

Electro-Magnetic Compatibility (EMC)

This product complies with Council Directive 89/336/EEC when installed and used in accordance with the relevant instructions.

Service and Technical Support

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Document number

S/DC/500-10-517 : Issue 1 : 21/7/05

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User Guide.

Skipmaster 800/8000 Weighing System

Installation

Software Ref: PS307-002

PS300-026

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1.1 The Strain Sensors

IMPORTANT ! The installation involves welding. Before you commence welding, disconnect the vehicle battery by means of the battery isolator switch adjacent to the battery box.

Install the strain sensor before the other components. This will give the adhesive time to cure sufficiently before working the machine. The hydraulics should be fully relaxed e.g. the lift arms are resting just their own weight on the ground.

Position the sensor adjacent to each ram pivot. This part of the lift arm has the highest strain. Ideally, the sensor should operate in tension so it should be mounted on the top side (A), however this may not be possible if;

- (a) the hydraulic pipes run up the top face.
- (b) there is insufficient clearance between the ram body and the rear face when the arms are in the fully raised position.

The alternative position is on the lower face where the sensors will operate in compression (B).

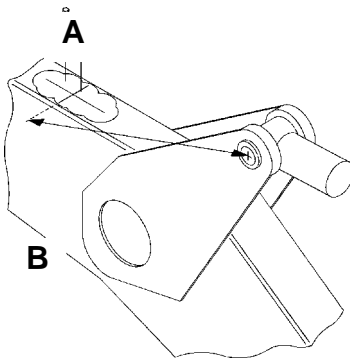


Figure 3 Strain sensor position

1. Measure 400 mm from the ram pivot point and mark across the face of the arm. Clean the area back to bare metal.
2. Bolt the Sensor Mounting Blocks onto the welding jig and clamp the assembly centrally over the mark (fig.4).

NOTE: ***IMPORTANT! The strain sensor is extremely sensitive to bending forces. Correct operation depends on it being bolted down to as flat a surface as possible, so take care to ensure that the welding jig, mounting blocks and surface of the box section are cleaned beforehand.***

1 - Installation

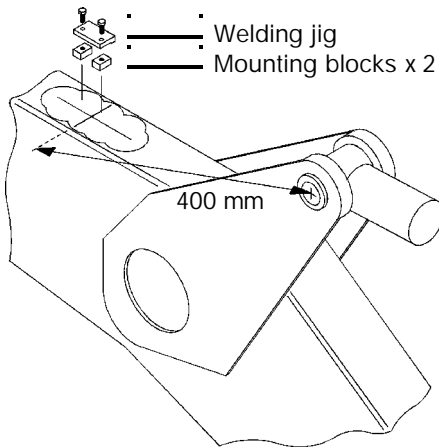


Figure 4 Fitting the Sensor Mounting Blocks

3. Weld the blocks with a continuous seam weld around the outer 3 sides of each block (fig. 5). Allow to cool fully before removing the welding jig to prevent the possibility of the mounting blocks warping.

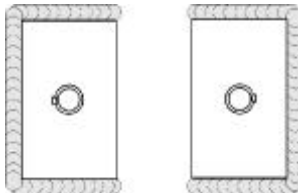


Figure 5 Weld position

4. Check the faces are flat using a suitable straight edge (e.g. a steel rule). In the event that the blocks have warped slightly, carefully file across both faces until they are flat and parallel. Mask the top face of the mounting blocks and around the mounting area, and make good with primer/top coat paint.
5. Check the mounting faces on the sensor are clean and flat. Use emery cloth if necessary and thoroughly degrease with proper solvent degreaser (not petrol or white spirit).

1 - Installation

6. Prepare the DEVCON 531 adhesive (Not included in Kit) following the instructions on the rear of the tube and apply to the mounting faces (figs 6,7)



Figure 6

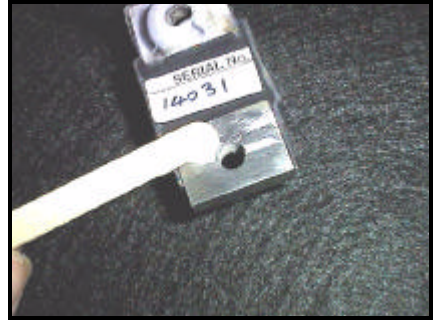


Figure 7

7. Degrease the mounting blocks and fasten the sensor using the M8 Socket Caphead screws supplied, with the cable facing back towards the lift arm pivot (fig. 8). Torque the screws to 35 Nm.

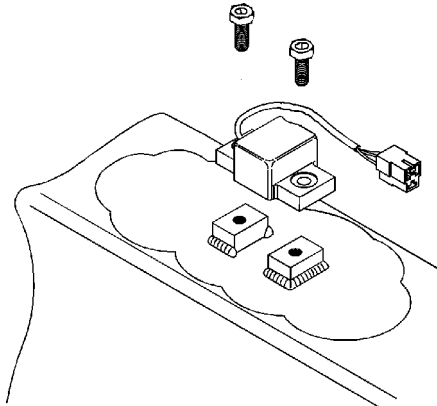


Figure 8 Mounting the sensor

NOTE: Avoid forcing the hex wrench against the sensor body. This will prevent large sensor offsets which may render the sensor inoperative.

The adhesive will start to set in only 3-5 minutes at 20°C - longer at lower temperatures. Full curing will take considerably longer. The lift arms should not be loaded for at least 1½ hours.

1 - Installation

- BOTH ARMS:** Position the sensor cover, mark through and drill and tap M6. Slip the heat shrink and conduit over the sensor cable (fig.9)...

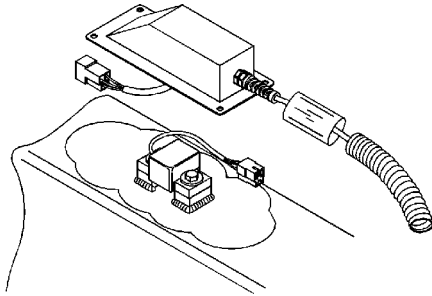


Figure 9

...then shrink together over the cable protection gland (fig. 10). Mate the 3-way connector using grease to protect against the possibility of any corrosion, and fit the sensor cover using rubber washers (or suitably sized rubber grommets) under the screw heads (fig. 13). Do not over tighten the screws.

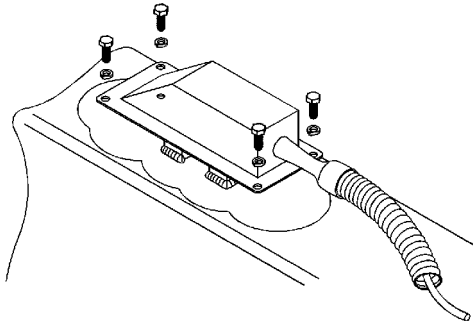


Figure 10

- Use 'P' clips fastened with POP Rivets, to fix the conduit securely back along the arm, following the hydraulic pipes back onto the vehicle body (fig. 11) to where the junction box will be mounted.

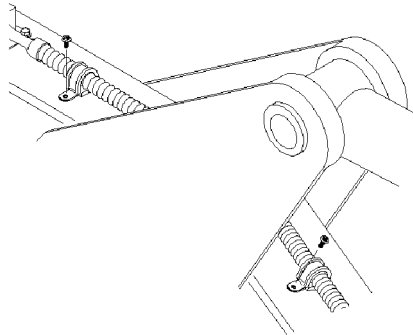


Figure 11

1.2 Angle Sensor

1. Lift the arms to the reference position. This is normally at the point where the cross bar is level with the top of the windscreen (fig.12).

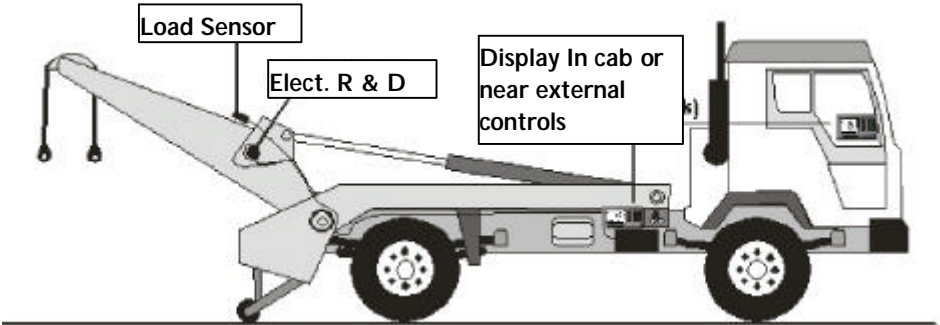


Figure 12 Weighing reference position

2. Fit the angle sensor on the centre of either_arm pivot (fig.12). **Rotate the sensor so that the cable gland on the sensor housing is horizontal and faces toward the rear of the vehicle.** The sensor won't work properly in any other position.
3. Drill and tap M6 through the centre of the slots on the sensor flange, to enable some angular adjustment in either direction if necessary.
4. Feed the sensor cable into the plastic conduit and route the conduit back along the hydraulic pipework/ wiring loom to where the junction box is to be mounted. Fasten the conduit to the side of the arm with 'P' clips as necessary.

NOTE: *On powering up the system you can check the power supply to the angle sensor. Simply remove the cover plate and when powered, a red LED will be visible through the potting compound. To other yellow and green LED's show the switching Direction and Reference outputs.*

1 - Installation

1.3 Head Unit and Wiring

1.3.1 Mounting the Head unit

Confirm with the operator on where to mount the head unit in the cab. The head unit must not restrict the view out of the cab or the use of the controls.

The *Skipmaster 8000* is supplied with a ball-jointed mounting stalk. Fit using the M8 screws nuts and washers provided in the kit. If the instrument needs to be mounted outside of the cab, it must be installed in a waterproof enclosure.

1.3.2 Mounting the Junction Box

All cable connections are made into this box. The junction box is sealed against moisture and dust. The cable glands all have removable blanking discs so that unused glands remain sealed.

Fit the junction box on the cab or chassis where it has some degree of protection from weather or physical damage, and where the various cables can be conveniently fed through. The actual position depends on the particular vehicle. In some cases you may be able to fit it behind the front grille.

1.3.3 Connecting the Head Unit

Route the 18-core cable from the 50-way 'D' connector on the head unit back to the junction box, and cut to length to suit the installation.

Connect the wires to their respective terminals 1 -12. Refer to the wiring label on the inside of the junction box lid.



Figure 13 Head Unit connections

1.3.4 Connecting the Sensors



Figure 14 Terminals for connecting the sensors

1. Connect the left-hand strain sensor to the terminals marked 'PRESSURE SENSOR 1'

Terminal	WireColour
+V	Brown (or Red)
0V	Blue
SIG	Green/Yellow

2. Connect the right-hand strain sensor to the terminals marked 'PRESSURE SENSOR 2'

Terminal	WireColour
+V	Brown (or Red)
0V	Blue
SIG	Green/Yellow

3. Connect the Angle sensor to the terminals marked 'ACCELERATION' & "REF/DIR". (Assuming Sensor has been installed to right hand side of truck with the cable exit pointing towards the front of the truck). Note: *Reverse Yellow and green wires if installed on left hand side.*

Terminal	WireColour
+V (ACC)	Red
0V (ACC)	Black
DIR (Ref/Dir)	Yellow
REF (Ref/Dir)	Green
1-4 Volts (Not used)	White

It is recommended that you clearly identify the strain sensor cables 'LEFT' and 'RIGHT' inside the junction box, in the event you need to replace a sensor.

1 - Installation

1.3.5 Connecting the Power Supply

Requires Kit Ref: K/24V-13.8/CON/KIT

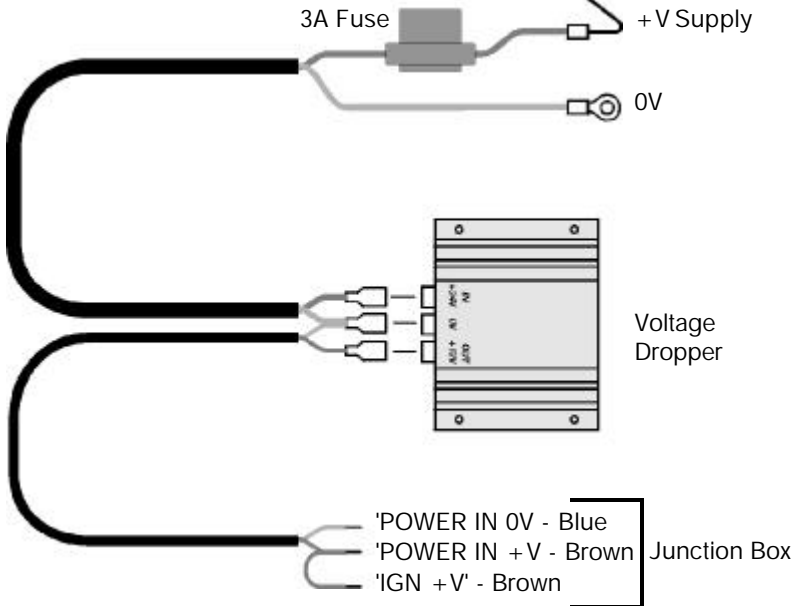
The head unit can operate in the voltage range 10 - 30V however, the strain sensors require a minimum 12.2V and a max of 15V. Whereas the head unit is switched on and off from the front panel, the strain sensors must be permanently powered in order to maintain their correct operational performance.

A power supply loom with an in-line fuseholder is provided and is suitable for any installation.

Connect to the the Power supply

The power supply loom (see below) includes a 24V - 13.8V voltage dropper. Connect the power supply from a suitable permanently live point - e.g. from the fusebox.

Locate the voltage dropper where it is protected from the elements, e.g. within the vehicle cabin. If installed into a MK 3 Junction Box, the ignition (brown) link is not required and therefore should be cut off.



NOTE: The junction box PCB has a jumper switch to select the voltage. Check that this is set to the 12v position.

Connection to Voltage Dropper

Connect the brown wire of the thicker cable to the '24V IN' terminal.
Connect the blue wire to the '0V' terminal.
Connect the brown wire of the thinner cable to the '12V OUT' terminal.

Connection to the junction box

Feed the cable through one of the cable glands and fit the crimp terminals,
Connect the brown wire to the 'POWER IN +V BROWN' terminal.
Connect the blue wire to the 'POWER IN 0V BLUE' terminal.
Connect the brown jump wire to the 'IGN +V' terminal in the junction box. If installed into a MK 3 Junction Box, the ignition (brown) link is not required and therefore should be cut off.

NOTE: *If the head unit system must be turned off with the ignition, then instead of connecting the jump wire 'to IGN +V', connect it across from the 'POWER IN +V BROWN' to the +V terminal of 'PRESSURE SENSOR 1' and 'PRESSURE SENSOR 2'. Only the strain sensors are then permanently powered.*

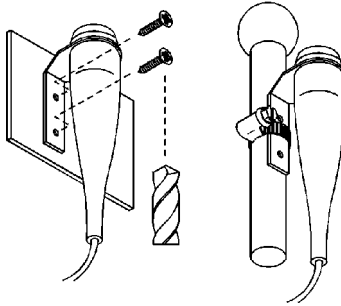
1.3.6 Connecting a Printer

ICP200 Printer

The power supply for an ICP200 printer can be 12V or 24V and should be powered separately i.e. from the junction box, not via the output port on the instrument.

1 - Installation

1.3.7 Remote Enter Switch



This is optional, replacing the use of the ENTER key on the head unit to manually enter the weight reading.

Mount where most convenient for the operator. Route the cable back to the junction box. The terminals are clearly marked 'REMOTE ENTER' .

Blue = 0v

Brown = +v

1.4 Testing the system

Skipmaster 800/8000

Check the following to confirm that the load sensors, reference / direction sensor and Remote Enter Switch are operating.

1 *The 'Check Zero' screen should be displayed, or direct to the weighing screen, depending on the Set Up of the instrument.*

2 *Warm up the oil in the machine to working temperature (If hydraulic sensors are used)*

3 Set the Weight Enter mode to 'MAN' and lift the bucket through the weighing position.

DYNAMIC MODE

As the Skip is lifted, a beep will be heard when the Ref/Dir sensor outputs switch together as the sample starts to be taken. A second beep shortly follows approximately 2 seconds later indicating the end of the weighing sample.

STATIC MODE

As the Skip is lifted, a beep will be heard when the Ref/Dir sensor outputs switch together as the sample starts to be taken.

A weight figure should be displayed although it is meaningless until the system is calibrated.

1 Press the Remote Enter Switch.

The instrument should beep.

This completes the check. If there are any problems then refer to the diagnostics screen (overleaf), otherwise you can commence with the calibration procedure.

2 - Diagnostics

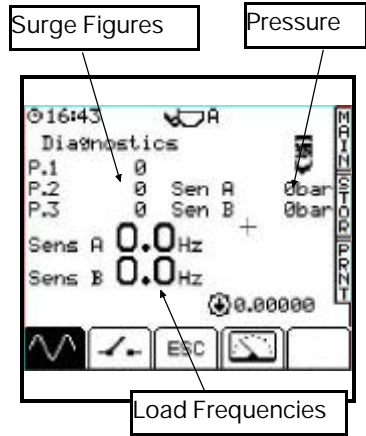
Diagnostics

2.1 Load Sensor / Ref/Direction Sensors

If you suspect a problem, select the diagnostics screen for more detailed information on the component functions.

1 Press the  key.

2 From the SETUP menu, press '4 Diagnostics'.



Load Sensor Signals

The first screen displays the frequency (Hz) from each load sensor. If you encounter a zero frequency for either sensor, check the connections. If OK, then the sensor may be at fault.

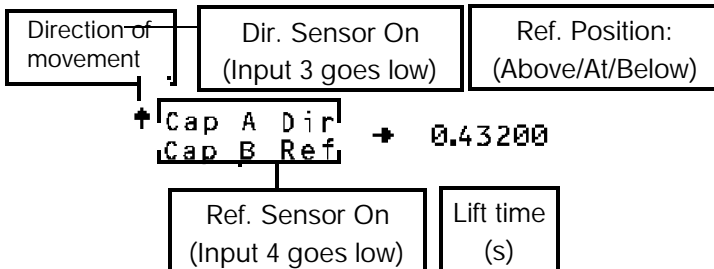
If there is a no signal coming from the pressure sensor "ERROR SENS A" or "ERROR SENS B" will be prompted. A Pressure reading is also shown on this screen (Hydraulic sensing only). This reading is only an approximation

Surge Figures

If the "Surge inhibition" is enabled, 4 small individual samples are made within the main weighing sample. The difference between these samples are shown as P1, P2 and P3. This provides information on the signal differences within the main weighing sample caused by a system problem or machine bounce.

Ref/Dir Sensor

The screen also displays information on the reference / direction sensor as you lift the skip;



2.2 Switching Inputs

This screen displays the input status of the sensors at any particular bucket position.



means the input is switched low.



means the input is switched high.

Input Function

- 1 Load sensor A
- 2 Load Sensor B
(IP1 and IP2 open and close indicating frequency).
- 3 Direction sensor
- 4 Reference sensor
- 5 Remote Enter Switch
- 7 Speed Sensor (Not used)
- 8 Bucket Sensor (Not used)

The switching sequence as you lift is,

3 4



Below weighing position



Reach Direction sensor - starts lift speed timing.



At weighing position - weight sampled




Just above weighing position - lift speed calculated.

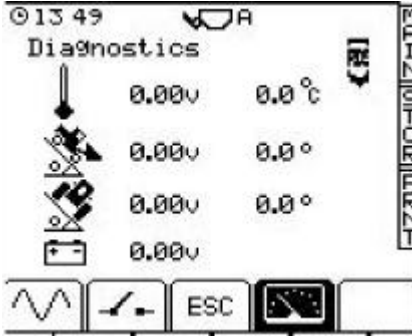


Above weighing position

2 - Diagnostics

2.3 Analogue (DIAGNOSTICS4)

Press  to display the Voltage Input screen.



Shows the Voltage and calibrated temp from the temperature sensor. *(Not Used for Skipmaster with Strain sensors)*



Shows the Voltage from the angle sensor for Fore & Aft measurement. *(Depending on J/Box installation). (Not Used for Skipmaster with Strain sensors)*



Shows the Voltage from the angle sensor for side to side measurement. *(Depending on J/Box installation). (Not Used for Skipmaster with Strain sensors)*



Battery Supply Voltage