



NATIONAL STANDARDS COMMISSION

WEIGHTS & MEASURES (PATTERNS OF INSTRUMENTS) REGULATIONS - REGULATION 9

CERTIFICATE OF APPROVAL No 6/10B/30

This is to certify that an approval has been granted by the Commission that the pattern and variants of the

Avery Weighing Instrument Model 5451/C3H/8650

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

are suitable for use for trade.

The approval of the pattern and variants is subject to review on or after 1/1/83.

All instruments purporting to comply with this approval shall be marked NSC No 6/10B/30.

Relevant drawings and specifications are lodged with the Commission.

Condition of Approval

1. The load cells shall be subject to regular certification by the National Standards Commission.

2. Provisional Variant 6

This variant has approval for 12 months up to 1/11/82 and may be cancelled at any time, if found to be unsuitable for use for trade.

Signed

Executive Director

Descriptive Advice

Pattern: approved 31/10/78

- An instrument of 150 t capacity with four HBM C3H2 load cells of 50 t capacity, and Avery 8650 indicator displaying up to 3000 increments.

Technical Schedule No 6/10B/30 dated 20/12/78 describes the pattern.

Variants: approved 8/9/80

- With 30 t HBM C3H2 load cells, with maximum capacity between 50 t and 80 t.
- With 20 t HBM C3H2 load cells, with maximum capacity between 40 t and 60 t.

Technical Schedule No 6/10B/30 Variation No 1 dated 19/9/80 describes variants 1 and 2.

Note: The load cells are referred to as HBM (GDR) Model C3H in the Technical Schedule; HBM C3H2 is the correct designation.

9/11/81

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Variants: approved 22/10/81

3. With 100 t HBM C3H2 load cells in a 4-cell configuration, with maximum capacity between 150 t and 200 t.
4. With 100 t HBM C3H2 load cells in a 6-cell configuration, with maximum capacity between 150 t and 300 t.
5. A low-profile weighbridge with either four or six 20 t HBM C3H2 load cells, as described in Variation No 2 of the Technical Schedule, and known as Model 5452/C3H/8650.

Provisional Variant: approved 22/10/81

6. Model 5452/C3H/8650 with four 12 t HBM C3H2 load cells, with maximum capacity between 25 t and 30 t.

Technical Schedule No 6/10B/30 Variation No 2 dated 9/11/81 describes variants 3, 4 and 5 and Provisional Variant 6.

Filing Advice

Certificate of Approval No 6/10B/30 dated 19/9/80 is superseded by this Certificate and may be destroyed.

The documentation for this approval now comprises:

Certificate of Approval No 6/10B/30 dated 9/11/81
Technical Schedule No 6/10B/30 dated 20/12/78
Technical Schedule No 6/10B/30 Variation No 1 dated 19/9/80
Technical Schedule No 6/10B/30 Variation No 2 dated 9/11/81.



NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 6/10B/30

Pattern: Avery Weighing Instrument Model 5451/C3H/8650

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

Date of Approval: 31 October 1978

All instruments conforming to this approval shall be marked "NSC No 6/10B/30".

Description:

The pattern is an Avery self-indicating weighing instrument of maximum capacity between 60 and 150 tonnes, comprising a load receptor, load cells, junction box and a weight indicator displaying up to 3000 increments (see Figures 1 to 3).

The basework Type 5451 comprises a load receptor supported on four pendulum-support mechanisms. Each pendulum-support mechanism comprises a Hottinger C3H compression load cell with spherical ends which apply the load to spherical caps (see Figures 3 and 4). The four load cells make up the resistant mechanism. Each load cell is rated to 50 tonnes; at maximum capacity of the instrument the force applied to each load cell is between 150 kN and 370 kN.

The pendulum-support mechanisms are self-centering devices allowing the load receptor to move freely in all horizontal directions and return automatically to the central position when the horizontal force is removed. The load-receptor surrounds or check links limit the horizontal movement of the load receptor.

The cable from each of the load cells terminates in a sealed load-cell junction and balance box (see Figure 2).

The weight indicator Avery 8650 converts the output from the load cells into a digital weight indication of up to 3000 increments. The instrument will automatically rezero to within 0,25e whenever it is at rest within 0,5e of zero; this is indicated by the word ZERO being illuminated. A tool-operated zero adjustment is provided

20/12/78

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on the front of the weight indicator for rezeroing the instrument when zero has changed by more than 0,25e.

A push-button which has internal indications of the words TARE and GROSS allows automatic taring of a vehicle on the load receptor to within 0,25e when pressed so that TARE is displayed. On removal of the vehicle 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. The serial number of each load cell is sealed to the weight indicator by the same seal (see Figure 5).

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

(III)

Max	=	60 t
Min	=	1 t
$d_q = e$	=	0,02 t
T	=	- 60 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 Authority of a State or Territory, may, for example, print receipts or 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.

* Devices which determine and indicate the value of a physical quantity, devices which calculate price and in the presence of the purchaser or vendor indicate price, devices which control the measurement, and devices which are intended to provide the purchaser or vendor with a permanent record, recorded at the time of the measurement, of the physical quantity or physical quantity and price, are a part of the measuring instrument which requires approval by the Commission.

Special Tests:

1. Zero balance — as the automatic device resets zero when the weighing mechanism is in equilibrium within 0,5 scale interval of zero, zero should be checked as described in the Commission's Test Procedure for the Elimination of Rounding Errors for Weighing Instruments with Digital Indication (Document 104), with, say, a load equal to 10e on the load receptor. The indication with 0,25e and 0,75e additional weight on the load receptor will then be 10e and 11e respectively.
2. Zero range — the maximum range of operation of the zero device should not exceed 4% of the capacity of the instrument ($\pm 2\%$ 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 checks 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 scale intervals*

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 scale intervals × scale interval

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



NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 6/10B/30

VARIATION No 1

Pattern: Avery Weighing Instrument Model 5451/C3H/8650

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

1. Description of Variants

1. With HBM (GDR) Model C3H compression-type load cells of 30 t capacity (Figure 3).

1.1 Range

Maximum number of verification scale intervals	3000
Minimum dead load	1,3 t
Minimum measuring range	12,0 t
Maximum measuring range	30 t

1.2 Marking

The following is the minimum of data required to be marked on each load cell:

Manufacturer's name	
Model number	
Serial number	
Output in the form	mV/V
Maximum capacity	

2. With HBM (GDR) Model C3H compression-type load cells of 20 t capacity.

2.1 Range

Maximum number of verification scale intervals	3000
Minimum dead load	1,3 t

19/9/80

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Minimum measuring range	8,0 t
Maximum measuring range	20,0 t

2.2 Marking

The minimum data described in 1.2 is marked on each load cell.



NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 6/10B/30

VARIATION No 2

Pattern: Avery Weighing Instrument Model 5451/C3H/8650

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

1. Description of Variants

1.1 Variant 3

With 100 t HBM C3H2 compression-type load cells in a 4-cell configuration, with maximum capacity between 150 t and 200 t.

1.2 Variant 4

With 100 t HBM C3H2 compression-type load cells in a 6-cell configuration, with maximum capacity of between 150 t and 300 t.

1.3.1 Load Cell Data

1.3.1.1 Range

Maximum number of verification scale intervals	3000
Minimum dead load	4 t
Minimum scale interval	0.02 t
Maximum measuring range	100 t.

1.3.1.2 Marking

The minimum data required to be marked on each load cell is:

Manufacturer's name	
Model number	
Serial number	
Output in the form:	mV/V
Maximum capacity	

1.4 Variant 5

A low profile version of the 5451/C3H/8650 weighing instrument known as the 5452/C3H/8650, incorporating 20 t HBM C3H2 load cells as approved in variant 2. Modules may be used singly, or bolted together by joining plates to achieve the required length. Modules may be of welded or bolted construction, with either concrete or steel platforms.

The instrument is approved for up to 3000 scale intervals either as a single module with 4 load cells and a maximum capacity range of 25 t to 35 t, or with 2 modules and 6 load cells, with maximum capacity range of 50 t to 70 t.

1.5 Provisional Variant 6

Model 5452/C3H/8650 weighing instrument with four 12 t HBM C3H2 load cells, with up to 3000 scale intervals, and a maximum capacity range of 25 t to 30 t.

9/11/81

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NATIONAL STANDARDS COMMISSION

CANCELLATION CERTIFICATE FOR APPROVAL No 6/10B/30

This is to certify that Approval No 6/10B/30 for the pattern of the

Avery Model 5451/C3H/8650 Weighing Instrument

submitted by Avery Australia Ltd
3-5 Birmingham Avenue
VILLAWOOD N.S.W. 2163

expired in respect of new instruments on 30/1/84.

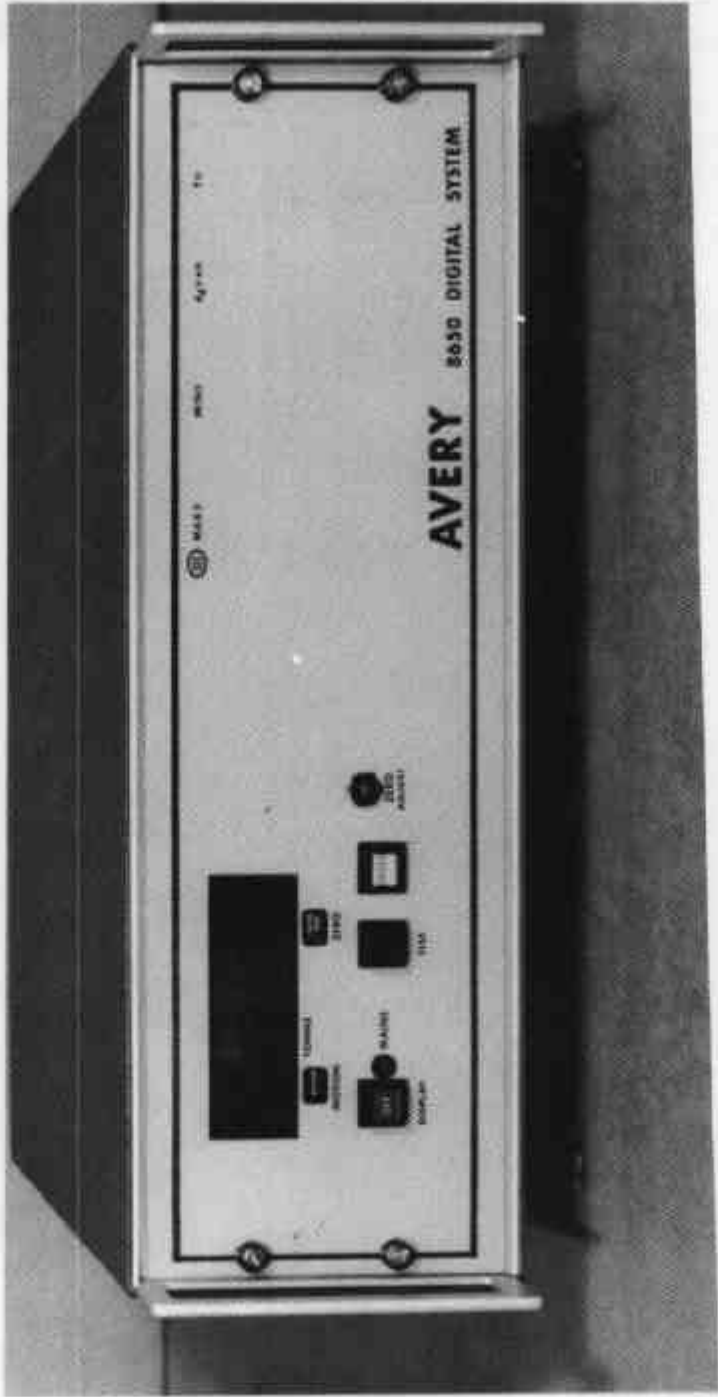
Instruments which were verified before that date may, with the concurrence of the relevant verifying authority, be submitted for reverification.

Signed

Executive Director

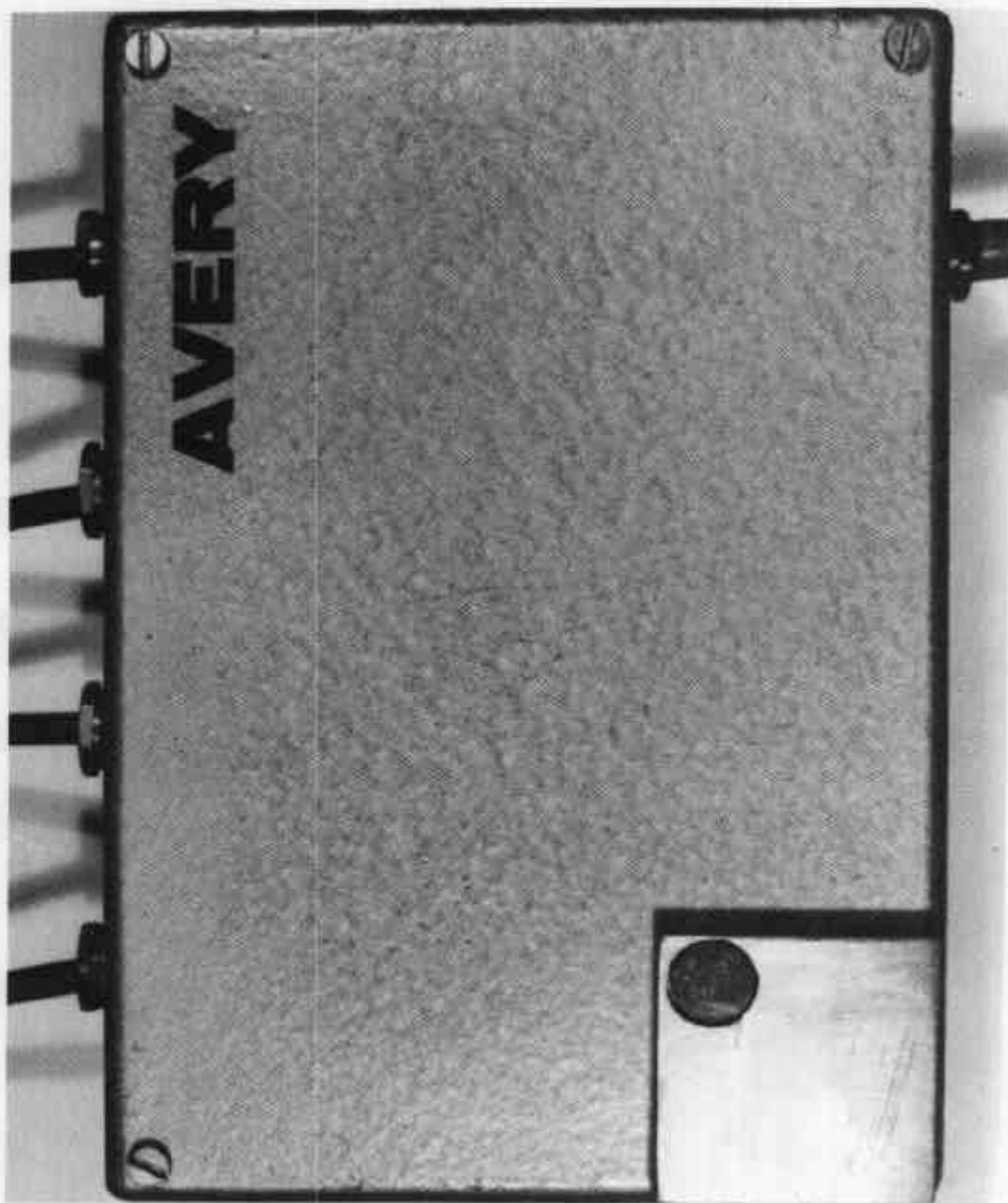
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FIGURE 6/10B/30 - 1



Avery Weight Indicator 8650

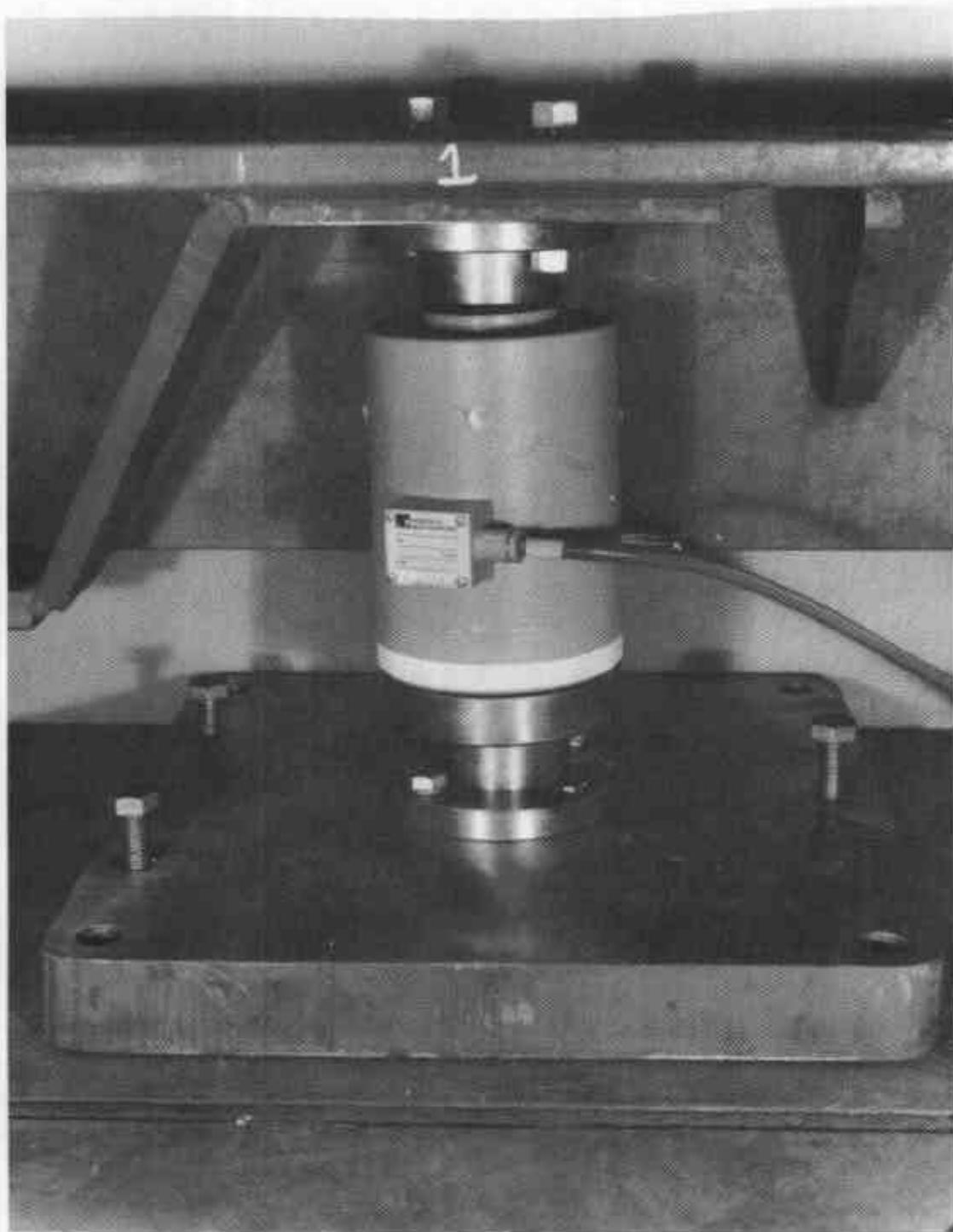
FIGURE 6/10B/30 - 2



Load-cell Junction and Balance Box

20/12/78

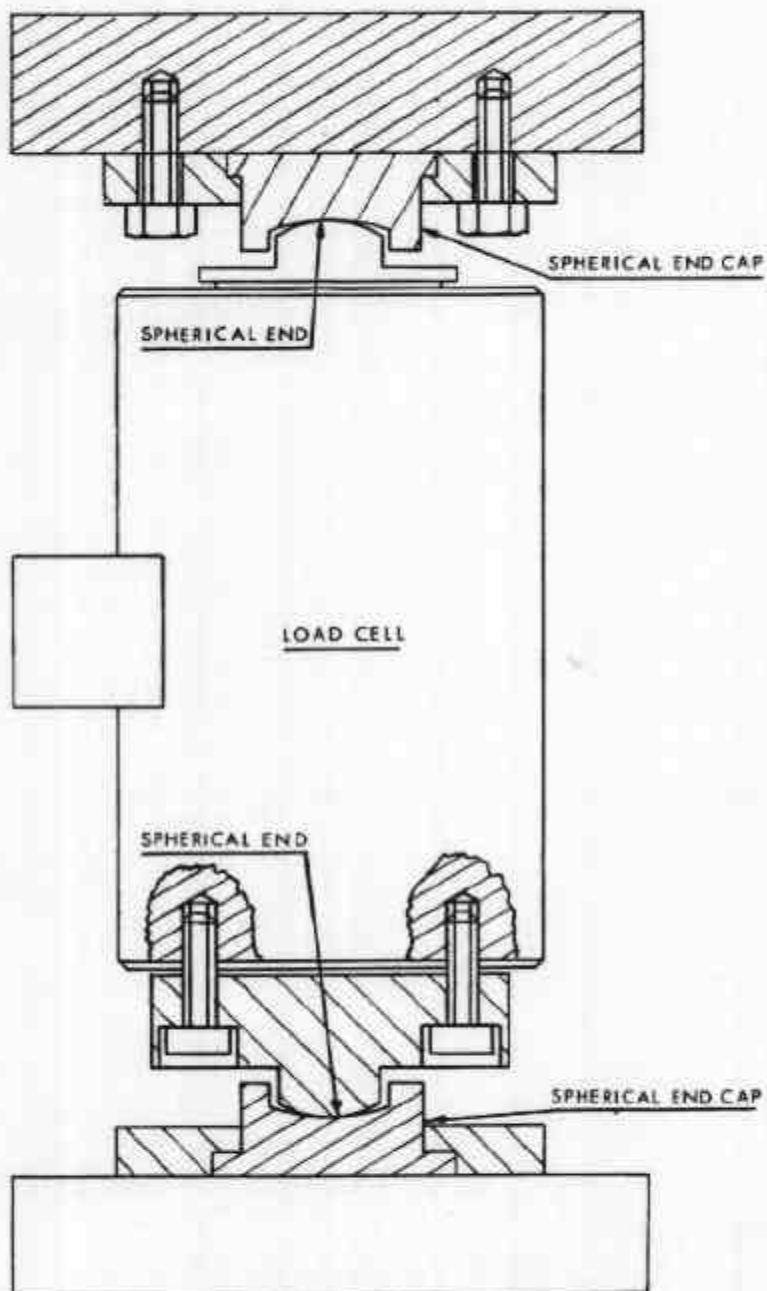
FIGURE 6/10B/30 - 3



Pendulum-support Mechanism — C3H Load Cell with
Spherical Ends and Spherical Caps

20/12/78

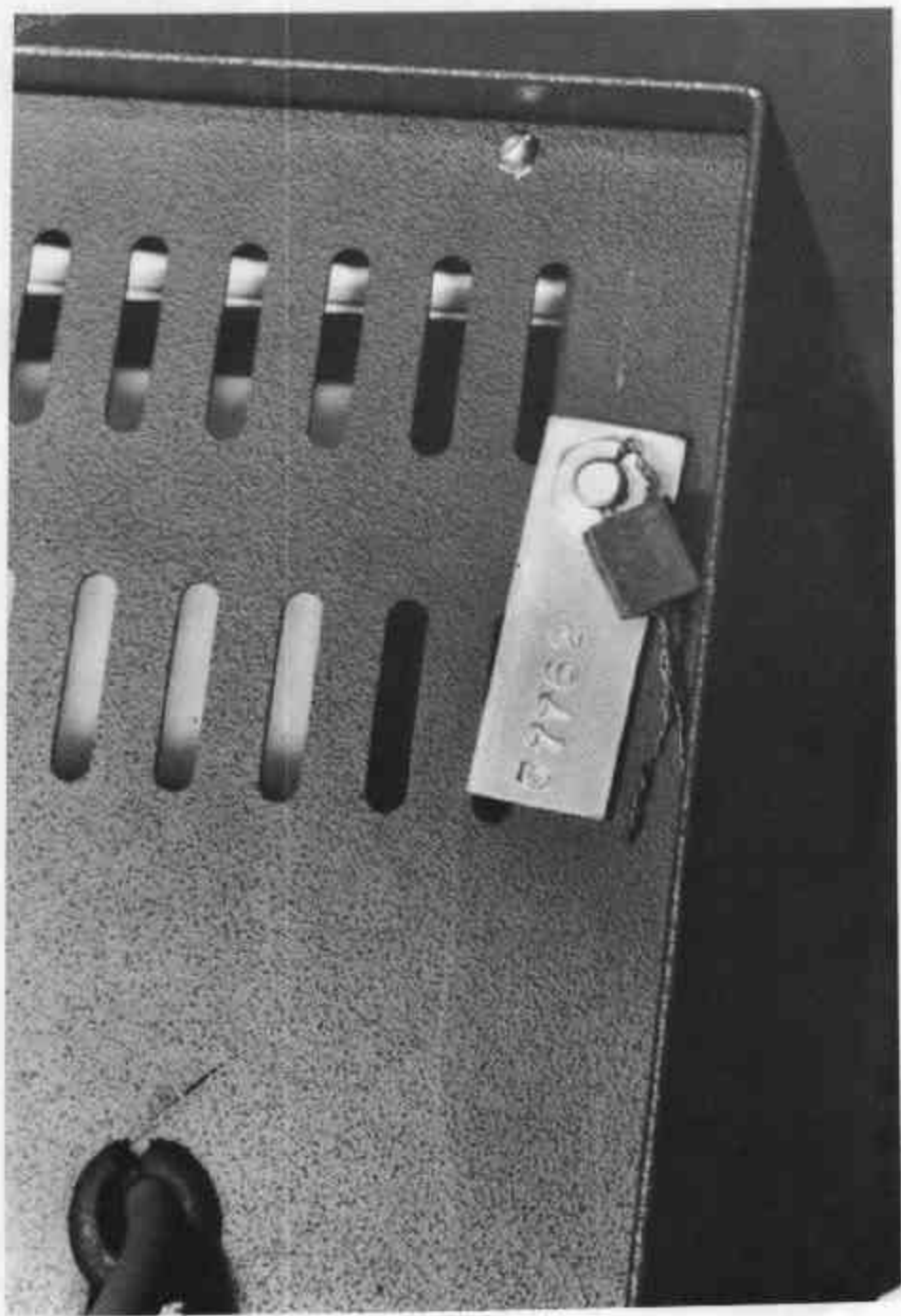
FIGURE 6/10B/30 - 4



Pendulum-support Mechanism — Schematic Diagram

20/12/78

FIGURE 6/10B/30 - 5



Sealing of Weight-indicator Cabinet and Load-cell Serial Number

20/12/78