



Laboratory Report experiment laboratory vehicles, in the vehicle Ledico ltd company. BOSCH representative in Israel

Present test vehicle

Mr. Erez Mosafi - Manager training guide.

Head of Bosch representative company Ledico Israel .

Mr. Yariv Sharmi - invites inspection.

Performed the testing – Mr. Erez Mosafi.

Test date – Oct/Nov 2009 .

Tested by LEDICO-BOSCH representative



Laboratory tests vehicles performance, “FUEL DOCTOR- FD 47

Cars tested:

- Mazda, Model 3, Year 2007, Engine model Z6.
- Mazda, Model 6, Year 2008, Engine model LF.
- Ford, Model Focus, Year 2008, Engine model SHDA.

The tests order that were performed in the laboratory included:

Power test in a chassis bi axel dynamometer.

- A relative compression test in an electronic device.
- Emission test in a 4 gas device including LAMBADA value.
- Computerized fault scanner test for the injection system, ignition system and combined engine system.
- Weigh Fuel consumption test.at dydomemter 10 km,speed 85 km/h,2000-2300 rpm.

The tests were performed in 3 rounds each time. In the test's framework, the “Fuel Doctor” FD 47 was inserted to the lighter socket in order to measure the differences between the test results.



Points for the exam and study in preparation for the experiment:

- External fuel tank with internal pump including Microns filter.
- Quick gas pipeline connections
- Log on scanner mishaps.
- Air pressure 32 tires According SS Islands.
- 0.23 drag coefficient.
- Barometric pressure - 103 Pa.
- Environmental air temperature 23 degrees Celsius for inspection.
- Fuel used: 95 octane (95 Ron).



How injection system work?

Fuel injection system is computer controlled system, aimed at raising The efficiency of the engine, engine power, fuel savings and preventing air pollution. Fuel injection system injects fuel syringe intervals induction manifold. The purpose of fuel injection system to provide all Cylinder the exact amount of fuel Necessary to prevent the according to data sensors .Required to perform this task Computer capable of processing data available depending on the speed of the engine load. The data provide sensors installed engine that convert the values Measured electrical signals. Fuel injected immediately before the suction valve, air induction manifold provides data in accordance with the engine.





Vehicle info: Ford Focus



BOSCH
Bosch Diagnostics Software
ESI[tronic]

10/27/2009
12:32:05 PM

Vehicle info

Description	Information
Make	FORD
Model range	Focus II
Manufacturer's model range	GA
Vehicle type	Focus II 1.6 i
Manufacturer identifier	-
Kind of vehicle	Notchback Saloon
Year of manufacture	06/2004 -
Power	77 kW / 105 PS
Bodywork / cab type	-
Bodywork / cab no.	-
Chassis model	-
Axle structure sample	-
Axle configuration	-

Tested by LEDICO-BOSCH representative



Vehicle info: Ford Focus

Motor tag	BZ
Motor identifier	DOHC 16v
Further engine types	-
Engine Manufacturer	-
Cubic capacity	1.6 l (1.596 l)
Cylinder	4
Kind of motor	Otto engine, Suction engine
Structural shape	In-line engine
Fuel mixture	Gasoline injection
Vehicle voltage	12 V
Introduction market	ZA
Country of manufacture	ZA
RB key	FOR 3695

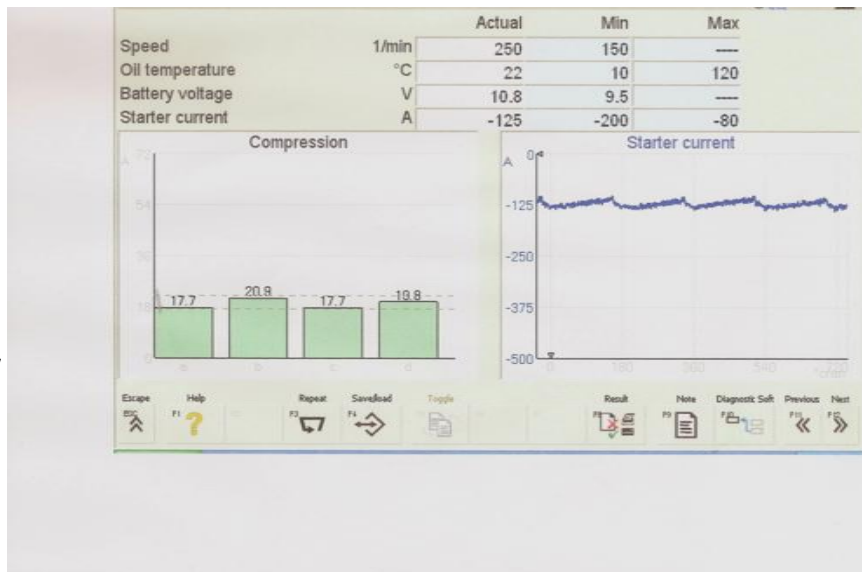
Equipment systems:

Kind of system	Description	Version	Manufacturer
Bodywork			
Airbag	AB	9.0	BOSCH
Body service	Manual interval reset	-	-
Lighting	Cornering light	M5.0	-
Lighting	Static ALWR	5.0	-
Lighting	Xenon light	P5.0	-



Compression test vehicle using a two channel oscilloscope

- Engine Temperature at test: 96 ° C
- Air Temperature at test: 53 ° C
- Engine compression test: + /-1A
- **Test result:**
The engine is in good mechanical condition .
- Data about the vehicle manufacturer



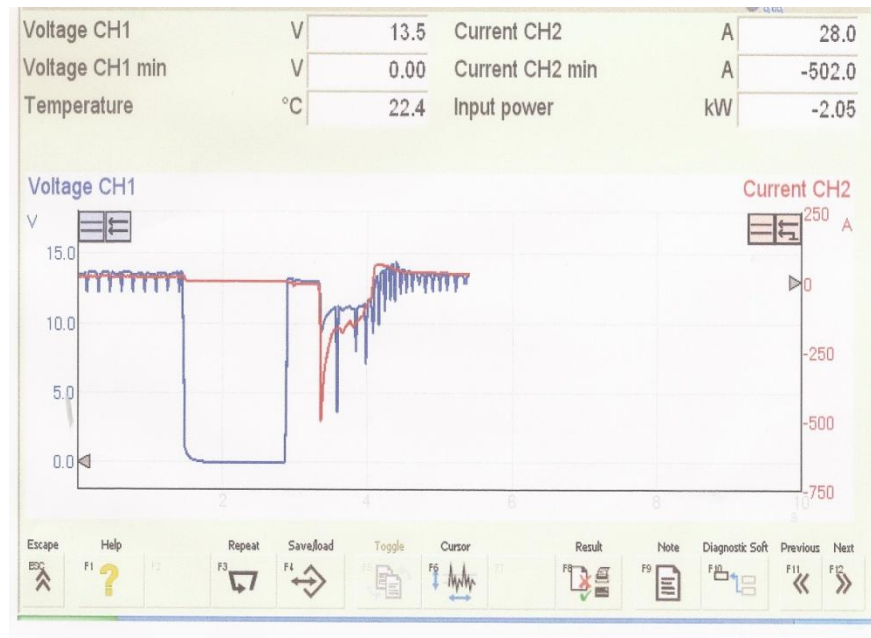


Starting voltage & starting current Check at engine working temperature

- Engine Temperature at test: 96 ° C
- Air Temperature at test: 53 ° C
- Max Current Starter :502A (peak)
- Battery recovers by excitation Alternator short period when the vehicle is running Idle rpm.

Test result:

- Alternator starter system operate in a manufacturer's data.





Injection time idle speed test

(800 rpm)

Without FD-47

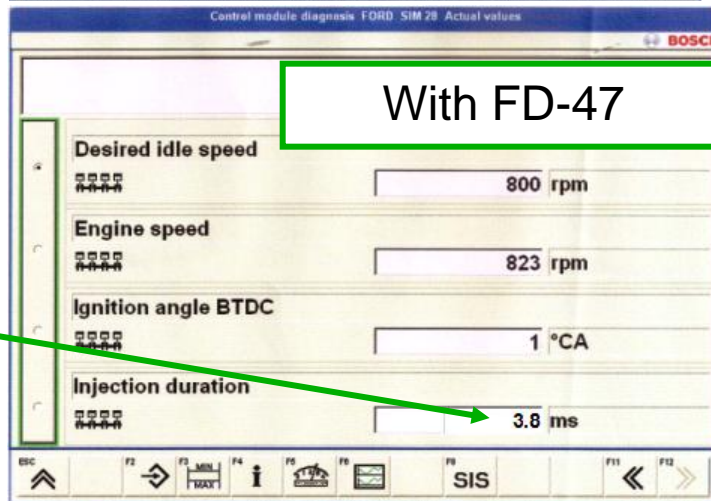
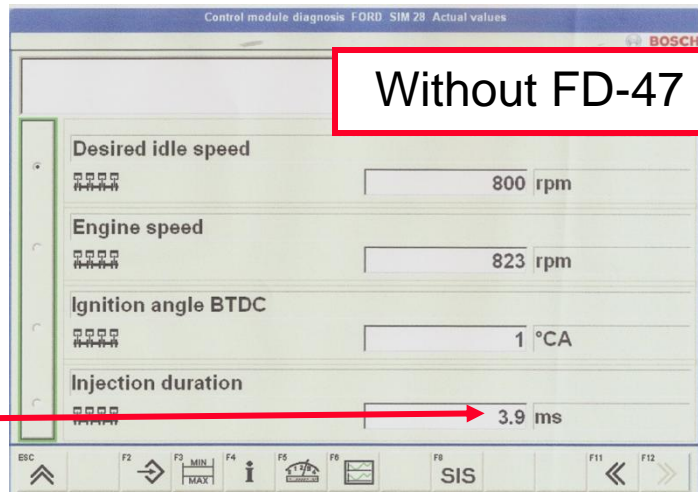
- Engine Temperature at test: 96 ° C
- Air Temperature at test: 53 ° C
- Injection duration :**3.9ms.**

With FD-47

- Engine Temperature at test: 96 ° C
- Air Temperature at test: 53 ° C
- Injection duration :**3.8ms.**

With 47-FD has a drop of 0.1ms during the injection at idle speed.

This result explains the fuel savings we receive further practical test .





Dynamometer test with same condition

Without FD-47

FLA - 206 SOFTWARE VERSION
 13.09.2009
 Robert Bosch GmbH
 Franz-Oechsle Strasse 4
 73201 Plochingen
 Tel.: 07153/666-0

ENGINE PERFORMANCE

Prated= 77 kW
 Pmax = 63.8 kW
 Ptol = -17.2 %

nspecs= 4500 1/min
 at v = 120.0 km/h
 Pwheel= 48.4 kW

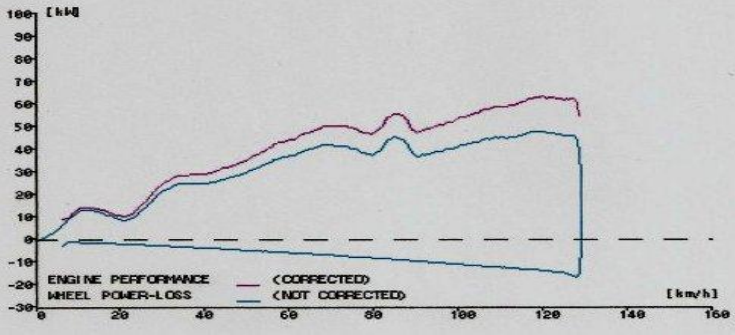
vmax = 130 km/h
 n = *** 1/min
 Ploss = 13.2 kW

Temp. = 30 C
 PASSENGER CAR
 4-STROKE SECONDARY

Press. = 994 hPa
 AUTOMATIC

k = 1.036 (DIN)
 FRONT WHEEL DRIVE

- Manufacturer's data:77kw.
- Power at test: **63.8kw**
- Power tolerance: -17.2 kw



With FD-47

FLA - 206 SOFTWARE VERSION
 13.09.2009
 Robert Bosch GmbH
 Franz-Oechsle Strasse 4
 73201 Plochingen
 Tel.: 07153/666-0

ENGINE PERFORMANCE

Prated= 77 kW
 Pmax = 70.1 kW
 Ptol = -9.0 %

nspecs= 4500 1/min
 at v = 110.5 km/h
 Pwheel= 56.1 kW

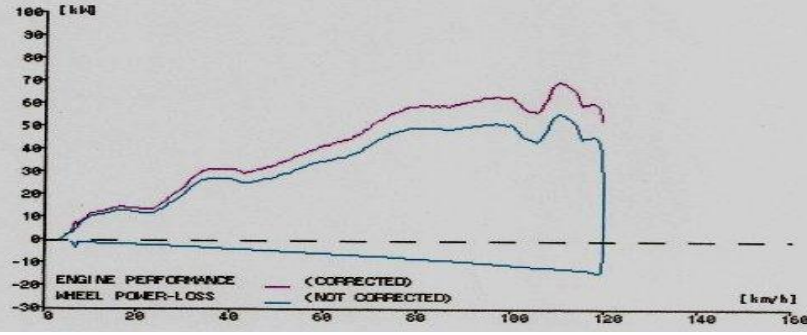
vmax = 130 km/h
 n = *** 1/min
 Ploss = 11.5 kW

Temp. = 31 C
 PASSENGER CAR
 4-STROKE SECONDARY

Press. = 994 hPa
 AUTOMATIC

k = 1.038 (DIN)
 FRONT WHEEL DRIVE

- Manufacturer's data:77kw.
- Power at test: **70.1kw.**
- Power tolerance: -9.0kw.



With the FD-47 has a **9.9%** improvement in engine capacity.



Exhaust gases Analysis test

Without FD-47

Average:

Co2: **15.795%** vol.

```
-----
B O S C H
Exhaust gas analysis
-----
BEA version: V3.00-EURO
AMM version: 5575
-----
Date: 27.10.2009
Time: 15:55
-----
Fuel: Petrol
-----
Result of measure 1
-----
Oil temp. 27 °C
Lambda 1.002
CO 0.010 % vol
CO2 15.79 % vol
HC 3 ppm vol
O2 0.05 % vol
COcor 0.010 % vol
-----
Result of measure 2
-----
Oil temp. 27 °C
Lambda 0.999
CO 0.003 % vol
CO2 15.80 % vol
HC 2 ppm vol
O2 -0.01 % vol
COcor 0.003 % vol
-----
```

With FD-47

Average:

Co2: **15.74%** vol.

```
-----
B O S C H
Exhaust gas analysis
-----
BEA version: V3.00-EURO
AMM version: 5575
-----
Date: 27.10.2009
Time: 17:02
-----
Fuel: Petrol
-----
Result of measure 1
-----
Oil temp. 29 °C
Lambda 0.999
CO 0.026 % vol
CO2 15.74 % vol
HC -0 ppm vol
O2 -0.01 % vol
COcor 0.026 % vol
-----
Result of measure 2
-----
Oil temp. 29 °C
Lambda 0.999
CO 0.025 % vol
CO2 15.74 % vol
HC -0 ppm vol
O2 -0.01 % vol
COcor 0.025 % vol
-----
```

With the FD-47 has 0.055% reduction of CO2 emissions of the exhaust.

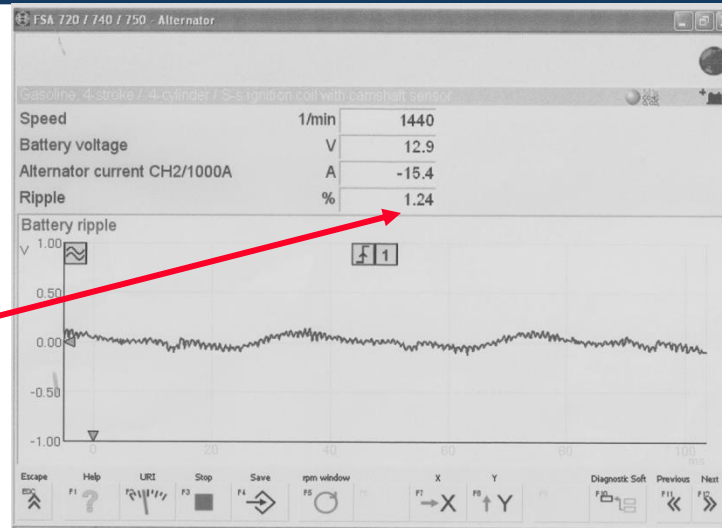


Ripple fluctuations in the test

Without FD-47

Engine Temperature at test: 96 ° C

- Air Temperature at test: 53 ° C
- U-ripple: 1.24%.



With FD-47

Engine Temperature at test: 96 ° C

- Air Temperature at test: 53 ° C
- U-ripple: 0.48%.



With 47-FD has a **58%** reduction wave ripples.
An optimization of the electrical system .



**Laboratory Testing Equivalence fuel consumption,
Driving 10 km, Speed 85 km/h, 2000-2300 rpm.**

Without FD-47

Fuel consumption: 530 grams .

With FD-47

Fuel consumption: 450 grams .



With the FD-47 has a **16%** improvement in fuel consumption.



Summary results of the Ford Focus test

Test type	Without FD-47	With FD-47	Conclusions
Motor output	63.8 KW	70.1 KW	+9.5 KW
4 gases test	~CO2-15.795%	CO2-15.74%	-0.055%
Compression	Average start up current- 116 AMP	Average start up current 128 AMP	+ 12 AMP
Injection time idle speed (800 rpm)	3.9 ms	3.8 M/S	- 0.1 M/S
Scanner Faults	No fault	No fault	
Fuel consumption	530 gr.	450 gr.	80 gr - 16% saving