WT2000 – Weigh Belt Feeder

Operation and Installation Manual

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WT2000 – OPERATION AND INSTALLATION MANUAL

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System Description

Your weigh feeder has been crated for protection during transit. The weigh feeder electronics are normally packed separately in secure cardboard packaging. Upon delivery, please inspect all packaging for signs of damage. Report any damage to both the Transport Company and Web-Tech.

Customer, Job Number:

Weigh Belt Feeder:		**Motor:**	
Integrator:		**Speed Sensor:**	
Variable Speed Drive:		**Load Cells:**	
Belt:		**Ventilation:**	
Calibration Weights:			
Remote Instruments:			
Spare Parts:			
Customer Requests:			

If in any doubt regarding any aspect of the delivery, contact:

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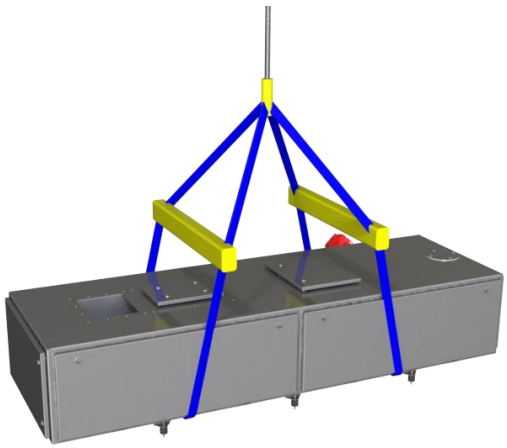
UNPACKING

1) Carefully open the crate.
2) The weigh feeder is held in place by bolts in the mounting feet.
3) Remove the bolts and lift the weigh feeder clear of the crate using web slings – **NOT CHAINS.**
4) Ensure no parts have come loose during transit.
5) Carefully transport the weigh feeder to point of installation.
6) Open the cardboard box containing the electronics. Remove the electronics and check box for any remaining items.
7) Check electronics enclosure for any obvious damage.
   Proceed to Mechanical and Electrical installation sections.



PLEASE READ ALL SECTIONS OF THE MANUAL BEFORE PLACING THE WEIGH FEEDER INTO SERVICE.

IF UNSURE ASK

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Family Description

The Web-Tech model WT2000 series consists of a range of light to medium duty weigh feeders capable of handling various products. The model number extension .i.e. “300” denotes the belt width. Therefore a WT2000-300 is a model WT2000 with a belt width of 300mm. Web-Tech has selected a belt width based on the operating parameters supplied to us. Standard belt widths are 300mm, 450mm, 600mm, 750mm, 900mm 1050mm and 1200mm.

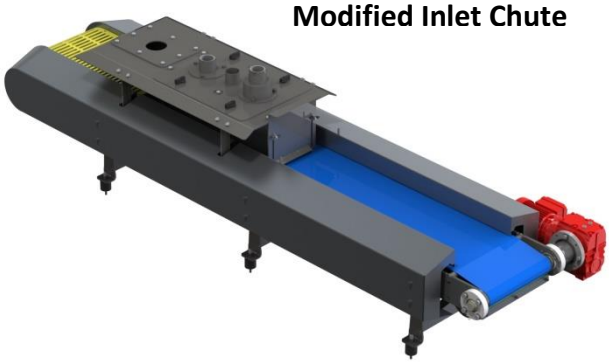
The model WT2000 is available in either “open construction, semi enclosed construction & enclosed construction”. Apart from the enclosure, the mechanical aspects are the same for all types. For open construction and semi enclosed models, the weigh feeder may be supplied with an inlet chute with connection flange, or with a “horseshoe” type inlet which consists of side and rear skirts. Enclosed construction models are supplied with an internal inlet chute. The inlet chute flange may be bolted directly to the outlet of a bin, however it is not designed to support any loads. This may happen for example if the bin is supported by a structure that can deflect when fully loaded. If this is the case a flexible connection should be used. Severe belt damage can occur if the inlet chute is forced into contact with the belt because of inlet chute external loading.

The weighfeeder dimensional layout and capacity have been determined by information supplied to Web-Tech at the product enquiry stage. Some WT2000 weigh feeders may change in overall dimensions and/or supply of ancillaries to suit the operational requirements. Should your weigh feeder vary from the standard design, an addendum will have been inserted in this manual to reflect the changes.

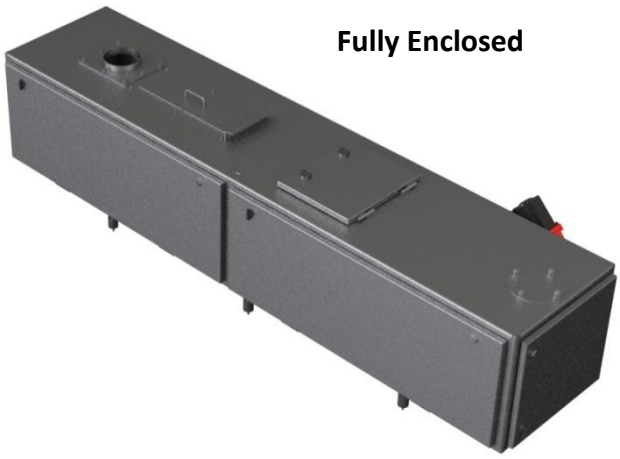
If there are any questions regarding any aspect of the weigh feeder design or installation, please do not hesitate in contacting Web-Tech for clarification before placing the weighfeeder into operation. The weighfeeder is generally programmed and calibrated in our factory prior to dispatch, however the weighfeeder will need to have the calibration re-checked after installation. The calibration sheets are located at the rear of this manual.

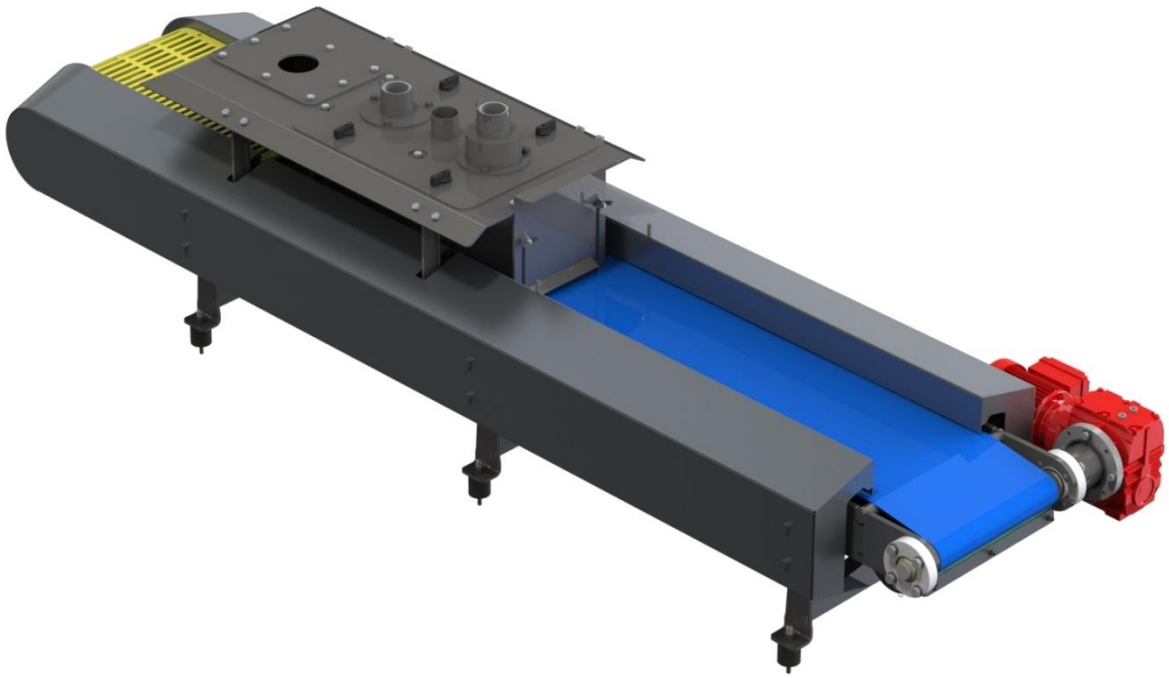
Open Horseshoe

Semi Enclosed with Modified Inlet Chute



Fully Enclosed





Semi-Enclosed WT2000
with Modified Inlet Chute

The Model WT2000 series of open construction and semi-enclosed weigh feeders can be fitted with an inlet chute and shear gate arrangement, making the feeder suitable for use with a silo/ hopper.

The inlet chute dimensions are as shown in the accompanying drawing. Generally the inlet chute width is half the belt width. The shear gate settings are:

- Min 5mm.
- Max 120mm.

Web Tech will have designed the weighfeeder to operate with a prescribed shear gate height as there is a direct relationship with the weighfeeder capacity, belt speed, permitted motor turn down ratio and product lump size.

Lump Size
The shear gate must be set to 2.5 times the diameter of the max lump size.

Capacity
The shear gate height setting must allow sufficient product volume to pass at max belt speed.

Turn Down Ratio
Web Tech specifies a max turn down of 10:1 to avoid the use of a cooling fan. Forced fan cooling and servo motor options are available.

Belt Speed
Web Tech generally does not design the weigh feeder that requires a motor input frequency above 80Hz.

Open WT2000 with Horseshoe Inlet

The model WT2000 series of open construction and semi-enclosed weigh feeders can also be configured with a horseshoe style inlet arrangement. This has been designed with the food, tobacco and chemical industries in mind, as these industries often cannot or choose not to use pre-feed hoppers. The horseshoe style inlet allows the user to use conveyors, augers and vibratory feeders to supply product to the feeder. Depending on factors such as bulk density and lump size, this configuration will generally be manufactured with an impact plate positioned prior to the weigh area.

Without a shear gate, mass rate control is not as accurate owing to product bed depth variations caused by inconsistency of pre-feeding devices. Therefore if mass rate control is the primary function, careful attention must be paid to the pre-feed strategy.

Fully Enclosed WT2000

Full enclosed WT2000 series weigh feeders have been designed for use with dusty or toxic products. An inlet chute and adjustable shear gate arrangement is used with this model.

The feeder is dust tight when installed correctly and an adjustable vent is built into the rear door which provides an air path through the feeder.

The inlet chute dimensions are as shown in the accompanying drawing. Generally the inlet chute width is half the belt width. The shear gate settings are:

- Min 5mm
- Max 120mm

Web Tech design the weigh feeder to operate with a prescribed shear gate height as there is a direct relationship with the weigh feeder capacity, belt speed, permitted motor turn down ratio and product lump size.

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Open/Semi-Enclosed Construction – Inlet Chute Installation

The following is a summary of works required for the mechanical installation of an open or semi-enclosed construction model WT2000 weighfeeder which is supplied with an inlet chute.

For high vibration areas (client to advise at quotation time) the weighfeeder will be supplied with rubber vibration isolators (loose supply). Locate these isolators and bolt them to the weighfeeder support feet.

Cover the weighfeeder if any metal cutting is to be performed nearby as hot slag will melt the belt. If any welding is to be carried out in close proximity to the feeder, remove the load cell from the weighfeeder as stray electrical currents will damage the load cell.

****** Never Weld Anything To The Weigh Feeder ******

Locate the weighfeeder on the support structure ensuring correct alignment. The structure must be flat and sufficiently rigid to eliminate any deflection due to the weight of the weighfeeder and the product it's transporting. Level the weighfeeder by placing a spirit level across and along the weighfeeder belt/structure. Any vertical alignment should be compensated for by using shim material under the support structure or weighfeeder vibration isolators/mounting feet.

DO NOT "PULL UP" ANY GAPS BY USING THE MOUNTING BOLTS AS THIS MAY TWIST THE WEIGHFEEDER FRAME

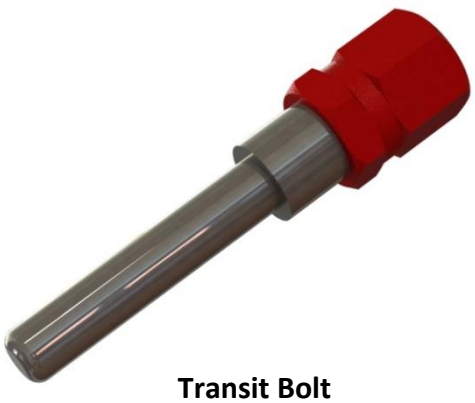
The weighfeeder should be level in both directions to ±0.50°. This is an important requirement and a suitable spirit level or other device must be used in order to comply with this requirement.
If the weighfeeder is to be bolted directly to an overhead bin, a flexible gasket should be used between the bin and weighfeeder flanges. The thickness of the gasket should be sufficient to take-up any variation in gap that may exist between the two flanges. If in doubt ring Web Tech for advice. Carefully tighten the flange bolts so that the gasket is compressed and the gap is completely closed.

DO NOT OVER TIGHTEN THE CONNECTION BOLTS SO THAT THE FLANGE IS BENT

If a flexible connection is to be used, ensure that any excess in the flexible material does not create a ledge, or restrict the flow of material from the outlet of the bin.

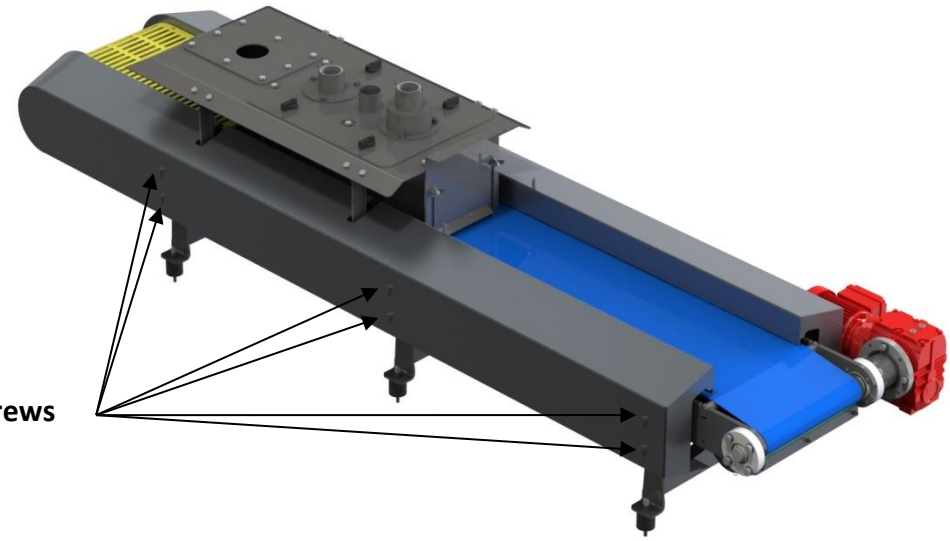
REMOVING TRANSIT BOLTS

The weighfeeder has been fitted with a transit bolt to the combination gravity assisted belt tensioner and steering mechanism during transit to relieve belt tension. There may also be a transit bolt fitted to the weigh frame to protect the loadcell. These bolts must be removed prior to running the belt. Damage to the weighfeeder will occur if not removed. Locate and remove the gravity take-up transit bolt. The transit bolt head will have been painted red for easy identification. Note the transit bolts will be hidden by the guards fitted to the semi enclosed model. Remove the guard(s) to access the transit bolts. The guard(s) to be removed will depend on the orientation (left or right) of the weighfeeder. Please read all other Instructions located on the Weigh Feeder before placing into operation. If in doubt, please ring Web Tech for advice.

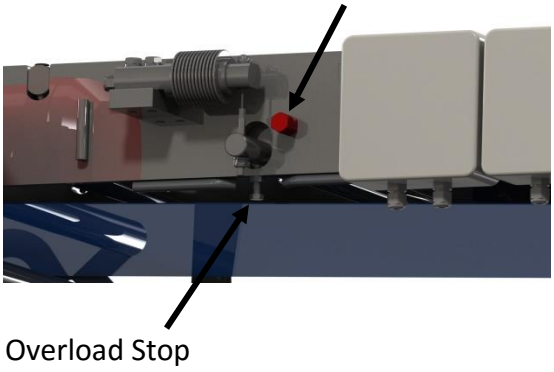


Transit Bolt

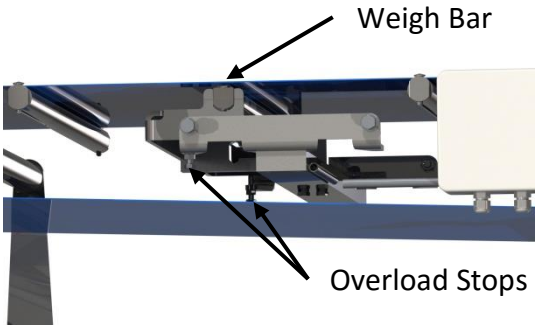
To gain access to the transit bolts, the guards must be removed. The guards are fitted to the weighfeeder by means of hex head screws, as shown below.



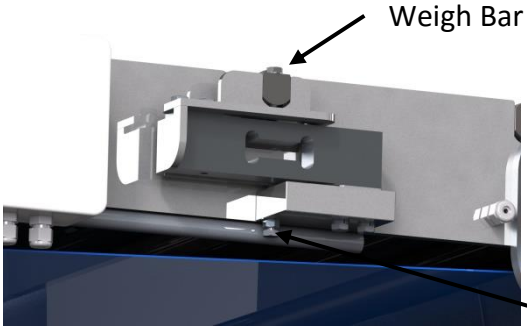
The load cell overload stop has been factory set and should not be interfered with. If the stop is accidently adjusted, then use the setting procedure detailed elsewhere to re-set.



Flexure Weighframe Model

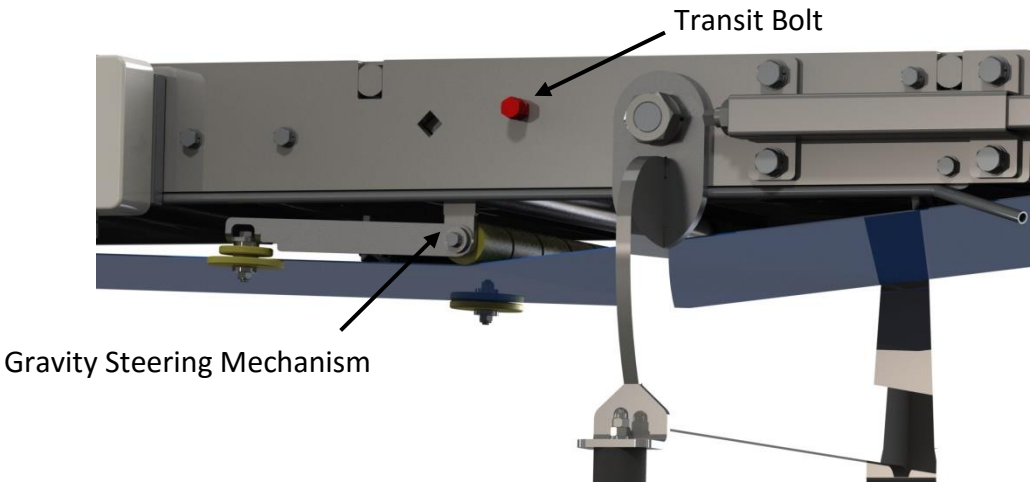


Internal Single-Point Loadcell Model
(Side rails not shown for clarity)



External Dual Single-Point Loadcell Model

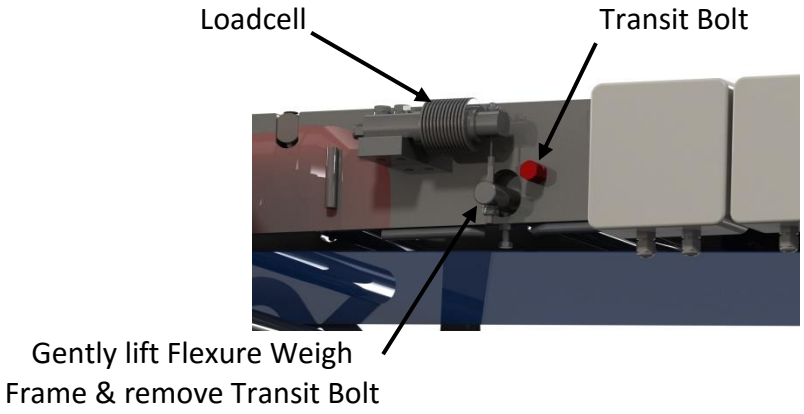
Gravity Steering Transit Bolt (all models)



Transit Bolt(s) Have Been Inserted to the Weigh Feeder to Prevent Damage During Transport

Leaving the Transit Bolt(s) in Place During Operation Will Damage the Weigh Feeder

Weigh Frame Transit Bolt (flexure weigh frame models only)



Before placing into operation, the alignment of the weigh bar should be checked once the transit bolt(s) have been removed.

DO NOT ADJUST: RING FACTORY FOR ADVICE

Locate the weigh bar position. Place a straight edge along each edge of the carry bars and check the height of the weigh bar. The weigh bar should be within a tolerance of +0.25mm/-0.00mm with respect to the approach and retreat bars. If the weigh bar requires adjustment, remove the dust caps on the end of the weigh bar and adjust the grub screw. When finished aligning replace the dust caps. The mechanical installation is now complete; proceed to the electrical installation section.

The following is a summary of works required for the mechanical installation of an open/semi-enclosed construction model WT2000 weighfeeder which is supplied with a "horseshoe style" inlet.

For high vibration areas (client to advise at quotation time) the weighfeeder will be supplied with rubber vibration isolators (loose supply). Locate these isolators and bolt them to the weighfeeder support feet.

Cover the weighfeeder if any metal cutting is to be performed nearby as hot slag will melt the belt. If any welding is to be carried out in close proximity to the feeder, remove the load cell from the weighfeeder as stray electrical currents will damage the load cell.

****** Never Weld Anything To The Weigh Feeder ******

Locate the weighfeeder on the support structure ensuring correct alignment. The structure must be flat and sufficiently rigid to eliminate any deflection due to the weight of the weighfeeder and the product it's transporting. Level the weighfeeder by placing a spirit level across and along the weighfeeder belt/structure. Any vertical alignment should be compensated for by using shim material under the support structure or weighfeeder vibration isolators/mounting feet.

DO NOT "PULL UP" ANY GAPS BY USING THE MOUNTING BOLTS AS THIS MAY TWIST THE WEIGHFEEDER FRAME

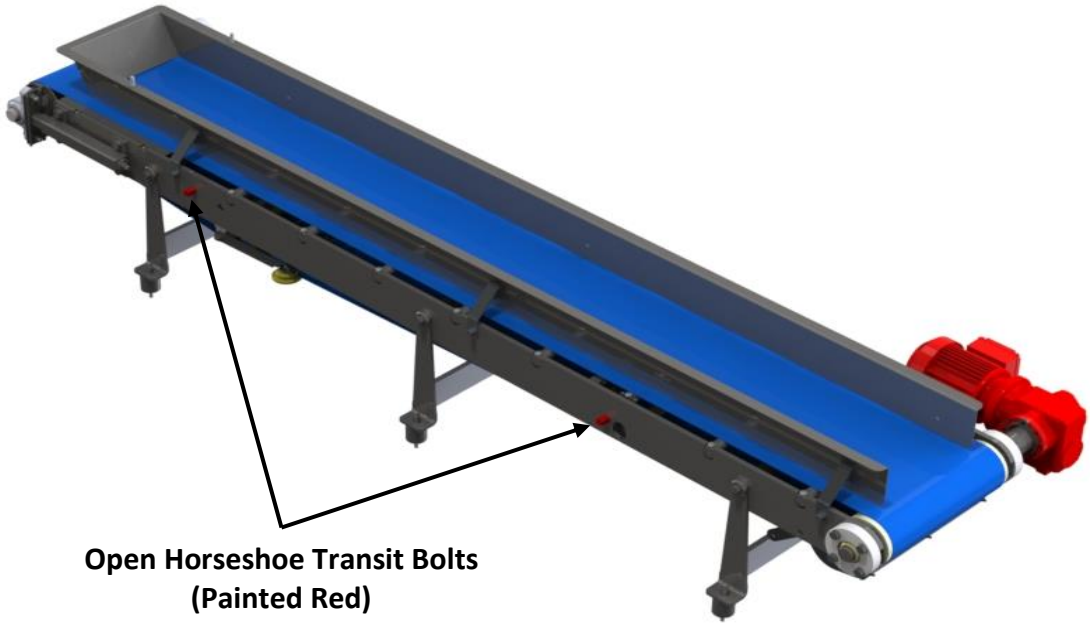
The weighfeeder should be level in both directions to ±0.50°. This is an important requirement and a suitable spirit level or other device must be used in order to comply with this requirement.
The use of the "horseshoe" style inlet allows for a conveyor, metering tube or a pre-feeder such as a vibratory feeder to be used. If the specification calls for a conveyor, metering tube, or vibratory feeder ensure that nothing is in contact with the belt.

If the bottom of the chute/metering tube is fitted with skirts, ensure that excessive load is not placed on the belt. Flexible skirts should just be in contact with the belt, rigid skirts MUST NOT be in contact with the belt.

If the weighfeeder is to be supplied with a pre-feeding device such as a vibratory feeder or conveyor, ensure that material is not deposited forward of the product impact zone (refer to the drawing for location of the product impact zone limits).

Locate and remove the transit bolts as instructed in the previous section. Note that an open construction weighfeeder does not have any guarding requiring to be removed. The transit bolt head will have been painted red for easy identification. Carefully lower the gravity take-up roll down onto the return belt.

Each load cell is fitted with an overload screw(s). On belt widths up to and including 600mm, one load cell is used. On wider belt widths, two load cells are used (one per side). These screw(s) have been factory set and should not be altered. Beside each of these screws there is a red transit bolt (flexure weigh frame models only). During transit, these transit bolt(s) are inserted to reduce any load on the load cell. Before operation carefully remove the transit bolt, if fitted, as described in the previous section.



Open Horseshoe Transit Bolts (Painted Red)

Transit Bolt(s) Have Been Inserted to the Weigh Feeder to Prevent Damage During Transport

Leaving the Transit Bolt(s) in Place During Operation Will Damage the Weigh Feeder

The load cell overload stop has been factory set and should not be interfered with. If the stop is accidently adjusted, then use the setting procedure detailed elsewhere to re-set.

Before placing into operation, the alignment of the weigh bar should be checked.

DO NOT ADJUST: RING FACTORY FOR ADVICE

Locate the weigh bar position. Place a straight edge along each edge of the carry bars and check the height of the weigh bar. The weigh bar should be within a tolerance of +0.25mm/-0.00mm with respect to the approach and retreat bars. If the weigh bar requires adjustment, remove the dust caps on the end of the weigh bar and adjust the grub screw. When finished aligning replace the dust caps.

The mechanical installation is now complete; proceed to the electrical installation section.

The following is a summary of works required for the mechanical installation of an "enclosed" construction model WT2000 weighfeeder which is supplied with an internal inlet chute.

For high vibration areas (client to advise at quotation time) the weighfeeder will be supplied with rubber vibration isolators (loose supply). Locate these isolators and bolt them to the weighfeeder support feet.

Cover the weighfeeder if any metal cutting is to be performed nearby as hot slag will melt the belt. If any welding is to be carried out in close proximity to the feeder, remove the load cell from the weighfeeder as stray electrical currents will damage the load cell.

****** Never Weld Anything To The Weigh Feeder ******

Remove the side doors from the weighfeeder prior to proceeding. The doors are fitted with hinges allowing them to be slid off. Locate the weighfeeder on the support structure ensuring correct alignment. The structure must be sufficiently rigid to eliminate any deflection due to the weight of the weighfeeder and the product it's transporting. Level the weighfeeder by placing a spirit level across and along the weighfeeder belt/structure. Any vertical alignment should be compensated for by using shim material under the support structure or weighfeeder isolation blocks/mounting feet.

DO NOT "PULL UP" ANY GAPS BY USING THE MOUNTING BOLTS AS THIS MAY TWIST THE WEIGHFEEDER FRAME

The weighfeeder should be level in both directions to ±0.50°. If the weighfeeder is to be bolted directly to an overhead bin, a flexible gasket should be used between the bin and weighfeeder flanges. The thickness of the gasket should be sufficient to take-up any variation in gap that may exist between the two flanges. Carefully tighten the flange bolts so that the gasket is compressed and the gap is completely closed.

DO NOT OVER TIGHTEN THE CONNECTION BOLTS SO THAT THE FLANGE IS BENT

If a flexible connection is to be used, ensure that any excess in the flexible material does not create a ledge, or restrict the flow of material from the outlet of the bin.

Connect the outlet of the weighfeeder using the same method i.e. use a flexible gasket.

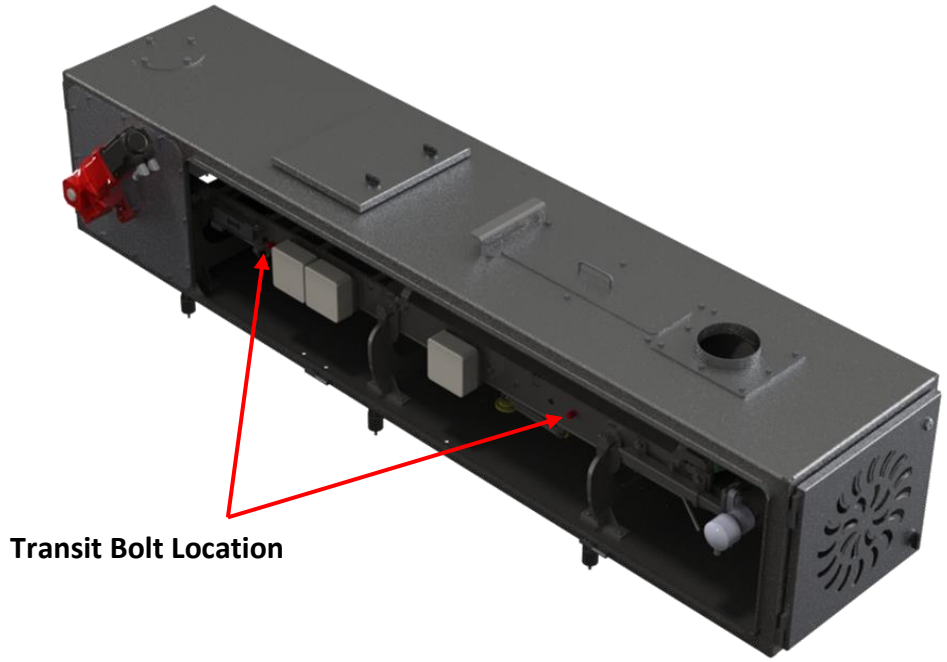
Locate and remove the gravity take-up transit bolt as described in the previous sections. The transit bolt head will have been painted red for easy identification.

Each load cell is fitted with an overload screw(s). On belt widths up to and including 600mm, one load cell is used. On wider belt widths, two load cells are used (one per side). These screw(s) have been factory set and should not be altered. Beside each of these screws there is a red transit bolt (flexure weigh frame models only). During transit, these transit bolt(s) are inserted to reduce any load on the load cell. Before operation carefully remove the transit bolt, if fitted, as described in the previous section.

Before placing into operation, the alignment of the weigh bar should be checked. Locate the weigh bar position. Place a straight edge along each edge of the carry bars and check the height of the weigh bar. The weigh bar should be within a tolerance of +0.25mm/-0.00mm with respect to the approach and retreat bars. If the weigh bar requires adjustment, remove the dust caps on the end of the weigh bar and adjust the grub screw. When finished aligning replace the dust caps.

The mechanical installation is now complete; proceed to the electrical installation section.

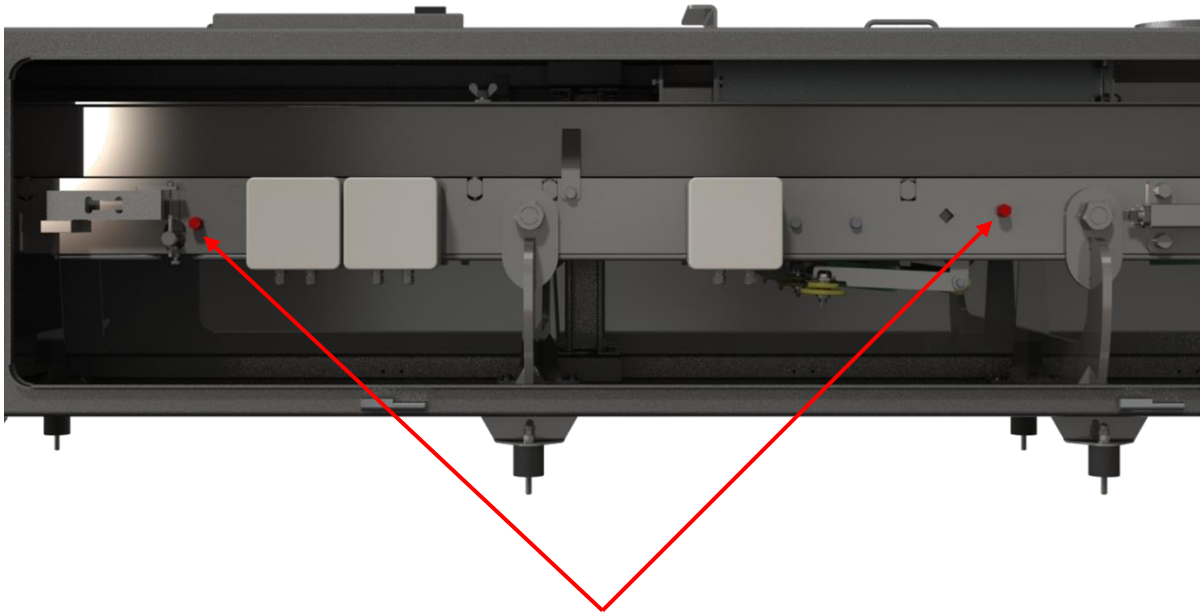
Transit Bolts



Transit Bolt Location

Transit Bolt(s) Have Been Inserted to the Weigh Feeder to Prevent Damage During Transport

Leaving the Transit Bolt(s) In Place During Operation Will Damage The Weigh Feeder



Transit Bolts Side on View

Electrical connection diagrams for the weighfeeder electronics, load cell and belt speed sensor junction boxes are located in the drawing section of this manual. Electrical connection diagrams for the gear motor and variable speed drive (if applicable) are located in the appropriate manufacturer's manuals.

Electrical installation comprises the following work:

1) Install and connect weighfeeder electronics to mains supply.
2) Install and connect supply to weighfeeder motor (or via VSD if applicable).
3) Install and connect cable between load cell junction box and electronics.
4) Install and connect cable between belt speed sensor junction box and electronics.
5) Install and connect cable between weighfeeder electronics and variable speed drive (if supplied).
6) Install cable between weighfeeder electronics and PLC (if required).

Install earth strap to weighfeeder structure (refer G.A. drawing for location). The weighfeeder structure should be earthed to eliminate static build-up from the structure.

Weigh Feeder Electronics

The weighfeeder may be supplied with either of the following electronics models:

- Masterweigh 6
- Masterweigh 7
- Optimus
- Masterweigh Novus

The appropriate electrical connection drawing for the electronics supplied is located in the drawings section of the manual.

The electronics enclosure is an IP66 reinforced fibre polyester enclosure, or optionally an IP66 stainless steel enclosure.

The enclosure should be located so that it:

- Is not in direct sunlight (install sunshield if located outdoors).
- Is not subject to direct wash down.
- Is not installed in close proximity to high power cables, variable speed drives or vibratory feeder controllers.
- Is not more than 100 metres from the weighfeeder. The closer the electronics can be located to the weighfeeder reduces the chances of electrical interference on the cables. It also makes it easier when carrying out calibrations and fault finding.

Novus Integrator in Hoffman Enclosure

Cables

All cables between the load cell/belt speed sensor junction boxes and the electronics should be proper screened instrumentation quality. As the signal levels from these devices are very low, any cable runs between the weighfeeder and electronics should be carried out so that these cables are not installed close to power cables. Any cable runs should not interfere with the "access" side of the weighfeeder which may interfere with belt removal.

Suggested cable type for each application is as follows:

- Load Cell - 4 core overall screened, Belden type 8723 or equivalent (2 Pairs individually Shielded, 22 AWG (7/0.25) Tinned Copper, Polypropylene Insulated, common 24 AWG (7/0.20) Tinned Copper Drain Wire, PVC Jacket).
- Belt Speed Sensor - 3 core overall screened, Belden type 8723 or equivalent.
- VSD/Motor - To suit the motor power installed. As the model WT2000 weighfeeder is supplied with a variety of motor/VSD combinations, it is beyond the scope of this manual to give installation/ instruction here. Please refer to the manufacturer's manuals in other sections of the manual.

Ensure that all cable entries into the electronics enclosure and junction boxes use the correct size waterproof glands.

Cable Terminations

Load Cell junction box
Refer to drawing "LCJB" in the drawing section of the manual.

Speed sensor junction box
Refer to the appropriate drawing depending on the type of speed sensor supplied with the weighfeeder.

Pre-Start Up Checks

Startup

Prior to turning on the equipment and starting the weighfeeder, ensure the following has been done:

- Double check all electrical connections are correct.
- All mechanical installation has been completed and no tools have been left on the belt or in the inlet chute.
- The rotation of the motor has been checked and wired correctly. Start Up Steps When starting up the system for the first time, follow these steps:
- Turn on the electronics, and ensure it displays the Mass Rate, Mass Total screen (MRMT).
- Start the weighfeeder. If using a variable speed drive, start it in local and ramp the frequency up to 50Hz.
- Ensure the belt is tracking centrally. If the belt is not tracking centrally, turn the weighfeeder off and check that the belt is sitting correctly in the guides on the tracking system. Belt tracking will have been done at the factory prior to shipment. If the belt is not tracking at this point in the installation procedure, check that the feet of the weighfeeder are vertical aligned and the feeder is square in all directions (+/- 0.5º). Do not start adjusting any part of the feeder until all relevant checks have been done. Please contact Web Tech if in doubt.
- The load cell output can be directly read from the electronics. Refer to the electronics manual for the appropriate menu for reading the load cell voltage. Refer to the calibration sheets at the rear of the manual and compare the factory programmed voltage (mV) to the existing value. It should be within ±0.5mV.
- The belt speed sensor output can be read directly from the electronics. Refer to the electronics manual for the appropriate menu for reading the belt speed sensor frequency output. Run the weighfeeder, refer to the calibration sheets at the rear of the manual and compare the factory programmed frequency (Hz) to the existing value. It should be within ±1Hz. If all readings appear correct, proceed to the Calibration section of the manual.

The weighfeeder has been programmed and calibrated at the factory. However, due to changes that may have occurred during transit and installation, the weighfeeder calibration should be checked. Once initiated the calibrations are automatic and only require the pressing of acceptance keys.
The two basic calibration steps are the "Zero" calibration and the "Span" calibration.

Calibration Basic Notes

- All Masterweigh functions are performed over a specified number of belt revolutions. Which will have been pre-programmed into Masterweigh in the factory.
- Masterweigh interprets the number of belt revolutions as a number of pulses from the tachometer/encoder.
- The total number of pulses to be acquired by Masterweigh is based on the following:
  - Time duration minimum is 5 minutes.
  - The minimum number of belt revs is 1, however 5 or more is preferred.

Zero Calibration

The zero calibration is established by running the weighfeeder empty for the programmed number of belt revolutions and calculating the average load cell output during this period. The weighfeeder electronics will automatically calculate the zero value when the test has been initiated and completed. Refer to the electronics manual supplied with your WT2000 (Masterweigh 6, Masterweigh 7, Optimus or Masterweigh Novus) for the procedure. The weighfeeder must be able to be run empty during this test, with the number of belt revolutions programmed for its duration found on the calibration sheets at the end of this manual.

Span Calibration

The span calibration is generally carried out on a model WT2000 weighfeeder with the use of calibration chains. The calibration chains consist of one or more strands of roller chain attached to a restraining bracket. The size of the chain and number of strands has typically been calculated by Web Tech to simulate approximately 75% of the maximum feeder capacity. The calibration chains are placed on the belt and attached to the calibration chains restraining bracket via hooks. The weighfeeder is run and the test is carried out over the same number of belt revolutions as the zero tests. The result is compared to a target weight calculated by Web Tech at the time of factory commissioning. The procedure for carrying out the test can be found in the electronics manual. The target weight can be found on the calibration sheets in this manual.

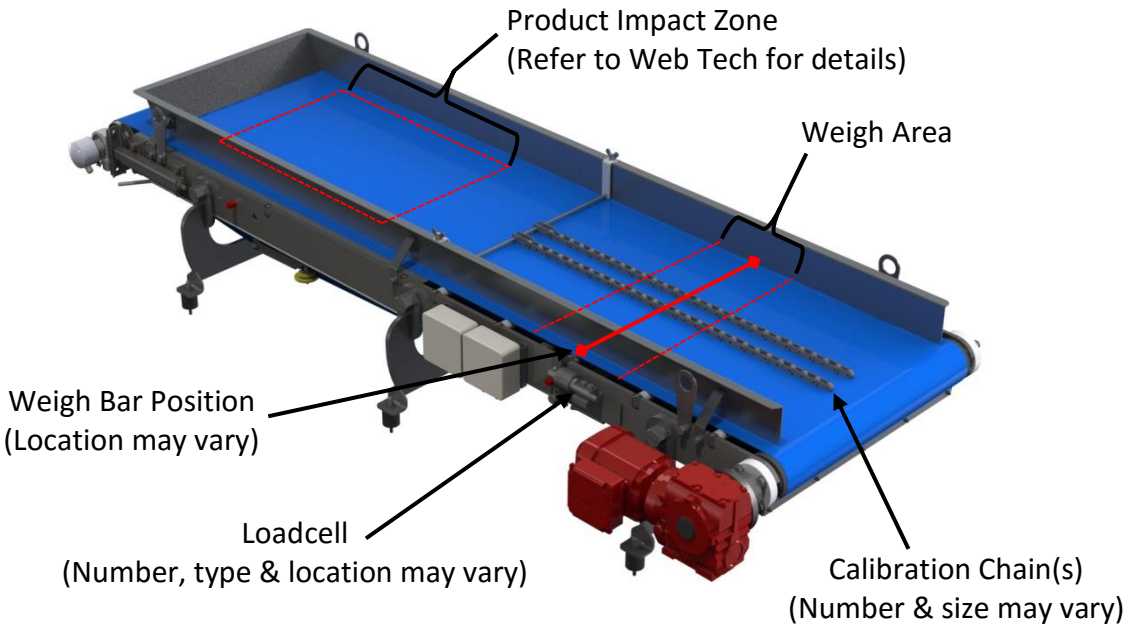
Material Test

We strongly suggest that a material test be carried out where possible. A material test involves weighing product on an accurate static scale prior to, or after it has passed over the weighfeeder. When carrying out a material test the following should be considered: The amount of material required for the tests must be proportional to the weighfeeder capacity. A rule of thumb quantity would be a minimum of 3 minutes of running time at maximum capacity (e.g. if the capacity is 10 tph, the amount of material would be 10 000 kg/60 x 3 = 500 kg). A smaller amount could be used, however it must be understood that the accuracy achievable may be diminished due to the resolution used. It must be guaranteed that all of the material used in the test has passed over the weighfeeder.

The material feed over the weighfeeder must be continuous, consistent & representative.

When the tests have been carried out any correction to the calibration can be carried out in the "Empirical Calibration" menu of the electronics (refer to the electronics manual section). Any changes to the calibration should be recorded on the calibration sheets for future reference.

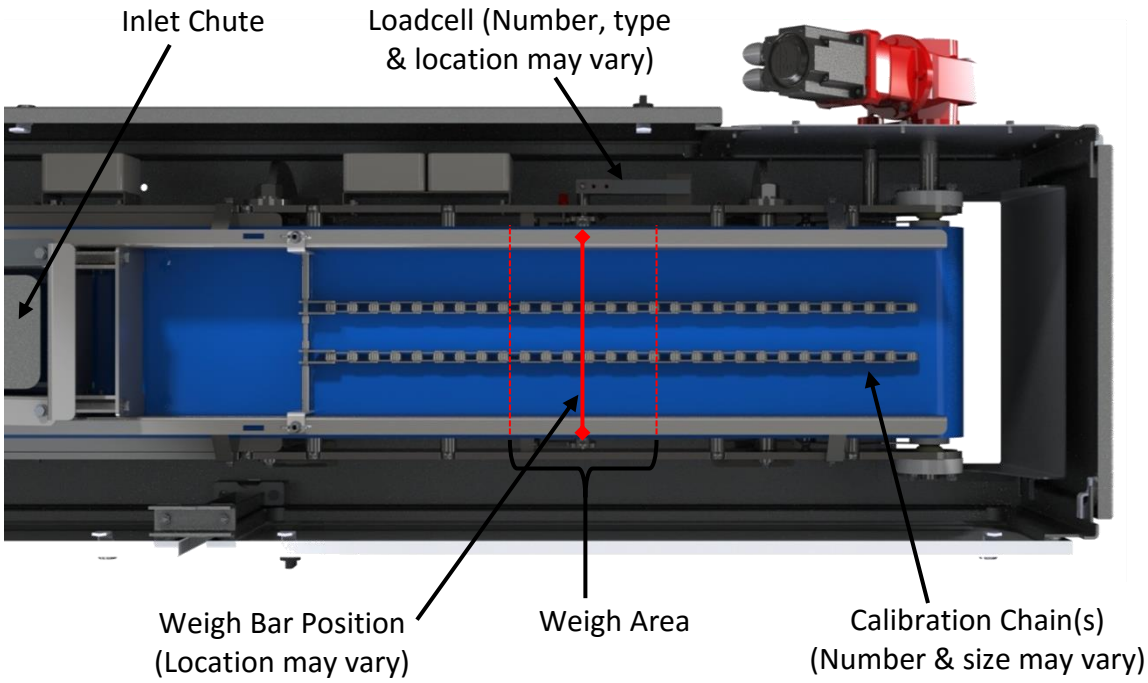
Typical Open Horseshoe Calibration Chain Position



Web Tech supply calibration chains with each feeder. The calibration chains are fitted as shown in these two pictures. Each weighfeeder will have calibration chains designed and manufactured specifically for the weighfeeder and its proposed duty. The number and total weight of the assembly is dependent on application.

After calibration is complete all components associated with the calibration chains must be removed from the feeder and stored in a suitable place. The chain must be kept clean and the rolls must be capable of rotating on the belt during a calibration check.

Typical Fully Enclosed Calibration Chain Position
(Enclosure top removed for clarity)



Mechanical Adjustments

The WT2000 series has eight areas that may require mechanical adjustment over the operating life of the feeder.

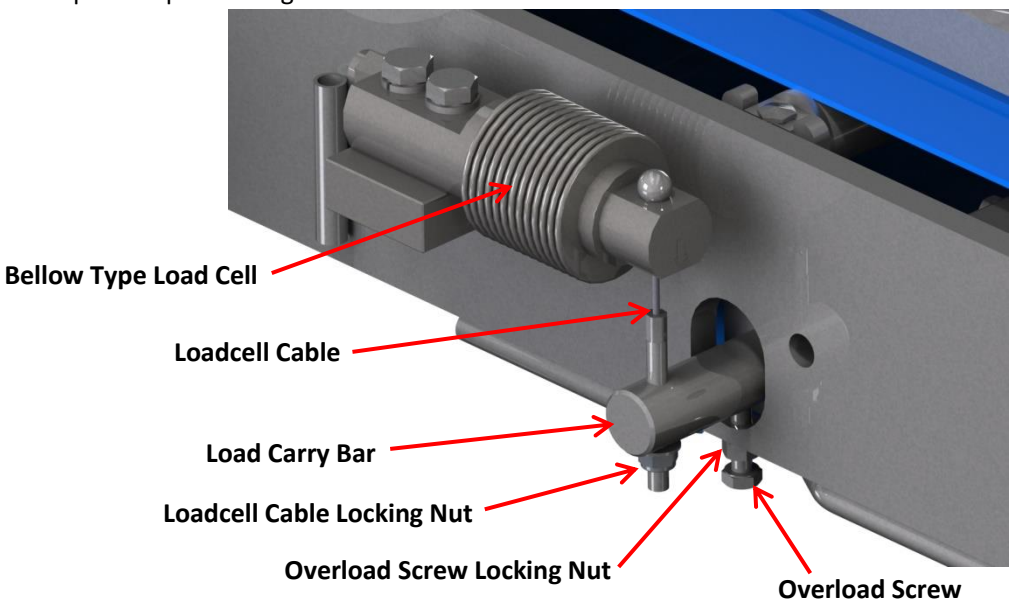
1) Load Cell Overload Protection
2) Belt Pre-Tensioning
3) Weigh Bar Height
4) Belt Carry Bar Heights
5) Belt Scraper(s) Carry Side Blade
6) Belt Scrapers Non Carry Side (Steering)
7) Belt Scrapers Non Carry Side (Plough)
8) Tail Pulley Scraper

The WT2000 series weigh feeders typically use load cells in the range of 5kg - 20kg. Their capacity is a function of the duty. In an effort to prevent accidental load cell overloads, Web Tech have provided a mechanism which will arrest the load cell travel after a set point has been exceeded. The overload mechanism comprises a 6mm bolt and lock nut, which will normally be set in the factory.

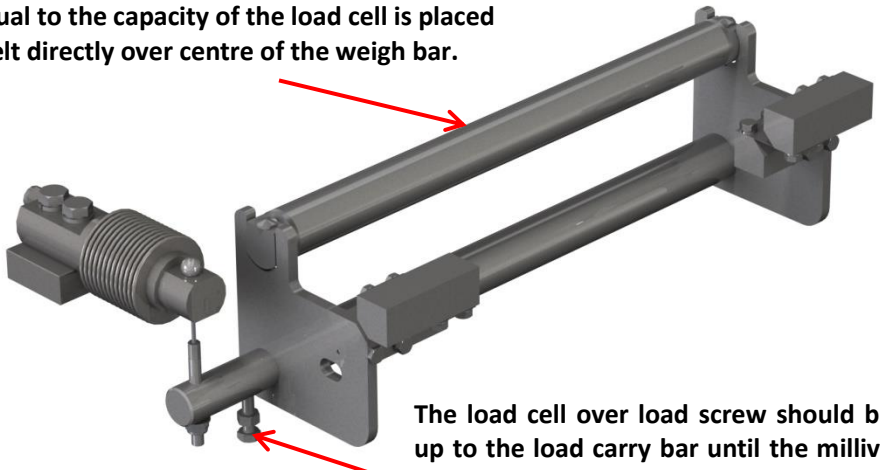
To set the overload(s) follow the following procedure:

(It is assumed that the height of the carry bars, weigh bar and the loadcell cable are correctly set)

1) Whilst monitoring the millivolt output of the loadcell(s) on the electronic integrator, place a weight equal to the capacity of the load cell on the belt directly over the centre of the weigh bar. Ensure the millivolt output does not exceed 125% of the loadcell capacity (i.e. 25mV).
2) Release the overload screw locking nut and adjust the load cell overload screw until it just contacts the load carry bar, and adjust until the millivolt output is approximately 21mV to 22mV. Tighten the overload locking nut up against the bottom of the stringer whilst maintaining the millivolt output. Repeat for the opposite side if applicable. The over load stop mechanism has now been set up and the weight should be removed from the belt.
3) Check that a clear gap can be seen between the top of the overload screw and the load carry bar prior to proceeding.



A weight equal to the capacity of the load cell is placed on the belt directly over centre of the weigh bar.

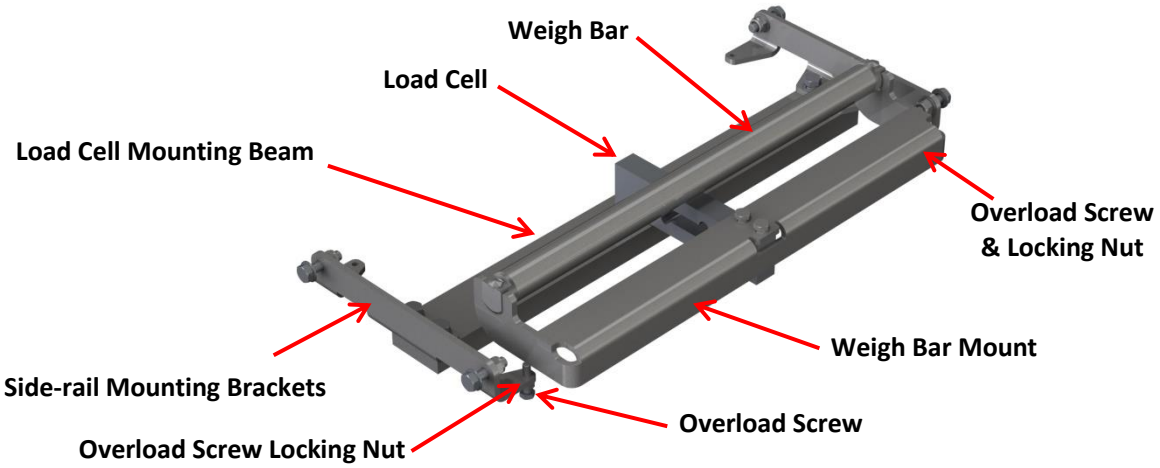


The load cell over load screw should be screwed up to the load carry bar until the millivolt output is approximately 21mV to 22mV. Finally tighten the locking nut up making sure that the bolt position and millivolts does not change.

Overload Protection
(Flexure Weighframe Models)

Where an internally mounted single point loadcell has been used, the procedure is similar to that previously mentioned, however there are two overload screws located just inside the each side rail in the weigh area. To set the overload(s) follow the following procedure:
(It is assumed that the height of the carry bars and weigh bar are correctly set)

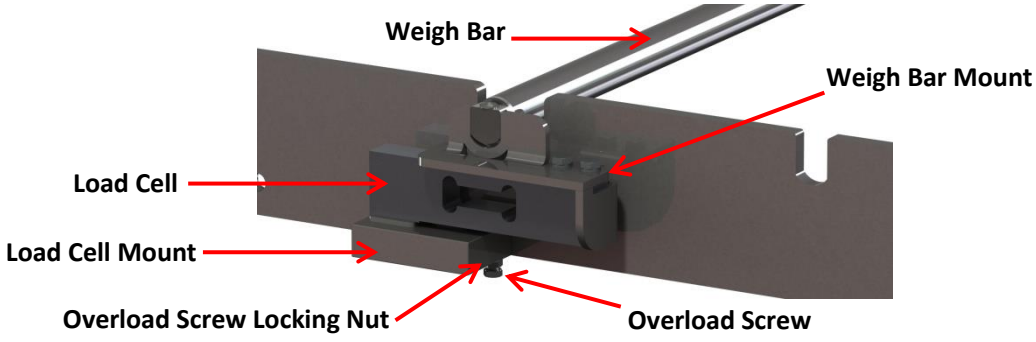
1) Whilst monitoring the millivolt output of the loadcells on the electronic integrator, place a weight equal to the capacity of the load cell on the belt directly over the centre of the weigh bar. Ensure the millivolt output does not exceed 125% of the loadcell capacity (i.e. 25mV).
2) Release the overload screw locking nuts and adjust the load cell overload screws until it just contacts the load carry bar, and adjust until the millivolt output is approximately 21mV to 22mV. Tighten the overload locking nut up against the bottom of the siderail mounting brackets whilst maintaining the millivolt output. Repeat for the opposite side. Move the weight to left and right hand side of the weigh bar to ensure both sides are set correctly.
3) Check that a clear gap can be seen between the top of the overload screw and the load carry bar prior to proceeding.



Overload Protection (Internal Single Point Loadcell Models)

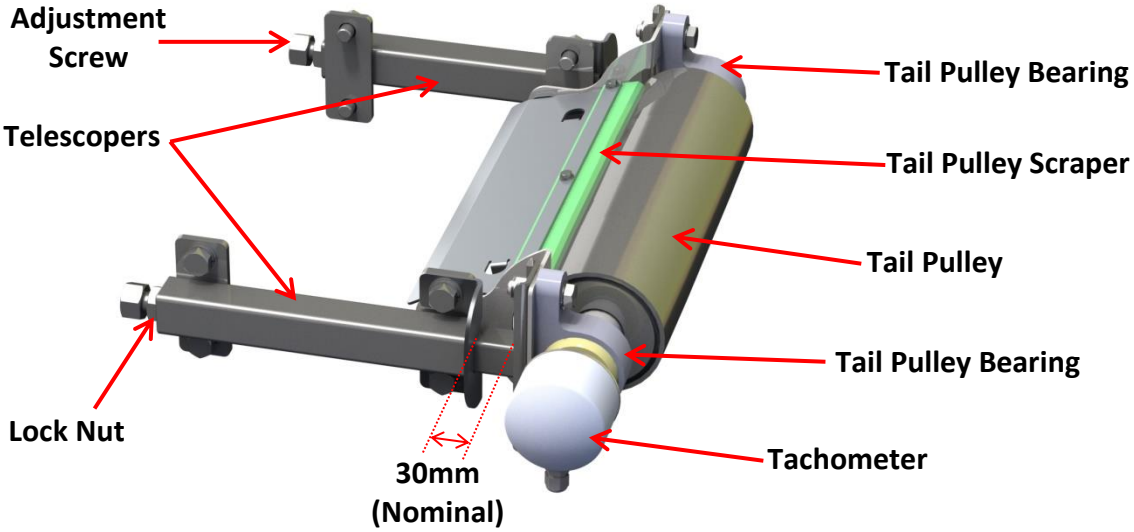
Where externally mounted single point loadcells have been used, the overload screws are located under each loadcell mount and will have to be set individually. To set the overloads:
(It is assumed that the height of the carry bars and weigh bar are correctly set)

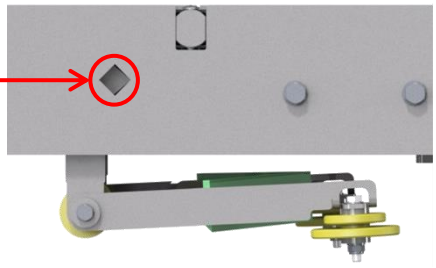
1) Whilst monitoring the millivolt output of the loadcells on the electronic integrator, place a weight equal to the capacity of the load cell on the belt directly over the centre of the weigh bar. Ensure the millivolt output does not exceed 125% of the loadcell capacity (i.e. 25mV).
2) Isolate one of the loadcells in the junction box and set the overload as per step 2 above. Isolate the other loadcell and repeat for the opposite side. Move the weight to left and right hand side of the weigh bar to ensure both sides are set correctly.
3) Check that a clear gap can be seen between the top of the overload screw and the load carry bar prior to proceeding.

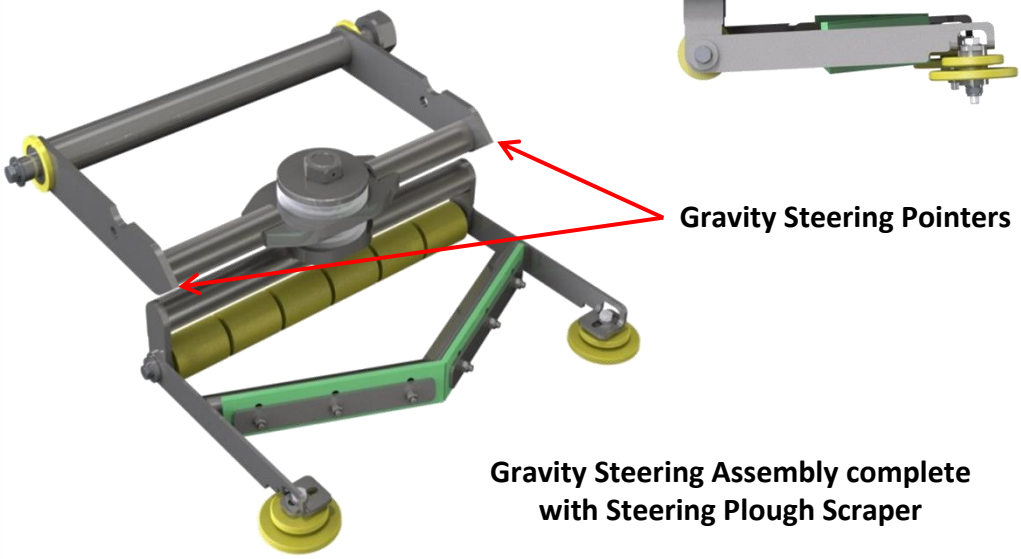


Overload Protection (External Single Point Loadcell Models)

It is important that weigh feeders are not subjected to varying belt tension during operation. The WT2000 series are fitted with a gravity assisted belt tensioning device to provide constant tension during normal operation, but are not designed to take up the large amount of slack required to make belt fitting and replacement easy. Therefore the WT2000 series of weigh feeders have been fitted with two telescope takeups. The tail pulley, tail pulley bearings, tachometer and tail pulley scraper are all attached to the telescopers and all move out from the weigh feeder when pre-tensioning the belt. The housing of the telescoper is bolted to the side rail of the weigh feeder and as the adjustment screw is turned the bearing plate with extend and retract from the housing. Please note the adjustment screw will not move out from the housing when rotated, only the bearing plate end. Both telescopers should be extended out from their housings by an equal amount, adjusting no more than 10mm on each side at one time, until they reach a nominal extension of 30mm (use a six inch rule to confirm). This distance may vary depending on belt length and pulley sizes. Final adjustments are made so the pointers on the Gravity Steering are aligned with the horizontal corners of the alignment window/diamond cut in the weigh feeder's side rails, and central tracking of the belt is maintained. Once final adjustments are made the telescope lock nuts are tightened. For more detail refer to the WT2000 Belt Replacement Guide.





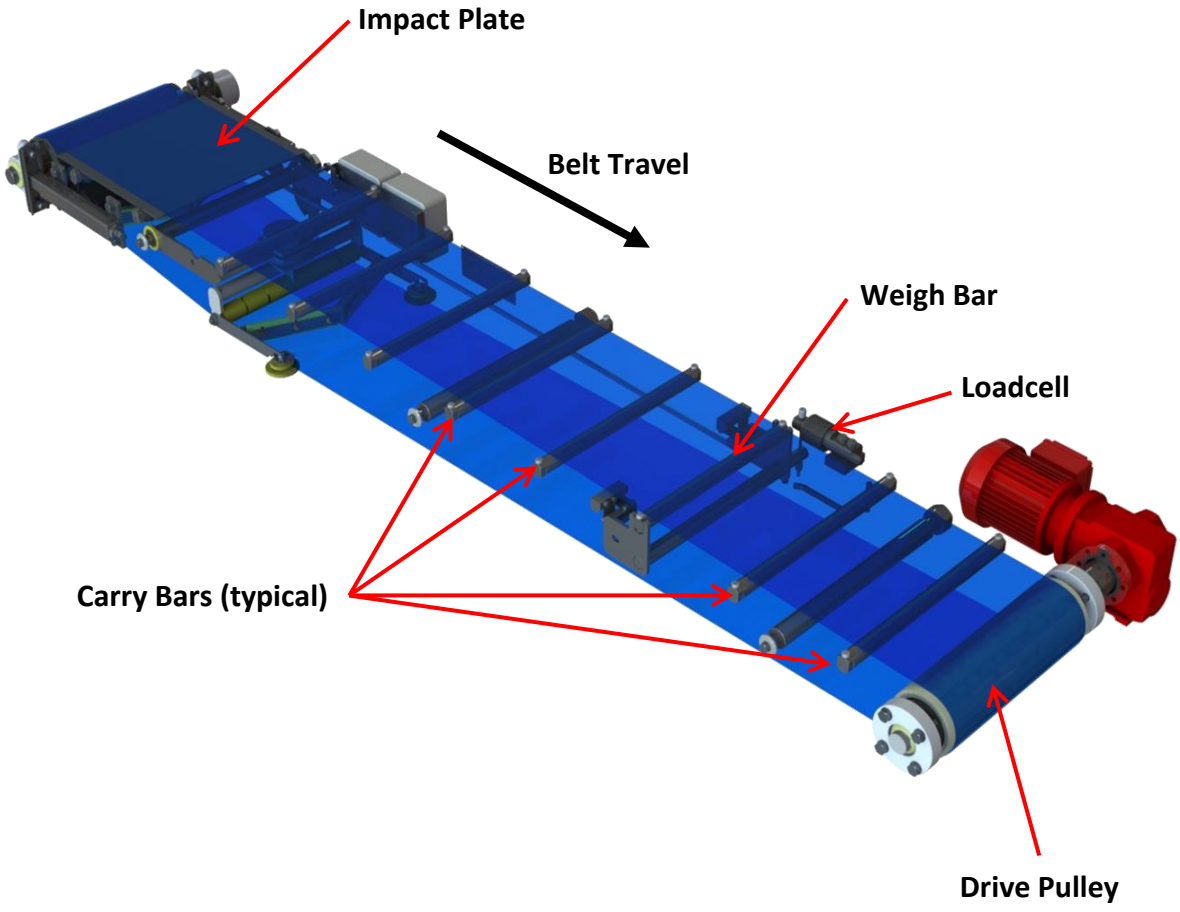


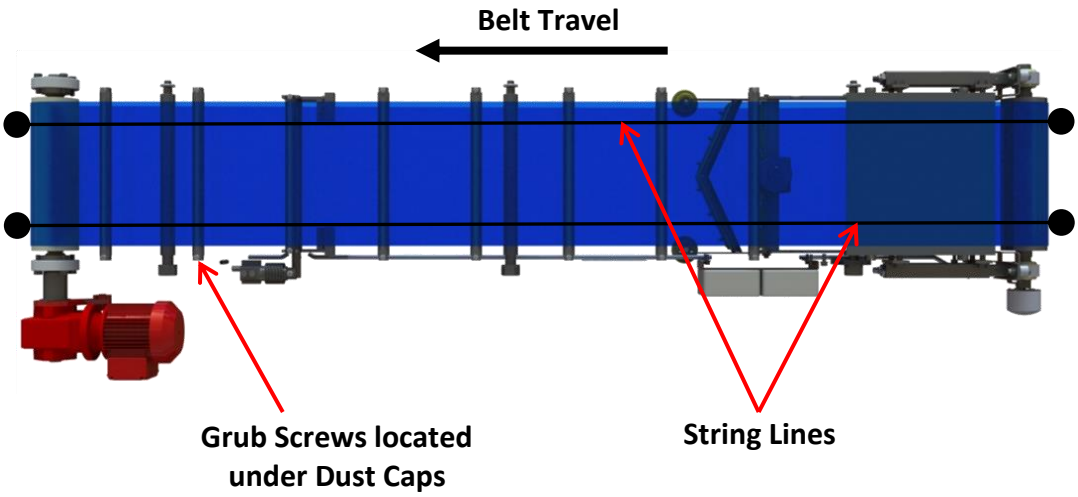
Gravity Steering Assembly complete with Steering Plough Scraper

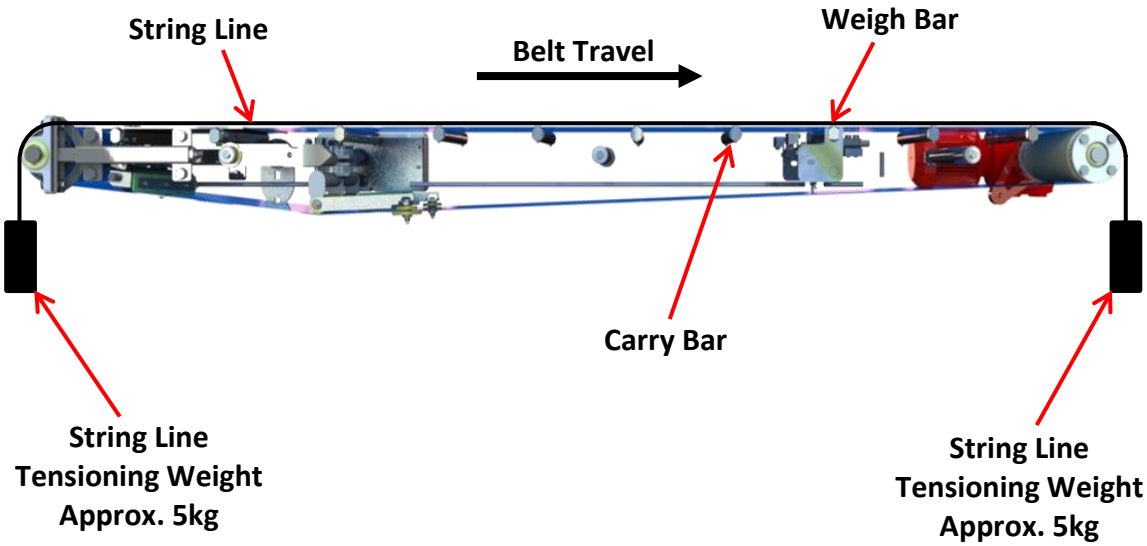
It is important that the belt path on the carry side of the weighfeeder be level. Each bar must be within 0.1mm vertically with all other carry bars, and also in line with the impact plate and drive pulley. Typically there will be two carry bars before the weigh bar, and two after (this may vary depending on the length and model of weighfeeder). The weigh bar must also be adjusted to the same precision as the carry bars if the weigh feeder is to return the accuracies specified. During transportation the weigh bar and carry bars may have settled. During commissioning, the commissioning technician will check the vertical alignment using a nylon string line with a breaking capacity of 120kg. If any bars are found not to meet our height specification they must be adjusted.

Adjustment is achieved by means of two grub screws located at either end of the bar. The grub screws can be located under a plastic or stainless dust cap which must be removed to gain access to the grub screws. When removing the dust caps on the weigh bar care must be taken not to damage the load cell. The 6mm grub screw will have been set in position using a thread locking liquid ("Loctite" or equivalent). The base of the screw will have been smeared with the compound so as to provide greater locking. It is therefore important that a correctly sized Allen Key be used (typically 3mm) if the grub screw is to be broken out without damaging the grub screw.

It is highly unlikely that adjustments in the order of +/- 0.5mm should be required. If this is found, check your methodology in assessing the bars relative heights.

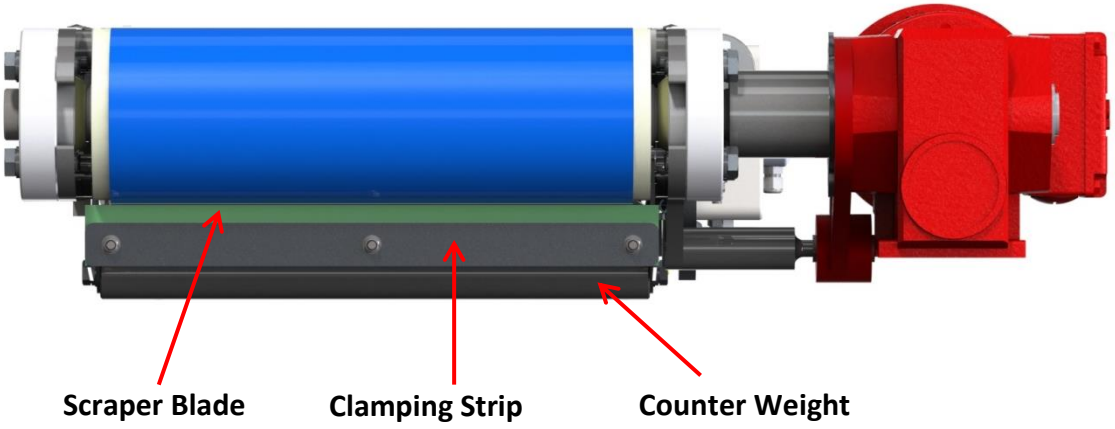


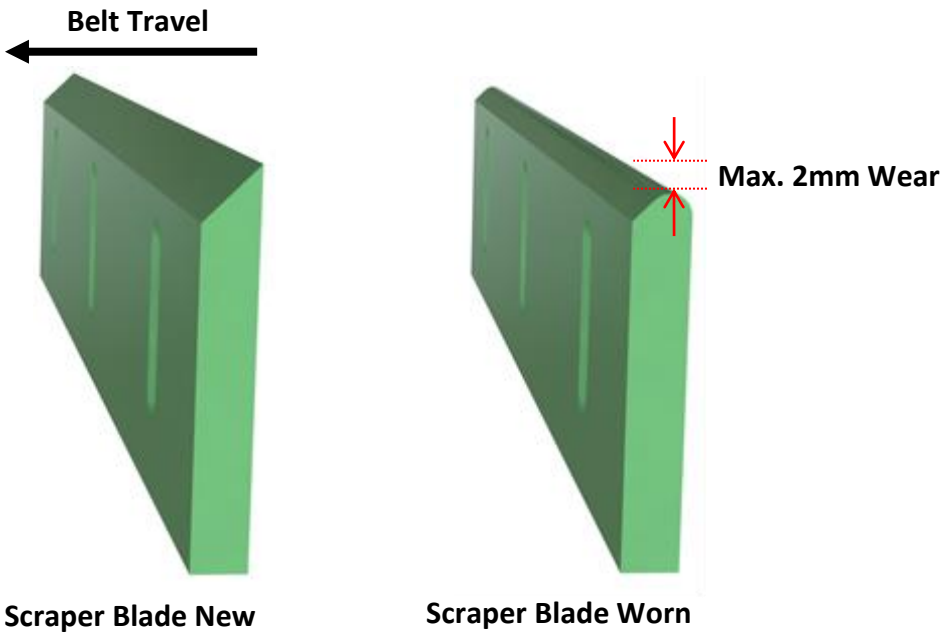

Belt Travel
Grub Screws located under Dust Caps
String Lines

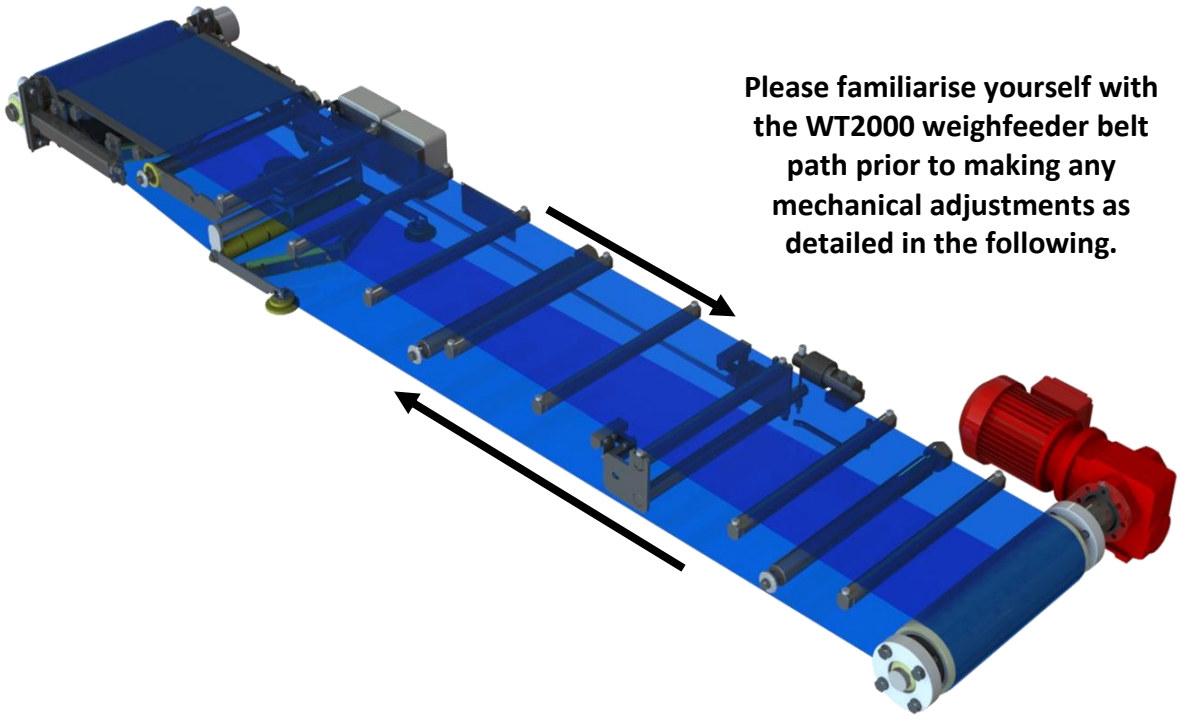

String Line
Belt Travel
Weigh Bar
Carry Bar
String Line Tensioning Weight Approx. 5kg
String Line Tensioning Weight Approx. 5kg

The WT2000 weighfeeder is fitted with a carry side belt scraper. The scraper prevents the conveyed product from building up on the carry side, and dropping off along the return belt path or piling up against the rear of the inlet chute.

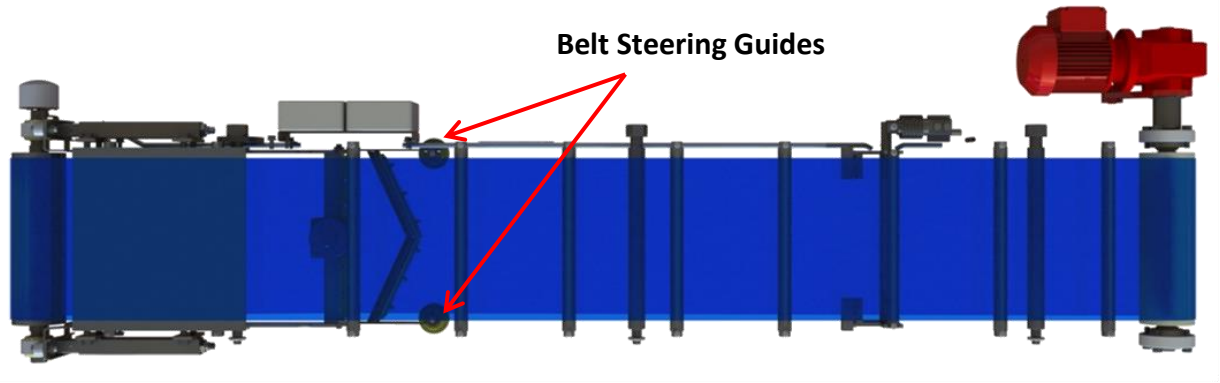
The scraper is manufactured from a pre lubricated material that is machined to form a scraper blade. It is important that the profile of the blade be maintained so that its cleaning properties are maintained. The blade is held in place by means of a backing plate and bolted clamping strip. Slots in the blade provide a means of adjustment along with the tension provided by a counterweight.

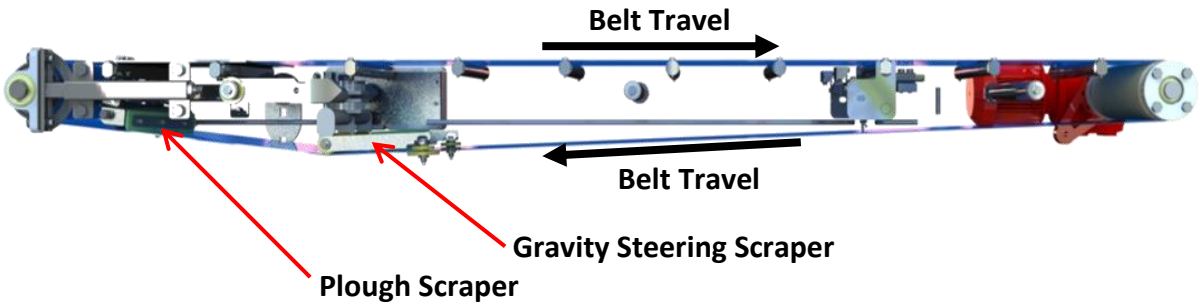






Please familiarise yourself with the WT2000 weighfeeder belt path prior to making any mechanical adjustments as detailed in the following.

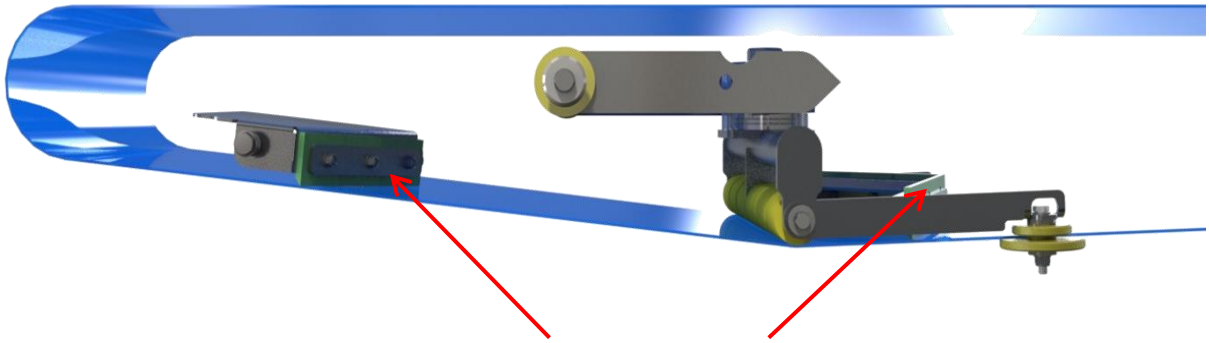




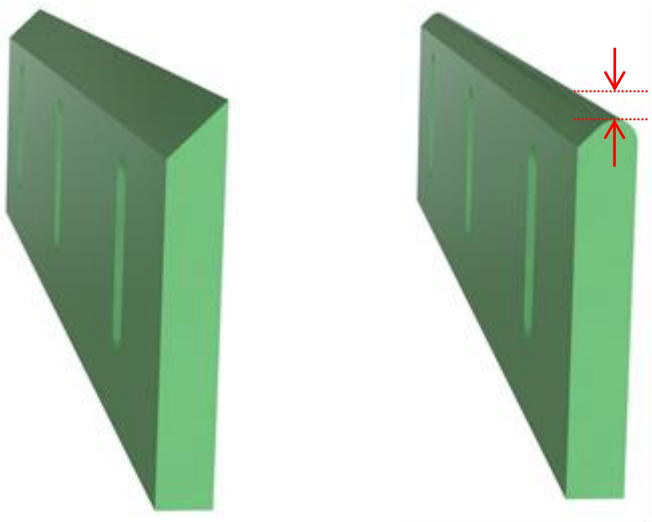
Belt length for the WT2000 series weigh feeder is typically 4550mm. Reliable belt tracking on short centred belts is quite difficult. Web-Tech achieves belt centring by taking care that the entire weighfeeder is built “square”. The tail pulley is crowned and the belt is tensioned by a gravity assisted mechanism that is fitted with active belt steering. Crowned pulleys have the greatest effect on belt tracking, however they introduce a lateral tension line along the belt which will affect the performance of the weighing mechanism. Web Tech only crown the tail pulley in an effort to minimise belt creasing, therefore it is important that this pulley be kept clean. The profile of the crowned pulley changes when contaminated, negating the effect of crowning.

Three scrapers are used to keep the pulley surface clean. There are two plough style scrapers fitted to the non-carry side of the belt. One is fitted to the gravity steering device and the other is a stand-alone unit fitted to the rear of the weighfeeder just before the belt wraps around the tail pulley.

The scraper elements are subject to wear. For the weighfeeder to operate correctly and perform to the advertised specifications, both sides of the belt and critical components in the belt path must be kept clear of contaminants. Regular inspection of the scraper blade elements must be undertaken and the blades must be maintained to the specifications shown below. The blade elements can be machined a number of times prior to being replaced. Blade elements are manufactured from a pre-lubricated high density plastic compound and must not be replaced with blades manufactured from any other material.



Plough Scraper Locations



Scraper Blade New

Scraper Blade Worn (Needs Replacing)

The plough scraper fitted to the gravity steering/tensioning device acts as a pre-scraper to the stand alone plough scraper, as well as keeping the gravity steering rolls clean. The plough is formed by two blades machined from a pre-lubricated material and held in place by means of a backing plate and clamping strips. Each blade can be adjusted by means of machined slots. When adjusting these blades care must be taken to ensure that the belts path is not distorted by adjusting the blade too deep into the belt. The profile of the scraper blade is important to provide an effective scraping mechanism. If the scraper blade does not meet the approximate dimensions as shown, it must be either machined or replaced.

The stand-alone plough scraper is formed by two machined blades fitted to a pressed steel/ stainless steel frame. As well as providing an attachment point for the scraper blades, the frame acts as a cover, protecting the belt from material removed from the pulley by the pulley scraper that is located directly above it. As with all the scraper blades used it is important that the profile of the blade be maintained by either machining or replacing.

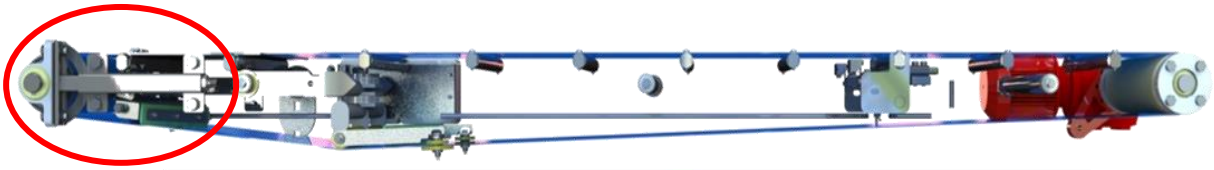
Plough Belt Scraper

Gravity Steering Plough Scraper

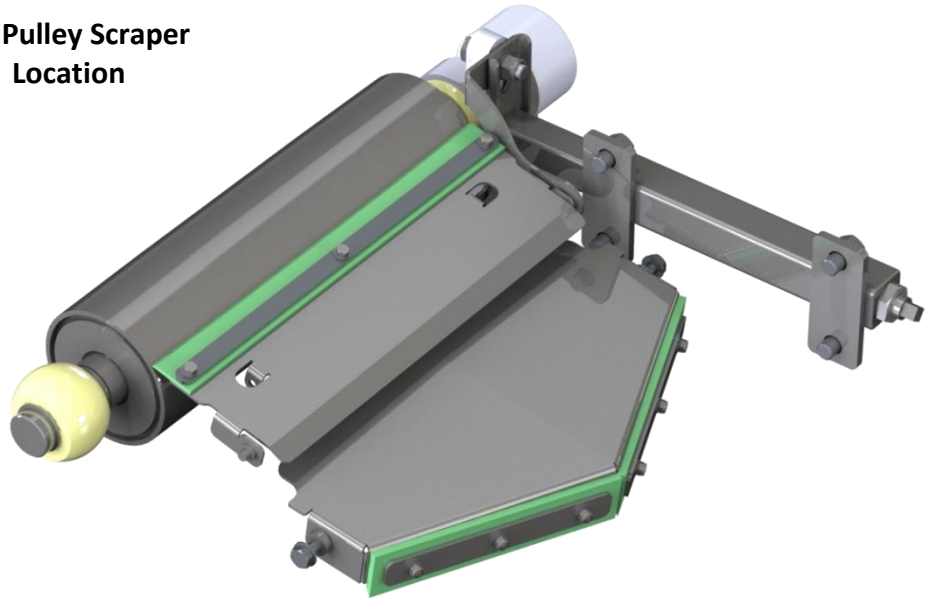
Mechanical Adjustments – Tail Pulley Scraper

As previously stated, the crowned tail pulley has the greatest effect on belt tracking. A build-up of material on this pulley will change its shape and negate the effects of crowning. Web Tech has incorporated a pulley scraper to assist in keeping the pulley free of any material build up on the pulley face. To assist in keeping the scraper in contact with the crowned face an additional weighted bar can be added. In older models springs have been fitted to the blade mounting hardware. The tension on those springs can be adjusted by means of a lever. To increase the tension the lever securing nut should be loosened, the lever can then be repositioned and locked in the new position.

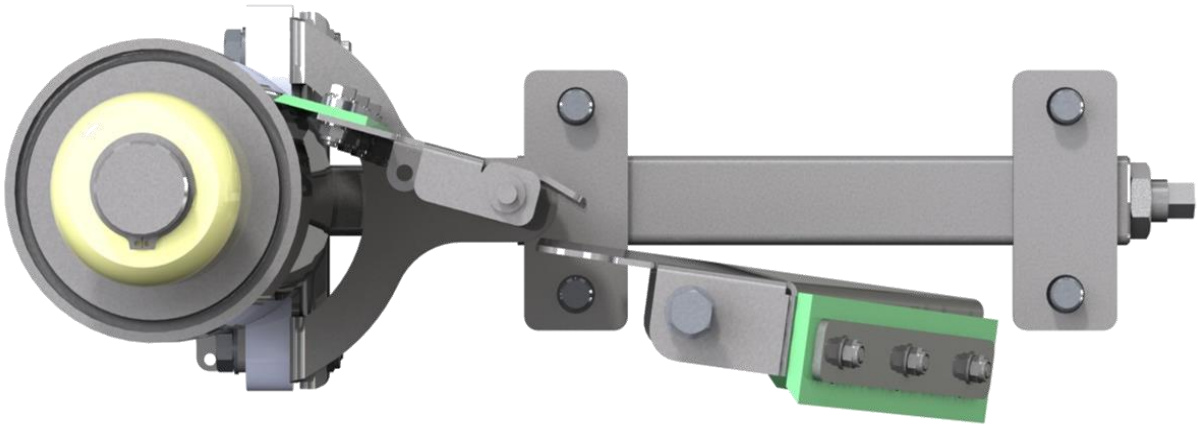
As with all the WT2000 Weigh Feeder scraper blade elements, the profile of the blade must be maintained if the scraper is to work as intended.



Tail Pulley Scraper Location



Tail Pulley Scraper Isolated

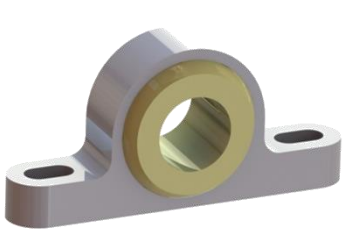


Tail Pulley Scraper Side View

Mechanical Lubrication

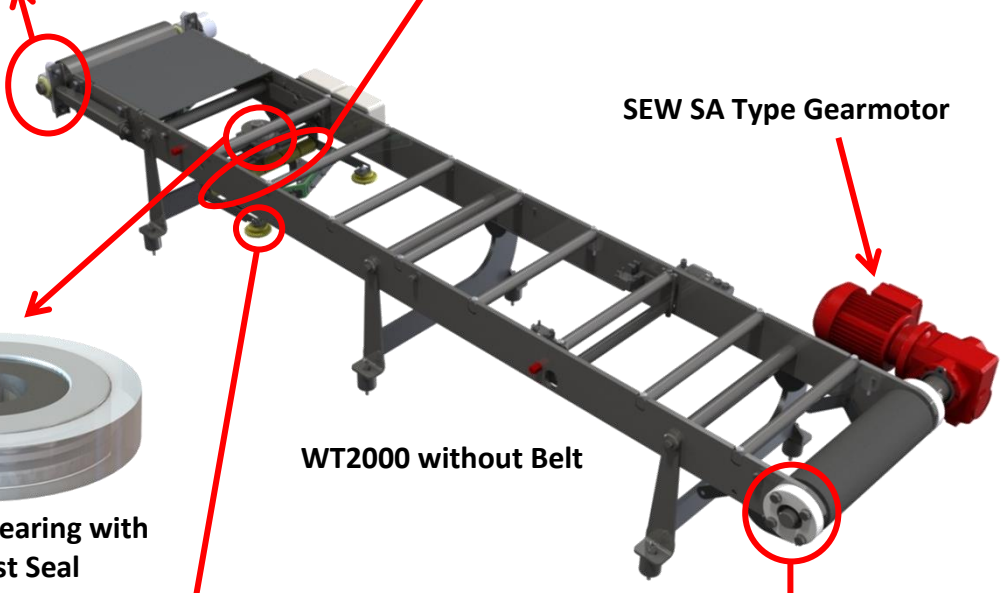
The WT2000 series of weigh feeders have been designed primarily for use in the food, snack food and chemical industries where the use of grease and oil may not be permitted. Where possible the bearings and rubbing surfaces have been designed using material that uses no or little oil and grease.

- Both pulleys are fitted with Igus polymer bearings that require no lubrication.
- The gravity steering rollers are manufactured from pre-lubricated materials that need no lubrication.
- The belt steering capstans are manufactured from pre-lubricated materials that need no lubrication.
- The belt steering pivoting bearings are factory packed with food grade grease.
- The motor gearbox is supplied with oil specified by the manufacturers. The manual for the motor and gear box can be found in the rear of this manual.



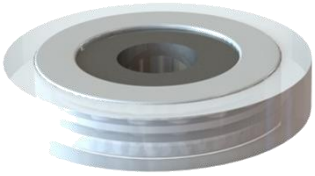
IGUS Pillow block Bearing

Gravity Steering rollers



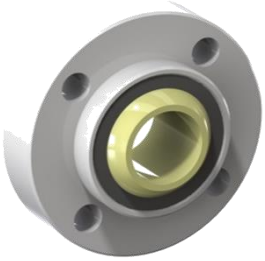
SEW SA Type Gearmotor

WT2000 without Belt



Thrust Bearing with Dust Seal

Belt Steering Capstan



IGUS Press-fit bearing

Electrical Motor

The motor supplied with the weighfeeder depends on the application. The WT2000 series of weigh feeders are generally used to control the mass rate of powders and food stuffs at a maximum of:

- 300mm Belt - 16m³
- 450mm Belt - 24m³
- 600mm Belt - 32m³
- 750mm Belt - 40m³
- 900mm Belt - 48m³

Based on max shear gate opening 100mm, shear gate width equal to half of belt width and maximum belt speed of 0.3m/S.

The torque required to extract the feed from the WT2000 series inlet chute is generally quite low. The most important factor when designing a weighfeeder is the belt speed. The belt speed is directly proportional to the shear gate height and inlet chute width.

When dealing with a lumpy product Web Tech sets the shear gate height greater than or equal to 2.5 times the maximum lump size. When dealing with powders, the shear gate height is usually set to suite the belt width, belt speed and the products angle of repose.

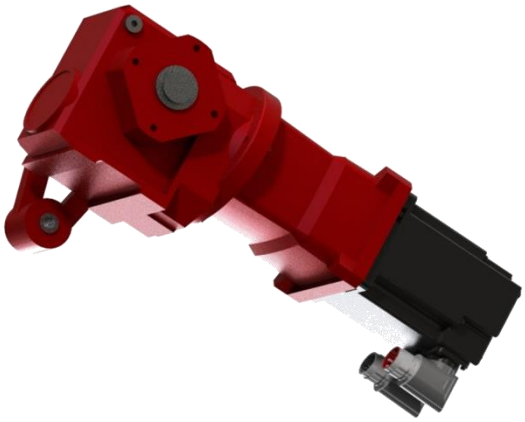
Web Tech attempts to design a weighfeeder so that the maximum rate is achievable at VSD outputs in the range of 50Hz to 60Hz, and the minimum VSD output of no less than 10Hz. Outputs of less than 10Hz may cause the motor to fail due to overheating. It is possible to fit an electric fan to the motor, however Web Tech prefers to avoid this by using a gearbox reduction that suits the application.

Very low belt speeds and large bed depths can also cause the product to “briquette” at the discharge point.

For applications in the food and snack food industries non-toxic food grade oil is available.

Motor gearbox information is covered in the manufacturer’s manual, which can be found in the rear of this manual.

The WT2000 range of weigh feeders incorporate shaft mounted motor gearbox arrangements. The pulley shaft, manufactured by Web Tech, will have been coated with an anti-seize grease supplied by the motor/gearbox manufacturer.



SEW Gearbox with Allen Bradley Servo Motor

SEW SA Type Gearmotor