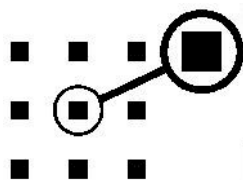


gate adjuster **22C1**

22C1 Gate Adjuster

INSTALLATION & OPERATION INSTRUCTIONS

VERSION 4.0



FARMSCAN

PART No: AM – 22C1V4

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1.0 Introduction

1.1 General Outline

The 22C1 Gate Adjuster will automatically adjust the feed gate to deliver the selected Target Rate or can be used in Manual Mode where the operator can adjust the gate height to a known position.

Rates can be changed under GPS control when the Gate Adjuster is connected via the serial port to a Farmscan canLink terminal or other computer-based product with GPS rate map and appropriate controlling software.

The spreader may be calibrated using either of two methods. The first method requires that the material be weighed as it falls from the gate whilst the second method requires the calculation of a factor based on the spreader manufacturer's charts supplied in the spreader manual. The factor may be fine tuned after the first loads.

The 22C1 will also monitor Spinner RPM via a sensor mounted on one of the spinners. The spinner can then be monitored to maintain the correct width of spread as products change. An alarm can be set which will notify the operator when the spinner RPM drops below the set alarm point.

The built in Trip meter allows for records of up to 10 trips. Each trip will record the area covered and weight of product spread. The Total key allows a display of overall Area, Weight and Distance covered.

2.0 Installation

2.1 Monitor Installation

When installing the monitor use the brackets, securing knobs and mounting hardware supplied to mount the monitor. Keep the following points in mind when finding the best location for the monitor.

- The Monitor should be installed in the cab, clearly visible to the operator but not subject to intense heat or moisture.
- Keep the unit away from radios or other electronic equipment to minimize any risk of interference. As a precaution all connection cables should take an alternative route to other cables in the cab, especially antenna cables or clutch, solenoid and engine kill switch cables.
- Mount the unit firmly on the bracket using securing knobs supplied (AH-861). Don't use substitute bolts into the monitor.
- When installing the wiring loom ensure the green 12 way connector is inserted into the back of the monitor with the screws in the connector facing upwards.

DO NOT force the connector. If it does not connect easily check that the connector is being inserted the correct way.

- When running the tractor loom through the cab to the back of the monitor it may be easier if the Green plug was removed so the cable can be inserted through a smaller diameter hole in the cab wall etc.

***Take note of the wiring of the green plug before removal.
Refer to the back panel to make sure the cable
Colours correspond when rewiring the plug.***

- Use the cable ties supplied to secure the cable away from risk of damage.

2.2 Power connection

Do not connect power until all other installation is complete.

Connect **power cable** from tractor loom **direct** to 12-volt DC vehicle battery terminals to ensure a clean uninterrupted source of power.

DO NOT connect power cable to alternative power source such as the Starter Solenoid as damage may result.

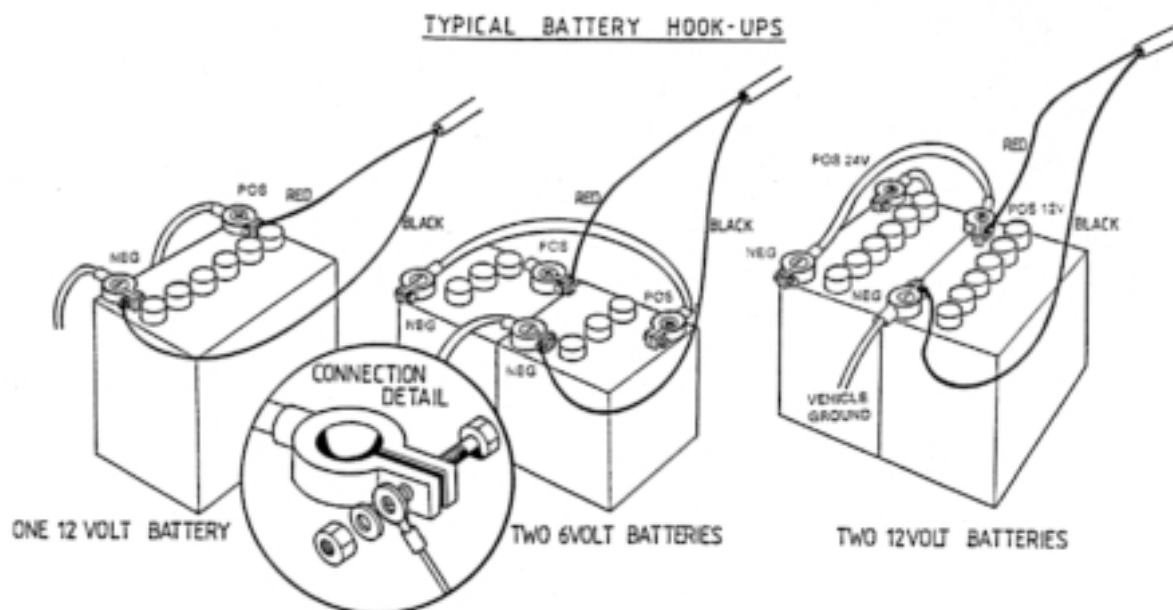
DO NOT connect other electrical equipment to the 22C1 monitor **power cable**.

Run the **power cable** away from radio antenna leads and mobile phones or wiring to solenoids or electric clutches.

Use cable ties supplied to secure power cable away from risk of damage.

Connections to battery terminals must be clean and tight.

WARNING - Disconnect Power Cable when arc welding



2.3 Wiring Loom Installation

The wiring loom supplied is used for both the Truck mount version and the Tow behind version. The loom will need to be installed on the jockey wheel side of the spreader.

On the Truck mount spreader this is the Right hand side looking forward and the Tow behind version requires the loom to be fitted on the Left hand side looking forward.

The Tow behind version requires more cable to reach across the draw bar. For the Truck mount version this excess cable will need to be rolled up and fastened away from damage.

- Lay the loom out down the length of the machine and fasten with cable ties along the body of the spreader. The drawing below shows the best location for mounting the loom.
- Don't tighten the cable ties at this stage. This allows the loom to be adjusted so that the connectors align properly with the Actuator and sensors.



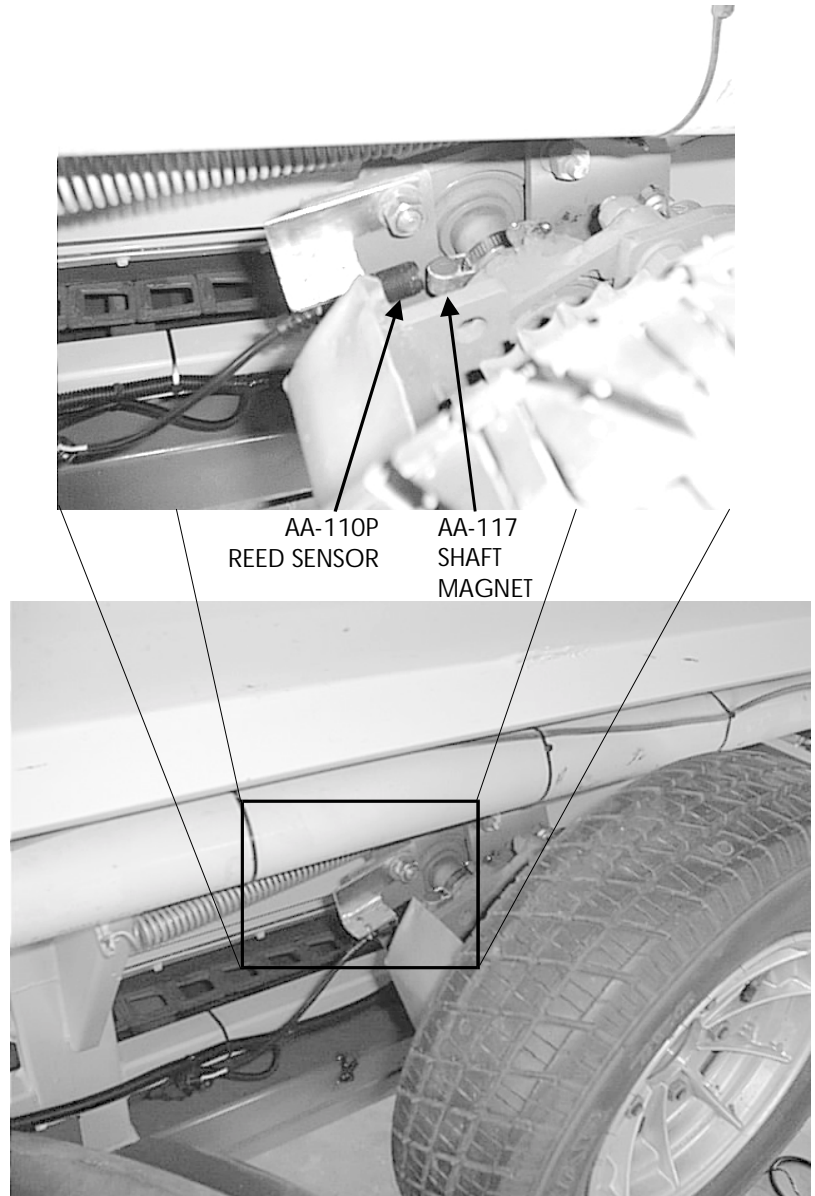
- When the sensors have been installed and connected to the loom, align the loom so that there is the least amount of excess cable near the sensors. When correct tighten the cable ties.

2.4 Wheel Sensor Installation

The Wheel sensor is installed on the jockey wheel that drives the belt. This requires the Reed switch sensor (AA-110P) to be mounted on the wheel sensor bracket supplied (AH-494) with the M4 x 20mm stainless steel bolts.

Follow the points below to mount the sensor.

- Mount one of the Shaft clamp magnets supplied in the kit on the axle of the jockey wheel.
- The magnet should be mounted on the bare part of the axle that can be located between the two bearings holding the shaft.
- Mount the sensor on the bracket and find the bolt holding the bearing housing as in the picture. This bolt needs to be undone and the bracket slipped over the bolt before re-tightening.
- Align the sensor and the magnet mounted on the shaft. The sensor will need to be moved towards the magnet until there is a clearance of around 10 - 15mm. The sensor has long slots on its bracket that allow for such adjustment.
- When the sensor and magnet are properly aligned tighten the bolts holding the sensor to the bracket and the bolt holding the sensor to the bearing housing.
- The sensor connection tail can be connected to the two-way connector on the loom. (The wheel connector has a White and Black wire)
- The Truck mount version will be exactly opposite to these pictures. Locate the bearing bolt that will allow the bracket to be used in the same manner.

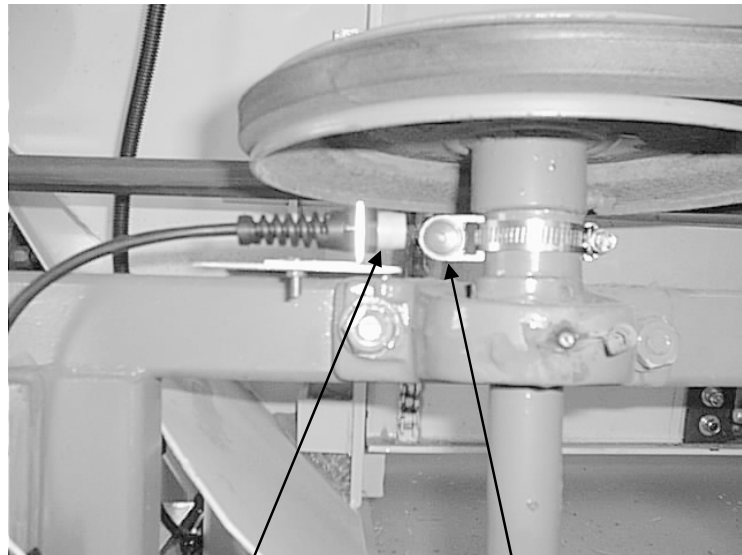


2.5 Spinner Sensor Installation

The Spinner sensor needs to be mounted on the spinner that is on the same side as the jockey wheel. The sensor bracket has two holes, which will allow the bracket to be mounted in the same way for both the Truck mount and the Tow behind versions. (The Pictures show installation on a Tow behind version)

Follow the points below to mount the sensor

- Remove the outside bolt of the saddle clamp containing the bearing at the top of the spinner.
- Place the bracket to the back of the RHS frame which the bearing is bolted to and place the bolt through the bracket and then through the saddle clamp, tighten the bolt to secure the bracket and bearing. See pictures.
- Place a shaft magnet around the spinner shaft above the top bearing.
- Using two M4 x20mm bolts to mount the coil type sensor (yellow cap sensor) on to the bracket facing the shaft magnet.
- Align the shaft magnet and the sensor so that there is a clearance of approximately 5mm between the end of the sensor (yellow cap) and the magnet. (Slide sensor away from magnet if spinner rpm readout is unstable)
- Tighten the 2 bolts to secure the sensor and tighten the shaft clamp to hold the magnet in place.
- Connect the sensor tail to the loom. (The loom connector is a two-way connector with Green and Black wires).



AA-112P
COIL SENSOR

AA-117
SHAFT
MAGNET



2.6 Linear Actuator Installation

Mount the Linear actuator using the two large brackets (AH-495 & AH-496). The smaller bracket will be mounted at the bottom of the Feed gate and the larger bracket will be mounted on the side of the bin wall.

To mount the actuator correctly the actuator needs to be fully extended and both brackets need to be attached to the actuator. Check the following pictures to attach the brackets the correct way.

Provided in the kit is a 6 Way plug with two 1 metre lengths of cable attached. Use this to extend the actuator.

- Plug the 6-way connector into the actuator.
- Connect the wires across a +12 Volt battery, the polarity of these wires does not matter. Connect the wires one-way and if the actuator retracts, then reverse the wires to extend.

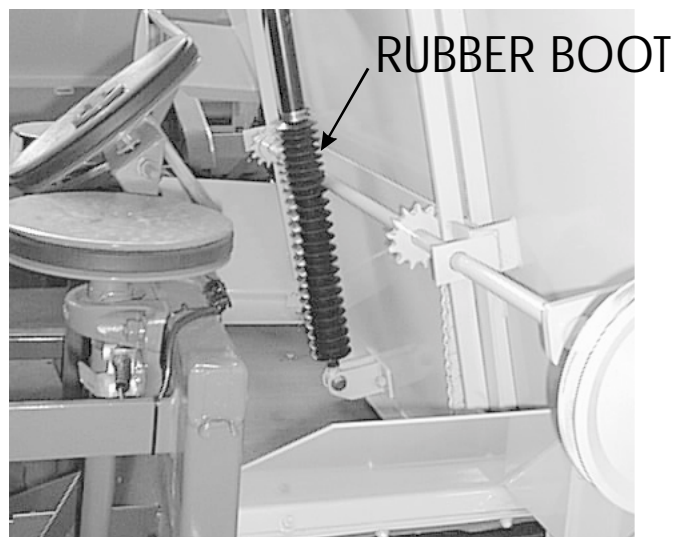
Follow the points below to mount the Actuator.

- Lower the Feed Gate down so that it is set 10mm above the belt. This is important because it will not allow the gate to ever hit and wear away the belt or bolts.
- Mark the centre of the gate and the equivalent position directly above it on the bin wall. This will help you centralise the actuator when marking the mounting holes
- Line the actuator up against the feed gate and the bin wall.
- Make sure the bottom bracket is positioned as low down the door as possible. (Hard up against the bend at the bottom of the gate). Ensure the tapered side of the gate bracket is downwards.
- When aligned make sure the top bracket is centralised around the centre mark and mark the holes in the brackets.
- When marked drill the holes out to 9mm.
- Using the M8 Bolts supplied to secure the bottom bracket in place.



Linear Actuator installation continued


- Align the rectangular plate inside the bin with the back of the top bracket. One side of the bracket is shorter which will need to be mounted at the top of the bin so the bracket does not interfere with the bend in the bin wall. Use M8 bolts to fasten both of these brackets in place.




- Supplied in the kit is an extendible rubber boot that must be fitted over the actuator arm. This will help to stop Fertiliser and dirt entering the actuator through the arm. Fit the boot as shown below and use cable ties to secure it from moving.
- Do not remove sealed rubber casing or top cover from actuator under any circumstances.


3.0 Operation


3.1 Power On/Off Key

To switch the monitor ON, press the  key

Whenever the monitor is switched ON the display will run through a start up routine displaying version of software and the program the monitor is running.

e.g. 

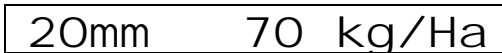




The version number indicates which generation of functions and features are programmed into your unit.


If an upgraded program is installed, a new version number e.g. VERSION 3.10 will be displayed.

After momentarily displaying the current program and version number, the monitor will then display the Gate height and selected rate of application.

e.g. 

If stationary the monitor will immediately go into HOLD mode when first switched on, See section 3.11 RUN / HOLD function for an explanation of this alarm.

3.2 Imperial / Metric Key

Press the  key to change any readout on display between metric and imperial.


e.g.

TOTAL 10.0Ha

TOTAL 25.0Ac

NOTE: IMP/MET key is not active during calibration. All calibration factors must be entered in metric values.

3.3 Speed Key

Press the  key to display the current working speed and the Spinner rpm.

e.g.

15 kph 764 RPM

An alarm can be set to notify the operator that the spinner RPM has dropped below a set point. The following display will appear accompanied by an audible beep to warn when the rpm has dropped below this point.

e.g.

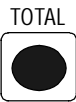
SPI NNER SLOW

See section 4.10 for the details on how to set the spinner alarm point.

3.4 Total Key

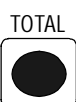
The TOTAL key is used to display Total Area covered, Total weight applied and Total Distance travelled.

Area, Weight and Distance readings are only incremented when "UNIT OFF HOLD" & travelling with the jockey wheel engaged.

Press  key once to display total AREA.


e.g.

AREA 150.0Ha

Press  key again to display total WEIGHT

e.g.

WEI GHT 2.55 t

Press  key again to display total DISTANCE

e.g.


DI STANCE 2.325km

To Reset TOTALS press  key once to start reset process.

Both Total Area, Total Weight and Total Distance are reset simultaneously; this can be done at the start of a spreading program to keep overall records.

E.g.

RESET TOTAL?

Press  again to complete reset process OR **to abort reset process**, press any other key.

After reset of TOTALS you will have the **option** to reset all trip memories at the same time

e.g.

RESET ALL TRIPS?

Press  again to reset all trips OR **to abort reset of all trips**, press any other key.


3.5 Trip Key

The TRIP key allows the display of a sub total for area covered and weight applied. The TRIP function has 10 resetable memories to keep a tally of the areas and weights for 10 different plots or loads.

To display the current TRIP AREA press  key once.


e.g.

TRI P 1 12.5Ha

Press  key again to display TRIP 1 weight


e.g.

TRI P 1 0.85 t

To reset Trip memory on display, press  key to start reset process

e.g.

RESET TRI P 1?

Press  key again to complete reset process OR **to abort reset process**, press any other key.

To change to another Trip memory, press the  or  arrow keys to change the current trip number on display.

e.g.

TRI P 2 0.00 t

NOTE:

Previously engaged trips can be viewed or reactivated by using the UP and DOWN keys to display and hence activate any one of the 10 trip memories 1-10. Whichever trip number is displayed will be active when working.

3.6 Rate Key

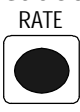
The Gate Adjuster can be operated in AUTOMATIC or MANUAL mode.


AUTOMATIC MODE - Requires the correct pulse/kg calibration factor. See Section 4.7

In AUTOMATIC Mode, the RATE key displays the current gate height and the selected spreading rate.



The gate height displayed is the distance from the belt to the bottom of the gate. The height reading will increase or decrease as the actuator moves to attain the selected rate.

The Rate readout is the amount of material being spread per Hectare or Acre.

Press the  key to display the Rate readout.


e.g. 20mm  70 kg/Ha

The Rate that is displayed is the Target Spreading Rate. Based on the Pulse/kg calibration factor, the actuator will increase or decrease the feed gate opening to attain the Target rate. See section 4.5 Target Rate for information on setting the Target rate.

To increase or decrease the spreading rate while operating use the  or  keys. The amount of change in the rate from each press of the arrow keys can be set to any amount, e.g. 5, 10, 20kg per step up or down from the standard Target Rate. This is referred to as the **STEP SET**.

See section 4.6 for instructions on changing the Step Set.

When the Rate has been changed an arrow will appear on the display. This arrow reminds the operator which way the rate has been adjusted from the Target rate. To return back to the base Target Rate quickly, press the RESET key.

e.g. 40mm  70 kg/Ha

If the gate cannot achieve the desired rate, the monitor will display one of the following alarms.

e.g. RATE TOO LOW


or RATE TOO HIGH

There is also an alarm, which will appear to warn the operator when there is a Gate Jam. The monitor will continuously beep and display "GATE JAM" until the problem is rectified.

e.g. GATE JAM



"GATE JAM" may be caused by a rock or something caught in the feed gate or the gate may have reached the upper or lower limit, if an unattainable Target Rate is selected.

Rate Key cont'd...

MANUAL MODE – Press the  key to switch to MANUAL mode. The monitor will display the gate height only.

e.g.



In MANUAL mode, the RATE key displays only the GATE height and allows the operator to adjust the gate to any position using  the  or arrow keys.

3.7 Test Key


The TEST key provides a means of testing that the sensors and actuator are working correctly. The test function is also used in the calibration procedures.


Press the  key and the DISTANCE TEST will appear.

e.g.



The distance test enables the operator to test the wheel sensor mounted on the jockey wheel. Each time the magnet passes the sensor the monitor will beep and count the pulse.

To reset the pulse-count back to zero press the  key.


Pressing the  key again will display the SPINNER TEST.


e.g.



The spinner test will beep and count up each time the magnet on the spinner shaft passes the coil sensor.



NOTE: The sensor will only activate when the magnet passes the sensor quickly. Turning the spinner by hand may not activate the test function.

To reset the spinner count press the  key

Pressing the  key again will display the ACTUATOR TEST.


e.g.




The Actuator test should increase or decrease a number as the Actuator is extended or retracted using the  or  key.

The Actuator is Okay if the number changes continuously from gate up to gate fully down (10mm above the belt)



3.8 Cal Key

Pressing the  key will step through a series of set up factors that need to be entered for the monitor to work correctly. The Calibration section of this manual explains each of these set up factors in greater detail.

3.9 Timer Key

The  Key allows display of the ELAPSED TIME of machine operation. The ELAPSED timer can be RESET to zero at any point. When the monitor goes ON HOLD the elapsed timer will stop (and the colon between the Hours & Minutes stop flashing) and will restart when the monitor is taken OFF HOLD.

If required, the ELAPSED timer may be programmed with an elapsed time alarm point which can serve as a warning of a due maintenance interval.

Press the  key to display the elapsed timer.
e.g. 



To reset Elapsed Timer press the  key

TIMER ALARM

An elapsed time alarm may be set to activate after the ELAPSED display **counts up to a set point.**

To set Timer Alarm press  key again to display SET TIMER.



e.g.  (20 Hours)

Use  or  arrow keys to set duration of time to elapse before alarm will activate.

When the alarm activates, the monitor will display:




To cancel Timer press  key to display SET TIMER then press  to set timer value to zero.

To start Timer press  key to display ELAPSED TIME then press  to start timer counting up from zero.



3.10 Print Key



The Gate adjuster has a print facility that will print out Trip Area, Weight and Distance for each Trip (1-10) or all trips. Use the optional 2040 Printer Kit connected to the adapter cable provided in the kit.

Press the  key and the monitor will display the current trip to be printed.

e.g.




To print another Trip e.g. Trip 2, Press the Trip key and use  the or  arrow keys to select the required Trip then press Print again.

To print all the Trip information, select Print then use the  or  arrow keys to change the display to Print all trips.

e.g.



When the correct option is displayed press  key again and the display will say PRINTING and the printer will begin to operate.

If there is no trip data the monitor will display NO TRIP DATA and printing will cease.

Note: Each TRIP data takes approx. 16 secs to finish printing. Printing ALL TRIPS will take approx 3 mins.

3.11 Run/Hold Function

The Run / Hold function is activated by lifting the jockey wheel. Whenever the jockey wheel is stationary the monitor will go ON HOLD stopping the Trip, Total and Elapsed time functions from accumulating.

The MONITOR ON HOLD message will re-appear every thirty seconds accompanied by an alarm to remind the operator the monitor is not accumulating.

e.g.



When the jockey wheel is engaged and rotating the monitor will go OFF HOLD and the trip and total functions will begin to accumulate.

e.g.



3.12 Automatic Mode



Automatic mode allows the operator to close or open the gate while stationary or during spreading.

To **CLOSE** or **OPEN** the gate whilst **STATIONARY** or when the jockey wheel is raised,

press the  key.

e.g.

50mm	⊙	500kg/Ha
------	---	----------

Use the  arrow key to move the gate to the minimum height (10mm) and the  arrow key to open the gate.

e.g.

25mm	↓	250kg/Ha
------	---	----------



e.g.

75mm	↑	750 kg/Ha
------	---	-----------

To **CLOSE** or **OPEN** the gate whilst **SPREADING**, press the  key.

e.g.

20mm	⊙	70kg/Ha
------	---	---------

Use the  arrow key to move the gate to the minimum height (0kg/Ha) and the  arrow key to open the gate.

e.g.

10mm		0kg/Ha
------	--	--------

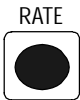
e.g.

20mm	⊙	70kg/Ha
------	---	---------

When the gate is closed, lift the jockey wheel to prevent wear on the belt.


3.13 Manual Mode

Manual mode allows the operator to close or open the gate while stationary or during spreading.

To select Manual Mode press the  key until display shows MANUAL.



e.g.

50mm	MANUAL
------	--------

To **close** or **open** the gate whilst **stationary** or when **spreading**, press the  key.

e.g.

20mm	MANUAL
------	--------

Use the  arrow key to move the gate to the minimum height (10mm) and the  arrow key to open the gate.

e.g.

10mm	MANUAL
------	--------

e.g.

55mm	MANUAL
------	--------

When the gate is closed, lift the jockey wheel to prevent wear on the belt.

3.14 Bin Level Sensor (Optional)

The optional A-2220P Bin/Tank Level Sensor can be fitted to the bin to detect a low bin level and give a visual and audible warning to the operator.

e.g.

BIN	LOW
-----	-----

To cancel BIN LOW message on the screen:

- Press any other key.
- Re-fill bin
- Put UNIT ON HOLD.

Note: BIN LOW message will re-appear if monitor goes OFF HOLD and bin is still empty.

INSTALLATION

Install the sensor through the bin wall by cutting a 35mm clearance hole.

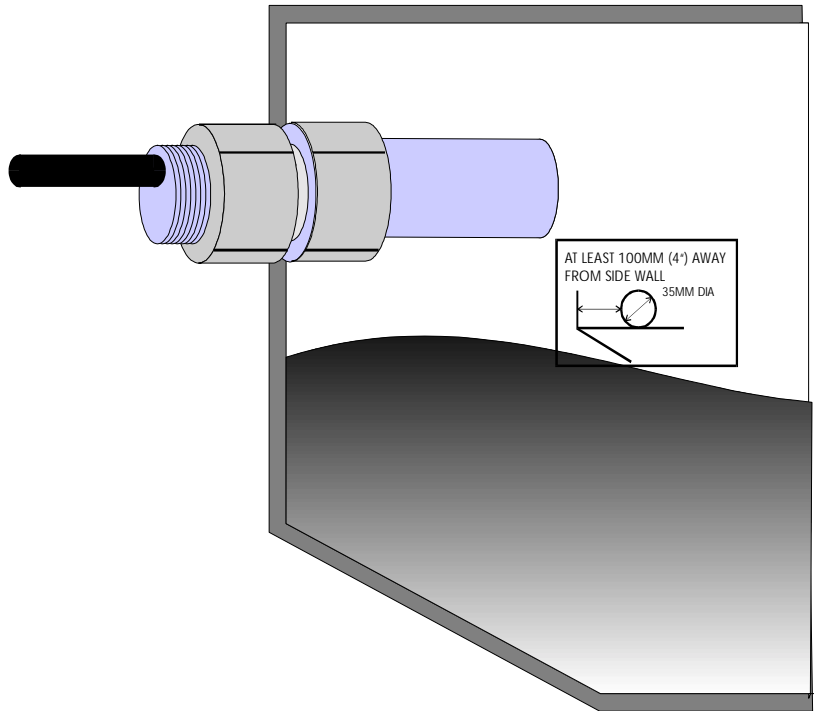
The sensor must be at least 100mm (4inches) away from any adjacent sidewall.

Bin Level Sensor INSTALLATION cont'd...

Install the sensor at the bottom of the bin.

Some bins empty from one side first, so it pays To observe the unloading characteristics before making any holes.


When the sensor is plugged into the harness, the light at the rear (cable entry side) of the sensor glows brightly when the sensor is uncovered and dims when the sensor is covered.





4.0 Calibration



4.1 General Outline


Variable factors need to be entered into the calibration memory before operation.

Press the  key to step through the calibration functions.

All calibration factors must be entered in METRIC units only. To adjust the factor

displayed, use the  or  arrow keys to change the displayed value.

Holding the  or  arrow keys will cause the numbers to change faster.

Press the  key after the required figure is set. The monitor will then proceed to the next calibration function.

To exit from the calibration routine, Press any other operation key (e.g. Rate) will return the Monitor to normal operation.

4.2 Memory Backup

An inbuilt memory backup system will hold all calibrations and accumulated totals in memory whenever the power is switched off.

Memory will last for at least 3 months after disconnection from the 12 Volt DC. Power Source.

4.3 Calibration Warning

A Calibration checking system incorporated into the system will warn you if any calibration factors are lost from memory or change value without your knowledge.


If for any reason a calibration factor does change value, a continuous series of beeps will sound and the display will indicate which calibration factor has altered.

In this case the operator must press the CAL key to check and re-enter the correct factor. Save this factor by pressing CAL key again. Press any other key (e.g. Speed) to return to normal display.



4.4 Setting up the Actuator

In order for the actuator to work correctly over the full range of the gate travel, the open and closed positions need to be set.

This will only need to be performed ONCE when the Actuator is first installed, but must be done before attempting to set any other calibration factors. The set up section for the actuator can be found by switching the monitor ON, pressing CAL key to display TARGET.

Press and hold the  key and the closed position can be set.



e.g. 


Press the  or  arrow keys to make the actuator close the feed door down to 10mm above the belt

At this point the monitor does not know which way is up or down so use either arrow key to determine which key closes the door.

When the door is closed to 10mm press the  key again.



The display will now ask for the zero height. This value is the distance from the bottom of the gate to the belt. (e.g. 10mm)

Use the  or  arrow keys to enter the size of the gap.

e.g. 

Press the  key again to display the Max position readout.

e.g. 


Use the  or  arrow keys to open the door to it's maximum readout position.

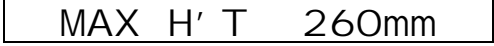
Be sure to stop the door 2 – 5 mm before the fully open position. This is to allow the actuator room to over shoot and prevent the gate from jamming and displaying




Setting up the Actuator cont'd...

Once the door has reached it's maximum (less 2 – 5 mm), carefully measure the gate height following the same angle as the door.

Press the  key and enter the maximum height using the arrow keys.

e.g. 


Press the  key again and the monitor will change back to the normal calibration routine displaying the Target Rate.

The options available from Target Rate onwards are part of the normal calibration options. These factors can be accessed by pressing the CAL key at any time.

4.5 Target Rate

With Target displayed, the  or  arrow keys can be used to set the Base Target spreading rate.

e.g. 

Press the  key to proceed to Step Set.


4.6 Step Set

The Step Set is the amount the target rate can be changed up or down when using the arrow keys to change the rate on the go. e.g. 5kg, 10kg, or 50kg steps.

Use the Arrow keys to set the steps as desired.

e.g. 

Note: If operating under GPS Rate map control, the step set may be used but your selection will be automatically overridden anytime the computer commands the rate to change.

Press the  key again to proceed to the Pulse/kg factor.

4.7 Pulse/Kg Factor


For AUTOMATIC gate operation, the Pulse/kg factor must be correctly set for each product type.

The correct Pulse/kg factor can be established by following the Calibration Procedure below or by using the table on Page 28 for MARSHALL Spreaders as a guide only.

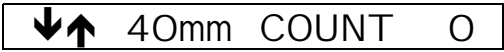
After the first load of a known weight, the factor can be fine tuned by taking the Monitor Weight reading multiplied by the Pulse/kg factor divided by the ACTUAL Weight.



Calibration Procedure

Follow the steps below to work out the Pulse/kg factor.

Press the  key to display Pulse/Kg


Press the  key to select the Pulse/kg Calibration screen.

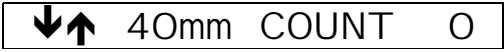
e.g. 

Use the  or  arrow keys to set the door to roughly a normal working height for that material. e.g. 40mm

When the door is set find a means of catching material delivered off the belt when turning the jockey wheel by hand.

Turn the jockey wheel until the Belt is fully primed with material falling evenly off the entire width of the belt. Stop turning when the jockey wheel magnet and sensor are aligned.

Press the  key to zero the count of wheel rotations.


e.g. 

Now prepare to catch material and proceed to turn the jockey wheel at least 10 turns stopping exactly on a pulse count. (When magnet and sensor are aligned)

Accurately weigh the material with digital scales.



DO NOT RESET THE COUNTER.

Calibration Procedures cont'd...

Now press the  key and weight will be displayed.

e.g.

 WEI GHT 0. 000kg

Use the  or  arrow keys to enter the correct material weight into the monitor.

e.g.

 WEI GHT 1. 760kg

Press CAL again when the weight is entered and the monitor will automatically calculate the new Pulse/kg factor. (Step through CAL options again to display new Pulse/Kg factor)

This Pulse/Kg Factor is accurate only for 50% more or 50% less than the required Target Rate.

A new Pulse/Kg Factor must be obtained, even for the same product, if the new Target Rate is 50% above or 50% below the previous Target Rate.

The above procedure will need to be carried out for each new product. Once the factor is established, it will be the same each time the same product is used unless material consistency differs greatly.



Record your Pulse/kg factors for future reference.

<i>Product</i>	<i>Pulse/Kg</i>

Calibration Guide

Located on Page 29 is a chart that has a Pulse/kg factor that has been calculated based on the Marshall charts.

4.8 Width

The Width is the effective width over which material is being spread. Use the  or  arrow keys to enter the width in metres.

e.g.

WI DTH 16m

Press the  key to proceed to setup the distance.

4.9 Distance

The Distance factor is the distance covered per rotation of the jockey wheel.

Carry out the procedure below to establish this value.

Press the  key until DISTANCE TST is displayed.

e.g.

DI STANCE TST 0

Engage the jockey wheel and crawl the spreader forward and stop when the DISTANCE TST beeps and counts up. (When the jockey wheel magnet and sensor are aligned)

Peg the ground at the bottom centre of the spreader main ground wheel tyre.




Drive forward in a straight line until the monitor has counted to approximately 10, stopping exactly on a beep count.

(If you go past a beep don't reverse; go forward to the next beep.)

Measure the distance from the peg to the bottom centre of the same tyre.


Divide the distance traveled by the number of jockey wheel rotations as displayed.

e.g. $15.7\text{m} \div 10 = 1.570$ Distance Factor

Press the  key to display Distance and use the  or  arrow keys to enter the distance factor.



e.g.

DI STANCE .570m


Press the  key to proceed to Spinner alarm.

4.10 Spinner Alarm

The Spinner alarm is the slow rpm alarm point for the spinner. Whenever the spinner rpm drops below this value the monitor will beep and warn the operator that there is a problem with the spinner.

Use the  or  arrow keys to enter this value or set zero for no alarm.

e.g.

Press the  key again to set up the Remote Run / Hold.

4.11 Remote Run/Hold

The Run/Hold function may be activated either by the Wheel signal or by an external connection to the rear of the monitor.

This requires Pin 12 of the 12 way green connector at the back of the monitor being connected as follows :-

Unit is OFF HOLD (in RUN mode) when connection is to EARTH

This function may be enabled or disabled by setting the Remote Hold ON or OFF

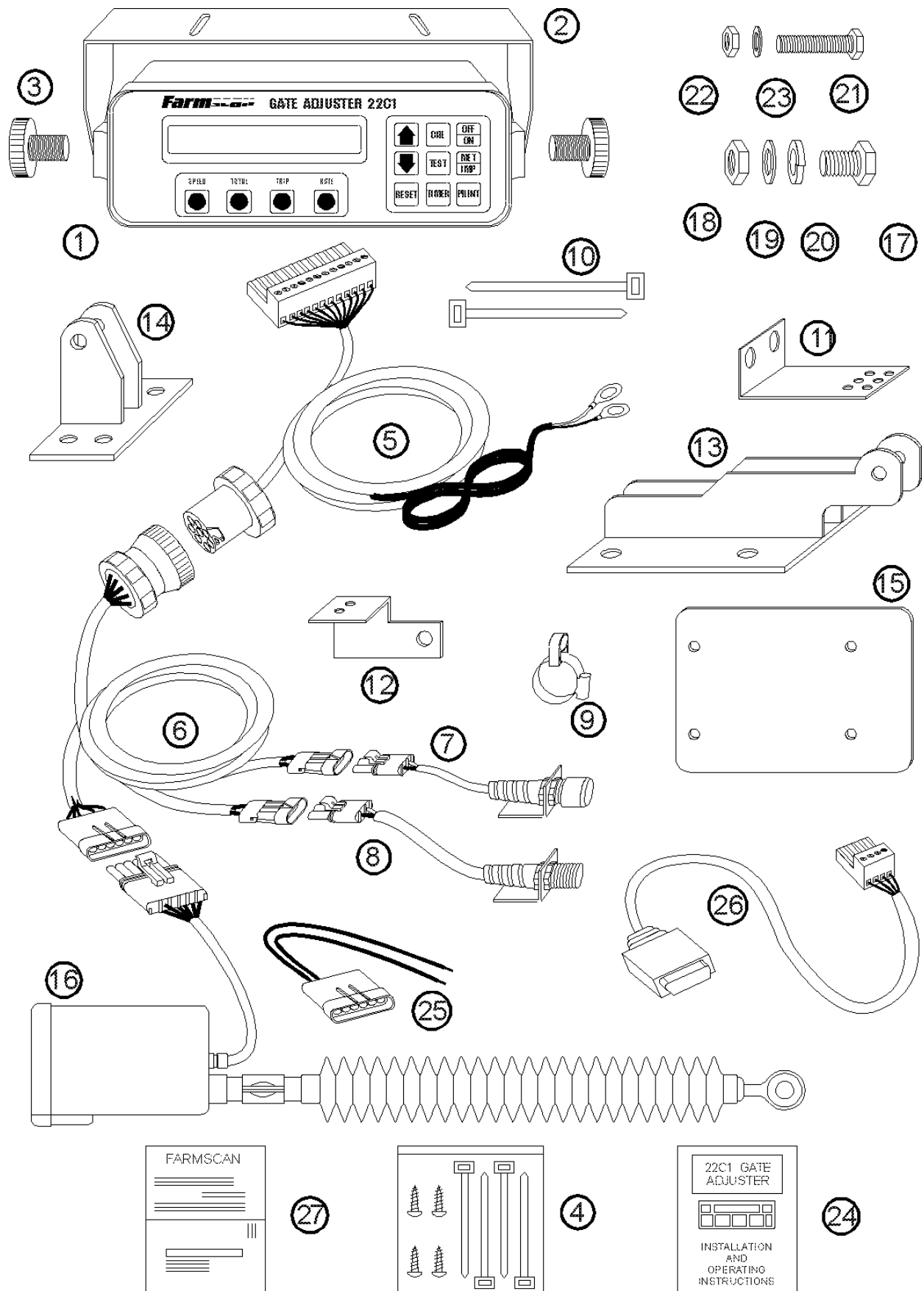
Use the  or  arrow keys to change between the options below.

e.g.

5.0 Parts List

REF	PART No.	DESCRIPTION	QTY
1	A-22C1	GATE ADJUSTER MONITOR	1
2	AH-406	MOUNTING BRACKET	1
3	AH-861	SECURING KNOBS	2
4	AH-408	UNIVERSAL HARDWARE PACK	1
5	AC-22C1-T	22C1 TRACTOR LOOM	1
6	AC-22C1-TB	MARSHALL SPREADER LOOM	1
7	AA-110P	REED TYPE SENSOR (WHEEL)	1
8	AA-112P	COIL TYPE SENSOR (SPINNER)	1
9	AA-117	SHAFT MAGNET & CLAMP	2
10	HG-706	CABLE TIES	20
11	AH-493	SPINNER SENSOR BRACKET	1
12	AH-494	WHEEL SENSOR BRACKET	1
13	AH-495	ACTUATOR TOP BRACKET	1
14	AH-496	ACTUATOR BOTTOM BRACKET	1
15	AH-497	ACTUATOR TOP BRACKET BACK PLATE	1
16	A-122	LINEAR ACTUATOR	1
17	HS-M8X25SS	M8 X 25mm BOLT	8
18	HN-M8SS	M8 NUT	8
19	HW-M8	FLAT WASHER	8
20	HW-M8SS	SPRING WASHER	8
21	HS-4X20SS	M4 X 20mm BOLT	4
22	HN-M4SS	M4 NUT	4
23	HW-M4SS	FLAT WASHER	4
24	AM-22C1	22C1 MANUAL	1
25	AC-079	ACTUATOR TEST CABLE	1
26	AC-080	PRINTER ADAPTOR CABLE	1
27	AM-200	2 YEAR WARRANTY CARD	1

5.1 Parts Drawing



6.0 Calibration Chart

Marshall Multispread Calibration Chart

Models: 850T/G 880T/G 850TM/G 880TM/G 810 TM/G

PRODUCT	DRIVE SPROCKET SETTINGS		DOOR HEIGHT RANGE (mm)	PULSE/KG FACTOR
	Side A	Side B		
Super Phosphate 1150 Kg/M*	14:30	15:30	25:75	4.15
	14:30	20:28	25:75	2.62
	30:14	15:30	25:75	0.87
Agras 950 Kg/M*	14:30	15:30	25:50 50:75	4.48 4.18
	14:30	20:28	25:50 50:75	3.10 2.91
	14:30	15:30	25:50 50:75	6.12 5.86
	14:30	20:28	25:50 50:75	4.27 3.84

TO FINE TUNE PULSE/KG FACTOR

AFTER FIRST LOAD
USE THIS FORMULA

MONITOR WEIGHT x PULSE/KG

ACTUAL WEIGHT

= NEW FACTOR

7.0 Troubleshooting Guide

PROBLEM		CAUSE	REMEDY
1.	MONITOR DOES NOT TURN ON	Fuse Blown.	<ul style="list-style-type: none"> Replace 20 Amp at rear of monitor. If there is no fuse then the monitor uses internal Poly-Fuses. These will cut out if the monitor is drawing too much current and will automatically restore power when the fault has been repaired.
		Monitor not connected correctly.	<ul style="list-style-type: none"> Connect BLACK from loom directly to -ve side and RED to +ve side of battery. Check there is 12V between pins 10 & 11 on the green plug at the back of the monitor.
		Interference	<ul style="list-style-type: none"> Make sure no other electrical device is connected to the monitor power cable. Do not share power with other devices such as foam markers, using 22C1 loom.
		Poor battery connections.	<ul style="list-style-type: none"> Ensure battery terminals are clean & tight. Check in-line fuse holder (if fitted) for blown fuse or corrosion.
2.	MONITOR TURNS ON AND THEN TURNS OFF WHEN ACTUATOR MOVES. (Ensure Truck/Tractor engine is running)	Not enough power to the monitor.	<ul style="list-style-type: none"> Run Power Cable directly to battery. Do not share power with other devices such as foam markers, using 22C1 loom
		Poor battery connections	<ul style="list-style-type: none"> Ensure battery terminals are clean & tight. Check in-line fuse holder (if fitted) for blown fuse or corrosion
3.	LCD DISPLAY DROPS OUT OR GREY SQUARES APPEAR ON READOUT.	Not enough power to the monitor	<ul style="list-style-type: none"> See TROUBLESHOOTING 2 above.
		Monitor not connected directly to battery.	<ul style="list-style-type: none"> Connect BLACK from loom directly to -ve side and RED to +ve side of battery. Do not share power with other devices such as foam markers, using 22C1 loom
		Faulty battery.	<ul style="list-style-type: none"> Replace battery.
		Poor battery connections	<ul style="list-style-type: none"> Ensure battery terminals are clean & tight. Check in-line fuse holder (if fitted) for blown fuse or corrosion.
4.	MONITOR LOSING CALIBRATION VALUES.	Poor power connection or inadequate power source.	<ul style="list-style-type: none"> Run Power Cable directly to battery. Do not share power with other devices such as foam markers, using 22C1 loom
		Poor battery connections	<ul style="list-style-type: none"> Ensure battery terminals are clean & tight. Check in-line fuse holder (if fitted) for blown fuse or corrosion
		Interference	<ul style="list-style-type: none"> Ensure 2-Way and other electrical equipment positioned 1m away from 22C1 monitor.
		Wire ignition leads causing interference (Petrol trucks)	<ul style="list-style-type: none"> Fit carbon leads to ignition system.

PROBLEM	CAUSE	REMEDY
5. UNSTABLE OR NO SPINNER RPM.	Spinner magnet is missing or incorrect distance from sensor.	<ul style="list-style-type: none"> • Ensure gap between sensor and magnet is 10 – 15mm. Move sensor away from magnet until reading is stable.
	Break in wiring loom.	<ul style="list-style-type: none"> • Press the TEST button until SPINNER TST is displayed. Disconnect spinner sensor from loom and short across loom pins. Monitor should beep and count each time the pins get shorted together if wiring OK. • If monitor does not count pulses, check for breaks in the loom by shorting the green and black wires together in the 9-pin break away plug and at the back of the monitor. • If no response directly at monitor, return monitor for repair.
	Interference in loom. (Usually accompanied by another action, such as machine moving or CB coming on).	<ul style="list-style-type: none"> • Ensure loom does not run close to other electrical cables. Ensure 2-Way and other electrical equipment positioned 1m away from 22C1 monitor
	Faulty or incorrect sensor. (Correct sensor has a YELLOW end cap)	<ul style="list-style-type: none"> • Unplug sensor and use a multimeter to check resistance of sensor pins is 50 – 70 Ohms. • Replaced with Farmscan Part No. AA-112P if faulty.
6. UNSTABLE OR NO SPEED READOUT. (Can be checked by setting monitor to Distance and driving known distance)	Wheel magnet missing or incorrect distance from sensor.	<ul style="list-style-type: none"> • Ensure gap between sensor and magnet is 10 – 15mm.
	DISTANCE CALIBRATION FACTOR incorrect or zero.	<ul style="list-style-type: none"> • See Section 4.9 DISTANCE in manual.
	Break in wiring loom.	<ul style="list-style-type: none"> • Press the TEST button until DISTANCE TST is displayed. Disconnect wheel sensor from loom and short across pins of loom. Monitor will beep and count each time pins get shorted together if wiring and monitor OK. • If monitor does not count pulses check for breaks in the loom by shorting the White and Black wires together in the 9-pin break away plug and at the back of the monitor. • If no response directly at the monitor, return monitor for repair.
Faulty or incorrect sensor. (Correct sensor is BLACK)	<ul style="list-style-type: none"> • Press the TEST button until DISTANCE TST is displayed and rotate the wheel. Monitor will beep and count each time wheel magnet passes sensor. • If no response unplug the wheel sensor and short pins of loom plug. • If monitor counts, replace sensor. 	

PROBLEM		CAUSE	REMEDY
6.	UNSTABLE OR NO SPEED READOUT. Cont'd.	Faulty or incorrect sensor. (Correct sensor is BLACK) cont'd.	<ul style="list-style-type: none"> To test the wheel sensor, measure the continuity (resistance) of the sensor with a multimeter. The multimeter should show a closed circuit (short) only when the magnet passes the sensor. Replace with Farmscan Part No. AA-110P if faulty.
7.	INCORRECT AREA. (Note: Does not record hectares when "Monitor On Hold".)	Inconsistent speed.	<ul style="list-style-type: none"> Drive at consistent speed and check that readout is fairly stable. If speed readout unstable see TROUBLESHOOTING 6 above.
		DISTANCE CALIBRATION FACTOR incorrect.	<ul style="list-style-type: none"> See Section 4.9 DISTANCE in manual and ensure distance calibration factor measured correctly.
		WIDTH CALIBRATION FACTOR incorrect.	<ul style="list-style-type: none"> Is machine not overlapping or under lapping. Press CALIBRATE until WIDTH is displayed, using the ↑ ↓ keys enter realistic width.
		Jockey wheel making insufficient contact.	<ul style="list-style-type: none"> Check if jockey wheel is bouncing excessively.
8.	GATE JAM WARNING (Reset the GATE JAM warning by pressing the CAL key then RATE key or by turning the monitor off and then on.)	Incorrect PULSE/KG factor. (Actuator moves using ↑ ↓ keys when stationary.)	<ul style="list-style-type: none"> Check to see if actuator has stopped at full open or full closed position. Check PULSES/KG calibration factor is correct, see SECTION 4.7 PULSE/KG FACTOR.
		Gate limits set incorrectly. (Actuator moves using ↑ ↓ keys when stationary.)	<ul style="list-style-type: none"> If PULSE/KG factor is correct and target rate is realistic, check gate limits are set correctly. See SECTION 4.4 SETTING UP THE ACTUATOR.
		Gate jammed.	<ul style="list-style-type: none"> Check the actuator has not jammed by removing the bolt at the base of the actuator and moving the gate by hand.
		Dirty or faulty plugs.	<ul style="list-style-type: none"> Check the green 12-pin plug at rear of monitor is firmly inserted in to monitor. Check both the 9 pin breakaway plug and the 6-pin plug (near the actuator) have all pins fastened securely to wires (Pulling gently on wires will test). Check contact quality of all pins, damaged or dirty pins will not give correct signal.
		No feedback from actuator. (The actuator will ONLY move UP or DOWN during ACTUATOR TST.)	<ul style="list-style-type: none"> Press TEST on the monitor until ACTUATOR TST is displayed. Use the ↑ ↓ keys on the monitor to move the actuator, the monitor display should increase or decrease between values -917 & 20. If values do not change then actuator feedback is faulty. If actuator does not move then see TROUBLESHOOTING below.

PROBLEM		CAUSE	REMEDY
8.	GATE JAM WARNING cont'd.	No feedback from actuator....cont'd	<p><u>Actuator only moves UP</u></p> <ul style="list-style-type: none"> • Unplug the 6-pin plug at the actuator. The monitor should read a high value near 20. Short the BLACK and PURPLE wires together, taking care not to short the RED and BLACK wires together. • If the monitor reads a low value near -917 then return for repair or replace actuator with part A-122 if faulty. • If the value displayed does not change go to green 12-pin plug at the back of monitor, leaving actuator unplugged. Repeat test changes by shorting across pins 3 and 9 of 12-pin plug. • If there is no change in reading on the monitor then return the monitor for service. • If actuator test displays a value near -917 check wiring loom for breaks. <p><u>Actuator only moves DOWN</u></p> <ul style="list-style-type: none"> • Using a multimeter ONLY check for 12V between the RED and BLACK wires at the actuator plug. • If there is 12V, return actuator for repair or replace actuator with part A-122 if faulty. • If there is no 12V then go to green 12-pin plug at the back of monitor. Test for 12V between pins 8 and 9 of the green 12-pin plug. • If there still is no 12V then return monitor for repair. • If there is 12V then check the wiring loom for breaks.
		No Power to actuator.	<ul style="list-style-type: none"> • Connect BLUE and YELLOW wires from actuator (or use ACTUATOR TST cable supplied with kit) directly to battery. If actuator does not move, reverse wires. <p>WARNING: ACTUATOR WILL MOVE SUDDENLY.</p> <ul style="list-style-type: none"> • If actuator does not move return actuator for repair or replace actuator with part A-122 if faulty. • If actuator moves re-connect 6 pin plug to monitor, press TEST on the monitor until ACTUATOR TST is displayed. <p>Pressing the ↑↓ keys will send 12V to the actuator along the BLUE and YELLOW wires.</p>

PROBLEM		CAUSE	REMEDY
8.	GATE JAM WARNING cont'd	No Power to actuator cont'd.	Using a test light or multimeter test for 12V between the YELLOW and BLUE wires connected to the 12-pin plug at the back of the monitor when pressing the ↑↓keys. <ul style="list-style-type: none"> • If there is no 12V return the monitor for repair. • If there is 12V check for breaks in the YELLOW and BLUE loom wires.
9.	TOO MUCH OR TOO LITTLE PRODUCT USED.	Incorrect DISTANCE CALIBRATION FACTOR.	• See TROUBLESHOOTING 6 above.
		Incorrect AREA recorded.	• See TROUBLESHOOTING 7 above
		Incorrect PULSE/KG CALIBRATION FACTOR	• See SECTION 4.7 PULSE/kg FACTOR in manual.
		Incorrect gate limits set.	• Reset the gate limits. See SECTION 4.4 SETTING UP THE ACTUATOR.
		Gate operating at significantly different height to calibration height.	• Recalculate new PULSE/kg factor for new target. See SECTION 4.7 PULSE/kg FACTOR in manual.
10.	MANUAL OPERATION (Version 2 Only)	To bypass automatic rate application.	<ul style="list-style-type: none"> • Press the CAL key until PULSE/kg is displayed. Set the PULSE/kg CALIBRATION FACTOR to 0 using the ↑↓ keys. In operating mode the ↑↓ keys will now adjust gate height and display gate opening size on the screen.

7.1 Summary of Alarms

Alarm Type	Reference
GATE JAM	Section 3.6 page 14 Section 4.4 page 22
UNIT ON HOLD	Section 3.11 page 17
UNIT OFF HOLD	Section 3.11 page 17
RATE TOO HIGH	Section 3.6 page 14
RATE TOO LOW	Section 3.6 page 14
SPINNER SLOW	Section 3.3 page 11
TIMER EXPIRED	Section 3.9 page 16
BIN LOW	Section 3.14 page 20