

F / I / A / T LANCIA TESTER

**OPERATION
MANUAL**

**MAGNETI
MARELLI**





Interchangeable
memory module for
customization to
various types of
on-board electronic
control units.

KEYBOARD FUNCTIONS

R RESTART

Program halts and starts over again

? HELP REQUEST

On-line help about messages displayed

M

SELECTION OF ANCILLARY FUNCTIONS

Gives access to utility programs (Buffer, RS 232, printer, active diagnosis, etc.).

E/S

ACTIVATION OF SELECTED FUNCTION

Activates selected function with the blinking cursor or controls buffer function.

FC

REQUEST OF GUIDED DIAGNOSIS

Allows entering guided diagnosis.

?

RETURN TO PREVIOUS FUNCTION

Gives the possibility of returning to the previous function or recovering from a wrong selection.

OK

AFFIRMATIVE REPLY

OK

NEGATIVE REPLY

Δ

BACKWARDS

These keys allow changing selection and shifting the cursor.

Δ

FORWARDS

Ø

NUMERIC KEYS

9

INTRODUCTION

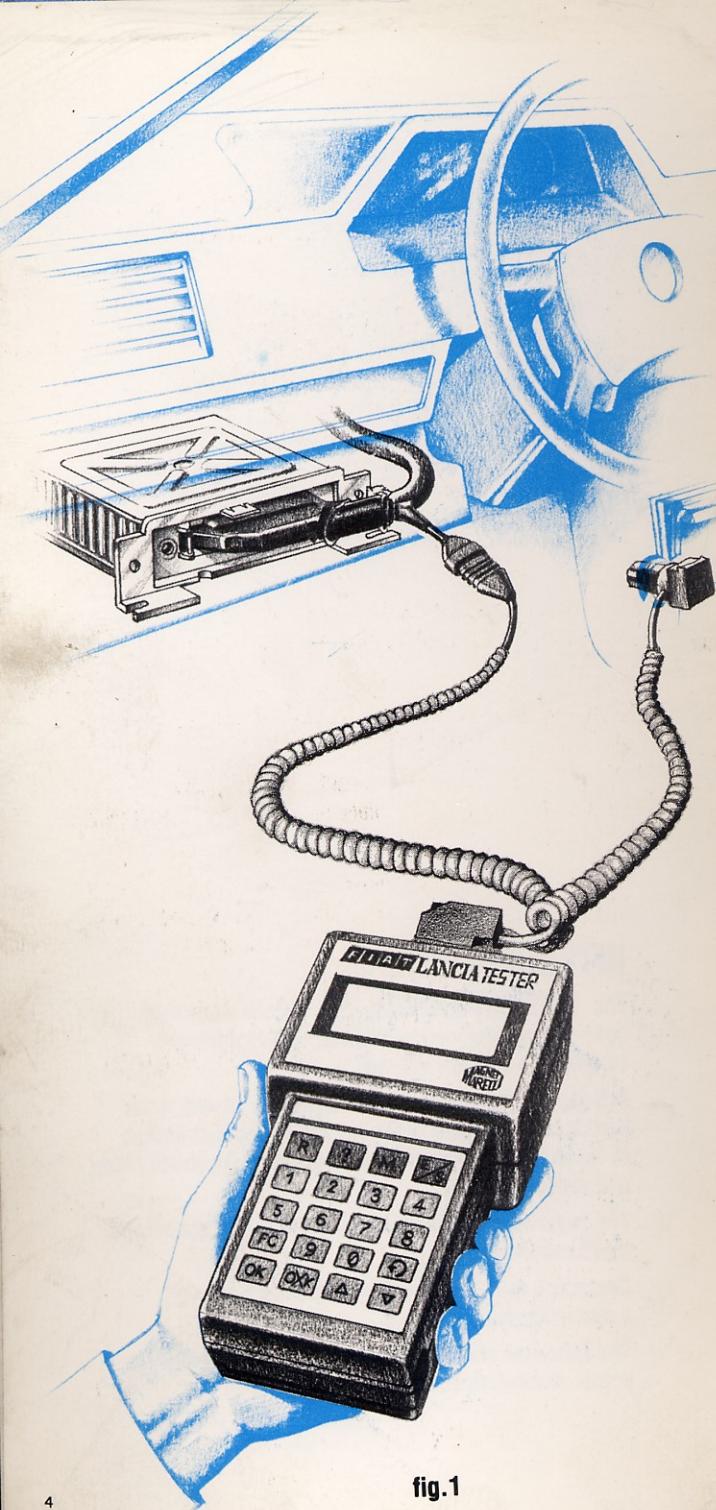
The **FIAT LANCIA TESTER** is a portable computerized diagnoser which interrogates electronic control units on board vehicles.

It is capable of processing and storing data relative to the system being checked, displaying appropriate instructions to the operator for malfunction analysis and the identification of defective parts.

The Tester automatically recognizes the type of control unit that's connected to.

Connection to on-board control units is made through a standard connector (fig. 1).

The Tester can also send data to other units such as a printer, monitor, mainframe, etc.



Connection between the Tester and the control unit is made according to the following sequence:

- connect Tester to battery through the lighter socket
- connect the diagnostic port to the control unit port

DISPLAY WILL SHOW



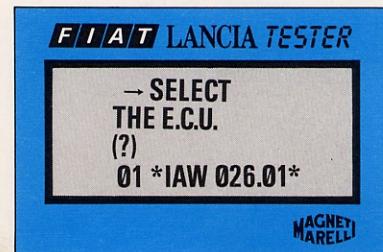
The operator can select the desired test program by means of **Δ** and **∇** and put it through execution by pressing key **ES**

AUTOMATIC Tester checks type of control unit and enters Function A.

WRITE CODE ISO Tester checks control unit, displays an appropriate code for 10 secs and then enters Function A.

SKIP ISO CODE use this program to connect the Tester to the control unit on board a vehicle without turning off the motor, so as not to lose stored error information.

Upon pressing key **ES** the display will show:



The operator can select the type of the control unit installed by means of keys **Δ** and **∇** and enter Function A - data acquisition and read-out - upon pressing key **ES**

FUNCTIONS

- A. Data acquisition and read-out**
- B. Malfunction state warning**
- C. Malfunction identification through guided diagnosis**
- D. Operator-requested information**
- E. Ancillary functions.**

Function A. DATA ACQUISITION AND READ-OUT

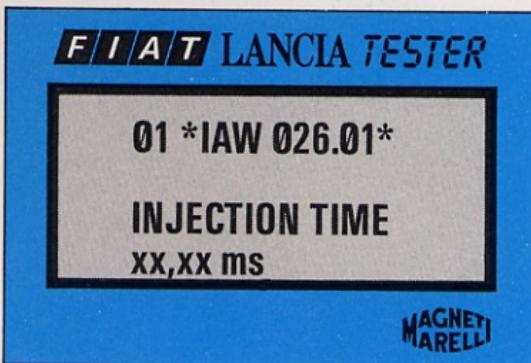
Function A. DATA ACQUISITION AND READ-OUT (fig. 2)

The Tester shows quantities communicated by the electronic control unit in engineering units (pressure mmHg, rotation speed rpm, temperature °C, etc.).

The operator can thus check values continuously updated and displayed as quantities vary.



Press key



Now press key to display all the values available.

Function B.
MALFUNCTION WARNING

Function B.

MALFUNCTION WARNING (fig. 2)

While in Function A, a bleep warns the operator and the display shows the type of error detected in case of malfunction.

Otherwise, the error condition is stored and displayed upon reverting to Function A.

Typical error warning



Upon pressing key **OK** guided diagnosis is entered, leading the operator to error identification.

Upon pressing key **OK** error diagnosing is momentarily suspended and the error condition stored in memory.

Error diagnosis may be requested later by pressing key **FC**. The stored error condition is deleted by pressing key **R**.

Function C.
MALFUNCTION IDENTIFICATION
THROUGH GUIDED DIAGNOSIS

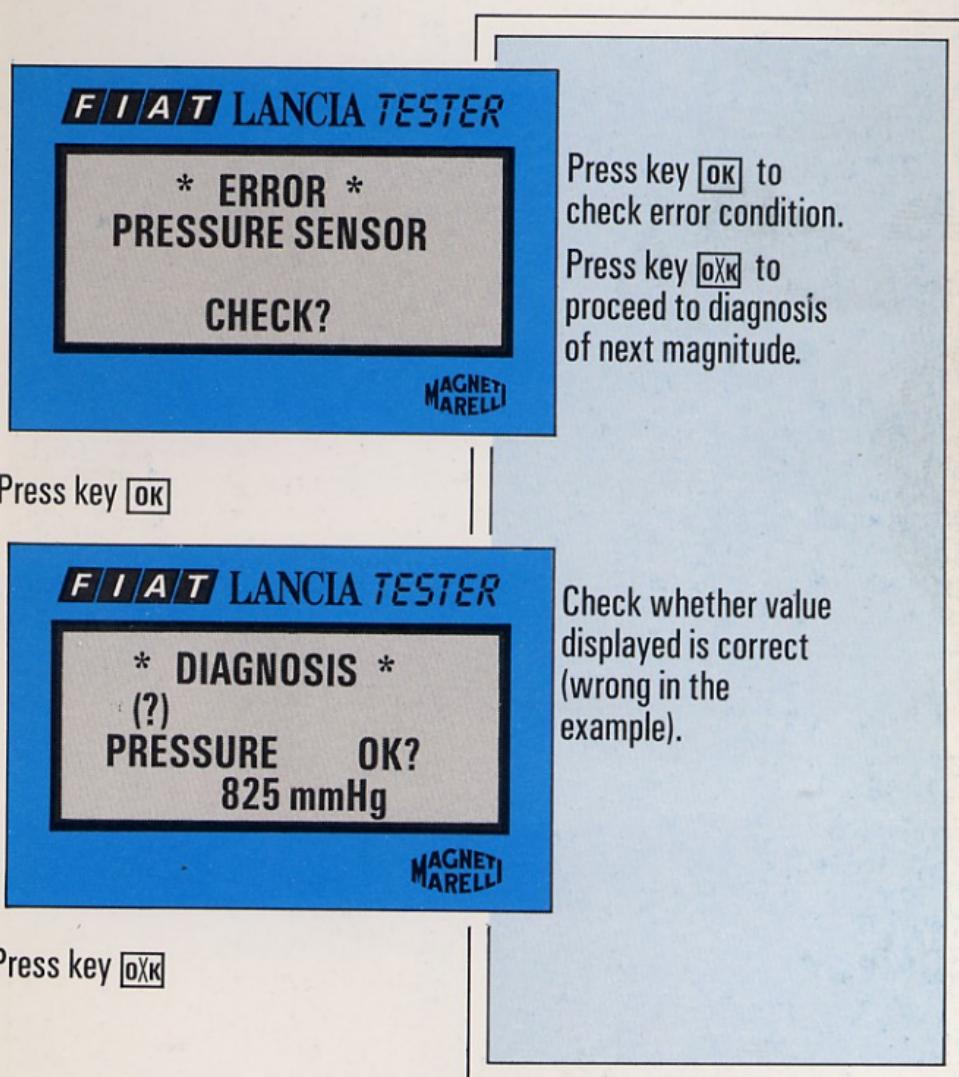
Function C. MALFUNCTION IDENTIFICATION THROUGH GUIDED DIAGNOSIS (fig. 2)

Guided diagnosis is entered upon pressing key **FC** or automatically as soon as an error condition arises within the system.

Example of guided diagnosis

PRESSURE ERROR

(arising from an interruption in a wire)



FIAT LANCIA TESTER

**TURN THE KEY
ON STOP**

MAGNETI
ARELLI

... next, the display will show.

As soon as this is done
test proceeds and ...

FIAT LANCIA TESTER

→ **CONNECT SENS.
OF REF. (R7)**

DONE?

MAGNETI
ARELLI

Press key **OK**

FIAT LANCIA TESTER

**TURN THE KEY
TO MAR
(AND WAIT!)**

MAGNETI
ARELLI

... next, the display will show.

As soon as this is done
test proceeds and ...

FIAT LANCIA TESTER

01 *IAW 026.01*
THE E.C.U.
IS IN AUTO TEST

MAGNETI
ARELLI

... next, the display will show.

FIAT LANCIA TESTER

**TURN THE KEY
ON STOP**

MAGNETI
ARELLI

... next, the display will show.

As soon as this is done
test proceeds and ...

FIAT LANCIA TESTER

→ **CHECK
CABLES:
WIRE N. 11, 15, 30
OK?**

MAGNETI
ARELLI

Press key **OK**

FIAT LANCIA TESTER

→ **REFIX SENS.
OF REF. (R7)**
DONE?

MAGNETI
ARELLI

Press key **OK**

FIAT LANCIA TESTER

**TURN THE KEY
TO MAR
(AND WAIT!)**

MAGNETI
ARELLI

... next, the display will show.

The operator locates and
diagnosis may be ended
at this point by pressing
key **OK** and reverting to
Function A, or (as in the
example) go on to check
for any further faults.

Now the operator
is guided through
a performance check
of the pressure sensor.

As soon as this is done
test proceeds and ...

FIAT LANCIA TESTER

01 *IAW 026.01*

**THE E.C.U.
IS IN AUTO TEST**

MAGNETI
ARELLI

... next, the display will show.

FIAT LANCIA TESTER

**→ TURN THE KEY
ON STOP**

MAGNETI
ARELLI

... next, the display will show.

FIAT LANCIA TESTER

**→ RE-ASSEMBLE
PRESSURE SENSOR**

DONE?

MAGNETI
ARELLI

Press key **OK**

FIAT LANCIA TESTER

**TURN THE KEY
TO MAR
(AND WAIT!)**

MAGNETI
ARELLI

... next, the display will show.

FIAT LANCIA TESTER

01 *IAW 026.01*

**THE E.C.U.
IS IN AUTO TEST**

MAGNETI
ARELLI

... next, the display will show.

FIAT LANCIA TESTER

*** DIAGNOSIS *
(?)
PRESSURE OK?
XXXX mmHg**

MAGNETI
ARELLI

Value now displayed
is correct.
Press key **OK** to return
to Function A.

Example of guided diagnosis: **PRESSURE SENSOR TEST**

FIAT LANCIA TESTER

*** DIAGNOSIS *
WANT AUTO TEST
PRESSURE SENSOR ?**

MAGNETI
ARELLI

Press **FC** to reach Step...

Press key **OK**

FIAT LANCIA TESTER

**TURN THE KEY
ON STOP**

MAGNETI
ARELLI

Read out from the
installed pressure sensor
is stored and the display
will show.

... next, the display will show.

FIAT LANCIA TESTER

→ CONNECT SEN.
SAMPLE (R3)

DONE?

MAGNETI
ARELLI

Press key **OK**

FIAT LANCIA TESTER

TURN THE KEY
ON MAR
(AND WAIT!)

MAGNETI
ARELLI

As soon as this done
test proceeds and ...

... next, the display will show.

FIAT LANCIA TESTER

01 *IAW 026.01*
THE E.C.U.
IS IN AUTO TEST

MAGNETI
ARELLI

... next, the display will show.

FIAT LANCIA TESTER

SAMPLE PRESS. =
xxx mmHg

(▽)

MAGNETI
ARELLI

Pressure measured by
the sample sensor is
displayed.

Press key **▼**

FIAT LANCIA TESTER

01 *IAW 026.01*

THE E.C.U.
IS IN AUTO TEST

MAGNETI
ARELLI

... next, the display will show.

FIAT LANCIA TESTER

* DIAGNOSIS *
(?)
PRESSURE OK?
xxxx mmHg

MAGNETI
ARELLI

Value now displayed
is correct.
Press key **OK** to return
to Function A.

Example of guided diagnosis: PRESSURE SENSOR TEST

FIAT LANCIA TESTER

* DIAGNOSIS *
WANT AUTO TEST
PRESSURE SENSOR ?

MAGNETI
ARELLI

Press **FC** to reach Step...

Press key **OK**

FIAT LANCIA TESTER

TURN THE KEY
ON STOP

MAGNETI
ARELLI

Read out from the
installed pressure sensor
is stored and the display
will show.

... next, the display will show.

FIAT LANCIA TESTER

→ CONNECT SEN.
SAMPLE (R3)

DONE?

MAGNETI
MARELLI

Press key **OK**

FIAT LANCIA TESTER

TURN THE KEY
ON MAR
(AND WAIT!)

MAGNETI
MARELLI

... next, the display will show.

As soon as this done
test proceeds and ...

FIAT LANCIA TESTER

01 *IAW 026.01*

THE E.C.U.
IS IN AUTO TEST

MAGNETI
MARELLI

... next, the display will show.

FIAT LANCIA TESTER

SAMPLE PRESS. =
xxx mmHg

(▽)

MAGNETI
MARELLI

Press key **▼**

Pressure measured by
the sample sensor is
displayed.

FIAT LANCIA TESTER

TURN THE KEY
ON STOP

MAGNETI
MARELLI

... next, the display will show.

FIAT LANCIA TESTER

→ SENSOR OK!
→ PUT IT BACK

DONE?

MAGNETI
MARELLI

Press key **OK**

As soon as this is done
test proceeds and ...

The installed sensor is
deemed faulty if its read
out differs by more than
 $\pm 15\%$, from pressure
measured by the sample
sensor. In the example it
is assumed to perform
within tolerance.

FIAT LANCIA TESTER

TURN THE KEY
ON MAR
(AND WAIT!)

MAGNETI
MARELLI

As soon as this done
test proceeds and ...

FIAT LANCIA TESTER

01 *IAW 026.01*

THE E.C.U.
IS IN AUTO TEST

MAGNETI
MARELLI

... next, the display will show.

FIAT LANCIA TESTER

* DIAGNOSIS *
(?)
PRESSURE OK?
xxx mmHg

MAGNETI
ARELLI

Press key

This is the point where the operator pressed key to request a check against the sample sensor.

FIAT LANCIA TESTER

01 *IAW 026.01*
ENGINE REV.
xxx rpm

MAGNETI
ARELLI

Press key

FIAT LANCIA TESTER

01 *IAW 026.01*
T. INJECTION
xx,xx ms

MAGNETI
ARELLI

etc., etc ...

Guided diagnosis may be used even though no error condition has been detected.

Pressing key the operator enters guided diagnosis, analysing parameters and judging whether values are correct or not. This procedure is most useful when the error condition is due to faulty sensors (for example, an actual water temperature of 90°C, displayed as 20°C).

Example of operator-requested guided diagnosis to check positioning of the butterfly sensor.

FIAT LANCIA TESTER

* DIAGNOSIS *
(?)
REQUIRE THE TEST
SENS. BUTTERFLY?

MAGNETI
ARELLI

Press key

FIAT LANCIA TESTER

→ MOVE SLOWLY
THE ACCELERATOR
ACCEL= xx DG
OK?

MAGNETI
ARELLI

Press key

FIAT LANCIA TESTER

→ RELEASE
THE ACCELERATOR
OK?

MAGNETI
ARELLI

Press key

The operator, by slowly pressing the accelerator can check the continuity of the butterfly potentiometer.

FIAT LANCIA TESTER

→ MOVE LITTLE
THE ACCELERATOR

OK?

MAGNETI
ARELLI

Press key **OK**

FIAT LANCIA TESTER

TURN THE KEY
ON STOP

MAGNETI
ARELLI

... next, the display will show.

The Tester detects
faulty regulation of the
butterfly potentiometer
and therefore the display
shows:

As soon as this is done
test proceeds and ...

FIAT LANCIA TESTER

→ ADJUST POSIT.
POTENTIOMETER

OK?

MAGNETI
ARELLI

Press key **OK**

FIAT LANCIA TESTER

TURN THE KEY
ON MAR
(AND WAIT!)

MAGNETI
ARELLI

As soon as this is done
test proceeds and ...

...next, the display will show.

FIAT LANCIA TESTER

01 *IAW 026.01*

THE E.C.U.
IS IN AUTO TEST

MAGNETI
ARELLI

... next, the display will show.

FIAT LANCIA TESTER

→ RELEASE
THE ACCELERATOR

OK?

MAGNETI
ARELLI

Press key **OK**

FIAT LANCIA TESTER

→ MOVE LITTLE
THE ACCELERATOR

OK?

MAGNETI
ARELLI

Press key **OK**

FIAT LANCIA TESTER

* DIAGNOSIS *
REQUIRE THE TEST
AIR CONDIT.?

MAGNETI
ARELLI

No error has been
detected through the
test and the Tester
proceeds to check the
next magnitude.

etc. etc...

Function D.

OPERATOR-REQUESTED

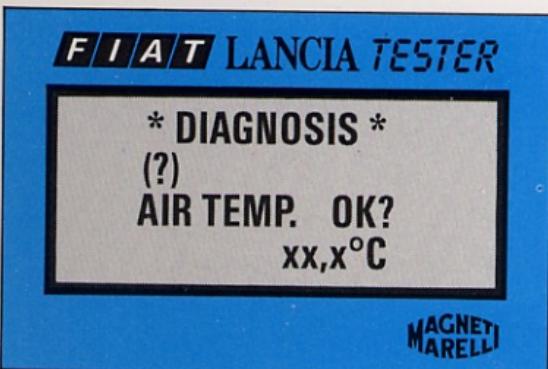
INFORMATION

Function D. OPERATOR-REQUESTED INFORMATION (fig. 2)

The operator has on-line help available to use the Tester and interpret data easily.

Access to help is gained by pressing key when appropriate i.e., when the symbol is displayed.

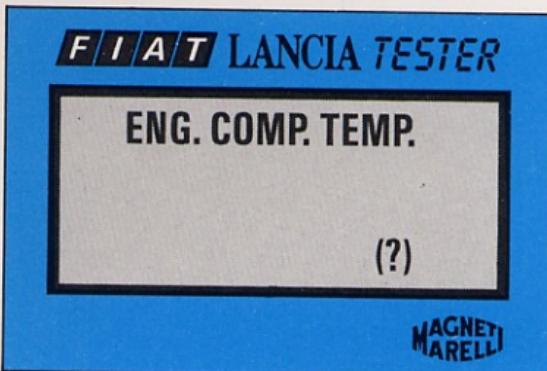
Example:



Upon pressing key ...



Press key



Return to the point where information was requested by pressing key again, proceeding in the diagnosis.

Function E. ANCILLARY FUNCTIONS

Function E. **ANCILLARY FUNCTIONS** (fig. 2)

By pressing key **M** ancillary functions may be selected, such as:

Activation of system actuators

The Tester sends control signals to sequentially excite actuators through the on-board control station (see Technical Sheet).

Data buffering

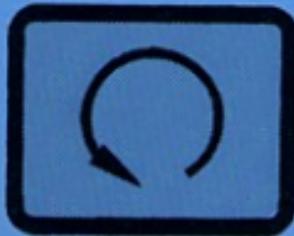
Up to 100 values of each system parameter can be stored (e.g., pressure, rpm, temperature) for later display.

Activation of the RS 232 interface

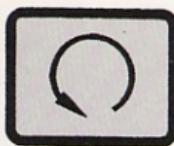
A standard RS 232 interface for connection to various terminals or peripherals is provided through a 9-pole connector.

Key **M** is active only while in Function A.

EXAMPLES USING KEYS



EXAMPLE USING KEY



return to previous function

F I A T LANCIA TESTER

01 *IAW 026.01*

ENGINE REV.
XXXX rpm

MAGNETI
ARELLI

Tester is now in Function A.

Upon pressing key **FC**

F I A T LANCIA TESTER

*** DIAGNOSIS ***
?
BATT. VOLT. OK?
xx,x V

MAGNETI
ARELLI

The Tester is now in
Function C (guided diagnosis)
Press key **Q**
to return to Function A.

Upon pressing key **Q**

F I A T LANCIA TESTER

01 *IAW 026.01*

ENGINE REV.
XXXX rpm

MAGNETI
ARELLI

Return to Function A.

TECHNICAL SPECIFICATIONS

Supply voltage: 7V ÷ 30 V dc

Working temperature: 0 ÷ 70°C

Diagnostic code format: NRZ, PCM, Two-phase

Input frequency: 1 Hz ÷ 10 k Hz

Additional output: RS 232 (50 ÷ 19.200 bit/s)

Display: LCD

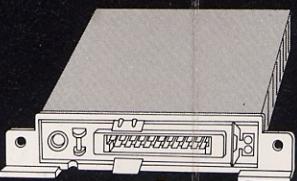
4 lines x 16 characters

RAM storage: 2/8 Kbytes with permanent
data storage

ROM memory: 136 Kbytes max.

fig. 2

ON BOARD CONTROL UNIT



FUNCTION A.
DATA ACQUISITION
AND READ OUT

FUNCTION E.
ANCILLARY
FUNCTIONS

FUNCTION B.
ERROR

FUNCTION C.
GUIDED
DIAGNOSIS

FUNCTION D.
OPERATOR-REQUESTED
INFORMATION

ACTIVATE
ACTUATORS

OK

BUFFER

OK

PRINT DATA

OK

DISPLAY DATA

PRINTER

SEARCH
ERROR

DETET
ERROR

FUNCTION STATE DIAGRAM
FIAT LANCIA TESTER

M

FC

?

?

?

?

?

?

?

?

OK

OK

OK