PEUGEOT Motocycles

SALES DIVISION
NETWORK TECHNICAL INFORMATION

WORKSHOP MANUAL

Scoot'élec

DIAGNOSTIC

Réf: 755815

CONTENTS

CONTENTS

CHARACTERISTICS

Machine markings:

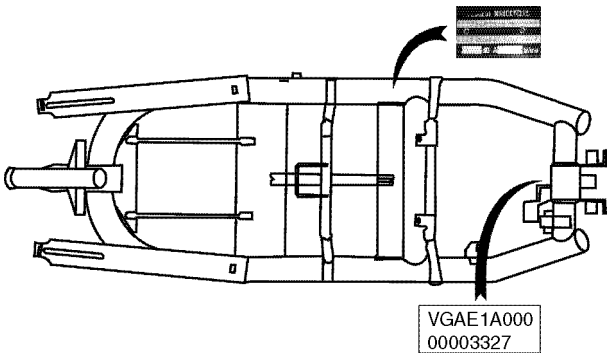
Model code	E1A

Characteristics:

Engine	
Characteristics	Direct current and separate excitation
	Energy recovery on motor braking
Marque	Leroy Somer or Schabmüller
Max. power output	2.8 kW
Engine speed	2100 rpm
Torque speed	2000 rpm

Frame:

1 Manufacturer's plate
2 VIN number



Capacities:

Relay module	0.12 litres Esso Gear oil (EZL 848) P/N 753054

Dimensions:

Length	1755 mm
Width	695 mm
Height without rear view mirror	1100 mm
Ground clearance	160 mm
Wheelbase	1300 mm

Weight:

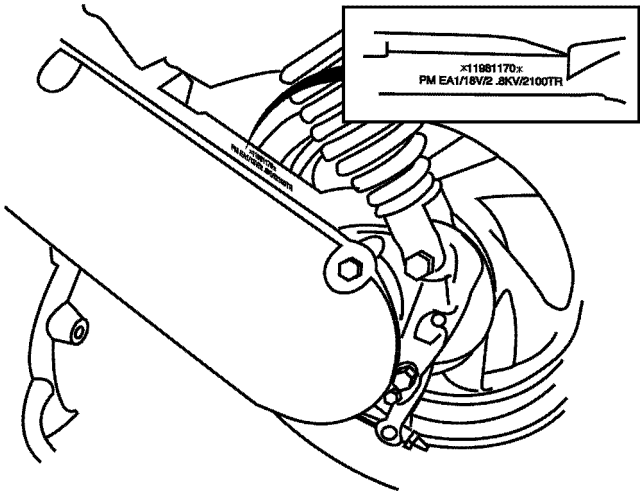
Weight	115 kg

Tyres:

Front wheel	2.5"x10"
Front tyre	100/80x10
Front tyre pressure	2.5 bar
Rear wheel	2.5"x10"
Rear tyre	110/80x10
Rear tyre pressure	2.5 bar

Engine markings:

Engine type	EA1



SERVICE AND COMMISSIONING INSTRUCTIONS

Heavy duty servicing is aimed at machines used under “harsh” conditions: door-to-door calls, intensive urban use (courrier service)

Servicing operations	500 Kms or 3 months	Every 5000 Kms or months	Every 10000 Kms
Heavy duty service	500 Kms	Every 2500 Kms	Every 5000 Kms
Check:			
Diagnostic readout	X	X	X
Throttle control	X	X	X
Functioning of electrical equipment	X	X	X
Front and rear brake control	X	X	X
Tyre pressures	X		
Tyre condition, pressure and wear		X	X
Tightness of nuts and bolts	X	X	X
Change:			
Front and rear brake lining			X
Grease cam spindle		X	X
Drive belt	10000 km for heavy duty service		
Check and change:			
Motor brushes # (depending on engine manufacturer)	10000 km for heavy duty service		X
Test machine:			
On road	X	X	X

if necessary

Battery commissioning and maintenance procedure

Remark: the maintenance procedure is identical to the commissioning procedure

Important:

It is essential to use distilled water supplied by PEUGEOT MOTOCYCLES under P/N: 973582

The use of distilled water from another sources will destroy the battery.

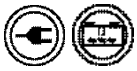
It is forbidden to pour in distilled water before the end of charging.

Commissioning:

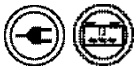
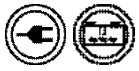
Ensure you have 3 litres of PEUGEOT distilled water, P/N: 973582.

- Connect the charge cable to the 230 V – 10/16 A mains.
- The charge lamp  comes on with a beep, the battery lamp  flashes
- Press key "V" on the keypad there is a beep and hold until there is a second beep.
- Release the « V » key, a series of 3 beeps indicates the operation is to commence, the charge lamp  flashes.
- If it does not flash, repeat the operations more quickly.

The commissioning procedure has started and will take 10 to 15 minutes.

At the end of charging, the  lamps stay on indicating that water may be added to the battery.

Note:
From this point on, you may leave the machine connected to the mains for a period of 72 hours. Beyond this time, you will have to repeat the procedure from the start.

- Disconnect the charging cable, the  lamps stay on. You now have a maximum of 30 minutes to add water to the battery.
- Open the maintenance cover with a Torx screwdriver and slowly pour in the distilled water (P/N: 973582) until the water runs out of the overflow under the scooter.
- Close and tighten the maintenance cover, the  lamps go off indicating the end of commissioning.
- Wait for a minimum of 15 seconds before turning on the ignition.

Charging after prolonged immobilisation

After not being used for a few months, the battery voltage may drop below 8 volts and it is impossible to put the machine on charge.
In this case, the battery needs to be "woken up" by one or more connections / disconnections to and from the mains socket.

Procedure:

1. Connect the charging connector to the mains.

Important:

- The charge lamp does not come on on the instrument panel.
- No beep on the multifunction keypad.
- The fan does not run.

This is normal.

Do not turn on the scooter lights.
Do not connect the TEP96.

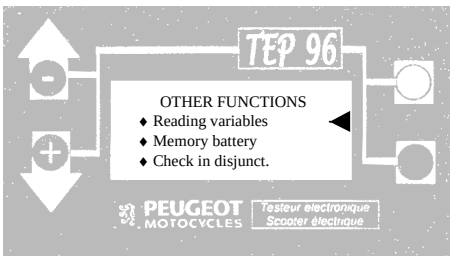
2. Leave the connector connected 5 minutes to the mains
3. Disconnect the connector from the mains and reconnect it immediately

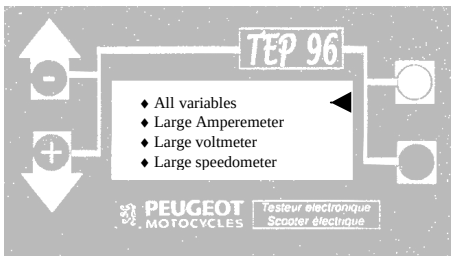
Repeat operations 2 and 3 until:

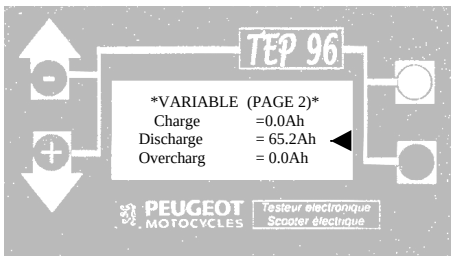
- The charge lamp comes on on the instrument panel.
- The multifunction key pad sounds a beep.
- The charger fan starts.

After 5 minutes charging (for ECU, electronic control unit, Software version 4.2.4, production prior to July 97)

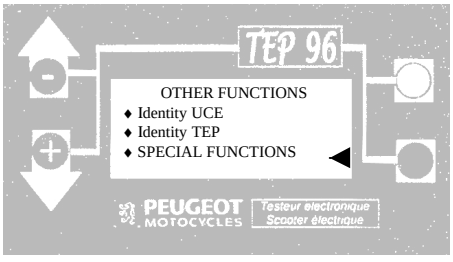
Connect the TEP96 to the machine

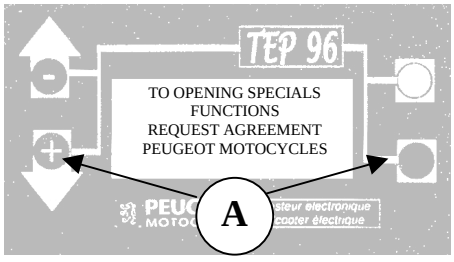


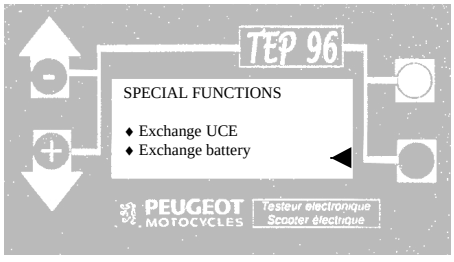




The DISCHARGE value must be between 0 and 110 Ah
If the number of discharged Ah is over 110, use the TEP96 to carry out a "Exchange battery" procedure







Press the two buttons (A) for 3 seconds

Checks before handing over to the customer:

Check the wheel nuts are tight
- Front wheel: 6 m.daN
- Rear wheel 10 m.daN

Check all nuts and bolts are tight
Check brake adjustment and efficiency
Check the tyre pressures cold
- Front wheel: 2.5 bar
- Rear wheel 2.5 bar

Check operation of the lights, flashers, road and pedestrian horn, and brake light
Check operation of the various instrument panel lamps
Check the power reserve
Carry out a road test

SPECIAL IMPORTANT POINTS

The scoot'elec is fitted with a coded immobiliser. This system prevents the machine from being started if the user has not entered the secret code number. See manual.

Charging of the 3 Cadmium-Nickel batteries is by means of the on-board charger fitted with a 220V 10/16A power connector with earth.
A partial charge may be carried out, and each charge of 10 minutes enables approximately 5 km to be covered in ECO mode.

If the battery temperature is high, charging will only commence after the time it takes to cool down which is controlled automatically by the charger and the ECU (which means that the charging time will be prolonged by the same time).
The  lamp will flash until the charge is triggered automatically. See manual.

TIGHTENING TORQUES AND SPECIAL TOOLS

Tightening torques:

Lower body fairing	0.2m.daN
Footboard	0.4 m.daN
Speedo casing	0.1 m.daN
Saddle cover	0.6 m.daN
Front panel	0.1 m.daN
Rear panel	0.1 m.daN
Side fairings	0.1 m.daN
Rear mudguard *	0.8/0.1 m.daN
Mud flap *	0.6/0.8m.daN
Saddle locking plate	1.2 m.daN

Frame:

Front wheel spindle nut	6 m.daN
Rear wheel spindle nut	10 m.daN
arm to chassis mounting	4.6 m.daN
Shock absorber upper mount	4.3 m.daN
Shock absorber lower mount	2.5 m.daN
Steering locknut	7 m.daN

Engine:

Arm to engine mount	2.3 m.daN
Battery terminal nut	1.2 m.daN
Strap and 200 A fuse	1.2 m.daN
Engine to casing	1 m.daN
Drive pulley	4 m.daN
Driven pulley	4 m.daN

Standard:

Nut and bolt 5 mm diameter	0.5 m.daN
Nut and bolt 6mm diameter	1 m.daN
Nut and bolt 8mm diameter	2.2 m.daN
Nut and bolt 10mm diameter	3.5 m.daN
Nut and bolt 12mm diameter	5.5 m.daN

Special tools:

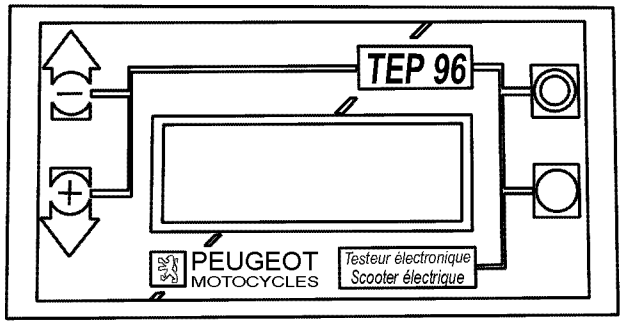
Description	Item no..
Steering column spanner	754086
Discharge bench	753012
TEP 96	753011
Optional charger	5409

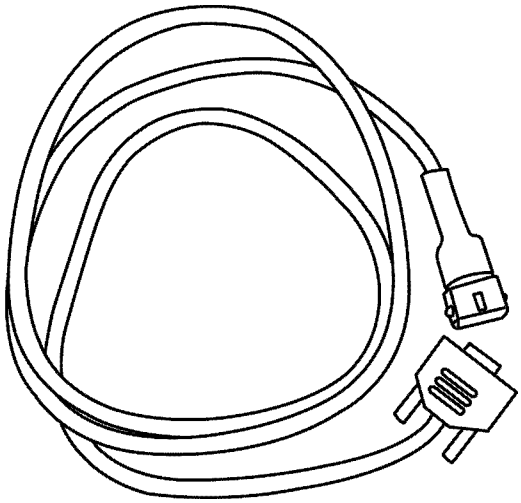
* depending on size of bolt

TEP USER INSTRUCTIONS
VERSION 1.5 AND 2.0

Presentation:

Unit with a display window, and connecting cable





Functioning:

Powered by the machine over the cable, the TEP 96 contains no batteries.
It dialogs with the ECU (Electronic Control Unit).

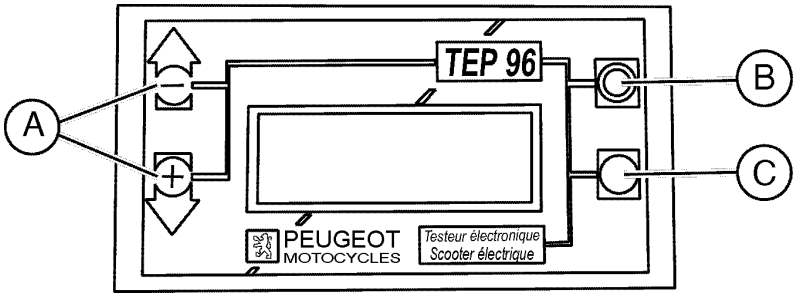
Apparatus functions:

Reads off the system functioning parameters
Reads off the fault codes recorded by the system
Checks the opening status of the maintenance hatch
Tests the functions (charger, keypad, ignition switch)
Runs the maintenance procedures to:
- Change one or more of the traction battery cells
- Change the ECU

Instructions for use:

Connect the cable to the TEP 96 unit
Connect the other end of the cable to the diagnostic plug under the machine saddle
Read off the indications in the window

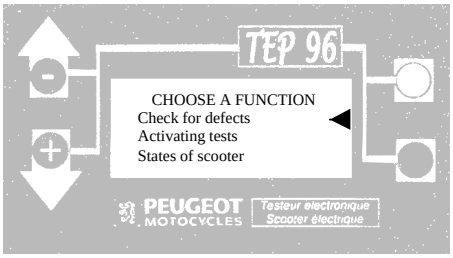
Buttons (A) are used to scroll through the menu or to change from one page to another
Button (B) is used to return to the menu or answer no
Button (C) is used to confirm or answer yes

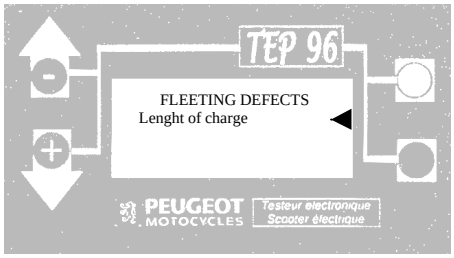


Example of checking the charge with the TEP 96:

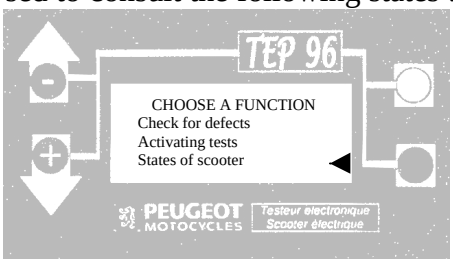
Connect the TEP96 to the machine diagnostic plug
Connect the scooter charge cable to the 220/230V mains
In the main menu, you have 3 read lines to check the charge

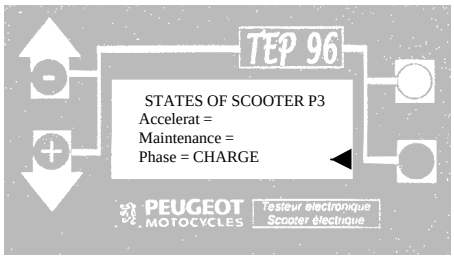
1/ Check for defects
Used to read the following defects : Lenght of charge or Lenght of overcharge



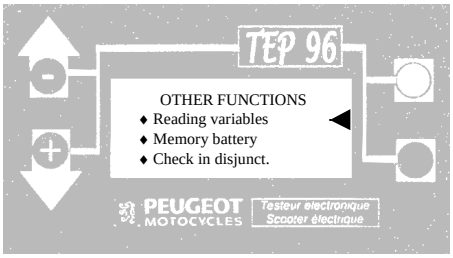


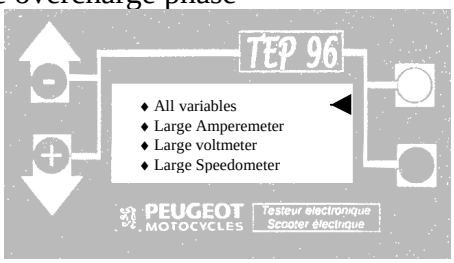
2/ States of scooter
Used to consult the following states : Phase = CHARGE or Phase = OVERCHARGE

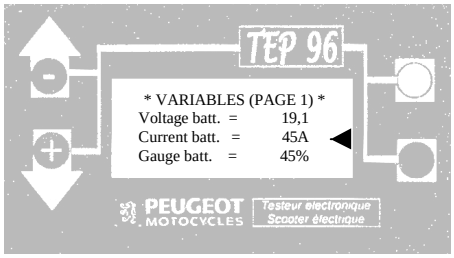




3/Reading variables/all variables
Used to read the following variables :.Current batt = +42A to +50A for the charge phase
or Batt. current = +4A to +6A for the overcharge phase







In case of a fault on your TEP96:

Test the continuity of the connection cable with an ohmmeter

Precautions:

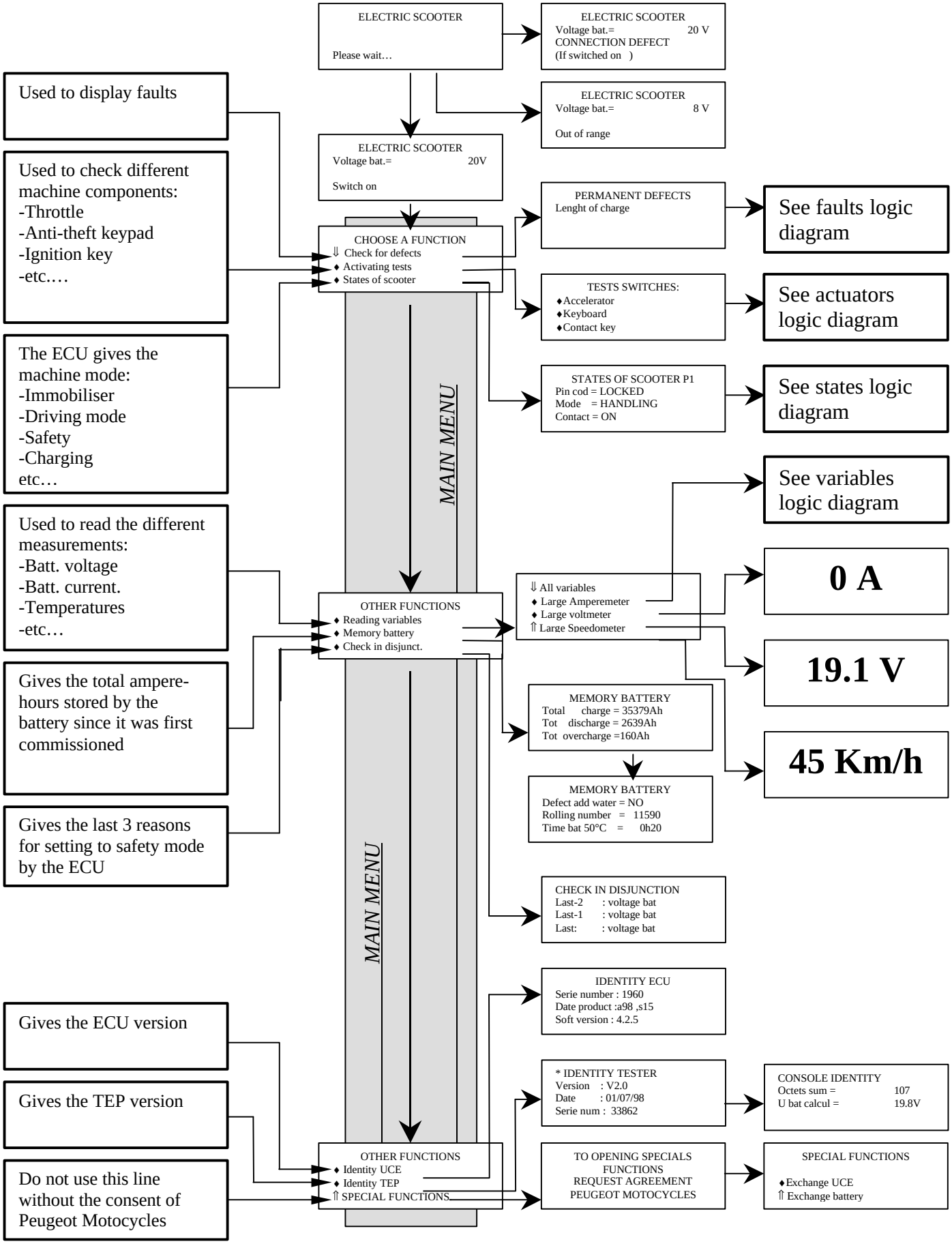
Do not splash liquid on the TEP96
Do not open the casing

Important:

The Exchange battery and Exchange uce functions can only be used with the consent of PEUGEOT MOTOCYCLES
If you select one of these menus by mistake, answer NO as quickly as possible as you may disturb the ECU memories

Do not leave the TEP96 connected too long, for example, in order to watch the counters, as an excessively long connection may disturb certain of the ECU measurements or counters.
It may be necessary to disconnect the TEP96 and turn off the ignition for 20 seconds to confirm certain operations.

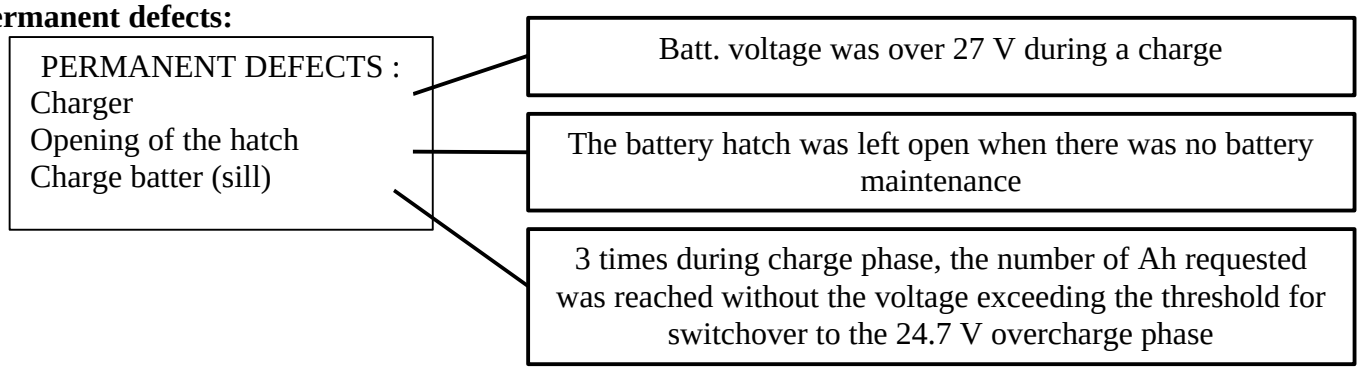
TEP96 Version 2.0 logic diagram (the TEP96 screen order) :



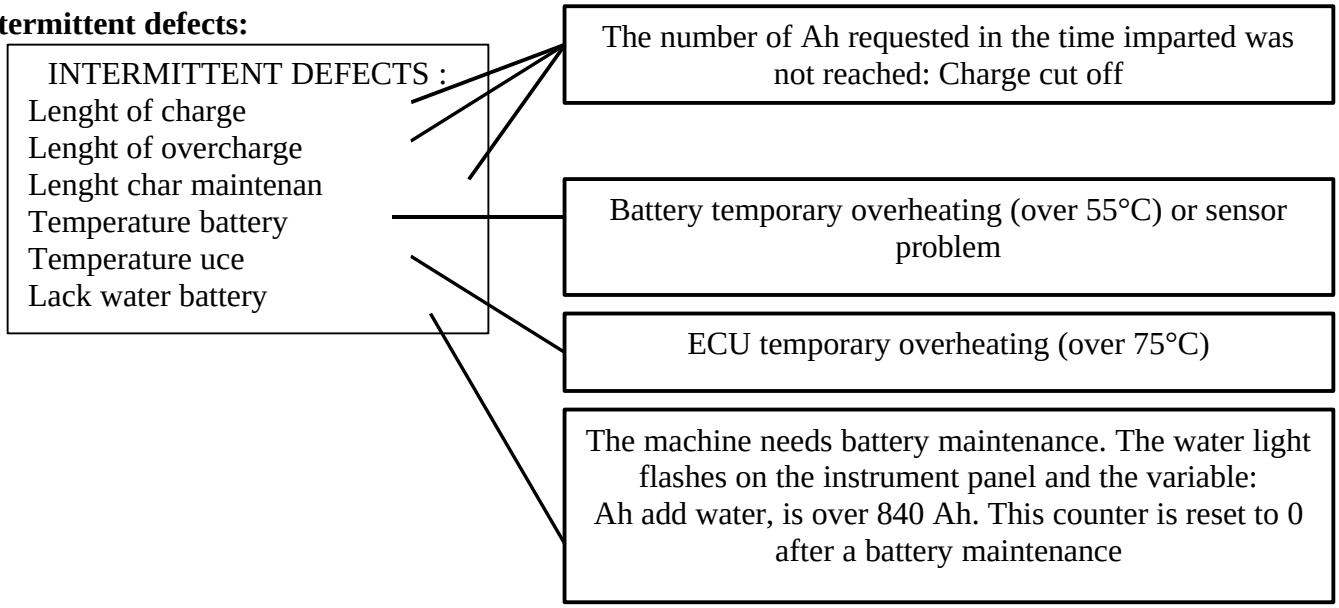
Faults logic diagram:

List of faults recorded by the ECU during use of the machine

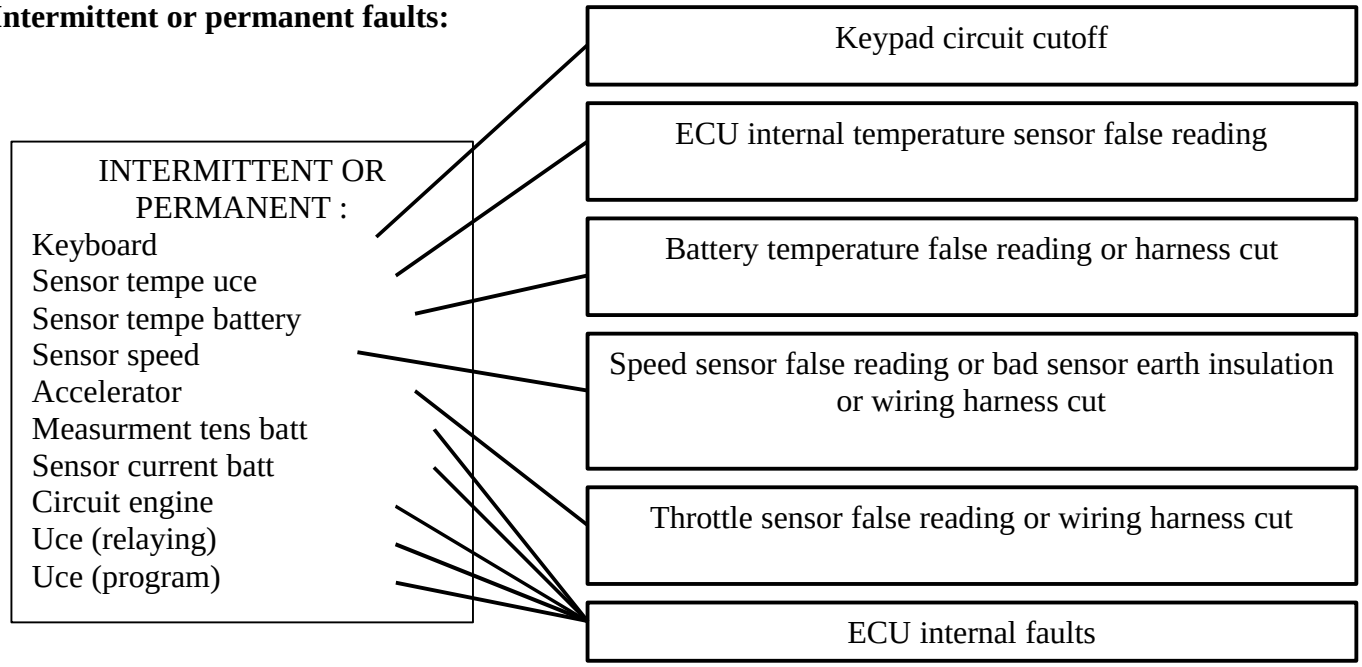
Permanent defects:



Intermittent defects:

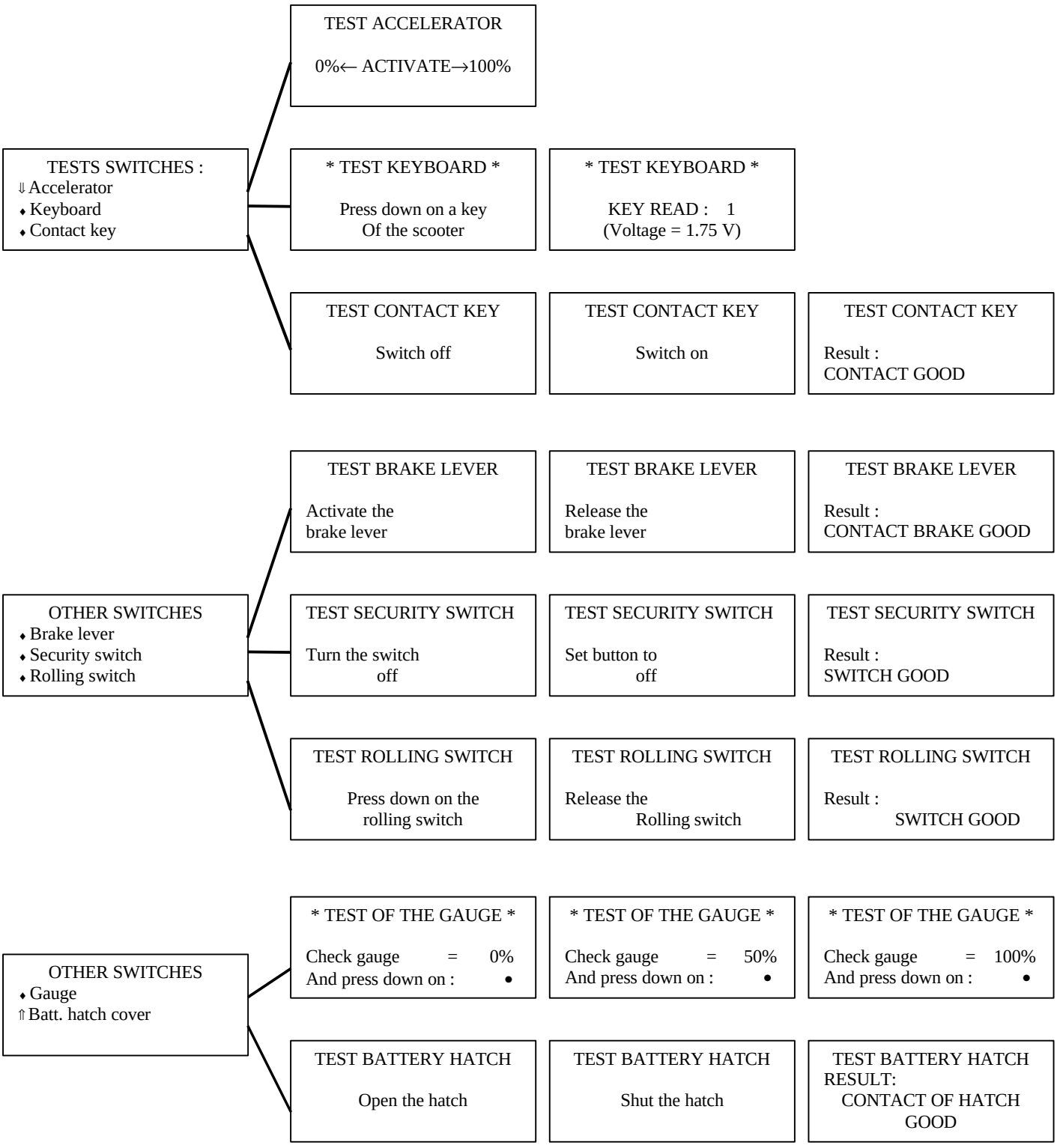


Intermittent or permanent faults:



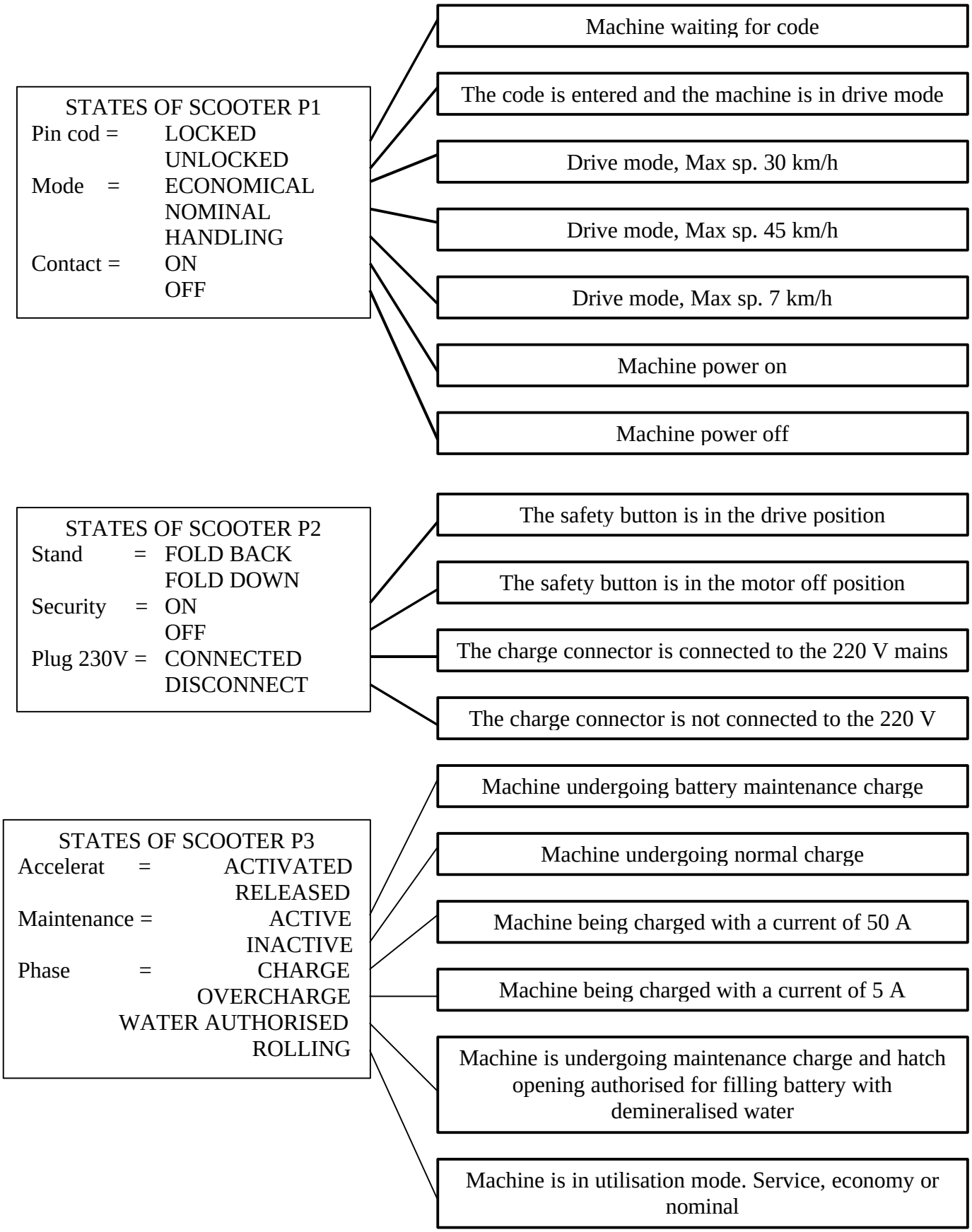
Actuators logic diagram:

Testing the machine actuators is used to check they are functioning at the time of diagnostic



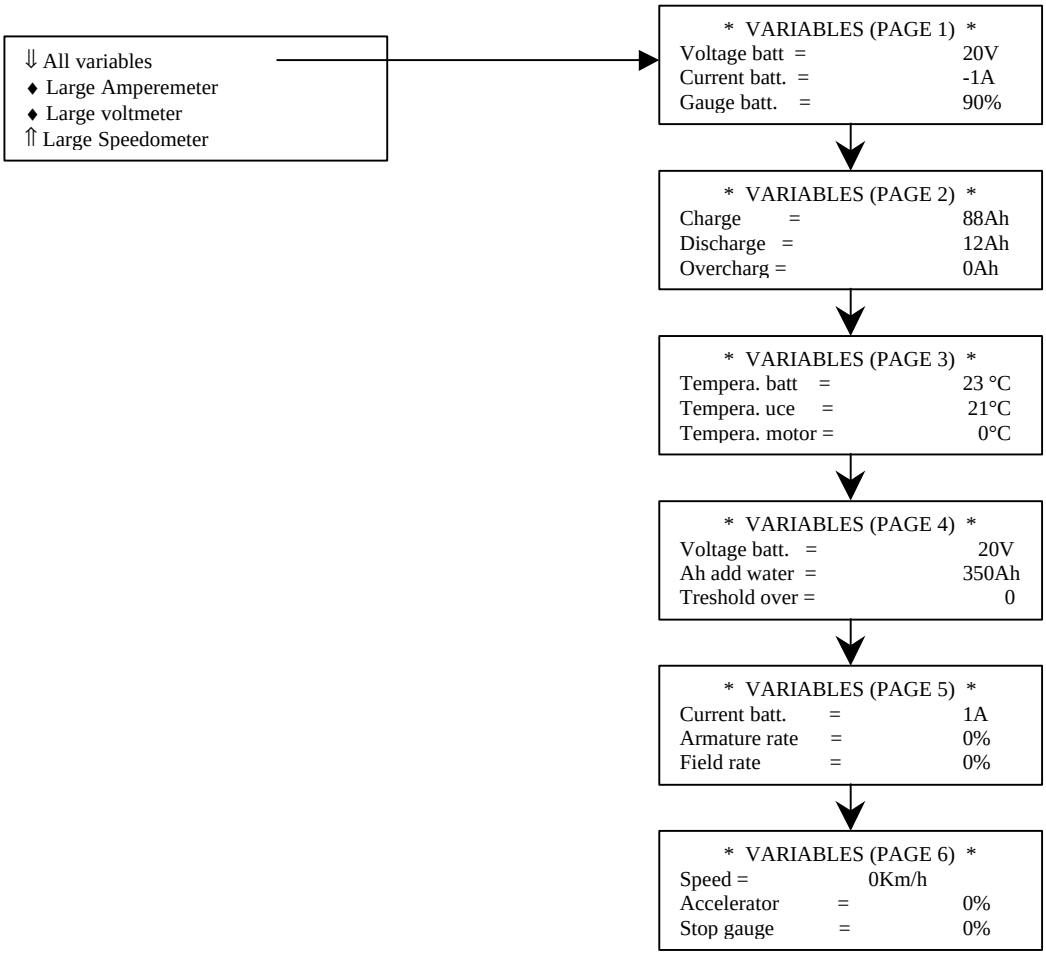
States logic diagram:

List of the machine accessory states having an effect on ECU functioning



Variables logic diagram:

Display of functioning parameters read by the ECU at the time of diagnostic



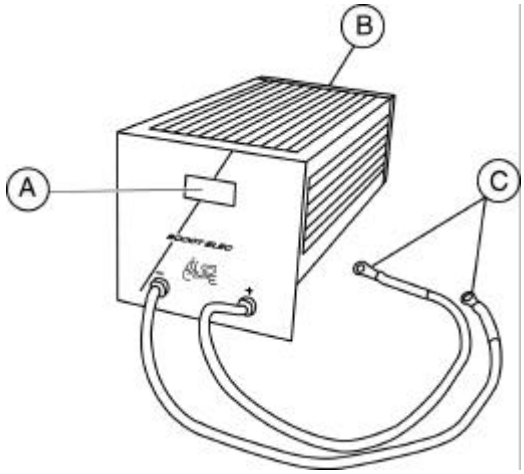
6Volt BATTERY CELL DISCHARGE BENCH INSTRUCTIONS FOR USE

Characteristics:

Operating voltage 6 Volts
Discharge current 100 amperes
Ventilated discharger

Presentation:

Liquid crystal display (A) on front panel
Fan (B) at rear
2 connection cables (C) + red wire / - blue wire



Protection:

Against polarity inversions (display off)
Against connection of cells in series (display off)
Heat protection, discharge stopped temporarily (display flashes)

Instructions for use:

Disconnect and remove the 3 cells
Connect the cell to the discharge bench
- Red wire to the cell + terminal
- Blue wire to the cell - terminal

Tighten the terminals, the cell voltage is displayed
The cooling fan (B) runs (if the voltage is between 7.5 V and 4.5 V)
The cell discharges automatically
When discharge is finished, the fan stops and the discharge time is displayed in minutes on the display (A) (e.g.: T=50)

Battery cell discharge:

On reception of a new uncharged cell
The other 2 cells must be discharged, one after the other in order to equalise and have the same voltage as the new cell.
After refitting the cells, carry out the battery replacement procedures on the TEP96 and commissioning the battery with the TEP96 (see corresponding chapters).

Precautions:

Do not use the discharge bench with batteries from another source
Do not splash water, petrol or oil on the discharge bench
Keep the discharge bench away from inflammable materials

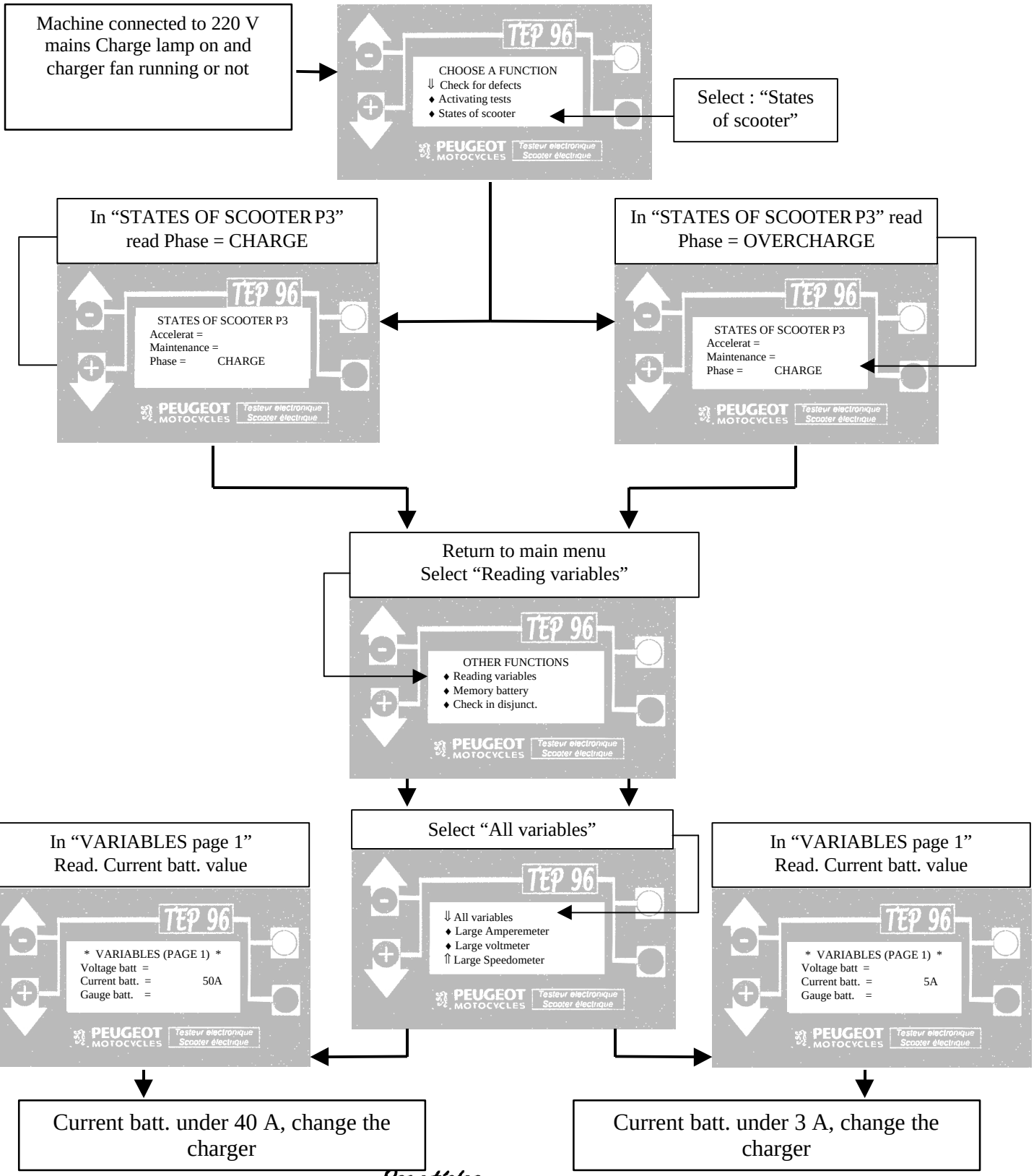
TROUBLESHOOTING LOGIC DIAGRAM

Incident: the machine does not charge 100%:

Charge indicator needle does not move to maximum

With or without the following fault codes: “Lenght of charge” or “Lenght of overcharge”

Important: for this test, the machine should not be at the end of charge nor in an atmosphere of over 60°C, if so, the measurements will be false.



TROUBLESHOOTING LOGIC DIAGRAM

Incident: the machine does not charge:
With or without the following fault codes: BAT. TEMPERATURE or BATTERY TEMP SENSOR

Machine connected to 220 V mains

Charge lamp on, fault lamp flashing and charger fan not running

Charge lamp on and charger fan not running

Charge lamp off and charger fan not running

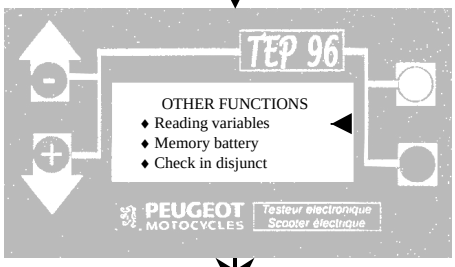
On TEP96 test:

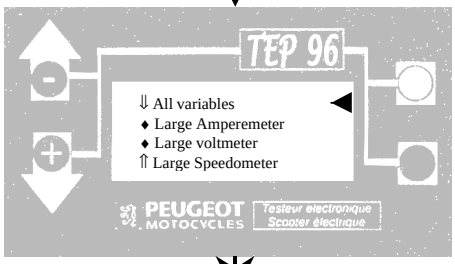
Change the charger. See workshop documentation

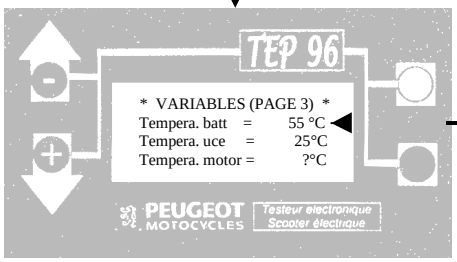
Test 200 A fuse

Test the 220-230 V mains and charging cable

Check battery voltage







Voltage under 8 V apply procedure: charging after prolonged immobilisation (see appropriate chapter)

Voltage over 12V, change the charger (see workshop documentation)

Battery voltage over 55°c

No fault but battery temperature safety triggered (room too hot, external temperature too high)
in this case leave the machine connected and the charge to finish

If after 2 hrs the battery temperature is not under 55°, check the battery temperature functions and change it if necessary (sensor fault, or sensor information error).

TROUBLESHOOTING LOGIC DIAGRAM

Incident: problems during the maintenance charge:

With or without the following fault codes: CHARGE TIME, MAINTENANCE CHARGE TIME, BAT TEMPERATURE or BATTERY TEMP SENSOR

Machine connected to 220 V mains

Charge lamp is on and maintenance lamp flashes

NO

Check battery voltage

Test 200 A fuse

Check 220-230 V mains and charging cable

Voltage under 8 V apply procedure: *charging after prolonged immobilisation* (see appropriate chapter

Voltage over 12V, change the charger (see workshop documentation)

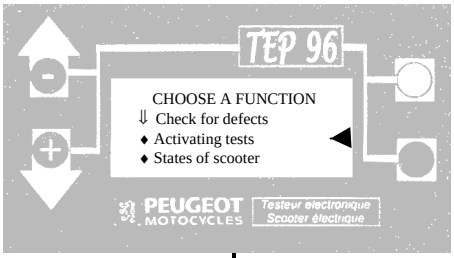
YES

Press the "V" key on the keypad for a minimum of 2 seconds

The charge and maintenance lamps flash

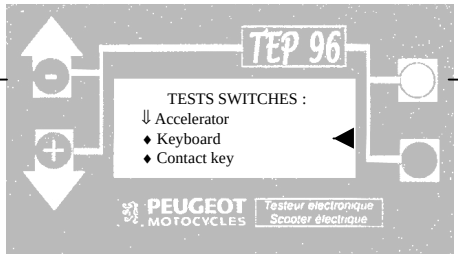
NO

On the TEP 96, carry out a keypad test



YES

Charge between 10 and 15 hours



See next page

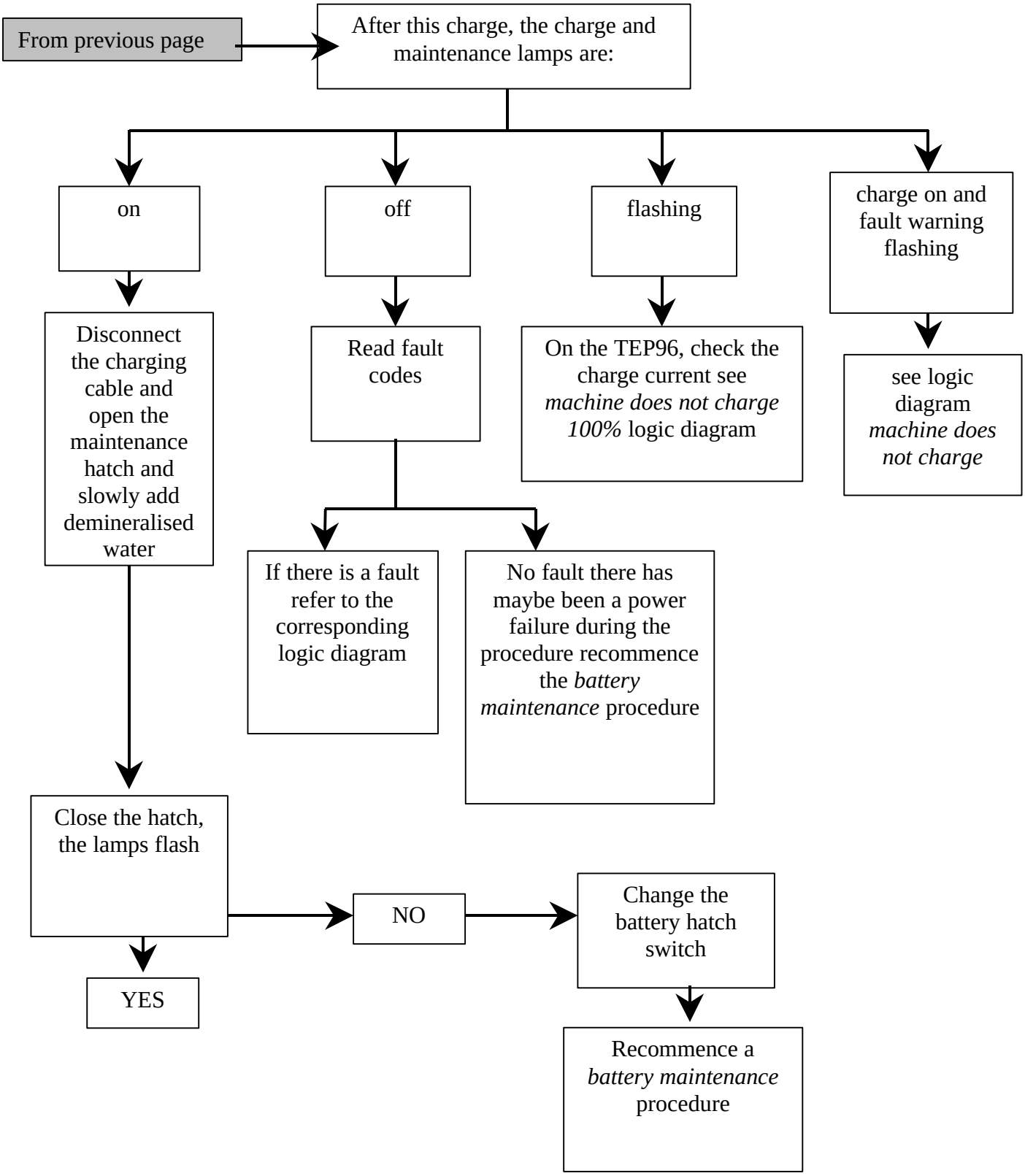
Test OK

Test incorrect

1. Disconnect the charging cable
2. Test drive for 2 or 3 km to slightly discharge the battery
3. Repeat the procedure from the start

Change keypad

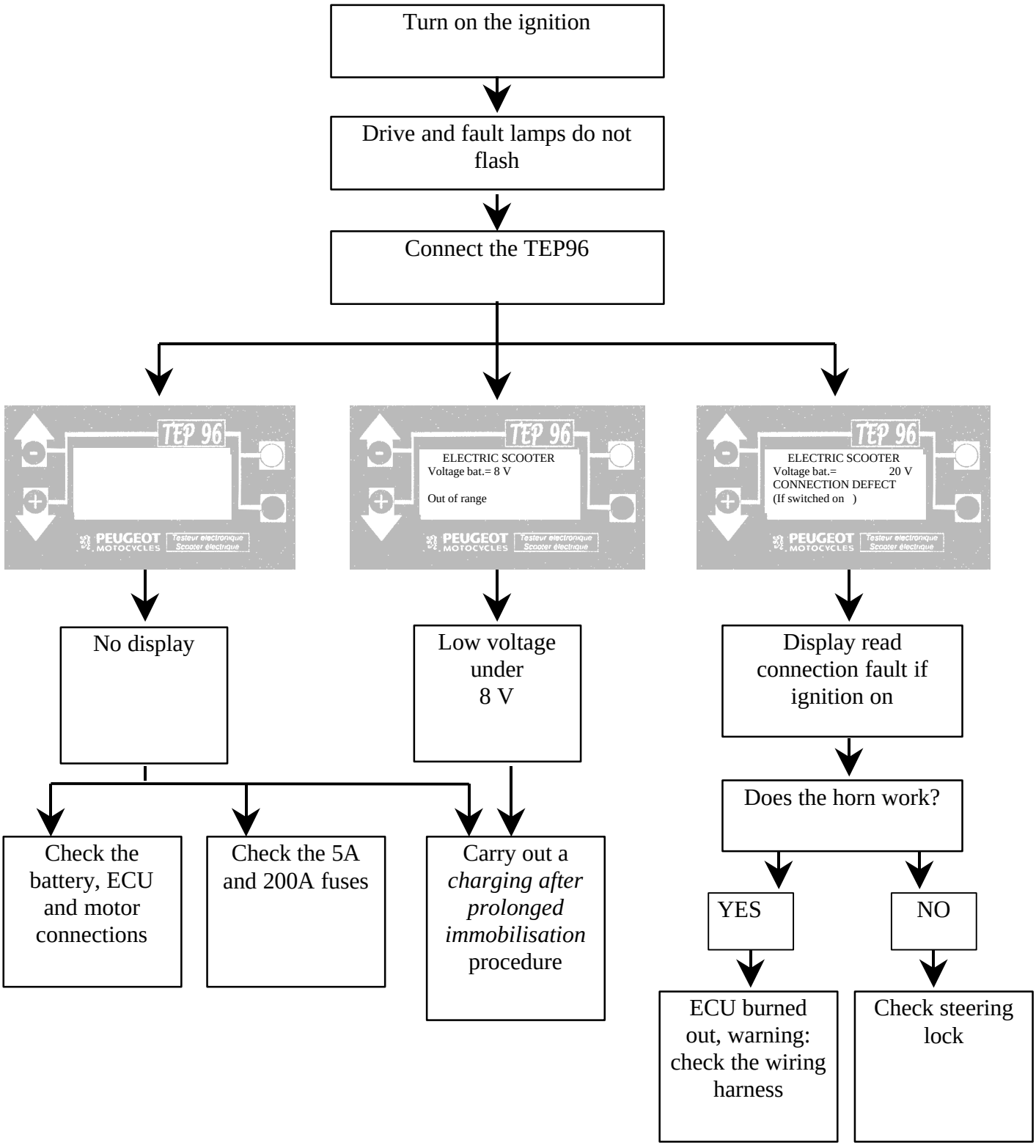
TROUBLESHOOTING LOGIC DIAGRAM



TROUBLESHOOTING LOGIC DIAGRAM

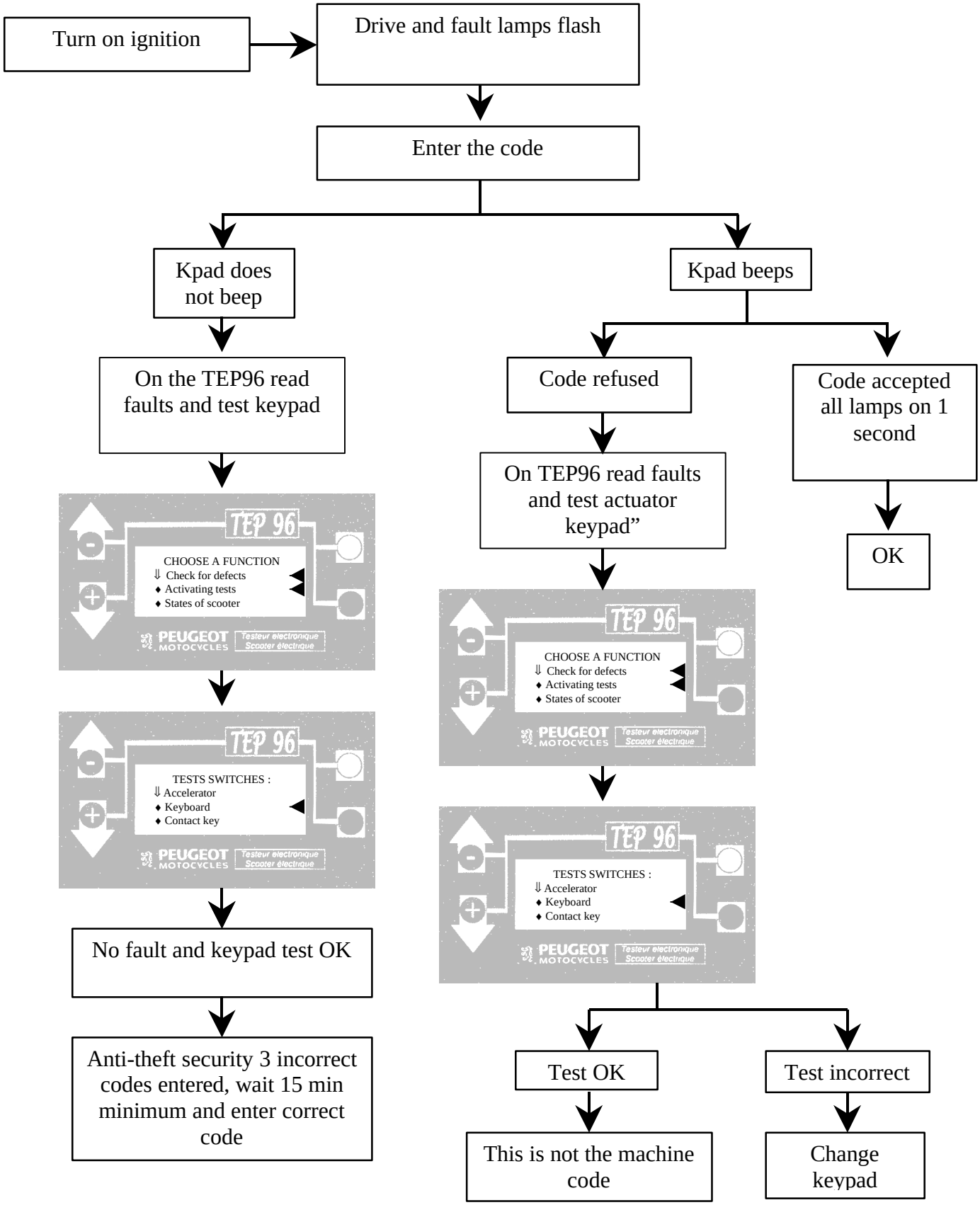
Incident: when the ignition is turned on, the machine does not start:

With or without the following fault codes: CHARGE TIME, MAINTENANCE CHARGE TIME, BAT TEMPERATURE or BATTERY TEMP SENSOR



TROUBLESHOOTING LOGIC DIAGRAM

Incident: impossible to enter immobiliser code:
With or without the following fault codes: KEYPAD



TROUBLESHOOTING LOGIC DIAGRAM

Incident: no drive from motor:

No fault code

Turn on ignition

Drive and fault lamp flash

Enter code

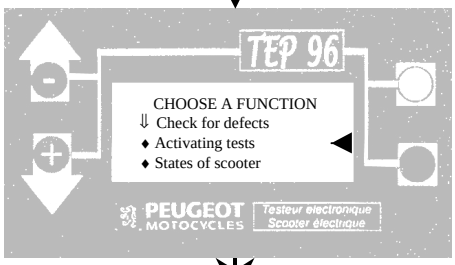
Code accepted all lamps on for 1 second

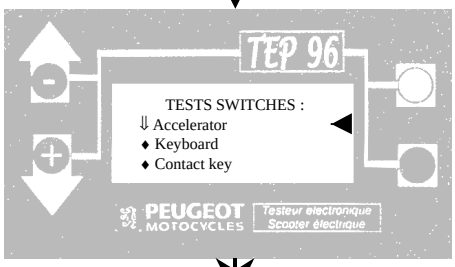
ECU relay does not click

Check the battery voltage if under 14.5 V charge

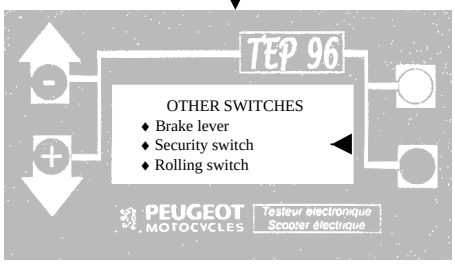
On the TEP96 do actuator test:
- SAFETY BUTTON
- THROTTLE

ECU destroyed: important, check wiring harness



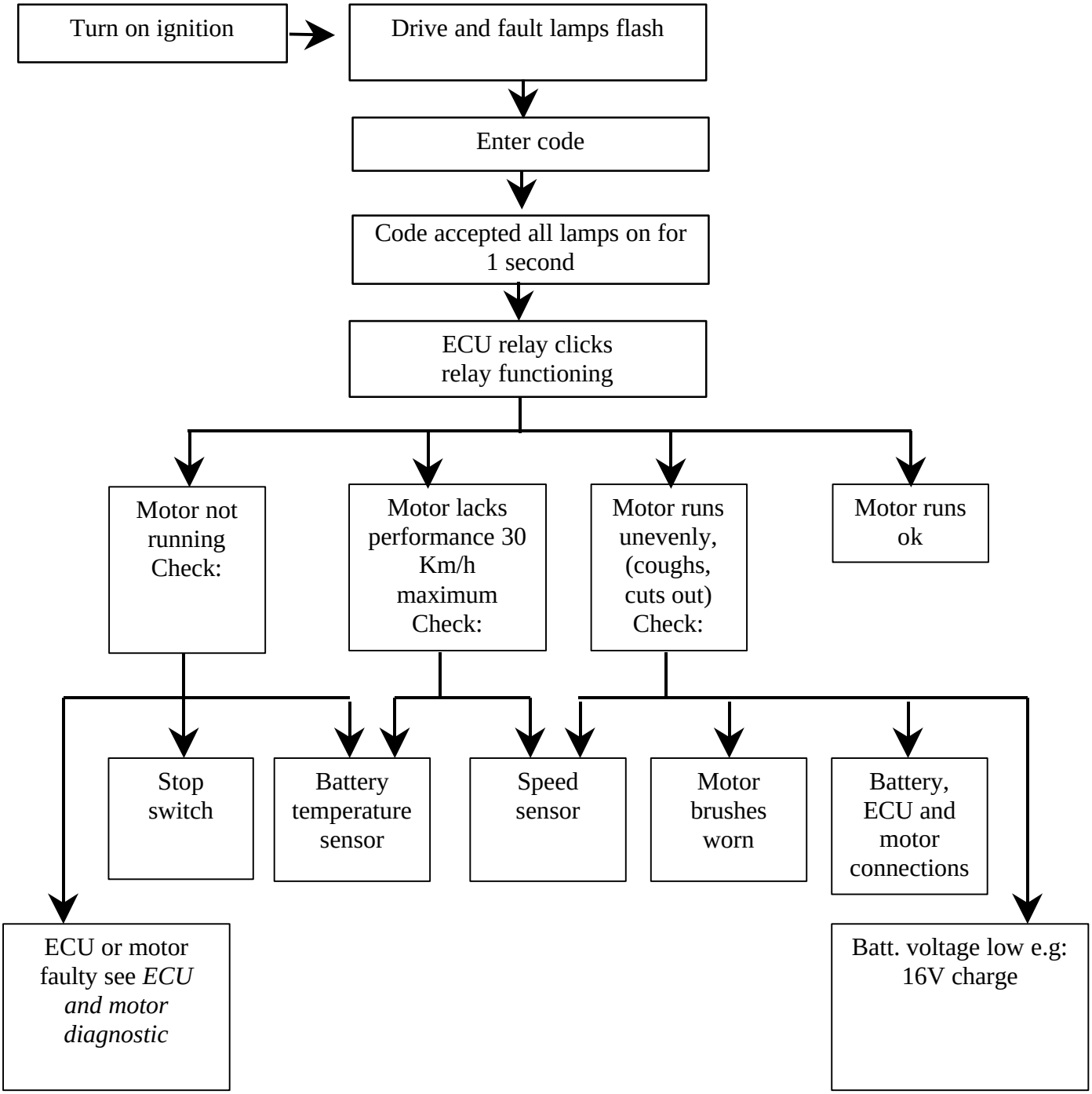


The throttle grip position parameter value should return to 0%



TROUBLESHOOTING LOGIC DIAGRAM

Incident: motor traction fault: (motor does not run, lacks performance)
With or without fault codes: BATTERY TEMP SENSOR, BAT TEMPERATURE, SPEED SENSOR



Incident: loss of range:

Reminder: The scoot'elec has a range of 35 to 40 km at a stabilised speed of 45 k/h with a rider weighing 70 kg, and over a flat route covered without interruption

If a drop in range or low range is experienced, the following parameters are essential to determine the possible fault

- the maximum distance covered with a machine complete charge
- the type of use: short journeys, frequent stops...
- the type of route: town, mountains...
- the rider's weight and load carried
- accessories: windshield, top-case

Before starting work, check the following points:

- tyre pressures: 2.5 bars (look for punctures)
- adjustment of brakes: 20 mm travel on lever

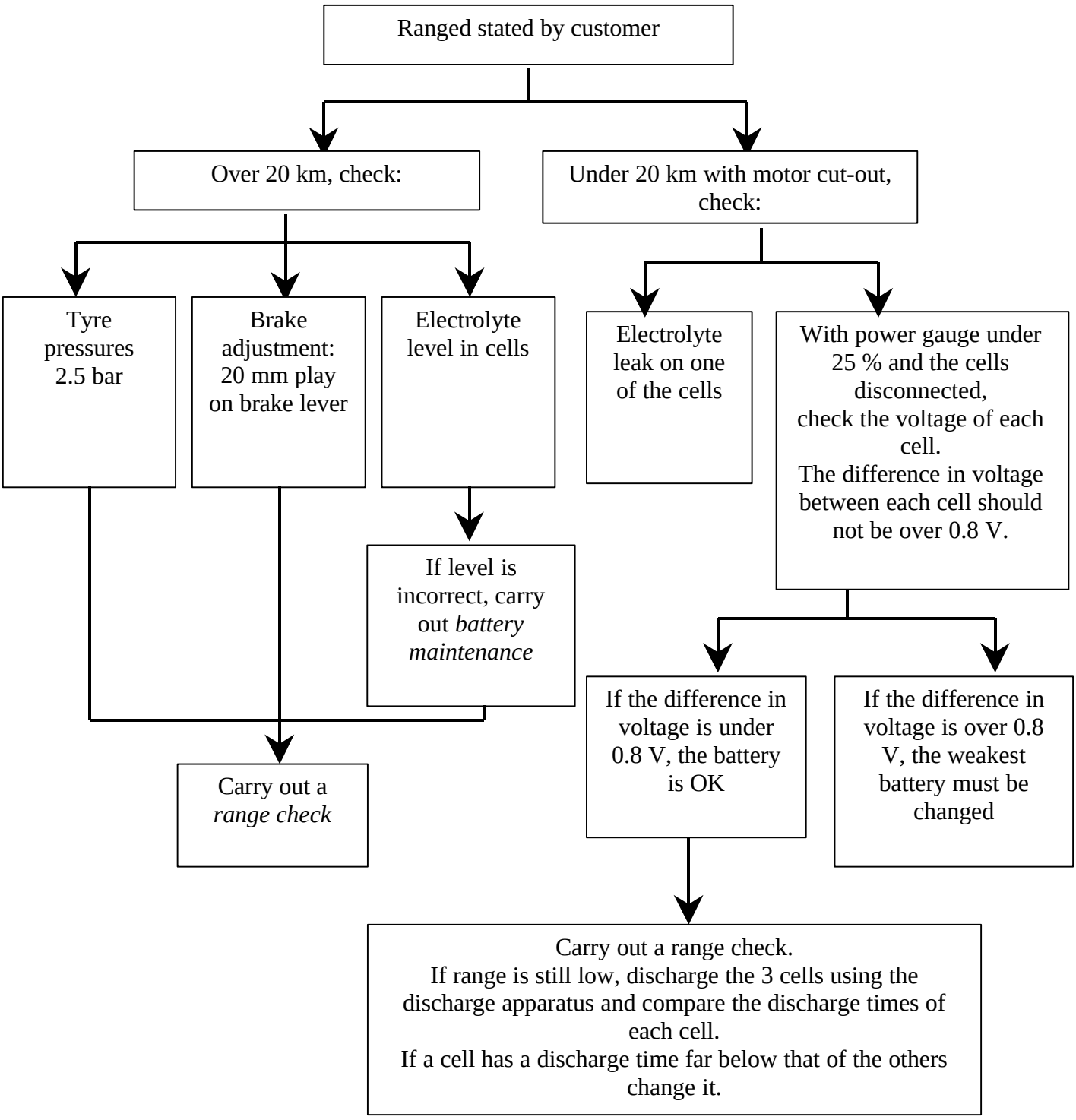
All these points may result in a loss of between 10 and 20 km of range

After these checks, do a range test

TROUBLESHOOTING LOGIC DIAGRAM

Range test:

Under the following conditions:
Scooter charged 100%, run it within a maximum of 8 hours after the end of charging
The route should be covered without interruption, on flat roads with a minimum of stops and until the reserve light comes on (the reserve you to cover another 5 km)



ECU AND MOTOR DIAGNOSTIC

Incidents:

Machine on its stand:
- Motor not running
- The motor runs if helped by turning the rear wheel by hand
- The motor revs hard (E.g.: 67 km/h maximum speed on the TEP96)
- The motor power cables are hot

Causes:

ECU destroyed
Motor destroyed (in this case, the ECU is also faulty)

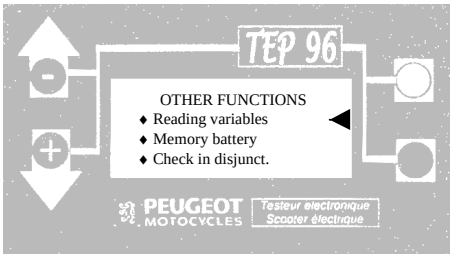
Troubleshooting:

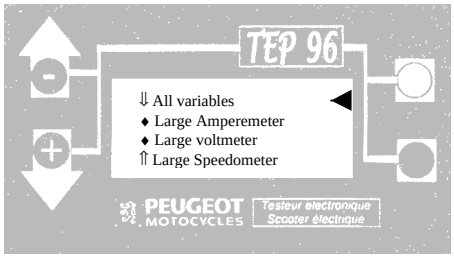
Important:

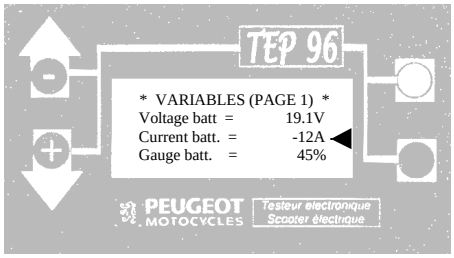
Do not fit another ECU to find the fault, it may also be destroyed if the motor is faulty
The machine charge must be over 50%

1/Fault diagnosis:

Leave the machine on its stand
Turn on the ignition, enter the code on the keypad
Connect the TEP96 and select READ VARIABLES





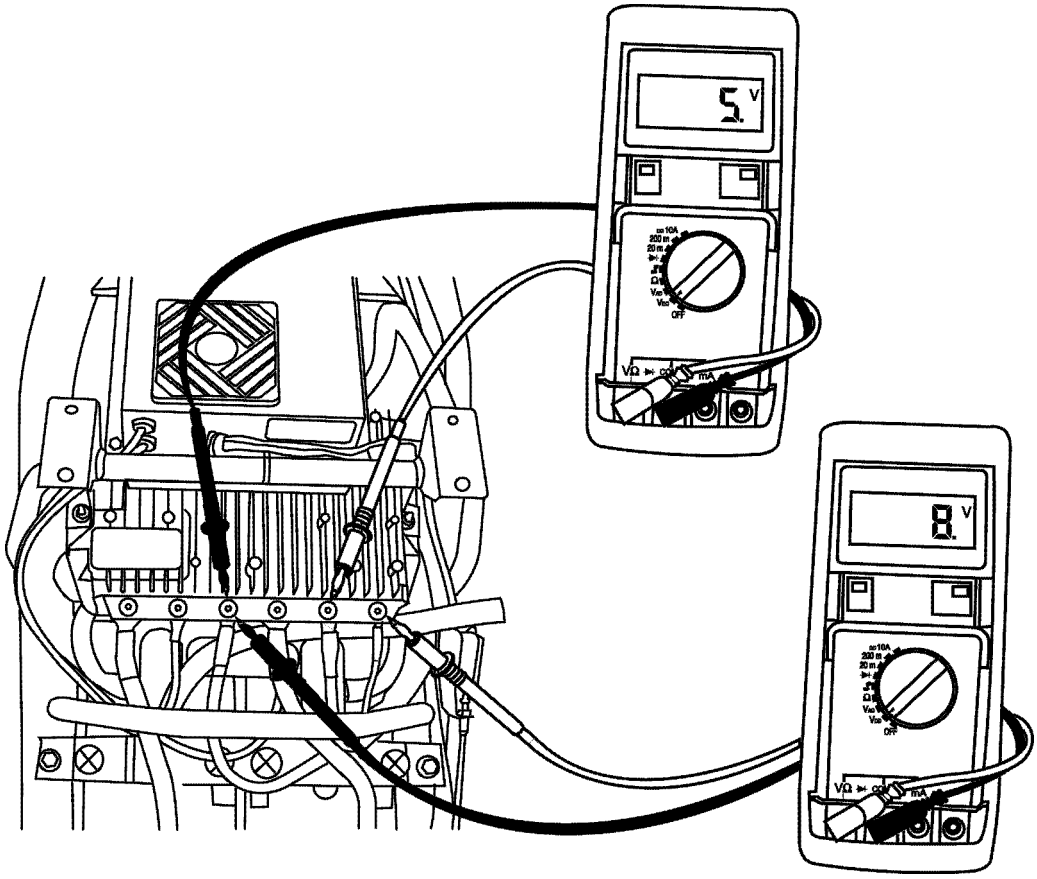


Set the throttle to 100% and take the measurements for each driving mode

	DIAGNOSTIC OPERATIONS	NOMINAL
BATT. CURRENT	-12A	-21 A
ARMATURE RATE	24 %	100 %
EXCIT. RATE	43 %	24 %
SPEED	10 km/h	52 km/h

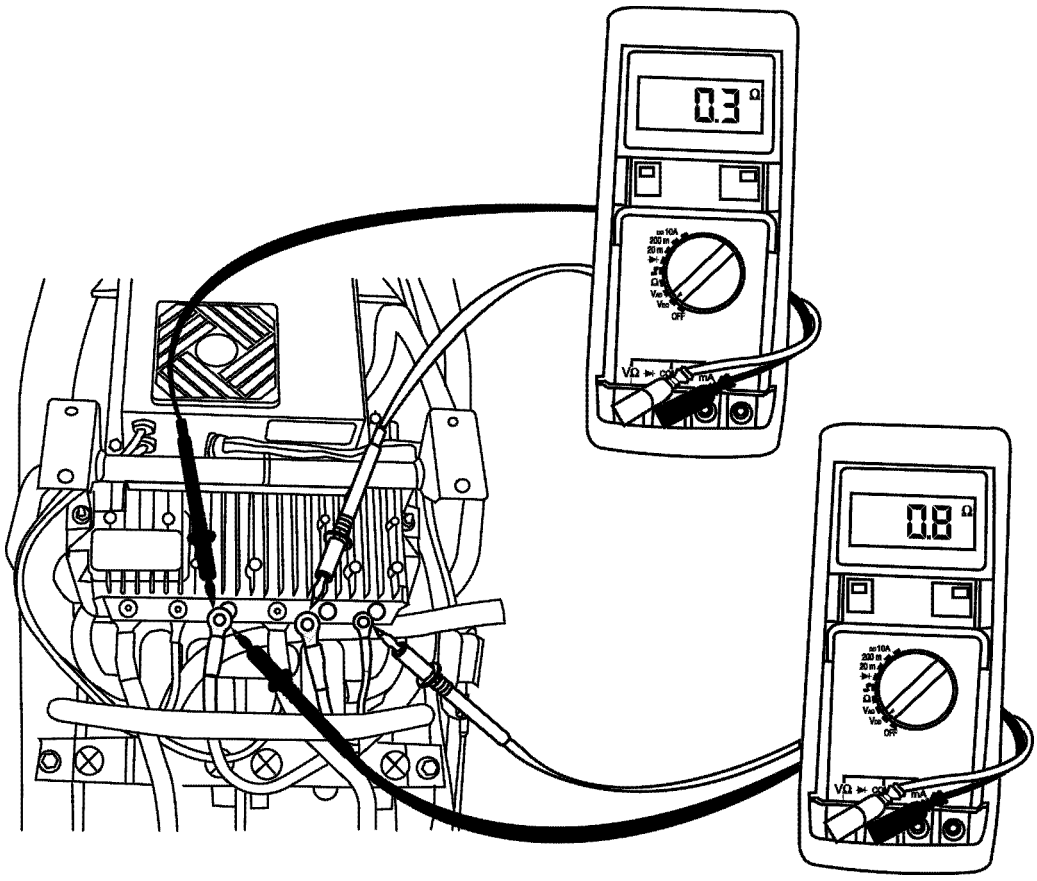
If the readings are different and disparate, the motor or the ECU is faulty.

2/To determine the faulty component:
Remove the saddle and the saddle cover
Turn on the ignition, enter the code on the keypad
Stay in handling mode and fully open the throttle
Measure the voltages with a multimeter set to the DC voltmeter range
Between the +MOT and the –MOT correct value 5V ±1V
Between the +MOT and EXC correct value 8V ±1V



If the values are lower, the ECU is faulty.
If the values are higher, the motor is faulty (in this case the ECU is also faulty).

3/Checking the motor:
Cut off the ignition
Disconnect the battery + and -
Disconnect the motor power cables from the ECU
Measure the resistances with a multimeter set to the ohmmeter range
Between the +MOT and the –MOT correct value 0.3Ω
Between the +MOT and EXC correct value 0.8Ω
Check the insulation of the 3 wires from the motor casing



If the resistances are not correct, the motor and the ECU must be changed.

CHANGING THE ELECTRONIC CONTROL UNIT

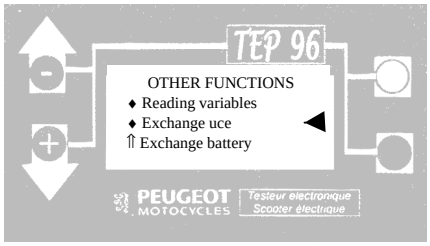
Important point:

- Only do this job if the ECU is being changed
- Before starting any work, the memory of the ECU to be replaced must be copied into the TEP 96

1. Connect the TEP 96 and turn on the ignition.
2. Parameter memorisation

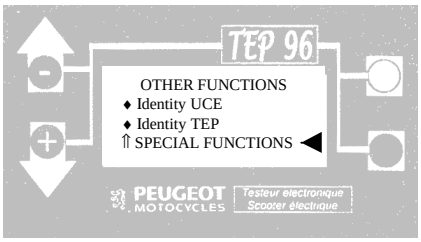
Method for TEP 96 version 1.5. before July 1998:

Select the “Exchange uce” line from the main menu and confirm

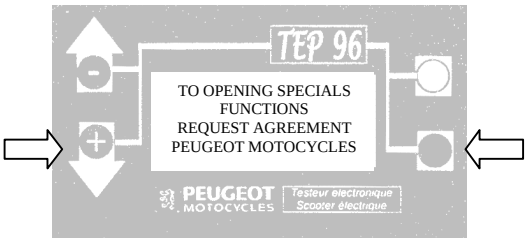


Method for TEP 96 version 2.0. after July 1998:

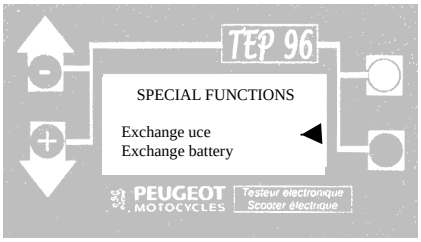
Select the “SPECIAL FUNCTIONS” line from the main menu and confirm



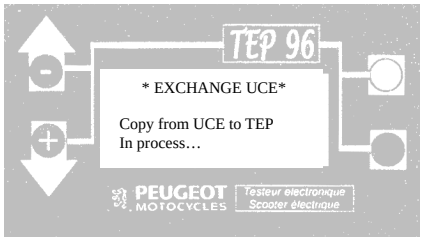
To access the special functions, press on the 2 buttons on the bottom of the TEP 96 for a minimum of 3 seconds.



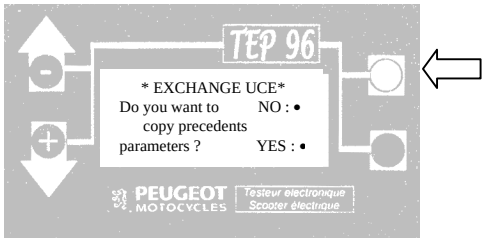
Then confirm on the “Exchange uce“ line.



3. A “Copy from UCE to TEP In process…” screen is briefly displayed (1 second) indicating memorisation of the parameters in the TEP 96

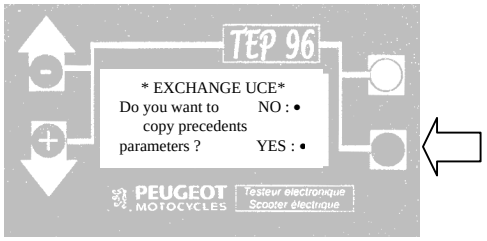


4. Following this screen the TEP 96 displays “Do you want to copy parameters ? NO/YES“ press NO to save the ECU parameters and return to the main menu

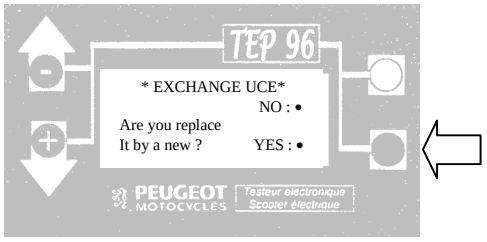


5. Disconnect the TEP 96, turn off the ignition, and change the ECU refer to the *scoot’elect workshop manual*
6. After changing it, repeat operations 1 and 2

the TEP 96 displays “Do you want to copy parameters ? NO/YES“, press YES to transfer the parameters previously memorised to the new ECU



7. Another screen is displayed asking you to confirm writing in the ECU, press YES



<u>The ECU now contains the parameters from the old ECU</u>

8. Disconnect the TEP 96 and switch off the ignition for a minimum of 20 seconds to confirm parameter transfer
9. Turn on the ignition again, enter factory code 1111 and do a road test

BATTERY REPLACEMENT PROCEDURE (3 cells)

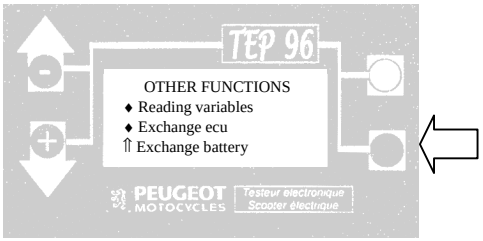
Important point:

This operation may only be carried out after battery replacement consent from PEUGEOT MOTOCYCLES
If one or two of the cells is to be replaced, discharge the remaining cell(s) separately using the discharge bench (see discharge bench user manual)

1. To change the battery, see the *scoot'elect workshop manual*
2. After replacement, connect the TEP 96 and turn on the ignition
3. Initialise parameters

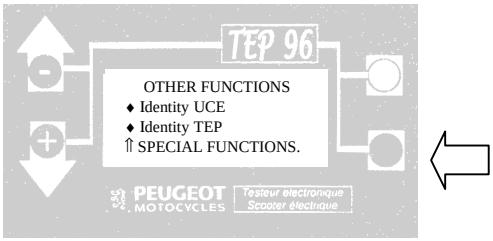
Method for TEP 96 version 1.5. before July 1998:

Select the "Exchange battery" line from the main menu and confirm

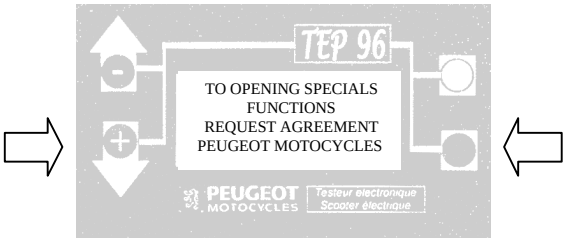


Method for TEP 96 version 2.0. after July 1998:

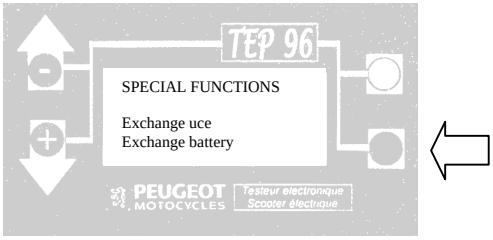
Select the "SPECIAL FUNCTIONS" line from the main menu and confirm



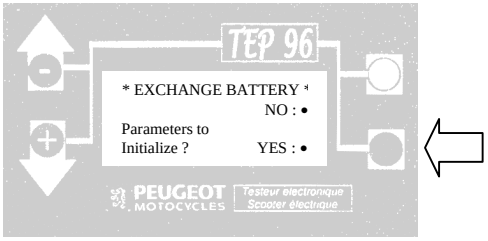
To access the special functions, press on the 2 buttons on the bottom of the TEP 96 for a minimum of 3 seconds.



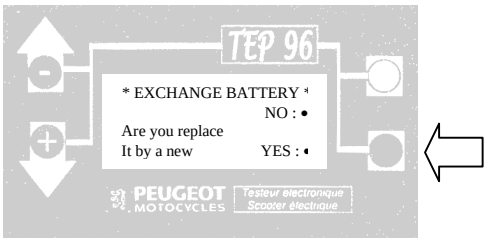
Then confirm on the "Exchange battery" line.



4. A “Parameters to initialize ? NO/YES” screen is displayed, press YES



5. Another screen is displayed asking you to confirm writing in the ECU, press YES



6. Disconnect the TEP 96 and switch off the ignition for a minimum of 20 seconds to confirm parameter transfer
7. Turn on the ignition and enter the machine code, the power gauge is at 0%, the charge and maintenance lights flash showing that the parameters have been initialised
8. At this point, battery commissioning must be carried out (see battery commissioning and maintenance procedure chapter)

PEUGEOT Motocycles

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