

Automotive Diagnostic Scanner

MERCEDES BENZ

BASIC INSTRUCTION MANUAL

Baum Tools Unlimited Inc. June 4, 2003

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ACKNOWLEDGMENT

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***NOTICE**

The specifications, information, and illustrations contained in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

This instruction manual tells you how to use the Scanner to perform diagnostic tests and find possible locations of vehicle problems. It does NOT tell you how to correct the problems. Consult the manufacturer vehicle service manual or other publication for repair instructions.

To take full advantage of the Scanner, you should be knowledgeable and well trained in each of the vehicle computer control systems described in this manual.

Service data that appear to be non-functional on some vehicles may be due to vehicle manufacturing design changes. Always refer to the manufacturers specification for the month and year of production of the model in question.

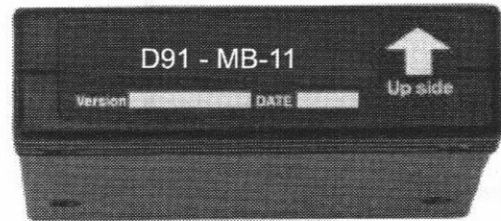
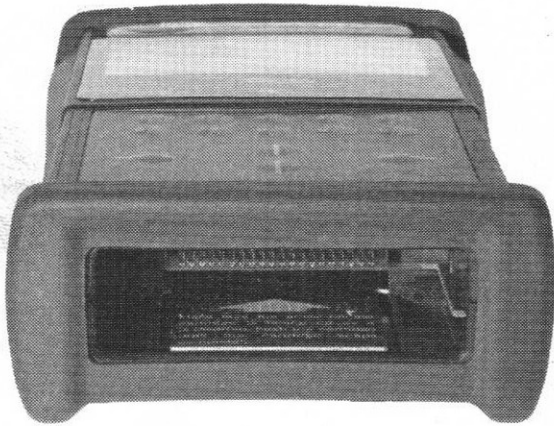
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SCANNER FEATURES

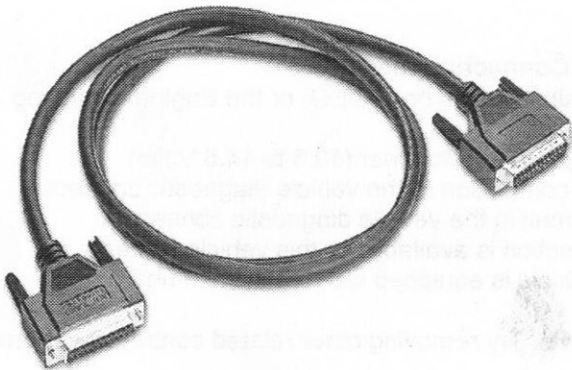


SCANNER CONNECTION

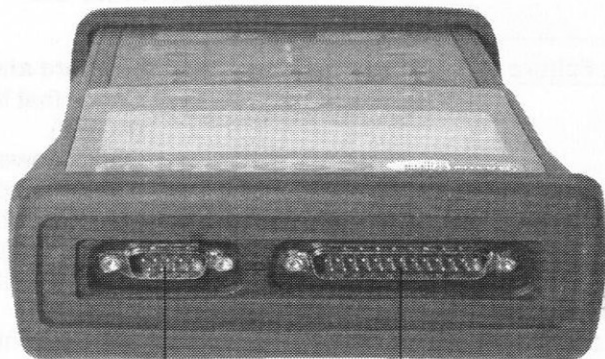
Insert the Software Module into the base of the the **iSCAN** Diagnostic Scanner and press in till you feel it click into place.



Connect the extension adapter #OB91-C0 to the 25 pin connector located on the top of the **iSCAN** Diagnostic Scanner. Tighten connector screws.



OB91-C0



Printer/Serial
Connector
(9 pin)

Adapter Cable
Connector
(25 pin)

Next locate the diagnostic port for the vehicle being tested. Choose the appropriate adapter cable for the vehicle being tested and connect to the extension #OB91-C0.

With the ignition key off, connect the adapter to the vehicles diagnostic socket and if necessary to the vehicle's battery power supply. Most diagnostic connectors supply access to power directly (Early model Volvo and Mercedes do not).

After connecting to the diagnostic socket and power is supplied, turn on the **iSCAN** Diagnostic Scanner at the ON/OFF switch on the right side of the unit. The unit will now boot up it's screen and beep to indicate it has successfully read the software module.

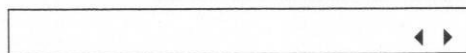
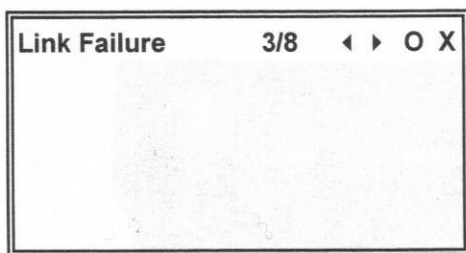
If the screen is not visible, adjust the CONTRAST CONTROL on the Left side of the unit.

Next turn the ignition key to the RUN position or Start the vehicle. Now follow the menu on the screen to access the system you wish to test.

!!! If the diagnostic link circuit is shorted to ground or a control unit is faulty, the green or yellow LED light will turn on steadily when the scanner is connected to the vehicle diagnostic connector.

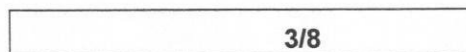
SCANNER SCREEN ICONS

Some displays include icons on top line of the screen that give you extra information.



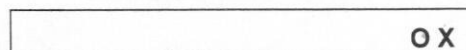
Page keys

When either of these icons ◀ ▶ appears in the top line of the screen, there is more information available. Press the ◀ (left) or ▶ (right) arrow key to view this additional information.



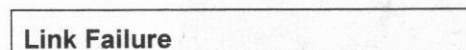
Page information

Display current page number and total number of pages.



Options Possible

- O - Press Enter
- X - Press Exit



Link Failure and No Connection messages

- Check that the Ignition key is on (KOEO) or the Engine is running (KOER).
- Check power supply to the Scanner (10.5 to 14.5 Volts).
- Check for correct connection to the vehicle diagnostic connector.
- Check for short circuit in the vehicle diagnostic connector.
- Check that this function is available for this vehicle system.
- Check that the vehicle is equipped with the system under test.

A faulty control unit can interrupt the diagnosis of other control units. Try removing other related control units from the CAN bus until the control unit under test responds.

Communication Troubleshooting

1. If the scanner can't communicate with the control unit, please check the following:

- ! Does the car have this system installed.
- ! Ignition ON?
- ! Is the diagnostic connection okay? Check for a damage to the connector, pin drop outs, broken wires or corrosion.
- ! Check power supply at control unit in accordance with the factory circuit diagram.
- ! Is the control unit installed properly?
- ! If the control unit is new, check to see that the control unit was coded properly.
- ! If the car has been jumped or had a power failure, disconnect the control unit and reconnect after 5 minute to reinitialize the controller.

If the diagnostic circuit is shorted to ground or a faulty control unit is in vehicle, the green or yellow LED light on the scanner will remain on steadily when the scanner is connected to the vehicle diagnostic connector.

2. A faulty control unit can interrupt the diagnosis of other control units. Try removing other related control units from the CAN bus until the control unit under test responds.

iSCAN Internal Error Codes

10006 Communication received from ECU is not understandable. This error most often occurs occur when the diagnostic line is held at a voltage different than that which is normal for the vehicle under test or when the information is distorted. This can caused by a faulty ECU, an ECU which is "diagnostically locked" or when the contacts to the diagnostic connector are dirty or corroded causing an incomplete connection.
Recommendation: Clean contacts, disconnect ECU from power and reconnect. For DMEs from 1988-94 perform a "pedal code test" to determine if the diagnostic circuit is functioning.

Link Failure - Communications received from ECU suddenly ceased or did not meet CRC checksum. See above.

Technical Support

Before calling technical support please have the following information ready:

Your Name:

Telephone:

Base Unit Serial Number: (**iSCAN** remove rubber cover to view label on bottom of unit.)
(iScan turn on unit with no module inserted and press the ENTER button)

iSCAN Software Version Number

Make/Model of Vehicle Tested:

Model Production Date:

System Under Test: (Engine, Transmission, ABS...)

Battery Voltage:

Nature of failure:. Please describe as completely as possible. (No communication, no service reset, no data stream,...)

Did other systems test properly? (Engine, ABS, SRS, ...etc.)

Original reason for scanning vehicle (Owners complaint)

Baum Tools Technical Support hotline

800-804-1002

or

email: tech@baumtools.com

548-6657

Mercedes-Benz

1. Setting Up:



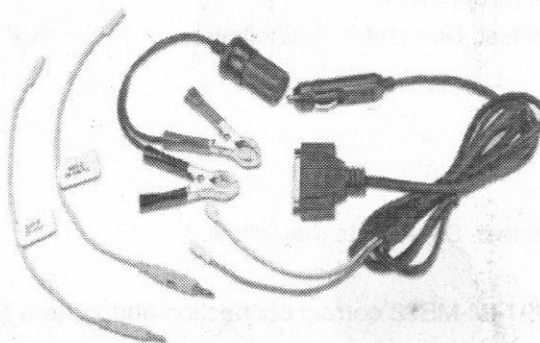
Module Insertion

Insert the **OB91-2** memory module into the base of the scanner. Make sure the arrow on the module is facing up as it is inserted. Push the module until the module snaps into place completely. If the module is inserted correctly, you will feel it click into place.



Cable Hook up

Universal Mercedes Adapter for 8, 16 and 38 Pin 1988-1999 (1986-1992 Diesel)



D51-C-MBLV

Attach 25-pin connector of the extension cable to the D51-C-MBLV adapter. Next connect a Mercedes probe D51-C1-2P-MB-8/16 (yellow cable) to the yellow wire. Next connect the yellow probe to the pin location in the 8, 16 or 38 pole diagnostic socket. (See diagnostic socket layouts on the next 4 pages.)

Optional Multiplexer for vehicles with 38 Pin diagnostic sockets 1993-1999 except W124

This optional adapter allows the software to automatically select the correct diagnostic test point for the system under test.



D91-IM-MB38 38 Pin Multiplexer

General Usage Notes

The **ISCAN** Code Scanner can display available fault codes from Mercedes Benz vehicles fitted with 8-pole, 16-pole and 38-pole Diagnostic Connectors by using the adapter P/N 91-C2 and P/N 91-C2-1 (38 pin socket only). Once fitted to the scanner the adapters wires are connected to vehicle diagnostic socket as follows:

8 Pin Socket

- Red - Battery + (use included battery clip)
- Black - pin #1 or any ground point (Earth)
- Yellow - To pin system under test. See charts that follow.

16 Pin Socket

- Red - Pin 16 (if pin is wired) or to Battery + (use included battery clip)
- Black - Pin #1 or any ground point (Earth)
- Yellow - Pin to system under test. See charts that follow.

38 Pin Socket

- Red - Pin 3
- Black - Pin #1
- Yellow - Pin to system under test. See charts that follow.

When using the 38 pin multiplexer #91-IM-MB38 correct connection and system choice is automatic.

Vehicle Diagnostic Connector Location

! Model 201, 126, 124

Vehicle diagnostic connector is located in the engine compartment, passenger side and near battery.

! Model 202, 129 and model 140 up to 1996

Vehicle diagnostic connector is located in the engine compartment, passenger side, in the ECU box.

! Model 140 from late 1996

Vehicle diagnostic connector is located in the engine compartment, under passenger side cover

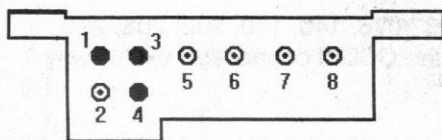
! Model 163, 170, 203, 208, 215, 220 and all models from 2000

Use OBD-II connector located in the center console.

! Model 170, 210

Vehicle diagnostic connector is located in the engine compartment, driver side, in the fuse box.

Connector Layout of Vehicle Diagnostic Connector

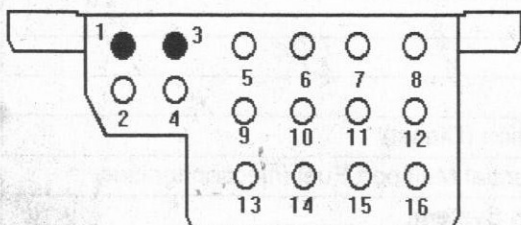


8-pole Diagnostic Connector

Models: 201, 124 - Engine compartment next to battery.

107, 126 - Engine compartment center of plenum.

1		Ground
2		Not used
3	CIS-E	Continuous fuel injection system (CFI)
4	ELR EDS	Diesel injection system - Electronic idle speed control system Electronic diesel system
5	ASD 4MATIC	Automatic locking differential Automatic-engaged four wheel drive (124 only)
6	SRS	Supplemental Restraint System
7	A/C	Air Conditioning
8		Not used



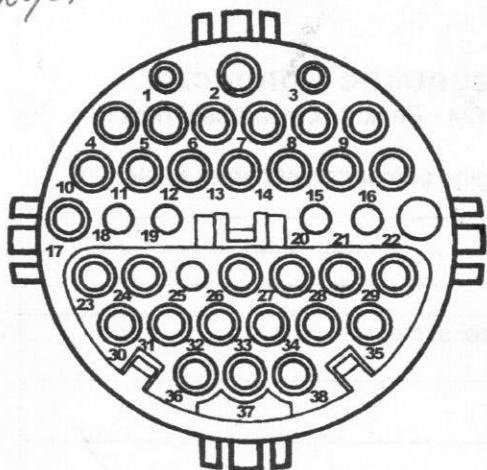
16-pole Diagnostic Connector

Models 124, 129 - Passenger side of engine compartment under computer cover.

1		Ground
2	OBD	Push-button for On Board Diagnostic (California only)
3	CIS-E DM	Continuous Fuel injection system (CFI) Diagnostic Module - LED (California only)
4	EDS	Electronic diesel system
5	ASD 4MATIC	Automatic locking differential Automatic-engaged four wheel drive
6	SRS / AB	Supplemental Restraint System / Air Bag
7	A/C RB	Air Conditioning (Model 124) Roll Bar (Model 129)
8	DI HFM-SFI PEC	Distributor ignition HFM Sequential multi-port Fuel Injection/Ignition system Pressurized engine control
9	ADS RB	Adaptive Damping System Roll Bar (Model 124)*
10	RST	Roadster Soft Top (Model 129) TN-signal (Gasoline)
11	ATA	Anti Theft Alarm system
12	IRCL	Infrared Remote Central Locking
13	ETC	Electronic automatic Transmission Control
14	EA CC / ISC ESCM	Electronic Accelerator (Model 124) Cruise Control / Idle Speed Control (Model 124) Engine System Control Module (MAS), (Model 129)
15		Not used
16		Voltage, Ignition ON (Circuit 15) (Not equipped on all models.)

*Model 124 Convertible Soft Top Test port is in the passenger side footwell. Access pin #2 to test for codes.

707-518-6415
Angelo



38-Pin Diagnostic Connector

Models

124.034/036, 129.058/063/067/076, 140, 170, 202, 208, 210
(Note the 163 chassis uses the OBD-II connection exclusively for all diagnostics)

This connector is best accessed using the Mercedes 38 pin Multiplexer cable #CS2-OB91-IM-MB38

The Mercedes Diagnostic "Mushroom" #140-1463 available from Baum Tools Unltd. is recommended to allow access to the diagnostic connector using the CS2-OB91-C2 adapter. Call 800-848-6657 or 941-927-1414 for more information.

Pin	System	Description
1	Ground (Terminal 31)	W12 (Chassis Ground), W15 (Electronics Ground)
2	Voltage, terminal 87	Ignition Switch 12volts +
3	Voltage, terminal 30	Battery 12volts +
4	EDS	Electronic Diesel System
	IFI	In-line Fuel Injection
	DFI	Electronic Distributor-type Fuel Injection (Diesel)
	HFM-SFI	Hot-Film Engine Management Sequential Multiport Fuel Injection/ignition
	LH-SFI	LH Sequential Multiport Fuel Injection System Engines 104, 119 Engine 120 Right Bank
	ME-SFI	Motor Electronics with Sequential Multiport Fuel Injection/ignition System Engine 111, 112, 113, 119 Engine 120, Right Bank
5	LH-SFI	LH Sequential Multiport Fuel Injection, Engine 120 Left Bank
	ME-SFI	Motor Electronics with Sequential Multiport Fuel Injection/ignition System Engine 120 Left Bank
6	ABS	Anti-lock Brake System
	ETS	Electronic Traction System
	ASR	Acceleration Slip Regulation
	ESP	Electronic Stability Program
7	EA	Electronic Accelerator+
	ISC	Idle Speed Control
	CC	Cruise Control/idle Speed Control
8	BM	Base Module
	BAS	Brake Assist
9	ASD	Automatic Locking Differential, Models 124, 129, 140
10	EATC	Electronic Automatic Transmission Control (5-speed AT) (722.6)
	ETC	Electronic Transmission Control (722.6)
11	ADS	Adaptive Damping System
12	SPS	Speed-sensitive Power Steering
13	TD	Speed Signal (Time Division) (Di) (Diesel) Models 202, 210
	TNA	Signal (Gasoline) on LH-SFI
	TN	Speed Signal (DI/KSS) (Gasoline) on HFM-SFI, ME-SFI
14	Lambda ON/OFF ratio	LH-SFI Engine 119, LH-SFI Engine 120 LH-SFI, Right Bank

15	Lambda ON/OFF ratio	LH-SFI Engine 120 Left Bank
	IC	Instrument Cluster
16	HEAT	Automatic Heater
	TA/C	Air Conditioning (Tempmatic)
	AA/C	Air Conditioning (Automatic)
17	DI	Distributor Ignition, Engines 104, 119, Engine 120, Right
	TD	Speed Signal (Time Division) (Di) (Diesel) Model 140
	TN	Speed Signal (DI/KSS) (Gasoline) on LH-SFI / model 202 HFM-SFI
18	DI	Distributor Ignition, Engine 120, Left
19	DM	Diagnostic Module
20	PSE	Pneumatic System Equipment, Model 140
	MFCM	Multi-function Control Module, Model 210
21	CF	Convenience Feature, Model 140
	RST	Roadster Soft Top, Model 129
22	RB	Roll Bar, Model 129
23	ATA	Anti-theft Alarm
24-25	-	
26	ASD	Automatic Locking Differential, Model 202
27	-	
28	PTS	Parktronic System, Model 140
29	-	
30	AB	Airbag/emergency Tensioning Retractor
31	RCL	Remote Central Locking
32	-	
33	RD	Radio audio 10, Audio 30, Audio 30 APS and COMMAND with D2B
34	ICS/CNS	Information Communication and Navigation System
35	-	
36	STH	Stationary Heater
36	HB/ZUH	Heater Booster
37-38	-	

Mercedes Models from 1994-99 with OBD-II Socket in Passenger Compartment



OBD-II Connector

Models 124, 140, 163, 170, 202, 208, 210, 220 chassis.

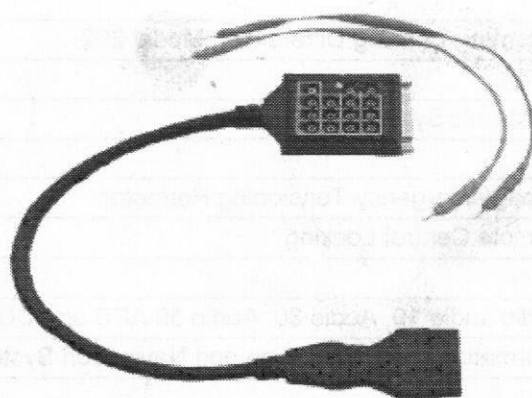
The diagnostic connector is located in the passenger compartment, within 3 feet of the steering column or in the center console. The most common location is the center console of the dash, near the parking brake or transmission lever or under the dash on the left or right side of steering column.

DO NOT CONFUSE THIS WITH THE 16-PIN CONNECTOR IN THE INSTRUCTION MENU. NEVER HOOK TO PIN 8 OF THIS CONNECTOR.

Beginning with the 1994 3.2 liter 104 engine and all 1996 and later **ML320** Mercedes began to phase in the 16 pin OBD-II (J1962) X11/22 diagnostic socket. in the passenger compartment, drivers side, under the dash.

The adapter #OB91-C4-16H is designed to allow access to the 1994 and later Mercedes models utilizing the OBD-II Socket J1962 found in the dash.

For 1996 and later Mercedes models **without 38 pin diagnostic block** use the following adapters with the **iSCAN**.



OB91-C4-16H

Example: To test a vehicle equipped with ME Engine control, jumper the YELLOW wire from the YELLOW spot into pin #7. Then perform engine diagnostic with the **iSCAN** by going to **Engine > ME >** and choose the appropriate system type (4/6, 8 or 12 Cylinder Right or Left).

ATTENTION: NEVER JUMPER TO PIN 8 ON THE OBD-II (J1962) CONNECTOR

If the vehicle is equipped with the 38 pin X11/4 diagnostic socket, use it in place of the OBD-II socket in the passenger compartment.

Chassis 163, 170, 203, 208, 210, 211, 215, 220

Pin No	Application	Note
1	ME (Pin B3) 111, 112, 113 and 137 Engine from 2001.	ME 2.8, ME2.7, SIM4.
2		
3	ME (pin C38) 112/113 Engine HFM (pin 2/18) 111 Engine	Not for USA vehicles. Use pin 7.
6	CAN Bus H-Line (High)	
7	ME (pin C39) 112/113 Engine HFM (pin 2/19) 111 Engine	All 1996 and later models
8	Ignition Key (87) DANGER - DO NOT CONNECT	DO NOT CONNECT
9	Electronic Traction Systems (ABS, ETS, SPS, ESP, BAS)	
10		
11	Transmission Control Module (TCM or ETC)	
12	All Activity Module (AAM) (163 only) Extended Activity Module	All models from 8/1999 prod. Use this pin for all internal body systems on M-Class vehicles except SRS/Airbag.
13	SRS, ETR, ETA, GUS	
14	CAN Bus L-Line (Low)	
15	Instrument Cluster (IC) Automatic Air Conditioning (AAC) (Except 163, use AAM) Headlight Control (163 only)	If the vehicle is equipped with the 38 pin diagnostic socket, try it also.

On M-Class models (163) ALL diagnostics for AC, Anti-Theft, Immobilizer and radio are performed through the AAM connection at Pin 12.

A Class A140/A160 (168 Chassis)

Pin No	Application	Note
1	Driver Authorization System (DAS)	Not for USA vehicles.
2		
3	TN signal (RPM)	
6	CAN Bus H-Line (High)	
7	MSM Fuel/Ignition System CDI (Common Rail Diesel Injection)	ECM/MSM
8	Ignition Key (87) DANGER - DO NOT CONNECT	DO NOT CONNECT
9	Electronic Traction Systems (ABS, ETS, SPS, ESP, BAS) Parktronic System (PTS)	
10		
11	Transmission Control Module (TCM or ETC) Automatic Clutch Auto-Pilot System (APS GPS/Radio Nav system)	
12	Anti-Theft Alarm (ATA) Radio Auto-Pilot System (APS GPS/radio Nav system)	APS from 9/98-
13	SRS	ETR (GUS)
14	CAN Bus L-Line (Low)	
15	Instrument Cluster (IC) Automatic Air Conditioning (AAC)	

Starting Diagnosis

- A) Identify systems present in the model under test. If unsure see the model identifier on page ?.
- B) Turn ignition ON (KOEO) or start Engine (KOER). Note: Some tests can only be performed with the engine running, such as 4MATIC systems.
- C) Select System to test. See menu listing that follows. Use the left and right arrows to page through the systems choices and the up and down arrow to highlight the desired test. Use ENTER to begin test.
- D) Follow the menu directions on the screen for hookup. **Note: NEVER CONNECT TO PIN 8 OF THE OBD-II CONNECTOR. This is Battery + and will cause damage to the unit.**

RANGE OF DIAGNOSTICS

Controller Identification

When the **iSCAN** first connects to the controller it requests the internal identification information in order to correctly interpret the data it receives. The scanner presents this information as 1 or 2 screens at the beginning of analysis. This information includes the Mercedes Benz part number, manufacturer, hardware number, software number and diagnostic index, as well as other information such as coding number if available. **It is important to record this information if coding, resetting of adaption or programming is to be attempted.**

Data Stream

The displays the sensor signals, component readiness and output stage information from the electronic control unit (ECU). This information is used to analyze the particular fault that may be present or to monitor running of the engine or controller under test. Use this feature to verify component operation and system parameters. Nominal values for most systems are found in the Mercedes Benz Diagnostic Manuals or Workshop Information System (WIS). See page ? for a listing.

Reading Codes

The scanner reads fault codes, known as Diagnostic trouble Codes or DTCs for short, directly from the electronic control unit's memory and displays a short description of each code. When there is no fault in the system, the message "No fault stored" will be displayed on the screen.

About Stored, Registered and Current Faults

Stored or Permanent Faults - These faults generally turn on the MIL (malfunction indicator lamp) for the system with the failure and are recorded in the permanent memory of the cars system controller. Clearing these codes most often will extinguish the MIL. (See Registered Faults below.)

Registered or Pending Faults - These faults can keep the MIL on. These faults are recorded in the temporary memory of the of the cars system controller. This temporary memory records the number of times a component fails. When a certain number of failures has occurred the fault is moved to permanent storage and the Check Engine Light (MIL) will be illuminated. On cars equipped with Fault Registers the Check Engine Light may stay on after the Stored or Permanent Fault has been erased if another occurrence of the fault has happened since the original Permanent Fault was stored. To ensure the MIL is extinguished, erase the Stored and Registered faults.

Current or Actual Faults - These faults are detected while the car is running at idle or speed. They represent components currently failing or, in the case of some HFM and LH systems, components that are not present. These codes cannot be erased, and are only meaningful with the ignition on and the engine running. Codes found in this system with the KOEO have no meaning. Components not present on the vehicle may be flagged as failing by the cars internal diagnostics due to the generic nature of the cars software. This is particularly true in C-Class (202) cars.

More on DTCs

The **Engine Control Modules** for the LH-SFI, HFM-SFI, ME-SFI and some CIS/E (CFI) systems are equipped with diagnostic trouble code (DTC) memory. Injection and ignition malfunctions are detected through a variety of strategies and are stored as trouble codes and are distinguished as follows:

- ▶ Malfunctions which are constantly present,
- ▶ Malfunctions which occur longer than a pre determined number of seconds,
- ▶ Intermittent contact malfunctions which have occurred 5x during a trip.

The DTC memory remains active even if the vehicle's battery is disconnected.

Malfunctions which are no longer present, are automatically erased again after a maximum of 19 trips.

Under HFM-SFI a **TRIP** has occurred if:

- ✓ Engine running more than 5 minutes
- ✓ Vehicle speed >4 km/h (2.5 mph),
- ✓ Engine speed >700 rpm,
- ✓ Engine shut off for 30 seconds.

Under ME-SFI a **TRIP** is

- ✓ Engine running for more than 20 minutes,
- ✓ Engine temperature is greater than -7 degrees C,
- ✓ Engine speed is greater than 500 RPM,

The stored diagnostic trouble codes (DTCs) can be read at the 8, 16 (129 SL and 124 E-class), 38 pin or OBD-II data link connector with the ignition switched "ON" or with the "engine running".

Diagnosis via an on-off ratio readout has been eliminated in all models after 1991.

The **Transmission Controllers** for 722.5 and 722.6 monitor the operation of solenoids and speed sensors and flags failures or components whose values are out of range for proper operation. When values are stored the controller will turn on the MIL and will normally enter a "Limp Mode" to limit damage.

ABS and Traction Controllers monitor for incorrect sensor signals. When faults are stored the MIL may or may not be illuminated depending on the severity of the fault. Illumination of the MIL for these systems always indicates that the system is not function and has been turned off.

Identification/Rectification of Faults

Record the fault codes and pertinent information from the Data Stream for these components. Clear all fault codes. Perform a test drive to reproduce the fault and rerun the diagnosis with the scanner. Verify all codes and carry out the repair procedures as outlined in the factory service and repair literature.

Clearing Codes

After repairs have been carried out. Select the **CLEAR CODE** function to erase all of the fault codes from the control unit memory. See the section on **Check Engine Light (MIL) Diagnosis** following this section for special consideration of the Engine MIL diagnosis and erasing.

Check Engine Light (MIL) Diagnosis

Mercedes S(140), SL(129), E(124, 210) and C(202) class have multiple system controllers which can turn on an Check Engine Lights. All related systems must be tested for codes, the codes erased and components repaired before the light will extinguish.

107, 124, 126, 129, 201	CFI (CIS/E) (pin 3), Engine System Control Module (MAS) (pin 14)
129 LH	LH (pin 4 & 5), EA/CC/ISC (pin 7), BM (pin 8), DI (pin 17 & 18) and DM (pin 19)
140 LH	LH (pin 4), EA/CC/ISC (pin 7), BM (pin 8), DI (pin 17) and DM (pin 19)
124 HFM	HFM (pin 8), EA/CC/ISC (pin 14), and DM (pin 3)
140 HFM	HFM (pin 4), EA/CC/ISC (pin 7), BM (pin 8), DI (pin 17) and DM (pin 19)
202 HFM	HFM (pin 4), EA/CC/ISC (pin 7) (except C220) and DM (pin 19)
210 HFM	HFM (pin 4), EA/CC/ISC (pin 7), BM (pin 8), DI (pin 17) and DM (pin 19)

Note: ME-SFI injection integrates all these systems into the ME-SFI controller.

"The check engine light still has not gone out after clearing ALL codes!"

Be sure to cycle the ignition on and off in the following manner.

Clear all codes.
Turn off ignition for 10 seconds.
Turn on ignition and start vehicle. Run for 30 seconds.
Turn off ignition for 10 seconds.
Turn on ignition and start vehicle.

Has the light gone out? If not, on LH and HFM injected vehicles, reset the Diagnostic Module. Note that if the cause of the fault has not been corrected the light WILL NOT GO OUT.

Adaption

Adaption is the learning done by the control unit over a period time in order to optimize running conditions.

Engine adaptation is the precise control of fuel and air to maintain optimal burning. This is known as the lambda Control System.

The Lambda Control System precisely determines fuel injection duration so that the fuel/air ratio is consistently kept at Lambda equal 1 (Lambda=1 is 14.7 kg air per 1 kg fuel) under all operating conditions.

Long Term Adaption (Additive), also called Long Term Fuel Trim (LTF), is calculated while the engine is at idle. Maximum allowable correction to rich or lean is ± 1.0 msec of the injection duration at idle.

Short Term Adaption (Multiplicative), also called Short Term Fuel Trim (STF), is calculated while the engine is at Low Partial Load and at High Partial Load. Maximum allowable correction to rich or lean is $\pm 32\%$ of the injection duration at Low or High partial load.

Under ME-SFI the engine control will automatically adapt itself again (ME injection) over the course of **10 TRIPS**.

Should a malfunction occur in the form of:

- * Intake air leaks
- * Injector defects or carbon build-up,
- * Air Flow Sensor defects
- * Pressure regulator defects, such as a blown diaphragm.
- * Fuel tank purge control valve defects or EVAP system leaks.]
- * EGR defects
- * Vacuum leaks of any kind.
- * Mechanical engine wear, such as, chipped valves or leaking rings.

The engine control module automatically performs a mixture adjustment. The degree of correction is calculated constantly and stored in KAM (Keep Alive Memory) RAM. The self-adaptation is performed at idle and under partial load. Maximum correction towards rich or lean is 25%. After repair work is performed, the engine control module will automatically adapt itself again after approx. 10 trips. After eliminating a malfunction or after trial installation of an engine control module from another vehicle, the self-adaptation feature must be reset to its mean value.

"Resetting and Reactivating for BOSCH Engine Control Module Memory"

For LH & HFM systems only.

To reset and reactivate the LH or HFM control module :

1. Read and clear all fault codes
2. After display of 1 (No faults present) short the diagnostic plug (pin 8 for 16 pin diagnostic socket, pin 4 for 38 pin diagnostic socket) to ground for 6 to 8 seconds
3. Switch ignition off and wait at least 5 seconds
4. Turn ignition on, wait minimum of 10 seconds then restart engine.

A DM "RESETTING" feature is built into the **iSCAN** and is accessed through the Diagnostic Module menu.

Activation

This feature lets you to activate all solenoid driven components accessible to the control unit. This allows you to check whether the component is functional and the quality of its operation.

Activation occurs in 2 ways, with KOEO and KOER. Older systems like LH require some solenoids to only be activated with the key in the run position and the engine OFF. Later systems may not have this requirement. Just follow the screen directions for proper operation for the vehicle under test.

DO NOT SKIP A STEP OR DAMAGE TO THE ENGINE MAY OCCUR!

CODING & PROGRAMMING

Basic Definition of Coding and Programming

Let's imagine that control units are like books.

Some controllers are codable which means that the book comes full of all the short stories needed. Each short story stands on its own and does not require the assistance of any other story. When you code this controller you are choosing one short story over all of the others. This "story" would describe all the components this controller can talk to, such as EGR, EVAP or Secondary Air systems and other components effecting operation, such as Catalytic Convertors or Oxygen Sensors. This type of coding is sometimes called "variant" coding.

Programming a controller is an entirely different matter. Programmable controllers come with the basic publishing information, but lacks the short stories. In essence, the body of the book is nothing more than blank pages. This method allows you to use few books for many stories. There is no need for an extensive book collection on your shelf.

Coding or Variant Coding

Most Mercedes Benz controllers only require coding in order to make them fully operational. The easiest method of coding, called "Auto Coding".

To "Auto Code" an HFM or ME engine controller:

- ! Query the old controller for its coding information. This information is then recorded in the **iSCAN**.
- ! Install the new controller without powering down the **iSCAN**.
- ! Input the information from the **iSCAN** into the new controller.

Currently the **iSCAN** supports "manual" coding for the HFM controllers only. Manual coding is only required when a control unit cannot be queried for identification information due to catastrophic failure. The coding information for new controllers is available from the Mercedes Benz parts department and is found in the footnote section of the EPC for the ECU in question.

Available ECU Coding functions.

ECU versions:

LH-SFI 104 Engine 1991 – 7/1993 119/120 Engine 1991 - 1995	ECU does not allow Coding.
PMS (PEC) 111 Engine (1.8L/2.0L) 1992 - 1995	ECU not allows the Coding function
HFM-SFI	iSCAN performs Manual and Auto/Transfer Coding. ECU Diagnostic Index before 42/00 does not allow Coding. Coding allowed from Diagnostic Index 45/00. (ECU Diagnostic Index will be shown on ECU Identification page.)
ME-SFI 2.0, 2.1 up to 5/2000	iSCAN performs Auto/Transfer Coding only.
ME-SFI 2.7, 2.8 and SM4LE from 6/2000	iSCAN DOES NOT perform Coding at this time.
SRS (Airbag) 1994-1998 (1993 model can be coded if retrofit with later model controller)	ECU allows Parameter setting and Coding. iSCAN automatically detects whether the SRS controller allows parameter setting and coding. If the Adaptation choice is not available in the menu the controller can not parameter set and coded.

Basic Coding Procedure:

- 1) Choose ENGINE/Digital (LH/HFM/ME)
- 2) Write down ALL Identification information numbers for the controller.
- 3) Press ENTER (O).
- 4) Choose ADAPTATION and Press ENTER
- 5) Choose TRANSFER CODING and press ENTER
- 6) Follow screen directions.
- 7) Turn off ignition DO NOT DISCONNECT THE **iSCAN** / CS2000 UNIT FROM POWER.
- 8) Replace controller with new unlocked controller.
- 9) Turn ignition on wait 10 mseconds then follow screen directions.

Programming

Programming starts with an EEPROM or basic programmable control module that has very little information in it. This is referred to as resident data. This resident data gives the EPROM its identification and contains instructions for the programming of the operational maps. When you program, you are inputting operational maps to the control module such as injection timing and ignition timing.

Currently Mercedes Engine controllers do not require “programming” currently.

MERCEDES BENZ A/C AND HEATING SYSTEMS

**Chassis 129, 140, 202, 208 & 210
(1990-97)**

PROCEDURES FOR SELF DIAGNOSIS

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TAU 2.1

READING ACTUAL VALUES

1. Remove the operating console from the TAU
2. At the upper side of the operating console there is a display.
3. Ignition ON : Position 1
4. The fan speed selector NOT on position 1
5. The display alternates between the sensor/component number and the value of that sensor/component. Example: "OP E" : Open circuit or "CL O" : Closed circuit.

COMPONENT UNDER TEST

Number	Component
02	Interior Temperature Sensor
04	Exterior Temperature Sensor
06	Evaporator Temperature Sensor
08	Left Heater Core Temperature Sensor
10	Right Heater Core Temperature Sensor
12	Engine Coolant Temperature Sensor (ECT)
14	Left Temperature Selector Wheel Setting (Degree C)
16	Right Temperature Selector Wheel Setting (Degree C)
18	Vehicle Speed Signal(km/h)
20	Soft Top OPEN : "U", Soft Top CLOSED : "O"
22	Power Supply Voltage
83	OFF/ON (Not Used)
84	Blower Motor Voltage "050" (0.5v) - "600" (6.0v)

TAU 2.1

FAULT DIAGNOSIS

- 1 Turn temperature selector wheel into the white area.
- 2 Place the air speed selector at position 0 and the air direction to "DOWN"
- 3 IGNITION = ON : Position 1
- 4 Within the next 10 sec., press the "RECIRCULATE AIR" and "REST" button simultaneously for 3 sec.
- 5 Press the AUTO button until all error numbers are read and recorded.

FAULT CODES - TAU 2.1

DTC Readout	Description	Cause
1	No DTC's Stored in System Memory.	No faults
2	In-Car Temperature Sensor (B10/4)	Short Circuit
3	In-Car Temperature Sensor (B10/4)	Open Circuit
4	Outside Temperature Sensor (B10/5)	Short Circuit
5	Outside Temperature Sensor (B10/5)	Open Circuit
6	Evaporator Temperature Sensor (B10/6)	Short Circuit
7	Evaporator Temperature Sensor (B10/6)	Open Circuit
8	Heater Core Temperature Sensor (B10/1)	Short Circuit
9	Heater Core Temperature Sensor (B10/1)	Open Circuit
10	Heater Core Temperature Sensor (Right)	Short Circuit

FAULT CODES - TAU 2.1

DTC Readout	Description	Cause
11	Heater Core Temperature Sensor(Right)	Open Circuit
12	Engine Coolant Temperature Sensor (B10/8)	Short Circuit
13	Engine Coolant Temperature Sensor (B10/8)	Open Circuit
16	Center Air Vent Control Module (N18/2r2)	Short Circuit
17	Center Air Vent Control Module (N18/2r2)	Open Circuit
18	Center Air Vent Feedback Potentiometer (R23/3)	Short Circuit
19	Center Air Vent Feedback Potentiometer (R23/3)	Open Circuit
20	Left Air Vent Control Module (N18/2r1)	Short Circuit
21	Left Air Vent Control Module (N18/2r1)	Open Circuit
22	Left Air Vent Feedback Potentiometer (R23/1)	Short Circuit
23	Left Air Vent Feedback Potentiometer (R23/1)	Open Circuit
24	Right Air Vent Control Module (N18/2r3)	Short Circuit
25	Right Air Vent Control Module (N18/2r3)	Open Circuit
26	Right Air Vent Feedback Potentiometer (R23/2)	Short Circuit
27	Right Air Vent Feedback Potentiometer (R23/2)	Open Circuit
30	Auxiliary Coolant Pump	Short Circuit
31	Automatic A/C Monovalve (Left)	Short Circuit
32	Automatic A/C Monovalve (Right)	Short Circuit
33	A/C Compressor Signal	Short Circuit
34	Auxiliary Fan Signal 2 Stage	Short Circuit
35	Auxiliary Fan Signal 1 Stage	Short Circuit
50	Switchover Valve Block Signal	Short Circuit
70	Auxiliary Coolant Pump	Open Circuit
71	Automatic A/C Monovalve (Left)	Open Circuit
72	Automatic A/C Monovalve (Right)	Open Circuit
73	A/C Compressor Signal	Open Circuit
74	Auxiliary Fan Signal 2nd Stage	Open Circuit
75	Auxiliary Fan Signal 1st Stage	Open Circuit

129 Chassis to 8/95

READING ACTUAL VALUES

1. IGNITION ON : Position 1
2. Press the REST button and within 1 second press blower speed button 4.
3. The temperature window (upper left) will alternately display the test step number (ex. "02" In-car Temp) or "0P E" for Open Circuit or "CI 0" for Closed Circuit.
4. Press "F" button to go to higher test.
5. Press "C" button to go to a lower test.
6. To end this test mode turn IGNITION OFF : Position 0 for longer then 5 seconds.

COMPONENT UNDER TEST

Number	Component
02	In-Car Temperature Sensor
04	Outside Temperature Sensor
06	Evaporator Temperature Sensor
08	Heater Core Temperature Sensor
12	Engine Coolant Temperature (ETC) Sensor
14	Temperature Selector Wheel Setting
18	Vehicle Speed Signal(km/h)
20	Soft Top OPEN : "U" ; Soft Top CLOSED : "O"
22	Power Supply Voltage
83	OFF/ON (Not Used)
84	Blower motor voltage "050" (0,5V) - "600" (6,0V)

129 Chassis to 8/95

FAULT DIAGNOSIS

1. Turn temperature selector wheel into the white area.
2. IGNITION ON : Position 1
3. Within the next 10 sec., press the "F", "RECIRCULATE AIR" and "REST" buttons simultaneously for 2 to 4 seconds.
4. The display will show the permanent DTC's stored. press the "RECIRCULATE AIR" button after each is displayed until the display reads "END"
5. Press "RECIRCULATE AIR" button again and the intermittent DTC's will be shown. A SQUARE is shown after each DTC to indicate that it is intermittent. Press the "RECIRCULATE AIR" button again to see the next DTC. Until "END" is shown.
6. To erase the DTC's : IGNITION ON : Position 1 Press the "RECIRCULATE AIR", "REST" and "UP" buttons simultaneously until --- is displayed in the window.

FAULT CODES - 129 Chassis to 8/95

DTC Readout	Description	Cause
1	No DTC's Stored in System Memory.	No Faults
2	In-Car Temperature Sensor (B10/4)	Short Circuit
3	In-Car Temperature Sensor (B10/4)	Open Circuit
4	Outside Temperature Sensor (B10/5)	Short Circuit
5	Outside Temperature Sensor (B10/5)	Open Circuit
6	Evaporator Temperature Sensor (B10/6)	Short Circuit
7	Evaporator Temperature Sensor (B10/6)	Open Circuit
8	Heater Core Temperature Sensor (B10/1)(Left)	Short Circuit

FAULT CODES - 129 Chassis to 8/95

DTC Readout	Description	Cause
9	Heater Core Temperature Sensor (B10/1)(Left)	Open Circuit
10	Heater Core Temperature Sensor (Right)	Short Circuit
11	Heater Core Temperature Sensor(Right)	Open Circuit
12	Engine Coolant Temperature Sensor (B10/8)	Short Circuit
13	Engine Coolant Temperature Sensor (B10/8)	Open Circuit
16	Center Air Vent Control Module (N18/2r2)	Short Circuit
17	Center Air Vent Control Module (N18/2r2)	Open Circuit
18	Center Air Vent Feedback Potentiometer (R23/3)	Short Circuit
19	Center Air Vent Feedback Potentiometer (R23/3)	Open Circuit
20	Left Air Vent Control Module (N18/2r1)	Short Circuit
21	Left Air Vent Control Module (N18/2r1)	Open Circuit
22	Left Air Vent Feedback Potentiometer (R23/1)	Short Circuit
23	Left Air Vent Feedback Potentiometer (R23/1)	Open Circuit
24	Right Air Vent Control Module (N18/2r3)	Short Circuit
25	Right Air Vent Control Module (N18/2r3)	Open Circuit
26	Right Air Vent Feedback Potentiometer (R23/2)	Short Circuit
27	Right Air Vent Feedback Potentiometer (R23/2)	Open Circuit
30	Auxiliary Coolant Pump (M13)	Short Circuit
31	Automatic A/C Monovalve (Y19)	Short Circuit
32	Automatic A/C Monovalve (Right)	Short Circuit
33	A/C Compressor Signal	Short Circuit
34	Auxiliary Fan Signal, 2nd Stage	Short Circuit
35	Auxiliary Fan Signal, 1st Stage	Short Circuit
50	Switchover Valve Block Signal (Y11)	Short Circuit
70	Auxiliary Coolant Pump (M13)	Open Circuit
71	Automatic A/C Monovalve (Y19)	Open Circuit
72	Automatic A/C Monovalve (Right)	Open Circuit
73	A/C Compressor Signal	Open Circuit
74	Auxiliary Fan Signal, 2nd Stage	Open Circuit
75	Auxiliary Fan Signal, 1st Stage	Open Circuit

129 Chassis from 9/95

READING ACTUAL VALUES

1. IGNITION : Position 1
2. Set temperature selector to 72 degrees F.
3. Press the REST button for more than 6 seconds.
4. The left display will alternately show the number "01" and the in-car temperature.
5. Press the FAN button and the next component number and its value will be displayed.
6. Press the REST button to end the test program.

COMPONENT UNDER TEST

Number	Component
01	In-Car Temperature Sensor with Aspirator Blower (B10/4)
02	Outside Temperature Sensor (B14)
03	Left Heater Core Temperature Sensor (B10/2)
05	Evaporator Temperature Sensor (B10/6)
06	Engine Coolant Temperature Sensor (ECT) (B11/4)
07	Refrigerant Pressure in Bar
08	Refrigerant Temperature Sensor (B12/1)
09	Not Used
10	Blower Control Voltage
20	Control Current for Auxiliary Fan exp. : 7 = 7 mA
21	Engine RPM. example 00..99 (x100) = 9900
22	Vehicle Speed
23	PIN 58D exp. 99.0 = 99% of Battery Voltage
24	Battery Voltage : 12.8 = 12,8 Volt
40	A/C Controller Software Version Coding
41	A/C Controller Hardware Version
42	Variant code 1
43	Variant code 2
50	Not Used
51	Not Used
52	Not Used
54	ON/OFF A/C Compressor emergency off signal from engine control module.
60	Roof "OPE" = OPEN, "CLO" = CLOSED
61	Left Air Outlet, Potentiometer Voltage
62	Vacuum Actuator 46, Feedback Potentiometer Voltage
63	Center Air Outlet, Potentiometer Voltage
64	Vacuum Actuator 47, Feedback Potentiometer Voltage
65	Right Air Outlet, Potentiometer Voltage
66	Vacuum Actuator 47, Feedback Potentiometer Voltage

129 Chassis from 9/95

FAULT DIAGNOSIS

1. IGNITION : Position 1
2. Temperature selector wheel : "LO"
3. Within 20 seconds press the REST and DEFROST buttons simultaneously for more than 5 seconds.
4. The LED in the RECIRCULATE button flashes and "dl A" appears on the display.
5. Press the AUTO button until all DTC's are displayed and recorded.
6. The current faults are displayed first, then the intermittent faults. "END" is displayed when all codes have been displayed.
7. To erase codes press AUTO again, "dEL" will be displayed. Press v and ^ simultaneously for more than 5 seconds. The display will then show "----". Press AUTO to cancel the erase.
8. IGNITION : OFF to end the test program.

FAULT CODES - 129 Chassis from 9/95

DTC Readout	Description
026	CAN Bus Communication
226	In-Car Air Temperature Sensor (B10/4)
227	Outside Air Temperature Sensor (B14)
228	Heater Core Temperature Sensor (B10/2)
230	Evaporator Temperature Sensor (B10/6)
231	Engine Coolant Temperature Sensor (B11/4)
232	Refrigerant Pressure Sensor (B12)
233	Refrigerant Temperature Sensor (B12/1)
241	Refrigerant Level
416	Coolant Circulation Pump (A31m1)
417	Automatic A/C Monovalve (Y19)
419	A/C Compressor Electromagnetic Clutch (A9k1)
420	Closed (Idle) Throttle Speed Increase
421	Auxiliary Fan Control Module (N65/1)
422	Serial Interface Connection (K1) to Instrument Cluster (IC)
423	Switchover Valve Block (15 connection multiplex) (Y11)
459	Serial Interface Connection (K2) to Instrument Cluster (IC)

140 Chassis to 8/95

READING ACTUAL VALUES

1. Turn temperature selector wheel into the white area.
2. IGNITION = ON : Position 1
3. Press the left and right "AUTO" buttons.
4. Within 20 seconds press the "REST" button for more than 5 sec.
5. LEFT DISPLAY = Component Number
RIGHT DISPLAY = Actual Component Value or "HI" for a short circuit or "LO" for an open circuit
6. Press the left "AUTO" button to monitor the next component.
7. Press the "REST" button to end the test mode.

COMPONENTS UNDER TEST

Number	Component
01	In-Car Temperature Sensor with Aspirator Blower (B10/4)
02	Outside Temperature Sensor (B10/5)
03	Left Heater Core Temperature Sensor (B10/2)
04	Right Heater Core Temperature Sensor (B10/3)
05	Evaporator Temperature Sensor (B10/6)
06	Engine Coolant Temperature (ECT) Sensor (A/C) (B10/8)
07	Refrigerant Pressure in Bar : Ex. 06'4 = 6.4 Bar
08	Blower Control Voltage from 8(min) - 60(max)
09	Software Status, A/C Pushbutton Control Module(N22) Mfg.
10	Left rear heater core temperature sensor (B10/9)
11	Right rear heater core temperature sensor (B10/10)
12	Rear Evaporator Temperature Sensor (B10/11)
13	Software Status, Rear A/C Pushbutton Control Module(N22) Mfg.
16	Control Module Applicable for Charcoal Filter : "A"=YES "0"=NO

140 Chassis to 8/95

FAULT DIAGNOSIS

1. Turn the left selector wheel into the red area.
2. Turn the right selector wheel into the blue area.
3. IGNITION = ON : Position 1.
4. Press the "AUTO" button.
5. Within 20 seconds, press the "REST" and "O" button for more than 2 seconds.
6. The display will show the permanent DTC's stored. Left window "E0" or "E1", right window "01", "02"...etc. Record each DTC and press the right "AUTO" button to display the next code. Continue until "END" is displayed.
7. To erase the DTC's : Turn IGNITION OFF, Then turn IGNITION ON : Position 1. Press the left "AUTO" button. A "d" (delete) is displayed in the left window. By pressing the right "AUTO" button the DTC will be deleted. Alternate left and right "AUTO" buttons until all DTCs are erased and "E0 00" is displayed.

Go to next page for Fault Codes

FAULT CODES - 140 Chassis to 8/95

DTC Readout	Description	Cause	Fault Type
001	No DTC's Stored in System Memory.		
002	A/C Pushbutton Control Module (N22)		
003	Rear A/C Pushbutton Control Module (N22/3)		
006	Connection to the Switchover Valve Block (Y11)		
007	Data Exchange (CAN B)	Short Circuit.	
008	Data Exchange (CAN A)	Short Circuit.	
009	Data Exchange (CAN A and CAN B)	Short Circuit.	
010	Make the Diagnosis Again.		
011	Data Exchange (CAN B)	Open Circuit.	
012	Data Exchange (CAN A)	Open Circuit.	
013	Connection with the Rear A/C Pushbutton Control Module		
014	Data Exchange (CAN B) : Rear A/C Control Module	Open Circuit.	
015	Data Exchange (CAN A) : Rear A/C Control Module	Open Circuit.	
016	In-Car Air Temperature Sensor (B10/4)	Short Circuit	Continuous
017	In-Car Air Temperature Sensor (B10/4)	Short Circuit	Intermittent
018	In-Car Air Temperature Sensor (B10/4)	Short or Open Circuit	Continuous
019	In-Car Air Temperature Sensor (B10/4)	Short or Open Circuit	Intermittent
024	Left Heater Core Temperature Sensor (B10/2)	Short Circuit	Continuous
025	Left Heater Core Temperature Sensor (B10/2)	Short Circuit	Intermittent
026	Left Heater Core Temperature Sensor (B10/2)	Short or Open Circuit	Continuous
027	Left Heater Core Temperature Sensor (B10/2)	Short or Open Circuit	Intermittent
028	Right Heater Core Temperature Sensor (B10/3)	Short Circuit	Continuous
029	Right Heater Core Temperature Sensor (B10/3)	Short Circuit	Intermittent
030	Right Heater Core Temperature Sensor (B10/3)	Short or Open Circuit	Continuous
031	Right Heater Core Temperature Sensor (B10/3)	Short or Open Circuit	Intermittent
032	Outside Air Temperature Sensor (B10/5)	Short Circuit	Continuous
033	Outside Air Temperature Sensor (B10/5)	Short Circuit	Intermittent
034	Outside Air Temperature Sensor (B10/5)	Short or Open Circuit	Continuous
035	Outside Air Temperature Sensor (B10/5)	Short or Open Circuit	Intermittent
036	Evaporator Temperature Sensor (B10/6)	Short Circuit	Continuous
037	Evaporator Temperature Sensor (B10/6)	Short Circuit	Intermittent
038	Evaporator Temperature Sensor (B10/6)	Short or Open Circuit	Continuous
039	Evaporator Temperature Sensor (B10/6)	Short or Open Circuit	Intermittent
040	Engine Coolant Temperature Sensor (B10/8)	Short Circuit	Continuous
041	Engine Coolant Temperature Sensor (B10/8)	Short Circuit	Intermittent
042	Engine Coolant Temperature Sensor (B10/8)	Short or Open Circuit	Continuous
043	Engine Coolant Temperature Sensor (B10/8)	Short or Open Circuit	Intermittent
044	Refrigerant Pressure Sensor (B12)	Short Circuit	Continuous

FAULT CODES - 140 Chassis to 8/95

DTC Readout	Description	Cause	Fault Type
045	Refrigerant Pressure Sensor (B12)	Short Circuit	Intermittent
046	Refrigerant Pressure Sensor (B12)	Short or Open Circuit	Continuous
047	Refrigerant Pressure Sensor (B12)	Short or Open Circuit	Intermittent
048	Left Temperature Wheel	Short Circuit	Continuous
049	Left Temperature Wheel	Short Circuit	Intermittent
050	Left Temperature Wheel	Short or Open Circuit	Continuous
051	Left Temperature Wheel	Short or Open Circuit	Intermittent
052	Right Temperature Wheel	Short Circuit	Continuous
053	Right Temperature Wheel	Short Circuit	Intermittent
054	Right Temperature Wheel	Short or Open Circuit	Continuous
055	Right Temperature Wheel	Short or Open Circuit	Intermittent
072	Heater Supply Unit Coolant Circulation Pump (A31m1)	Short Circuit	Continuous
073	Heater Supply Unit Coolant Circulation Pump (A31m1)	Short Circuit	Intermittent
074	Coolant Circulation Pump (A31m1)	Short or Open Circuit	Continuous
075	Coolant Circulation Pump (A31m1)	Short or Open Circuit	Intermittent
076	Coolant Circulation Pump (A31m1)	Overload	Continuous
077	Coolant Circulation Pump (A31m1)	Overload	Intermittent
080	Left Duovalve (Water Valve) (A31y1)	Short Circuit	Continuous
081	Left Duovalve (Water Valve) (A31y1)	Short Circuit	Intermittent
082	Left Duovalve (Water Valve) (A31y1)	Short or Open Circuit	Continuous
083	Left Duovalve (Water Valve) (A31y1)	Short or Open Circuit	Intermittent
084	Right Duovalve (Water Valve) (A31y2)	Short Circuit	Continuous
085	Right Duovalve (Water Valve) (A31y2)	Short Circuit	Intermittent
086	Right Duovalve (Water Valve) (A31y2)	Short or Open Circuit	Continuous
087	Right Duovalve (Water Valve) (A31y2)	Short or Open Circuit	Intermittent
088	A/C Compressor Ground Activation		Continuous
089	A/C Compressor Ground Activation		Intermittent
090	A/C Compressor Ground Activation	Short or Open Circuit	Continuous
091	A/C Compressor Ground Activation	Short or Open Circuit	Intermittent
096	Auxiliary Fan, 1ST Stage Activation	Short Circuit	Continuous
097	Auxiliary Fan, 1ST Stage Activation	Short Circuit	Intermittent
098	Auxiliary Fan, 1ST Stage Activation	Short or Open Circuit	Continuous
099	Auxiliary Fan, 1ST Stage Activation	Short or Open Circuit	Intermittent
100	Auxiliary Fan, 2ND Stage Activation	Short Circuit	Continuous
101	Auxiliary Fan, 2ND Stage Activation	Short Circuit	Intermittent
102	Auxiliary Fan, 2ND Stage Activation	Short or Open Circuit	Continuous
103	Auxiliary Fan, 2ND Stage Activation	Short or Open Circuit	Intermittent
104	Auxiliary Fan, 3RD Stage Activation	Short Circuit	Continuous

FAULT CODES - 140 Chassis to 8/95

DTC Readout	Description	Cause	Fault Type
105	Auxiliary Fan, 3RD Stage Activation	Short Circuit	Intermittent
106	Auxiliary Fan, 3RD Stage Activation	Short or Open Circuit	Continuous
107	Auxiliary Fan, 3RD Stage Activation	Short or Open Circuit	Intermittent
108	Auxiliary Coolant Pump Control Relay Module (K30), Power Supply	Short Circuit	Continuous
109	Auxiliary Coolant Pump Control Relay Module (K30), Power Supply	Short Circuit	Intermittent
110	Auxiliary Coolant Pump Control Relay Module (K30), Power Supply	Short or Open Circuit	Continuous
111	Auxiliary Coolant Pump Control Relay Module (K30), Power Supply	Short or Open Circuit	Intermittent
112	Engine RPM Increase Diode Matrix (V2)	Short Circuit	Continuous
113	Engine RPM Increase Diode Matrix (V2)	Short Circuit	Intermittent
114	Engine RPM Increase Diode Matrix (V2)	Short or Open Circuit	Continuous
115	Engine RPM Increase Diode Matrix (V2)	Short or Open Circuit	Intermittent
116	Activated Charcoal Filter Actuator (A32m2) : (OPEN)	Short Circuit	Continuous
117	Activated Charcoal Filter Actuator (A32m2) : (OPEN)	Short Circuit	Intermittent
118	Activated Charcoal Filter Actuator (A32m2) : (OPEN)	Short or Open Circuit	Continuous
119	Activated Charcoal Filter Actuator (A32m2) : (OPEN)	Short or Open Circuit	Intermittent
120	Activated Charcoal Filter Actuator (A32m2) : (CLOSED)	Short Circuit	Continuous
121	Activated Charcoal Filter Actuator (A32m2) : (CLOSED)	Short Circuit	Intermittent
122	Activated Charcoal Filter Actuator (A32m2) : (CLOSED)	Short or Open Circuit	Continuous
123	Activated Charcoal Filter Actuator (A32m2) : (CLOSED)	Short or Open Circuit	Intermittent
128	Left Rear Heater Core Temperature Sensor (B10/9)	Short Circuit	Continuous
129	Left Rear Heater Core Temperature Sensor (B10/9)	Short Circuit	Intermittent
130	Left Rear Heater Core Temperature Sensor (B10/9)	Short or Open Circuit	Continuous
131	Left Rear Heater Core Temperature Sensor (B10/9)	Short or Open Circuit	Intermittent
132	Right Rear Heater Core Temperature Sensor (B10/10)	Short Circuit	Continuous
133	Right Rear Heater Core Temperature Sensor (B10/10)	Short Circuit	Intermittent
134	Right Rear Heater Core Temperature Sensor (B10/10)	Short or Open Circuit	Continuous
135	Right Rear Heater Core Temperature Sensor (B10/10)	Short or Open Circuit	Intermittent
136	Left Temperature Selector wheel	Short Circuit	Continuous
137	Left Temperature Selector wheel	Short Circuit	Intermittent
138	Left Temperature Selector wheel	Short or Open Circuit	Continuous
139	Left Temperature Selector wheel	Short or Open Circuit	Intermittent
140	Right Temperature Selector wheel	Short Circuit	Continuous
141	Right Temperature Selector wheel	Short Circuit	Intermittent
142	Right Temperature Selector wheel	Short or Open Circuit	Continuous
143	Right Temperature Selector wheel	Short or Open Circuit	Intermittent

FAULT CODES - 140 Chassis to 8/95

DTC Readout	Description	Cause	Fault Type
144	Rear Evaporator Temperature Sensor (B10/11)	Short Circuit	Continuous
145	Rear Evaporator Temperature Sensor (B10/11)	Short Circuit	Intermittent
146	Rear Evaporator Temperature Sensor (B10/11)	Short or Open Circuit	Continuous
147	Rear Evaporator Temperature Sensor (B10/11)	Short or Open Circuit	Intermittent
148	Coolant Circulation Pump (A31/1m1)	Short Circuit	Continuous
149	Coolant Circulation Pump (A31/1m1)	Short Circuit	Intermittent
150	Coolant Circulation Pump (A31/1m1)	Short or Open Circuit	Continuous
151	Coolant Circulation Pump (A31/1m1)	Short or Open Circuit	Intermittent
152	Coolant Circulation Pump (A31/1m1)	Overload	Continuous
153	Coolant Circulation Pump (A31/1m1)	Overload	Intermittent
156	Left Duovalve (Water Valve) (A31/1y1)	Short Circuit	Continuous
157	Left Duovalve (Water Valve) (A31/1y1)	Short Circuit	Intermittent
158	Left Duovalve (Water Valve) (A31/1y1)	Short or Open Circuit	Continuous
159	Left Duovalve (Water Valve) (A31/1y1)	Short or Open Circuit	Intermittent
160	Right Duovalve (Water Valve) (A31/1y2)	Short Circuit	Continuous
161	Right Duovalve (Water Valve) (A31/1y2)	Short Circuit	Intermittent
162	Right Duovalve (Water Valve) (A31/1y2)	Short or Open Circuit	Continuous
163	Right Duovalve (Water Valve) (A31/1y2)	Short or Open Circuit	Intermittent
164	Rear Refrigerant Shut-Off Valve (Y67)	Short Circuit	Continuous
165	Rear Refrigerant Shut-Off Valve (Y67)	Short Circuit	Intermittent
166	Rear Refrigerant Shut-Off Valve (Y67)	Short or Open Circuit	Continuous
167	Rear Refrigerant Shut-Off Valve (Y67)	Short or Open Circuit	Intermittent
168	Rear Tunnel Flap Vacuum Valve (Y67/1)	Short Circuit	Continuous
169	Rear Tunnel Flap Vacuum Valve (Y67/1)	Short Circuit	Intermittent
170	Rear Tunnel Flap Vacuum Valve (Y67/1)	Short or Open Circuit	Continuous
171	Rear Tunnel Flap Vacuum Valve (Y67/1)	Short or Open Circuit	Intermittent

140 Chassis from 9/95

READING ACTUAL VALUES

1. IGNITION : Position 1
2. Press the AUTO button
3. Set both temperature selectors to 72 degrees F.
4. Press the REST button for more than 5 seconds.
5. The left display will alternately show the number "1" and the in-car temperature.
6. Press the AUTO button and the next component number and its value will be displayed.
7. Press the REST button to end the test program.

COMPONENT UNDER TEST

Number	Component
01	In-Car Temperature Sensor with Aspirator Blower (B10/4)
02	Outside Temperature Sensor (B10/5) 1996, (B14) as of 1997
03	Left Heater Core Temperature Sensor (B10/2)
04	Right Heater Core Temperature Sensor (B10/3)
05	Evaporator Temperature Sensor (B10/6)
06	Engine Coolant Temperature (ECT) Sensor (A/C) (B11/4)
07	Refrigerant Pressure in Bar
08	Refrigerant Temperature Sensor (B12/1)
10	Blower Control Voltage
11	Emissions (Refrigerant Leak) Sensor (B31)
12	Sun (Excessive Heat) Sensor (B32)
20	Control Current for Auxiliary Fan example : 7 = 7 mA
21	Engine RPM. example 00..99 (x100) = 9900
22	Vehicle Speed
23	PIN 58D example. 99.0 = 99% of Battery Voltage
24	Battery Voltage : 12.8 = 12,8 Volt
30	Left Rear Heater Core Temperature Sensor (B10/9)
31	Right Rear Heater Core Temperature sensor (B10/10)
32	Rear Evaporator Temperature Sensor (B10/11)
33	Rear Blower Control Voltage
34	Left Rear Temperature Sensor version
35	Right Rear Temperature Sensor
38	Rear A/C Controller Software Version Coding
39	Rear A/C Controller Hardware Version
40	Front A/C Controller Software Version Coding
41	Front A/C Controller Hardware Version
42	Variant code 1
43	Variant code 2

140 Chassis from 9/95

FAULT DIAGNOSIS

1. IGNITION : Position 1
2. Left Temperature selector wheel : HI
Right Temperature selector wheel : LO
3. Within 20 seconds press the REST and EC buttons simultaneously for more than 5 seconds.
4. The LED in the RECIRCULATE button flashes and "OFF" appears on the display.
5. Press the right AUTO button until all DTC's are displayed and recorded.
6. To erase all codes must be read out. Press both AUTO buttons simultaneously for more than 2 seconds. "d" will be displayed on the left and "FF" is displayed on the right. The erase can be canceled by pressing the AUTO button.
7. Reset temperature selector to normal setting.
8. IGNITION : OFF to end the test program.

FAULT CODES - 140 Chassis from 9/95

DTC Readout	Description
026	CAN Bus Communication
226	In-Car Air Temperature Sensor (B10/4)
227	Outside Air Temperature Sensor (B10/5) to 1996, (B14) as of 1997
228	Left Heater Core Temperature Sensor (B10/2)
229	Right Heater Core Temperature Sensor (B10/3)
230	Evaporator Temperature Sensor (B10/6)
231	Engine Coolant Temperature Sensor (B11/4) DFI or IFI models Right Engine Coolant Temperature Sensor (B11/10) to 1996
232	Refrigerant Pressure Sensor (B12)
233	Refrigerant Temperature Sensor (B12/1)
234	Sun Sensor (B32)
235	Emissions (Refrigerant Leak) Sensor (B31)
241	Refrigerant Level
416	Coolant Circulation Pump (A31m1)
417	Left Duovalve (Water Valve) (Y21y1)
418	Right Duovalve (Water Valve) (Y21y2)
419	A/C Compressor Electromagnetic Clutch (A9k1)
420	Closed (Idle) Throttle Speed Increase
421	Pulse Module (N65)
422	Serial Interface Connection (K1) to Instrument Cluster (IC)
423	Switchover Valve Block (Y11)
424	Activated Charcoal Filter Actuator (A32m2) : OPEN
425	Activated Charcoal Filter Actuator (A32m2) : CLOSE
432	Maximum Heat
459	Serial Interface Connection (K2) to Instrument Cluster (IC)
460	LED - Center Air Outlet "Warm"
461	LED - Center Air Outlet "Cold"
462	Wide Open Throttle (WOT) Position Signal - Diesel Engine Only

202 Chassis to 8/95

READING ACTUAL VALUES

1. IGNITION : Position 1
2. Set temperature selection to 72 degrees F (Press v and ^ simultaneously).
3. Press the AUTO button.
4. Press the REST button for more than 5 seconds.
5. The display will alternately show the number "01" and the in-car temperature or "LO" if there is an open circuit or "HI" if there is a short circuit.
6. Press the "Top Air Outlet" button to increase the component tested and the "Bottom Air Outlet" button to decrease the component number tested.
7. Press the REST button to end the test program.

COMPONENT UNDER TEST

Number	Component
01	In-Car Temperature Sensor with Aspirator Blower (B10/4)
02	Outside Temperature Sensor (B10/5)
03	Heater Core Temperature Sensor (B10/1)
05	Evaporator Temperature Sensor (B10/6)
06	Engine Coolant Temperature (ECT) Sensor (A/C) (B10/8)
07	Refrigerant Pressure in Bar
08	Blower Control Voltage
09	Software Status of A/C Pushbutton Control Module
15	Selected In-Car Temperature
20	Version Code
21	Engine Speed in RPM
22	A/C Compressor Speed in RPM
23	Vehicle Speed in km/h
50	Not Used
51	Number of Current Poly-V Belt Slip Recognitions
52	Number of Stored Poly-V Belt Slip Recognitions

202 Chassis to 8/95

FAULT DIAGNOSIS

1. IGNITION : Position 1
2. Press the V button until "LO" appears on the display.
3. Within 20 seconds press the REST and BLOWER buttons simultaneously for more than 2 seconds.
4. The LED in the RECIRCULATE button flashes and "dl R" appears on the display
5. Press the AUTO button until all DTC's are displayed and recorded. Continuous faults are displayed first. if no faults are stored, "En d" is displayed. Press AUTO again to retrieve intermittent faults. If no intermittent faults are stored, "En d" is displayed.
6. Press the AUTO button until "dE L" is displayed. To erase codes press both V and ^ simultaneously for at least 5 seconds. The display will show "---"
7. IGNITION : OFF to end the test program.

Go to next page for Fault Codes

FAULT CODES - 202 Chassis to 8/95			
DTC Readout	Description	Cause	Fault Type
01	No ERROR Stored	No Faults	

FAULT CODES - 202 Chassis to 8/95

DTC Readout	Description	Cause	Fault Type
02	A/C Pushbutton Control Module (N22).	Power failure or damaged computer	
03	In-Car Temperature Sensor with Aspirator Blower (B10/4)	Short circuit	Continuous
04	In Car Temperature Sensor with Aspirator Blower (B10/4)	Short circuit	Intermittent
05	In-Car Temperature Sensor with Aspirator Blower (B10/4)	Short or Open circuit	Continuous
06	In-Car Temperature Sensor with Aspirator Blower (B10/4)	Short or Open circuit	Intermittent
07	Outside Air Temperature Sensor (B10/5)	Short circuit	Continuous
08	Outside Air Temperature Sensor (B10/5)	Short circuit	Intermittent
09	Outside air Temperature Sensor (B10/5)	Short or Open circuit	Continuous
10	Outside air Temperature Sensor (B10/5)	Short or Open circuit	Intermittent
11	Heater Core Temperature Sensor (B10/1)	Short circuit	Continuous
12	Heater Core Temperature Sensor (B10/1)	Short circuit	Intermittent
13	Heater Core Temperature Sensor (B10/1)	Short or Open circuit	Continuous
14	Heater Core Temperature Sensor (B10/1)	Short or Open circuit	Intermittent
19	Evaporator Temperature Sensor (B10/6)	Short circuit	Continuous
20	Evaporator Temperature Sensor (B10/6)	Short circuit	Intermittent
21	Evaporator Temperature Sensor (B10/6)	Short or Open circuit	Continuous
22	Evaporator Temperature Sensor (B10/6)	Short or Open circuit	Intermittent
23	Engine Coolant Temperature Sensor (ETC) (B10/8)	Short circuit	Continuous
24	Engine Coolant Temperature Sensor (ETC) (B10/8)	Short circuit	Intermittent
25	Engine Coolant Temperature Sensor (ETC) (B10/8)	Short or Open circuit	Continuous
26	Engine Coolant Temperature Sensor (ETC) (B10/8)	Short or Open circuit	Intermittent
27	Refrigerant Pressure Sensor (B12)	Short circuit	Continuous
28	Refrigerant Pressure Sensor (B12)	Short circuit	Intermittent
29	Refrigerant Pressure Sensor (B12)	Short or Open circuit	Continuous
30	Refrigerant Pressure Sensor (B12)	Short or Open circuit	Intermittent
31	A/C Compressor RPM Sensor (A9I1)	Bad Sensor	
32	Poly-V Belt Slip Recognition	Slipping Belt	
47	Auxiliary Coolant Pump (M13)	Unknown	
48	Auxiliary Coolant Pump (M13)	Short circuit	Intermittent
49	Auxiliary Coolant Pump (M13)	Short or Open circuit	Continuous
50	Auxiliary Coolant Pump (M13)	Short or Open circuit	Intermittent
51	Duovalve (Water Valve) (Y21)	Short circuit	Continuous
52	Duovalve (Water Valve) (Y21)	Short circuit	Intermittent
53	Duovalve (Water Valve) (Y21)	Short or Open circuit	Continuous
54	Duovalve (Water Valve) (Y21)	Short or Open circuit	Intermittent
59	A/C Compressor Electromagnetic Clutch (A9k1)	Short circuit	Continuous
60	A/C Compressor Electromagnetic Clutch (A9k1)	Short circuit	Intermittent

FAULT CODES - 202 Chassis to 8/95

DTC Readout	Description	Cause	Fault Type
61	A/C Compressor Electromagnetic Clutch (A9k1)	Short or Open circuit	Continuous
62	A/C Compressor Electromagnetic Clutch (A9k1)	Short or Open circuit	Intermittent
63	Activation of Auxiliary Fan Stage 1	Short circuit	Continuous
64	Activation of Auxiliary Fan Stage 1	Short circuit	Intermittent
65	Activation of Auxiliary Fan Stage 1	Short or Open circuit	Continuous
66	Activation of Auxiliary Fan Stage 1	Short or Open circuit	Intermittent
67	Activation of Auxiliary Fan Stage 2	Short circuit	Continuous
68	Activation of Auxiliary Fan Stage 2	Short circuit	Intermittent
69	Activation of Auxiliary Fan Stage 2	Short or Open circuit	Continuous
70	Activation of Auxiliary Fan Stage 2	Short or Open circuit	Intermittent
71	Closed (Idle) Throttle Speed Increase	Short or Open circuit	Continuous
72	Closed (Idle) Throttle Speed Increase	Short or Open circuit	Intermittent
73	Closed (Idle) Throttle Speed Increase	Short circuit	Continuous
74	Closed (Idle) Throttle Speed Increase	Short circuit	Intermittent
75	Switchover Valve Block (Y11/3), Diverter Flap		Continuous
76	Switchover Valve Block (Y11/3), Diverter Flap		Intermittent
77	Switchover Valve Block (Y11/3), Diverter Flap	Short or Open circuit	Continuous
78	Switchover Valve Block (Y11/3), Diverter Flap	Short or Open circuit	Intermittent
79	Switchover Valve Block (Y11/3), Tempering Flap		Continuous
80	Switchover Valve Block (Y11/3), Tempering Flap		Intermittent
81	Switchover Valve Block (Y11/3), Tempering Flap	Short or Open circuit	Continuous
82	Switchover Valve Block (Y11/3), Tempering Flap	Short or Open circuit	Intermittent
83	Switchover Valve Block (Y11/3), Fresh/Recirculating Air Flap Long Stroke (80%)		Continuous
84	Switchover Valve Block (Y11/3), Fresh/Recirculating Air Flap Long Stroke (80%)		Intermittent
85	Switchover Valve Block (Y11/3), Fresh/Recirculating Air Flap Long Stroke (80%)	Short or Open circuit	Continuous
86	Switchover Valve Block (Y11/3), Fresh/Recirculating Air Flap	Short or Open circuit	Intermittent
87	Switchover Valve Block (Y11/3), Fresh/Recirculating Air Flap Short Stroke (20%)		Continuous
88	Switchover Valve Block (Y11/3), Fresh/Recirculating Air Flap Short Stroke (20%)		Intermittent
89	Switchover Valve Block (Y11/3), Fresh/Recirculating Air Flap Short Stroke (20%)	Short or Open circuit	Continuous
90	Switchover Valve Block (Y11/3), Fresh/Recirculating Air Flap Short Stroke (20%)	Short or Open circuit	Intermittent
91	Switchover Valve Block (Y11/3), Defroster Flap Long Stroke (80%)		Continuous
92	Switchover Valve Block (Y11/3), Defroster Flap Long Stroke (80%)		Intermittent

FAULT CODES - 202 Chassis to 8/95

DTC Readout	Description	Cause	Fault Type
93	Switchover Valve Block (Y11/3), Defroster Flap Long Stroke (80%)	Short or Open circuit	Continuous
94	Switchover Valve Block (Y11/3), Defroster Flap Long Stroke (80%)	Short or Open circuit	Intermittent
95	Switchover Valve Block (Y11/3), Defroster Flap Short Stroke (20%)		Continuous
96	Switchover Valve Block (Y11/3), Defroster Flap Short Stroke (20%)		Intermittent
97	Switchover Valve Block (Y11/3), Defroster Flap Short Stroke (20%)	Short or Open circuit	Continuous
98	Switchover Valve Block (Y11/3), Defroster Flap Short Stroke (20%)	Short or Open circuit	Intermittent
99	Switchover Valve Block (Y11/3), Footwell Flap Long Stroke (80%)		Continuous
100	Switchover Valve Block (Y11/3), Footwell Flap Long Stroke (80%)		Intermittent
101	Switchover Valve Block (Y11/3), Footwell Flap Long Stroke (80%)	Short or Open circuit	Continuous
102	Switchover Valve Block (Y11/3), Footwell Flap Long Stroke (80%)	Short or Open circuit	Intermittent
103	Switchover Valve Block (Y11/3), Footwell Flap Short Stroke (20%)		Continuous
104	Switchover Valve Block (Y11/3), Footwell Flap Short Stroke (20%)		Intermittent
105	Switchover Valve Block (Y11/3), Footwell Flap Short Stroke (20%)	Short or Open circuit	Continuous
106	Switchover Valve Block (Y11/3), Footwell Flap Short Stroke (20%)	Short or Open circuit	Intermittent

202 Chassis from 9/95

READING ACTUAL VALUES

1. IGNITION : Position 1
2. Set temperature selector to 72 degrees F.
3. Press the REST button for more than 6 seconds.
4. The left display will alternately show the number "01" and the in-car temperature.
5. Press the FAN button and the next component number and its value will be displayed.
6. Press the REST button to end the test program.

COMPONENT UNDER TEST

Number	Component
01	In-Car Temperature Sensor with Aspirator Blower (B10/4)
02	Outside Temperature Sensor (B14)
03	Heater Core Temperature Sensor (B10/1)
05	Evaporator Temperature Sensor (B10/6)
06	Engine Coolant Temperature Sensor (ECT) (B11/4)
07	Refrigerant Pressure in Bar
08	Refrigerant Temperature Sensor (B12/1)
09	Not Used
10	Blower Control Voltage
20	Control Current for Auxiliary Fan exp. : 7 = 7 mA
21	Engine RPM. example 00..99 (x100) = 9900
22	Vehicle Speed
23	PIN 58D exp. 99.0 = 99% of Battery Voltage
24	Battery Voltage : 12.8 = 12,8 Volt
40	A/C Controller Software Version Coding
41	A/C Controller Hardware Version
42	Variant code 1
43	Variant code 2
50	Not Used
51	Not Used
52	Not Used
54	ON/OFF A/C Compressor emergency off signal from engine control module.

202 Chassis from 9/95

FAULT DIAGNOSIS

1. IGNITION : Position 1
2. Temperature selector wheel : "LO"
3. Within 20 seconds press the REST and DEFROST buttons simultaneously for more than 5 seconds.
4. The LED in the RECIRCULATE button flashes and "dl A" appears on the display.
5. Press the AUTO button until all DTC's are displayed and recorded.
6. The current faults are displayed first, then the intermittent faults. "END" is displayed when all codes have been displayed.
7. To erase codes press v and ^ simultaneously for more than 5 seconds. The display will then show "----". Press AUTO to cancel the erase.
8. IGNITION : OFF to end the test program.

FAULT CODES - 202 Chassis from 9/95

DTC Readout	Description
026	CAN Bus Communication
226	In-Car Air Temperature Sensor (B10/4)
227	Outside Air Temperature Sensor (B14)
228	Heater Core Temperature Sensor (B10/1)
230	Evaporator Temperature Sensor (B10/6)
231	Engine Coolant Temperature Sensor (B11/4)
232	Refrigerant Pressure Sensor (B12)
233	Refrigerant Temperature Sensor (B12/1)
241	Refrigerant Level
416	Coolant Circulation Pump (A31m1)
417	Left Duovalve (Water Valve) (Y21y1)
418	Right Duovalve (Water Valve) (Y21y2)
419	A/C Compressor Electromagnetic Clutch (A9k1)
420	Closed (Idle) Throttle Speed Increase
421	Pulse Module (N65)
422	Serial Interface Connection (K1) to Instrument Cluster (IC)
451	Diverter Flap (Y11/3)
452	Blend Air Flap (Y11/3)
453	Fresh/Recirculated Air Flap (Y11/3) Long Stroke
454	Fresh/Recirculated Air Flap (Y11/3) Short Stroke
455	Defroster Outlet Flap (Y11/3) Long Stroke
456	Defroster Outlet Flap (Y11/3) Short Stroke
457	Footwell Flap (Y11/3) Long Stroke
458	Footwell Flap (Y11/3) Short Stroke
459	Serial Interface Connection (K2) to Instrument Cluster (IC)
462	Wide Open Throttle (WOT) Position Signal - Diesel Engine Only

210 Chassis from 9/95 & 208

READING ACTUAL VALUES

1. IGNITION : Position 1
2. Press the AUTO button
3. Set both temperature selectors to 72 degrees F.
4. Press the REST button for more than 6 seconds.
5. The left display will alternately show the number "1" and the in-car temperature.
6. Press the AUTO button and the next component number and its value will be displayed.
7. Press the REST button to end the test program.

COMPONENT UNDER TEST

Number	Component
01	In-Car Temperature Sensor with Aspirator Blower (B10/4)
02	Outside Temperature Sensor (B14)
03	Left Heater Core Temperature Sensor (B10/1)
04	Right Heater Core Temperature Sensor (B10/1)
05	Evaporator Temperature Sensor (B10/6)
06	Engine Coolant Temperature (ECT) Sensor (A/C) (B1/4)
07	Refrigerant Pressure in Bar
08	Refrigerant Temperature Sensor (B12/1)
10	Blower Control Voltage
11	Emissions (Refrigerant Leak) Sensor (B31)
12	Sun (Excessive Heat) Sensor (B32)
20	Control Current for Auxiliary Fan exp. : 7 = 7 mA
21	Engine RPM. example 00..99 (x100) = 9900
22	Vehicle Speed
23	PIN 58D exp. 99.0 = 99% of Battery Voltage
24	Battery Voltage : 12.8 = 12,8 Volt
40	Software Version Encoded
41	Hardware Version

210 Chassis from 9/95

FAULT DIAGNOSIS

1. IGNITION : Position 1
2. Left Temperature selector wheel : HI
Right Temperature selector wheel : LO
3. Within 20 seconds press the REST and EC buttons simultaneously for more than 5 seconds.
4. The LED in the RECIRCULATE button flashes and "dI R" appears on the display
5. Press the right AUTO button until all DTC's are displayed and recorded.
6. To erase, all codes must be read out. Press both AUTO buttons simultaneously for more than 2 seconds. "d" will be displayed on the left and "FF" is displayed on the right. The erase can be canceled by pressing the AUTO.
7. Reset temperature selector to normal setting.
8. IGNITION : OFF to end the test program.

FAULT CODES - 210 Chassis from 9/95

DTC Readout	Description
026	CAN - Communication
226	In-Car Air Temperature Sensor (B10/4)
227	Outside Air Temperature Sensor (B14)
228	Left Heater Core Temperature Sensor (B10/1)
229	Right Heater Core Temperature Sensor (B10/1)
230	Evaporator Temperature Sensor (B10/6)
231	Engine Coolant Temperature Sensor (B10/8)
232	Refrigerant Pressure Sensor (B12)
233	Refrigerant Temperature Sensor (B12/1)
234	Sun Sensor (B32)
235	Emissions (Refrigerant Leak) Sensor (B31)
241	Refrigerant Level
416	Coolant Circulation Pump (M13)
417	Left Duovalve (Water Valve) (Y21y1)
418	Right Duovalve (Water Valve) (Y21y2)
419	A/C Compressor Electromagnetic Clutch (A9k1)
420	Closed (Idle) Throttle Speed Increase
421	Pulse Module
422	Serial Interface Connection (K1) to Instrument Cluster (IC)
423	Switchover Valve Block (Y11)
424	Activated Charcoal Filter Actuator (A32m2) : OPEN
425	Activated Charcoal Filter Actuator (A32m2) : CLOSE
432	Maximum Heat
459	Serial Interface Connection (K2) to Instrument Cluster (IC)
462	Wide Open Throttle (WOT) Position Signal - Diesel Engine Only

Mercedes Benz Model Identifier

Model	Chassis	Engine	Trans.	Fuel Sys.	Prod Start	Prod End
190C	110	121.924	GA190C	CARB	1961	1965
190D 2.2	201.122	601.921	722.4	DIESEL	1984	1985
190D 2.5	201.126	602.911	722.4	ELR	1986	1989
190D 2.5 TURBO	201.128	602.961	722.4	EDS	1987	1987
190DC	110	621.912	GA190DC	CARB	1961	1965
190E 2.3	201.024	102.961	722.4	CIS	1982	1985
190E 2.3-16v	201.034	102.983	722.4	CIS-E	1984	1987
190E 2.3	201.024	102.985	722.4	CIS-E	1986	1993
190E 2.6	201.029	103.942	722.4	CIS-E	1986	1993
190E 2.3	201.028	102.985	722.4	CIS-E	1987	1993
190E 2.5-16v	201	102.983	722.4	CIS-E	1988	1993
200	110	121.94	GA190C	CARB	1965	1968
200CE	124.021	102	722.4	CIS-E	1990	1993
200D	110	621.918	GA190DC	CARB	1965	1968
200E	124.021	102.963	722.4	CIS-E	1993	1995
200TE	124.021	102	722.4	CIS-E	1988	1992
220	115.010	115.920	722.1	CARB	1967	1972
220B	111	180.94	GA220B	CARB	1959	1965
220D	115.110	615.912	722.2	DIESEL	1967	1972
220SB	111	180.941	GA220SB	CARB	1959	1965
220SE Cabriolet	111.023	127.984	GA220SEB	CARB	1951	1965
220SE Coupe	111.021	127.984	GA220SEB	CARB	1959	1965
220SEB/C	111	127.984	GA220SEB	CARB	1951	1965
220SEB	111	127.982	GA220SEB	CARB	1959	1965
230	110	180.945	GA230	CARB	1965	1966
230	114.015	180.954	722.2	CARB	1967	1972
230	115.017	115.951	722.1	CARB	1973	1978
230	123.023	115.954	722.1	CARB	1976	1985
230S	111	180.945	GA220B,SB	CARB	1965	1968
230SL	113.042	127.981	GA230SL	CARB	1963	1968
240D	115.117	616.916	722.1	DIESEL	1973	1975
240D	123.123	616.912	722.1	DIESEL	1976	1985
250	114.010	114.920	722.2	CARB	1967	1969
250	114.011	130.923	722.2	CARB	1970	1975
250C	114.023	130.923	722.2	CARB	1969	1975
250D	124.125	602.912	722.414	EDS	1986	1993
250S	108	108.92	GA230SL	CARB	1963	1968
250SE	108	129.98	GA230SL	CARB	1965	1968
250SE Cabriolet	111.023	129.98	GA230SL	CARB	1965	1968
250SE Coupe	111.021	129.98	GA230SL	CARB	1965	1968
250SL	113.043	129.982		CARB		
260E	124.026	103.940	722.4	CIS-E	1985	1995
280	114.060	110.921	722.1	CARB	1972	1976
280C	114.073	110.921	722.1	CARB	1972	1976
280CE	123.053	110.984	722.1	CARB	1976	1985
280E	123.033	110.984	722.1	CARB	1976	1985
280S	108.016	130.920	722.2	CARB	1967	1972
280S	116.020	110.922	722.1	CARB	1972	1980
280SE 3.5 Cabriolet	111.025	116.98		CARB		
280SE 3.5 Coupe	111.024	116.98		CARB		
280SE Cabriolet	111.025	130.98		CARB		
280SE Coupe	111.024	130.98		CARB		
280SE	108.018	130.980	722.2	CARB	1967	1972

Model	Chassis	Engine	Trans.	Fuel Sys.	Prod Start	Prod End
280SE 4.5	108.067	117.984	722	CARB	1971	1972
280SE	116.024	110.985	722.1	CARB	1972	1980
280SEL	108.019	130.98	722.2	CARB		
280SEL 4.5	108.068	117.984	722	CARB	1971	1972
280SL	113.044	130.983		CARB		
300CD	123.150	617.912	722.1	DIESEL	1976	1985
300CD Turbo	123.153	617.952	722.3	DIESEL	1982	1985
300CE	124.050	103.983	722.3	CIS-E	1987	1989
300CE	124.051	104.98	722.3	CIS-E	1990	1992
300CE	124.052	104.992	722.369	HFM	1993	1995
300CE Cabriolet	124.066	104.992	722.369	HFM	1993	1995
300CE	124.051	104.980	722.3	HFM	1993	1995
300D	115.114	617.910	722.1	DIESEL	1975	1975
300D Turbo	123.133	617.952	722.3/722.4	DIESEL	1976	1985
300D	123.130	617.912	722.1	DIESEL	1976	1985
300D Turbo	123.13	617.952	722.3	DIESEL	1982	1985
300D Turbo	124.133	603.96	722.3	EDS	1985	1993
300D 2.5 Turbo	124.128	602.962	722.4	DIESEL	1985	1995
300E 2.8	124.028	104.942	722.4	HFM	1983	1995
300E 2.6	124.026	103.94	722.4	CIS-E	1985	1992
300E 2.8	124.028	103.942	722.4	CIS-E	1985	1992
300E	124.03	103.983	722.3	CIS-E	1985	1992
300E 4MATIC	124.230	103.985	722.342	CIS-E	1987	1993
300E	124.032	104.992	722.369	HFM	1990	1992
300SD Turbo	116.120	617.950	722.1	DIESEL	1972	1980
300SD Turbo	126.120	617.951	722.3	DIESEL	1981	1992
300SD Turbo	126.12	617.951	722.3	DIESEL	1981	1985
300SD	140.134	603.971	722.3	EDS	1992	1995
300SD Turbo	140.134	603.971	722.367	EDS	1992	1993
300SDL Turbo	126.125	603.961	722.3	DIESEL	1985	1992
300SE	112	189	GA300SE,-E,-EH	CARB	1961	1965
300SE/C	112	189	GA300SE,-E,-EH	CARB	1961	1967
300SE	126.024	103.981	722.3	CIS	1981	1985
300SE	126.024	103.981	722.351	CIS-E	1985	1992
300SE	140.032	104.99	722.502	LH	1992	1993
300SEB	108	189	GA300SE-EH	CARB	1965	1972
300SEL	109.016	130.981		CARB		
300SEL	109	189	GA300SE-EH	CARB	1966	1968
300SEL 6.3	109.018	100.981	K4A050	CARB	1967	1972
300SEL 3.5	109.056	116.981	722.2	CARB	1969	1972
300SEL 4.5	109.057	117.981	722	CARB	1971	1972
300SEL	126.025	103.981	722.3	CIS/CIS-E	1981	1992
300SEL	126.025	103.981	722.319	CIS-E	1985	1992
300SL	129.061	103	722.5	CIS-E	1988	1993
300SL-24	129.061	104.981	722.5	LH	1990	1992
300TD	123.190	617.912	722.1	DIESEL	1976	1985
300TD Turbo	123.193	617.952	722.3	DIESEL	1981	1984
300TD Turbo	124.193	603.96	722.3	DIESEL	1985	1995
300TE	124.090	103.983	722.369	CIS-E	1985	1992
300TE	124.090	103.983	722.3	CIS-E	1985	1990
300TE 4MATIC	124.29	103.985	722.342	CIS-E	1987	1993
300TE	124.092	104.992	722.3		1993	1995
350SD Turbo	126.134	603.97	722.3	DIESEL	1985	1988
350SD Turbo	126.134	603.97	722.361	EDS	1989	6/91
350SDL Turbo	126.135	603.97	722.3	DIESEL	1985	1988

Model	Chassis	Engine	Trans.	Fuel Sys.	Prod Start	Prod End
350SDL Turbo	126.135	603.97	722.361	EDS	1989	6/91
380SE	126.032	116.963	722.3	CIS	1981	1984
380SE	126.032	116.963	722.3	CIS-E	1985	1989
380SEC	126.043	116.963	722.3	CIS	1981	1984
380SEC	126.043	116.983	722.3	CIS-E	1985	1985
380SEL	126.033	116.961	722.3	CIS	1980	1984
380SEL	126.033	116.963	722.3	CIS-E	1985	1989
380SL	107.045	116.960	722.3	CARB	1971	1989
380SL	107.045	116.96	722.3	CIS	1980	1989
380SLC	107.025	116.960	722.3	CARB	1971	1980
380SLC	107.025	116.96	722.3	CIS	1980	1989
400E	124.034	119.975	722.3	CIS	1985	1991
400E	124.034	119.975	722.354	LH	1990	1993
400SE	140.042	119.971	722.3	LH	1992	1993
400SEL	140.043	119.971	722.366	LH	1992	1993
420SEL	126.035	116.965	722.3	CIS	1981	1984
420SEL	126.035	116.965	722.351	CIS-E	1985	6/91
450SE	116.032	117.983	722	CARB	1972	1973
450SE	116.032	117.986	722	CARB	1972	1980
450SE	116.032	117.986	722	CARB	1974	1980
450SEL	116.033	117.986	722	CARB	1972	1980
450SEL	116.033	117.983	722	CARB	1972	1973
450SEL	116.033	117.986	722	CARB	1974	1980
450SL	107.044	117.982	722	CARB	1971	1974
450SL	107.044	117.985	722	CARB	1975	1980
450SLC	107.024	117.982	722	CARB	1971	1974
450SLC	107.024	117.985	722	CARB	1975	1980
500E	124.036	119.974	722.3		1985	1992
500E	124.036	119.974	722.365	LH	1993	1993
500SEC	126.044	117.963	722.3	CIS	1981	1985
500SEC	126.044	117.965	722.356	CIS-E	1986	1992
500SEC	140.070	119.970	722.3	LH	1992	1993
500SEC	140.070	119.97	722.37	LH	1992	1993
500SEL	126.037	117.963	722.3	CIS	1981	1984
500SEL	126.037	117.963	722.311	CIS-E	1985	1991
500SEL	140.051	119.97	722.37	LH	1992	1993
500SL	129.066	119.96	722.3	CIS-E	1990	1992
500SL	129.067	119.972	722.364	LH	1992	1993
560SEC	126.045	117.968	722.3	CIS	1981	1984
560SEC	126.045	117.968	722.35	CIS-E	1985	1985
560SEL	126.039	117.968	722.3	CIS	1981	1984
560SEL	126.039	117.968	722.35	CIS-E	1985	1985
560SL	107.048	117.967	722.3	CARB	1971	1989
6.9	116.036	100.985	722	CARB	1972	1980
600 (long 6-dr)	100.016	100.980	K4A050	CARB	1964	
600	100.012	100.980	K4A050	CARB	1964	
600 (long 4-dr)	100.014	100.980	K4A050	CARB	1964	
600	100	100	GA600	CARB	1964	
600	129.076	120.981	722.3	LH	1990	1993
600SEC	140.076	120.98	722.362	LH	1992	1993
600SEL	140.057	120.98	722.362	LH	1992	1993
600SL	129.076	120.981	722.362	LH	1990	1993
A140	168.031	166.940	722.7	MSM		
A140 L	168.131	166.960	722.7	MSM		
A160	168.033	166.96	722.7			

Model	Chassis	Engine	Trans.	Fuel Sys.	Prod Start	Prod End
A160 CDI	168.006	668.94	722.701	CDI		
A160 L	168.133	166.96	722.7			
A170 CDI	168.009	668.942	722.701	CDI		
A190	168.032	166.99	722.7			
A190 L	168.132	166.99	722.7			
A210 Evolution	168.035	166.995	722.702			
A210 L Evolution	168.135	166.995	722.702			
C180	202.018	111.920	722.421	PMS	1994	2000
C200D	202.12	601.913	722.425	EDS	1994	1995
C220	202.022	111.961	722.423	HFM	1994	1996
C220D	202.121	604.910	722.426	EVE	1994	1995
C230	202.023	111.974	722.6	ME 2.1	1997	2000
C230 Kompressor	202.024	111.975	722.6	ME 2.1	1999	2000
C230 Kompressor	203.747	111.981	722.616	SIM4	2001	
C240	203.061	112.912	722.696	ME 2.8	2001	
C240	203.061	112.912	MT	ME 2.8	2001	
C240 4Matic	203.081	112.912	722.667	ME 2.8	2001	2001
C250D	202.125	605.910	722.427	ERE	1994	1995
C280	202.028	104.941	722.424	HFM	1994	1996
C280	202.028	104.941	722.604	HFM	1997	1997
C280	202.029	112.920	722.606	ME 2.0	1998	2000
C32 AMG Komp.	203.065	112.961	722.633	ME 2.8	2002	
C320	203.064	112.946	722.618	ME 2.8	2001	
C320 Wagon	203.264	112.946	722.633	ME 2.8	2001	
C320 4Matic	203.284	112.912	722.668	ME 2.8	2002	
C320 4MATIC	203.084	112.946	722.668	ME 2.8	2002	
C36 AMG	202.028	104.941	722.604	HFM	1996	1997
C36 AMG	202.028	104.941	722.424	HFM	1996	1996
C43 AMG	202.033	113.944	722.631	ME 2.0	1998	1999
CL500	140.070	119.980	722.6	ME 1.0	1996	1999
CL500 (Coupe)	140.070	119.98	722.62	ME 1.0	1996	1999
CL500 AMG	215.373	113.982	722.6	ME 2.8	2001	
CL500 (Coupe)	215.375	113.96	722.633	ME 2.8	2001	2003
CL55 AMG	215.373	113.986	722.633			
CL55 AMG	215.373	113.982	722.6		2001	
CL55 AMG Komp.	215.374	113.991	722.636	ME 2.8	2002	
CL600	140.076	120.982	722.621	ME 1.0	1996	1998
CL600	215.376	275.95	722.649	ME	2002	
CL600	215.378	137.97	722.628	ME 2.7	2003	
CLK200	208.335	111.945	722.602	ME 2.1		
CLK200 Kompressor	208.345	111.944	722.605	ME 2.1		
CLK200 Kompressor	208.344	111.956	722.616	ME 2.1		
CLK200 Komp Convertible	208.445	111.944	722.605	ME 2.1		
CLK200 Komp Convertible	208.444	111.956	722.616	ME 2.1		
CLK200 Convertible	208.435	111.945	722.602	ME 2.1	1998	
CLK230 Komp Convertible	208.447	111.975	722.605	ME 2.1	1998	2000
CLK230 Kompressor	208.347	111.975	722.605	ME 2.1	1998	2000
CLK230 Komp Convertible	208.448	111.982	722.616	SIM4	2001	
CLK230 Kompressor	208.348	111.982	722.616	SIM4	2001	
CLK320 Convertible	208.465	112.94	722.618	ME 2.0	1996	2000
CLK320 Cabriolet	208.465	112.940	722.6	ME 2.0	1998	1999
CLK320	208.365	112.94	722.618	ME 2.0	1998	1999
CLK320 (Coupe)	208.465	112.94	722.607	ME 2.8	2000	2003
CLK430	208.370	113.943	722.6	ME 2.0	1998	1999
CLK430 Cabriolet	208.470	113.943	722.6	ME 2.0	1998	1999

Model	Chassis	Engine	Trans.	Fuel Sys.	Prod Start	Prod End
CLK430 (Coupe)	208.470	113.94	722.6	ME 2.8	2000	2003
CLK500	209.375	113.968	722.633	ME 2.8	2002	
CLK55 AMG	208.374	113.984	722.636	ME 2.8	05/99	2002
CLK55 AMG Convertible	208.474	113.984	722.636	ME 2.0	1998	1999
CLK55	208.374	113.984	722.636	ME 2.8	2001	2001
E250D Turbo	124.025	602		EDS	1988	1995
E250D	124.025	602		EDS	1992	1994
E280	124.028	104.942	722.433/722.504	HFM	1994	1995
E300 Diesel	124.131	606.91	722.4	DIESEL	1985	1995
E300	124.23	103.985	722.342	CIS-E	1994	1995
E300 Diesel	210.020	606.912	722.4	IFI	1996	1999
E300 Turbodiesel	210.025	606.962	722.6		1996	1999
E300D TURBO	124.133	603.96	722.4	DIESEL	1994	1995
E300D	124.131	606.91	722.4/722.435	DIESEL	1994	1995
E300D	210.02	606.912	722.6	IFI	1997	1997
E300TD TURBO	124.193	603.96	722.4/722.317	DIESEL	1994	1995
E320	124.052	104.992	723.369	CIS-E/CFI	1990	1992
E320	124.092	104.992	722.3	HFM	1993	1995
E320 4MATIC Wagon	210.282	112.941	722.6	ME 2.0	1996	1999
E320	210.055	104.995	722.605	HFM	1996	1996
E320 Wagon	210.265	112.941	722.607		1996	2001
E320	210.065	112.941	722.6	ME 2.0	1997	1999
E320	210.055	104.995	722.605	ME 2.1	1997	1997
E320 Wagon/4MATIC	210.265	112.995	722.607	ME 2.0	1998	1999
E320 4MATIC	210.082	112.941	722.6	ME 2.8	2000	2001
E320 4MATIC	210.082	112.995	722.664	ME 2.8	2001	2001
E320 Sedan	210.065	112.941	722.607	ME 2.8	2001	2001
E320 Wagon/4MATIC	210.265	112.941	722.664	ME 2.8	2001	2001
E420	124.034	119.975	722.3	LH	1992	1995
E420	210.072	119.985	722.625	ME 1.0	1996	1997
E430	210.07	113.94	722.623	ME 2.0	1998	1999
E430	210.070	113.940	722.6		2000	2001
E430 4MATIC	210.083	113.940	722.6	ME 2.8	2000	2001
E430 4MATIC	210.083	113.94	722.66	ME 2.8	2001	2001
E430 Sedan	210.070	113.94	722.623	ME 2.8	2001	2001
E500	124.036	119.974	722.3		1983	1995
E500	124.036	119.974	722.37	LH	1994	1995
E500	211.07	113.967	722.633	ME 2.8	2002	2002
E55 AMG	210	113	722.6	ME 2.0	1999	1999
E55 AMG	210.074	113.98	722.6	ME 2.8	2001	2001
Maybach	240.078	285.950	722.649		2003	
ML230	163.136	111.977	722.66	ME 2.1	1998	2000
ML270 CDI	163.113	612.963	722.661	CDI	2000	
ML320	163.154	112.942	722.662	ME 2.0	1998	1999
ML320	163.154	112.942	722.662	ME 2.8	2000	2003
ML350	163.157	112.97	722.674	ME 2.0	1998	
ML400 CDI	163.128	628.963	722.666	CDI	2000	
ML430	163.1	113	722.6	ME 2.0	1999	1999
ML430	163.172	113.942	722.663	ME 2.8	2000	2003
ML500	163.175	113.965	722.666	ME 2.8	2001	
ML55	163	113	722.6	ME 2.8	2000	2000
ML55 AMG	163.174	113.981	722.666		2001	2003
S280	220.063	112.922	722.617			
S320 CDI	220.025	648.96	722.626	CDI		
S320	140.032	104.994	722.508	HFM	1992	1996

Model	Chassis	Engine	Trans.	Fuel Sys.	Prod Start	Prod End
S320	140.033 (Long)	104.994	722.508	HFM	1996	1996
S320	140.032	104.99	722.605	ME 2.1	1997	1999
S320	140.033 (Long)	104.99	722.605	ME 2.1	1997	1999
S320	220.065	112.944	722.618	ME 2.8	2000	
S320 CDI	220.026	613.96	722.626	CDI	2000	
S350 Turbo Diesel	140.134	603.971	722.367	DIESEL	1994	1995
S370	220.167	112.972	722.644	ME 2.8	2000	
S370	220.067	112.972	722.644	ME 2.8	2000	
S370 4MATIC	220.087	112.975	722.675	ME 2.8	2001	
S400 CDI	220.028	628.96	722.639	CDI		
S420	140.043	119.981	722.6		1992	1999
S420	140.043	119.971	722.366	LH	1994	1995
S420	140.043	119.981	722.622	ME 1.0	1996	1999
S430	140	113	722.6	ME 2.0	1998	1999
S430	220.07	113.941	722.632	ME 2.0	1999	1999
S430	220.17	113.941	722.6	ME 2.8	2000	2001
S430	220.170	113.941	722.6		2000	
S430	220.070	113.941	722.6		2000	
S430 4MATIC	220.083	113.948	722.671	ME 2.8	2001	
S430 4MATIC	220.17	113.941	722.632	ME 2.8	2001	2001
S500	220.075	113.96	722.633	ME 2.8		
S500	140.070	119.97	722.3	LH	1994	1995
S500	140.051	119.97	722.37	LH	1994	1995
S500	140.051	119.98	722.62	ME 1.0	1996	1999
S500	140.070	119.97	722.62	ME 1.0	1996	1998
S500	220.175	113.96	722.635	ME 2.8	2000	2001
S500 PULLMAN	220.875	113.96	722.633	ME 2.8	2000	2001
S500	220.175	113.960	722.6	ME 2.8	2000	
S500 4MATIC	220.084	113.966	722.672	ME 2.8	2001	
S55 AMG	220.073/173	113.986	722.636			
S55 AMG Kompressor	220.074/174	113.991	722.636, 722.643			
S55 AMG Komp Pullman	220.874	113.991	722.636, 722.643			
S55 AMG	220.173	113.982	722.6		2000	
S55 AMG	220	113	722.6	ME 2.8	2002	2002
S600	220.178	137.97	722.628	ME 2.7		
S600	220.176	275.95	722.649			
S600 Pullman	220.878	137.97	722.628	ME 2.7		
S600 Pullman	220.876	275.95	722.649			
S600	140.076	120.980	722.3	LH	1992	1995
S600	140.057	120.980	722.3	LH	1992	1995
S600	140.057	120.98	722.362	LH	1994	1995
S600	140.057	120.982	722.621	ME 1.0	1996	1999
S600	220.178	120.982	722.621	ME 1.0	2000	2001
S600	220.178	137.970	722.6		2000	
S600 lg	220.178	137.97	722.628	ME 2.7	2002	
SL280	129.058	104.943	722	HFM	1994	1996
SL280	129.058	104.94	722	ME 2.1	1997	1999
SL320	129.063	104.991	722.507	HFM	1994	1996
SL320	129.063	104.991	722.605	HFM	1997	1997
SL500	129.067	119.972	722.364	LH	1994	1995
SL500	129.067	119.982	722.62	ME 1.0	1996	1998
SL500	129.068	113.961	722.620/.624	ME 2.0	1999	2001
SL500	230.475	113.963	722.633	ME 2.8	2002	
SL500	230.475	113.963	722.633	ME 2.8	2003	
SL600	129.076	120.981	722.362	LH	1994	1995

Model	Chassis	Engine	Trans.	Fuel Sys.	Prod Start	Prod End
SL600	129.076	120.983	722.621	ME 1.0	1996	2001
SL600	230	137	722.6	ME 2.7	2003	
SLK230	170.447	111.973	722.605	ME 2.1	1998	1999
SLK230	170.447	111.973	716.6	ME 2.1	1998	1999
SLK230	170.449	111.983	722.6	ME 2.1	1998	2000
SLK230	170.449	111.983	716.662	ME 2.1	2000	2000
SLK230	170.449	111.983	722.616	SIM4	2001	2001
SLK32 AMG	170.466	112.960	722.6	ME 2.0	1998	1999
SLK320	170.465	112.947	716.660	ME 2.0	1998	1999
SLK320	170.465	112.947	722.618	ME 2.0	1998	1999
SLK320	170.465	112.973	722.618	ME 2.8	2000	2003
SLK320	170.465	112.973	716.660	ME 2.8	2000	2003
SLK430	170.4	113	722.6	ME 2.0	1999	1999

Mercedes Benz Acronyms

Acronym	Description
4MATIC	4 Wheel Drive Transmission Control
A/C (Automatic)	Air Conditioning (Automatic) [AAC/ACC]
A/C (Tempmatic)	Air Conditioning (Tempmatic) [TAU]
AAC	Automatic Air Conditioning
AAM	All Activity Module
AB	Supplemental Restraint System (Airbag)
ABC	Active Body Control
ABL	Exterior Lights
ABS	Anti-lock Brake System
ABW	Distance Warning Device
ACC	Automatic Climate Control
ACSR	Automatic Child Seat Recognition
ADA	Atmospheric Pressure-dependent Fill-load Stop
ADM	Automatic Dimming Inside Rearview Mirror
ADS	Automatic Damping System (Suspension)
AFE	Automatic Lane Recognition
AG	Automatic Transmission [AG]
AGW	Audio gateway
AHV	Trailer Hitch
AIR	Secondary Air Injection
AKR	Anti-knock Regulation [AKC]
AKSE	Automatic child seat recognition [ACSR]
ALDA	Barometric Pressure/charge Air Pressure Compensation [BCAPC]
AP	Accelerator Pedal
APS	Auto Pilot System
ARA	Antijerk Control
ARF	Exhaust Gas Recirculation (EGR)
ARMIN	Airbag with Integrated Emergency Call System
AS	Antenna System
AS	Towing Sensor [TS]
ASA	Automatic dimming mirror [ADM]
ASD	Automatic Locking Differential
ASF	Drive authorization system shutoff valve [DSV]
ASG	Sequentronic automated manual transmission [SEQ]
ASR	Acceleration Slip Regulation
AT	Automatic Transmission
ATA	Anti-theft Alarm System
ATS	Antenna systems
AWR	Distance warning radar [DWR]
BA	Backup Assist
BARO	Barometric Pressure
BAS	Brake Assist
BCAPC	Barometric Pressure-charge Air Pressure Compensation
BDC	Bottom Dead Center
BM	Base Module (Master Ecu Controller)
BPC	Barometric Pressure Compensation
CA	Closing Assist
CAN	Controller Area Network (databus)
CC	Cruise Control (Tempomat)
CCM	Combination Control Module
CDC	Cd Changer
CDI	Common Rail Direct Injection

Acronym	Description
CDI	Common rail diesel injection (CDI)
CDW	CD changer [CDC]
CF	Convenience Feature
CFI	Continuous Fuel Injection
CKA	Crank Angle
CKP	Crankshaft Position
CL	Central Locking
CLUS	Instrument Cluster
CMP	Camshaft Position
CNS	Communication and Navigation System
COMAND	Cockpit Management and Data System
CST	Cabriolet Soft Top
CTEL	Cellular Telephone
CTP	Closed Throttle Position (Idle)
CTU	Central Triggering Unit
CV	Convertible soft top [CST]
D2B	D2 bus
DAS	Driver Authorization System
DBE	Overhead control panel control module [OCP]
DFI	Electronic Distributor-type Fuel Injection
DH	Diagnosis manual [DMAN]
DI	Distributor Ignition System
DM (USA)	Diagnostic Module (Emissions)
DTC	Diagnostic Trouble Code
DTR	Distronic (autonomous intelligent cruise control)
EA	Electronic Accelerator
EAG	Electronic Automatic Transmission Control
EATC	Electronic Automatic Transmission Control
EBR	Engine Brake Regulation
EC	Electrochromatic (Mirror Glass)
E-CALL	Emergency call system
ECI	Electronic controlled ignition
ECL	Engine Coolant Level
ECT	Engine Coolant Temperature
EDC	Electronic Diesel Control
EDC	Electronic diesel control
EDR	Electronic Diesel Regulation
EDS	Electronic Diesel System
EDS	Electronic diesel system
EDW	Anti-theft alarm system [ATA]
EFH	Power windows
EFP	Electronic accelerator [EA]
EGR	Exhaust Gas Recirculation
EGS	Electronic transmission control [ETC]
EHD	Electronic high-pressure diesel injection system
EI	Electronic Ignition (Distributorless)
EIFI	Electronic In-line Fuel Injection
EL	Exterior Lighting
ELR	Electronic Idle Speed Control [ISC]
ELV	Electronic Steering Column Adjustment
EMSC	Electric Mirror, Steering Column Adjustment, Heated Mirrors
ENR	Electronic level adjustment [ELA]
EPC	Electronic Parts Catalog
EPC	Electronic Power Control

Mercedes Benz Acronyms

Acronym	Description
ERE	Diesel injection system (electronic in-line fuel injection) [IFI]
ESA	Electric Seat Adjustment
ESC	Electric Steering Column Adjustment
ESCM	Engine System Control Module
ESL	Electric mirror, steering column adjustment, heated mirror [MSC]
ESP	Electronic Stability Program
ESV	Electric seat adjustment [ESA]
ETC	Electronic Transmission Control
ETR	Emergency Tensioning Retractor
ETS	Electronic Traction System
EVAP	Evaporative Emission Control System
EVE	Diesel Electronic Distributor-type Fuel Injection [DFI]
EVL	Electrically adjustable steering column [ESC]
EWM	Electronic selector module [ESM]
EZL	Distributor Ignition System
EZS	Electronic ignition switch control module [ESM]
FAN	Fanfare Horns
FBS	Drive authorization system [DAS]
FDS-VL	Left front dynamic seat [DS-LF]
FDS-VR	Right front dynamic seat [DS-RF]
FFS	Frame Floor System
FFZ/IFZ	Radio frequency locking/infrared remote central locking [RFL/IRCL]
FG	Function group
FOM	Folding Outside Mirrors
FP	Fuel Pump
FSA	Hands-free system [HFS]
FUG	Function subgroup
GDB	Controlled Differential Brake
GES	Vehicle speed signal [VSS]
GIM	Governor Impulse Method
GM	Base module [BM]
GPS	Global Positioning System
GUB	Seat Belt Extender [SBE]
GUS	Emergency Tensioning Retractor [ETR]
HAL	Rear Axle Steering
HAU	Automatic Heater [HEAT]
HCS	Headlamp Cleaning System
HDF	Remote trunk lid release [RTR]
HDFS	Remote trunk lid locking [RTL]
HEAT	Automatic Heater [HAU]
HF	High Frequency
HFM	Hot Film Engine Management Sequential Multiport Fuel Injection/ignition System) [HFM-SFI]
HFM-SFI	Hot Film Engine Management
HFS	Hands Free System
HHS	Heated rear window
HHT	Hand Held Tester
HM	Heated Mirrors
HORN	Horn Signal System
HPF	Hydro Pneumatic Suspension
HS	Heated Seats

Acronym	Description
HZS	Trunk Lid Auxiliary Lock [TAL]
IAT	Intake Air Temperature
IC	Instrument Cluster
ICS	Information und Communications System (only H)
IDC	In Dash Controller
IFI	Electronic In-line Fuel System(diesel)
IFZ	Infrared Remote Central Locking [IRCL]
IL	Interior Lighting
INFO	Information Center
IR	Infrared
IRCL	Infrared Remote Central Locking
IRM	Inside Rearview Mirror
IRS	Interior motion sensor [IMS]
ISC	Idle Speed Control
KAF	Retractable Rear Headr Restraint
KAT	Three-way catalytic converter [TWC]
KE	Continuous Injection System (CIS)
KFB	Convenience Feature [CF]
KG	Keyless Go
KI	Instrument Cluster
K-KLA	Comfort automatic air conditioning [C-AAC]
KLA	Automatic Air Conditioning (AAC/ACC)
KLS	Climate-controlled seat
KS	Knock Sensor
KSG	Easy-shift manual transmission (Sequentronic)
KSS	Knock Sensor System
KW	Crank angle [CKA]
LDH	Lamella roof
LH	Gasoline injection system [LH-SFI]
LH2	LH Sequential Fuel Management Bank 2 (7-12 Cylinders)
LHS	Left Hand Steering
LH-SFI	LH Sequential Fuel Management Bank 1 (1-6 or 1-8 Cylinders)
LL	Left-hand drive [LHD]
LLR	Idle Speed Control [ISC]
LOC	Low Compression
LRH	Steering wheel heater
LS	Loudspeaker System
LS	Power steering gear
LSA	Loudspeaker system [LS]
LWR	Headlamp range adjustment [HRA]
MAF	Mass Air Flow
MAP	Manifold Absolute Pressure
MAS	Engine Systems Control Module [ESCM]
ME	Gasoline injection and ignition system [ME-SFI]
ME-SFI	Motor Electronics
MG	Manual transmission [MT]
MIL	Malfunction Indicator Lamp (Check Engine)
MKL	Multicontour backrest [OSB]
MKS	Multicontour seat [MCS]
MRA	Residual engine heat utilization system [REST]
MRM	Steering column module
MRS	Multifunction restraint system

Mercedes Benz Acronyms

Acronym	Description
MSC	Mirror, Steering Column Adjustment, Heated Mirrors
MSR	Engine braking regulation [EBR]
MSS	Special vehicle multifunction control module [SVMCM]
MT	Manual Transmission
MVA	Manifold Vacuum Assist
MVH	Main Wiring Harness
NAT	New Automatic Transmission
NMT	New Manual Transmission
NS	Network System (CAN)
NV	Low compression [LOC]
O2S	Oxygen (O2) Sensor
OBD	On-board Diagnostics
OBF	Upper control panel [UCP]
OC	Oxidation Catalytic Converter
OCP	Over-head Control Panel
OMS	Operating monitoring system
ORB	Roll bar [RB]
ORM	Outside Rearview Mirror
OSB	Orthopedic Seat Backrest
OSL	Orthopedic seat backrest
OT	Top dead center [TDC]
PE	Electrics diagram
PEC	Pressure Engine Control [PMS]
PFDS	Dynamic seat pump [DSP]
PL	Power Lock
PLA	Pneumatic idle speed increase [PISI]
PME	Vegetable Oil Methyl Ester
PML	Speed-sensitive Power Steering
PML	Speed-sensitive power steering [SPS]
PMP	Partial Intake Manifold Preheater
PMS	Pressure Management System [PEC]
PNP	Park/neutral Position
PS	Power Steering
PSE	Pneumatic System Equipment
PSV	Partial intake manifold preheater [PMP]
PTS	Parktronic System
PW	Power Windows
PWM	Pulse Width Modulation
R	Reverse gear
RA	Repair instructions
RB	Roll Bar Control
RBA	Frame-floor system [FFS]
RCL	Remote Central Locking
RD	Radio
RDK	Tire pressure monitor [TPM]
RDS	Radio data system
RDU	Tire pressure monitor [TPM]
REST	Residual Engine Heat Utilization
RevGUS-VL	Left front reversible emergency tensioning retractor [RevETR-LF]
RevGUS-VR	Right front reversible emergency tensioning retractor [RevETR-RF]
RFH	Backup assist [BA]

Acronym	Description
RHR	Retractable Rear Head Restraints
RHS	Rear Heated Seats
RL	Right-hand drive [RHD]
RPM	Revolutions Per Minute (Engine Speed)
RRE	Trip computer [TRIP]
RST*	Roadster Soft Top
RTG	Retractable Trunk Lid Grip
RTR	Remote Trunk Release
RUF	Retrofit solution
RV	Roadster Soft Top [RST]
RWD	Rear Window Defroster
SA	Special Equipment
SAM	Signal acquisition and actuation module
SBC	Sensotronic Brake Control
SBE	Seat Belt Extender
SBL	Seat ventilation
SBS	Voice control system [VCS]
SD	System diagnosis
SHD	Tilting/sliding roof [SR]
SHI	Closing assist [CA]
SIF	Heated rear seats
SIH	Heated Seats [HS]
SKF	Multi-function control module
SLO	Starter Lock-out
SMS	Service Microfiche System
SOR	Seat Occupied recognition
SOUND	SOUND system (for example amplifier)
SPH	Mirror heater
SPK	Folding outside mirrors
SPS	Speed-sensitive Power Steering
SPT	Taximeter Mirror
SR	Sliding/Pop-up Roof
SRA	Headlamp Cleaning System [HCS]
SRS	Supplemental Restraint System (Airbag)
SRU	Manifold vacuum assist [MVA]
STH	Stationary Heater
SVMCM	Special Vehicle Multifunction Control Module
SVS	Door and Trunk Closing Assist
TAF	Trunk Lid Auxiliary Fuse
TAU	Tempomatic Air Conditioning TAC (German acronym)
TAV	Tank Aeration Valve
TB	Throttle Body
TC	Turbo Charger
TCM	Transmission Control Module
TD	Engine Speed Signal (Time Division) [DI/EZL]
TDC	Top Dead Center
TEL	Telephone [CTEL]
TELE AID	Telematic Alarm Identification on Demand (emergency call system)
TIC	Transistorized Ignition Control
TN	Engine Speed Signal RPM [DI/KSS/EZL/AKR]
TPC	Tire Pressure Control
TPM	Throttle Position Monitor (CC/ISC control module under HFM). Same as TPS.

Mercedes Benz Acronyms

Acronym	Description	Acronym	Description
TPM	Tire Pressure Monitoring [RDK/RDU]		
TRAP	Trap Oxidizer		
TRIP	Trip Computer, Tripmeter		
TS	Parts Kit		
TS	Towing Sensor		
TSG	Door control module [DCM]		
TSZ	Transistorized Ignition System		
TURBO	Turbocharger		
TV	TV tuner		
TVV	Tank Ventilation Valve		
TWC	Three Way Catalytic Converter		
UBF	Lower control panel [LCP]		
ÜRB	Roll Bar Control/Crash Release		
UT	Bottom dead center [BDC]		
UVS	roll bar Vario roof control module [RVC]		
VAF	Volume Air Flow		
VD	Vario roof [VR]		
VHG	Retractable trunk lid grip [RTG]		
VNT	Variable Nozzle Turbine		
VRLA	Valve Regulated Lead Acid (Mat Battery)		
VSS	Vehicle Speed Signal		
W	Sedan Version		
WFS	Immobilizer [IMM]		
WIS	Workshop Information System		
WOT	Wide Open Throttle (Full Load)		
WS	Wiper System		
ZAE	Central triggering unit (airbag) [CTU]		
ZAS	Cylinder shut-off [CSO]		
ZB	Accessories		
ZGW	Central gateway [CGW]		
ZUH	Heater booster [HB] (German acronym)		
ZV	Central Locking System [CL]		

