Contents

continued...

continued ...

1. Meaning and Definition of the Different "Price Line" Payout Unit "Lines"

"Line" is what the exchange of information is called that takes place through changes in the value of the electrical power phases that the payout unit sends to the machine where it is installed or that the machine sends to the payout unit.

1.1 Push button (or sensor) line

This goes from the machine to the payout unit. It occurs when a button on the machine has been pushed, meaning that a product from the machine has been ordered.

1.2 Price line

This goes from the payout unit to the machine. When the payout unit receives a sensor line, it verifies if it has the sufficient amount to make that sale, and if so, it activates the price line relay corresponding to the sensor line. This is how the extractor motor receives power to operate.

When a button on the machine is pushed, during that short instant when the switch remains closed, the following things happen:

.

-As shown in the drawing, the circuit is closed between the payout unit phase and the machine neutral, so that a small current circulates (limited by the payout unit internal resistance), which is not enough to start up the motor but is enough for the payout unit to detect that a product has been requested from that selection (sensor line).

-The payout unit immediately verifies if sufficient credit has been introduced in order to be able to serve the product from that selection, and if so, it closes the relay that starts up the product extractor motor in the machine (price line).

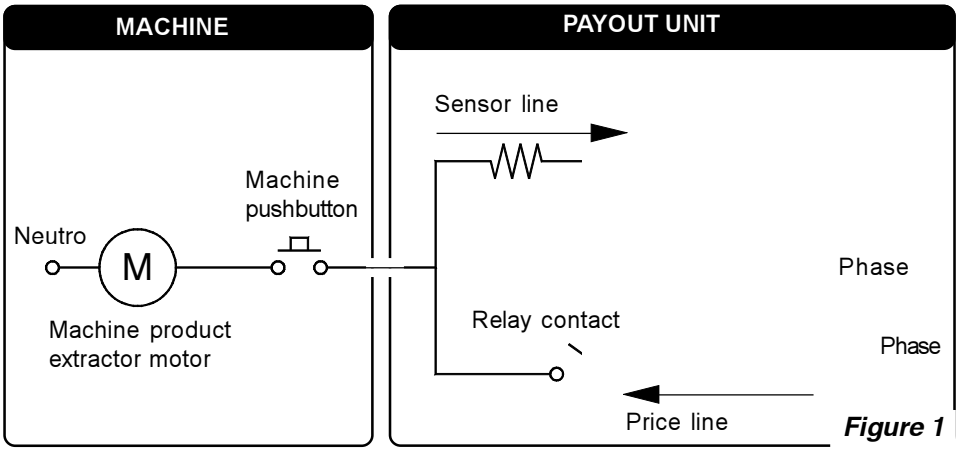


Figure 1

1.3 Blocking line

This is a signal from the machine to the payout unit. It allows the machine to indicate to the payout unit if it is in the process of selling a product or if it is in the idle mode.

The machine sends phase to the payout unit when it is idle and zero volts when it is vending.

In order for the payout unit to admit coins, it needs to have phase on the blocking line.

1.4 Internal erasing

If internal erasing is programmed through function **F04**, this means that the payout unit charges the sale when it detects that the blocking line has disappeared. Therefore, it makes the charge immediately after the machine starts to serve the product.

1.5 External erasing

If external erasing is programmed through function **F04**, the payout unit waits to charge the sale until the machine has finished vending and sends phase again through the blocking line.

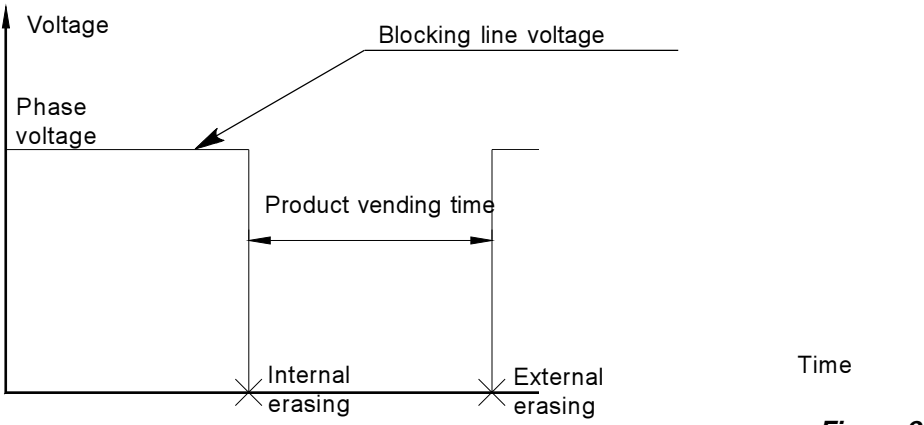


Figure 2

1.6 Maintaining the price line or not

Maintaining the price line or not can be programmed through function **F04**.

If maintaining the price line is programmed, this means that the payout unit will be sending the price line (relay closed) during the entire time it takes to vend the product. If the machine is programmed not to maintain the price line, the relay will only remain closed for an instant (milliseconds), just enough time to initiate vending.

Programming one thing or anther depends on whether or not the machine is capable of making its product extractor motors operate.

"MODULE 4: ADDITIONS AND ACCESSORIES" indicates the programming to be carried out for each machine according to its characteristics.

In any case, if internal erasing has been programmed through function F04, independently of whether it has been programmed to maintain the price line or not, the payout unit will not maintain it.

If external erasing is programmed, it does allow the price line to be maintained or not.

1.7 Security line

This is a signal from the payout unit to the machine.
It allows the payout unit to indicate to the machine whether it can carry out vending or not.

In order for the machine to be able to carry out vending, it needs to receive phase through the security line.See **figure 3**.

If a price line relay remains closed due to a malfunction, as a protection measure, the payout unit is prepared so that the machine cannot receive phase through the security line wire.

1.8 EA Line

There are machines that do not take into account the security line, so that the security line wire from the payout unit will remain disconnected, unable to attach to any machine wire.

Some machine models, especially those designed for cold drink sales, can be provided with a product output detector.

When an **AN 300** or **AN 400** series payout unit is installed in a machine with a product output detector, the payout unit receives the information sent by said detector through the EA line. If the machine does not have a product output selector, the payout unit EA line (Function **F04**) must be programmed **OFF**, if not, the machine would provide the product but the payout unit would not collect the sale.

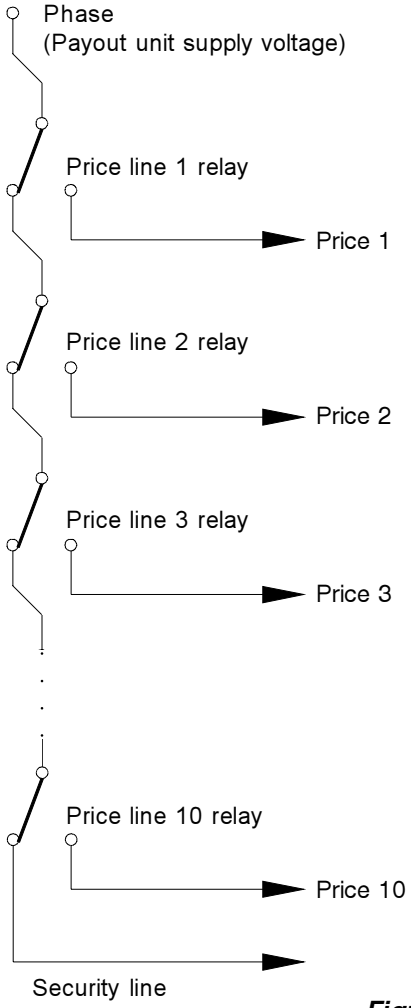


Figure 3

1.9 Out of change

When the payout unit is out of change, it can illuminate the machine indicator light for exact change.

For this, it has a wire that can be connected to one of the light phases on the machine. The light must have the same voltage as that feeding the payout unit (See section 3.5, *Payout unit electrical wiring*).

2. Installation

Any time that the payout unit is connected or disconnected, be sure that the machine is disconnected from the electrical system.

1.Verify that the voltage to be connected to the payout unit corresponds with what is indicated on its specifications label.

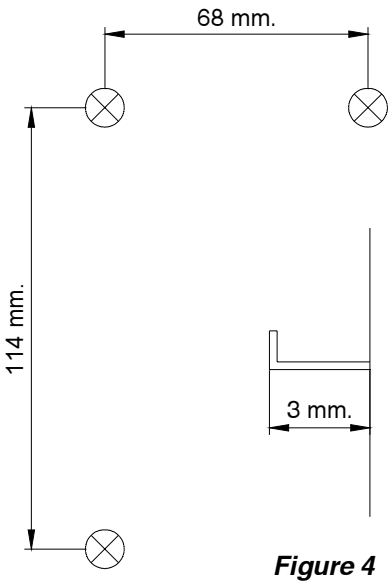


Figure 4

2.Place the machine on the three machine attachment screws. See **figure 4**.

3.Connect the power wiring cable, the exact change light, then the ground wire. After these items, verify that the payout unit is positioned vertically. For it to be in the best working conditions, ensure that the maximum deviation at any angle is not greater than 5º.

Likewise, verify that the pathways to be followed by coins when admitted, rejected, and charged are not poorly positioned. Finally, verify that the return lever is free and in its normal position so that when said function is specified from the exterior, the coin selector can openfully.

4. Proceed to connect power to the payout unit.

5. Fill the return tubes. To carry out this process, see "MODULE 3: PROGRAMMING" «F02 Fill tubes».

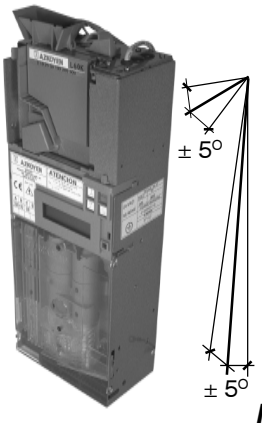


Figure 5

3. Maintenance

The **AN 300** and **AN 400** payout units do not need any special or routine maintenance.

It simply must be kept in mind that coins bring dirt into the payout unit, obstructing the coin selector optical elements.

One indication that the selector has accumulated dirt on its optical elements is when it is necessary to introduce coins various times until they are accepted.

The unit can be cleaned with 96% ethyl alcohol, applying it with a scrubber or a brush, as long as the bristles are not metallic.

Cleaning products that contain benzol hydrocarbons must not be used since they would cause rapid deterioration of the plastic and irreparable damage to the payout unit as well as to the selector module.

Pull on the hinge so that it turns and thus provides access to the coin passage area. This is the area that must be cleaned, endeavouring to keep the small holes where the photodiodes and phototransistors are located from being obstructed with dirt. See **figure 6**.

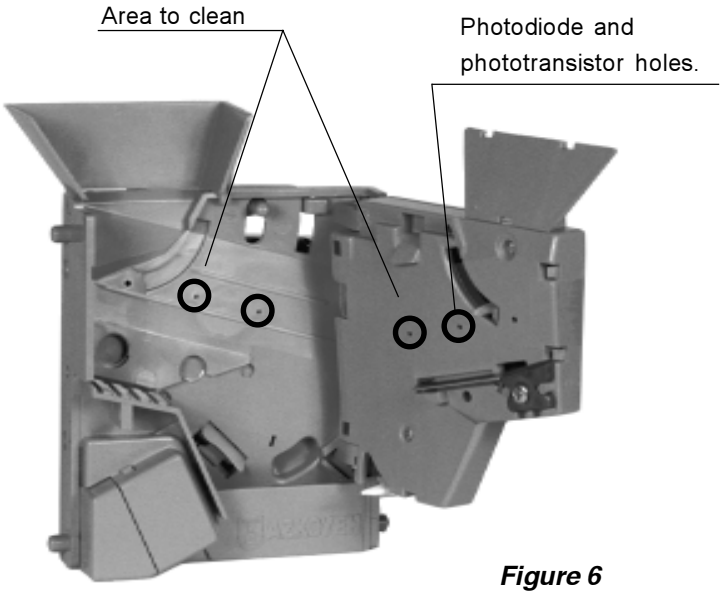
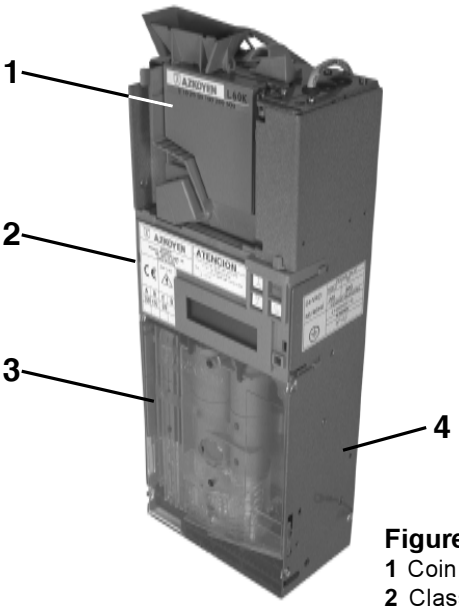


Figure 6

4. Operation of the AN 300 and AN 400 Series Payout Units

AN 300 Payout Unit



AN 400 Payout Unit

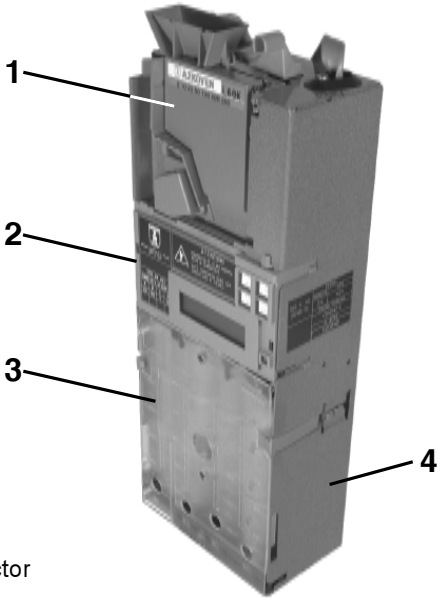


Figure 7
1 Coin selector
2 Classifier
3 Returner tubes
4 "U" Support

4.1 Coin selector

The **AN 300** and **AN 400** series payout units can use the **L60 K** selector or the **LS 5** selector indiscriminately. The characteristics for both of them can be seen in MODULE 1: TECHNICAL CHARACTERISTICS, BASIC LEVEL.

4.1.1 Programming tokens in an LS 6

In order to program one or two tokens for the selector, proceed as follows:
The payout unit must have the power supply connected, the selector must be connected to the payout unit, and the selector control card cover must be removed.

-Using a bridge, connect the two terminals on the left of the connector located in the upper rear part of the selector, as indicated in **figure 8**. The noise caused by activation of the obturator coil can be heard when the two terminals are connected indicating that it is prepared to allow programming for tokens.

-Introduce about 25 tokens of the type to be programmed. In case there are not that many available, they will have to be reintroduced various times. The tokens to be programmed must be within the diameter and thickness limits allowed by the selector. (See point 3 of MODULE 1: BASIC LEVEL TECHNICAL CHARACTERISTICS).

-Remove the bridge placed previously on the selector connector. The noise caused by activation of the obturator coil will be heard again.

-The token is now programmed in the selector, but in order for it to be accepted by the payout unit, its acceptance must be validated and it must be given a value through the **F43** function (TOKENS) of the payout unit.

-In order to program another token, proceed the same way, but place the microswitch (see **figure 8**) in the opposite position from when programming the first token. This means that if it was in the ON position, place it in the OFF position, or vice versa. Once programming is finished for this token, return the microswitch to its original position.

-If you wish to de-program the tokens, just put on and take off the bridge on the upper connector terminals without introducing any tokens.

-In order to void both tokens, repeat the operation with microswitch 1 for both of its positions.

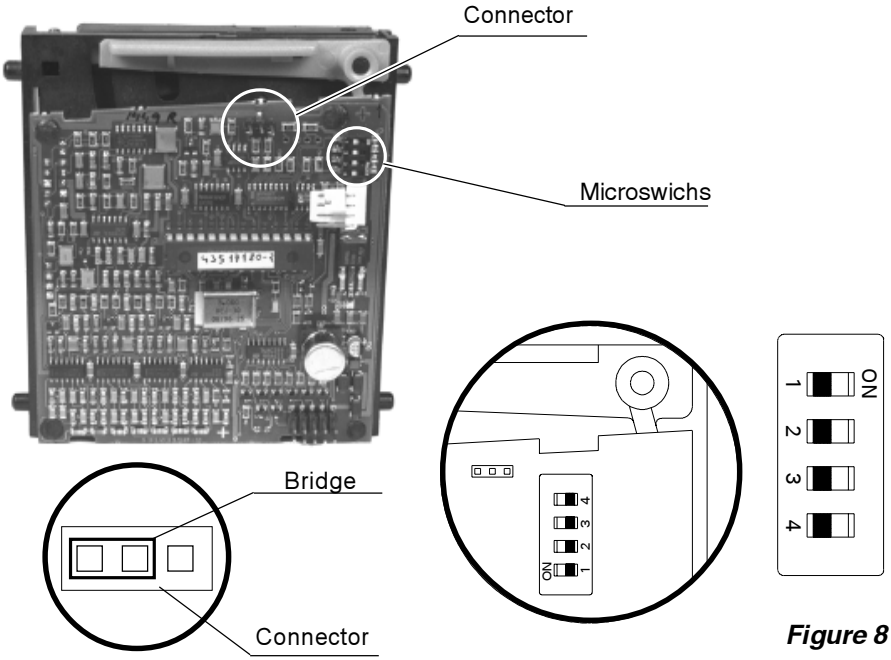


Figure 8

4.1.2 Communication between the selector and payout unit

The **L60 K** and **LS 6** selectors are called "communicators", since they establish a "dialogue" with the microprocessor on the payout unit control card.

When the selector accepts a coin as valid, it sends a code to the payout unit control card in order to indicate the type of coin. In turn, the payout unit control card sends another code to the selector, authorising it to accept the coin or not. If affirmative, the selector directs the coin to the admittance area and sends a code again to the control card in order to indicate that it has correctly admitted the coin.

In order to send the coin codes, the **L 60 K** as well as the **LS 6** have 10 wires, although they only use 9:

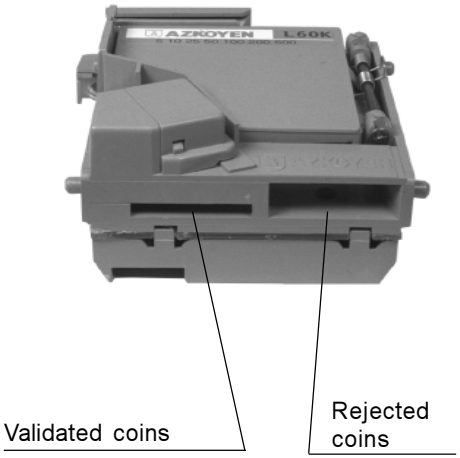


Figure 9

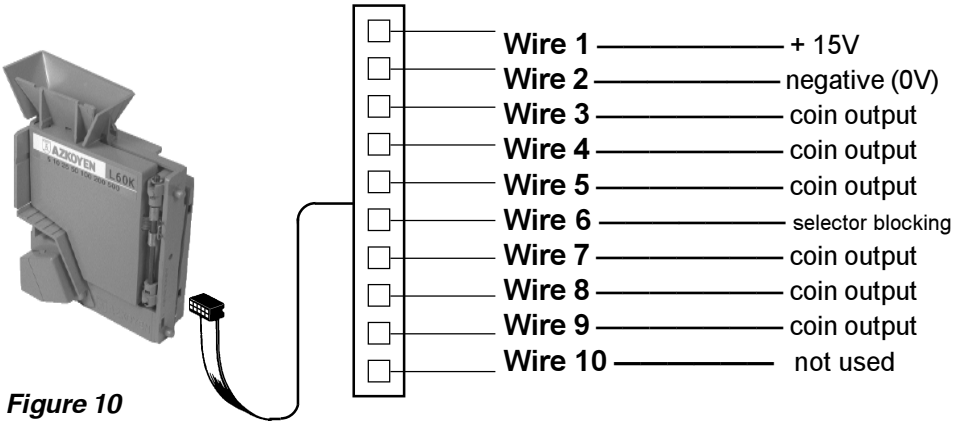
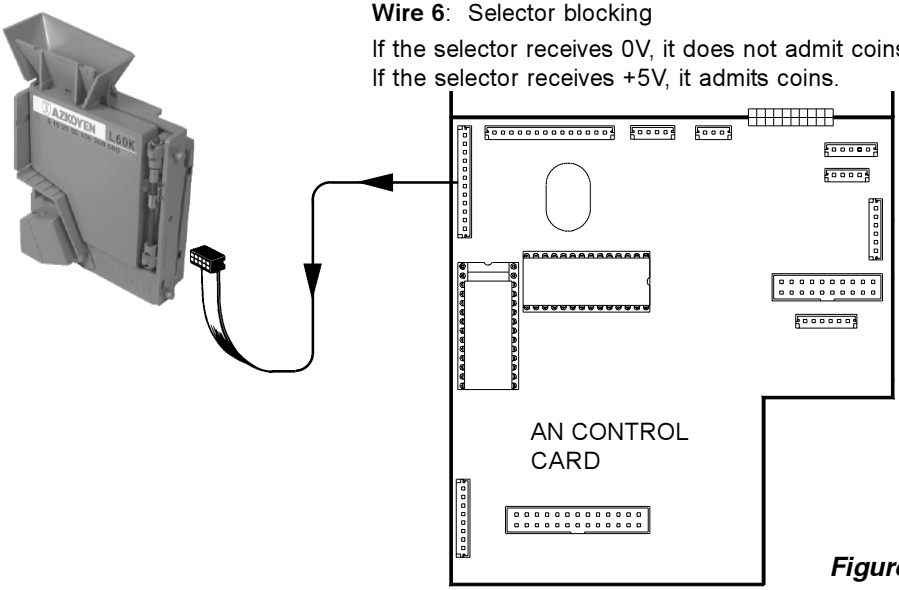


Figure 10

In the idle state, the coin outputs are at 5V, going to 0V when the code is sent.

Using selector inhibitor wire 6, the payout unit can make the selector reject all coins. This way, when the machine where the payout unit is installed is dispensing a product, the selector remains inoperative.



Wire 6: Selector blocking

If the selector receives 0V, it does not admit coins.
If the selector receives +5V, it admits coins.

Figure 11

4.1.3 Coin codes and blocking

The second table shows the outputs activated by the selector when it admits a coin (for the **L 60 K** as well as for the **LS 6**).

The microprocessors are also shown that allow coins to be blocked (void the admission).

Coin	5	10	25	50	100	200	500
Activated outputs	9	4/8	4/9	8/9	4/8/7	4/8/9	4
Blocking	Microswitch	-	-	-	-	2	3

Some coins can be blocked (refusing admission) through the selector control card. To do so, it incorporates 4 microswitches: When they are in the OFF position, the selector admits all coins, and when in the ON position, it rejects certain ones, as indicated in the table.

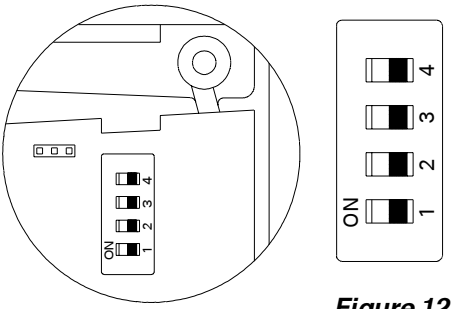


Figure 12

4.1.4 Return code

In the majority of the machines where the **AN 300** and **AN 400** series payout units can go, pushing the return button acts directly on the coin selector, causing it to open.

This opening is detected by the selector photocells, and they immediately send an indicator code to the payout unit control plaque that a return has been requested so that the payout unit «erases» the credit on the display, if there were any.

When it opens, the code that the selector sends to the payout unit control plaque is called the return code.

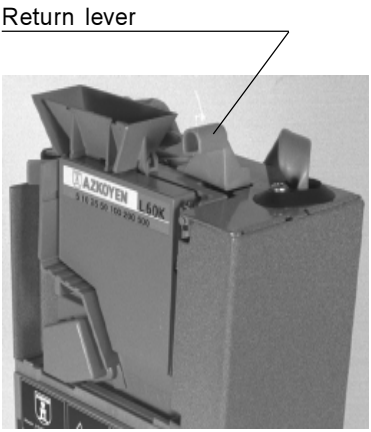


Figure 13

4.2 Classifier

Of the different coins that can be admitted by the selector, three in the **AN 300** and four in the **AN 400** are used as coins for change.

The function of the classifier is to direct the coins admitted by the selector, either to the returner tubes (those for change) or else to the coin bin (those that are not for change).

The types of coins used as change can be easily selected using function **F27** on the payout unit.

When a payout unit returner tube is completely full, coins of this type are also directed to the coin bin.

The classifier also has a fifth route that directly returns those coins that are defective or not allowed by the payout unit, as well as possible frauds.

The entire classification process is done using electromagnets controlled by the payout unit control card and that activate knife paths. The operational coil voltage is 15 volts DC

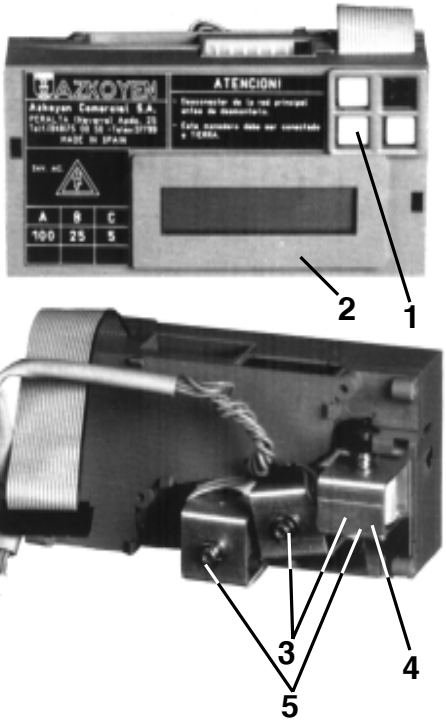
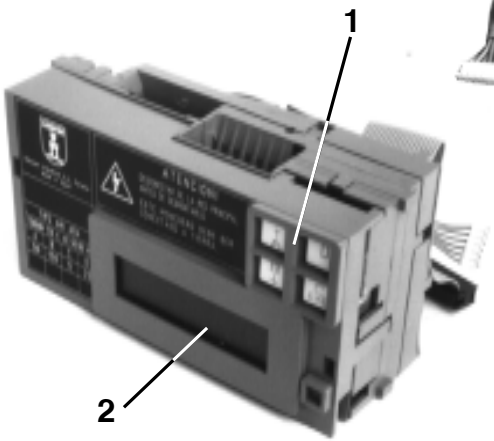


Figure 15. AN 300 Classifier

1 Keyboard
2 LCD Display
3 Coils activated for classifying the tube C coin
4 Coils activated for classifying the tube B coin
5 Coils activated for classifying the tube A coin



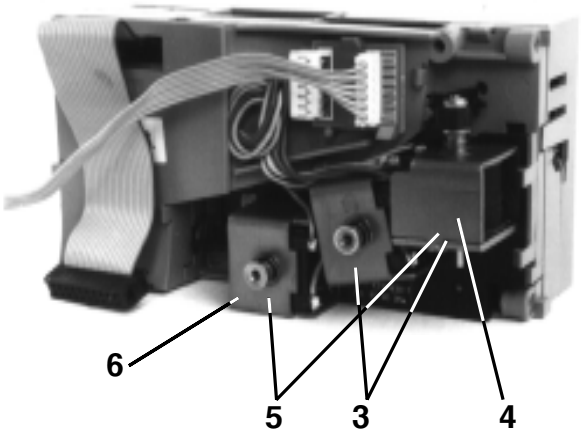


Figure 16. AN 400 Classifier

1 Keyboard
2 LCD Display
3 Classification coil (tube C)
4 Classification coil (tube B)
5 Classification coil (tube A)
6 Classification coil (tube D)

4.3 Returner unit

Its function is to provide change, when necessary, after completing a sale.

Each returner unit has a tube where coins are accumulated and a motor plus a reducer responsible for the extraction.

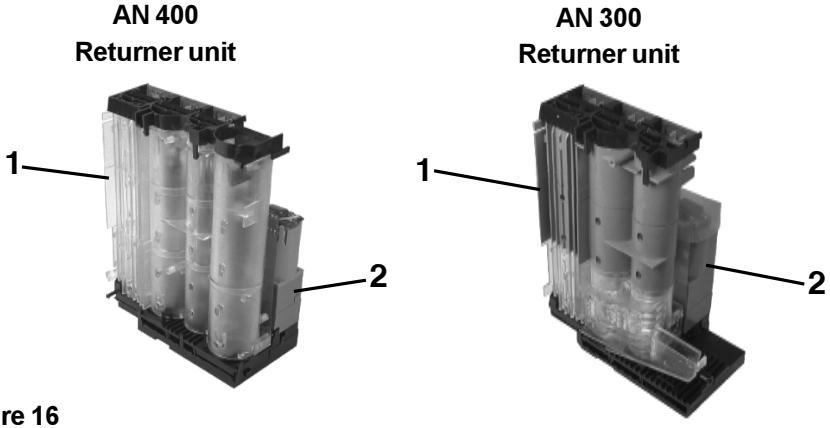


Figure 16

1 Returner tubes unit
2 Coin extractor unit

4.3.1 Returner tubes unit

This is where the coins are stored that were previously separated by the classifier and that will later be used as change.

The **AN 300** series payout units have three returner tubes, while the **AN 400** series have four.

Additional tubes can be placed inside the returner tubes (bushings also, in the AN 300 case), which allow the tube diameter to be suited to the coin that is going to be provided as change.

In this way it is easy to update the payout unit to changes in coins used on the market, or simply to adapt the payout unit to the wishes of its owner regarding the value of the coins to return. In order to understand the additional tubes and the possibilities for adapting to new coins for returns, see MODULE 4: ADDITIONS AND ACCESSORIES.

The payout unit has a programming function (**F27**) that easily allows selection of the type of coin to be returned through each tube. In order to understand this programming, consult MODULE 3: PROGRAMMING.
There are two electronic cards located on the returner tubes that detect whether each tube is full or empty.

Figure 17. Items in AN 300 tubes

1 Full bushings
2 Full detection card
3 Additional tubes
4 Upper tube
5 Central tube
6 Lower tube
7 Empty detection card
8 Bushings

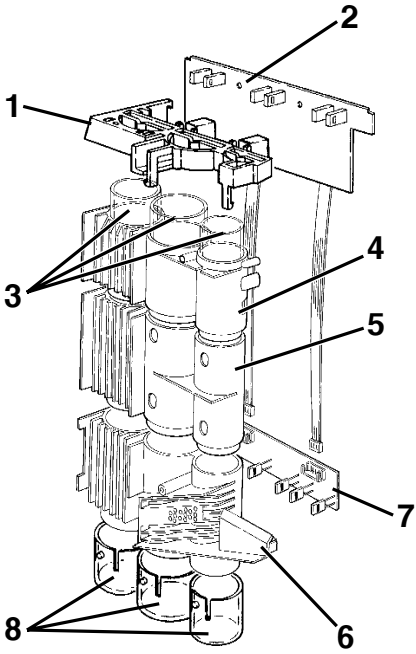
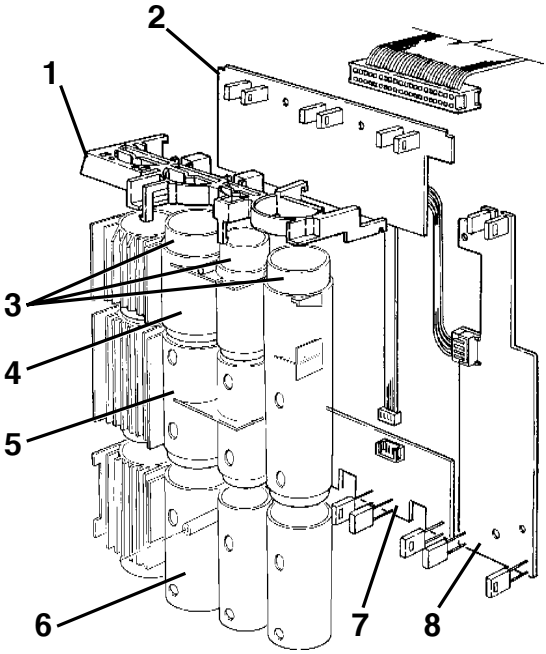


Figure 18. Items in AN 400 tubes

1 Full bushings
2 Full detection card
3 Additional tubes
4 Upper tube
5 Central tube
6 Lower tube
7 Empty detection card
8 Tube number 4 control card



4.3.2 Full tubes control

Detecting whether the returner tubes are full of coins is done through a photodiode and a phototransistor on each tube. Three tubes for the AN 300 and four for the AN 400.

The two photocells face each other and are attached on both sides at the upper end of the tube. A rocker lever is positioned between them, which moves when a coin passes by. This rocker lever has a small orifice cut in it, which when idle, allows a light beam to pass. When the phototransistor receives the light, it is in the saturation mode, so that its collector voltage is approximately 0 VDC. When the coin level in the tube is high enough, the rocker lever cannot return to its idle position, since the last coin admitted activates it. In this situation, the phototransistor does not receive the light emitted by the photodiode, so it disconnects and 5 volts can be measured in its collector.

This voltage change is detected by the payout unit control card, which interprets that the corresponding tube is full of coins.

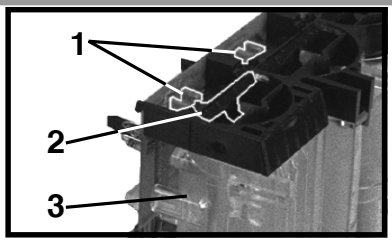


Figure 19
1 Photocells
2 Rocker lever
3 Returner tube

The rocker lever also allows for counting the real passage of change coins into the corresponding tube, which allows the detection of possible jams in the classifier.

The photodiodes are connected in series, so that in case any photodiode wire breaks, the three remaining ones are left without power. Therefore, the three phototransistors will stop receiving light, whereby the control card will interpret that the three returner tubes are full of coins, although there may be none in them.

The same thing would happen if one of the photodiodes broke or remained open; the circulation of current would be interrupted in the three photodiodes and none of them would emit the corresponding light beam.

The phototransistors are completely independent. If one of them broke down, it would only affect the corresponding tube.

4.3.3 Empty control

Just like for full control, the minimum coin level in the returner tubes is controlled by a photodiode and a phototransistor located on both sides at the lower end of each tube.

When the coin level interrupts the light beam emitted by the photodiode, the phototransistor closes the circuit, and 5 V can be measured at its collector. This voltage change in the collector is detected by the control card, which interprets that the minimum level of coins exists in the tube.

The three photodiodes are powered in series, while the phototransistors are independent.

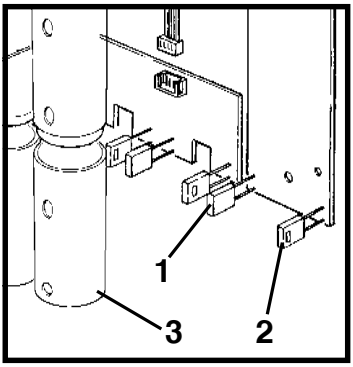


Figure 20
1 Photodiode
2 Phototransistor
3 Returner tube

4.3.4 Coin extractor unit

Its function is to extract the change coins store in the returner tubes.

There is a motor plus a reducer for each returner, three for the **AN 300** and four for the **AN 400**.

The power supply for the motors is 15DCV, and each reducer moves a knife located under the column of coins in the returner.

This knife extracts coins one by one.

Counting of the extracted coins is done through an run-end microswitch that is activated by a cam every time the reducer rotates 360 degrees.

The schematic for connecting the motors and their run-end microswitches is the following:

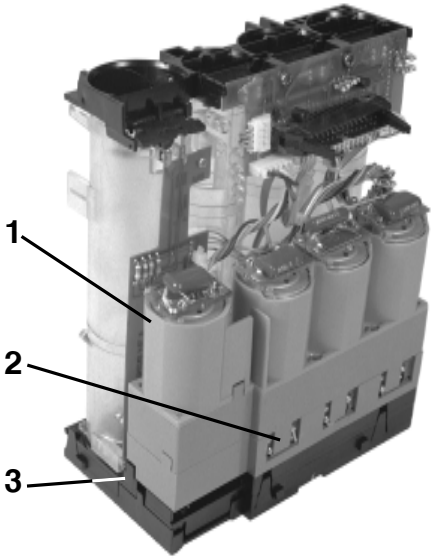


Figure 21
1 Motor + reducer
2 Run-end microswitch
3 Knife unit

4.4 Payout Unit electrical wiring

Two electrical bundles come out from the payout unit control plaque, which have the following functions and characteristics:

.

-One bundle ending in 15-way Molex connector with only three wires.

This bundle is for the payout unit power supply: 24 ACV.
It also incorporates a third wire that the payout unit can use for an out-of-change light (24 AC V) on the machine.

Colour	Function
Brown	24 V A.C. Phase
Blue	Neutral
Brown/Blue	Out-of-change light ilumination

· **Bundle that ends in a 9-way Molex connector**

This bundle allows communication between the machine electronics plaque and the payout unit. This communication is called EJECUTIVO type.

Coleur	Function
Yellow	Tx+
Brown	Rx-
White	Rx+
Green	Tx-
Black	Screen

4.5 Eprom Memory

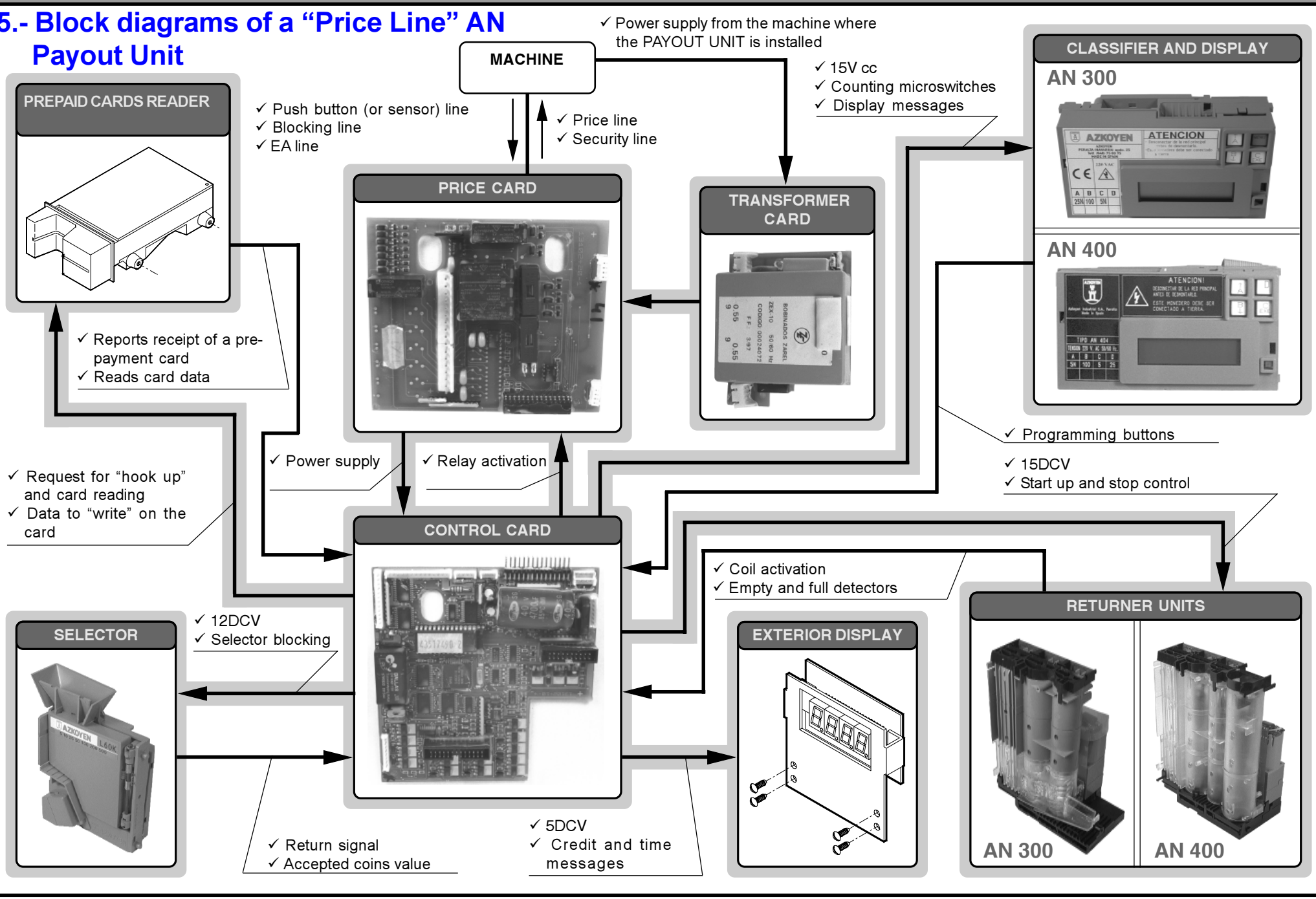
She eprom memory is located at a socket on the payout unit control plaque. The general operational instructions for an EJECUTIVO-type payout unit are recorded in this memory.

It is distinguishable with the sticker that is placed on it by the program reference number:

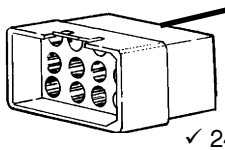
· **43517490** ———— For the **AN 300**
· **43514450** ———— For the **AN 400**

These references also have a number, separated by a dash, that indicates the memory version. When a program is incorporated into a payout unit for the first time, it is indicated by version 0; every time an improvement is introduced into the program, the version number advances by one.

5.- Block diagrams of a "Price Line" AN Payout Unit



6. Block diagrams of an "EJECUTIVEO" type AN Payout Unit



✓ 24DCV

✓Illumination of out-of-change light (brown/blue wire)

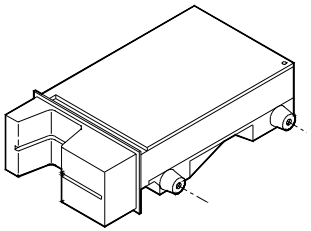
✓ 15V cc
✓ Counting microswitches
✓ Display messages

CLASSIFIER AND DISPLAY

AN 300

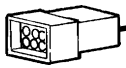
AN 400

PREPAID CARDS READER



✓ Reports receipt of a pre-payment card
✓ Reads card data

REGULATOR CARD



✓ RS type of communication with V.M.C.

✓ Activation of the out-of-change relay

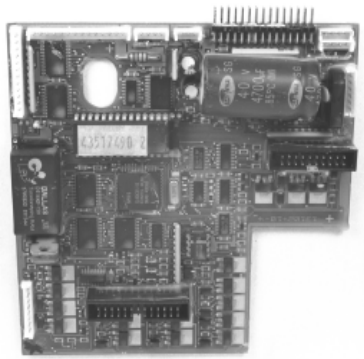
✓ Power supply

✓ Programming buttons

✓ 15DCV
✓ Start up and stop control

✓ Request for "hook up" and card reading
✓ Data to "write" on the card

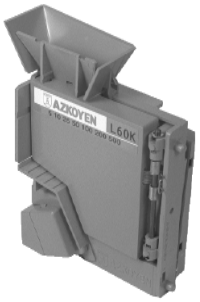
CONTROL CARD



✓ 12DCV
✓ Selector blocking

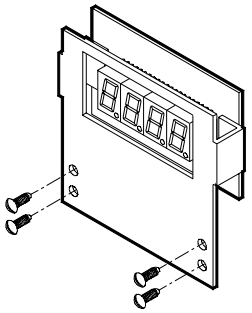
✓ Coil activation
✓ Empty and full detectors

SELECTOR



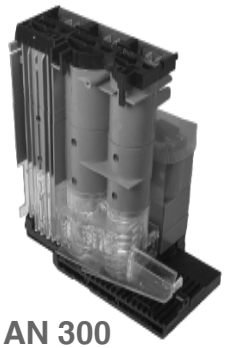
✓ Return signal
✓ Accepted coins value

EXTERIOR DISPLAY



✓ 5DCV
✓ Credit and time messages

RETURNER UNITS



AN 300

AN 400

7. Troubleshooting

When the payout unit display indicates any malfunction message, in order to be able to enter programming and reset that malfunction, the red menu button must be kept pressed for several seconds.

7.1 Malfunctions detected by the payout unit

The **AN 300** and **AN 400** series payout units are capable of detecting a series of malfunctions, indicating a message on display. A list is given below of these malfunctions as well as their possible causes.

DISPLAY MESSAGE	POSSIBLE CAUSES
MOTOR A MALFUNCTION MOTOR B MALFUNCTION MOTOR C MALFUNCTION MOTOR D MALFUNCTION	-Coin jam. -.Motor broken. -The microswitch for the motor run-end does not operate correctly. -Broken payout unit plaque.
CLASSIFIER JAM	-Coin jammed in the classifier. -Broken full photocell for the returner tubes -Broken payout unit plaque
BLOCKING LINE ERROR	-The blocking line between the machine and the payout unit has not been connected -Payout unit wiring cable with split wires or poor contact. -Broken payout unit plaque.
ADMISSION LIMIT	-More money is being introduced into the payout unit than what is programmed as the maximum allowable, (see **F03**).

DISPLAY MESSAGE	POSSIBLE CAUSES
RETURN LIMIT	-This appears when the payout unit specifies giving more change than what has been programmed as the maximum return (see F03).
RETURN BLOCKED	-This appears when trying to get back the money introduced, and mandatory sale has been programmed
VMC DOES NOT RESPOND TO “ACCEPT DATA” VMC DOES NOT RESPOND TO “COMMAND STATUS” VMC DOES NOT RESPOND TO “CREDIT VMC DOES NOT RESPOND TO “SALE”	-These four messages can only be offered in payout unit communications with the EJECUTIVO-type language, and not the “price lines” or those with MDB language. –The four messages are commands that the pay unit sends to the machine control plaque. When they appear on the payout unit display, it is because good communication does not exist between the payout unit and the plaque. This could be due to the fact that either the plaque for the machine or the payout unit is broken. It could also be due to problems in the wiring that connects the two elements. -In the specific case of the Azkoyen Husimat series machine models, if the VMC. does not respond to command status message is seen, it could be due to the fact that the **F28** function for the payout unit is programmed ON. Just change the programming to OFF in order to correct the problem.

7.2 Malfunctions not detected by the payout unit

A wide variety of malfunctions can occur that the payout unit is not capable of detecting and indicating on a display message. Some of these possible malfunctions and their causes are given below:

The display does not illuminate and no coin is accepted

-The payout unit does not have power due to the fact that the machine where it is located is disconnected.

-The payout unit is connected incorrectly to the machine or it is being supplied with inadequate power.

-The 0.8-ampere fuse is blown.

-The display is broken.

-The control plaque is broken.

It rejects all coins that are introducced

-The payout unit is out of service, and a malfunction message can be read on its display. It is necessary to correct the malfunction and reset the payout unit.

-In function F09, it has been programmed to not admit any coin.

-The payout unit does not have change and in function **F30** it has been programmed to reject all coins in an “out-of-change” situation. In order to find out if it is in an out-of-change situation, see function **F06** (number of coins in the returners) and **F11** (programming minimums).

-Wiring cable connection between the selector and the payout unit plaque is disconnected or broken.

-The selector placed in the payout unit is not the proper one. Compare its reference number with the “Variable sheet” on the parts list.

-Broken coin selector

It rejects all coins of a certain value

-In function **F09**, it has been programmed not to admit specific coins in question.

-Coin or coins blocked by the coin selector microswitches

-The selector placed in the payout unit is not the proper one. Compare its reference number with the “Variable sheet” from the parts list.

-Broken selector

swiches del selector de monedas

The coins must be introduced various times until they are accepted.	-The coin selector is dirty and must be cleaned (see maintenance) -Selector broken.
It does not classify some or all of the return coins, even though	-The coin (or all of them) is not programmed as a change coin (see F27). -Full photocell broken for the tube corresponding to the coin. -It could be that the coin count for one tube or all tubes does not correspond to the true number of coins existing in them. Check accounting for coins in the tube using function **F06**. If it is not correct, erase it from the RAM using function **F22**. -Broken payout unit control plaque
When return is pushed, the payout unit does not return the coins.	-Mandatory sale has been programmed from function F04. In this case, when return is pushed, "Return blocked" can bee read on the payout unit display. -Broken coin selector. -Broken payout unit control plaque
It does not return some of the change coins.	-If the payout unit is out of service and "Motor A, B, C, or D malfunction" can be read on the display, in this case see the section on malfunctions detected by the payout unit. -The corresponding tube is empty and in function **F27** that coin has not been programmed as a change coin. -It could be due to the fact that the coin count for that tube does not correspond to the true number of coins existing in it. It could happen that the tube is full, and that due some error or because the RAM has been erased (**F22**), the coin count for that tube is at zero coins. See accounting for coins in tubes using function **F06**, and if it is not correct, extract all of the coins from the tubes and introduce them again using function **F02**. -Broken payout unit control plaque

No change coins areturned.	-The payout unit is out of service and "Motor A, B, C, or D malfunction" can be read on the display, see the section on malfunctions detected by the payout unit. -The returner tubes are empty and in function **F27** no coin has been programmed as a return coin. · -In function **F04**, "multiple sale" has been programmed. In this case the payout unit does not provide the change immediately after having made the sale, but it does provide the change when "return" is pushed. · -It could be due to the fact that the coin count in the tubes does not correspond to the true number of coins existing in them. It may be that the tubes are full of coins and that due to some count error or because the RAM has been erased (**F22**), the coin count in the tubes is at zero. Check accounting for coins in tubes using function **F06**. If it is not correct, extract all of the coins from the tubes and reintroduce them again using function **F02**. -Broken payout unit control plaque
The 0.8-amp fuse is blown.	-The payout unit is being powered at a voltage above its nominal operating voltage. -Broken payout unit control plaque
No change coins are returned.	-Some of the price lines are programmed at zero pesetas -Broken payout unit control plaque