

INSTANT WEIGHT PTY LTD

COMPULOAD CL2000MKII Dynamic Series MANUAL



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NOTE: - These basic installation instructions are given based on the installer having previous experience in the servicing and maintenance of machinery. General safety precautions should be undertaken similar to carrying out maintenance on this type of machinery. Inexperienced personnel should not undertake this task if they are unsure of the safety precautions necessary

WARRANTY COMPULOAD CL2000MKII

THE COMPULOAD CL2000MKII HAS NO USER SERVICEABLE COMPONENTS INSIDE DO NOT ATTEMPT TO DISMANTLE THE UNIT AS THIS WILL CAUSE YOUR WARRANTY TO BECOME NULL AND VOID.

INSTANT WEIGHT Pty. Ltd. warrants the COMPULOAD Series CL2000MKII load weighing gauge and any optional equipment to be free of defects in workmanship and material for a period of twelve (12) months from date of dispatch or installation, (whichever is applicable)

This Warranty only applies provided the COMPULOAD CL2000MKII and accessories are used in accordance with the recommendations of INSTANT WEIGHT Pty. Ltd. under normal use and reasonable care.

The warranty does not cover damage in any way whatsoever including transit damage. The warranty does not cover malfunction or failure resulting from misuse, neglect or abuse.

The warranty immediately becomes void should any repairs, alterations or modifications are carried out or attempted to be carried out by other than INSTANT WEIGHT Pty. Ltd.

The warranty is not transferable and applies only to the original purchaser unless authorised by INSTANT WEIGHT Pty. Ltd.

The warranty does not include travel expenses should a factory engineer or representative be required to preform repairs on site.

At the option of INSTANT WEIGHT Pty. Ltd. any faulty units or components will be repaired or replaced free of charge whilst within the warranty period providing the unit or component is returned to our premises with freight pre-paid.

Our factory engineers will offer all possible assistance to rectify any difficulties experienced in the field. The larger majority of problems can be overcome by telephone. Please contact our office prior to forwarding any units or components for attention

NOTE Our carrier does not accept responsibility for loss or damage in transit. Should transit or freight loss or damage insurance be required it must be indicated on your order and the cost of such insurance will be charged accordingly.

OPERATING PRINCIPAL

The COMPULOAD CL2000MKII Dynamic weighing system works by measuring the pressure in the lift side of the hydraulic cylinders lifting the arms. It compares this pressure to the speed that the arm is lifting the load at to determine the weight of the load.

The speed is measured by angle sensors fitted to the arm and the frame. The pressure is measured by the pressure sensors (Transducer). The **PRESSURE SENSOR (TRANSDUCER)** and **ANGLE SENSORS** are connected to the **INDICATOR** via the **JUNCTION BOARD**.

INDICATOR



PRESSURE TRANSDUCER



ANGLE SENSOR - CHASSIS



ANGLE SENSOR - BOOM



JUNCTION BOARD



IO Converter

6 Port CAN Bus

Parts Supplied List

- C2000mk2 indicator with RAM mount
- Junction Board with 4 connectors
- Angle Sensor x 2
- Pressure Transducer x 1 with Superseal connector and ¼" BSP adapter
- Cable: Indicator / Printer - Junction Board
- Cable: Junction Board - Transducer
- Cable: Boom Angle Sensor (with CAN bus terminator) - Junction Board
- Cable: Chassis Angle Sensor - Junction Board
- Cable: Power - Junction Board
- 4-Pin CAN Plug Pack
- Hydraulic fitting pack
- Power supply pack
- Adhesive pack
- Cable Tie Pack
- Cable Mount Pack
- Installation Manual

Safety Considerations

- ⇒ Extreme Caution should be used when accessing the machine hydraulics. This should only be undertaken by experienced technicians who are familiar with machine hydraulics.
- ⇒ Ensure the main boom lifting arms are fully lowered to the ground prior to accessing the hydraulic lifting circuit or removing any hydraulic fittings.
- ⇒ Remove any excess hydraulic pressure in the lifting circuit by exercising the lift lever fully forward with the machine turned OFF. Refer to the machine manual if in doubt.
- ⇒ Remove the hydraulic tank cap to remove any pressure inside the tank.
- ⇒ Slowly remove any “easy to get at” hydraulic fitting in the lifting circuit very carefully to check for excess pressure.

REMOVING OR LOOSENING ANY HYDRAULIC HOSES WITHOUT RELEASING THE PRESSURE CAN RESULT IN SERIOUS INJURY OR DEATH. IF IN DOUBT ENGAGE THE SERVICES OF A HYDRAULIC SPECIALIST.

DO NOT, UNDER ANY CIRCUMSTANCES, WORK or WALK UNDER UNSUPPORTED LIFTING ARMS. DOING SO CAN RESULT IN SERIOUS INJURY OR DEATH.

INSTALLATION PROCEDURE FOR THE COMPULOAD CL2000MKII

- 1- Determine hydraulic fitting and install Transducer
- 2- Mount The Indicator / printer
- 3- Attach the Boom Angle Sensor
- 4- Attach the Chassis Angle Sensor
- 5- Mount the Junction Board
- 6- Route Transducer cable
- 7- Route Angle Sensors cables
- 8- Source power
- 9- Setup and calibrate the system

1. Determine Hydraulic Fitting and Install Transducer

Safety!

- **Deenergize any sources of energy. Isolate battery. Lower implement to ground and relieve hydraulic oil pressure. NB: removing hydraulic oil tank cap is not sufficient!**
- **Use a stand if the boom needs to be raised of the ground to allow access.**
- **Confirm isolations are effective.**

Steps

1. Locate lift side of the hydraulic cylinder. (Piston end) [see [diagram 1](#)]
2. Locate pipe connected to lift side of hydraulic cylinder
3. Follow the pipe all the way back to the control valve, noting all the connection points along the pipe/hose.
4. Determine the best connection point to fit the transducer via tee block. [see [diagrams 2-6](#)]
5. If no connection point is viable, determine best fitting to remove to be drilled and taped for direct connection. (See Direct Connection this page)
6. Open the connection and determine type and size of fitting. Contact Instant Weight Pty Ltd for help identifying and supplying correct tee block to suit. Take photos of connection and measure any threads etc and send to Instant Weight Pty Ltd. We stock a full range of fittings.
7. Install tee block or direct connection and attach transducer.
8. Ensure all connections are tight and test for leaks.
9. Optional - bleed transducer by SLIGHTLY loosening transducer connect when boom is raised just of the ground. Re-tighten connection once bubbles in oil disappear.

Considerations

- Choose a location easy to access
- Mount transducer in a way that prevents debris hitting it.
- Consider how you will route the cable to the transducer.
- Does the connection point move during operation?
- Vibration or heat sources (exhaust etc)
- Are there any test points / pilot lines coming off the pipe which may be easier?

Direct Connection [see [diagram 7,8](#)]

1. Remove the fitting to be tapped.
2. Drill an 8.5mm hole.
3. Tape to 1/8bspt.
4. Thoroughly clean swarf from fitting.
5. Install supplied 1/8" bspt male - 1/4" bsp female swivel fitting.
6. Reinstall fitting to pipe.
7. Attach Transducer using 1/4" bspt adapter.
8. Check for leaks and bleed.

2. Mount C2000MKII Indicator and Optional Printer

Safety!

- Do not restrict or impair operator vision or controls.
- Do not drill, weld, or cut R.O.P.S / F.O.P.S

Steps

1. Locate a suitable location - normally within easy reach of the operator's right hand.
2. Determine how to mount the supplied RAM mount to the machine. [see [diagram 9](#)]
3. Mount RAM mount to machine.
4. Mount indicator to RAM mount.
5. Connect the Indicator cable to the indicator and route the cable to the Junction Board. 4-pin connector wiring [see [diagram 26](#)]

Considerations

- A bracket can be bolted onto a lock striker plate or door frame aperture.
- Sometimes mounting points are supplied within the cabin for brackets.
- A "clamp" type bracket may be required on some model loaders. This clamps onto the hand rails in the machine. Instant Weighing has these mounts in stock.
- Use the supplied Sika 252 adhesive to attach a flat plate to the R.O.P.S. and mount off that.
- When mounting printers, consider mounting the printer above the indicator. This keeps the indicator within reach of the operator.

3. Attach the Boom Angle Sensor

Safety!

- **Support the boom if working on it while raised.**

Steps

1. Select the position on the boom to mount the sensor. [see [diagram 10,11](#)]
2. Mark outline of sensor plate.
3. Tape outline. [see [diagram 12](#)]
4. Roughen surface with Scotch pad (red). [see [diagram 12](#)]
5. Roughen sensor plate.
6. Thoroughly clean surfaces with clean, lint free cloth using zero residue cleaner. Methylated Spirits, Isopropyl Alcohol etc.
7. Apply Sika 252 to sensor plate, leaving gap for air to escape. [see [diagram 13](#)]
8. Press plate onto surface until adhesive is pressed out from each edge. [see [diagram 14](#)]
9. Scrape away all excess adhesive using supplied plastic scraper and rag. Remove tape. Use Methylated Spirits to clean uncured Sika 252. [see [diagram 15,16](#)]
10. If required, support sensor with tape until adhesive cures in a few hours. 12-24 hours for full cure. [see [diagram 17](#)]

Considerations

- Consider how the cable will be run to the sensor. Use supplied cable mounts if needed. [see [diagram 18](#)] Use Sika 252 to attach them to boom. Follow same preparations procedures as boom sensor.
- The Lift Arm angle sensor is mounted on either the inside or outside of the left-hand side or right-hand side boom. The position of the sensor will be programmed in the settings. The position of the boom angle sensor is best determined by the ability to position it in a protected position that will be away from falling objects or similar that can damage the sensor. Mounting under a steel bracket that may support hydraulic hoses or similar is recommended.
- With the lifting arms horizontal (pin on bottom of bucket and pin connecting the chassis to the boom level with the horizon), [see [diagram 19](#)] mount the Lift Arm angle sensor with the connectors pointing down. Connectors will be at approx 45 degrees with arms horizontal. [see [diagram 10,11](#)]

4. Attach the Chassis Angle Sensor

Safety!

- **Support the boom if working on it while raised.**

Steps

1. Select the position on the chassis to mount the sensor. [see [diagram 20-23](#)] **For articulated loaders mount the chassis sensor forward of the articulation point.**
2. Follow the same procedure as boom angle sensor to glue sensor to chassis. [page 13]

Considerations

- The Chassis Angle Sensor is mounted flat on any solid flat surface of the main chassis of the loader.
- The cable for the Chassis Angle Sensor should be facing the rear of the loader.
- A typical mounting for the Chassis Angle Sensor position is near where the junction board is located.

5. Mount the Junction Board

Safety!

- **Support the boom if working on it while raised.**

Steps

1. Select the position on the chassis to mount the Junction Board.
2. Follow the same procedure as boom angle sensor to glue sensor to chassis.

Considerations

- The Junction Board is the hub where the sensor wiring, power wiring, and wiring from any other options will also terminate.
- **All cables must be in range of the junction board. Plan ahead.**
- Run the indicator cable to a position to where the junction board is mounted.
- In most articulated loaders, the Junction board will be mounted at the front section of the machine.
- The Junction Board mounting bracket is normally glued to the side wall of the chassis near the main hydraulic control valve. In other machines, the junction board can be mounted beneath the cabin, behind the cabin or any other relatively safe place.
- The junction board should be mounted in a position where it is protected. It should not be mounted where it will be subjected to high pressure water.
- The junction board can be removed from the mounting plate and mounted using the mounting holes.

6. Run the Transducer cable from the Junction Board and Connect to Transducer

Safety!

- **Support the boom if working on it while raised.**

Note: The second transducer is optional. Some applications benefit from the second transducer.

Steps

1. Connect the cable to the IO Converter on the Junction Board.
1. Connect the other connector to the 6 Port CAN Bus on the Junction Board. **Use the wiring layout at the end of this manual to determine which port to connect to.**
2. Run the cable to the Transducer. Ensure to follow existing cables/hoses all the way.
3. Allow some excess and trim the cable to length.
4. Attach the Superseal connector to the cable. [see [diagram 24](#)]
5. For instructions how to assemble the transducer connector: [see [diagram 25](#)]
6. Connect to the cable to the transducer.

Considerations

- The Junction Board is the hub where the sensor wiring, power wiring, and wiring from any other options will also terminate.
- **All cables must be able to reach the junction board. Plan ahead.**
- Run the indicator cable to a position to where the junction board is mounted.
- In most articulated loaders, the Junction board will be mounted at the front section of the machine.
- The Junction Board mounting bracket is normally glued to the side wall of the chassis near the main hydraulic control valve. In other machines, the junction board can be mounted beneath the cabin, behind the cabin or any other relatively safe place.
- The junction board should be mounted in a position where it is protected. It should not be mounted where it will be subjected to high pressure water.
- The junction board can be removed from the mounting plate and mounted using the mounting holes directly.

7. Run the Angle Sensor Cables to the Junction Board

Safety!

- Support the boom if working on it while raised.
- Use ladders and safety steps to avoid falls.

Steps

1. Connect the cable to the **Boom Angle Sensor** and route the cable to the Junction Board. Use the glue on mounts if no tie down points are available [see [diagram 18](#)].
2. Connect the 4-pin connector [see [diagram 26](#)] and attach the connector to 6 Port Can Bus. [see [diagram 28](#)]
3. Ensure the CAN terminator plug is connected to the other port on Boom Angle Sensor. [see [diagram 10](#)]
4. Connect the cable to the **Chassis Angle Sensor** and route the cable to the Junction Board.
5. Connect the 4-pin connector [see [diagram 27](#)] and attach the connector to 6 Port Can Bus. [see [diagram 28](#)] Allow some excess and trim the cable to length.

Considerations

- When routing cables through the articulation ensure that only one pipe/hose/harness is followed the entire way from fixed point on the front half to fixed point on the rear half otherwise the cable will be damaged.
- **All cables must be able to reach the junction board. Plan ahead.**
- Place cables ties at a maximum of 300mm apart.
- Keep cables away form heat sources and electric noise sources like high current relays and solenoids and generators.

8. Source Power

Safety!

- **Isolate battery before connecting to power.**
- **Confirm isolation.**
- **Support the boom if working on it while raised.**
- **Use ladders and safety steps to avoid falls.**

Steps

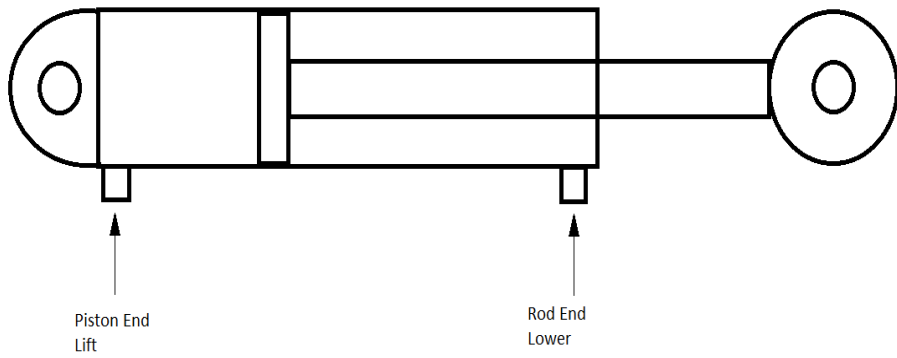
1. Locate an ignition switching source. Also called accessories.
2. Locate a suitable ground point near the ignition source.
3. With the key turned to Accessory using a test light, or multimeter if no test light is available, measure the voltage between the ignition source and the ground. C2000MKII needs 12-24Volt DC. System draws max 5amps with a printer.
4. With the key off confirm no voltage is present.
5. **Isolate the machine**
6. Connect the fuse holder supplied to the ignition source. Connect the brown wire from the power lead to the other end of the fuse wire.
7. Connect the white wire from the power lead to the ground source.
8. Connect the power lead to the 6-Port Can Bus Rail. [see [diagram 28](#)]

Considerations

- Easily accessed ignition source is on the back of the key or back of the fuse panel.
- A good ground is essential. Causes of bad grounds can be painted panels or plastic panels. Make sure the ground source is a bolt connected to bare metal. Run a tap through the thread if required to remove any paint.
- **All cables must be able to reach the junction board. Plan ahead.**
- If direct battery power is connected, a ON/OFF toggle switch can be installed.

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Diagram 1



DIAGRAMS

Diagram 2

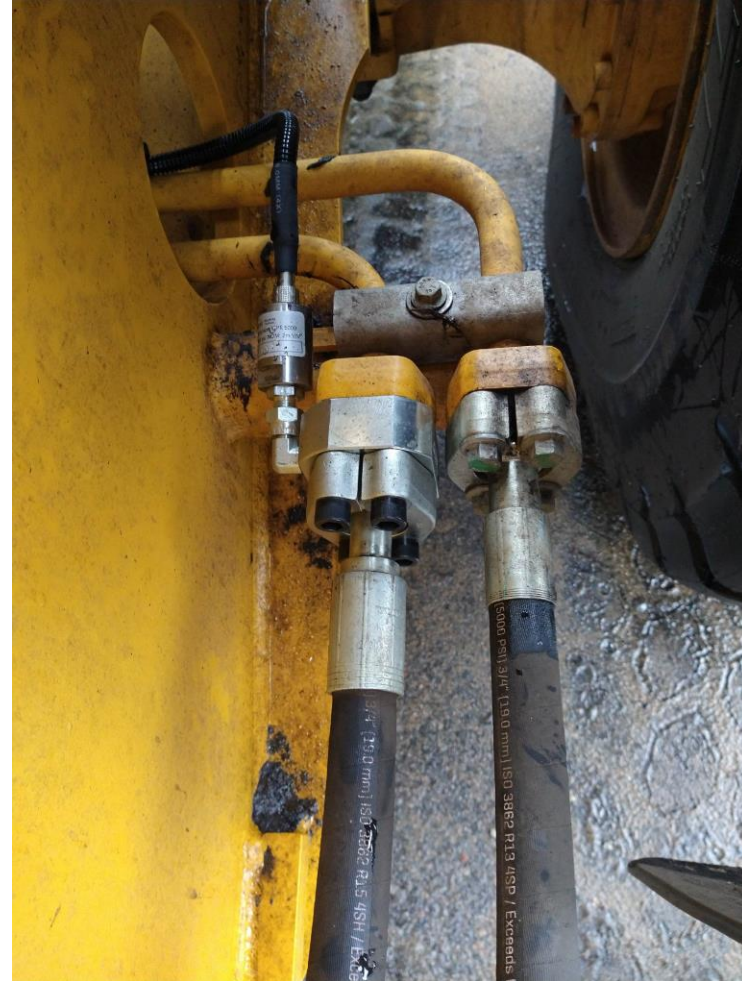


Diagram 3



Diagram 4



Diagram 5



Diagram 6



Diagram 7

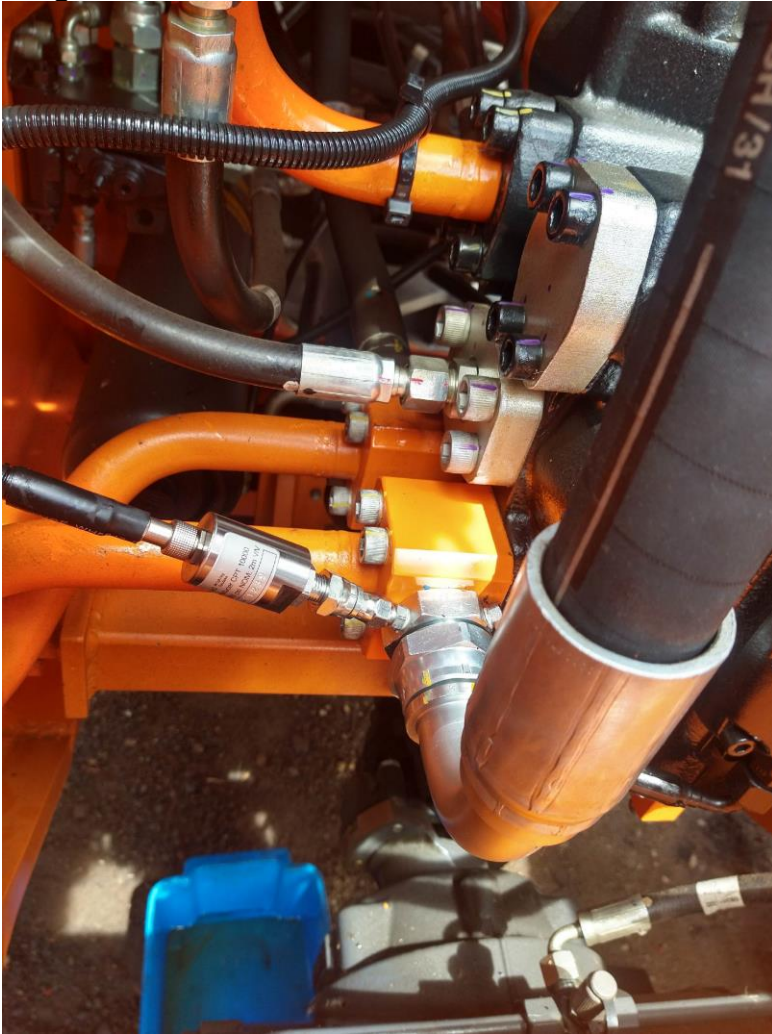


Diagram 8



Diagram 9



Diagram 10



Diagram 11

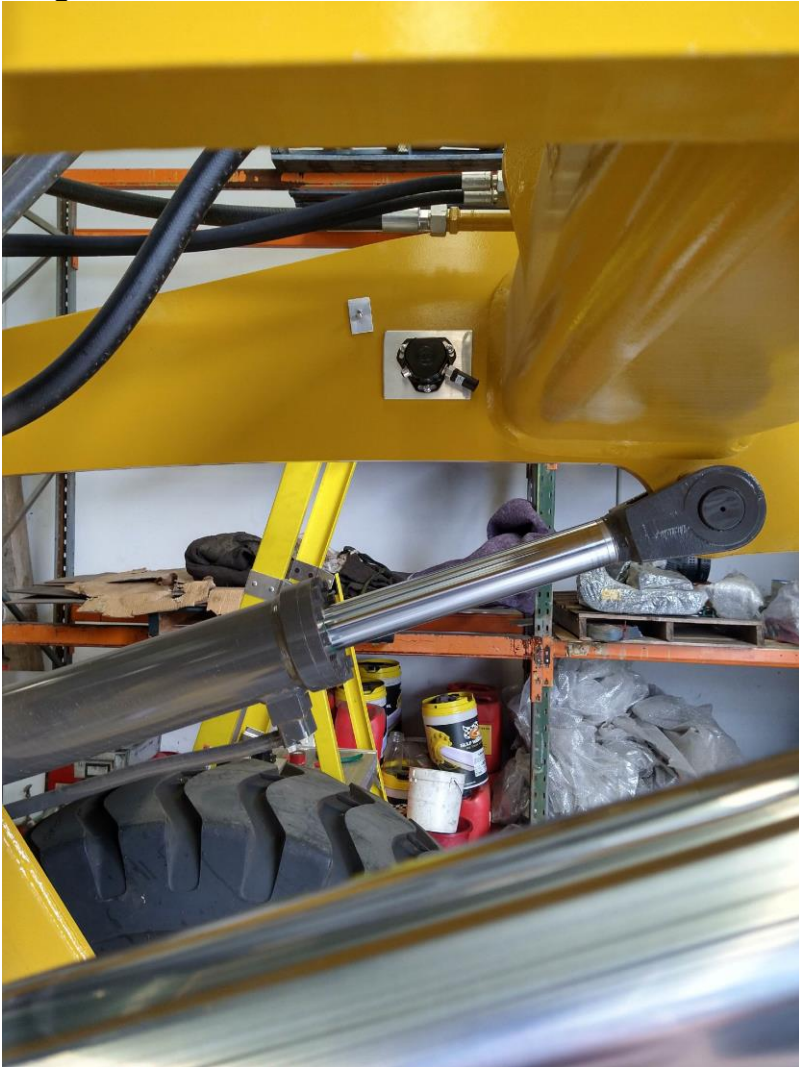


Diagram 12



Diagram 13



Diagram 14



Diagram 15



Diagram 16



Diagram 17



Diagram 18



Diagram 19



Diagram 20



Diagram 21

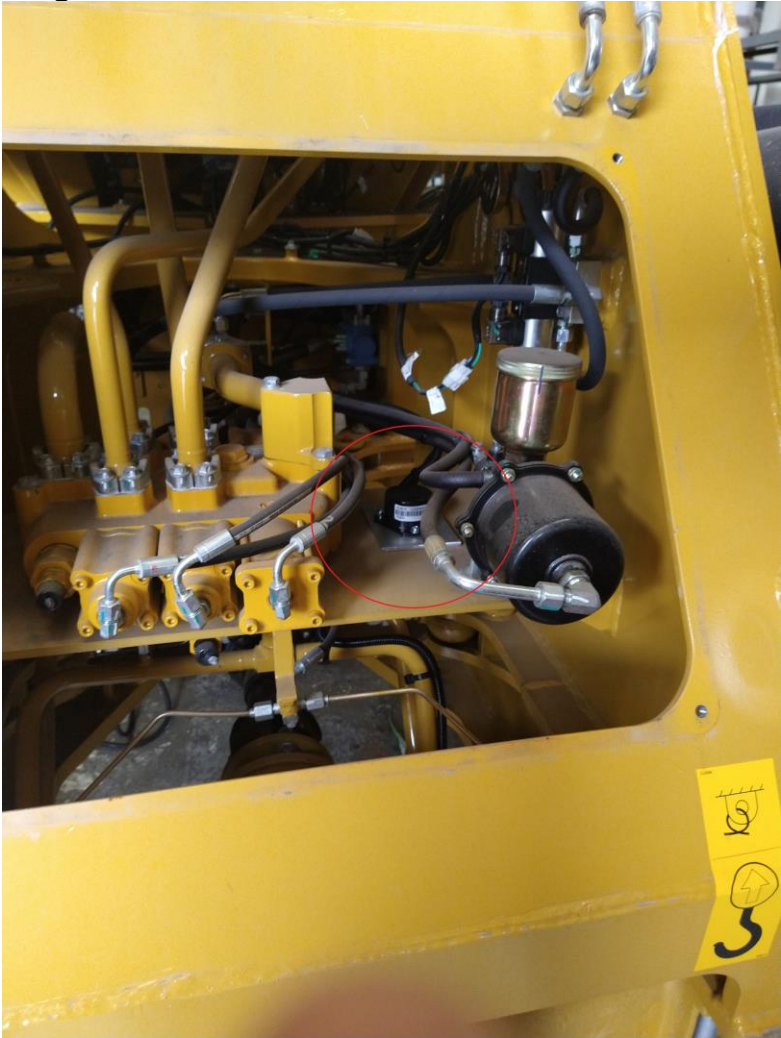


Diagram 22

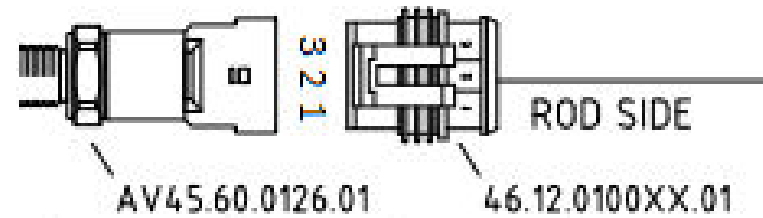
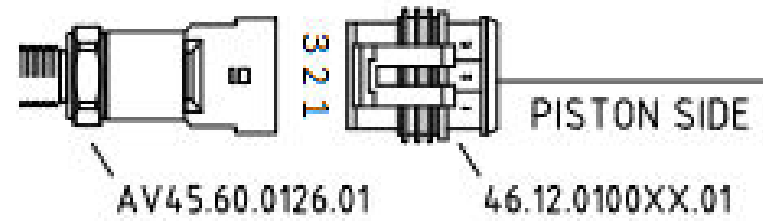


Diagram 23



Diagram 24
Superseal Connector

Pin	Function	Wire
1	Signal	Grey
2	-VB	White
3	+VB	Brown



Pin	Function	Wire
1	Signal	Pink
2	-VB	White
3	+VB	Brown

Diagram 25

Superseal Instruction YouTube



Diagram 26

Boom Angle Sensor / Indicator 4-pin connector wiring

Pin	Function	Wire
1	-VB	White
2	+VB	Brown
3	CANH	Green
4	CANL	Yellow

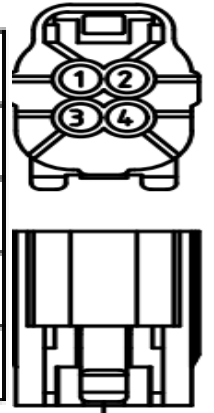


Diagram 27

Chassis Angle Sensor 4-pin connector wiring

Pin	Function	Wire
1	-VB	Yellow
2	+VB	Green
3	CANH	White
4	CANL	Brown

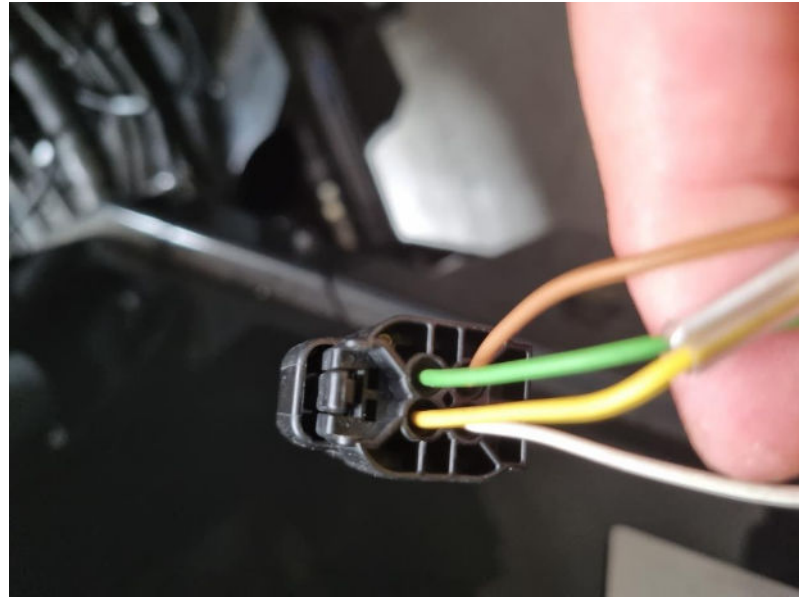


Diagram 28

6-Port CAN Bus Rail

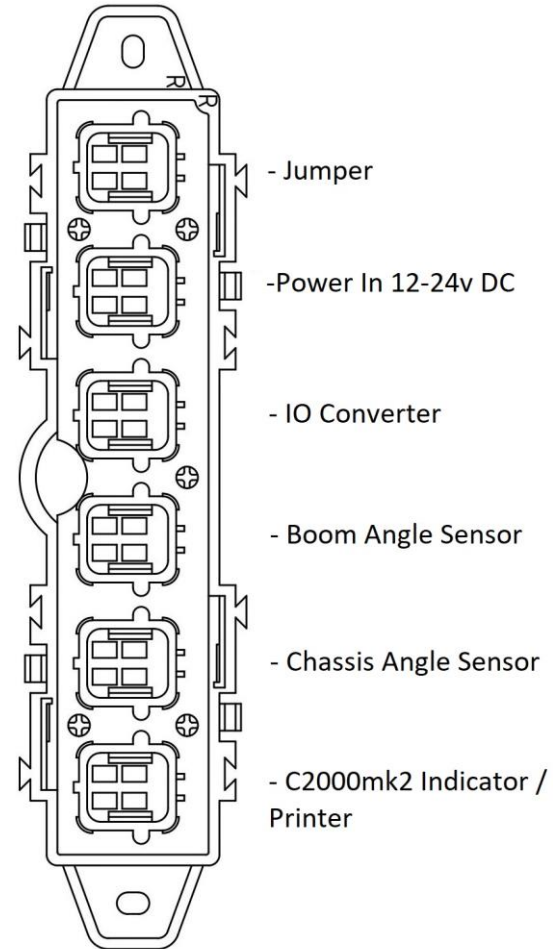


Diagram 29

Compuload CL2000MKII Boom Angle Sensor M12 Connector

Pin 1 = NOT USED

Pin 2 = Brown

Pin 3 = White

Pin 4 = Green

Centre = Yellow

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CALIBRATING THE COMPULOAD CL2000MKII - Code = 4482

The Compuload CL2000MKII can be used on a variety of machines. These calibration instructions are written based on the system being installed on a standard articulated Front-End Loader.

To calibrate the Compuload CL2000MKII Load Weighing System, the loader should be at NORMAL working temperature. Work the loader until it is at NORMAL operating temperature before calibrating.

A Test Weight will be required for accurate calibration. A Test Weight should be minimum $\frac{1}{2}$ the bucket capacity, and should not hang over the front, sides or rear of the bucket. It should simulate the material being loaded.

Alternatively, testing the weight of a bucket load of material over a weighbridge is also acceptable.

The scales will only ever be as accurate as the Test Weight used. If you are guessing the weight of a test weight, don't expect the scales to be accurate!!

When a bucket load of material is raised at different engine RPM, the pressure in the Lifting Circuit changes. Using Lift Speed Compensation, the CL2000MKII is able to monitor the speed of the loading arm being raised, using the Arm Angle Sensor and therefore compensate for the different engine RPM.

To calibrate, you are going to be lifting an Empty Bucket up through the Weighing Window at 5 x different speeds ranging from just above idle to high engine RPM (machine dependant). You are going to do 1 x lift per speed with an Empty bucket. So, for example, 1 x lift at just above idle, then 1 x lift at 1200RPM, then 1 x lift at 1600RPM, then 1900RPM and then 2200RPM. After this you are then going to do exactly the same thing with the Test Weight in the bucket. 1 x lift at just above idle, 1 x lift at 1200RPM and so on. If you do not have an RPM display on the loader, this can be done by engine noise. It does not need to be exact, just consistent engine RPM rises on every speed.

Starting the Calibration Process-



From the main screen, press the Menu button once.



Now Press the Settings button



Now Press the Calibration button



Enter the Code 4482 using the Up, Down, Left and Right arrows. Then Press Exit



The Geometry button on the screen allows the measurements of the hydraulic rams to be entered. The Diameter of the rams must be entered. To get the diameter measurements, measure the Circumference (measurement of the length around the ram), we use a piece of wire or string and then a tape measure, and divide this by 3.14 For example- if the circumference is 150mm $\div 3.14 = \text{Diameter } 47\text{mm}$. Press EXIT.



Press the ANGLE SENSOR CALIBRATION button. On this screen, there are settings that need to be made.
 The position of the Arm Angle Sensor needs to be set.
 If the sensor is mounted on the inside left arm or the outside right arm then set the sensor to RIGHT.
 If the sensor is mounted on the outside left arm or inside right arm, then set the sensor to LEFT.
 The Chassis Angle Sensor and the Arm Angle Sensor needs to be Zeroed.
 On flat level ground, drop the main boom to the lowest position that it can go. Wait for a few seconds for the readings to stabilise and then press the ZERO PITCH & ROLL button.

The Weighing Reset Point and the Set Weighing Start Point then needs to be set. This will determine where the weighing is done as the bucket is raised, "Weighing Window". Raise the bucket just up from the ground, as in the diagram below.



Now press the SET WEIGHING RESET POINT button. This has set a height where after a Weighing process has been completed, the bucket must go lower than this point to RESET and be ready for another lift.

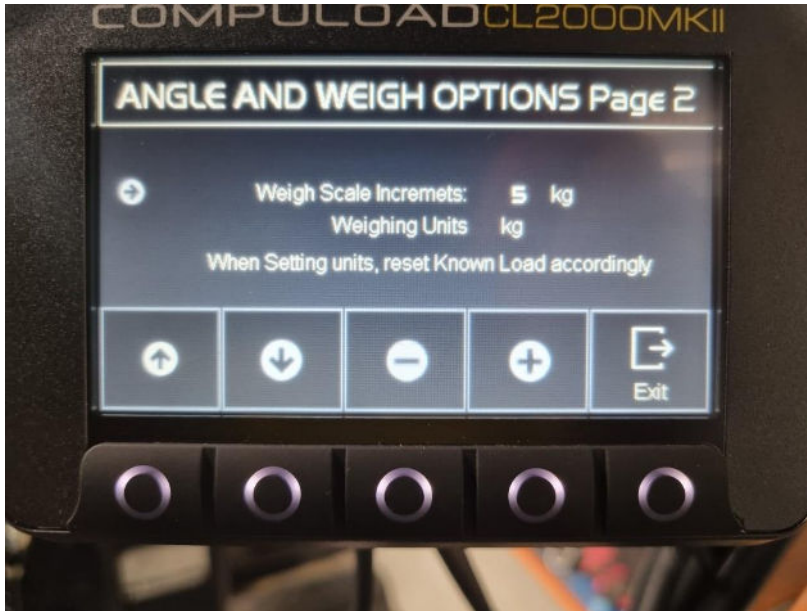
Raise slightly higher, but below the Horizontal position mentioned earlier. Now press the SET WEIGHING START POINT. The Set Weighing Start Point angle must be slightly higher than the Weighing Reset Point.

Once this is completed, press the EXIT button

Press the ANGLE and WEIGH OPTIONS Button. The below page/s will show. Settings in this page should NOT be altered without consultation with your supplier. Settings have been set based on your application. If changes are made, note the original settings so you can return to the settings if required.

Pressing the Down arrow will scroll through to the 2nd options page. Press EXIT to return to Calibration Page





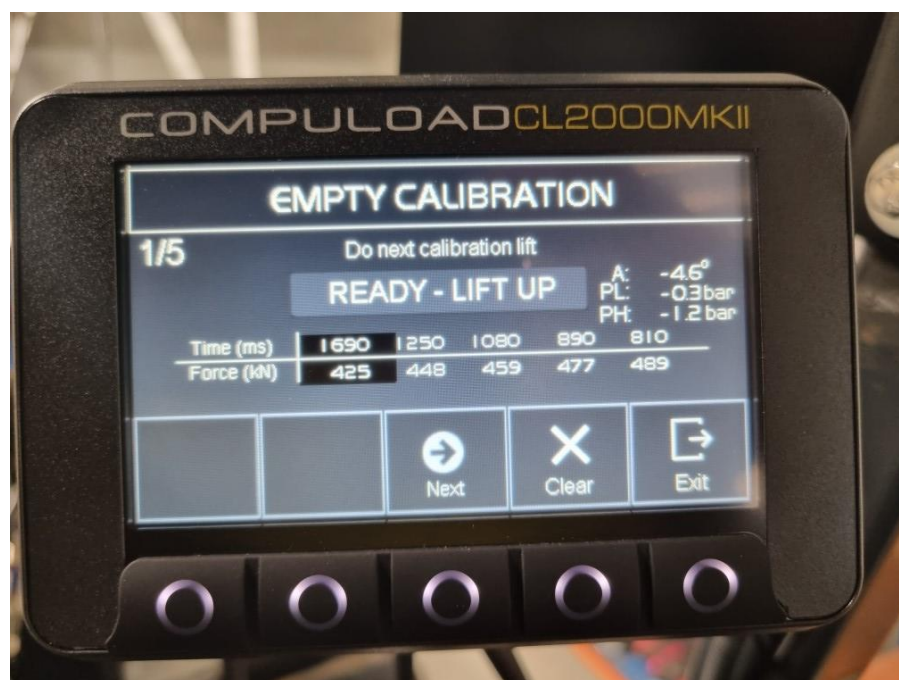
Press the WEIGHING CALIBRATION button. The screen will be shown as per the photo below



This is where the 5 x speeds mentioned earlier is carried out. To begin, enter the Known Load.

Setting the LIFT SPEED CALIBRATION.

Press the START EMPTY CALIBRATION button



There will be 5 x set points shown. On the top is the speed of the lift -Time (ms). The slower the speed, the higher the reading. On the bottom is the pressure sensor reading. Force (kN). As the speed of the lift gets faster, the pressure reading will increase. The 5 x speeds should be spread evenly across the usable engine RPM (Normal lifts aren't carried out at idle RPM, so don't calibrate at idle. If full engine RPM is too fast, don't calibrate at full RPM. Use usable engine RPM).

**Ensure that all lift data is deleted prior to doing a new calibration using the CLEAR and NEXT buttons. If data is present, Clear prior to calibrating

**Ensure lift RPM is smooth whilst calibrating and Lift lever is open 100%.

The Lift Number is shown in the top right. 1/5, 2/5 etc. Complete all 5 x lifts and then press EXIT. After Lift 1/5, the scale should automatically move to 2/5 and so on.

Once Lift 5/5 is done, check the readings are correct (Speed decreasing in time, Pressure increasing in Force. Press EXIT button.

Now load the Test Weight into the bucket of the loader and press START LADEN CALIBRATION.

Using the same process as in the Empty Calibration, complete 5 x Laden Lifts. Then press the EXIT button.

The Calibration process is now complete. Press the EXIT Button until the screen returns to the normal weighing Home Screen. Carry out test lifts to ensure the system is working to your satisfaction.

If the weights are out slightly when loading trucks for example, the calibration can be “fine-tuned” by altering the Test Weight amount rather than carrying out a full recalibration.

ABOUT THE COMPULOAD CL2000MKII DYNAMIC WEIGHING SYSTEM

MANUFACTURE

Designed in Australia, the COMPULOAD CL2000MKII is a state of the art on board weighing instrument designed for measuring the weight of loads lifted by forklifts, front end loaders, log loaders or other hydraulically operated machinery. The weight can then be totalised to assist with loading. This Total along with each individual bucket weight is also able to be printed if the optional On-Board Printer is fitted.

STANDARD FEATURES

- Accurate weighing as the load is being lifted.
- Automatic or Manual totalising (operator selected).
- Fully illuminated display and keypad.
- Bucket Count

OPTIONAL FEATURES AND EQUIPMENT

COMPULOAD 4070 printer allows hard-copy tickets as follows.

- a. Date and time stamped ticket showing individual lifts and total.

