NATIONAL STANDARDS COMMISSION

CERTIFICATE OF APPROVAL No 6/10B/33

This is to certify that the pattern and variants of the

Avery Weighing Instrument Model Z3H/8650-5109

submitted by Avery Australia Ltd,
3-5 Birmingham Avenue,
Villawood, New South Wales, 2163,

have been approved under the Weights and Measures (Patterns of Instruments) Regulations as being suitable for use for trade.

Pattern: approved 21/12/77

- An instrument of 50 tonne capacity with 1000 kg Hottinger load cell and Avery 8650 indicator displaying up to 3000 increments;
- with other baseworks.

Variation No 1: approved 9/2/79

- with 20 kg or 50 kg Hottinger load cell.

Variation No 2: approved 6/4/79

- with 200 kg or 500 kg Hottinger load cell

Variation No 3: approved 21/12/77

- with Avery Type SB 350 indicator displaying up to 3000 increments.

The patterns and variants are described in Technical Schedule No 6/10B/33 and Variations Nos 1, 2 and 3 issued on 16/2/78, 26/2/79, 4/5/79 and 20/7/79, and in drawings and specifications lodged with the Commission.

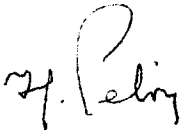
The approval is subject to review on or after 1/1/83.

20/7/79 .../2

All instruments conforming to this approval shall be marked with the approval number "NSC No 6/10B/33".

This Certificate replaces Certificate No 6/10B/33 and its Variations issued on 16/2/78, 26/2/79 and 4/5/79, and Certificate of Approval No 6/10B/28 and its Technical Schedule issued on 10/8/78, all of which may be destroyed.

Signed



Executive Officer

20/7/79

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 6/10B/33

Pattern: Avery Weighing Instrument Model Z3H/8650-5109

Submittor: Avery Australia Ltd,
3-5 Birmingham Avenue,
Villawood, New South Wales, 2163.

Date of Approval: 21 December 1977

All instruments conforming to this approval shall be marked "NSC No 6/10B/33".

Description:

The pattern is a mechanical-lever weighbridge of capacity 50 tonnes with a load-cell resistant mechanism and an electronic weight indicator displaying up to 2500 increments (see Figures 1 to 3).

The load receptor is supported by an Avery Model 5109 three-lever two-section basework with the transfer lever applying the load through a pullrod to a Hottinger 1000-kg tension load cell which is supported from a fixed beam. The lever ratio is selected so that at maximum capacity the force applied to the load cell is between 3900 N and 9800 N (400 to 1000 kgf).

The weight indicator, Avery 8650, converts the output from the load cell into a digital weight indication of up to 2500 increments. The instrument will rezero automatically whenever it comes to rest within 0,5e of zero; this is indicated by the word "zero" being illuminated. A tool-operated zero adjustment is provided on the front of the weight indicator for rezeroing the instrument when zero has changed by more than 0,5e.

A push-button with internal indication of the word "tare" or "gross" when pressed so that "tare" is displayed allows automatic taring of a container on the load receptor to within 0,25e. On removal of the container the value of the tare to the nearest whole graduation is indicated on the weight indicator prefixed by a - (minus) sign. The tare is subtractive and of

maximum effect equal to the capacity of the instrument. The tare is cancelled by pressing the tare gross button; the word "gross" will then be indicated and the instrument will "gross" weigh until a tare is selected.

The weight indicator is retained in its cabinet by a lead-and-wire seal as it is too fragile for a stamping-plug seal. The serial number of the load cell is sealed to the weight indicator by the weight-indicator seal (see Figure 4).

The instrument is marked adjacent to the weight reading face, for example:

(III)

Max	=	50 t
Min	=	1 t
$d_c = e$	=	0,05 t
T	=	- 50 t

An output socket located inside the sealed weight indicator may be used to provide weight information to peripheral devices which are not a part of the measuring instrument*. These supplementary devices, which may only be provided with the authorisation of the Weights and Measures Authorities of the State or Territory, may, for example, print receipts or store and process the data, etc. The output information is inhibited until the signal sampled in successive counting periods is the same, that is, the instrument is in equilibrium.

The use of such peripheral equipment will not affect the operation of the weighing instrument.

The approval includes the baseworks of other Commission-approved patterns replacing the Avery 5109 basework described in the pattern, provided that:

1. the basework† is of an instrument conventionally known as a platform weighing machine, weighbridge or hopper scale, etc.,

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* The measuring instrument examined and approved by the Commission is limited to the devices which determine the value of a physical quantity, control the measurement, and indicate the result of the measurement on a visual display, for example, a nixie-tube indicator or a seven-segment indicator.

† The basework design may be varied by reducing the lever ratio of the transfer lever, or by including an additional force breakdown or transfer lever to match the pullrod force to the load cell.

where the headwork and basework are separate assemblies connected by a mechanical linkage;

2. the force applied to the load cell is between 3900 N and 9800 N;

3. the capacity of the instrument is not more than the capacity approved for the basework;

4. a levelling device and an indicator are fitted, except for instruments installed in a fixed position, or instruments which satisfy the following accuracy requirements and indication limits when tilted to a slope of 1 in 20 in any direction:

Accuracy Requirements

(i) ± 0,5e for loads between zero and 500e inclusive;

(ii) ± 1e for loads between 500e exclusive and 2000e inclusive;

(iii) ± 1,5e for loads greater than 2000e.

Indication Limits

(i) Tilting at no-load — the zero indication does not vary more than 2e when tilted to a slope of 1 in 20, the zero being first adjusted in the reference (level) position; and

(ii) Tilting when loaded — the indication does not vary more than e, tilted to a slope of 1 in 20, the indication at zero being adjusted in the reference position before tilting and in the tilted position before reloading.

5. If a level indicator is required, its sensitivity shall be such that, when the instrument is tilted so that the bubble in the level indicator moves 2 mm, the zero should not change by more than two graduations, and when zero is reset in the tilted position the instrument should satisfy the weighing-accuracy specification, that is, ± ½ graduation for the first 500 graduations, ± 1 graduation for graduations over 500 and up to 2000, and ± 1½ graduations over 2000 graduations. A notice adjacent to the level indicator shall advise that the instrument must be level when in use.

6. The instrument is marked:

"Approval Numbers

Headwork NSC No 6/10B/33
Basework NSC No ....."

Special Tests:

1. Zero balance — place a small weight equal to, say, 10 graduations (10 d_d) on the load receptor before checking "zero". Two readings are taken at each applied load with the instrument equilibrium being disturbed before each reading.

   With an additional load of 0,25 d_d, that is, 10,25 d_d, on the load receptor, readings of 11 d_d and 11 d_d indicate that the alignment of the instrument is not correct, readings of 10 d_d and 11 d_d or 10 d_d and 10 d_d are acceptable.

   With an additional load of 0,75 d_d, that is, 10,75 d_d, on the load receptor, readings of 10 d_d and 10 d_d indicate that the alignment of the instrument is not correct, readings of 10 d_d and 11 d_d or 11 d_d and 11 d_d are acceptable.

2. Zero range — the maximum range of operation of the zero device should not exceed 4% of the capacity of the instrument (± 2% approximately).

3. Load-cell Creep — leaving a maximum-capacity load on the load receptor for a period of 30 minutes should not cause the weight indicated to be incorrect, and on removal of the load the weight indicated should be zero.

4. Test loads — the application of the test loads specified in Table 1 and the display of these loads within the applicable tolerance is one method of checking that the instrument operates in accordance with the approved design.

5. Range of indication — the maximum weight indicated should not exceed the maximum capacity (max); above this indicated weight the indicator should be blank.

TABLE 1

Test Load in Graduations*

0	10	25	60	120	250	698,5
1	12	30	70	140	300	798,5
2	14	35	80	160	350	898,5
3	16	40	90	180	400	998,5
4	18	45	100	200	450	1198,5
5	20	50			500	1398,5
6						1598,5
7						1798,5
8						1998,5
9						2498
						2998

* Test Load = Number of graduations × graduation value

Note: The test load should include a test at capacity, less the tolerance and less 0,5 graduation

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 6/10B/33

VARIATION No 1

Pattern: Avery Weighing Instrument Model Z3H/8650-5109

Submittor: Avery Australia Ltd,
3-5 Birmingham Avenue,
Villawood, New South Wales, 2163.

Date of Approval of Variation: 9 February 1979

The modification described in this Schedule applies to the patterns described in Technical Schedule No 6/10B/33 dated 16 February 1978.

All instruments conforming to this approval shall be marked "NSC No 6/10B/33".

Description:

The approved modification provides for the resistant mechanism to be a Hottinger 20 kg or 50 kg load cell. The lever ratio is selected so that at maximum capacity the force applied to each load cell is:

1. 20 kg cell — between 75 N and 200 N;

2. 50 kg cell — between 195 N and 490 N.

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 6/10B/33

VARIATION No 2

Pattern: Avery Weighing Instrument Model Z3H/8650-5109

Submittor: Avery Australia Ltd,
3-5 Birmingham Avenue,
Villawood, New South Wales, 2163.

Date of Approval of Variation: 6 April 1979

The modification described in this Schedule applies to the patterns described in Technical Schedule No 6/10B/33 dated 16 February 1978.

All instruments conforming to this approval shall be marked "NSC No 6/10B/33".

Description of Variant:

Hottinger 200 kg and 500 kg load cells with the lever ratio selected so that at maximum capacity the force applied to the load cell is:

1. 200 kg load cell — between 780 N and 1960 N;

2. 500 kg load cell — between 1960 N and 4900 N.

NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 6/10B/33

VARIATION No 3

Pattern: Avery Weighing Instrument Model Z3H/8650-5109

Submittor: Avery Australia Ltd,
3-5 Birmingham Avenue,
Villawood, New South Wales, 2163.

Date of Approval: 21/12/77

Description of Variant:

The variant comprises the pattern or other variants with an Avery Type SB 350 mass indicator replacing the Type 8650 indicator and converting the output from the load cell to a digital mass indication of up to 3000 increments (Figure 5).

Coarse and fine tool-operated zero adjustments are provided on the front of the mass indicator. A light marked ZERO illuminates when zero is set within 0,25e. Indication of mass is by nixie tubes.

A push-button marked TARE allows automatic taring of a container on the load receptor to within 0,25e. On removal of the container the value of the tare to the nearest whole graduation is indicated on the mass indicator, prefixed by a minus sign. The tare is subtractive and of maximum effect equal to the capacity of the instrument. When tare is selected the word TARE will illuminate. The tare is cancelled by pressing the gross button; the word GROSS will then be illuminated and the instrument will GROSS weigh until a tare is selected.

The mass indicator is retained in its cabinet by a lead-and-wire seal as it is too fragile for a stamping-plug seal (Figure 6). The serial number of the load cell and the cable from the load cell are sealed to the mass indicator (Figure 7).

An output socket may be used to provide mass information to

peripheral devices which are not a part of the measuring instrument.* These supplementary devices, which may only be provided with the authorisation of the Weights and Measures Authority of the State or Territory, may, for example, print receipts or store and process the data, etc. The output information is inhibited until the signal sampled in successive counting periods is the same, that is, the instrument is in equilibrium. Provision is made to seal the output socket to prevent the use of peripheral devices or to seal such devices to the measuring instrument (Figure 8).

The use of such peripheral equipment will not affect the operation of the weighing instrument.

Test Procedure:

As described in Technical Schedule No 6/10B/33 with the exception of Zero Balance test, which is described below.

Accuracy requirements

The maximum permissible errors are:

± 0,5e for loads between 0 and 500e;
± 1e for loads between 501e and 2000e; and
± 1,5e for loads above 2000e.

Zero balance

Illumination of the ZERO LIGHT indicates that zero is set within 0,25e; this may be checked in accord with the Commission's digital zero test (Design Manual No 1, Document 104, Testing Procedures for the Elimination of Rounding Error for Weighing Instruments with Digital Indication).

* The measuring instrument examined and approved by the Commission is limited to the devices which determine the value of a physical quantity, control the measurement, and indicate the result of the measurement on a visual display, for example, a nixie-tube indicator or a seven-segment indicator.

NATIONAL STANDARDS COMMISSION

NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 6/10B/33

CHANGE No 1

The approval of the

Avery Weigning Instrument Model Z3H/8650-5109

given in Certificate No 6/10B/33 dated 16 February 1978 and described in Tecnnical Schedule No 6/10B/33 dated 16 February 1978 is altered by changing:

the first paragrapn on page 1 to read "3000 increments" instead of "2500" increments.

22/5/78

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NATIONAL STANDARDS COMMISSION

NOTIFICATION OF CHANGE

CERTIFICATE OF APPROVAL No 6/10B/33

CHANGE No 2

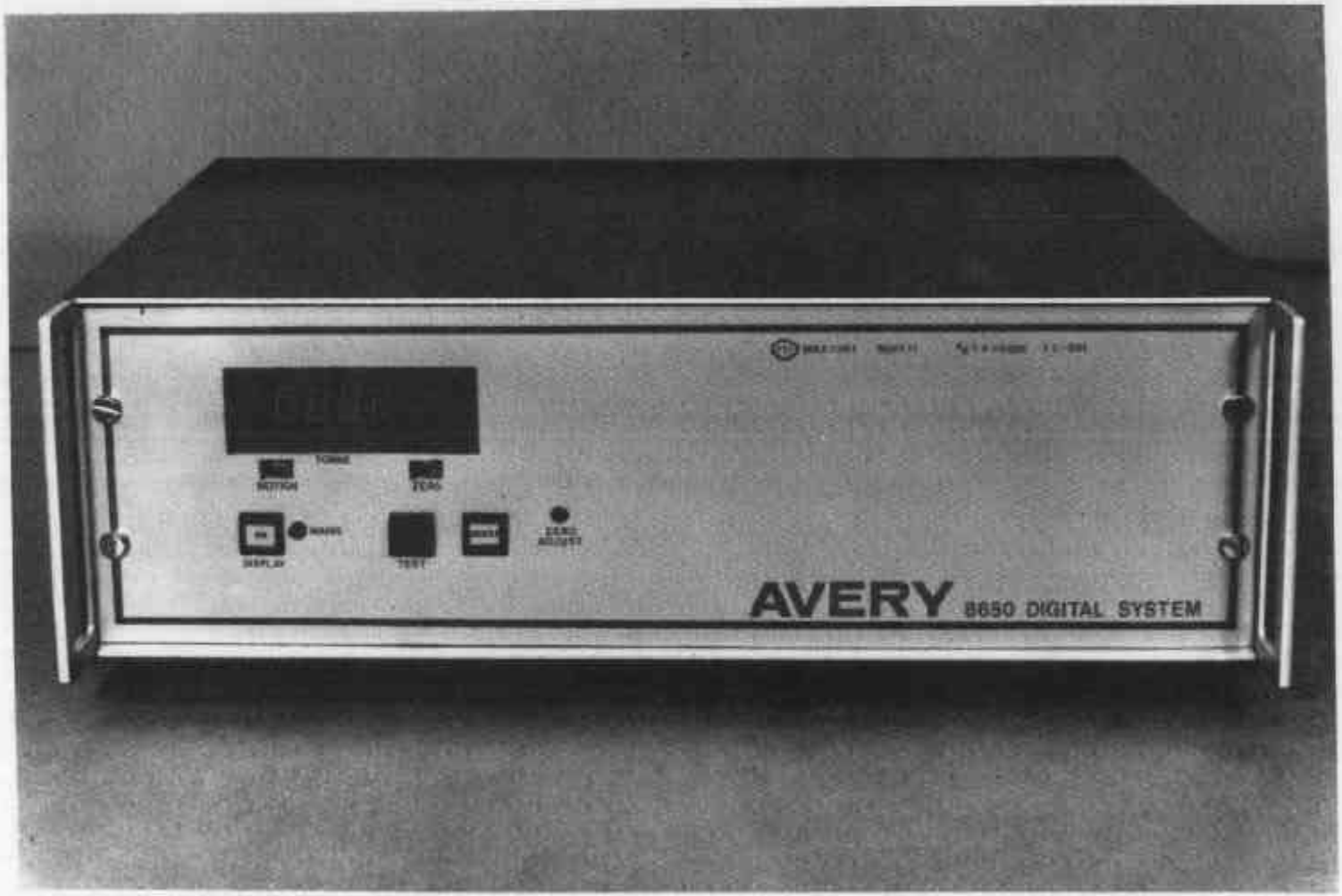
The description of the

Avery Weighing Instrument Model Z3H/8650-5109

given in Certificate No 6/10B/33 dated 16 February 1978 is altered by adding "2998" to the end of the table of test loads.

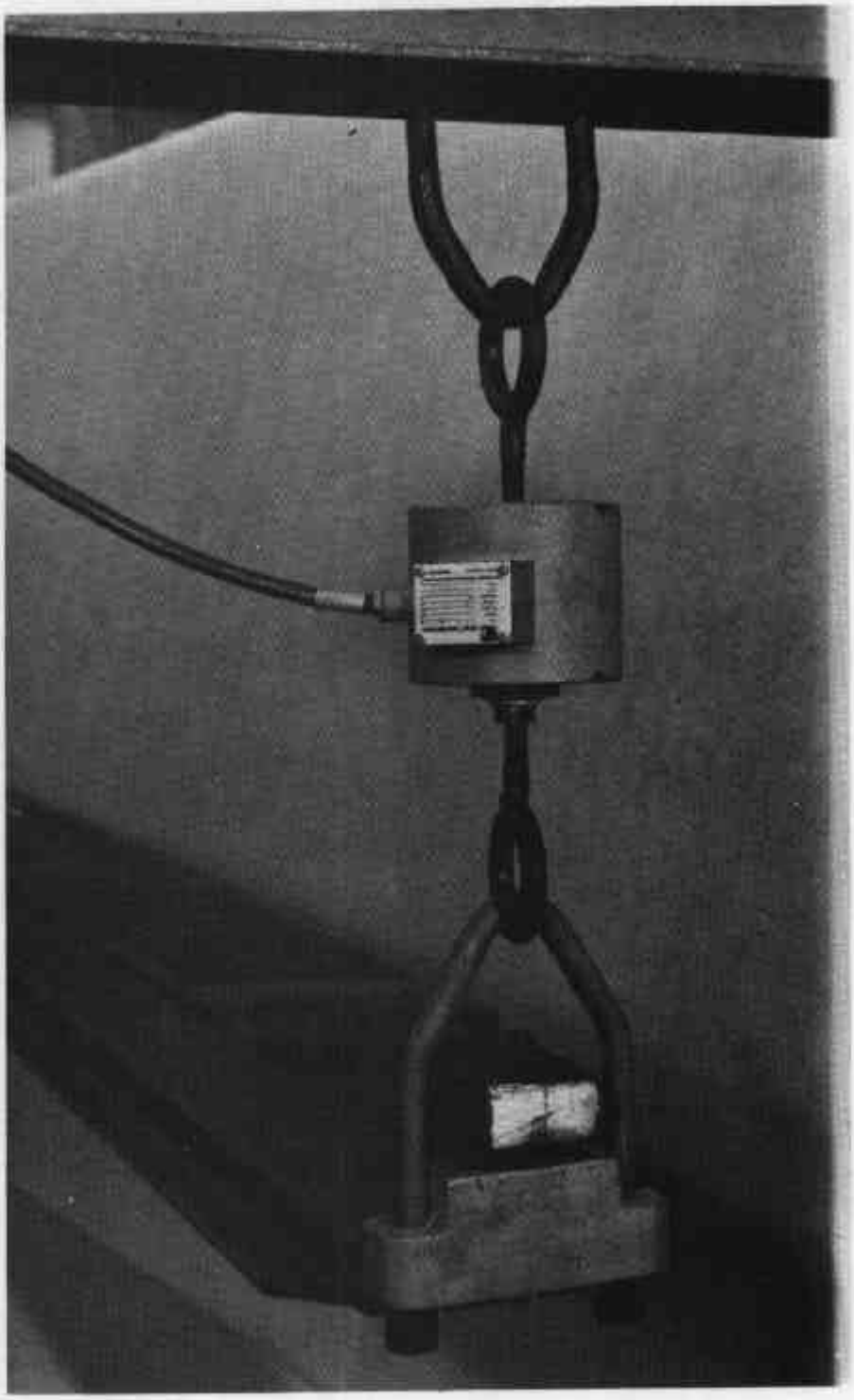
20/7/79

FIGURE 6/10B/33 - 1



Avery 8650 Weight Indicator

FIGURE 6/10B/33 - 2

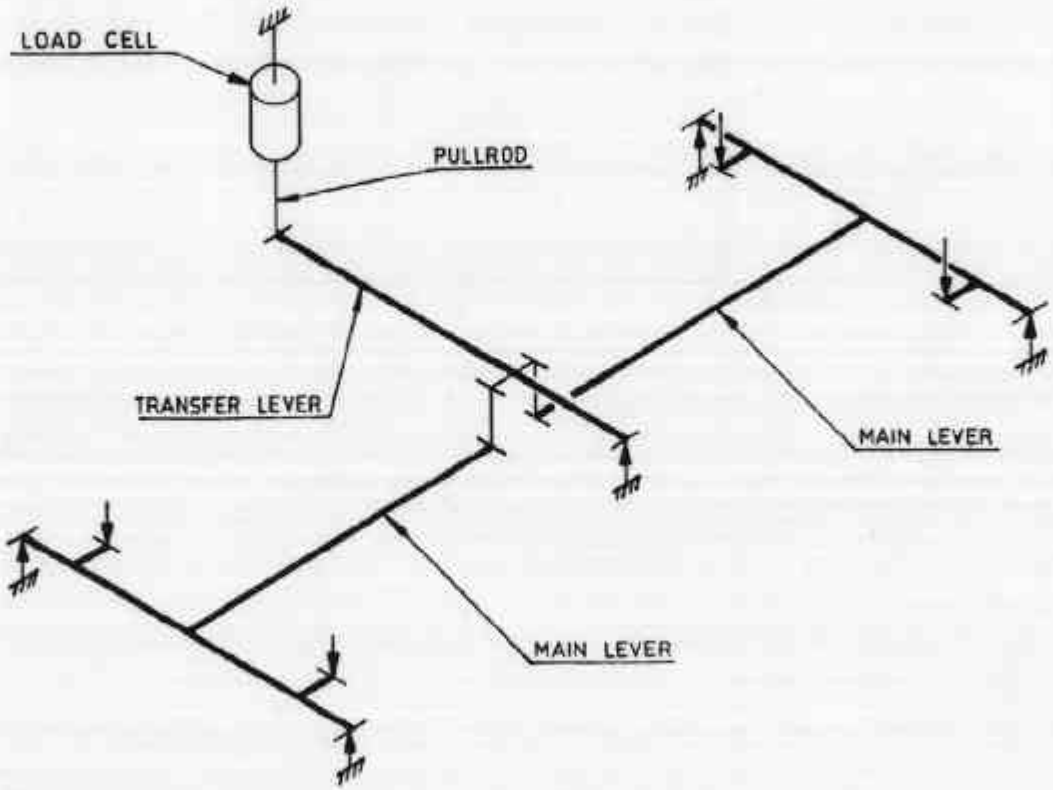


Hottinger Load-cell Resistant Mechanism

16/2/78

FIGURE 6/10B/33 - 3

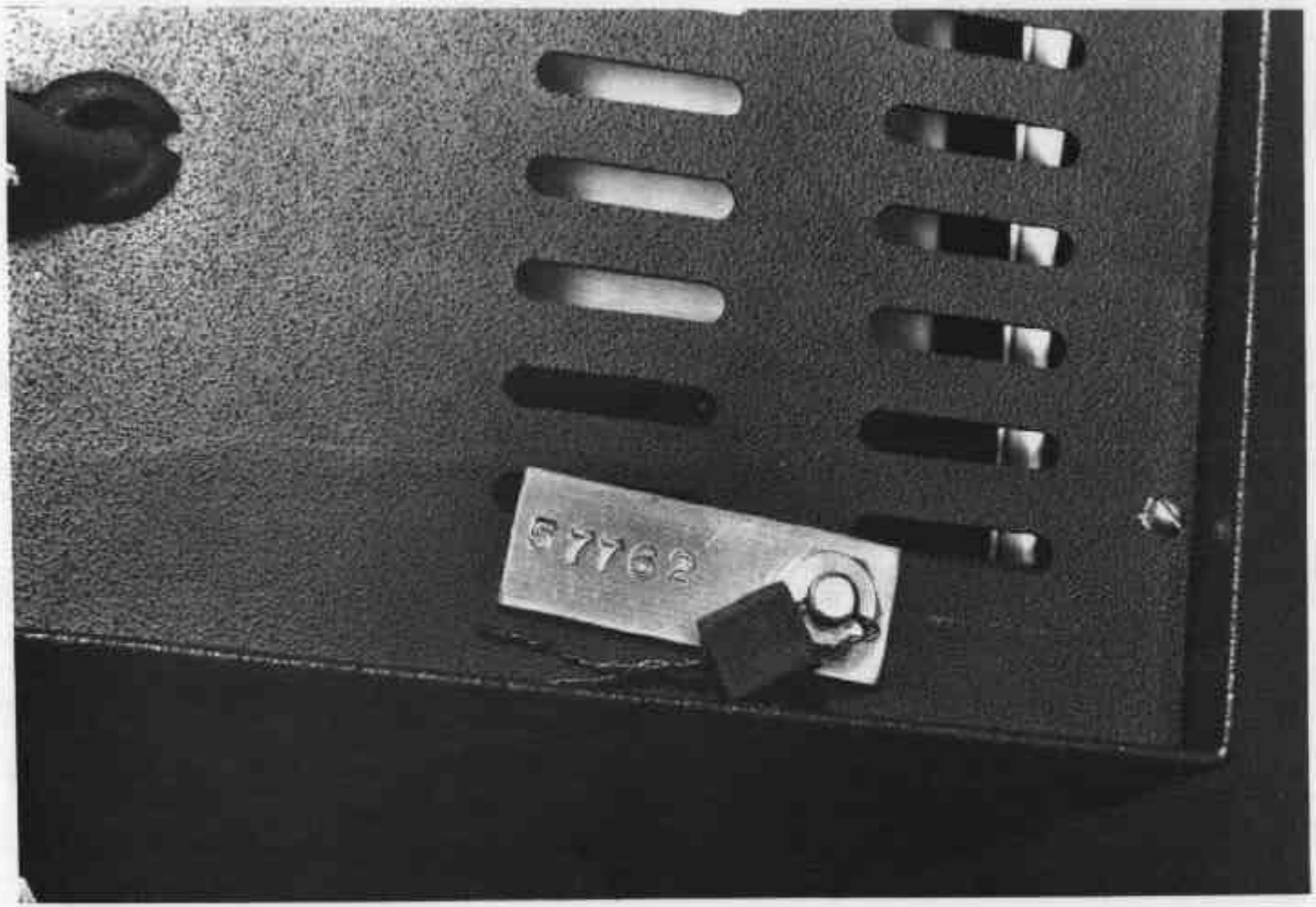
16/2/78



Avery 5109 Basework — Schematic Diagram

FIGURE 6/108/33 - 4

16/2/78



Sealing of Weight Indicator and Load Cell Serial Number

FIGURE 6/10B/33 - 5

Avery Weight Indicator Type SB 350

FIGURE 6/10B/33 - 6

Sealing of SB 350 Mass Indicator

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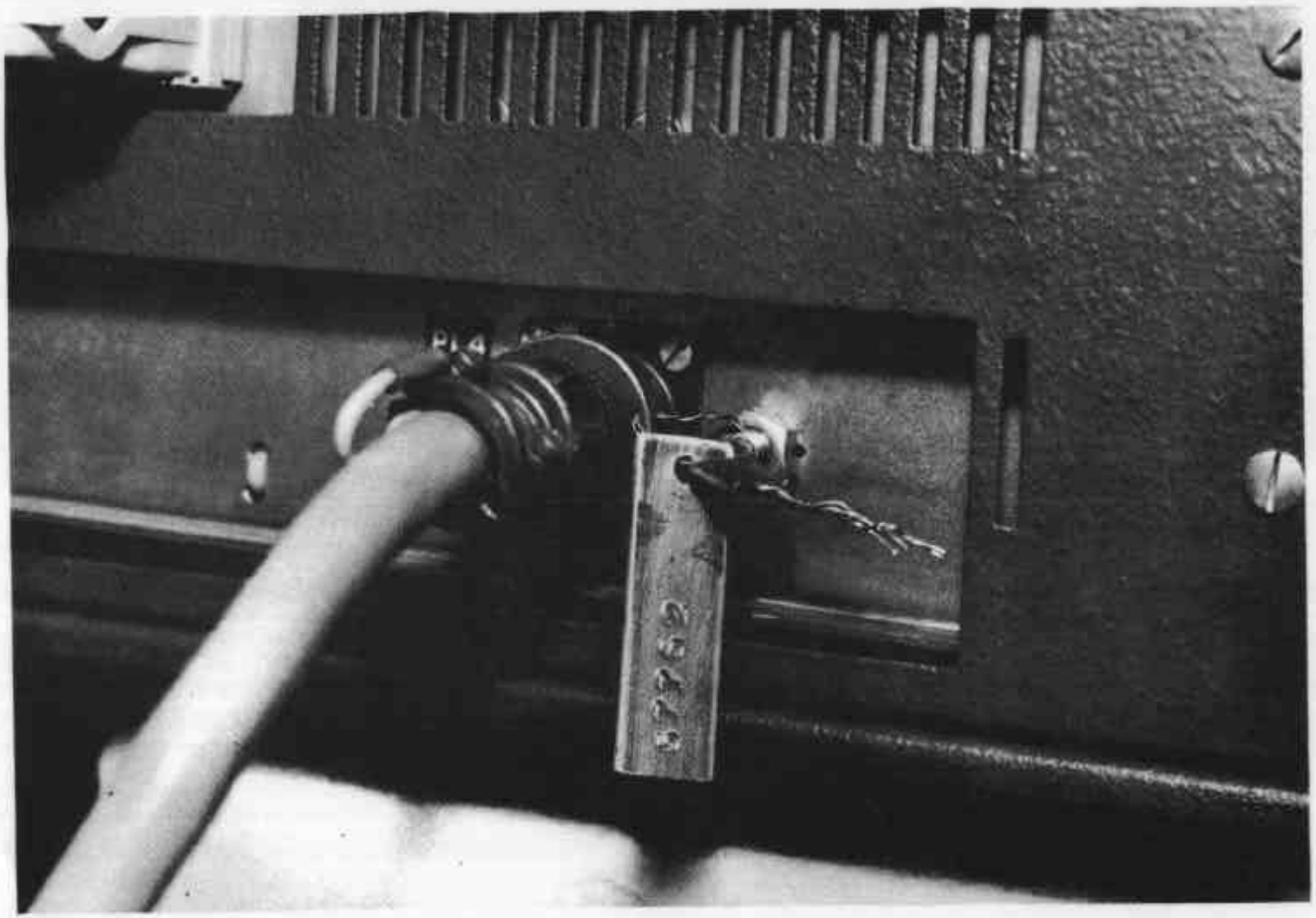
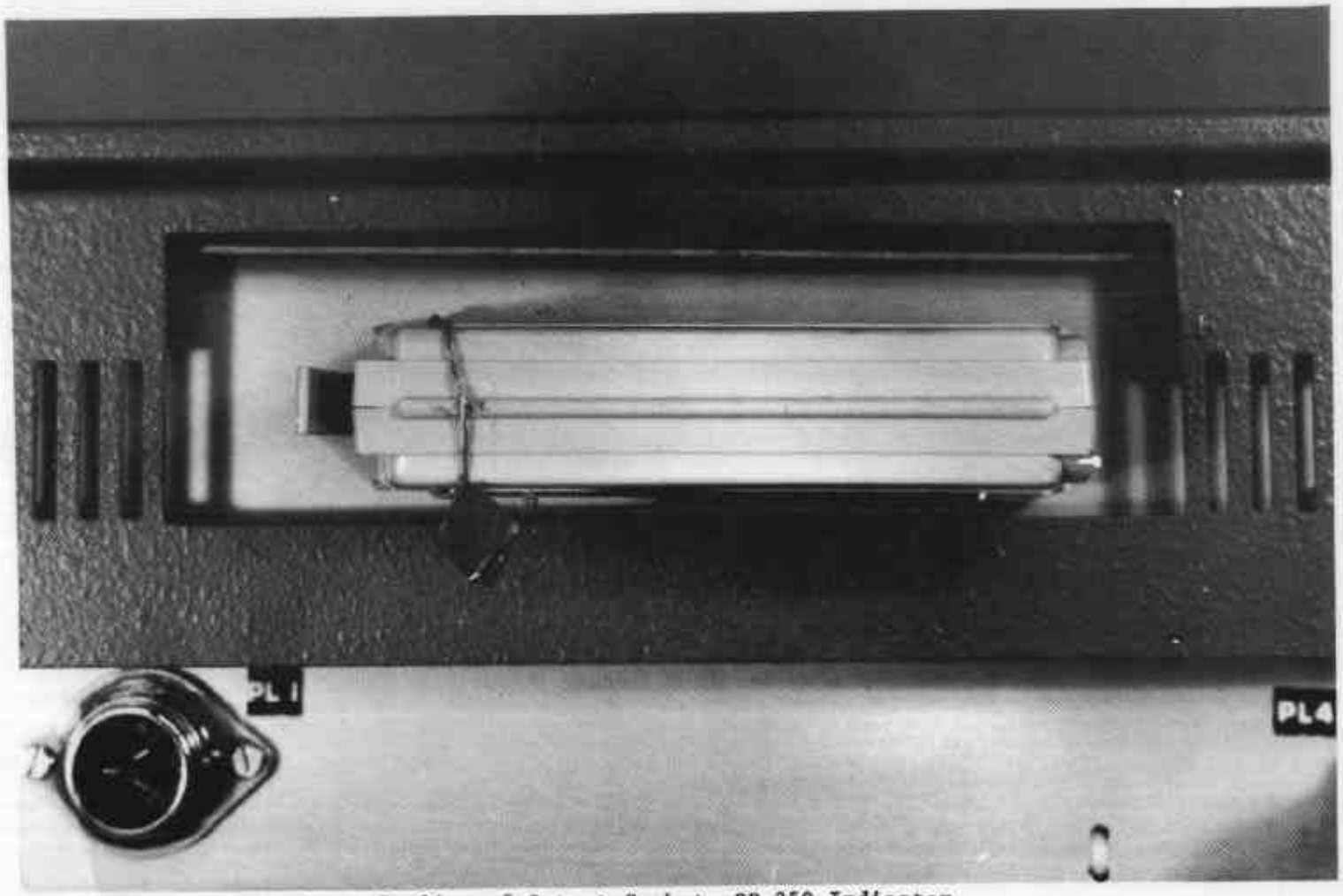
FIGURE 6/10B/33 - 7



Sealing of Load-cell Cable and Load-cell Serial Number to the SB 350 Mass Indicator



Sealing of Output Socket, SB 350 Indicator