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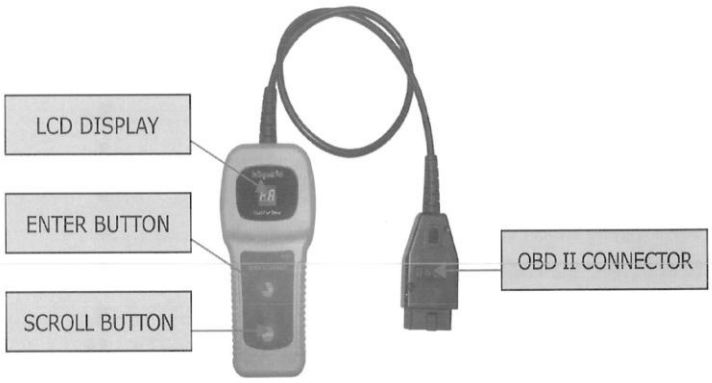
Tool Description



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 STARTENGNE)

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

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.)

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.)

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)

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 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.

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 Year	Model	VDS	Table
1987	325is	AA13	K1
1987	325is A	AA23	K1
1987	325i/4	AD13	K1
1987	325IA/4	AD23	K1
1987	321iC	BB13	K1
1987	325iCA	BB23	K1

1988 Year	Model	VDS	Table
1988	325is	AA13	K1
1988	325is A	AA23	K1
1988	325iX A/2	AB03	K1
1988	325/2	AB54	K1
1988	325 A2	AB64	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
3	Electrical fuel pump relay
4	Idle speed actuator (open)
5	Evaporative purge control valve
7	Air flow meter
0A	Emission (lambda) control
0F	Check engine lamp
10	Fuel injectors (Cyl. 1,3,5)
11	Fuel Injectors
16	Idle speed actuator (close)
17	Oxy sensor heating relay
1C	Oxy sensor
1d	Vehicle speed signal not present
21	AT kick –down prevent solenoid valve
25	Control unit supply
26	Automatic Stability control / DWA
28	A/C Compressor
2b	Idle CO Potentiometer
2C	Intake air temperature sensor
2d	Coolant temperature sensor
32	Engine drag torque control(MSR)
33	Ignition timing intervention
34	Idle switch
35	Full load switch
36	Torque Convector Clutch
64	Unspecified DME Output Stage

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
11	Camshaft sensor
17	Ignition Coil, Cyl #4
18	Ignition Coil, Cyl #6
19	Ignition Coil, Cyl #5
1A	Control unit supply
1d	Idle speed actuator (open)
1F	Fuel Injector, Cyl #3
20	Fuel Injector, Cyl #2
21	Fuel Injector, Cyl #1
24	Evaporative purge control valve
26	Oxy sensor heating relay
29	Air mass sensor
2A	Vehicle speed signal not present
30	A/C Compressor control
32	Ignition Coil, Cyl #1
33	Ignition Coil, Cyl #2
34	Ignition Coil, Cyl #3
36	Battery voltage /DME main relay
37	Misfire detected, Cyl #6
39	Ignition timing intervention
41	A/C Compressor
42	DWA/EWS Input
45	Knock Sensor, Cyl 4-6
46	Knock Sensor, Cyl 1-3
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
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 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 sontrol
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 sontrol 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 Potentioneter
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
5	AfterCat oxy sensor heater, Bank 2
8	Misfire w/low fuel
0A	PreCat oxy sensor, Bank 1
0C	AfterCat oxy sensor, Bank 1
0d	PreCat oxy sensor heater, Bank 1
0E	AfterCat oxy sensor heater, Bank 1
0F	PreCat oxy sensor response time, Bank 1
10	PreCat oxy sensor aging, Bank 1
11	AfterCat oxy sensor response time, Bank 1
12	PreCat oxy sensor, Bank 2
14	AfterCat oxy sensor, Bank 2
15	PreCat oxy sensor response time, Bank 2
16	PreCat oxy sensor aging, Bank 2
17	AfterCat oxy sensor response time, Bank 2
18	A/C Compressor
1A	Fuel trim, multiplicative, Bank 1
1b	Fuel trim, QL additive, Bank 1
1C	Fuel trim, Ti additive, Bank 1
20	Idle control valve stuck mechanically
22	Fuel trim, multiplicative, Bank 2
23	Fuel trim, QL additive, Bank 2
24	Fuel trim, Ti additive, Bank 2
27	EWS message
28	Catalyst efficiency, Bank 1
2d	Catalyst efficiency, Bank 2
32	Misfire detected, Cyl #1
33	Misfire detected, Cyl #2
34	Misfire detected, Cyl #3
35	Misfire detected, Cyl #4
36	Misfire detected, Cyl #5
37	Misfire detected, Cyl #6
38	Misfire detected, Cyl #7
39	Misfire detected, Cyl #8
3A	Misfire detected, Cyl #9
3b	Misfire detected, Cyl #10
3C	Misfire detected, Cyl #11
3d	Misfire detected, Cyl #12
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
49	Misfire detected, catalyst damaging, Cyl #11
4A	Misfire detected, catalyst damaging, Cyl #12
4b	Misfire detected, catalyst damaging, random/unknown Cyl.
4E	Crankshaft position sensor (too many teeth)
50	Secondary air control, Bank 1
54	Secondary air pump final stage
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, TOM failure
68	Fault code memory error
6b	Control unit supply voltage
6C	Battery disconnected
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
9E	Fuel Injector, Cyl #9
9F	Fuel Injector, Cyl #10
A0	Fuel Injector, Cyl #11
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 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
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
55	A/C Compressor request
64	Unspecified DME Output Stage
C8	DME control unit selftest
C9	Emission (lambda) control

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

CODE TABLES (FOR 1996 AND LATER)

USE THE CODE DEFINITOIONS 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
02	Idle speed actuator (close)
03	"Fuel injector, Cyl #1"
04	"Fuel injector, Cyl #4"
05	"Fuel injector, Cyl #6"
06	"Fuel injector, Unknown"
07	"Fuel injector, Cyl #7"
08	Check engine tamp
0C	"Oxygen sensor, #2"
0D	"Oxygen sensor, #1"
0F	Ignition secondary monitor
10	Crankshaft sensor
11	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	Oxygen 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 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
22	"Fuel trim, multiplicative, Cyl 5-8"
23	"Fuel trim, QL additive, Cyl 5-8"
24	"Fuel trim, Ti additive, Cyl 5-8"
27	EWS message
28	"Catalyst efficiency, Cyl 1-4"
2D	"Catalyst efficiency, Cyl 5-8"
32	"Misfire detected, Cyl #1"
33	"Misfire detected, Cyl #2"
34	"Misfire detected, Cyl #3"
35	"Misfire detected, Cyl #4"
36	"Misfire detected, Cyl #5"
37	"Misfire detected, Cyl #6"
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

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 recuction
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, Cly 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 airvalve
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
D7	Knock control offset
D8	Knock control test pulse
DB	CAN timeout
DC	"CAN timeout, EGS"
DD	"CAN timeout, ASC/DSC"
DE	"CAN timeout, instrument cluster"
DF	"CAN timeout, ACC"
E0	MSR intervention plausibility
E1	ACC intervention plausibility
E2	Fuel level plausibility
E5	Pedal position sensor supply voltage
E6	Pedal position sensors
E7	Pedal position sensor 1
E8	Pedal position sensor 2
E9	Automatic starter control output
EA	Automatic starter input signal
EC	Intake air flap dontrol
ED	Automatic starter

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"
19	"Ignition Coil, Cyl #1"
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"
24	Evaporative emission purge control valve
25	"PreCat oxygen sensor heater control, Cyl #1-3"
26	"PreCat oxygen sensor heater control, Cyl #4-6"
27	"AfterCat oxygen sensor heater control, Cyl #1-3"
28	"AfterCat oxygen sensor heater control, Cyl #4-6"
29	Air mass sensor
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"

4C	Ambient pressure sensor
4D	Intake air temperature sensor
4E	Coolant temperature sensor
4F	Exhaust gas temperature sensor
50	Switch-chain grip
51	MFL interface signal
52	Muffler flap
55	"Throttle position sensor, master measurement"
56	CAN bus offline
57	"AfterCat oxygen sensor voltage, Cyl #1-3"
58	"AfterCat oxygen sensor voltage, Cyl #4-6"
59	"Control unit self-test, Safety Concept slave check "
5A	"PreCat oxygen sensor aging, Cyl #1-3"
5B	"PreCat oxygen sensor aging, Cyl #4-6"
5C	"AfterCat oxygen sensor aging, Cyl #1-3"
5D	"AfterCat oxygen sensor aging, Cyl #4-6"
63	"Control unit self-test, Safety Concept master check "
69	"Engine coolant temperature, plausibility"
6A	Brake light switch
6B	"Control unit self-test, pre-drive check of Drive-by-wire system "
6C	Switching valve oil circuit left
6D	Switching valve oil circuit right
6E	Sport switch LED indicator
6F	"Pedal position sensor 1, cross check"
70	"Pedal position sensor 2, cross check"
73	"control unit self-test, internal ECU temperature"
76	Throttle position sensor 1
77	Throttle position sensor 2
78	"Throttle position sensors, cross check"
79	"Throttle position sensors, both bad"
7A	"Control unit self-test, master processor"
7B	"Bus offline, SMG-CAN"
7E	Fuel pump crash shut-off
7F	DM-TL module
80	Idle speed deviation
82	"EWS signal, manipulation detected"
83	"DSC intervention, plausibility"
84	DSC message timeout
86	Instrument Cluster message timeout
87	Vehicle speed signal
88	Idle speed controller
8C	Cruise control system
8D	"Fuel level, plausibility"
8F	E-box-fan
90	"Fuel control, Cyl #1-3"
91	"Fuel control, Cyl #4-6"
95	Misfire w/empty fuel tack
96	"Control unit self-test, memory test master"
97	"Control unit self-test, driver diagnostics chain"
98	"Control unit self-test, communication master"
9B	"Control unit self-test, adaptation EEPROM master"
9C	"Control unit self-test, adaptation EEPROM SALVE"
9D	"Control unit self-test, memory test slave"
9E	"Control unit self-test, communication slave"
9F	"Control unit self-test, knock detection IC 1"
A0	"Control unit self-test, knock detection IC 2"
A1	Knock control
A3	"Control unit self-test, master resets"
AA	"Secondary air system, flow too low"
AB	"Secondary air system, valve sticking"
AC	VANOS pressure storage valve
AD	Starter switch input
AE	"Mixture adaptation, Cyl #1-3"
AF	"Mixture adaptation, Cyl #4-6"
B0	DM-TL error
B2	"Catalyst system efficiency, Cyl #1-3""
B3	"Catalyst system efficiency, Cyl #4-6""
B4	Tank leak detected
B5	Filler cap open
B6	"Injection driver 1, over temp"
B7	"Injection driver 2, over temp"
B8	Intake camshaft VANOS position control
B9	Exhaust camshaft VANOS position control
BA	"Ignition output stage, Cyl #1"
BB	"Ignition output stage, Cyl #2"
BC	"Ignition output stage, Cyl #3"
BD	"Ignition output stage, Cyl #4"
BE	"Ignition output stage, Cyl #5"
BF	"Ignition output stage, Cyl #6"
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"
C6	"Misfire w/fuel cutoff, Cyl #3"
C7	"Misfire w/fuel cutoff, Cyl #4"
C8	"Misfire w/fuel cutoff, Cyl #5"
C9	"Misfire w/fuel cutoff, Cyl #6"
CC	"Misfire multiple cylinders w/fuel cutoff"
CD	"Misfire during warm-up, Cyl #1"
CE	"Misfire during warm-up, Cyl #2"
CF	"Misfire during warm-up, Cyl #3
D0	"Misfire during warm-up, Cyl #4"
D1	"Misfire during warm-up, Cyl #5"
D2	"Misfire during warm-up, Cyl #6"
D5	"Misfire during warm-up, multiple cylinders"
D6	"PreCat oxygen sensor slow response, Cyl #1-3"
D7	"PreCat oxygen sensor slow response, Cyl #4-6"
D8	"PreCat oxygen sensor slow switching (rich to lean), Cyl #1-3"
D9	"PreCat oxygen sensor slow switching (rich to lean), Cyl #4-6"
DA	"PreCat oxygen sensor signal size/amplitude, Cyl #1-3"
DB	"PreCat oxygen sensor signal size/amplitude, Cyl #4-6"
E4	"Drive-by-wire, throttle control failure"
E5	"Drive-by-wire, throttle control failure"
E6	"Drive-by-wire, throttle position failure"
E7	"Control unit self-test, slave processor check"
E8	Evaporative emissions purge valve functional check
F7	VANOS pressure accumulator valve
F8	Intake camshaft VANOS Moving time
F9	Exhaust camshaft VANOS moving time
FA	Intake camshaft VANOS sealing
FB	Exhaust camshaft VANOS sealing

Table 06

04	"PreCat oxygen sensor heater, Cyl 5-8"
05	"AfterCat oxygen sensor heater, Cyl 5-8"
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 1-4"
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"
20	Idle control valve stuck mechanically
22	"Fuel trim, multiplicative, Cyl 5-8"
23	"Fuel trim, QL additive, Cyl 5-8"
24	"Fuel trim, Ti additive, Cyl 5-8"
27	EWS message
28	"Catalyst efficiency, Cyl 1-4"
2D	"Catalyst efficiency, Cyl 5-8"
32	"Misfire detected, Cyl #1"
33	"Misfire detected, Cyl #2"
34	"Misfire detected, Cyl #3"
35	"Misfire detected, Cyl #4"
36	"Misfire detected, Cyl #5"
37	"Misfire detected, Cyl #6"
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"
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
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 falure"
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"
66	"DME, internal RAM failure"
67	"DME, ROM failure"
68	Fault code memory error
6B	Control unit supply voltage
6C	Battery disconnected
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
8F	"Intervention, MSR"
90	"Intervention, ASC"
94	EWS Input
96	"Fuel Injector, Cyl #1"
97	"Fuel Injector, Cyl #2"
98	"Fuel Injector, Cyl #3"
99	"Fuel Injector, Cyl #4"
A5	Check engine lamp
A7	Electrical fuel pump relay
A8	Idle speed actuator (open)
A9	Idle speed actuator (close)
AA	A/C Compressor control
AF	DISA (intake resonance) flap
D2	"Knock Sensor, Cyl 1-2"
D3	"Knock Sensor, Cyl 3-4"
DC	Knock control zero test
DE	Knock control test pulse
EC	"CAN timeout, EGS"

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"
10	"PreCat oxygen sensor aging, Bank 1"
11	"AfterCat oxygen sensor response time, Bank 1"
12	"PreCat oxygen sensor, Bank 2"
14	"AfterCat oxygen sensor, Bank 2"
15	"PreCat oxygen sensor response time, Bank 2"
16	"PreCat oxygen sensor aging, Bank 2"
17	"AfterCat oxygen sensor response time, Bank 2"
18	A/C Compressor
1A	"Fuel trim, multiplicative, Bank 1"
1B	"Fuel trim, QL additive, Bank 1"
1C	"Fuel trim, Ti additive, Bank 1"
20	Idle control valve stuck mechanically
22	"Fuel trim, multiplicative, Bank 2"
23	"Fuel trim, QL additive, Bank 2"
24	"Fuel trim, Ti additive, Bank 2"
27	EWS message
28	"Catalyst efficiency, Bank 1"
2D	"Catalyst efficiency, Bank 2"
32	"Misfire detected, Cyl #1"
33	"Misfire detected, Cyl #2"
34	"Misfire detected, Cyl #3"
35	"Misfire detected, Cyl #4"
36	"Misfire detected, Cyl #5"
37	"Misfire detected, Cyl #6"
38	"Misfire detected, Cyl #7"
39	"Misfire detected, Cyl #8"
3A	"Misfire detected, Cyl #19
3B	"Misfire detected, Cyl #10"
3C	"Misfire detected, Cyl #11"
3D	"Misfire detected, Cyl #12"
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"

49	"Misfire detected, catalyst damaging, Cyl #11"
4A	"Misfire detected, catalyst damaging, Cyl #12"
4B	"Misfire detected, catalyst damaging, random or unknown cylinder"
4E	Crankshaft position sensor (too many teeth)
50	"Secondary air control, Bank 1"
54	Secondary air pump final stage
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, internal RAM failure"
67	"DME, ROM failure"
68	Fault code memory error
6B	Control unit supply voltage
6C	Battery disconnected
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"
9E	"Fuel Injector, Cyl #9"
9F	"Fuel Injector, Cyl #10"
A0	"Fuel Injector, Cyl #11"
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 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"
21	"Ignition Coil, Cyl #4"
23	Secondary air system relay/pump
2E	Fuel level signal (reserve lamp)
2F	Catalyst temperature after start-up
32	EVAP system running losses valve
33	EVAP system shutoff valve
34	Rear exhaust valve flap
35	Idle speed actuator (open)
37	"PreCat oxygen sensor heater, Cyl #4-6"
38	Ignition feedbac – shunt resistor
39	"Knock Sensor, Cyl #1-3"
3B	"Knock Sensor, Cyl #4-6"
3D	AfterCat oxygen sensor heater, Cyl #4-6
3E	"Secondary air system, switching valve"
41	Camshaft sensor
44	"EVAP system, purge control valve ckt."
45	Electrical fuel pump relay
4A	A/C compressor relay
4B	"PreCat oxygen sensor voltage, Cyl #1-3"
4C	"PreCat oxygen sensor voltage, Cyl #4-6"
4D	"AfterCat oxygen sensor voltage, Cyl #1-3"
4E	"AfterCat oxygen sensor voltage, Cyl #4-6"
4F	"AfterCat oxygen sensor heater, Cyl #1-3"
50	"ASC signal, active too long"
51	"MSR signal, active too long"
52	"EML signal, active too long"
53	Crankshaft Sensor
64	DME Control Unit
BE	EVAP reed switch not closed
BF	EVAP reed switch doesn't open
C0	EVAP reed switch doesn't closed
C1	EVAP clamped tube check
C2	EVAP large leak detected
C3	EVAP small leak detected
C4	EVAP electrical LDP valve
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
D2	Ignition feedback faulty (>2 cylinders)
D3	Idle control valve mechanically stuck
D4	VANOS mechanically stuck
D6	Vehicle speed signal not present
D7	ACS/MSR/EML – interface not plausible
D8	"Gear selector signal, signal undefined"
D9	CAN bus timeout
DA	CAN controller – warning level reached
DB	CAN bus offline
DE	Time to closed loop temperature too long
E3	"Oxygen sensor adaption limit, Cyl #1-3"
E4	"Oxygen sensor adaption limit, Cyl #4-6"
E5	"PreCat oxygen sensor response time, Cyl #1-3"
E6	"PreCat oxygen sensor response time, Cyl #4-6"
E7	"PreCat oxygen sensor switching time, Cyl #1-3"
E8	"PreCat oxygen sensor switching time, Cyl #4-6"
E9	"Catalyst efficiency below threshold, Cyl #1-3"
EA	"Catalyst efficiency below threshold, Cyl #4-6"
EB	"AfterCat oxygen sensor heater power, Cyl #1-3"
EC	"AfterCat oxygen sensor heater power, Cyl #4-6"
EE	"Misfire detected, Cyl #1"
EF	"Misfire detected, Cyl #2"
F0	"Misfire detected, Cyl #3"
F1	"Misfire detected, Cyl #4"
F2	"Misfire detected, Cyl #5"
F3	"Misfire detected, Cyl #6"
F4	"Flywheel adaption, segment timing faulty"
F5	"Secondary air system flow too low, Cyl #1-3"
F6	"Secondary air system flow too low, Cyl #4-6"
F7	Secondary air system injector valve jammed
FA	EVAP TEV not operating
FB	EVAP small leak detected
FC	EVAP incorrect purge flow
FD	EVAP shut off valve stuck closed
FE	EVAP large leak detected
FF	EVAP TEV stuck open

Table 15

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

8F	EVAP clamped tube check
90	EVAP Large leak detected
91	EVAP small leak detected
92	EVAP capillary leak (0.5mm) detected
95	MDK position and air mass signal not plausible
96	PreCat oxygen sensor short to B+, Cyl #1-3
97	PreCat oxygen sensor short to ground, Cyl #1-3
98	PreCat oxygen sensor disconnection, Cyl #1-3
99	PreCat oxygen sensor short to B+, Cyl #4-6
9A	PreCat oxygen sensor short to ground, Cyl #4-6"
9B	PreCat oxygen sensor disconnection, Cyl #4-6
9C	AfterCat oxygen sensor short to B+, Cyl #1-3
9D	AfterCat oxygen sensor short to ground, Cyl #1-3
9F	AfterCat oxygen sensor short to B+, Cyl #4-6
A0	AfterCat oxygen sensor short to ground, Cyl #4-6
A8	Electrical thermostat mechanically jammed open
A9	Motorized Throttle (MDK) final stage failure
AA	Communication with safety controller disturbed
AB	Safety controller has shut down MDK function
AC	Pedal sensor (PWG) short between Potentiometers
AD	Motorized Throttle (MDK) short between Potentiometers
AE	Motorized Throttle (MDK) idle position not plausible
AF	Pedal sensor (PWG) pot. #1 idle position not plausible
B0	Pedal sensor (PWG) pot. #2 idle position not plausible
BC	PreCat oxygen sensor heater insufficient, Cyl #1-3
BD	PreCat oxygen sensor heater insufficient, Cyl #4-6
BE	AfterCat oxygen sensor heater insufficient, Cyl #1-3
BF	AfterCat oxygen sensor heater insufficient, 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
D0	EWS engine speed check not ok
D1	EWS message
D2	Ignition feedback faulty (>2 cylinders)
D3	Idle control valve mechanically stuck
D6	Vehicle speed signal not present
D7	AfterCat oxygen sensor disconnection, Cyl #1-3
D8	AfterCat oxygen sensor disconnection, Cyl #4-6
D9	CAN timeout (EGS1)
DB	CAN bus offline
DC	AfterCat oxygen sensor slow response time, Cyl #1-3
DD	AfterCat oxygen sensor slow response time, Cyl #4-6
DE	Coolant temp too low for closed loop operation
DF	AfterCat oxygen sensor slow switching time, Cyl #1-3
E0	AfterCat oxygen sensor slow switching time, Cyl #4-6
E1	AfterCat oxygen sensor trim control, Cyl #1-3
E2	AfterCat oxygen sensor trim control, Cyl #4-6
E3	Oxygen sensor adaption limit, Cyl #1-3
E4	Oxygen sensor adaption limit, Cyl #4-6
E5	PreCat oxygen sensor slow response time, Cyl #1-3
E6	PreCat oxygen sensor slow response time, Cyl #4-6
E7	PreCat oxygen sensor slow switching time, Cyl #1-3
E8	PreCat oxygen sensor slow switching time, Cyl #4-6
E9	Catalyst efficiency below threshold, Cyl #1-3
EA	Catalyst efficiency below threshold, Cyl #4-6
EB	PreCat oxygen sensor trim control, Cyl #1-3
EC	PreCat oxygen sensor trim control, Cyl #4-6
EE	Misfire detected, Cyl #1
EF	Misfire detected, Cyl #2
F0	Misfire detected, Cyl #3
F1	Misfire detected, Cyl #4
F2	Misfire detected, Cyl #5
F3	Misfire detected, Cyl #6
F4	Flywheel adaption, segment timing faulty
F5	Secondary air system flow too low, Cyl #1-3
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
F9	AfterCat oxygen sensor, signal after decel not plausible, Cyl #4-6
FA	Functional check purge valve

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"
22	"Fuel Injector, Cyl #7"
23	"Fuel Injector, Cyl #8
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

50	Switch-chain grip
51	MFL interface signal
52	Muffler flap
53	"Exhaust camshaft VANOS advance valve, Cyl #5-8"
54	"Exhaust camshaft VANOS retard valve, Cyl #5-8"
55	"Throttle position sensor, master measurement"
56	CAN bus offline
57	"AfterCat oxygen sensor voltage, Cyl #1-4"
58	"AfterCat oxygen sensor voltage, Cyl #5-8"
59	"Control unit self-test, Safety Concept slave check"
5A	"PreCat oxygen sensor aging, Cyl #1-4"
5B	"PreCat oxygen sensor aging, Cyl #5-8"
5C	"AfterCat oxygen sensor aging, Cyl #1-4"
5D	"AfterCat oxygen sensor aging, Cyl #5-8"
63	"Control unit self-test, Safety Concept master check"
64	Tire pressure left front
65	Tire pressure right front
66	Tire pressure right back
67	Tire pressure left back
69	"Engine coolant temperature, Plausibility"
6A	Brake light switch
6B	"Control unit self-test, pre-drive check of drive-by-wire system"
6C	Switching valve oil circuit left
6D	Switching valve oil circuit right
6E	Sport switch LED indicator
6F	"Pedal position sensor 1, cross check"
70	"Pedal position sensor 2, cross check"
71	"Intake camshaft VANOS position control, Cyl #5-8"
72	"Exhaust camshaft VANOS position control, Cyl #5-8"
73	"Control unit self-test, internal ECU temperature
74	Servotronic valve current
75	Servotronic speed signal
76	Throttle position sensor 1
77	Throttle position sensor 2
78	"Throttle position sensors, cross check "
79	"Throttle position sensors, both bad"
7A	"Control unit self-test, master processor"
7B	"Bus offline, SMG-CAN"
7C	Active engine bearing
7D	Spoiler adjustment
7E	Fuel pump crash shut-off
7F	DM-TL module
80	Idle speed deviation
82	"EWS signal, manipulation detected"
83	"DSC intervention, plausibility"
84	DSC message timeout
85	Steering angle sensor message timeout
86	Instrument Cluster message timeout
87	Vehicle speed signals (both Discrete & CAN)
88	Idle speed controller
89	Jet stream pump
8A	Differential lock
8B	Cruise control system
8C	Engine noise too high
8D	"Fuel level, plausibility"
8F	E-box-fan
90	"Fuel control, Cyl #1-4"
91	"Fuel control, Cyl #5-8"
95	Misfire w/empty fuel tank
96	"Control unit self-test, memory test master"
97	"Control unit self-test, driver diagnostics chain"
98	"Control unit self-test, communication master"
9B	"Control unit self-test, adaption EEPROM master"
9C	"Control unit self-test, adaption EEPROM slvae"
9D	"Control unit self-test, memory test slave"
9E	"Control unit self-test, communication slave"
9F	"Control unit self-test, knock detection IC 1"
A0	"Control unit self-test, knock detection IC 2"
A1	Knock control
A2	"Crankshaft/Camshaft position correlation, Cyl #5-8"
A3	"Control unit self-test, master resets"
AA	"Secondary air system, flow too low"
AB	"Secondary air system, valve sticking"
AC	VANOS pressure storage valve
AD	Starter switch input
AE	"Air-fuel adaptation, Cyl #1-4"
AF	"Air-fuel adaptation, Cyl #5-8"
B0	"Air-fuel adaptation at idle, Cyl #1-4"

B1	"Air-fuel adaptation at idle, Cyl #5-8"
B2	"Catalyst system efficiency, Cyl #1-4"
B3	"Catalyst system efficiency, Cyl #5-8"
B4	Tank leak detected
B5	Filler cap open
B6	"Injection driver 1, over temp."
B7	"Injection driver 2, over temp."
B8	"Intake camshaft VANOS position control, Cyl #1-4"
B9	"Exhaust camshaft VANOS position control, Cyl #1-4"
BA	"Ignition output stage, Cyl #1"
BB	"Ignition output stage, Cyl #2"
BC	"Ignition output stage, Cyl #3"
BD	"Ignition output stage, Cyl #4"
BE	"Ignition output stage, Cyl #5"
BF	"Ignition output stage, Cyl #6"
C0	"Ignition output stage, Cyl #7"
C1	"Ignition output stage, Cyl #8"
C2	"Control unit self-test, cruise control shut-off"
C3	"Control unit self-test, torque manager Monitoring"
C4	"Misfire, Cyl #1"
C5	"Misfire, Cyl #2"
C6	"Misfire, Cyl #3"
C7	"Misfire, Cyl #4"
C8	"Misfire, Cyl #5"
C9	"Misfire, Cyl #6"
CA	"Misfire, Cyl #7"
CB	"Misfire, Cyl #8"
CC	"Misfire, multiple cylinders"
CD	"Misfire during warm-up, Cyl #1"
CE	"Misfire during warm-up, Cyl #2"
CF	"Misfire during warm-up, Cyl #3"
D0	"Misfire during warm-up, Cyl #4"
D1	"Misfire during warm-up, Cyl #5"
D2	"Misfire during warm-up, Cyl #6"
D3	"Misfire during warm-up, Cyl #7"
D4	"Misfire during warm-up, Cyl #8"
D5	"Misfire during warm-up, multiple cylinders"
D6	"PreCat oxygen sensor slow response, Cyl #1-4"
D7	"PreCat oxygen sensor slow response, Cyl #5-8"
D8	"PreCat oxygen sensor slow switching, (rich to lean),Cyl #1-4"
D9	"PreCat oxygen sensor slow switching, (rich to lean),Cyl #5-8"
DA	"PreCat oxygen sensor signal size/amplitude, Cyl #1-4"
DB	"PreCat oxygen sensor signal size/amplitude, Cyl #5-8"
E4	"Drive-by-wire, throttle control failure"
E5	"Drive-by-wire, throttle control failure"
E6	"Drive-by-wire, throttle position failure"
E7	"Control unit self-test, slave processor check"
E8	Evaporative emissions purge valve functional check
F7	VANOS pressure accumulator valve
F8	"Intake camshaft VANOS moving time, Cyl #1-4"
F9	"Exhaust camshaft VANOS moving time, Cyl #1-4"
FA	"Intake camshaft VANOS sealing, Cyl #1-4"
FB	"Exhaust camshaft VANOS sealing, Cyl #1-4"
FC	"Intake camshaft VANOS moving time, Cyl #5-8"
FD	"Exhaust camshaft VANOS moving time, Cyl #5-8"
FE	"Intake camshaft VANOS sealing, Cyl #5-8"
FF	"Exhaust camshaft VANOS sealing, Cyl #5-8"

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"
19	"ProCat oxygen sensor heater insufficient, Cyl #1-3"
1B	Idle speed actuator (close)
1D	Ignition Coil, Cyl #1
1E	Ignition Coil, Cyl #3
1F	Ignition Coil, Cyl #5
21	Fuel Injector, Cyl #5
23	Secondary air pump relay
24	Main relay
25	Main relay switching delay
26	Clutch switch
27	BLS/BTS plausibility
2A	MFL signal redundancy
2B	MFL seesaw key
2D	MFL bit toggle
2F	"Torque limitation, safety level 1"
30	"Control module self-test, control module defective"
31	"Control module self-test, torque monitoring"
32	"Control module self-test, speed monitoring"
33	"Control module self-test, speed monitoring"
34	Exhaust flap
35	Idle speed actuator (open)
37	"PreCat oxygen sensor heater insufficient, Cyl #4-6
38	Ignition feedback – shunt resistor
39	"Knock Sensor, Cyl #1-3"
3A	"Control module self-test, control module defective"
3B	"Knock Sensor, Cyl #4-6"
3D	"AfterCat oxygen sensor heater insufficient, Cyl #4-6
3E	"Secondary sir system, switching valve circuit"
3F	"Control module self-test, control module defective"
41	Intake camshaft position sensor
42	"Control module self-test, control module defective"
43	"Control module self-test, control module defective"
44	"Evaporative emission system, control module defective"
45	Fuel pump relay
46	"Control module self-test, control module defective"
47	"Control module self-test, control module defective"
48	"Control module self-test, control module defective"
4A	A/C compressor relay
4F	"AfterCat oxygen sensor heater insufficient, Cyl #1-3"
53	Crankshaft Sensor
5E	"Secondary air system, air mass"
5F	"Secondary air system, tube blocked"
60	"Secondary air system, pump not active"
61	"Secondary air system, flow too low"
62	"Secondary air system, flow too high"
63	"Secondary air system, valve jammed open"
64	"Memory self-test, control module defective"
67	"Intake camshaft VANOS, over-advanced or System perf."
68	"Exhaust camshaft VANOS, over-advanced or System perf."
69	"Intake camshaft VANOS, over-retarded"
6A	"Exhaust camshaft VANOS, over-retarded"
6D	Throttle valve control circuit
6E	Pedal position sensor 1
6F	Pedal position sensor 2
70	Throttle position sensor 1
71	Throttle position sensor 2
72	"Pedal position sensor, plausibility"
73	"Throttle position sensor, adaptation"
75	"Pedal position sensor, range/performance"
76	"Throttle position sensor 1, plausibility, range, or performance"
77	"Throttle position sensor 2, plausibility, range, or performance"
78	Brake and Pedal position not plaubible
7A	Oil temperature sensor
7B	Map controlled thermostat
7C	DISA control
7D	E-fan
7E	DM-TL Switching solenoid
80	EWS signal

81	"Timeout, SSG"
82	"Timeout, CAN – ASC1"
83	"Timeout, CAN – INSTR2"
84	"Timeout, CAN – INSTR3"
85	"Timeout, CAN – ASC3"
86	"SSG intervention, plausibility"
87	"Throttle position sensor, adaptation self-test"
88	"Throttle position sensor, adaptation self-test"
8C	DM-TL pump control circuit
8E	DM-TL pump current
8F	DM-TL leak detected
92	"Pedal position sensor 1, supply voltage"
93	"Pedal position sensor 2, supply voltage"
95	"Air mass sensor, range/performance"
96	"PreCat oxygen sensor voltage, Cyl #1-3"
97	"PreCat oxygen sensor voltage, Cyl #4-6"
98	"AfterCat oxygen sensor voltage, Cyl #1-3"
99	"AfterCat oxygen sensor voltage, Cyl #4-6"
A0	"Throttle valve position controller, stuck temporarily"
A1	"Throttle valve position controller, stuck permanently"
A2	"Throttle valve position controller, control deviation"
A8	Coolant thermostat jammed open
BA	"Oxygen sensor heating during regulation, Cyl #1-3"
BB	"Oxygen sensor heating during regulation, Cyl #4-6"
BC	"PreCat oxygen sensor heater cirsuit, Cyl #1-3"
BD	"PreCat oxygen sensor heater cirsuit, Cyl #4-6"
BE	"AfterCat oxygen sensor heater cirsuit, Cyl #1-3"
BF	"AfterCat oxygen sensor heater cirsuit, Cyl #4-6"
C4	Pressure sensor circuit
C5	Pressure sensor circuit
C6	"Catalytic convertor efficiency, Cyl #1-3"
C7	"Catalytic convertor efficiency, 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
D2	Ignition feedback faulty (>2 cylinders)
D3	Idle control valve mechanically stuck
D6	Vehicle speed signal not present
D7	"AfterCat oxygen sensor disconnection, Cyl #1-3"
D8	"AfterCat oxygen sensor disconnection, Cyl #4-6"
D9	CAN timeout (EGS 1)
DB	CAN bus offline
DC	"AfterCat oxygen sensor slow resp time, Cyl #1-3"
DD	"AfterCat oxygen sensor slow resp time, Cyl #4-6"
DE	Coolant temp too low for closed loop operation
DF	"AfterCat oxygen sensor slow switching time, Cyl #1-3"
E0	"AfterCat oxygen sensor slow switching time, Cyl #4-6"
E1	"AfterCat fuel trim system, Cyl #1-3"
E2	"AfterCat fuel trim system, Cyl #4-6"
E3	"Oxygen sensor adaptation limit, Cyl #1-3"
E4	"Oxygen sensor adaptation limit, Cyl #4-6"
E5	"PreCat oxygen sensor slow resp time, Cyl #1-3"
E6	"PreCat oxygen sensor slow resp time, Cyl #4-6"
E7	"PreCat oxygen sensor slow switching time, Cyl #1 -3"
E8	"PreCat oxygen sensor slow switching time, Cyl #4-6"
E9	"Catalyst efficiency below threshold, Cyl #1-3"
EA	"Catalyst efficiency below threshold, Cyl #4-6"
EB	"PreCat fuel trim system, Cyl #1-3"
EC	"PreCat fuel trim system, Cyl #4-6"
EE	"Misfire detected, Cyl #1"
EF	"Misfire detected, Cyl #2"
F0	"Misfire detected, Cyl #3"
F1	"Misfire detected, Cyl #4"
F2	"Misfire detected, Cyl #5"
F3	"Misfire detected, Cyl #6"
F4	"Flywheel adaptation, segment timing faulty"
F5	"Secondary air system flow too low, Cyl #1-3"
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"
F9	"AfterCat oxygen sensor, signal after decel not Plausible, Cyl #4-6"
FA	Functional check purge valve

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. WARING: 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.