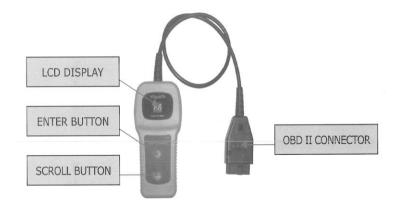
Table of Contents

Tool Description
Directions
Using the B1003
Function Reference3
Reading DTCs (diagnostic trouble codes)3
Resetting Check-Engine and Service Engine Soon3
Clearing DTC's (diagnostic trouble codes)3
Resetting Oilservice and Inspection Light3
Resetting Maintenance milage indicator3
Determining which code table to use4
How to read the code tables4
Code tables 1987 -1995 / "FF" tables4
Code tables 1996 and later13
Appendix
Troubleshooting information
Glossary (terms and abbreviations)3

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)
- 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 through 26). 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 0 to 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

Tlp1: 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.

Tlp2: 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	1990	325iX A/2	AB03	K1
1988	325iA4	AD23	K1	1990	325iX/2	AB93	K1
1988	325/4	AE54	K1	1990	325i/4	AD13	K1
1988	325 A/4	AE64	K1	1990	325iA/4	AD23	K1
1988	325iC	BB13	K1	1990	325iX A/4	AE03	K1
1988	325iCA	BB23	K1	1990	325iX/4	AE93	K1
1988	528e	DK73	K1	1990	325iC	BB13	K1
1988	528e A	DK83	K1	1990	325iCA	BB23	K1
1988	635CSi	EC74	K1	1990	M3		K1
1988	635CSi A	EC84	K1	1990	735i	GB33	K1
1988	735i	GB33	K1	1990	735i A	GB43	K1
1988	735i A	GB43	K1	1990	735iL A	GC43	K1
1988	735iL A	GC43	K1	1990	750iL A	GC83	K15
1988	750iL A	GC83	K15	1990	525i	HC13	K1
1988	M3		K1	1990	525i A	HC23	K1
				1990	535i	HD13	K1
1989				1990	535i A	HD23	K1
Year	Model	VDS	Table	1990	M5		K1
1989	325i/is	AA13	K1				
1989	325iA/2	AA23	K1	1991			
1989	325iX A/2	AB03	K1	Year	Model	VDS	Table
1989	325iX/2	AB93	K1	1991	325i/is/2	AA13	K1
1989	325i/4	AD13	K1	1991	325iA/2	AA23	K1
1989	325iA/4	AD23	K1	1991	325iX A/2	AB03	K1
1989	325iX A/4	AE03	K1	1991	325iX/2	AB93	K1
1989	325iX/4	AE93	K1	1991	325i/4	AD13	K1
1989	325iC	BB13	K1	1991	325iA/4	AD23	K1
1989	325iCA	BB23	K1	1991	325iX A/4	AE03	K1
1989	M3		K1	1991	325iX/4	AE93	K1
1989	635CSi	EC74	K1	1991	318is/2	AF93	K13
1989	635CSi A	EC84	K1	1991	318i/4	AJ93	K13
1989	735i	GB33	K1	1991	318iC/2	BA73	K13
1989	735i A	GB43	K1	1991	325iC	BB13	K1
1989	735iL A	GC43	K1	1991	325iCA	BB23	K1
1989	750iL A	GC83	K15	1991	M3		K1
1989	525i	HC13	K1	1991	850i	EG13	K7
1989	525i A	HC23	K1	1991	850i A	EG23	K7
1989	535i	HD13	K1	1991	735i A	GB43	K1
1989	535i A	HD23	K1	1991	735iL A	GC43	K1
1989	M5		K1	1991	750iL A	GC83	K7
				1991	535i	HD13	K1
1990				1991	535i A	HD23	K1
Year	Model	VDS	Table	1991	525i	HD53	K10
1990	325i/is/2	AA13	K1	1991	525i A	HD63	K10
1990	325iA/2	AA23	K1	1991	M5	HD93	K1

1002				1002	EGE: A	HD63	V.E
1992				1993	525i A	HD63	K5
Year	Model	VDS	Table	1993	M5	HD93	K1
1992	318is/2	BA73	K13	1993	525iT	HJ63	K5
1992	325iC	BB13	K1				
1992	325iCA	BB23	K1	1994			
1992	318is	BE53	K6	Year	Model	VDS	Table
1992	325is	BF33	K10	1994	318is	BE53	K6
1992	325is A	BF43	K10	1994	318is A	BE63	K6
1992	318i	CA53	K6	1994	325is	BF33	K5
1992	325i	CB33	K10	1994	325is A	BF43	K5
1992	325i A	CB43	K10	1994	325iC	BJ53	K5
1992	M3		K1	1994	325iCA	BJ63	K5
1992	850i	EG13	K7	1994	318iC	BK53	K6
1992	850i A	EG23	K7	1994	318iC A	BK63	K6
1992	735i A	GB43	K1	1994	318i	CA53	K6
1992	735iL A	GC43	K1	1994	318i A	CA63	K6
1992	750iL A	GC83	K7	1994	325i	CB33	K5
1992	535i	HD13	K1	1994	325i A	CB43	K5
1992	535i A	HD23	K1	1994	840Ci A	EF63	K11
1992	525i	HD53	K10	1994	850i A	EG23	K7
1992	525i A	HD63	K10	1994	850CSi	EG93	K7
1992	M5	HD93	K1	1994	750iL A	GC83	K7
1992	525iT	HJ63	K10	1994	740i A	GD43	K11
1002				1994	740iL A	GD83	K11
1993 Year	Model	VDS	Table	1994 1994	525i 525i A	HD53 HD63	K5 K5
1993	325iC	BB13	K1	1994	530i	HE13	K11
1993	325iCA	BB23	K1	1994	530i A	HE23	K11
1993	318is	BE53	K6	1994	540i A	HE63	K11
1993	318is A	BE63	K6	1994	525iT	HJ63	K5
1993	325is	BF33	K5	4005			
1993 1993	325is A	BF43	K5	1995	Model	VDS	Toblo
	318i	CA53	K6	Year	Model		Table
1993	318i A	CA63	K6	1995	318is	BE53	K6
1993	325i	CB33	K5	1995	318is A	BE63	K6
1993	325i A	CB43	K5	1995	МЗА	BF03	K5
1993	M3	===	K5	1995	325is	BF33	K5
1993	850i	EG13	K7	1995	325is A	BF43	K5
1993	850i A	EG23	K7	1995	M3	BF93	K5
1993	750iL A	GC83	K7	1995	325iC	BJ53	K5
1993	740i A	GD43	K11	1995	325iCA	BJ63	K5
1993	740iL A	GD83	K11	1995	318iC	BK53	K6
1993	535i	HD13	K1	1995	318iC A	BK63	K6
1993 1993	535i A 525i	HD23	K1	1995	318i	CA53	K6
1993	5251	HD53	K5	1995	318i A	CA63	K6

						500 ST000	
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
1000							

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)

Ta	ab	le	K1
4		_	

Crankshaft sensor

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)
OF	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 Convector Clutch	49	Throttle position sensor
64	Unspecified DME Output Stage	4C	Idle CO Potentiometer
		4d	Intake air temperature sensor
Tab	le K5	4E	Coolant temperature sensor
1	Electrical fuel pump relay	52	Intervention, MSR
2	Idle speed actuator (close)	53	Intervention, ASC
3	Fuel Injector, Cyl #5	64	Output Stage, Group #1
4	Fuel Injector, Cyl #6	C8	DME Control Unit
5	Fuel Injector, Cyl #4	C9	Lambda control #1
6	Fuel Injector, Unknown	CA	Fault code memory error
7	VANOS (Solenoid)	CC	Idle speed increase during MSR
8	Check engine lamp	CE	Knock control test pulse
0d	Oxy sensor	dC	EWS message
OF	Ignition secondary monitor		
10	0		

Tabl	e K6	36	Control unit supply
1	Electrical fuel pump relay	3F	Torque convertor clutch
3	Fuel Injectors (Cyl 2,4)	40	Ignition timing intervention
8	Check engine lamp	46	Oxy sensor
0C	Throttle position sensor	49	Vehicle speed signal not present
OF	Knock sensor, Cyl 1-2	4C	Idle CO Potentiometer
10	Camshaft/Cylinder ID sensor	4d	Intake air temperature sensor
12	Intake air resonance (DISA) valve	4E	Coolant temperature sensor
1d	Idle Control Valve	52	Engine drag torque control (MSR)
20	Fuel Injectors (Cyl 1,3)	53	ASC/ZAB
24	Evaporative purge control valve	64	Unspecified DME Output stage
25	Oxy sensor heating relay	C8	DME control unit selftest
29	Air flow sensor	C9	Emission (lambda) control
2A	Knock sensor, Cyl 3-4		
30	A/C Compressor sontrol	Tabl	e K10
36	Control unit supply	1	Electrical fuel pump relay
37	Ignition coils	2	Idle speed actuator (close)
40	Ignition timing intervention	3	Fuel Injector, Cyl #1
46	Oxy sensor	4	Fuel Injector, Cyl #2
49	Vehicle speed signal not present	5	Fuel Injector, Cyl #3
4C	Idle CO Potentiometer	6	Fuel Injector, Unknown
4d	Intake air temperature sensor	8	Check engine lamp
4E	Coolant temperature sensor	OC	Throttle position sensor
51	DWA/EWS input	10	Camshaft sensor
55	A/C Compressor	12	Output Stage, Group #1
64	Unspecified DME Output Stage	13	Output Stage, Group #2
C8	DME control unit selftest	17	Ignition Coil, Cyl #2
C9	Emission (lambda) control	18	Ignition Coil, Cyl #3
CE	Knock control test pulse	19	Ignition Coil, Cyl #1
CF	Knock control regulation	1A	Control unit supply
dC	EWS message	1d	Idle speed actuator (open)
		1F	Fuel Injector Cyl #5
Tabl	e K7	20	Fuel Injector Cyl #6
1	Electrical fuel pump relay	21	Fuel Injector Cyl #4
3	Fuel Injectors (Cyl 2,4,6 or 8,10,12)	24	Evaporative purge control valve
8	Check engine lamp	25	Oxy sensor heating relay
10	Camshaft/Cylinder ID sensor	29	Air mass sensor
20	Fuel Injectors (Cyl 1,3,5 or 7,9,11)	2E	Output Stage
24	Evaporative purge control valve	30	A/C Compressor control
25	Oxy sensor heating relay	32	Ignition Coil, Cyl #4
29	Air flow sensor	33	Ignition Coil, Cyl #6
30	A/C Compressor control	34	Ignition Coil, Cyl #5

36	Pottony voltage / DMC in male		
37	Battery voltage / DME main relay	1d	Idle speed actuator (open)
3E	Ignition output stage	1F	Fuel Injector, Cyl #5
3F	EML Signal	20	Fuel Injector, Cyl #8
	Torque convertor clutch lockup	21	Fuel Injector, Cyl #3
40	Ignition timing intervention	23	Fuel Injector, Cyl #2
43	Crankshaft sensor	24	Evaporative purge sontrol valve
46	Oxy sensor	25	Oxy sensor heating relay
49	Vehicle speed signal not present	29	Air mass sensor
4C	Idle CO Potentiometer	2A	Vehicle speed signal not present
4d	Intake air temperature sensor	30	A/C Compressor control
4E	Coolant temperature sensor	31	Ignition Coil, Cyl #2
51	DWA Input	32	Ignition Coil, Cyl #3
52	Engine drag torque control (MSR)	33	Ignition Coil, Cyl #8
53	Intervention, ASC	34	Ignition Coil, Cyl #5
55	A/C Compressor	36	Battery voltage / DME main relay
64	Output Stage	3E	EML Signal
C8	DME Control Unit	41	A/C Compressor
C9	Lambda control	42	DWA/EWS Input
CA	Fault code memory error	43	Knock Sensor, Cyl 7-8
Cb	Ignition circuit primary monitor	44	Knock Sensor, Cyl 5-6
CC	Stall protection	45	Knock Sensor, Cyl 3-4
		46	Knock Sensor, Cyl 1-2
Tab	le K11	49	Throttle position sensor
1	Electrical fuel pump relay	4C	Idle CO Potentioneter
2	Idle speed actuator (close)	4d	Intake air temperature sensor
3	Fuel Injector, Cyl #1	4e	Coolant temperature sensor
4	Fuel Injector, Cyl #4	52	Intervention, MSR
5	Fuel Injector, Cyl #6	53	Intervention, ASC
6	Fuel Injector, Unknown	64	Output Stage, Group #1
7	Fuel Injector, Cyl #7	65	Output Stage, Group #2
8	Check engine lamp	C8	DME Control Unit
0C	Oxy sensor, #2	C9	Lambda Control #1
0d	Oxy sensor, #1	CA	Fault code memory error
OF	Ignition secondary monitor	Cb	Lambda Control #2
10	Crankshaft sensor	CC	Idle speed increase –CAN BUS
10	Camshaft sensor	Cd	Ignition timing intervention
13	Secondary air pump relay	CE	Knock control test pulse
16	Ignition Coil, Cyl #7	D2	20 - 3 - 3 - 3
17	Ignition Coil, Cyl #6	dC	CAN message
18	Ignition Coil, Cyl #4	uC	EWS message
19	Ignition Coil, Cyl #1		
1A	Control unit supply		
	Control drift Supply		

		41	Misfire detected, catalyst damaging, Cyl #3
Tabl	e K12	42	Misfire detected, catalyst damaging, Cyl #4
4	PreCat oxy sensor heater, Bank 2	43	Misfire detected, catalyst damaging, Cyl #5
5	AfterCat oxy sensor heater, Bank 2	44	Misfire detected, catalyst damaging, Cyl #6
8	Misfire w/low fuel	45	Misfire detected, catalyst damaging, Cyl #7
0A	PreCat oxy sensor, Bank 1	46	Misfire detected, catalyst damaging, Cyl #8
0C	AfterCat oxy sensor, Bank 1	47	Misfire detected, catalyst damaging, Cyl #9
0d	PreCat oxy sensor heater, Bank 1	48	Misfire detected, catalyst damaging, Cyl #10
0E	AfterCat oxy sensor heater, Bank 1	49	Misfire detected, catalyst damaging, Cyl #11
OF	PreCat oxy sensor response time, Bank 1	4A	Misfire detected, catalyst damaging, Cyl #12
10	PreCat oxy sensor aging, Bank 1	4b	Misfire detected, catalyst damaging,
11	AfterCat oxy sensor response time, Bank 1		random/unknown Cyl.
12	PreCat oxy sensor, Bank 2	4E	Crankshaft position sensor (too many teeth)
14	AfterCat oxy sensor, Bank 2	50	Secondary air control, Bank 1
15	PreCat oxy sensor response time, Bank 2	54	Secondary air pump final stage
16	PreCat oxy sensor aging, Bank 2	55	Secondary air valve final stage
17	AfterCat oxy sensor response time, Bank 2	5d	EVAP emission control system
18	A/C Compressor	5E	EVAP large leak
1A	Fuel trim, multiplicative, Bank 1	61	EVAP small leak
1b	Fuel trim, QL additive, Bank 1	62	EVAP purge control valve circuit
1C	Fuel trim, Ti additive, Bank 1	65	DME, internal RAM failure
20	Idle control valve stuck mechanically	66	DME, external RAM failure
22	Fuel trim, multiplicative, Bank 2	67	DME, TOM failure
23	Fuel trim, QL additive, Bank 2	68	Fault code memory error
24	Fuel trim, Ti additive, Bank 2	6b	Control unit supply voltage
27	EWS message	6C	Battery disconnected
28	Catalyst efficiency, Bank 1	6F	Crankshaft position sensor
2d	Catalyst efficiency, Bank 2	70	Camshaft position sensor
32	Misfire detected, Cyl #1	73	Air mass sensor
33	Misfire detected, Cyl #2	75	Throttle position sensor
34	Misfire detected, Cyl #3	78	Vehicle speed signal not present
35	Misfire detected, Cyl #4	79	Load calculation crosscheck (HFM vs TPS)
36	Misfire detected, Cyl #5	7b	Coolant temperature sensor
37	Misfire detected, Cyl #6	7C	Intake air temperature sensor
38	Misfire detected, Cyl #7	87	Torque reduction: Transmission
39	Misfire detected, Cyl #8	8A	A/C Compressor torque reduction
3A	Misfire detected, Cyl #9	8b	Electric thermostat control final stage
3b	Misfire detected, Cyl #10	8d	ASC signal plausibility
3C	Misfire detected, Cyl #11	8F	Intervention, MSR
3d	Misfire detected, Cyl #12	90	Intervention, ASC
3E	Misfire detected,random or unknown cylinder	93	Electric thermostat control performance
3F	Misfire detected, catalyst damaging, Cyl #1	94	EWS Input
40	Misfire detected, catalyst damaging, Cyl #2	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	Tabl	e K15
A7	Electrical fuel pump relay	1	DME control unit selftest
A8	Idle speed actuator (open)	3	Electric fuel pump relay TR Signal
A9	Idla speed actuator (class)	5	Evaporative purge control valve
	Idle speed actuator (close)	5	Evaporative purge control valve
AA	A/C Compressor control	7	Air flow meter
AA d0			
	A/C Compressor control	7	Air flow meter
d0	A/C Compressor control Secondary air control, Bank 2	7 0A	Air flow meter Emission (lambda) control
d0 d2	A/C Compressor control Secondary air control, Bank 2 Knock Sensor #1	7 0A 0F	Air flow meter Emission (lambda) control Check engine lamp
d0 d2 d3	A/C Compressor control Secondary air control, Bank 2 Knock Sensor #1 Knock Sensor #2	7 0A 0F 10	Air flow meter Emission (lambda) control Check engine lamp Fuel Injectors (Cyl. 1,3,5 or 7,9,11)
d0 d2 d3 d4	A/C Compressor control Secondary air control, Bank 2 Knock Sensor #1 Knock Sensor #2 Knock Sensor #3	7 0A 0F 10 11	Air flow meter Emission (lambda) control Check engine lamp Fuel Injectors (Cyl. 1,3,5 or 7,9,11) Fuel Injectors (Cyl. 2,4,6 or 8,10,12)
d0 d2 d3 d4 d5	A/C Compressor control Secondary air control, Bank 2 Knock Sensor #1 Knock Sensor #2 Knock Sensor #3 Knock Sensor #4	7 0A 0F 10 11	Air flow meter Emission (lambda) control Check engine lamp Fuel Injectors (Cyl. 1,3,5 or 7,9,11) Fuel Injectors (Cyl. 2,4,6 or 8,10,12) Oxy sensor heating relay
d0 d2 d3 d4 d5 d8	A/C Compressor control Secondary air control, Bank 2 Knock Sensor #1 Knock Sensor #2 Knock Sensor #3 Knock Sensor #4 CAN timeout, ASC	7 0A 0F 10 11 17	Air flow meter Emission (lambda) control Check engine lamp Fuel Injectors (Cyl. 1,3,5 or 7,9,11) Fuel Injectors (Cyl. 2,4,6 or 8,10,12) Oxy sensor heating relay Oxy sensor
d0 d2 d3 d4 d5 d8 dC	A/C Compressor control Secondary air control, Bank 2 Knock Sensor #1 Knock Sensor #2 Knock Sensor #3 Knock Sensor #4 CAN timeout, ASC Knock control test pulse	7 0A 0F 10 11 17 1C 25	Air flow meter Emission (lambda) control Check engine lamp Fuel Injectors (Cyl. 1,3,5 or 7,9,11) Fuel Injectors (Cyl. 2,4,6 or 8,10,12) Oxy sensor heating relay Oxy sensor Control unit supply
d0 d2 d3 d4 d5 d8 dC dE	A/C Compressor control Secondary air control, Bank 2 Knock Sensor #1 Knock Sensor #2 Knock Sensor #3 Knock Sensor #4 CAN timeout, ASC Knock control test pulse Knock control test pulse	7 0A 0F 10 11 17 1C 25 2b	Air flow meter Emission (lambda) control Check engine lamp Fuel Injectors (Cyl. 1,3,5 or 7,9,11) Fuel Injectors (Cyl. 2,4,6 or 8,10,12) Oxy sensor heating relay Oxy sensor Control unit supply idle CO Potentiometer
d0 d2 d3 d4 d5 d8 dC dE EA	A/C Compressor control Secondary air control, Bank 2 Knock Sensor #1 Knock Sensor #2 Knock Sensor #3 Knock Sensor #4 CAN timeout, ASC Knock control test pulse Knock control test pulse Automatic start input	7 0A 0F 10 11 17 1C 25 2b 2C	Air flow meter Emission (lambda) control Check engine lamp Fuel Injectors (Cyl. 1,3,5 or 7,9,11) Fuel Injectors (Cyl. 2,4,6 or 8,10,12) Oxy sensor heating relay Oxy sensor Control unit supply idle CO Potentiometer Intake air temperature sensor
d0 d2 d3 d4 d5 d8 dC dE EA	A/C Compressor control Secondary air control, Bank 2 Knock Sensor #1 Knock Sensor #2 Knock Sensor #3 Knock Sensor #4 CAN timeout, ASC Knock control test pulse Knock control test pulse Automatic start input CAN timeout, EGS	7 0A 0F 10 11 17 1C 25 2b 2C 2d	Air flow meter Emission (lambda) control Check engine lamp Fuel Injectors (Cyl. 1,3,5 or 7,9,11) Fuel Injectors (Cyl. 2,4,6 or 8,10,12) Oxy sensor heating relay Oxy sensor Control unit supply idle CO Potentiometer Intake air temperature sensor Coolant temperature sensor

Table K13

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

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.

Tab	le 00	21	"Fuel injector, Cyl #3"
01	Electrical fuel pump relay	23	"Fuel injector, Cyl #2"
02	Idle speed actuator (close)	24	Evaporative purge control valve
03	"Fuel injector, Cyl #1"	25	Oxygen sensor heating relay
04	"Fuel injector, Cyl #4"	29	Air mass sensor
05	"Fuel injector, Cyl #6"	2A	Vehicle speed signal not present
06	"Fuel injector, Unknown"	30	A/C Compressor control
07	"Fuel injector, Cyl #7"	31	"Ignition Coil, Cyl #2"
80	Check engine tamp	32	"Ignition Coil, Cyl #3"
0C	"Oxygen sensor, #2"	33	"Ignition Coil, Cyl #8"
0D	"Oxygen sensor, #1"	34	"Ignition Coil, Cyl #5"
OF	Ignition secondary monitor	36	Battery voltage / DME main relay
10	Crankshaft sensor	3E	EML Signal
11	Camshaft sensor	41	A/C Compressor
13	Secondary air pump relay	42	DWA/EWS Input
16	"Ignition Coil, Cyl #7"	43	"Knock Sensor, Cyl 7-8"
17	"Ignition Coil, Cyl #6"	44	"Knock Sensor, Cyl 5-6"
18	"Ignition Coil, Cyl #4"	45	"Knock Sensor, Cyl 3-4"
19	"Ignition Coil, Cyl #1"	46	"Knock Sensor, Cyl 1-2"
1A	Control unit supply	49	Throttle position sensor
1D	Idle speed actuator (open)	4C	Idle CO Potentiometer
1F	"Fuel injector, Cyl #5"	4D	Intake air temperature sensor
20	"Fuel injector, Cyl #8"	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 #7"	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	
CC	Idle speed increase –CAN Bus	34	"Misfire detected, Cyl #2"
CD	Ignition timing intervention		"Misfire detected, Cyl #3"
		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"
T-1-1	- 01-	39	"Misfire detected, Cyl #8"
	e 0b	3E	"Misfire detected, random or unknown cylinder"
01	EVAP LDP Valve final stage	3F	"Misfire detected, catalyst damaging, Cyl #1"
02	EVAP Running losses valve final stage	40	"Misfire detected, catalyst damaging, Cyl #2"
03	"EVAP Reed switch not closed, doesn't	41	"Misfire detected, catalyst damaging, Cyl #3"
	open/close"	42	"Misfire detected, catalyst damaging, Cyl #4"
04	"PreCat oxygen sensor heater, Cyl 5-8"	43	"Misfire detected, catalyst damaging, Cyl #5"
05	"AfterCat oxygen sensor heater, Cyl 5-8"	44	"Misfire detected, catalyst damaging, Cyl #6"
06	"CAN timeout, instrument cluster"	45	"Misfire detected, catalyst damaging, Cyl #7"
07	"Engine coolant temperature, radiator outlet"	46	"Misfire detected, catalyst damaging, Cyl #8"
80	Misfire w/low fuel	4B	"Misfire detected, catalyst damaging, random
0A	"PreCat oxygen sensor, Cyl 1-4"		or unknown cylinder"
0C	"AfterCat oxygen sensor, Cyl 1-4"	4D	"Air containment valve, shrouded injectors, Cyl 5-8"
0D	"PreCat oxygen sensor heater, Cyl 1-4"	4E	Crankshaft position sensor (too many teeth)
0E	"AfterCat oxygen sensor heater, Cyl 1-4"	50	"Secondary air control, Cyl 1-4"
OF	"PreCat oxygen sensor response time, Cyl 1-4"	54	Secondary air pump final stage
10	"PreCat oxygen sensor aging, Cyl 1-4"	55	Secondary air valve final stage
11	"AfterCat oxygen sensor response time, Cyl 1-4"	5B	"EVAP purge control valve, Cyl 5-8"
12	"PreCat oxygen sensor, Cyl 5-8"	5D	EVAP emission control system
14	"AfterCat oxygen sensor, Cyl 5-8"	5E	EVAP large leak
15	"PreCat oxygen sensor response time, Cyl 5-8"	61	EVAP small leak
16	"PreCat oxygen sensor aging, Cyl 5-8"	62	EVAP purge control valve circuit
17	"AfterCat oxygen sensor response time, Cyl 5-8"	65	"DME, internal RAM failure"
18	A/C Compressor	66	"DME, external RAM failure"
1A	"Fuel trim, multiplicative, Cyl 1-4"	67	"DME, ROM failure"
1B	"Fuel trim, QL additive, Cyl 1-4"	68	Fault code memory error
1C	"Fuel trim, Ti additive, Cyl 1-4"	69	"DME, EEPROM failure"
1D	"Air containment valve, shrouded injectors, Cyl 1-4"	6B	Control unit supply voltage
20	Idle control valve stuck mechanically	6C	Battery disconnected

6F	Crankshaft position sensor	D9	"CAN signal, EML"
70	Camshaft position sensor	DC	Knock control test pulse
73	Air mass sensor	DE	Knock control test pulse
75	Throttle position sensor	E4	Automatic start output
78	Vehicle speed signal not present	E9	Automatic start output
79	Load calculation crosscheck (HFM vs TPS)	EA	Automatic start input
7B	Coolant temperature sensor	EC	"CAN timeout, EGS"
7C	Intake air temperature sensor	ED	Automatic start output
87	Torque reduction: Transmission	FD	Coolant fan final stage
8A	A/C Compressor torque recuction	10	Coolant fair final stage
8B	Electric thermostat control final stage	Tab	le 0F
8D	ASC signal plausibility	01	LDP control circuit
		02	DM-TL solenoid control circuit
8F	"Intervention, MSR" "Intervention, ASC"	03	
90		03	PreCat oxygen sensors swapped
93	Electric thermostat control performance	05	"PreCat oxygen sensor heater, Cyl #5-8"
94	EWS Input		"AfterCat oxygen sensor heater, Cyl #5-8"
96	"Fuel Injector, Cyl #1"	0A	"PreCat oxygen sensor, Cyl #1-4"
97	"Fuel Injector, Cyl #2"	0C	"AfterCat oxygen sensor, Cyl #1-4"
98	"Fuel Injector, Cyl #3"	0D	"PreCat oxygen sensor heater, Cyl #1-4"
99	"Fuel Injector, Cyl #4"	0E	"AfterCat oxygen sensor heater, Cyl #1-4"
9A	"Fuel Injector, Cyl #5"	0F	"PreCat oxygen sensor slow response t, Cyl #1-4"
9B	"Fuel Injector, Cyl #6"	10	"PreCat oxygen sensor aging, Cyl #1-4"
9C	"Fuel Injector, Cyl #7"	11	"AfterCat oxygen sensor aging, Cyl #1-4"
9D	"Fuel Injector, Cyl #8"	12	"PreCat oxygen sensor, Cyl #5-8"
A4	EVAP Barometric tank pressure sensor	14	"AfterCat oxygen sensor, Cyl #5-8"
A5	Check engine lamp	15	"PreCat oxygen sensor slow response, Cyl #5-8"
A7	Electrical fuel pump relay	16	"PreCat oxygen sensor aging, Cyl #5-8"
A8	Idle speed actuator (open)	17	"AfterCat oxygen sensor response time, Cyl #5-8"
A9	Idle speed actuator (close)	18	"Mixture Control, higher load, Cyl #1-4"
AA	A/C Compressor control	19	"Mixture Control, higher load, Cyl #5-8"
B7	EVAP large leak	1A	"Mixture Control, off idle, Cyl #1-4"
B8	EVAP pinched hose check	1B	"Mixture Control, off idle, Cyl #5-8"
CB	Ignition feedback failed	1C	"Mixture Control, idle, Cyl #1-4"
CC	EWS rolling code storage	1D	"Mixture Control, idle, Cyl #5-8"
D0	"Secondary air control, Cly 5-8"	1E	"Mixture Control, idle, Cyl #1-4"
D2	"Knock Sensor, Cyl 1-2"	1F	"Mixture Control, idle, Cyl #5-8"
D3	"Knock Sensor, Cyl 3-4"	20	Idle speed control
D4	"Knock Sensor, Cyl 5-6"	21	"Camshaft VANOS control, Cyl #1-4"
D5	"Knock Sensor, Cyl 7-8"	22	"Camshaft VANOS control, Cyl #5-8"
D6	CAN index verification	27	"EWS, manipulation detected"
D7	"CAN timeout, left/right DME"	28	"Catalyst efficiency, Cyl #1-4"
D8	"CAN timeout, ASC"	2D	"Catalyst efficiency, Cyl #5-8"

32	"Misfire, Cyl #1"	83	Drive-by-wire throttle control
33	"Misfire, Cyl #5"	84	Drive-by-wire throttle control output stage
34	"Misfire, Cyl #4"	85	"Drive-by-wire throttle controller, spring check"
35	"Misfire, Cyl #8"	86	"Drive-by-wire throttle controller, lower
36	"Misfire, Cyl #6"		adaptation"
37	"Misfire, Cyl #3"	87	"Drive-by-wire throttle controller, amplifier
38	"Misfire, Cyl #7"		check
39	"Misfire, Cyl #2"	88	"Drive-by-wire throttle emergency air
3E	"Misfire, random/multiple cylinders"		position test
50	"Secondary air system, Cyl #1-4"	8B	Map controlled thermostat jammed
51	"Secondary air system, Cyl #5-8"	8C	Map controlled thermostat circuit/control
52	Secondary air valve	8D	Engine cooling fan control
54	Secondary air control circuit	8E	Exhaust flap control
55	Secondary airvalve	94	EWS signal/interface
5D	Evaporative emission system	96	"Fuel Injector, Gyl #1"
62	Evaporative emission system purge valve	97	"Fuel Injector, Cyl #5"
65	Torque monitoring	98	"Fuel Injector, Cyl #4"
66	MFL interface	99	"Fuel Injector, Cyl #8"
67	Safety concept monitoring	9A	"Fuel Injector, Cyl #6"
68	Clutch switch	9B	"Fuel Injector, Cyl #3"
69	"Control unit self-test, RAM faulty"	9C	"Fuel Injector, Cyl #7"
6A	Brake switch	9D	"Fuel Injector, Cyl #2"
6B	"Control unit self-test, ROM faulty"	АЗ	Throttle position / air mass plausibility
6C	"Control unit self-test, reset"	A4	Ambient pressure sensor
6D	Battery voltage	A5	"VANOS output stage, Cyl #1-4"
6E	Torque control	A6	"VANOS output stage, Cyl #5-8"
6F	Crankshaft sensor	A7	Fuel pump relay control
70	Timing reference high resolution signal	A8	Check engine lamp/MIL
71	"Camshaft position sensor, Cyl #1-4"	AA	A/C compressor control
72	"Camshaft position sensor, Cyl #5-8"	B7	LDP diagnosis
73	Air mass sensor	B8	LDP system
75	Throttle position sensors	B9	LDP pressure sensor
76	Throttle position sensor 1	BA	DM-TL pump control circuit
77	Throttle position sensor 2	BB	DM-TL small leak
78	Vehicle speed	BC	DM-TL large leak
79	Wheel sensor failure	BD	DM-TL pump current
7A	Ambient temperature sensor	C9	DM-TL heater
7B	Engine coolant temperature sensor	CC	EWS exchange code stored
7C	Intake air temperature sensor	D2	"Knock sensor, Cyl #1-2"
7D	Radiator outlet temperature sensor	D3	"Knock sensor, Cyl #3-4"
7F	Coolant temperature plausibility	D4	"Knock sensor, Cyl #5-6"
82	Drive-by-wire throttle position monitoring	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
DD	"CAN timeout, ASC/DSC"		monitoring"
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
E5	Pedal position sensor supply voltage		#1-3"
E6	Pedal position sensors	26	"PreCat oxygen sensor heater control, Cyl
E7	Pedal position sensor 1		#4-6"
E8	Pedal position sensor 2	27	"AfterCat oxygen sensor heater control, Cyl
E9	Automatic starter control output		#1-3"
EA	Automatic starter input signal	28	"AfterCat oxygen sensor heater control, Cyl
EC	Intake air flap dontrol		#4-6"
ED	Automatic starter	29	Air mass sensor
		2A	Vehicle speed signal
Tab	le 1b	2B	Radiator outlet temperature sensor
01	Fuel pump relay	2C	Thermal oil level sensor
02	Idle speed actuator (close)	2D	Drive-by-wire throttle actuator driver
03	"Fuel Injector, Cyl #1"	2E	Fuel consumption (KVA) signal output
04	"Fuel Injector, Cyl #3"	2F	Engine RPM (TD) signal output
05	"Fuel Injector, Cyl #2"	30	A/C Compressor relay
06	Timeout SMG-CAN	32	"Ignition Coil, Cyl #4"
07	Intake camshaft position sensor	33	"Ignition Coil, Cyl #6"
09	"Knock sensor, Cyl #1-2"	34	"Ignition Coil, Cyl #5"
0A	Exhaust camshaft position sensor	35	Electronic fan (relay)
0C	"PreCat oxygen sensor, Cyl #4-6"	36	Battery voltage behind main relay
0D	"PreCat oxygen sensor, Cyl #1-3"	3A	Sensor voltage supply 1
0E	Tank small leak	3B	Sensor voltage supply 2
10	Crankshaft sensor	3C	"Pedal position sensor 1, master measurement"
12	Map controlled thermostat actuator	3D	"Pedal position sensor 2, master measurement"
13	Secondary air pump relay	3F	Secondary air switching valve
14	Starter relay	41	"Throttle position sensor 2, slave measurement"
15	"Exhaust camshaft VANOS retard valve, Cyl	42	EWS interface
	#1-4"	43	Intake camshaft VANOS advance valve
16	"Exhaust camshaft VANOS advance valve,	45	"Knock sensor, Cyl #5-6"
	Cyl #1-4"	46	"Knock sensor, Cyl #3-4"
17	"Ignition Coil, Cyl #2"	48	Intake camshaft VANOS retard valve
18	"Ignition Coil, CvI #3"	49	"Sir mass sensor, plausibility"

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	9C	"Control unit self-test, adaptation EEPROM SALVE"
	check "	9D	"Control unit self-test, memory test slave"
5A	"PreCat oxygen sensor aging, Cyl #1-3"	9E	"Control unit self-test, communication slave"
5B	"PreCat oxygen sensor aging, Cyl #4-6"	9F	"Control unit self-test, knock detection IC 1"
5C	"AfterCat oxygen sensor aging, Cyl #1-3"	A0	"Control unit self-test, knock detection IC 2"
5D	"AfterCat oxygen sensor aging, Cyl #4-6"	A1	Knock control
63	"Control unit self-test, Safety Concept master	АЗ	"Control unit self-test, master resets"
	check "	AA	"Secondary air system, flow too low"
69	"Engine coolant temperature, plausibility"	AB	"Secondary air system, valve sticking"
6A	Brake light switch	AC	VANOS pressure storage valve
6B	"Control unit self-test, pre-drive check of	AD	Starter switch input
	Drive-by-wire system "	AE	"Mixture adaptation, Cyl #1-3"
6C	Switching valve oil circuit left	AF	"Mixture adaptation, Cyl #4-6"
6D	Switching valve oil circuit right	В0	DM-TL error
6E	Sport switch LED indicator	B2	"Catalyst system efficiency, Cyl #1-3""
6F	"Pedal position sensor 1, cross check"	В3	"Catalyst system efficiency, Cyl #4-6""
70	"Pedal position sensor 2, cross check"	B4	Tank leak detected
73	"control unit self-test, internal ECU temperature"	B5	Filler cap open
76	Throttle position sensor 1	B6	"Injection driver 1, over temp"
77	Throttle position sensor 2	B7	"Injection driver 2, over temp"
78	"Throttle position sensors, cross check"	B8	Intake camshaft VANOS position control
79	"Throttle position sensors, both bad"	B9	Exhaust camshaft VANOS position control
7A	"Control unit self-test, master processor"	BA	"Ignition output stage, Cyl #1"
7B	"Bus offline, SMG-CAN"	BB	"Ignition output stage, Cyl #2"
7E	Fuel pump crash shut-off	BC	"Ignition output stage, Cyl #3"
7F	DM-TL module	BD	"Ignition output stage, Cyl #4"
80	Idle speed deviation	BE	"Ignition output stage, Cyl #5"
82	"EWS signal, manipulation detected"	BF	"Ignition output stage, Cyl #6"
83	"DSC intervention, plausibility"	C2	"Control unit self-test, cruise control shut off"
84	DSC message timeout	C3	"Control unit self-test, torque manager
86	Instrument Cluster message timeout		Monitoring"
87	Vehicle speed signal	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,
C7	"Misfire w/fuel cutoff, Cyl #4"		Cyl 1-4"
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,
CD	"Misfire during warm-up, Cyl #1"	15	Cyl 5-8"
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,
D0	"Misfire during warm-up, Cyl #4"	17	Cyl 1-4"
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"
		20	Idle control valve stuck mechanically
D7	"PreCat oxygen sensor slow response, Cyl #4-6"	22	
D8	"PreCat oxygen sensor slow switching (rich	23	"Fuel trim, multiplicative, Cyl 5-8" "Fuel trim, QL additive, Cyl 5-8"
D0	to lean), Cyl #1-3"		
D9	"PreCat oxygen sensor slow switching (rich to	24	"Fuel trim, Ti additive, Cyl 5-8"
D.4	lean), Cyl #4-6"	27	EWS message
DA	"PreCat oxygen sensor signal size/amplitude,	28	"Catalyst efficiency, Cyl 1-4"
	Cyl #1-3"	2D	"Catalyst efficiency, Cyl 5-8"
DB	"PreCat oxygen sensor signal size/amplitude,	32	"Misfire detected, Cyl #1"
	Cyl #4-6"	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"
Tab	le 06	43	"Misfire detected, catalyst damaging, Cyl #5"
04	"PreCat oxygen sensor heater, Cyl 5-8"	44	"Misfire detected, catalyst damaging, Cyl #6"
05	"AfterCat oxygen sensor heater, Cyl 5-8"	45	"Misfire detected, catalyst damaging, Cyl #7"
08	Misfire w/low fuel	46	"Misfire detected, catalyst damaging, Cyl #8"
0A	"PreCat oxygen sensor, Cyl 1-4"	4B	"Misfire detected, catalyst damaging, random
0C	"AfterCat oxygen sensor, Cyl 1-4"		or unknown cylinder"
OD	"PreCat oxygen sensor heater, Cyl 1-4"	4E	Crankshaft position sensor (too many teeth)
0E	"AfterCat oxygen sensor heater, Cyl 1-4"	50	"Secondary air control, Cyl 1-4"
OF	"PreCat oxygen sensor response time, Cyl 1-4"	54	Secondary air pump final stage

55	Secondary air valve final stage	D4	"Knock Sensor, Cyl 5-6"
5D	EVAP emission control system	D5	"Knock Sensor, Cyl 7-8"
5E	EVAP large leak	D8	"CAN timeout, ASC"
61	EVAP small leak	DC	Knock control test pulse
62	EVAP purge control valve circuit	DE	Knock control test pulse
65	"DME, internal RAM failure"	EA	Automatic start input
66	"DME, external RAM failure"	EC	"CAN timeout, EGS"
67	"DME, ROM falure"	ED	Automatic start output
68	Fault code memory error	FD	Coolant fan final stage
6B	Control unit supply voltage		
6C	Battery disconnected	Tab	le 07
6F	Crankshaft position sensor	08	Misfire w/low fuel
70	Crankshaft position sensor	0A	PreCat oxygen sensor
73	Air mass sensor	0C	AfterCat oxygen sensor
75	Throttle position sensor	0D	PreCat oxygen sensor heater
78	Vehicle speed signal not present	0E	AfterCat oxygen sensor heater
79	Load calculation crosscheck (HFM vs TPS)	OF	PreCat oxygen sensor response time
7B	Coolant temperature sensor	10	PreCat oxygen sensor aging
7C	Intake air temperature sensor	11	AfterCat oxygen sensor response time
87	Torque reduction: Transmission	18	A/C Compressor
8A	A/C Compressor torque reduction	1A	"Fuel trim, multiplicative"
8B	Electric thermostat control final stage	1B	"Fuel trim, QL additive"
8D	ASC signal plausibility	1C	"Fuel trim, Ti additive"
8F	"Intervention, MSR"	20	Idle control valve stuck mechanically
90	"Intervention, ASC"	27	EWS message
93	Electric thermostat control performance	28	Catalyst efficiency
94	EWS Input	32	"Misfire detected, Cyl #1"
96	"Fuel Injector, Cyl #1"	33	"Misfire detected, Cyl #2"
97	"Fuel Injector, Cyl #2"	34	"Misfire detected, Cyl #3"
98	"Fuel Injector, Cyl #3"	35	"Misfire detected, Cyl #4"
99	"Fuel Injector, Cyl #4"	3E	"Misfire detected, random or unknown cylinder"
9A	"Fuel Injector, Cyl #5"	3F	"Misfire detected, catalyst damaging Cyl #1"
9B	"Fuel Injector, Cyl #6"	40	"Misfire detected, catalyst damaging Cyl #2"
9C	"Fuel Injector, Cyl #7"	41	"Misfire detected, catalyst damaging Cyl #3"
9D	"Fuel Injector, Cyl #8"	42	"Misfire detected, catalyst damaging Cyl #4"
A5	Check engine lamp	4B	"Misfire detected, catalyst damaging random
A7	Electrical fuel pump relay		or unknown cylinder
A8	Idle speed actuator (open)	4E	Crankshaft position sensor (too many teeth)
A9	Idle speed actuator (close)	50	Secondary air control
AA	A/C Compressor control	5D	EVAP emission control system
D0	"Secondary air control, Cyl 5-8"	5E	EVAP large leak
D2	"Knock Sensor, Cyl 1-2"	61	EVAP small leak
D3	"Knock Sensor, Cyl 3-4"	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,
67	"DME, ROM failure"		Bank 1"
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,
73	Air mass sensor		Bank 2"
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"
Tabl	e 09	40	"Misfire detected, catalyst damaging, Cyl #2"
04	"PreCat oxygen sensor heater, Bank 2"	41	"Misfire detected, catalyst damaging, Cyl #3"
05	"AfterCat oxygen sensor heater, Bank 2"	42	"Misfire detected, catalyst damaging, Cyl #4"
80	Misfire w/low fuel	43	"Misfire detected, catalyst damaging, Cyl #5"
0A	"PreCat oxygen sensor, Bank 1"	44	"Misfire detected, catalyst damaging, Cyl #6"
0C	"AfterCat oxygen sensor, Bank 1"	45	"Misfire detected, catalyst damaging, Cyl #7"
0D	"PreCat oxygen sensor heater, Bank 1"	46	"Misfire detected, catalyst damaging, Cyl #8"
0E	"AfterCat oxygen sensor heater, Bank 1"	47	"Misfire detected, catalyst damaging, Cyl #9"
0F	"PreCat oxygen sensor response time, Bank 1"	48	"Misfire detected, catalyst damaging, Cyl #10"

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	A1	"Fuel Injector, Cyl #12"
	or unknown cylinder"	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 concer	Tola	- 44
70	Throttle position sensor	lab	le 11
78	Vehicle speed signal not present	01	"Ignition Coil, Cyl #2"
	Section 1. Section 2.		
78	Vehicle speed signal not present	01	"Ignition Coil, Cyl #2"
78 79	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS)	01 02	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4"
78 79 7B	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor	01 02 03	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6
78 79 7B 7C	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor	01 02 03 05	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2"
78 79 7B 7C 87	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage	01 02 03 05 06	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1"
78 79 7B 7C 87	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction	01 02 03 05 06 08	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor
78 79 7B 7C 87 8A	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage	01 02 03 05 06 08 0A	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor
78 79 7B 7C 87 8A 8B 8D 8F 90	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage ASC signal plausibility "Intervention, MSR" "Intervention, ASC"	01 02 03 05 06 08 0A 0B	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor EVAP system pressure sensor
78 79 7B 7C 87 8A 8B 8D 8F 90	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage ASC signal plausibility "Intervention, MSR"	01 02 03 05 06 08 0A 0B	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor EVAP system pressure sensor Throttle position sensor
78 79 7B 7C 87 8A 8B 8D 8F 90	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage ASC signal plausibility "Intervention, MSR" "Intervention, ASC" Electric thermostat control performance EWS Input	01 02 03 05 06 08 0A 0B 0C	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor EVAP system pressure sensor Throttle position sensor Intake air temperature sensor
78 79 7B 7C 87 8A 8B 8D 8F 90 93 94	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage ASC signal plausibility "Intervention, MSR" "Intervention, ASC" Electric thermostat control performance EWS Input "Fuel Injector, Cyl #1"	01 02 03 05 06 08 0A 0B 0C 0E	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor EVAP system pressure sensor Throttle position sensor Intake air temperature sensor A/C Compressor PWM signal
78 79 7B 7C 87 8A 8B 8D 8F 90 93 94 96	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage ASC signal plausibility "Intervention, MSR" "Intervention, ASC" Electric thermostat control performance EWS Input	01 02 03 05 06 08 0A 0B 0C 0E 10	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor EVAP system pressure sensor Throttle position sensor Intake air temperature sensor A/C Compressor PWM signal EWS Signal
78 79 7B 7C 87 8A 8B 8D 8F 90 93 94 96 97	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage ASC signal plausibility "Intervention, MSR" "Intervention, ASC" Electric thermostat control performance EWS Input "Fuel Injector, Cyl #1" "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #3"	01 02 03 05 06 08 0A 0B 0C 0E 10 12 14 15	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor EVAP system pressure sensor Throttle position sensor Intake air temperature sensor A/C Compressor PWM signal EWS Signal Check engine lamp VANOS (Solenoid) "Fuel Injector, Cyl #3"
78 79 7B 7C 87 8A 8B 8D 8F 90 93 94 96	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage ASC signal plausibility "Intervention, MSR" "Intervention, ASC" Electric thermostat control performance EWS Input "Fuel Injector, Cyl #1" "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #3" "Fuel Injector, Cyl #4"	01 02 03 05 06 08 0A 0B 0C 0E 10 12 14 15 16	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor EVAP system pressure sensor Throttle position sensor Intake air temperature sensor A/C Compressor PWM signal EWS Signal Check engine lamp VANOS (Solenoid)
78 79 7B 7C 87 8A 8B 8D 8F 90 93 94 96 97	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage ASC signal plausibility "Intervention, MSR" "Intervention, ASC" Electric thermostat control performance EWS Input "Fuel Injector, Cyl #1" "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #3" "Fuel Injector, Cyl #4" "Fuel Injector, Cyl #4" "Fuel Injector, Cyl #5"	01 02 03 05 06 08 0A 0B 0C 0E 10 12 14 15 16 17	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor EVAP system pressure sensor Throttle position sensor Intake air temperature sensor A/C Compressor PWM signal EWS Signal Check engine lamp VANOS (Solenoid) "Fuel Injector, Cyl #3"
78 79 7B 7C 87 8A 8B 8D 93 94 96 97 98 99 9A 9B	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage ASC signal plausibility "Intervention, MSR" "Intervention, ASC" Electric thermostat control performance EWS Input "Fuel Injector, Cyl #1" "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #3" "Fuel Injector, Cyl #4" "Fuel Injector, Cyl #5" "Fuel Injector, Cyl #5" "Fuel Injector, Cyl #6"	01 02 03 05 06 08 0A 0B 0C 0E 10 12 14 15 16 17 18	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor EVAP system pressure sensor Throttle position sensor Intake air temperature sensor A/C Compressor PWM signal EWS Signal Check engine lamp VANOS (Solenoid) "Fuel Injector, Cyl #3" "Fuel Injector, Cyl #6" "Fuel Injector, Cyl #4" "PreCat oxygen sensor heater, Cyl #1-3"
78 79 7B 7C 87 8A 8B 8D 8F 90 93 94 96 97 98 99 9A 9B 9C	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage ASC signal plausibility "Intervention, MSR" "Intervention, ASC" Electric thermostat control performance EWS Input "Fuel Injector, Cyl #1" "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #3" "Fuel Injector, Cyl #4" "Fuel Injector, Cyl #6" "Fuel Injector, Cyl #6" "Fuel Injector, Cyl #6" "Fuel Injector, Cyl #7"	01 02 03 05 06 08 0A 0B 0C 0E 10 12 14 15 16 17 18 19 1B	"Ignition Coil, Cyl #2" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor EVAP system pressure sensor Throttle position sensor Intake air temperature sensor A/C Compressor PWM signal EWS Signal Check engine lamp VANOS (Solenoid) "Fuel Injector, Cyl #3" "Fuel Injector, Cyl #6" "Fuel Injector, Cyl #4" "PreCat oxygen sensor heater, Cyl #1-3" Idle speed actuator (close)
78 79 7B 7C 87 8A 8B 8D 93 94 96 97 98 99 9A 9B	Vehicle speed signal not present Load calculation crosscheck (HFM vs TPS) Coolant temperature sensor Intake air temperature sensor Torque reduction: Transmission A/C Compressor torque reduction Electric thermostat control final stage ASC signal plausibility "Intervention, MSR" "Intervention, ASC" Electric thermostat control performance EWS Input "Fuel Injector, Cyl #1" "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #3" "Fuel Injector, Cyl #4" "Fuel Injector, Cyl #5" "Fuel Injector, Cyl #5" "Fuel Injector, Cyl #6"	01 02 03 05 06 08 0A 0B 0C 0E 10 12 14 15 16 17 18	"Ignition Coil, Cyl #4" "Ignition Coil, Cyl #4" "Ignition Coil, Cyl #6 "Fuel Injector, Cyl #2" "Fuel Injector, Cyl #1" Air mass sensor Coolant temperature sensor EVAP system pressure sensor Throttle position sensor Intake air temperature sensor A/C Compressor PWM signal EWS Signal Check engine lamp VANOS (Solenoid) "Fuel Injector, Cyl #3" "Fuel Injector, Cyl #6" "Fuel Injector, Cyl #4" "PreCat oxygen sensor heater, Cyl #1-3"

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 feedbac – 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,
3D	AfterCat oxygen sensor heater, Cyl #4-6	Lo	Cyl #1-3"
3E	"Secondary air system, switching valve"		Cyl #1-5
41	Camshaft sensor	E6	"PreCat oxygen sensor response time,
44	"EVAP system, purge control valve ckt."	Lo	Cyl #4-6"
45	Electrical fuel pump relay	E7	"PreCat oxygen sensor switching time,
4A	A/C compressor relay		Cyl #1-3"
4B	"PreCat oxygen sensor voltage, Cyl #1-3"	E8	"PreCat oxygen sensor switching time,
4C	"PreCat oxygen sensor voltage, Cyl #4-6"		Cyl #4-6"
4D	"AfterCat oxygen sensor voltage, Cyl #1-3"	E9	"Catalyst efficiency below threshold, Cyl #1-3"
4E	"AfterCat oxygen sensor voltage, Cyl #4-6"	EA	"Catalyst efficiency below threshold, Cyl #4-6"
4F	"AfterCat oxygen sensor heater, Cyl #1-3"	EB	"AfterCat oxygen sensor heater power,
50	"ASC signal, active too long"		Cyl #1-3"
51	"MSR signal, active too long"	EC	"AfterCat oxygen sensor heater power,
52	"EML signal, active too long"		Cyl #4-6"
53	Crankshaft Sensor	EE	"Misfire detected, Cyl #1"
64	DME Control Unit	EF	"Misfire detected, Cyl #2"
BE	EVAP reed switch not closed	FO	"Misfire detected, Cyl #3"
BF	EVAP reed switch doesn't open	F1	"Misfire detected, Cyl #4"
CO	EVAP reed switch doesn't closed	F2	"Misfire detected, Cyl #5"
C1	EVAP clamped tube check	F3	"Misfire detected, Cyl #6"
C2	EVAP large leak detected	F4	"Flywheel adaption, segment timing faulty"
C3	EVAP small leak detected	F5	"Secondary air system flow too low, Cyl #1-3"
C4	EVAP electrical LDP valve	F6	"Secondary air system flow too low, Cyl #4-6"
C5	EVAP barometric pressure sensor	F7	Secondary air system injector valve jammed
C8	"PreCat oxygen sensor no activeity, Cyl #1-3"	FA	EVAP TEV not operating
C9	"PreCat oxygen sensor no activeity, Cyl #4-6"	FB	EVAP small leak detected
CA	"Oxygen sensor control limit, Cyl #1-3"	FC	EVAP incorrect purge flow
СВ	"Oxygen sensor control limit, Cyl #4-6"	FD	EVAP shut off valve stuck closed
CC	"Idle control system, idle speed not plausible"	FE	EVAP large leak detected
D1	EWS message	FF	EVAP TEV stuck open
			The second secon

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

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,
99	PreCat oxygen sensor short to B+, Cyl #4-6		Cyl #1-3
9A	PreCat oxygen sensor short to ground, Cyl #4-6"	DD	AfterCat oxygen sensor slow response time,
9B	PreCat oxygen sensor disconnection, Cyl #4-6		Cyl #4-6
9C	AfterCat oxygen sensor short to B+, Cyl #1-3	DE	Coolant temp too low for closed loop operation
9D	AfterCat oxygen sensor short to ground, Cyl #1-3	DF	AfterCat oxygen sensor slow switching time,
9F	AfterCat oxygen sensor short to B+, Cyl #4-6		Cyl #1-3
A0	AfterCat oxygen sensor short to ground, Cyl #4-6	E0	AfterCat oxygen sensor slow switching time,
A8	Electrical thermostat mechanically jammed		Cyl #4-6
	open	E1	AfterCat oxygen sensor trim control, Cyl #1-3
A9	Motorized Throttle (MDK) final stage failure	E2	AfterCat oxygen sensor trim control, Cyl #4-6
AA	Communication with safety controller disturbed	E3	Oxygen sensor adaption limit, Cyl #1-3
AB	Safety controller has shut down MDK function	E4	Oxygen sensor adaption limit, Cyl #4-6
AC	Pedal sensor (PWG) short between	E5	PreCat oxygen sensor slow response time,
	Potentiometers		Cyl #1-3
AD	Motorized Throttle (MDK) short between	E6	PreCat oxygen sensor slow response time,
	Potentiometers		Cyl #4-6
AE	Motorized Throttle (MDK) idle position not	E7	PreCat oxygen sensor slow switching time,
	plausible		Cyl #1-3
AF	Pedal sensor (PWG) pot. #1 idle position not	E8	PreCat oxygen sensor slow switching time,
	plausible		Cyl #4-6
B0	Pedal sensor (PWG) pot. #2 idle position not	E9	Catalyst efficiency below threshold, Cyl #1-3
	plausible	EA	Catalyst efficiency below threshold, Cyl #4-6
BC	PreCat oxygen sensor heater insufficient, Cyl	EB	PreCat oxygen sensor trim control, Cyl #1-3
	#1-3	EC	PreCat oxygen sensor trim control, Cyl #4-6
BD	PreCat oxygen sensor heater insufficient, Cyl	EE	Misfire detected, Cyl #1
	#4-6	EF	Misfire detected, Cyl #2
BE	AfterCat oxygen sensor heater insufficient, Cyl	F0	Misfire detected, Cyl #3
	#1-3	F1	Misfire detected, Cyl #4
BF	AfterCat oxygen sensor heater insufficient, Cyl	F2	Misfire detected, Cyl #5
	#4-6	F3	Misfire detected, Cyl #6
CA	Oxygen sensor control limit, Cyl #1-3	F4	Flywheel adaption, segment timing faulty
СВ	Oxygen sensor control limit, Cyl #4-6	F5	Secondary air system flow too low, Cyl #1-3
CC	Idle control system, idle speed not plausible	F6	Secondary air system flow too low, Cyl #4-6
D0	EWS engine speed check not ok	F7	Secondary air system valve stuck open
D1	EWS message	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	23	"Fuel Injector, Cyl #8
	plausible, Cyl #4-6	24	Evaporative emission purge control valve
FA	Functional check purge valve	25	"PreCat oxygen sensor heater control, Cyl #1-4"
		26	"PreCat oxygen sensor heater control, Cyl #5-8"
Tabl	e 16 (see table 11)	27	"AfterCat oxygen sensor heater control, Cyl #1-4"
		28	"AfterCat oxygen sensor heater control, Cyl #5-8"
Tabl	e 18	29	"Air mass sensor, Cyl #1-4"
01	Fuel pump relay	2A	"Vehicle speed input signal, hardwired "A" signal"
02	Idle speed actuator (close)	2B	Radiator outlet temperature sensor
03	"Fuel Injector, Cyl #1"	2C	Thermal oil level sensor
04	"Fuel Injector, Cyl #3"	2D	Drive-by-wire throttle actuator driver
05	"Fuel Injector, Cyl #2"	2E	Fuel consumption (KVA) signal output
06	Timeout SMG-CAN	2F	Engine RPM (TD) signal output
07	"Intake camshaft position sensor, Cyl #1-4"	30	A/C Compressor relay
08	"Intake camshaft position sensor, Cyl #5-8"	32	"Ignition Coil, Cyl #4"
09	"Knock sensor, Cyl #1-2"	33	"Ignition Coil, Cyl #6"
OA	"Exhaust camshaft position sensor, Cyl #1-4"	34	"Ignition Coil, Cyl #5"
0B	"Exhaust camshaft position sensor, Cyl #5-8"	35	Electronic fan (relay)
0C	"PreCat oxygen sensor Cyl #5-8"	36	Battery voltage behind main relay
0D	"PreCat oxygen sensor Cyl #1-4"	37	"Ignition Coil, Cyl #7"
0E	Tank small leak	39	"Air mass sensor, Cyl #5-8"
OF	"Crankshaft/Camshaft position correlation,	3A	Sensor voltage supply 1
	Cyl #1-4	3B	Sensor voltage supply 2
10	Crankshaft sensor	3C	"Pedal position sensor 1, master measurement"
12	Map controlled thermostat actuator	3D	"Pedal position sensor 2, master measurement"
13	Secondary air pump relay	3F	Secondary air switching valve
14	Starter relay	41	"Throttle position sensor 2, slave measurement"
15	"Exhaust camshaft VANOS retard valve, Cyl	42	EWS interface
	#1-4	43	"Intake camshaft VANOS advance valve,
16	"Exhaust camshaft VANOS advance valve,		Cyl #1-4"
	Cyl #1-4	45	"Knock sensor, Cyl #5-6"
17	"Ignition Coil, Cyl #2"	46	"Knock sensor, Cyl #3-4"
18	"Ignition Coil, Cyl #3	47	"Knock sensor, Cyl #7-8"
19	"Ignition Coil, Cyl #1"	48	"Intake camshaft VANOS read valve, Cyl #1-4"
1A	"Ignition Coil, Cyl #8"	49	"Air mass sensor, plausibility"
1B	DM-TL switching valve	4A	"Intake camshaft VANOS advance valve,
1C	Map controlled thermostat control		Cyl #5-8"
1D	Idle speed actuator(open)	4B	"Intake camshaft VANOS read valve, Cyl #5-8"
1E	"Control unit self-test, A/D converter monitoring"	4C	Ambient pressure sensor
1F	"Fuel Injector, Cyl #5"	4D	Intake air temperature sensor
20	"Fuel Injector, Cyl #6"	4E	Coolant temperature sensor
21	"Fuel Injector, Cyl #4"	4F	Exhaust gas temperature sensor

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

B1	"Air-fuel adaptation at idle, Cyl #5-8"		(rich to lean),Cyl #1-4"
B2	"Catalyst system efficiency, Cyl #1-4"	D9	"PreCat oxygen sensor slow switching,
В3	"Catalyst system efficiency, Cyl #5-8"		(rich to lean),Cyl #5-8"
B4	Tank leak detected	DA	"PreCat oxygen sensor signal size/amplitude,
B5	Filler cap open		Cyl #1-4"
B6	"Injection driver 1, over temp."	DB	"PreCat oxygen sensor signal size/amplitude,
B7	"Injection driver 2, over temp."		Cyl #5-8"
B8	"Intake camshaft VANOS position control,	E4	"Drive-by-wire, throttle control failure"
	Cyl #1-4"	E5	"Drive-by-wire, throttle control failure"
B9	"Exhaust camshaft VANOS position control,	E6	"Drive-by-wire, throttle position failure"
	Cyl #1-4"	E7	"Control unit self-test, slave processor check"
BA	"Ignition output stage, Cyl #1"	E8	Evaporative emissions purge valve functional
BB	"Ignition output stage, Cyl #2"		check
BC	"Ignition output stage, Cyl #3"	F7	VANOS pressure accumulator valve
BD	"Ignition output stage, Cyl #4"	F8	"Intake camshaft VANOS moving time,
BE	"Ignition output stage, Cyl #5"		Cyl #1-4"
BF	"Ignition output stage, Cyl #6"	F9	"Exhaust camshaft VANOS moving time,
CO	"Ignition output stage, Cyl #7"		Cyl #1-4"
C1	"Ignition output stage, Cyl #8"	FA	"Intake camshaft VANOS sealing, Cyl #1-4"
C2	"Control unit self-test, cruise control shut-off"	FB	"Exhaust camshaft VANOS sealing, Cyl #1-4"
C3	"Control unit self-test, torque manager	FC	"Intake camshaft VANOS moving time,
	Monitoring"		Cyl #5-8"
C4	"Misfire, Cyl #1"	FD	"Exhaust camshaft VANOS moving time,
C5	"Misfire, Cyl #2"		Cyl #5-8"
C6	"Misfire, Cyl #3"	FE	"Intake camshaft VANOS sealing, Cyl #5-8"
C7	"Misfire, Cyl #4"	FF	"Exhaust camshaft VANOS sealing, Cyl #5-8"
C8	"Misfire, Cyl #5"		
C9	"Misfire, Cyl #6"	Tab	le 19
CA	"Misfire, Cyl #7"	01	"Ignition Coil, Cyl #2"
CB	"Misfire, Cyl #8"	02	"Ignition Coil, Cyl #4"
CC	"Misfire, multiple cylinders"	03	"Ignition Coil, Cyl #6
CD	"Misfire during warm-up, Cyl #1"	05	"Fuel Injector, Cyl #2"
CE	"Misfire during warm-up, Cyl #2"	06	"Fuel Injector, Cyl #1"
CF	"Misfire during warm-up, Cyl #3"	80	Air mass sensor
D0	"Misfire during warm-up, Cyl #4"	0A	Engine coolant temperature
D1	"Misfire during warm-up, Cyl #5"	0B	"Engine coolant temperature, radiator outlet"
D2	"Misfire during warm-up, Cyl #6"	0C	"Engine coolant temperature, Plausibility"
D3	"Misfire during warm-up, Cyl #7"	0E	Intake air temperature
D4	"Misfire during warm-up, Cyl #8"	12	Exhaust camshaft position sensor
D5	"Misfire during warm-up, multiple cylinders"	13	Exhaust camshaft solenoid valve
D6	"PreCat oxygen sensor slow response, Cyl #1-4"	15	Intake camshaft solenoid valve
D7	"PreCat oxygen sensor slow response, Cyl #5-8"	16	"Fuel Injector, Cyl #3"
D8	"PreCat oxygen sensor slow switching,	17	"Fuel Injector, Cyl #6"

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

81	"Timeout, SSG"	D6	Vehicle speed signal not present
82	"Timeout, CAN - ASC1"	D7	"AfterCat oxygen sensor disconnection, Cyl #1-3"
83	"Timeout, CAN - INSTR2"	D8	"AfterCat oxygen sensor disconnection, Cyl #4-6"
84	"Timeout, CAN - INSTR3"	D9	CAN timeout (EGS 1)
85	"Timeout, CAN - ASC3"	DB	CAN bus offline
86	"SSG intervention, plausibility"	DC	"AfterCat oxygen sensor slow resp time, Cyl #1-3"
87	"Throttle position sensor, adaptation self-test"	DD	"AfterCat oxygen sensor slow resp time, Cyl #4-6"
88	"Throttle position sensor, adaptation self-test"	DE	Coolant temp too low for closed loop operation
8C	DM-TL pump control circuit	DF	"AfterCat oxygen sensor slow switching time,
8E	DM-TL pump current		Cyl #1-3"
8F	DM-TL leak detected	E0	"AfterCat oxygen sensor slow switching time,
92	"Pedal position sensor 1, supply voltage"		Cyl #4-6"
93	"Pedal position sensor 2, supply voltage"	E1	"AfterCat fuel trim system, Cyl #1-3"
95	"Air mass sensor, range/performance"	E2	"AfterCat fuel trim system, Cyl #4-6"
96	"PreCat oxygen sensor voltage, Cyl #1-3"	E3	"Oxygen sensor adaptation limit, Cyl #1-3"
97	"PreCat oxygen sensor voltage, Cyl #4-6"	E4	"Oxygen sensor adaptation limit, Cyl #4-6"
98	"AfterCat oxygen sensor voltage, Cyl #1-3"	E5	"PreCat oxygen sensor slow resp time, Cyl #1-3"
99	"AfterCat oxygen sensor voltage, Cyl #4-6"	E6	"PreCat oxygen sensor slow resp time, Cyl #4-6"
A0	"Throttle valve position controller, stuck	E7	"PreCat oxygen sensor slow switching time, Cyl #1 -3"
	temporarily"	E8	"PreCat oxygen sensor slow switching time, Cyl #4-6"
A1	"Throttle valve position controller, stuck	E9	"Catalyst efficiency below threshold, Cyl #1-3"
	permanently"	EA	"Catalyst efficiency below threshold, Cyl #4-6"
A2	"Throttle valve position controller, control	EB	"PreCat fuel trim system, Cyl #1-3"
	deviation"	EC	"PreCat fuel trim system, Cyl #4-6"
A8	Coolant thermostat jammed open	EE	"Misfire detected, Cyl #1"
BA	"Oxygen sensor heating during regulation,	EF	"Misfire detected, Cyl #2"
	Cyl #1-3"	FO	"Misfire detected, Cyl #3"
BB	"Oxygen sensor heating during regulation,	F1	"Misfire detected, Cyl #4"
	Cyl #4-6"	F2	"Misfire detected, Cyl #5"
BC	"PreCat oxygen sensor heater cirsuit, Cyl #1-3"	F3	"Misfire detected, Cyl #6"
BD	"PreCat oxygen sensor heater cirsuit, Cyl #4-6"	F4	"Flywheel adaptation, segment timing faulty"
BE	"AfterCat oxygen sensor heater cirsuit, Cyl #1-3"	F5	"Secondary air system flow too low, Cyl #1-3"
BF	"AfterCat oxygen sensor heater cirsuit, Cyl #4-6"	F6	"Secondary air system flow too low, Cyl #4-6"
C4	Pressure sensor circuit	F7	Secondary air system valve stuck open
C5	Pressure sensor circuit	F8	"AfterCat oxygen sensor, signal after decel not
C6	"Catalytic convertor efficiency, Cyl #1-3"		Plausible, Cyl #1-3"
C7	"Catalytic convertor efficiency, Cyl #4-6"	F9	"AfterCat oxygen sensor, signal after decel not
CA	"Oxygen sensor control limit, Cyl #1-3"		Plausible, Cyl #4-6"
CB	"Oxygen sensor control limit, Cyl #4-6"	FA	Functional check purge valve
CC	"Idle control system, idle speed not plausible"		
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 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 is 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

convertor

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 Electrically catalytic EKAT= heated

EKM= electronic Body Module

EML=Electronic Throttle Control

EVAP= relates to fuel vapor recovery often this code indicates a Loose gas cap

protection(alarm EWS= Drive away 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

Sequential SMG= BMW Motor sport 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.