

Diagnosis - Diagnostic Trouble Code (DTC) Memory

Preliminary work: Engine Test, Adjustment, Engines (SMS, Job No. 07-1100)

⚠ WARNING!

Risk of severe injury when touching ignition parts which produce high voltages. Do not touch ignition components.

Persons with heart pacemakers are not to perform repairs on this type of ignition system..

Electronic ignition systems produce dangerous high voltages on both the primary circuit and the secondary (ignition) circuits. Due to the high voltages produced, contact with any of the voltage carrying components can be dangerous to your health (burns, heart palpitations, cardiac arrest etc).

- Ignition must be turned OFF prior to performing any repair work on the ignition system.
- Do not come in contact or remove with any of the ignition components while the engine is cranking or idling.
- Wear rubber soled shoes.
- Disconnect connectors for CKP sensor at sensor or control module.
- If repairs require that the ignition be turned on, then dangerous voltages will be present through out the entire ignition system.
- No exposed metal connectors or sending units may be installed in the ignition wires.

⚠ WARNING!

Risk of fatal injury from being pulled into rotating vehicle parts.

Do not reach into rotating parts.

Wear closed and tight-fitting work clothes.

Protect vicinity of rotating vehicle components from unauthorized access.

⚠ WARNING!

Risk of explosion from fuel igniting, risk of poisoning from inhaling and swallowing fuel as well as risk of injury to eyes and skin from contact with fuel.

No fire, sparks, exposed flames or smoking.

Pour fuels only into suitable and appropriately marked containers.

Wear protective clothing when handling fuel.

Possible hazards

Risk of explosion, poisoning and injury

Fuels are highly inflammable and toxic if inhaled. Fuel may cause skin damage. Contact with gasoline fuel, for example, removes the natural oils on the skin. Fuel vapors are explosive, invisible and spread out at floor level. They are toxic if inhaled and have a narcotic effect in high concentrations.

Protective measures/guidelines

- Pay attention to national safety regulations and provisions.
- No fire, sparks, exposed flames or smoking.
- Ensure that the place of work is adequately ventilated.
- Never drain or pour in fuels over assembly pits.
- Store drained fuel in suitable and sealed containers.
- Immediately eliminate any fuel spills which have been spilled out of the container.

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Conducting work on a vehicle with exposed flame

(e.g. welding etc.)

- Prior to commencing such work, remove appropriate parts of the fuel system and seal open fuel lines with plugs.


First-aid measures

- Clean contaminated/exposed skin with water and soap.
- Change contaminated clothing as quickly as possible.
- If fuel gets into the eyes, rinse out eyes immediately with water, and contact a doctor, if necessary.

To Avoid Damage to the Ignition System

- To avoid damage to the engine control module, connect/disconnect the control module connectors only with the ignition: **OFF**.
- Circuit 1 of the ignition coil may not be shorted to ground, e.g. theft deterrence.
- Only original equipment should be installed in the ignition system.
- Do not operate the ignition system at cranking speed unless the entire ignition harness is connected.
- Do not perform any tests (grounding of ignition cable 4 disconnecting a spark plug connector or pulling cable 4 out of the ignition coil) at cranking or idle speed.

- The high output side of the ignition system must carry at least 2 kΩ of load (spark plug connector).
- If assisting a disabled vehicle and it becomes necessary to perform an ignition spark test, perform this test only on one ignition/spark plug. Ensure a good ground connection to the spark plug.
- ME - SFI: the ignition system is to be turned OFF, when cranking engine to perform compression tests, additionally, it is necessary to disconnect connector 2 from the control module.

 Engine 120 has separate ignition and fuel injection system.



Readout via the impulse counter scan tool is not possible.

Note:

Symbol for emission related malfunctions which lead to the activation of the CHECK ENGINE MIL when a certain test cycle was performed and a fault was recognized.

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Note regarding diagnostic trouble code (DTC) readout:

The engine control module (N3/10) for the ME-SFI system is equipped with diagnostic trouble code (DTC) memory. Malfunctions are recognized and stored as DTC's and are distinguished as follows:

- Malfunctions which are constantly present,
- Intermittent contact malfunctions which have occurred during a trip.

The DTC memory is erased when the vehicle's battery is disconnected.

Malfunctions which are no longer present, are automatically erased as follows:

- After three trips the "CHECK ENGINE" MIL goes out.
- After an additional 40 warm-up periods the DTC is automatically erased.

A warm-up period or trip is defined as follows:

Warm-up period

- Engine coolant temperature at start < 35° C,
- Engine coolant temperature increases to > 70° C.

Trip

- Engine running for > 20 minutes,
- Engine temperature > - 7° C,
- Engine speed > 500 rpm,
- All emission related logic chain functions already were checked during previous trips.

The stored DTC's can be read at the data link connector (X11/4) **using the HHT only**, with the ignition switched "ON" or with the "engine running".

Readout via an on-off ratio readout or impulse counter scan tool has been eliminated.

Note regarding mixture preparation self-adaptation:

The Lambda control system determines the fuel injection duration so precisely that the fuel/air ratio is kept constant at Lambda level 1 (equals 14.7 kg air to 1 kg fuel) under all operating conditions.

Should malfunctions occur in the form of:

- Intake air leaks,
- Injector wear or injector carbon build-up,
- Engine wear,
- Transition resistance in MAF sensor,
- Defective diaphragm pressure regulator,
- Defective purge control valve,

the engine control module (ME-SFI, 2.1) automatically performs a mixture adjustment.

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The degree of correction is constantly calculated and permanently stored. The self-adaptation is performed additive at idle and multiplicative under partial load. The correction towards rich or lean is ± 1.0 milliseconds (injection duration) at idle and the factor of 0.68 – 1.32 at partial load. After repair work is performed, the engine control module will automatically adapt itself again.

Note regarding version coding:

The engine control module is equipped with a version coding feature. The coding must be performed with the Hand-Held Tester (automatically or manually, see Notes for HHT “Version coding“ 11/5) upon installation of a new control module.

The following vehicle version data must be determined for coding:

- Vehicle model,
- Engine,
- Manual/automatic transmission
- Non-catalytic converter (non-TWC),
- Country version,
- 30 km/h limitation

Note regarding Drive Authorization System (DAS X, DAS 2b and DAS 3):

Model 170 as of production start up and model 202 as of 08/96:

Vehicles with ME-SFI are equipped with DAS. DAS is activated from the DAS control module (N54/1) via the CAN data bus to the engine control module.

Upon activation of the DAS, the engine control module renders the fuel injection system inoperative.

Model 170 and model 202 up to 05/97 as well as model 210 up to 02/97 use DAS X.

Model 170 uses DAS 2b as of 02/97

The activation or deactivation is accomplished with a transponder in the ignition key. As soon as the key is turned in the steering lock, the DAS control module receives a signal and activates the engine control via the CAN data bus.

As of M.Y. 1998, in models 202 and 208, 210 **DAS 3** is used. DAS 3 can only be activated or deactivated using the electronic key. Upon inserting the electronic key into the ignition lock, the DAS control module activates the engine control via the CAN data bus.

The locking and unlocking of the vehicle, using the mechanical key has no effect on the DAS system.

The engine control module and the DAS control module are “married” to one another through identification codes. The identification codes can not be erased (see HHT nominal values “DAS”, menu selection 3/7).

Therefore, swapping the engine or DAS control module from one vehicle to another is not possible!



If an exchange engine control module is installed for test purposes, up to 40 start attempts can be performed before the engine and DAS control modules “marry” to one another. Prior to performing the first start, the engine control module must be version coded using the HHT. Additionally, the code number and VIN must be entered (see HHT nominal values “DAS”, menu selection 3/7).

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Notes regarding automatic recognition of the mechanical end stop and wide open position of the throttle valve from the actuator:

The end stops of the throttle valve is determined by the actuator and stored in the engine control module.

After replacing the control module or actuator, the mechanical end stop and wide open position must again be determined and recorded.

Thereby allowing learned data to be erased with the HHT and new data to be learned. When the new engine control module is connected for the first time to circuit 30 (B+), the engine control module performs a self-adaptation of the actuator with the ignition "ON" (lower mechanical end stop).

Requirements for learning process:

- Selector lever in position P/N,
- Vehicle standing still,
- Engine off,
- Engine coolant temperature between 5° C and 100° C,
- Accelerator pedal not applied.

When all requirements are met, turn **ignition ON for at least 60 seconds**, then turn **ignition OFF for at least 10 seconds**.

The learned value is stored in memory, only after the first 10 start cycles, provided the voltage supply has not been interrupted. Should the battery be disconnected after the 9th start cycle, the re-learning process must be performed again.

Notes regarding VSS sensor adaption for rough running engine test:

After the replacement of the ME-SFI control module, CKP sensor (L5), starter ring gear or motor mount, a sensor adaption must be performed:

- Engine coolant temperature approx. > 70 °C,
- Drive vehicle on road.

- With selector lever in position 4: Increase engine rpm to approx. 2,500 rpm and then coast until engine rpm is approx. < 1,500 rpm.
- With selector lever in position 2: Increase engine rpm to approx. 6,100 rpm and then coast until engine rpm is approx. < 4,100 rpm. Again increase engine rpm to approx. 6,100 rpm and then coast until engine rpm is approx. < 3,000 rpm.
- Using the HHT, determine if VSS sensor adaption has taken place.

Notes regarding performance/speedometer test:

Disconnecting the ESP/ASR/ETS/ABS control modules is not allowed. The engine control module and transmission control module rely on these modules to supply the VSS data via the CAN bus.

To disable the brake and engine regulation function of the ESP/ASR/ETS/ABS control modules:

A. Working without HHT

- Ignition: **OFF**.
- Connect HHT adapter to data link connector (X11/4).
- Bridge sockets 1 and 6.
- Engine: **Start** (BAS/ESP or BAS/ASR MIL must illuminate!).

B. Working with HHT

- Ignition: **OFF**.
- Disconnect front axle VSS sensor connector (ESP/ASR MIL must illuminate!).

When work is completed, reconnect VSS sensor connector and erase DTC's with HHT!

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Notes for HHT

- **Fault search with HHT**
Diagnostic trouble code (DTC) memory: Select "Current DTC's".
If the actual condition changes, e.g. when wiggling a connector, the change is reported optically and acoustically so that troubleshooting can be performed directly with the HHT.
- **Loose connections**
Loose connections are stored if they occur several times in a certain time period. Therefore, they can appear only as "Stored DTC's" and never as "Current DTC's".
- **Nominal values**
All nominal values relative to the actual values shown on the HHT are listed in the Diagnostic Manual, Engines, Volume 1, section A.
- **Actual value for engine speed**
For engine speed, the HHT display indicates the closed throttle speed (CTP) nominal value calculated by the control module on the left, and the rpm actual value on the right. Both values should differ from each other only slightly. Permissible tolerances are not yet determined.
- **Version coding with HHT**
 - a) Before replacement of the engine control module, the existing code number must be read and stored with the HHT (menu selection 5 "Version coding"). After installation of the new control module, the previously read code number must be entered.
Note:
If returning a new control module to a PDC, the code number must be erased.
 - b) If the code number can **not** be read, the vehicle equipment/version must be determined, the corresponding code number obtained from the Spare Parts Microfiche (group 54) and manually entered with the HHT.
- **Drive authorization system (DAS) stage X**
Upon replacement the engine control module must be version coded using the HHT. Additionally, the code number and VIN must be entered (see HHT nominal values "DAS", menu selection 3/7).

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Special Tools



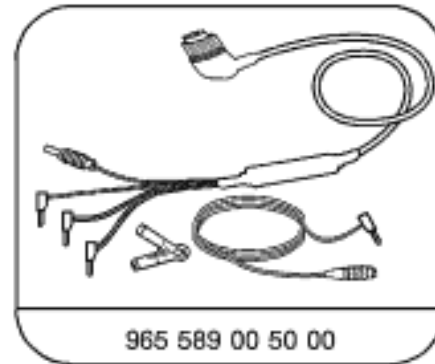
965 589 00 01 00

Hand-Held-Tester



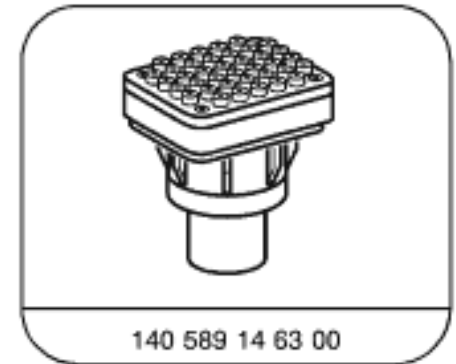
965 589 00 40 00

Test cable



965 589 00 50 00

Adapter cable



140 589 14 63 00

Adapter

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Connection Diagram - Hand-Held Tester (HHT)

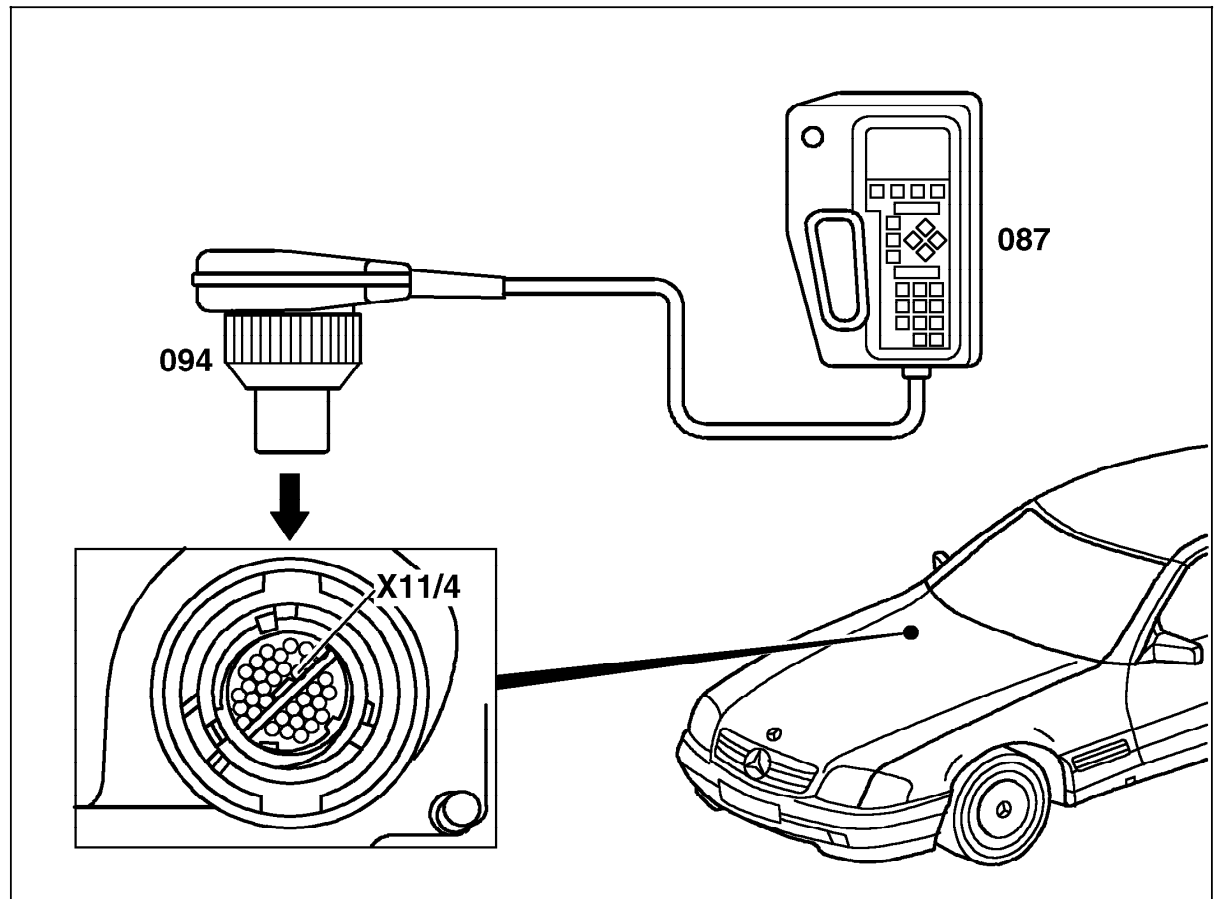
1. Connect HHT (087) with test cable (097) to data link connector (X11/4)
2. Ignition: **ON**
3. As per display in HHT:
 - a) read out/erase DTC memory
 - b) read out actual values
 - c) perform activations
 - d) program control modules
4. Disconnect HHT



Observe system specific notes, which are described in the beginning of each chapter. Erase all stored faults which come about when tests or simulations are performed, upon completion of the repairs.

Figure 1

- | | |
|-------|---|
| 087 | Hand-Held Tester |
| 094 | Multiplexer cable |
| X11/4 | Data link connector (DTC readout) (38-pole) |



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Connection Diagram - Hand-Held Tester (HHT)

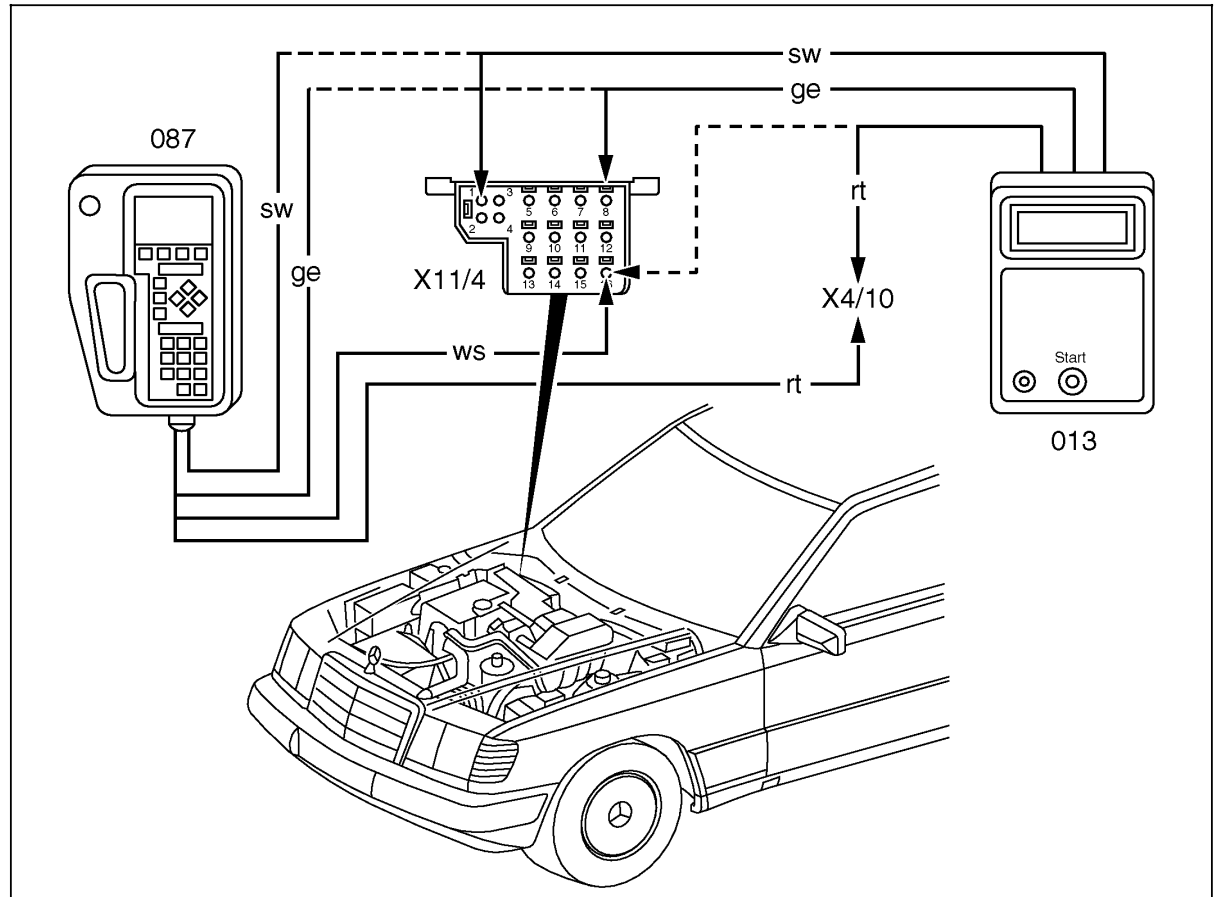
1. Connect HHT (087) with test cable (097) to data link connector (X11/4)
2. Ignition: **ON**
3. As per display in HHT:
 - a) read out/erase DTC memory
 - b) read out actual values
 - c) perform activations
 - d) program control modules
4. Disconnect HHT



Observe system specific notes, which are described in the beginning of each chapter. Erase all stored faults which come about when tests or simulations are performed, upon completion of the repairs.

Figure 1

- 087 Hand-Held Tester
- 094 Multiplexer cable
- X11/4 Data link connector (DTC readout) (38-pole)



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Diagnosis – Diagnostic Trouble Code (DTC) Memory

Prerequisites for readout of DTC memory




Readout via the impulse counter scan tool is not possible.

Note:


Symbol for emission related malfunctions which lead to the activation of the CHECK ENGINE MIL when a certain test cycle was performed and a fault was recognized.

1. Review **WARNING!** on pages 11/1 and 11/2,
2. Review document (in WIS): AD07.61-P-1000WZ,
3. Perform Test and adjustment of engine, see DM, Engines, Vol. 1, section B, if necessary.
4. Review 11, 21, 22, 23, 24, 31, 33,
5. Connect HHT (087) with test cable (097) to data link connector (X11/4). Readout DTC fault codes.
6. Ignition: **ON**

DTC 	Possible cause		Test step/Remedy ¹⁾
	SAE nomenclature	Explanation	
–	No malfunction in system		In case of complaint, perform 23, 24, 25 or 26 entirely.
PO 100	MAF circuit malfunction	Hot film MAF sensor (B2/5)	23⇒ 4.0
PO 105	MAP circuit malfunction	Pressure sensor (B28)	23⇒ 6.0
PO 110	IAT circuit malfunction	IAT sensor (in Hot film MAF sensor B2/5)	23⇒ 5.0
PO 115	ECT circuit malfunction	ECT sensor (B11/4)	23⇒ 8.0
PO 120	Throttle position circuit malfunction	Actual value potentiometer in CC/ISC actuator (M16/2)	25⇒ 3.0
PO 130	O2S 1 circuit malfunction	A. O2S 1 (before TWC) (G3/2) B. O2S 1 (before TWC) (G3/2) Voltage increase insufficient	23⇒ 10.0


1) Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

DTC 	Possible cause		Test step/Remedy ¹⁾
	SAE nomenclature	Explanation	
P0133	O2S 1 circuit slow response	A O2S 1 (before TWC) (G3/2), ageing correction value exceeded B O2S 1 (before TWC) (G3/2), ageing time period too long	23⇒ 10.0
P0135	O2S 1 heater circuit malfunction	O2S 1 heater (before TWC) (G3/2)	23 ⇒ 11.0
P0136	O2S 2 circuit malfunction	O2S 2 (after TWC) (G3/1) (only USA)	23 ⇒ 12.0
P0141	O2S 2 heater circuit malfunction	Right O2S 2 heater (after TWC) (G3/1) (only USA)	23⇒ 13.0
P0170	Fuel trim malfunction	A Self adaptation of fuel mixture “partial load“ at limit from engine control module (N3/10). B Self adaptation of fuel mixture “CTP“ at limit from engine control module (N3/10).	Intake air leak, injectors, diaphragm pressure regulator, engine wear.
P0201	Injector circuit malfunction - cyl. 1	Injector (Y62y1) – cylinder 1	23⇒ 14.0
P0202	Injector circuit malfunction - cyl. 2	Injector (Y62y2) – cylinder 2	23⇒ 15.0
P0203	Injector circuit malfunction - cyl. 3	Injector (Y62y3) – cylinder 3	23 ⇒ 16.0
P0204	Injector circuit malfunction - cyl. 4	Injector (Y62y4) – cylinder 4	23 ⇒ 17.0
P0243	Recirculated air flap actuator(M16/7) for supercharger	For engine with supercharger only	23 ⇒ 37.0


1) Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

 DTC	Possible cause		Test step/Remedy ¹⁾
	SAE nomenclature	Explanation	
P0 300	Random misfire detected	A Random misfire B Random misfire, TWC damaging	24 ⇒ 7.0 – 8.0 24 ⇒ 9.0 36 ⇒ 1.0 – 2.0 Compression pressure
P0 301	Cylinder 1 misfire detected	A Cylinder 1 misfire B Cylinder 1 misfire, TWC damaging	24 ⇒ 7.0 24 ⇒ 9.0 36 ⇒ 1.0 – 2.0 Compression pressure
P0 302	Cylinder 2 misfire detected	A Cylinder 2 misfire B Cylinder 2 misfire, TWC damaging	24 ⇒ 8.0 24 ⇒ 9.0 36 ⇒ 1.0 – 2.0 Compression pressure
P0 303	Cylinder 3 misfire detected	A Cylinder 3 misfire B Cylinder 3 misfire, TWC damaging	24 ⇒ 8.0 24 ⇒ 9.0 36 ⇒ 1.0 – 2.0 Compression pressure
P0 304	Cylinder 4 misfire detected	A Cylinder 4 misfire B Cylinder 4 misfire, TWC damaging	24 ⇒ 7.0 24 ⇒ 9.0 36 ⇒ 1.0 – 2.0 Compression pressure


¹⁾ Observe Preparation for Test, see 22.

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DTC 	Possible cause		Test step/Remedy ¹⁾
	SAE nomenclature	Explanation	
P0 325	KS 1 circuit malfunction	Front KS 1 (A16)	Wiring, connector, A16
P0 335	CKP sensor circuit malfunction	CKP sensor (L5)	24 ⇒ 5.0
P0 341	CMP sensor circuit range/performance	Camshaft Hall-effect sensor (B6/1)	24 ⇒ 6.0
P0 370	Angle deviation between camshaft and crankshaft	Angle deviation between camshaft and crankshaft	Check basic adjustment of camshaft.
P0 400	Only (USA) Model 202: without supercharger	Exhaust gas recirculation flow malfunction	Exhaust gas recirculation malfunction (logic chain), engine 111.974 (USA)
P0 410	Only (USA) Models 170, 202	Air injection system malfunction	AIR system malfunction (logic chain), Compressor (engine 111.975) (USA)
P0 422		TWC efficiency below threshold	Replace TWC
P0 440	Only (USA) Model 170, Model 202 as of 09/97	EVAP system malfunction	EVAP system leak (logic chain)
P0 441		EVAP system incorrect purge flow	EVAP not functioning


¹⁾ Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

DTC 		Possible cause		Test step/Remedy ¹⁾
		SAE nomenclature	Explanation	
P0442	Only (USA) Model 170 Model 202 as of 09/97	EVAP system leak detected (small leak)	EVAP system, small leak	23 ⇒ 28.0
P0443		EVAP system purge control valve circuit malfunction	Purge control valve (Y58/1)	23 ⇒ 26.0
P0446	Only (USA) Model 170 Model 202 as of 09/97	EVAP system vent control malfunction	A. Activated charcoal canister shut-off valve (Y58/4) B. End stage activated charcoal canister shut-off valve (Y58/4)	23 ⇒ 27.0, 28.0, 29.0, 30.0
P0450	Only (USA) Model 170 Model 202 as of 09/97 Model 202 only (USA), up to 08/97	EVAP system pressure sensor malfunction	A. Fuel tank pressure sensor (B4/3) electrical fault B. Fuel tank pressure sensor (B4/3) electrical fluctuations Purge monitoring pressure sensor (B4/4)	23 ⇒ 30.0 Charcoal canister plugged. 23 ⇒ 31.0
P0455	Only (USA) Model 170 Model 202 as of 09/97	EVAP system leak detected (large leak)	EVAP system, large leak Fuel tank pressure sensor (B4/3)	23 ⇒ 28.0 23 ⇒ 30.0


¹⁾ Observe Preparation for Test, see 22.

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DTC 	Possible cause		Test step/Remedy ¹⁾
	SAE nomenclature	Explanation	
P0 460 Only (USA) Model 170 Model 202 as of 09/97	Fuel level sensor circuit low input	Fuel tank level too low	Read out Instrument Cluster memory.
P0 500	VSS sensor malfunction	A VSS left front B VSS left rear	Test ASR/ETS see DM, Chassis and Drivetrain, Vol. 3, Section 9.3
P0 507	ISC rpm higher than expected	Idle control system	25 ⇒ 1.0 – 3.0
P0 560	System voltage malfunction	Voltage supply at engine control module (N3/10)	23 ⇒ 1.0 – 2.0
P0 565	Cruise control switch	CC switch (S40)	26 ⇒ 1.0
P0 600	Serial communication link malfunction	CAN bus from ESP/SPS control module (N47-5)	23 ⇒ 32.0
P0 604	Internal control module random Access memory (RAM) error	A. Engine control module (N3/10) B. Engine control module (N3/10)	(N3/10)
P0 605	Internal control module read only memory (ROM) error	Engine control module (N3/10)	(N3/10)
P0 700	Transmission control system malfunction	Read DTC memory of transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P0 702	Transmission control system electrical	Read DTC memory of transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.


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DTC 	Possible cause		Test step/Remedy ¹⁾
	SAE nomenclature	Explanation	
P0 715	Input/turbine speed sensor circuit malfunction	Read DTC memory of transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P0 720	Output speed sensor circuit malfunction	Read DTC memory of transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P0 730	Incorrect gear ratio	Read DTC memory of transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P0 740	Torque converter clutch circuit malfunction	Read DTC memory of transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P0 743	Torque converter clutch circuit electrical	Read DTC memory of transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P0 748	Pressure control solenoid electrical	Read DTC memory of transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P0 753	Shift solenoid A electrical	Read DTC memory of transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P0 758	Shift solenoid B electrical	Read DTC memory of transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P0 763	Shift solenoid C electrical	Read DTC memory of transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P0 801	Engine/climate control electric cooling fan malfunction	Engine/climate control electric cooling fan (M4/3)	23 ⇒ 38.0








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DTC 	Possible cause		Test step/Remedy ¹⁾
	SAE nomenclature	Explanation	
P0 803 Supercharger only	Air flap/air filter actuator (M16/7) malfunction	Supercharger function, (logic chain, measured via air mass)	23 ⇒ 37.0
P0 805 Supercharger only	Air flap/air filter actuator (M17/6) malfunction	Supercharger function, (endstage of actuator)	23 ⇒ 35.0
P0 806 Supercharger only	Magnetic supercharger clutch (y2/1)	Magnetic supercharger clutch (Y2/1)	23 ⇒ 36.0
P0 809	Angle deviation between camshaft and crankshaft	Angle deviation between camshaft and crankshaft	Check basic adjustment of camshaft.
P0 811	CAN from electronic ignition lock	CAN from electronic ignition lock	23 ⇒ 32.0
P1 163	Oil level switch	Oil level switch (S43)	23 ⇒ 33.0
P1 181	Engine/climate control electric cooling fan malfunction	Engine/climate control electric cooling fan (M4/3) functional fault	23 ⇒ 38.0
P1 182 Model 170 only Model 202 as of 06/97	Starter lock-out relay module (N65k2) Starter relay (K40/4k2)	Starter relay in passenger-side fuse and relay module box (K40/4)	23 ⇒ 3.0
P1 186	Fuel safety shut-off recognized	EA/CC/ISC actuator (M16/1)	25 ⇒ 3.0 – 4.0, EA/CC/ISC actuator (M16/1) sticks or jammed, Check intake system for residue.



1) Observe Preparation for Test, see 22.

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DTC 	Possible cause		Test step/Remedy ¹⁾
	SAE nomenclature	Explanation	
P1 235 Supercharger only	Air flap/air filter actuator (M17/6)	Supercharger function, (endstage of actuator)	23 ⇒ 35.0
P1 236 Supercharger only	Magnetic supercharger clutch (Y2/1)	Magnetic clutch function	23 ⇒ 36.0
P1 386	Knock sensor control from ECM (N3/10) at end stop	Knock sensor regulation from engine control module (N3/10) at end stop	1. Increased knock tendency due to bad fuel, carbon in combustion chamber or mechanical damage, 2. Engine control module (N3/10).
P1 400 Only  Model 202, without supercharger	EGR switchover valve malfunction	EGR switchover valve (Y27), engine 111.974 	23 ⇒ 21.0
P1 420 Only  Models 170, 202	AIR pump switchover valve	AIR pump switchover valve (Y32), Compressor (engine 111.975) 	23 ⇒ 19.0
P1 453 Only  Model 202, without supercharger	AIR relay module	AIR relay module in passenger-side fuse and relay module box (K40/4), engine 111.974 	23 ⇒ 18.0
P1 491	Refrigerant pressure in A/C system too high	Refrigerant pressure in A/C system too high	Check automatic A/C system.
P1 519	Adjustable camshaft timing solenoid	Adjustable camshaft timing solenoid (Y49) (logic chain)	23 ⇒ 25.0


1) Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

DTC 	Possible cause		Test step/Remedy ¹⁾
	SAE nomenclature	Explanation	
P1 525	Adjustable camshaft timing solenoid	Adjustable camshaft timing solenoid (Y49)	23 ⇒ 24.0
P1 542	Pedal value sensor	Pedal value sensor (B37)	25 ⇒ 1.0 – 2.0
P1 551	A/C compressor shut-off, endstage	With Tempmatic A/C 	23 ⇒ 39.0, Wrong A/C pushbutton control module installed.
P1 570	CAN signal from DAS control module to engine control module	A. Start attempted with "locked" DAS B. CAN signal from DAS control module (N54/1) to engine control module (N3/10) interrupted. C. Engine control module (ME-SFI) and DAS control module are not compatible.	User error, Check correct operation of DAS, see DM, Body and Accessories, Vol. 1 23 ⇒ 32.0 Check control modules and part no.
P1 580	EA/CC/ISC actuator	EA/CC/ISC actuator (M16/6)	25 ⇒ 3.0 – 4.0
P1 584	Stop lamp switch	Stop lamp switch (S9/1)	Check switch.
P1 603	CAN signal from EIS	CAN failure	23 ⇒ 32.0
P1 605		Poor road/traction condition recognition signal (via comparison of VSS rpm signals)	Test ASR/ESP, see DM, Chassis and Drivetrain, Vol. 3, Section 9.3, 10.2
P1 642	Engine control module incorrectly coded	Engine control module incorrectly coded (coded for MT, vehicle has AT)	Check version coding and correct.

1) Observe Preparation for Test, see 22.

Diagnosis – Diagnostic Trouble Code (DTC) Memory

DTC 	Possible cause		Test step/Remedy ¹⁾
	SAE nomenclature	Explanation	
P1 643	Engine control module incorrectly coded or No CAN transmission from transmission control module	Engine control module incorrectly coded (coded for MT, vehicle has AT) or No CAN transmission from transmission control module (N15/3)	Check version coding and correct. Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P1 644	Transmission version can not be checked due to low voltage at transmission control module	Transmission version can not be checked due to low voltage at transmission control module (N15/3)	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2.
P1 681	Crash signal not plausible.	as of 06/98	23 ⇒ 41.0
P1 747	CAN signal from ETC	A. CAN failure: Transmission protection malfunction from transmission control module (N15/3) B. CAN failure: Instrument cluster	Test ETC, see DM, Chassis & Drivetrain, Vol. 1, section 2. Test instrument cluster, see DM, Body & Accessories, Vol. 1

1) Observe Preparation for Test, see 22.