Checking Procedure

General Information

This Checking Procedure contains the diagnosis of the following electronic system:

- Motronic ME1.5.5, Z 20 LET

Vehicle Diagnostic Concept:

The main purpose of a vehicle diagnostic concept is locating and eliminating faults in the shortest time possible. Therefore, the following diagnostic strategy has been developed as a guideline that leads technicians straight to the source fault:

Starting point is the vehicle that contains a certain number of electronic systems, e.g. engine management system, airbag, and ABS system.
Each of these electronic systems consists of so - called "functional groups" that are functionally related to each other. A Coolant Temperature Sensor Circuit for example represents such a functional group.
Each of the functional groups consists of several components, such as switches, sensors, wires etc. A Coolant Temperature Sensor Circuit for example is made up of a sensor, a wiring harness, a control unit, and the software of the control unit.
Based on this structure, the first diagnostic step should be the identification and localisation of the defective electronic system, next comes the diagnosis of the corresponding defective functional group, and finally, locate and repair of the defective component within that group.

The Diagnostic System Check (described in table A, Diagnostic System Check) of this checking procedure follows that diagnostic path. Diagnosis of an electronic system according to the above described concept always starts with this Main Check.

The instructions described in the Diagnostic System Check section must be followed closely. Every time a test or test step is passed without fault, the Diagnostic System Check continues with the next step. Some of the tests include references to related functional groups (tables B-x). When there is a fault, the corresponding functional group tests are performed in order to detect the defective functional group. When that group has been identified, the troubleshooting tables (C-x) are used to locate the faulty component. After repair of the fault, the affected functional group (tables B-x) must be rechecked to continue after this test at the appropriate position of the Diagnostic System Check (table A).
When all test steps of the Diagnostic System Check have been completed successfully, the system is fully operational.

Safety Measures

Please take notice of any relevant safety measures for each work operation / step.

The safety measures can be found in the following area of TIS 2000:

- Service Information
- Standard Information
- Select: Model
- Select: Model year
- Select: One or more assembly groups
- Application: Warnings, disclaimers, safety

Electronic System Specific Information

- **Trouble Code Features**
  In a few cases, the diagnostic tester may display a trouble code status or description that looks unfamiliar:

  Trouble Code Status:
  Instead of the known PRESENT, NOT PRESENT (and INTERMITTENT) message, you may read UNKNOWN DTC in the tester display. This tells you that the diagnostic software or control unit contains a piece of incorrect information that is unknown to the diagnostic tester and that it is unable to read or evaluate. Both the trouble code number and the trouble code text are not changed in this case.

  The above mentioned special cases can not be removed by means of a diagnostic tester function.
- **Service-Programming SPS**
  The new FLASH-Programming makes it possible to cover different software variants with one hardware version of a control unit. Depending on the system calibration values, curves and mappings can be programmed into a specific control unit type.
  In order to program those specific vehicle data into the control unit, you need a diagnostic tester and a TIS (TECH Information-System) unit. Up to now, that could only be done by replacing the program memory (EPROM) or even the complete control unit.
  The newest programming data is published with the TIS CD.
  Programming Procedure:
  Connect the diagnostic tester to the vehicle diagnostic connector.
  Start the SPS service programming application.
  Download vehicle data and security access from control unit to diagnostic tester.
  Connect diagnostic tester to TIS.
  Upload vehicle data and security access from diagnostic tester to TECH Information-System (TIS) .
  TIS checks the security access and compares the vehicle data with the data stored on the TIS CD.
  If the security check fails, TIS cannot automatically select the relevant

programming data. In case of a failure, TIS requests all information (e.g. vehicle identification number, system name) required in order to select the appropriate system software. For further information please refer to the SPS manual.
If the security check is passed, the data selected by TIS will be copied from the CD to the diagnostic tester.
Connect the diagnostic tester with the required program copy to the vehicle.
The program download to the control unit is executed.
The SPS service programming procedure is completed, the diagnostic tester recognises whether the data has been properly transferred or not.
The diagnostic tester is the interface between the storage device TIS and the control unit to be programmed. A direct connection between TIS and control unit is not possible.
The diagnostic tester is the interface between the storage device (TIS with latest TIS-CD) and the control unit to be programmed. A direct connection between TIS and control unit is not possible.
Note:
After service programming the control unit must be labelled with the current calibration identifier.

Electronic System Picture Information

Rated Fuse Current of the Fused Jumper Wire

Wire gauge given in mm^2	Rated fuse current of the fused jumper wire given in A
0,35	3
0,5	5
0,75	7,5
1,0	10
2,5	25
4,0	30
6,0	40

A - Diagnostic System Check

T01 - Checking Procedure Validity

Work Order Description	Nominal Value
Motronic ME1.5.5, Z 20 LET	

This Checking Procedure is valid for the following vehicles: • Opel Speedster 2003 • Vauxhall VX220 2003 Production dependent vehicle modifications of other model years are not covered by this Checking Procedure. This might lead to improper diagnosis.	

Yes:T02

T02 - Customer Complaint Validation

Work Order Description	Nominal Value
• Record customer complaint for later use • Verify, validate and understand the customer complaint **Note:** Record the information by using the Protocol-Function of the TIS 2000 Checking Procedure Application.	Is the malfunction reproducible?

Yes:T03	No:T12

T03 - System Operation as Designed

Work Order Description	Nominal Value
• Check if the customer complaint is a normal system behaviour and if the customer operates the system properly. **Note:** Refer to the operating manual of the system / the vehicle	System okay?

Yes:T04	No:T05

Yes:

T04 - Inform the Customer

Work Order Description	Nominal Value
• Please inform the customer, that the system behaviour is normal system operation respectively that the complaint can not be reproduced.	

T05 - Preliminary Diagnostic Check (Visual Inspection)

Work Order Description	Nominal Value
Perform a visual check of all accessible components of the concerned system using the recorded customer complaint (this should take a maximum of 2 minutes) • All consumers turned off • Verify battery condition • Check the following fuses for proper operation: FL1, FL4, FB5, FB7, FB8, FB12, FB20, FR2, FR3 Fuse • Check if all ground connections are clean, tight and installed properly • Check if all connections and plugs of the concerned system are clean, tight / correctly installed and have no damages. • Check vacuum hoses for splits, kinks, leaks and proper connections. • Check hose connectors and fittings on intake system / vacuum system • After successful test/fault repair proceed to the next test step **Note:** The battery must not be disconnected at this point of the Diagnostic System Check, as the control units of the vehicle could otherwise lose stored diagnostic information. If the system operates correctly after replacing a defective fuse, the switched circuits, which are supplied by this fuse, should be checked for short circuit to ground.	

Yes:T06

T06 - Check: Other system

Work Order Description	Nominal Value
Check the following system / signal for proper operation: • Immobiliser Signal Refer to Table B-15 Immobiliser Check	

• After successful test/fault repair proceed to the next test step	

Yes:T07

T07 - Connect Diagnostic Tester and Establish Communication

Work Order Description	Nominal Value
Before connecting the diagnostic tester, observe the instructions of the diagnostic tester operators manual • Connect diagnostic tester, select concerned Electronic System, establish communication and verify, that the correct control unit is installed: Refer to Table B-03 Connect Diagnostic Tester and Establish Communication • Check the following system / signal for proper operation: • Verify programming of the control unit: Refer to Table B-04 PROGRAMMING • After successful test/fault repair proceed to the next test step	

Yes:T08

T08 - Diagnostic Trouble Codes

Work Order Description	Nominal Value
Important: Trouble codes are only a reference on faults in a subgroup of the system. Trouble codes are not a direct reference on a defective component. Trouble codes are not updated as long as the diagnostic tester communicates with the control unit. • Read and record diagnostic trouble codes including status • Delete trouble codes • The trouble code status PRESENT only exists under certain conditions. • Operate the vehicle over an appropriate distance at various engine speed / load conditions, until the trouble code is PRESENT.	

• If a trouble code with status present is stored: Refer to Table B-01 DIAGNOSTIC TROUBLE CODE • After successful test/fault repair proceed to the next test step **Note:** If a trouble code is set, check for newest Technical Information TI regarding the trouble code before proceeding with the diagnostic procedure.	

Yes:T09

T09 - Check: Symptom/Customer Complaint

Work Order Description	Nominal Value
If a defect has been found in previous test steps, the following test can be skipped (follow result "YES"). • Evaluate customer complaint: Refer to Table B-06 Symptom Chart/Customer Complaints • After successful test/fault repair proceed to the next test step **Note:** Refer to the newest Technical Information TI regarding the symptom/customer complaint before proceeding with the diagnostic procedure.	

Yes:T10

T10 - No Matching Customer Complaint

Work Order Description	Nominal Value
If a defect has been found in previous test steps, the following test can be skipped (follow result "YES"). • Perform the following evaluation: Refer to Table B-08 No Matching Customer Complaint • After successful test/fault repair proceed to the next test step	

Yes:T11	
Yes:	
T11 - System / Function End Test	
Work Order Description	**Nominal Value**
• Check if the customer complaint is repaired and the concerned system is fully operational. **Note:** • Drive the vehicle in different driving conditions (engine speed and engine load conditions) over a considerable distance. Pay attention to unusual noise and other system irregularities. • Turn ignition OFF and ON • Delete trouble codes **Note:** Read the trouble codes again after the test drive and check for symptoms / customer complaints. If a complaint still exists, restart the diagnostic session for a second time. If the problem can not be solved in the second diagnostic session, contact the local support centre.	
T12 - Intermittent System Operation	
Work Order Description	**Nominal Value**
Most intermittent problems are caused by faulty electrical connectors, faulty ground connections, broken wiring, temperature problems or radio interference. Intermittent faults can be traced either by using INTERMITTENT/NOT PRESENT trouble codes or the snapshot function of the diagnostic tester in combination with the following tests: • Perform the following evaluation: Refer to Table B-14 Check: Intermittent Faults After successful test/fault repair proceed to the next test step	
Yes:T11	
B-01 - DIAGNOSTIC TROUBLE CODE	

P0100 - Mass or volume air flow circuit high input

- The voltage at the control unit input (terminal 6 (X80)) is greater than 4.98 V .
- Above condition must be fulfilled for at least 0.5 s .

Concerned Terminals:
6, 9 (X32)

Refer to test step :B-16

Refer to test step :B-16

P0100 - Mass or volume air flow circuit low input

- The voltage at the control unit input (terminal 6 (X80)) is less than 0 V .
- Above condition must be fulfilled for at least 0.5 s .

Concerned Terminals:
6, 9 (X32)

Refer to test step :B-16

P0100 - Mass or volume air flow circuit range/performance problem

- The sensor signal at control unit terminal 6 (X80) is noisy.

Concerned Terminals:
6, 9 (X32)

P0101 - Mass Air Flow Sensor Circuit Range/Performance

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
6, 9 (X32)

Refer to test step :C-08

P0101 - Mass Air Flow Sensor Circuit Range/Performance

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
6, 9 (X32)

Refer to test step :C-08

P0110 - Intake Air Temperature Circuit High Input

- 180 s elapsed time since engine start
- Throttle valve is closed for longer than 10 s (idle speed)
- Intake air temperature is less than -36.75 °C (-32.80 °F) (Short circuit to voltage)

Replacement Value:

- The control unit takes 20.25 °C (68.00 °F) as replacement value.

Effect:

- The learn functions are locked and current values are used for calculation.

Concerned Terminals:
9, 55 (X32)

Refer to test step :C-11

Refer to test step :C-11

P0110 - Intake Air Temperature Circuit Low Input

- 180 s elapsed time since engine start
- Intake air temperature is greater than 138.75 °C (280.40 °F)
  (Short circuit to ground)

Effect:

- The control unit takes 20.25 °C (68.00 °F) as replacement value.

Concerned Terminals:
9, 55 (X32)

P0115 - Engine Coolant Temperature Circuit High Input

- Coolant temperature is greater than 139 °C (282 °F)
  Above condition must be fulfilled for at least 0.5 s .

Concerned Terminals:
38 (X32)

Refer to test step :C-09

Refer to test step :C-09

P0115 - Engine Coolant Temperature Circuit Low Input

- Coolant temperature is less than -36.75 °C (-32.80 °F)
  Above condition must be fulfilled for at least 0.5 s .

Concerned Terminals:
38 (X32)

Refer to test step :C-09

P0115 - Engine coolant temperature circuit malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
38 (X32)

Refer to test step :C-09

P0115 - Insufficient coolant temperature for closed loop fuel control

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
38 (X32)

P0120 - Throttle/Pedal Position Incorrect Ratio

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

Refer to test step :C-07

P0120 - Throttle/pedal position sensor/switch "A" circuit high input

- Throttle position sensor voltage is greater than 4.9 V
  (Short circuit to voltage)

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P0120 - Throttle/pedal position sensor/switch "A" circuit low input

- Throttle position sensor voltage is less than 0.2 V
  (Short circuit to ground)

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

P0120 - Throttle/pedal position sensor/switch "A" circuit malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P0130 - O2 Sensor Circuit High Voltage (Bank 1 Sensor 1)

- Oxygen sensor voltage is greater than 1.5 V
  (Short circuit to voltage)

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

Refer to test step :C-22

P0130 - O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1)

- Oxygen sensor voltage is less than 60 mV
  (Short circuit to ground)

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0130 - O2 Sensor Circuit Slow Response (Bank 1 Sensor 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0130 - O2 Sensor Circuit Slow Response (Bank 1 Sensor 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0130 - O2 sensor circuit malfunction (Bank 1 Sensor 1)

- Oxygen sensor control limit "lean" was reached for 18 s .

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0130 - O2 sensor circuit malfunction (Bank 1 Sensor 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0130 - O2 sensor circuit malfunction (Bank 1 Sensor 1)

- Oxygen sensor control limit "rich" was reached for 18 s .

Concerned Terminals:
8, 25 (X32)

P0135 - O2 Sensor Heater Circuit High Voltage (Bank 1 Sensor 1)

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:
49 (X32)

Refer to test step :C-21

Refer to test step :C-21

P0135 - O2 Sensor Heater Circuit Low Voltage (Bank 1 Sensor 1)

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
49 (X32)

Refer to test step :C-21

P0135 - O2 Sensor Heater Circuit Open (Bank 1 Sensor 1)

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
49 (X32)

Refer to test step :C-21

P0135 - O2 sensor heater circuit malfunction (Bank 1 Sensor 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
49 (X32)

P0136 - O2 Sensor Circuit High Voltage (Bank 1 Sensor 2)

- Oxygen sensor voltage is greater than 1.5 V
  (Short circuit to voltage)

Concerned Terminals:
41, 57 (X32)

Refer to test step :C-24

Refer to test step :C-24

P0136 - O2 Sensor Circuit Open (Bank 1 Sensor 2)

- Oxygen sensor voltage is less than 60 mV
  (Short circuit to ground)

Concerned Terminals:
41, 57 (X32)

Refer to test step :C-24

P0136 - O2 sensor circuit malfunction (Bank 1 Sensor 2)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
41, 57 (X32)

Refer to test step :C-24

P0136 - O2 sensor circuit malfunction (Bank 1 Sensor 2)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
41, 57 (X32)

Refer to test step :C-24

P0136 - O2 sensor circuit malfunction (Bank 1 Sensor 2)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
41, 57 (X32)

Refer to test step :C-24

P0136 - O2 sensor circuit malfunction (Bank 1 Sensor 2)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
41, 57 (X32)

P0141 - O2 Sensor Heater Circuit High Voltage (Bank 1 Sensor 2)

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:
17 (X32)

Refer to test step :C-23

Refer to test step :C-23

P0141 - O2 Sensor Heater Circuit Low Voltage (Bank 1 Sensor 2)

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
17 (X32)

Refer to test step :C-23

P0141 - O2 Sensor Heater Circuit Open (Bank 1 Sensor 2)

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
17 (X32)

Refer to test step :C-23

P0141 - O2 sensor heater circuit malfunction (Bank 1 Sensor 2)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
17 (X32)

Refer to test step :C-22

P0170 - Fuel trim malfunction (Bank 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0170 - Fuel trim malfunction (Bank 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0170 - Fuel trim malfunction (Bank 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0170 - Fuel trim malfunction (Bank 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0170 - Fuel trim malfunction (Bank 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0170 - Fuel trim malfunction (Bank 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0170 - Fuel trim malfunction (Bank 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0170 - Fuel trim malfunction (Bank 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-22

P0170 - Fuel trim malfunction (Bank 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8, 25 (X32)

Refer to test step :C-14

P0201 - Cylinder 1 Injector Circuit Open

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
51 (X32)

P0201 - Cylinder 1 injector circuit high

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:
51 (X32)

Refer to test step :C-14

Refer to test step :C-14

P0201 - Cylinder 1 injector circuit low

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
51 (X32)

Refer to test step :C-15

P0202 - Cylinder 2 Injector Circuit Open

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
18 (X32)

P0202 - Cylinder 2 injector circuit high

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:
18 (X32)

Refer to test step :C-15

Refer to test step :C-15

P0202 - Cylinder 2 injector circuit low

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
18 (X32)

Refer to test step :C-16

P0203 - Cylinder 3 Injector Circuit Open

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
2 (X32)

P0203 - Cylinder 3 injector circuit high

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:
2 (X32)

Refer to test step :C-16

Refer to test step :C-16

P0203 - Cylinder 3 injector circuit low

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
2 (X32)

Refer to test step :C-17

P0204 - Cylinder 4 Injector Circuit Open

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
34 (X32)

P0204 - Cylinder 4 injector circuit high

- Final stage diagnosis in control unit

(Short circuit to voltage)

Concerned Terminals:
34 (X32)

Refer to test step :C-17

Refer to test step :C-17

P0204 - Cylinder 4 injector circuit low

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
34 (X32)

P0219 - Engine overspeed condition

- Engine speed is greater than 6500 rpm

Concerned Terminals:
-

Refer to test step :C-35

Refer to test step :C-07

P0220 - Throttle/pedal position sensor/switch "B" circuit high input

- Throttle position sensor voltage is greater than 4.8 V
  (Short circuit to voltage)

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P0220 - Throttle/pedal position sensor/switch "B" circuit low input

- Throttle position sensor voltage is less than 0.2 V
  (Short circuit to ground)

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

P0220 - Throttle/pedal position sensor/switch "B" circuit malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

Refer to test step :C-05

P0230 - Fuel Pump Relay Open Circuit

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
62 (X31)

P0230 - Fuel pump secondary circuit high

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:
62 (X31)

Refer to test step :C-05

Refer to test step :C-05

P0230 - Fuel pump secondary circuit low

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
62 (X31)

Refer to test step :C-10

P0235 - Boost Pressure Sensor Open Circuit

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
7, 9, 22 (X32)

P0235 - Boost Pressure Sensor Short To Battery

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:
7, 9, 22 (X32)

Refer to test step :C-10

Refer to test step :C-10

P0235 - Boost Pressure Sensor Short To Ground

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
7, 9, 22 (X32)

Refer to test step :C-13

P0243 - Boost Pressure Control Device Open Circuit

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
35 (X32)

P0243 - Boost Pressure Control Device Short To Battery

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:
35 (X32)

Refer to test step :C-13

Refer to test step :C-13

P0243 - Boost Pressure Control Device Short To Ground

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
35 (X32)

P0300 - Random/multiple cylinder misfire detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0300 - Random/multiple cylinder misfire detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0300 - Random/multiple cylinder misfire detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0301 - Cylinder 1 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0301 - Cylinder 1 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal

evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0301 - Cylinder 1 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0302 - Cylinder 2 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0302 - Cylinder 2 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0302 - Cylinder 2 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0303 - Cylinder 3 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0303 - Cylinder 3 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:

15, 16, 31, 32 (X32)

Refer to test step :C-18

P0303 - Cylinder 3 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0304 - Cylinder 4 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0304 - Cylinder 4 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0304 - Cylinder 4 Misfire Detected

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
15, 16, 31, 32 (X32)

Refer to test step :C-18

P0325 - Knock sensor 1 circuit high input (Bank 1 or single sensor)

- The control unit recognises an implausible value from the knock module

Concerned Terminals:
21, 37 (X32)

Refer to test step :C-19

P0325 - Knock sensor 1 circuit low input (Bank 1 or single sensor)

- The control unit recognises an implausible value from the knock module

Concerned Terminals:
21, 37 (X32)

Refer to test step :C-19

P0335 - Crankshaft Position Sensor "A" Circuit Open

- The control unit recognises the malfunction of the circuit via an internal

evaluation logic.

Concerned Terminals:
10, 42 (X32)

Refer to test step :C-04

P0335 - Crankshaft position sensor "A" circuit high input

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
10, 42 (X32)

Refer to test step :C-04

P0335 - Crankshaft position sensor "A" circuit low input

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
10, 42 (X32)

Refer to test step :C-04

P0335 - Crankshaft position sensor "A" circuit malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
10, 42 (X32)

Refer to test step :C-04

P0335 - Crankshaft position sensor "A" circuit malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
10, 42 (X32)

Refer to test step :C-04

P0340 - Camshaft Position Sensor Circuit Range/Performance

- Engine running
- The control unit cannot synchronise the camshaft signal.

Concerned Terminals:
36 (X32)

Refer to test step :C-12

Refer to test step :C-12

P0340 - Camshaft Position Sensor Signal Missing

- Engine running
- Camshaft signal not recognised

Concerned Terminals:
36 (X32)

Refer to test step :C-12

P0340 - Camshaft position sensor circuit high input

- The voltage at the control unit input (terminal 36 (X80)) is too high.
- The fault is stored directly on recognition.

Concerned Terminals:
36 (X32)

Refer to test step :C-12

P0340 - Camshaft position sensor circuit low input

- The voltage at the control unit input (terminal 36 (X80)) is temporary too low.
- The fault is stored directly on recognition.

Concerned Terminals:
36 (X32)

P0340 - Camshaft position sensor circuit malfunction

- Engine running
- The control unit cannot synchronise the camshaft signal.

Concerned Terminals:
36 (X32)

Refer to test step :C-12

Refer to test step :C-24

P0420 - Catalyst System Efficiency Below Threshold (Bank 1)

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
41, 57 (X32)

Refer to test step :C-20

P0443 - Evaporative emission control system purge control valve circuit open

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
33 (X32)

P0443 - Evaporative emission control system purge control valve circuit shorted

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:

33 (X32)

Refer to test step :C-20

Refer to test step :C-20

P0443 - Evaporative emission control system purge control valve circuit shorted

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
33 (X32)

P0500 - Vehicle speed sensor malfunction

- Incorrect signal from speed sensor

Concerned Terminals:
59 (X31)

Refer to test step :B-05

P0500 - Vehicle speed sensor malfunction

- Incorrect signal from speed sensor

Concerned Terminals:
59 (X31)

Refer to test step :B-05

Refer to test step :C-07

P0505 - Idle control system RPM higher than expected

- The desired idle speed is not in nominal range; the deviation is more than 200 rpm.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P0505 - Idle control system RPM lower than expected

- The desired idle speed is not in nominal range; the deviation is more than 100 rpm.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

P0560 - System Voltage High Input

- Switched battery voltage (ignition) is greater than 16.5 V
- Vehicle speed is greater than 5 km/h (3 mph)
- Above conditions must be fulfilled for at least 180 s .

Concerned Terminals:
17, 19, 33, 49 (X31)

Refer to test step :C-03

Refer to test step :C-03

P0560 - System Voltage Low Input

- Switched battery voltage (ignition) is less than 10 V
- Above condition must be fulfilled for at least 180 s .

Concerned Terminals:
17, 19, 33, 49 (X31)

Refer to test step :C-03

P0560 - System voltage malfunction

- Switched battery voltage (ignition) is less than 2.5 V
- Above condition must be fulfilled for at least 180 s .

Concerned Terminals:
17, 19, 33, 49 (X31)

Refer to test step :C-03

P0560 - System voltage malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
17, 19, 33, 49 (X31)

Refer to test step :C-03

P0560 - System voltage malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
17, 19, 33, 49 (X31)

P0571 - Cruise control/brake switch "A" circuit malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
25, 57 (X31)

Refer to test step :C-28

P0602 - Control Module Program Version Error

- Control unit recognises programming error

or

- Control unit hardware failure

Concerned Terminals:
-

Refer to test step :C-02

P0602 - Control Module Programming Error

- Control unit recognises programming error

or

- Control unit hardware failure

Concerned Terminals:
-

Refer to test step :C-02

P0602 - Variant-Coding Not Programmed

- Variant Configuration not programmed
- The fault is stored directly on recognition.

Concerned Terminals:
-

Refer to test step :C-02

P0602 - Vehicle Identification Number Not Programmed

- Vehicle Identification Number (VIN) not programmed

Concerned Terminals:
-

Refer to test step :C-02

P0607 - Knock Sensor Circuit

- The control unit recognises an implausible value from the knock module

Concerned Terminals:
21, 37 (X32)

Refer to test step :C-19

P0607 - Knock Sensor Circuit

- The control unit recognises an implausible value from the knock module

Concerned Terminals:
21, 37 (X32)

Refer to test step :C-19

P0607 - Knock Sensor Circuit

- The control unit recognises an implausible value from the knock module

Concerned Terminals:
21, 37 (X32)

Refer to test step :C-19

P0650 - Malfunction Indicator (MI) Control Circuit High

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:
13 (X31)

Refer to test step :C-31

Refer to test step :C-31

P0650 - Malfunction Indicator (MI) Control Circuit Low

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
13 (X31)

Refer to test step :C-31

P0650 - Malfunction Indicator (MI) Control Circuit Open

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
13 (X31)

P0704 - Clutch Switch

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
8 (X31)

Refer to test step :C-29

P1105 - Barometric Boost Pressure Sensor Short To Battery

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
5, 23, 53 (X31)

Refer to test step :C-27

P1105 - Barometric Boost Pressure Sensor Short To Ground

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
5, 23, 53 (X31)

Refer to test step :C-27

Refer to test step :C-13

P1106 - Boost Pressure Control Device Malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:

35 (X32)

Refer to test step :C-13

P1106 - Boost Pressure Sensor Test

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
35 (X32)

Refer to test step :C-13

P1106 - Boost Pressure Signal Out Of Range

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
35 (X32)

Refer to test step :C-06

P1120 - Accelerator Pedal Position Sensor 1 High Input

- The voltage at the control unit input (terminal 54 (X79)) is greater than 4.9 V .
  (Short circuit to voltage)

Concerned Terminals:
4, 5, 21, 22, 37, 54 (X31)

P1120 - Accelerator Pedal Position Sensor 1 Incorrect Signal

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
4, 5, 21, 22, 37, 54 (X31)

Refer to test step :C-06

Refer to test step :C-06

P1120 - Accelerator Pedal Position Sensor 1 Low Input

- The voltage at the control unit input (terminal 54 (X79)) is less than 0.9 V .

Concerned Terminals:
4, 5, 21, 22, 37, 54 (X31)

P1120 - Accelerator Pedal Position Sensor 1-2 Correlation

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
4, 5, 21, 22, 37, 54 (X31)

Refer to test step :C-06

P1122 - Accelerator Pedal Position Sensor 1-2 Correlation

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
4, 5, 21, 22, 37, 54 (X31)

Refer to test step :C-06

Refer to test step :C-06

P1122 - Accelerator Pedal Position Sensor 2 High Input

- The voltage at the control unit input (terminal 37 (X79)) is greater than 4.8 V .
  (Short circuit to voltage)

Concerned Terminals:
4, 5, 21, 22, 37, 54 (X31)

Refer to test step :C-06

P1122 - Accelerator Pedal Position Sensor 2 Low Input

- The voltage at the control unit input (terminal 37 (X79)) is less than 0.9 V .

Concerned Terminals:
4, 5, 21, 22, 37, 54 (X31)

P1243 - Turbocharger Bypass Solenoid Valve Circuit High Voltage

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.
  (Short circuit to voltage)

Concerned Terminals:
50 (X32)

Refer to test step :C-33

Refer to test step :C-33

P1243 - Turbocharger Bypass Solenoid Valve Circuit Low Voltage

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.
  (Short circuit to ground or circuit interruption)

Concerned Terminals:
50 (X32)

Refer to test step :C-33

P1243 - Turbocharger Bypass Solenoid Valve Circuit Open

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.
  (Short circuit to ground or circuit interruption)

Concerned Terminals:
50 (X32)

P1300 - EOBD Error Because Of Empty Fuel Tank

- Check fuel level

Concerned Terminals:
55 (X31)

Refer to test step :B-10

P1481 - Fan Relay 1 Circuit High

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:
29 (X31)

Refer to test step :C-30

Refer to test step :C-30

P1481 - Fan Relay 1 Circuit Low

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
29 (X31)

Refer to test step :C-30

P1481 - Fan Relay 1 Circuit Open

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
29 (X31)

Refer to test step :C-32

P1490 - Auxiliary Cooling Pump Relay Open Circuit

- Final stage diagnosis in control unit
  (Circuit interruption)

Concerned Terminals:
45 (X31)

P1490 - Auxiliary Cooling Pump Relay Short To Battery

- Final stage diagnosis in control unit
  (Short circuit to voltage)

Concerned Terminals:
45 (X31)

Refer to test step :C-32

Refer to test step :C-32

P1490 - Auxiliary Cooling Pump Relay Short To Ground

- Final stage diagnosis in control unit
  (Short circuit to ground)

Concerned Terminals:
45 (X31)

P1500 - Electronic Throttle Control Motor Failure

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1500 - Electronic Throttle Control Motor Failure

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1500 - Electronic Throttle Control Motor Failure

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1500 - Electronic Throttle Control Motor Failure

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1500 - Electronic Throttle Control Motor Failure

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1523 - Electronic Throttle Control Malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1523 - Electronic Throttle Control Malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1523 - Electronic Throttle Control Malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1523 - Electronic Throttle Control Malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1526 - Electronic Throttle Control Malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1526 - Electronic Throttle Control Malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1526 - Electronic Throttle Control Malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1526 - Electronic Throttle Control Malfunction

- The control unit recognises the malfunction of the circuit via an internal

evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1526 - Electronic Throttle Control Malfunction

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
11, 23, 28, 39, 43, 56, 58, 60 (X32)

Refer to test step :C-07

P1600 - Reprogram or Replace Electronic Control Unit (ECU)

- Control unit recognises programming error

or

- Control unit hardware failure

Concerned Terminals:
-

Refer to test step :C-02

P1600 - Reprogram or Replace Electronic Control Unit (ECU)

- Control unit recognises programming error

or

- Control unit hardware failure

Concerned Terminals:
-

Refer to test step :C-02

P1600 - Reprogram or Replace Electronic Control Unit (ECU)

- Control unit recognises programming error

or

- Control unit hardware failure

Concerned Terminals:
-

Refer to test step :C-02

P1600 - Reprogram or Replace Electronic Control Unit (ECU)

- Control unit recognises programming error

or

- Control unit hardware failure

Concerned Terminals:
-

Refer to test step :C-02

P1600 - Reprogram or Replace Electronic Control Unit (ECU)

- Control unit recognises programming error

or

- Control unit hardware failure

Concerned Terminals:
-

Refer to test step :C-02

P1600 - Reprogram or Replace Electronic Control Unit (ECU)

- Control unit recognises programming error

or

- Control unit hardware failure

Concerned Terminals:
-

Refer to test step :C-02

P1610 - Immobiliser Function not Programmed

- The engine control unit is in reset state.

Effect:

- The engine telltale is triggered (flashing).
- Approximately 5 s after ignition ON, the injection function is blocked and the fuel pump is switched off.

Concerned Terminals:
-

Refer to test step :Immobiliser B-09

P1611 - Wrong Security Code Entered

- Entered security code is not valid for the actual vehicle

Effect:

- The engine telltale is triggered (flashing).
- Approximately 5 s after ignition ON, the injection function is blocked and the

fuel pump is switched off.

Concerned Terminals:
-

Refer to test step :Immobiliser C-02

P1612 - Immobiliser No Or Wrong Signal

- Communication error between immobiliser control unit and engine control unit.

Effect:

- The engine telltale is triggered (flashing).
- Approximately 5 s after ignition ON, the injection function is blocked and the fuel pump is switched off.

Concerned Terminals:
-

Refer to test step :Immobiliser C-05

P1613 - Immobiliser No Or Wrong Signal

- Communication error between immobiliser control unit and engine control unit.

Effect:

- The engine telltale is triggered (flashing).
- Approximately 5 s after ignition ON, the injection function is blocked and the fuel pump is switched off.

Concerned Terminals:
-

Refer to test step :Immobiliser C-05

P1614 - Immobiliser Not Programmed

- Wrong transponder response received.

Effect:

- The engine telltale is triggered (flashing).
- Approximately 5 s after ignition ON, the injection function is blocked and the fuel pump is switched off.

Concerned Terminals:
-

Refer to test step :Immobiliser C-06

P1614 - Immobiliser Wrong Signal Received

- Wrong transponder response received.

Effect:

- The engine telltale is triggered (flashing).
- Approximately 5 s after ignition ON, the injection function is blocked and the fuel pump is switched off.

Concerned Terminals:
-

Refer to test step :Immobiliser C-06

P1614 - Wrong Transponder Key

- Wrong transponder response received.

Effect:

- The engine telltale is triggered (flashing).
- Approximately 5 s after ignition ON, the injection function is blocked and the fuel pump is switched off.

Concerned Terminals:
-

Refer to test step :Immobiliser C-06

U2100 - CAN-BUS Malfunction

- Engine control unit recognises CAN bus error
- Above condition must be fulfilled for at least 1 s .

Concerned Terminals:
-

Refer to test step :C-02

U2101 - CAN-BUS Max.- Config.- List not Programmed

- Variant Configuration not programmed
- The fault is stored directly on recognition.

Concerned Terminals:
-

Refer to test step :C-02

U2104 - CAN-BUS reset counter overrun

- Engine control unit recognises CAN bus error
- Above condition must be fulfilled for at least 1 s .

Concerned Terminals:
-

Refer to test step :C-02

U2106 - CAN-BUS no Communication with TCM

- The control unit recognises the malfunction of the circuit via an internal evaluation logic.

Concerned Terminals:
-

Refer to test step :C-02

Refer to test step :C-02

U2108 - CAN-BUS no Communication with ABS/TC

- Communication error between ABS control unit and engine control unit

Concerned Terminals:
-

B-02 - DATA LIST

T01 - Tester Display Battery Voltage

Work Order Description	Nominal Value
• Ignition OFF • Engine OFF • All consumers turned off	11 ... 13.5 V
• Engine starting	greater than 8 V
• Engine running • All consumers turned off	12 ... 15 V
Concerned Terminals: 17, 19, 33, 49 (X31)	

Yes:T02	No:C-03

T02 - Tester Display Main Relay

Work Order Description	Nominal Value
• Ignition OFF • Engine OFF • All consumers turned off	Active
Concerned Terminals: 17, 19, 33, 49 (X31)	

Yes:T03	No:C-03

T03 - Tester Display Fuel Pump Relay

Work Order Description	Nominal Value
• Ignition OFF • Engine OFF • All consumers turned off	Inactive
• Engine running at idle speed, operating temperature	Active

• Accelerator pedal not actuated	
Concerned Terminals: 62 (X31)	

Yes:T04	No:C-05

T04 - Tester Display APP Sensor 1 (Accelerator Pedal Position)

Work Order Description	Nominal Value
• Ignition ON • Engine OFF • All consumers turned off • Accelerator pedal not actuated	less than 1 V
• Accelerator pedal slightly actuated	greater than 1 V
• Accelerator pedal actuated to full load stop	greater than 3 V
Concerned Terminals: 4, 5, 21, 22, 37, 54 (X31)	

Yes:T05	No:C-06

T05 - Tester Display APP Sensor 2 (Accelerator Pedal Position)

Work Order Description	Nominal Value
• Ignition ON • Engine OFF • All consumers turned off • Accelerator pedal not actuated	less than 0.5 V
• Accelerator pedal slightly actuated	greater than 0.5 V
• Accelerator pedal actuated to full load stop	greater than 1.6 V
Concerned Terminals: 4, 5, 21, 22, 37, 54 (X31)	

Yes:T06	No:C-06

T06 - Tester Display Calculated Pedal Position

Work Order Description	Nominal Value
• Ignition ON • Engine OFF • All consumers turned off • Accelerator pedal not actuated	0 %
• Accelerator pedal actuated to full load stop	100 %
Concerned Terminals:	

4, 5, 21, 22, 37, 54 (X31)	
Yes:T07	**No:C-06**

T07 - Tester Display APP at Idle Position (Accelerator Pedal Position)

Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • All consumers turned off • Accelerator pedal not actuated	Active
• Accelerator pedal slightly actuated	Inactive
Concerned Terminals: 4, 5, 21, 22, 37, 54 (X31)	
Yes:T08	**No:C-06**

T08 - Tester Display TP Sensor 1 (Throttle Position)

Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • All consumers turned off • Accelerator pedal not actuated • Wait time: minimum 15 s	less than 0.8 V
• Accelerator pedal actuated to full load stop	greater than 4 V
Concerned Terminals: 11, 23, 28, 39, 43, 56, 58, 60 (X32)	
Yes:T09	**No:C-07**

T09 - Tester Display TP Sensor 2 (Throttle Position)

Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • All consumers turned off • Accelerator pedal not actuated • Wait time: minimum 15 s	greater than 4 V
• Accelerator pedal slightly actuated	0.9 ... 4 V
• Accelerator pedal actuated to full load stop	less than 0.9 V
Concerned Terminals: 11, 23, 28, 39, 43, 56, 58, 60 (X32)	
Yes:T10	**No:C-07**

T10 - Tester Display Calculated Throttle Position	
Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • All consumers turned off • Accelerator pedal not actuated • Wait time: minimum 15 s	0 ... 9 %
• Accelerator pedal actuated to full load stop	greater than 90 %
Concerned Terminals: 11, 23, 28, 39, 43, 56, 58, 60 (X32)	
Yes:T11	**No:C-07**

T11 - Tester Display Throttle Position	
Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • All consumers turned off • Accelerator pedal not actuated • Wait time: minimum 15 s	Idle
• Accelerator pedal slightly actuated	Partial Load
Concerned Terminals: 11, 23, 28, 39, 43, 56, 58, 60 (X32)	
Yes:T12	**No:C-07**

T12 - Tester Display Engine Speed	
Work Order Description	**Nominal Value**
• Engine starting	greater than 60 RPM.
Concerned Terminals: 10, 42 (X32)	
Yes:T13	**No:C-04**

T13 - Tester Display Mass Air Flow Sensor	
Work Order Description	**Nominal Value**
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	less than 12 kg/h less than 1.5 V
Concerned Terminals:	

6, 9 (X32)	
Yes:T14	**No:C-08**

T14 - Tester Display Coolant Temperature

Work Order Description	Nominal Value
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	greater than 80 °C greater than 176 °F less than 1.25 V
Concerned Terminals: 38 (X32)	

Yes:T15	**No:C-09**

T15 - Tester Display Intake Air Temperature

Work Order Description	Nominal Value
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	10 ... 40 °C 50 ... 104 °F 4.1 ... 2.6 V
Concerned Terminals: 9, 55 (X32)	

Yes:T16	**No:C-11**

T16 - Tester Display Brake Switch 1

Work Order Description	Nominal Value
• Ignition OFF • Engine OFF • All consumers turned off	Inactive
• Ignition ON • Brake pedal actuated	Active
Concerned Terminals: 25, 57 (X31)	

Yes:T17	**No:C-28**

T17 - Tester Display Brake Switch 2

Work Order Description	Nominal Value
• Ignition OFF • Engine OFF • All consumers turned off	Inactive

• Ignition ON • Brake pedal actuated	Active
Concerned Terminals: 25, 57 (X31)	

Yes:T18	No:C-28

T18 - Tester Display Clutch Switch

Work Order Description	Nominal Value
• Ignition ON • Engine OFF • All consumers turned off • Do not actuate clutch pedal	Inactive
• Clutch pedal actuated	Active
Concerned Terminals: 8 (X31)	

Yes:T19	No:C-29

T19 - Tester Display Vehicle Speed

Work Order Description	Nominal Value
• Vehicle travelling (constant speed, approximately 30 km/h (19 mph))	30 km/h 19 mph Diagnostic tester display converges to speedometer display
Concerned Terminals: 59 (X31)	

Yes:T20	No:C-26

T20 - Tester Display Fuel Tank Ventilation Valve

Work Order Description	Nominal Value
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	0 %
• Vehicle travelling (constant speed, approximately 30 km/h (19 mph))	greater than 0 %
Concerned Terminals: 33 (X32)	

Yes:T21	No:C-20

T21 - Tester Display Knock Control	
Work Order Description	**Nominal Value**
• Ignition OFF • Engine OFF • All consumers turned off	Inactive
• Engine running at idle speed, operating temperature • Accelerator pedal not actuated	Inactive
• Accelerator pedal briefly actuated to full load stop **Note:** This test will only function, if the accelerator pedal is depressed briefly to full load stop once, not several times in a row. Even if the instructions given in the checking procedure are followed closely, the diagnostic tester may not indicate a signal change.	Active Value changing briefly
Concerned Terminals: 21, 37 (X32)	

Yes:T22	No:C-19

T22 - Tester Display B1S1 O2 Sensor Heater (Bank 1 Sensor 1)	
Work Order Description	**Nominal Value**
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	Active Value changing briefly
Concerned Terminals: 49 (X32)	

Yes:T23	No:C-21

T23 - Tester Display B1S1 O2 Sensor (Bank 1 Sensor 1)	
Work Order Description	**Nominal Value**
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	50 ... 950 mV Sensor signal alternates between high and low voltage range

Concerned Terminals: 8, 25 (X32)	
Yes:T24	**No:C-22**

T24 - Tester Display B1S1 Air/Fuel Ratio (Bank 1 Sensor 1)

Work Order Description	**Nominal Value**
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	LEAN and RICH Value changing briefly
Concerned Terminals: 8, 25 (X32)	

Yes:T25	**No:C-22**

T25 - Tester Display B1S2 O2 Sensor Heater (Bank 1 Sensor 2)

Work Order Description	**Nominal Value**
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	Active Value changing briefly
Concerned Terminals: 17 (X32)	

Yes:T26	**No:C-23**

T26 - Tester Display B1S2 O2 Sensor (Bank 1 Sensor 2)

Work Order Description	**Nominal Value**
• Vehicle rapidly accelerated (up to approximately 30 km/h (19 mph))	50 ... 950 mV Sensor signal alternates between high and low voltage range
Concerned Terminals: 41, 57 (X32)	

Yes:T27	**No:C-24**

T27 - Tester Display B1S2 Air/Fuel Ratio (Bank 1 Sensor 2)

Work Order Description	**Nominal Value**
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	LEAN and RICH

Concerned Terminals: 41, 57 (X32)	

Yes:T28	No:C-24

T28 - Tester Display O2 Sensor Loop

Work Order Description	Nominal Value
• Engine running at idle speed, cold • All consumers turned off	Open
• Engine running at idle speed, operating temperature • Accelerator pedal not actuated	Closed
• Accelerator pedal briefly actuated to full load stop	Open
Concerned Terminals: 8, 25 (X32)	

Yes:T29	No:C-22

T29 - Tester Display B1 Long Term Fuel Trim (Bank 1)

Work Order Description	Nominal Value
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	-5 ... 5 %
Concerned Terminals: 8, 25 (X32)	

Yes:T30	No:C-22

T30 - Tester Display B1 Short Term Fuel Trim (Bank 1)

Work Order Description	Nominal Value
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	-5 ... 5 %
Concerned Terminals: 8, 25 (X32)	

Yes:T31	No:C-22

T31 - Tester Display Fan Relay 1

Work Order Description	Nominal Value

• Ignition ON • Engine OFF • All consumers turned off • Coolant temperature is less than 60 °C (140 °F)	Inactive
• Engine running • Coolant temperature is greater than 100 °C (212 °F)	Active
Concerned Terminals: 29 (X31)	

Yes:T32	**No:C-30**

T32 - Tester Display Malfunction Indicator (MI)

Work Order Description	**Nominal Value**
• Ignition OFF • Engine OFF • All consumers turned off	On
• Engine running at idle speed, operating temperature • Accelerator pedal not actuated	Off
Concerned Terminals: 13 (X31)	

Yes:T33	**No:C-31**

T33 - Tester Display Barometric Pressure

Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • All consumers turned off	95 ... 105 kPa Diagnostic tester display is nearly identical to outside-air pressure
Concerned Terminals: 5, 23, 53 (X31)	

Yes:T34	**No:C-27**

T34 - Tester Display Boost Pressure Command

Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • All consumers turned off • Accelerator pedal not actuated	90 ... 110 kPa

• Engine running at idle speed, operating temperature	90 ... 110 kPa
• Vehicle rapidly accelerated (up to approximately 30 km/h (19 mph))	greater than 110 kPa
Concerned Terminals: 7, 9, 22 (X32)	

Yes:T35	**No:C-10**

T35 - Tester Display Boost Pressure

Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • All consumers turned off • Accelerator pedal not actuated	90 ... 110 kPa
• Engine running at idle speed, operating temperature	90 ... 110 kPa
• Vehicle rapidly accelerated (up to approximately 30 km/h (19 mph))	greater than 110 kPa
Concerned Terminals: 7, 9, 22 (X32)	

Yes:T36	**No:C-10**

T36 - Tester Display Pulse Ratio Boost Pressure Solenoid Valve

Work Order Description	**Nominal Value**
• Engine running at idle speed, operating temperature • All consumers turned off • Accelerator pedal not actuated	0 %
• Vehicle rapidly accelerated (up to approximately 30 km/h (19 mph))	greater than 0 %
Concerned Terminals: 7, 9, 22 (X32)	

Yes:T37	**No:C-10**

T37 - Tester Display Auxiliary Cooling Pump

Work Order Description	**Nominal Value**
• Engine running at idle speed, operating temperature	ACTIVE and INACTIVE

• All consumers turned off • Accelerator pedal not actuated	
Concerned Terminals: 45 (X31)	

Yes:T38	No:C-32

T38 - Tester Display Turbocharger Bypass Solenoid

Work Order Description	Nominal Value
• Ignition ON • Engine OFF • All consumers turned off	Inactive
• Engine running at idle speed, operating temperature • Accelerator pedal not actuated	Inactive
• Accelerator pedal briefly actuated to full load stop **Note:** Even if the instructions given in the checking procedure are followed closely, the diagnostic tester may not indicate a signal change.	Active
Concerned Terminals: 50 (X32)	

No:C-33

B-03 - Connect Diagnostic Tester and Establish Communication

T01 - Connect Diagnostic Tester and Establish Communication

Work Order Description	Nominal Value
Before connecting the diagnostic tester, observe the instructions of the diagnostic tester operators manual Connect diagnostic tester: • Ignition OFF • Connect the diagnostic tester with the required adapter to the diagnostic link • Ignition ON	Communication established?

Select concerned electronic system and establish communication: • Select diagnostics • Select model year: 2003 • Select model: Speedster/VX220 • Select electronic system group: Electronic engine system • Select electronic system or engine: Motronic ME1.5.5, Z 20 LET • Diagnostic tester now establishes communication with the selected Electronic System.	

Yes:	No:T02

T02 - Check: Fault Location

Work Order Description	Nominal Value
• Communication with control unit is interrupted • Does one of the following messages appear on the Diagnostic Tester display? Selected System Existing ECU Mismatch! or Mismatch between selected engine and existing engine ECU! or Unknown ECU!	

Yes:T03	No:T06

T03 - Check: Programming

Work Order Description	Nominal Value
• Is the used diagnostic tester software up to date? **Note:** Refer to information about the current software version in the menu point - TIS 2000 News	

Yes:T04	No:T05

T04 - Program Software

Work Order Description	Nominal Value

• Perform service programming (SPS) to download the latest version of control unit software into the control unit.	

Yes:T01

T05 - Program Software

Work Order Description	Nominal Value
• Program Software: Download the latest version of diagnostic software into the diagnostic tester.	

Yes:T01

T06 - Check: System

Work Order Description	Nominal Value
• Perform the following test step: Refer to Table C-01 No Communication between Diagnostic Tester and Control Unit • After successful test/fault repair proceed to the next test step	

Yes:T01

B-04 - PROGRAMMING

T01 - Tester Display Program Variant Configuration

Work Order Description	Nominal Value
• Ignition ON	
• Press corresponding key in the system main menu to call up Programming functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	Programming okay?
Concerned Terminals: -	

Yes:T02	No:C-02

T02 - Tester Display Program CAN Configuration

Work Order Description	Nominal Value
• Ignition ON	
• Press corresponding key in the system main menu to call up Programming	Programming okay?

functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	
Concerned Terminals: -	

Yes:T03	**No:C-02**

T03 - Tester Display Reset O2-Loop Block Learn Map

Work Order Description	**Nominal Value**
• Ignition ON • Press corresponding key in the system main menu to call up Programming functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	Programming okay?
Concerned Terminals: -	

Yes:T04	**No:C-02**

T04 - Tester Display Reset Learned Values

Work Order Description	**Nominal Value**
• Ignition ON	
• Press corresponding key in the system main menu to call up Programming functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	Programming okay?
Concerned Terminals: -	

No:C-02

Yes:

B-05 - Distance Signal Check

T01 - Check: Other system

Work Order Description	**Nominal Value**
Perform the following tests in the given order until a defect is found. Before connecting the diagnostic tester, observe the instructions of the diagnostic tester operators	

manual • Connect diagnostic tester, select concerned Electronic System, establish communication and verify, that the correct control unit is installed: Refer to ABS 430 Anti-Lock Brake System Table B-03 Connect Diagnostic Tester and Establish Communication • Read and record diagnostic trouble codes including status • If a trouble code with status present is stored: Refer to ABS 430 Anti-Lock Brake System Table B-01 DIAGNOSTIC TROUBLE CODE • Check the following parameters for correct status: • Refer to ABS 430 Anti-Lock Brake System Table B-02 DATA LIST T03 RL Wheel Speed (Rear Left) • If a defect has been found in previous test steps, the following test can be skipped (follow result "YES"). Refer to Table C-26 Vehicle Speed Input Signal Circuit • After successful test/fault repair proceed to the next test step	

Yes:

B-06 - Symptom Chart/Customer Complaints

T01 - Check: Symptom / Customer Complaint Match

Work Order Description	Nominal Value
Select the suitable symptom group, which fits the complaint. • Refer to Table B-07 Complaint: Engine Start	

B-07 - Complaint: Engine Start

- Customer complaint Remedy

Customer complaint	Remedy
Engine does not start, starter runs normal	Perform the following tests

	in the given order until a defective component is found. • Refer to Table B-09 ACTUATOR TEST T02 Ignition Coil Cylinder 1 Test - • Refer to Table B-09 ACTUATOR TEST T03 Ignition Coil Cylinder 2 Test - • Refer to Table B-09 ACTUATOR TEST T04 Ignition Coil Cylinder 3 Test - • Refer to Table B-09 ACTUATOR TEST T05 Ignition Coil Cylinder 4 Test - • Refer to Table B-10 Fuel System - • Refer to Table B-11 Mechanical Function Check

- Customer complaint Remedy

Customer complaint	Remedy
Engine does not start, starter slow / does not turn	Refer to Table C-34 Starter Circuit

Yes:

B-08 - No Matching Customer Complaint

T01 - No Matching Customer Complaint

Work Order Description	Nominal Value
The following test steps may or may not be helpful, they are only a proposal. Diagnostic Trouble Codes	

- Read and record diagnostic trouble codes including status
- Check for trouble codes with status INTERMITTENT or NOT PRESENT. If a trouble code is stored this may indicate the circuit which has the intermittent condition.
- Use the following table to obtain the concerned functional group and perform the following additional test steps, while performing the troubleshooting in the C-x tables.
  Refer to Table B-01 DIAGNOSTIC TROUBLE CODE
- Move the related connectors, wiring harness and components in order to find the failure. Switch on all electric consumers by turns, because this can cause an electromagnetic interference in a circuit. Use the TECH 31 or an oscilloscope to observe the wiring harness for disturbances. Operate the system under different conditions over a considerable time.

Quick Check

- Perform the following evaluation:
  Refer to Table B-02 DATA LIST
  Refer to Table B-09 ACTUATOR TEST
  Refer to Table B-13 CONTROL TEST
- Check Additional Information
  Refer to Table B-12 ADDITIONAL FUNCTIONS

SPS Programming

- Compare the SPS software number in the control unit with the version on TIS/TIS 2000 . If there is a newer version on TIS/TIS 2000 , perform the SPS programming.

After successful test/fault repair proceed to the next test step

B-09 - ACTUATOR TEST

T01 - Tester Display Fuel Pump Relay Test

Work Order Description	Nominal Value
• Ignition ON • Engine OFF • Press corresponding key in the system main menu to call up Actuator-Test functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	
• Press soft key INACTIVE	
• Press soft key ACTIVE	Noise check: Clicking noise from the relay and Fuel pump running
Concerned Terminals: 62 (X31)	

Yes:T02	No:C-05

T02 - Tester Display Ignition Coil Cylinder 1 Test

Work Order Description	Nominal Value
• Ignition OFF • Crankshaft position sensor plug disconnected • Connect test spark plug to spark plug socket for cylinder 1 • Ignition ON • Engine OFF	
• Press corresponding key in the system main menu to call up Actuator-Test functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display. **Note:** Use only the appropriate Special Service Tool for removal of the ignition module. The test spark plug is actuated at a frequency of 5 Hz (on-time 0.01 s). The test is completed after a maximum of 30 s .	Ignition sparks visible at test spark plug.

Concerned Terminals: 15, 16, 31, 32 (X32)	
Yes:T03	**No:C-18**

T03 - Tester Display Ignition Coil Cylinder 2 Test	
Work Order Description	**Nominal Value**
• Ignition OFF • Crankshaft position sensor plug disconnected • Connect test spark plug to spark plug socket for cylinder 2 • Ignition ON • Engine OFF	
• Press corresponding key in the system main menu to call up Actuator-Test functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display. **Note:** Use only the appropriate Special Service Tool for removal of the ignition module. The test spark plug is actuated at a frequency of 5 Hz (on-time 0.01 s). The test is completed after a maximum of 30 s .	Ignition sparks visible at test spark plug.
Concerned Terminals: 15, 16, 31, 32 (X32)	
Yes:T04	**No:C-18**

T04 - Tester Display Ignition Coil Cylinder 3 Test	
Work Order Description	**Nominal Value**
• Ignition OFF • Crankshaft position sensor plug disconnected • Connect test spark plug to spark plug socket for cylinder 3 • Ignition ON • Engine OFF	
• Press corresponding key in the system main menu to call up Actuator-Test	Ignition sparks visible at test spark plug.

functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display. **Note:** Use only the appropriate Special Service Tool for removal of the ignition module. The test spark plug is actuated at a frequency of 5 Hz (on-time 0.01 s). The test is completed after a maximum of 30 s .	
Concerned Terminals: 15, 16, 31, 32 (X32)	

Yes:T05	No:C-18

T05 - Tester Display Ignition Coil Cylinder 4 Test

Work Order Description	Nominal Value
• Ignition OFF • Crankshaft position sensor plug disconnected • Connect test spark plug to spark plug socket for cylinder 4 • Ignition ON • Engine OFF	
• Press corresponding key in the system main menu to call up Actuator-Test functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display. **Note:** Use only the appropriate Special Service Tool for removal of the ignition module. The test spark plug is actuated at a frequency of 5 Hz (on-time 0.01 s). The test is completed after a maximum of 30 s .	Ignition sparks visible at test spark plug.
Concerned Terminals: 15, 16, 31, 32 (X32)	

Yes:T06	No:C-18

T06 - Tester Display Fuel Tank Ventilation Valve Test	
Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • Press corresponding key in the system main menu to call up Actuator-Test functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	
• Press soft key INACTIVE	Diagnostic tester display: 0 %
• Press soft key ACTIVE **Note:** The test is completed after a maximum of 30 s .	Noise check: Clicking noise from the valve and from the relay
Concerned Terminals: 33 (X32)	

Yes:T07	No:C-20

T07 - Tester Display Electronic Throttle Control Test	
Work Order Description	**Nominal Value**
• Ignition OFF • Remove intake hose from throttle valve positioner • Ignition ON • Engine OFF • Press corresponding key in the system main menu to call up Actuator-Test functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	
• Press soft key INACTIVE	Throttle valve closed
• Press soft key ACTIVE **Note:** The test is completed after a maximum of 30 s .	Throttle valve completely open
Concerned Terminals: 11, 23, 28, 39, 43, 56, 58, 60 (X32)	

Yes:T08	No:C-07

T08 - Tester Display Boost Pressure Valve Test	
Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • Press corresponding key in the system main menu to call up Actuator-Test functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	
• Press soft key INACTIVE	
• Press soft key ACTIVE	Clicking noise from the actuator
Concerned Terminals: 35 (X32)	

Yes:T09	No:C-13

T09 - Tester Display Turbocharger Bypass Solenoid Test	
Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • Press corresponding key in the system main menu to call up Actuator-Test functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	
• Press soft key INACTIVE	
• Press soft key ACTIVE	Clicking noise from the actuator
Concerned Terminals: 50 (X32)	

Yes:T10	No:C-33

T10 - Tester Display Cooling Fan Relay Test	
Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • Press corresponding key in the system main menu to call up Actuator-Test	

functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	
• Press soft key INACTIVE	All cooling fans are switched off
• Press soft key ACTIVE **Note:** The test is completed after a maximum of 30 s .	Following cooling fans run at low speed: M19 Motor - Blower, Radiator
Concerned Terminals: 29 (X31)	

Yes:T11	No:C-30

T11 - Tester Display Auxiliary Cooling Pump Relay Test

Work Order Description	Nominal Value
• Ignition ON • Engine OFF • Press corresponding key in the system main menu to call up Actuator-Test functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	
• Press soft key INACTIVE	
• Press soft key ACTIVE	Clicking noise from the relay and Coolant pump is running
Concerned Terminals: 45 (X31)	

Yes:T12	No:C-32

T12 - Tester Display Compression Test

Work Order Description	Nominal Value
• Ignition ON • Engine OFF • Press corresponding key in the system main menu to call up Actuator-Test functions, select the desired test and confirm with ENTER . Follow the	

instructions in the diagnostic tester display.	
• Press soft key INACTIVE	Throttle valve closed
• Press soft key ACTIVE	Throttle valve completely open
Concerned Terminals: 11, 23, 28, 39, 43, 56, 58, 60 (X32)	

Yes:T13	**No:C-07**

T13 - Tester Display Malfunction Indicator (MI) Test

Work Order Description	**Nominal Value**
• Ignition ON • Engine OFF • Press corresponding key in the system main menu to call up Actuator-Test functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	
• Press soft key INACTIVE	System telltale OFF
• Press soft key ACTIVE **Note:** The test is completed after a maximum of 30 s .	System telltale ON
Concerned Terminals: 13 (X31)	

No:C-31

B-10 - Fuel System

T01 - Check: Fuel Reserve

Work Order Description	**Nominal Value**
• Check fuel reserve • Check fuel tank for correct fuel sort content **Note:** The fuel reserve must be greater than 5 L	

Yes:T02

T02 - Actuator Test

Work Order Description	Nominal Value
• Ignition ON • Select and enable diagnostic tester actuator test: Actuator Test Fuel Pump Relay	Test okay?

Yes:T03	No:C-05

T03 - Check: Fuel Pressure

Work Order Description	Nominal Value
• Ignition OFF • Connect fuel pressure manometer KM-J-34730-91 to fuel feed line • Ignition ON • Select and enable diagnostic tester actuator test: Actuator Test Fuel Pump Relay	Pressure value okay? 3800 hPa (3.8 bar)

Yes:	No:T04

Yes:

T04 - Check: Fuel Pipes and Fuel Filter

Work Order Description	Nominal Value
• Check the following component for proper operation: Fuel pipes and fuel filter **Note:** Plugging, leakage or air in fuel system	

B-11 - Mechanical Function Check

T01 - Mechanical Function Check

Work Order Description	Nominal Value
• Check the following functional group for proper operation: Spark plugs	

Yes:T02

T02 - Mechanical Function Check

Work Order Description	Nominal Value
• Check the following functional group for proper operation:	

Engine-compression	
Yes:T03	
Yes:	

T03 - Mechanical Function Check

Work Order Description	Nominal Value
• Check the following functional group for proper operation: Valve timing	

B-12 - ADDITIONAL FUNCTIONS

T01 - Tester Display Read ECU Identification

Work Order Description	Nominal Value
• Ignition ON	Displayed value okay?
• Press corresponding key in the system main menu to call up Additional Functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	
Concerned Terminals: -	

Yes:T02	No:C-02

T02 - Tester Display Read Variant Configuration

Work Order Description	Nominal Value
• Ignition ON • Press corresponding key in the system main menu to call up Additional Functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	Displayed value okay?
Concerned Terminals: -	

Yes:T03	No:C-02

T03 - Tester Display Read CAN Configuration

Work Order Description	Nominal Value
• Ignition ON • Press corresponding key in the system	Displayed value okay?

main menu to call up Additional Functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	
Concerned Terminals: -	

Yes:T04	No:C-02

T04 - Tester Display Display Immobiliser Status

Work Order Description	Nominal Value
• Ignition ON • Press corresponding key in the system main menu to call up Additional Functions, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display.	Displayed value okay?
Concerned Terminals: -	

No:C-35

B-13 - CONTROL TEST

T01 - Tester Display Fuel Tank Ventilation Control

Work Order Description	Nominal Value
• Engine idling • Accelerator pedal not actuated • Vehicle stationary • Press corresponding key in the system main menu to call up ECU Control Tests, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display. • After the test is started, the corresponding component can be actuated using the soft keys.	Test okay?
Concerned Terminals: 33 (X32)	

Yes:T02	No:C-20

T02 - Tester Display Electronic Throttle Control

Work Order Description	Nominal Value

• Ignition ON • Engine OFF • Press corresponding key in the system main menu to call up ECU Control Tests, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display. • After the test is started, the corresponding component can be actuated using the soft keys.	Test okay?
Concerned Terminals: 11, 23, 28, 39, 43, 56, 58, 60 (X32)	

Yes:T03	No:C-07

T03 - Tester Display RPM Control

Work Order Description	Nominal Value
• Engine running at idle speed, operating temperature • Accelerator pedal not actuated • Vehicle stationary • Press corresponding key in the system main menu to call up ECU Control Tests, select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display. **Note:** The engine speed can be controlled in the range from 610 rpm to 1830 rpm (preset value: 1000 rpm). This mode is used when various different engine parameters must be checked at different engine speeds.	Test okay?
Concerned Terminals: -	

Yes:T04	No:C-02

T04 - Tester Display Injector Cutoff Test

Work Order Description	Nominal Value
• Press corresponding key in the system main menu to call up ECU Control Tests,	Test okay?

select the desired test and confirm with ENTER . Follow the instructions in the diagnostic tester display. • Press corresponding soft key to turn off the injection valves for 3 s sequentially. **Note:** This test helps to analyse engine compression. All fuel injectors are cut-off one after another. Each time an injection valve is cut-off, the engine must move the corresponding piston against the compression pressure. This leads to a reduction in torque and performance, and engine speed drops accordingly. The engine speed reduction must be identical for each injector, since the compression of all cylinders is nearly the same as long as the system is working properly. The electronic control of the engine immediately responds to the disabled cylinder by increasing the injection time of the remaining injectors and by opening the idle air controller. In order to avoid this, the spark angle and the idle air controller position are adjusted to a fixed value. Engine speed is increased to approximately 1200 rpm, with oxygen sensor closed loop control working normally. The test should only be started when the cooling fan is not running, otherwise the engine speed may be lowered by approximately 50 rpm. When one cylinder has been cut-off, engine speed will drop by approximately 150 rpm. If the cooling fan operates while the cylinder is being cut-off, this may further reduce engine speed by an additional 50 rpm. When an injector is switched off, unburned oxygen from the cylinder will reach the exhaust pipe. This lean combustion will be reflected by the oxygen sensor showing a permanent low voltage value.	
• Engine running at idle speed, operating temperature • Accelerator pedal not actuated • Vehicle stationary	
Concerned Terminals:	

-	

No:C-25
Yes:

B-14 - Check: Intermittent Faults

T01 - Intermittent System Operation

Work Order Description	Nominal Value
The following test steps may or may not be helpful, they are only a proposal. • Check the newest Technical Information TI for tips regarding the appeared intermittent problems before proceeding with the diagnostic procedure. Preliminary diagnostic check (visual inspection) • Check all sensors, actuators and the wiring harness of the system for corrosion and damages. • Check all connectors of the system for corrosion and for damaged terminals. • Check all ground connections of the system for corrosion and damages • Check if the fault was recognised in an area of strong electromagnetic sources e.g. near radio stations Diagnostic Trouble Codes • Read and record trouble codes • Check for trouble codes with status INTERMITTENT or NOT PRESENT. If a trouble code is stored this may indicate the circuit which has the intermittent condition. • INTERMITTENT and NOT PRESENT trouble codes are leading to an intermittent problem. This trouble codes refer to a related functional group. To find the defective component the following test steps may be helpful. • Use the following table to obtain the concerned functional group and perform the following additional test steps, while performing the troubleshooting in the C-x	

tables.
Refer to Table B-01 DIAGNOSTIC TROUBLE CODE

- Move the related connectors, wiring harness and components in order to find the failure. Switch on all electric consumers by turns, because this can cause an electromagnetic interference in a circuit. Use the TECH 31 or an oscilloscope to observe the wiring harness for disturbances. Operate the system under different conditions over a considerable time.

Snapshot function of the Diagnostic tester and TIS 2000

- Select the snapshot function of the Diagnostic Tester. Set the Diagnostic Tester to trigger on ANY CODE/CENTER and try to recreate the conditions that may cause the intermittent trouble code to be set (use the customer complaint information). Use the Diagnostic tester or TIS/TIS 2000 application to analyse the related data list parameters.
  The disturbances in the signal can be observed at the trigger point where the trouble code is set.
- Use the following table to obtain the concerned functional group and perform the following additional test steps, while performing the troubleshooting in the C-x tables.
  Refer to Table B-01 DIAGNOSTIC TROUBLE CODE
  Refer to Table B-02 DATA LIST
- Move the related connectors, wiring harness and components in order to find the failure. Switch on all electric consumers by turns, because this can cause an electromagnetic interference in a circuit. Use the TECH 31 or an oscilloscope to observe the wiring harness for disturbances. Operate the system under different conditions over a considerable time.

Symptoms / Customer Complaints • Check if one of the symptoms in the following table match the previously recorded customer complaint and perform the following additional test steps, while performing the troubleshooting in the C-x tables. Refer to Table B-06 Symptom Chart/Customer Complaints • Move the related connectors, wiring harness and components in order to find the failure. Switch on all electric consumers by turns, because this can cause an electromagnetic interference in a circuit. Use the TECH 31 or an oscilloscope to observe the wiring harness for disturbances. Operate the system under different conditions over a considerable time. After successful test/fault repair proceed to the next test step	

Yes:

B-15 - Immobiliser Check

T01 - Check: Other system

Work Order Description	Nominal Value
Before connecting the diagnostic tester, observe the instructions of the diagnostic tester operators manual • Connect diagnostic tester, select concerned Electronic System, establish communication and verify, that the correct control unit is installed: Refer to Immobiliser Table B-03 Connect Diagnostic Tester and Establish Communication Read and record diagnostic trouble codes including status • If a trouble code with status present is stored: Refer to Immobiliser Table B-05 Trouble Codes	

• Check the following Data List Parameters: Refer to Immobiliser Table B-02 DATA LIST T01 Ignition Status Refer to Immobiliser Table B-02 DATA LIST T09 Immobiliser Signal • After successful test/fault repair proceed to the next test step	

Yes:

B-16 - Check: Pressure Loss

T01 - Check: Mechanical Function

Work Order Description	Nominal Value
• Lack of boost pressure (leakage) can lead to trouble code P0100 • Check intake system for leaking • Check the hose clamps at the intake-air system / charge-air system for correct fitting. • If a defect has been found in previous test steps, the following test can be skipped (follow result "YES"). Refer to Table C-08 Mass Air Flow Circuit	

C-01 - No Communication between Diagnostic Tester and Control Unit

T01 - Check: Short to Ground/Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: A5 Control Unit - Motronic • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 18 (X31) & Ground	greater than 11 V

Yes:T02	No:T15

T02 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: A5 Control Unit - Motronic	greater than 11 V

Wiring harness connector (wiring harness side) terminal 18 (X31) & A5 Control Unit - Motronic Ground connection of the control unit case	

Yes:T03	No:E14

T03 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition ON • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 51 (X31) & Ground	greater than 11 V

Yes:T04	No:T05

T04 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A17 Control Unit - Immobiliser • Connect fused jumper wire to: A17 Control Unit - Immobiliser Wiring harness connector (wiring harness side) terminal 6 & A17 Control Unit - Immobiliser Wiring harness connector (wiring harness side) terminal 7 • Connect wiring harness connector to: A5 Control Unit - Motronic • Ignition ON • Establish communication with following control unit: A5 Control Unit - Motronic	Communication established?

Yes:E01	No:E02

T05 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Remove electrical component from socket:	Test okay?

FB20 Fuse • Check the following component for proper operation: FB20 Fuse	
Yes:T06	**No:T13**

T06 - Check: Short to Ground/Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition ON • Measure voltage between the following terminals: FB20 Fuse Input contact & Ground	greater than 11 V
Yes:E03	**No:T07**

T07 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Remove electrical component from socket: FL1 Fuse • Check the following component for proper operation: FL1 Fuse	Test okay?
Yes:T08	**No:T10**

T08 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: FL1 Fuse Input contact & Ground	greater than 11 V
Yes:T09	**No:E06**

T09 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: S1 Switch - Starter • Insert electrical component in socket: FL1 Fuse	greater than 11 V

• Measure voltage between the following terminals: S1 Switch - Starter Wiring harness connector (wiring harness side) terminal 30 & Ground	

Yes:E04	No:E05

T10 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • All consumers turned off • Insert new fuse FL1 and then check the fuse for proper operation.	Test okay?

Yes:T11	No:E10

T11 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: S1 Switch - Starter • Connect fused jumper wire to: S1 Switch - Starter Wiring harness connector (wiring harness side) terminal 15 & Battery Voltage (Positive Terminal) • Check the following component for proper operation: Fuse of the fused jumper wire	Test okay?

Yes:T12	No:E09

T12 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Connect fused jumper wire to: S1 Switch - Starter Wiring harness connector (wiring harness side) terminal 15A & Battery Voltage (Positive Terminal) • Check the following component for proper operation: Fuse of the fused jumper wire	Test okay?

Yes:E07	No:E08

T13 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• All consumers turned off • Ignition ON • Insert new fuse FB20 and then check the fuse for proper operation.	Test okay?

Yes:E11	No:T14

T14 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: Y8 Solenoid Valve - Boost Pressure Regulation • Insert new fuse into the socket of the fused jumper wire and then check this fuse for proper operation. • Disconnect each of the following components/control units from the wiring harness consecutively and check the fuse of the fused jumper wire for proper operation each time: T1 Ignition Coil - Direct Ignition C1 Capacitor - Ignition Coil	Test okay?

Yes:E12	No:E13

T15 - Check: Component

Work Order Description	Nominal Value
• Remove electrical component from socket: FB8 Fuse • Check the following component for proper operation: FB8 Fuse	Test okay?

Yes:T16	No:T17

T16 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: FB8 Fuse & Ground	greater than 11 V

Yes:E15	No:E16

T17 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• All consumers turned off • Insert new fuse FB8 and then check the fuse for proper operation.	Test okay?

Yes:E17	No:T18

T18 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: A13 Control Unit - Anti Theft Warning Unit & Central Door Locking • Insert new fuse FB8 and then check the fuse for proper operation. Disconnect each of the following components/control units consecutively from the wiring harness and repeat the check each time: H1 Instrument A17 Control Unit - Immobiliser	Test okay?

Yes:E18	No:E19

E01 - Result: Defective Component

- Defective component:
  A17 Control Unit - Immobiliser

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Interruption

- Circuit interruption between:
  A17 Control Unit - Immobiliser
  Wiring harness connector (wiring harness side) terminal 7
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 2 (X31)

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E03 - Result: Interruption

- Circuit interruption between:
  FB20 Fuse
  Output contact
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 51 (X31)

E04 - Result: Defective Component

- Circuit interruption between:
  S1 Switch - Starter
  Wiring harness connector (wiring harness side) terminal 15
  &
  FB20 Fuse
  Input contact

or

- Defective component:
  S1 Switch - Starter

E05 - Result: Short to Ground

- Circuit interruption between:
  FL1 Fuse
  Output contact
  &
  S1 Switch - Starter
  Wiring harness connector (wiring harness side) terminal 30

E06 - Result: Interruption

- Circuit interruption between:
  G1 Battery
  Wiring harness connector terminal 30
  &
  FL1 Fuse
  Input contact

E07 - Result: System Overload

- A temporary current overload in the system behind fuse FL1 has occurred

E08 - Result: Short to Ground

- Short circuit to ground between:
  S1 Switch - Starter
  Wiring harness connector (wiring harness side) terminal 15A
  &

FB3, FB4 Fuse
Input contact

E09 - Result: Short to Ground

- Short circuit to ground between:
  S1 Switch - Starter
  Wiring harness connector (wiring harness side) terminal 15
  &
  FB2, FB5, FB6, FB7, FB20, FB22 Fuse
  Input contact
  &
  A1 Control Unit - Airbag
  Wiring harness connector (wiring harness side) terminal 5

or

- Defective component:
  A2 Control Unit - Anti Lock Brake System

E10 - Result: Short to Ground

- Short circuit to ground between:
  FL1 Fuse
  Output contact
  &
  S1 Switch - Starter
  Wiring harness connector (wiring harness side) terminal 30

or

- Defective component:
  S1 Switch - Starter

E11 - Result: System Overload

- A temporary current overload in the system behind fuse FB20 has occurred

E12 - Result: Defective Component

- If the nominal value is reached during one of the measurements, the component/control unit that has been disconnected immediately before that measurement is defective.

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E13 - Result: Short to Ground

- Short circuit to ground between:
  FB20 Fuse
  Output contact

&
A5 Control Unit - Motronic
Wiring harness connector (wiring harness side) terminal 51 (X31)
&
T1 Ignition Coil - Direct Ignition
Wiring harness connector (wiring harness side) terminal 2
&
C1 Capacitor - Ignition Coil
Wiring harness connector (wiring harness side) wiring colour BK
&
Y8 Solenoid Valve - Boost Pressure Regulation
Wiring harness connector (wiring harness side) wiring colour BK

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E14 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Ground connection of the control unit case
  &
  Ground

E15 - Result: Interruption

- Circuit interruption between:
  FB8 Fuse
  Output contact
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 18 (X31)

E16 - Result: Interruption

- Circuit interruption between:
  G1 Battery
  Wiring harness connector terminal 30
  &
  FB8 Fuse
  Input contact

E17 - Result: System Overload

- A temporary current overload in the system behind fuse FB8 has occurred

E18 - Result: Defective Component

- If the nominal value is reached during one of the measurements, the component/control unit that has been disconnected immediately before that measurement is defective.

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E19 - Result: Short to Ground

- Short circuit to ground between:
  FB8 Fuse
  Output contact
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 18 (X31)
  &
  Wiring harness connector terminals of all components (wiring harness side), which were disconnected from the wiring harness during this trouble shooting session

C-02 - Control Unit Hard- and Software

T01 - Check: Programming

Work Order Description	Nominal Value
• Ignition ON • Repeat programming	Programming okay?

Yes:E01	No:E02

E01 - Result: Programming

- Previous programming was faulty

E02 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

C-03 - Power Supply Circuit

T01 - Check: Short to Ground/Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • All consumers turned off • Remove electrical component from socket:	greater than 11 V

K18 Relay - Engine Control Unit • Measure voltage between the following terminals: K18 Relay - Engine Control Unit Socket Terminal 1 (30), 2 (86) & Ground	

Yes:T02	No:T12

T02 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition ON • Measure voltage between the following terminals: K18 Relay - Engine Control Unit Socket Terminal 4 (85) & Ground	less than 0.3 V

Yes:T03	No:E11

T03 - Check: Short to Voltage of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic • Ignition ON • Measure voltage between the following terminals: K18 Relay - Engine Control Unit Socket Terminal 3 (87) & Ground	less than 0.3 V

Yes:T04	No:T09

T04 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: K18 Relay - Engine Control Unit Socket Terminal 4 (85) & A5 Control Unit - Motronic Wiring harness connector (wiring harness	less than 5 Ohm

side) terminal 19 (X31)	
Yes:T05	**No:E06**

T05 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: K18 Relay - Engine Control Unit Socket Terminal 4 (85) & Ground	greater than 500 kOhm
Yes:T06	**No:E05**

T06 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: K18 Relay - Engine Control Unit Socket Terminal 3 (87) & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 17, 33, 49 (X31)	less than 5 Ohm
Yes:T07	**No:E04**

T07 - Check: Transition Resistance of Voltage Supply Circuit

Work Order Description	Nominal Value
• Insert electrical component in socket: K18 Relay - Engine Control Unit • Connect fused jumper wire to: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 19 (X31) & Ground • Connect test lamp (21 W) and multimeter in parallel and measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 17, 33, 49 (X31) & Ground	greater than 11 V
Yes:E01	**No:T08**

T08 - Check: Transition Resistance of Voltage Supply Circuit	
Work Order Description	**Nominal Value**
• Remove electrical component from socket: K18 Relay - Engine Control Unit • Remove test light • Connect test lamp (21 W) and multimeter in parallel and measure voltage between the following terminals: K18 Relay - Engine Control Unit Socket Terminal 1 (30), 2 (86) & Ground	greater than 11 V
Yes:E02	**No:E03**

T09 - Check: Short to Voltage of Voltage Supply Circuit	
Work Order Description	**Nominal Value**
• Ignition OFF • Remove electrical component from socket: K16 Relay - Fuel pump • Ignition ON • Measure voltage between the following terminals: K18 Relay - Engine Control Unit Socket Terminal 3 (87) & Ground	less than 0.3 V
Yes:T10	**No:T11**

T10 - Check: Component	
Work Order Description	**Nominal Value**
• Measure voltage between the following terminals: K16 Relay - Fuel pump Socket Terminal 4 (85) & Ground	less than 0.3 V
Yes:E07	**No:E08**

T11 - Check: Short to Voltage of Voltage Supply Circuit	
Work Order Description	**Nominal Value**
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic	less than 0.3 V

• Ignition ON • Measure voltage between the following terminals: K18 Relay - Engine Control Unit Socket Terminal 3 (87) & Ground • Disconnect each of the following components/control units consecutively from the wiring harness and repeat the measurement each time: B46 Air Mass Meter B117 Sensor - Oxygen, Exhaust, Heated 1 B118 Sensor - Oxygen, Exhaust, Heated 2	
Yes:E09	**No:E10**

T12 - Check: Short to Ground/Interruption of Voltage Supply Circuit

Work Order Description	**Nominal Value**
• Remove electrical component from socket: FL4 Fuse • Check the following component for proper operation: FL4 Fuse	Test okay?
Yes:E12	**No:T13**

T13 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	**Nominal Value**
• Insert new fuse FL4 and then check the fuse for proper operation.	Test okay?
Yes:T14	**No:E15**

T14 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	**Nominal Value**
• Remove fused jumper wire • Connect fused jumper wire to: K18 Relay - Engine Control Unit Socket Terminal 3 (87) & Battery voltage • Check the following component for proper operation: Fuse of the fused jumper wire	Test okay?
Yes:E13	**No:T15**

T15 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Remove electrical component from socket: K16 Relay - Fuel pump • Insert new fuse into the socket of the fused jumper wire and then check this fuse for proper operation.	Test okay?

Yes:E09	No:T16

T16 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: B46 Air Mass Meter • Insert new fuse into the socket of the fused jumper wire and then check this fuse for proper operation. • Disconnect each of the following components/control units consecutively from the wiring harness and repeat the check each time: B117 Sensor - Oxygen, Mixture Control, Heated B118 Sensor - Oxygen, Catalytic Converter Check	Test okay?

Yes:E09	No:E14

E01 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: High Transition Resistance

- High transition resistance between:
  K18 Relay - Engine Control Unit
  Socket Terminal 3 (87)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 17, 33, 49 (X31)

or

- Defective component:
  K18 Relay - Engine Control Unit

E03 - Result: High Transition Resistance

- High transition resistance between:
  G1 Battery
  Wiring harness connector (wiring harness side) terminal 30
  &
  FL4 Fuse
  Input contact
  or
  FL4 Fuse
  Output contact
  &
  K18 Relay - Engine Control Unit
  Socket Terminal 1 (30), 2 (86)

E04 - Result: Interruption

- Circuit interruption between:
  K18 Relay - Engine Control Unit
  Socket Terminal 3 (87)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 17, 33, 49 (X31)

E05 - Result: Short to Ground

- Short circuit to ground between:
  K18 Relay - Engine Control Unit
  Socket Terminal 4 (85)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 19 (X31)

E06 - Result: Interruption

- Circuit interruption between:
  K18 Relay - Engine Control Unit
  Socket Terminal 4 (85)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 19 (X31)

E07 - Result: Defective Component

- Defective component:
  K16 Relay - Fuel pump

E08 - Result: Short to Voltage

- Short circuit to voltage between:
  K16 Relay - Fuel pump
  Socket Terminal 4 (85)
  &
  A5 Control Unit - Motronic

Wiring harness connector (wiring harness side) terminal 62 (X31)

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E09 - Result: Defective Component

- If the nominal value is reached during one of the measurements, the component/control unit that has been disconnected immediately before that measurement is defective.

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E10 - Result: Short to Voltage

- Short circuit to voltage between:
  K18 Relay - Engine Control Unit
  Socket Terminal 3 (87)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 17, 33, 49 (X31)
  &
  Wiring harness connector terminals of all components (wiring harness side), which were disconnected from the wiring harness during this trouble shooting session

E11 - Result: Short to Voltage

- Short circuit to voltage between:
  K18 Relay - Engine Control Unit
  Socket Terminal 4 (85)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 19 (X31)

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E12 - Result: Interruption

- Circuit interruption between:
  G1 Battery
  Wiring harness connector (wiring harness side) terminal 30
  &
  FL4 Fuse
  Input contact
  or
  FL4 Fuse
  Output contact
  &
  K18 Relay - Engine Control Unit
  Socket Terminal 1 (30), 2 (86)

E13 - Result: System Overload

- A temporary current overload in the system behind fuse FL4 has occurred

E14 - Result: Short to Ground

- Short circuit to ground between:
  K18 Relay - Engine Control Unit
  Socket Terminal 3 (87)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 17, 33, 49 (X31)
  &
  FR2 Fuse
  Input contact
  &
  Wiring harness connector terminals of all components (wiring harness side), which were disconnected from the wiring harness during this trouble shooting session

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E15 - Result: Short to Ground

- Short circuit to ground between:
  FL4 Fuse
  Output contact
  &
  K18 Relay - Engine Control Unit
  Socket Terminal 1 (30), 2 (86)
  &
  K24 Relay - Starter
  Socket Terminal 1 (30), 2 (86)
  &
  FR1, FR3 Fuse
  Input contact

or

- Defective component:
  K24 Relay - Starter

C-04 - Crankshaft Sensor Circuit

T01 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 10 (X32) & Ground **Note:** Blower motor is running	less than 0.3 V

Yes:T02	No:E06

T02 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals:	greater than 500 kOhm

A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 10 (X32) & Ground	

Yes:T03	No:E05

T03 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 42 (X32) & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 10 (X32)	600 ... 1000 Ohm

Yes:T04	No:T05

T04 - Check: Component

Work Order Description	Nominal Value
• Ignition ON • Start engine • Switch multimeter to alternating-current voltage measurement. • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 42 (X32) & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 10 (X32)	greater than 1 V Alternating-current voltage

Yes:E01	No:E02

T05 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 42 (X32)	less than 600 Ohm

& A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 10 (X32)	

Yes:E03	No:E04

E01 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Defective Component

- Defective component:
  B34 Impulse Sensor - Crankshaft
  (intermittent problems, missing teeth, wrong reference point, incorrect gap position, etc.)

E03 - Result: Short Circuit in Wiring Harness

- Short circuit in wiring harness between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 42 (X32)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 10 (X32)

or

- Defective component:
  B34 Impulse Sensor - Crankshaft

E04 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 42 (X32)
  &
  B34 Impulse Sensor - Crankshaft
  Wiring harness connector (wiring harness side) terminal 1
  or
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 10 (X32)
  &
  B34 Impulse Sensor - Crankshaft
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  B34 Impulse Sensor - Crankshaft

E05 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 10 (X32)
  &
  B34 Impulse Sensor - Crankshaft
  Wiring harness connector (wiring harness side) terminal 2
  or
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 42 (X32)
  &
  B34 Impulse Sensor - Crankshaft
  Wiring harness connector (wiring harness side) terminal 1

or

- Defective component:
  B34 Impulse Sensor - Crankshaft

E06 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 10 (X32)
  &
  B34 Impulse Sensor - Crankshaft
  Wiring harness connector (wiring harness side) terminal 2
  or
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 42 (X32)
  &
  B34 Impulse Sensor - Crankshaft
  Wiring harness connector (wiring harness side) terminal 1

or

- Defective component:
  B34 Impulse Sensor - Crankshaft

C-05 - Fuel Pump Relay Circuit

T01 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF	greater than 11 V

• All consumers turned off • Remove electrical component from socket: K16 Relay - Fuel pump • Ignition ON • Measure voltage between the following terminals: K16 Relay - Fuel pump Socket Terminal 1 (30) & Ground	

Yes:T02	No:T13

T02 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition ON • Measure voltage between the following terminals: K16 Relay - Fuel pump Socket Terminal 2 (86) & Ground	greater than 11 V

Yes:T03	No:E12

T03 - Check: Short to Voltage of Voltage Supply Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: K16 Relay - Fuel pump Socket Terminal 3 (87) & Ground	less than 0.3 V

Yes:T04	No:T08

T04 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: K16 Relay - Fuel pump Socket Terminal 4 (85) & Ground	greater than 500 kOhm

Yes:T05	No:E05

T05 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: A5 Control Unit - Motronic • Measure resistance between the following terminals: K16 Relay - Fuel pump Socket Terminal 4 (85) & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 62 (X31)	less than 5 Ohm

Yes:T06	No:E04

T06 - Check: Component

Work Order Description	Nominal Value
• Remove electrical component from socket: K18 Relay - Engine Control Unit • Connect fused jumper wire to: K16 Relay - Fuel pump Socket Terminal 3 (87) & K18 Relay - Engine Control Unit Socket Terminal 1 (30) • Is the fuel pump running?	Test okay?

Yes:E01	No:T07

T07 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Remove fused jumper wire • Disconnect wiring harness connector from: M21 Pump - Fuel • Measure resistance between the following terminals: M21 Pump - Fuel Wiring harness connector (wiring harness side) wiring colour BK & Ground **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange,	less than 5 Ohm

PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	

Yes:E02	No:E03

T08 - Check: Short to Voltage of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: Y5 Solenoid Valve - Tank Ventilation • Ignition ON • Measure voltage between the following terminals: K16 Relay - Fuel pump Socket Terminal 3 (87) & Ground	less than 0.3 V

Yes:E06	No:T09

T09 - Check: Short to Voltage of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: Y9.1 Injection Valve - Cylinder - 1 • Ignition ON • Measure voltage between the following terminals: K16 Relay - Fuel pump Socket Terminal 3 (87) & Ground	less than 0.3 V

Yes:E07	No:T10

T10 - Check: Short to Voltage of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: Y9.2 Injection Valve - Cylinder - 2 • Ignition ON • Measure voltage between the following terminals: K16 Relay - Fuel pump Socket Terminal 3 (87) &	less than 0.3 V

Ground	

Yes:E08	No:T11

T11 - Check: Short to Voltage of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: Y9.3 Injection Valve Cylinder - 3 • Ignition ON • Measure voltage between the following terminals: K16 Relay - Fuel pump Socket Terminal 3 (87) & Ground	less than 0.3 V

Yes:E09	No:T12

T12 - Check: Short to Voltage of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: Y9.4 Injection Valve Cylinder - 4 • Ignition ON • Measure voltage between the following terminals: K16 Relay - Fuel pump Socket Terminal 3 (87) & Ground	less than 0.3 V

Yes:E10	No:E11

T13 - Check: Component

Work Order Description	Nominal Value
• Remove electrical component from socket: FR2 Fuse • Check the following component for proper operation: FR2 Fuse	Test okay?

Yes:T14	No:T16

T14 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition ON	greater than 11 V

• Measure voltage between the following terminals: FR2 Fuse Input contact & Ground	

Yes:T15	No:E15

T15 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Actuate the following component: S94 Shock Switch - Fuel Cut-Off • Check the following component for proper operation: FR2 Fuse	Test okay?

Yes:E13	No:E14

T16 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: S94 Shock Switch - Fuel Cut-Off • Insert new fuse FR2 and then check the fuse for proper operation.	Test okay?

Yes:E16	No:E17

E01 - Result: Defective Component

- Defective component:
  K16 Relay - Fuel pump
  or
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Defective Component

- Circuit interruption between:
  M21 Pump - Fuel
  Wiring harness connector (wiring harness side) wiring colour BNGY
  &
  K16 Relay - Fuel pump
  Socket Terminal 3 (87)

or

- Defective component:
  M21 Pump - Fuel

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E03 - Result: Interruption

- Circuit interruption between:
  M21 Pump - Fuel
  Wiring harness connector (wiring harness side) wiring colour BK
  &
  Ground

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E04 - Result: Interruption

- Circuit interruption between:
  K16 Relay - Fuel pump
  Socket Terminal 4 (85)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 62 (X31)

E05 - Result: Short to Ground

- Short circuit to ground between:
  K16 Relay - Fuel pump
  Socket Terminal 4 (85)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 62 (X31)

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic

tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E06 - Result: Short to Voltage

- Short circuit to voltage between:
  Y5 Solenoid Valve - Tank Ventilation
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 33 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E07 - Result: Short to Voltage

- Short circuit to voltage between:
  Y9.1 Injection Valve - Cylinder - 1
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 51 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E08 - Result: Short to Voltage

- Short circuit to voltage between:
  Y9.2 Injection Valve - Cylinder - 2
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic

Wiring harness connector (wiring harness side) terminal 18 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E09 - Result: Short to Voltage

- Short circuit to voltage between:
  Y9.3 Injection Valve Cylinder - 3
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 2 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E10 - Result: Short to Voltage

- Short circuit to voltage between:
  Y9.4 Injection Valve Cylinder - 4
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 34 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic

tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E11 - Result: Short to Voltage

- Short circuit to voltage between:
  K16 Relay - Fuel pump
  Socket Terminal 3 (87)
  &
  Y5 Solenoid Valve - Tank Ventilation
  Wiring harness connector (wiring harness side) terminal 1
  &
  M21 Pump - Fuel
  Wiring harness connector (wiring harness side) terminal B
  &
  Y9.1 Injection Valve - Cylinder - 1
  Wiring harness connector (wiring harness side) terminal 1
  &
  Y9.2 Injection Valve - Cylinder - 2
  Wiring harness connector (wiring harness side) terminal 1
  &
  Y9.3 Injection Valve Cylinder - 3
  Wiring harness connector (wiring harness side) terminal 1
  &
  Y9.4 Injection Valve Cylinder - 4
  Wiring harness connector (wiring harness side) terminal 1

or

- Defective component:
  M21 Pump - Fuel

E12 - Result: Interruption

- Circuit interruption between:
  K16 Relay - Fuel pump
  Socket Terminal 2 (86)
  &
  K18 Relay - Engine Control Unit
  Socket Terminal 3 (87)

E13 - Result: Interruption

- Circuit interruption between:
  FR2 Fuse
  Output contact
  &
  S94 Shock Switch - Fuel Cut-Off
  Wiring harness connector (wiring harness side) terminal 3
  or
  S94 Shock Switch - Fuel Cut-Off
  Wiring harness connector (wiring harness side) terminal 1

&
K16 Relay - Fuel pump
Socket Terminal 1 (30)

or

- Defective component:
  S94 Shock Switch - Fuel Cut-Off

E14 - Result: Short to Ground

- Short circuit to ground between:
  S94 Shock Switch - Fuel Cut-Off
  Wiring harness connector (wiring harness side) terminal 1
  &
  K16 Relay - Fuel pump
  Socket Terminal 1 (30)

or

- Defective component:
  S94 Shock Switch - Fuel Cut-Off

E15 - Result: Interruption

- Circuit interruption between:
  K18 Relay - Engine Control Unit
  Socket Terminal 3 (87)
  &
  FR2 Fuse
  Input contact

E16 - Result: Defective Component

- If the nominal value is reached during one of the measurements, there is a short to ground in the circuit behind the component that has been disconnected immediately before that measurement, or the corresponding component is defective.

E17 - Result: Short to Ground

- Short circuit to ground between:
  FR2 Fuse
  Output contact
  &
  S94 Shock Switch - Fuel Cut-Off
  Wiring harness connector (wiring harness side) terminal 3

C-06 - Pedal Position Sensor Circuit

T01 - Check: Short to Voltage/Ground/Interruption of Voltage Supply

Work Order Description	Nominal Value
• Ignition OFF • All consumers turned off	4.8 ... 5.2 V

• Disconnect wiring harness connector from: B19 Sensor - Pedal Position Ignition ON • Measure voltage between the following terminals: B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour GN & Ground **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	

Yes:T02	No:E14

T02 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Diagnostic Tester Data List Parameter APP Sensor 1 (Accelerator Pedal Position)	less than 0.3 V

Yes:T03	No:E13

T03 - Check: Short to Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Connect fused jumper wire to: B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour GN & B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour BU • Ignition ON • Diagnostic Tester Data List Parameter APP Sensor 1 (Accelerator Pedal Position) **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange,	greater than 4.8 V

PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	

Yes:T04	No:E12

T04 - Check: Short to Voltage of Ground Circuit

Work Order Description	Nominal Value
• Ignition OFF • Remove fused jumper wire • Connect fused jumper wire to: B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour BU & B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour BK • Ignition ON • Diagnostic Tester Data List Parameter APP Sensor 1 (Accelerator Pedal Position) **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	less than 0.3 V

Yes:T05	No:E11

T05 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic • Measure resistance between the following terminals: B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour BK & Ground **Note:**	greater than 500 kOhm

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	

Yes:T06	No:E10

T06 - Check: Circuit Interruption of Ground Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour BK & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 22 (X31) **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	less than 5 Ohm

Yes:T07	No:E09

T07 - Check: Short to Voltage/Ground/Interruption of Voltage Supply

Work Order Description	Nominal Value
• Connect wiring harness connector to: A5 Control Unit - Motronic • Measure voltage between the following terminals: B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour YE & Ground **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise,	4.8 ... 5.2 V

VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	

Yes:T08	No:E08

T08 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Diagnostic Tester Data List Parameter APP Sensor 2 (Accelerator Pedal Position)	less than 0.3 V

Yes:T09	No:E07

T09 - Check: Short to Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Connect fused jumper wire to: B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour YE & B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour BN • Diagnostic Tester Data List Parameter APP Sensor 2 (Accelerator Pedal Position) **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	4.8 ... 5.2 V

Yes:T10	No:E06

T10 - Check: Short to Voltage of Ground Circuit

Work Order Description	Nominal Value
• Remove fused jumper wire • Connect fused jumper wire to: B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour BN & B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour WH • Diagnostic Tester Data List Parameter	less than 0.3 V

APP Sensor 2 (Accelerator Pedal Position) **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	

Yes:T11	No:T13

T11 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic • Measure resistance between the following terminals: B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour WH & Ground **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	greater than 500 kOhm

Yes:T12	No:E03

T12 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: B19 Sensor - Pedal Position Wiring harness connector (wiring harness side) wiring colour WH & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 5 (X31)	less than 5 Ohm

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark

Yes:E01	No:E02

T13 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B110 Sensor - Atmospheric Pressure • Ignition ON • Diagnostic Tester Data List Parameter APP Sensor 2 (Accelerator Pedal Position)	less than 0.3 V

Yes:E04	No:E05

E01 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic
  or
  B19 Sensor - Pedal Position

E02 - Result: Interruption

- Circuit interruption between:
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) wiring colour WH
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 5 (X31)

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark

E03 - Result: Short to Ground

- Short circuit to ground between:
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) wiring colour WH
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 5 (X31)
  &

B110 Sensor - Atmospheric Pressure
Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  B110 Sensor - Atmospheric Pressure

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E04 - Result: Defective Component

- Defective component:
  B110 Sensor - Atmospheric Pressure

E05 - Result: Short to Voltage

- Short circuit to voltage between:
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) wiring colour WH
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 5 (X31)
  &
  B110 Sensor - Atmospheric Pressure
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E06 - Result: Short to Ground/Interruption

- Short circuit to ground/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 37 (X31)
  &
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) wiring colour BN

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E07 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 37 (X31)
  &
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) wiring colour BN

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green,

GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise,
VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E08 - Result: Short to Voltage/Ground/Interruption

- Short to voltage/ground/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 4 (X31)
  &
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) wiring colour YE

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green,
GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise,
VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E09 - Result: Interruption

- Circuit interruption between:
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) wiring colour BK
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 22 (X31)

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green,
GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise,
VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E10 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 22 (X31)

&
B19 Sensor - Pedal Position
Wiring harness connector (wiring harness side) wiring colour BK

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E11 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 22 (X31)
  &
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) wiring colour BK

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E12 - Result: Short to Ground/Interruption

- Short circuit to ground/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 54 (X31)
  &
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) wiring colour BU

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E13 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 54 (X31)
  &
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) wiring colour BU

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E14 - Result: Short to Voltage/Ground/Interruption

- Short to voltage/ground/interruption of circuit between:
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) wiring colour GN
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 21 (X31)

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

C-07 - Throttle Valve Positioner Circuit

T01 - Check: Short to Voltage/Ground/Interruption of Voltage Supply

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: Y11 Throttle Valve - Positioner • Ignition ON • Measure voltage between the following terminals: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 3 & Ground	4.8 ... 5.2 V

Yes:T02	No:E16

T02 - Check: Short to Voltage of Voltage Supply Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 2 & Ground	less than 0.3 V

Yes:T03	No:E15

T03 - Check: Short to Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Connect fused jumper wire to: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 3 & Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 6 • Diagnostic Tester Data List Parameter TP Sensor 1 (Throttle Position)	4.8 ... 5.2 V

Yes:T04	No:E14

T04 - Check: Short to Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Remove fused jumper wire • Connect fused jumper wire to: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 3 & Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 5 • Diagnostic Tester Data List Parameter TP Sensor 2 (Throttle Position)	4.8 ... 5.2 V

Yes:T05	No:E13

T05 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Remove fused jumper wire • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 5 & Ground	less than 0.3 V

Note: Blower motor is running	
Yes:T06	**No:E12**

T06 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 6 & Ground	less than 0.3 V
Yes:T07	**No:E11**

T07 - Check: Circuit Interruption of Ground Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 58 (X32) & Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 2	less than 5 Ohm
Yes:T08	**No:E10**

T08 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 2 & Ground	greater than 500 kOhm
Yes:T09	**No:E09**

T09 - Check: Component

Work Order Description	Nominal Value

• Connect wiring harness connector to: A5 Control Unit - Motronic • Ignition ON • Connect fused jumper wire to: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 2 & Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 6 • Diagnostic Tester Data List Parameter TP Sensor 1 (Throttle Position)	less than 0.3 V

Yes:T10	No:E08

T10 - Check: Component

Work Order Description	Nominal Value
• Remove fused jumper wire • Connect fused jumper wire to: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 2 & Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 5 • Diagnostic Tester Data List Parameter TP Sensor 2 (Throttle Position)	less than 0.3 V

Yes:T11	No:E08

T11 - Check: Short to Voltage of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 1 & Ground	less than 0.3 V

Yes:T12	No:E07

T12 - Check: Short to Voltage of Voltage Supply Circuit	
Work Order Description	**Nominal Value**
• Measure voltage between the following terminals: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 4 & Ground	less than 0.3 V
Yes:T13	**No:E06**

T13 - Check: Short to Ground of Voltage Supply Circuit	
Work Order Description	**Nominal Value**
• Ignition OFF • Measure resistance between the following terminals: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 4 & Ground	greater than 500 kOhm
Yes:T14	**No:E05**

T14 - Check: Interruption of Voltage Supply Circuit	
Work Order Description	**Nominal Value**
• Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 28 (X32), 60 (X32) & Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 4	less than 5 Ohm
Yes:T15	**No:E04**

T15 - Check: Short to Ground of Voltage Supply Circuit	
Work Order Description	**Nominal Value**
• Measure resistance between the following terminals: Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 1	greater than 500 kOhm

& Ground	

Yes:T16	No:E03

T16 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 11 (X32), 43 (X32) & Y11 Throttle Valve - Positioner Wiring harness connector (wiring harness side) terminal 1	less than 5 Ohm

Yes:E01	No:E02

E01 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic
  or
  Y11 Throttle Valve - Positioner

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 11 (X32), 43 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 1

E03 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 11 (X32), 43 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 1

E04 - Result: Interruption

- Circuit interruption between:

A5 Control Unit - Motronic
Wiring harness connector (wiring harness side) terminal 28 (X32), 60 (X32)
&
Y11 Throttle Valve - Positioner
Wiring harness connector (wiring harness side) terminal 4

E05 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 28 (X32), 60 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 4

E06 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 28 (X32), 60 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 4

E07 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 11 (X32), 43 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 1

E08 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E09 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 58 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 2

E10 - Result: Interruption

- Circuit interruption between:

A5 Control Unit - Motronic
Wiring harness connector (wiring harness side) terminal 58 (X32)
&
Y11 Throttle Valve - Positioner
Wiring harness connector (wiring harness side) terminal 2

E11 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 23 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 6

E12 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 39 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 5

E13 - Result: Short to Ground/Interruption

- Short circuit to ground/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 39 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 5

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E14 - Result: Short to Ground/Interruption

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 23 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 6

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E15 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 58 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E16 - Result: Short to Voltage/Ground/Interruption

- Short to voltage/ground/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 56 (X32)
  &
  Y11 Throttle Valve - Positioner
  Wiring harness connector (wiring harness side) terminal 3

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both

control units are never reset and replaced at the same time.

C-08 - Mass Air Flow Circuit

T01 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B46 Air Mass Meter • Ignition ON • Measure voltage between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 2 & Ground	greater than 11 V

Yes:T02	No:E13

T02 - Check: Circuit Interruption of Ground Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 2 & B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 3	greater than 11 V

Yes:T03	No:T12

T03 - Check: Short to Voltage/Ground/Interruption of Voltage Supply

Work Order Description	Nominal Value
• Measure voltage between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 4 & Ground	4.8 ... 5.2 V

Yes:T04	No:T07

T04 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 5 & Ground	less than 0.3 V

Yes:T05	No:E04

T05 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Measure resistance between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 5 & Ground **Note:** Blower motor is running	greater than 500 kOhm

Yes:T06	No:E03

T06 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 5 & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 6 (X32)	less than 5 Ohm

Yes:E01	No:E02

T07 - Check: Short to Voltage/Ground/Interruption of Voltage Supply

Work Order Description	Nominal Value

• Measure voltage between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 4 & Ground	greater than 5.2 V

Yes:T08	No:T10

T08 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B21 Sensor - Absolute Pressure, Intake Manifold • Ignition ON • Measure voltage between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 4 & Ground	4.8 ... 5.2 V

Yes:E05	No:T09

T09 - Check: Short to Voltage of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B35 Sensor - Camshaft • Ignition ON • Measure voltage between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 4 & Ground	4.8 ... 5.2 V

Yes:E06	No:E07

T10 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from:	4.8 ... 5.2 V

B21 Sensor - Absolute Pressure, Intake Manifold • Ignition ON • Measure voltage between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 4 & Ground • Disconnect each of the following components/control units consecutively from the wiring harness and repeat the measurement each time: B35 Sensor - Camshaft	

Yes:E08	No:T11

T11 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic • Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 7 (X32) & B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 4	less than 5 Ohm

Yes:E09	No:E10

T12 - Check: Short to Voltage of Ground Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 3 & Ground	less than 0.3 V

Yes:E11	No:T13

T13 - Check: Short to Voltage of Ground Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B21 Sensor - Absolute Pressure, Intake Manifold • Ignition ON Measure voltage between the following terminals: B46 Air Mass Meter Wiring harness connector (wiring harness side) terminal 3 & Ground • Disconnect each of the following components/control units consecutively from the wiring harness and repeat the measurement each time: A5 Control Unit - Motronic	less than 0.3 V

Yes:E08	No:E12

E01 - Result: Defective Component

- Defective component:
  B46 Air Mass Meter
  or
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 6 (X32)
  &
  B46 Air Mass Meter
  Wiring harness connector (wiring harness side) terminal 5

E03 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 6 (X32)
  &
  B46 Air Mass Meter
  Wiring harness connector (wiring harness side) terminal 5

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 6 (X32)
  &
  B46 Air Mass Meter
  Wiring harness connector (wiring harness side) terminal 5

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E05 - Result: Defective Component

- Defective component:
  B21 Sensor - Absolute Pressure, Intake Manifold

E06 - Result: Short to Voltage

- Defective component:
  B35 Sensor - Camshaft

E07 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 7 (X32)
  &
  B35 Sensor - Camshaft
  Wiring harness connector (wiring harness side) terminal 3
  &
  B46 Air Mass Meter
  Wiring harness connector (wiring harness side) terminal 4
  &
  B21 Sensor - Absolute Pressure, Intake Manifold
  Wiring harness connector (wiring harness side) terminal 3

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic

tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E08 - Result: Defective Component

- If the nominal value is reached during one of the measurements, the component/control unit that has been disconnected immediately before that measurement is defective.

E09 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 7 (X32)
  &
  B35 Sensor - Camshaft
  Wiring harness connector (wiring harness side) terminal 3
  &
  B46 Air Mass Meter
  Wiring harness connector (wiring harness side) terminal 4
  &
  B21 Sensor - Absolute Pressure, Intake Manifold
  Wiring harness connector (wiring harness side) terminal 3

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E10 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 7 (X32)
  &
  B46 Air Mass Meter
  Wiring harness connector (wiring harness side) terminal 4

E11 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 9 (X32)
  &
  B46 Air Mass Meter
  Wiring harness connector (wiring harness side) terminal 3

E12 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 9 (X32)
  &
  B46 Air Mass Meter
  Wiring harness connector (wiring harness side) terminal 3
  &
  Wiring harness connector terminals of all components (wiring harness side), which were disconnected from the wiring harness during this trouble shooting session

or

- Defective component:
  B61 Sensor - Temperature, Coolant (Gauge)

E13 - Result: Interruption

- Circuit interruption between:
  K18 Relay - Engine Control Unit
  Socket Terminal 3 (87)
  &
  B46 Air Mass Meter
  Wiring harness connector (wiring harness side) terminal 2

C-09 - Engine Coolant Temperature Sensor Circuit

T01 - Check: Short to Voltage/Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B61 Sensor - Temperature, Coolant (Gauge) • Ignition ON • Measure voltage between the following terminals: B61 Sensor - Temperature, Coolant (Gauge) Wiring harness connector (wiring harness side) wiring colour BNBU & Ground **Note:** Blower motor is running **Note:**	4.8 ... 5.2 V

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	

Yes:T02	No:T04

T02 - Check: Component

Work Order Description	Nominal Value
• Diagnostic Tester Data List Parameter Coolant Temperature	greater than 4.8 V

Yes:T03	No:E03

T03 - Check: Circuit Interruption of Ground Circuit

Work Order Description	Nominal Value
• Connect fused jumper wire to: B61 Sensor - Temperature, Coolant (Gauge) Wiring harness connector (wiring harness side) wiring colour BNBU & B61 Sensor - Temperature, Coolant (Gauge) Wiring harness connector (wiring harness side) wiring colour BN • Diagnostic Tester Data List Parameter Coolant Temperature **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	less than 0.1 V

Yes:E01	No:E02

T04 - Check: Short to Voltage/Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B61 Sensor - Temperature, Coolant (Gauge) • Ignition ON	greater than 5.2 V

- Measure voltage between the following terminals:
  B61 Sensor - Temperature, Coolant (Gauge)
  Wiring harness connector (wiring harness side) wiring colour BNBU
  &
  Ground

Note:

Blower motor is running

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark

Yes:E04	No:E05

E01 - Result: Defective Component

- Defective component:
  B61 Sensor - Temperature, Coolant (Gauge)

E02 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 9 (X32)
  &
  B61 Sensor - Temperature, Coolant (Gauge)
  Wiring harness connector (wiring harness side) wiring colour BN

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green,

GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise,
VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E03 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 38 (X32)
  &
  B61 Sensor - Temperature, Coolant (Gauge)
  Wiring harness connector (wiring harness side) wiring colour BNBU

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green,
GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise,
VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E05 - Result: Short to Ground

- Short circuit to ground/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 38 (X32)
  &
  B61 Sensor - Temperature, Coolant (Gauge)
  Wiring harness connector (wiring harness side) wiring colour BNBU

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

C-10 - Boost Pressure Sensor Circuit

T01 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B21 Sensor - Absolute Pressure, Intake Manifold • Ignition ON • Measure voltage between the following terminals: B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 3 & Ground **Note:** Blower motor is running	4.8 ... 5.2 V

Yes:T02	No:T06

T02 - Check: Circuit Interruption of Ground Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals:	4.8 ... 5.2 V

B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 3 & B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 1	

Yes:T03	No:E05

T03 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 4 & Ground	less than 0.3 V

Yes:T04	No:E04

T04 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 4 & Ground	greater than 500 kOhm

Yes:T05	No:E03

T05 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following	less than 5 Ohm

terminals: B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 4 & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 22 (X32)	

Yes:E01	No:E02

T06 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B21 Sensor - Absolute Pressure, Intake Manifold • Ignition ON • Measure voltage between the following terminals: B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 3 & Ground **Note:** Blower motor is running	greater than 5.2 V

Yes:T07	No:T08

T07 - Check: Short to Voltage/Ground/Interruption of Voltage Supply

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B46 Air Mass Meter • Ignition ON • Measure voltage between the following terminals: B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 3 &	4.8 ... 5.2 V

Ground • Disconnect each of the following components/control units consecutively from the wiring harness and repeat the measurement each time: B35 Sensor - Camshaft	

Yes:E06	No:E07

T08 - Check: Short to Ground/Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B46 Air Mass Meter • Ignition ON • Measure voltage between the following terminals: B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 3 & Ground • Disconnect each of the following components/control units consecutively from the wiring harness and repeat the measurement each time: B35 Sensor - Camshaft	4.8 ... 5.2 V

Yes:E06	No:T09

T09 - Check: Short to Ground/Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Measure resistance between: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 7 (X32) & B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 3	less than 5 Ohm

Note:

Blower motor is running

Yes:E08	No:E09

E01 - Result: Defective Component

- Defective component:
  B21 Sensor - Absolute Pressure, Intake Manifold
  or
  A5 Control Unit - Motronic

E02 - Result: Interruption

- Circuit interruption between:
  B21 Sensor - Absolute Pressure, Intake Manifold
  Wiring harness connector (wiring harness side) terminal 4
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 22 (X32)

E03 - Result: Short to Ground

- Short circuit to ground between:
  B21 Sensor - Absolute Pressure, Intake Manifold
  Wiring harness connector (wiring harness side) terminal 4
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 22 (X32)

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  B21 Sensor - Absolute Pressure, Intake Manifold
  Wiring harness connector (wiring harness side) terminal 4
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 22 (X32)

E05 - Result: Short to Voltage/Ground/Interruption

- Short to voltage/ground/interruption of circuit between:
  B21 Sensor - Absolute Pressure, Intake Manifold
  Wiring harness connector (wiring harness side) terminal 1
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 9 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E06 - Result: Defective Component

- If the nominal value is reached during one of the measurements, the component/control unit that has been disconnected immediately before that measurement is defective.

E07 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 7 (X32)
  &
  B35 Sensor - Camshaft
  Wiring harness connector (wiring harness side) terminal 3
  &
  B21 Sensor - Absolute Pressure, Intake Manifold
  Wiring harness connector (wiring harness side) terminal 3
  &
  B46 Air Mass Meter
  Wiring harness connector (wiring harness side) terminal 4

or

- Defective component:
  A5 Control Unit - Motronic

E08 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 7 (X32)
  &
  B21 Sensor - Absolute Pressure, Intake Manifold
  Wiring harness connector (wiring harness side) terminal 3
  &
  B46 Air Mass Meter
  Wiring harness connector (wiring harness side) terminal 4
  &
  B35 Sensor - Camshaft
  Wiring harness connector (wiring harness side) terminal 3

or

- Defective component:
  A5 Control Unit - Motronic

E09 - Result: Short to Voltage

- Circuit interruption between:

B21 Sensor - Absolute Pressure, Intake Manifold
Wiring harness connector (wiring harness side) terminal 3
&
A5 Control Unit - Motronic
Wiring harness connector (wiring harness side) terminal 7 (X32)

C-11 - Intake Air Temperature Sensor Circuit

T01 - Check: Short to Ground/Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B21 Sensor - Absolute Pressure, Intake Manifold • Ignition ON • Measure voltage between the following terminals: B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 2 & Ground **Note:** Blower motor is running	4.8 ... 5.2 V

Yes:T02	No:T04

T02 - Check: Component

Work Order Description	Nominal Value
• Diagnostic Tester Data List Parameter Intake Air Temperature	greater than 4.8 V

Yes:T03	No:E03

T03 - Check: Circuit Interruption of Ground Circuit

Work Order Description	Nominal Value
• Connect fused jumper wire to: B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 1 & B21 Sensor - Absolute Pressure, Intake Manifold	less than 0.1 V

Wiring harness connector (wiring harness side) terminal 2 • Diagnostic Tester Data List Parameter Intake Air Temperature	
Yes:E01	**No:E02**

T04 - Check: Short to Ground/Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B21 Sensor - Absolute Pressure, Intake Manifold • Ignition ON • Measure voltage between the following terminals: B21 Sensor - Absolute Pressure, Intake Manifold Wiring harness connector (wiring harness side) terminal 2 & Ground **Note:** Blower motor is running	greater than 5.2 V
Yes:E04	**No:E05**

E01 - Result: Defective Component

- Defective component:
  B21 Sensor - Absolute Pressure, Intake Manifold

E02 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 9 (X32)
  &
  B21 Sensor - Absolute Pressure, Intake Manifold
  Wiring harness connector (wiring harness side) terminal 1

or

- Defective component:
  A5 Control Unit - Motronic

E03 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 55 (X32)
  &
  B21 Sensor - Absolute Pressure, Intake Manifold
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E05 - Result: Short to Ground

- Short circuit to ground/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 55 (X32)
  &
  B21 Sensor - Absolute Pressure, Intake Manifold
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

C-12 - Camshaft Position Sensor Circuit

T01 - Check: Short to Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B35 Sensor - Camshaft • Ignition ON • Measure voltage between the following terminals: • B35 Sensor - Camshaft Wiring harness connector (wiring harness side) terminal 3 & Ground	greater than 4.8 V
Yes:T02	**No:E07**

T02 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: B35 Sensor - Camshaft Wiring harness connector (wiring harness side) terminal 2 & Ground **Note:** Blower motor is running	less than 0.3 V
Yes:T03	**No:E06**

T03 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Remove electrical component from socket: K18 Relay - Engine Control Unit • Measure voltage between the following terminals: B35 Sensor - Camshaft Wiring harness connector (wiring harness side) terminal 3 &	less than 0.3 V

Ground	
Yes:T04	**No:E05**

T04 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: B35 Sensor - Camshaft Wiring harness connector (wiring harness side) terminal 2 & Ground	greater than 500 kOhm
Yes:T05	**No:E04**

T05 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 36 (X32) & B35 Sensor - Camshaft Wiring harness connector (wiring harness side) terminal 2	less than 5 Ohm
Yes:T06	**No:E03**

T06 - Check: Interruption in Wiring Harness

Work Order Description	Nominal Value
• Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 45 (X32) & B35 Sensor - Camshaft Wiring harness connector (wiring harness side) terminal 1	less than 5 Ohm
Yes:E01	**No:E02**

E01 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic

or
B35 Sensor - Camshaft

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 45 (X32)
  &
  B35 Sensor - Camshaft
  Wiring harness connector (wiring harness side) terminal 1

E03 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 36 (X32)
  &
  B35 Sensor - Camshaft
  Wiring harness connector (wiring harness side) terminal 2

E04 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 36 (X32)
  &
  B35 Sensor - Camshaft
  Wiring harness connector (wiring harness side) terminal 2

E05 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 7 (X32)
  &
  B35 Sensor - Camshaft
  Wiring harness connector (wiring harness side) terminal 3

E06 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 36 (X32)
  &
  B35 Sensor - Camshaft
  Wiring harness connector (wiring harness side) terminal 2

E07 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 7 (X32)
  &
  B35 Sensor - Camshaft
  Wiring harness connector (wiring harness side) terminal 3

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

C-13 - Boost Pressure Control Valve Circuit

T01 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: Y8 Solenoid Valve - Boost Pressure Regulation • Ignition ON • Measure voltage between the following terminals: Y8 Solenoid Valve - Boost Pressure Regulation Wiring harness connector (wiring harness side) terminal 2 & Ground	greater than 11 V

Yes:T02	No:E05

T02 - Check: Short to Voltage/Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Connect test light to: Y8 Solenoid Valve - Boost Pressure Regulation Wiring harness connector (wiring harness side) terminal 1	Test light OFF?

& Y8 Solenoid Valve - Boost Pressure Regulation Wiring harness connector (wiring harness side) terminal 2 • Ignition ON • Select and enable diagnostic tester actuator test: Boost Pressure Control Solenoid Valve Test • Press soft key INACTIVE	

Yes:T03	No:E04

T03 - Check: Short to Voltage/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Press soft key ACTIVE	Test light ON?

Yes:E01	No:T04

T04 - Check: Short to Voltage/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: Y8 Solenoid Valve - Boost Pressure Regulation Wiring harness connector (wiring harness side) terminal 1 & Ground **Note:** Blower motor is running	less than 0.3 V

Yes:E02	No:E03

E01 - Result: Defective Component

- Defective component:
  Y8 Solenoid Valve - Boost Pressure Regulation

E02 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic

Wiring harness connector (wiring harness side) terminal 35 (X32)
&
Y8 Solenoid Valve - Boost Pressure Regulation
Wiring harness connector (wiring harness side) terminal 1

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E03 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 35 (X32)
  &
  Y8 Solenoid Valve - Boost Pressure Regulation
  Wiring harness connector (wiring harness side) terminal 1

E04 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 35 (X32)
  &
  Y8 Solenoid Valve - Boost Pressure Regulation
  Wiring harness connector (wiring harness side) terminal 1

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E05 - Result: Interruption

- Circuit interruption between:
  FB20 Fuse
  Output contact
  &

Y8 Solenoid Valve - Boost Pressure Regulation
Wiring harness connector (wiring harness side) terminal 2

C-14 - Cylinder 1 Injector Circuit

T01 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • All consumers turned off • Disconnect wiring harness connector from: Y9.1 Injection Valve - Cylinder - 1 • Remove electrical component from socket: K16 Relay - Fuel pump • Connect fused jumper wire to: K16 Relay - Fuel pump Socket Terminal 3 (87) & Battery voltage • Measure voltage between the following terminals: Y9.1 Injection Valve - Cylinder - 1 Wiring harness connector (wiring harness side) terminal 1 & Ground	greater than 11 V

Yes:T02	No:E05

T02 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Remove fused jumper wire • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: Y9.1 Injection Valve - Cylinder - 1 Wiring harness connector (wiring harness side) terminal 2 & Ground **Note:** Blower motor is running	less than 0.3 V

Yes:T03	No:E04

T03 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: Y9.1 Injection Valve - Cylinder - 1 Wiring harness connector (wiring harness side) terminal 2 & Ground	greater than 500 kOhm

Yes:T04	No:E03

T04 - Check: Component

Work Order Description	Nominal Value
• Measure resistance between the following terminals: Y9.1 Injection Valve - Cylinder - 1 Wiring harness connector (component side) terminal 1 & Y9.1 Injection Valve - Cylinder - 1 Wiring harness connector (component side) terminal 2	12 ... 18 Ohm

Yes:E01	No:E02

E01 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 51 (X32)
  &
  Y9.1 Injection Valve - Cylinder - 1
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Defective Component

- Defective component:
  Y9.1 Injection Valve - Cylinder - 1

E03 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 51 (X32)
  &
  Y9.1 Injection Valve - Cylinder - 1
  Wiring harness connector (wiring harness side) terminal 2

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 51 (X32)
  &
  Y9.1 Injection Valve - Cylinder - 1
  Wiring harness connector (wiring harness side) terminal 2

E05 - Result: Interruption

- Circuit interruption between:
  K16 Relay - Fuel pump
  Socket Terminal 3 (87)
  &
  Y9.1 Injection Valve - Cylinder - 1
  Wiring harness connector (wiring harness side) terminal 1

C-15 - Cylinder 2 Injector Circuit

T01 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • All consumers turned off • Disconnect wiring harness connector from: Y9.2 Injection Valve - Cylinder - 2 • Remove electrical component from socket: K16 Relay - Fuel pump • Connect fused jumper wire to: K16 Relay - Fuel pump Socket Terminal 3 (87) & Battery voltage • Measure voltage between the following terminals: Y9.2 Injection Valve - Cylinder - 2 Wiring harness connector (wiring harness side) terminal 1 & Ground	greater than 11 V

Yes:T02	No:E05

T02 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Remove fused jumper wire • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: Y9.2 Injection Valve - Cylinder - 2 Wiring harness connector (wiring harness side) terminal 2 & Ground **Note:** Blower motor is running	less than 0.3 V

Yes:T03	No:E04

T03 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: Y9.2 Injection Valve - Cylinder - 2 Wiring harness connector (wiring harness side) terminal 2 & Ground	greater than 500 kOhm

Yes:T04	No:E03

T04 - Check: Component

Work Order Description	Nominal Value
• Measure resistance between the following terminals: Y9.2 Injection Valve - Cylinder - 2 Wiring harness connector (component side) terminal 1 & Y9.2 Injection Valve - Cylinder - 2 Wiring harness connector (component side) terminal 2	12 ... 18 Ohm

Yes:E01	No:E02

E01 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 18 (X32)
  &
  Y9.2 Injection Valve - Cylinder - 2
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Defective Component

- Defective component:
  Y9.2 Injection Valve - Cylinder - 2

E03 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 18 (X32)
  &
  Y9.2 Injection Valve - Cylinder - 2
  Wiring harness connector (wiring harness side) terminal 2

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 18 (X32)
  &
  Y9.2 Injection Valve - Cylinder - 2
  Wiring harness connector (wiring harness side) terminal 2

E05 - Result: Interruption

- Circuit interruption between:
  K16 Relay - Fuel pump
  Socket Terminal 3 (87)
  &
  Y9.2 Injection Valve - Cylinder - 2
  Wiring harness connector (wiring harness side) terminal 1

C-16 - Cylinder 3 Injector Circuit

T01 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • All consumers turned off • Disconnect wiring harness connector from: Y9.3 Injection Valve Cylinder - 3 • Remove electrical component from socket: K16 Relay - Fuel pump • Connect fused jumper wire to: K16 Relay - Fuel pump Socket Terminal 3 (87) & Battery voltage • Measure voltage between the following terminals: Y9.3 Injection Valve Cylinder - 3 Wiring harness connector (wiring harness side) terminal 1 & Ground	greater than 11 V

Yes:T02	No:E05

T02 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Remove fused jumper wire • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: Y9.3 Injection Valve Cylinder - 3 Wiring harness connector (wiring harness side) terminal 2 & Ground **Note:** Blower motor is running	less than 0.3 V

Yes:T03	No:E04

T03 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value

• Ignition OFF • Measure resistance between the following terminals: Y9.3 Injection Valve Cylinder - 3 Wiring harness connector (wiring harness side) terminal 2 & Ground	greater than 500 kOhm

Yes:T04	No:E03

T04 - Check: Component

Work Order Description	Nominal Value
• Measure resistance between the following terminals: Y9.3 Injection Valve Cylinder - 3 Wiring harness connector (component side) terminal 1 & Y9.3 Injection Valve Cylinder - 3 Wiring harness connector (component side) terminal 2	12 ... 18 Ohm

Yes:E01	No:E02

E01 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 2 (X32)
  &
  Y9.3 Injection Valve Cylinder - 3
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Defective Component

- Defective component:
  Y9.3 Injection Valve Cylinder - 3

E03 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 2 (X32)
  &
  Y9.3 Injection Valve Cylinder - 3
  Wiring harness connector (wiring harness side) terminal 2

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 2 (X32)
  &
  Y9.3 Injection Valve Cylinder - 3
  Wiring harness connector (wiring harness side) terminal 2

E05 - Result: Interruption

- Circuit interruption between:
  K16 Relay - Fuel pump
  Socket Terminal 3 (87)
  &
  Y9.3 Injection Valve Cylinder - 3
  Wiring harness connector (wiring harness side) terminal 1

C-17 - Cylinder 4 Injector Circuit

T01 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • All consumers turned off • Disconnect wiring harness connector from: Y9.4 Injection Valve Cylinder - 4 • Remove electrical component from socket: K16 Relay - Fuel pump • Connect fused jumper wire to: K16 Relay - Fuel pump Socket Terminal 3 (87) & Battery voltage • Measure voltage between the following terminals: Y9.4 Injection Valve Cylinder - 4 Wiring harness connector (wiring harness side) terminal 1 & Ground	greater than 11 V

Yes:T02	No:E05

T02 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Remove fused jumper wire • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: Y9.4 Injection Valve Cylinder - 4 Wiring harness connector (wiring harness side) terminal 2 & Ground **Note:** Blower motor is running	less than 0.3 V

Yes:T03	No:E04

T03 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: Y9.4 Injection Valve Cylinder - 4 Wiring harness connector (wiring harness side) terminal 2 & Ground	greater than 500 kOhm

Yes:T04	No:E03

T04 - Check: Component

Work Order Description	Nominal Value
• Measure resistance between the following terminals: Y9.4 Injection Valve Cylinder - 4 Wiring harness connector (component side) terminal 1 & Y9.4 Injection Valve Cylinder - 4 Wiring harness connector (component side) terminal 2	12 ... 18 Ohm

Yes:E01	No:E02

E01 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 34 (X32)
  &
  Y9.4 Injection Valve Cylinder - 4
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Defective Component

- Defective component:
  Y9.4 Injection Valve Cylinder - 4

E03 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 34 (X32)
  &
  Y9.4 Injection Valve Cylinder - 4
  Wiring harness connector (wiring harness side) terminal 2

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 34 (X32)
  &
  Y9.4 Injection Valve Cylinder - 4
  Wiring harness connector (wiring harness side) terminal 2

E05 - Result: Interruption

- Circuit interruption between:
  K16 Relay - Fuel pump
  Socket Terminal 3 (87)
  &
  Y9.4 Injection Valve Cylinder - 4
  Wiring harness connector (wiring harness side) terminal 1

C-18 - Misfire Detection

T01 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • All consumers turned off • Disconnect wiring harness connector from: T1 Ignition Coil - Direct Ignition • Ignition ON • Measure voltage between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 2 & Ground	greater than 11 V

Yes:T02	No:E16

T02 - Check: Circuit Interruption of Ground Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 2 & T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 1	greater than 11 V

Yes:T03	No:E15

T03 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 3 & Ground **Note:**	less than 0.3 V

Blower motor is running	
Yes:T04	**No:E14**

T04 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 4 & Ground	less than 0.3 V
Yes:T05	**No:E13**

T05 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 5 & Ground	less than 0.3 V
Yes:T06	**No:E12**

T06 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 6 & Ground	less than 0.3 V
Yes:T07	**No:E11**

T07 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness	greater than 500 kOhm

side) terminal 6 & Ground	

Yes:T08	No:E10

T08 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 5 & Ground	greater than 500 kOhm

Yes:T09	No:E09

T09 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 4 & Ground	greater than 500 kOhm

Yes:T10	No:E08

T10 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 3 & Ground	greater than 500 kOhm

Yes:T11	No:E07

T11 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: T1 Ignition Coil - Direct Ignition	less than 5 Ohm

Wiring harness connector (wiring harness side) terminal 3 & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 15 (X32)	

Yes:T12	No:E06

T12 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 4 & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 32 (X32)	less than 5 Ohm

Yes:T13	No:E05

T13 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 5 & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 31 (X32)	less than 5 Ohm

Yes:T14	No:E04

T14 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: T1 Ignition Coil - Direct Ignition Wiring harness connector (wiring harness side) terminal 6 & A5 Control Unit - Motronic Wiring harness connector (wiring harness	less than 5 Ohm

side) terminal 16 (X32)	

Yes:T15	No:E03

T15 - Check: Component

Work Order Description	Nominal Value
• Check the following component for proper operation: Engine-compression Fuel pressure Fuel pipes and fuel filter Plugging, leakage, air or water in fuel system Spark plugs Spark plug connectors Check intake system/charge air hoses for leaks (secondary air, porosity and blockages) Tightness of the line connections Check vacuum hoses for splits, kinks, leaks and proper connections. Perform visual check of all exhaust related components for completeness, leakage and damage. Check the exhaust system for leakage, installation and the condition of the rubber suspension.	Test okay?

Yes:E01	No:E02

E01 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic
  or
  T1 Ignition Coil - Direct Ignition

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Repair other system

- Repair the concerned circuit/component.

E03 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 16 (X32)

&
T1 Ignition Coil - Direct Ignition
Wiring harness connector (wiring harness side) terminal 6

E04 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 31 (X32)
  &
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 5

E05 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 32 (X32)
  &
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 4

E06 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 15 (X32)
  &
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 3

E07 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 15 (X32)
  &
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 3

E08 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 32 (X32)
  &
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 4

E09 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 31 (X32)
  &
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 5

E10 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 16 (X32)
  &
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 6

E11 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 16 (X32)
  &
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 6

E12 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 31 (X32)
  &
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 5

E13 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 32 (X32)
  &
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 4

E14 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 15 (X32)
  &
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 3

E15 - Result: Interruption

- Circuit interruption between:
  T1 Ignition Coil - Direct Ignition
  Wiring harness connector (wiring harness side) terminal 1
  &
  Ground

E16 - Result: Interruption

- Circuit interruption between:
  S1 Switch - Starter
  Socket Terminal 15

&
T1 Ignition Coil - Direct Ignition
Wiring harness connector (wiring harness side) terminal 2

C-19 - Knock Sensor Signal Circuit

T01 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 21 (X32) & Ground **Note:** Blower motor is running	less than 0.3 V

Yes:T02	No:E05

T02 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 21 (X32) & Ground	greater than 500 kOhm

Yes:T03	No:E04

T03 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 37 (X32)	greater than 500 kOhm

& Ground	

Yes:T04	No:E03

T04 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: B30 Sensor - Knocking Control 1 • Connect fused jumper wire to: B30 Sensor - Knocking Control 1 Wiring harness connector (wiring harness side) terminal 1 & B30 Sensor - Knocking Control 1 Wiring harness connector (wiring harness side) terminal 2 • Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 21 (X32) & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 37 (X32)	less than 5 Ohm

Yes:E01	No:E02

E01 - Result: Defective Component

- Defective component:
  B30 Sensor - Knocking Control 1
  or
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 21 (X32)
  &
  B30 Sensor - Knocking Control 1
  Wiring harness connector (wiring harness side) terminal 1

or
A5 Control Unit - Motronic
Wiring harness connector (wiring harness side) terminal 37 (X32)
&
B30 Sensor - Knocking Control 1
Wiring harness connector (wiring harness side) terminal 2

E03 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 37 (X32)
  &
  B30 Sensor - Knocking Control 1
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  B30 Sensor - Knocking Control 1

E04 - Result: Short to Ground

- Short circuit to ground between:
  B30 Sensor - Knocking Control 1
  Wiring harness connector (wiring harness side) terminal 1
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 21 (X32)
  or
- Defective component:
  B30 Sensor - Knocking Control 1

E05 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 21 (X32)
  &
  B30 Sensor - Knocking Control 1
  Wiring harness connector (wiring harness side) terminal 1
  or
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 37 (X32)
  &
  B30 Sensor - Knocking Control 1
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  B30 Sensor - Knocking Control 1

C-20 - Charcoal Canister Purge Valve Circuit

T01 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: Y5 Solenoid Valve - Tank Ventilation • Ignition ON • Measure voltage between the following terminals: Y5 Solenoid Valve - Tank Ventilation Wiring harness connector (wiring harness side) wiring colour RDBU & Ground **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	greater than 11 V

Yes:T02	No:E04

T02 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Connect test light to: Y5 Solenoid Valve - Tank Ventilation Wiring harness connector (wiring harness side) wiring colour RDBU & Y5 Solenoid Valve - Tank Ventilation Wiring harness connector (wiring harness side) wiring colour BNRD • Select and enable diagnostic tester actuator test: Fuel Tank Ventilation Valve Test • Press soft key INACTIVE **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,	Test light OFF?

L=Light, D=Dark	

Yes:T03	No:E03

T03 - Check: Short to Voltage/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Press soft key ACTIVE	Test light ON?

Yes:E01	No:E02

E01 - Result: Defective Component

- Defective component:
  Y5 Solenoid Valve - Tank Ventilation

E02 - Result: Short to Voltage/Interruption

- Short circuit to voltage/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 33 (X80)
  &
  Y5 Solenoid Valve - Tank Ventilation
  Wiring harness connector (wiring harness side) wiring colour BNRD

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E03 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 33 (X80)
  &
  Y5 Solenoid Valve - Tank Ventilation
  Wiring harness connector (wiring harness side) wiring colour BNRD

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E04 - Result: Interruption

- Circuit interruption between:
  K16 Relay - Fuel pump
  Socket Terminal 3 (87)
  &
  Y5 Solenoid Valve - Tank Ventilation
  Wiring harness connector (wiring harness side) wiring colour RDBU

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

C-21 - O2 Sensor Heater Circuit (Before Catalyst)

T01 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B117 Sensor - Oxygen, Exhaust, Heated 1 • Ignition ON • Measure voltage between the following terminals: B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (wiring harness side) terminal 1 & Ground	greater than 11 V

Yes:T02	No:E06

T02 - Check: Short to Voltage of Ground Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (wiring harness side) terminal 2 & Ground **Note:** Blower motor is running	less than 0.3 V

Yes:T03	No:E05

T03 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (component side) terminal 1 & B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (component side) terminal 2	5 ... 20 Ohm

Yes:T04	No:T05

T04 - Check: Component

Work Order Description	Nominal Value
• Measure resistance between the following terminals: B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (component side) terminal 1 & Ground	greater than 500 kOhm

Yes:E01	No:E02

T05 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (component side) terminal 1 & B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (component side) terminal 2	greater than 20 Ohm

Yes:E03	No:E04

E01 - Result: Short to Ground/Interruption

- Short circuit to ground/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 49 (X32)
  &
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Short to Ground

- Short circuit to ground between:
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (component side) terminal 1
  &
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (component side) terminal 2

or

- Defective component:
  B117 Sensor - Oxygen, Exhaust, Heated 1

E03 - Result: Defective Component

- Defective component:
  B117 Sensor - Oxygen, Exhaust, Heated 1

E04 - Result: Short Circuit in Wiring Harness

- Short circuit in wiring harness between:
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (component side) terminal 1
  &
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (component side) terminal 2

or

- Defective component:
  B117 Sensor - Oxygen, Exhaust, Heated 1

E05 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 49 (X32)
  &
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (wiring harness side) terminal 2

E06 - Result: Interruption

- Circuit interruption between:
  K18 Relay - Engine Control Unit
  Socket Terminal 3 (87)
  &
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (wiring harness side) terminal 1

C-22 - O2 Sensor Circuit (Before Catalyst)

T01 - Check: Short to Voltage/Interruption of Ground Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) and B117 Sensor - Oxygen, Exhaust, Heated 1 • Ignition ON • Measure voltage between the following terminals: B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (wiring harness side) terminal 4	less than 0.3 V

& Ground **Note:** Blower motor is running	

Yes:T02	No:E07

T02 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (wiring harness side) terminal 4 & Ground	greater than 500 kOhm

Yes:T03	No:E06

T03 - Check: Circuit Interruption of Ground Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (wiring harness side) terminal 4 & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 8 (X32)	less than 5 Ohm

Yes:T04	No:E05

T04 - Check: Short to Voltage/Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Connect wiring harness connector to: A5 Control Unit - Motronic • Ignition ON • Measure voltage between the following terminals: B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (wiring harness side) terminal 3	350 ... 550 mV

& B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (wiring harness side) terminal 4	

Yes:T05	No:T06

T05 - Check: Mechanical Functionality

Work Order Description	Nominal Value
• Check mechanical functionality of the following components and all attached parts: Exhaust system Intake system Injection valves Fuel pressure	Test okay?

Yes:E01	No:E02

T06 - Check: Short to Voltage/Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Connect wiring harness connector to: A5 Control Unit - Motronic • Ignition ON • Measure voltage between the following terminals: B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (wiring harness side) terminal 3 & B117 Sensor - Oxygen, Exhaust, Heated 1 Wiring harness connector (wiring harness side) terminal 4	less than 350 mV

Yes:E03	No:E04

E01 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic
  or
  B117 Sensor - Oxygen, Exhaust, Heated 1

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both

control units are never reset and replaced at the same time.

E02 - Result: Defective Component

- Repair the concerned circuit/component.

E03 - Result: Short to Ground/Interruption

- Short circuit to ground/interruption of circuit between:
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (wiring harness side) terminal 3
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 25 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (wiring harness side) terminal 3
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 25 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E05 - Result: Interruption

- Circuit interruption between:
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (wiring harness side) terminal 4
  &
  A5 Control Unit - Motronic

Wiring harness connector (wiring harness side) terminal 8 (X32)

E06 - Result: Short to Ground

- Short circuit to ground between:
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (wiring harness side) terminal 4
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 8 (X32)

E07 - Result: Short to Voltage

- Short circuit to voltage between:
  B117 Sensor - Oxygen, Exhaust, Heated 1
  Wiring harness connector (wiring harness side) terminal 4
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 8 (X32)

C-23 - O2 Sensor Heater Circuit (Behind Catalyst)

T01 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B118 Sensor - Oxygen, Exhaust, Heated 2 • Ignition ON • Measure voltage between the following terminals: B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (wiring harness side) terminal 1 & Ground	greater than 11 V

Yes:T02	No:E06

T02 - Check: Short to Voltage of Ground Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (wiring harness side) terminal 2	less than 0.3 V

& Ground **Note:** Blower motor is running	
Yes:T03	**No:E05**

T03 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (component side) terminal 1 & B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (component side) terminal 2	5 ... 20 Ohm
Yes:T04	**No:T05**

T04 - Check: Component

Work Order Description	Nominal Value
• Measure resistance between the following terminals: B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (component side) terminal 1 & Ground	greater than 500 kOhm
Yes:E01	**No:E02**

T05 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (component side) terminal 1 & B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (component side)	greater than 20 Ohm

terminal 2	
Yes:E03	**No:E04**

E01 - Result: Short to Ground/Interruption

- Short circuit to ground/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 17 (X32)
  &
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Short to Ground

- Short circuit to ground between:
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (component side) terminal 1
  &
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (component side) terminal 2

or

- Defective component:
  B118 Sensor - Oxygen, Exhaust, Heated 2

E03 - Result: Defective Component

- Defective component:
  B118 Sensor - Oxygen, Exhaust, Heated 2

E04 - Result: Short Circuit in Wiring Harness

- Short circuit in wiring harness between:
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (component side) terminal 1
  &
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (component side) terminal 2

or

- Defective component:
  B118 Sensor - Oxygen, Exhaust, Heated 2

E05 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 17 (X32)
  &
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (wiring harness side) terminal 2

E06 - Result: Interruption

- Circuit interruption between:
  K18 Relay - Engine Control Unit
  Socket Terminal 3 (87)
  &
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (wiring harness side) terminal 1

C-24 - O2 Sensor Circuit (Behind Catalyst)

T01 - Check: Short to Voltage/Interruption of Ground Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) and B118 Sensor - Oxygen, Exhaust, Heated 2 • Ignition ON • Measure voltage between the following terminals: B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (wiring harness side) terminal 4 & Ground **Note:** Blower motor is running	less than 0.3 V

Yes:T02	No:E07

T02 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following	greater than 500 kOhm

terminals: B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (wiring harness side) terminal 4 & Ground	

Yes:T03	No:E06

T03 - Check: Circuit Interruption of Ground Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (wiring harness side) terminal 4 & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 57 (X32)	less than 5 Ohm

Yes:T04	No:E05

T04 - Check: Short to Voltage/Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Connect wiring harness connector to: A5 Control Unit - Motronic • Ignition ON • Measure voltage between the following terminals: B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (wiring harness side) terminal 3 & B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (wiring harness side) terminal 4	350 ... 550 mV

Yes:T05	No:T06

T05 - Check: Mechanical Functionality

Work Order Description	Nominal Value
• Check mechanical functionality of the following components and all attached parts: Exhaust system	Test okay?

Intake system Injection valves Fuel pressure	

Yes:E01	No:E02

T06 - Check: Short to Voltage/Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Connect wiring harness connector to: A5 Control Unit - Motronic • Ignition ON • Measure voltage between the following terminals: B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (wiring harness side) terminal 3 & B118 Sensor - Oxygen, Exhaust, Heated 2 Wiring harness connector (wiring harness side) terminal 4	less than 350 mV

Yes:E03	No:E04

E01 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic
  or
  B118 Sensor - Oxygen, Exhaust, Heated 2

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Defective Component

- Repair the concerned circuit/component.

E03 - Result: Short to Ground/Interruption

- Short circuit to ground/interruption of circuit between:
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (wiring harness side) terminal 3
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 41 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (wiring harness side) terminal 3
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 41 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E05 - Result: Interruption

- Circuit interruption between:
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (wiring harness side) terminal 4
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 57 (X32)

E06 - Result: Short to Ground

- Short circuit to ground between:
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (wiring harness side) terminal 4
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 57 (X32)

E07 - Result: Short to Voltage

- Short circuit to voltage between:
  B118 Sensor - Oxygen, Exhaust, Heated 2
  Wiring harness connector (wiring harness side) terminal 4
  &

A5 Control Unit - Motronic
Wiring harness connector (wiring harness side) terminal 57 (X32)

C-25 - Engine-Compression

T01 - Mechanic and/or Hydraulic Check

Work Order Description	Nominal Value
• Ignition OFF • Engine oil temperature is greater than 80 °C (176 °F) • Disconnect wiring harness connector from: A5 Control Unit - Engine • Remove following component: Spark plugs • Accelerator pedal actuated to full load stop • Verify mechanical system functions/components Engine-compression	Test okay?

Yes:E01	No:E02

E01 - Result: Defective Component

- Defective component:
  A5 Control Unit - Engine

or

- Check mechanical functionality of the following components and all attached parts:
  Ignition system, intake manifold, injection valve, combustion chamber (carbon deposit)

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Mechanical Fault

- Check mechanical functionality of the following components and all attached parts:
  Cylinder-head gasket, induction valve, discharge valve, piston ring, cylinder head

C-26 - Vehicle Speed Input Signal Circuit

T01 - Check: Component

Work Order Description	Nominal Value

• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic • Vehicle jacked-up and rear left wheel slowly turned by hand • Ignition ON • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 59 (X31) & Battery voltage • Disconnect each of the following components/control units consecutively from the wiring harness and repeat the measurement each time: H1 Instrument	The value alternates between less than 6 V and greater than 10 V

Yes:E01	No:T02

T02 - Check: Vehicle Configuration

Is the following information correct for the actual vehicle?

Radio

Yes:T03	No:T04

T03 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Remove following component: A14 Radio • Ignition ON • Vehicle jacked-up and rear left wheel slowly turned by hand • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 59 (X31) & Ground	The value alternates between less than 6 V and greater than 10 V

Yes:E01	No:T04

T04 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value

• Ignition OFF • Disconnect wiring harness connector from: A2 Control Unit - Anti Lock Brake System • Ignition ON • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 59 (X31) & Ground	less than 0.3 V

Yes:T05	No:E04

T05 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 59 (X31) & Ground	greater than 500 kOhm

Yes:E02	No:E03

E01 - Result: Defective Component

- If the nominal value is reached during one of the measurements, the component/control unit that has been disconnected immediately before that measurement is defective.

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 59 (X31)
  &
  A2 Control Unit - Anti Lock Brake System
  Wiring harness connector (wiring harness side) terminal 3

or

- Defective component:
  A2 Control Unit - Anti Lock Brake System

E03 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 59 (X31)
  &
  A2 Control Unit - Anti Lock Brake System
  Wiring harness connector (wiring harness side) terminal 3
  &
  Wiring harness connector terminals of all components (wiring harness side), which were disconnected from the wiring harness during this trouble shooting session

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 59 (X31)
  &
  A2 Control Unit - Anti Lock Brake System
  Wiring harness connector (wiring harness side) terminal 3
  &
  Wiring harness connector terminals of all components (wiring harness side), which were disconnected from the wiring harness during this trouble shooting session

C-27 - Barometer Sensor Circuit

T01 - Check: Short to Voltage/Ground/Interruption of Voltage Supply

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: B110 Sensor - Atmospheric Pressure • Ignition ON • Measure voltage between the following terminals: B110 Sensor - Atmospheric Pressure • Wiring harness connector (wiring harness side) terminal 1 & Ground	4.8 ... 5.2 V

Yes:T02	No:E06

T02 - Check: Short to Voltage/Interruption of Ground Circuit

Work Order Description	Nominal Value
• Measure voltage between the following	4.8 ... 5.2 V

terminals: B110 Sensor - Atmospheric Pressure Wiring harness connector (wiring harness side) terminal 1 & B110 Sensor - Atmospheric Pressure Wiring harness connector (wiring harness side) terminal 2	

Yes:T03	No:E05

T03 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X31) • Ignition ON • Measure voltage between the following terminals: B110 Sensor - Atmospheric Pressure Wiring harness connector (wiring harness side) terminal 3 & Ground	less than 0.3 V

Yes:T04	No:E04

T04 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: B110 Sensor - Atmospheric Pressure Wiring harness connector (wiring harness side) terminal 3 & Ground	greater than 500 kOhm

Yes:T05	No:E03

T05 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 23 (X31)	less than 5 Ohm

& B110 Sensor - Atmospheric Pressure Wiring harness connector (wiring harness side) terminal 3	

Yes:E01	No:E02

E01 - Result: Defective Component

- Defective component:
  B110 Sensor - Atmospheric Pressure
  or
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 23 (X31)
  &
  B110 Sensor - Atmospheric Pressure
  Wiring harness connector (wiring harness side) terminal 3

E03 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 23 (X31)
  &
  B110 Sensor - Atmospheric Pressure
  Wiring harness connector (wiring harness side) terminal 3

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 23 (X31)
  &
  B110 Sensor - Atmospheric Pressure
  Wiring harness connector (wiring harness side) terminal 3

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E05 - Result: Short to Voltage/Interruption

- Short circuit to voltage/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 5 (X31)
  &
  B110 Sensor - Atmospheric Pressure
  Wiring harness connector (wiring harness side) terminal 2
  &
  B19 Sensor - Pedal Position
  Wiring harness connector (wiring harness side) terminal 5

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E06 - Result: Short to Voltage/Ground/Interruption

- Short to voltage/ground/interruption of circuit between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 53 (X31)
  &
  B110 Sensor - Atmospheric Pressure
  Wiring harness connector (wiring harness side) terminal 1

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

C-28 - Brake Switch Circuit

T01 - Check: Short to Ground of Voltage Supply Circuit	
Work Order Description	**Nominal Value**
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic • Ignition ON • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 57 (X31) & Ground	greater than 11 V
Yes:T02	**No:T06**

T02 - Check: Interruption of Voltage Supply Circuit	
Work Order Description	**Nominal Value**
• Brake pedal actuated • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 25 (X31) & Ground	greater than 11 V
Yes:T03	**No:T05**

T03 - Check: Short to Voltage of Signal Circuit	
Work Order Description	**Nominal Value**
• Brake pedal not actuated • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 25 (X31) & Ground	less than 0.3 V
Yes:E01	**No:T04**

T04 - Check: Short to Voltage of Signal Circuit	
Work Order Description	**Nominal Value**
• Ignition OFF • Disconnect wiring harness connector from:	less than 0.3 V

A2 Control Unit - Anti Lock Brake System • Ignition ON • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 25 (X31) & Ground • Disconnect each of the following components/control units consecutively from the wiring harness and repeat the measurement each time: E24 Stop Lamp - Centre Position E3 Back Lamp Unit - Left E4 Back Lamp Unit - Right	

Yes:E02	No:E03

T05 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: S43 Switch - Stop Lamp, Double • Ignition ON • Measure voltage between the following terminals: S43 Switch - Stop Lamp, Double Wiring harness connector (wiring harness side) terminal 4 & Ground	greater than 11 V

Yes:E04	No:E05

T06 - Check: Concerned Fuse

Work Order Description	Nominal Value
• Remove electrical component from socket: FB5 Fuse • Check the following component for proper operation: FB5 Fuse	Test okay?

Yes:T07	No:T09

T07 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value

• Disconnect wiring harness connector from: S43 Switch - Stop Lamp, Double • Connect fused jumper wire to: S43 Switch - Stop Lamp, Double Wiring harness connector (wiring harness side) terminal 1 & S43 Switch - Stop Lamp, Double Wiring harness connector (wiring harness side) terminal 2 • Insert electrical component in socket: FB5 Fuse • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 57 (X31) & Ground	greater than 11 V
Yes:E06	**No:T08**

T08 - Check: Interruption of Voltage Supply Circuit

Work Order Description	**Nominal Value**
• Ignition OFF • Remove electrical component from socket: FB5 Fuse • Ignition ON • Measure voltage between the following terminals: FB5 Fuse Input contact & Ground	greater than 11 V
Yes:E07	**No:E08**

T09 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	**Nominal Value**
• Connect fused jumper wire to: FB5 Fuse Output contact & Battery voltage • Check the following component for proper operation: Fuse of the fused jumper wire	Test okay?

Yes:T10	No:T19

T10 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Brake pedal actuated • Check the following component for proper operation: Fuse of the fused jumper wire	Test okay?

Yes:T11	No:T18

T11 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Clutch pedal actuated • Check the following component for proper operation: Fuse of the fused jumper wire	Test okay?

Yes:T12	No:E11

T12 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Reverse gear is engaged • Check the following component for proper operation: Fuse of the fused jumper wire	Test okay?

Yes:E09	No:T13

T13 - Check: Vehicle Configuration

Is the following information correct for the actual vehicle?

Left Hand Driven

Yes:T14	No:T17

T14 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: E4 Back Lamp Unit - Right • Reverse gear is engaged • Insert new fuse into the socket of the fused jumper wire and then check this fuse for proper operation.	Test okay?

Yes:E02	No:T15

T15 - Check: Vehicle Configuration

Is the following information correct for the actual vehicle?

Radio

Yes:T16	No:E10

T16 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Remove following component: A14 Radio • Reverse gear is engaged • Insert new fuse into the socket of the fused jumper wire and then check this fuse for proper operation.	Test okay?

Yes:E02	No:E10

Yes:E02	No:T15

T17 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: E3 Back Lamp Unit - Left • Reverse gear is engaged • Insert new fuse into the socket of the fused jumper wire and then check this fuse for proper operation.	Test okay?

T18 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: A2 Control Unit - Anti Lock Brake System • Brake pedal actuated • Insert new fuse into the socket of the fused jumper wire and then check this fuse for proper operation. • Disconnect each of the following components/control units consecutively from the wiring harness and repeat the check each time: A5 Control Unit - Motronic E3 Back Lamp Unit - Left E4 Back Lamp Unit - Right E24 Stop Lamp - Centre Position	Test okay?

Yes:E02	No:E12

T19 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value

• Disconnect wiring harness connector from: S43 Switch - Stop Lamp, Double • Insert new fuse into the socket of the fused jumper wire and then check this fuse for proper operation.	Test okay?

Yes:E13	No:T20

T20 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: S28 Switch - Clutch • Insert new fuse into the socket of the fused jumper wire and then check this fuse for proper operation. • Disconnect each of the following components/control units consecutively from the wiring harness and repeat the check each time: S31 Switch - Back up Lamp	Test okay?

Yes:E02	No:E14

E01 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Defective Component

- If the nominal value is reached during one of the measurements, the component/control unit that has been disconnected immediately before that measurement is defective.

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E03 - Result: Short to Voltage

- Short circuit to voltage between:
  S43 Switch - Stop Lamp, Double
  Wiring harness connector (wiring harness side) terminal 3

&
A5 Control Unit - Motronic
Wiring harness connector (wiring harness side) terminal 25 (X31)
&
Wiring harness connector terminals of all components (wiring harness side), which were disconnected from the wiring harness during this trouble shooting session

E04 - Result: Interruption

- Circuit interruption between:
  S43 Switch - Stop Lamp, Double
  Wiring harness connector (wiring harness side) terminal 3
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 25 (X31)

or

- Defective component:
  S43 Switch - Stop Lamp, Double

E05 - Result: Interruption

- Circuit interruption between:
  FB5 Fuse
  Output contact
  &
  S43 Switch - Stop Lamp, Double
  Wiring harness connector (wiring harness side) terminal 4

E06 - Result: Defective Component

- Defective component:
  S43 Switch - Stop Lamp, Double

E07 - Result: Interruption

- Circuit interruption between:
  FB5 Fuse
  Output contact
  &
  S43 Switch - Stop Lamp, Double
  Wiring harness connector (wiring harness side) terminal 1

or

- S43 Switch - Stop Lamp, Double
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 57 (X31)

E08 - Result: Interruption

- Circuit interruption between:

S1 Switch - Starter
Wiring harness connector (wiring harness side) terminal 15
&
FB5 Fuse
Input contact

E09 - Result: Short to Ground

- A temporary current overload in the system behind fuse FB5 has occurred

E10 - Result: Short to Ground

- Short circuit to ground between:
  S31 Switch - Back up Lamp
  Wiring harness connector (wiring harness side) terminal B
  &
  Wiring harness connector terminals of all components (wiring harness side), which were disconnected from the wiring harness during this trouble shooting session

or

- Defective component:
  S31 Switch - Back up Lamp

E11 - Result: Short to Ground

- Short circuit to ground between:
  S28 Switch - Clutch, Cruise Control
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 8 (X31)

or

- Defective component:
  S28 Switch - Clutch, Cruise Control

E12 - Result: Short to Ground

- Short circuit to ground between:
  S43 Switch - Stop Lamp, Double
  Wiring harness connector (wiring harness side) terminal 3
  &
  Wiring harness connector terminals of all components (wiring harness side), which were disconnected from the wiring harness during this trouble shooting session

or

- Defective component:
  S43 Switch - Stop Lamp, Double

E13 - Result: Short to Ground

- Short circuit to ground between:
  S43 Switch - Stop Lamp, Double
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 57 (X31)

or

- Defective component:
  S43 Switch - Stop Lamp, Double
  or
  A5 Control Unit - Motronic

E14 - Result: Short to Ground

- Short circuit to ground between:
  FB5 Fuse
  Output contact
  &
  S43 Switch - Stop Lamp, Double
  Wiring harness connector (wiring harness side) terminal 1, 4
  &
  S28 Switch - Clutch
  Wiring harness connector (wiring harness side) terminal 4
  &
  S31 Switch - Back up Lamp
  Wiring harness connector (wiring harness side) terminal A

C-29 - Clutch Switch Circuit

T01 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: S28 Switch - Clutch, Cruise Control • Ignition ON • Measure voltage between the following terminals: S28 Switch - Clutch, Cruise Control Wiring harness connector (wiring harness side) terminal 4 & Ground	greater than 11 V

Yes:T02	No:E04

T02 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value

• Diagnostic Tester Data List Parameter Clutch Switch	Active

Yes:T03	No:E03

T03 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Connect fused jumper wire to: S28 Switch - Clutch, Cruise Control Wiring harness connector (wiring harness side) terminal 4 & S28 Switch - Clutch, Cruise Control Wiring harness connector (wiring harness side) terminal 2 • Ignition ON • Diagnostic Tester Data List Parameter Clutch Switch	Inactive

Yes:E01	No:E02

E01 - Result: Defective Component

- Check adjustment of the following component (refer to Service Manual):
  S28 Switch - Clutch, Cruise Control

or

- Defective component:
  S28 Switch - Clutch, Cruise Control

E02 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 8 (X79)
  &
  S28 Switch - Clutch, Cruise Control
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both

control units are never reset and replaced at the same time.

E03 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 8 (X79)
  &
  S28 Switch - Clutch, Cruise Control
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E04 - Result: Interruption

- Circuit interruption between:
  FB5 Fuse
  Output contact
  &
  S28 Switch - Clutch, Cruise Control
  Wiring harness connector (wiring harness side) terminal 4

C-30 - Fan Circuit

T01 - Check: Short to Voltage/Ground/Interruption of Voltage Supply

Work Order Description	Nominal Value
• Ignition OFF • Remove electrical component from socket: K13 Relay - Blower, Radiator • Measure voltage between the following terminals: K13 Relay - Blower, Radiator Socket Terminal 86 & Ground	greater than 11 V

Yes:T02	No:T11

T02 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value

• Measure voltage between the following terminals: K13 Relay - Blower, Radiator Socket Terminal 30 & Ground	greater than 11 V

Yes:T03	No:E10

T03 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition ON • Measure voltage between the following terminals: K13 Relay - Blower, Radiator Socket Terminal 87 & Ground	less than 0.3 V

Yes:T04	No:E09

T04 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: K13 Relay - Blower, Radiator Socket Terminal 85 & Ground	less than 0.3 V

Yes:T05	No:E08

T05 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic • Measure resistance between the following terminals: K13 Relay - Blower, Radiator Socket Terminal 85 & Ground	greater than 500 kOhm

Yes:T06	No:E07

T06 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value

• Measure resistance between the following terminals: K13 Relay - Blower, Radiator Socket Terminal 85 & A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 29 (X31)	less than 5 Ohm

Yes:T07	No:E06

T07 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: M19 Motor - Blower, Radiator • Connect fused jumper wire to: K13 Relay - Blower, Radiator Socket Terminal 87 & Battery voltage • Measure voltage between the following terminals: M19 Motor - Blower, Radiator Wiring harness connector (wiring harness side) terminal A & Ground	greater than 11 V

Yes:T08	No:E05

T08 - Check: Circuit Interruption of Ground Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: M19 Motor - Blower, Radiator Wiring harness connector (wiring harness side) terminal B & Ground	less than 5 Ohm

Yes:T09	No:E04

T09 - Check: Component

Work Order Description	Nominal Value
• Remove fused jumper wire • Insert electrical component in socket: K13 Relay - Blower, Radiator	Is cooling fan M19 running at low speed?

• Connect wiring harness connector to: M19 Motor - Blower, Radiator • Ignition ON	

Yes:E01	No:T10

T10 - Check: Component

Work Order Description	Nominal Value
• Connect fused jumper wire to: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 29 (X31) & Ground	Is cooling fan M19 running at high speed? and Clicking noise from the relay

Yes:E02	No:E03

T11 - Check: Component

Work Order Description	Nominal Value
• Remove electrical component from socket: FB12 Fuse • Check the following component for proper operation: FB12 Fuse	Test okay?

Yes:T12	No:T13

T12 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: FB12 Fuse Input contact & Ground	greater than 11 V

Yes:E11	No:E12

T13 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Connect fused jumper wire to: K13 Relay - Blower, Radiator Socket Terminal 87 & Battery voltage • Check the following component for proper operation:	Test okay?

Fuse of the fused jumper wire	

Yes:E13	No:E14

E01 - Result: Defective Component

- Defective component:
  K13 Relay - Blower, Radiator

E02 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E03 - Result: Defective Component

- Defective component:
  M19 Motor - Blower, Radiator
  or
  K13 Relay - Blower, Radiator

E04 - Result: Interruption

- Circuit interruption between:
  M19 Motor - Blower, Radiator
  Wiring harness connector (wiring harness side) terminal B
  &
  Ground

E05 - Result: Interruption

- Circuit interruption between:
  K13 Relay - Blower, Radiator
  Socket Terminal 87
  &
  M19 Motor - Blower, Radiator
  Wiring harness connector (wiring harness side) terminal A

E06 - Result: Interruption

- Circuit interruption between:
  K13 Relay - Blower, Radiator
  Socket Terminal 85
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 29 (X31)

E07 - Result: Short to Ground

- Short circuit to ground between:
  K13 Relay - Blower, Radiator
  Socket Terminal 85

&
A5 Control Unit - Motronic
Wiring harness connector (wiring harness side) terminal 29 (X31)

E08 - Result: Short to Voltage

- Short circuit to voltage between:
  K13 Relay - Blower, Radiator
  Socket Terminal 85
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 29 (X31)

or

- Defective component:
  A5 Control Unit - Motronic

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E09 - Result: Short to Voltage

- Short circuit to voltage between:
  K13 Relay - Blower, Radiator
  Socket Terminal 87
  &
  M19 Motor - Blower, Radiator
  Wiring harness connector (wiring harness side) terminal A
  or

or

- Defective component:
  M19 Motor - Blower, Radiator

E10 - Result: Interruption

- Circuit interruption between:
  FB12 Fuse
  Output contact
  &
  K13 Relay - Blower, Radiator
  Socket Terminal 30

E11 - Result: Interruption

- Circuit interruption between:
  Output contact
  FB12 Fuse
  &

K13 Relay - Blower, Radiator
Socket Terminal 30

E12 - Result: Interruption

- Circuit interruption between:
  G1 Battery
  Wiring harness connector (wiring harness side) terminal 30
  &
  FB12 Fuse
  Input contact

E13 - Result: Short to Ground

- Short circuit to ground between:
  FB12 Fuse
  Output contact
  &
  K13 Relay - Blower, Radiator
  Socket Terminal 30, 86

or

- Defective component:
  K13 Relay - Blower, Radiator

E14 - Result: Short to Ground

- Short circuit to ground between:
  K13 Relay - Blower, Radiator
  Socket Terminal 87
  &
  M19 Motor - Blower, Radiator
  Wiring harness connector (wiring harness side) terminal A

or

- Defective component:
  M19 Motor - Blower, Radiator

C-31 - Malfunction Indication Lamp (MI) Circuit

T01 - Check: Short to Voltage/Ground/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Ignition ON	Is at least one of the following telltales ON? H1.4 Telltale - Airbag or H1.5 Telltale - Anti Lock Brake System

Yes:T02	No:E06

T02 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic • Ignition ON	System telltale OFF

Yes:T03	No:T06

T03 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Remove electrical component from socket: FB7 Fuse • Ignition ON • Measure voltage between the following terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 13 (X31) & Ground	less than 0.3 V

Yes:T04	No:T05

T04 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Insert electrical component in socket: FB7 Fuse • Connect fused jumper wire to: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 13 (X31) & Ground • Ignition ON	System telltale ON

Yes:E01	No:E02

T05 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A17 Control Unit - Immobiliser • Ignition ON • Measure voltage between the following	less than 0.3 V

terminals: A5 Control Unit - Motronic Wiring harness connector (wiring harness side) terminal 13 (X31) & Ground	

Yes:E03	No:E04

T06 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A17 Control Unit - Immobiliser • Ignition ON	System telltale OFF

Yes:E03	No:E05

E01 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E02 - Result: Interruption

- Circuit interruption between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 13 (X31)
  &
  H1 Instrument
  Wiring harness connector (wiring harness side) terminal B5

or

- Defective component:
  H1 Instrument
  or
  H1.6 Telltale - Engine

E03 - Result: Defective Component

- Defective component:
  A17 Control Unit - Immobiliser

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E04 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 13 (X31)
  &
  H1 Instrument
  Wiring harness connector (wiring harness side) terminal B5
  &
  A17 Control Unit - Immobiliser
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  H1 Instrument

E05 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 13 (X31)
  &
  H1 Instrument
  Wiring harness connector (wiring harness side) terminal B5
  &
  A17 Control Unit - Immobiliser
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  H1 Instrument

E06 - Result: Defective Component

- Following system/component is faulty:
  H1 Instrument

C-32 - Auxiliary Coolant Pump Circuit

T01 - Check: Short to Ground/Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Remove electrical component from socket: K82 Relay - Pump, Timing Control • Measure voltage between the following	greater than 11 V

terminals: K82 Relay - Pump, Timing Control Socket Terminal 2 (86) & Ground	
Yes:T02	**No:T09**

T02 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Measure voltage between the following terminals: K82 Relay - Pump, Timing Control Socket Terminal 1 (30) & Ground	greater than 11 V
Yes:T03	**No:E08**

T03 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Connect test light to: K82 Relay - Pump, Timing Control Socket Terminal 4 (85) & Socket Terminal 2 (86) • Ignition ON • Select and enable diagnostic tester actuator test: Auxiliary Cooling Pump Relay Test • Press soft key INACTIVE	Test light OFF?
Yes:T04	**No:E07**

T04 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Press soft key ACTIVE	Test light ON?
Yes:T05	**No:E06**

T05 - Check: Short to Voltage of Voltage Supply Circuit

Work Order Description	Nominal Value
• Remove test light • Measure voltage between the following terminals: K82 Relay - Pump, Timing Control Socket Terminal 3 (87)	less than 0.3 V

& Ground	
Yes:T06	**No:E05**

T06 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Connect fused jumper wire to: K82 Relay - Pump, Timing Control Socket Terminal 3 (87) & Socket Terminal 1 (30)	Is the following component switched on? M55 Pump - Timing Control
Yes:T07	**No:T08**

T07 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: A5 Control Unit - Motronic • Ignition ON • Measure voltage between the following terminals: K82 Relay - Pump, Timing Control Socket Terminal 4 (85) & Ground	less than 0.3 V
Yes:E01	**No:E02**

T08 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Do not remove fused jumper wire • Disconnect wiring harness connector from: M55 Pump - Timing Control • Measure voltage between the following terminals: M55 Pump - Timing Control Wiring harness connector (wiring harness side) terminal 2 & Ground	greater than 11 V
Yes:E03	**No:E04**

T09 - Check: Short to Ground/Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value

• Remove electrical component from socket: FR3 Fuse • Check the following component for proper operation: FR3 Fuse	Test okay?
Yes:E09	**No:T10**

T10 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Insert new fuse FR3 and then check the fuse for proper operation.	Test okay?
Yes:T11	**No:E12**

T11 - Check: Short to Ground of Voltage Supply Circuit

Work Order Description	Nominal Value
• Connect fused jumper wire to: K82 Relay - Pump, Timing Control Socket Terminal 3 (87) & Battery voltage • Check the following component for proper operation: Fuse of the fused jumper wire	Test okay?
Yes:E10	**No:E11**

E01 - Result: Defective Component

- Defective component:
  K82 Relay - Pump, Timing Control

E02 - Result: Short to Voltage

- Short circuit to voltage between:
  K82 Relay - Pump, Timing Control
  Socket Terminal 4 (85)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 45 (X31)

E03 - Result: Defective Component

- Circuit interruption between:
  M55 Pump - Timing Control
  Wiring harness connector (wiring harness side) terminal 1
  &
  Ground

or

- Defective component:

M55 Pump - Timing Control

E04 - Result: Interruption

- Circuit interruption between:
  K82 Relay - Pump, Timing Control
  Socket Terminal 3 (87)
  &
  M55 Pump - Timing Control
  Wiring harness connector (wiring harness side) terminal 2

E05 - Result: Defective Component

- Short circuit to voltage between:
  K82 Relay - Pump, Timing Control
  Socket Terminal 3 (87)
  &
  M55 Pump - Timing Control
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  M55 Pump - Timing Control

E06 - Result: Short to Voltage/Interruption

- Short circuit to voltage/interruption of circuit between:
  K82 Relay - Pump, Timing Control
  Socket Terminal 4 (85)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 45 (X31)

or

- Defective component:
  A5 Control Unit - Motronic

E07 - Result: Short to Ground

- Short circuit to ground between:
  K82 Relay - Pump, Timing Control
  Socket Terminal 4 (85)
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 45 (X31)

or

- Defective component:
  A5 Control Unit - Motronic

E08 - Result: Interruption

- Circuit interruption between:

FR3 Fuse
Output contact
&
K82 Relay - Pump, Timing Control
Socket Terminal 1 (30)

E09 - Result: Interruption

- Circuit interruption between:
  FL4 Fuse
  Output contact
  &
  FR3 Fuse
  Input contact

or

- Circuit interruption between:
  FR3 Fuse
  Output contact
  &
  K82 Relay - Pump, Timing Control
  Socket Terminal 2 (86)

E10 - Result: Defective Component

- Defective component:
  K82 Relay - Pump, Timing Control

E11 - Result: Defective Component

- Short circuit to ground between:
  K82 Relay - Pump, Timing Control
  Socket Terminal 3 (87)
  &
  M55 Pump - Timing Control
  Wiring harness connector (wiring harness side) terminal 2

or

- Defective component:
  M55 Pump - Timing Control

E12 - Result: Short to Ground

- Short circuit to ground between:
  FR3 Fuse
  Output contact
  &
  K82 Relay - Pump, Timing Control
  Socket Terminal 1 (30), 2 (86)

C-33 - Turbocharger Bypass Solenoid Valve Circuit

T01 - Check: Short to Ground/Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: Y2 Actuator - Circulation • Ignition ON • Measure voltage between the following terminals: Y2 Actuator - Circulation Wiring harness connector (wiring harness side) terminal 1 & Ground	greater than 11 V
Yes:T02	**No:E06**

T02 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition ON • Measure voltage between the following terminals: Y2 Actuator - Circulation Wiring harness connector (wiring harness side) terminal 2 & Ground	less than 5 V
Yes:T03	**No:E05**

T03 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Connect test light to: Y2 Actuator - Circulation Wiring harness connector (control unit side) terminal 2 & Y2 Actuator - Circulation Wiring harness connector (control unit side) terminal 1 • Ignition ON • Select and enable diagnostic tester actuator test: Turbocharger Bypass Solenoid Test • Press soft key INACTIVE	Test light OFF?
Yes:T04	**No:E04**

T04 - Check: Short to Voltage/Interruption of Signal Circuit

Work Order Description	Nominal Value
• Press soft key ACTIVE	Test light ON?

Yes:T05	No:E03

T05 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Remove test light • Disconnect wiring harness connector from: A5 Control Unit - Motronic (Wiring Harness Connector X32) • Ignition ON • Measure voltage between the following terminals: Y2 Actuator - Circulation Wiring harness connector (wiring harness side) terminal 2 & Ground **Note:** Blower motor is running	less than 0.3 V

Yes:E01	No:E02

E01 - Result: Defective Component

- Defective component:
  Y2 Actuator - Circulation

E02 - Result: Short to Voltage

- Short circuit to voltage between:
  Y2 Actuator - Circulation
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 50 (X32)

E03 - Result: Short to Voltage/Interruption

- Short circuit to voltage/interruption of circuit between:
  Y2 Actuator - Circulation
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 50 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E04 - Result: Short to Ground

- Short circuit to ground between:
  Y2 Actuator - Circulation
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 50 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E05 - Result: Short to Voltage

- Short circuit to voltage between:
  Y2 Actuator - Circulation
  Wiring harness connector (wiring harness side) terminal 2
  &
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 50 (X32)

or

- Defective component:
  A5 Control Unit - Motronic

Note:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E06 - Result: Interruption

- Circuit interruption between:
  FB7 Fuse
  Output contact
  &
  Y2 Actuator - Circulation
  Wiring harness connector (wiring harness side) terminal 1

C-34 - Starter Circuit

T01 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Connect loaded battery parallel to the battery in the vehicle • Ignition ON • Actuate the following component: S124 Switch - Starter Button	Does the starter crank?

Yes:T02	No:T13

T02 - Check: Component

Work Order Description	Nominal Value
• Start engine	Does the engine start?

Yes:T03	No:T09

T03 - Check: Wiring Harness

Work Order Description	Nominal Value
• Ignition OFF • All consumers turned off • Charge or replace battery • Disconnect wiring harness connector from: G1 Battery Terminal 31 • Measure current between the following terminals: G1 Battery Terminal 31 & G1 Battery Terminal 31 **Note:** All car systems must be switched OFF during these tests. Doors and trunk / tailgate must be	less than 60 mA

closed, engine compartment lighting must be disconnected.	
Yes:T04	**No:E06**

T04 - Check: Battery Voltage

Work Order Description	Nominal Value
• Connect wiring harness connector to: G1 Battery Terminal 31 • Engine running • Turn all electrical consumers ON • Increase engine speed to 3000 rpm • Measure voltage between the following terminals: G1 Battery Terminal 30 & G1 Battery Terminal 31	greater than 12.5 V
Yes:E01	**No:T05**

T05 - Check: Charging Indicator Lamp Circuit

Work Order Description	Nominal Value
• Ignition OFF • Ignition ON	Is the following telltale ON? H1.1 Charging Indicator Lamp
Yes:T06	**No:T08**

T06 - Check: Charging Indicator Lamp Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: G2 Alternator Terminal D+ • Ignition ON	Is the following telltale OFF? H1.1 Charging Indicator Lamp
Yes:T07	**No:E04**

T07 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure voltage between the following terminals:	greater than 11 V

G2 Alternator Wiring harness connector (wiring harness side) terminal B+ & Ground	

Yes:E02	No:E03

T08 - Check: Charging Indicator Lamp Circuit

Work Order Description	Nominal Value
• Ignition OFF • Disconnect wiring harness connector from: G2 Alternator • Connect fused jumper wire to: G2 Alternator Wiring harness connector (wiring harness side) terminal D+ & Ground • Ignition ON	Is the following telltale ON? H1.1 Charging Indicator Lamp

Yes:E05	No:E04

T09 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Start engine • Measure voltage between the following terminals: M1 Starter Wiring harness connector (component side) terminal 50 & G1 Battery Terminal 31	greater than 11 V

Yes:T10	No:E11

T10 - Check: Transition Resistance of Voltage Supply Circuit

Work Order Description	Nominal Value
• Start engine • Measure voltage between the following terminals: M1 Starter Wiring harness connector (component side) terminal 30 & G1 Battery	less than 0.75 V

Terminal 30	

Yes:T11	No:E10

T11 - Check: Transition Resistance of Ground Circuit

Work Order Description	Nominal Value
• Start engine • Measure voltage between the following terminals: M1 Starter Wiring harness connector (component side) terminal 31 & G1 Battery Terminal 31	less than 0.75 V

Yes:T12	No:E09

T12 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Check engine mechanic	Test okay?

Yes:E07	No:E08

T13 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition OFF • All consumers turned off • Remove electrical component from socket: K24 Relay - Starter • Measure voltage between the following terminals: K24 Relay - Starter Socket connector colour BN & Ground **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	greater than 11 V

Yes:T14	No:E23

T14 - Check: Interruption of Voltage Supply Circuit

Work Order Description	Nominal Value
• Ignition ON • Measure voltage between the following terminals: K24 Relay - Starter Socket connector colour GN & Ground **Note:** **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	greater than 11 V

Yes:T15	No:E22

T15 - Check: Component

Work Order Description	Nominal Value
• Ignition OFF • Connect fused jumper wire to: K24 Relay - Starter Socket connector colour BNRD & Battery voltage **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	Does the starter crank?

Yes:T16	No:E21

T16 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Remove fused jumper wire • Ignition ON • Measure voltage between the following terminals:	less than 0.3 V

K24 Relay - Starter Socket connector colour WHRD & Ground **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	

Yes:T17	No:E20

T17 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Connect test light to: K24 Relay - Starter Socket connector colour WHRD & Battery voltage **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	Test light OFF?

Yes:T18	No:E19

T18 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Actuate the following component: S124 Switch - Starter Button	Test light ON?

Yes:T19	No:T23

T19 - Check: Short to Voltage of Signal Circuit

Work Order Description	Nominal Value
• Remove test light • Disconnect wiring harness connector from: A5 Control Unit - Motronic H1 Instrument	less than 0.3 V

• Ignition ON • Measure voltage between the following terminals: K24 Relay - Starter Socket connector colour WHBK & Ground **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	

Yes:T20	No:E16

T20 - Check: Short to Ground of Signal Circuit

Work Order Description	Nominal Value
• Ignition OFF • Measure resistance between the following terminals: K24 Relay - Starter Socket connector colour WHBK & Ground **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	greater than 500 kOhm

Yes:T21	No:E15

T21 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Measure resistance between the following terminals: K24 Relay - Starter Socket connector colour WHBK & A5 Control Unit - Motronic Wiring harness connector (wiring harness	less than 5 Ohm

side) terminal 20 (X31) **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	

Yes:T22	No:E14

T22 - Check: Component

Work Order Description	Nominal Value
• Insert electrical component in socket: K24 Relay - Starter • Connect wiring harness connector to: A5 Control Unit - Motronic • Ignition ON • Actuate the following component: S124 Switch - Starter Button	Does the starter crank?

Yes:E12	No:E13

T23 - Check: Interruption of Signal Circuit

Work Order Description	Nominal Value
• Disconnect wiring harness connector from: S124 Switch - Starter Button • Measure voltage between the following terminals: S124 Switch - Starter Button Wiring harness connector (wiring harness side) wiring colour WHRD & Ground **Note:** Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow, L=Light, D=Dark	greater than 11 V

Yes:E17	No:E18

E01 - Result: Defective Component

- Defective component:
  G1 Battery

E02 - Result: Defective Component

- High transition resistance between:
  G2 Alternator
  Wiring harness connector (wiring harness side) terminal B+
  &
  G1 Battery
  Terminal 30

or

- Defective component:
  G2 Alternator

E03 - Result: Interruption

- Circuit interruption between:
  G2 Alternator
  Wiring harness connector (wiring harness side) terminal B+
  &
  G1 Battery
  Terminal 30

E04 - Result: Short to Ground/Interruption

- Check the following component for proper operation:
  H1 Instrument

and/or

- Check the following circuit for proper operation:
  Terminal D+

E05 - Result: Defective Component

- Defective component:
  G2 Alternator

E06 - Result: Defective Component

- Stall current of one or more consumers is too high

Note:

During fault searching in the wiring harness, the sections of the wiring harness can be separated at the assigned connectors. When the stall current changes to the permissible value after separating a section, the fault is located in the concerning section of the wiring harness.

E07 - Result: Defective Component

- Defective component:
  M1 Starter

E08 - Result: Defective Component

- Repair the concerned mechanical component

E09 - Result: High Transition Resistance

- High transition resistance between:
  M1 Starter
  Wiring harness connector (component side) terminal 31
  &
  G1 Battery
  Terminal 31

Note:

Check if all ground connections are clean, tight and installed properly

E10 - Result: High Transition Resistance

- High transition resistance between:
  M1 Starter
  Wiring harness connector (component side) terminal 30
  &
  G1 Battery
  Terminal 30

E11 - Result: Short to Ground/Interruption

- Check the following component for proper operation:
  S1 Switch - Starter

and/or

- Check the following circuit for proper operation:
  Terminal 50

E12 - Result: Defective Component

- Defective component:
  H1 Instrument

E13 - Result: Defective Component

- Defective component:
  A5 Control Unit - Motronic
  or
  K24 Relay - Starter

Important:

Reset concerned control unit (engine or immobiliser control unit) with diagnostic tester before replacing. Select immobiliser in the diagnostic tester and call up the corresponding test in the menu ADDITIONAL FUNCTIONS. Ensure that both control units are never reset and replaced at the same time.

E14 - Result: Interruption

- Circuit interruption between:
  K24 Relay - Starter
  Socket connector colour WHBK
  &
  A5 Control Unit - Motronic

Wiring harness connector (wiring harness side) terminal 20 (X31)

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E15 - Result: Short to Ground

- Short circuit to ground between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 20 (X31)
  &
  K24 Relay - Starter
  Socket connector colour WHBK
  &
  H1 Instrument
  Wiring harness connector (wiring harness side) terminal A4

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E16 - Result: Short to Voltage

- Short circuit to voltage between:
  A5 Control Unit - Motronic
  Wiring harness connector (wiring harness side) terminal 20 (X31)
  &
  K24 Relay - Starter
  Socket connector colour WHBK
  &
  H1 Instrument
  Wiring harness connector (wiring harness side) terminal A4

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E17 - Result: Defective Component

- Circuit interruption between:
  S124 Switch - Starter Button
  Wiring harness connector (wiring harness side) wiring colour BK
  &

Ground

or

- Defective component:
  S124 Switch - Starter Button

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E18 - Result: Interruption

- Circuit interruption between:
  K24 Relay - Starter
  Socket connector colour WHRD
  &
  S124 Switch - Starter Button
  Wiring harness connector (wiring harness side) wiring colour WHRD

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E19 - Result: Short to Ground

- Short circuit to ground between:
  K24 Relay - Starter
  Socket connector colour WHRD
  &
  S124 Switch - Starter Button
  Wiring harness connector (wiring harness side) wiring colour WHRD

or

- Defective component:
  S124 Switch - Starter Button

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E20 - Result: Short to Voltage

- Short circuit to voltage between:
  K24 Relay - Starter
  Socket connector colour WHRD
  &
  S124 Switch - Starter Button
  Wiring harness connector (wiring harness side) wiring colour WHRD

or

- Defective component:
  S124 Switch - Starter Button

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E21 - Result: Interruption

- Circuit interruption between:
  K24 Relay - Starter
  Socket connector colour BNRD
  &
  M1 Starter
  Wiring harness connector (wiring harness side) terminal 50

or

- Defective component:
  M1 Starter
  or
  Bad ground connection

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E22 - Result: Interruption

- Circuit interruption between:
  FB7 Fuse
  Output contact
  &
  K24 Relay - Starter
  Socket connector colour GN

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

E23 - Result: Interruption

- Circuit interruption between:
  FL4 Fuse
  Output contact
  &
  K24 Relay - Starter
  Socket connector colour BN

Note:

Wiring colours: BK=Black, BN=Brown, BU=Blue, GD=Gold, GN=Green, GY=Grey, OG=Orange, PK=Pink, RD=Red, SR=Silver, TQ=Turquoise, VT=Violet, WH=White, YE=Yellow,
L=Light, D=Dark

C-35 - System Status Information

E01 - Result: Defective Component

- The information/functions (data list parameter) described within this functional group are internal values of the system and are listed for information only. If all remaining diagnostic tests are passed and there are no additional customer complaints, the control unit should only be replaced in agreement with the customer.