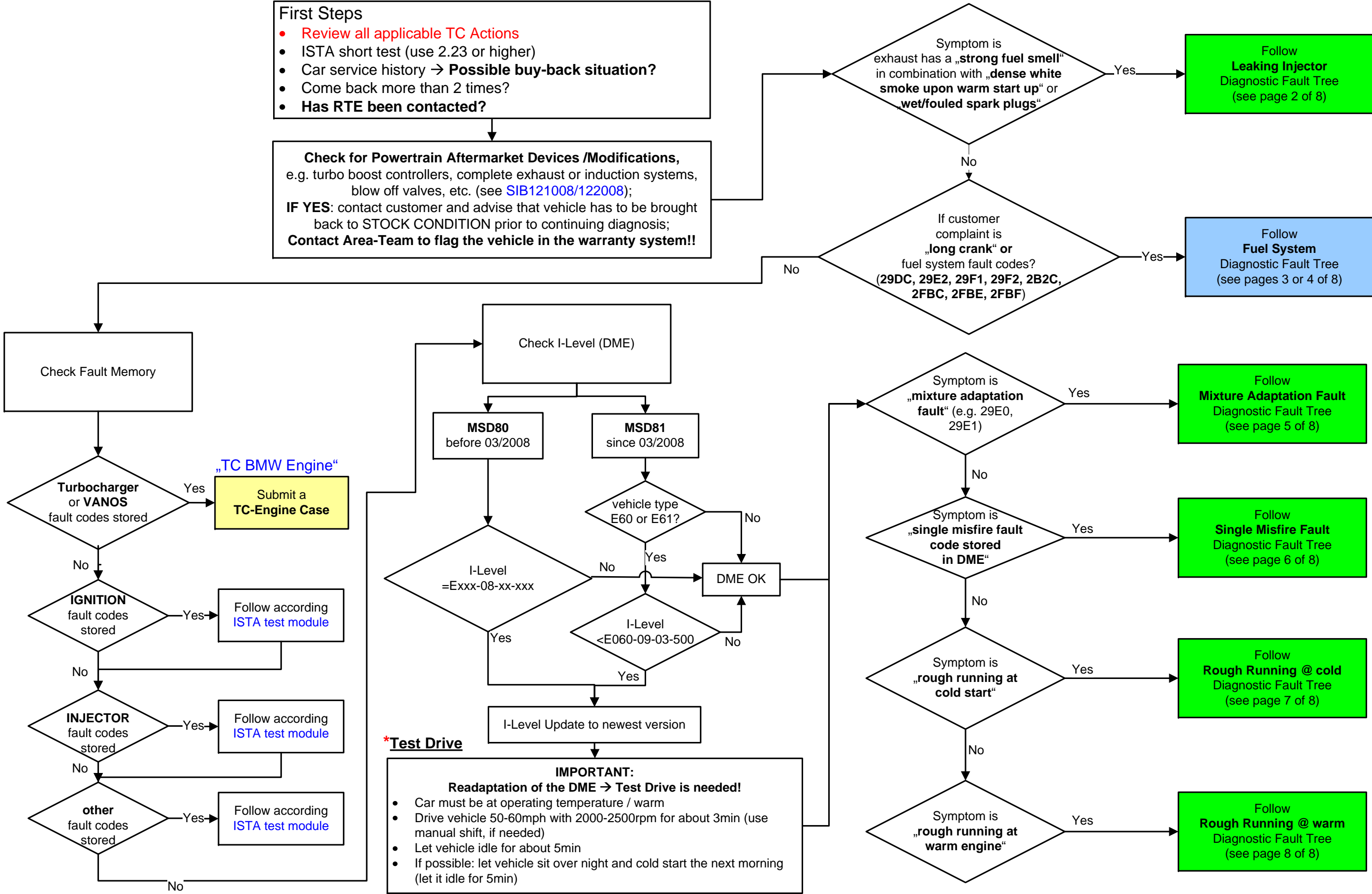


N54 Engine Diagnostic Fault Tree Version 01_06_11

- First Steps**
- Review all applicable TC Actions
 - ISTA short test (use 2.23 or higher)
 - Car service history → **Possible buy-back situation?**
 - Come back more than 2 times?
 - **Has RTE been contacted?**

Check for Powertrain Aftermarket Devices /Modifications,
 e.g. turbo boost controllers, complete exhaust or induction systems,
 blow off valves, etc. (see [SIB121008/122008](#));
IF YES: contact customer and advise that vehicle has to be brought
 back to STOCK CONDITION prior to continuing diagnosis;
Contact Area-Team to flag the vehicle in the warranty system!!

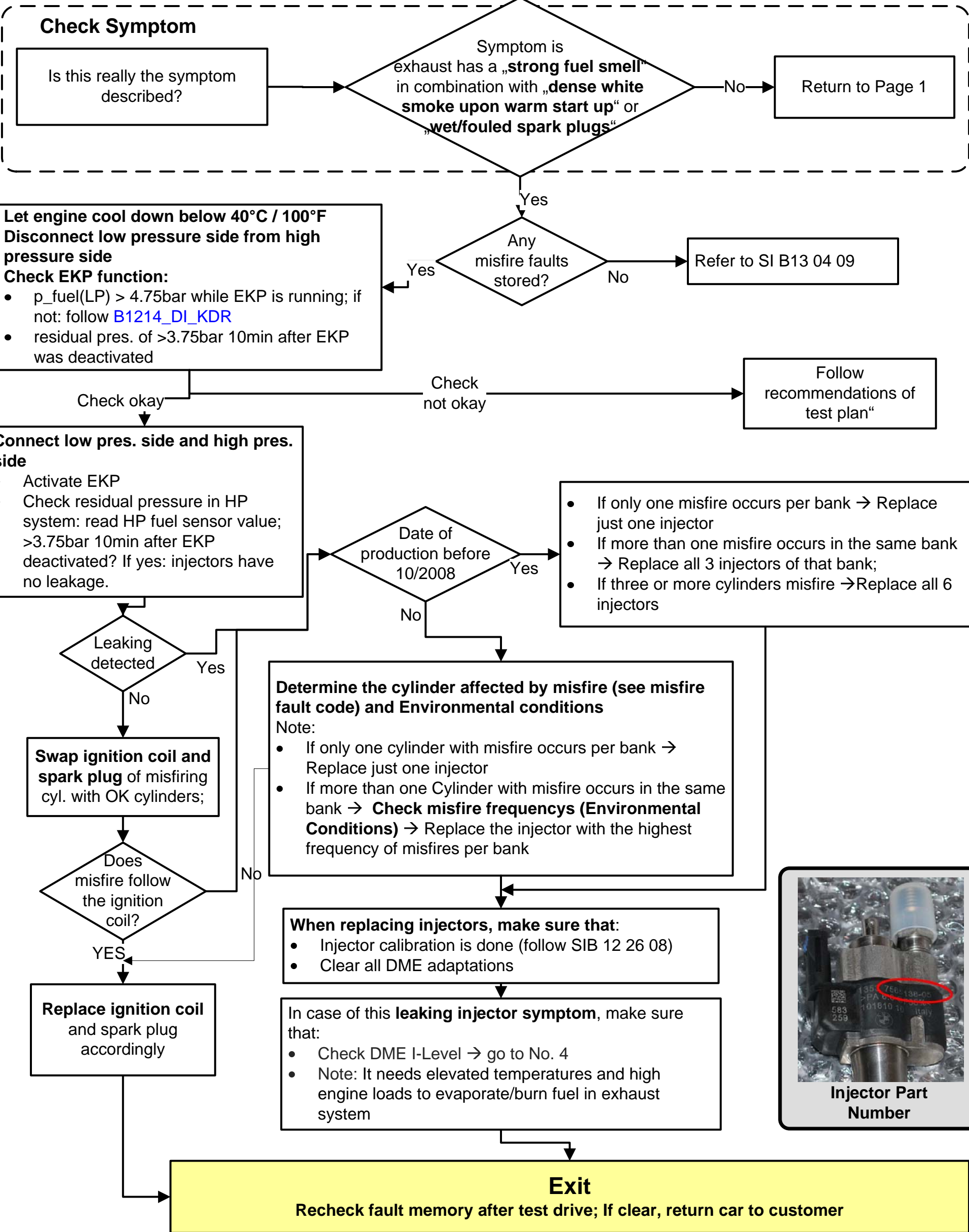


***Test Drive**

IMPORTANT:
Readaptation of the DME → Test Drive is needed!

- Car must be at operating temperature / warm
- Drive vehicle 50-60mph with 2000-2500rpm for about 3min (use manual shift, if needed)
- Let vehicle idle for about 5min
- If possible: let vehicle sit over night and cold start the next morning (let it idle for 5min)

DFT – Leaking Injector



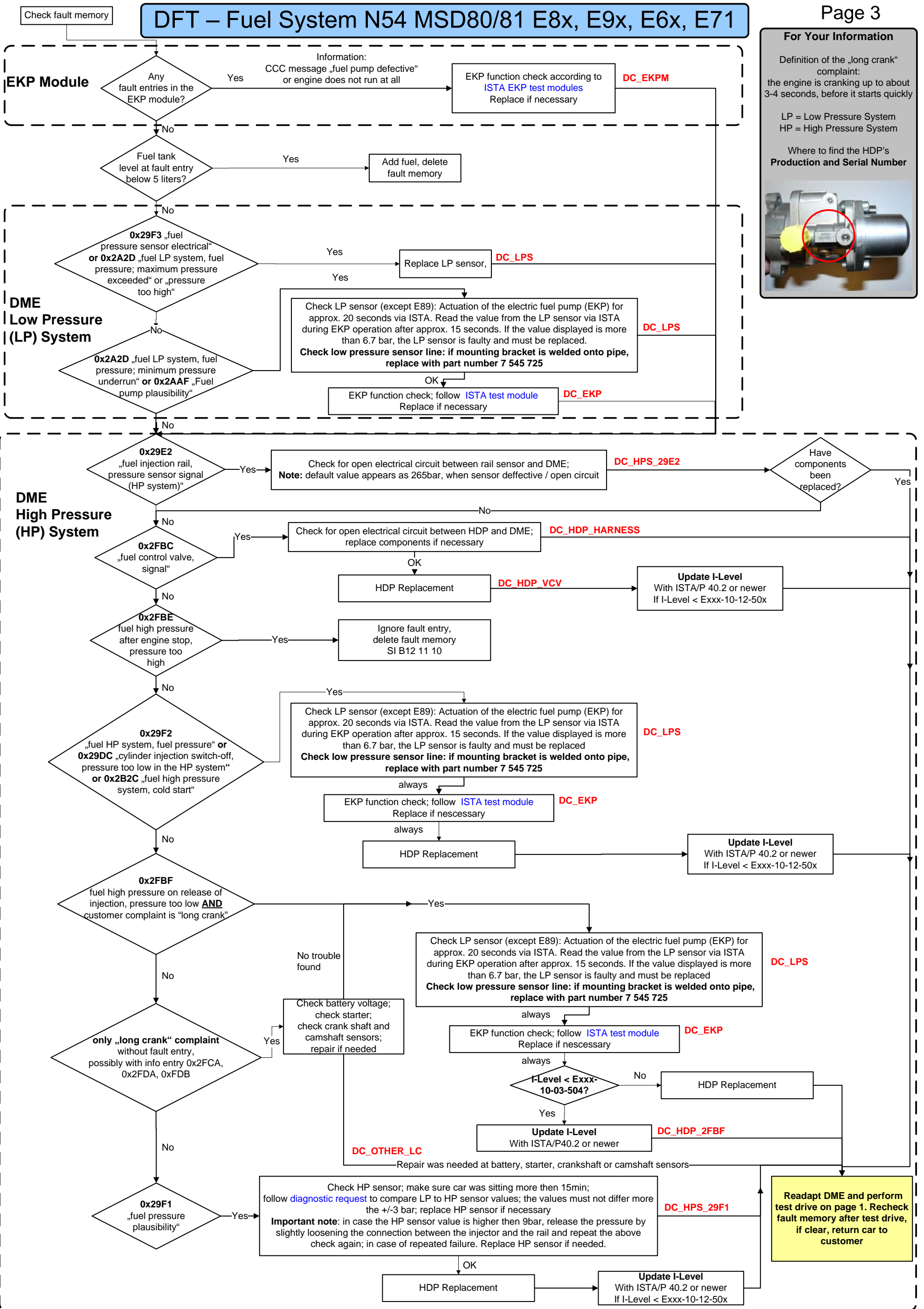
DFT – Fuel System N54 MSD80/81 E8x, E9x, E6x, E71

For Your Information

Definition of the „long crank“ complaint:
the engine is cranking up to about 3-4 seconds, before it starts quickly

LP = Low Pressure System
HP = High Pressure System

Where to find the HDP's
Production and Serial Number




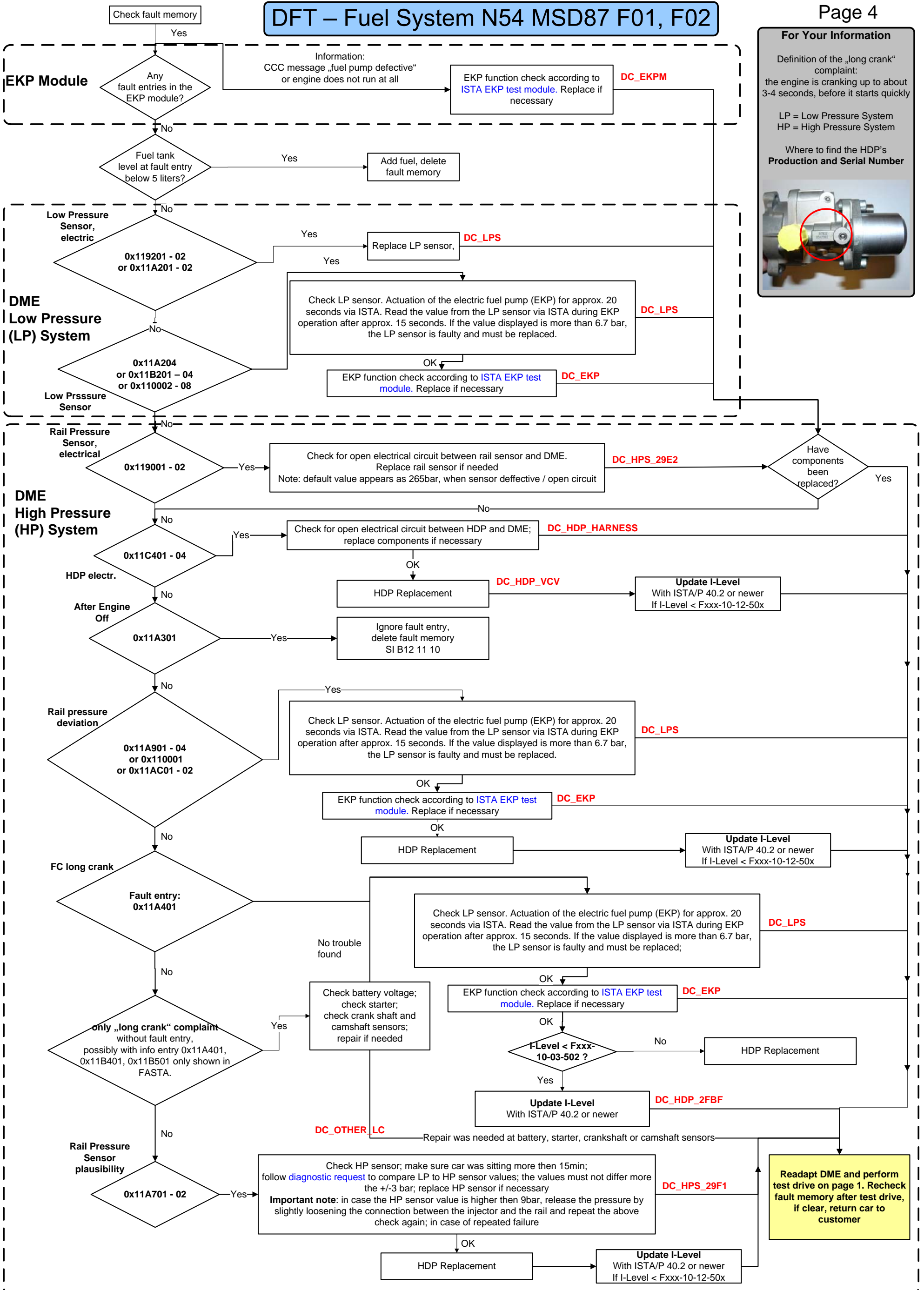
DFT – Fuel System N54 MSD87 F01, F02

For Your Information

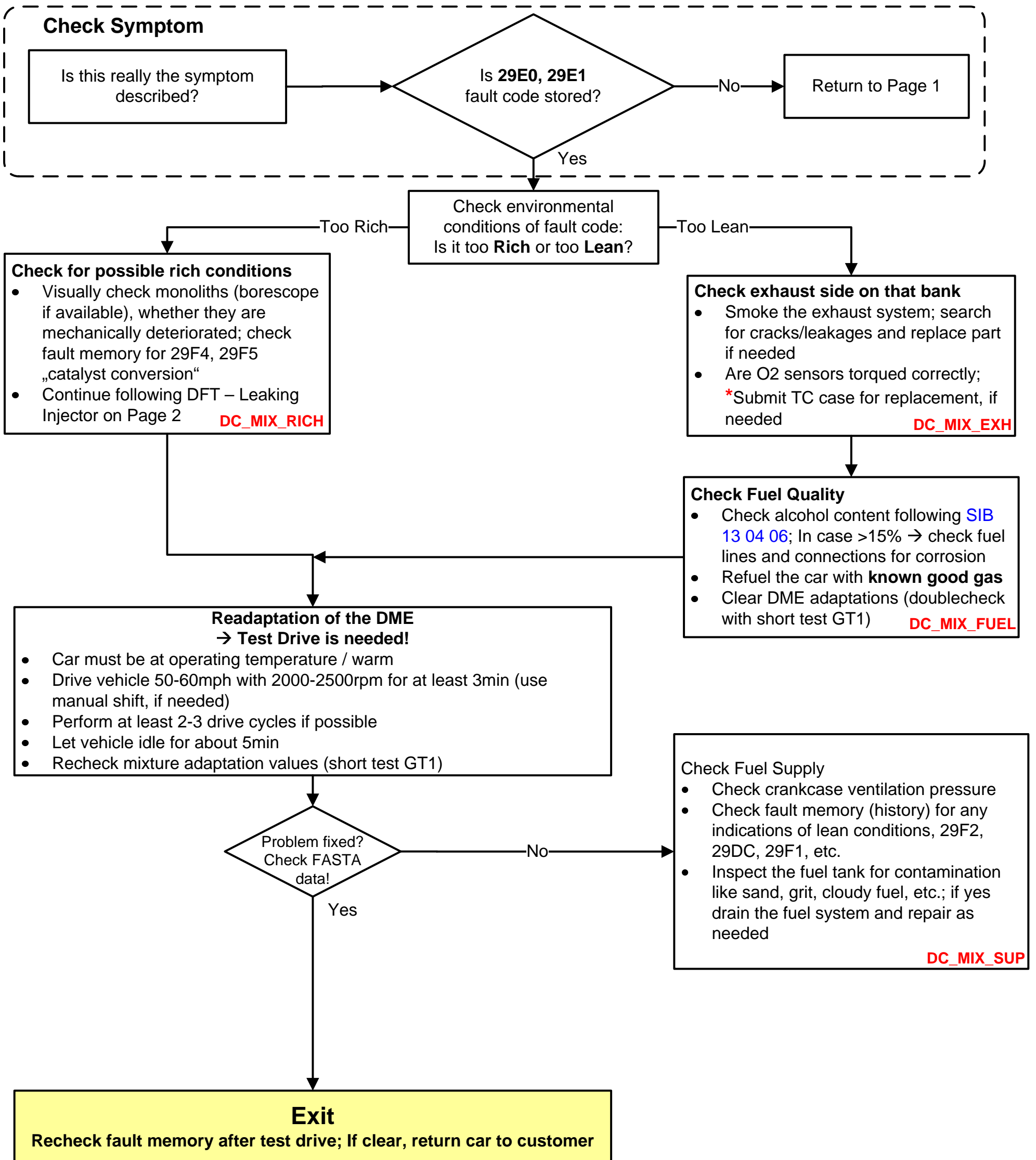
Definition of the „long crank“ complaint:
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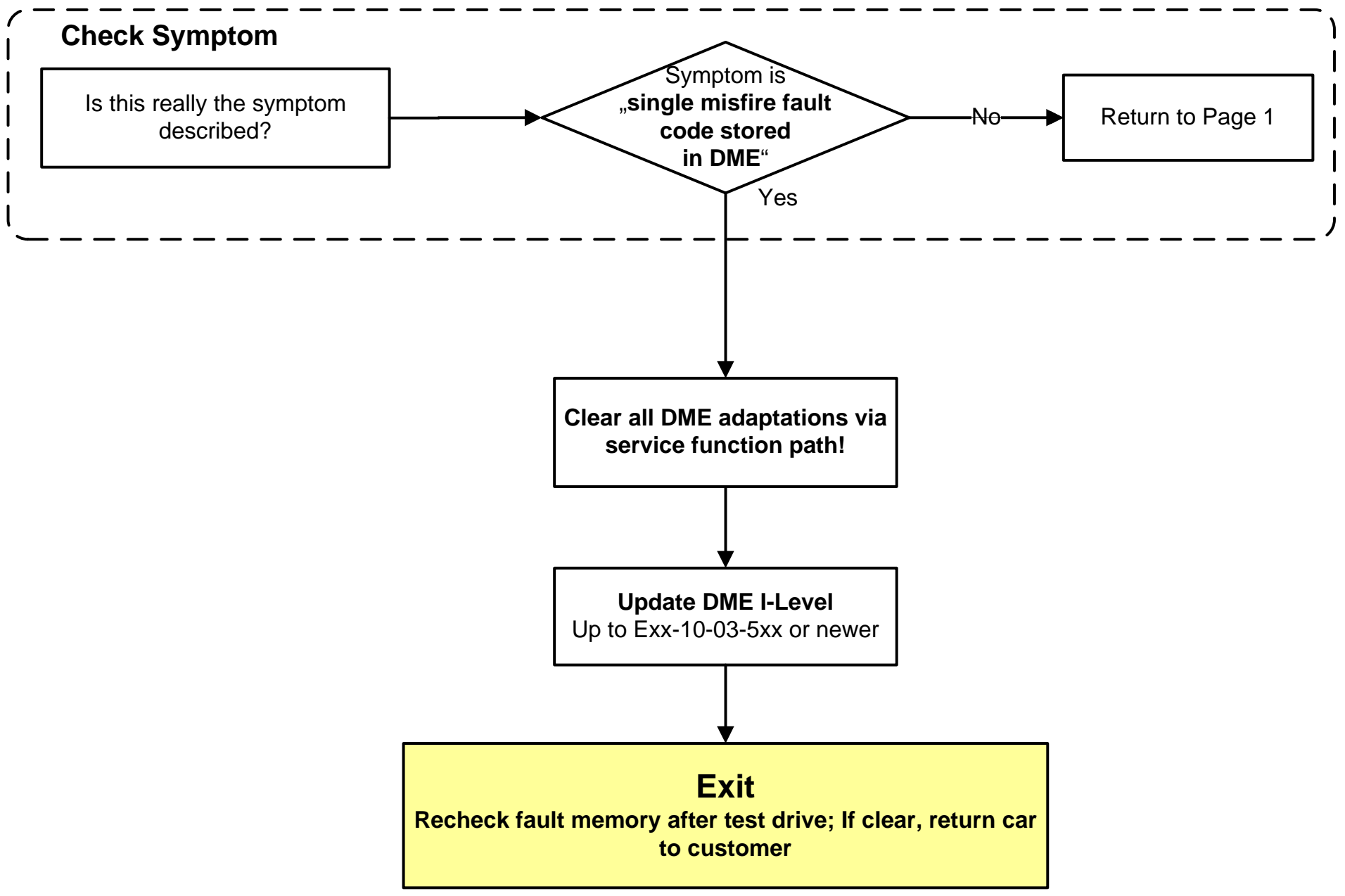
Where to find the HDP's
Production and Serial Number

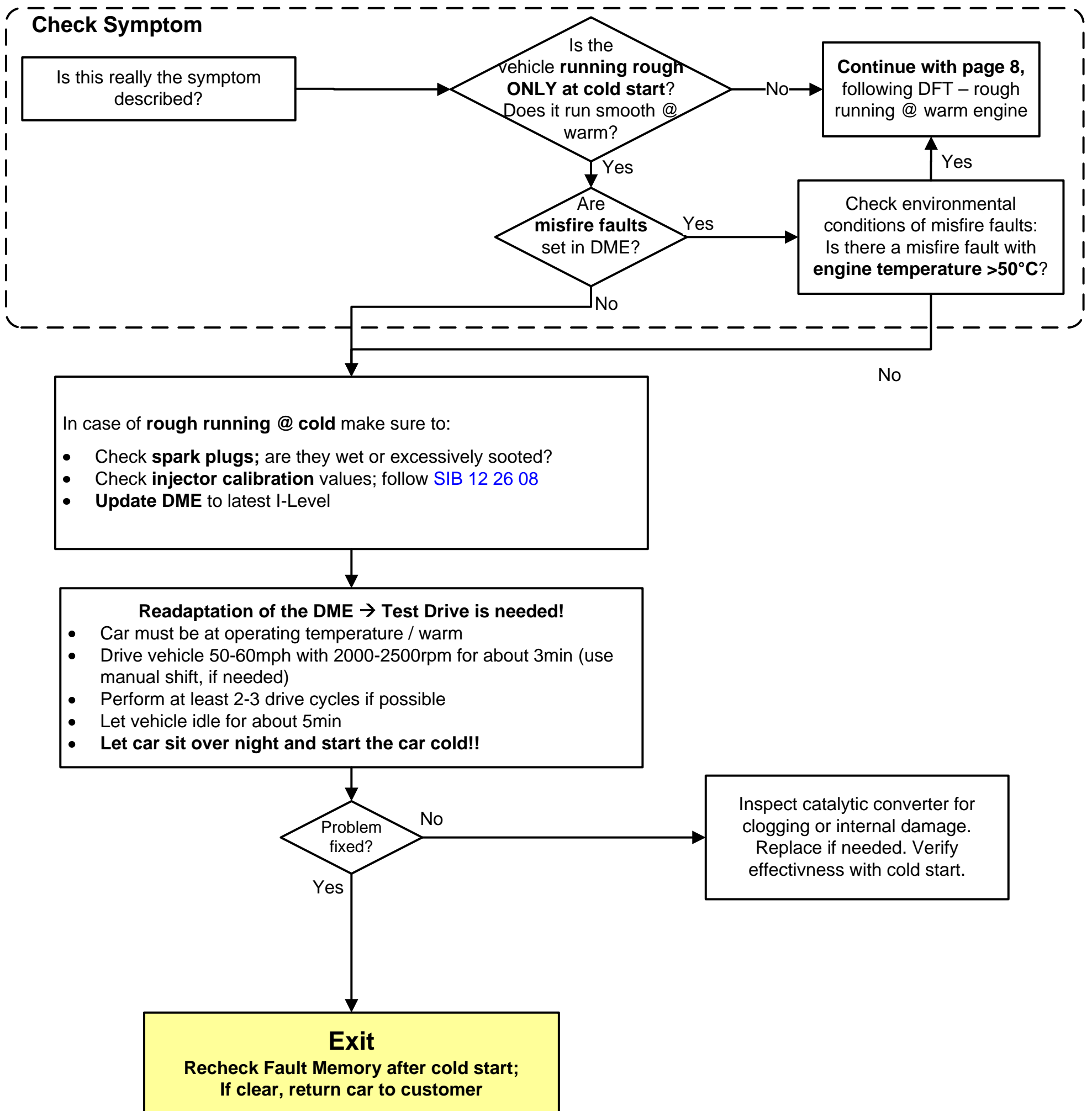
DFT – Mixture Adaptation Fault



DFT – Single Misfire Fault



DFT – Rough Running @ Cold Start

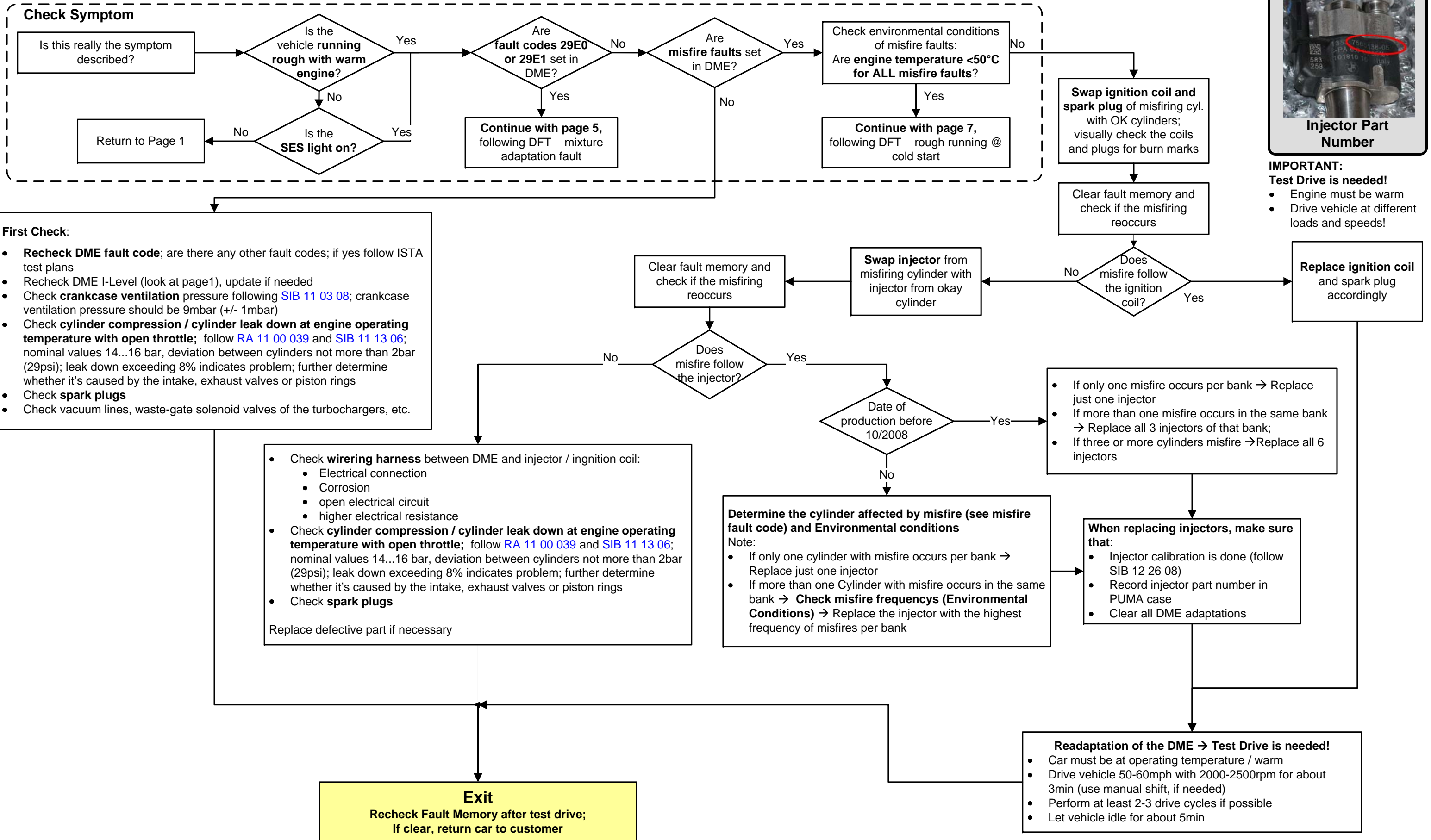


DFT – Rough Running @ Warm Engine



IMPORTANT:
Test Drive is needed!

- Engine must be warm
- Drive vehicle at different loads and speeds!



First Check:

- **Recheck DME fault code**; are there any other fault codes; if yes follow ISTA test plans
- Recheck DME I-Level (look at page1), update if needed
- Check **crankcase ventilation** pressure following [SIB 11 03 08](#); crankcase ventilation pressure should be 9mbar (+/- 1mbar)
- Check **cylinder compression / cylinder leak down at engine operating temperature with open throttle**; follow [RA 11 00 039](#) and [SIB 11 13 06](#); nominal values 14...16 bar, deviation between cylinders not more than 2bar (29psi); leak down exceeding 8% indicates problem; further determine whether it's caused by the intake, exhaust valves or piston rings
- Check **spark plugs**
- Check vacuum lines, waste-gate solenoid valves of the turbochargers, etc.

- Check **wiring harness** between DME and injector / ignition coil:
 - Electrical connection
 - Corrosion
 - open electrical circuit
 - higher electrical resistance
- Check **cylinder compression / cylinder leak down at engine operating temperature with open throttle**; follow [RA 11 00 039](#) and [SIB 11 13 06](#); nominal values 14...16 bar, deviation between cylinders not more than 2bar (29psi); leak down exceeding 8% indicates problem; further determine whether it's caused by the intake, exhaust valves or piston rings
- Check **spark plugs**

Replace defective part if necessary

Determine the cylinder affected by misfire (see misfire fault code) and Environmental conditions

Note:

- If only one cylinder with misfire occurs per bank → Replace just one injector
- If more than one Cylinder with misfire occurs in the same bank → **Check misfire frequencies (Environmental Conditions)** → Replace the injector with the highest frequency of misfires per bank

- If only one misfire occurs per bank → Replace just one injector
- If more than one misfire occurs in the same bank → Replace all 3 injectors of that bank;
- If three or more cylinders misfire → Replace all 6 injectors

When replacing injectors, make sure that:

- Injector calibration is done (follow [SIB 12 26 08](#))
- Record injector part number in PUMA case
- Clear all DME adaptations

Readaptation of the DME → Test Drive is needed!

- Car must be at operating temperature / warm
- Drive vehicle 50-60mph with 2000-2500rpm for about 3min (use manual shift, if needed)
- Perform at least 2-3 drive cycles if possible
- Let vehicle idle for about 5min

Exit
 Recheck Fault Memory after test drive;
 If clear, return car to customer