



Australian Government

**National Measurement
Institute**

12 Lyonpark Road, North Ryde NSW 2113

**Cancellation
Certificate of
Approval No 6/10B/47B**

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that the approval for use for trade granted in Certificate of Approval
No 6/10B/47B issued 13 January 1998 in respect of the

Railweight Model 8200 Weighing-in-motion Weighing Instrument

submitted by Downer Engineering Power Pty Ltd, Automation Division
(formerly Delairco Bartrol)
now of 480 Victoria Road
Gladesville NSW 2111

has been cancelled in respect of new instruments as from 1 December 2004.

Signed by a person authorised by the Chief Metrologist
to exercise his powers under Regulation 60 of the
National Measurement Regulations 1999.

A handwritten signature in black ink, appearing to be the initials "JHT" with a stylized flourish at the bottom.



National Standards Commission

Certificate of Approval

No 6/10B/47B

Issued under Regulation 9
of the
National Measurement (Patterns of Measuring Instruments) Regulations

This is to certify that an approval for use for trade has been granted in respect of the

Railweight Model 8200 Weighing-in-motion Weighing Instrument

submitted by Delairco Bartrol
112-118 Talavera Road
North Ryde NSW 2113.

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This Certificate is issued upon completion of a review of NSC approval No 6/10B/47A.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 July 2002, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No 6/10B/47B and only by persons authorised by the submitter.

It is the submitter's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the Commission and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with the Commission's Document 106.

The Commission reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate No S1/0/A.

This approval shall NOT be used in conjunction with General Certificate No 6B/0.

Special: (for Variant 2)

The submitter shall notify the Commission in writing of each instrument purporting to comply with Variant 2 prior to it being submitted to a trade measurement authority/licensed certifier for initial verification/certification.

Trade measurement authorities/licensed certifiers should not verify/certify any instrument purporting to comply with Variant 2 until advised in writing by the Commission.

DESCRIPTIVE ADVICE

Pattern: approved 13 June 1997

- A Railweight model 8200 weighing-in-motion weighing instrument.

Variants: approved 13 June 1997

1. With an alternative weighing platform.
2. With various components of the pattern replaced by certain other components.

Technical Schedule No 6/10B/47B describes the pattern and variants 1 & 2.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 6/10B/47B dated 13 January 1998
Technical Schedule No 6/10B/47B dated 13 January 1998 (incl. Test
Procedure)
Figures 1 to 8 dated 13 January 1998

Signed and sealed by a person authorised under
Regulation 9 of the National Measurement
(Patterns of Measuring Instruments) Regulations
to exercise the powers and functions of the
Commission under this Regulation.

A handwritten signature in black ink, appearing to read "J. Bish". The signature is written in a cursive style with a large initial "J" and a long, sweeping underline.

TECHNICAL SCHEDULE No 6/10B/47B

Pattern: Railweight Model 8200 Weighing-in-motion Weighing Instrument.

Submittor: Delairco Bartrol
112-118 Talavera Road
North Ryde NSW 2113.

1. Description of Pattern

A Railweight model 8200 weighing instrument for the determination of individual axle masses, and hence the mass of each wagon and the total mass of a train, when weighed in motion. The instrument is approved for class 2 wagon weighing and class 1 train weighing, with a maximum wagon weight of up to 150 t, a minimum wagon weight of at least 25 t, and a scale interval of at least 50 kg, over a speed range of 0.5 to 4.5 km/h.

1.1 Weighing Platform

This supports a short section of rail track on four load cells (Figure 1) to weigh individual axles. The platform is fitted with stays to restrict both longitudinal and transverse movement.

1.2 Load Cells

Four HBM model C3H2 load cells of 30 000 kg maximum capacity are used and mounted as shown in Figure 1. The load cells are also described in the documentation of NSC approval No S310.

1.3 Indicator

A Railweight model 8200 indicator (Figure 2) is used and is suitable for use with up to 1500 verification scale intervals. In addition, the indicator may be connected to speed signals, a printer, and a remote display/control unit (which may also be connected to a printer and keyboard for entry of data such as train identification).

The Railweight 8200 indicator has the following controls:

- (a) **START WEIGH:** Sets the instrument into the mode in which a weighing can begin.
- (b) **LOCAL/REMOTE:** (optional) Sets the indicator so that it is either operated by the controls on its panel, or those on the remote display/control unit.
- (c) **TARE/GROSS:** Used to select whether the weighing to be carried out is of the empty train (TARE or T), or the full train (GROSS or G).
- (d) **DISPLAY TEST:** Performs a test of the instrument display.

- (e) **END WEIGH:** Sets the instrument to inhibit further weighing. When pressed following a weighing operation, the total train mass is printed; further operations will print duplicate weight bills.

The Railweight 8200 indicator utilises a dynamic offset facility for both low and high mass wagons in dynamic (in-motion) weighing mode only. This facility operates in a manner similar to a programmable 2 point linearisation facility.

TABLE 1

Type: Railweight 8200	
Maximum number of verification scale intervals	1500
Minimum sensitivity	3.575 μ V/scale interval
Excitation voltage	11 or 14 V
Minimum load impedance	58.3 ohms
Maximum excitation current	189 mA

1.4 Printer

The printer will print "CALIBRATED: YES" to indicate that the system had been set to zero before commencement of weighing. The wagon sequence number, individual bogie mass, individual wagon mass and total train mass will also be printed, as will any overspeeding or other error messages.

In addition, the statement **BOGIE WEIGHTS NOT TO BE USED FOR TRANSACTION PURPOSES** is printed. Other information may also be printed but locomotive masses will not be printed.

1.5 Remote Control Unit

This incorporates a control to calibrate the system prior to commencement of weighing, and a control to cause the total train mass to be printed and the system to be reset, at the completion of weighing. These controls may be in the form of switches, or by an automatic control initiated by the arrival and departure of the train.

1.6 Track Switches

Alternative track switches may be used (Figures 3 and 4) and these are operated by the wheel flanges of the rail vehicles. The operating sequence provides logic signals which initiate and calibrate the system, prevent the locomotive mass from being printed, enable the instrument to determine the type and position of the wagon being weighed, detect any reversal of train movement, and monitor the speed of the wagons during weighing.

1.7 Markings

Instruments bear the following basic markings at each location having a weight indication or printing device:

Manufacturer's name or mark	
Importer's name or mark	
Model designation	
Serial number of the instrument	
Pattern approval mark	NSC No 6/10B/47B
Accuracy class	
• Train weighing	1
• Wagon weighing	2
Maximum capacity	<i>Max</i> kg or t
Minimum capacity	<i>Min</i> kg or t
Scale interval	<i>d</i> = kg or t
Maximum wagon weight kg or t
Minimum wagon weight kg or t
Maximum operating speed	v_{\max} km/h
Minimum operating speed	v_{\min} km/h
Maximum number of wagons per train (*)	n_{\max}

(*) If less than 60 wagons

1.8 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

1.9 Sealing Provision

Provision is made for the calibration adjustments in the indicator to be sealed by means of a seal and sealing wire through holes in the rear panel of the Railweight model 8200 indicator.

2. Description of Variants

2.1 Variant 1

With an alternative weighing platform (Figures 5 and 6) which determines the wagon mass and the total train mass by weighing of individual bogies. The platform may be either an all steel construction with internal stays (Figure 7) or a concrete-filled steel frame with external stays (Figure 8).

2.2 Variant 2

With various components of the pattern as listed below replaced by certain other compatible components.

NOTE: Agreement in writing to the substitution of components shall be obtained from the National Standards Commission. Refer to the Special Conditions of Approval.

- With alternative bogie or axle weighing platforms.
- With alternative Commission-approved load cells.
- With alternative track switches.

TEST PROCEDURE

Instruments shall be tested in accordance with any relevant tests specified in the Inspector's Handbook, but with the maximum permissible errors for weighing-in-motion and the dynamic test procedure modified as follows:

1. Maximum Permissible Errors

The maximum permissible errors for weighing-in-motion shall be:

Wagon Weighing (Accuracy class 2)

The maximum permissible error for dynamic weighing of a coupled wagon during initial verification/certification shall be:

- $\pm 1\%$ of the wagon weight, rounded to the nearest scale interval;
- $\pm 1\%$, rounded to the nearest scale interval, of the weight of a single wagon equal to 35% of the maximum wagon weight as inscribed on the descriptive markings; or
- \pm one scale interval,

whichever is the greatest.

Errors of not more than 10% of the weighing results, taken from one or more passes of the test train, may exceed $\pm 1\%$ but shall not exceed $\pm 2\%$ of the wagon weight.

Train Weighing (Accuracy class 1)

The maximum permissible error for dynamic weighing of a train of coupled wagons during initial verification/certification shall be:

- (a) $\pm 0.5\%$ of the total train weight, rounded to the nearest scale interval;
- (b) $\pm 0.5\%$, rounded to the nearest scale interval, of the weight of a single wagon equal to 35% of the maximum wagon weight as inscribed on the descriptive markings, times the number of wagons in the train but not exceeding 10 wagons; or
- (c) \pm one scale interval for each wagon in the train, but not exceeding 10 scale intervals,

whichever is the greatest.

In-service Errors

The maximum permissible errors applicable in-service are twice the values for initial verification/certification, namely:

- (a) wagon weighing $\pm 2\%$ of the wagon weight; and
- (b) train weighing $\pm 1\%$ of the total train weight.

2. Dynamic Test Procedure

The dynamic test procedure specified in clause 9.1(b) in Test Procedure No 20 (of the Inspector's Handbook) has been modified in terms of the number of test wagons in the test train as detailed below.

Test Train

The types and number of wagons shall be in accordance with the normal operation of the instrument provided that the number does not exceed 60.

The test train shall be made up of test wagons and normal operational wagons. The wagons shall be loaded to represent the loads weighed by the weighing instrument. If the loads vary, then wagons full, partially filled, and empty shall be used as applicable.

Number of Test Wagons

Each test train shall have not less than five and not normally more than 15 test wagons in accordance with the table below.

Total number of wagons in test train (n)	Minimum number of test wagons
$n < 10$	n
$10 < n < 30$	10
$30 < n$	15

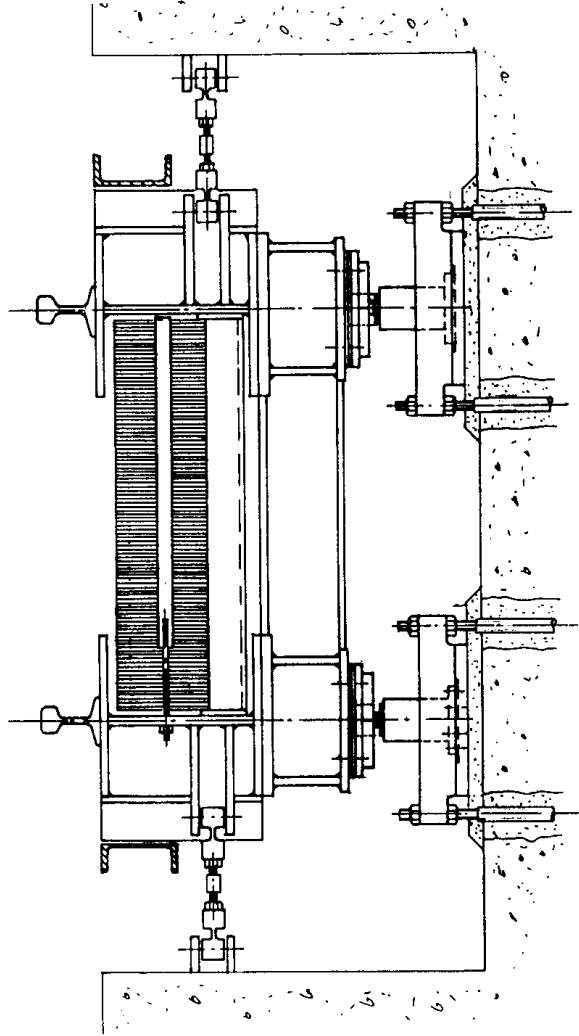
If the number of test wagons is less than the total number of wagons in a test train, the test wagons shall be distributed evenly throughout the train.

3. Performance Requirements

The test train shall be weighed repeatedly to yield not less than 60 wagon weights or their equivalent in total train weight. Every weight indication and printout shall comply with the maximum permissible errors.

If applicable, repeat the tests for other speeds, other directions of travel, or other entry or exit tracks to or from the weighing instrument.

FIGURE 6/10B/47B - 1



Railweight 8200 (Axle) Weighing Platform

FIGURE 6/10B/47B - 2



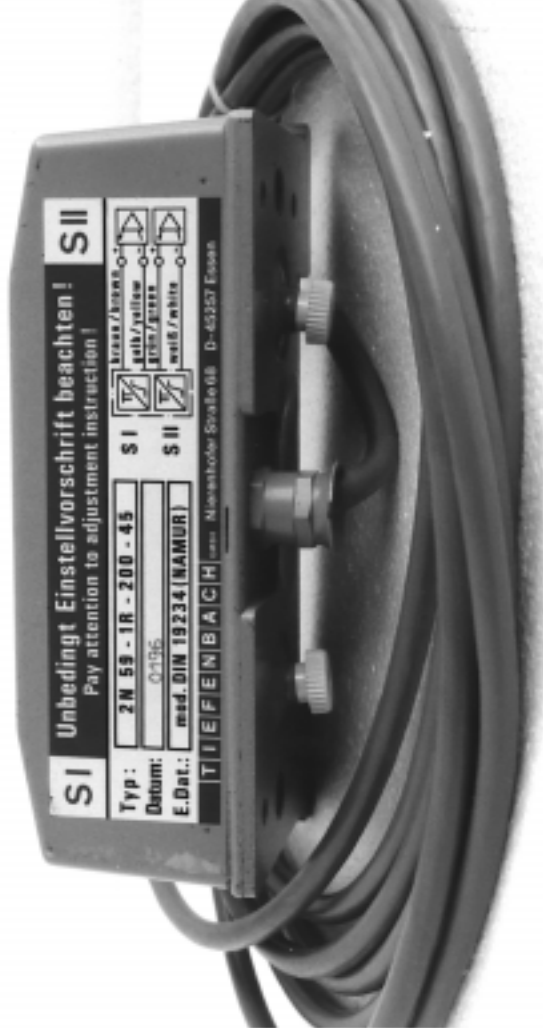
Railweight Model 8200 Indicator

FIGURE 6/10B/47B - 3



Railweight Double-arm Track Switch

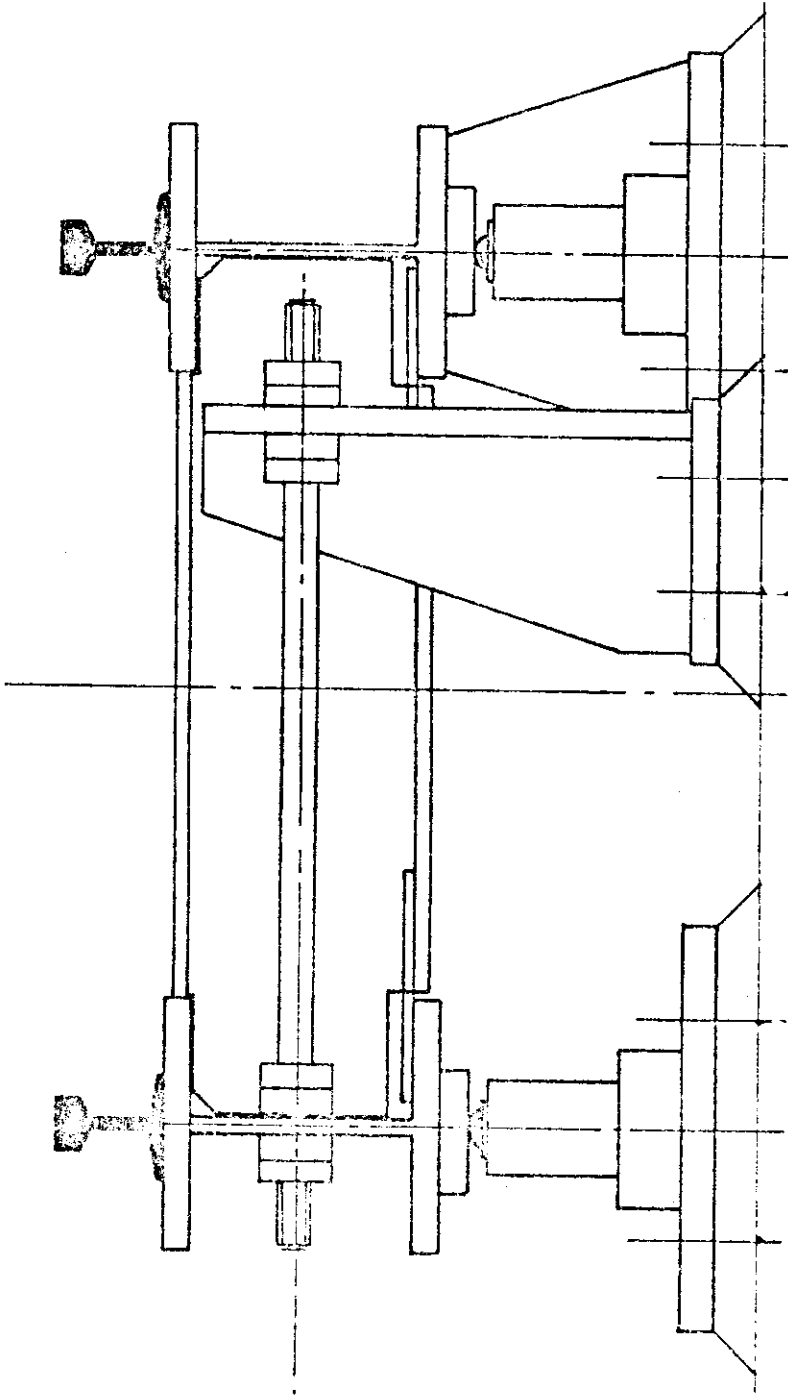
FIGURE 6/10B/47B - 4



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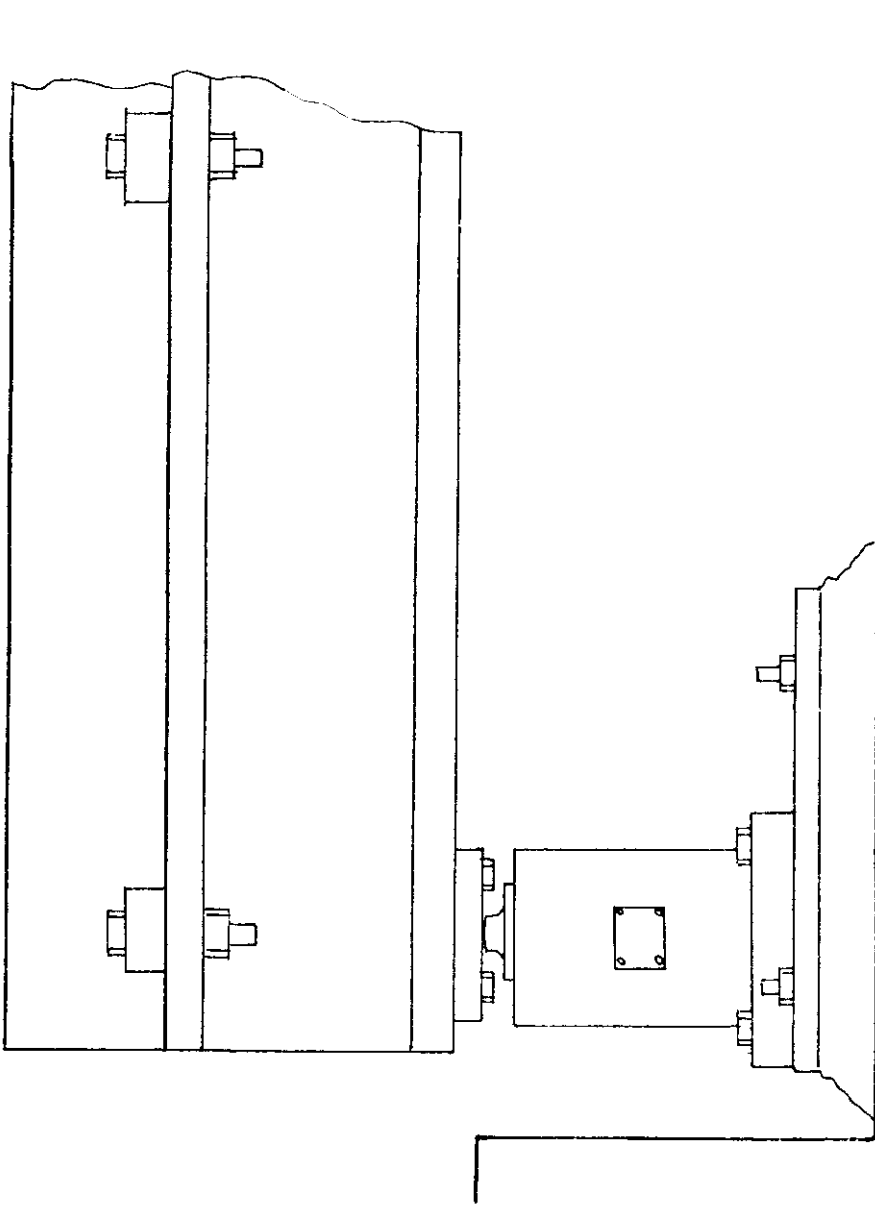
Tiefenbach Proximity Track Switch

FIGURE 6/10B/47B - 5



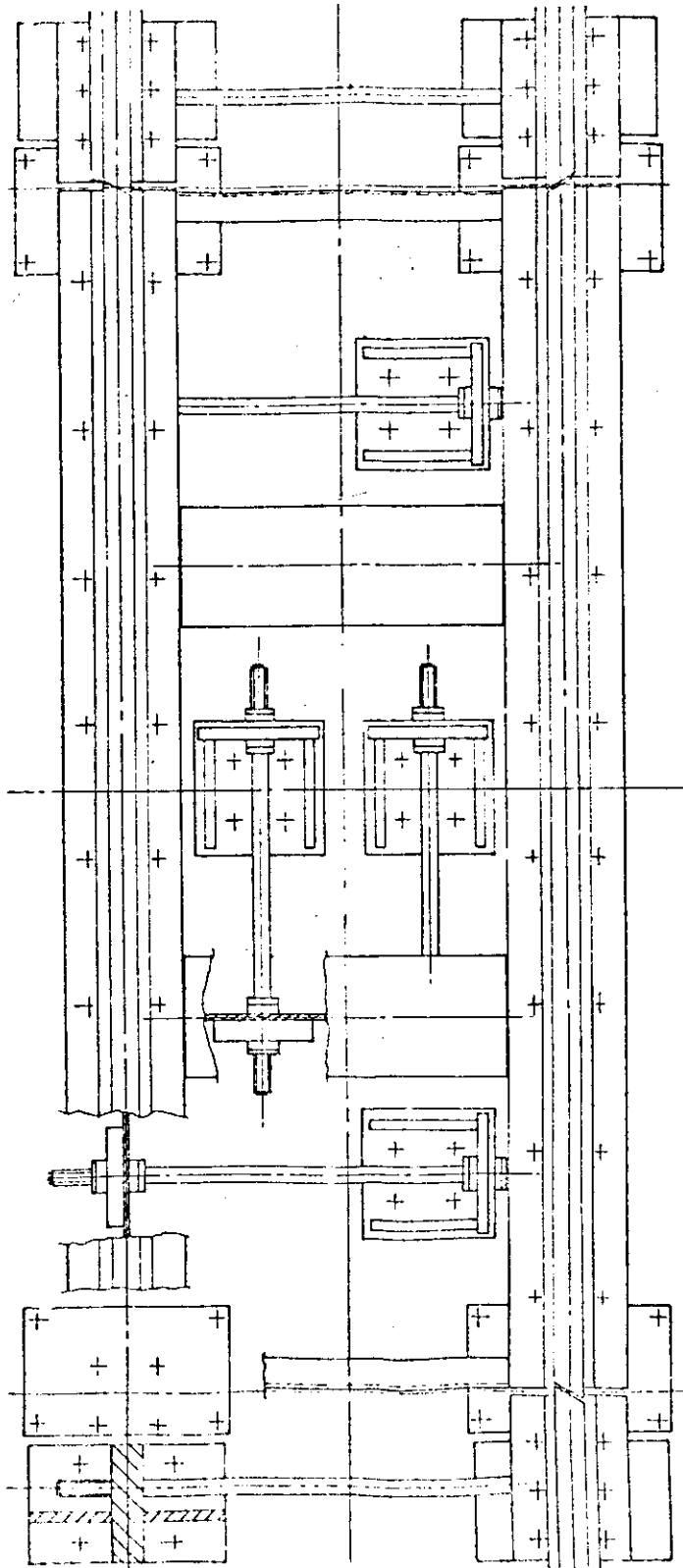
Bogie Weighing Platform - Variant 1

FIGURE 6/10B/47B - 6



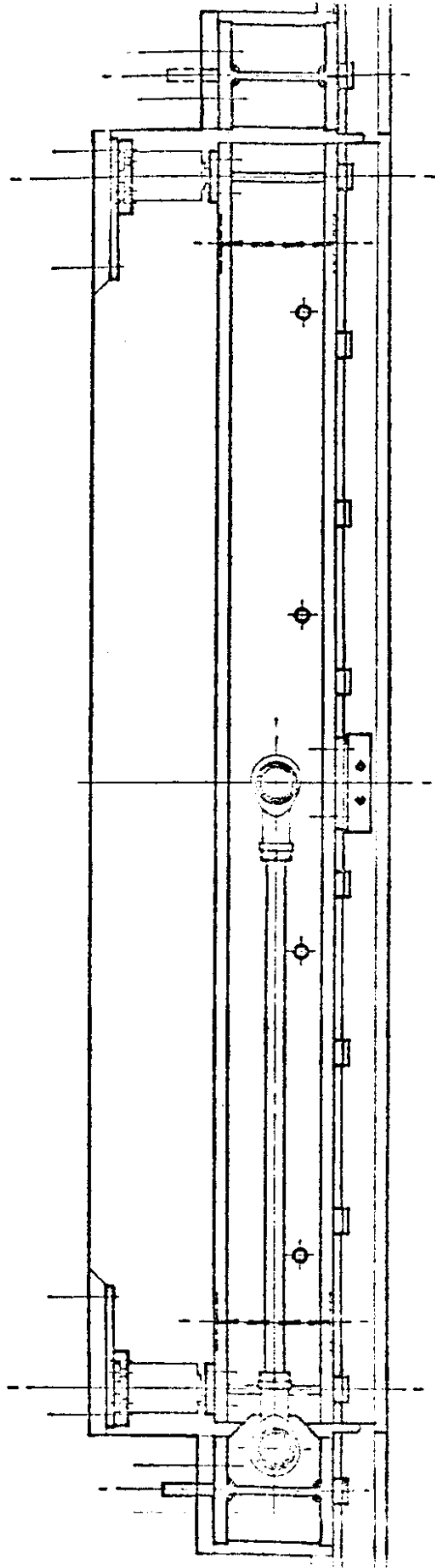
Load Cell Mounting - Variant 1

FIGURE 6/10B/47B - 7



Platform With Internal Stays - Variant 1

FIGURE 6/10B/47B - 8



Platform With Internal Stays - Variant 1