

Mazda6

**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.

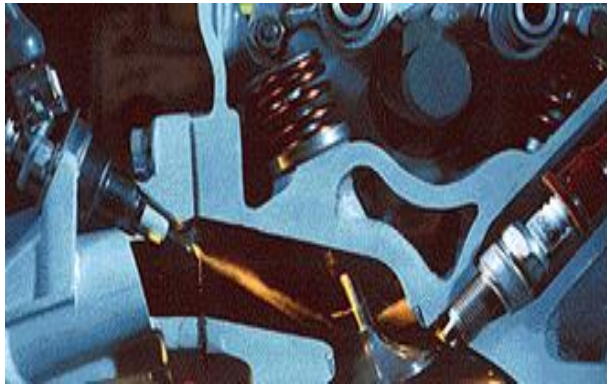
The tests were performed in 3 rounds each time. In the test's framework, the “Fuel Doctor” FD 47 was inserted to the lighter socket in order to measure the differences between the test results.

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: Mazda 6



BOSCH
Bosch Diagnostics Software
ESI[tronic]

11/1/2009

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Vehicle info

Description	Information
Make	MAZDA
Model range	6 [GH] Fastback
Manufacturer's model range	GH
Vehicle type	6 2.0 MZR Fastback
Manufacturer identifier	-
Kind of vehicle	Squareback/hatchback limousine
Year of manufacture	08/2007 -
Power	108 kW / 147 PS
Bodywork / cab type	-
Bodywork / cab no.	-
Chassis model	-
Axle structure sample	-
Axle configuration	-

Vehicle info: Mazda 6

Motor tag	LF
Motor identifier	-
Further engine types	-
Engine Manufacturer	-
Cubic capacity	2.0 l (1.999 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	-
Country of manufacture	J
RB key	MAZ 1703

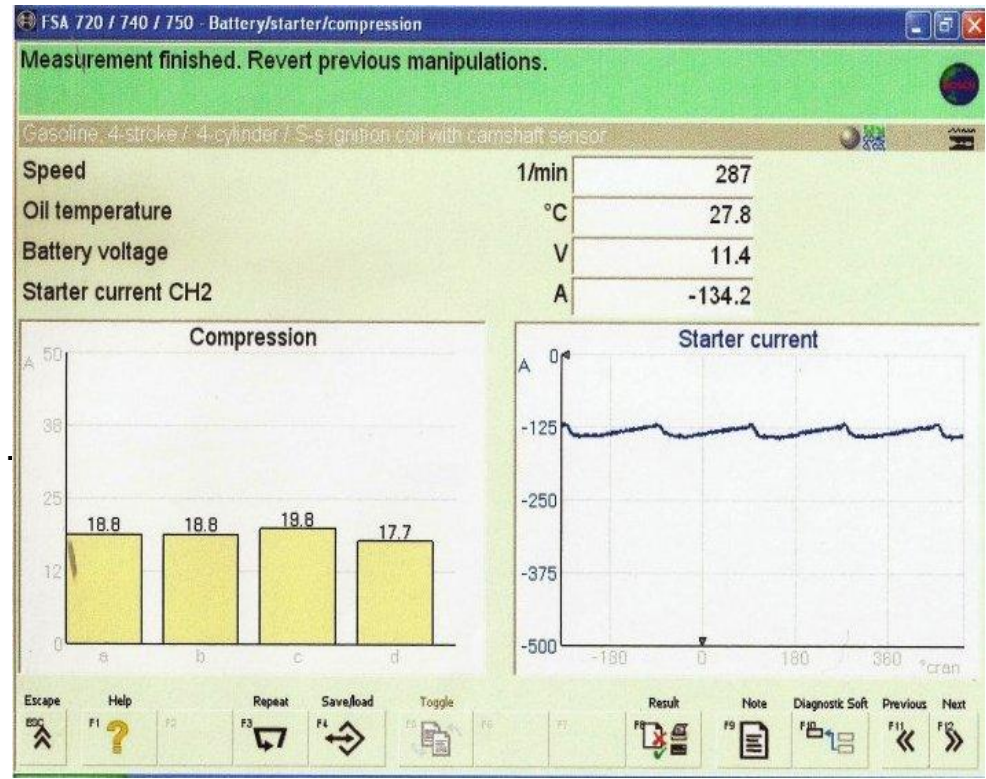
Equipment systems:

Kind of system	Description	Version	Manufacturer
Bodywork			
Airbag	AB	8.6	BOSCH
Central electronics	ZE	8.6	-
Heater/air conditioner	Automatic A/C	8.6	-
Instrumentation	Instrument cluster	8.6	-
Suspension			
Running gear/steering	Electric power steering	8.6	-

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 .

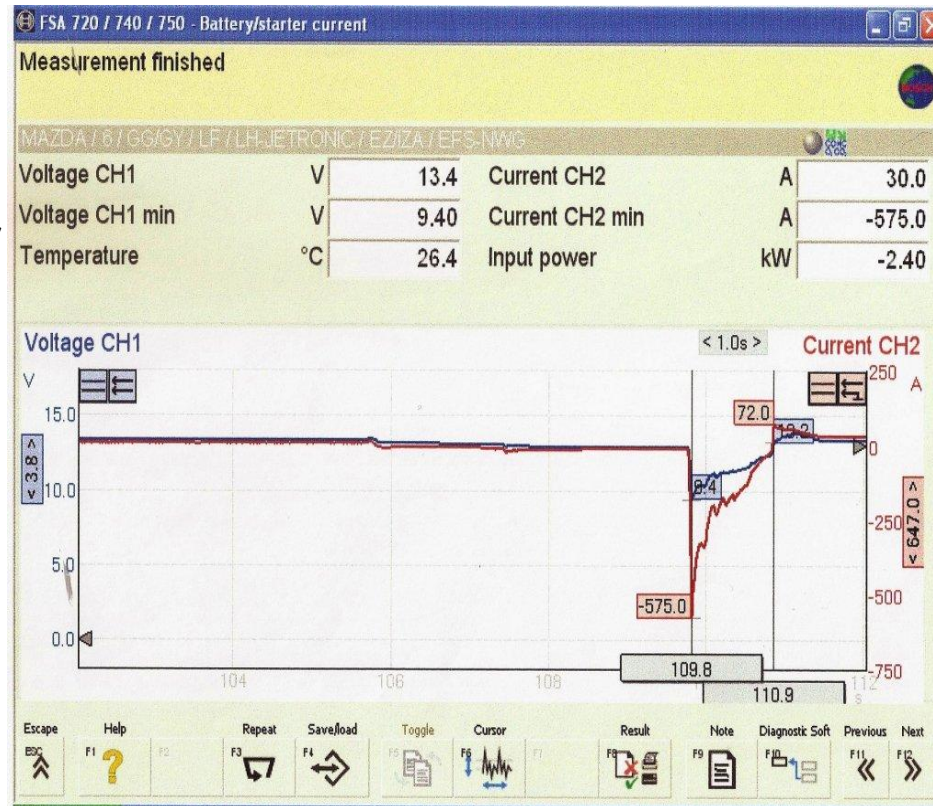


Starting voltage & starting current Check at engine working temperature

- Engine Temperature at test: 96 ° C
- Air Temperature at test: 53 ° C
- Max Current Starter :575A (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

(760 rpm)

Without FD-47

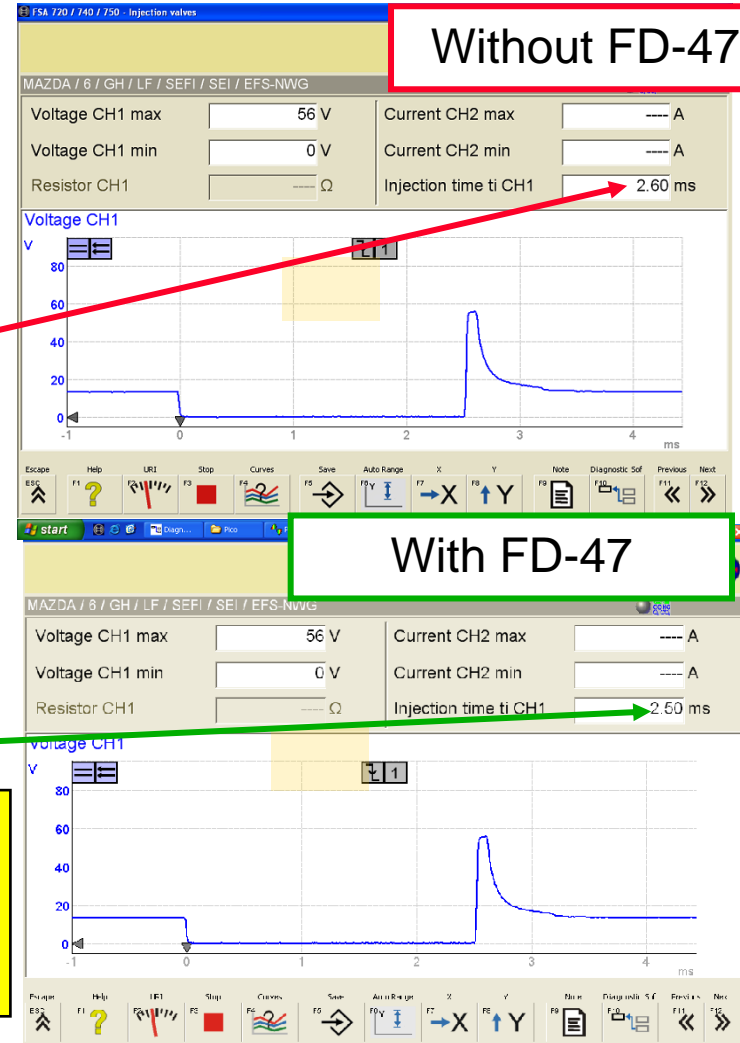
- Engine Temperature at test: 96 ° C
- Air Temperature at test: 53 ° C
- Injection duration :**2.6ms.**

With FD-47

- Engine Temperature at test: 96 ° C
- Air Temperature at test: 53 ° C
- Injection duration :**2.5ms.**

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 .



Injection time cruise test

(2910-2970 rpm)

Without FD-47

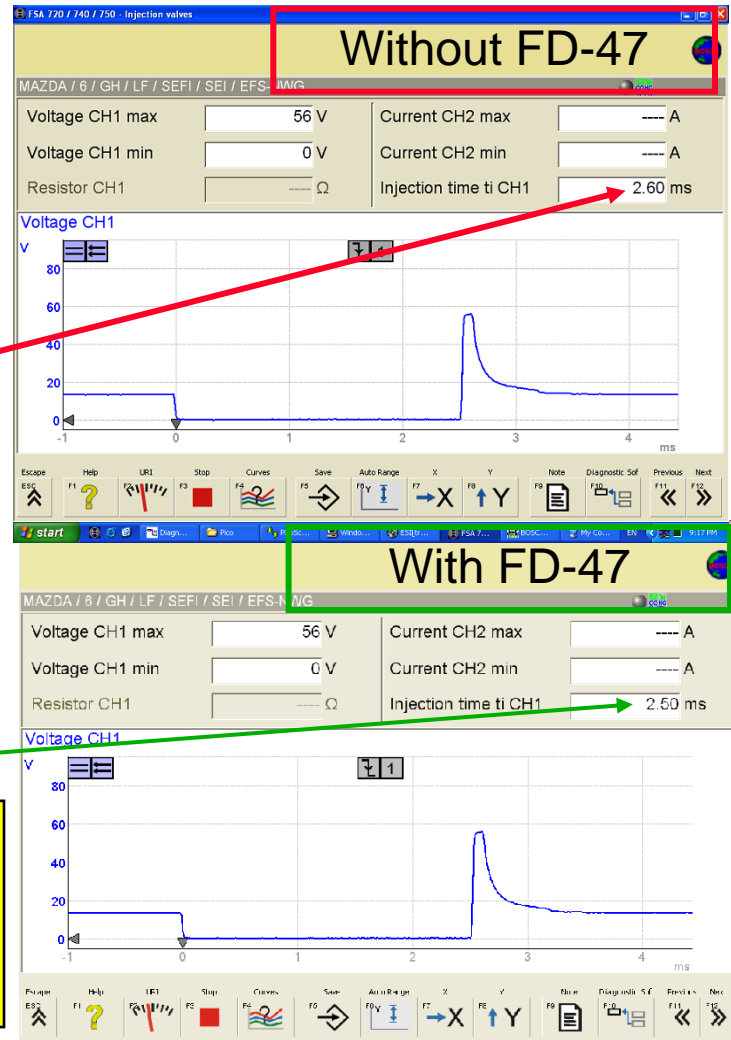
- Engine Temperature at test: 96 ° C
- Air Temperature at test: 53 ° C
- Injection duration cruise: **2.6ms**

With FD-47

- Engine Temperature at test: 96 ° C
- Air Temperature at test: 53 ° C
- Injection duration cruise: **2.5ms.**

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

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



Dynamometer test with same condition

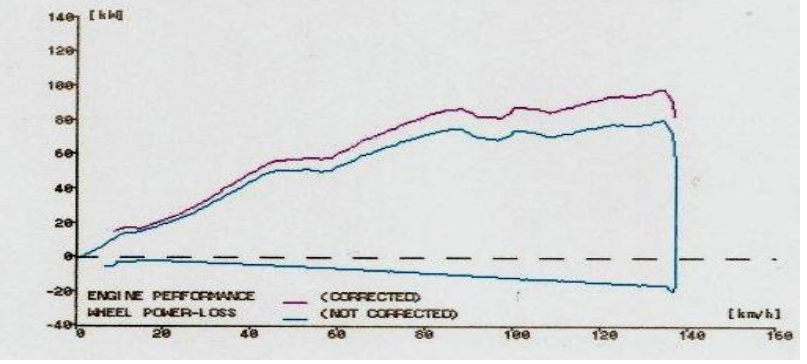
Without FD-47

FLA - 206 SOFTWARE VERSION
15.09.2009
Robert Bosch GmbH
Franz-Oechsle Strasse 4
73201 Plochingen
Tel.: 07153/666-0

ENGINE PERFORMANCE

Prated=	108 kW	nspecs=	4700 1/min	vmax =	125 km/h
Pmax =	99.2 kW	at v =	134.5 km/h	n =	*** 1/min
Pto1 =	-8.2 %	Pwheel=	80.9 kW	Ploss =	15.4 kW
Temp =	26 C	Press.=	993 hPa	k =	1.031 (DIN)
PASSENGER CAR		AUTOMATIC		FRONT WHEEL DRIVE	
4-STROKE SECONDARY					

- Manufacturer's data:108kw.
- Power at test: **99.2kw**
- Power tolerance: -8.2 kw



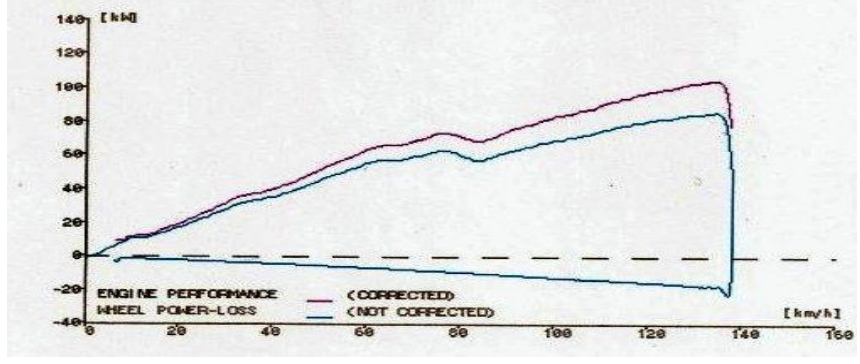
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ENGINE PERFORMANCE

Prated=	108 kW	nspecs=	4700 1/min	vmax =	125 km/h
Pmax =	105.8 kW	at v =	135.0 km/h	n =	*** 1/min
Pto1 =	-2.1 %	Pwheel=	86.5 kW	Ploss =	16.2 kW
Temp =	26 C	Press.=	993 hPa	k =	1.031 (DIN)
PASSENGER CAR		AUTOMATIC		FRONT WHEEL DRIVE	
4-STROKE SECONDARY					

- Manufacturer's data:108kw.
- Power at test: **105.8kw.**
- Power tolerance: -2.1kw.



With the FD-47 has a **6.7%** improvement in engine capacity.

Exhaust gases Analysis test

Without FD-47

Average:
Co2: **15.89%** vol.

With FD-47

Average:
Co2: **15.50%** vol.

Without FD-47

Oil temp.	18		°C
Lambda	1.005		
CO	0.010	% vol	
CO2	15.89	% vol	
HC	-2	ppm vol	
O2	0.12	% vol	
COcar	0.010	% vol	

With FD-47

Oil temp.	17		°C
Lambda	1.011		
CO	0.011	% vol	
CO2	15.50	% vol	
HC	-0	ppm vol	
O2	0.25	% vol	
COcar	0.011	% vol	

With the FD-47 has 0.39% 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: 0.8%.

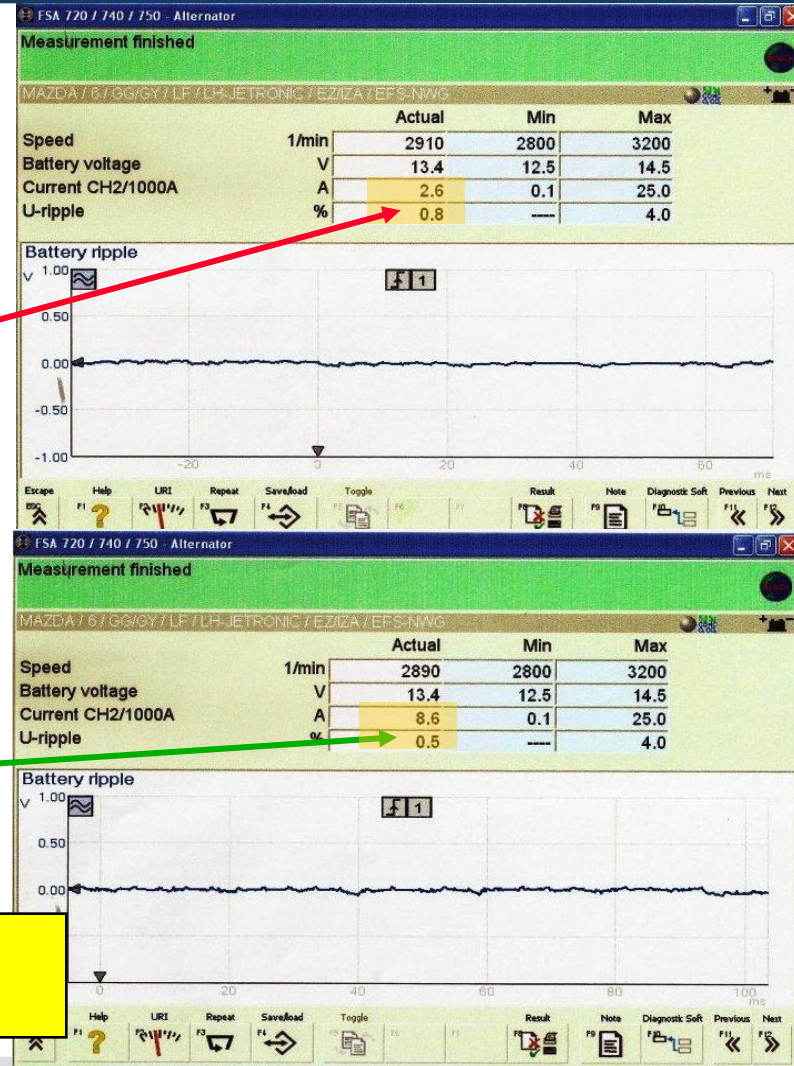
With FD-47

Engine Temperature at test: 96 ° C

- Air Temperature at test: 53 ° C
- U-ripple: 0.5%.

With 47-FD has a **38%** reduction wave ripples.

An optimization of the electrical system .



MAZDA6

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

Without FD-47

Fuel consumption: 475 grams .

With FD-47

Fuel consumption: 415 grams .



With the FD-47 has a **13%** improvement in fuel consumption.

Summary results of the Mazda 6 test

Test type	Without FD-47	With FD-47	Conclusions
Motor output	99.2 KW	105.8 KW	+6.6 KW
4 gases test	~CO2-15.89%	CO2-15.50%	-0.39%
Compression	Average start up current- 130 AMP	Average start up current 120 AMP	10- AMP
Injection time idle speed (760 rpm)	2.6 ms	2.5 M/S	- 0.1 M/S
Injection time Cruse (2900 rpm)	2.6ms	2.5ms	-0.1ms
Scanner Faults	No fault	No fault	
Fuel consumption	475 gr.	415 gr.	70 gr - 13% saving