

# Defender Fault History Summer 2017

Land Rover Defender 110 XS Station Wagon 2.4 TDCi MY2007

Date	Narrative		
Jun '17	Noticed small fuel leak from fuel tank/breather hose connection when tank full. No action taken.		
Jul '17	Aux Drive Belt squealing. Removed Fan Cowell - nothing found.		
04/08/17	Aux Drive belt squealing. Removed Cowell and Fan inspected all pulleys and components - nothing found. Ordered new Polly-V belt.		
12/08/17	Removed Fan Cowell and Fan. Removed Aux drive belt and inspected all drive components. Nothing found. Fitted new Polly-V belt. OEM part.		
14/08/17	Drove - Les Houches to Cluses via AutoRoute and D1205; OK. (Very Slight hunting before Sallanches on AutoRoute). Departed Cluses on AutoRoute and entered Limp mode at Bonneville J17 (12km). Stopped; inspected engine bay nothing found re-started OK. Re-joined AutoRoute at Bonneville J17 & entered "limp mode" after 3km. Stopped engine at Bonneville J16 toll and restarted. Drove to Perfect Land (Sallanches) on D1205, all OK. Drove to Passy. Drove home via AutoRoute (55km). All OK. Checked Fault Code, MIL off, P0404 ERG valve stuck (open/closed not shown) <a href="#">see freeze frame report</a> . Erased DLC. ERG clean cycle audible.		
18/08/17	Departed Les Houches on AutoRoute, very slight hunting from Sallanches onwards also puffs of black smoke. Entered limp mode at Bonneville J17 (50km). Stopped ; inspected engine bay nothing found re-started OK. Departed Bonneville J17 on AutoRoute and entered limp mode at J18 (La Vallee Vert) (10km). Stopped and restarted engine OK. Drove to Leroy Merlin Annemasse (13km), all OK. Departed Leroy Merlin via AutoRoute entered Limp Mode at Bonneville J17 (23km of which 10km on AutoRoute) MIL light on. Stopped and restarted engine. Drove to LH via D1205 (53km), all OK. Called at three Land Rover Garages all closed for holiday. ERG valve cleaning cycle audible. Checked fault codes. P0299 turbo under pressure - <a href="#">see freeze frame report</a> . Reset MIL & Erased DLC Removed and cleaned MAP sensor with "aerosol Clutch and Brake cleaner". Inspected electrical connection. Fitted new Air Filter. Visual inspection of MAF sensor and MAF connector- nothing found.		
19/08/17	Drove Les Houches to Le Bossons via AutoRoute, slight hunting and puffs of black smoke (5km)		
23/08/17	Checked diagnostics with iCarSoft LR - no faults found. ERG cleaning cycle audible and appeared normal on diagnostics monitoring. Drove Les Houches to Sallanches: slight surging and puffs of black smoke from Passy on AutoRoute (10km). EGR command ~16% dropping to 0% with surging/smoke. MAP and MAF varying with surging/smoke. Fuel rail pressure $\pm 5\%$ , intake air temp, and barometric pressure all constant. EGR cleaning cycle audible on engine switch off. No DTC's. <b>Un-plugged EGR valve</b> . Road tested - performance normal, MIL on.		
24/08/17	With EGR valve un-plugged: Drove to Bonneville J17 an AutoRoute. Returned to Sallanches on RN. Returned to Les Houches. Everything normal (except MIL on - caused by EGR un-plugged. No loss of power, no smoke, no		

	surging.) Ordered new ERG valve.		
01/09/17	Fitted new EGR valve (OEM) cleared fault codes and road tested. Everything normal. No DTC's recorded.		
2/9/17	<p>Les Houches to Sallanches: no surging, puffs of black smoke started at Dormancy then "limp mode" (80kph, reduced power) at Sallanches (28km). P0299 Turbo Under Boost, pending. Turbo output fault detected - TRUE. ERG audible on shut down. Engine reset and OK, re-joined AutoRoute. After 8km (36km) limp mode. Re started engine OK for another 4km the Limp mode. MIL on <a href="#">see freeze frame report</a>. Re started engine and drove on RN to Sallanches everything normal. Un-plugged EGR valve and returned to Les Houches on AutoRoute - everything normal - no smoke.</p> <p>Checked fault codes:</p> <p>After Initial limp mode      P0299 Turbo Under Pressure</p> <p>After unplugged EGR also:   P2562 Turbo Control Position</p> <p>                                       P1402 EGR Sensor</p> <p>                                       P0403 EGR Control Circuit</p> <p>                                       P1409 EGR vacuum regulator solenoid circuit</p> <p>After driving 30km also:                         - commanded position not reachable</p> <p>                                                          see P0403</p> <p>                                       P1103 MAF in range but high</p>		

## Freeze Frame Reports

P0404 is the DTC that caused this Freeze Frame Data to be Stored on 14/08/17

Exhaust Gas Recirculation Circuit Range/Performance

Calculated Load	83.9 %	
Coolant Temperature	87 °C	188.6 °F
Engine Speed	1981 Rpm	
Manifold Absolute Pressure	205 kPaA	29.7 PsiA
Vehicle Speed	93 Kmh	58 Mph
Intake Air Temperature	15 °C	59.0 °F
Mass Air Flow	80.17 g/s	10.6 lb/min
Engine Runtime	01 Hrs 46 Min 24 Sec	Don't recognise this figure

P0299 is the DTC that caused this Freeze Frame Data to be Stored on 18/08/17

Turbo Under Pressure

Calculated Load	100%	
Coolant Temperature	89 °C	192.2 °F
Engine Speed	1982 Rpm	
Manifold Absolute Pressure	139 kPaA	20.02 PsiA
Vehicle Speed	91 Kmh	57 Mph
Intake Air Temperature	27 °C	60.6 °F
Mass Air Flow	52.04 g/s	6.9 lb/min
Engine Runtime	00 Hrs 09 Min 5 Sec	

02/09/17 DTC that caused required freeze frame data storage P0299

(The day after fitting new EGR valve)

Calculated Load	100.0%	Unexpected
Engine Coolant Temperature	89°C	
Intake Manifold Absolute Pressure	134.0 kPa	
Engine RPM	1981 /min	
Vehicle Speed	92 km/h	
Intake Air Temperature	13 °C	
Air Flow Rate from Mass Air Flow Sensor	59.02 g/s	
Time Since Engine Start	1094 sec.	= 18 min. 14 sec.
Fuel Rail Pressure	109430 kPa	Impossible !
Barometric Pressure	94 kPa	
Control module voltage	14.25 V	
Accelerator Pedal Position D	34.1%	
Accelerator Pedal Position E	33.3%	

## Workshop Manual for P0299:

P029900	Turbocharger A under boost condition	<ul style="list-style-type: none"> <li>• Turbocharger circuit fault</li> <li>• Turbocharger fault</li> <li>• Engine control module (ECM) fault</li> </ul>	<p>Clear the DTCs and test for normal operation.</p> <p>Check the turbocharger and circuits. Refer to the electrical guides. Rectify as necessary. Check turbocharger operation, check for sticking turbocharger vanes etc. Install a new turbocharger if necessary. REFER to: <a href="#">Turbocharger</a> (303-04B Fuel Charging and Controls - Turbocharger - 2.4L Duratorq-TDCi HPCR (103kW/140PS) - Puma. Removal and Installation).</p>
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“Check the turbocharger and circuits. Refer to the electrical guides .....”

## Conclusion:

With EGR valve “plugged in” (applied to Old and New ERG valve).

- Puffs of black smoke when driving on AutoRoute (constant 65mph, 2000rpm). Very slight surging felt with old ERG valve but not with new ERG valve. Starts after 1-5km of level “ish” AutoRoute and does not happen on steeper sections.
- Acceleration feels normal and maximum power feels normal.
- After 5-10km Maximum speed suddenly becomes limited to 50mph (80kmh) in any gear and acceleration is limited (it’s possible that Turbo boost may be limited to 100Pa). RPM is not limited.
- Tick over is steady and normal.
- If the AutoRoute is re-joined the engine reverts suddenly to “limp mode” every 1-5km.
- If non-AutoRoute are used the vehicle drives normally once the engine is restarted.
- There are no fluid leaks or visual problems in the engine bay.

With the ERG valve “un-plugged” (applied to Old and New ERG valve).

- No Puffs of black smoke
- No surging
- Engine does not enter “limp mode” or whatever is limiting maximum speed and power output.
- The vehicle feels completely normal
- MIL comes on (understandably)

When running up and down the valley on non-AutoRoute roads (mainly hills) the following are completely normal:

- Power Output
- Tick Over
- Never stalls
- EGR cleaning cycle is audible on engine switch off
- Dashboard temperature gauge (mid-range and static)
- Acceleration, gear changes and hill climbing
- Cold, warm and part warm starting
- Heavy traffic (stop, start) driving
- Engine braking, long or short duration
- Full electrical load has discernible effect (air con. + heated seats + heated rear + heated windscreen + lights etc.)

The problem has not occurred on the long steep sections of the AutoRoute (Dormancy to Les Houches) where near maximum power is required in 6<sup>th</sup> and sometimes 5<sup>th</sup> gear. Power feels normal along this section.

Smoke has been observed on the less steep AutoRoute section from Les Houches to Chamonix but the vehicle has not entered limp mode. (Possible this section is not long enough or the power output required is too high to trigger the fault.)