

# Bavarian Autosport

## Fault Code Reader / Reset Tool

### Instruction Manual and Code Charts



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#### IMPORTANT DISCLAIMER - READ NOW

Thank you for purchasing the SR-300x scanner/resetter for BMWs. This product was designed to provide a long service life and ease of use at a low cost. In designing this product we went to great lengths to assure compatibility and safe operation with the majority of BMWs. As with any software-based device, there is a risk that a small number of unique DME variants may not be compatible with this device. Bavarian Autosport may not be held liable for any problems resulting from incompatibilities. Additionally, the code definitions contained in this manual should be regarded as a starting point for diagnosing a problem - the codes your BMW generates can often be misleading, and there may be errors in our code definitions. Before spending your money on a repair, make sure you have a clear understanding of the problem by using additional sources of information, such as a good quality repair manual (see page 39), expert advice, the Internet, etc... **Bavarian Autosport may not be held liable for any expenses you incur in response to the codes or instructions contained in this manual.**

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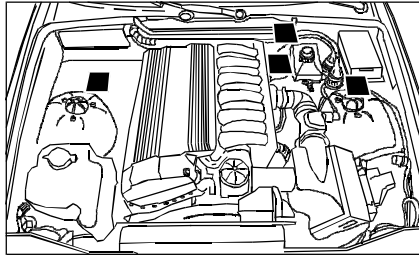
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## LOCATING THE DIAGNOSTIC CONNECTOR

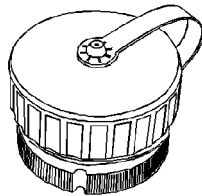
### 1987 Through 2000 (Located under the hood)\*

**Important Note:** Mid-2000-on often use OBD connector, page 4

BMW's built 1987 to year 2000 have a 20 pin diagnostic connector located in the engine compartment. The car image at right gives a general idea of where the connector can be found depending on year and model. The images below show what the connector looks like, covered and uncovered.

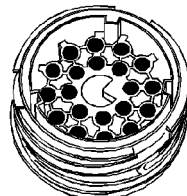


Black squares show possible locations



20 pin Connector used in BMWs 1987-2000

Left- dust cap on.



Right- dust cap removed.

#### Orientation:

BMW located the 20 pin diagnostic connector in several locations in varying orientations. You may find that when the tool is plugged in properly, the face panel is actually upside-down relative to your position.

#### Plugging tool in properly:

When inserting the SR-300, plug it straight in, as you would plug a lamp into a wall socket. The car's connector appears to be a twist-on type, but the SR-300 DOES NOT twist in (twisting will damage tool)

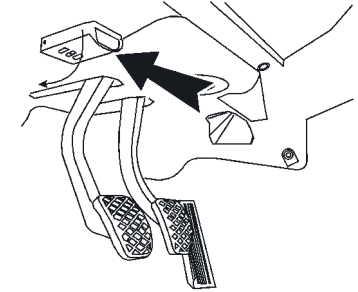
#### \*Not there?

All BMWs 1989 - 1999 have the above connector - no exceptions. Mid 2000 forward is when BMW began to phase out the above connector in favor of the "OBD" connector on page 4.

### 2001 and Later (Connector Located inside the Car)

Important: an adaptor may be required on some SR-300 configurations see Appendix, page 38 for details.

To locate the Diagnostic Connector in most BMWs built 2001 and later, open the driver's door, kneel down and look up at the underside of the dashboard. You will see the diagnostic connector near the pedals, above the driver's left leg (see illustration below.) You will see a rectangular access panel, (often embossed with the letters OBD) with a rounded thumb grip you will use to snap it off. The cover will swing downward revealing the 16 pin diagnostic connector inside.



Under the dashboard:

#### Not there?

Try looking on the passenger side of the center console, or to the left of the driver's left leg. Note: A small number of 2001 and later models also have the 20 pin connector, such as the 2001 X5 and the Z3 up to 2003. See pg 3.

## SR-300 FACE PANEL



1. **Display:** Shows menu selections, activity and fault codes.
2. **Function button:** Used to review and select the available functions. (See page 5)
3. **Start button:** After using "Function" to choose a function (see page 5). The Start button causes the function to execute.

## DIRECTIONS

- 1.) Turn on key (DO NOT START ENGINE)
- 2.) Plug tool into diagnostic connector (see page 3 and 4 for description, and page 39 for warning)- Tool is ready to use when it displays "Fc".
- 3.) Use the "Function" button to select one of the functions shown below
- 4.) Press "Start" to execute the function

### Function Reference

**FC** **Fault Code Read.** The tool automatically starts in this mode, (though it won't read the fault codes until you press the "Start" button). When Start 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 35 ). To then view the faults press Start, repeat until the end of the fault list - (tool will show a double dash line. Press Start to return to "Fc" )

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

**OL** **Oilservice Reset.** When you have selected oL in the display, you are now ready to reset the "oilservice" light. Pressing Start 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 38 for trouble shooting)

**IN** **Inspection reset.** When you have selected "in" in the display, you are now ready to reset the "inspection" light. Pressing Start 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 38 for troubleshooting)

**Fii** and **Cii** apply only 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 2<sup>nd</sup> ECU.

**CE**

## Making sense of the codes

**Tip 1: The first number is not a code!** After pressing "Start" to read codes, the first number shown is the code table to use. See Tip 2.

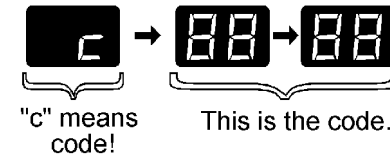
**Tip 2: There is no code table "FF".** BMWs built 1995 and earlier will not tell the tool which code table to use, so the tool just says "FF" See below.

**Tip 3: Is that a b or a 6?** The tool displays a "B" as "b" which looks like a "6". Case does not matter; a "b" on the tool = "B" in the table.



**When codes starts with a "c"** (applies only to 2002 and later BMWs)

A "c" indicates a four digit code is coming. Example: code 8888 would be shown as follows.



Repeats in loop until Start is pressed.

(If there is no "c" then the codes are only two digits in length. )

### 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 thru 7 in the vin:

**WBAAA13LAE57862**

### Table 1: "FF" Fault Table Locator

Year	Model	VDS	Table
1987	325is	AA13	K1
1987	325is A	AA23	K1
1987	325i/4	AD13	K1
1987	325iA/4	AD23	K1
1987	325iC	BB13	K1
1987	325iCA	BB23	K1
1988	325is	AA13	K1
1988	325is A	AA23	K1
1988	325iX A/2	AB03	K1
1988	325i/2	AB54	K1
1988	325 A/2	AB64	K1
1988	325iX/2	AB93	K1
1988	325i/4	AD13	K1
1988	325iA/4	AD23	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	325i/5	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

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

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	318i/s/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

Year	Model	VDS	Table
1992	318iC/2	BA73	K13
1992	325iC	BB13	K1
1992	325iCA	BB23	K1
1992	318i/s	BE53	K6
1992	325i/s	BF33	K10
1992	325i/s 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

Year	Model	VDS	Table
1993	325iC	BB13	K1
1993	325iCA	BB23	K1
1993	318i/s	BE53	K6
1993	318i/s A	BE63	K6
1993	325i/s	BF33	K5
1993	325i/s 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

Year	Model	VDS	Table
1994	318i/s	BE53	K6
1994	318i/s A	BE63	K6
1994	325i/s	BF33	K5
1994	325i/s 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
1994	530iT A	HK23	K11

Year	Model	VDS	Table
1995	318i/s	BE53	K6
1995	318i/s A	BE63	K6
1995	M3 A	BF03	K5
1995	325i/s	BF33	K5
1995	325i/s 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	325i A	CB43	K5
1995	318i	CC73	K6
1995	318i A	CC83	K6
1995	318i/s	CG53	K6
1995	318i/s A	CG63	K6
1995	840Ci A	EF63	K11
1995	850Ci A	EG43	K12
1995	850CSi	EG93	K7
1995	740i A	GF63	K11
1995	740iL A	GJ63	K11
1995	750iL A	GK23	K12
1995	525i	HD53	K5
1995	525i A	HD63	K5
1995	530i	HE13	K11
1995	530i A	HE23	K11
1995	540i	HE53	K11
1995	540i A	HE63	K11
1995	525iT	HJ63	K5
1995	530iT A	HK23	K11

**For 1996 and later see page 10**

## 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 SR-300 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 (Cyl. 2,4,6)
- 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 Converter Clutch
- 64 Unspecified DME Output Stage

- 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, 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

- 2A Knock sensor, Cyl 3-4
- 30 A/C Compressor control
- 36 Control unit supply
- 37 Ignition coils
- 40 Ignition timing intervention
- 46 Oxy sensor
- 49 Vehicle speed signal not present
- 4C Idle CO Potentiometer
- 4d Intake air temperature sensor
- 4E Coolant temperature sensor
- 51 DWA/EWS input
- 55 A/C Compressor
- 64 Unspecified DME Output Stage
- C8 DME control unit selftest
- C9 Emission (lambda) control
- CE Knock control test pulse
- CF Knock control regulation
- dC EWS message

### Table K7

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

### 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

### 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

- 2 Idle speed actuator (close)
- 3 Fuel Injector, Cyl #1
- 4 Fuel Injector, Cyl #3
- 5 Fuel Injector, Cyl #2
- 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 Lambda Control #2
- CC Ignition circuit primary monitor
- CC Stall protection

- 23 Fuel Injector, Cyl #2
- 24 Evaporative purge control valve
- 25 Oxy sensor heating relay
- 29 Air mass sensor
- 2A Vehicle speed signal not present
- 30 A/C Compressor control
- 31 Ignition Coil, Cyl #2
- 32 Ignition Coil, Cyl #3
- 33 Ignition Coil, Cyl #8
- 34 Ignition Coil, Cyl #5
- 36 Battery voltage / DME main relay
- 3E EML Signal
- 41 A/C Compressor
- 42 DWA/EWS Input
- 43 Knock Sensor, Cyl 7-8
- 44 Knock Sensor, Cyl 5-6
- 45 Knock Sensor, Cyl 3-4
- 46 Knock Sensor, Cyl 1-2
- 49 Throttle position sensor
- 4C Idle CO Potentiometer
- 4d Intake air temperature sensor
- 4E Coolant temperature sensor
- 52 Intervention, MSR
- 53 Intervention, ASC
- 64 Output Stage, Group #1
- 65 Output Stage, Group #2
- C8 DME Control Unit
- C9 Lambda Control #1
- CA Fault code memory error
- Cb Lambda Control #2
- CC Idle speed increase - CAN Bus
- Cd Ignition timing intervention
- CE Knock control test pulse
- d2 CAN message
- dC EWS message

**Table K12**

- 4 PreCat oxy sensor heater, Bank 2
- 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, Cyl #1
- 33 Misfire, Cyl #2
- 34 Misfire, Cyl #3
- 35 Misfire, Cyl #4
- 36 Misfire, Cyl #5
- 37 Misfire, Cyl #6
- 38 Misfire, Cyl #7
- 39 Misfire, Cyl #8
- 3A Misfire, Cyl #9

**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
- 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

- 3b Misfire, Cyl #10
- 3C Misfire, Cyl #11
- 3d Misfire, Cyl #12
- 3E Misfire, random or unknown cylinder
- 3F Misfire, catalyst damaging, Cyl #1
- 40 Misfire, catalyst damaging, Cyl #2
- 41 Misfire, catalyst damaging, Cyl #3
- 42 Misfire, catalyst damaging, Cyl #4
- 43 Misfire, catalyst damaging, Cyl #5
- 44 Misfire, catalyst damaging, Cyl #6
- 45 Misfire, catalyst damaging, Cyl #7
- 46 Misfire, catalyst damaging, Cyl #8
- 47 Misfire, catalyst damaging, Cyl #9
- 48 Misfire, catalyst damaging, Cyl #10
- 49 Misfire, catalyst damaging, Cyl #11
- 4A Misfire, catalyst damaging, Cyl #12
- 4b Misfire det, ctlyst 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, 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 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)

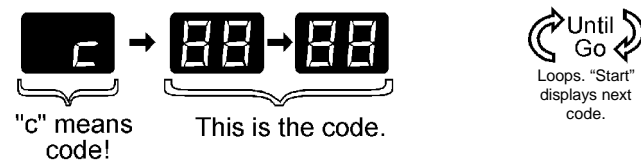
### USE THESE CODE DEFINITIONS WISELY:

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.

**Important: If the tool displayed "FF" you are in the wrong table section. Please go back and read page 6**

**When codes starts with a "c"** (applies only to 2002 and later BMWs)

A "c" indicates a four digit code is coming. Example: code 8888 would be displayed as follows:



If 8888 were a real code, it would cycle "c-88-88" in a loop until "Start" is pressed. If there is no "c" then the codes are only two digits long.

**Begin Tables for 1996-2006 BMWs**

**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 lamp
- 0C O2 sensor, #2
- 0d O2 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 O2 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 06

04 PreCat 02 sensor heater, Cyl 5-8  
05 AfterCat 02 sensor heater, Cyl 5-8  
08 Misfire w/ low fuel  
0A PreCat 02 sensor, Cyl 1-4  
0C AfterCat 02 sensor, Cyl 1-4  
0D PreCat 02 sensor heater, Cyl 1-4  
0E AfterCat 02 sensor heater, Cyl 1-4  
0F PreCat 02 sensor response time, Cyl 1-4  
10 PreCat 02 sensor aging, Cyl 1-4  
11 AfterCat 02 sensor response time, Cyl 1-4  
12 PreCat 02 sensor, Cyl 5-8  
14 AfterCat 02 sensor, Cyl 5-8  
15 PreCat 02 sensor response time, Cyl 5-8  
16 PreCat 02 sensor aging, Cyl 5-8  
17 AfterCat 02 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  
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, Cyl #1  
33 Misfire, Cyl #2  
34 Misfire, Cyl #3  
35 Misfire, Cyl #4  
36 Misfire, Cyl #5  
37 Misfire, Cyl #6  
38 Misfire, Cyl #7  
39 Misfire, Cyl #8  
3E Misfire, random or unknown cylinder  
3F Misfire, catalyst damaging, Cyl #1  
40 Misfire, catalyst damaging, Cyl #2  
41 Misfire, catalyst damaging, Cyl #3  
42 Misfire, catalyst damaging, Cyl #4  
43 Misfire, catalyst damaging, Cyl #5  
44 Misfire, catalyst damaging, Cyl #6  
45 Misfire, catalyst damaging, Cyl #7  
46 Misfire, catalyst damaging, Cyl #8  
4B Misfire, 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 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  
A5 Check engine lamp  
A7 Electrical fuel pump relay  
A8 Idle speed actuator (open)  
AA A/C Compressor control  
AP 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 02 sensor  
0C AfterCat 02 sensor  
0D PreCat 02 sensor heater  
0E AfterCat 02 sensor heater  
0F PreCat 02 sensor response time  
10 PreCat 02 sensor aging  
11 AfterCat 02 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  
22 Fuel trim, multiplicative, Bank 2  
27 EWS message  
28 Catalyst efficiency  
32 Misfire, Cyl #1  
33 Misfire, Cyl #2  
34 Misfire, Cyl #3  
35 Misfire, Cyl #4  
3E Misfire, random or unknown cylinder  
3F Misfire, catalyst damaging, Cyl #1  
40 Misfire, catalyst damaging, Cyl #2  
41 Misfire, catalyst damaging, Cyl #3  
42 Misfire, catalyst damaging, Cyl #4

4B Misfire, 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, external RAM failure  
67 DME, ROM failure  
68 Fault code memory error  
6B Control unit supply voltage  
6C Battery disconnected  
6F Crankshaft position sensor  
70 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  
AP 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 02 sensor heater, Bank 2  
05 AfterCat 02 sensor heater, Bank 2  
08 Misfire w/ low fuel  
0A PreCat 02 sensor, Bank 1  
0C AfterCat 02 sensor, Bank 1  
0D PreCat 02 sensor heater, Bank 1  
0E AfterCat 02 sensor heater, Bank 1  
0F PreCat 02 sensor response time, Bank 1  
10 PreCat 02 sensor aging, Bank 1  
11 AfterCat 02 sensor response time, Bank 1  
12 PreCat 02 sensor, Bank 2  
14 AfterCat 02 sensor, Bank 2  
15 PreCat 02 sensor response time, Bank 2  
16 PreCat 02 sensor aging, Bank 2  
17 AfterCat 02 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, Cyl #1  
33 Misfire, Cyl #2  
34 Misfire, Cyl #3  
35 Misfire, Cyl #4  
3E Misfire, random or unknown cylinder  
3F Misfire, catalyst damaging, Cyl #1  
40 Misfire, catalyst damaging, Cyl #2  
41 Misfire, catalyst damaging, Cyl #3  
42 Misfire, catalyst damaging, Cyl #4

38 Misfire, Cyl #7  
39 Misfire, Cyl #8  
3A Misfire, Cyl #9  
3B Misfire, Cyl #10  
3C Misfire, Cyl #11  
3D Misfire, Cyl #12  
3E Misfire, random or unknown cylinder  
3F Misfire, catalyst damaging, Cyl #1  
40 Misfire, catalyst damaging, Cyl #2  
41 Misfire, catalyst damaging, Cyl #3  
42 Misfire, catalyst damaging, Cyl #4  
43 Misfire, catalyst damaging, Cyl #5  
44 Misfire, catalyst damaging, Cyl #6  
45 Misfire, catalyst damaging, Cyl #7  
46 Misfire, catalyst damaging, Cyl #8  
47 Misfire, catalyst damaging, Cyl #9  
48 Misfire, catalyst damaging, Cyl #10  
49 Misfire, catalyst damaging, Cyl #11  
4A Misfire, catalyst damaging, Cyl #12  
4B Misfire, 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, external RAM failure  
67 DME, ROM failure  
68 Fault code memory error  
6B Control unit supply voltage  
6C Battery disconnected  
6F Crankshaft position sensor  
70 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  
AP 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

EA Automatic start input  
EC CAN timeout, EGS  
ED Automatic start output  
FD Coolant fan final stage

## 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 02 sensor heater, Cyl 5-8  
05 AfterCat 02 sensor heater, Cyl 5-8  
06 CAN timeout, instrument cluster  
07 Engine coolant temperature, radiator outlet  
08 Misfire w/ low fuel  
0A PreCat 02 sensor, Cyl 1-4  
0C AfterCat 02 sensor, Cyl 1-4  
0D PreCat 02 sensor heater, Cyl 1-4  
0E AfterCat 02 sensor heater, Cyl 1-4  
0F PreCat 02 sensor response time, Cyl 1-4  
10 PreCat 02 sensor aging, Cyl 1-4  
11 AfterCat 02 sensor response time, Cyl 1-4  
12 PreCat 02 sensor, Cyl 5-8  
14 AfterCat 02 sensor, Cyl 5-8  
15 PreCat 02 sensor response time, Cyl 5-8  
16 PreCat 02 sensor aging, Cyl 5-8  
17 AfterCat 02 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, Cyl #1  
33 Misfire, Cyl #2  
34 Misfire, Cyl #3  
35 Misfire, Cyl #4  
36 Misfire, Cyl #5  
37 Misfire, Cyl #6  
38 Misfire, Cyl #7  
39 Misfire, Cyl #8  
3E Misfire, random or unknown cylinder  
3F Misfire, catalyst damaging, Cyl #1  
40 Misfire, catalyst damaging, Cyl #2  
41 Misfire, catalyst damaging, Cyl #3  
42 Misfire, catalyst damaging, Cyl #4  
43 Misfire, catalyst damaging, Cyl #5  
44 Misfire, catalyst damaging, Cyl #6  
45 Misfire, catalyst damaging, Cyl #7  
46 Misfire, catalyst damaging, Cyl #8  
4B Misfire, 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)  
7C Intake air temperature sensor  
87 Torque reduction: Transmission  
8A A/C Compressor torque reduction  
8B Electric thermostat control final stage  
8D ASC signal plausibility  
8F Intervention, MSR  
90 Intervention, ASC  
93 Electric thermostat control performance  
94 EWS Input  
96 Fuel Injector, Cyl #1  
97 Fuel Injector, Cyl #2  
98 Fuel Injector, Cyl #3  
99 Fuel Injector, Cyl #4  
9A Fuel Injector, Cyl #5  
9B Fuel Injector, Cyl #6  
9C Fuel Injector, Cyl #7  
9D Fuel Injector, Cyl #8  
A4 EVAP Barometric tank pressure sensor  
A5 Check engine lamp  
A7 Electrical fuel pump relay  
A8 Idle speed actuator (open)  
1B Fuel trim, QL additive, Cyl 1-4  
1C Fuel trim, Ti additive, Cyl 1-4  
AA A/C Compressor control  
B7 EVAP large leak  
B8 EVAP pinched hose check  
CB Ignition feedback failed  
CC EWS rolling code storage  
D0 Secondary air control, Cyl 5-8  
D2 Knock Sensor, Cyl 1-2  
D3 Knock Sensor, Cyl 3-4  
D4 Knock Sensor, Cyl 5-6  
D5 Knock Sensor, Cyl 7-8  
D6 CAN index verification  
D7 CAN timeout, left/right DME  
D8 CAN timeout, ASC  
D9 CAN signal, EML  
DC Knock control test pulse  
DE Knock control test pulse  
E4 Automatic start output  
E9 Automatic start output  
EA Automatic start input  
EC CAN timeout, EGS  
ED Automatic start output  
FD Coolant fan final stage

## Table 0E

1 EVAP LDP Valve final stage  
2 EVAP Running losses valve final stage  
3 EVAP Reed switch not closed, doesn't open/close  
4 PreCat oxy sensor heater, Bank 2  
5 AfterCat oxy sensor heater, Bank 2  
6 CAN timeout, instrument cluster  
7 Engine coolant temperature, radiator outlet  
8 Misfire w/ low fuel  
0A PreCat oxy sensor, Bank 1  
0E EVAP emission control system  
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  
13 CAN timeout, EKAT  
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  
 1d Air containment valve, shrouded injectors, Bank 1  
 1E EKAT - Status 7 - power switch control  
 20 Idle control valve stuck mechanically  
 21 EKAT - Status 8 - EKAT ECU  
 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  
 2A EKAT - Status 1 - heater disconnection, Catalyst #1  
 2b EKAT - Status 2 - Switch on operation condition for Catalyst #1  
 2C EKAT - Status 3 - Power switch for Catalyst #1  
 2d Catalyst efficiency, Bank 2  
 2E EKAT - Status 4 - Heater disconnection, Catalyst #2  
 2F EKAT - Status 5 - Switch on operation condition for Catalyst #2  
 30 EKAT - Status 6 - Power switch for Catalyst #2  
 32 Misfire, Cyl #1  
 33 Misfire, Cyl #2  
 34 Misfire, Cyl #3  
 35 Misfire, Cyl #4  
 36 Misfire, Cyl #5  
 37 Misfire, Cyl #6  
 38 Misfire, Cyl #7  
 39 Misfire, Cyl #8  
 3A Misfire, Cyl #9  
 3b Misfire, Cyl #10  
 3C Misfire, Cyl #11  
 3d Misfire, Cyl #12  
 3E Misfire, random or unknown cylinder  
 3F Misfire, catalyst damaging, Cyl #1  
 40 Misfire, catalyst damaging, Cyl #2  
 41 Misfire, catalyst damaging, Cyl #3  
 42 Misfire, catalyst damaging, Cyl #4  
 43 Misfire, catalyst damaging, Cyl #5  
 44 Misfire, catalyst damaging, Cyl #6  
 45 Misfire, catalyst damaging, Cyl #7  
 46 Misfire, catalyst damaging, Cyl #8  
 47 Misfire, catalyst damaging, Cyl #9  
 48 Misfire, catalyst damaging, Cyl #10  
 49 Misfire, catalyst damaging, Cyl #11  
 4A Misfire, catalyst damaging, Cyl #12  
 4b Misfire detctd, catalyst dng, random/unknown cyl.  
 4d Air containment valve, shrouded injectors, Bank 2  
 4E Crankshaft position sensor (too many teeth)  
 50 Secondary air control, Bank 1  
 51 EKAT - Status 9 - Sensor check temperature sensor 1 in batt.  
 52 EKAT - Status 10 - Sensor check temperature sensor 2 in batt.  
 53 EKAT - Status 11 - plausibility check of sensor temp. in batt.  
 54 Secondary air pump final stage  
 55 Secondary air valve final stage  
 5b EVAP purge control valve, Bank 2  
 5d EVAP emission control system  
 5E EVAP large leak

61 EVAP small leak  
 62 EVAP purge control valve circuit  
 64 Transmission/coolant heat exchanger  
 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  
 82 Swapped oxy sensors, PreCat  
 85 DME bank identification input  
 87 Torque reduction: Transmission  
 8A A/C Compressor torque reduction  
 8b Electric thermostat control final stage  
 8C Torque imbalance  
 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  
 A3 Electrical fuel pump relay, Bank 2  
 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  
 b3 A/C Compressor control, Bank 2  
 b7 EVAP large leak  
 b8 EVAP pinched hose  
 Cb Ignition feedback failed  
 CC EWS rolling code storage  
 D0 Secondary air control, Bank 2  
 d2 Knock Sensor #1  
 d3 Knock Sensor #2  
 d4 Knock Sensor #3  
 d5 Knock Sensor #4  
 d6 CAN index verification  
 d7 CAN timeout, left/right DME  
 d8 CAN timeout, ASC  
 d9 CAN timeout, EML  
 dC Knock control test pulse  
 dE Knock control test pulse  
 E1 EKAT - Status 12 - temperature sensor - plausibility power switch  
 E2 EKAT - Status 13 - temperature sensor - plausibility power switch  
 E3 EKAT - Status 14 - plausibility check of battery disconnect switch  
 E4 Automatic start output  
 E9 Automatic start output

EA Automatic start input

## Table 0F

01 LDP control circuit  
 02 DM-TL solenoid control circuit  
 03 PreCat O2 sensors swapped  
 04 AfterCat O2 sensor heater, Cyl#5-8  
 05 PreCat O2 sensor heater, Cyl#5-8  
 0A PreCat O2 sensor, Cyl#1-4  
 0C AfterCat O2 sensor heater, Cyl#1-4  
 0D PreCat O2 sensor heater, Cyl#1-4  
 0E AfterCat O2 sensor heater, Cyl#1-4  
 0F PreCat O2 sensor slow response, Cyl#1-4  
 10 PreCat O2 sensor aging, Cyl#1-4  
 11 AfterCat O2 sensor aging, Cyl#1-4  
 12 PreCat O2 sensor, Cyl#5-8  
 14 AfterCat O2 sensor, Cyl#5-8  
 15 PreCat O2 sensor slow response, Cyl#5-8  
 16 PreCat O2 sensor aging, Cyl#5-8  
 17 AfterCat O2 sensor aging, 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  
 2D Misfire, Cyl #1  
 33 Misfire, Cyl #5  
 34 Misfire, Cyl #4  
 35 Misfire, Cyl #8  
 36 Misfire, Cyl #6  
 37 Misfire, Cyl #7  
 39 Misfire, Cyl #2  
 3E Misfire, random/multiple cylinders  
 50 Secondary air system, Cyl #1-4  
 51 Secondary air system, Cyl #5-8  
 52 Secondary air valve  
 54 Secondary air control circuit  
 55 Secondary air valve  
 5D Evaporative emission system  
 62 Evaporative emission system purge valve  
 65 Torque monitoring  
 66 MFL interface  
 67 Safety concept monitoring  
 68 Clutch switch  
 69 Control unit self-test, RAM faulty  
 6A Brake switch  
 6B Control unit self-test, ROM faulty  
 6C Control unit self-test, reset  
 6D Battery voltage  
 6E Torque control  
 6F Crankshaft sensor  
 70 Timing reference high resolution signal  
 71 Camshaft position sensor, Cyl#1-4  
 72 Camshaft position sensor, Cyl#5-8  
 73 Air mass sensor  
 75 Throttle position sensors  
 76 Throttle position sensor 1  
 77 Throttle position sensor 2

78 Vehicle speed  
 79 Wheel sensor failure  
 7A Ambient temperature sensor  
 7B Engine coolant temperature sensor  
 7C Intake air temperature sensor  
 7D Radiator outlet temperature sensor  
 7F Coolant temperature plausibility  
 82 Drive-by-wire throttle position monitoring  
 83 Drive-by-wire throttle control  
 84 Drive-by-wire throttle control output stage  
 85 Drive-by-wire throttle controller, spring check  
 86 Drive-by-wire throttle controller, lower adaptation  
 87 Drive-by-wire throttle controller, amplifier check  
 88 Drive-by-wire throttle, emergency air position test  
 8B Map controlled thermostat jammed  
 8C Map controlled thermostat circuit/control  
 8D Engine cooling fan control  
 8E Exhaust flap control  
 94 EWS signal/interface  
 96 Fuel Injector, Cyl #1  
 97 Fuel Injector, Cyl #5  
 98 Fuel Injector, Cyl #4  
 99 Fuel Injector, Cyl #8  
 9A Fuel Injector, Cyl #6  
 9B Fuel Injector, Cyl #3  
 9C Fuel Injector, Cyl #7  
 9D Fuel Injector, Cyl #2  
 A3 Throttle position / air mass plausibility  
 A4 Ambient pressure sensor  
 A5 VANOS output stage, Cyl #1-4  
 A6 VANOS output stage, Cyl #5-8  
 A7 Fuel pump relay control  
 A8 Check engine lamp/MIL  
 AA A/C compressor control  
 B7 LDP diagnosis  
 B8 LDP dystem  
 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 control  
 ED Automatic starter

## Table 10 (See Table 20)

## Table 11 (& 16)

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 O2 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 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 O2 sensor heater, Cyl #4-6  
 38 Ignition feedback - shunt resistor  
 39 Knock Sensor, Cyl #1-3  
 3B Knock Sensor, Cyl #4-6  
 3D AfterCat O2 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 O2 sensor voltage, Cyl #1-3  
 4C PreCat O2 sensor voltage, Cyl #4-6  
 4D AfterCat O2 sensor voltage, Cyl #1-3  
 4E AfterCat O2 sensor voltage, Cyl #4-6  
 4F AfterCat O2 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 close  
 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 O2 sensor no activity, Cyl #1-3  
 C9 PreCat O2 sensor no activity, Cyl #4-6  
 CA O2 sensor control limit, Cyl #1-3  
 CB O2 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 ASC/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  
 DC O2 snsr, post cat.slow response, bank-1  
 DD O2 snsr, post cat.slow response, bank-2  
 DE Time to closed loop temperature too long  
 E3 O2 sensor adaption limit, Cyl #1-3  
 E4 O2 sensor adaption limit, Cyl #4-6  
 E5 PreCat O2 sensor response time, Cyl #1-3  
 E6 PreCat O2 sensor response time, Cyl #4-6  
 E7 PreCat O2 sensor switching Time, Cyl #1-3  
 E8 PreCat O2 sensor switching Time, Cyl #4-6  
 E9 Catalyst efficiency below threshold, Cyl #1-3  
 EA Catalyst efficiency below threshold, Cyl #4-6  
 EB AfterCat O2 sensor heater power, Cyl #1-3  
 EC AfterCat O2 sensor heater power, Cyl #4-6  
 EE Misfire, Cyl #1  
 EF Misfire, Cyl #2  
 F0 Misfire, Cyl #3  
 F1 Misfire, Cyl #4  
 F2 Misfire, Cyl #5  
 F3 Misfire, 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 14

01 Relay Fuel pump  
 02 Idle adjuster closing coil  
 03 Injector valve 1  
 04 Injector valve 3  
 05 Injector valve 2  
 07 input camshaft sensor  
 09 ignition current Bank 2  
 0A output camshaft sensor  
 0C Lambda probe 2  
 0D Lambda probe 1  
 0F ignition current Bank 1  
 10 Error crankshaft-sensor  
 13 Relay Secondary air pump  
 15 output-VANOS-late valve  
 16 output-VANOS-early valve  
 17 ignition output transistor 2  
 18 ignition output transistor 3  
 19 ignition output transistor 1  
 1D Idle adjuster opening coil  
 1F Injector valve 5  
 20 Injector valve 6  
 21 Injector valve 4  
 24 Tank ventilation valve  
 25 Relay Lambda probe heating  
 29 air mass flow meter  
 2A speed sensor  
 2C active Oil level sensor  
 2E consumption signal  
 2F Engine speed signal  
 30 Relay Air conditioning compressor

32 ignition output transistor 4  
 33 ignition output transistor 6  
 34 ignition output transistor 5  
 35 Relay electric fan  
 36 battery voltage  
 40 aircondition switch AC/KO  
 42 EWS-interface  
 43 output-VANOS-early valve  
 44 Knock sensor 3  
 45 Knock sensor 2  
 46 Knock sensor 1  
 48 output-VANOS-late valve  
 49 Throttle valve potentiometer  
 4D intake air temperature sensor  
 4E cooling water temperature sensor  
 50 Switch Gear  
 52 starter switch KL50  
 56 CAN-bus Off  
 82 EWS-signal manipulation  
 88 Error idle speed controller  
 89 CAN-protocol error  
 8A CAN-Timeout message 1  
 8B CAN-Timeout message 2  
 8C CAN-Timeout message 3  
 90 lambda controller 1  
 91 lambda controller 2  
 96 internal: memory test Master  
 97 internal: driver diagnosis  
 98 internal: Kommunikation Master  
 9B internal: error memory Master  
 9C internal: error memory slave  
 9D internal: memory test slave  
 9E internal: Kommunikation slave  
 9F internal: knock module 1  
 A0 internal: knock module 2  
 A1 internal: knock module 3  
 A2 synchronisation camshaft sensor  
 A3 internal: ecu-reset

29 Multi-function steering wheel (MFL) signal  
 2A Multi-function steering wheel (MFL) redundant code transmission  
 2B Multi-function steering wheel (MFL) control switch  
 2D Multi-function steering wheel (MFL) toggle bit  
 32 Running loss (3/2) valve final stage  
 34 Rear exhaust valve flap  
 35 Idle speed actuator (open)  
 37 PreCat 02 sensor heater, Cyl #4-6  
 38 Ignition feedback - shunt resistor  
 39 Knock Sensor, Cyl #1-3  
 3B Knock Sensor, Cyl #4-6  
 3D AfterCat 02 sensor heater, Cyl #4-6  
 3E Secondary air system, switching valve  
 41 Camshaft sensor, intake cam  
 44 EVAP system, purge control valve circuit  
 45 Electrical fuel pump relay  
 4A A/C compressor relay  
 4F AfterCat 02 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 Valve (MDK) potentiometer #1  
 71 Motorized Throttle Valve (MDK) potentiometer #2  
 72 Motorized Throttle Valve (MDK) final stage  
 73 Reference voltage (5v) source for #1 potentiometers  
 74 Reference voltage (5v) source for #2 potentiometers  
 75 Pedal sensor (PWG) potentiometer plausibility  
 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 airmass signal not plausible  
 96 PreCat 02 sensor short to B+, Cyl #1-3  
 97 PreCat 02 sensor short to ground, Cyl #1-3

**Table 15** (not the same as table K15)

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 02 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 Brakelight switch (BLS) / brake light test plausibility  
 28 Brake light switch (BLS) / pedal sensor plausibility

E9 Catalyst efficiency below threshold, Cyl #1-3  
 EA Catalyst efficiency below threshold, Cyl #4-6  
 EB PreCat 02 sensor trim control, Cyl #1-3  
 EC PreCat 02 sensor trim control, Cyl #4-6  
 EE Misfire, Cyl #1  
 EF Misfire, Cyl #2  
 F0 Misfire, Cyl #3  
 F1 Misfire, Cyl #4  
 F2 Misfire, Cyl #5  
 F3 Misfire, 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 02 sensor, signal after decel not plausible, Cyl #1-3  
 F9 AfterCat 02 sensor, signal after decel not plausible, Cyl #4-6  
 FA Functional check purge valve

29 Air mass sensor 1  
 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 2  
 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 1  
 45 Knock sensor 3  
 46 Knock sensor 2  
 47 Knock sensor 4  
 48 Intake camshaft VANOS retard valve 1  
 49 Air mass sensor, plausibility  
 4A Intake camshaft VANOS advance valve 2  
 4B Intake camshaft VANOS retard valve 2  
 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 2  
 54 Exhaust camshaft VANOS retard valve 2  
 55 Throttle position sensor, master measurement  
 56 CAN bus offline  
 57 AfterCat oxygen sensor 1 voltage  
 58 AfterCat oxygen sensor 2 voltage  
 59 Control unit self-test, Safety Concept slave check  
 5A PreCat oxygen sensor 1 aging  
 5B PreCat oxygen sensor 2 aging  
 5C AfterCat oxygen sensor 1 aging  
 5D AfterCat oxygen sensor 2 aging  
 60 Radiator outlet temperature plausibility  
 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 2 VANOS position control  
 72 Exhaust camshaft 2 VANOS position control  
 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  
 81 Catalyst protection engaged, fuel tank low  
 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  
 8E System jet stream pump  
 8F E-box-fan  
 90 Fuel control, Bank 1  
 91 Fuel control, Bank 2  
 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  
 9A Crankcase venting  
 9B Control unit self-test, adaption EEPROM master  
 9C Control unit self-test, adaption EEPROM slave  
 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 2 correlation  
 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, Bank 1  
 AF Air-fuel adaptation, Bank 2  
 B0 DM-TL Error  
 B1 MIL external info  
 B2 Catalyst system efficiency, Bank 1  
 B3 Catalyst system efficiency, Bank 2  
 B4 Tank leak detected

**Table 16** (see table 11)

**Table 18 & 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  
 08 Intake camshaft position sensor 2 (V8)  
 09 Knock sensor 1  
 0A Exhaust camshaft position sensor  
 0B Exhaust camshaft position sensor 2 (V8)  
 0C PreCat oxygen sensor 2  
 0D PreCat oxygen sensor 1  
 0E Tank small leak  
 0F Crankshaft/Camshaft position correlation  
 10 Crankshaft sensor  
 11 SMG shifting  
 12 Map controlled thermostat actuator  
 13 Secondary air pump relay  
 14 Starter relay  
 15 Exhaust camshaft VANOS retard valve  
 16 Exhaust camshaft VANOS advance valve  
 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 1 heater control  
 26 PreCat oxygen sensor 2 heater control  
 27 AfterCat oxygen sensor 1 heater control  
 28 AfterCat oxygen sensor 2 heater control



B5 Filler cap open  
 B6 Injection driver 1, over temp.  
 B7 Injection driver 2, over temp.  
 B8 Intake camshaft 1 VANOS position control  
 B9 Exhaust camshaft 1VANOS 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  
 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 1 slow response  
 D7 PreCat oxygen sensor 2 slow response  
 D8 PreCat oxygen sensor 1 slow switching (rich to lean)  
 D9 PreCat oxygen sensor 2 slow switching (rich to lean)  
 DA PreCat oxygen sensor 1 signal size/amplitude  
 DB PreCat oxygen sensor 2 signal size/amplitude  
 DD Crankcase ventilation system check  
 DE CAN timeout - ZSG  
 DF Intake manifold pressure  
 E0 Load signal plausibility  
 E1 Ambient temperature  
 E2 Instrument cluster relative time  
 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 1 VANOS moving time  
 F9 Exhaust camshaft 1 VANOS moving time  
 FA Intake camshaft 1 VANOS sealing  
 FB Exhaust camshaft 1 VANOS sealing  
 FC Intake camshaft 2 VANOS moving time  
 FD Exhaust camshaft 2 VANOS moving time  
 FE Intake camshaft 2 VANOS sealing  
 FF Exhaust camshaft 2 VANOS sealing

## 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 shut-off  
 16 Fuel Injector, Cyl #3  
 17 Fuel Injector, Cyl #6  
 18 Fuel Injector, Cyl #4  
 19 PreCat 02 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 02 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 02 sensor heater insufficient, Cyl #4-6  
 3E Secondary air 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, purge control valve  
 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 02 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 positions not plausible  
 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 selftest  
 88 Throttle position sensor, adaptation selftest  
 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 02 sensor voltage, Cyl #1-3  
 97 PreCat 02 sensor voltage, Cyl #4-6  
 98 AfterCat 02 sensor voltage, Cyl #1-3  
 99 AfterCat 02 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 02 sensor heating during regulation, Cyl #1-3  
 BB 02 sensor heating during regulation, Cyl #4-6  
 BC PreCat 02 sensor heater circuit, Cyl #1-3  
 BD PreCat 02 sensor heater circuit, Cyl #4-6  
 BE AfterCat 02 sensor heater circuit, Cyl #1-3  
 BF AfterCat 02 sensor heater circuit, Cyl #4-6  
 C4 Pressure sensor circuit  
 C5 Pressure sensor circuit  
 C6 Catalytic converter efficiency, Cyl #1-3

C7 Catalytic converter efficiency, Cyl #4-6  
 CA 02 sensor control limit, Cyl #1-3  
 CB 02 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 02 sensor disconnection, Cyl #1-3  
 D8 AfterCat 02 sensor disconnection, Cyl #4-6  
 D9 CAN timeout (EGS1)  
 DB CAN bus offline  
 DC AfterCat 02 sensor slow resp time, Cyl #1-3  
 DD AfterCat 02 sensor slow resp time, Cyl #4-6  
 DE Coolant temp too low for closed loop operation  
 DF AfterCat 02 sensor slow switching time, Cyl #1-3  
 E0 AfterCat 02 sensor slow switching time, Cyl #4-6  
 E1 AfterCat fuel trim system, Cyl #1-3  
 E2 AfterCat fuel trim system, Cyl #4-6  
 E3 02 sensor adaptation limit, Cyl #1-3  
 E4 02 sensor adaptation limit, Cyl #4-6  
 E5 PreCat 02 sensor slow resp time, Cyl #1-3  
 E6 PreCat 02 sensor slow resp time, Cyl #4-6  
 E7 PreCat 02 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, Cyl #1  
 EF Misfire, Cyl #2  
 F0 Misfire, Cyl #3  
 F1 Misfire, Cyl #4  
 F2 Misfire, Cyl #5  
 F3 Misfire, 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 02 sensor, signal after decel not plausible, Cyl #1-3  
 F9 AfterCat 02 sensor, signal after decel not plausible, Cyl #4-6  
 FA Functional check purge valve

## Table 20 & 10

2712 DM TL magnetic valve  
 2715 PreCat 02 sensor heater control, Bank 2  
 2716 AfterCat 02 sensor heater control, Bank 1  
 2717 AfterCat 02 sensor heater control, Bank 2  
 2718 Camshaft generator: positioning  
 2719 crank shaft sensor: cycle duration  
 271A PreCat 02 sensor signal, Bank 1  
 271C AfterCat 02 sensor signal, Bank 1  
 271D PreCat 02 sensor heater control, Bank 1  
 271F 02 sensor aging bank 1: period duration  
 2720 02 sensor aging bank 1: switching time  
 2721 AfterCat 02 sensor aging, Bank 1  
 2722 PreCat 02 sensor signal, Bank 2  
 2724 AfterCat 02 sensor signal, Bank 2  
 2725 02 sensor aging bank 2: period duration

2726 02 sensor aging bank 2: switching time  
 2727 AfterCat 02 sensor aging, Bank 2  
 2734 TPS 1: signal not plausible against MAF  
 2735 TPS 2: signal not plausible against MAF  
 2737 EWS 3.3 manipulation protection  
 2738 Catalyst bank 1  
 273B Catalyst bank 1 via NOx-sensor  
 273C Catalyst bank 2 via NOx-sensor  
 273D Catalyst bank 2  
 2740 Pedal 1: voltage supply  
 2741 Pedal 2: voltage supply  
 2742 misfire Cyl. 1  
 2743 misfire Cyl. 5  
 2744 misfire Cyl. 3  
 2745 misfire Cyl. 6  
 2746 misfire Cyl. 2  
 2747 misfire Cyl. 4  
 274E misfire on several cylinders  
 2750 Electronic throttle controller: momentarily sticking  
 2751 Electronic throttle controller: permanently sticking  
 2752 Electronic throttle controller: hard movement  
 2753 Ignition coil cyl. 1  
 2754 Ignition coil cyl. 5  
 2755 Ignition coil cyl. 3  
 2756 Ignition coil cyl. 6  
 2757 Ignition coil cyl. 2  
 2758 Ignition coil cyl. 4  
 2760 Secondary air system  
 2761 Secondary air system  
 2762 Secondary air valve  
 2764 Relay sec.air pump: controller  
 2765 solenoid valve secondary air: activation  
 2766 Camshaft sensor inlet: signal time  
 2767 Camshaft sensor outlet: signal time  
 2768 Camshaft sensor inlet: phase position  
 276C Camshaft sensor outlet: phase position  
 276D function-check tank venting  
 2770 secondary air heated film air mass sensor  
 2772 TEV: controller  
 2774 engine cut off time  
 2777 DME-selftest: AD-converter  
 2778 clutch switch  
 2779 DME-selftest: RAM  
 2783 heated film at air mass measuring sensor  
 2786 TPS 1  
 2787 TPS 2  
 2788 Vehicle speed  
 278B Coolant temp sensor  
 278C Intake air sensor  
 278D Radiator outlet temp sensor  
 278F generator: under uproar  
 2790 coolant-outlet-temperature: implausible  
 2794 Electronic throttle controller  
 2796 Electronic throttle controller: adaption wrong  
 279B Mapped thermostat cooling: mechanical  
 279C Mapped thermostat cooling: control  
 279D engine fan: activation  
 279E Exhaust flap: control  
 27A0 E-box fan: control  
 27A1 Electronic throttle controller: start check  
 27A4 Interface EWS 3.3 - DME  
 27A5 throttle valve: new adaption  
 27A6 Injection valve cyl. 1  
 27A7 Injection valve cyl. 5  
 27A8 Injection valve cyl. 3

27A9 Injection valve cyl. 6  
 27AA Injection valve cyl. 2  
 27AB Injection valve cyl. 4  
 27B2 brake-light-switch: signal  
 27B4 Ambient-pressure sensor  
 27B5 Camshaft control inlet bank1: controller  
 27B7 Gas pump relay: control  
 27B9 PreCat 02 sensor voltage increase, Bank 1  
 27BA PreCat 02 sensor voltage increase, Bank 2  
 27BD Camshaft control outlet bank1: controller  
 27C2 AC-compressor controller  
 27C3 Thermal oil level sensor  
 27C4 main relay  
 27C5 brake-light-test-switch: signal  
 27C7 Main relay: switching delay  
 27CA DM TL pump: controlled  
 27CC DM TL: leakage  
 27CD DM TL: module failure  
 27CF Ignition cyl. 1  
 27D0 Ignition cyl. 5  
 27D1 Ignition cyl. 3  
 27D2 Ignition cyl. 6  
 27D3 Ignition cyl. 2  
 27D4 Ignition cyl. 4  
 27D6 Idle controller: position closed  
 27D7 Idle controller: position open  
 27D9 DM TL heater: controlled  
 27DA BSD-generator  
 27DB accelerator pedal and brake pedal: signal implausible  
 27DC EWS 3.3 exchange code storing  
 27DD temperature sensor engine coolant: gradient  
 27DE temperature sensor engine coolant: signal  
 27DF temperature sensor engine coolant: constant signal  
 27E0 crankshaft sensor: segment time measurement  
 27E2 knock sensor 1  
 27E3 knock sensor 2  
 27EB Telegram (EGS 2) missing from EGS-ECU  
 27EC Telegram (EGS 1) missing from EGS-ECU  
 27F2 petrol tank level implausible  
 27F7 Pedal input sensor 1  
 27F8 Pedal input sensor 2  
 27F9 Start auto.: control  
 27FB controlled air management: activation  
 2800 Telegram (l-combi 2) missing from combi-ECU  
 2801 idle-speed implausible (air leakage)  
 2804 driving speed regulation: requirement  
 2805 switch driving speed regulation: signal  
 2806 driving speed regulation: time limit data transmission reached  
 2807 Mapped potentiometer: signal  
 2808 PWM: signal  
 2809 Telegram (l-combi 3) missing from combi-ECU  
 280B Telegram (ASC 1) missing from ASC-ECU  
 280C Telegram (ASC 3) missing from ASC-ECU  
 280D Telegram (LWS) missing from LWS-ECU  
 280E Telegram (SMG 1) missing from SMG-ECU

280F	message (ASC 4) missing from ASC-ECU	28CF	Fuel pump: emergency switch off	2995	NOx-sensor 2: heater power	2A10	exhaust fume return valve, signal	2A81	Intake VANOS, Control 2	2C24	PreCat 02 sensors switched
2811	local CAN communication error	28D0	Fuel pump	2996	NOx-sensor 1: systemcheck plausibility	2A12	DMTL diagnosis module tank leakage, magnetic valve, input signal	2A82	Intake Vanos variable cam control test	2C27	PreCat 02 sensor systemcheck, Bank 1
2812	oil temperature	28DD	air mass system	2997	NOx-sensor 2: OBD-II-diagnostics plausibility	2A13	DMTL diagnosis module tank leakage, leakage diagnosis pump, input signal	2A85	Exhaust VANOS variable cam control test	2C28	PreCat 02 sensor systemcheck, Bank 2
281A	telegramm (TxU) missing	28E6	02 sensor analysis unit/self test, Bank 1	2998	NOx-sensor 1: systemcheck	2A15	DMTL diagnosis module tank leakage, fine leakage	2A86	Exhaust VANOS, Control 2	2C2B	PreCat 02 sensor systemcheck, Bank 1
281B	Telegram (EKP) missing from EKP-ECU	28E7	02 sensor analysis unit/self test, Bank 2	2999	NOx-sensor 2: systemcheck	2A16	DMTL diagnosis module tank leakage, finest leakage	2A87	Exhaust Vanos variable cam control test, mechanics	2C2C	PreCat 02 sensor systemcheck, Bank 2
281C	bit serial data interface (BSD): signal	28E8	02 sensor trim control, Bank 1	299A	error management EGS	2A17	DMTL diagnosis module tank leakage, system failure	2A8A	Intake VANOS, Adaption limit stop	2C2D	PreCat 02 sensor thrust control, Bank 1
281D	BSD generator: signal	28E9	02 sensor trim control, Bank 2	299B	battery sensor: signal	2A18	DMTL diagnosis module tank leakage, heating: input signal	2A8C	Exhaust VANOS, Adaption limit stop	2C2E	PreCat 02 sensor thrust control, Bank 2
281E	variable air intake system: activation	28EA	AfterCat 02 sensor signal, Bank 1	299C	batterysensor: Function	2A19	tank ventilation valvel, input signal	2A92	Exhaust VANOS 1, control	2C31	PreCat 02 sensor trim control, Bank 1
282F	PT-CAN communication error	28EB	AfterCat 02 sensor signal, Bank 2	299D	battery sensor: data transmission	2A1A	tank ventilation system, function	2A93	Intake VANOS, control	2C32	PreCat 02 sensor trim control, Bank 2
2830	DME-selftest: checksum	28EC	AfterCat 02 sensor (after full load) Bank 1	299E	AfterCat 02 sensor signal, Bank 1	2A1B	tank lid	2A94	crankshaft sensor, signal	2C37	PreCat 02 sensor heater connection, Bank 1
2831	DME self diagnostics: CPU monitoring	28ED	AfterCat 02 sensor (after full load) Bank 2	299F	AfterCat 02 sensor signal, Bank 1	2A1C	tank filling level, plausibility	2A95	crankshaft sensor, synchronisation	2C38	PreCat 02 sensor heater connection, Bank 2
283A	Oil condition sensor	28EF	AfterCat 02 sensor systemcheck, Bank 1	29A0	AfterCat 02 sensor signal, Bank 1	2A26	Cat conversion during shift operation	2A96	crankshaft sensor, tooth failure	2C39	PreCat 02 sensor dynamics, Bank 1
283F	Oil pressure switch: signal implausible	28F2	02 sensor trim control, Bank 1	29A1	AfterCat 02 sensor signal, Bank 1	2A27	Cat 2, conversion during shift operation	2A97	crankshaft sensor, gap failure	2C3A	PreCat 02 sensor dynamics, Bank 2
2869	DME self diagnostics: RAM-check failed	28F3	02 sensor trim control, Bank 2	29A2	PreCat 02 sensor signal, Bank 2	2A29	Fuel low pressure sensor, Signal	2A98	crank shaft - intake camshaft, correlation	2C3B	PreCat 02 sensor disconnected, Bank 1
286A	DME self diagnostics: knock sensor module	28F4	PreCat 02 sensor cold test, Bank 1	29A3	PreCat 02 sensor signal, Bank 2	2A2B	fuel mixture control	2A99	crank shaft - exhaust camshaft, correlation	2C3C	PreCat 02 sensor disconnected, Bank 2
286B	DME self diagnostics: multi output module	28F5	PreCat 02 sensor cold test, Bank 2	29A4	PreCat 02 sensor heater control, Bank 1	2A2C	fuel mixture control 2	2A9A	camshaft sensor intake, signal	2C3D	PreCat 02 sensor lines/wires, Bank 1
2882	mixture preparation bank1	28F6	AfterCat 02 sensor cold test, Bank 1	29A5	PreCat 02 sensor heater control, Bank 2	2A2E	fuel low pressure system, fuel pressure	2A9B	camshaft sensor exhaust, signal	2C3E	PreCat 02 sensor lines/wires, Bank 2
2883	mixture preparation bank2	28F7	AfterCat 02 sensor cold test, Bank 2	29A6	PreCat 02 sensor signal, Bank 1	2A2F	mixture control	2A9C	crank shaft sensor, electric	2C3F	DME, internal error: lambda probe (Bank 1) analysing chip
2882	mixture preparation bank1	28F8	AfterCat 02 sensor cold test, Bank 2	29A7	PreCat 02 sensor signal, Bank 1	2A30	Valvetronic, eccentric shaft sensor: power supply	2A9E	camshaft sensor intake, synchronization	2C40	DME, internal error: lambda probe (Bank 2) analysing chip
2883	mixture preparation bank2	28F9	roughness: segment time measurement	29A8	telegram monitoring failure: network failure power management	2A31	Valvetronic, eccentric shaft sensor: guidance	2A9F	camshaft sensor exhaust, synchronization	2C41	DME, internal error: lambda probe Bank 1
2892	misfire with low tank volume	28FA	torque in shift phase	29A9	telegram monitoring failure: battery Powermanagement	2A32	Valvetronic, eccentric shaft sensor: reference	2AA0	camshaft sensor intake, signal	2C42	DME, internal error: lambda probe Bank 2
2893	internal ECU temperature	28FB	Active Cruise Control (ACC)	29AB	torque request with CAN	2A33	Valvetronic, eccentric shaft sensor: guidance	2AA1	camshaft sensor exhaust, signal	2C6A	AfterCat 02 sensors switched
2894	irreversible ecu error	28FF	DME-selftest	29AE	Tank flap	2A34	Valvetronic, eccentric shaft sensor: reference	2AA2	camshaft sensor intake, gap loss	2C6B	AfterCat 02 sensor systemcheck, Bank 1
2895	crank shaft sensor: signal	2900	DME-selftest	29AF	telegram and signal monitoring KL.15	2A35	Valvetronic, eccentric shaft sensor: guidance	2AA3	camshaft sensor exhaust, loss	2C6C	AfterCat 02 sensor systemcheck, Bank 2
2896	camshaft sensor: input-signal	293C	telegram monitoring: torque requirement AFS	29B5	Second air system	2A36	Valvetronic, eccentric shaft sensor: reference	2AA4	camshaft sensor intake, tooth failure	2C6D	AfterCat 02 sensor aging, Bank 1
2897	camshaft sensor: output-signal	293D	telegram monitoring: EKP	29B6	Cyl. switch off	2A37	Valvetronic, eccentric shaft sensor: plausibility	2AA5	camshaft sensor exhaust, tooth failure	2C6E	AfterCat 02 sensor aging, Bank 2
2898	AfterCat 02 sensor signal, Bank 1	2947	Telegram monitoring: torque request ACC	29B7	Misfire, several Cyls	2A38	Valvetronic, actuator: sluggish or open circuit	2AA8	variable suction unit adjustment motor: input signal	2C6F	AfterCat 02 sensor signal at full load, Bank 1
2899	AfterCat 02 sensor signal, Bank 2	2948	Telegram monitoring: ARS	29B8	Misfire, Cyl. 2	2A39	Valvetronic, adjustable range	2AA9	variable suction unit adjustment motor 2: input signal	2C70	AfterCat 02 sensor signal at full load, Bank 2
289A	PreCat 02 sensor heater function, Bank 1	2949	Telegram monitoring: CAS	29B9	Misfire, Cyl. 3	2A40	Valvetronic, internal error	2AAA	variable suction unit, plausibility	2C73	AfterCat 02 sensor signal, Bank 1
289B	PreCat 02 sensor heater function, Bank 2	294A	Telegram monitoring: torque request SMG	29BA	Misfire in case of tank filling level too low	2A41	Valvetronic, thermic overload protection	2AAB	variable suction unit, self diagnosis	2C74	AfterCat 02 sensor signal, Bank 2
289C	AfterCat 02 sensor heater function, Bank 1	294B	Telegram monitoring: speed DSC	29BB	crankshaft sensor, segment adaptation	2A42	Valvetronic, position at restart: plausibility	2AAC	variable suction unit 2, self diagnosis	2C75	AfterCat 02 sensor signal, Bank 1
289D	AfterCat 02 sensor heater function, Bank 2	294C	Telegram monitoring: status DSC	29BC	engine roughness, segment time measurement	2A43	Valvetronic, thermic overload protection: warning threshold	2AAD	fuel pump, emergency off	2C76	AfterCat 02 sensor signal, Bank 2
289E	PreCat 02 sensor, Bank 1	294D	Telegram monitoring: torque request EGS	29BD	engine roughness, segment time measurement	2A44	Valvetronic, output limitation	2AAE	Fuel pump	2C77	AfterCat 02 sensor signal, Bank 1
289F	PreCat 02 sensor, Bank 2	294E	Telegram monitoring: transmission data EGS/SMG	29BE	fuel injection rail, pressure sensor signal	2A45	Valvetronic, adjustment motor: plausibility	2AAF	fuel pump, plausibility	2C78	AfterCat 02 sensor signal, Bank 2
28A1	driving speed regulation	294F	Telegram monitoring: torque request SMG	29BF	fuel mixture control 2	2A46	Valvetronic, adaption	2AAB	DME, internal error: RAM	2C79	AfterCat 02 sensor signal, Bank 1
28A2	air path	2950	Telegram monitoring: AC	29C0	fuel mixture control 2	2A47	Valvetronic, eccentric shaft sensor: plausibility	2AB3	DME, internal error: checksum	2C7A	AfterCat 02 sensor signal, Bank 2
28A4	engine-speed	2951	Telegram monitoring: temp. combi	29C1	fuel injection rail, pressure sensor signal	2A48	Valvetronic, Temp. Plausibility	2AB4	DME, internal error: RAM-checksum	2C7B	AfterCat 02 sensor signal, Bank 1
28A5	Pedal value	2952	Telegram monitoring: km-count combi	29C2	fuel mixture control 2	2A49	Valvetronic, mechanical	2AB5	DME, internal error: knocksensor	2C7C	AfterCat 02 sensor signal, Bank 2
28A7	telegram monitoring: NOx-sensor 1	2953	Telegram monitoring: status combi	29C3	fuel mixture control 2	2A50	Valvetronic, servo motor: rotation direction	2AB6	DME, internal error: output chip	2C7D	AfterCat 02 sensor signal, Bank 1
28A8	telegram monitoring: NOx-sensor 2	2954	Telegram monitoring: batt.voltage powermodul	29C4	fuel mixture control 2	2A51	Valvetronic, relay, input signal	2ABC	charging pressure sensor, electrical	2C7E	AfterCat 02 sensor trim control, Bank 1
28AA	idle speed regulator	2955	Telegram monitoring: charge voltage powermodul	29C5	fuel mixture adaptation, upper speed range	2A52	Valvetronic, adjustment motor: input signal	2ABD	intake pressure sensor, re-running	2C7F	AfterCat 02 sensor trim control, Bank 2
28AB	external torque requirement: monitoring	2956	Telegram monitoring: cruise control	29C6	fuel mixture adaptation 2, upper speed range	2A53	Valvetronic, servo motor: power supply	2AC7	Sport switch illumination, electric	2C7F	AfterCat 02 sensor trim control, Bank 2
28AC	nominal torque	2957	Telegram monitoring: steering angle	29C7	fuel high pressure system, fuel pressure	2A54	Valvetronic, thermic overload protection	2ACB	DME digital motor electronics main relay, input signal	2C92	exhaust gas temperature sensor, electric
28AD	actual torque	2958	Telegram monitoring: sport switch	29C8	fuel pressure sensor, electrical	2A55	Valvetronic, position at restart: plausibility	2ACC	DME digital motor electronics main relay, switch delay	2C93	exhaust gas temperature sensor, plausibility
28AE	torque limit	2960	PreCat 02 sensor, Bank 1	29C9	Cat conversion	2A56	Valvetronic, warning threshold	2AD0	gear control	2C9C	PreCat 02 sensor heater input signal, Bank 1
28B1	rpm limit	2961	PreCat 02 sensor, Bank 2	29FA	Cat conversion 2	2A57	Valvetronic, thermic overload protection	2AD8	EAC-sensor, control	2C9D	PreCat 02 sensor heater input signal, Bank 2
28B2	rpm limiting: reset	2962	PreCat 02 sensor dynamics, Bank 1	29FB	Cat conversion, complete system: below threshold	2A58	Valvetronic, output limitation	2ADA	EAC-sensor, coding	2C9E	AfterCat 02 sensor heater input signal, Bank 1
28B3	Throttle flap: cont. adaption	2963	PreCat 02 sensor dynamics, Bank 2	29FC	Cat conversion 2, complete system: below threshold	2A59	Valvetronic, adjustment motor: plausibility	2ADB	EAC-sensor, communication	2C9F	AfterCat 02 sensor heater input signal, Bank 2
28B4	Sport button	2964	PreCat 02 sensor dynamics, Bank 2	29FD	secondary air system	2A60	Valvetronic, adaption	2ADC	EAC-Sensor, Communication	2CA6	PreCat 02 sensor function, Bank 1
28B5	Soundflap: signal	2965	PreCat 02 sensor ceramic temp, Bank 1	29FE	secondary air system	2A61	Valvetronic, eccentric shaft sensor: plausibility	2ADF	idle running control, speed	2CA7	PreCat 02 sensor function, Bank 2
28B6	Inlet-camshaft bank1: mechanical	2966	PreCat 02 sensor ceramic temp, Bank 2	29FF	secondary air valve, mechanics	2A62	Valvetronic, secondary air valve, mechanics	2AE1	demand for power output in idle running too high	2CA8	AfterCat 02 sensor function, Bank 1
28B8	exhaust camshaft bank1: mechanical	2967	PreCat 02 sensor signal, Bank 1	299F	secondary air valve, input signal	2A63	Valvetronic, secondary air pump relay, input signal	2AE4	engine ventilation-heater relais, control	2CA9	AfterCat 02 sensor function, Bank 2
28BA	Inlet-camshaft bank1: rough-running	2968	PreCat 02 sensor signal, Bank 2	2A00	secondary air valve, input signal	2A64	Valvetronic, secondary air mass sensor, plausibility	2AE5	idle switch position OPEN	2CAA	PreCat 02 sensor temperature, Bank 1
28BC	exhaust camshaft bank1: stiff	2969	PreCat 02 sensors switched	2A01	secondary air valve, input signal	2A65	Valvetronic, secondary air valve, mechanics	2AE6	idle switch position CLOSE	2CAB	PreCat 02 sensor temperature, Bank 2
28BD	intake camshaft sensor: latching	296A	AfterCat 02 sensors switched	2A02	secondary air valve, input signal	2A66	Valvetronic, exhaust fume return, systemfunction	2AF0	nitric oxide sensor, heating	2CEC	throttle positioner, stuck for an intermediate time
28BE	exhaust camshaft sensor: latching	296B	AfterCat 02 sensors switched	2A03	secondary air valve, input signal	2A67	Valvetronic, exhaust fume return valve, input signal	2AF2	nitric oxide sensor, Lambda linear	2CED	throttle positioner, permanently stuck
28BF	NOx-sensor 1	296C	PreCat 02 sensors switched	2A04	secondary air valve, input signal	2A77	ecu, internal error: Valvetronic-output	2AF4	NOXsensor, electrical	2CEE	throttle positioner, sluggish
28C0	NOx-sensor 2	296D	AfterCat 02 sensors switched	2A05	secondary air valve, input signal	2A80	Intake Vanos variable cam control test, input signal	2AF6	nitric oxide sensor, Lambda binary	2CEF	throttle positioner, input signal
28C1	PreCat 02 sensor, Bank 1	296E	AfterCat 02 sensors switched	2A06	secondary air valve, input signal			2B00	overspeed, lean-range		
28C2	PreCat 02 sensor, Bank 2	296F	AfterCat 02 sensors switched	2A07	secondary air valve, input signal						
28C3	PreCat 02 sensor heater function, Bank 1	296G	AfterCat 02 sensors switched	2A08	secondary air valve, input signal						
28C4	PreCat 02 sensor heater function, Bank 2	296H	AfterCat 02 sensors switched	2A09	secondary air valve, input signal						
28C5	AfterCat 02 sensor systemcheck, Bank 1	296I	AfterCat 02 sensors switched	2A0A	secondary air valve, input signal						
28C6	AfterCat 02 sensor systemcheck, Bank 2	296J	AfterCat 02 sensors switched	2A0B	secondary air valve, input signal						
28CA	Ozone exchange: too low	296K	AfterCat 02 sensors switched	2A0C	secondary air valve, input signal						
28CB	Ozone sensor 2	296L	AfterCat 02 sensors switched	2A0D	secondary air valve, input signal						
28CC	Ozone sensor 1	296M	AfterCat 02 sensors switched	2A0E	secondary air valve, input signal						

2CF6 throttle valve potentiometer 1, plausibility with regard to air mass	failure: control hardware	2E35 injection valve Cyl. 6, input signal	2F4A interface EWS-DME electronic vehicle immobilization/digital motor electronics	30A3 ignition coil Cyl. 4, input signal	CD9A message (torque requirement SMG, BD)
2CF7 throttle valve potentiometer 2, plausibility with regard to air mass	2D5F ECU, internal error: Reset	2E68 knock sensor signal 1	2F4B DME digital motor electronics, internal failure: EWS (electronic vehicle immobilization) data	30A4 ignition coil Cyl. 5, input signal	CD9B message (vehicle mode, 315)
2CF9 throttle valve potentiometer 1	2D60 fuel mass, monitoring	2E69 knock sensor signal 2	2F4C message EWS-DME digital motor electronics electronic vehicle immobilization-digital motor electronics failure	30A5 ignition coil Cyl. 6, input signal	CD9C message (speed, 1A0)
2CFA throttle valve potentiometer 2	2D61 throttle valve, monitoring	2E6A knock sensor signal 3	2F4E vehicle speed, signal	30AC injection valve Cyl. 1, input signal	CD9D message (gear data, BA)
2CFB throttle valve adaptation value	2D64 control stoichiometric mixture	2E74 mixture adaption, injector ageing: Bank 1	2F4F vehicle speed, plausibility	30AD injection valve Cyl. 2, input signal	CD9E message (gear data 2, 1A2)
2CFC throttle valve, start test	2D67 DME digital motor electronics, internal failure: control processors	2E75 mixture adaption, injector ageing: Bank 2	2F58 start automatics, input signal	30AE injection valve Cyl. 3, input signal	CD9F message (kilometer reading/coverage, 330)
2CFD throttle valve adaptation value missing	2D68 DME digital motor electronics, internal failure: control processors	2E77 ignition, voltage supply	2F59 start automatics, input signal	30AF injection valve Cyl. 4, input signal	CDAA message (status ARSActive roll stabilizing module, 1AC)acceleration?
2CFE throttle valve, continuous adaptation	2DB5 driving speed control, signal	2E7C bit serial data interface, signal	2F63 brake light switch, plausibility	30B0 injection valve Cyl. 5, input signal	CDAB message (lamp condition, 21A)
2D06 air mass system	2DB6 cruise control, switch multifunction steering wheel	2E81 electrical coolant pump, speed deviation	2F64 brake light test switch, plausibility	30B1 injection valve Cyl. 6, input signal	CDAC message (status water valve, 3B5)
2D07 Throttle flap 1	2DB7 driving speed control, time limit of data transfer achieved	2E82 electrical coolant pump, shut down	2F65 brake booster, system check	30BA Injector bank 1 or ECU, internal error	CDAD message (requirement road wheel torque drive line, BF)
2D09 Throttle valve	2DBE active speed control, locked for driving	2E83 electrical coolant pump, power reduced operation	2F66 brake booster, electric ATIC39	30BB Injector bank 2 or ECU, internal error	CDAE message (time/date, 2F8)
2D0B throttle valve heater, Relay	2DC0 longitudinal dynamics management	2E84 electrical coolant pump, communication	2F67 clutch switch, signal	30BE injector, calibration: plausibility	CDAF message (status trailer, 2E4)
2D0C throttle valve, defrosting	2DC3 control Klemme 15	2E85 electrical coolant pump, communication	2F6C exhaust flap, input signal	30C0 motor oil pressure control, dynamically	CD80 message (display gear data)
2D0E air mass meter, electrical	2DC5 torque requirement over CAN, plausibility	2E88 intelligent battery sensor, signal	2F71 E-box-fan, input signal	30C1 motor oil pressure control, statically	CD81 message (status central locking system, 2FC)
2D0F air mass meter, signal	2DC6 fuel tank level, plausibility	2E8C intelligent battery sensor, function	2F76 ambient pressure sensor, signal	30C2 oil pressure regulating valve, control	CD83 Message (speed demand steering, B9)
2D15 air mass sensor, metering range	2DC8 message of electronic gear control? missing, electronic gear control? 1	2E8D intelligent battery sensor, signal transmission	2F77 ambient pressure sensor, plausibility	30C3 motor oil pressure sensor, signal	CD84 Message (transmission data 3, 3B1) missing
2D16 air mass meter, signal	2DC9 message of electronic gear control? missing, electronic gear control? 2	2E8E intelligent battery sensor, communication	2F79 ambient pressure sensor, re-running	30C4 motor oil pressure control, mechanically	CD85 PT-CAN communication failure
2D18 manipulation protection, max air mass	2DCC message of ASC/DSC anti slip control/dynamic stability control missing, ASCanti slip control 1	2E96 generator, under excitation	2F7A ambient pressure sensor, re-running	30C5 engine oil pump, mechanical: engine oil pressure	CD88 Message speed demand DKG, B8)
2D19 accelerator pedal module, pedal sensor signal 1	2DCD message of ASC/DSC anti slip control/dynamic stability control missing, ASCanti slip control 3	2E97 Generator	2F7B oil pressure switch, plausibility	30C6 motor oil pressure sensor, plausibility	CD89 message (status EMF, 201)
2D1C accelerator pedal module, pedal sensor signal 2	2DCE message of ASC/DSC anti slip control/dynamic stability control missing, ASC 4	2E98 Generator, communication	2F80 motor shutoff time, plausibility	30C7 motor oil pressure system	CD8A message (Stellanforderung EMF, 1A7)
2D1D accelerator pedal module, pedal sensor 1, voltage supply	2DD0 message of instrument cluster missing, I-Kombi 2	2E99 Generator	2F85 DME digital motor electronics, internal failure: inside temperature sensor, signal	30C8 motor oil pressure, final stage (preliminary)	CD8E message, (torque demand from DSC)
2D1E accelerator pedal module, pedal sensor 2, voltage supply	2DD1 message of instrument cluster missing, I-Kombi 3	2E9E Generator, communication	2F8F accelerator pedal module and brake pedal, plausibility	30C9 engine oil pump, control	
2D1F accelerator pedal module, pedal sensor potentiometer, signal	2DD2 message of LWS steering angle sensor control unit missing, LWS	2E9F oil condition sensor	2F94 fuel pump relay, input signal	30CF Wastegate, input signal	
2D20 accelerator pedal module, pedal sensor, plausibility between signal 1 and signal 2	2DD3 message of SMG-control unit missing, SMG 1	2EA1 oil condition sensor, communication	2F99 ambient temperature sensor, plausibility	30D0 Wastegate 2, input signal	
2D28 differential pressure sensor, suction pipe: Signal	2DD4 telegramm (TxU) missing	2EAE message of nitrogen oxide sensor 1 missing	2FA9 ambient temperature sensor, communication	30D6 nitric oxide sensor, plausibility	
2D29 differential pressure sensor, suction pipe: plausibility	2DD5 message from EKP missing	2EAF message of nitrogen oxide sensor 2 missing	2FAA wrong data set	30D8 NOX sensor, Sensor damaged	
2D2A differential pressure sensor, suction pipe: adaptation	2DE0 message of electrical fuel pump missing, EKP	2EC2 LIN-Bus, communication	2FAB active engine bearing	30DA NOX sensor, Signal	
2D2B pressure sensor of the intake pipe, re-running	2DE1 fuel level sensor, right: Signal	2ECB Generator, emission worsening	2FAC Active engine bearing 2, electrical	30DC nitric oxide sensor, heating	
2D2E angle of throttle valve - intake pipe underpressure, correlation	2DE2 fuel level sensor, left: Signal	2ECC generator, communication	2FBC fuel pressure control valve, signal	30DE NOX sensor - PreCat 02 sensor, Correlation	
2D33 Absolute pressure sensor, intake pipe: Signal	2DE3 message instrument panel missing, I-Kombi 7	2ECD Generator, electric	2FBD fuel pressure steuer ventil, plausibility	30E0 NOX sensor, Offset	
2D35 Absolute pressure sensor, intake pipe: adaption	2DEB power management, vehicle wiring system control	2ECE Generator, Plausibility: electrical	2FBE fuel pressure after motorstop	30E2 NOX sensor, thrust test	
2D50 DME digital motor electronics, internal failure: driving speed contro	2DEC power management, battery control	2ECF Generator, overtemperature	2FBF fuel pressure at injection release	30E4 NOX sensor, aging	
2D51 Air path control	2DED power management, standby current control	2ED0 Generator, plausibility: temperature	2FC0 fuel pressure, measurement range	30E6 NOX, dynamics	
2D52 DME digital motor electronics, internal failure: control motor speed	2E18 ignition, Cyl. 1	2ED1 Generator, mechanical	2FC3 fuel pressure steuer ventil, plausibility	30E9 NOX Cat, aging	
2D53 DME digital motor electronics, internal failure: control speed limitation	2E19 ignition, Cyl. 2	2ED2 Generator, controller false	2FC6 energy save mode active	30EA NOX Cat, sulfurated	
2D54 DME, internal error: control overspeed trip unit reset	2E24 ignition coil, Cyl. 1	2ED3 Generator, type false	2FC7 power saving mode 2, active	30ED extreme knock Cyl. 1	
2D55 DME digital motor electronics, internal failure: control driver pedal module	2E25 ignition coil, Cyl. 2	2EE0 coolant temperature sensor, Signal	2FDA cank case ventilation, system check	30EE extreme knock Cyl. 2	
2D56 DME digital motor electronics, internal failure: control idle running	2E26 ignition coil, Cyl. 3	2EE1 coolant temperature sensor, plausibility	2FDB cank case ventilation, electric ATIC39	30EF extreme knock Cyl. 3	
2D57 DME digital motor electronics, internal failure: control external torque requirement	2E27 ignition coil, Cyl. 4	2EE2 coolant temp sensor, plausibility: Signal constant	3070 Cyl. same adjustment via irregular running Cyl. 1	30F0 extreme knock Cyl. 4	
2D58 DME digital motor electronics, internal failure: control nominal torque??	2E28 ignition coil, Cyl. 5	2EE3 coolant temp sensor, plausibility: Gradient	3071 Cyl. same adjustment via irregular running Cyl. 2	30F1 extreme knock Cyl. 5	
2D59 DME digital motor electronics, internal failure: control actual torque??	2E29 ignition coil, Cyl. 6	2EE6 coolant temperature sensor, metering range	3072 Cyl. same adjustment via irregular running Cyl. 3	30F2 extreme knock Cyl. 6	
2D5A control motor torque limitation	2E30 injection valve Cyl. 1, input signal	2EEA temperature sensor radiator outlet, signal	3073 Cyl. same adjustment via irregular running Cyl. 4	30FC Turbo charger, density	
2D5B DME, internal error: torque control	2E31 injection valve Cyl. 2, input signal	2EEB temperature sensor radiator outlet, plausibility, gradient	3074 Cyl. same adjustment via irregular running Cyl. 5	30FE Turbo charger, high pressure side	
2D5C DME digital motor electronics, internal failure: control nominal torque??	2E32 injection valve Cyl. 3, input signal	2EEC temperature sensor radiator outlet, plausibility	3075 Cyl. same adjustment via irregular running Cyl. 6	30FF Turbo charger, low pressure side	
	2E33 injection valve Cyl. 4, input signal	2EEF electrical fan, self diagnosis		3100 Air charge control, shut-down	
	2E34 injection valve Cyl. 5, input signal	2F08 inlet air temperature sensor, signal		3104 engine roughness, layer charging operation	
		2F09 inlet air temperature sensor, plausibility		3105 engine roughness, layer charging operation: warming	
		2F0A inlet air temperature sensor turbo charger, signal		3C1D crank shaft sensor: signal	
		2F0C intake airtemperature, signal: Gradient		3C1E camshaft sensor: input-signal	
		2F0D radiator blind, input signal, (GLF)		3C1F camshaft sensor: output-signal	
		2F0F radiator blind, bottom		3D33 torque request with CAN	
		2F10 radiator blind, bottom		CD87 PT-CAN communication failure	
		2F11 radiator blind, top		CD88 local-CAN communication failure	
		2F12 air conditioning compressor, input signal		CD8F PT-CAN communication error	
		2F44 EWS manipulation protection		CD94 message (outside temperature/relative time, 310)	
		2F45 interface EWS-DME		CD95 Message (handling FGR / ACC, 194)	
		2F46 EWS code-saving		CD96 message (torque requirement ACCActive cruise control, B7)	
		2F47 EWS irreversible ecu error		CD97 Message (speed demand AFS, B1)	
		2F49 EWS manipulation protection		CD98 message (torque requirement DSCdynamic stability control, B6)	
				CD99 message (torque requirement EGSelectronic gear control?, B5)	

## Table 21

2711	DMTL pump final stage
2712	DMTL magnetic valve control
2713	Oxygen sensors switched
2714	Oxygen sensor heater after cat. (bank2)
2715	Oxygen sensor heater before cat. (bank2)
2716	Controller heater sensor after cat
2717	Controller heater sensor after cat (Bank2)
2718	Speed (rpm) sensor for missing tooth
2719	Speed (rpm) sensor for periode timing
271A	Oxygen sensor before cat.
271B	Oxygen sensor before cat.
271C	Oxygen sensor after cat.
271D	Oxygen sensor heater before cat.
271E	Oxygen sensor heater after cat.
271F	Lambda sensor periode duration ageing
2720	Lambda sensor ageing TV
2721	Lambda sensor ageing after cat
2722	Oxygen sensor2 before cat.
2723	output heater O2-sensor before catalyist bank2
2724	Oxygen sensor2 after cat.
2725	Lambda sensor periode duration ageing bank2
2726	Lambda sensor ageing TV bank2
2727	Lambda sensor ageing after cat bank2
2728	Adaption multipl. area2

2729	Adaption multipl. area2 (bank2)	2770	failure within secondary air system	27B6	Control inlet-VANOS bank2	2811	Local CAN Bus Off	2860	VVT-Controll	29AE	tank-ventilation-system major leak
272A	Adaption multipl. area1	2771	Secondary air system locked	27B7	Controll gas pump relay	2812	oil temperature	2861	VVT-Controll (bank2)	29CC	misfire detection summation error
272B	Adaption multipl. area1 (bank1)	2772	Control gas ventilation valve	27B8	Plausibility diff. pressure sensor	2813	Control unit monitoring group A	2862	VVT-Power supply	29CD	misfire detection cylinder 1 in 1. ignition sequence
272C	Adaption add. per time	2773	Tank-ventilation valve output stage bank2	27B9	BLS/BTS Plausibility	2814	Control unit monitoring group B	2863	VVT-Power supply (bank2)	29CE	misfire detection cylinder 2 in 4. ignition sequence
272D	Adaption add. per time (Bank2)	2774	Monitoring cyc. failurestoring	27BA	Output AC-kompr. enable from AC-SG	2815	Control unit monitoring group C	2864	DM-TL-Pump control failure	29CF	misfire detection cylinder 3 in 2. ignition sequence
272E	Adaption add. per ignition	2775	engine moment monitoring level 2	27BB	Camshaft control outlet-VANOS	2816	engine rpm monitor	2865	Power supply limit VVT-emergency	29D0	misfire detection cylinder 4 in 3. ignition sequence
272F	Adaption add. per ignition bank2	2776	Interface multifunction steering wheel	27BC	Camshaft control outlet-VANOS bank2	2818	voltage-monitoring O2-sensor on air	2866	VVT-stops leaning necessary	29D9	misfire at too low fuel filling level
2730	failure within the idle-speed control	2777	Monitoring controller function	27BD	Control outlet-VANOS	281C	BSD wire failure	2867	VVT system overload	29DD	Bad way detection
2731	Camshaft control inlet - VANOS	2778	Switch clutch	27BE	Output outlet-VANOS bank2	281E	Control DISA	2868	VVT system overload (bank2)	29E5	LR-Adaption multiplicative area2 (Bank1)
2732	NW-Control of inlet B2 (8cyl)/outlet (4cyl)	2779	SG selftest RAM	27BF	Camshaft sensor inlet bank2	281F	DISA-mount response	286F	AGR Valve output	29E6	LR-Adaption additive per time (Bank1)
2733	NW-KW synchronfailure	277A	Switch break	27C0	Camshaft sensor outlet bank2	2820	Failure DISA	2870	AGR Valve monitoring	29E7	LR-Adaption additive per time (bank2)
2734	TPS/MAF plausibility	277B	SG selftest ROM	277C	Master camshaft sensor	2821	DISA temp. warn level engine protection model	2871	AGR Valve positioning sensor	29E8	LR-Adaption add. per ignition
2735	TPS/MAF plausibility bank2	277C	SG selftest reset	27C2	Controll AC-compressor relay	2822	Forced switched EGS	2872	Diagnose AGR valve	29EA	LR-Adaption add. per ignition bank2
2736	Throttle controller PWM short test	277D	Battery Voltage	27C3	Signal oil level sensor (TOENS)	2823	Heating lambda sensor befor Cat	2873	Output-stage HDEV-SG1 bank1	29EB	LR-Deviation
2737	EWS-manipulation control	277E	Moment restrictor level 1	27C6	LDP Diagnose 0.5mm leak	2824	Heating lambda sensor befor Cat bank2	2874	Output-stage HDEV-SG1 bank2	29EC	LR-Deviation bank2
2738	Catalytic-converter conversion	277F	Crankshaft sensor	27C7	LDP Diagnose 1.0mm leak	2825	Heating lambda sensor after Cat	2875	Output-stage HDEV-SG1 bank3	29ED	LR-Adaption multiplicative area1 (Bank1)
2739	Catalytic-converter conversion LSU	2780	Ref. marking generator	27C8	DM-TL system	2826	Lambdasensor aging after Cat	2876	Output-stage HDEV-SG2 bank1	29EE	LR-Adaption multiplicative area1 (Bank2)
273A	Catalytic-converter conversion LSU bank2	2781	Camshaft sensor inlet	27C9	Leak diag. module	2827	Lambdasensor aging after Cat bank2	2877	Output-stage HDEV-SG2 bank2	29F4	Catalytic-converter conversion
273B	Throttle controller PWM long test	2782	Camshaft sensor outlet	27CA	Ansteuerung DM-TL Pumpenmotor	2828	heater link at signal-path	2878	Output-stage HDEV-SG2 bank3	29F5	Catalytic-converter conversion (bank2)
273C	Throttle controller diff.	2783	Hot film air mass meter	27CB	DM-TL 0.5mm leak MIL off	2828	CAN ARS-Signalfehler	2879	Signal exhaust temp. sensor 4	29F8	Cat-konversion LSU
273D	Catalytic-converter conversion (bank2)	2784	Thermostat diag. THM	27CC	DM-TL 1mm & 0.5mm leak	2829	CAN CAS-Signalfehler	287A	Output pressure control valve	29F9	Catalytic-converter conversion LSU bank2
273E	Signal temper.sensor exhaust1	2785	DK-Potentiometer	27CD	DM-TL module	282A	CAN IHKA-Signalfehler	287B	Signal exhaust temp. sensor 3	29FE	secondary air injection system
273F	Signal temper.sensor exhaust2	2786	Throttle-valve potentiometer 1	27CE	Load sensor monitoring	282B	CAN PWML-Signalfehler	287C	Pressure sensor suction tube	29FF	secondary air system (Bank2)
2740	Pedal-travel1 permanently	2787	Throttle-valve potentiometer 2	27CF	Ignition time Cyl.1	282C	CAN SZL-Signalfehler	287D	Signal rail-pressure sensor	2A01	secondary air injection control valve
2741	Pedal-travel2 permanently	2788	Vehicle speed	27D0	Ignition time Cyl.3	282D	heater link at signal-path bank2	287E	Pressure control valve	2A02	Control air system valve
2742	Misfire detection cyl.1	2789	Bad way detection	27D1	Ignition time Cyl.4	282E	PWG-movement	287F	High pressure sensor test	2A03	secondary air pump relay
2743	Misfire detection cyl.3	278A	Ambient temperature	27D2	Ignition time Cyl.2	2830	aging of O2-sensor behind catalyst (Bank 2)	2880	AGR system	2A05	Secondary air valve bank2
2744	Misfire detection cyl.4	278B	Engine temperature	27D5	failure within the idle-speed control	2832	Plausibility ASR-Torque	2881	CDKBKE Output twist generator controller	2A0E	AGR valve
2745	Misfire detection cyl.2	278C	Intake air temperature	27D6	Output idle-speed controller OFF	2833	Plausibility CAS	2882	Output pressure control valve	2A12	magnetic valve DMTL control
2746	Misfire detection cyl.	278D	Temp. sensor coolant temperature	27D7	Output idle-speed controller ON	2834	Plausibility IHKA	2883	Rail-pressure regulation	2A13	Control DMTL pump motor
2747	Misfire detection cyl.	278E	Diff. pressure sensor suction tube	27D8	Failure depressure pump	2835	Plausibility PWML	2889	plausibility monitoring of the RAM backup	2A14	DM-TL Fine leak
2748	Misfire detection cyl.	278F	LowRange signal not plausible	27D9	Output DM-TL heater	2836	Plausibility SZL	2893	DME- Temperature	2A15	tank-ventilation-system major leak
2749	Misfire detection cyl	2790	transmission temp.	27DA	generator failure	2837	Plausibility EMF	2898	lambda sensor after cat bank1: signal	2A16	DM-TL 0.5mm leak MIL off
274A	Misfire detection cyl	2791	Parts exchange without adaption	27DC	EWS3.3 Random-code storing	2838	Output-stage AAV	28A0	Output gas circuit switch	2A17	DM-TL module
274B	Misfire detection cyl	2792	Drosselklappe - Positionsüberwachung	27E1	monitoring pedal-travel sensor	2839	AAV-Functionality	28C8	Lambdacontrol mismatch	2A18	Control DMTL heater
274C	Misfire detection cyl	2793	DK-Actuator regulator area	27E2	Knock sensor 1	283A	Failure oil quality sensor	28C9	Lambdacontrol mismatch bank2	2A19	Tank ventilation valve
274D	Misfire detection cyl	2794	DK-Actuator controlled	27E3	knock sensor2 bank1	283B	Camshaft control output bank2	28D2	Pressure sensor charge-air	2A1A	Tank-ventilation functional check
274E	Misfire detection, Checksum failure	2795	Spring test DK-controller closing spring	27E4	Knock sensor 3	283C	Camshaft control output	28D3	Plausibility ambient- to charge pressure	2A1D	Tank leakage monitoring
274F	Misfire, Checksum failure, service rel.	2796	Throttle flap lower stop	27E5	Knock sensor 4	283D	PT - CAN bus off	28D4	Pressure control valve	2A1E	Leakage diagnostic pump
2752	Pedal-travel half plausibility	2797	DK-Controller failure booster	27E6	Knock sensor zero test	283E	VVT enable control	28D5	Output charge pressure control valve	2A58	VVT-Enable control
2753	Monitoring ign. coil 1	2798	Throttle flap emergency air point	27E7	Knock sensor offset	283F	Plausibilitaet Oeldruckschalter	28D6	HO-Proc.failure, coding missing	2A59	VVT-leading sensor
2754	Monitoring ign. coil 3	2799	Abort DV-adaption because of environment	27E8	Knock regulation Test impulse	2841	Air flushed injector valves control	28D7	Generator communication	2A5A	VVT-leading sensor bank2
2755	Monitoring ign. coil 4	279A	Throttle flap adation - abort after reteaching	27E9	Knock sensor zero test bank2	2843	plausibility diagnostics LSU by LSH after catalyst	28D8	RAM backup-failure	2A5B	VVT-ref. sensor
2756	Monitoring ign. coil 2	279B	Thermostat jammed	27EA	CAN-Timeout HDEV	2844	internal diagnostics CJ125 SPI communication	28D9	elec. heater	2A5C	VVT-ref. sensor (bank2)
2757	Monitoring ign. coil	279C	Control heater cooler	27EB	CAN-Timeout TCU	2849	power break at pump-current	28DA	CAN timeout elec. heater	2A5D	VVT-Sensor plausibility
2758	Monitoring ign. coil	279C	Control heater cooler	27EC	CAN-Timeout EGS	284A	LSU dynamic too slow	28DB	min. Lift adaption repeat. ran over	2A5E	VVT-Sensor plausibility (bank2)
2759	Monitoring ign. coil	279D	Control engine fan	27ED	CAN-Timeout ASC/DSC	284F	failure at speed-display kombi	28DC	generator 2 communication	2A5F	VVT-Supply volatge for the sensor
275A	Monitoring ign. coil	279E	Output exhaust flap	27EE	CAN-Timeout Instrumentenkombination	2850	VVT-guiding sensor	2906	AGR valve monitoring	2A60	VVT-Supply volatge for the sensor (bank2)
275B	Monitoring ign. coil	279F	Output fanA	27EF	CAN ACC-Signalfehler	2851	VVT-guiding sensor (bank2)	2907	AGR valve monitoring	292C	LSU adjustment line bank2
275C	Monitoring ign. coil	27A0	Controll E-box fan	27F0	Plausibility MSR-control	2852	VVT-ref. sensor	2908	CAN timeout DSG SG	292D	LSU Nernst cell break
275D	Monitoring ign. coil	27A1	failure within secondary air system 2	27F1	Plausibility ACC-control	2853	VVT-ref. sensor (bank2)	2909	CAN timeout EGS	292E	LSU Nernst cell break bank2
275E	Monitoring ign. coil	27A2	Temp.sensor engine LR	27F2	Plausibility gas level	2854	VVT-Sensor plausibility	290A	active front steering torque	2930	LSU virtual mass break
275F	Pedal-travel defect	27A3	CAN timeout HDEV2 SG	27F3	CAN-Timeout VVT-Control unit	2855	VVT-Sensor plausibility (bank2)	292B	LSU adjustment line	2931	LSU virtual mass break bank2
2760	Secondary air system	27A4	EWS3.3 Schnittstelle EWS-DME	27F4	CAN-Timeout VVT-Control unit bank2	2856	VVT-Supply volatge for the sensor	292B	LSU adjustment line bank2	2936	fuel pressure sensor
2761	Secondary air system bank2	27A6	Ansteuerung Einspritzventil 1	27F5	CAN-Timeout DME-Control unit	2857	VVT-Supply volatge for the sensor (bank2)	292D	LSU Nernst cell break	2937	funktion monitoring: Lambda Plausibility
2762	Secondary air valve	27A7	Ansteuerung Einspritzventil 3	27F6	Pedal-travel	2858	VVT-Teaching function at stop	292E	LSU Nernst cell break bank2	296B	inverted lambda sensors of front cat
2763	Secondary air valve bank2	27A8	Ansteuerung Einspritzventil 4	27F7	Pedal-travel Poti1	2859	VVT-Teaching function at stop (bank2)	292E	LSU Nernst cell break bank2	296B	Control pump for breaks
2764	Control sek.air pump relay	27A9	Ansteuerung Einspritzventil 2	27F8	Pedal-travel Poti2	285A	VVT-Actuator monitoring	292F	CAN SSG signal failure	2967	Control controlled airflow
2765	Control sek.air valve	27AA	Ansteuerung Einspritzventil	27F9	Start automatic control	285B	VVT-Actuator monitoring (Bank2)	2981	Control controlled airflow	2991	IBS communication
2766	Phase generator1 time duration	27AB	Ansteuerung Einspritzventil	27FA	Input starter automatic	285C	VVT-CAN-communication	299B	IBS communication	299C	IBS general error
2767	Phase generator2 time duration	27AC	Ansteuerung Einspritzventil	27FB	Output controlled airflow	285D	VVT-CAN-communication (bank2)	299C	IBS general error	299D	IBS plausibility
2768	Phase generator positioning failure	27AD	Ansteuerung Einspritzventil 4	27FD	Starter automatic	285E	VVT-Control unit internal failure	299D	IBS plausibility	29A8	power management network failure
2769	Spring test DK-controller open spring	27AE	Ansteuerung Einspritzventil	27FE	Knock control offset bank2	285F	VVT-Control unit internal failure (bank2)	29A9	power management	29A9	power management
276A	Control-unit recognition	27AF	Ansteuerung Einspritzventil	27FF	Knock control test signal bank2						
276B	Secondary air valve output stage bank2	27B0	Ansteuerung Einspritzventil	280A	Assign. camshaft to crankshaft						
276C	Phase generator2 positioning failure	27B1	Ansteuerung Einspritzventil	280D	Control unit monitoring						
276D	Tank-ventilation functional check	27B3	Diagnose DK/HFM adjustment	280E	Control unit monitoring						
276E	Tank-ventilation functional check bank2	27B4	Ambient-pressure sensor	280F	Camshaft control						
276F	failure within secondary air system	27B5	Control inlet-VANOS	2810	Engine speed monitoring						

2A70	error current plausibility	2C54	LSU virtual mass break bank2	2DD7	CAN timeout DSG SG	2F62	Switch brakes	2743	misfire detection cyl. 5	279D	Control engine fan
2A71	output stage diagnostics of discharge relay VVT	2C55	Lambda sensor periode duration ageing	2DD8	active front steering torque	2F67	Switch clutch	2744	misfire detection cyl. 4	279E	Control exhaust flap
2A72	Actuator control VVT throw adjustment	2C56	Lambda sensor ageing TV	2DD9	CAN ARS signal failure	2F6C	Control exhaust flap	2745	misfire detection cyl. 8	279F	Control fan A
2A80	injector-VANOS	2C6A	inverted lambda sensors of front cat	2DDA	CAN CAS signal failure	2F71	E-Box blower	2746	misfire detection cyl. 6	27A0	Control E-box fan
2A81	Control inlet-VANOS bank2	2C6D	Lambda sensor aging of rear cat bank1	2DDB	CAN IHKA signal failure	2F76	Ambient-pressure sensor	2747	misfire detection cyl. 3	27A4	EWS3.3 Interface DME-EWS
2A83	Control inlet- Input	2C6E	Lambda sensor aging of rear cat bank2	2DDC	CAN SZL signal failure	2F7B	oil pressure switch	2748	misfire detection cyl. 7	27A6	activation EV1
2A85	outlet-VANOS	2C6F	lambda sensor aging of rear cat (VL- test)	2DDD	CAN-Timeout VVT-Control unit	2F80	error CAN / relative timer	2749	misfire detection cyl. 2	27A7	activation EV5
2A86	Control outlet-VANOS bank2	2C70	aging of O2-sensor behind catalyst (Bank 2)	2DDE	VVT-CAN-communication	2F85	DME- relative timing	2757	Misfire detection, Checksum failure	27A8	activation EV4
2A88	camshaft control outlet	2C71	lambda sensor in rear of cat	2DDF	VVT-CAN-communication (bank2)	2F8A	Battery Voltage	2753	monitoring igniter 1	27A9	activation EV8
2A89	camshaft control outlet-VANOS bank2	2C72	Lambda sensor of rear cat bank2	2DE6	CAN-Timeout DME-Control unit	2F94	fuelpump relay	2754	monitoring igniter 5	27AA	activation EV6
2B5C	Crankshaft sensor	2C9C	output heater O2-sensor before catalyst	2DEB	power management network failure	2F99	Ambient temperature	2755	monitoring igniter 4	27AB	activation EV3
2B5D	Ref. marking generator	2C9D	output heater O2-sensor before catalyst bank2	2DEC	power management	2F9E	Thermal oillevel sensor	2756	monitoring igniter 8	27AC	activation EV7
2B61	Assign. camshaft to crankshaft	2C9E	Control heater sensor after cat	2DED	Powermanagement: quiescent current violation	2FA3	HO-proc.failure, coding missing	2757	monitoring igniter 6	27AD	activation EV2
2B62	camshaft sensor inlet	2C9F	Control heater sensor after cat (bank2)	2E24	spark coil cylinder 1 in 1. ignition sequence	2FB2	suction jet pump for brake force amplifier	2758	monitoring igniter 3	27B3	Diagnose DK/HFM adjustment
2B63	camshaft sensor outlet	2CA0	lambda sensor heating in front of cat	2E25	spark coil cylinder 2 in 4. ignition sequence	2FB7	electr. under pressure pump for brake booster	2759	monitoring igniter 7	27B4	Ambient-pressure sensor
2B64	camshaft sensor inlet bank2	2CA1	Oxygen sensor heater before cat. (bank2)	2E26	spark coil cylinder 3 in 2. ignition sequence	CD87	PT - CAN bus off	275A	monitoring igniter 2	27B5	Control inlet-VANOS
2B65	camshaft sensor outlet bank2	2CA2	heating lambda sensor of front cat (shearing stress)	2E27	spark coil cylinder 4 in 3. ignition sequence	CD8B	Local CAN Bus Off	2760	secondary air injection system	27B6	Control inlet-VANOS bank2
2B66	Master camshaft sensor	2CA3	heating lambda sensor of front cat (shearing stress) Bank2	2E30	injection valve cylinder 1 in 1. cylinder sequence	CD9B	status vehicle-mode	2761	Secondary air system bank2	27B7	Control fuel pump relay
2B70	DISA	2CA8	Oxygen sensor heater after cat.	2E31	injection valve cylinder 2 in 4. cylinder sequence	CD99	angle of steering wheel	2762	secondary air injection control valve	27B8	Plausibility diff. pressure sensor
2B71	Failure DISA	2CA9	Oxygen sensor heater after cat. (bank2)	2E32	injection valve cylinder 3 in 2. cylinder sequence	CDA1	powermanagement battery voltage	2763	Secondary air valve bank2	27BB	camshaft control outlet-VANOS0
2B72	DISA temp. warn level engine protection model	2CEF	DK-actuator	2E33	injection valve cylinder 4 in 3. cylinder sequence	CDA2	powermanagement throttle voltage	2764	Control stagerelais secondary air pompe	27BC	camshaft control outlet-VANOS bank2
2B7F	Diagnose DK/HFM adjustment	2CF0	DK-Actuator regulator area	2E68	Knock sensor 1	CDA3	powermanagement charge voltage	2765	Control air system valve	27BD	Control outlet-VANOS
2B80	idle running controlling	2CF1	DK position monitoring	2E69	Knock sensor2 (Bank1)	CDA7	status gear reverse	2769	spring-check throttle-valve-actuator opening spring	27BE	Control outlet-VANOS bank2
2B8A	Knock sensor zero test	2CF8	DK-poti sensor	2E6A	Knock sensor 3	CDA8	control crash-switch-off EKP	2766	Control secondary air valve bank2	27BF	camshaft sensor inlet bank2
2B8B	Knock sensor offset	2CF9	Throttle-valve potentiometer 1	2E6B	Knock sensor 4	CDAC	status water valve	276B	Tank-ventilation functional check	27C0	camshaft sensor outlet bank2
2B8C	Knock regulation Test impulse	2CFA	Throttle-valve potentiometer 2	2E6C	Knock sensor 4			276D	Tank-ventilation functional check	27C1	Master camshaft sensor
2B8D	Knock sensor zero test bank2	2CFF	DK-Controller failure booster	2E6E	Knock sensor2 (Bank1)			276E	Tank-ventilation functional check bank2	27C2	Control A/C-compressor control
2B8E	Knock control offset bank2	2D00	spring-check throttle-valve-actuator closing spring	2E6F	Knock sensor 3			2772	Control tank-ventilation valve	27C3	Failure oil status sensor
2B8F	Knock control test signal bank2	2D01	spring-check throttle-valve-actuator opening spring	2E7C	BSD wire failure			2773	Control tank-ventilation valve bank2	27C8	tank-ventilation-system major leak
2B98	plausibility monitoring of the RAM backup	2D02	error emergency air setpoint	2E86	Electrical water pump			2774	Engine Off Time	27CA	Control DMTL pump motor
2B99	RAM Backup	2D03	Abort DV-adaption because of environment	2E88	IBS communication			2775	engine moment monitoring level 2	27CB	DM-TL 0.5mm leak MIL off
2B9A	ECU self-test RAM	2D04	throttle valve adaption	2E8C	IBS general error			2776	interface MFL	27CC	DM-TL Fine leak
2B9B	ECU self-test ROM	2D05	Abort at UMA-repeat learning	2E8D	IBS plausibility			2778	Monitoring controller function	27CD	DM-TL module
2B9C	ECU self-test Reset	2D08	parts exchange without adaption	2E95	generator communication			2778	Switch clutch	27CE	Load sensor monitoring
2B9D	overvoltage detection on VCC	2D0F	Hot film air mass meter	2E97	CDKDGEN/CDKGEN - BSD generator			2779	ECU self-test RAM	27D5	failure within the idle-speed control
2B9E	Energy saving mode active	2D10	Plausibility HFM	2E9F	Failure oil quality sensor			277A	Control DMTL heater	27D9	Control DMTL heater
2BA7	torque restrictor level 1	2D11	Plausibility, mass flow Lambda sensor	2EA0	Oil status sensor			277B	ECU self-test ROM	27DA	generator failure
2BB6	Control main relay	2D12	Plausibility, mass flow Lambda sensor Bank2	2E8B	BSD-message from IBS not existent			277C	ECU self-test Reset	27DC	EWS3.3 Random-code storing
2C24	interchanged O2-sensors	2D19	PWG-movement	2E8C	BSD message from oil sensor missing			277D	Battery Voltage	27E1	monitoring pedal-travel sensor
2C37	heater link at signal-path	2D1A	acelarator potentiometer	2E8D	BSD message from generator missing			277E	torque restrictor level 1	27E2	Knock sensor 1
2C38	heater link at signal-path bank2	2D1B	Pedal-travel Poti1	2E8E	BSD message from generator missing			2780	Ref. marking generator	27E3	Knock sensor 2
2C39	LSU dynamic too slow	2D1C	Pedal-travel Poti2	2EE0	Temperature sensor engine cooling liquid			2781	camshaft sensor inlet	27E4	Knock sensor 3
2C3A	LSU dynamic too slow bank2	2D28	Diff. pressure sensor suction tube	2EEA	Temp. sensor coolant temperature			2782	camshaft sensor outlet	27E5	Knock sensor 4
2C3B	voltage-monitoring O2-sensor on air	2D29	Plausibility diff. pressure sensor	2EF4	Thermostat characteristic diagram cooling, mechanical			2783	Hot film air mass meter	27E6	Knock sensor zero test
2C3C	voltage-monitoring O2-sensor on air bank2	2D32	Plausibility pressure sensor intake tube	2EF5	Thermostat characteristic diagram cooling, activation			2785	DK-poti sensor	27E7	Knock sensor offset
2C45	lambda sensor in front of cat	2D6E	moment monitoring level 2	2EF6	characteristic diagram thermostat			2786	Throttle-valve potentiometer 1	27E8	Knock regulation Test impulse
2C46	Lambda sensor of front cat bank2	2D6F	Load sensor monitoring	2EF6	characteristic diagram thermostat			2787	Throttle-valve potentiometer 2	27E9	Knock sensor zero test bank2
2C47	short circuit to minus or to plus at sensor-line	2D70	Control unit monitoring group A	2EFE	engine blower			2788	Vehicle speed	27EA	CAN-Timeout HDEV
2C48	short circuit to minus or to plus at sensor-line bank2	2D71	Control unit monitoring group B	2F08	Intake air temperature			2789	Bad way detection	27EB	CAN-Timeout TXU
2C49	plausibility diagnostics LSU by LSH after catalyst	2D72	Control unit monitoring group C	2F0D	Control controlled airflow			278A	Ambient temperature	27EC	CAN EGS signal failure
2C4A	plausibility diagnostics LSU by LSH after catalyst bank2	2D73	fuel pressure sensor	2F12	Air conditioner compressor control			278B	Engine temperature	27ED	CAN ASC/DSC signal failure
2C4B	internal diagnostics CJ125 SPI communication	2D74	funktion monitoring: Lambda Plausibility	2F17	Forced switched EGS			278C	Intake air temperature	27EE	CAN Instrument cluster signal failure
2C4C	internal diagnostics CJ125 SPI communication bank2	2D75	engine speed monitoring	2F1C	oil temperature sensor			278D	Temp. sensor coolant temperature	27EF	CAN ACC signal failure
2C4D	power break at pump-current	2D76	pedal encoder monitoring (level2)	2F21	engine controller, power reduction			278E	Diff. pressure sensor suction tube	27F0	Plausibility MSR-control
2C4E	power break at pump-current bank2	2D78	Control air mass flow adjustment	2F44	EWS3.3 manipulation protection			278F	LowRange signal not plausible	27F1	Plausibility ACC-control
2C4F	LSU adjustment line	2DB4	interface MFL	2F45	EWS3.3 Interface DME-EWS			2790	transmission temp.	27F2	Plausibility gas level
2C50	LSU adjustment line bank2	2DBF	CAN ACC signal failure	2F46	EWS3.3 Random-code storing			2791	parts exchange without adaption	27F3	CAN-Timeout VVT-Control unit
2C51	LSU Nernst cell break	2DC8	CAN- Timeout EGS	2F4E	Vehicle speed			2792	DK position monitoring	27F5	CAN-Timeout DME-Control unit
2C52	LSU Nernst cell break bank2	2DCA	CAN timeout EGS	2F50	failure at speed-display kombi			2793	DK-Actuator regulator area	27F6	acelarator potentiometer
2C53	LSU virtual mass break	2DCB	CAN SSG signal failure	2F58	Control starter automatic			2794	DK-Actuator controlled	27F7	Pedal-travel Poti1
		2DCF	CAN- Timeout instrument combination	2F59	Input starter automatic			2795	spring-check throttle-valve-actuator closing spring	27F8	Pedal-travel Poti2
		2DD6	CAN- Timeout ASC/DSC	2F5A	Start automatic control			2796	check at lower stop	27F9	Control starter automatic
								2797	DK-Controller failure booster	27FA	Input starter automatic
								2798	error emergency air setpoint	27FB	controlled airflow
								2799	Abort DV-adaption because of environment	27FD	Start automatic control
								279A	Abort at UMA-repeat learning	27FE	Knock control offset bank2
								279B	Thermostat jamming	27FF	Knock control test signal bank2
								279C	Control thermostat map cooling	280A	Assign. camshaft to crankshaft
										2812	oil temperature
										2813	Control unit monitoring group A

## Table 22

2712	magnetic valve DMTL control
2713	interchanged O2-sensors
2714	Oxygen sensor heater after cat. (bank2)
2715	Oxygen sensor heater before cat. (bank2)
2716	Control heater sensor after cat
2717	Control heater sensor after cat (bank2)
271A	lambda sensor before catalyst bank 1
271B	output heater O2-sensor before catalyst
271C	Oxygen sensor after cat.
271D	Oxygen sensor heater before cat.
271E	Oxygen sensor heater after cat.
271F	Lambda sensor periode duration ageing
2720	Lambda sensor ageing TV
2721	Lambda sensor ageing after cat
2722	Oxygen sensor2 before cat.
2723	output heater O2-sensor before catalyst bank2
2724	Oxygen sensor2 after cat.
2725	Lambda sensor periode duration ageing bank2
2726	Lambda sensor ageing TV bank2
2727	Lambda sensor ageing after cat bank2
2728	LR-Adaption multiplicative area2
2729	LR-Adaption multiplicative area2 (bank2)
272A	LR-Adaption multiplicative area1
272B	LR-Adaption multiplicative area1 (bank1)
272C	LR-Adaption additive per time
272D	LR-Adaption additive per time (bank2)
272E	LR-Adaption add. per ignition
272F	LR-Adaption add. per ignition bank2
2731	camshaft control inlet
2732	NW-intaken control bank2
2737	EWS3.3 manipulation protection
2738	Catalytic-converter conversion
2739	Cat-konversion LSU
273A	Catalytic-converter conversion LSU bank2
273D	Catalytic-converter conversion (bank2)
273E	exhaust temperature sensor in front of catalyst
273F	exhaust temperature sensor in front of catalyst (Bank2)
2742	misfire detection cyl. 1
2743	misfire detection cyl. 5
2744	misfire detection cyl. 4
2745	misfire detection cyl. 8
2746	misfire detection cyl. 6
2747	misfire detection cyl. 3
2748	misfire detection cyl. 7
2749	misfire detection cyl. 2
2757	Misfire detection, Checksum failure
2753	monitoring igniter 1
2754	monitoring igniter 5
2755	monitoring igniter 4
2756	monitoring igniter 8
2757	monitoring igniter 6
2758	monitoring igniter 3
2759	monitoring igniter 7
275A	monitoring igniter 2
2760	secondary air injection system
2761	Secondary air system bank2
2762	secondary air injection control valve
2763	Secondary air valve bank2
2764	Control stagerelais secondary air pompe
2765	Control air system valve
2769	spring-check throttle-valve-actuator opening spring
276B	Control secondary air valve bank2
276D	Tank-ventilation functional check
276E	Tank-ventilation functional check bank2
2772	Control tank-ventilation valve
2773	Control tank-ventilation valve bank2
2774	Engine Off Time
2775	engine moment monitoring level 2
2776	interface MFL
2778	Monitoring controller function
2778	Switch clutch
2779	ECU self-test RAM
277A	Control DMTL heater
277B	ECU self-test ROM
277C	ECU self-test Reset
277D	Battery Voltage
277E	torque restrictor level 1
277F	Crankshaft sensor
2780	Ref. marking generator
2781	camshaft sensor inlet
2782	camshaft sensor outlet
2783	Hot film air mass meter
2785	DK-poti sensor
2786	Throttle-valve potentiometer 1
2787	Throttle-valve potentiometer 2
2788	Vehicle speed
2789	Bad way detection
278A	Ambient temperature
278B	Engine temperature
278C	Intake air temperature
278D	Temp. sensor coolant temperature
278E	Diff. pressure sensor suction tube
278F	LowRange signal not plausible
2790	transmission temp.
2791	parts exchange without adaption
2792	DK position monitoring
2793	DK-Actuator regulator area
2794	DK-Actuator controlled
2795	spring-check throttle-valve-actuator closing spring
2796	check at lower stop
2797	DK-Controller failure booster
2798	error emergency air setpoint
2799	Abort DV-adaption because of environment
279A	Abort at UMA-repeat learning
279B	Thermostat jamming
279C	Control thermostat map cooling

2814	Control unit monitoring group B	2862	VVT-Power supply	2A05	Sekundary luftventil 2, Mechanics	2B61	crankshaft - camshaft, correlation control	2DDA	CAN, CAS: signal error
2815	Control unit monitoring group C	2863	VVT-Power supply (bank2)	2A08	secondary air system 2	2B62	camshaft sensor, intake	2DDB	CAN, IHKA: signal error
2816	engine speed monitoring	2864	DM-TL-Pump control failure	2A09	secondary air pump plausibility	2B63	camshaft sensor, outlet	2DDC	Message from SZL is absent
2818	voltage-monitoring O2-sensor on air	2865	Power supply limit VVT-emergency	2A12	DMTL-magnetic valve, control	2B64	camshaft sensor 2, intake	2DDD	Valvetronic message missing
281D	BSD wire failure	2866	VVT-stops leaning necessary	2A13	DMTL-Leckdiagnosepumpe, control	2B65	camshaft sensor 2, outlet	2DDE	Local-CAN communication
281E	Control DISA	2867	VVT-system overload	2A14	DMTL, subtlest leakage	2B66	camshaft sensor, master	2DDF	Local-CAN communication 2
281F	voltage-monitoring O2-sensor on air bank2	2868	VVT-system overload bank2	2A15	DMTL, fine leakage	2B70	variable intake system, control	2DEB	Powermanagement, vehicle electrical system monitoring
2820	Failure DISA	287C	Pressure sensor suction tube	2A16	DMTL, subtlest leakage	2B71	Variable suction system	2DEC	Powermanagement, battery monitoring
2821	DISA temp. warn level engine protection model	2880	AGR system	2A17	DMTL, system error	2B72	variable intake system, temperature warning limit	2DED	Powermanagement, quiescent current control
2822	Forced switched EGS	2889	plausibility monitoring of the RAM backup	2A18	DMTL, Heizung: control	2B73	Variable intake system, plausibility	2E24	spark coil cylinder 1
2823	Lambda sensor heater before cat (within acceleration)	28C8	LR-Deviation	2A19	fuel evaporation valve, control	2B7F	trim throttle valve-air mass sensor	2E25	spark coil cylinder 2
2824	Lambda sensor heater before cat (within acceleration) bank2	28C9	LR-Deviation bank2	2A1A	fuel evaporation system, function	2B80	idle running control	2E26	spark coil cylinder 3
2825	aging of O2-sensor behind catalyst	28D2	Pressure sensor charge-air	2A1B	gascap	2B84	Intake flap, Signal	2E27	spark coil cylinder 4
2826	aging of O2-sensor behind catalyst (Bank 2)	28D3	charge pressure sensor	2A1C	fuel level, plausibility	2B98	ecu, internal error: RAM backup, plausibility	2E28	spark coil cylinder 5
2827	heater link at signal-path	28D4	charge pressure actuator	2A1D	fuel level, plausibility	2B99	ecu, internal error: RAM backup	2CF1	throttle valve actuator, position monitoring
2828	CAN ARS signal failure	28D5	Control charge pressure control valve	2A1E	fuel level, signal	2B9A	ecu, internal error: RAM	2CF8	throttle valve potentiometer
2829	CAN CAS signal failure	28D6	HO-proc.failure, coding missing	2A20	Tank ventilation valve, plausibility	2B9B	ecu, internal error: ROM	2CF9	throttle valve potentiometer 1
282A	CAN IHKA signal failure	28D7	generator communication	2A23	DMTL, leakage diagnostic pump	2B9C	ecu, internal error: reset	2CFA	throttle valve potentiometer 2
282B	CAN PWML signal failure	28D8	network-system switched off, error-memory deleted	2A59	Valvetronic, eccentric shaft sensor: guide	2B9D	ecu, internal error: overvoltage	2CFF	throttle valve actuator, amplifier alignment
282C	CAN SZL signal failure	28DB	multip. min lift adaption stop	2A5A	Valvetronic, eccentric shaft sensor 2: guide	2BA7	monitoring engine torque limit	2D00	throttle valve actuator, spring check closing spring
282D	heater link at signal-path bank2	28DC	generator 2 communication	2A5B	Valvetronic, eccentric shaft sensor: reference	2BBF	Oil control lamp Control	2D01	throttle valve actuator, spring check opening spring
282E	PWG-movement	2908	CAN Timeout DSC SG	2A5C	Valvetronic, eccentric shaft sensor 2: reference	2BC0	Environment temperature sensor, Plausibility	2D02	throttle valve actuator, auxiliary air point
2830	aging of O2-sensor behind catalyst (Bank 2)	2909	CAN timeout EGS	2A5D	Valvetronic, eccentric shaft sensor: plausibility	2BC1	ambienttemperature sensor, signal	2D03	throttle valve actuator, abort alignment because of environmental condition
2832	plausibility diagnostics LSU by LSH after catalyst bank2	290A	active front steering torque	2A5E	Valvetronic, eccentric shaft sensor 2: plausibility	2C24	lambda probe front catalyst, exchanged	2D04	throttle valve actuator, checking lower block
2833	internal diagnostics CJ125 SPI communication bank2	292D	LSU adjustment line	2A5F	Valvetronic, eccentric shaft sensor: power supply	2C31	lambda probe front catalyst, adjustment control	2D05	throttle valve actuator, abort at UMA releasn
2834	power break at pump-current bank2	292E	LSU Nernst cell break bank2	2A60	Valvetronic, eccentric shaft sensor 2: power supply	2C37	lambda probe front catalyst, heater interconnection	2D08	throttle valve actuator, change detection without alignment
2835	short circuit to minus or to plus at sensor-line bank2	2930	LSU virtual mass break	2A61	Valvetronic, adjustable range	2C38	lambda probe front catalyst 2, heater interconnection	2D0F	airflow sensor, signal
2836	LSU dynamic too slow bank2	2931	LSU virtual mass break bank2	2A62	Valvetronic, adjustable range 2	2C39	lambda probe front catalyst, dynamic	2D10	Lair mass gauger, plausibility
283A	Failure oil quality sensor	297D	CAN SSG signal failure	2A63	Valvetronic, servo motor: monitoring tightness, rotation direction	2C3A	lambda probe front catalyst 2, dynamic	2D11	Lair mass current, plausibility
283E	VVT-enable-wire control	2981	Control controlled airflow	2A64	Valvetronic, servo motor 2: monitoring tightness, rotation direction	2C3B	lambda probe front catalyst, not plugged	2D13	Luftmassenmesser, rational
283F	Plausibility oil pressure switch	2982	oil control light activation	2A65	Valvetronic, internal error	2C3C	lambda probe front catalyst 2, not plugged	2D14	air mass gauger, correction rsignal
2841	Containment injectors control	299B	Communication DME - IBS	2A66	Valvetronic, internal error	2C45	lambda probe front catalyst	2D19	gas pedal device, gas pedal sensor
2842	2. generator error	299C	IBS proprietary diagnostic 1	2A67	Valvetronic, internal error 2	2C46	lambda probe front catalyst 2	2D1A	gas pedal device, gas pedal sensor
2843	plausibility diagnostics LSU by LSH after catalyst	299D	IBS proprietary diagnostic 2	2A68	Valvetronic, servo motor 2: control	2C47	lambda probe front catalyst, sensor line	2D1B	gas pedal device, gas pedal sensor 1
2844	internal diagnostics CJ125 SPI communication	29A8	power management network failure	2A69	Valvetronic, servo motor 2: control	2C48	lambda probe front catalyst 2, sensor line	2D1C	gas pedal device, gas pedal sensor 2
2849	power break at pump-current	29A9	power management	2A6A	Valvetronic, servo motor 2: power supply	2C49	lambda probe front catalyst, plausibility	2D28	differential airpressure, intake tube: signal
284A	short circuit to minus or to plus at sensor-line	29AE	Check Filler Cap	2A6B	Valvetronic, servo motor 2: power supply	2C4A	lambda probe front catalyst 2, plausibility	2D29	differential airpressure, intake tube: plausibility
284C	LSU dynamic too slow	29CC	misfire, several cylinder	2A6C	Valvetronic, position at restart: plausibility	2C4B	ecu, internal error: lambda probe device 2	2D32	differential pressure, intake tube: plausibility
284F	failure at speed-display kombi	29CD	misfire, cylinder 1	2A6D	Valvetronic, electric overload protection	2C4C	ecu, internal error: lambda probe device 2	2D6E	DME, internal error: monitoring actual torque
2850	VVT-leading sensor	29CE	misfire, cylinder 2	2A6E	Valvetronic, electrical overload protection 2	2C4E	lambda probe front catalyst 2, pumping electricity line	2D6F	monitoring airflow
2851	VVT-leading sensor bank2	29CF	misfire, cylinder 3	2A6F	Valvetronic, minimal stroke	2C4F	lambda probe front catalyst, alignment line	2D70	DME, internal error: monitoring engine functions
2852	VVT-ref. sensor	29D0	misfire, cylinder 4	2A80	Intake-VANOS, control	2C50	lambda probe front catalyst 2, alignment line	2D71	DME, internal error: monitoring input variable
2853	VVT-ref. sensor (bank2)	29D1	misfire, cylinder 5	2A81	Intake-VANOS, Control 2	2C51	lambda probe front catalyst, Nernst line	2D72	DME, internal error: monitoring hardware
2854	VVT-Sensor plausibility	29D2	misfire, cylinder 6	2A83	intake-VANOS	2C52	lambda probe front catalyst 2, Nernst line	2D75	DME, internal error: monitoring engine speed
2855	VVT-Sensor plausibility (bank2)	29D3	misfire, cylinder 7	2A84	Intake-VANOS 2	2C53	lambda probe front catalyst, virtuell mass	2D76	DME, internal error: monitoring gas pedal device
2856	VVT-Supply volatge for the sensor	29D4	misfire, cylinder 8	2A85	outlet-VANOS, control	2C54	lambda probe front catalyst 2, virtuell mass	2D78	air mass current alignment
2857	VVT-Supply volatge for the sensor (bank2)	29D9	misfire with low fuel	2A86	Outlet-VANOS, Control 2	2C61	lambda probe front catalyst, electrical error	2DB4	multifunction steering wheel, communication
2858	VVT-Teaching function at stop	29DD	Bad way detection	2A88	outlet-VANOS	2C62	lambda probe front catalyst 2, electrical error	2DBF	CAN, ACC: signal error
2859	VVT-Teaching function at stop (bank2)	29E5	mixture adaption, upper speed range	2A89	Outlet-VANOS 2	2C6D	lambda probe rear catalyst, aging	2DCA	EGS message missing, timeout
285A	VVT-Actuator monitoring	29E6	mixture adaption 2, upper speed range	2A8A	Intake-VANOS, Adaption limit stop	2C6E	lambda probe rear catalyst 2, aging	2DCB	CAN, SSG: signal error
285B	VVT-Actuator monitoring (Bank2)	29E7	mixture adaption at idle speed per time	2A8B	Intake-VANOS, Adaption limit stop 2	2C71	lambda probe rear catalyst	2DCF	CAN, control panel: signal error
285C	VVT-CAN-communication	29E8	mixture adaption 2 at idle speed per time	2A8C	Outlet-VANOS, Adaption limit stop	2C72	lambda probe rear catalyst 2	2DD7	DSC message missing, timeout
285D	VVT-CAN-communication (bank2)	29E9	mixture adaption at idle speed per ignition	2A8D	outlet-VANOS, Adaption limit stop 2	2C9C	lambda probe heater front catalyst, control	2DD8	AFS message missing, timeout
285E	VVT-Control unit internal failure	29EA	mixture adaption 2 at idle speed per ignition	2A8E	intake camshaft, cog offset of crankshaft	2C9D	lambda probe heater front catalyst 2,	2DD9	CAN, ARS: signal error
285F	VVT-Control unit internal failure (bank2)	29EB	mixture adaption, deflection	2A8F	intake camshaft 2, cog offset of crankshaft				
2860	VVT-Output	29EC	mixture adaption 2, deflection	2A90	outlet camshaft, cog offset of crankshaft				
2861	VVT-Output-stage (bank2)	29ED	mixture adaption, lower speed range	2A91	outlet camshaft 2, cog offset of crankshaft				
		29EE	mixture adaption 2, lower speed range	2B5C	crankshaft sensor, signal				
		29EF	mixture adaption, total fault	2B5D	crankshaft sensor, plausibility				
		29F0	mixture adaption 2, total fault						
		29F4	catalyst conversion						
		29F5	Catalyst conversion 2						
		29FE	Sekundary air system						
		2A01	Sekundary air valve, Mechanics						
		2A02	Sekundary air valve, Control						
		2A03	Sekundary air pump relais, Control						

2F09	intake air temperature sensor, plausibility	2721	Message (Moment request DKG)	VKAT bank 2	2791	IBS general	27CB	Lambda probe Wiedereinsetz-Diagnose NKAT Bank 2	2B14	initialisation throttle positioner	
2F0D	cooler louver, control, (GLF)	2722	fuel pressure sensor electr. Diagnostics	2752	SG internal error lnj working page	2792	Power management vehicle electrical system	27CC	Lambda probe heating energy NKAT Bank 1	2B15	Throttle valve actuator control monitor bank 1
2F0F	cooler jalousie, above	2723	Message (Status reverse gear )	2753	Ignition cyl 1 actuation electric diagnostic	2793	Power management battery	27CD	Lambda probe heating energy NKAT Bank 2	2B16	Throttle valve actuator control monitor bank 2
2F12	air-conditioning compressor, control	2724	Lambda sensor electric diagnostic VKAT bank 1	2754	Ignition cyl 2 actuation electric diagnostic	2794	Unterdrucksensor Mastervac	27CE	fuel pressure-/Model comparison	2B17	Throttle valve adaption bank 1
2F17	engine oil temperature, temporary to high, EGS-Zwangsschaltung	2725	Lambda sensor electric diagnostic VKAT bank 2	2755	Ignition cyl 3 actuation electric diagnostic	2796	Motor emergency programm activated	27CF	building up of fuel pressure EKP-forward stroke	2B18	Throttle valve adaption bank 2
2F26	Koordinator thermal management	2726	Lambda sensor plausibility VKAT bank 1	2757	Ignition cyl 4 actuation electric diagnostic	2797	Intake jet pump system check	27D0	fuel pressure control adaption	2B19	Ion current signal amplification bank 1
2F44	EWS manipulation prevention	2727	Lambda sensor plausibility VKAT bank 2	2758	Ignition cyl 6 actuation electric diagnostic	2798	EWS interface	27D1	Gear temperature sensor of manual transmission	2B1A	Ion current measurement voltage selection bank 1
2F45	interface EWS-DME	2728	Lambda sensor thrust diagnostic VKAT bank 1	2759	Ignition cyl 7 actuation electric diagnostic	2799	EWS	27D2	Lambda probe VKAT/ATIC42 SPI-communication	2B22	Throttle valve actuator predrive check bank 2
2F46	EWS saving changing code	2729	Lambda sensor thrust diagnostic VKAT bank 2	275A	Ignition cyl 8 actuation electric diagnostic	279A	IBS communication error	27D3	INDEX_195_INJ	2B23	Idling speed control valve control monitor bank 2
2F4E	vehicle speed, signal	272A	Lambda sensor electric diagnostic NKAT bank 1	275B	Ignition cyl 9 actuation electric diagnostic	279B	Generator communication error	27D4	Message (OBD-Errortype)	2B24	Idling speed control valve control monitor bank 2
2F4F	vehicle speed, plausibility	272B	Lambda sensor electric diagnostic NKAT bank 2	275C	Ignition cyl 10 actuation electric diagnostic	279C	BSD bus error (general)	27D5	tank sensor left electrical failure	2B25	Throttle valve monitor bank 1
2F50	vehicle speed, plausibility	272C	Lambda sensor driver diagnostic heating NKAT bank 1	275D	Lambda control stop error bank 1	279D	Power management battery closed-circuit current violation	27D6	tank sensor right electrical failure	2B26	Throttle valve monitor bank 2
2F59	Start automatic, start signal	272A	Lambda sensor electric diagnostic NKAT bank 1	275E	Lambda control stop error bank 2	279E	oil quality sensor	27D7	Lambda sensor SLOPE diagnostics NKAT Bank 1	2B27	Throttle valve test reset springs bank 1
2F5A	Start automatic control	272B	Lambda sensor electric diagnostic NKAT bank 2	275F	VANOS maximum stop inlet bank 1	279F	box blower actuation electric diagnostic	27D8	Lambda sensor SLOPE diagnostics NKAT Bank 2	2B28	Throttle valve test reset springs bank 2
2F62	Brake light switch	272C	Lambda sensor driver diagnostic heating NKAT bank 1	2760	VANOS maximum stop outlet bank 1	27A0	SG internal error	27D9	Plausibility Difference-pressure-sensor Mastervac	2B29	Torque manager monitor
2F67	clutch switch, Signal	272C	Lambda sensor driver diagnostic heating NKAT bank 1	2761	VANOS maximum stop inlet bank 2	27A1	Throttle valve actuator enable cable bank 1	27DA	Plausibility depressionpump Mastervac	2B2A	Idling speed control valve initialisation
2F6C	flue gas damper, control	272D	Lambda sensor driver diagnostic heating NKAT bank 2	2762	VANOS maximum stop outlet bank 2	27A2	Throttle valve actuator enable cable bank 2	27DB	INDEX_203_INJ	2B2B	DSC requirement plausibility
2F71	E-Box-fan, control	272E	Lambda sensor driver diagnostic heating NKAT bank 2	2763	VANOS valve inlet bank 1	27A3	Oil pressure switch electric diagnostic	27DD	INDEX_205_INJ	2B2C	Throttle valve initialisation bank 1
2F76	ambient pressure, signal	272D	Lambda sensor driver diagnostic heating NKAT bank 2	2764	VANOS valve outlet bank 1	27A4	Tank ventilation function test bank 1	27DE	INDEX_206_INJ	2B2D	Throttle valve initialisation bank 2
2F77	ambient pressure, plausibility	272E	Lambda sensor driver diagnostic heating NKAT bank 2	2765	VANOS valve inlet bank 2	27A5	Tank ventilation function test bank 2	27DF	INDEX_207_INJ	2B2E	Idling speed control valve initialisation bank 1
2F78	DME, internal error: environment pressure sensor	272F	Fill plausibility bank 1	2766	VANOS valve outlet bank 2	27A6	Tank ventilation actuation bank 1	27E0	INDEX_208_INJ	2B2F	Idling speed control valve initialisation bank 2
2F7B	oil pressure switch, plausibility	2730	Fill plausibility bank 2	2767	Injection valve cyl 1 electric diagnostic	27A7	Tank ventilation actuation bank 2	27E1	INDEX_209_INJ	2B35	Combustion misfire with cut-out cyl 1
2F80	engine turn off time, plausibility	2731	secondary air Mini-HFM electr. Diagnostics	2768	Injection valve cyl 2 electric diagnostic	27A8	SG internal monitor level 2	27E2	INDEX_210_INJ	2B36	Combustion misfire with cut-out cyl 2
2F8A	Battery Voltage	2732	Lambda sensor vibration test NKAT bank 1	2769	Injection valve cyl 3 electric diagnostic	27A9	Crankshaft sensor	27E3	INDEX_211_INJ	2B37	Combustion misfire with cut-out cyl 3
2F94	Fuel pump relay, actuation	273A	Lambda sensor vibration test NKAT bank 2	276A	Injection valve cyl 4 electric diagnostic	27AA	Lambda adaption at VKAT stop bank 1	27E4	INDEX_212_INJ	2B38	Combustion misfire with cut-out cyl 4
2F99	Environment temperature sensor, Plausibility	273B	Lambda sensor vibration test NKAT bank 2	276B	Injection valve cyl 5 electric diagnostic	27AB	Lambda adaption at VKAT stop bank 2	27E5	INDEX_213_INJ	2B39	Combustion misfire with cut-out cyl 5
2F9E	thermic oil level sensor	273C	Lambda sensor part/full diagnostic VKAT bank 1	276C	Injection valve cyl 6 electric diagnostic	27AC	Crank housing ventilation diagnostic bank 1	27E6	INDEX_214_INJ	2B3A	Combustion misfire with cut-out cyl 6
2FA3	coding is absence	273D	Lambda sensor part/full diagnostic VKAT bank 2	276D	Injection valve cyl 7 electric diagnostic	27AD	Crank housing ventilation diagnostic bank 2	27E7	INDEX_215_INJ	2B3B	Combustion misfire with cut-out cyl 7
CD87	PT-CAN communication error	273E	Lambda sensor terminal stage heating VKAT bank 1	276E	Injection valve cyl 8 electric diagnostic	27AE	Tank fuel level implausible	27E8	INDEX_216_INJ	2B3C	Combustion misfire with cut-out cyl 8
CD8B	local CAN communication error	273F	Lambda sensor terminal stage heating VKAT bank 2	276F	Injection valve cyl 9 electric diagnostic	27AF	Secondary air pump	27E9	INDEX_217_INJ	2B3D	Combustion misfire with cut-out cyl 9
CD9B	telegram monitoring (vehicle mode, 315)	273E	Lambda sensor terminal stage heating VKAT bank 1	2770	Injection valve cyl 10 electric diagnostic	27B0	Secondary air system throughput bank 1	27EA	INDEX_218_INJ	2B3E	Combustion misfire with cut-out cyl 10
CDAA	telegram monitoring (power management battery voltage, 3B4)	273E	Lambda sensor terminal stage heating VKAT bank 1	2771	Lambda sensor dynamic diagnostic VKAT bank 1	27B1	Secondary air system throughput bank 2	27EB	INDEX_219_INJ	2B3F	Ion current signal bank 1
CDA2	telegram monitoring (power management battery voltage, 3B4)	273F	Lambda sensor terminal stage heating VKAT bank 2	2772	Lambda sensor dynamic diagnostic VKAT bank 2	27B2	Secondary air system throughput main section	27EC	INDEX_220_INJ	2B40	Ion current signal bank 2
CDA3	telegram monitoring (power management charging voltage, 334)	2740	Lambda sensor heating control diagnostic VKAT bank 1	2776	DMTL pump	27B3	Energy saving mode active	27ED	INDEX_221_INJ	2B41	Combustion misfire with cut-out several cyl
CDA7	message (Status reverse gear, 3B0)	2741	Lambda sensor heating control diagnostic VKAT bank 2	2777	DMTL valve	27B4	Gear leergassen switch of manual transmission	27EE	INDEX_222_INJ	2B42	Combustion misfire with emissions deterioration cyl 1
CDA8	Message (Status Crash shut off EKP, 135)	2742	Lambda sensor heater resistance diagnostic VKAT bank 1	2778	DMTL heating	27B5	Clutch switch manual gearbox	27EF	INDEX_223_INJ	2B43	Combustion misfire with emissions deterioration cyl 2
CDAC	message (status of water valve, 3B5)	2743	Lambda sensor heater resistance diagnostic VKAT bank 2	2779	DMTL leak detection	27B6	VANOS oil pressure	27F0	ECU internal IGN-error memory test	2B44	Combustion misfire with emissions deterioration cyl 3
CDEB	Message (lamp status, 21A)	2744	Lambda sensor heater diagnostic after START VKAT bank 1	277A	DMTL pump moisture cut-out	27B7	elektrische Unterdruckpumpe fuer Mastervac	27F1	Coolant temperature sensor	2B45	Combustion misfire with emissions deterioration cyl 4
CDED	Message (request wheel torque drivetrain, BF)	2745	Lambda sensor heater diagnostic after START VKAT bank 2	277B	Tank cover message	27B8	E blower actuation electric diagnostic	27F2	Coolant temperature sensor plausibility	2B46	Combustion misfire with emissions deterioration cyl 5
CDEE	Message (time/date, 2F8)	2746	Lambda probe Reference resistance diag. VKAT Bank 1	277C	Lambda sensor trim control diagnostic bank 1	27B9	Fuel system diagnostic bank 1	27F3	Intake air temperature sensor bank 1	2B47	Combustion misfire with emissions deterioration cyl 6
CDEF	Message (status of trailer, 2E4)	2747	Lambda probe Reference resistance diag. VKAT Bank 2	277D	Lambda sensor trim control diagnostic bank 2	27BA	Fuel system diagnostic bank 2	27F4	Catalyst protection sensor bank 2	2B48	Combustion misfire with emissions deterioration cyl 7
2710	ECU internal INJ-error memory test	2748	Lambda probe Reference resistance diag. VKAT Bank 1	277E	Main relay actuation electric diagnostic	27BB	Fuel system diagnostic bank 2	27F5	Relative time plausibility	2B49	Combustion misfire with emissions deterioration cyl 8
2711	Ambient pressure sensor	2748	Lambda probe Reference resistance diag. VKAT Bank 2	277F	EKP module actuation electric diagnostic	27BC	Catalyst protection Bank 1	27F6	Voltage at terminal 87	2B4A	Combustion misfire with emissions deterioration cyl 9
2712	Air mass meter bank 1	2749	Lambda probe Diag.via ATIC42-device VKAT Bank1	2780	Intake jet pump actuation electric diagnostic	27BD	Catalyst protection Bank 2	27F7	Radiator output temperature sensor	2B4B	Combustion misfire with emissions deterioration cyl 10
2713	Air mass meter bank 2	2749	Lambda probe Diag.via ATIC42-device VKAT Bank2	2781	TD signal actuation electric diagnostic	27BE	Message (Status Gear)	27F8	Control module temperature sensor	2B4C	Combustion misfire with emissions deterioration cyl 1
2714	Intake pipe pressure sensor bank 1	274A	Lambda sensor pump current assimilation error VKAT bank 1	2782	Secondary air pump actuation electric diagnostic	27BF	Message (Request wheel moment)	27F9	Voltage supply at PIN 111,219,514	2B4D	Combustion misfire with emissions deterioration cyl 2
2715	Intake pipe pressure sensor bank 2	274A	Lambda sensor pump current assimilation error VKAT bank 1	2783	Secondary air valve actuation electric diagnostic	27C0	Tankgeber elektrischer Fehler	27FA	Voltage supply at PIN 124,512	2B4E	Combustion misfire with emissions deterioration cyl 3
2716	Camshaft sensor inlet bank 1	274B	Lambda sensor pump current assimilation error VKAT bank 2	2786	Plausi fuel pressure sensor to mech. pressure actuator	27C1	Info Tank leer bei Fehlereintrag	27FB	SG internal error Ign working page	2B4F	Combustion misfire with emissions deterioration cyl 4
2717	Camshaft sensor outlet bank 1	274C	Message (gear data)	2787	fuel pressure variance comparison at controled operation	27C2	Message (wheel tolerance adjustment)	27FC	Radiator outlet temperature plausibility	2B50	Pedal value sensor 1
2718	Camshaft sensor inlet bank 2	274C	Message (gear data)	2788	fuel pressure variance comparison at max pressure	27C3	DMTL leak detection	27FD	Pedal value sensor 2	2B51	Pedal value sensor 2
2719	Camshaft sensor outlet bank 2	274D	Message (gear data 2)	2789	Catalytic converter conversion bank 1	27C4	environment pressure Plausibility	27FE	Pedal value sensor plausibility	2B52	SG internal error IGN processor control
271A	VANOS control inlet bank 1	274E	Lambda sensor error Nemst cable VKAT bank 1	278A	Catalytic converter conversion bank 2	27C5	secondary air Mini-HFM Plausibility	27FF	Idling speed control valve monitor bank 1	2B53	Idling speed control valve monitor bank 2
271B	VANOS control outlet bank 1	274E	Lambda sensor error Nemst cable VKAT bank 1	278B	VANOS pressure accumulation valve actuation	27C6	Lambda probe AD-Diagnostics trim control Bank 1	2800	Idling speed control valve monitor bank 2	2B54	SMG switch process monitor
271C	VANOS control inlet bank 2	274F	Lambda sensor error Nemst cable VKAT bank 2	278C	Generator	27C7	Lambda sensor trim control AD diagnostic bank 2	2801	SMG module monitor	2B55	SMG engine speed monitor
271D	VANOS control outlet bank 2	274F	Lambda sensor error Nemst cable VKAT bank 2	278D	BSD interface	27C8	Lambda probe electr.	2802	Ambient temperature sensor plausibility	2B56	Speed registration
271E	Camshaft synchronisation bank 1	2750	Lambda sensor error pump current cable VKAT bank 1	278E	oil quality sensor	27C9	Lambda probe electr.	2803	Speed registration		
271F	Camshaft synchronisation bank 2	2751	Lambda sensor error pump current cable	278F	IBS communication						
2720	SG internal error INJ process control			2790	IBS implausible						

## Table 23



2B4B Combustion misfire with emissions deterioration cyl 10  
 2B4C Ion current control module internal bank 1  
 2B4D Ion current control module internal bank 2  
 2B4E Combustion misfire with emissions deterioration several cyl  
 2B4F Intake air temperature sensor plausibility bank 1  
 2B50 request Plausibility  
 2B51 Message (Status EKP)  
 2B52 Additional oil pump bank 1  
 2B53 Additional oil pump bank 2  
 2B54 SG internal error  
 2B55 SG internal monitor level 2  
 2B56 Brake light/test switch plausibility  
 2B57 Motor emergency programm activated  
 2B58 Idling control monitor  
 2B59 Coolant thermostat monitor  
 2B5A Intake air temperature sensor plausibility bank 2  
 2B5B throttle valve error status Bank 1  
 2B5C throttle valve error status Bank 2  
 2B5D Vehicle speed control release  
 2B5E acknowledgement of accelerator and brake at the same time  
 2B5F CAS Control electrical Diagnostics  
 2B60 longitudinal acceleration sensor Handschaltgetriebe  
 2B61 Gear input speed sensor / slipping clutch  
 2B62 environment temperature sensor  
 2B63 Idle running switch control - CSS  
 2B64 Shunt coolant temperature sensor  
 2B65 Post adaption longitudinal acceleration sensor HSG  
 2B66 INDEX\_110\_IGN  
 2B67 INDEX\_111\_IGN  
 2B68 INDEX\_112\_IGN  
 2B69 INDEX\_113\_IGN  
 2B6A INDEX\_114\_IGN  
 2B6B INDEX\_115\_IGN  
 2B6C INDEX\_116\_IGN  
 2B6D INDEX\_117\_IGN  
 2B6E INDEX\_118\_IGN  
 2B6F INDEX\_119\_IGN  
 2B70 INDEX\_120\_IGN  
 2B71 INDEX\_121\_IGN  
 2B72 INDEX\_122\_IGN  
 2B73 INDEX\_123\_IGN  
 2B74 INDEX\_124\_IGN  
 2B75 INDEX\_125\_IGN  
 2B76 INDEX\_126\_IGN  
 2B77 INDEX\_127\_IGN  
 CD87 CAN bus communication error  
 CD8B Bus off idling speed control valve /SMG CAN  
 CD93 Bus off throttle valve CAN  
 CD94 Message (exterior temperature)  
 CD95 Message (control FGR)  
 CD98 Message (current requirement DSC)  
 CD9B Message (vehicle mode)  
 CD9C Message (vehicle speed)  
 CD9F Message (mileage)  
 CDA0 Message (terminal status)  
 CDA1 Message (steering angle)  
 CDA5 Message (status DSC)  
 CDA8 Message (cluster status)  
 CDA9 Message (air-conditioning requirement)  
 CDAA Message (crash cut-out)  
 CDAF Message (trailer status)  
 CDBB Message (wheel speeds)

## Table 24

2712 Actuation of solenoid valve DM-TL  
 2713 Reversed Lambda probes or plug assignment HDEV control module reversed  
 2716 Actuation of heating sensor downstream of cat  
 271A Lambda probe upstream of cat  
 271B Output heating probe upstream of catalytic converter  
 271C Lambda probe downstream of cat  
 271D Lambda probes heating upstream of cat  
 271E Lambda probes heating downstream of cat  
 2721 Lambda probe ageing downstream of cat  
 2728 LR adaption multiplicative range2  
 272A LR adaption multiplicative range1  
 272C LR adaption additive per time  
 272E LR adaption additive per ignition  
 2730 Mix adaption summ error  
 2731 camshaft controller inlet  
 2733 Mix adaption summ error Bank2  
 2736 Lambda probe in front of catalyst, electrical error  
 2737 EWS3.3 manipulation guard  
 2738 Catalytic conversion  
 2742 Failure recognition cyl.1  
 2743 Failure recognition cyl.7  
 2744 Failure recognition cyl.5  
 2745 Failure recognition cyl.11  
 2746 Failure recognition cyl.3  
 2747 Failure recognition cyl.9  
 2748 Failure recognition cyl.6  
 2749 Failure recognition cyl.12  
 274A Failure recognition cyl.2  
 274B Failure recognition cyl.8  
 274C Failure recognition cyl.4  
 274D Failure recognition cyl.10  
 274E Failure recognition sum error  
 2753 Monitor magneto 1  
 2754 Control igniter 5  
 2755 Control igniter 3  
 2756 Control igniter 6  
 2757 Control igniter 2  
 2758 Control igniter 4  
 2759 Control igniter 7  
 275A Control igniter 11  
 275B Control igniter 9  
 275C Control igniter 12  
 275D Control igniter 8  
 275E Monitor magneto 10  
 2760 Secondary air system  
 2762 Secondary air valve  
 2764 (crash Activation of secondary air pump  
 2765 Activate secondary air valve  
 2769 Spring test throttle valve adjuster opening

353 Message (audio telephone control) spring  
 276A Control module selection  
 276D Tank ventilation functional check  
 2772 Activate tank ventilation valve  
 2774 plausibility system clock power module  
 2775 Engine torque monitor level 2  
 2776 Multi-functional steering wheel interface  
 2778 Clutch switch  
 2779 Control module self-test RAM  
 277A Brake switch  
 277B Control module self-test ROM  
 277C Control module self-test RESET  
 277D Battery voltage  
 277E Torque limitation level 1  
 277F Crankshaft sensor  
 2780 Reference mark sensor  
 2781 Camshaft sensor inlet  
 2782 Camshaft sensor outlet  
 2783 Hot film air mass meter  
 2785 Throttle valve potentiometer  
 2786 Throttle valve potentiometer 1  
 2787 Throttle valve potentiometer 2  
 2788 Driving speed  
 2789 Poor road recognition  
 278A Ambient temperature  
 278B Engine temperature  
 278C Intake air temperature  
 278D Temperature sensor radiator outlet  
 278E Differential pressure sensor intake pipe  
 2791 Exchanger code without adaption  
 2792 Throttle valve position monitor  
 2793 DK-Actuator Control deviation  
 2794 Throttle valve adjuster activation  
 2795 Spring test throttle valve adjuster closing spring  
 2796 Check bottom stop  
 2797 Throttle valve adjuster error during amplifier matching  
 2798 Check emergency air point  
 2799 Cancel DV activation because of environmental conditions  
 279A Cancel during UMA relearn  
 279B Thermostat jamming  
 279C Activation of thermostat characteristic field cooling  
 279D activation engine electric fan  
 279E Activation of exhaust valve  
 279F Output fanA  
 27A0 Activation of E box fan  
 27A2 engine fan 2 activated  
 27A4 EWS3.3 EWS-DME interface  
 27B0 environment temperature sensor, Signal  
 27B1 environment temperature sensor, Plausibility  
 27B3 Throttle valve/HFM matching activation  
 27B4 Pressure sensor environment  
 27B5 Activation of inlet VANOS  
 27B7 Activation of fuel pump relay  
 27B8 Plausibility differential pressure sensor  
 27B9 Environment pressure sensor, Signal  
 27BA Environment pressure sensor, Plausibility  
 27BB camshaft control outlet  
 27BD Activation of outlet VANOS  
 27C1 Master camshaft sensor  
 27C2 Activation of air conditioning compressor controller  
 27C8 DM-TL rough leakage  
 27CA Activation of DM-TL pump motor  
 27CB DM-TL Very fine leak (0.5 mm) MIL off  
 27CC DM-TL fine leak

27CD DM-TL module  
 27CE Load-sensor-, wire- or ECU-error  
 27D5 Idling control defective  
 27D9 Activation of DM-TL heating  
 27DA Generator error  
 27DC EWS3.3 alternating code saving  
 27E1 Pedal value sensor monitor  
 27E2 Knocking sensor1  
 27E3 Knocking sensor2  
 27E4 Knocking sensor3  
 27E5 Knocking sensor3  
 27E6 Knocking control zero test  
 27E7 Knocking control offset  
 27E8 Knocking control test pulse  
 27E9 Knocking control zero test bank2  
 27EA CAN timeout HDEV  
 27EC CAN-EGS Signal error  
 27ED CAN-ASC/DSC signal error  
 27EE CAN-instrument cluster signal error  
 27EF CAN-ACC signal error  
 27F2 Plausibility tank fill level  
 27F3 CAN-Timeout VVT control module  
 27F4 fuel level, signal  
 27F5 fuel level, plausibility  
 27F6 Pedal value sensor  
 27F7 Pedal value sensor potentiometer1  
 27F8 Pedal value sensor potentiometer2  
 27FA Automatic start input  
 27FD Automatic start  
 27FE Knocking control offset bank2  
 27FF Knocking control test pulse bank2  
 2813 Control module monitor group A  
 2814 Control module monitor group B  
 2815 Control module monitor group C  
 2816 Engine speed monitor  
 2818 Voltage monitor probe on air (probe not fitted but connected)  
 2819 time out ECU-coupling  
 281E Activation of DISA  
 2822 Forced circuit EGS  
 2823 Lambda probe heating upstream of cat (in thrust)  
 2825 Lambda probe ageing downstream of cat  
 2827 Heating connection to signal path  
 2828 CAN-ARS signal error  
 2829 CAN-CAS signal error  
 282A ICAN-HKA signal error  
 282B CAN-PWML signal error  
 282C CAN-SZL signal error  
 282E PWG movement  
 283A Error oil level sensor  
 283D PT CAN bus off  
 283E VVT enable cable activation  
 283F Plausibility oil pressure switch  
 2841 Air-encased injection valves activation  
 2842 2. generator error  
 2843 Plausibility diagnostic LSU by LSH rear cat  
 2844 Self-diagnostic CJ125 SPI communication  
 2846 Activation of intake valve  
 2847 Pressure switch activation  
 2848 Output relay HDEV SG  
 2849 Cable break on pump current  
 284A Short circuit probe cables against earth or Ub  
 284B Control return blocking valve  
 284C LSU dynamic too slow  
 284F Speed display in cluster defective  
 2850 VVT guide sensor  
 2851 VVT-direction sensor (Bank2)

2852 VVT reference sensor  
 2853 VVT reference sensor (bank2)  
 2854 VVT sensor plausibilisation  
 2855 VVT sensor plausibilisation (bank2)  
 2856 VVT sensor supply voltage  
 2857 VVT sensor supply voltage (bank2)  
 2858 VVT learn function stop  
 2859 VVT learn function stop (bank2)  
 285A VVT actuator monitor  
 285B VVT actuator monitor (bank2)  
 285C VVT-CAN communication  
 285D VVT-CAN communication (bank2)  
 285E VVT control module internal error  
 2860 VVT-output  
 2862 VVT-power supply  
 2864 DM-TL pump activation error  
 2865 Performance limit VVT emergency operation  
 2866 VVT stop learning necessary  
 2867 VVT system overload  
 286D output HDEV9, cable 9  
 286E output HDEV12, cable 12  
 286F output HDEV8, cable 8  
 2870 output HDEV10, cable 10  
 2871 high pressure injection valve high side 7  
 2872 high pressure injection valve high side 11  
 2873 high pressure injection valve high side 9  
 2874 high pressure injection valve high side 12  
 2875 high pressure injection valve high side 8  
 2876 high pressure injection valve high side 10  
 2877 high pressure injection valve high side 7  
 2878 high pressure injection valve high side 11  
 287A high pressure injection valve high side 9  
 287D high pressure injection valve low side 12  
 287E high pressure injection valve low side 8  
 287F high pressure injection valve low side 10  
 2880 activation return ventilation-valve  
 2889 Plausibility monitor RAM backup  
 28C8 LR deviation  
 28D6 HO process error, no coding  
 28D7 Generator communication  
 28D8 RAM backup error  
 28DB Min stroke adaption stop several times  
 28DC 2. generator communication  
 28DE Boostertimeout high pressure injection valve cyl 1  
 28DF Boostertimeout high pressure injection valve cyl 5  
 28E0 Boostertimeout high pressure injection valve cyl 3  
 28E1 Boostertimeout high pressure injection valve cyl 6  
 28E2 Boostertimeout high pressure injection valve cyl 2  
 28E3 Boostertimeout high pressure injection valve cyl 4  
 28E4 Boostertimeout high pressure injection valve cyl 7  
 28E5 boostertimeout high pressure injector cyl 11  
 2901 Boostertimeout high pressure injection valve cyl 9  
 2902 boostertimeout high pressure injector cyl 12  
 2903 Boostertimeout high pressure injection valve cyl 8  
 2904 boostertimeout high pressure injector cyl 10  
 290F high pressure sensor test (signal rail pressure sensor)

2913 output HDEV1, cable 1  
 2914 output HDEV5 wire 5  
 2915 output HDEV3, cable 3  
 2916 output HDEV6, cable 6  
 2917 output HDEV2, cable 2  
 2918 output HDEV4, cable 4  
 2919 output HDEV7, cable 7  
 291A output HDEV11 cable 11  
 291B high pressure injection valve high side 1  
 291C high pressure injection valve high side 5  
 291D high pressure injection valve high side 3  
 291E high pressure injection valve high side 6  
 291F high pressure injection valve, communication  
 2920 high pressure injection valve low side 1  
 2921 high pressure injection valve low side 5  
 2922 high pressure injection valve low side 3  
 2923 high pressure injection valve low side 6  
 2924 Rail pressure control  
 292B LSU matching cable  
 292D LSU Nemst cell break  
 2930 LSU virtual earth break  
 2932 output pressure control valve  
 2937 Function monitor: Lambda plausibilisation  
 2940 high pressure injection valve high side 2  
 2941 high pressure injection valve low side 4  
 2942 high pressure injection valve low side 2  
 2943 high pressure injection valve low side 4  
 2944 DME coupling messages  
 296C CAN timeout TXU  
 296D Engine torque bank comparison  
 2971 Program and data state plausibilisation of master and slave  
 297C RL limiting  
 298E high pressure injection valve 1  
 298F high pressure injection valve 5  
 2990 high pressure injection valve 3  
 2991 high pressure injection valve 6  
 2992 high pressure injection valve 2  
 2993 high pressure injection valve 4  
 2994 high pressure injection valve 7  
 2995 high pressure injection valve 11  
 2996 high pressure injection valve 9  
 2997 high pressure injection valve 12  
 2998 high pressure injection valve 8  
 2999 high pressure injection valve 10  
 29AE fuel tank cap open  
 CD87 PT CAN bus off  
 CD8B Local CAN bus off  
 CDC7 PT CAN bus off  
 CDCB Local CAN bus off

## Table 25

29CC misfirings, several cylinders  
 29CD misfirings, cylinder 1  
 29CE misfirings, cylinder 2  
 29CF misfirings, cylinder 3  
 29D0 misfirings, cylinder 4  
 29D1 misfirings, cylinder 5  
 29D2 misfirings, cylinder 6  
 29D3 misfire, cylinder 7  
 29D4 misfire, cylinder 8  
 29D5 misfire, cylinder 9  
 29D6 misfire, cylinder 10  
 29D7 misfire, cylinder 11  
 29D8 misfire, cylinder 12  
 29DD Bad way detection  
 29E2 fuel injection rail, pressure sensor signal



29E3	Fuel pressure regulation, plausibility	2B99	ecu, internal error: RAM backup	plausibility	2E6E	Ignition, control: firing time	01	Relay electric Fuel pump	82	Signal CAN IKE	
29E4	Volume control valve, control	2B9A	control unit, internal failure: RAM		2E6F	Ignition 2, control: firing time	02	idle speed control valve closing coil	83	Signal Speed	
29E5	fuel mixture adaptation, upper speed range	2B9B	ecu, internal error: ROM	2D6D	DME, internal error: control DME/DME2	2E72	control unit, internal failure: knock sensor module	03	Injector valve Cylinder 2	84	reference voltage for air flow meter
29E7	mixture adaption at idle speed per time	2B9C	ecu, internal error: reset	2D6F	DME, internal error: control air path	2E73	control unit, internal failure: knock sensor module	04	Injector valve Cylinder 4	85	reference voltage for Throttle valve potentiometer
29ED	mixture adaption, lower speed range	2BA7	DME, internal error: toque limit control level 1	2D70	DME, internal error: monitoring engine functions	2E97	Generator	0C	Throttle valve potentiometer		
29EF	mixture adaption, total fault	2BAC	DME, DME2: Programmstand	2D71	DME, internal error: monitoring input variable	2E98	generator, communication	0F	Knock sensor 1	87	Signal Camshaft sensor
29F0	mixture adaption 2, total fault	2BAD	DME, DME2: Hardware, plausibility	2D72	DME digital motor electronics, internal failure: control hardware	2E99	Generator 2	12	difference suction pipe	88	Signal Crankshaft sensor
29F4	catalytic converter conversion	2BC0	ambient temperature sensor, plausibility	2D74	DME, internal error: control fuel pressure sensor	2E9A	Generator 2, communication	18	ignition coil Cylinder 3	89	Signal Knock sensor 1
2A12	DMTL diagnosis module tank leakage, magnetic valve, input signal	2BC1	ambient temperature sensor, signal	2D75	DME digital motor electronics, internal failure: control motor speed	2E9B	Generator 2, communication	19	ignition coil Cylinder 1	8A	Signal Knock sensor 2
2A13	DMTL diagnosis module tank leakage, leakage diagnosis pump, input signal	2BC2	Lambda probe in front of catalytic converter, muddled	2D76	DME digital motor electronics, internal failure: control driver pedal module	2E9F	oil condition sensor	1D	idle adjuster opening coil	8B	Signal Lambda probe after KAT
2A14	DMTL diagnosis module tank leakage, finest leakage	2C24	Lambda probe in front of catalytic converter, muddled	2D77	DME, DME2: torque comparison	2EE0	coolant temperature sensor, Signal	1F	Injector valve Cylinder 3	8C	Interface DME - EWS
2A15	DMTL diagnosis module tank leakage, fine leakage	2C31	Lambda probe in front of catalytic converter, trimming control	2D78	DME, DME2: torque comparison	2EE1	coolant temperature sensor, plausibility	20	Injector valve Cylinder 1	8D	lambda regulation control range block
2A16	DMTL diagnosis module tank leakage, finest leakage	2C37	Lambda probe in front of catalytic converter, heatingcoupling	2DDB	CAN, IHKA: signal error	2EEA	Temperature sensor radiator emission, signal	24	Tank ventilation valve	8E	regulation-self-test
2A17	DMTL diagnosis module tank leakage, system failure	2C39	Lambda probe in front of catalytic converter, dynamics	2DD7	DME, DME2: signal error	2EF4	map thermostat, mechanics	25	Lambda probe heating	8F	control unit self-test
2A18	DMTL diagnosis module tank leakage, heating: input signal	2C3B	Lambda probe in front of catalytic converter, not plugged	2DC1	message from powermodul missing	2EF5	map thermostat, input signal	29	air mass flow sensor	90	manipulation protection EWS
2A19	tank ventilation valve, input signal	2C47	lambda probe front catalyst, sensor line	2DCF	CAN, control panel: signal error	2EF6	electric fan 2, control	2A	Knock sensor 2	91	misfire by Cylinder 1
2A1A	tank ventilation system, function	2C49	lambda probe front catalyst, plausibility	2DD7	Message from DSC doesn't exist, timeout	2EF7	electrical fan, input signal	2C	Sensor	92	misfire by Cylinder 2
2A1D	tank filling level, plausibility	2C4B	ecu, internal error: lambda probe device	2DD9	CAN, ARS: signal error	2EFE	inlet air temperature sensor, signal	2E	electric fan	93	misfire by Cylinder 3
2A1E	fuel level, signal	2C4D	lambda probe front catalyst, pumping electricity line	2DDA	CAN, CAS: signal error	2F08	inlet air temperature sensor, signal	30	Relay Air conditioning compressor	94	misfire by Cylinder 4
2A21	Tank fill level 2, signal	2C4F	lambda probe front catalyst, alignment line	2DDC	CAN, IHKA: signal error	2F09	inlet air temperature sensor, plausibility	33	ignition coil Cylinder 4	95	control valve secondary air
2A2A	Ventilation valve return system, control	2C51	lambda probe front catalyst, Nernst line	2DDD	Valvetric message missing	2F0B	intake air temperature sensor, cold portion, plausibility (preliminary)	34	ignition coil Cylinder 2	96	control Relay Secondary air pump
2A58	Valvetric, power supply	2C53	lambda probe front catalyst, virtuell mass	2DDE	Local-CAN communication	2F17	engine oil temperature, temporary to high, EGS-Zwangsschaltung	36	Battery Voltage	97	Sekundaeerluftsystem Plausibilitaet
2A59	Valvetric, eccentric shaft sensor: track	2C61	lambda probe front catalyst, electrical error	2DE6	Local-CAN, DME/DME2: communication	2F44	EWS manipulation protection	40	CAN function EGS	98	Selbsttest E2PROM-Emulation
2A5B	Valvetric, eccentric shaft sensor: referenz	2C6D	Lambda probe behind catalytic converter, aging	2E24	Ignition coil cyl. 1	2F45	interface EWS-DME electronic vehicle immobilization/digital motor electronics	43	Sensor	99	control Lambda probe heating after KAT
2A5D	Valvetric, eccentric shaft sensor: plausibility	2C71	lambda probe rear catalyst	2E25	Ignition coil cyl. 2	2F46	EWS variable code storage	46	Lambda probe	9B	Aussetzer abgasrelevant Summe
2A5F	Valvetric, eccentric shaft sensor: power supply	2C84	Lambda probe behind catalyst, Dynamics	2E26	Ignition coil cyl. 3	2F4E	vehicle speed, signal	49	signal	9C	Aussetzer katschaedigend Zyl.1
2A61	Valvetric, adjustment range	2C9C	Lambda probe heating in front of catalytic converter, input signal	2E27	Ignition coil cyl. 4	2F4F	vehicle speed, plausibility	4C	potentiometer	9D	Aussetzer katschaedigend Zyl.2
2A63	Valvetric, servo motor: monitoring tightness, rotation direction	2C9E	Lambda probe heating behind catalytic converter, input signal	2E28	Ignition coil cyl. 5	2F50	vehicle speed, plausibility	4D	Intake air temperature	9E	Aussetzer katschaedigend Zyl.3
2A65	Valvetric, internal error	2CA0	lambda probe heater front catalyst	2E29	Ignition coil cyl. 6	2F59	Start automatic, start signal	4E	Engine temperature	9F	Aussetzer katschaedigend Zyl.4
2A67	Valvetric, adjustment motor: input signal	2CA8	Lambda probe heating behind catalytic converter, function	2E2B	spark coil cylinder 8	2F5A	Start automatic control	51	theft alarm system-PIN	A0	Aussetzer katschaedigend Summe
2A69	Valvetric, servo motor: power supply	2CEF	throttle valve actuator, activation	2E2C	ignition coil cylinder 9	2F62	Brake light switch	52	air condition	A5	Katalysatorkonvertierung
2A6B	Valvetric, power limiting	2CF0	throttle valve actuator, control range	2E2D	ignition coil cylinder 10	2F6C	exhaust fumeflap, input signal	53	Switch Aircondition	A6	Periodendauer Lambdasonde vor Kat
2A6C	Valvetric, position at restart: plausibility	2CF1	throttle valve actuator, position monitoring	2E2E	ignition coil cylinder 11	2F71	E-box-fan, input signal	58	control unit self-test	A9	Heizleistung Sonde vor Kat
2A6D	Valvetric, electronic overload protection	2CF8	throttle valve potentiometer	2E2F	ignition coil cylinder 12	2F77	ambient pressure sensor, plausibility	C9	fuel trim limit	AA	Heizleistung Sonde nach Kat
2A6F	Valvetric, minimal stroke	2CF9	throttle valve potentiometer 1	2E3D	HDEV-control unit line 12, control	2F78	DME, internal error: environment pressure sensor	CE	Knock regulation	AB	Pruefung Kraftstoff-Versorgungssystem
2A80	inlet-Vanos variable cam control test, input signal	2CFA	throttle valve potentiometer 2	2E3E	HDEV-control unit line 8, control	2F7B	oil pressure switch, plausibility	D8	ASC-Signal		
2A83	injector-VANOS	2CFF	throttle valve actuator, amplifier alignment	2E3F	HDEV-control unit line 10, control	2F80	motor shutoff time, plausibility	DC	function		
2A85	outlet-VANOS variable cam control test	2D00	throttle valve actuator, spring check closing spring	2E40	HDEV-control unit line 1, control	2F8A	Battery Voltage	EC	EGS-Signal		
2A88	outlet-VANOS	2D01	throttle valve actuator, spring check opening spring	2E41	HDEV-control unit line 2, control	2FA3	coding missing				
2A8A	intake-VANOS, Adaption limit stop	2D02	throttle valve actuator, auxiliary air point	2E42	HDEV-control unit line 3, control	30AC	injection valve cylinder 1, input signal	64	control Ignition Cylinder 1	64	control Ignition Cylinder 1
2A8C	outlet-VANOS, Adaption limit stop	2D03	throttle valve actuator, abort alignment	2E43	HDEV-control unit line 4, control	30AD	injection valve cylinder 2, input signal	65	control Ignition Cylinder 2	65	control Ignition Cylinder 2
2A8E	intake camshaft, cog offset of crankshaft	2D04	throttle valve actuator, checking lower block	2E44	HDEV-control unit line 5, control	30AE	injection valve cylinder 3, input signal	66	control Ignition Cylinder 3	66	control Ignition Cylinder 3
2A90	outlet camshaft, cog offset of crankshaft	2E45	HDEV-control unit line 6, control	2E45	HDEV-control unit line 6, control	30AF	injection valve cylinder 4, input signal	67	control Ignition Cylinder 4	67	control Ignition Cylinder 4
2B5C	crankshaft sensor, signal	2E46	HDEV-control unit line 7, control	2E46	HDEV-control unit line 7, control	30AE	injection valve cylinder 4, input signal	68	control Injector valve Cylinder 1	68	control Injector valve Cylinder 1
2B5D	crankshaft sensor, plausibility	2E47	HDEV-control unit line 11, control	2E47	HDEV-control unit line 11, control	30AF	injection valve cylinder 4, input signal	69	control Injector valve Cylinder 2	69	control Injector valve Cylinder 2
2B62	camshaft sensor, intake	2E48	Booster high pressure injector 1	2E48	Booster high pressure injector 1	30AE	injection valve cylinder 4, input signal	6A	control Injector valve Cylinder 3	6A	control Injector valve Cylinder 3
2B63	camshaft sensor, outlet	2E49	Booster high pressure injector 5	2E49	Booster high pressure injector 5	30AE	injection valve cylinder 4, input signal	6B	control Injector valve Cylinder 4	6B	control Injector valve Cylinder 4
2B66	camshaft sensor, master	2E4A	Booster high pressure injector 3	2E4A	Booster high pressure injector 3	30AF	injection valve cylinder 4, input signal	6C	control electric fan	6C	control electric fan
2B7A	Stop valve return system, control	2E4B	Booster high pressure injector 6	2E4B	Booster high pressure injector 6	30AF	injection valve cylinder 4, input signal	6E	control Air conditioning compressor	6E	control Air conditioning compressor
2B7F	Adjustment throttle valve-air mass sensor	2E4C	Booster high pressure injector 2	2E4C	Booster high pressure injector 2	30B0	injection valve cylinder 5, input signal	6F	control Relay Fuel pump	6F	control Relay Fuel pump
2B81	idle speed control at homogen mode	2E4D	Booster high pressure injector 4	2E4D	Booster high pressure injector 4	30B0	injection valve cylinder 5, input signal	70	control electric fan	70	control Solenoid Valve suction tube (DISA)
2B82	Idle running control at catalyst heating system	2E4E	Booster high pressure injector 7	2E4E	Booster high pressure injector 7	30B1	injection valve cylinder 6, input signal	71	control Air conditioning compressor	71	control Solenoid Valve Tank ventilation
2B84	Additional air flap, control	2E4F	Booster high pressure injector 11	2E4F	Booster high pressure injector 11	30B1	injection valve cylinder 6, input signal	72	control Relay Fuel pump	72	control Solenoid Valve suction jet pump
2B98	ecu, internal error: RAM backup, plausibility	2D13	air mass sensor, rationality	2E50	Booster high pressure injector 9	30B3	injection valve cylinder 7, control	70	control Solenoid Valve suction tube (DISA)	72	control Solenoid Valve suction jet pump (DISA)
		2D1A	gas pedal device, gas pedal sensor	2E51	Booster high pressure injector 9	30B4	Injector cylinder 9, control	71	control Solenoid Valve suction tube (DISA)	73	control grid-controlled cooling
		2D1B	accelerator pedal module, pedal sensor signal 1	2E52	Booster high pressure injector 8	30B5	Injector cylinder 10, control	71	control Solenoid Valve Tank ventilation	75	control grid-controlled cooling
		2D1C	accelerator pedal module, pedal sensor signal 2	2E53	Booster high pressure injector 10	30B6	Injector cylinder 11, control	72	control Solenoid Valve Tank ventilation	75	control Solenoid Valve Tank ventilation
		2D28	differential pressure sensor, suction pipe: Signal	2E53	Booster high pressure injector 10	30B7	Injector cylinder 12, control	72	control Solenoid Valve suction jet pump	76	control Solenoid Valve suction jet pump
		2D29	differential pressure sensor, suction pipe: plausibility	2E60	HDEV-control unit, internal error: communication	30D4	Message from HDEV missing	73	control grid-controlled cooling	77	control Solenoid Valve suction jet pump (DISA)
				2E68	knock sensor signal 1	30E8	Filling limit	75	control grid-controlled cooling	78	control Solenoid Valve suction jet pump (DISA)
				2E69	knock sensor signal 2	CD87	PT-CAN communication failure	76	control Lambda probe heating before KAT	79	control Solenoid Valve suction jet pump (DISA)
				2E6A	Knocking sensor signal 3	CD8B	local-CAN communication failure	77	Signal Throttle valve potentiometer	79	control Solenoid Valve suction jet pump (DISA)
						CD87	PT-CAN communication failure	77	Signal Idle adjuster	79	control Solenoid Valve suction jet pump (DISA)
						CD8B	local-CAN communication failure	77	control Lambda probe heating before KAT	79	control Solenoid Valve suction jet pump (DISA)
						CD87	Message (OBD-Sensor Diagnosis status, SE0)	78	Signal Lambda probe before KAT	7A	control Solenoid Valve suction jet pump (DISA)
						CDC7	PT-CAN communication failure	78	Signal cooling water exit temperature	7B	control Solenoid Valve suction jet pump (DISA)
						CDCB	local-CAN communication failure	79	Signal Intake air temperature	7C	control Solenoid Valve suction jet pump (DISA)
						CDDD	message (gear data, BA)	79	Signal Throttle valve potentiometer	7C	control Solenoid Valve suction jet pump (DISA)
						CDE0	message (terminal state, 130)	7A	control Lambda probe heating before KAT	7D	control Solenoid Valve suction jet pump (DISA)
								7B	Signal Lambda probe before KAT	7E	control Solenoid Valve suction jet pump (DISA)
								7C	Signal Intake air temperature	7E	control Solenoid Valve suction jet pump (DISA)
								7D	Signal cooling water exit temperature	7F	control Solenoid Valve suction jet pump (DISA)
								7E	Battery Voltage main relay	7F	control Solenoid Valve suction jet pump (DISA)
								7F	Signal Lambda probe before KAT	80	control Solenoid Valve suction jet pump (DISA)
								80	Signal CAN ASC	81	control Solenoid Valve suction jet pump (DISA)
								81	request CAN ASC	82	control Solenoid Valve suction jet pump (DISA)
								82	Signal CAN EGS	83	control Solenoid Valve suction jet pump (DISA)
								83	request CAN EGS	84	control Solenoid Valve suction jet pump (DISA)
								84	Signal CAN IKE		
									reference voltage for air flow meter		

## Table 26

## Table 27

64	control Ignition Cylinder 1	71	control Solenoid Valve Tank ventilation
65	control Ignition Cylinder 2	72	control Solenoid Valve suction jet pump
66	control Ignition Cylinder 3	73	control grid-controlled cooling
67	control Ignition Cylinder 4	75	control Solenoid Valve Tank ventilation
68	control Injector valve Cylinder 1	76	control Solenoid Valve suction jet pump
69	control Injector valve Cylinder 2	77	control grid-controlled cooling
6A	control Injector valve Cylinder 3	78	control Idle adjuster
6B	control Injector valve Cylinder 4	79	Signal Intake air temperature
6C	control electric fan	7A	Signal cooling water temperature
6E	control Air conditioning compressor	7B	Signal cooling water exit temperature
6F	control Relay Fuel pump	7C	Battery Voltage main relay
70	control electric fan	7D	Signal Lambda probe before KAT
71	control Air conditioning compressor	7E	Signal CAN ASC
72	control Relay Fuel pump	7F	request CAN ASC
73	control Solenoid Valve suction tube (DISA)	80	Signal CAN EGS
74	control Solenoid Valve Tank ventilation	81	request CAN EGS
75	control Solenoid Valve suction jet pump	82	Signal CAN IKE
76	control Lambda probe heating before KAT	83	Signal Speed
77	Signal Throttle valve potentiometer	84	reference voltage for air flow meter
78	control Idle adjuster		
79	Signal Intake air temperature		
7A	Signal cooling water temperature		
7B	Signal cooling water exit temperature		
7C	Battery Voltage main relay		
7D	Signal Lambda probe before KAT		
7E	Signal CAN ASC		
7F	request CAN ASC		
80	Signal CAN EGS		
81	request CAN EGS		
82	Signal CAN IKE		
83	Signal Speed		
84	reference voltage for air flow meter		

85 reference voltage for Throttle valve potentiometer  
 87 Signal Camshaft sensor  
 88 Signal Crankshaft sensor  
 89 Signal Knock sensor 1  
 8A Signal Knock sensor 2  
 8B Signal Lambda probe after KAT  
 8C interface DME - EWS  
 8D lambda regulation control range block  
 8E knock-regulation-self-test  
 8F control unit self-test  
 90 manipulation protection EWS  
 91 misfire by Cylinder 1  
 92 misfire by Cylinder 2  
 93 misfire by Cylinder 3  
 94 misfire by Cylinder 4  
 95 control valve secondary air  
 96 control Relay Secondary air pump  
 97 Sekundaerluftsystem Plausibilitaet  
 98 SG-Selbsttest E2PROM-Emulation  
 99 control Lambda probe heating after KAT  
 9B Aussetzer abgasrelevant Summe  
 9C Aussetzer katschaedigend Zyl.1  
 9D Aussetzer katschaedigend Zyl.2  
 9E Aussetzer katschaedigend Zyl.3  
 9F Aussetzer katschaedigend Zyl.4  
 A0 Aussetzer katschaedigend Summe  
 A5 Katalysatorkonvertierung  
 A6 Periodendauer Lambdasonde vor Kat  
 A9 Heizleistung Sonde vor Kat  
 AA Heizleistung Sonde nach Kat  
 AB Pruefung Kraftstoff-Versorgungssystem

## Appendix

### Common Problems /Troubleshooting

#### E10 ERROR MESSAGE ON TOOL:

"E" means the car is not responding to the tool: This often happens when the data line (also called "diagnostic bus") inside the car is "hung" or disabled. Occasionally the SR-300 will display the message "E" followed by a number (most commonly 10 or 11) when an attempt is made to read codes or to reset the MIL light (Check Engine or Service Engine Soon)

#### Things To Try to Resolve the Flashing "E":

- 1.) **Insertion Depth:** Check the insertion depth of the SR-300. If it is not fully inserted the unit will not work. See page 39.
- 2.) **Reversing the power-up sequence:** Plug in the SR-300 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.) **Pin 19:** Observe that pin 19 of your diagnostic connector is not recessed. A number of models in the early 1990s had pin 19 improperly installed.
- 4.) **Cycle power:** Plug in tool, cycle the ignition key on and off two or three times (do not start engine)
- 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 (see page 39) and attempt to isolate the problem by removing the module from the diagnostic bus. **WARNING:** This procedure is for qualified mechanics only.

ABS service bulletin 34 01 96: BMW circulated a service bulletin and low cost repair advice detailing the malfunction of the ABS unit ground wiring which caused diagnostic bus problems on a large number of BMWs. This is often the problem on BMWs built prior to 10/1994 that are getting the "E" message on the SR-300 code tool. (Please do not Contact Bavarian Autosport

for service bulletins. Contact Central Letter Shop (see page 39), BMWs authorized publication vendor 1-800-695-0079, or 973-808-8339, 9:00am - 4:30pm EST)

### 8.) Trying the tool on a similar BMW

If you have access to a similar BMW, you can rule out the tool as the source of the problem by trying it on that car. If it either reads or resets without the E message, then you can narrow your attention to the car.

The SR-300 will not serve its 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.

### ENGINE LAMP WILL NOT RESET:

When the MIL is on, will not reset, yet no codes are found this can be caused by one of two things; most common: the car has automatic transmission related faults which can occasionally trigger an engine MIL. Another possible cause is the engine MIL circuit from the Engine ECU to the instrument cluster is open.

### SERVICE LIGHT BATTERY PROBLEMS:

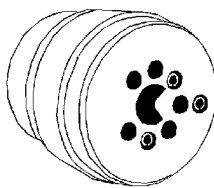
**(note: only applies to BMWs older than 1989)** The SR-300 is not giving error messages and appears to be working normally but one of the following conditions occurs: **a.)** The reset seemed successful but the service lights come back on shortly after the reset was done. **b.)** The service lights 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 reset 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. When this "backup" battery dies, the S.I. computer has to re-start every time you start your car, at which point an "Inspection" light 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. Battery replacement kits are available on the web for most pre 1989 models

### WRONG PLUG STYLE: THE TOOL DOESN'T FIT THE CAR.

If the tool does not fit the connector in the car please read the following guidelines which detail the possible causes:

1.) You may not have found the correct diagnostic plug (please closely review the illustrations on page 3 and 4)

2.) The BMW is 1988 or older and equipped with the 15 pin plug, which the SR-300 will not fit. An adaptor is available (see image at right) to adapt the SR-300 back to the older BMW for service light reset only, but no codes can be read on BMWs with the 15 pin connector built 1987 or earlier.



AB02, adapts SR-300 to pre-1988

3.) The tool is not equipped with the correct connector - there are two

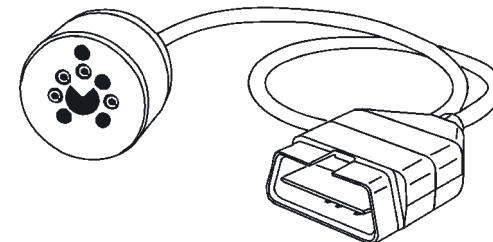
native connector configurations for the SR-300

**The 20 pin SR-300** Fits BMWs 1987 to year 2000 (20 pin format). (Note: Can be adapted to the 16 pin format of 2001 and later BMWs. Part number AB03, see "Adaptor advice" below)

**SR-300-16:** Fits BMWs 2001 to present: (16 pin format) No adaptor available to adapt back to earlier BMWs. Important: Not for use on 1996 - 2000, even though it will fit.

### INCREASING COMPATIBILITY:

If you require compatibility with BMWs built both before and after 2000, we highly recommend the AB03 adaptor to go along with the SR-300 (20 pin version). This gives the broadest range of code scanning and resets from 1987 to 2006.



AB03 Adaptor. Adapts 20 pin tool to 16 pin car.

If you plan to reset the Service Lights on older BMWs (1982 - 1986) we recommend the SR-300 in conjunction with the AB02 Adaptor (see image above).

**Mechanics Universal Kit:** For mechanics, we recommend a two piece kit consisting of a SR-300 (20 pin) tool and the AB03 adaptor, which will cover 1987 through year 2000.

### WHERE'S THE ADAPTOR I ORDERED!

If you ordered the AB02 adaptor and do not see it in the box, do the following before calling us: (a) Check to see if the tool fills the entire hard plastic storage case, (b) see if there are three silver pins in the tool connector. If you answered yes/yes, then the adaptor is there, just tug it out of the end of the tool- we ship them plugged together - it looks like one unit with no adaptor.

### SERVICE LIGHT RESET FAILS:

Commonly a reset was attempted before one of the Oilservice or Inspection lights came on but the five green lights did not illuminate. • The computer was counting down to a different service interval than the one you tried to reset. There is no way to know if the next light will be Oilservice or Inspection. Some BMWs will not reset prior to the illumination of the Oilservice or the Inspection lights. In all cases we advise you to wait for the Oilservice or Inspection light to come on before attempting a reset. In other words, if there are any green "countdown" lights remaining, do not attempt a reset because it probably won't work. Another cause of the service light not resetting is the tool type is using the wrong port; if your BMW has the round diagnostic port under the hood and the under dash port (see page 3), you can only reset the service lights through that round under-hood port.

### TOOL WILL NOT RESET OTHER LIGHTS:

The SR-300 would not reset the brake lining light, the SRS/airbag light, or the ABS brake light. • The SR-300 only resets the Check engine, Service Engine Soon, Oilservice and Inspection

lights. However, Peak Research Corp offers the R5/SRS, Airbag Scan and Reset Tool, which will scan the airbag codes and reset the airbag light.

## Sources of Technical Information:

**Central Letter Shop** is BMWs official technical documentation distribution source. All documentation relating to the service and maintenance of BMWs is available from them: Internet Address: <http://www.centrallettershop.com/> Phone 1-800-695-0079, or 973-808-8339

**BMW:** Pay-by-use technical information can be obtained online directly from BMW at <http://www.bmw-tis.com/>

## Manual Publishers

Robert Bentley Publishing: 1-800-423-4595 Alldata: 1-800-859-3282 Chiltons: 1-800-695-1214	Mitchells: 888-724-6742 Haynes: 1-800-442-9637
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**Recommended Reading:** • Bosch Automotive Handbook, by Robert Bosch, ISBN: 0837606144 • Bosch Fuel Injection and Engine Management, by Charles O. Probst. ISBN: 0837603005.

## Warning about insertion of tool (applies to 20 pin tool only)

Tool must be fully inserted in order to work properly. To check for full insertion, first observe the faint line on the side of the connector on the SR-300. That line should be just even with the top of the BMW's diagnostic connector. If that line is more than 1/16th of an inch above the top of the diagnostic connector, the tool is not fully inserted. (Note: for your reference, the bold black line above this paragraph is exactly 1/16th of an inch thick).

## Bank Definition

Fault codes will often indicate Bank-1, Bank-2, A, B, Sensor-1 or Sensor-2. These refer to cylinder banks, intake or exhaust camshaft sensors and oxygen sensors, as follows:

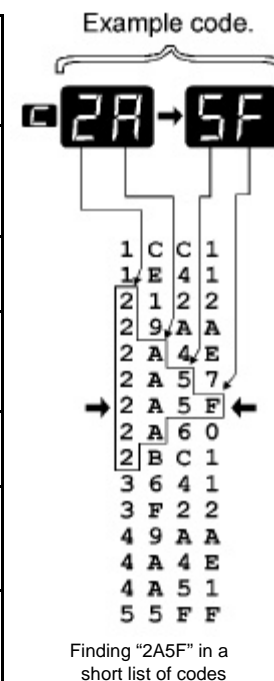
- Bank-1 = cyl 1-3 (6-cyl), cyl 1-4 (V8) or cyl 1-6 (V12); can also refer to Intake camshaft for cam sensors.
- Bank-2 = cyl 4-6 (6-cyl), cyl 5-8 (V8) or cyl 7-12 (V12); can also refer to Exhaust camshaft for cam sensors.
- A = Intake cam.
- B = Exhaust cam.
- Sensor-1 = oxygen sensor, pre-catalytic converter.
- Sensor-2 = oxygen sensor, after-catalytic converter.

## Confusion over codes with letters and numbers

Most late model BMWs store codes in a four digit format using letters and numbers. If you read these simple explanations, you will find that finding a code in this manual is almost exactly like finding a word in a dictionary.

Remember this sort order: **0 1 2 3 4 5 6 7 8 9 A B C D E F**

Let's compare looking up code "2A5F" to looking up the word "easy" in the dictionary:	
DICTIONARY Looking up the word "EASY"	CODE TABLE Looking up the code "2A5F"
Find words that start with the letter "E"	Find codes that start with the a "2"
Find the "E" words who's second letter is "A"	Find the "2" codes who's second digit is "A" ( <i>A is always between 9 and B</i> )
Find the "EA" words who's third letter is "S"	Find the "2A" codes who's third digit is "5"
Find the "EAS" words who's final letter is "Y"	Find the "2A5" codes who's final digit is "F"
<b>The only difference: instead of 26 letters, you are using 10 numbers and 6 letters: sorted: 0 1 2 3 4 5 6 7 8 9 A B C D E F</b>	



**Test Yourself:** What comes after 1999? If you said 199A, you've got it.  
What comes after 1FFF? If you answered 2000, you're set.

Note: this numbering system is called "hexadecimal". (see [Wikipedia.com](http://Wikipedia.com) for extensive info)

## Glossary:

**A/C** = Air conditioner  
**ABS** = Anti-lock Brake System  
**ASC** = Skid control (see "Intervention")  
**ADS** = Aux Throttle Position Motor  
**AHK** = Active Rear Axle Kinematics  
**Bank** = see page 39  
**BLS** = Brake Light Switch  
**Check Engine Light:** on the dashboard, indicates the DME has detected a problem  
**CAN** = Controller Area Network  
**CC** = Check control  
**CO** = Carbon Monoxide  
**DDE** = ECU for Diesel Engine  
**Diagnostic Connector:** Where the SR-300 plugs into the car. See pages 3 and 4.  
**Decimal** = Numeric format the dealer diagnostic machines report codes in. See page ? for explanation.  
**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 bank that indicates a past or present problem.  
**Fuel Trim** = adjustments to maintain proper air fuel ratio (see Lambda Control)  
**Flashing E:** (in SR-300 display) communication problem in the vehicle  
**GM** = General Module  
**Hex** = The SR-300 shows codes in a format called hexadecimal. See page ?.  
**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 request 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 Check (HFM vs TPS)**= 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 lamp  
**MLF** = Multi function Steering Wheel  
**MSR** = Drag Torque Intervention (torque reduction for anti skid) see Intervention above  
**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)  
**SR-300:** The scan/reset tool. Subject of this manual  
**RAM** = DME random access memory  
**ROM** = DME program memory  
**Scan Tool:** Generic term for the SR-300  
**Service Engine Soon:** on the dashboard, indicates the DME has detected a problem.  
**SI** = Service Interval  
**SMG** = BMW Motorsport 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 Trim)  
**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.

## Your Notes:

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**Warranty:**

Bavarian Autosport warrants, to the original purchaser, that your model number SR-300, BMW reset/scan tool, hereinafter called "unit", is free from any defects in material and workmanship and software compatibility issues for a period not exceeding ninety days from the date of purchase.\* If any such defect is discovered within the warranty period, Bavarian Autosport will repair or replace the unit free of charge, subject to verification of proof of purchase, and verification of the defect or malfunction upon delivery. This warranty does not apply to defects resulting from abuse, alterations, or unreasonable use of the unit; resulting in cracked or broken parts, or units damaged by excessive heat, cold, or moisture, or problems related to the re-programming of the car's ECU. This warranty does not apply to non-functional and cosmetic attributes of the unit such as color, finish, or labels. In no event does Bavarian Autosport assume liability for any damage beyond the refund of the purchase price of the unit. This warranty is null and void if the unit has been disassembled or modified.

\*It is the buyers responsibility to test the unit on the intended car within the warranty period to assess its functionality and compatibility (to test, simply read the codes (see pg 5) - does not effect the vehicle in any way) Failure to spot and report a problem within the warranty period will result in non-coverage.

To process a warranty claim please contact Bavarian Autosport for information & return authorization. All warranty claims must be accompanied by the original receipt. Warranty claims can only be processed by the original purchaser. This warranty is non-transferrable.

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