

# BOSCH INJECTION PUMP TEST SPECIFICATIONS ELECTRICAL TEST

Observe notes in remark column

Test sheet : Audi  
Date of manufacture :  
Edition : 30.05.1994  
Replaces :  
Test oil : ISO 4113

Injection pump : VE5/11E2300L460-1

Type No. : 0 460 415 994  
Customer Ident.No. :

Customer-specific details  
Customer : Audi

Engine : 180-02-TDI-C4

Output kW :  
Speed 1/min :

## TEST BENCH PREREQUISITES

Inlet pressure, bar: 0.30...0.40

Calibrating nozzle-  
holder assembly > : 1 688 901 114

Opening  
pressure > bar : 207...210

Test pressure line : 1 680 750 085

Outer diameter : 6.00  
x wall thickness > : 2.20  
x length > mm : 350

Overflow valve : 2 467 413 009

Test line : 0 986 612 440  
(fuel-delivery  
actuator) :

Test line : 0 986 612 435  
Solenoid valve  
start of injection):

## TEST PRECONDITIONS

Test oil  
return temp. > °C  
with thermometer : 55

Test oil supply  
temperature > °C : 42...47

Hold-up  
revolutions >1/min : 1200  
Feedback  
voltage mV : 2500

Actuator  
Connections 4 and 7  
Test temperature:  
15°...30°C, ohms : 0.4...1.0  
50°...70°C, ohms : 0.45...1.1

Connections 4 and.  
ground, Mohms min. : 1.0  
Connections 7 and  
ground, Mohms min. : 1.0  
Connections 2 and 7  
Mohms min. : 1.0  
Connections 4 and 6  
Mohms min. : 1.0

High-pressure compressor sensor  
Sensor coils  
Connections 1 and 3  
Ohms : 4.9...6.5  
Connections 2 and 3  
Ohms : 4.9...6.5  
Connections 1 and 2  
Ohms : 9.8...13.0

Connections 1 and.  
ground, Mohms min. : 1.0  
Connections 2 and  
ground, Mohms min. : 1.0  
Connections 3 and  
ground, Mohms min. : 1.0

Temperature sensor, fuel  
Connections 5 and 6  
Test temperature:  
15°...30°C, kohms : 1.2...4.0  
50°...70°C, kohms : 0.3...1.2

Connections 5 and  
ground, Mohms min. : 1.0  
Connections 6 and  
ground Mohms min. : 1.0

Solenoid valve, start of injection  
Connections 1 and 2  
Test temperature :  
15°...30°C, ohms : 14.3...17.3  
50°...70°C, ohms : 15.5...21.0

Starting stop mV : 4120...4650

Shutoff stop mV : 650...850

Setting values of injection pump  
Check values in brackets

Supply pump pressure:

Speed 1/min : 750  
Checkbk. volt.  
mV : 3900  
Setting value, bar : 6.0...7.0

Timing device travel:

Speed 1/min : 750  
Checkbk. volt  
mV : 3900  
Setting value, mm : 9.3...9.5

Full-load delivery :

1st temperature-conditioning  
revolution 1/min : 2125  
Checkbk. volt  
mV : 2500  
Output  
temperature °C : 61  
Speed 1/min : 750  
Checkbk. volt  
mV : 2460  
Measuring  
temperature °C : 57  
Fuel delivery cm<sup>3</sup>/  
> 1000s : 40.8...41.2  
Dispersion cm<sup>3</sup>/  
> 1000s :

Test specifications of injection pump  
Check values in brackets

Supply pump pressure variations:

1st speed 1/min : 2125  
Checkbk. volt  
mV : 3900  
Supply pump  
pressure > bar : 7.9...8.9  
> bar :

Timing device variations:

1st speed 1/min : 500  
Checkbk. volt. mV : 3900  
Timing device  
travel mm : 7.5...9.9  
> mm : (7.2...10.2)

2nd speed 1/min : 750  
Checkbk. volt. mV : 3900  
Timing device  
travel mm :  
> mm : (7.5...11.3)

3rd speed 1/min : 1200  
Checkbk. volt. mV : 1800  
Timing device  
travel mm : max. 0.3  
> mm : (max. 2.5)

Solenoid valve  
Start of  
injection, volts : 12

4.th speed 1/min : 2125  
Checkbk. volt. mV : 3900  
Timing device  
travel mm : 11.6...12.6  
> mm : (11.5...12.7)

Overflow at overflow valve:

1st temperature-conditioning  
revolution 1/min : 100  
Checkbk. volt. mV : 2500  
Output  
temperature °C : 51  
Speed 1/min : 2125  
Checkbk. volt. mV : 3900  
Measuring  
temperature °C : 53  
Overflow : 97...180  
> cm<sup>3</sup>/10s :

## Fuel delivery variations:

1st temperature-conditioning  
revolution 1/min : 100  
Checkbk. volt mV : 2500  
Output  
temperature °C : 51  
Speed 1/min : 2125  
Checkbk. volt mV : 3910  
Meßtemperatur °C : 53  
Fuel delivery cm³/ : 55.7...58.3  
> 1000s : (55.0...59.0)  
Dispersion cm³/ : 3.0  
> 1000s :

2nd temperature-conditioning  
revolution 1/min : 2125  
Checkbk. volt mV : 2500  
Output  
temperature °C : 60  
Speed 1/min : 1000  
Checkbk. volt mV : 3210  
Measuring  
temperature °C : 56  
Fuel delivery cm³/ : 56.8...59.4  
> 1000s : (56.1...60.1)  
Dispersion cm³/ : 3.0  
> 1000s :

3rd temperature-conditioning  
revolution 1/min : 2125  
Checkbk. volt mV : 2500  
Output  
temperature °C : 61  
Speed 1/min : 750  
Checkbk. volt mV : 2460  
Measuring  
temperature °C : 57  
Fuel delivery cm³/ :  
> 1000s : (39.7...42.3)  
Dispersion cm³/ :  
> 1000s :

4th temperature-conditioning  
revolution 1/min : 2125  
Checkbk. volt mV : 2500  
Output  
temperature °C : 61  
Speed 1/min : 500  
Checkbk. volt mV : 2320  
Measuring  
temperature °C : 57  
Fuel delivery cm³/ : 41.9...44.5  
> 1000s : (41.2...45.2)  
Dispersion cm³/ : 3.0  
> 1000s :

## Idle delivery:

1st temperature-conditioning  
revolution 1/min : 2125  
Checkbk. volt mV : 2500  
Output  
temperature °C : 61  
Speed 1/min : 500  
Checkbk. volt mV : 1520  
Meßtemperatur °C : 57  
Fuel delivery cm³/ : 10.2...13.5  
> 1000s : (9.2...15.2)  
Solenoid valve  
Start of  
injection, volts : 12  
Dispersion cm³/ : 3.0  
> 1000s : (4.0)

## Starting fuel delivery:

1st temperature-conditioning  
revolution 1/min : 2125  
Checkbk. volt mV : 2500  
Output  
temperature °C : 65  
Speed 1/min : 100  
Checkbk. volt mV : 2960  
Measuring  
temperature °C : 61  
Fuel delivery cm³/ : 79.0  
> 1000s :  
Solenoid valve  
Start of  
injection, volts : 12

## Stop test:

Speed 1/min : 1500  
Checkbk. volt mV : 4125  
ELAB volts : 0  
Fuel delivery cm³/ :  
max. 1000s : 3.0  
Solenoid valve  
Start of  
injection, volts : 12  
Shutoff solenoid:  
Cut-in voltage  
min.> volts : 10.0  
Rated voltage,  
volts : 12.0

Notes:  
High-pressure compressor sensor  
Testing only possible with ballast  
EPS 910

Take note of test instructions  
"Distributor pump for direct  
injectors"!

Dimensions for mounting and setting:

Description		
K	mm	: 2.7...2.9
KF	mm	: 6.5...6.9
SVS max.	mm	:
FH	mm	:
TS		: 1 467 010 494