



COMMONWEALTH OF AUSTRALIA

NATIONAL STANDARDS COMMISSION

Weights and Measures
(National Standards)
Act 1960-1966

Weights and Measures
(Patterns of Instruments)
Regulations

Certificate of Approval

CERTIFICATE NUMBER 5/6A/40

In respect of the pattern of

Gilbarco T173C Transaction System and Variants.

Submitted and
manufactured by: Gilbarco Australia Ltd.,
 16-34 Talavera Road,
 North Ryde,
 New South Wales. 2113.

This is to certify that the pattern and variants of the instrument illustrated and described in this Certificate have been examined by the National Standards Commission under the provisions of the abovementioned Regulations and have been approved as being suitable for use for trade.

The pattern and variants were approved on 29th March 1972.

Approval was granted on condition that:

1. all instruments conforming to this Certificate:
 - (a) are appropriately marked NSC No 5/6A/40; and
 - (b) comply with the General Specifications for Measuring Instruments to be Used for Trade;
2. the Commission is notified[‡] of the location and serial number

‡ Inspectors should not verify any instrument conforming to this Certificate until advised in writing by the Pattern Approval Laboratory that this condition has been complied with.

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Cont'd over

of the first ten instruments (Transaction Systems) conforming to the pattern and variants, submitted to State or Territorial Weights and Measures Authorities for verification;

3. the Commission may re-examine any instrument after verification; and
4. the instruments are tested in accordance with the test procedure specified in the General Notes.

This Certificate comprises:

Pages 1 to 12 dated 12th April 1972.

Figures 5/6A/40 - 1 to 16 dated 12th April 1972.

Date of issue 12th April 1972.

Signed



A person authorized by the Commission to sign Certificates under the abovementioned Regulations.

DESCRIPTION OF PATTERN

The pattern is of a post-payment self-serve driveway flowmeter, known as the Gilbarco T173C Transaction System. It comprises the components tabulated in Column 5 of Figure 1 which, with the exception of Components Nos 26 to 28, are housed in a steel cabinet (see Figure 2) and arranged as shown in Figure 3. The driveway flowmeter is known as a Gilbarco T166Q.

The Transaction System permits an operator located within sight of the driveway flowmeter to supervise and control, by means of the control unit, purchaser operation of the driveway flowmeter. A printer provides the operator with printed tickets which are marked with the pump number and the quantity and price of a delivery.

A mode-selection switch is available to the operator and allows the driveway flowmeter to be used in either "manual" or "automatic" mode.

With the system on "auto" and with the driveway flowmeter authorized for use by the operator pressing the "authorize" button, the removal of the nozzle from the hang-up bracket will automatically reset the computer to zero and then start the pump motor. At the completion of a delivery, returning the nozzle to the hang-up bracket will stop the pump motor and engage interlocks which will prevent the pump motor from being restarted and the computer from being reset. A ticket will automatically be printed by the printer on the operator's console.

When the purchaser completes his transaction with the operator, the operator, by pressing the "authorize" button, releases the driveway flowmeter for use by the next purchaser.

With the mode-selection switch on "manual" the driveway flowmeter is not controlled by the operator's control unit, no tickets are printed, and the computer may be reset to zero without using the "authorize" button.

The operator is also provided with a "lock-out" switch for the driveway flowmeter which, when selected, will open the triac switch supplying power to the pump motor. The operation of lock-out during a delivery will stop the pump motor without engaging any interlocks and without

causing a ticket to be printed. When the lock-out is switched off, the pump motor will restart and the delivery will continue without the computer resetting to zero. The return of the nozzle to the hang-up during lock-out will engage interlocks and cause a ticket to be printed.

The control circuit of the Transaction System is shown in Figure 4. The hydraulic diagram is the same as for the Gilbarco T166A, described in Certificate No 5/6A/24, and the maximum flow rate is 50 litres per minute.

DESCRIPTION OF VARIANTS

1. The components tabulated in Column 6 of Figure 1 assembled, with the exception of Components Nos 26 to 28, in a metal cabinet and arranged as in the pattern (see Figures 2 and 3), make up variants which are post-payment self-serve driveway flowmeters, known as the Gilbarco T173C Transaction System.

The Transaction System (see Figures 2, 5 and 7) may comprise up to eight driveway flowmeters (Gilbarco T166Q) — Components Nos 1 to 25), controlled and supervised from one control unit and one ticket printer (Components Nos 27 and 28).

The hydraulic diagrams and the control circuits are the same as for the pattern and the maximum flow rate of each driveway flowmeter is 50 litres per minute.

2. The components tabulated in Column 7 of Figure 1 assembled, with the exception of Components Nos 26 to 28, in a round metal cabinet (see Figure 8) and arranged as shown in Figure 9, make up variants which are post-payment self-serve driveway flowmeters, known as the Gilbarco T173C Transaction System.

This variant is similar to variant 1 except that each driveway flowmeter is known as a Gilbarco T180C.

The hydraulic diagrams and the control circuits are the same as for the pattern and the maximum flow rate of each driveway flowmeter is 50 litres per minute.

DESCRIPTION OF COMPONENTS

1. Pump — positive displacement rotary type, with integral gas

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- separator Gilbarco T258GD, as described in Certificate No 5/6A/24.
2. Float chamber — Gilbarco T257R, as described in Certificate No 5/6A/24.
 3. Meter — Gilbarco T262X, as described in Certificate No 5/6A/24, with external gears of ratio 1.9 : 1 so that the output is 0.25 litre for each revolution of the drive shaft to the computer.
 4. Meter — Component No 3 with external gears of ratio 1 : 2.4 so that the output is 0.25 gallon for each revolution of the drive shaft to the computer.
 5. Meter sealing — lead-plug seal, as described in Certificate No 5/6A/24.
 6. Computer — Veeder-Root VR 101, which is a 4-drum decimal-currency unit indicating price to \$99.99, unit price to 99.9 cents per litre in 0.1-cent increments, and quantity to 999.9 litres. The computer is similar to the Veeder-Root VR 101 computer as described in Certificate No 5/6A/30, except for the following significant modifications:
 - (a) the right-hand price and quantity-indicating wheels have ten graduations numbered 0 to 9;
 - (b) all other price and quantity wheels are numbered 0 to 9; and
 - (c) the semi-automatic reset mechanism has been replaced by an automatic electric reset unit.
 7. Computer — Component No 6 except:
 - (a) the unit price is indicated to 99.9 cents per gallon in 0.1-cent increments; and
 - (b) the quantity is indicated to 999.9 gallons.
 8. Non-return valve — Gilbarco T260Y, with integral pressure-relief valve.

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9. Non-return valve — Gilbarco T260Z, with integral pressure-relief valve.
10. Sight glass — Gilbarco T261X, by-pass type, as described in Certificate No 5/6A/7.
11. Sight glass — Gilbarco T261AC, by-pass type, as described in Certificate No 5/6A/24.
12. Back-pressure valve — Gilbarco T162-6, as described in Certificate No 5/6A/24.
13. Hose — external retractable $\frac{3}{4}$ -inch bore.
14. Swivel hose coupling — fitted between the nozzle and the hose to allow the nozzle to rotate about the axis of the hose.
15. Nozzle — STM 363 automatic hose nozzle, as described in Certificate No 5/6A/7.
16. Nozzle — Gilbarco T250H manual hose nozzle, as described in Certificate No 5/6A/7.
17. Nozzle — OPW 1A or 1AM automatic hose nozzle, as described in Certificate No 5/6A/7.
18. Final filter — as described in Certificate No 5/6A/1/3.
19. Dial face — on each side of the housing behind a glazed window is a grey or black dial face with white markings or a white dial face with black markings. The quantity aperture and the unit-price aperture are marked "litres" and "cents per litre" respectively and the price aperture is marked "dollars" (see Figures 2 and 8).
20. Dial face — Component No 19 with the quantity and unit-price apertures marked "gallons" and "cents per gallon" respectively (see Figures 10 and 11).
21. Nameplate — marked "approved for petroleum $\leq 1 \text{ mm}^2/\text{s}$ ", which means that the pattern is approved for liquid petroleum of viscosity not more than $1 \text{ mm}^2/\text{s}$ (1 cSt).

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22. Driveway flowmeter number (see Figures 2 and 8) — the driveway flowmeter is identified by a number which is the same as the "pump" number on the corresponding printed ticket.

This number is marked, in figures not less than 100 mm high, in any position on the driveway flowmeter, provided the dial faces and nozzle hang-up are not obscured, and provided the number is visible to the operator at the control unit at all times, and visible to the purchaser when using the driveway flowmeter.

23. Pump interlock — as described in Certificate No 5/6A/24.
24. Electric reset unit — as described in Certificate No 5/6A/24, except that relay A in the interlock module is energized through the reset-motor microswitch when the nozzle is on its hang-up (see Figure 4).
25. Pulse-transmitter unit — Gilbarco T173-0017 (see Figures 12 and 13) — which is located on the side of the computer. The quantity and price information shafts in the computer, through extension shafts and gearing, drive two pulse generators. The pulse generators comprise reed switches which are operated by eight equally spaced magnets which are moulded into a rotating disc, driven from the gearing. The outputs from the two pulse generators are 50 pulses for each revolution of the right-hand price-indicating wheel, and 100 pulses for each revolution of the right-hand quantity-indicating wheel, that is, 50 pulses for each revolution of the cents wheel and 100 pulses for each revolution of the litre or gallon wheel.
26. Module enclosure (see Figures 4 and 5) — which contains up to eight pump modules, one or two triac modules, a station logic module, a transformer module, an interlock module and power isolation switches.
- (a) Pump module — provides interlocks and memory for the pulses received from the quantity and price pulse generators in the transmitter unit attached to one driveway flowmeter.

When a delivery is authorized by pressing the "authorize" button, the memory is reset to zero and gate circuits are activated which close the triac switch in the supply to the

pump motor, and engage interlocks which determine the order of events. During the delivery the price pulses which occur every 0.2 cent are divided by five and entered into the memory as 1-cent units, except for the first three pulses which, to minimize the rounding error, are entered into the memory as a 1-cent unit. The quantity pulses are entered directly into the memory as 0.01-gallon units.

At the end of a delivery when the nozzle is returned to its hang-up, relay A, operated by the electric reset unit, provides a data-release signal to the gate circuits which open the triac switch and allow the data stored in the memory to be transferred to the station logic module.

- (b) Station logic module — provides a sequential transfer of the data stored in a pump module to the printer.

A scanning circuit in sequence continually samples the condition of the gate circuits in each pump module and stops when it reaches a pump module which is ready to transfer its stored data to the station logic module, that is, a module for which the corresponding nozzle has been returned to its hang-up. The stopped scan then causes the module memory to be scanned and released to the station logic module.

Each column of information is then transferred in turn to the printer. At the conclusion of the information transfer to the printer a print command is given.

At the conclusion of printing an unlatch signal returned from the printer restarts the scan, which in turn disconnects the pump memory from the station logic module. The unlatch signal also resets the gate circuits in the pump module to permit the operator to again close the triac switch and thus authorize the use of the corresponding driveway flowmeter.

The scanning circuit again samples the condition of the gate circuits in each pump module, and again stops when it reaches a pump module which is ready to transfer its stored data to the station logic module.

- (c) Triac module — contains four separate triac switches, so

that it is able to control the voltage supply to up to four separate driveway flowmeters. Each triac is opened or closed by a gate signal from the corresponding pump module.

- (d) Interlock module (see Figures 5 and 6) — provides the starting sequence and mode selection for each driveway flowmeter.

A mode switch is provided for each driveway flowmeter.

Each mode switch allows the corresponding driveway flowmeter to be used by an operator when "manual" is selected or by the purchaser when "auto" is selected. With "auto" selected the triac switch must be closed by a signal from the gate circuits in the pump module before power is applied to the pump motor, and with "manual" selected the triac switch will be closed whenever the power isolation switch is "on".

The application of power to the Transaction System commences a sequence of timer and relay operations which ensure that, irrespective of the position of any controls or despite a nozzle not being on its hang-up, the system will only operate as described and will, if "auto" has been selected, require authorization before a driveway flowmeter can be used.

A time-delay circuit provides a three-minute delay between the application of power and the time the Transaction System is activated by relay T (refer Figure 4).

- (e) Transformer module — provides power to all the modules except the interlock module.
 - (f) Power isolation switch — for each driveway flowmeter will, if switched to "off" during a delivery, interrupt the delivery as though lock-out had been selected.
27. Control unit (see Figures 4 and 14) — controls up to eight driveway flowmeters. The operator is provided with an "authorize" button and "lock-out" switch for each driveway flowmeter and an "emergency stop" switch for the system. Each set of controls is identified by a number which is the same as the identifying number on the corresponding driveway flowmeter.

Pressing an "authorize" button will provide a signal to the appropriate pump module, which will close the triac switch, allowing the corresponding driveway flowmeter to be used. All of the driveway flowmeters may be authorized at the same time.

Selecting "lock-out" will provide a switching signal to a gate in the appropriate pump module, which will cause the triac switch to open, stopping the pump motor. Cancellation of lock-out will switch the pump-module gate circuit and close the triac switch, allowing the pump motor to restart.

Selecting "emergency stop" will reset the time delay to zero, and thus de-energize relay T (refer Figure 4). Contacts of relay T will provide a data-release signal to the gate circuits in each pump module which is receiving quantity and price pulses from a driveway flowmeter operating on "auto". The gate circuits will open the triac switches, thus stopping the pump motors, and allow the data stored in each pump module to be transferred in sequence, by means of the scanning circuit, to the station logic module and then printed. A further contact of relay T will open the triac switch and stop the pump motor of any driveway flowmeter operating on "manual". The time-delay circuit will be inhibited and held at zero while "emergency stop" is selected.

Release of "emergency stop" will, after a period of three minutes, allow the driveway flowmeters on "auto" to be re-authorized. The nozzles will have to be returned to their hang-up positions and the computers reset to zero before the pump motors will restart. The pump motor for each driveway flowmeter on "manual" will restart and the delivery will continue without the computer resetting to zero, or if the nozzle has been returned to its hang-up the pump motor will not start until the computer has been reset to zero.

A "clear" (pump-in-use) and a "call" light may be provided for each driveway flowmeter, in which case the "clear" light will be illuminated when the driveway flowmeter is in use. The "call" light will operate when a purchaser presses a call button on the side of the driveway flowmeter.

An audible signal may operate in conjunction with the call light.

28. Ticket printer — Addo-X (see Figure 7), which prints the pump

number, price and quantity on a continuous roll of preprinted paper to provide a printed record of each transaction (see Figures 15 and 16). The tear-off ticket which automatically feeds from the printer is not less than 32 mm in length. The printer keyboard is made inaccessible by covering it with a metal plate which is fastened from the inside.

GENERAL NOTES

Test Procedure

The following tests will apply to all instruments manufactured in accordance with this Certificate:

1. Select "manual" mode of operation.
2. Carry out the tests normally applied to a driveway flowmeter.
3. Check that no tickets were printed in step 2.
4. Select "auto" mode of operation.
5. Authorize all of the driveway flowmeters by pressing the "authorize" buttons.
6. For each driveway flowmeter:
 - (a) deliver sufficient liquid to cause the price and quantity indicators on the computer to move significantly off zero;
 - (b) stop the pump motor by returning the nozzle to the hang-up bracket;
 - (c) record the pump number and the quantity and price indicated on the computer; and
 - (d) remove the nozzle from the hang-up bracket, and check that the computer does not reset to zero and the pump motor does not restart.
7. Check that the printed tickets agree with the quantity and price indications as recorded for each driveway flowmeter. The

indications of quantity and price on the printed tickets may differ from those indicated on the computer by ± 0.6 cent and ± 0.01 litre or gallon.

8. Check that the operation of the lock-out switch during a delivery does not cause a ticket to be printed unless the nozzle is returned to its hang-up, and allows the delivery to continue when the operating position is selected.
9. Check for one driveway flowmeter that the operation of the "emergency stop" during a delivery causes a ticket to be printed and, on release of the "emergency stop", that the pump motor does not start, until the nozzle is returned to its hang-up and the "authorize" button is pressed.

If it is desired to isolate a driveway flowmeter from the Transaction System during the above tests, in order to allow the service station to continue functioning, the particular driveway flowmeter can be switched to "manual" mode.

FIGURE 5/6A/40 - 1

1	2	3	4	5	6	7
	COMPONENT	DATE APPROVED	FOOT-NOTES	PATTERN T173C	VARIANTS	
					T173C (T166Q)	T173C (T180C)
1	Pump — Gilbarco T258GD	29 MAR 72		*	*	*
2	Float chamber — Gilbarco T257R	29 MAR 72		*	*	*
3	Meter — Gilbarco T262X 1.9 : 1	29 MAR 72		*	A	A
4	Meter — Gilbarco T262X 1 : 2.4	29 MAR 72		*	A	A
5	Seal — stamping plug	29 MAR 72		*	*	*
6	Computer — VR 101 litres	29 MAR 72		*	B	B
7	Computer — VR 101 gallons	29 MAR 72		*	B	B
8	Non-return valve — Gilbarco T260Y	29 MAR 72		*	*	
9	Non-return valve — Gilbarco T260Z	29 MAR 72		*		*
10	Sight glass — Gilbarco T261X	29 MAR 72		*	*	
11	Sight glass — Gilbarco T261AC	29 MAR 72		*		*
12	Back-pressure valve — Gilbarco T162-6	29 MAR 72		*	*	*
13	Hose — $\frac{3}{4}$ -inch bore	29 MAR 72		*	*	*
14	Swivel hose coupling — Gilbarco	29 MAR 72		*	‡	‡
15	Nozzle — STM 363	29 MAR 72			C	C
16	Nozzle — Gilbarco T250H	29 MAR 72			C	C
17	Nozzle — OPW 1A	29 MAR 72			C	C
18	Final filter	29 MAR 72		*	‡	‡
19	Dial face — "litres"	29 MAR 72		*	D	D
20	Dial face — "gallons"	29 MAR 72			D	D
21	Nameplate — approved for petroleum $\leq 1 \text{ mm}^2/\text{s}$	29 MAR 72		*	*	*
22	Driveway flowmeter number, 100 mm	29 MAR 72		*	*	*
23	Pump interlock — starting lever	29 MAR 72		*	*	*
24	Electric reset unit	29 MAR 72		*	*	*
25	Pulse-transmitter unit — Gilbarco T173-0017	29 MAR 72		*	*	*
26	Module enclosure	29 MAR 72		*	*	*
27	Control unit	29 MAR 72		*	*	*
28	Ticket printer — Addo-X	29 MAR 72		*	*	*

- * - indicates required component
- A - indicates alternative component, one of which is required
- B to D - as for A
- ‡ - optional component

Compatibility Table for Components Described
in this Certificate

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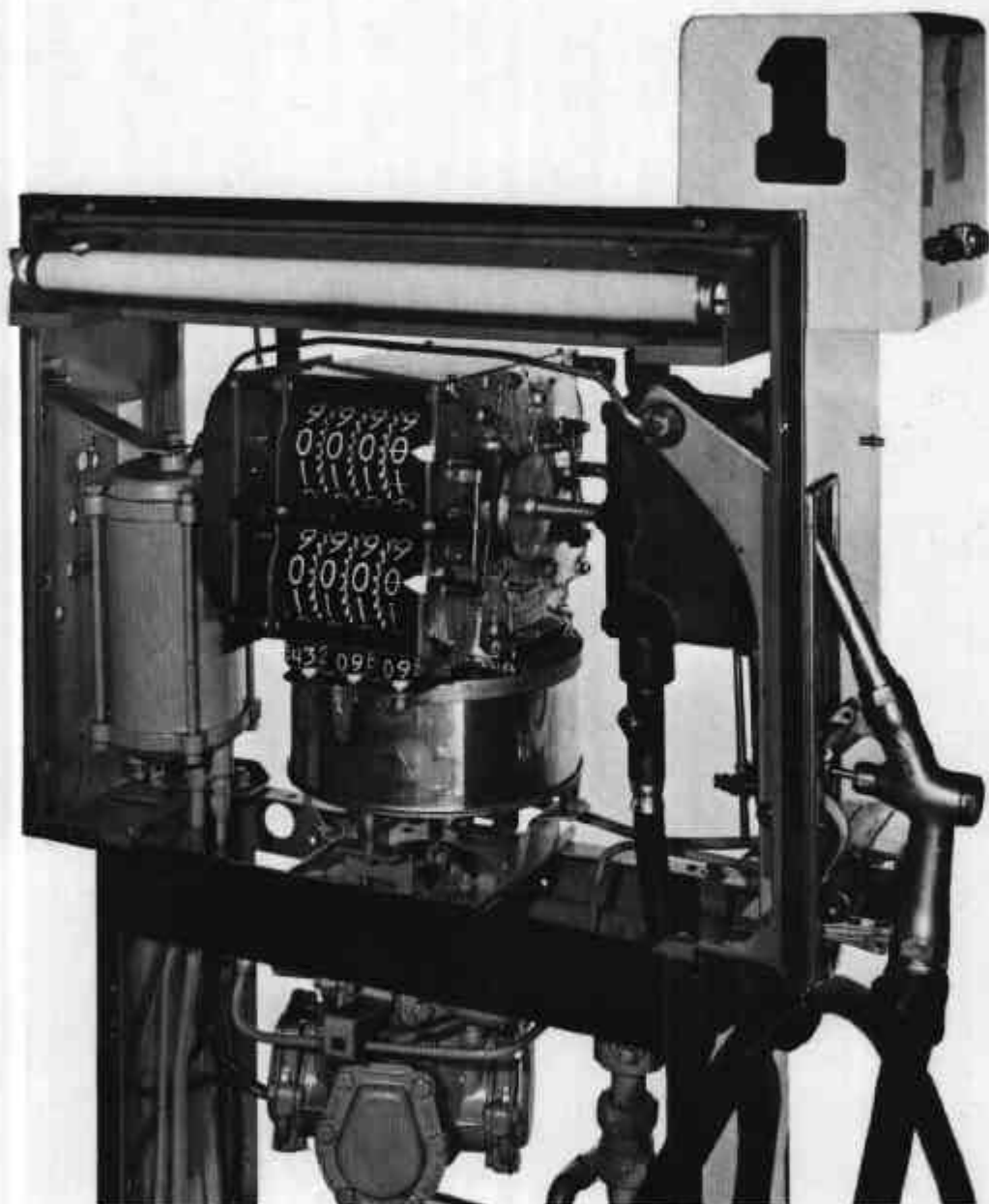
FIGURE 5/6A/40 - 2



Gilbarco T166Q

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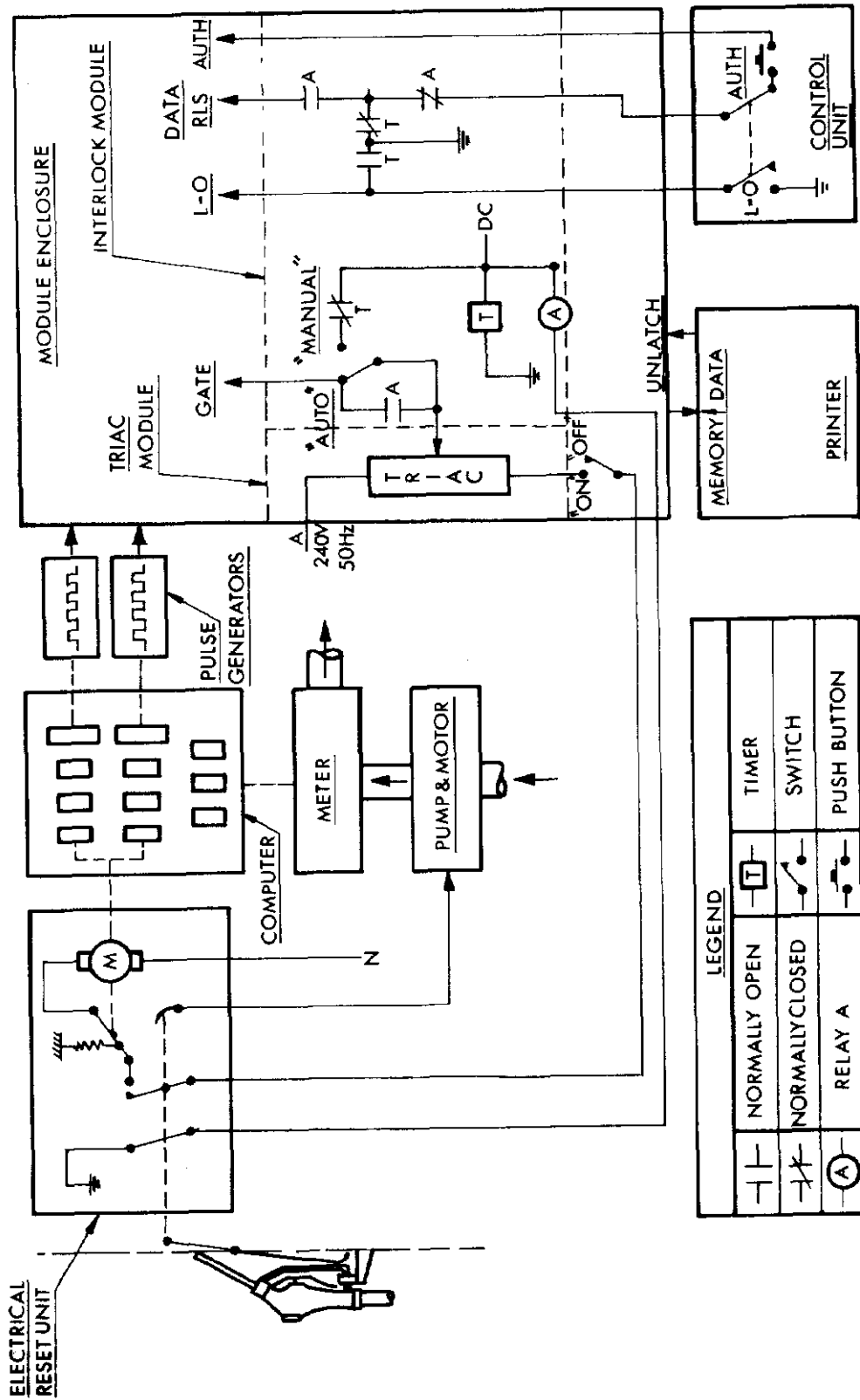
FIGURE 5/6A/40 - 3



Gilbarco T166Q

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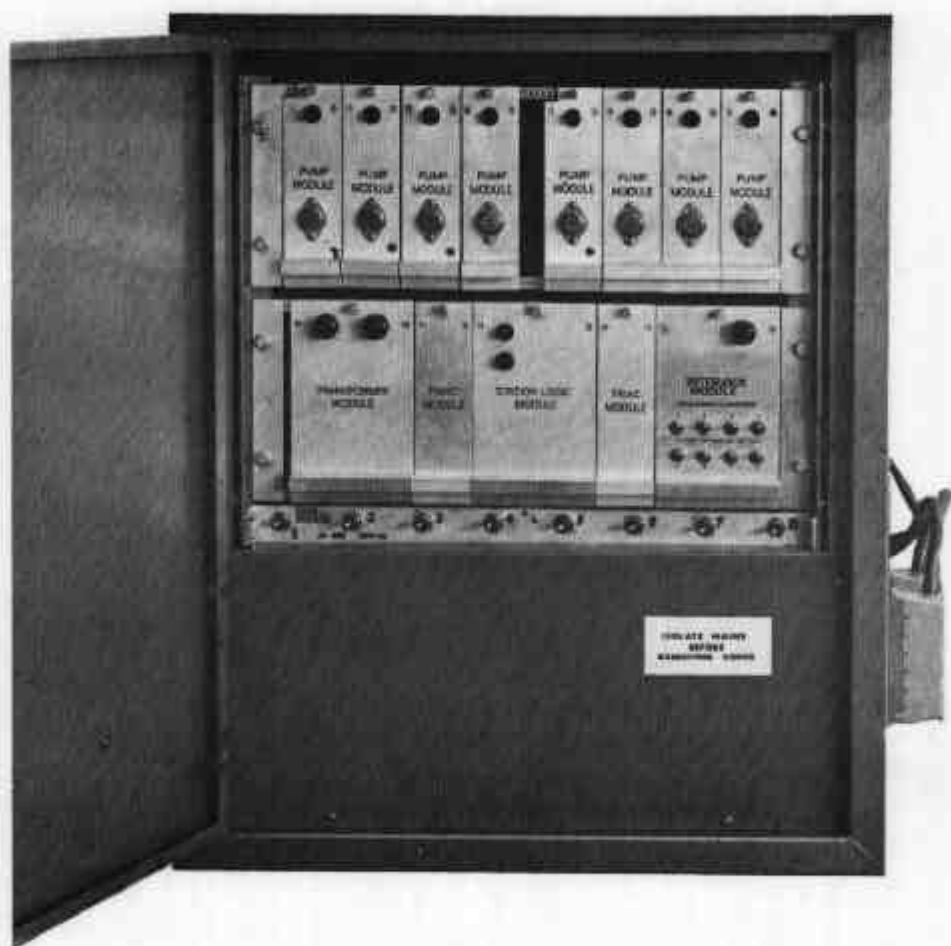
FIGURE 5/6A/40 - 4



Gilbarco TI73C — Control Circuit

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FIGURE 5/6A/40 - 5



Module Enclosure (door open)

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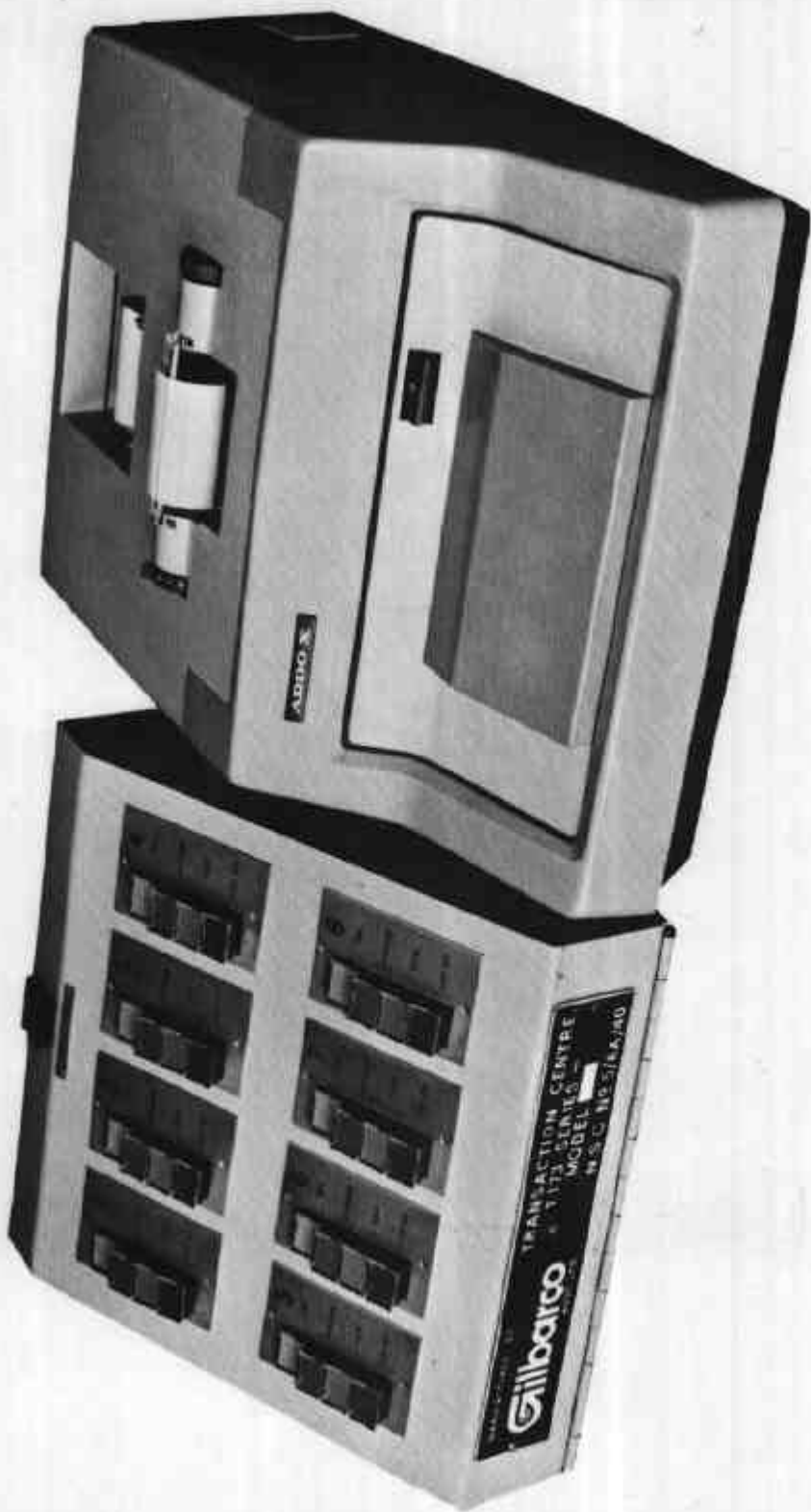
FIGURE 5/6A/40 - 6



Interlock Module

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FIGURE 5/6A/40 - 7



Control Unit and Printer

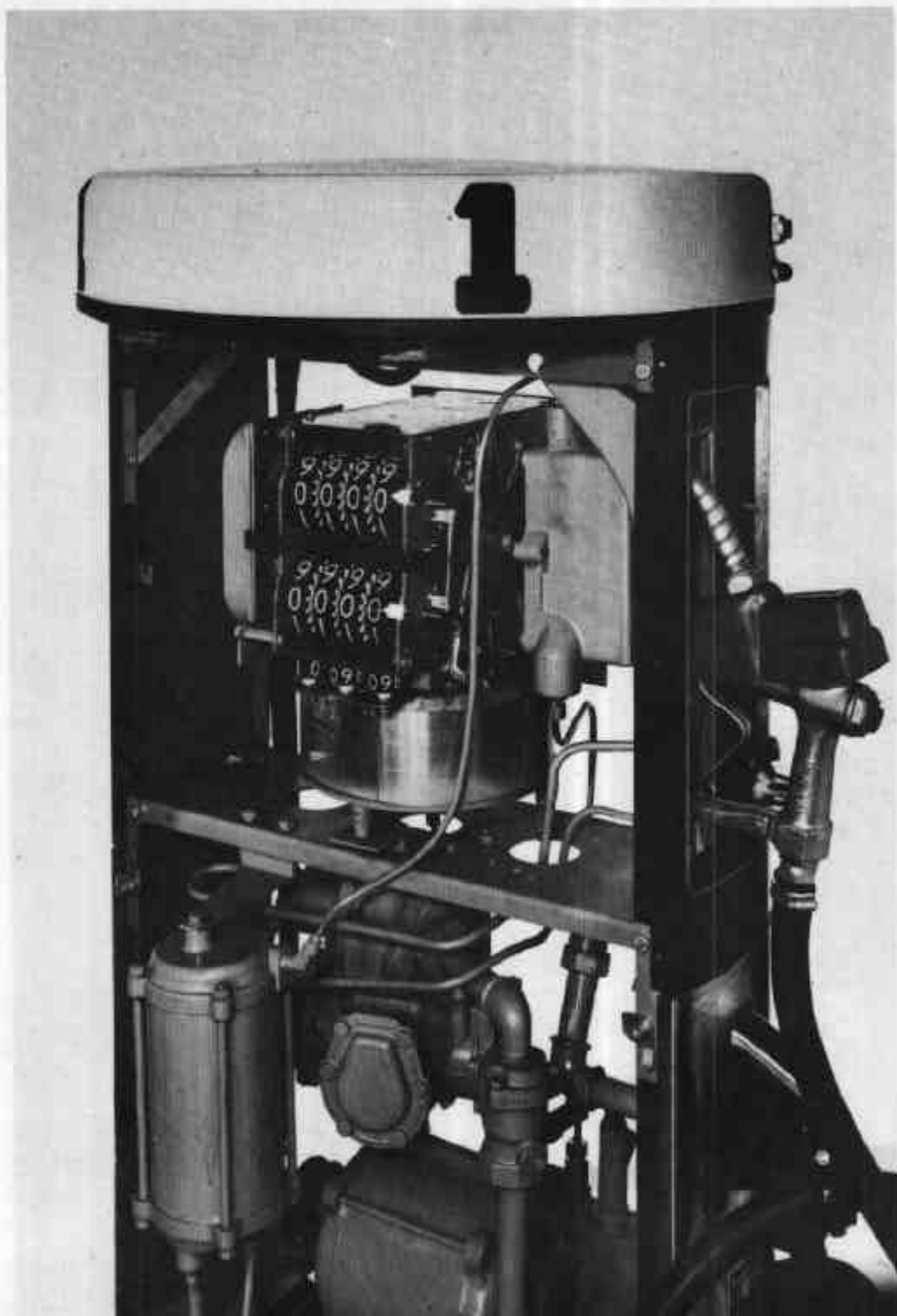
FIGURE 5/6A/40 - 8



Gilbarco T180C

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FIGURE 5/6A/40 - 9



Gilbarco T180C

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FIGURE 5/6A/40 - 10



Gilbarco T166Q Dial Face — Gallons
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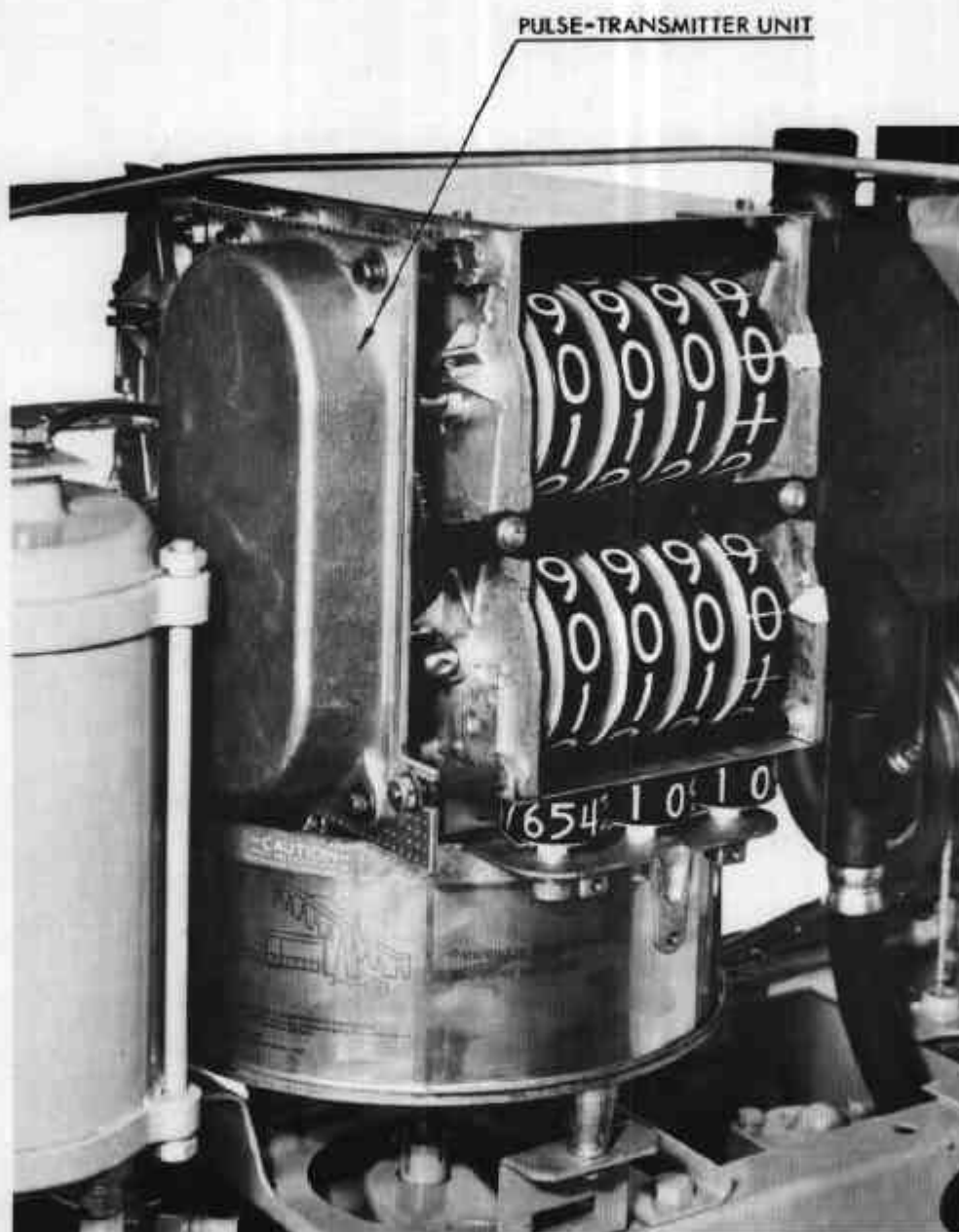
FIGURE 5/6A/40 - 11



Gilbarco T180C Dial Face — Gallons

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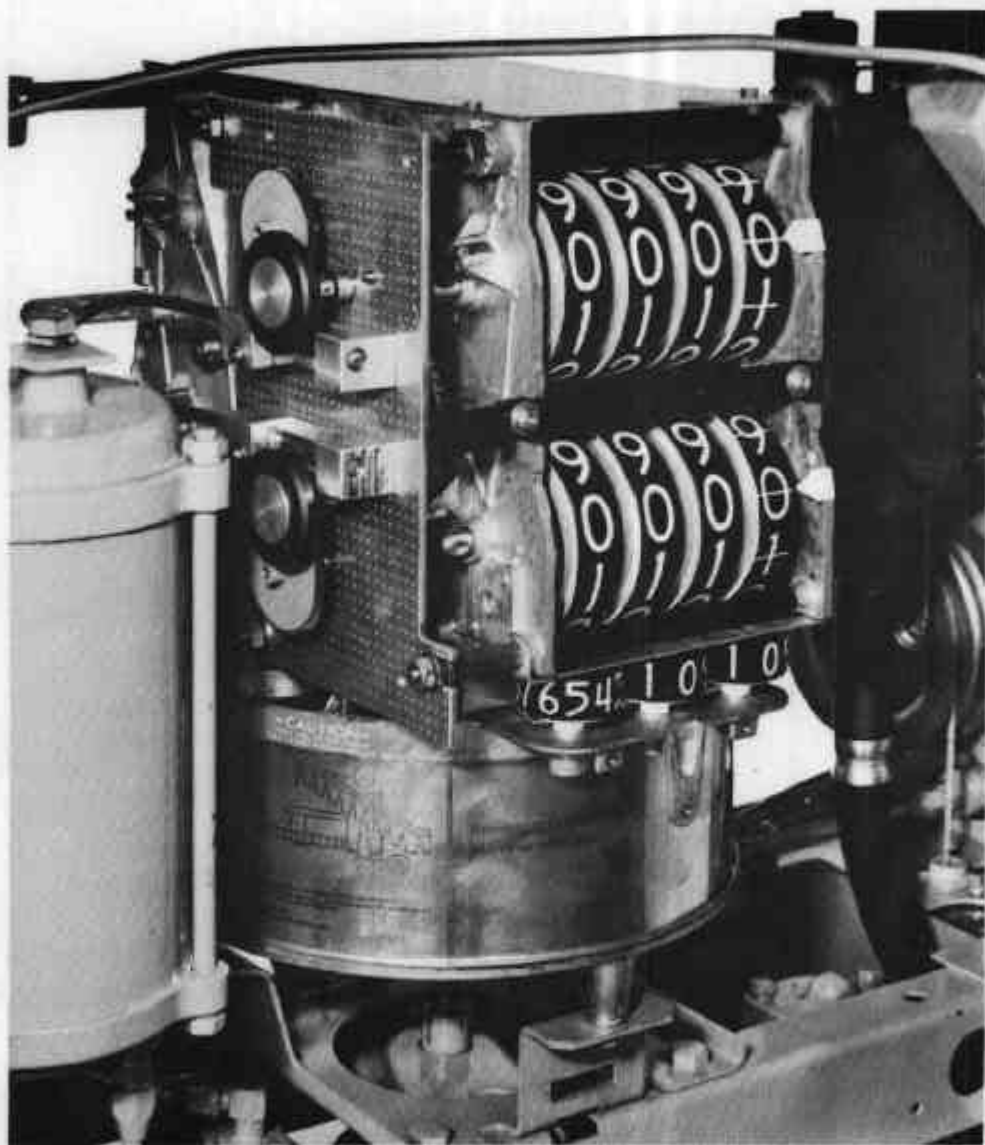
FIGURE 5/6A/40 - 12



Pulse-transmitter Unit (cover on)

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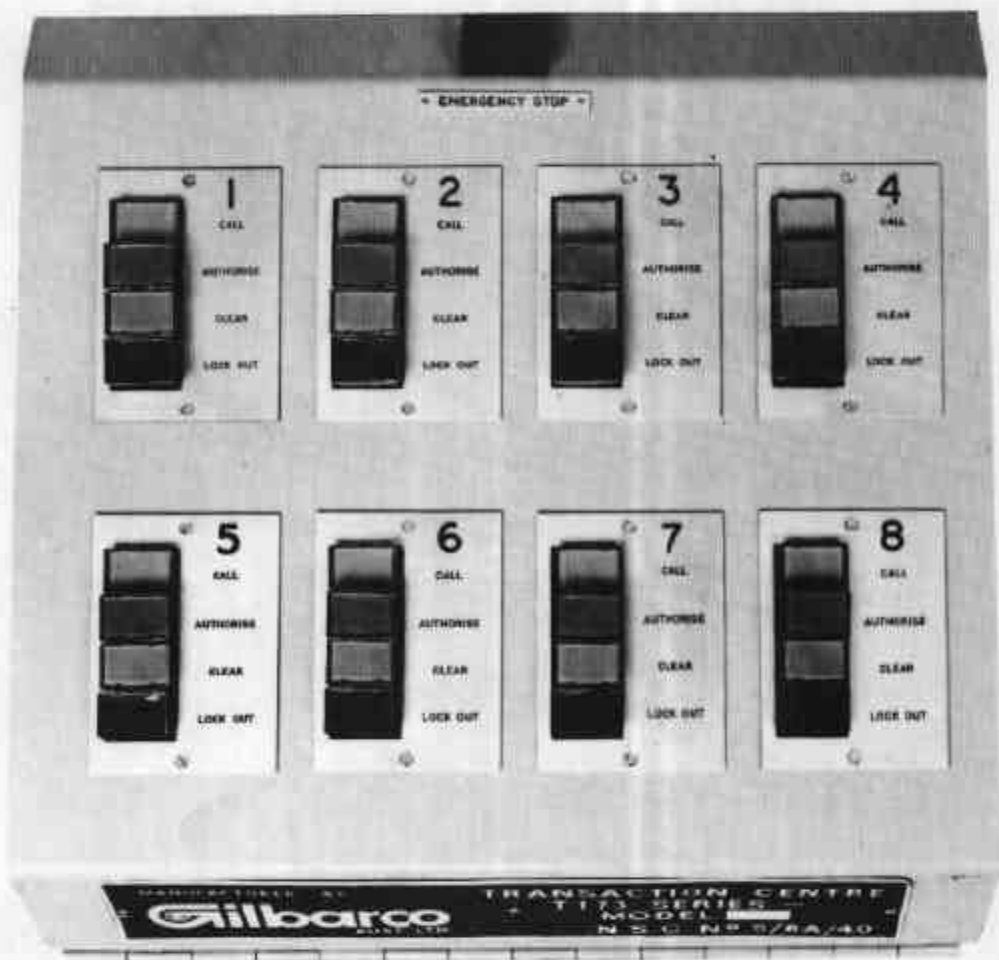
FIGURE 5/6A/40 - 13



Pulse-transmitter Unit (cover removed)

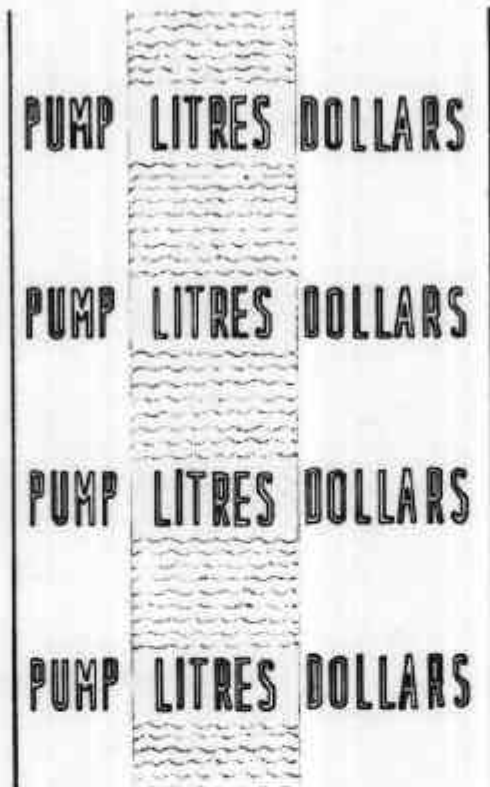
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FIGURE 5/6A/40 - 14



Control Unit

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(a) Section of preprinted ticket roll before printing



(b) After printing

Sample Ticket — Litres (actual size)

FIGURE 5/6A/40 - 16



(a) Section of preprinted ticket roll before printing



(b) After printing

Sample Ticket — Gallons (actual size)

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