

FIAT LANCIA *TESTER*

OPERATION
MANUAL

MAGNETI
MARELLI



R

?

M

E
S

1

2

3

4

5

6

7

8

FC

9

Ø



OK

O~~X~~K

Δ

▽



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

- OxK**

NEGATIVE REPLY

- 

BACKWARDS
These keys allow changing selection and shifting the cursor.

- 

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.

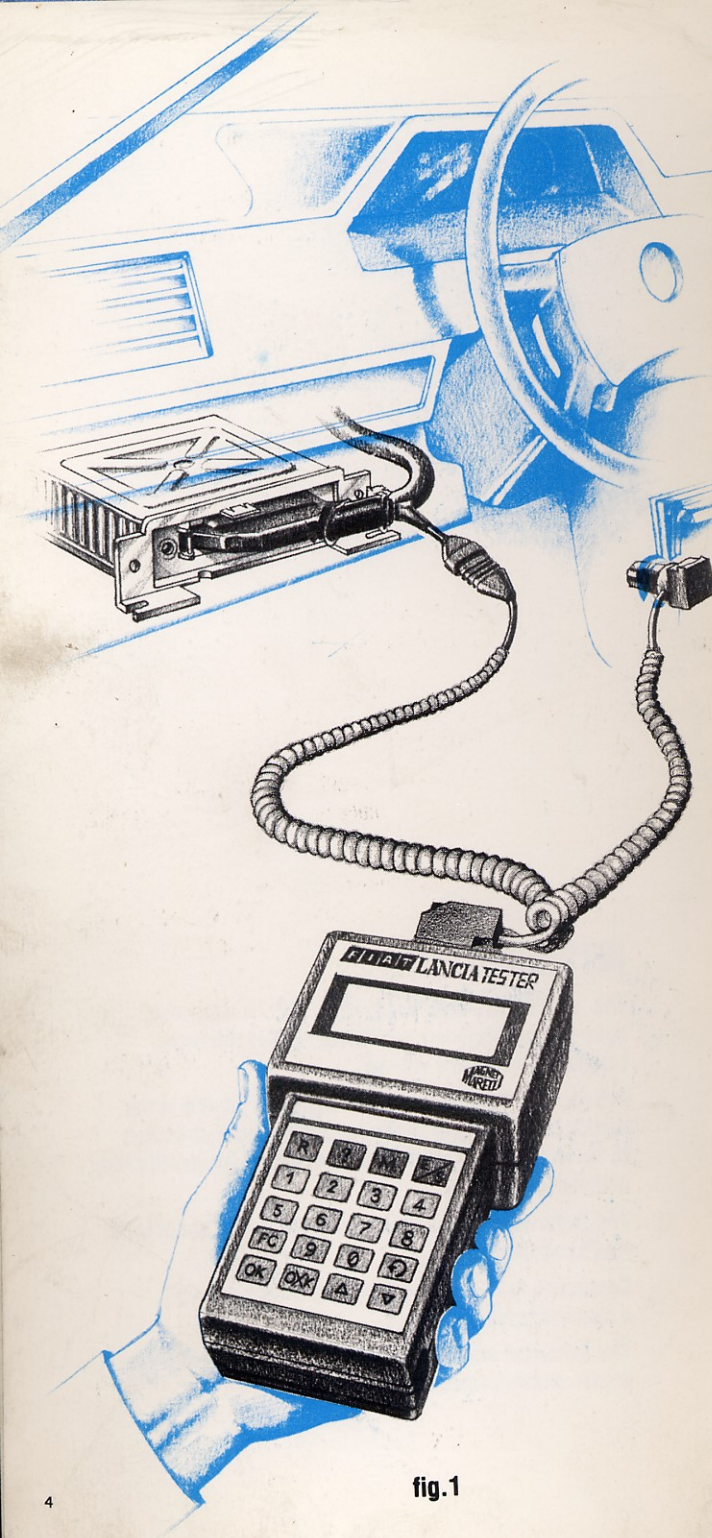


fig.1

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



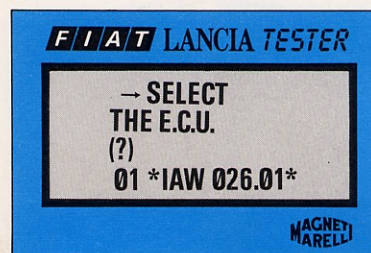
The operator can select the desired test program by means of Δ and ∇ and put it through execution by pressing key E/S

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 E/S 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 E/S

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)

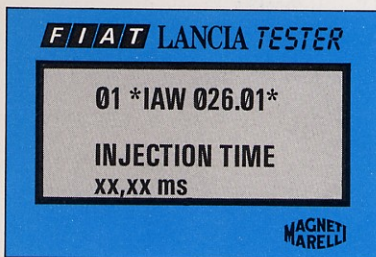
The Tester shows quantities communicated by the electronic control unit in engineering units (pressure mmHg, rotation speed rpm, temperature °C, etc.).


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



xxxx is actual value displayed.

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 **[OXX]** 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

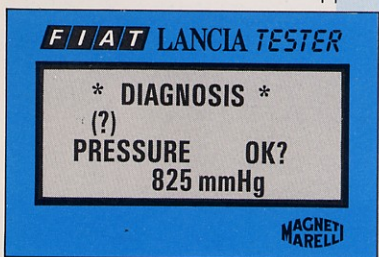
(arising from an interruption in a wire)



Press key **OK** to check error condition.

Press key **OK** to proceed to diagnosis of next magnitude.

Press key **OK**



Check whether value displayed is correct (wrong in the example).

Press key **OK**

FIAT LANCIA TESTER

TURN THE KEY
ON STOP

**MAGNETI
MARELLI**

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

... next, the display will show.

FIAT LANCIA TESTER

→ CONNECT SENS.
OF REF. (R7)

DONE?

**MAGNETI
MARELLI**

Press key **OK**

FIAT LANCIA TESTER

TURN THE KEY
TO MAR
(AND WAIT!)

**MAGNETI
MARELLI**

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
MARELLI**

... next, the display will show.

FIAT LANCIA TESTER

TURN THE KEY
ON STOP

**MAGNETI
MARELLI**


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

... next, the display will show.

FIAT LANCIA TESTER

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

**MAGNETI
MARELLI**

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

Press key **OK**

FIAT LANCIA TESTER

→ REFIX SENS.
OF REF. (R7)

DONE?

**MAGNETI
MARELLI**

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

Press key **OK**

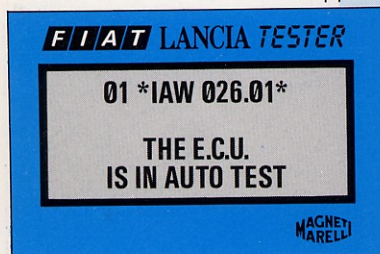
FIAT LANCIA TESTER

TURN THE KEY
TO MAR
(AND WAIT!)

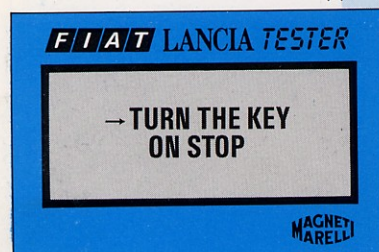
**MAGNETI
MARELLI**

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

... next, the display will show.



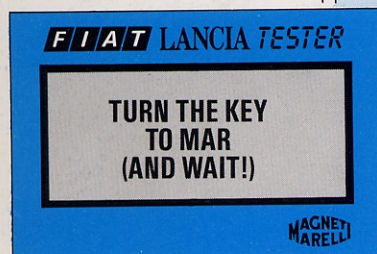
... next, the display will show.



... next, the display will show.



Press key **OK**

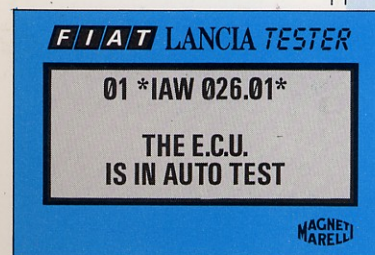


... next, the display will show.

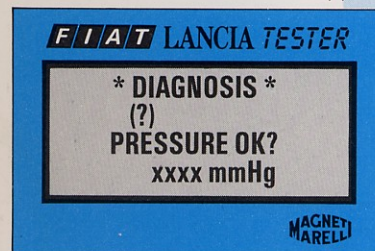
As soon as this is done test proceeds and ...

If an error condition no longer exists, the operator must reinstall the pressure sensor.

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



... next, the display will show.



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

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



Press key **OK**



... next, the display will show.

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

Read out from the installed pressure sensor is stored and 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

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
MARELLI

... next, the display will show.

FIAT LANCIA TESTER

SAMPLE PRESS. =
xxx mmHg

(▽)

MAGNETI
MARELLI

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
MARELLI

... next, the display will show.

FIAT LANCIA TESTER

* DIAGNOSIS *
(?)

PRESSURE OK?
xxxx mmHg

MAGNETI
MARELLI

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
MARELLI

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

Press key **OK**

FIAT LANCIA TESTER

TURN THE KEY
ON STOP

MAGNETI
MARELLI

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

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

... next, the display will show.

FIAT LANCIA TESTER

→ SENSOR OK!
→ PUT IT BACK

DONE?

MAGNETI
MARELLI

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.

Press key **OK**

FIAT LANCIA TESTER

TURN THE KEY
ON MAR
(AND WAIT!)

MAGNETI
MARELLI

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
MARELLI

... next, the display will show.

FIAT LANCIA TESTER

* DIAGNOSIS *
(?)
PRESSURE OK?
xxx mmHg

MAGNETI
MARELLI

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

Press key [OK]

FIAT LANCIA TESTER

01 *IAW 026.01*
ENGINE REV.
xxx rpm

MAGNETI
MARELLI

Press key [V]

FIAT LANCIA TESTER

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

MAGNETI
MARELLI

etc., etc ...

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

Pressing key [FC] 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
MARELLI

Press key [OK]

FIAT LANCIA TESTER

→ MOVE SLOWLY
THE ACCELERATOR
ACCEL= xx DG
OK?

MAGNETI
MARELLI

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

Press key [OK]

FIAT LANCIA TESTER

→ RELEASE
THE ACCELERATOR
OK?

MAGNETI
MARELLI

Press key [OK]

FIAT LANCIA TESTER

→ MOVE LITTLE
THE ACCELERATOR

OK?

MAGNETI
MARELLI

Press key **OK**

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

TURN THE KEY
ON STOP

MAGNETI
MARELLI

... next, the display will show.

FIAT LANCIA TESTER

→ ADJUST POSIT.
POTENTIOMETER

OK?

MAGNETI
MARELLI

The operator sets the
potentiometer
appropriately.

Press key **OK**

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

FIAT LANCIA TESTER

TURN THE KEY
ON MAR
(AND WAIT!)

MAGNETI
MARELLI

...next, the display will show.

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

→ RELEASE
THE ACCELERATOR

OK?

MAGNETI
MARELLI

Press key **OK**

FIAT LANCIA TESTER

→ MOVE LITTLE
THE ACCELERATOR

OK?

MAGNETI
MARELLI

Press key **OK**

FIAT LANCIA TESTER

* DIAGNOSIS *

REQUIRE THE TEST
AIR CONDIT.?

MAGNETI
MARELLI

etc. etc...

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

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

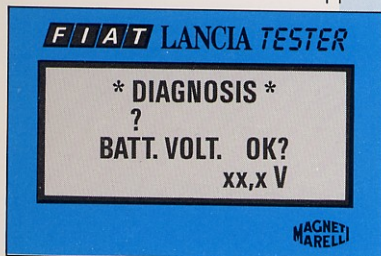


return to previous function



Tester is now in Function A.

Upon pressing key



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

Upon pressing key



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

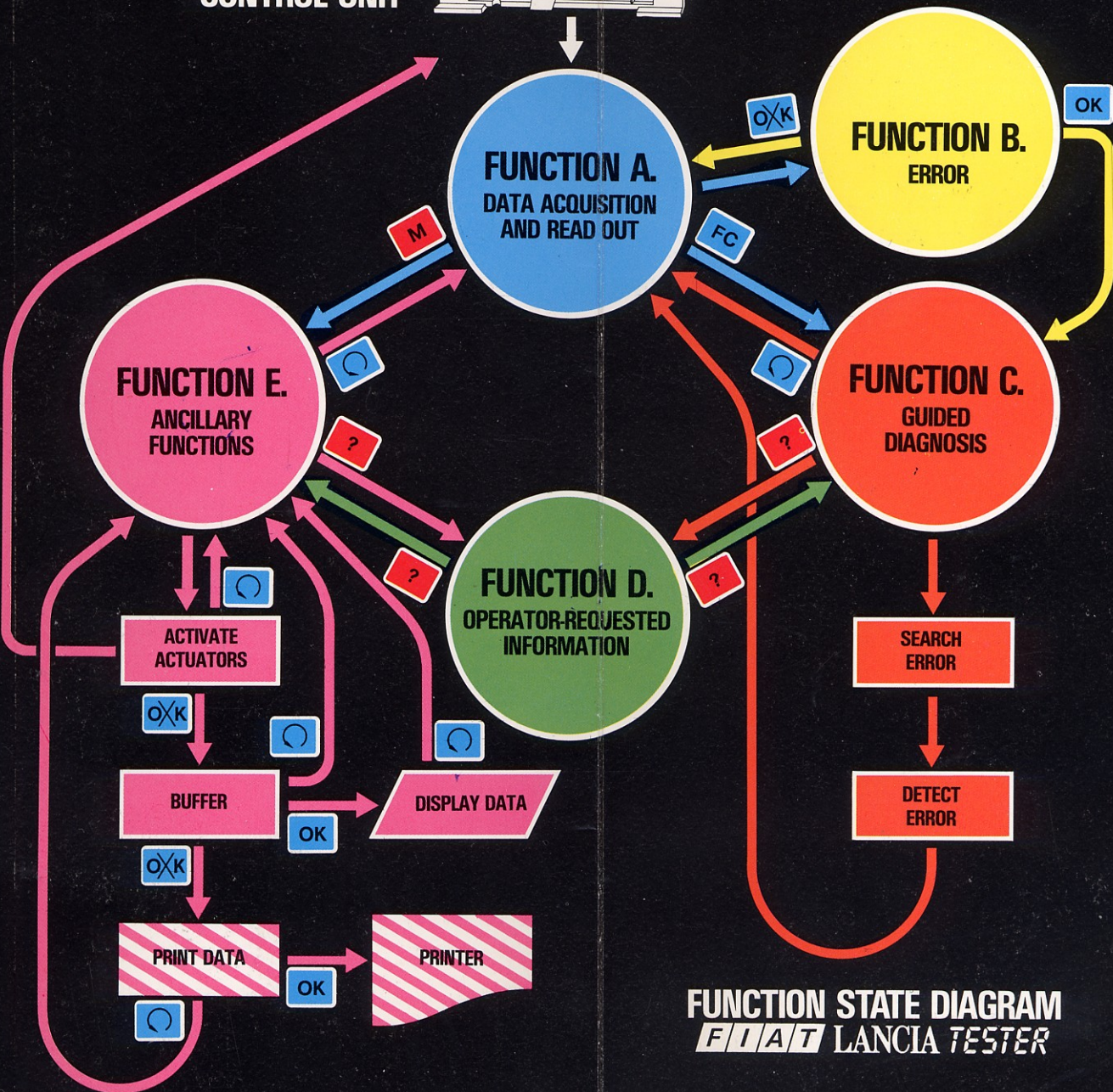
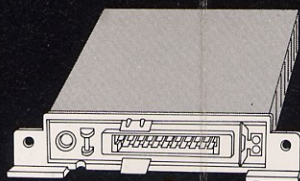
4 lines x 16 characters

RAM storage: 2/8 Kbytes with permanent
data storage

ROM memory: 136 Kbytes max.

fig. 2

**ON BOARD
CONTROL UNIT**



FUNCTION STATE DIAGRAM
FIAT LANCIA TESTER