twingo

N.T. 3490A

X06X

FAULT FINDING
SEQUENTIAL GEARBOX
D7F engine

VDIAG N°: 04

77 11 302 202 **Edition 2 - DECEMBER 2006** **EDITION ANGLAISE**

Contents

SEQUENTIAL GEARBOX
Fault finding - Introduction

This document presents the fault finding procedure applicable to computers (sequential gearbox) with VDIAG 04 fitted on the TWINGO with a D7F engine.

The following are thus required to carry out fault finding on this system:

- **the Fault Finding Special Features Technical Note for the vehicle,**
- **the electrical circuit diagram of the function for the vehicle concerned,**
- **the tools listed under Special tooling required.**

GENERAL APPROACH TO FAULT FINDING:

– Use one of the fault finding tools to identify the system equipping the vehicle (to read the computer family, the program number, the vdiag, etc.).

– Find the Fault finding documents corresponding to the system identified.

– Take note of information contained in the introductory sections.

– Read the faults stored in the computer memory and use the Interpretation of Faults section of the documents.
Reminder: Each fault is interpreted for a particular type of storage (fault present, fault stored, fault present or stored). The checks defined for dealing with each fault are therefore only to be performed if the fault declared by the diagnostic tool is interpreted in the document for the way it is stored. The storage type should be considered when using a diagnostic tool after switching the ignition off then on again.
If a fault is interpreted when it is declared as "stored", the conditions for applying fault finding appear in the "NOTES" box. When the conditions are not satisfied, use the fault finding strategy to check the circuit of the faulty part since the fault is no longer present on the vehicle. Perform the same operation when a fault is declared as stored by the diagnostic tool but is only interpreted in the documentation as a "present" fault.

– Carry out the conformity check (appearance of possible faults not yet identified by the system's auto-diagnostic procedure) and implement the associated fault finding strategies according to the results.

– Validate the repair (disappearance of the phenomenon reported by the customer).

– Use the fault finding strategy for each Customer complaint if the problem persists.

Special tooling required for working on the sequential gearbox:

– Diagnostic tools (except XR25),
– Multimeter.
– Sequential gearbox bornier: **Elé. 1589**.

DF002 **PRESENT**	Computer 1.DEF: Internal electronic fault 2.OBD: Main relay fault (integrated in computer)

NOTES	**Special notes:** None.

Check the condition and the wiring of the earths on **tracks 1** and **2** on the 52 track connector of the computer.

Check the condition and position of the sequential gearbox fuses in the engine compartment and in the passenger compartment.

Check the wiring on the **52 track** connector of the sequential gearbox computer.

Ensure the presence of **+ before ignition feed** on **track 27** of the 52 track connector, check the continuity between the engine **fuse box** and **track 27**. Repair if necessary.

Ensure the presence of **+ after ignition feed** on **track 28** of the 52 track connector, check the continuity between the **passenger compartment fuse box** and **track 28**. Repair if necessary.

Erase the computer memory, exit the fault finding procedure and switch off the ignition.

Carry out a new check using the diagnostic tool. Replace the sequential gearbox computer if the fault persists.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF005 **PRESENT**	Oil pressure sensor circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts 1.DEF: Inconsistency

NOTES	**Special notes:** None.

CC.0 - CC.1	***NOTES***	**Special notes:** None.

Check the wiring of the sensor connector and computer connectors.

Check the continuity and insulation of the connections between:

Sensor connector **track A** → **track 66** Computer connector

Sensor connector **track B** → **track 73** Computer connector

Sensor connector **track C** → **track 40** Computer connector

If the connection is faulty:

Disconnect the intermediate 24 track connector located on the hydraulic unit and check the condition of the wiring.

Check and ensure the continuity and insulation of the connections between:

Sensor connector **track 66** → **track C1** Intermediate connector

Sensor connector **track 73** → **track C8** Intermediate connector

Sensor connector **track 40** → **track C5** Intermediate connector

Also check the insulation between these connections.

Check and ensure the continuity and insulation of the connections between:

Sensor connector **track A** → **track C1** Intermediate connector

Sensor connector **track B** → **track C8** Intermediate connector

Sensor connector **track C** → **track C5** Intermediate connector

Also check the insulation between these connections.

If the fault persists, replace the oil pressure sensor on the sequential gearbox.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF005 CONTINUED	

1.DEF	***NOTES***	**Special notes:** None.

Check the oil level following the accumulator discharge procedure.

Check the pump relay. Replace if necessary.

If the fault persists, replace the sensor.

Exit the fault finding procedure and switch off the ignition. Switch the ignition back on again and replace the electric pump unit if the fault reappears.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF048 PRESENT	Vehicle speed signal 1.DEF: Consistency 2.DEF: No signal

NOTES	**Special notes:** The fault can only be erased from the memory using the diagnostic tool after a road test where the vehicle speed signal is detected by the computer.

1.DEF	***NOTES***	**Special notes:** None.

Check that the primary speed sensor, the vehicle speed sensor and the engine speed sensor work correctly.

Check the mechanical condition of the clutch.

AFTER REPAIR	**A road test must be performed along with another check using the diagnostic tool to erase the vehicle speed signal fault.**

DF048 CONTINUED	

2.DEF	***NOTES***	**Special notes:** None.

Check that the mileometer works correctly when driving.

Check the condition and correct connection of the wiring on the sensor connector, the instrument panel connector and the computer connectors.Repair if necessary.

Check the continuity and insulation of the connections between:

- Sensor connector **track B1** → **track 36** of the sequential gearbox computer
- Sensor connector **track A** → **terminals** of the passenger compartment fuse box
- Sensor connector **track B1** → **track 7** instrument panel display connector
- Sensor connector **track B2** → **Vehicle earth**

If the connection is faulty:

Check the condition and correct connection of the intermediate connector **R212**.

Ensure the continuity and insulation of the connections between:

- Intermediate connector **track A3** → **terminals** of the passenger compartment fuse box
- Intermediate connector **track B4** → **track 7** instrument panel display black connector

Also check the insulation between these connections. Repair if necessary.

Ensure the continuity and insulation of the connections between:

- Sensor connector **track A** → **track A3** Intermediate connector
- Sensor connector **track B1** → **track B4** Intermediate connector

Also check the insulation between these connections. Repair if necessary.

If the fault persists, replace the vehicle speed sensor on the sequential gearbox and apply the after repair procedure to erase this fault.

AFTER REPAIR	**A road test must be performed along with another check using the diagnostic tool to erase the vehicle speed signal fault.**

DF057 **PRESENT**	Gearbox input speed sensor circuit 1.DEF: Consistency 2.DEF: No signal

NOTES	**Special notes:** None.

1.DEF	***NOTES***	**Special notes:** None.

Check that the primary speed sensor, the vehicle speed sensor and the engine speed sensor work correctly.

Check the mechanical condition of the clutch.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF057 CONTINUED	

2.DEF	***NOTES***	**Special notes:** None.

Check that the mileometer works correctly when driving.

Check the wiring of the 52 track connector of the computer and of the sensor. Repair if necessary.

Check the continuity and insulation of the connections between:

Sensor connector **track 1** → **track 38** Computer connector

Sensor connector **track 2** → **track 50** Computer connector

If the connection is faulty:

Disconnect the intermediate 24 track connector located on the hydraulic unit and check the condition of the wiring.

Ensure the continuity and insulation of the connections between:

Computer connector **track 38** → **track C7** Intermediate connector

Computer connector **track 50** → **track C6** Intermediate connector

Also check the insulation between these connections.

Check and ensure the continuity and insulation of the connections between:

Sensor connector **track 1** → **track C7** Intermediate connector

Sensor connector **track 2** → **track C6** Intermediate connector

Also check the insulation between these connections.

If the fault persists, replace the vehicle speed sensor on the sequential gearbox.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF062 PRESENT	CAN fault 1.DEF: CAN connection fault 2.DEF: Incorrect parameter

NOTES	**Special notes:** None.

1.DEF	***NOTES***	**Special notes:** None.

Check the condition and correct connection of the injection computer connector and the sequential gearbox computer connector.

Check the continuity and insulation of the connections between:

Sequential gearbox computer **track 33** → **track K3** Injection computer

Sequential gearbox computer **track 45** → **track K4** Injection computer

If the connection is faulty:

Check the condition and correct connection of the intermediate connector R212.

Ensure the continuity and insulation of the connections between:

Intermediate connector **track C3** → **track K4** Injection computer

Intermediate connector **track D3** → **track K3** Injection computer

Also check the insulation between these connections. Repair if necessary.

Ensure the continuity and insulation of the connections between:

Sequential gearbox computer **track 33** → **track D3** Intermediate connector

Sequential gearbox computer **track 45** → **track C3** Intermediate connector

Also check the insulation between these connections.

If the fault persists, perform fault finding on the engine injection and repair accordingly.

If the fault is still present, there may be a CAN problem inside the injection or sequential gearbox computers.

Perform the tests described on the following page so as to determine which computer is faulty.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF062 CONTINUED	

1. Switch off the ignition, disconnect the sequential gearbox computer and switch on the ignition. Using the oscilloscope, measure (procedure below) the signal between **track 33** (CAN L, taken as earth reference) and **track 45** (CAN H) on the sequential gearbox harness connector.

If you see a signal (sequence of signals with amplitude of 2.3 V), perform test **2.b.**

If you do not see a signal, perform test **2.a.**

2.a. Switch off the ignition, reconnect the sequential gearbox computer, disconnect the **Injection** computer and switch on the ignition.

Using the oscilloscope, measure (procedure below) the signal between track **K4** (CAN L, taken as earth reference) and **track K3** (CAN H) on the **Injection harness** connector.

If you see a signal (sequence of signals with amplitude of **2.3V**), replace the **Injection** computer.

If you do not see a signal: an error has occurred in the procedure, restart from the beginning.

2.b. Switch off the ignition, reconnect the sequential gearbox computer, disconnect the Injection computer and switch on the ignition.

Using the oscilloscope, measure (procedure below) the signal between track **K4** (CAN L, taken as earth reference) and **track K3** (CAN H) on the Injection computer connector.

If you do not see a signal, replace the sequential gearbox computer.

If you see a signal: an error has occurred in the procedure, restart from the beginning.

Procedure: using the oscilloscope of the diagnostic tools.

Select the Oscilloscope function in voltage mode.

AUTOMATIC adjustment inactive.

Time base: 10 ms or 500 µs depending on the tool.

Signal amplitude: 1V.

2.DEF	***NOTES***	**Special notes:** None.

Check the injection system using the diagnostic tool.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF063 **PRESENT**	Buzzer circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts C0 : Open circuit

NOTES	**Special notes:** None.

CC.0 - CC.1 - C0	***NOTES***	**Special notes:** None.

Check the wiring on the buzzer connector and on the **52 track** connector of the computer.

Ensure continuity and insulation of the connection between:

Sensor connector **track A5** ⟶ **track 80** Computer connector

Also check the insulation between these connections.

Replace the buzzer if the fault persists.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF064 **PRESENT**	Display circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts C0 : Open circuit

NOTES	**Special notes:** None.

CC.0 - CC.1 - C0	***NOTES***	**Special notes:** None.

Check the wiring on the display connector and the **52 track** connector of the computer.

Ensure the continuity and insulation of the connections between:

Black **terminal block** display connector **track 8** ⟶ **track 72** Computer connector

Also check the insulation between these connections.

Replace the display if the fault persists.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF065 PRESENT	Pump relay circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts 1.DEF: Permanent control of the pump motor

NOTES	**Special notes:** None.

CC.0 - CC.1	***NOTES***	**Special notes:** None.

Ensure the presence and conformity of the relay in the engine fuse box.

Check the wiring on the pump relay connector and the 52 track connector of the computer.

Check for the presence of **+ before ignition feed** between **tracks 2** and **3** of the relay. Repair if necessary.

Ensure the continuity and insulation of the connections between:

Relay connector **track 1** ⟶ **track 31** Computer connector

Replace the pump relay if the fault persists.

1.DEF	***NOTES***	**Special notes:** None.

Disconnect the relay and ensure that the pump has stopped turning. Replace the pump relay.

Check the wiring and correct connection of the pressure sensor. Repair if necessary.

Check for the presence of **+ 12 volts** on **track 31** of the 52 track connector using the **AC012** command.

Ensure that the pump motor is not seized.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF066 **PRESENT**	Starter motor relay circuit CC.1 : Short circuit to +12 volts C0 : Open circuit

NOTES	**Special notes:** None.

C0 - CC.1	***NOTES***	**Special notes:** None.

Ensure the presence and conformity of the relay in the engine fuse box.

Check the wiring on the starter motor relay connector and the 52 track connector of the computer.

Check for the presence of **+ before ignition feed** between **tracks 2** and **3** of the relay. Repair if necessary.

Check for the presence of **+ 12 volts** on **track 42** of the 52 track connector using command **AC013**.

Ensure the continuity and insulation of the connections between:

Relay connector ⟶ **track 42** Computer connector

Replace the starter motor relay if the fault persists.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF067 **PRESENT**	Lever position switch circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts

NOTES	**Special notes:** None.

CC.0 - CC.1	***NOTES***	**Special notes:** None.

Check the condition and correct connection of the wiring on the lever connector and the **28** and **52 track** connectors of the computer.

Check and ensure the continuity and insulation of the connections between:

Switch connector **track 1** → **track 65** Computer connector

Switch connector **track 2** → **track 26** Computer connector

Switch connector **track 3** → **track 68** Computer connector

Switch connector **track 4** → **track 67** Computer connector

Switch connector **track 5** → **track 74** Computer connector

Also ensure the insulation between these five connections. Repair if necessary.

Apply the fault finding procedure associated with states: **ET043**, **ET044**, **ET045**, **ET046** in the interpretation of states fault finding procedure.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF068 **PRESENT**	Clutch position sensor circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts 1.DEF: Consistency

NOTES	**Special notes:** None.

CC.0 - CC.1	***NOTES***	**Special notes:** None.

Check the connection and condition of the sensor and the computer.

Check the continuity and insulation of the connections between:

Sensor connector **track A** → **track 73** Computer connector

Sensor connector **track B** → **track 66** Computer connector

Sensor connector **track C** → **track 52** Computer connector

If the connection is faulty:

Disconnect the intermediate **24 track** connector located on the hydraulic unit and check the condition of the wiring.

Check and ensure the continuity and insulation of the connections between:

Sensor connector **track 73** → **track C8** Intermediate connector

Sensor connector **track 66** → **track C1** Intermediate connector

Sensor connector **track 52** → **track C4** Intermediate connector

Also check the insulation between these connections. Repair if necessary.

Check and ensure the continuity and insulation of the connections between:

Sensor connector **track A** → **track C8** Intermediate connector

Sensor connector **track B** → **track C1** Intermediate connector

Sensor connector **track C** → **track C4** Intermediate connector

Also check the insulation between these connections. Repair if necessary.

Check the mechanical condition of the actuator (clutch cable seized or broken). Repair if necessary.

Using the diagnostic tool, issue the **AC014** command and check that the clutch fork moves correctly.

If the clutch fork does not move correctly, replace the clutch solenoid valve.

Replace the clutch position sensor if the fault persists.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF068 CONTINUED 1	

1.DEF	***NOTES***	**Special notes:** None.

Check the connection and the condition of the sensor connectors.

Check and ensure the continuity and insulation of the connections between:

Sensor connector **track A** → **track 73** Computer connector

Sensor connector **track B** → **track 66** Computer connector

Sensor connector **track C** → **track 52** Computer connector

Also ensure the insulation between these three connections:

Carry out a visual inspection of the sensor wiring and check the quality of the connections on the **52** and **28 track** connectors of the computer. Replace the clutch position sensor if necessary.

Using the diagnostic tool, ensure that **PR006** and **PR014** vary with the engine running. Repair if necessary.

If the checks are correct, replace the clutch position sensor.

If the fault persists, check that the clutch is not overheating.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF069 **PRESENT**	Selection position sensor circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts

NOTES	**Special notes:** None.

CC.0 - CC.1	***NOTES***	**Special notes:** None.

Check the connection and condition of the sensor and the computer.

Check the continuity and insulation of the connections between:

Sensor connector **track A** → **track 73** Computer connector

Sensor connector **track B** → **track 66** Computer connector

Sensor connector **track C** → **track 51** Computer connector

If the connection is faulty:

Disconnect the intermediate **24 track** connector located on the hydraulic unit and check the condition of the wiring.

Check and ensure the continuity and insulation of the connections between:

Computer connector **track 73** → **track C8** Intermediate connector

Computer connector **track 66** → **track C1** Intermediate connector

Computer connector **track 51** → **track C3** Intermediate connector

Also ensure the insulation between these three connections. Repair if necessary.

Check and ensure the continuity and insulation of the connections between:

Sensor connector **track A** → **track C8** Intermediate connector

Sensor connector **track B** → **track C1** Intermediate connector

Sensor connector **track C** → **track C3** Intermediate connector

Also ensure the insulation between these three connections. Repair if necessary.

Remove the selection position sensor and check the wear of the potentiometer-actuator mechanical link. Repair if necessary.

If the checks show no faults, replace the selection position sensor.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF070 PRESENT	Engagement position sensor circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts

NOTES	**Special notes:** None.

CC.0 - CC.1	***NOTES***	**Special notes:** None.

Check the connection and condition of the sensor and the computer.

Check the continuity and insulation of the connections between:

Sensor connector **track A**	→	**track 66**	Computer connector
Sensor connector **track B**	→	**track 73**	Computer connector
Sensor connector **track C**	→	**track 39**	Computer connector

If the connection is faulty:

Disconnect the intermediate 24 track connector located on the hydraulic unit and check the condition of the wiring.

Check and ensure the continuity and insulation of the connections between:

Computer connector **track 73**	→	**track C1**	Intermediate connector
Computer connector **track 66**	→	**track C8**	Intermediate connector
Computer connector **track 51**	→	**track C2**	Intermediate connector

Also ensure the insulation between these three connections. Repair if necessary.

Check and ensure the continuity and insulation of the connections between:

Sensor connector **track A**	→	**track C1**	Intermediate connector
Sensor connector **track B**	→	**track C8**	Intermediate connector
Sensor connector **track C**	→	**track C2**	Intermediate connector

Also ensure the insulation between these three connections. Repair if necessary.

Remove the selection position sensor and check the wear of the potentiometer-actuator mechanical link. Repair if necessary.

If the checks are correct, replace the engagement position sensor.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF071 **PRESENT**	Clutch solenoid valve circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts C0 : Open circuit

NOTES	**Special notes:** None.

C0 - CC.1 - CC.0	***NOTES***	**Special notes:** None.

Check the connection and condition of the sensor and the computer.

Check the continuity and insulation of the connections between:

Sensor connector **track 1** → **track 43** Computer connector

Sensor connector **track 2** → **Earth** Terminal on hydraulic block

If the connection is faulty:

Disconnect the intermediate **24 track** connector located on the hydraulic unit and check the condition of the wiring.

Check and ensure the continuity and insulation of the connection between:

Computer connector **track 43** → **track B2** Intermediate connector

Repair if necessary.

Check and ensure the continuity and insulation of the connection between:

Sensor connector **track 1** → **track B2** Intermediate connector

Repair if necessary.

If the checks are correct, replace the clutch solenoid valve.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF072 **PRESENT**	Engagement solenoid valve 1 circuit CC.0 : Short circuit to earth CC.1 : Short circuit to +12 volts C0 : Open circuit

NOTES	**Special notes:** None.

C0 - CC.1 - CC.0	***NOTES***	**Special notes:** None.

Check the connection and condition of the sensor and the computer.

Check the continuity and insulation of the connections between:

Solenoid valve connector **track 1** → **track 32** Computer connector

Solenoid valve connector **track 2** → **Earth** Terminal on hydraulic block

If the connection is faulty:

Disconnect the intermediate **24 track** connector located on the hydraulic unit and check the condition of the wiring.

Check and ensure the continuity and insulation of the connection between:

Computer connector **track 32** → **track B5** Intermediate connector

Repair if necessary.

Check and ensure the continuity and insulation of the connection between:

Sensor connector **track 1** → **track B5** Intermediate connector

Repair if necessary.

If the checks are correct, replace the engagement solenoid valve 1.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF073 **PRESENT**	Engagement solenoid valve 2 circuit CC.0 : Short circuit to +12 volts CC.1 : Short circuit to earth C0 : Open circuit

NOTES	**Special notes:** None.

C0 - CC0 - CC.1	***NOTES***	**Special notes:** None.

Check the connection and condition of the sensor and the computer.

Check the continuity and insulation of the connections between:

Solenoid valve connector **track 1** → **track 44** Computer connector

Solenoid valve connector **track 2** → **Earth** Terminal on hydraulic block

If the connection is faulty:

Disconnect the intermediate **24 track** connector located on the hydraulic unit and check the condition of the wiring.

Check and ensure the continuity and insulation of the connection between:

Computer connector **track 44** → **track B3** Intermediate connector

Repair if necessary.

Check and ensure the continuity and insulation of the connection between:

Sensor connector **track 1** → **track B3** Intermediate connector

Repair if necessary.

If the checks are correct, replace engagement solenoid valve 2.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF074 **PRESENT**	Selection solenoid valve 1 circuit CC.0 : Short circuit to +12 volts CC.1 : Short circuit to earth

NOTES	**Special notes:** None.

CC0 - CC.1	***NOTES***	**Special notes:** None.

Check the connection and condition of the sensor and the computer.

Check the continuity and insulation of the connections between:

Solenoid valve connector **track 1** → **track 29** Computer connector

Solenoid valve connector **track 2** → **Earth** Terminal on hydraulic block

If the connection is faulty:

Disconnect the intermediate **24 track** connector located on the hydraulic unit and check the condition of the wiring.

Check and ensure the continuity and insulation of the connection between:

Computer connector **track 29** → **track B4** Intermediate connector

Repair if necessary.

Check and ensure the continuity and insulation of the connection between:

Sensor connector **track 1** → **track B4** Intermediate connector

Repair if necessary.

If the checks are correct, replace selection solenoid valve 1.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF075 **PRESENT**	Selection solenoid valve 2 circuit CC.0 : Short circuit to +12 volts CC.1 : Short circuit to earth

NOTES	**Special notes:** None.

CC0 - CC.1	***NOTES***	**Special notes:** None.

Check the connection and condition of the sensor and the computer.

Check the continuity and insulation of the connections between:

Solenoid valve connector **track 1** → **track 3** Computer connector

Solenoid valve connector **track 2** → **Earth** Terminal on hydraulic block

If the connection is faulty:

Disconnect the intermediate **24 track** connector located on the hydraulic unit and check the condition of the wiring.

Check and ensure the continuity and insulation of the connection between:

Computer connector **track 3** → **track B6** Intermediate connector

Repair if necessary.

Check and ensure the continuity and insulation of the connection between:

Sensor connector **track 1** → **track B6** Intermediate connector

Repair if necessary.

If the checks are correct, replace selection solenoid valve 2.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF076 stored	Clutch control 1.DEF: Clutch overheating

NOTES	**Priorities when dealing with a number of faults**: Deal with other faults declared present first.
	Conditions for applying the fault finding procedure to the stored fault: The fault is declared present when the clutch is used under severe conditions (prolonged driving up hill).

Erase the fault if it is the only one to be stored and ensure the clutch has not glazed over by driving the vehicle forwards at low load and then downhill.

If the clutch slips, proceed as follows:

– multiple moving off maneouvres at low load and check that the "PROGRESSIVENESS" information changes.

– if the problem persists, replace the clutch.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF077 stored	Gearbox control 1.DEF: Automatic mode problem 2.DEF: Mechanical fault

NOTES	**Priorities when dealing with a number of faults**: Deal with other faults declared present first.
	Special features:Conditions for applying the fault finding procedure to the stored fault: The fault is declared as present when the clutch is used under severe conditions (prolonged driving up hill).

1.DEF	***NOTES***	**Special notes:** None.

Problem linked to the injection, deal with the engine injection diagnostic part.

If there are no faults on the engine side, this fault is only due to forward movement with significant skidding on a slippery road followed by a return to tyre grip.

Erase this fault and perform a road test.

2.DEF	***NOTES***	**Special notes:** None.

Ensure there are no faults on a selection or engagement sensor, repair if necessary.

On the hydraulic unit and through the inspection cover, check that the gearbox control is correctly clipped in (follow the method described in the Workshop Repair Manual). Carry out the required repairs.

Check there is no water in the gearbox oil. Repair if necessary.

Control problem inside the gearbox. Repair or replace the gearbox.

If it is difficult to select gears, especially reverse gear, apply the fault finding procedure for **PR 018** described in the conformity check.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF078 PRESENT OR stored	Hydraulic control 1.DEF: Pressure too low 2.DEF: Pump fault 3.DEF: Slow loss of pressure 4.DEF: Pressure accumulator fault 5.DEF: Rapid loss of pressure

NOTES	**Priorities when dealing with a number of faults**: Deal with other faults declared present first.
	Conditions for applying the fault finding procedure to the stored fault: The fault is declared as present during a road test.

1.DEF	***NOTES***	**Special notes:** None.

Pressure level below a pressure threshold. Problem linked to a lack of oil (internal or external leak) or to a pump failure. Repair or replace if necessary.

2.DEF	***NOTES***	**Special notes:** None.

Case of excessive pump operation:

– Internal or external leak in the circuit. For an external leak, locate the leak and repair if necessary. For an internal leak, replace the hydraulic unit.

– Accumulator diaphragm porous or punctured: replace the accumulator.

3.DEF	***NOTES***	**Special notes:** None.

– Slight internal leak: replace the clutch solenoid valve. If the fault persists, replace the hydraulic unit.

– Slight external leak: repair or replace the faulty component.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF078 CONTINUED	

4.DEF	***NOTES***	**Special notes:** None.

Accumulator diagphragm porous or punctured: replace the accumulator.

5.DEF	***NOTES***	**Special notes:** None.

Check for the presence of a significant external leak. Repair if necessary.

Check the electrical connection of the **24 track** connector on the block, the wiring, the connections and the fuse.

Component seizing or wear. Replace the hydraulic valve block.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF080 **PRESENT**	Battery voltage 1.DEF: Supply voltage too low

1.DEF	***NOTES***	**Special notes:** None.

Measure the battery voltage and check the charging circuit. Repair if necessary.

Ensure that the battery and its connections are in good condition (condition and tightness of the terminal connectors, electrolyte level, etc).

Check the engine earths on the vehicle. Repair if necessary.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

DF082 **PRESENT**	Stop lights switch circuit C0 : Open circuit

C0	***NOTES***	**Special notes:** None.

Ensure that the connector is correctly connected, check the condition of the wiring as well as that of the computer. Repair if necessary.

Check the adjustment of the stop lights switch on the pedals.

Ensure the continuity, with the pedal pressed, between **tracks A3** and **B1** of the switch. Replace the switch if necessary.

Ensure there is no continuity, with the pedal released, between **tracks A3** and **B1** of the switch. Replace the switch if necessary.

If the fault persists, ensure the continuity of the connection between:

Switch track A3 ⟶ **track 69 of the 28 track connector Computer**

Also ensure the insulation to earth.

AFTER REPAIR	Erase the computer memory then switch off the ignition. Check again using the diagnostic tool.

NOTES	Only perform this conformity check after a complete check with the diagnostic tool.

Order	Function	Parameter/state checked or action	Display and notes	Fault finding
1	Diagnostic tool dialogue		**BVR**	**CHART 1**
2	Automatic mode not pressed detection	**ET029** Automatic mode	**ACTIVE state NOT CONFIRMED** automatic mode button not pressed	**ET029**
3	Automatic mode pressed detection	**ET029** Automatic mode	**ACTIVE state CONFIRMED** automatic mode button pressed	**ET029**
4	Lever position contact detection	**ET043** Lever contact N° 0 **ET044** Lever contact N° 1 **ET045** Lever contact N° 2 **ET046** Lever contact N° 3	**Closed or open** contact state **CONFIRMED** depending on position of gear lever	**ET044** **ET043** **ET046** **ET045**
5	Hydraulic pressure	**PR018** Hydraulic pressure	at 20°C and above: 40 - 50 bars at - 30°C: 35 - 44 bars	**DF005**
6	Clutch progressiveness	**PR096** Clutch progressiveness	1000 - 14000 Initial value: 7500	**DF071** **DF076**
7	Accelerator pedal position	**PR022** Accelerator pedal position	0 < pedal position < 1000	**See Injection Diag**
8	Clutch position	**PR015** Clutch position	6.3% < clutch position < 90%	**DF068**
9	Selection position in N	**PR016** Selection position	37% < selection position < 55%	**DF069**
10	Engagement position in N	**PR017** Engagement position	45% < selection position < 61%	**DF070**

ET 043	Lever contact N° 0
ET044	Lever contact N° 1
ET045	Lever contact N° 2
ET046	Lever contact N° 3

NOTES	**Special notes:** None.

Lever position	Contact state	Resistance measured on black 10 track connector on gear lever side
Lever idle **ET012** Stb confirmed	**ET043:** Closed **ET044:** Closed **ET045:** Closed **ET046:** Closed	between **tracks 1** and **2** ≈ 2.7 kΩ between **tracks 1** and **4** ≈ 2.7 kΩ between **tracks 1** and **5** ≈ 2.7 kΩ between **tracks 1** and **3** ≈ 2.7 kΩ
Neutral position maintained **ET012** N confirmed	**ET043:** Closed **ET044:** Open **ET045:** Open **ET046:** Closed	between **tracks 1** and **2** ≈ 2.7 kΩ between **tracks 1** and **4** ≈ 470 Ω between **tracks 1** and **5** ≈ 470 Ω between **tracks 1** and **3** ≈ 2.7 kΩ
R position maintained **ET012** R confirmed	**ET043:** Closed **ET044:** Closed **ET045:** Open **ET046:** Open	between **tracks 1** and **2** ≈ 2.7 kΩ between **tracks 1** and **4** ≈ 2.7 kΩ between **tracks 1** and **5** ≈ 470 Ω between **tracks 1** and **3** ≈ 470 Ω
+ position maintained **ET012** + confirmed	**ET043:** Open **ET044:** Open **ET045:** Closed **ET046:** Closed	between **tracks 1** and **2** ≈ 470 Ω between **tracks 1** and **4** ≈ 470 Ω between **tracks 1** and **5** ≈ 2.7 kΩ between **tracks 1** and **3** ≈ 2.7 kΩ
- position maintained **ET012** - confirmed	**ET043:** Closed **ET044:** Open **ET045:** Closed **ET046:** Open	between **tracks 1** and **2** ≈ 2.7 kΩ between **tracks 1** and **4** ≈ 470 Ω between **tracks 1** and **5** ≈ 2.7 kΩ between **tracks 1** and **3** ≈ 470 Ω

Replace the gear lever unit if one of the contacts is faulty.

ET029	Automatic mode

NOTES	**Special notes:** None.

ACTIVE STATE Button released

Check the wiring and correct connection of the gear lever. Repair if necessary.

Check that there is no continuity on the gear lever connector between **tracks 8** and **9** in the released position. If there is continuity, replace the switch.

Ensure the insulation to earth of the connections between:

Switch connector **track 9** → **track 1** Computer connector

Switch connector **track 9** → **track 6** Computer connector

INACTIVE STATE Button pressed

Check the wiring and correct connection of the gear lever. Repair if necessary.

Check the continuity on the gear lever between **tracks 8** and **9** in the pressed position. If there is no continuity, replace the switch.

Ensure the presence of earth on **tracks 1**, **6** and **9** of the gear lever connector.

REPLACING THE COMPUTER

When replacing the computer, perform the following operations using the diagnostic tool:

– **PARAMETER: VP008** PROGRAM SELECTION / ENGAGEMENT ZONES

– **CONFIGURATION: CF321** GEARBOX TYPE

For the programming operations to be performed when replacing parts, refer to the instructions given in the Workshop Repair Manual.

SEQUENTIAL GEARBOX
Fault finding - Customer complaints

NOTES	Only refer to these customer complaints after a complete check using the diagnostic tool

NO DIALOGUE WITH THE DIAGNOSTIC TOOL

No communication with the sequential gearbox computer.	**CHART 1**

OPERATING PROBLEMS OF THE SEQUENTIAL GEARBOX IMMOBILISING THE VEHICLE

Cannot select a forward or reverse gear when stationary	**CHART 2**
Cannot select Neutral	**CHART 2**
Impossible to start engine with gear engaged, even with brake pedal pressed	**CHART 2**
Impossible to engage or disengage a gear	**CHART 3**
Engine can only be started if brake pedal pressed	**CHART 3**
Semi-automatic mode impossible	**CHART 3**

OPERATING PROBLEMS OF THE SEQUENTIAL GEARBOX NOT IMMOBILISING THE VEHICLE

Cannot access automatic mode if semi-automatic mode was previously selected	**CHART 4**
Cannot access semi-automatic mode if automatic mode was previously selected	**CHART 4**
Automatic mode can be selected when starting the engine	**CHART 4**
No reversing light	**CHART 5**
No reverse gear repeater on the console	**CHART 5**

OPERATING PROBLEMS OF THE SEQUENTIAL GEARBOX NOT IMMOBILISING THE VEHICLE

No creep	**CHART 6**
Stop lights permanently on	**CHART 6**
Forward or reverse gear can be selected without pressing the brake pedal	**CHART 6**
Loss of automatic mode	**CHART 7**
Vehicle does not move forward, engine running	**CHART 8**

SEQUENTIAL GEARBOX
Fault finding - Fault finding chart

CHART 1	NO DIALOGUE WITH SEQUENTIAL GEARBOX COMPUTER

NOTES	**Special notes:** None.

Ensure that the diagnostic tool is not causing the fault by trying to communicate with a computer on another car. If the tool is not causing the fault and dialogue cannot be established with any other computer on the same car, it may be that a faulty computer is disrupting diagnostic line **K**.

Disconnect the computers one at a time to locate the fault.

Check the voltage of the battery and carry out the operations necessary to obtain a correct voltage (**9.5 volts** < **U battery** < **17.5 volts**).

Check for the presence of and the condition of the sequential gearbox fuses on the passenger compartment fuse plate (**3 A**) and in the engine fuse box (**20 A**).

Check the computer connector connection and its condition.

Check the sequential gearbox earths (quality, rusting, tightness of the earth bolts on top of the hydraulic unit).

Check that the computer is correctly supplied:

Earth on track 1 and 2 of the 52 track connector

+ before ignition feed on track 27 of the 52 track connector

+ after ignition feed on track 28 of the 52 track connector

Ensure that the fault finding socket is correctly supplied:

+ before ignition feed on track 16

Earth on track 5

Check and ensure continuity and the insulation of the connections between:

Computer connector **track 49** ⟶ **track 7** Diagnostic socket

If dialogue still cannot be established following these various checks, change the sequential gearbox computer.

AFTER REPAIR	Perform a road test then a new test with the diagnostic tool.

CHART 2	**CANNOT SELECT A FORWARD OR REVERSE GEAR WHEN STATIONARY** **CANNOT SELECT NEURAL** **IMPOSSIBLE TO START WITH GEAR ENGAGED, EVEN WITH BRAKE PEDAL PRESSED**

NOTES	**Special notes:** None.

Check for the presence and condition of the supply fuse of the stop lights switch on the passenger compartment fuse plate.

Ensure that the stop lights switch connector is correctly connected, check the condition of the wiring as well as that of the computer. Repair if necessary.

Check the adjustment of the stop lights switch on the pedals.

Ensure the continuity, with the pedal pressed, between **tracks A3** and **B1** of the switch. Replace the switch if necessary.

Ensure there is no continuity, with the pedal released, between **tracks A3** and **B1** of the switch. Replace the switch if necessary.

If the fault persists, ensure the continuity of the connection between:

Switch **track A3** ⟶ **track 69** 28 track connector Computer

Also ensure the insulation to earth.

AFTER REPAIR	Perform a road test then a new test with the diagnostic tool.

CHART 3	**IMPOSSIBLE TO ENGAGE OR DISENGAGE A GEAR** **ENGINE CAN ONLY BE STARTED IF BRAKE PEDAL PRESSED** **SEMI-AUTOMATIC MODE IMPOSSIBLE**

NOTES	**Special notes:** None.

Check that the gear lever is not seized or damaged or even broken. Replace the lever if necessary.

Apply the fault finding procedure for **ET043**, **ET044**, **ET045**, **ET046** in the interpretation of states section.

AFTER REPAIR	Perform a road test then a new test with the diagnostic tool.

CHART 4	**CANNOT ACCESS AUTOMATIC MODE IF SEMI-AUTOMATIC MODE WAS PREVIOUSLY SELECTED** **CANNOT ACCESS SEMI-AUTOMATIC MODE IF AUTOMATIC MODE WAS PREVIOUSLY SELECTED** **AUTOMATIC MODE CAN BE SELECTED WHEN STARTING THE ENGINE**

NOTES	**Special notes:** None.

ET029: STATE1 Button released

Check the wiring and correct connection of the gear lever. Repair if necessary.

Check there is no continuity on the gear lever connector between **tracks 8** and **9** in the released position. If there is continuity, replace the switch.

Ensure the insulation to earth of the connections between:

Switch connector **track 9** → **track 1** Computer connector

Switch connector **track 9** → **track 6** Computer connector

ET029: STATE2 Button pressed

Check the wiring and correct connection of the gear lever. Repair if necessary.

Check the continuity on the gear lever between **tracks 8** and **9** in the pressed position. If there is no continuity, replace the switch.

Ensure the presence of earth on **tracks 1**, **6** and **9** of the gear lever connector.

AFTER REPAIR	Perform a road test then a new test with the diagnostic tool.

CHART 5	**NO REVERSING LIGHTS** **NO REVERSE GEAR REPEATER ON THE CONSOLE**

NOTES	**Special notes:** None.

Ensure the condition and correct connection of the reverse gear switch wiring on the gearbox as well as the wiring of the gear lever switch.

Check there is no continuity on the reversing light switch between **tracks 1** and **2** with the switch disconnected and reverse gear not engaged. Replace the switch if necessary.

Check **the continuity** on the reversing light switch between **tracks 1** and **2** with the switch disconnected and reverse gear engaged. Replace the switch if necessary.

Ensure the continuity and insulation of the connections between:

Switch connector **track 2** ⟶ **track 7** Gear lever switch

Switch connector **track 1** ⟶ **track 6** Passenger compartment fuse box

Also check the insulation between these connections.

Check the fuse of the reversing light.

Replace the gear lever handle.

AFTER REPAIR	Perform a road test then a new test with the diagnostic tool.

CHART 6	**NO CREEP** **STOP LIGHTS PERMANENTLY ILLUMINATED** **FORWARD OR REVERSE GEAR CAN BE SELECTED WITHOUT PRESSING THE BRAKE PEDAL**

NOTES	In a case where there is no creep, if the customer has heard the buzzer whilst driving, it is normal for creep to be prohibited (clutch overheating). The clutch must be allowed to cool before checking that creep is once again active. Apply the following procedure if the fault persists.

Ensure that the connectors for the stop switch and handbrake switch are correctly connected and check the condition of the wiring as well as that of the computer. Repair if necessary.

Check the adjustment of the stop lights switch on the pedals.

Ensure continuity with the pedal depressed between **tracks A3** and **B1** of the switch. Replace the switch if necessary.

Ensure that there is **no continuity**, with the pedal released, between **tracks A3** and **B1** of the switch. Replace the switch if necessary.

If the fault persists, ensure the continuity of the connection between:

Switch **track A3** ⟶ **track 69** 28 track connector Computer

Check the condition of the handbrake switch on its support.

Also ensure the insulation to earth.

Ensure **the continuity**, with the handbrake applied, between **track 1** of the switch and vehicle **earth**. Replace the switch if necessary.

Ensure **there is no continuity**, with the handbrake released, between **track 1** of the switch and vehicle **earth** . Replace the switch if necessary.

If the fault persists, ensure the continuity of the connection between:

Switch **track 1** ⟶ **track 71** 28 track connector Computer

Also ensure the insulation to earth.

AFTER REPAIR	Perform a road test then a new test with the diagnostic tool.

CHART 7	LOSS OF AUTOMATIC MODE

NOTES	**Special notes:** None.

Injection fault of severity **1** sent by the engine management computer on a CAN connection.

Check the petrol injection using the diagnostic tool.

AFTER REPAIR	Perform a road test then a new test with the diagnostic tool.

CHART 8	VEHICLE DOES NOT MOVE FORWARD, ENGINE RUNNING

NOTES	**Special notes:** None.

Check the condition and correct connection of the injection computer connector and the sequential gearbox computer connector.

Check the continuity and insulation of the connections between:

Sequential gearbox computer **track 33** → **track K3** Injection computer

Sequential gearbox computer **track 45** → **track K4** Injection computer

If the connection is faulty:

Check the condition and correct connection of the intermediate connector **R212**.

Ensure the continuity and insulation of the connections between:

Intermediate connector **track C3** → **track K4** Injection computer

Intermediate connector **track D3** → **track K3** Injection computer

Also check the insulation between these connections. Repair if necessary.

Ensure the continuity and insulation of the connections between:

Sequential gearbox computer **track 33** → **track D3** Intermediate connector

Sequential gearbox computer **track 45** → **track C3** Intermediate connector

Also check the insulation between these connections.

If the fault persists, perform fault finding on the engine injection and repair accordingly.

If the fault is still present, there may be a CAN problem inside the injection or sequential gearbox computers.

Perform the tests described on the following page to determine which computer is faulty.

AFTER REPAIR	Perform a road test then a new test with the diagnostic tool.

CHART 8 CONTINUED	

1. Switch off the ignition, disconnect the sequential gearbox computer and switch on the ignition. Using the oscilloscope, measure (procedure below) the signal between **track 33** (CAN L, taken as earth reference) and **track 45** (CAN H) on the sequential gearbox harness connector.

If you see a signal (sequence of signals with amplitude of **2.3 V**), perform test **2.b.**

If you do not see a signal, perform test **2.a.**

2.a. Switch off the ignition, reconnect the sequential gearbox computer, disconnect the **Injection** computer and switch on the ignition.

Using the oscilloscope, measure (procedure below) the signal between track **K4** (CAN L, taken as earth reference) and **track K3** (CAN H) on the **Injection harness** connector.

If you see a signal (sequence of signals with amplitude of **2.3V**), replace the **Injection** computer.

If you do not see a signal: an error has occurred in the procedure, restart from the beginning.

2.b. Switch off the ignition, reconnect the sequential gearbox computer, disconnect the **Injection** computer and switch on the ignition.

Using the oscilloscope, measure (procedure below) the signal between track **K4** (CAN L, taken as earth reference) and **track K3** (CAN H) on the **Injection computer** connector.

If you do not see a signal, replace the sequential gearbox computer.

If you see a signal: an error has occurred in the procedure, restart from the beginning.

Procedure: using the oscilloscope of the diagnostic tools.

Select the Oscilloscope function in voltage mode.

AUTOMATIC adjustment inactive.

Time base: 10 ms or 500 µs depending on the tool.

Signal amplitude: 1V.

AFTER REPAIR	Perform a road test then a new test with the diagnostic tool.