22 . **NOTE :** The vehicle must be driven on a suitable road where 56 mile/h (90 km/h) can be maintained and will require two people (one to drive and one to monitor IDS). Once on the motorway the service regeneration should be carried out using IDS. The service

regeneration should only be started when very close to, or on, the motorway itself and the vehicle should be driven constantly until the service regeneration has finished (14-18mins).

NOTE : Remove IDS from trolley and use on road test (ensure sufficient charge is in the IDS unit to carry out the procedure).

From the 'DTC Monitor' page select 'Vehicle Configuration' tab.

- 23 . XJ/S-TYPE - Select 'Set-up and configuration'.
 - 1 . XF - Select 'Special applications'.
- 24 . XJ/S-TYPE - Select 'Engine Management'.
 - 1 . XF - Select 'Powertrain'.
- 25 . XJ/S-TYPE - Select 'Particle Filter Regeneration'.
 - 1 . XF - Select 'Diesel particulate filter dynamic regeneration'
- 26 . Follow all on-screen instructions to complete this task.
- 27 . Return vehicle to workshop.
- 28 . Repeat steps 3 to 17.
- 29 . If the value is now below 90mBar at 4000rpm+/-50rpm go to step 40.
- 30 . If the value is 91mBar to 110mBar a poor service re-gen has been conducted or there is a sensor error, please contact Dealer Technical Support (DTS) for further assistance.

Appendix 2

- 31 . Install a new Diesel Particulate Filter (see Global Technical Reference GTR Workshop Manual, section: 309-00).
- 32 . Connect IDS, and from the 'DTC Monitor' page select 'Vehicle Configuration' tab.
- 33 . Follow the IDS prompts to read the vehicle configuration.
- 34 . When prompted 'Do you wish to read diagnostic trouble codes?', select 'NO' and then press 'tick' to continue.
- 35 . When the 'Content Model' is displayed select 'Vehicle Configuration' tab.
- 36 . XJ/S-TYPE - Select 'Set-up and configuration'.
 - 1 . XF - Select 'Special applications'.
- 37 . XJ/S-TYPE - Select 'Engine Management'.
 - 1 . XF - Select 'Powertrain'.
- 38 . XJ/S-TYPE - Select 'Reset The Diesel Particulate Filter Stored values'.
 - 1 . XF - Select 'Diesel particulate filter replacement'.
- 39 . Follow all on-screen instructions to complete this task.
- 40 . Renew engine oil and filter.
- 41 . Select the 'Vehicle Configuration' tab.
 - 1 . XJ/S-TYPE - Select 'set-up and configuraton'.
 - 2 . XF - Select 'Special applications'.
- 42 . XJ/S-TYPE - Select 'Engine Management'.
 - 1 . XF - select 'Powertrain'.
- 43 . Select 'Reset oil service counter'.
- 44 . Follow all on-screen instructions to complete this task.
- 45 . Follow the IDS prompts to read the vehicle configuration.

- 46 . When prompted 'Do you wish to read diagnostic trouble codes?', select 'Yes' and then press 'tick' to continue.
- 47 . Follow all on-screen instructions to clear DTCs.
- 48 . When the 'Content Model' is displayed select 'Vehicle Configuration' tab.
- 49 . Check if the module has the latest level of calibration software as follows:
 - 1 . XF: From the 'Vehicle Configuration' menu Select 'Module Programming' then select from the menu 'Configure existing modules'.
 - 2 . XJ/S-TYPE: From the 'Vehicle Configuration' menu select 'Configure existing modules'.
- 50 . From the drop down menu select 'Engine control module'. Press 'tick' to continue.
- 51 . Follow all on-screen instructions to update the ECM calibration and complete the task.
- 52 . When the task is completed, exit the current session.
- 53 . Disconnect IDS and the battery charger/power supply.
- 54 . **NOTE** : When road testing the vehicle, include at least three strong accelerations in high gears, for example 40-70mile/h on an open road (kick-down is not necessary in automatic vehicles).

Road test vehicle.

If DTC P244B / P2453 / P2455 / P244B / P2453 / P2455 is stored and the vehicle has the latest calibration, then there may be another issue causing the DPF soot level to be high. Follow the Diagnostic Procedure outlined below.

Diagnostic Procedure

NOTE : If required, the Diagnostic Procedure and any faults found are to be carried out as a separate Warranty Claim.

If the issue still exists then the following areas should be investigated:

- 1 . Air Intake System (any form of boost leak or restriction significantly increases the engine soot output and the chance of a 244B fault).
 - 1 . Check the air filter for signs of excessive dirt.
 - 2 . MAF sensor to clean air side duct (upper and lower) connections. The pipes should be seated evenly against the shoulder on the MAF sensor.
 - 3 . Turbine outlets to intercooler inlet pipes.
 - 4 . Intercooler for any signs of leak.
 - 5 . Intercooler outlet housing for signs of boost/oil leaks along the seam.
 - 6 . Inlet elbow pipe connection for signs of boost/oil leak.
 - 7 . Inlet elbow spring clip fitting to intake.
- 2 . EGR Valve and MAF
 - 1 . Following a key cycle (Ignition Off-On-Off) check that both EGR valves can be heard performing their cleaning cycle (series of clicks).
 - 2 . Warm the engine and with IDS connected to the vehicle, start the data logger, select 303-00 Engine System and select channels:
 - 3 . Mass airflow sensor 'A' signal frequency.
 - 4 . Mass airflow sensor 'B' signal frequency.

- 5 . Engine speed.
- 6 . **NOTE :** MAF is variable based on ambient air temperature, altitude, engine temperature, engine friction and EGR, if there is doubt, check it against another equivalent specification car at the same engine temperature and time at idle.

With the engine running, the two values of mass air flow should be similar, but may not read exactly the same value – this is perfectly normal. 0-4g/s difference is typical. If the engine speed is increased then returned to idle, the EGR valves will be open initially. They will shut after about three minutes of idle and the MAF values should increase if the EGRs are working correctly. Typical MAF values on IDS: No load idle: 3-5g/s, then 7-11g/s with EGRs shut. No load 2000rpm: 16-19g/s. No load 3000rpm: 37-42g/s.

- 3 . Turbocharger
 - 1 . Has turbocharger Recall S529 been conducted if applicable?
 - 2 . Check for DTC related to turbocharger sticking or not operating correctly.
- 4 . Engine Sensors
 - 1 . Connect IDS.
 - 2 . Check for DTC related to engine sensors and repair as required.
 - 3 . Using data monitor select 303-00 Engine System and select channels: Engine Oil Temperature. Coolant Temperature. Intake Air Temperature. Boost Air Temperature. Ambient Temperature. Fuel Rail Temperature before FMEM substitution.
 - 4 . Check that the values displayed are within reasonable operating parameters for the current environmental conditions.
- 5 . Differential Pressure Sensor
 - 1 . To check the sensor use the following procedure: Connect IDS, select 303-00 Engine system and select channel 'differential pressure across the particle filter'. With the vehicle ignition 'on' (position 2) but the engine not running, test the pressure from the sensor. It should read 0 bar. Start the car and let it idle. The output should read approximately between 2.0mbar to 10.0mBar (2.0mbar would be an empty DPF, 10.0mbar full). Raise the engine speed. The pressure reading from the sensor should INCREASE as the engine revs increase. The pressure should then return to the idle level when the engine idles. If the pressure falls with increased engine revs, then the pipes from sensor to DPF have been fitted the wrong way around.

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