

Table of Contents

Tool Description.....2

Directions

Using the B100.....3

Function Reference.....3

Reading DTCs (diagnostic trouble codes).....3

Resetting Check-Engine and Service Engine Soon.....3

Clearing DTC's (diagnostic trouble codes).....3

Resetting Oilservice and Inspection Light.....3

Resetting Maintenance milage indicator.....3

Determining which code table to use.....4

How to read the code tables.....4

Code tables 1987 -1995 / "FF" tables.....4

Code tables 1996 and later.....13

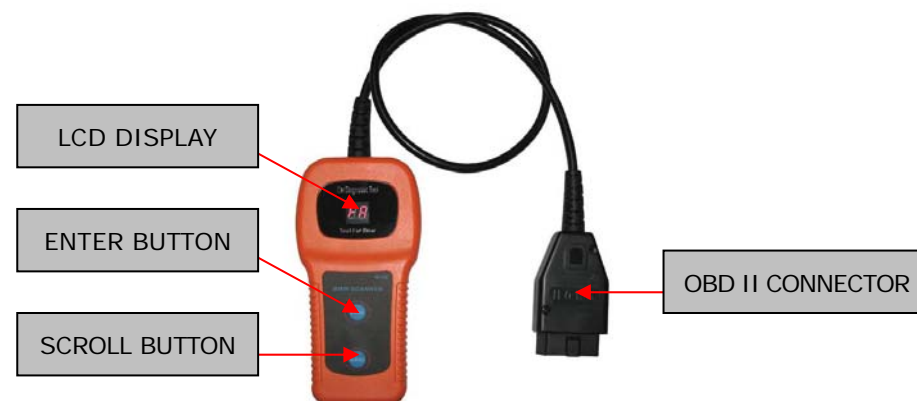
Appendix

Troubleshooting information.....31

Glossary (terms and abbreviations).....33

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Tool Description



1. **LCD DISPLAY:** shows the test results.
2. **ENTER BUTTON:** confirms a selection of a menu list, or returns to the main menu.
3. **SCROLL BUTTON:** Scrolls through menu items or cancel an operation.
4. **OBD II CONNECTOR:** Connects the B100 to the vehicle's Data Link Connector (DLC)

DIRECTICONS

- 1.) Turn key (DO NOT STARTENGINE)
- 2.) Plug tool into diagnostic connector (see page 3and4 for description , and page30 For warning) Tool is ready to use when it displays “Fc”.
- 3.) Use the “Scroll” button to select one of the functions shown below
- 4.) Press “ENTER” to execute the function”

Function Reference

Fc **Fault Code Read** The tool automatically starts in this mode,(though it won't read the fault codes until you press the “ENTER” button). When ENTER is pressed the unit will attempt to read the fault codes. If There are no faults it will display“--”.If it finds faults, it will automatically display the number of the code table to use (see pages 6 through26).To then view The faults press ENTER, repeat until the end of the fault list-(tool will show“--”).Press ENTER to return to “FC”(starting point.)

cE **MIL Reset** .(Resets “Check Engine” or “Service Engine Soon) When you have selected cE in the display, you are now ready to Reset the MIL “malfunction indicator lamp ”.Pressing ENTER will execute the reset when finished it will return to “Fc”. This clears all faults and extinguishes the MIL To verify the reset, UNPLUG the tool and start the engine MIL should be off. (Note: After a MIL reset, on some models with Automatic Transmission, the Automatic Transmission Light will be on. To clear it, simply start the engine twice.)

oL **Oil service Reset.** when you have selected oL in the display, you are now ready to reset the “oil service” light. Pressing ENTER will execute the reset. During the reset procedure the display will count from 0to 2. when finished the display will return to “Fc”. Si indicator will indicate a successful reset when finished. (See page 29 for trouble shooting)

in **Inspection reset.** When you have selected “in” in the display, you are now ready to reset the “inspection ”light. Pressing ENTER will execute reset.

During the reset procedure the display will count from 0 to 9.when finished the display will return to “Fc”. Si indicator will indicate a Successful reset when finished. (See page 29 for troubleshooting)

Fii Fii and Cii only apply to 12 cylinder BMWs, all of which have two Engine ECU's. It is the exact same procedure as Fc and cE (see above),except you are reading the 2nd ECU.

Cii

Making sense of the codes

Tip1: The first number is not a code! After pressing “ENTER” to read codes, the first number shown is the code table to use. See Tip2 & pg 12.

Tip2: There is no code table “FF”. BMWs built 1995 and earlier will not tell the tool which code table to use, so the tool just say's “FF” See below.

Tip3: Is that a b or a 6?The tool displays a “b” which looks Like a “6”.Case does not matter; a “b” on the tool = “B” in the table.

1995 And Older BMWs:

If the tool displays “FF” for the table designator, note the year and model of the BMW (and the VDS number if necessary)and find the car in table 1

Note: VDS number is digit 4 thru7 in the vin: **WBAAA13LAE57862**

Table 1: “FF” Fault Table Locator

1987				1988			
Year	Model	VDS	Table	Year	Model	VDS	Table
1987	325is	AA13	K1	1988	325is	AA13	K1
1987	325is A	AA23	K1	1988	325is A	AA23	K1
1987	325i/4	AD13	K1	1988	325iX A/2	AB03	K1
1987	325IA/4	AD23	K1	1988	325/2	AB54	K1
1987	321iC	BB13	K1	1988	325 A2	AB64	K1
1987	325ICA	BB23	K1	1988	325iX/2	AB93	K1

1988	325i/4	AD13	K1
1988	325iA4	AD23	K1
1988	325/4	AE54	K1
1988	325 A/4	AE64	K1
1988	325iC	BB13	K1
1988	325iCA	BB23	K1
1988	528e	DK73	K1
1988	528e A	DK83	K1
1988	635CSi	EC74	K1
1988	635CSi A	EC84	K1
1988	735i	GB33	K1
1988	735i A	GB43	K1
1988	735iL A	GC43	K1
1988	750iL A	GC83	K15
1988	M3		K1

1989

Year	Model	VDS	Table
1989	325i/is	AA13	K1
1989	325iA/2	AA23	K1
1989	325iX A/2	AB03	K1
1989	325iX/2	AB93	K1
1989	325i/4	AD13	K1
1989	325iA/4	AD23	K1
1989	325iX A/4	AE03	K1
1989	325iX/4	AE93	K1
1989	325iC	BB13	K1
1989	325iCA	BB23	K1
1989	M3		K1
1989	635CSi	EC74	K1
1989	635CSi A	EC84	K1
1989	735i	GB33	K1
1989	735i A	GB43	K1
1989	735iL A	GC43	K1
1989	750iL A	GC83	K15
1989	525i	HC13	K1
1989	525i A	HC23	K1
1989	535i	HD13	K1
1989	535i A	HD23	K1
1989	M5		K1

1990

Year	Model	VDS	Table
1990	325i/is/2	AA13	K1
1990	325iA/2	AA23	K1

1990	325iX A/2	AB03	K1
1990	325iX/2	AB93	K1
1990	325i/4	AD13	K1
1990	325iA/4	AD23	K1
1990	325iX A/4	AE03	K1
1990	325iX/4	AE93	K1
1990	325iC	BB13	K1
1990	325iCA	BB23	K1
1990	M3		K1
1990	735i	GB33	K1
1990	735i A	GB43	K1
1990	735iL A	GC43	K1
1990	750iL A	GC83	K15
1990	525i	HC13	K1
1990	525i A	HC23	K1
1990	535i	HD13	K1
1990	535i A	HD23	K1
1990	M5		K1

1991

Year	Model	VDS	Table
1991	325i/is/2	AA13	K1
1991	325iA/2	AA23	K1
1991	325iX A/2	AB03	K1
1991	325iX/2	AB93	K1
1991	325i/4	AD13	K1
1991	325iA/4	AD23	K1
1991	325iX A/4	AE03	K1
1991	325iX/4	AE93	K1
1991	318is/2	AF93	K13
1991	318i/4	AJ93	K13
1991	318iC/2	BA73	K13
1991	325iC	BB13	K1
1991	325iCA	BB23	K1
1991	M3		K1
1991	850i	EG13	K7
1991	850i A	EG23	K7
1991	735i A	GB43	K1
1991	735iL A	GC43	K1
1991	750iL A	GC83	K7
1991	535i	HD13	K1
1991	535i A	HD23	K1
1991	525i	HD53	K10
1991	525i A	HD63	K10
1991	M5	HD93	K1

1992

Year	Model	VDS	Table
1992	318is/2	BA73	K13
1992	325iC	BB13	K1
1992	325iCA	BB23	K1
1992	318is	BE53	K6
1992	325is	BF33	K10
1992	325is A	BF43	K10
1992	318i	CA53	K6
1992	325i	CB33	K10
1992	325i A	CB43	K10
1992	M3		K1
1992	850i	EG13	K7
1992	850i A	EG23	K7
1992	735i A	GB43	K1
1992	735iL A	GC43	K1
1992	750iL A	GC83	K7
1992	535i	HD13	K1
1992	535i A	HD23	K1
1992	525i	HD53	K10
1992	525i A	HD63	K10
1992	M5	HD93	K1
1992	525iT	HJ63	K10

1993

Year	Model	VDS	Table
1993	325iC	BB13	K1
1993	325iCA	BB23	K1
1993	318is	BE53	K6
1993	318is A	BE63	K6
1993	325is	BF33	K5
1993	325is A	BF43	K5
1993	318i	CA53	K6
1993	318i A	CA63	K6
1993	325i	CB33	K5
1993	325i A	CB43	K5
1993	M3		K5
1993	850i	EG13	K7
1993	850i A	EG23	K7
1993	750iL A	GC83	K7
1993	740i A	GD43	K11
1993	740iL A	GD83	K11
1993	535i	HD13	K1
1993	535i A	HD23	K1
1993	525i	HD53	K5

1993	525i A	HD63	K5
1993	M5	HD93	K1
1993	525iT	HJ63	K5

1994

Year	Model	VDS	Table
1994	318is	BE53	K6
1994	318is A	BE63	K6
1994	325is	BF33	K5
1994	325is A	BF43	K5
1994	325iC	BJ53	K5
1994	325iCA	BJ63	K5
1994	318iC	BK53	K6
1994	318iC A	BK63	K6
1994	318i	CA53	K6
1994	318i A	CA63	K6
1994	325i	CB33	K5
1994	325i A	CB43	K5
1994	840Ci A	EF63	K11
1994	850i A	EG23	K7
1994	850CSi	EG93	K7
1994	750iL A	GC83	K7
1994	740i A	GD43	K11
1994	740iL A	GD83	K11
1994	525i	HD53	K5
1994	525i A	HD63	K5
1994	530i	HE13	K11
1994	530i A	HE23	K11
1994	540i A	HE63	K11
1994	525iT	HJ63	K5

1995

Year	Model	VDS	Table
1995	318is	BE53	K6
1995	318is A	BE63	K6
1995	M3 A	BF03	K5
1995	325is	BF33	K5
1995	325is A	BF43	K5
1995	M3	BF93	K5
1995	325iC	BJ53	K5
1995	325iCA	BJ63	K5
1995	318iC	BK53	K6
1995	318iC A	BK63	K6
1995	318i	CA53	K6
1995	318i A	CA63	K6

1995	325i	CB33	K5	1995	740iL A	GJ63	K11
1995	325i A	CB43	K5	1995	750iL A	GK23	K12
1995	318i	CC73	K6	1995	525i	HD53	K5
1995	318i A	CC83	K6	1995	525i A	HD63	K5
1995	318ti	CG53	K6	1995	530i	HE13	K11
1995	318ti A	CG63	K6	1995	530i A	HE23	K11
1995	840Ci A	EF63	K11	1995	540i	HE53	K11
1995	850Ci A	EG43	K12	1995	540i A	HE63	K11
1995	850CSi	EG93	K7	1995	525iT	HJ63	K5
1995	740i A	GF63	K11	1995	530iT A	HK23	K11

For 1996 and later see page 11

A NOTE ABOUT NON-U.S.BMWS:

The above vehicle reference refers to US specification BMWs only, and does not include any non-US BMW variants. To best use the B100 on your non-US BMW, you will need to determine which of the above most closely matches your BMW. For instance a 1991 320i, is a 3 series, four cylinder, made for non-US markets: In this case, the best table for you to use would be table K13, as the closest US spec car would be a 1991 318i (which is also a 4cyl, 3 series). This method doesn't always work, you may need to experiment to find the correct table.

USE THESE CODE DEFINITIONS WISELY:

The code definitions contained in this manual should be regarded as a starting point for diagnosing a problem. the codes that your BMW generates can be misleading. There may also be errors in this manual. Before spending your money on a repair or replacement parts, make sure you have a clear understanding of the problem by using additional sources of information, such as a good quality repair manual, expert advice, the internet, etc... Note: Unfortunately, we are not staffed to answer your questions about codes, diagnostics, or BMW problems or offer repair advice, We apologize for any inconvenience this may cause.

"FF" CODE TABLES (FOR 1987-95)

Table K1

1	DME control unit selftest	11	Camshaft sensor
3	Electrical fuel pump relay	17	Ignition Coil, Cyl #4
4	Idle speed actuator (open)	18	Ignition Coil, Cyl #6
5	Evaporative purge control valve	19	Ignition Coil, Cyl #5
7	Air flow meter	1A	Control unit supply
0A	Emission (lambda) control	1d	Idle speed actuator (open)
0F	Check engine lamp	1F	Fuel Injector, Cyl #3
10	Fuel injectors (Cyl. 1,3,5)	20	Fuel Injector, Cyl #2
11	Fuel Injectors	21	Fuel Injector, Cyl #1
16	Idle speed actuator (close)	24	Evaporative purge control valve
17	Oxy sensor heating relay	26	Oxy sensor heating relay
1C	Oxy sensor	29	Air mass sensor
1d	Vehicle speed signal not present	2A	Vehicle speed signal not present
21	AT kick -down prevent solenoid valve	30	A/C Compressor control
25	Control unit supply	32	Ignition Coil, Cyl #1
26	Automatic Stability control / DWA	33	Ignition Coil, Cyl #2
28	A/C Compressor	34	Ignition Coil, Cyl #3
2b	Idle CO Potentiometer	36	Battery voltage /DME main relay
2C	Intake air temperature sensor	37	Misfire detected, Cyl #6
2d	Coolant temperature sensor	39	Ignition timing intervention
32	Engine drag torque control(MSR)	41	A/C Compressor
33	Ignition timing intervention	42	DWA/EWS Input
34	Idle switch	45	Knock Sensor, Cyl 4-6
35	Full load switch	46	Knock Sensor, Cyl 1-3
36	Torque Convectur Clutch	49	Throttle position sensor
64	Unspecified DME Output Stage	4C	Idle CO Potentiometer
		4d	Intake air temperature sensor
		4E	Coolant temperature sensor
		52	Intervention, MSR
		53	Intervention, ASC
		64	Output Stage, Group #1
		C8	DME Control Unit
		C9	Lambda control #1
		CA	Fault code memory error
		CC	Idle speed increase during MSR
		CE	Knock control test pulse
		dC	EWS message

Table K5

1	Electrical fuel pump relay
2	Idle speed actuator (close)
3	Fuel Injector, Cyl #5
4	Fuel Injector, Cyl #6
5	Fuel Injector, Cyl #4
6	Fuel Injector, Unknown
7	VANOS (Solenoid)
8	Check engine lamp
0d	Oxy sensor
0F	Ignition secondary monitor
10	Crankshaft sensor

Table K6

1	Electrical fuel pump relay
3	Fuel Injectors (Cyl 2,4)
8	Check engine lamp
0C	Throttle position sensor
0F	Knock sensor, Cyl 1-2
10	Camshaft/Cylinder ID sensor
12	Intake air resonance (DISA) valve
1d	Idle Control Valve
20	Fuel Injectors (Cyl 1,3)
24	Evaporative purge control valve
25	Oxy sensor heating relay
29	Air flow sensor
2A	Knock sensor, Cyl 3-4
30	A/C Compressor control
36	Control unit supply
37	Ignition coils
40	Ignition timing intervention
46	Oxy sensor
49	Vehicle speed signal not present
4C	Idle CO Potentiometer
4d	Intake air temperature sensor
4E	Coolant temperature sensor
51	DWA/EWS input
55	A/C Compressor
64	Unspecified DME Output Stage
C8	DME control unit selftest
C9	Emission (lambda) control
CE	Knock control test pulse
CF	Knock control regulation
dC	EWS message

Table K7

1	Electrical fuel pump relay
3	Fuel Injectors (Cyl 2,4,6 or 8,10,12)
8	Check engine lamp
10	Camshaft/Cylinder ID sensor
20	Fuel Injectors (Cyl 1,3,5 or 7,9,11)
24	Evaporative purge control valve
25	Oxy sensor heating relay
29	Air flow sensor
30	A/C Compressor control

36	Control unit supply
3F	Torque convertor clutch
40	Ignition timing intervention
46	Oxy sensor
49	Vehicle speed signal not present
4C	Idle CO Potentiometer
4d	Intake air temperature sensor
4E	Coolant temperature sensor
52	Engine drag torque control (MSR)
53	ASC/ZAB
64	Unspecified DME Output stage
C8	DME control unit selftest
C9	Emission (lambda) control

Table K10

1	Electrical fuel pump relay
2	Idle speed actuator (close)
3	Fuel Injector, Cyl #1
4	Fuel Injector, Cyl #2
5	Fuel Injector, Cyl #3
6	Fuel Injector, Unknown
8	Check engine lamp
0C	Throttle position sensor
10	Camshaft sensor
12	Output Stage, Group #1
13	Output Stage, Group #2
17	Ignition Coil, Cyl #2
18	Ignition Coil, Cyl #3
19	Ignition Coil, Cyl #1
1A	Control unit supply
1d	Idle speed actuator (open)
1F	Fuel Injector Cyl #5
20	Fuel Injector Cyl #6
21	Fuel Injector Cyl #4
24	Evaporative purge control valve
25	Oxy sensor heating relay
29	Air mass sensor
2E	Output Stage
30	A/C Compressor control
32	Ignition Coil, Cyl #4
33	Ignition Coil, Cyl #6
34	Ignition Coil, Cyl #5

36	Battery voltage / DME main relay
37	Ignition output stage
3E	EML Signal
3F	Torque convertor clutch lockup
40	Ignition timing intervention
43	Crankshaft sensor
46	Oxy sensor
49	Vehicle speed signal not present
4C	Idle CO Potentiometer
4d	Intake air temperature sensor
4E	Coolant temperature sensor
51	DWA Input
52	Engine drag torque control (MSR)
53	Intervention, ASC
55	A/C Compressor
64	Output Stage
C8	DME Control Unit
C9	Lambda control
CA	Fault code memory error
Cb	Ignition circuit primary monitor
CC	Stall protection

Table K11

1	Electrical fuel pump relay
2	Idle speed actuator (close)
3	Fuel Injector, Cyl #1
4	Fuel Injector, Cyl #4
5	Fuel Injector, Cyl #6
6	Fuel Injector, Unknown
7	Fuel Injector, Cyl #7
8	Check engine lamp
0C	Oxy sensor, #2
0d	Oxy sensor, #1
0F	Ignition secondary monitor
10	Crankshaft sensor
10	Camshaft sensor
13	Secondary air pump relay
16	Ignition Coil, Cyl #7
17	Ignition Coil, Cyl #6
18	Ignition Coil, Cyl #4
19	Ignition Coil, Cyl #1
1A	Control unit supply

1d	Idle speed actuator (open)
1F	Fuel Injector, Cyl #5
20	Fuel Injector, Cyl #8
21	Fuel Injector, Cyl #3
23	Fuel Injector, Cyl #2
24	Evaporative purge control valve
25	Oxy sensor heating relay
29	Air mass sensor
2A	Vehicle speed signal not present
30	A/C Compressor control
31	Ignition Coil, Cyl #2
32	Ignition Coil, Cyl #3
33	Ignition Coil, Cyl #8
34	Ignition Coil, Cyl #5
36	Battery voltage / DME main relay
3E	EML Signal
41	A/C Compressor
42	DWA/EWS Input
43	Knock Sensor, Cyl 7-8
44	Knock Sensor, Cyl 5-6
45	Knock Sensor, Cyl 3-4
46	Knock Sensor, Cyl 1-2
49	Throttle position sensor
4C	Idle CO Potentiometer
4d	Intake air temperature sensor
4e	Coolant temperature sensor
52	Intervention, MSR
53	Intervention, ASC
64	Output Stage, Group #1
65	Output Stage, Group #2
C8	DME Control Unit
C9	Lambda Control #1
CA	Fault code memory error
Cb	Lambda Control #2
CC	Idle speed increase –CAN BUS
Cd	Ignition timing intervention
CE	Knock control test pulse
D2	CAN message
dC	EWS message

Table K12

4	PreCat oxy sensor heater, Bank 2	41	Misfire detected, catalyst damaging, Cyl #3
5	AfterCat oxy sensor heater, Bank 2	42	Misfire detected, catalyst damaging, Cyl #4
8	Misfire w/low fuel	43	Misfire detected, catalyst damaging, Cyl #5
0A	PreCat oxy sensor, Bank 1	44	Misfire detected, catalyst damaging, Cyl #6
0C	AfterCat oxy sensor, Bank 1	45	Misfire detected, catalyst damaging, Cyl #7
0d	PreCat oxy sensor heater, Bank 1	46	Misfire detected, catalyst damaging, Cyl #8
0E	AfterCat oxy sensor heater, Bank 1	47	Misfire detected, catalyst damaging, Cyl #9
0F	PreCat oxy sensor response time, Bank 1	48	Misfire detected, catalyst damaging, Cyl #10
10	PreCat oxy sensor aging, Bank 1	49	Misfire detected, catalyst damaging, Cyl #11
11	AfterCat oxy sensor response time, Bank 1	4A	Misfire detected, catalyst damaging, Cyl #12
12	PreCat oxy sensor, Bank 2	4b	Misfire detected, catalyst damaging, random/unknown Cyl.
14	AfterCat oxy sensor, Bank 2	4E	Crankshaft position sensor (too many teeth)
15	PreCat oxy sensor response time, Bank 2	50	Secondary air control, Bank 1
16	PreCat oxy sensor aging, Bank 2	54	Secondary air pump final stage
17	AfterCat oxy sensor response time, Bank 2	55	Secondary air valve final stage
18	A/C Compressor	5d	EVAP emission control system
1A	Fuel trim, multiplicative, Bank 1	5E	EVAP large leak
1b	Fuel trim, QL additive, Bank 1	61	EVAP small leak
1C	Fuel trim, Ti additive, Bank 1	62	EVAP purge control valve circuit
20	Idle control valve stuck mechanically	65	DME, internal RAM failure
22	Fuel trim, multiplicative, Bank 2	66	DME, external RAM failure
23	Fuel trim, QL additive, Bank 2	67	DME, TOM failure
24	Fuel trim, Ti additive, Bank 2	68	Fault code memory error
27	EWS message	6b	Control unit supply voltage
28	Catalyst efficiency, Bank 1	6C	Battery disconnected
2d	Catalyst efficiency, Bank 2	6F	Crankshaft position sensor
32	Misfire detected, Cyl #1	70	Camshaft position sensor
33	Misfire detected, Cyl #2	73	Air mass sensor
34	Misfire detected, Cyl #3	75	Throttle position sensor
35	Misfire detected, Cyl #4	78	Vehicle speed signal not present
36	Misfire detected, Cyl #5	79	Load calculation crosscheck (HFM vs TPS)
37	Misfire detected, Cyl #6	7b	Coolant temperature sensor
38	Misfire detected, Cyl #7	7C	Intake air temperature sensor
39	Misfire detected, Cyl #8	87	Torque reduction: Transmission
3A	Misfire detected, Cyl #9	8A	A/C Compressor torque reduction
3b	Misfire detected, Cyl #10	8b	Electric thermostat control final stage
3C	Misfire detected, Cyl #11	8d	ASC signal plausibility
3d	Misfire detected, Cyl #12	8F	Intervention, MSR
3E	Misfire detected, random or unknown cylinder	90	Intervention, ASC
3F	Misfire detected, catalyst damaging, Cyl #1	93	Electric thermostat control performance
40	Misfire detected, catalyst damaging, Cyl #2	94	EWS Input
		96	Fuel Injector, Cyl #1

97	Fuel Injector, Cyl #2	40	Ignition timing intervention
98	Fuel Injector, Cyl #3	46	Oxy sensor
99	Fuel Injector, Cyl #4	49	Vehicle speed signal not present
9A	Fuel Injector, Cyl #5	4C	Idle CO Potentiometer
9b	Fuel Injector, Cyl #6	4d	Intake air temperature sensor
9C	Fuel Injector, Cyl #7	4E	Coolant temperature sensor
9d	Fuel Injector, Cyl #8	55	A/C Compressor request
9E	Fuel Injector, Cyl #9	64	Unspecified DME Output Stage
9F	Fuel Injector, Cyl #10	C8	DME control unit selftest
A0	Fuel Injector, Cyl #11	C9	Emission (lambda) control
A1	Fuel Injector, Cyl #12		
A5	Check engine lamp		
A7	Electrical fuel pump relay		
A8	Idle speed actuator (open)		
A9	Idle speed actuator (close)		
AA	A/C Compressor control		
d0	Secondary air control, Bank 2		
d2	Knock Sensor #1		
d3	Knock Sensor #2		
d4	Knock Sensor #3		
d5	Knock Sensor #4		
d8	CAN timeout, ASC		
dC	Knock control test pulse		
dE	Knock control test pulse		
EA	Automatic start input		
EC	CAN timeout, EGS		
Ed	Automatic start output		
Fd	Coolant fan final stage		

Table K15

1	DME control unit selftest
3	Electric fuel pump relay TR Signal
5	Evaporative purge control valve
7	Air flow meter
0A	Emission (lambda) control
0F	Check engine lamp
10	Fuel Injectors (Cyl. 1,3,5 or 7,9,11)
11	Fuel Injectors (Cyl. 2,4,6 or 8,10,12)
17	Oxy sensor heating relay
1C	Oxy sensor
25	Control unit supply
2b	idle CO Potentiometer
2C	Intake air temperature sensor
2d	Coolant temperature sensor
33	Ignition angle
36	Torque convertor Clutch
64	Unspecified DME Output Stage

Table K13

1	Electrical fuel pump relay
3	Fuel Injectors (Cyl 1,3)
8	Check engine lamp
0C	Throttle position sensor
10	Camshaft/Cylinder ID sensor
1d	Idle control valve
20	Fuel Injectors (Cyl 2,4)
24	Evaporative purge control valve
25	Oxy sensor heating relay
29	Air flow sensor
30	A/C Compressor control
36	Control unit supply

CODE TABLES (FOR 1996 AND LATER)

USE THE CODE DEFINITIONS WISELY:

The code definitions contained in this manual should be regarded as a starting point for diagnosing a problem. The codes that your BMW generates can be misleading. There may also be errors in this manual. Before spending your money on a repair or replacement parts, make sure you have a clear understanding of the problem by using additional sources of information, such as a good quality repair manual, expert advice, the internet, etc...

Note: Unfortunately, we are not staffed to answer your questions about codes, diagnostics, or BMW problems or offer repair advice. We apologize for any inconvenience this may cause.

Important: use the following code tables if the tool did NOT display "FF" for the table designator.

Table 00

01	Electrical fuel pump relay	21	"Fuel injector, Cyl #3"
02	Idle speed actuator (close)	23	"Fuel injector, Cyl #2"
03	"Fuel injector, Cyl #1"	24	Evaporative purge control valve
04	"Fuel injector, Cyl #4"	25	Oxygen sensor heating relay
05	"Fuel injector, Cyl #6"	29	Air mass sensor
06	"Fuel injector, Unknown"	2A	Vehicle speed signal not present
07	"Fuel injector, Cyl #7"	30	A/C Compressor control
08	Check engine lamp	31	"Ignition Coil, Cyl #2"
0C	"Oxygen sensor, #2"	32	"Ignition Coil, Cyl #3"
0D	"Oxygen sensor, #1"	33	"Ignition Coil, Cyl #8"
0F	Ignition secondary monitor	34	"Ignition Coil, Cyl #5"
10	Crankshaft sensor	36	Battery voltage / DME main relay
11	Camshaft sensor	3E	EML Signal
13	Secondary air pump relay	41	A/C Compressor
16	"Ignition Coil, Cyl #7"	42	DWA/EWS Input
17	"Ignition Coil, Cyl #6"	43	"Knock Sensor, Cyl 7-8"
18	"Ignition Coil, Cyl #4"	44	"Knock Sensor, Cyl 5-6"
19	"Ignition Coil, Cyl #1"	45	"Knock Sensor, Cyl 3-4"
1A	Control unit supply	46	"Knock Sensor, Cyl 1-2"
1D	Idle speed actuator (open)	49	Throttle position sensor
1F	"Fuel injector, Cyl #5"	4C	Idle CO Potentiometer
20	"Fuel injector, Cyl #8"	4D	Intake air temperature sensor
		4E	Coolant temperature sensor

52	"Intervention, MSR"	22	"Fuel trim, multiplicative, Cyl 5-8"
53	"Intervention, ASC"	23	"Fuel trim, QL additive, Cyl 5-8"
64	"Output Stage, Group #1"	24	"Fuel trim, Ti additive, Cyl 5-8"
65	"Output Stage, Group #2"	27	EWS message
C8	DME Control Unit	28	"Catalyst efficiency, Cyl 1-4"
C9	Lambda Control #1	2D	"Catalyst efficiency, Cyl 5-8"
CA	Fault code memory error	32	"Misfire detected, Cyl #1"
CB	Lambda Control #2	33	"Misfire detected, Cyl #2"
CC	Idle speed increase -CAN Bus	34	"Misfire detected, Cyl #3"
CD	Ignition timing intervention	35	"Misfire detected, Cyl #4"
CE	Knock control test pulse	36	"Misfire detected, Cyl #5"
D2	CAN message	37	"Misfire detected, Cyl #6"
DC	EWS message	38	"Misfire detected, Cyl #7"
		39	"Misfire detected, Cyl #8"
		3E	"Misfire detected, random or unknown cylinder"
		3F	"Misfire detected, catalyst damaging, Cyl #1"
		40	"Misfire detected, catalyst damaging, Cyl #2"
		41	"Misfire detected, catalyst damaging, Cyl #3"
		42	"Misfire detected, catalyst damaging, Cyl #4"
		43	"Misfire detected, catalyst damaging, Cyl #5"
		44	"Misfire detected, catalyst damaging, Cyl #6"
		45	"Misfire detected, catalyst damaging, Cyl #7"
		46	"Misfire detected, catalyst damaging, Cyl #8"
		4B	"Misfire detected, catalyst damaging, random or unknown cylinder"
		4D	"Air containment valve, shrouded injectors, Cyl 5-8"
		4E	Crankshaft position sensor (too many teeth)
		50	"Secondary air control, Cyl 1-4"
		54	Secondary air pump final stage
		55	Secondary air valve final stage
		5B	"EVAP purge control valve, Cyl 5-8"
		5D	EVAP emission control system
		5E	EVAP large leak
		61	EVAP small leak
		62	EVAP purge control valve circuit
		65	"DME, internal RAM failure"
		66	"DME, external RAM failure"
		67	"DME, ROM failure"
		68	Fault code memory error
		69	"DME, EEPROM failure"
		6B	Control unit supply voltage
		6C	Battery disconnected

Table 0b

01	EVAP LDP Valve final stage		
02	EVAP Running losses valve final stage		
03	"EVAP Reed switch not closed, doesn't open/close"		
04	"PreCat oxygen sensor heater, Cyl 5-8"		
05	"AfterCat oxygen sensor heater, Cyl 5-8"		
06	"CAN timeout, instrument cluster"		
07	"Engine coolant temperature, radiator outlet"		
08	Misfire w/low fuel		
0A	"PreCat oxygen sensor, Cyl 1-4"		
0C	"AfterCat oxygen sensor, Cyl 1-4"		
0D	"PreCat oxygen sensor heater, Cyl 1-4"		
0E	"AfterCat oxygen sensor heater, Cyl 1-4"		
0F	"PreCat oxygen sensor response time, Cyl 1-4"		
10	"PreCat oxygen sensor aging, Cyl 1-4"		
11	"AfterCat oxygen sensor response time, Cyl 1-4"		
12	"PreCat oxygen sensor, Cyl 5-8"		
14	"AfterCat oxygen sensor, Cyl 5-8"		
15	"PreCat oxygen sensor response time, Cyl 5-8"		
16	"PreCat oxygen sensor aging, Cyl 5-8"		
17	"AfterCat oxygen sensor response time, Cyl 5-8"		
18	A/C Compressor		
1A	"Fuel trim, multiplicative, Cyl 1-4"		
1B	"Fuel trim, QL additive, Cyl 1-4"		
1C	"Fuel trim, Ti additive, Cyl 1-4"		
1D	"Air containment valve, shrouded injectors, Cyl 1-4"		
20	Idle control valve stuck mechanically		

6F Crankshaft position sensor
70 Camshaft position sensor
73 Air mass sensor
75 Throttle position sensor
78 Vehicle speed signal not present
79 Load calculation crosscheck (HFM vs TPS)
7B Coolant temperature sensor
7C Intake air temperature sensor
87 Torque reduction: Transmission
8A A/C Compressor torque reduction
8B Electric thermostat control final stage
8D ASC signal plausibility
8F "Intervention, MSR"
90 "Intervention, ASC"
93 Electric thermostat control performance
94 EWS Input
96 "Fuel Injector, Cyl #1"
97 "Fuel Injector, Cyl #2"
98 "Fuel Injector, Cyl #3"
99 "Fuel Injector, Cyl #4"
9A "Fuel Injector, Cyl #5"
9B "Fuel Injector, Cyl #6"
9C "Fuel Injector, Cyl #7"
9D "Fuel Injector, Cyl #8"
A4 EVAP Barometric tank pressure sensor
A5 Check engine lamp
A7 Electrical fuel pump relay
A8 Idle speed actuator (open)
A9 Idle speed actuator (close)
AA A/C Compressor control
B7 EVAP large leak
B8 EVAP pinched hose check
CB Ignition feedback failed
CC EWS rolling code storage
D0 "Secondary air control, Cyl 5-8"
D2 "Knock Sensor, Cyl 1-2"
D3 "Knock Sensor, Cyl 3-4"
D4 "Knock Sensor, Cyl 5-6"
D5 "Knock Sensor, Cyl 7-8"
D6 CAN index verification
D7 "CAN timeout, left/right DME"
D8 "CAN timeout, ASC"

D9 "CAN signal, EML"
DC Knock control test pulse
DE Knock control test pulse
E4 Automatic start output
E9 Automatic start output
EA Automatic start input
EC "CAN timeout, EGS"
ED Automatic start output
FD Coolant fan final stage

Table 0F

01 LDP control circuit
02 DM-TL solenoid control circuit
03 PreCat oxygen sensors swapped
04 "PreCat oxygen sensor heater, Cyl #5-8"
05 "AfterCat oxygen sensor heater, Cyl #5-8"
0A "PreCat oxygen sensor, Cyl #1-4"
0C "AfterCat oxygen sensor, Cyl #1-4"
0D "PreCat oxygen sensor heater, Cyl #1-4"
0E "AfterCat oxygen sensor heater, Cyl #1-4"
0F "PreCat oxygen sensor slow response t, Cyl #1-4"
10 "PreCat oxygen sensor aging, Cyl #1-4"
11 "AfterCat oxygen sensor aging, Cyl #1-4"
12 "PreCat oxygen sensor, Cyl #5-8"
14 "AfterCat oxygen sensor, Cyl #5-8"
15 "PreCat oxygen sensor slow response, Cyl #5-8"
16 "PreCat oxygen sensor aging, Cyl #5-8"
17 "AfterCat oxygen sensor response time, Cyl #5-8"
18 "Mixture Control, higher load, Cyl #1-4"
19 "Mixture Control, higher load, Cyl #5-8"
1A "Mixture Control, off idle, Cyl #1-4"
1B "Mixture Control, off idle, Cyl #5-8"
1C "Mixture Control, idle, Cyl #1-4"
1D "Mixture Control, idle, Cyl #5-8"
1E "Mixture Control, idle, Cyl #1-4"
1F "Mixture Control, idle, Cyl #5-8"
20 Idle speed control
21 "Camshaft VANOS control, Cyl #1-4"
22 "Camshaft VANOS control, Cyl #5-8"
27 "EWS, manipulation detected"
28 "Catalyst efficiency, Cyl #1-4"
2D "Catalyst efficiency, Cyl #5-8"

32 "Misfire, Cyl #1"
33 "Misfire, Cyl #5"
34 "Misfire, Cyl #4"
35 "Misfire, Cyl #8"
36 "Misfire, Cyl #6"
37 "Misfire, Cyl #3"
38 "Misfire, Cyl #7"
39 "Misfire, Cyl #2"
3E "Misfire, random/multiple cylinders"
50 "Secondary air system, Cyl #1-4"
51 "Secondary air system, Cyl #5-8"
52 Secondary air valve
54 Secondary air control circuit
55 Secondary air valve
5D Evaporative emission system
62 Evaporative emission system purge valve
65 Torque monitoring
66 MFL interface
67 Safety concept monitoring
68 Clutch switch
69 "Control unit self-test, RAM faulty"
6A Brake switch
6B "Control unit self-test, ROM faulty"
6C "Control unit self-test, reset"
6D Battery voltage
6E Torque control
6F Crankshaft sensor
70 Timing reference high resolution signal
71 "Camshaft position sensor, Cyl #1-4"
72 "Camshaft position sensor, Cyl #5-8"
73 Air mass sensor
75 Throttle position sensors
76 Throttle position sensor 1
77 Throttle position sensor 2
78 Vehicle speed
79 Wheel sensor failure
7A Ambient temperature sensor
7B Engine coolant temperature sensor
7C Intake air temperature sensor
7D Radiator outlet temperature sensor
7F Coolant temperature plausibility
82 Drive-by-wire throttle position monitoring

83 Drive-by-wire throttle control
84 Drive-by-wire throttle control output stage
85 "Drive-by-wire throttle controller, spring check"
86 "Drive-by-wire throttle controller, lower adaptation"
87 "Drive-by-wire throttle controller, amplifier check"
88 "Drive-by-wire throttle emergency air position test"
8B Map controlled thermostat jammed
8C Map controlled thermostat circuit/control
8D Engine cooling fan control
8E Exhaust flap control
94 EWS signal/interface
96 "Fuel Injector, Cyl #1"
97 "Fuel Injector, Cyl #5"
98 "Fuel Injector, Cyl #4"
99 "Fuel Injector, Cyl #8"
9A "Fuel Injector, Cyl #6"
9B "Fuel Injector, Cyl #3"
9C "Fuel Injector, Cyl #7"
9D "Fuel Injector, Cyl #2"
A3 Throttle position / air mass plausibility
A4 Ambient pressure sensor
A5 "VANOS output stage, Cyl #1-4"
A6 "VANOS output stage, Cyl #5-8"
A7 Fuel pump relay control
A8 Check engine lamp/MIL
AA A/C compressor control
B7 LDP diagnosis
B8 LDP system
B9 LDP pressure sensor
BA DM-TL pump control circuit
BB DM-TL small leak
BC DM-TL large leak
BD DM-TL pump current
C9 DM-TL heater
CC EWS exchange code stored
D2 "Knock sensor, Cyl #1-2"
D3 "Knock sensor, Cyl #3-4"
D4 "Knock sensor, Cyl #5-6"
D5 "Knock sensor, Cyl #7-8"

D6	Knock control zero test	19	"Ignition Coil, Cyl #1"
D7	Knock control offset	1B	DM-TL switching valve
D8	Knock control test pulse	1C	Map controlled thermostat control
DB	CAN timeout	1D	Idle speed actuator (open)
DC	"CAN timeout, EGS"	1E	"Control unit self-test, A/D converter monitoring"
DD	"CAN timeout, ASC/DSC"		
DE	"CAN timeout, instrument cluster"	1F	"Fuel Injector, Cyl #5"
DF	"CAN timeout, ACC"	20	"Fuel Injector, Cyl #6"
E0	MSR intervention plausibility	21	"Fuel Injector, Cyl #4"
E1	ACC intervention plausibility	24	Evaporative emission purge control valve
E2	Fuel level plausibility	25	"PreCat oxygen sensor heater control, Cyl #1-3"
E5	Pedal position sensor supply voltage	26	"PreCat oxygen sensor heater control, Cyl #4-6"
E6	Pedal position sensors		
E7	Pedal position sensor 1	27	"AfterCat oxygen sensor heater control, Cyl #1-3"
E8	Pedal position sensor 2		
E9	Automatic starter control output	28	"AfterCat oxygen sensor heater control, Cyl #4-6"
EA	Automatic starter input signal		
EC	Intake air flap dontrrol	29	Air mass sensor
ED	Automatic starter	2A	Vehicle speed signal
		2B	Radiator outlet temperature sensor
		2C	Thermal oil level sensor
		2D	Drive-by-wire throttle actuator driver
		2E	Fuel consumption (KVA) signal output
		2F	Engine RPM (TD) signal output
		30	A/C Compressor relay
		32	"Ignition Coil, Cyl #4"
		33	"Ignition Coil, Cyl #6"
		34	"Ignition Coil, Cyl #5"
		35	Electronic fan (relay)
		36	Battery voltage behind main relay
		3A	Sensor voltage supply 1
		3B	Sensor voltage supply 2
		3C	"Pedal position sensor 1, master measurement"
		3D	"Pedal position sensor 2, master measurement"
		3F	Secondary air switching valve
		41	"Throttle position sensor 2, slave measurement"
		42	EWS interface
		43	Intake camshaft VANOS advance valve
		45	"Knock sensor, Cyl #5-6"
		46	"Knock sensor, Cyl #3-4"
		48	Intake camshaft VANOS retard valve
		49	"Sir mass sensor, plausibility"

Table 1b

01	Fuel pump relay
02	Idle speed actuator (close)
03	"Fuel Injector, Cyl #1"
04	"Fuel Injector, Cyl #3"
05	"Fuel Injector, Cyl #2"
06	Timeout SMG-CAN
07	Intake camshaft position sensor
09	"Knock sensor, Cyl #1-2"
0A	Exhaust camshaft position sensor
0C	"PreCat oxygen sensor, Cyl #4-6"
0D	"PreCat oxygen sensor, Cyl #1-3"
0E	Tank small leak
10	Crankshaft sensor
12	Map controlled thermostat actuator
13	Secondary air pump relay
14	Starter relay
15	"Exhaust camshaft VANOS retard valve, Cyl #1-4"
16	"Exhaust camshaft VANOS advance valve, Cyl #1-4"
17	"Ignition Coil, Cyl #2"
18	"Ignition Coil, Cyl #3"

4C	Ambient pressure sensor	88	Idle speed controller
4D	Intake air temperature sensor	8C	Cruise control system
4E	Coolant temperature sensor	8D	"Fuel level, plausibility"
4F	Exhaust gas temperature sensor	8F	E-box-fan
50	Switch-chain grip	90	"Fuel control, Cyl #1-3"
51	MFL interface signal	91	"Fuel control, Cyl #4-6"
52	Muffler flap	95	Misfire w/empty fuel tack
55	"Throttle position sensor, master measurement"	96	"Control unit self-test, memory test master"
56	CAN bus offline	97	"Control unit self-test, driver diagnostics chain"
57	"AfterCat oxygen sensor voltage, Cyl #1-3"	98	"Control unit self-test, communication master"
58	"AfterCat oxygen sensor voltage, Cyl #4-6"	9B	"Control unit self-test, adaptation EEPROM master"
59	"Control unit self-test, Safety Concept slave check "	9C	"Control unit self-test, adaptation EEPROM SALVE"
5A	"PreCat oxygen sensor aging, Cyl #1-3"	9D	"Control unit self-test, memory test slave"
5B	"PreCat oxygen sensor aging, Cyl #4-6"	9E	"Control unit self-test, communication slave"
5C	"AfterCat oxygen sensor aging, Cyl #1-3"	9F	"Control unit self-test, knock detection IC 1"
5D	"AfterCat oxygen sensor aging, Cyl #4-6"	A0	"Control unit self-test, knock detection IC 2"
63	"Control unit self-test, Safety Concept master check "	A1	Knock control
69	"Engine coolant temperature, plausibility"	A3	"Control unit self-test, master resets"
6A	Brake light switch	AA	"Secondary air system, flow too low"
6B	"Control unit self-test, pre-drive check of Drive-by-wire system "	AB	"Secondary air system, valve sticking"
6C	Switching valve oil circuit left	AC	VANOS pressure storage valve
6D	Switching valve oil circuit right	AD	Starter switch input
6E	Sport switch LED indicator	AE	"Mixture adaptation, Cyl #1-3"
6F	"Pedal position sensor 1, cross check"	AF	"Mixture adaptation, Cyl #4-6"
70	"Pedal position sensor 2, cross check"	B0	DM-TL error
73	"control unit self-test, internal ECU temperature"	B2	"Catalyst system efficiency, Cyl #1-3"
76	Throttle position sensor 1	B3	"Catalyst system efficiency, Cyl #4-6"
77	Throttle position sensor 2	B4	Tank leak detected
78	"Throttle position sensors, cross check"	B5	Filler cap open
79	"Throttle position sensors, both bad"	B6	"Injection driver 1, over temp"
7A	"Control unit self-test, master processor"	B7	"Injection driver 2, over temp"
7B	"Bus offline, SMG-CAN"	B8	Intake camshaft VANOS position control
7E	Fuel pump crash shut-off	B9	Exhaust camshaft VANOS position control
7F	DM-TL module	BA	"Ignition output stage, Cyl #1"
80	Idle speed deviation	BB	"Ignition output stage, Cyl #2"
82	"EWS signal, manipulation detected"	BC	"Ignition output stage, Cyl #3"
83	"DSC intervention, plausibility"	BD	"Ignition output stage, Cyl #4"
84	DSC message timeout	BE	"Ignition output stage, Cyl #5"
86	Instrument Cluster message timeout	BF	"Ignition output stage, Cyl #6"
87	Vehicle speed signal	C2	"Control unit self-test, cruise control shut off"
		C3	"Control unit self-test, torque manager Monitoring"
		C4	"Misfire w/fuel cutoff, Cyl #1"

C5	"Misfire w/fuel cutoff, Cyl #2"	10	"PreCat oxygen sensor aging, Cyl 1-4"
C6	"Misfire w/fuel cutoff, Cyl #3"	11	"AfterCat oxygen sensor response time, Cyl 1-4"
C7	"Misfire w/fuel cutoff, Cyl #4"		
C8	"Misfire w/fuel cutoff, Cyl #5"	12	"PreCat oxygen sensor, Cyl 5-8"
C9	"Misfire w/fuel cutoff, Cyl #6"	14	"AfterCat oxygen sensor, Cyl 5-8"
CC	"Misfire multiple cylinders w/fuel cutoff"	15	"PreCat oxygen sensor response time, Cyl 5-8"
CD	"Misfire during warm-up, Cyl #1"		
CE	"Misfire during warm-up, Cyl #2"	16	"PreCat oxygen sensor aging, Cyl 5-8"
CF	"Misfire during warm-up, Cyl #3"	17	"AfterCat oxygen sensor response time, Cyl 1-4"
D0	"Misfire during warm-up, Cyl #4"		
D1	"Misfire during warm-up, Cyl #5"	18	A/C Compressor
D2	"Misfire during warm-up, Cyl #6"	1A	"Fuel trim, multiplicative, Cyl 1-4"
D5	"Misfire during warm-up, multiple cylinders"	1B	"Fuel trim, QL additive, Cyl 1-4"
D6	"PreCat oxygen sensor slow response, Cyl #1-3"	1C	"Fuel trim, Ti additive, Cyl 1-4"
D7	"PreCat oxygen sensor slow response, Cyl #4-6"	20	Idle control valve stuck mechanically
D8	"PreCat oxygen sensor slow switching (rich to lean), Cyl #1-3"	22	"Fuel trim, multiplicative, Cyl 5-8"
		23	"Fuel trim, QL additive, Cyl 5-8"
D9	"PreCat oxygen sensor slow switching (rich to lean), Cyl #4-6"	24	"Fuel trim, Ti additive, Cyl 5-8"
		27	EWS message
DA	"PreCat oxygen sensor signal size/amplitude, Cyl #1-3"	28	"Catalyst efficiency, Cyl 1-4"
		2D	"Catalyst efficiency, Cyl 5-8"
DB	"PreCat oxygen sensor signal size/amplitude, Cyl #4-6"	32	"Misfire detected, Cyl #1"
		33	"Misfire detected, Cyl #2"
E4	"Drive-by-wire, throttle control failure"	34	"Misfire detected, Cyl #3"
E5	"Drive-by-wire, throttle control failure"	35	"Misfire detected, Cyl #4"
E6	"Drive-by-wire, throttle position failure"	36	"Misfire detected, Cyl #5"
E7	"Control unit self-test, slave processor check"	37	"Misfire detected, Cyl #6"
E8	Evaporative emissions purge valve functional check	38	"Misfire detected, Cyl #7"
F7	VANOS pressure accumulator valve	39	"Misfire detected, Cyl #8"
F8	Intake camshaft VANOS Moving time	3E	"Misfire detected, random or unknown cylinder"
F9	Exhaust camshaft VANOS moving time	3F	"Misfire detected, catalyst damaging, Cyl #1"
FA	Intake camshaft VANOS sealing	40	"Misfire detected, catalyst damaging, Cyl #2"
FB	Exhaust camshaft VANOS sealing	41	"Misfire detected, catalyst damaging, Cyl #3"
		42	"Misfire detected, catalyst damaging, Cyl #4"
		43	"Misfire detected, catalyst damaging, Cyl #5"
		44	"Misfire detected, catalyst damaging, Cyl #6"
		45	"Misfire detected, catalyst damaging, Cyl #7"
		46	"Misfire detected, catalyst damaging, Cyl #8"
		4B	"Misfire detected, catalyst damaging, random or unknown cylinder"
		4E	Crankshaft position sensor (too many teeth)
0E	"AfterCat oxygen sensor heater, Cyl 1-4"	50	"Secondary air control, Cyl 1-4"
0F	"PreCat oxygen sensor response time, Cyl 1-4"	54	Secondary air pump final stage

Table 06

55	Secondary air valve final stage
5D	EVAP emission control system
5E	EVAP large leak
61	EVAP small leak
62	EVAP purge control valve circuit
65	"DME, internal RAM failure"
66	"DME, external RAM failure"
67	"DME, ROM failure"
68	Fault code memory error
6B	Control unit supply voltage
6C	Battery disconnected
6F	Crankshaft position sensor
70	Crankshaft position sensor
73	Air mass sensor
75	Throttle position sensor
78	Vehicle speed signal not present
79	Load calculation crosscheck (HFM vs TPS)
7B	Coolant temperature sensor
7C	Intake air temperature sensor
87	Torque reduction: Transmission
8A	A/C Compressor torque reduction
8B	Electric thermostat control final stage
8D	ASC signal plausibility
8F	"Intervention, MSR"
90	"Intervention, ASC"
93	Electric thermostat control performance
94	EWS Input
96	"Fuel Injector, Cyl #1"
97	"Fuel Injector, Cyl #2"
98	"Fuel Injector, Cyl #3"
99	"Fuel Injector, Cyl #4"
9A	"Fuel Injector, Cyl #5"
9B	"Fuel Injector, Cyl #6"
9C	"Fuel Injector, Cyl #7"
9D	"Fuel Injector, Cyl #8"
A5	Check engine lamp
A7	Electrical fuel pump relay
A8	Idle speed actuator (open)
A9	Idle speed actuator (close)
AA	A/C Compressor control
D0	"Secondary air control, Cyl 5-8"
D2	"Knock Sensor, Cyl 1-2"
D3	"Knock Sensor, Cyl 3-4"

D4	"Knock Sensor, Cyl 5-6"
D5	"Knock Sensor, Cyl 7-8"
D8	"CAN timeout, ASC"
DC	Knock control test pulse
DE	Knock control test pulse
EA	Automatic start input
EC	"CAN timeout, EGS"
ED	Automatic start output
FD	Coolant fan final stage

Table 07

08	Misfire w/low fuel
0A	PreCat oxygen sensor
0C	AfterCat oxygen sensor
0D	PreCat oxygen sensor heater
0E	AfterCat oxygen sensor heater
0F	PreCat oxygen sensor response time
10	PreCat oxygen sensor aging
11	AfterCat oxygen sensor response time
18	A/C Compressor
1A	"Fuel trim, multiplicative"
1B	"Fuel trim, QL additive"
1C	"Fuel trim, Ti additive"
20	Idle control valve stuck mechanically
27	EWS message
28	Catalyst efficiency
32	"Misfire detected, Cyl #1"
33	"Misfire detected, Cyl #2"
34	"Misfire detected, Cyl #3"
35	"Misfire detected, Cyl #4"
3E	"Misfire detected, random or unknown cylinder"
3F	"Misfire detected, catalyst damaging Cyl #1"
40	"Misfire detected, catalyst damaging Cyl #2"
41	"Misfire detected, catalyst damaging Cyl #3"
42	"Misfire detected, catalyst damaging Cyl #4"
4B	"Misfire detected, catalyst damaging random or unknown cylinder"
4E	Crankshaft position sensor (too many teeth)
50	Secondary air control
5D	EVAP emission control system
5E	EVAP large leak
61	EVAP small leak
62	EVAP purge control valve circuit

65	"DME, internal RAM failure"	10	"PreCat oxygen sensor aging, Bank 1"
66	"DME, internal RAM failure"	11	"AfterCat oxygen sensor response time, Bank 1"
67	"DME, ROM failure"		
68	Fault code memory error	12	"PreCat oxygen sensor, Bank 2"
6B	Control unit supply voltage	14	"AfterCat oxygen sensor, Bank 2"
6C	Battery disconnected	15	"PreCat oxygen sensor response time, Bank 2"
6F	Crankshaft position sensor	16	"PreCat oxygen sensor aging, Bank 2"
70	Camshaft position sensor	17	"AfterCat oxygen sensor response time, Bank 2"
73	Air mass sensor		
75	Throttle position sensor	18	A/C Compressor
78	Vehicle speed signal not present	1A	"Fuel trim, multiplicative, Bank 1"
79	Load calculation crosscheck (HFM vs TPS)	1B	"Fuel trim, QL additive, Bank 1"
7B	Coolant temperature sensor	1C	"Fuel trim, Ti additive, Bank 1"
7C	Intake air temperature sensor	20	Idle control valve stuck mechanically
87	Torque reduction: Transmission	22	"Fuel trim, multiplicative, Bank 2"
8F	"Intervention, MSR"	23	"Fuel trim, QL additive, Bank 2"
90	"Intervention, ASC"	24	"Fuel trim, Ti additive, Bank 2"
94	EWS Input	27	EWS message
96	"Fuel Injector, Cyl #1"	28	"Catalyst efficiency, Bank 1"
97	"Fuel Injector, Cyl #2"	2D	"Catalyst efficiency, Bank 2"
98	"Fuel Injector, Cyl #3"	32	"Misfire detected, Cyl #1"
99	"Fuel Injector, Cyl #4"	33	"Misfire detected, Cyl #2"
A5	Check engine lamp	34	"Misfire detected, Cyl #3"
A7	Electrical fuel pump relay	35	"Misfire detected, Cyl #4"
A8	Idle speed actuator (open)	36	"Misfire detected, Cyl #5"
A9	Idle speed actuator (close)	37	"Misfire detected, Cyl #6"
AA	A/C Compressor control	38	"Misfire detected, Cyl #7"
AF	DISA (intake resonance) flap	39	"Misfire detected, Cyl #8"
D2	"Knock Sensor, Cyl 1-2"	3A	"Misfire detected, Cyl #19"
D3	"Knock Sensor, Cyl 3-4"	3B	"Misfire detected, Cyl #10"
DC	Knock control zero test	3C	"Misfire detected, Cyl #11"
DE	Knock control test pulse	3D	"Misfire detected, Cyl #12"
EC	"CAN timeout, EGS"	3E	"Misfire detected, random or unknown cylinder"
		3F	"Misfire detected, catalyst damaging, Cyl #1"
		40	"Misfire detected, catalyst damaging, Cyl #2"
		41	"Misfire detected, catalyst damaging, Cyl #3"
		42	"Misfire detected, catalyst damaging, Cyl #4"
		43	"Misfire detected, catalyst damaging, Cyl #5"
		44	"Misfire detected, catalyst damaging, Cyl #6"
		45	"Misfire detected, catalyst damaging, Cyl #7"
		46	"Misfire detected, catalyst damaging, Cyl #8"
		47	"Misfire detected, catalyst damaging, Cyl #9"
		48	"Misfire detected, catalyst damaging, Cyl #10"

Table 09

04	"PreCat oxygen sensor heater, Bank 2"
05	"AfterCat oxygen sensor heater, Bank 2"
08	Misfire w/low fuel
0A	"PreCat oxygen sensor, Bank 1"
0C	"AfterCat oxygen sensor, Bank 1"
0D	"PreCat oxygen sensor heater, Bank 1"
0E	"AfterCat oxygen sensor heater, Bank 1"
0F	"PreCat oxygen sensor response time, Bank 1"

49	"Misfire detected, catalyst damaging, Cyl #11"	9F	"Fuel Injector, Cyl #10"
4A	"Misfire detected, catalyst damaging, Cyl #12"	A0	"Fuel Injector, Cyl #11"
4B	"Misfire detected, catalyst damaging, random or unknown cylinder"	A1	"Fuel Injector, Cyl #12"
		A5	Check engine lamp
4E	Crankshaft position sensor (too many teeth)	A7	Electrical fuel pump relay
50	"Secondary air control, Bank 1"	A8	Idle speed actuator (open)
54	Secondary air pump final stage	A9	Idle speed actuator (close)
55	Secondary air valve final stage	AA	A/C Compressor control
5D	EVAP emission control system	D0	"Secondary air control, Bank 2"
5E	EVAP large leak	D2	"Knock Sensor, #1"
61	EVAP small leak	D3	"Knock Sensor, #2"
62	EVAP purge control valve circuit	D4	"Knock Sensor, #3"
65	"DME, internal RAM failure"	D5	"Knock Sensor, #4"
66	"DME, internal RAM failure"	D8	"CAN timeout, ASC"
67	"DME, ROM failure"	DC	Knock control test pulse
68	Fault code memory error	DE	Knock control test pulse
6B	Control unit supply voltage	EA	Automatic start input
6C	Battery disconnected	EC	"CAN timeout, EGS"
6F	Crankshaft position sensor	ED	Automatic start output
70	Camshaft position sensor	FD	Coolant fan final stage
73	Air mass sensor		
75	Throttle position sensor		
78	Vehicle speed signal not present		
79	Load calculation crosscheck (HFM vs TPS)		
7B	Coolant temperature sensor		
7C	Intake air temperature sensor		
87	Torque reduction: Transmission		
8A	A/C Compressor torque reduction		
8B	Electric thermostat control final stage		
8D	ASC signal plausibility		
8F	"Intervention, MSR"		
90	"Intervention, ASC"		
93	Electric thermostat control performance		
94	EWS Input		
96	"Fuel Injector, Cyl #1"		
97	"Fuel Injector, Cyl #2"		
98	"Fuel Injector, Cyl #3"		
99	"Fuel Injector, Cyl #4"		
9A	"Fuel Injector, Cyl #5"		
9B	"Fuel Injector, Cyl #6"		
9C	"Fuel Injector, Cyl #7"		
9D	"Fuel Injector, Cyl #8"		
9E	"Fuel Injector, Cyl #9"		

Table 11

01	"Ignition Coil, Cyl #2"
02	"Ignition Coil, Cyl #4"
03	"Ignition Coil, Cyl #6"
05	"Fuel Injector, Cyl #2"
06	"Fuel Injector, Cyl #1"
08	Air mass sensor
0A	Coolant temperature sensor
0B	EVAP system pressure sensor
0C	Throttle position sensor
0E	Intake air temperature sensor
10	A/C Compressor PWM signal
12	EWS Signal
14	Check engine lamp
15	VANOS (Solenoid)
16	"Fuel Injector, Cyl #3"
17	"Fuel Injector, Cyl #6"
18	"Fuel Injector, Cyl #4"
19	"PreCat oxygen sensor heater, Cyl #1-3"
1B	Idle speed actuator (close)
1D	"Ignition Coil, Cyl #1"
1E	"Ignition Coil, Cyl #3"

1F	"Ignition Coil, Cyl #5"	D2	Ignition feedback faulty (>2 cylinders)
21	"Ignition Coil, Cyl #4"	D3	Idle control valve mechanically stuck
23	Secondary air system relay/pump	D4	VANOS mechanically stuck
2E	Fuel level signal (reserve lamp)	D6	Vehicle speed signal not present
2F	Catalyst temperature after start-up	D7	ACS/MSR/EML – interface not plausible
32	EVAP system running losses valve	D8	"Gear selector signal, signal undefined"
33	EVAP system shutoff valve	D9	CAN bus timeout
34	Rear exhaust valve flap	DA	CAN controller – warning level reached
35	Idle speed actuator (open)	DB	CAN bus offline
37	"PreCat oxygen sensor heater, Cyl #4-6"	DE	Time to closed loop temperature too long
38	Ignition feedback – shunt resistor	E3	"Oxygen sensor adaption limit, Cyl #1-3"
39	"Knock Sensor, Cyl #1-3"	E4	"Oxygen sensor adaption limit, Cyl #4-6"
3B	"Knock Sensor, Cyl #4-6"	E5	"PreCat oxygen sensor response time, Cyl #1-3"
3D	AfterCat oxygen sensor heater, Cyl #4-6	E6	"PreCat oxygen sensor response time, Cyl #4-6"
3E	"Secondary air system, switching valve"	E7	"PreCat oxygen sensor switching time, Cyl #1-3"
41	Camshaft sensor	E8	"PreCat oxygen sensor switching time, Cyl #4-6"
44	"EVAP system, purge control valve ckt."	E9	"Catalyst efficiency below threshold, Cyl #1-3"
45	Electrical fuel pump relay	EA	"Catalyst efficiency below threshold, Cyl #4-6"
4A	A/C compressor relay	EB	"AfterCat oxygen sensor heater power, Cyl #1-3"
4B	"PreCat oxygen sensor voltage, Cyl #1-3"	EC	"AfterCat oxygen sensor heater power, Cyl #4-6"
4C	"PreCat oxygen sensor voltage, Cyl #4-6"	EE	"Misfire detected, Cyl #1"
4D	"AfterCat oxygen sensor voltage, Cyl #1-3"	EF	"Misfire detected, Cyl #2"
4E	"AfterCat oxygen sensor voltage, Cyl #4-6"	F0	"Misfire detected, Cyl #3"
4F	"AfterCat oxygen sensor heater, Cyl #1-3"	F1	"Misfire detected, Cyl #4"
50	"ASC signal, active too long"	F2	"Misfire detected, Cyl #5"
51	"MSR signal, active too long"	F3	"Misfire detected, Cyl #6"
52	"EML signal, active too long"	F4	"Flywheel adaption, segment timing faulty"
53	Crankshaft Sensor	F5	"Secondary air system flow too low, Cyl #1-3"
64	DME Control Unit	F6	"Secondary air system flow too low, Cyl #4-6"
BE	EVAP reed switch not closed	F7	Secondary air system injector valve jammed
BF	EVAP reed switch doesn't open	FA	EVAP TEV not operating
C0	EVAP reed switch doesn't closed	FB	EVAP small leak detected
C1	EVAP clamped tube check	FC	EVAP incorrect purge flow
C2	EVAP large leak detected	FD	EVAP shut off valve stuck closed
C3	EVAP small leak detected	FE	EVAP large leak detected
C4	EVAP electrical LDP valve	FF	EVAP TEV stuck open
C5	EVAP barometric pressure sensor		
C8	"PreCat oxygen sensor no activeity, Cyl #1-3"		
C9	"PreCat oxygen sensor no activeity, Cyl #4-6"		
CA	"Oxygen sensor control limit, Cyl #1-3"		
CB	"Oxygen sensor control limit, Cyl #4-6"		
CC	"Idle control system, idle speed not plausible"		
D1	EWS message		

Table 15

01	"Ignition Coil, Cyl #2"	44	EVAP system, purge control valve circuit
02	"Ignition Coil, Cyl #4"	45	Electrical fuel pump ,relay
03	"Ignition Coil, Cyl #6"	4A	A/C Compressor relay
05	"Fuel Injector, Cyl #2"	4F	AfterCat oxygen sensor heater, Cyl#1-3
06	"Fuel Injector, Cyl #1"	53	Crankshaft Sensor
08	Air mass sensor	64	DME Control Unit
0A	Coolant temperature sensor	67	VANOS, faulty intake reference value
0B	Radiator outlet temperature sensor	68	VANOS, faulty exhaust reference value
0E	Intake air temperature sensor	69	VANOS, intake mechanically stuck
12	Camshaft sensor, exhaust cam	6A	VANOS, exhaust mechanically stuck
13	VANOS solenoid, exhaust	6D	Motorized Throttle valve (MDK), PWM not plausible
15	VANOS solenoid, intake	6E	Pedal sensor (PWG) potentiometer #1
16	"Fuel Injector, Cyl #3"	6F	Pedal sensor (PWG) potentiometer #2
17	"Fuel Injector, Cyl #6"	70	Motorized Throttle Vave (MDK) potentiometer #1
18	"Fuel Injector, Cyl #4"	71	Motorized Throttle Vave (MDK) potentiometer #2
19	"PreCat oxygen sensor heater, Cyl #1-3"	72	Motorized Throttle Vave (MDK) final stage
1B	Idle speed actuator (close)	73	Reference voltage (5v) source ofr #1 potentiometers
1D	Ignition Coil, Cyl #1	74	Reference voltage (5v) source ofr #2 potentiometers
1E	Ignition Coil, Cyl #3	75	Pedal sensor (PWG) potentiometer plausibility
1F	Ignition Coil, Cyl #5	76	Motorized Throttle Valve (MDK) feedback plausibility
21	Fuel Injector, Cyl #5	77	Motorized Throttle Valve (MDK) mechanically stuck
23	Secondary air system electrical pump	78	PWG / MDK potentiometers not plausible
26	Clutch switch	7A	Oil temperature sensor
27	Brake light switch (BLS)/brake light test plausibility	7B	Electric thermostat control final stage
28	Brake light switch (BLS)/pedal sensor plausibility	7C	DISA flap control
29	Multi-function steering wheel (WFL) signal	7D	Coolant fan final stage
2A	Multi-function steering wheel (WFL) redundant Code transmission	7E	LDP solenoid valve
2B	Multi-function steering wheel (WFL) control switch	7F	Electrical fuel pump
2D	Multi-function steering wheel (WFL) toggle bit	80	EWS signal
32	Running loss (3/2) valve final stage	82	CAN timeout (ASC1)
34	Rear exhaust valve flap	83	CAN timeout (instr2)
35	Idle speed actuator (open)	84	CAN timeout (instr3)
37	PreCat oxygen sensor heater, Cyl #4-6	85	CAN timeout (ASC3)
38	Ignition feedback – shunt resistor	8C	EVAP LDP reed switch not closed
39	"Knock Sensor, Cyl #1-3"	8D	EVAP LDP reed switch doesn't open
3B	"Knock Sensor, Cyl #4-6"	8E	EVAP LDP reed switch doesn't close
3D	AfterCat oxygen sensor heater, Cyl #4-6		
3E	"Secondary air system, switching valve"		
41	Camshaft sensor		

8F	EVAP clamped tube check	D2	Ignition feedback faulty (>2 cylinders)
90	EVAP Large leak detected	D3	Idle control valve mechanically stuck
91	EVAP small leak detected	D6	Vehicle speed signal not present
92	EVAP capillary leak (0.5mm) detected	D7	AfterCat oxygen sensor disconnection, Cyl #1-3
95	MDK position and air mass signal not plausible	D8	AfterCat oxygen sensor disconnection, Cyl #4-6
96	PreCat oxygen sensor short to B+, Cyl #1-3	D9	CAN timeout (EGS1)
97	PreCat oxygen sensor short to ground, Cyl #1-3	DB	CAN bus offline
98	PreCat oxygen sensor disconnection, Cyl #1-3	DC	AfterCat oxygen sensor slow response time, Cyl #1-3
99	PreCat oxygen sensor short to B+, Cyl #4-6	DD	AfterCat oxygen sensor slow response time, Cyl #4-6
9A	PreCat oxygen sensor short to ground, Cyl #4-6"	DE	Coolant temp too low for closed loop operation
9B	PreCat oxygen sensor disconnection, Cyl #4-6	DF	AfterCat oxygen sensor slow switching time, Cyl #1-3
9C	AfterCat oxygen sensor short to B+, Cyl #1-3	E0	AfterCat oxygen sensor slow switching time, Cyl #4-6
9D	AfterCat oxygen sensor short to ground, Cyl #1-3	E1	AfterCat oxygen sensor trim control, Cyl #1-3
9F	AfterCat oxygen sensor short to B+, Cyl #4-6	E2	AfterCat oxygen sensor trim control, Cyl #4-6
A0	AfterCat oxygen sensor short to ground, Cyl #4-6	E3	Oxygen sensor adaption limit, Cyl #1-3
A8	Electrical thermostat mechanically jammed open	E4	Oxygen sensor adaption limit, Cyl #4-6
A9	Motorized Throttle (MDK) final stage failure	E5	PreCat oxygen sensor slow response time, Cyl #1-3
AA	Communication with safety controller disturbed	E6	PreCat oxygen sensor slow response time, Cyl #4-6
AB	Safety controller has shut down MDK function	E7	PreCat oxygen sensor slow switching time, Cyl #1-3
AC	Pedal sensor (PWG) short between Potentiometers	E8	PreCat oxygen sensor slow switching time, Cyl #4-6
AD	Motorized Throttle (MDK) short between Potentiometers	E9	Catalyst efficiency below threshold, Cyl #1-3
AE	Motorized Throttle (MDK) idle position not plausible	EA	Catalyst efficiency below threshold, Cyl #4-6
AF	Pedal sensor (PWG) pot. #1 idle position not plausible	EB	PreCat oxygen sensor trim control, Cyl #1-3
B0	Pedal sensor (PWG) pot. #2 idle position not plausible	EC	PreCat oxygen sensor trim control, Cyl #4-6
BC	PreCat oxygen sensor heater insufficient, Cyl #1-3	EE	Misfire detected, Cyl #1
BD	PreCat oxygen sensor heater insufficient, Cyl #4-6	EF	Misfire detected, Cyl #2
BE	AfterCat oxygen sensor heater insufficient, Cyl #1-3	F0	Misfire detected, Cyl #3
BF	AfterCat oxygen sensor heater insufficient, Cyl #4-6	F1	Misfire detected, Cyl #4
CA	Oxygen sensor control limit, Cyl #1-3	F2	Misfire detected, Cyl #5
CB	Oxygen sensor control limit, Cyl #4-6	F3	Misfire detected, Cyl #6
CC	Idle control system, idle speed not plausible	F4	Flywheel adaption, segment timing faulty
D0	EWS engine speed check not ok	F5	Secondary air system flow too low, Cyl #1-3
D1	EWS message	F6	Secondary air system flow too low, Cyl #4-6
		F7	Secondary air system valve stuck open
		F8	AfterCat oxygen sensor, signal after decel not

	plausible, Cyl #1-3	22	"Fuel Injector, Cyl #7"
F9	AfterCat oxygen sensor, signal after decel not plausible, Cyl #4-6	23	"Fuel Injector, Cyl #8
FA	Functional check purge valve	24	Evaporative emission purge control valve
		25	"PreCat oxygen sensor heater control, Cyl #1-4"
		26	"PreCat oxygen sensor heater control, Cyl #5-8"
		27	"AfterCat oxygen sensor heater control, Cyl #1-4"
		28	"AfterCat oxygen sensor heater control, Cyl #5-8"
		29	"Air mass sensor, Cyl #1-4"
		2A	"Vehicle speed input signal, hardwired "A" signal"
		2B	Radiator outlet temperature sensor
		2C	Thermal oil level sensor
		2D	Drive-by-wire throttle actuator driver
		2E	Fuel consumption (KVA) signal output
		2F	Engine RPM (TD) signal output
		30	A/C Compressor relay
		32	"Ignition Coil, Cyl #4"
		33	"Ignition Coil, Cyl #6"
		34	"Ignition Coil, Cyl #5"
		35	Electronic fan (relay)
		36	Battery voltage behind main relay
		37	"Ignition Coil, Cyl #7"
		39	"Air mass sensor, Cyl #5-8"
		3A	Sensor voltage supply 1
		3B	Sensor voltage supply 2
		3C	"Pedal position sensor 1, master measurement"
		3D	"Pedal position sensor 2, master measurement"
		3F	Secondary air switching valve
		41	"Throttle position sensor 2, slave measurement"
		42	EWS interface
		43	"Intake camshaft VANOS advance valve, Cyl #1-4"
		45	"Knock sensor, Cyl #5-6"
		46	"Knock sensor, Cyl #3-4"
		47	"Knock sensor, Cyl #7-8"
		48	"Intake camshaft VANOS read valve, Cyl #1-4"
		49	"Air mass sensor, plausibility"
		4A	"Intake camshaft VANOS advance valve, Cyl #5-8"
		4B	"Intake camshaft VANOS read valve, Cyl #5-8"
		4C	Ambient pressure sensor
		4D	Intake air temperature sensor
		4E	Coolant temperature sensor
		4F	Exhaust gas temperature sensor

Table 16 (see table 11)**Table 18**

01	Fuel pump relay
02	Idle speed actuator (close)
03	"Fuel Injector, Cyl #1"
04	"Fuel Injector, Cyl #3"
05	"Fuel Injector, Cyl #2"
06	Timeout SMG-CAN
07	"Intake camshaft position sensor, Cyl #1-4"
08	"Intake camshaft position sensor, Cyl #5-8"
09	"Knock sensor, Cyl #1-2"
0A	"Exhaust camshaft position sensor, Cyl #1-4"
0B	"Exhaust camshaft position sensor, Cyl #5-8"
0C	"PreCat oxygen sensor Cyl #5-8"
0D	"PreCat oxygen sensor Cyl #1-4"
0E	Tank small leak
0F	"Crankshaft/Camshaft position correlation, Cyl #1-4"
10	Crankshaft sensor
12	Map controlled thermostat actuator
13	Secondary air pump relay
14	Starter relay
15	"Exhaust camshaft VANOS retard valve, Cyl #1-4"
16	"Exhaust camshaft VANOS advance valve, Cyl #1-4"
17	"Ignition Coil, Cyl #2"
18	"Ignition Coil, Cyl #3"
19	"Ignition Coil, Cyl #1"
1A	"Ignition Coil, Cyl #8"
1B	DM-TL switching valve
1C	Map controlled thermostat control
1D	Idle speed actuator(open)
1E	"Control unit self-test, A/D converter monitoring"
1F	"Fuel Injector, Cyl #5"
20	"Fuel Injector, Cyl #6"
21	"Fuel Injector, Cyl #4"

50	Switch-chain grip	7A	"Control unit self-test, master processor"	B1	"Air-fuel adaptation at idle, Cyl #5-8"		(rich to lean),Cyl #1-4"
51	MFL interface signal	7B	"Bus offline, SMG-CAN"	B2	"Catalyst system efficiency, Cyl #1-4"	D9	"PreCat oxygen sensor slow switching, (rich to lean),Cyl #5-8"
52	Muffler flap	7C	Active engine bearing	B3	"Catalyst system efficiency, Cyl #5-8"		
53	"Exhaust camshaft VANOS advance valve, Cyl #5-8"	7D	Spoiler adjustment	B4	Tank leak detected	DA	"PreCat oxygen sensor signal size/amplitude, Cyl #1-4"
54	"Exhaust camshaft VANOS retard valve, Cyl #5-8"	7E	Fuel pump crash shut-off	B5	Filler cap open		
55	"Throttle position sensor, master measurement"	7F	DM-TL module	B6	"Injection driver 1, over temp."	DB	"PreCat oxygen sensor signal size/amplitude, Cyl #5-8"
56	CAN bus offline	80	Idle speed deviation	B7	"Injection driver 2, over temp."		
57	"AfterCat oxygen sensor voltage, Cyl #1-4"	82	"EWS signal, manipulation detected"	B8	"Intake camshaft VANOS position control, Cyl #1-4"	E4	"Drive-by-wire, throttle control failure"
58	"AfterCat oxygen sensor voltage, Cyl #5-8"	83	"DSC intervention, plausibility"			E5	"Drive-by-wire, throttle control failure"
59	"Control unit self-test, Safety Concept slave check"	84	DSC message timeout	B9	"Exhaust camshaft VANOS position control, Cyl #1-4"	E6	"Drive-by-wire, throttle position failure"
5A	"PreCat oxygen sensor aging, Cyl #1-4"	85	Steering angle sensor message timeout			E7	"Control unit self-test, slave processor check"
5B	"PreCat oxygen sensor aging, Cyl #5-8"	86	Instrument Cluster message timeout	BA	"Ignition output stage, Cyl #1"	E8	Evaporative emissions purge valve functional check
5C	"AfterCat oxygen sensor aging, Cyl #1-4"	87	Vehicle speed signals (both Discrete & CAN)	BB	"Ignition output stage, Cyl #2"		
5D	"AfterCat oxygen sensor aging, Cyl #5-8"	88	Idle speed controller	BC	"Ignition output stage, Cyl #3"	F7	VANOS pressure accumulator valve
63	"Control unit self-test, Safety Concept master check"	89	Jet stream pump	BD	"Ignition output stage, Cyl #4"	F8	"Intake camshaft VANOS moving time, Cyl #1-4"
64	Tire pressure left front	8A	Differential lock	BE	"Ignition output stage, Cyl #5"		
65	Tire pressure right front	8B	Cruise control system	BF	"Ignition output stage, Cyl #6"	F9	"Exhaust camshaft VANOS moving time, Cyl #1-4"
66	Tire pressure right back	8C	Engine noise too high	C0	"Ignition output stage, Cyl #7"		
67	Tire pressure left back	8D	"Fuel level, plausibility"	C1	"Ignition output stage, Cyl #8"	FA	"Intake camshaft VANOS sealing, Cyl #1-4"
69	"Engine coolant temperature, Plausibility"	8F	E-box-fan	C2	"Control unit self-test, cruise control shut-off"	FB	"Exhaust camshaft VANOS sealing, Cyl #1-4"
6A	Brake light switch	90	"Fuel control, Cyl #1-4"	C3	"Control unit self-test, torque manager Monitoring"	FC	"Intake camshaft VANOS moving time, Cyl #5-8"
6B	"Control unit self-test, pre-drive check of drive-by-wire system"	91	"Fuel control, Cyl #5-8"			FD	"Exhaust camshaft VANOS moving time, Cyl #5-8"
6C	Switching valve oil circuit left	95	Misfire w/empty fuel tank	C4	"Misfire, Cyl #1"		
6D	Switching valve oil circuit right	96	"Control unit self-test, memory test master"	C5	"Misfire, Cyl #2"	FE	"Intake camshaft VANOS sealing, Cyl #5-8"
6E	Sport switch LED indicator	97	"Control unit self-test, driver diagnostics chain"	C6	"Misfire, Cyl #3"	FF	"Exhaust camshaft VANOS sealing, Cyl #5-8"
6F	"Pedal position sensor 1, cross check"	98	"Control unit self-test, communication master"	C7	"Misfire, Cyl #4"		
70	"Pedal position sensor 2, cross check"	9B	"Control unit self-test, adaption EEPROM master"	C8	"Misfire, Cyl #5"		
71	"Intake camshaft VANOS position control, Cyl #5-8"	9C	"Control unit self-test, adaption EEPROM slvae"	C9	"Misfire, Cyl #6"		
72	"Exhaust camshaft VANOS position control, Cyl #5-8"	9D	"Control unit self-test, memory test slave"	CA	"Misfire, Cyl #7"		
73	"Control unit self-test, internal ECU temperature	9E	"Control unit self-test, communication slave"	CB	"Misfire, Cyl #8"		
74	Servotronic valve current	9F	"Control unit self-test, knock detection IC 1"	CC	"Misfire, multiple cylinders"		
75	Servotronic speed signal	A0	"Control unit self-test, knock detection IC 2"	CD	"Misfire during warm-up, Cyl #1"		
76	Throttle position sensor 1	A1	Knock control	CE	"Misfire during warm-up, Cyl #2"		
77	Throttle position sensor 2	A2	"Crankshaft/Camshaft position correlation, Cyl #5-8"	CF	"Misfire during warm-up, Cyl #3"		
78	"Throttle position sensors, cross check "	A3	"Control unit self-test, master resets"	D0	"Misfire during warm-up, Cyl #4"		
79	"Throttle position sensors, both bad"	AA	"Secondary air system, flow too low"	D1	"Misfire during warm-up, Cyl #5"		
		AB	"Secondary air system, valve sticking"	D2	"Misfire during warm-up, Cyl #6"		
		AC	VANOS pressure storage valve	D3	"Misfire during warm-up, Cyl #7"		
		AD	Starter switch input	D4	"Misfire during warm-up, Cyl #8"		
		AE	"Air-fuel adaptation, Cyl #1-4"	D5	"Misfire during warm-up, multiple cylinders"		
		AF	"Air-fuel adaptation, Cyl #5-8"	D6	"PreCat oxygen sensor slow response, Cyl #1-4"		
		B0	"Air-fuel adaptation at idle, Cyl #1-4"	D7	"PreCat oxygen sensor slow response, Cyl #5-8"		
				D8	"PreCat oxygen sensor slow switching,		

Table 19

01	"Ignition Coil, Cyl #2"
02	"Ignition Coil, Cyl #4"
03	"Ignition Coil, Cyl #6"
05	"Fuel Injector, Cyl #2"
06	"Fuel Injector, Cyl #1"
08	Air mass sensor
0A	Engine coolant temperature
0B	"Engine coolant temperature, radiator outlet"
0C	"Engine coolant temperature, Plausibility"
0E	Intake air temperature
12	Exhaust camshaft position sensor
13	Exhaust camshaft solenoid valve
15	Intake camshaft solenoid valve
16	"Fuel Injector, Cyl #3"
17	"Fuel Injector, Cyl #6"

18	"Fuel Injector, Cyl #4"	45	Fuel pump relay	81	"Timeout, SSG"	D6	Vehicle speed signal not present
19	"ProCat oxygen sensor heater insufficient, Cyl #1-3"	46	"Control module self-test, control module defective"	82	"Timeout, CAN – ASC1"	D7	"AfterCat oxygen sensor disconnection, Cyl #1-3"
1B	Idle speed actuator (close)	47	"Control module self-test, control module defective"	83	"Timeout, CAN – INSTR2"	D8	"AfterCat oxygen sensor disconnection, Cyl #4-6"
1D	Ignition Coil, Cyl #1	48	"Control module self-test, control module defective"	84	"Timeout, CAN – INSTR3"	D9	CAN timeout (EGS 1)
1E	Ignition Coil, Cyl #3	4A	A/C compressor relay	85	"Timeout, CAN – ASC3"	DB	CAN bus offline
1F	Ignition Coil, Cyl #5	4F	"AfterCat oxygen sensor heater insufficient, Cyl #1-3"	86	"SSG intervention, plausibility"	DC	"AfterCat oxygen sensor slow resp time, Cyl #1-3"
21	Fuel Injector, Cyl #5	53	Crankshaft Sensor	87	"Throttle position sensor, adaptation self-test"	DD	"AfterCat oxygen sensor slow resp time, Cyl #4-6"
23	Secondary air pump relay	5E	"Secondary air system, air mass"	88	"Throttle position sensor, adaptation self-test"	DE	Coolant temp too low for closed loop operation
24	Main relay	5F	"Secondary air system, tube blocked"	8C	DM-TL pump control circuit	DF	"AfterCat oxygen sensor slow switching time, Cyl #1-3"
25	Main relay switching delay	60	"Secondary air system, pump not active"	8E	DM-TL pump current	E0	"AfterCat oxygen sensor slow switching time, Cyl #4-6"
26	Clutch switch	61	"Secondary air system, flow too low"	8F	DM-TL leak detected	E1	"AfterCat fuel trim system, Cyl #1-3"
27	BLS/BTS plausibility	62	"Secondary air system, flow too high"	92	"Pedal position sensor 1, supply voltage"	E2	"AfterCat fuel trim system, Cyl #4-6"
2A	MFL signal redundancy	63	"Secondary air system, valve jammed open"	93	"Pedal position sensor 2, supply voltage"	E3	"Oxygen sensor adaptation limit, Cyl #1-3"
2B	MFL seesaw key	64	"Memory self-test, control module defective"	95	"Air mass sensor, range/performance"	E4	"Oxygen sensor adaptation limit, Cyl #4-6"
2D	MFL bit toggle	66	"Intake camshaft VANOS, over-advanced or System perf."	96	"PreCat oxygen sensor voltage, Cyl #1-3"	E5	"PreCat oxygen sensor slow resp time, Cyl #1-3"
2F	"Torque limitation, safety level 1"	67	"Exhaust camshaft VANOS, over-advanced or System perf."	97	"PreCat oxygen sensor voltage, Cyl #4-6"	E6	"PreCat oxygen sensor slow resp time, Cyl #4-6"
30	"Control module self-test, control module defective"	68	"Intake camshaft VANOS, over-retarded"	98	"AfterCat oxygen sensor voltage, Cyl #1-3"	E7	"PreCat oxygen sensor slow switching time, Cyl #1-3"
31	"Control module self-test, torque monitoring"	69	"Exhaust camshaft VANOS, over-retarded"	99	"AfterCat oxygen sensor voltage, Cyl #4-6"	E8	"PreCat oxygen sensor slow switching time, Cyl #4-6"
32	"Control module self-test, speed monitoring"	6A	Throttle valve control circuit	A0	"Throttle valve position controller, stuck temporarily"	E9	"Catalyst efficiency below threshold, Cyl #1-3"
33	"Control module self-test, speed monitoring"	6D	Pedal position sensor 1	A1	"Throttle valve position controller, stuck permanently"	EA	"Catalyst efficiency below threshold, Cyl #4-6"
34	Exhaust flap	6E	Pedal position sensor 2	A2	"Throttle valve position controller, control deviation"	EB	"PreCat fuel trim system, Cyl #1-3"
35	Idle speed actuator (open)	6F	Throttle position sensor 1	A8	Coolant thermostat jammed open	EC	"PreCat fuel trim system, Cyl #4-6"
37	"PreCat oxygen sensor heater insufficient, Cyl #4-6"	70	Throttle position sensor 2	BA	"Oxygen sensor heating during regulation, Cyl #1-3"	EE	"Misfire detected, Cyl #1"
38	Ignition feedback – shunt resistor	71	"Pedal position sensor, plausibility"	BB	"Oxygen sensor heating during regulation, Cyl #4-6"	EF	"Misfire detected, Cyl #2"
39	"Knock Sensor, Cyl #1-3"	72	"Throttle position sensor, adaptation"	BC	"PreCat oxygen sensor heater circuit, Cyl #1-3"	F0	"Misfire detected, Cyl #3"
3A	"Control module self-test, control module defective"	73	"Pedal position sensor, range/performance"	BD	"PreCat oxygen sensor heater circuit, Cyl #4-6"	F1	"Misfire detected, Cyl #4"
3B	"Knock Sensor, Cyl #4-6"	75	"Throttle position sensor 1, plausibility, range, or performance"	BE	"AfterCat oxygen sensor heater circuit, Cyl #1-3"	F2	"Misfire detected, Cyl #5"
3D	"AfterCat oxygen sensor heater insufficient, Cyl #4-6"	76	"Throttle position sensor 2, plausibility, range, or performance"	BF	"AfterCat oxygen sensor heater circuit, Cyl #4-6"	F3	"Misfire detected, Cyl #6"
3E	"Secondary air system, switching valve circuit"	77	Brake and Pedal position not plausible	C4	Pressure sensor circuit	F4	"Flywheel adaptation, segment timing faulty"
3F	"Control module self-test, control module defective"	78	Oil temperature sensor	C5	Pressure sensor circuit	F5	"Secondary air system flow too low, Cyl #1-3"
41	Intake camshaft position sensor	7A	Map controlled thermostat	C6	"Catalytic convertor efficiency, Cyl #1-3"	F6	"Secondary air system flow too low, Cyl #4-6"
42	"Control module self-test, control module defective"	7B	DISA control	C7	"Catalytic convertor efficiency, Cyl #4-6"	F7	Secondary air system valve stuck open
43	"Control module self-test, control module defective"	7C	E-fan	CA	"Oxygen sensor control limit, Cyl #1-3"	F8	"AfterCat oxygen sensor, signal after decel not Plausible, Cyl #1-3"
44	"Evaporative emission system, control module defective"	7D	DM-TL Switching solenoid	CB	"Oxygen sensor control limit, Cyl #4-6"	F9	"AfterCat oxygen sensor, signal after decel not Plausible, Cyl #4-6"
		7E	EWS signal	CC	"Idle control system, idle speed not plausible"	FA	Functional check purge valve
		80		D1	EWS message		
				D2	Ignition feedback faulty (>2 cylinders)		
				D3	Idle control valve mechanically stuck		

Appendix

Common Problems/Troubleshooting

Flashing E message on tool:

Occasionally the B100 will flash 'E' when an attempt is made to read codes or reset the MIL light (Check Engine or Service Engine Soon). "E" means the car is not responding to the tool: This happens when the data line (also called "diagnostic bus") inside the car is "hung" or disabled.

Things to try to resolve the "E" error message:

1.) Insertion Depth: Check the insertion of the B100 into the diagnostic connector. If it is not fully inserted the unit will not work .

2.) Reversing the power-up sequence: Plug in the B100 first , Then turn on the ignition key . This is the opposite of the routine specified by the manual and the tool label. This procedure has proven very effective on some cars.

3.) Cycle power: Plug in tool, cycle the ignition key on and off two or three times (do not start engine)

4.) Other warning lights: Observe that no other malfunction indicator lights are on. Often a malfunctioning module (i.e. DME, EGS/transmission, ABS traction control, etc...) can impair or "hang" the diagnostic bus.

5.) Other warning lights: Observe that no other malfunction indicator lights are on. Often a malfunctioning module (i.e. DME, EGS/transmission, ABS traction control, etc...) can impair or "hang" the diagnostic bus.

6.) Power resetting of all modules (entire car)

Note: before doing this procedure, get your radio security code from the dealer.

- a.) Disconnect the main car battery.

- b.) Activate the emergency flasher lights (this will fully drain all power from all ECUs) wait 5 minutes

- c.) Reconnect the main battery and try the tool again.

7.) Module Troubleshooting: If you suspect a particular module is malfunctioning or damaged, you may wish to consult repair documentation for the car and attempt to isolate the problem by removing the problem by removing the module the module form the diagnostic bus. **WARNING:** This procedure is for qualified mechanics only.

ABS service bulletin 34 01 96: BMW circulated a service bulletin and low cost repair advice detailing the malfunction of the ABS unit ground wiring which caused diagnostic bus problems on a large number of BMWs. This is often the problem on BMWs built prior to 10/1994 that are getting the "E" message on the B100 code tool.

8.) The Dealer

Visit your local BMW dealership. The B100 will not serve it's intended purpose if the diagnostic bus is impaired by a malfunctioning control module. If one of the modules ia inhibiting communications it is necessary to visit a BMW dealer or qualified repair facility to diagnose and fix/replace the bad module.

Service Light battery problems:

(Note: only applies to BMWs older than 1989) The lights on the B100 are working as they are supposed to but one of the following conditions occurs:

- a.) The reset seemed successful but the service lights come back on shortly after the reset was done.
- b.) The service lights stay on while the ignition is off and the key is out of the ignition switch.
- c.) The service lights flash off and on.
- d.) The service lights will not rest at all.
- e.) The tachometer, temperature gauge, or fuel economy gauge seem erratic (meter needle jumps rapidly) or have quit working completely. The list of problems above indicates a dying or dead backup battery on your S.I. (Service Interval) computer circuit board. Then this "backup" battery dies, the S.I. computer has to re-start every time you start your car, at which point an "inspection" will be

indicated. Winter storage without a trickle charger is the most common cause of premature S.I. battery failure. These specialized batteries have a life expectancy of approximately 4 to 7 years. Replacing the S.I. batteries takes about 90 minutes from start to finish and requires that you know how to operate a soldering iron. A battery replacement kit is available for most pre 1989 models from Peake Research corp.

Glossary

A/C = Air conditioner
ABS = Anti-lock System
ASC = Skid control (see "Intervention")
ADS = Aus Throttle Position Motor
AHK = Active Rear Axle Kinematics
BLS = Brake Light Switch
Check Engine Light: on the dashboard, Indicates the **DME** has detected problem
CC = Check control
CO = Carbon Monoxide
DDE = ECU for Diesel Engine
Diagnostic Connector: Where the Code Reader for B100 Plugs into the car.
DISA = intake runner length tuning mechanism
DME = Engine ECU (Gasoline engine): Monitors and controls all engine sensors and functions
DSC = Dynamic Stability Control
DWA = Alarm system
E = Communications error: See "Flashing E below"
EGS = Electronic Automatic Transmission
EKAT = Electrically heated catalytic convertor
EKM = electronic Body Module
EML = Electronic Throttle Control
EVAP = relates to fuel vapor recovery often this code indicates a Loose gas cap
EWS = Drive away protection(alarm system)
Fault Code: a "code" stored in the **DME** Memory-indicates a past or present problem.
Fuel Trim = adjustments to maintain proper air fuel ratio (see Lambda Control)
Flashing E: (in Code Reader for BMW display) communication problem in the vehicle,
GM = General Module
Intervention, MSR, ASC = intervention is when another control unit (i.e. skid control) requests a power/torque change from the **DME**. Code indicates **DME** assessed the requests as being incorrect or too long.
Lambda Control = Code means **DME** is unable to maintain requisite air/fuel ratio due to external factor (air leak, bad injector, sensor, etc..) (also see fuel trim)
LDP = Loss Diagnosis Pump
Load Calculation Cross (HFM VS TOS) = when actual air flow exceeds +/-25% of calculated air flow.
MDK = Motorized Throttle Valve
MIL = Malfunction Indicator Lamp, also called the "Check Engine" or "Service Engine Soon"
MLF = Malfunction function Steering Wheel
MSR = Drag Torque Intervention (torque reduction for anti skid)see "Intervention"
NTC = coolant temperature sensor
Oilservice & Inspection: Also called Si (abbrev. For service interval) Maintenance reminder lights
PWG = Pedal Sensor Potentiometer
QL = idle air mass adaption (see Fuel Trim)
PAM = **DME** random access memory
ROM = **DME** program memory
Scan Tool: Generic term for the Code Reader for Mini Cooper & Cooper S
Service Engine Soon: on the dashboard, indicates the DME has detected a problem.
SI = Service Interval
SMG = BMW Motor sport Sequential Gearbox
SRS = Airbag
TD = Tachometer Signal
TEV = Evap, fuel tank vent / purge valve
Ti Additive: idle fuel adaption (see fuel trim)
Ti multiplicative: adaption a Percentage +/- of injector time (see Fuel Train)
TR signal = from **DME**, **RPM** and valve position
VANOS = Adjustable Valve Train
VDS = Vehicle Description System. VIN Digits 4-7
VIN = Vehicle identification number.
ZAB = see ASC
ZKE = Central Body Electronics
 For further definitions, please consult documentation for the vehicle.