



Australian Government
**Department of Industry, Science,
Energy and Resources**

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval NMI 6/20A/2

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

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

Atlas Weighing Model Compuload 4000 Wheeled Loader Weighing Instrument

submitted by Atlas Weighing Pty Ltd
now of 11/322 Annangrove Road
Rouse Hill NSW 2155

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 approval has been granted with reference to documents NMI R 76, *Non-automatic weighing instruments, Parts 1 and 2*, dated July 2004 and NMI R 51, *Automatic Catchweighing Instruments*, dated August 2009.

This approval is subject to review at the decision of the Chief Metrologist in accordance with the conditions specified in the document NMI P 106.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 to 3 provisionally approved – interim certificate issued	19/07/02
1	Pattern & variants 1 to 3 approved – variant 4 provisionally approved – interim certificate issued	3/06/03
2	Pattern & variants 1 to 3 approved – variant 4 provisionally approved – certificate issued	20/11/03
3	Pattern & variants 1 to 4 reviewed – pattern amended – notification of change issued	22/05/08
4	Pattern & variants 1 to 4 reviewed & updated – certificate issued	9/06/16

DOCUMENT HISTORY (cont...)

Rev	Reason/Details	Date
5	Variant 5 approved – certificate issued	14/11/16
6	Variant 6 approved – certificate issued	01/03/22

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI (or NSC) 6/20A/2' and only by persons authorised by the submittor.

Instruments purporting to comply with this approval and currently marked 'NMI (or NSC) P6/20A/2 may be re-marked NSC No 6/20A/2 and only by persons authorised by the submittor.

It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) 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 document NMI P 106.

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

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

Special Conditions of Approval:

For this type of instrument, the ability to perform within the specified maximum permissible errors can depend substantially on characteristics of the wheeled loader to which it is fitted. Some designs of wheeled loaders simply may not be suitable for attachment of this weighing instrument, however the NMI is unable to clearly define particular wheeled loaders, or categories of wheeled weighers, for which the instrument is unsuitable.

It is the responsibility of the submittor (Atlas Weighing Pty Ltd) to exercise control over any installation to ensure compliance with this approval and to ensure performance within the appropriate maximum permissible errors.

In the event of unsatisfactory performance this approval may be withdrawn.

Special Conditions of Approval for Provisional Variant 4:

Instruments purporting to comply with provisional variant 4 shall be marked 'NMI (or NSC) P6/20A/2 and only by persons authorised by the submittor.

The submittor shall provide the NMI with copies of test results from all verification testing.

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

A handwritten signature in blue ink, appearing to read 'Darryl Hines', with a large, stylized loop at the bottom.

Darryl Hines
Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 6/20A/2

1. Description of Pattern **provisionally approved on 19/07/02**
approved on 3/06/03

The Atlas Weighing model Compuload 4000 class Y(b) automatic catchweighing instrument of 1000 kg maximum capacity with a verification scale interval of 10 kg fitted to a Furuwaka model 35-1 HST wheeled loader.

The Atlas Weighing model Compuload 4000 automatic catchweighing instrument comprises electronic equipment and sensors attached to a wheeled loader (i.e. typically 'front end loader') which automatically determine the load lifted by the lifting mechanism of the loader during the lifting process. Figure 1 shows a typical installation.

The electronic equipment and sensors are described below.

The indicator may be fitted with output sockets for the connection of auxiliary and/or peripheral devices.

1.1 Pressure Sensor(s)

A Pioden or Compuload model BP16 pressure sensor is used (Figure 2). This strain gauge type pressure sensor measures the pressure (0-5000 p.s.i) acting on the piston in the lift cylinder(s). Note: Some lifting systems (e.g. where back pressure is significant) may not be suitable for use of this system.

1.2 Position Reference/Lift Speed Module

The system has an arm-location module which (Figure 3), by use of two internal switches, can determine the position to weigh and the lifting speed of the loader arms.

Alarms are provided (and weighing results prevented) if the position or speed are outside acceptable limits.

1.3 Load Receptor (Bucket) Location Sensor

This sensor is located to detect when the load receptor (bucket) is in the correct location (i.e. the bucket is fully rotated 'crowded' back, so that the load will fall into the centre of the bucket). The system will inhibit weighing if the load receptor is not in this location.

Note: Equipment installed under Provisional Approval No P6/20A/2 may not include this facility and will need to be modified/upgraded to include this device to comply with this approval.

1.4 Level Sensor

A level sensor device (Figure 4) attached to the vehicle, which detects the degree to which the vehicle is tilted from its reference (level) condition, and allows the system to disable weight determination if acceptable levels of tilt are exceeded.

1.5 Junction Box

The system uses a junction box that houses terminations for the inputs and outputs of the other sensors.

1.6 Compuload 4000 Computing and Display Unit

The Compuload 4000 electronic computing, keyboard and display unit (Figure 5) has a dot matrix liquid crystal display (LCD) on which the weighing results as well as instructions, alarm or error messages are displayed.

A keyboard for operation of the unit is provided below the display.

1.7 Printer

A printer unit (typically a Compuload model 4060, Figure 6) is attached to the Compuload 4000 electronic computing, keyboard and display unit.

This unit can print load tickets automatically or by manual command. The printout will print information to identify the particular 'delivery' (time and date), the weight value of each load (lift), together with a total of the loads. Additional information may also be printed (product description, customer name, etc.).

1.8 Additional Features

The system has certain additional functions:

- A function in which a particular target total weight is set. The material is delivered (e.g. loaded into a truck) by a number of lifts, and after each lift the display provides an indication of the material still to be delivered to obtain the target total weight.
- A totalisation facility.
- An 'auto enter' facility allowing each weight value to be automatically accepted (added to total and printed).
- Provision for storage of customer details.
- Provision for storage of product details.

The instrument may have other additional functions. These functions other than the indications of measured mass (i.e. gross, tare, net, totals) displayed either on the indicator or on an auxiliary or peripheral device), are not approved for trade use.

1.9 Identification of Load Receptors

The system shall be verified for a particular load receptor (i.e. attachment to the lifting system), and if it appears that alternative receptors may possibly be used (e.g. if different attachments are available), clear identification of the attachments shall be provided and the indicator shall carry clear markings corresponding to the identification of the attachment to indicate those for which the system has been verified.

Use with load receptors other than those with which the system has been verified is not approved.

1.10 Power Supply

The instrument is powered by the vehicle power supply (battery) of 12 or 24 V DC.

1.11 Zero

A zero setting operation may be selected using the zero button of the instrument or it may be requested automatically by the system (e.g. after completion of a delivery or after a number of lifts have been carried out without zeroing).

Zero is set by raising the empty load receptor a number of times (according to instructions on the display). When zero has been set (to within $\pm 0.25e$) this is indicated by 'ZERO 0.00 t' on the display.

The instrument may have an initial zero-setting device with a nominal range of not more than 20% of the maximum capacity of the instrument.

1.12 Sealing Provision

The calibration and certain set-up parameters of the indicator can be secured with a password. To check that passwords have been set, attempt to enter the calibration menu (by entering FUNC 1 8) – a password should be requested. Pressing the 'CLEAR' key will exit this and return to the main menu.

In addition a calibration event counter that is non-resettable increments each time that the calibration mode is accessed. The value of the calibration event counter is shown in the display as part of the power-up display sequence, and the value at the time of verification shall be recorded on a destructible adhesive label attached to the instrument.

Any subsequent alteration to the calibration or parameters will be evident as the recorded value and the current calibration event counter value will differ.

1.13 Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full
Name or mark of manufacturer's agent
Indication of accuracy class, e.g.class Y(b)
Pattern approval mark for the instrument	NMI (or NSC) No 6/20A/2
Maximum capacity	<i>Max</i> kg or t *
Minimum capacity	<i>Min</i> kg or t *
Verification scale interval	<i>e</i> = kg or t *
Serial number of the instrument

* These markings shall also be shown near the display of the result if they are not already located there.


In addition, the value of the calibration event counter at the time of verification shall be recorded on a destructible adhesive label attached to the instrument (refer to clause 1.12).

1.14 Verification Provision

Provision is made for the application of a verification mark.

1.15 Descriptive Markings and Notices


Instruments are marked with the following data, together in one location, in the form shown at right:

Manufacturer's mark, or name written in full
Name or mark of manufacturer's agent
Indication of accuracy class	
Pattern approval number for the instrument	NMI 6/20A/2
Maximum capacity	<i>Max</i>/..... g or kg #1
Minimum capacity	<i>Min</i> g or kg #1
Verification scale interval	<i>e</i> =/..... g or kg #1
Maximum subtractive tare	<i>T</i> = - g or kg #2
Special temperature limits	0°C to +40°C
Serial number of the instrument


For single interval instruments (see variants) there is only one range therefore only one value of maximum capacity and verification scale interval to be marked.

- #1 These markings are also shown near the display of the result if they are not already located there.
- #2 This marking is required if *T* is not equal to *Max*.

2. Description of Variant 1 provisionally approved on 19/07/02 approved on 3/06/03

The Atlas Weighing model Compuload 4000 as described above for the pattern but configured as a class  non-automatic weighing instrument.

The instrument is as described above for the pattern (i.e. as an automatic catchweighing instrument) except as detailed below:

- When operating in this configuration, the lifting arm is lifted past the position reference module, and then allowed to lower back to the location of the position reference module where weighing occurs. The weight reading is then taken whilst the lifting arm is stationary in the weighing location.
- Automatic entry (totalisation) of weight values is not possible. Weight values must be accepted manually.
- The marking of accuracy class shall be .

3. Description of Variant 2 provisionally approved on 19/07/02 approved on 3/06/03

The Atlas Weighing model Compuload 4000 class Y(b) automatic catchweighing instrument or class 4 non-automatic weighing instrument similar to the pattern or variant 1 but fitted to different wheeled loaders which may also have different maximum capacities.

Instruments are approved for use with up to 250 verification scale intervals. Instruments configured to operate as non-automatic weighing instruments (variant 1) shall not have less than 100 verification scale intervals.

4. Description of Variant 3 **provisionally approved on 19/07/02**
approved on 3/06/03

With an Atlas Weighing model Compuload 3000 MkII electronic computing, keyboard and display unit (Figure 7). This unit is similar to the Compuload 4000 but has less operator keys and a reduced set of functions.

5. Description of Variant 4 **provisionally approved on 19/07/02**

The Atlas Weighing model Compuload 3000 MkII or Compuload 4000 class Y(b) automatic catchweighing instrument or class III non-automatic weighing instrument similar to the pattern and variants 1 to 3 but fitted to various forklifts (Figure 8) of various maximum capacities.

Instruments are approved for use with up to 250 verification scale intervals. Instruments configured to operate as non-automatic weighing instruments shall not have less than 100 verification scale intervals.

6. Description of Variant 5 **approved on 14/11/16**

The pattern or variants, using a WIKA model TTF-1 pressure sensor with a pressure range of 0 – 400 bar (rather than the pressure sensor described for the pattern in **1.1 Pressure Sensor(s)**).

Instruments are approved for use with up to 250 verification scale intervals. Instruments configured to operate as non-automatic weighing instruments shall not have less than 100 verification scale intervals.

7. Description of Variant 6 **approved on 01/03/22**

The Atlas Weighing model Compuload CL6000 class Y(b) automatic catchweighing instruments which is similar to the pattern but using a Compuload model CL6000 electronic computing, keyboard and display unit (Figure 9), a WIKA model TTF-1 pressure sensor and a Compuload Model CL-6030-C angle sensor (Figure 10) which detects the degree to which the vehicle is tilted from its reference (level) condition, and allows the system to disable weight determination if acceptable levels of tilt are exceeded.

Instruments are approved for use with up to 250 verification scale intervals.

7.1 Sealing Provision

The instrument is sealed by recording the event counter on verification.

Access to allow changing of set-up parameters including calibration parameters must be protected by a passcode.

In addition a calibration event counter that is non-resettable increments each time that the calibration or configuration mode is accessed. The value of the calibration event counter is shown in the display as part of the power-up display sequence, and the value at the time of verification shall be recorded on a destructible adhesive label attached to the instrument.

The value of the event counter is a hexadecimal format up to 4 digits. The last two digits are calculated from a 32 bit checksum of the stored calibration and configuration variables. The first two digits increment each time the instrument is re-configured or calibrated.

Any subsequent alteration to the calibration or parameters will be evident as the recorded value and the current calibration event counter value will differ.

7.2 Software

The legally relevant software is designated version TA0.25-xx, where 'xx' represents the identification of non-legally relevant software.

The software number can be seen in the switch-on display sequence when the power is first applied to the instrument.

TEST PROCEDURE No 6/20A/2

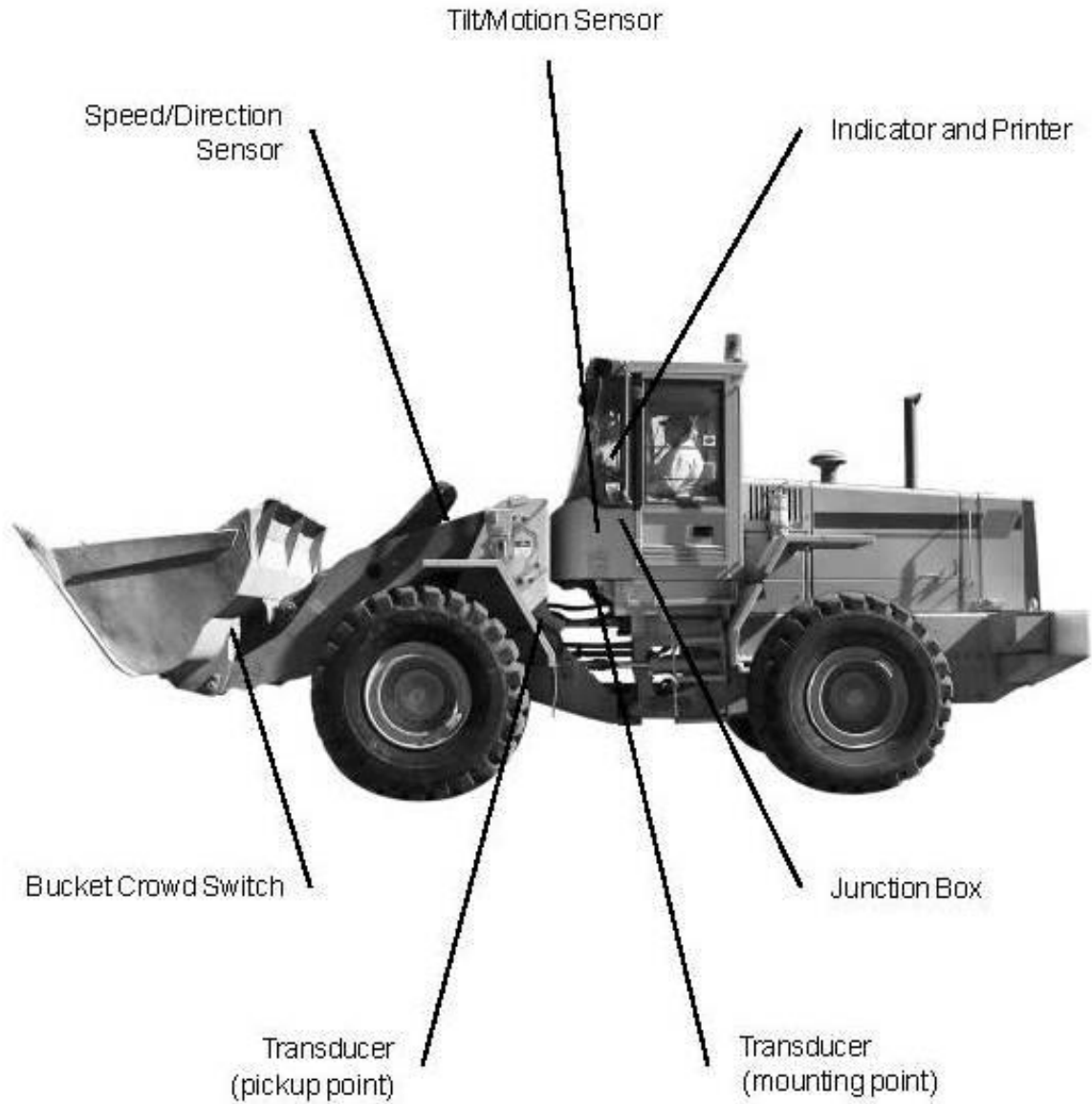
Instruments shall be tested in accordance with relevant tests for this category of instrument.

The instrument shall not be adjusted to anything other than as close as practical to zero error, even when these values are within the maximum permissible errors.

Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 1 of the *National Trade Measurement Regulations 2009*.

FIGURE 6/20A/2 – 1



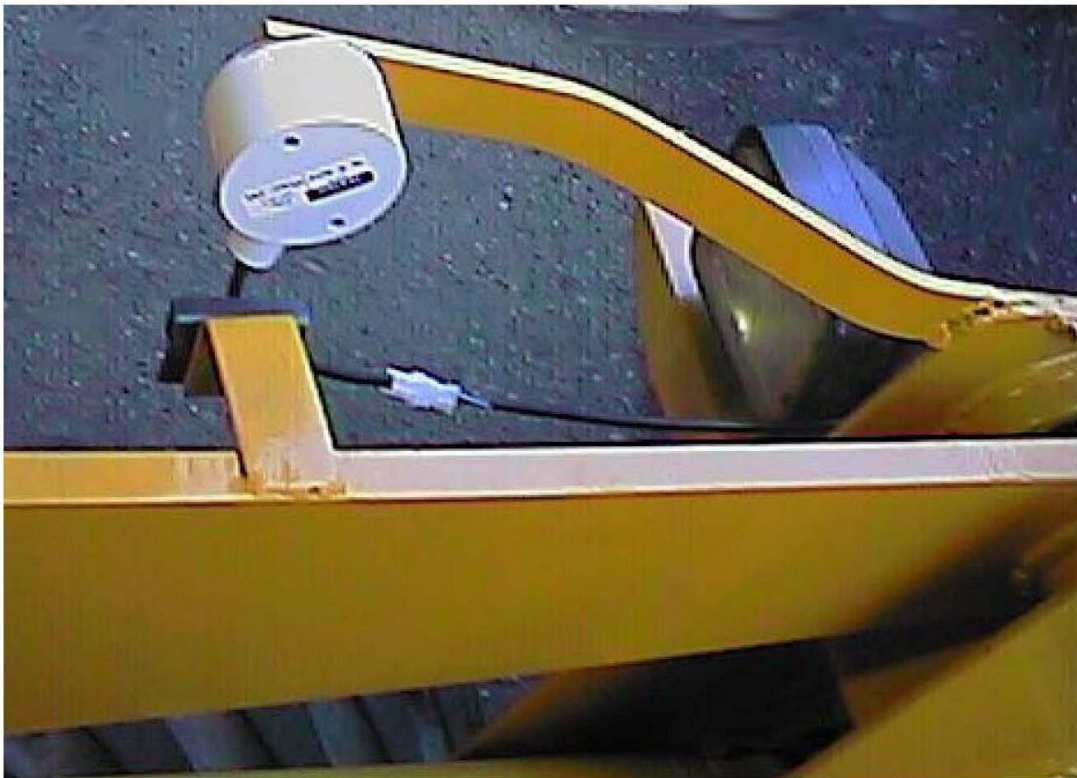
Atlas Weighing Model Compuload 4000 Wheeled Loader Weighing Instrument (Pattern)

FIGURE 6/20A/2 – 2



Pioden (Compuload) Model BP16 Pressure Sensor

FIGURE 6/20A/2 – 3



Position Reference/Lift Speed Module

FIGURE 6/20A/2 – 4



Level Sensor

FIGURE 6/20A/2 – 5



Compuload 4000 Computing and Display Unit

FIGURE 6/20A/2 – 6



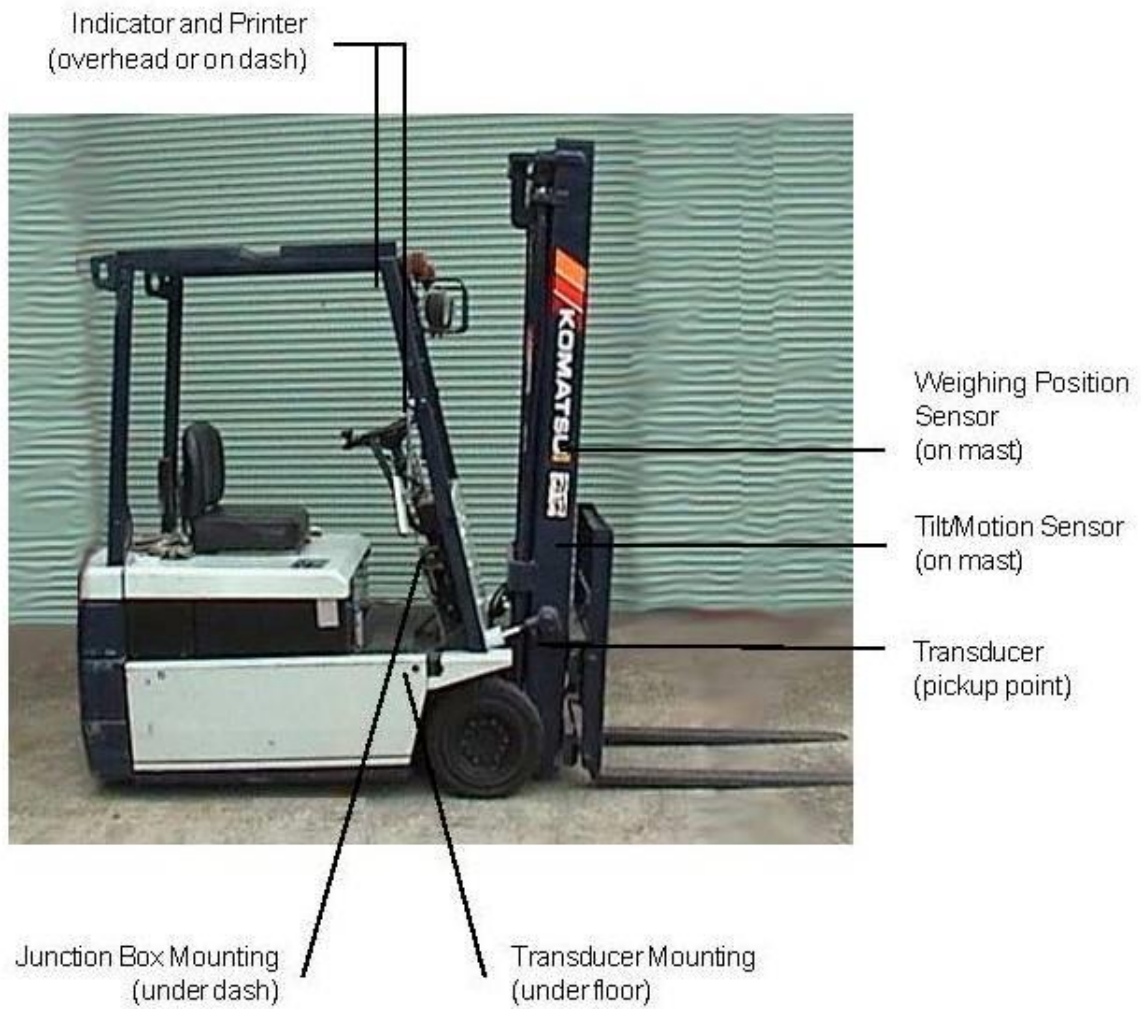
Compuload 4060 Printer Unit

FIGURE 6/20A/2 – 7



Compuload 3000 MkII Computing and Display Unit (Variant 3)

FIGURE 6/20A/2 – 8



Typical Atlas Weighing Model Compuload Wheeled Loader (Forklift)
Weighing Instrument (Variant 4)

FIGURE 6/20A/2 – 9



Compuload Model CL6000 Computing and Display Unit (Variant 6)

FIGURE 6/20A/2 – 10



Compuload Model CL-6030-C Angle Sensor

~ End of Document ~